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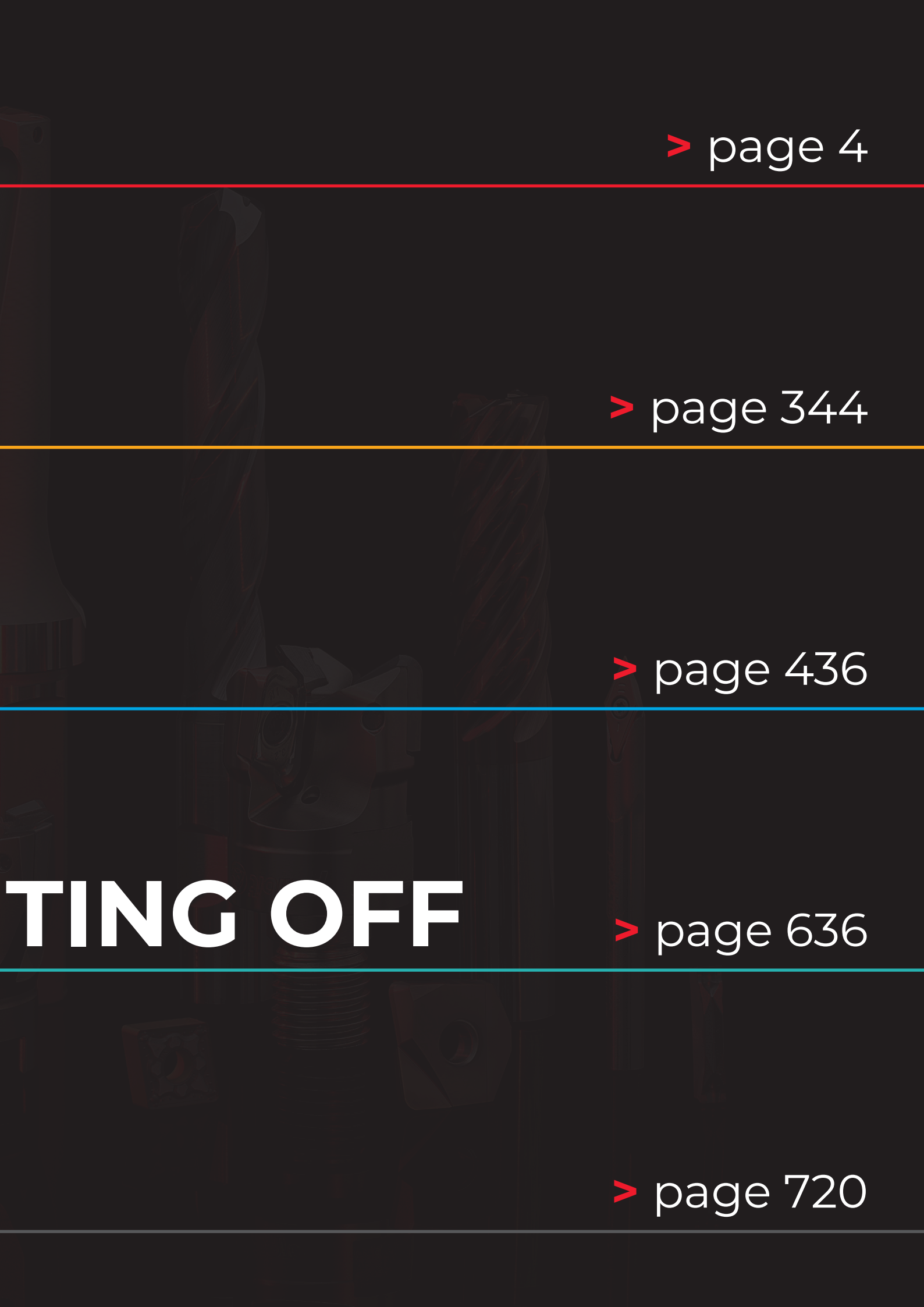
MILLING

HOLEMAKING

TURNING

GROOVING & PAR

THREADING



> page 4

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TING OFF

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CUTTING TOOLS FOR

MILLING



A

A - MILLING

A - 06 | Operation Selection
A - 11 | Milling Tools Codification
A - 12 | Milling Tools Overview
A - 18 | Milling Inserts Codification
A - 20 | Inserts Overview



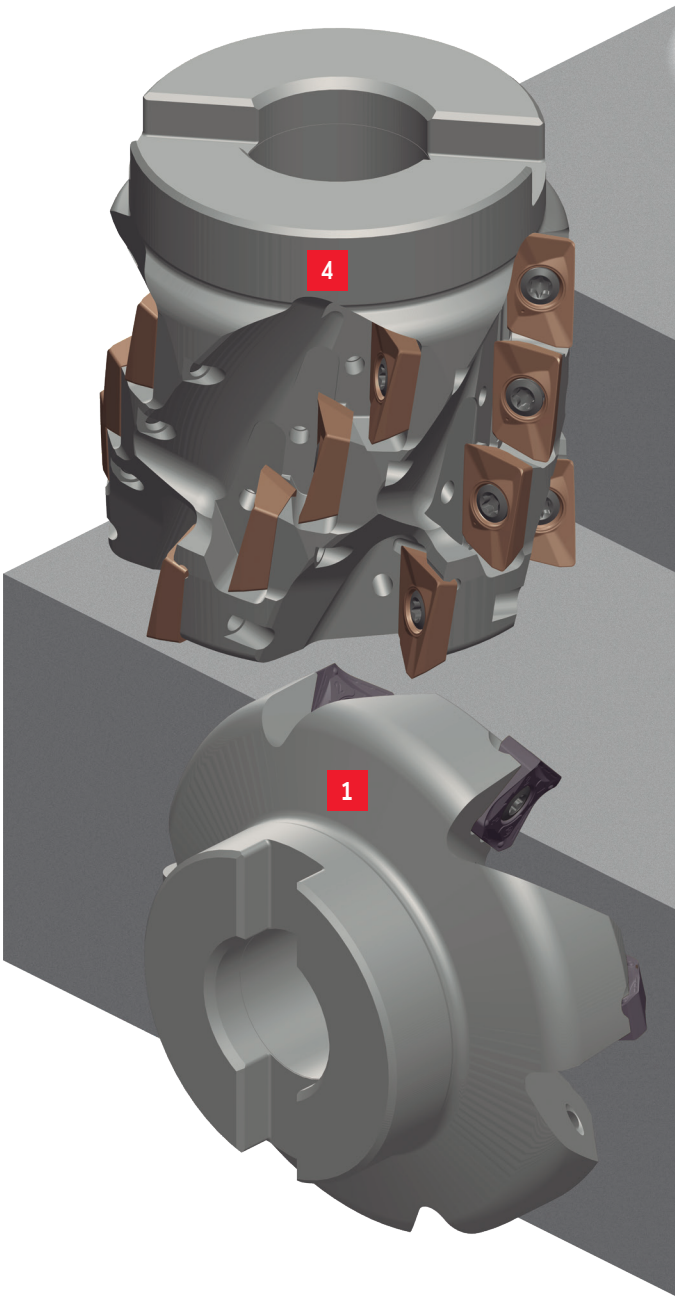
A - 44 | Face Milling
A - 82 | High Feed Milling
A - 132 | Shoulder Milling
A - 244 | Profile Milling
A - 270 | Specialty Milling
A - 288 | Spare Parts
A - 298 | Technical Data

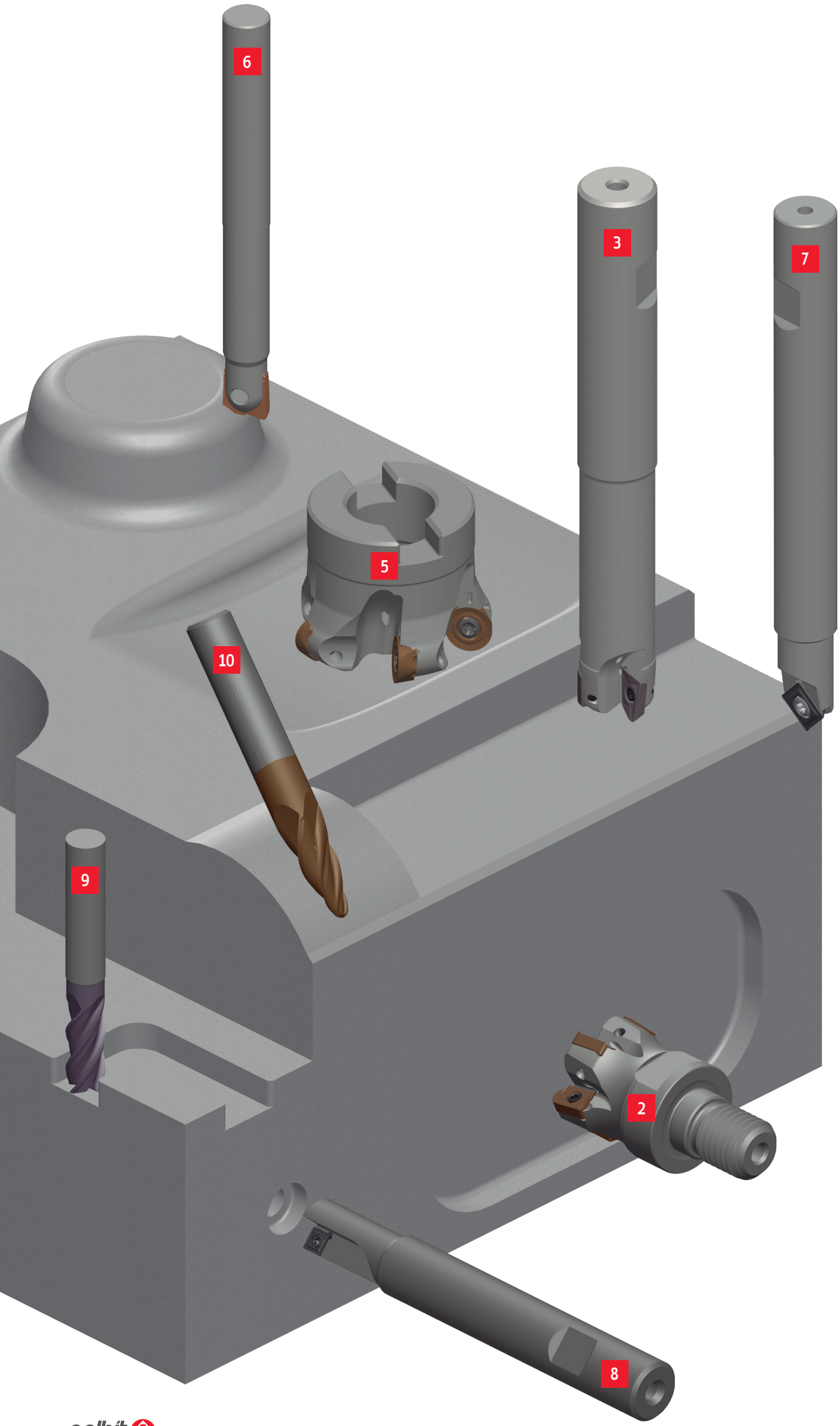
A - 314 | Solid Carbide End Mills
A - 316 | SCE - PCD Tipped
A - 322 | SCE - Choose by Material
A - 330 | SCE - Choose by Application
A - 340 | SCE Grades

OPERATION SELECTION Seleção da operação | Selección de operación

MILLING OPERATIONS

1. Face milling
2. High feed milling
3. Shoulder milling
4. Heavy milling
5. Profile milling
6. Finishing
7. Speciality
8. Spot face
9. Solid carbide end mills
10. 5-Axis




6
3
7
5
10
9
2
8

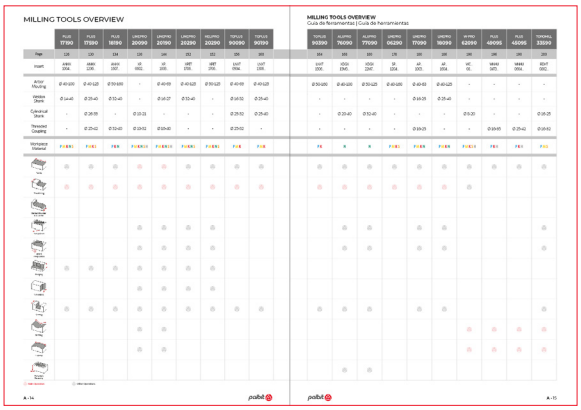
MILLING TOOL SELECTION Seleção da ferramenta de fresagem | Selección de la herramienta de fresado

1 - Define your operation type:

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

Select your tool:

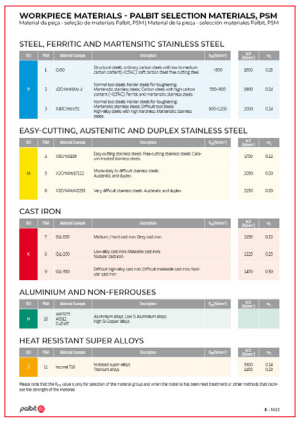
See page A - 12



2 - Define your material according to ISO:

- P Steel
- M Stainless Steel
- K Cast Iron
- N Aluminium & Non Ferrous Materials
- S Heat Resistant and Titanium Alloy
- H Hardened Material

See the last page for Palbit Selection Materials - PSM

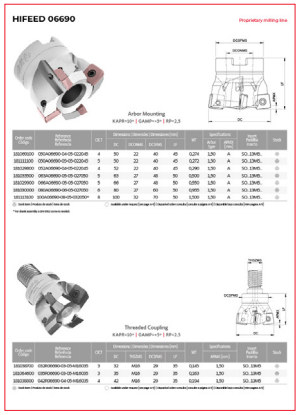


3 - Select your milling cutter.

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 mounting type
- The cutter marked as “stock available under request” has a minimum order quantity according to the following table:

Qty	* DC Size
10	≤ 3.937 in
5	> 3.937 in

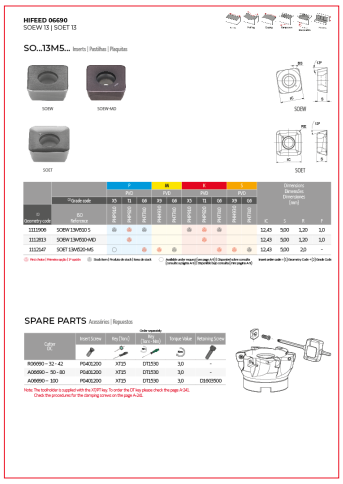


4 - Select your insert.

Choose the chip breaker for your operation:

- Chip breaker L= Light (for light cuts when low forces/power are required)
- Chip breaker M = Medium (first choice for mixed production)
- Chip breaker H = Heavy (for rough operations, forging, cast skin and vibration)
- Select insert grade for optimum productivity
- The insert marked as “stock available under request” has a minimum order quantity according to the following table:

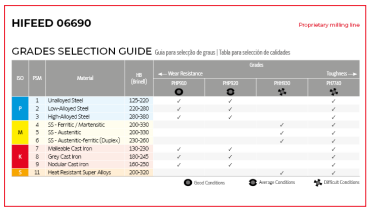
Qty	*IC Size
300	≤ IC 0.984 in
150	> IC 0.984 in



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.



INSERTS CODIFICATION FOR MILLING TOOLHOLDERS

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

Code	Inserts Description	Page
AN90-10	ANHX 1004...	146
AN90-12	ANHX 1204...	150
AN90-16	ANHX 1607...	154
AP90-10	AP... 1003...	192
AP90-16	AP... 1604	198
ON45-05	ON..X 0505.. | SN..X 1206	56
PN60-11	PNHX 1105...	52
RN90-12	RN... 1204...	254
RP90-10	RP... 10T3...	248
RP90-12	RP... 1204...	248
RP90-16	RP... 1605...	248
SN45-12	SN...X 1206...	56 | 60
SN45-16	SN...X 1606 | ON...X 0606...	64
SN88-12	SN...U 1206...	48
SO10-08	SO... 0803...	94
SO10-13	SO... 13M5...	100
SO15-16	SO... 1605...	106
WD60-12	WD... 1204...	112

Code	Inserts Description	Page
WN60-12	WNMW 1207...	116
WN90-04	WNHU 04T3...-LP	142
WN90-08	WNXT 0806..	136
XD90-15	XDGX 15M5...	182
XD90-22	XDGX 22M7...	186
XN20-06	XNKU 06T3...	86
XN90-12	XNHW 1205...	274
XP90-06	XP... 0602...	160
XP90-10	XP... 1003...	166
XP90-17	XPET 1706...	174

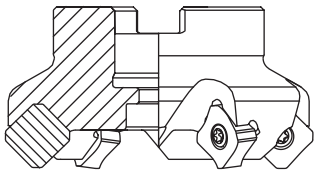
Code	Inserts Description	Page
	METRIC LINE	
060	SE...T/W 1204	76
062	SP..X 1204	230
063	POKT 0403	122
099	SE...T/W 13T3	78
164	XNKU 1205	128
202	XPET 1706...	210
211	XP... 1003...	204
494	W...XT 0403...	234
495	WNXT 0806...	240
570	SFHX 1004.. | OFHX 0403..	70
620	WC...	260
640	VPGT 0602...	282
900	LNXT 0904	216
901	LNXT 1306	220
903	LNXT 1506	224

COUPLING TYPES Tipo de acoplamento | Tipo de acoplamiento

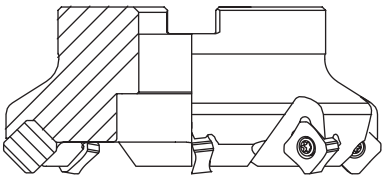
Symbol Símbolo Símblo	Coupling type Tipo de acoplamento Tipo de acoplamiento	Inserts fixation type Fixação de pastilhas Fijación de plaquitas	Standard Norma Norma
A	Arbor mounting Montagem tipo árvore Montaje tipo husillo	Insert screw Parafuso pastilha Tornillo de la plaquita	ISO 6462
B		Wedge Cunha 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
X	Special coupling Acoplamento especial Acoplamiento especial	Any type Qualquer tipo Cualquier tipo	

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

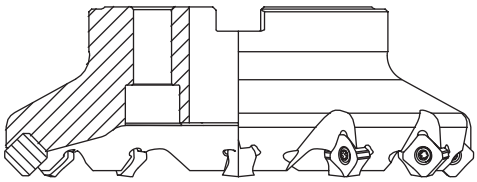
Arbor type A



Arbor type B



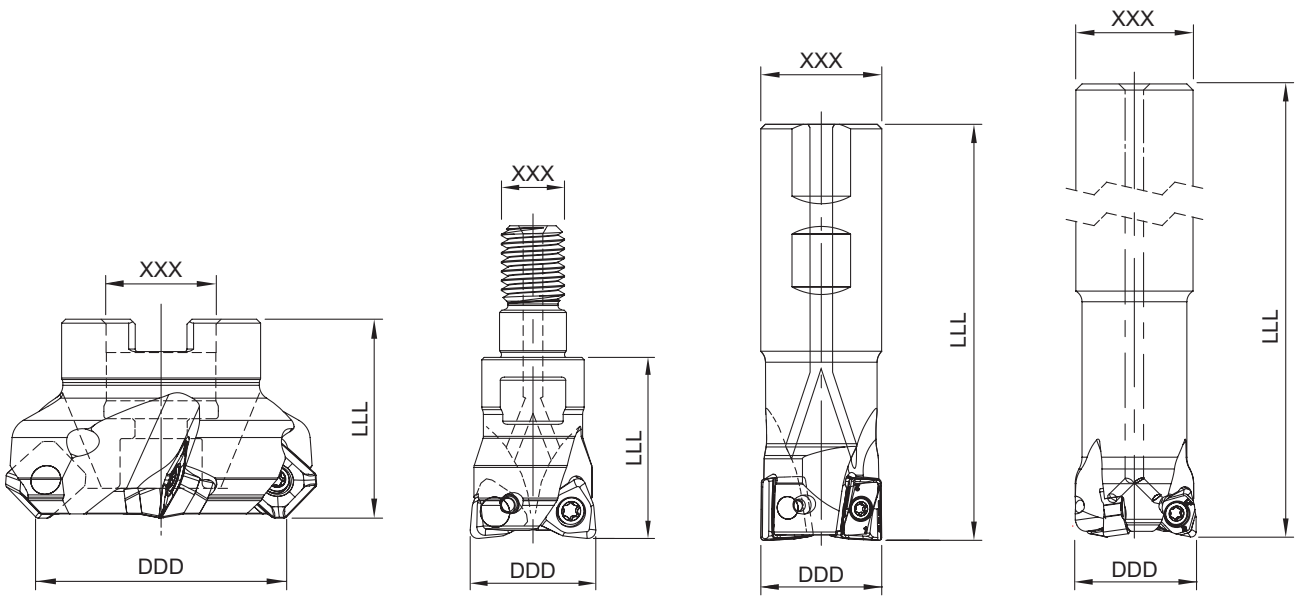
Arbor type C



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 TOOLS CODIFICATION

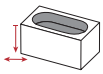
Codificação das ferramentas de fresagem | Codificación de heramientas de fresado



AN 90 - D3.00 A XXX / LLL U - 06 - 16 - L

- **AN** — Insert Type (A-9) / Pastilha aplicável (A-9) / Inserto aplicable (A-9)
- **90** — Lead angle / Ângulo de posicionamento da pastilha / Ángulo de posicion del inserto
- **D3.00** — Diameter / Diâmetro / Diametro
- **A** — Coupling Type (A-10) / Tipo de acoplamento (A-10) / Tipo de acoplamiento (A-10)
- **XXX** — Coupling diameter / Diâmetro de acoplamento / Diámetro de acoplamiento
- **LLL** — Total lenght / Comprimento total / Longitud total
- **U** — Cooling system / Refrigeração / Refrigeración
  - U - Whitout cooling system
  - U - Sem refrigeração
  - U - Sin refrigeración
- **06** — Number of teeth / Número de dentes / Numero de dientes
- **16** — Insert dimension / Dimensão da pastilha / Dimesion del inserto
- **L** — Rotation (R/L) / Rotação (R/L) / Rotación (R/L)
  *In case of right rotation the "R" is supressed.

MILLING TOOLS OVERVIEW

	PLUS SN88-12	PLUS PN90-11	PLUS ON45-05	PLUS SN45-12	PLUS SN45-16	METRIC LINE LINEPRO 57045	METRIC LINE LINEPRO 06045	METRIC LINE LINEPRO 09945	TETRAFEED XN20-06
Page	46	50	56	60	64	68	76	78	84
Insert	SN...U 1206...	PN...X 1105	SN... 1206 ON... 0505...	SN..X 1206	SN... 1606... ON... 0606...	SFHX 1004.. OFHX 0403..	SE... 1204...	SE... 13T3...	XNKU... 06...
Arbor Mounting	Ø 2.00 to 10.000	Ø 2.000 to 10.000	Ø 2.000 to 5.000	Ø 1.500 to 10.000	Ø 2.500 to 10.000	Ø 1.575 to 4.921	Ø 1.969 to 6.299	Ø 1.969 to 9.843	Ø 1.500 to 2.500
Weldon Shank	-	-	Ø 1.260 to 1.575	-	-	Ø 0.787 to 1.260	-	-	Ø 0.625 to 1.250
Cylindrical Shank	-	-	-	-	-	Ø 0.787 to 1.260	-	-	Ø 0.625 to 1.500
Threaded Coupling	-	-	-	-	-	Ø 0.787 to 1.260	-	-	Ø 0.625 to 1.500
Workpiece Material	P M K	P K	P M K N S	P M K N S	P M K S	P M K S	P M K N	P M K N	P M K S
 Facing	●	●	●	●	●	●	●	●	●
 Shouldering	○								
 Slanted Shoulder & Chamfer			○	○	○	○	○	○	
 Ramp down									○
 Helical Interpolation									○
 Plunging									○
 Side milling									
 Slotting									
 Profiling									○
 Copying									○
 Plunging & Recessing									

● Main Operation ○ Other Operations

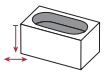
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MILLING TOOLS OVERVIEW

Guia de ferramentas | Guía de herramientas

	HIFEED SO10-08	HIFEED SO10-13	HIFEED SO15-16	HIFEED WD60-12	HIFEED WN60-12	METRIC LINE PENTA HIFEED 06320	METRIC LINE TETRAFEED 16420	HEXAPLUS WN90-08	PLUS WN90-04	PLUS AN90-10
	94	100	106	112	116	120	126	134	140	146
	SO... 0803...	SO... 13M5...	SO... 1605...	WD... 1204...	WN... 1207...	POKT 0403...	XNKU... 12...	WNXT 0806...	WNHU 04T308-LP	ANHX 1004...
	Ø 1.500 to 2.000	Ø 2.000 to 4.000	Ø 2.500 to 6.000	Ø 2.000 to 3.000	Ø 2.000 to 4.000	Ø 1.575 to 2.598	Ø 1.969 to 3.937	Ø 2.000 to 3.000	-	Ø 1.500 to 4.000
	Ø 0.750 to 1.250	-	-	-	-	-	Ø 1.260 to 1.575	-	-	Ø 0.750 to 2.000
	-	-	-	-	-	Ø 0.787 to 1.575	-	-	Ø 0.625 to 1.000	-
	Ø 0.750 to 1.250	Ø 1.260 to 1.654	-	-	Ø 1.378	Ø 0.630 to 1.654	-	-	Ø 0.625 to 1.000	-
	PMKS	PMKS	PMKS	PMKS	PK	PK	PMKS	PK	PK	PMKNS
	●	●	●	●	●	●	●	○	○	○
								●	●	●
	○	○	○	○	○	○	○	○		
	○	○	○	○	○	○	○	○		
	○	○	○		○	○	○			○
								○		
										○
	●	●	●	●	●	●	○			
	●	●	●	●	●	●	○			

MILLING TOOLS OVERVIEW

	PLUS AN90-12	PLUS AN90-16	LINEPRO XP90-06	LINEPRO XP90-10	LINEPRO XP90-17	ALUPRO XD90-15	ALUPRO XD90-22	LINEPRO AP90-10	LINEPRO AP90-16
Page	150	154	160	166	174	182	186	192	198
Insert	ANHX 1206...	ANHX 1607...	XP.. 0602...	XP.. 1003...	XPET 1706...	XDGX 15M5...	XDGX 22M7...	AP.. 1003...	AP.. 1604...
Arbor Mounting	Ø 2.000 to 4.000	Ø 2.000 to 6.000	-	Ø 1.500 to 2.500	Ø 1.500 to 5.000	Ø 1.500 to 4.000	Ø 2.000 to 5.000	Ø 1.575 to 2.480	Ø 1.500 to 6.000
Weldon Shank	Ø1.000 to 1.500	Ø 1.250 to 2.000	-	Ø 0.625 to 1.000	c	-	-	Ø 0.500 to 1.500	Ø 0.875 to 1.500
Cylindrical Shank	Ø 1.024 to 1.299	-	Ø 0.395 to 0.625	-	-	Ø 0.750 to 1.500	Ø 1.500 to 5.000	-	-
Threaded Coupling	Ø1.000 to 1.500	Ø 1.260 to 1.575	Ø 0.625 to 1.250	Ø 0.625 to 1.250	-	Ø 0.984 to 1.575	-	Ø 0.630 to 0.984	-
Workpiece Material	P M K S	P K N	P M K N S H	P M K N S H	P M K N S	N	N	P M K N	P M K N
 Facing	◎	◎	◎	◎	◎	◎	◎	◎	◎
 Shouldering	◎	◎	◎	◎	◎	◎	◎	◎	◎
 Slanted Shoulder & Chamfer									
 Ramp down			◎	◎	◎	◎	◎	◎	◎
 Helical Interpolation			◎	◎	◎	◎	◎	◎	◎
 Plunging	◎	◎	◎	◎	◎				
 Side milling			◎	◎	◎				
 Slotting	◎	◎	◎	◎	◎	◎	◎	◎	◎
 Profiling			◎	◎					
 Copying			◎	◎					
 Plunging & Recessing						◎	◎		

◎ Main Operation ◎ Other Operations

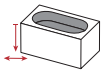
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MILLING TOOLS OVERVIEW

Guia de ferramentas | Guía de herramientas

	METRIC LINE FINEPRO 21190	METRIC LINE HELIPRO 20290	METRIC LINE TGPLUS 90090	METRIC LINE TGPLUS 90190	METRIC LINE TGPLUS 90390	METRIC LINE LINEPRO 06290	METRIC LINE HEXAPLUS 49490	METRIC LINE HEXAPLUS 49590
	202	208	216	220	224	228	234	240
	XP.. 1003...	XPET 1706...	LNXT 0904...	LNXT 1306...	LNXT 1506...	SP.. 1204...	W..XT 0403..	WNXT 0806...
	-	Ø 1.969 to 4.921	Ø 1.575 to 2.480	Ø 1.575 to 4.921	Ø 1.969 to 6.299	Ø 1.575 to 6.299	Ø 1.260 to 2.480	Ø 1.575 to 6.299
	-	-	Ø 0.630 to 1.260	Ø 0.984 to 1.575	-	-	Ø 0.787 to 1.260	Ø 1.260 to 1.969
	-	-	Ø 0.787 to 1.260	Ø 0.984 to 1.575	-	-	-	-
	Ø 0.630 to 1.575	-	Ø 0.984 to 1.260	-	-	-	Ø 0.709 to 1.260	-
	P M K N S H	P M K N S	P M K S	P M K	P K	P M K S	P K	P K
	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	●	●
	●	●					●	●
	●	●					●	●
	●	●						
	●	●					●	●
	●	●	●	●	●			
	●							
	●							

MILLING TOOLS OVERVIEW

	TOROMILL **RP90-10**	TOROMILL **RP90-12**	TOROMILL **RP90-16**	TOROMILL **RN90-12**	METRIC LINE W-PRO **62090**
Page	246	246	246	252	258
Insert	RPHT 10T3...	RPHT 1204...	RPHT 1605...	RNHX 1204...	WC... 08...
Arbor Mounting	Ø 1.00 to 2.000	Ø 2.000 to 4.000	Ø 3.000 to 5.000	Ø 1.500 to 3.000	-
Weldon Shank	-	-	-	Ø 1.250	-
Cylindrical Shank	Ø 1.000 to 1.500	-	-	-	Ø 0.315 to 0.787
Threaded Coupling	Ø 1.000 to 1.500	-	-	Ø 1.250 to 1.500	Ø 0.394 to 0.787
Workpiece Material	P M S	P M S	P M S	P M K S	P M K S H
 Facing	●	●	●	●	●
 Shouldering					●
 Slanted Shoulder & Chamfer					
 Ramp down	●	●	●	●	
 Helical Interpolation	●	●	●	●	
 Plunging					
 Side milling					
 Slotting	●	●	●	●	
 Profiling	●	●	●	●	●
 Copying	●	●	●	●	●
 Plunging & Recessing					

● Main Operation ● Other Operations

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MILLING TOOLS OVERVIEW

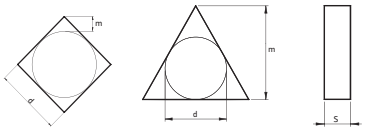
Guia de ferramentas | Guía de herramientas

	HARDMILL **XN90-12**	CENTER & CHAMFER	METRIC LINE ENGRAVING **64067**	METRIC LINE SPOT FACE	METRIC LINE **CERABOOST**
	272	276	280	284	36
	XNHW 1205...	SOMT 11T3.. SOGT 11T3..	VPGT 0602..	SPKX	RPGN RNGN
	Ø 1.500 to 4.000	Depth of machining 0.039 to 0.256 in	Depth of engraving 0.002 to 0.079 in	-	Ø 1.575 to 3.150
	-			Ø 0.394 to 0.984	-
	-			-	-
	-			-	Ø 0.630 to 1.260
	N	P M K	P M N S	P M K S	S
	●				●
	●				
					●
					●
					●
					●
					●

MILLING INSERTS ISO IDENTIFICATION SYSTEM

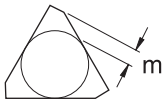
H	120°	M	86°
O	135°	V	35°
P	108°	W	80°
S	90°	L	90°
T	60°	A	85°
C	80°	B	82°
D	55°	K	55°
E	75°	R	
F	50°	X	Special

1- Insert shape symbol



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

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



Triangular inserts with a facet (secondary cutting edge)

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

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

3 - Tolerances symbol

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

2 - Normal clearance symbol

ISO | ANSI

S N H X

4 - Insert symbol

symbol	Type	Hole type	Chip breaker	Shape
W	with hole	Round hole / one countersink (40°~60°)	Without chip breaker	
T			Chip breaker on one side	
Q		Round hole / double countersink (40°~60°)	Without chip breaker	
U			Chip breaker on both sides	
B		Round hole / one countersink (70°~90°)	Without chip breaker	

symbol	Type	Hole type	Chip breaker	Shape
H	with hole	Round hole / one countersink (70°~90°)	Chip breaker on one side	
C		Round hole / double countersink (70°~90°)	Without chip breaker	
J			Chip breaker on both sides	
A		Round hole	Without chip breaker	
M			Chip breaker on one side	

symbol	Type	Hole type	Chip breaker	Shape
G	with hole	Round hole	Chip breaker on both sides	
N	without hole	-	Without chip breaker	
R		-	Chip breaker on one side	
F		-	Chip breaker on both sides	
X	-	-	-	On request

palbit

MILLING INSERTS ISO IDENTIFICATION SYSTEM

Sistema de identificação ISO para pastilhas de fixação mecânica | Codificación ISO para plaquitas indexables

R's	V's (35°)	D's (55°)	C's (80°)	S's (90°)	T's (60°)	W's (80°)	IC mm	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	

5 - Insert size symbol

* 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

6 - Insert thickness symbol

12 06 00 AN S N - MP

10* - Chip breaker 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 - Aluminium
*only when required.	S - HRSA Titanium Alloys
	H - Hardened Materials

Ex.: ANHX 160708 PNER - MP

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

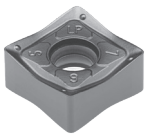
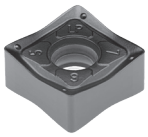
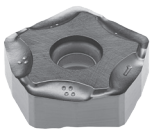
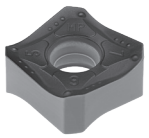
7.1* - Insert edges symbol			
For inserts having secondary edges two digits are used:			
1st digit is secondary edge		2nd digit is secondary edges relief angle	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	special	F	25°
*only when required.		G	30°
		N	0°
		P	11°
		Z	special

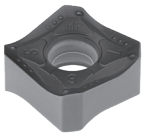
8* - Cutting edge information		
Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfred with honing	S
*only when required.		

9 - Cutting direction		
Shape	Hand	Symbol
	Right	R
	Left	L
	None	N

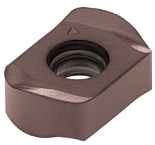
MILLING INSERTS OVERVIEW

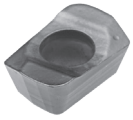
FACE MILLING INSERTS

Reference	SNHU	SNKU	PNHX	PNKX	SNHX
					
Size	12	12	11	11	12 | 16
Material	P M K	P M K	P K	P K	P M K N S
Page	49	49	53	53	57 | 61 | 65

Reference	SNKX	ONHX	ONKX	SEHW	SEHT
					
Size	12 | 16	05 | 06	05 | 06	12 | 13	12 | 13
Material	P K	P M K S	P M K S	P M K	P M K N
Page	57 | 61 | 65	57 | 65	57 | 65	76 | 79	76 | 79

HIGH FEED MILLING INSERTS

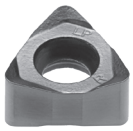
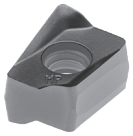
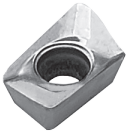
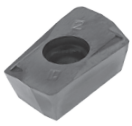
Reference	XNKU	POKT	SOEW	SOET	WDET
					
Size	06 | 12	04	08 | 13 | 16	08 | 13 | 16	12
Material	P M K S	P K	P K	P M S	P M S
Page	88 | 129	123	95 | 101 | 106	95 | 101 | 106	112

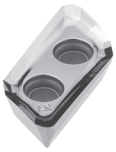
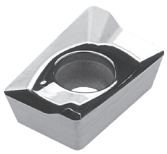
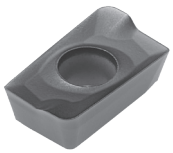
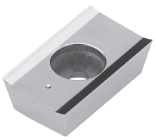
Reference	WDMW	WNMW	XPET...HF
			
Size	12	12	06 | 10
Material	P K	P K	P M K S
Page	112	117	161 | 168

MILLING INSERTS OVERVIEW

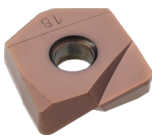
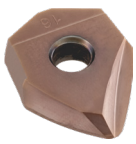
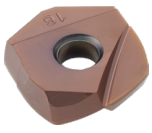
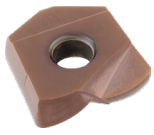
Visão genérica de pastilhas para fresagem | Visión general de plaquitas para fresado

SHOULDER MILLING INSERTS

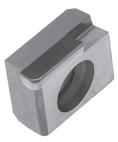
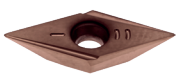
Reference	WOXT	WNXT	WNHU	ANHX	XPET	XPHW	LNXT
							
Size	04	04 | 08	04	10 | 12 | 16	06 | 10 | 17	06 | 10	09 | 13 | 15
Material	P K	P K	P K	P M K N S	P M K N S	P H	P M K
Page	235	136 | 235 | 241	143	146 | 152 | 155	161 | 168 | 175 | 205 | 211	161 | 168 | 205	218 | 221 | 225

Reference	XDGX	SPGX	SPMX	APET	APKT	APHT
						
Size	15 | 22	12	12	10	10 | 16	16
Material	N	P M K S	P M K S	N	P M K	N
Page	183 | 187	230	230	194	194 | 199	199

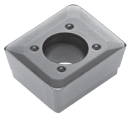
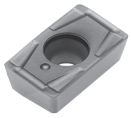
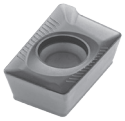
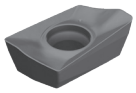
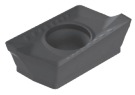
PROFILE MILLING INSERTS

Reference	RPHT	RNHX	WCR	WCL	WCX-XT	WCX-LE	WCX-HF
							
Size	10 | 12 | 16 | 20	12	08 | 10 | 12 | 16 | 20	08 | 10 | 12 | 16 | 20	12 | 16 | 20	16 | 20	08 | 10 | 12 | 16 | 20
Material	P M S	P M K S	P M K H	P M K H	P M K H	P M K H	P M K H
Page	249	255	261	262	264	266	268

SPECIAL MILLING INSERTS

	HARDMILL	CENTER & CHAMFER		ENGRAVING	SPOT FACE
Reference	XNHW	SOMT	SOGT	VPGT	SPKX
					
Size	12	11	11	06	05 | 06 | 07 | 09 | 11
Material	K N	P M K	P M K	P M N S	P M K S
Page	275	278	278	282	286

OTHER MILLING INSERTS

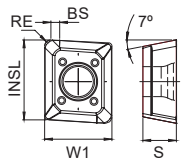
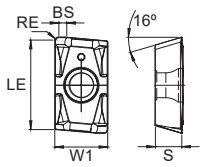
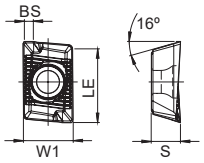
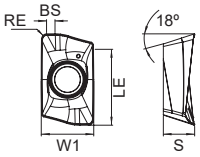
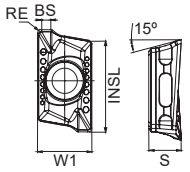
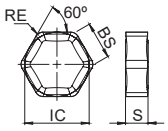
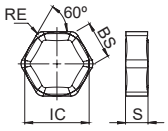
Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K								N
			PVD							PVD			CVD		PVD						UNC
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	L5	L9	D2	54	68	67	66	I5	10
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5705	PH5740	PH6705	PH6910	PH6920	PH6325	PH6930	PH6740	PH0910
	1111423	ACET 150612 TR			◉			△		◉							◉				
	1110014	APFT 1604 PDFR			○												○				
	1110015	APFT 1604 PDSR			◉												◉				
	1110557	APFT 1604 PDTR			○												○				
	1110006	ADKT 1505 PDR			◉	○				◉	○						◉		○		
	1111218	ADKT 1505 PDSR			◉	◉				◉	◉						◉		◉		
	1111209	ADKT 1505 PDTR			◉	○				◉	○						◉		○		
	1112192	BOMT 130408R			○												○				
	1110038	BCKT 1304 PDR						○													
	1110922	HNGF 090520 - V											◉				◉	△			
	1110957	HNGF 090520 - W											◉		◉	△					

◉ First choice | 1ª Escolha | 1ª Opción
◉ Stock Itens | Itens de stock
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

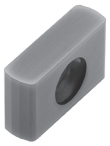
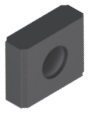
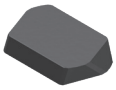
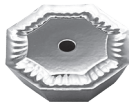
Insert Order Code: (1) Geometry code + (2) Grade code

OTHER MILLING INSERTS

Outras pastilhas para fresagem | Otras plaquitas para fresado

Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
IC | W1	S	INSL | LE	RE	BCH	BS	
0.500	0.250	0.591	0.047	-	0.067	
0.375	0.187	0.630	0.031	-	0.079	
0.375	0.187	0.630	0.031	-	0.079	
0.375	0.187	0.630	0.031	-	0.079	
0.376	0.222	0.618	-	-	0.063	
0.376	0.222	0.618	-	-	0.063	
0.376	0.222	0.618	-	-	0.063	
0.320	0.191	0.453	0.047	-	0.055	
0.331	0.193	0.504	0.024	-	0.055	
0.638	0.219	0.361	0.079	-	-	
0.638	0.219	0.361	0.079	-	-	

OTHER MILLING INSERTS

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K							N
			PVD							PVD			CVD		PVD					UNC
		(2) Grade code	54	68	G4	66	78	86	I5	68	66	I5	L5	L9	D2	54	68	67	I5	10
			PH6910	PH6920	PH7920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5705	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0910
	1111876	LNE 323-02															○			
	1111877	LNE 323-10															○			
	1110952	LNE 323-02 SP															○			
	1113037	LNE 434 R08-SP																		
	1113038	LNE 434 R16-SP																		
	1111420	LNE 434-02															○			
	1111894	LNE 434-05																		
	1111416	LNJN 2205 DDSR-A1															○			
	1111518	OFEN 070405 TN	◎	◎					◎							◎	◎		◎	
	1111569	OFKR 070408 FN-LN																		◎
	1111568	OFKR 070408 SN-MP	◎	◎			◎		◎			◎				◎	◎		◎	
	1110555	PDMW 120420 T					○	○												
	1110554	PDHW 120420 T		◎			◎	◎									◎			
	1112133	RPEW 1204 M0		○							○						○			
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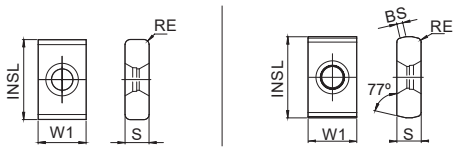
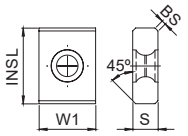
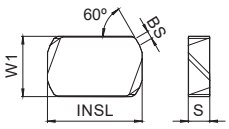
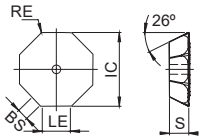
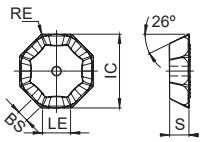
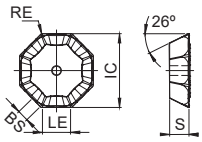
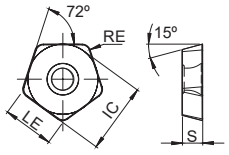
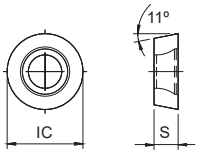
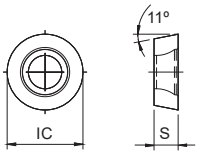
◎ First choice | 1ª Escolha | 1ª Opción
◎ Stock Itens | Itens de stock
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

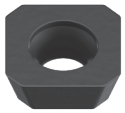
palbit

OTHER MILLING INSERTS

Outras pastilhas para fresagem | Otras plaquitas para fresado

Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
IC | W1	S	INSL | LE	RE	BCH	BS	
0.375	0.187	0.625	-	-	0.016	
0.375	0.187	0.625	0.050	-	-	
0.375	0.187	0.625	0.031	-	0.047	
0.561	0.230	0.730	0.031	-	-	
0.561	0.230	0.730	0.063	-	-	
0.561	0.250	0.750	-	-	0.031	
0.561	0.250	0.750	0.063	-	-	
0.551	0.197	0.866	-	0.079	-	
0.709	0.187	0.291	0.024	-	0.087	
0.709	0.187	0.291	0.024	-	0.087	
0.709	0.187	0.291	0.024	-	0.063	
0.650	0.187	0.472	0.079	-	-	
0.650	0.187	0.472	0.079	-	-	
0.472	0.187	-	-	-	-	
0.394	0.125	-	-	-	-	
0.472	0.187	-	-	-	-	

OTHER MILLING INSERTS

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K							N
			PVD							PVD			CVD		PVD					UNC
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	L5	L9	D2	54	68	67	I5	10
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5705	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0910
	1110200	SDHT 1204 AEEN			○						○						○			
	1110693	SDHT 1204 AFFN		○													○			
	1110201	SDHT 1204 AESN-PL			○		○										○			
	1110818	SDHW 09T3 AEEN			○												○			
	1110743	SDHW 09T3 AEFN			○												○			
	1110781	SDHW 1204 AEEN			○												○			
	1110782	SDHW 1204 AETN			○												○			
	1112339	SDHW 150412			○												○			
	1110206	SEAN 1203 AFEN			○												○			
	1110207	SEAN 1203 AFFN			○												○			
	1110208	SEAN 1203 AFSN			◬												◬			
	1110209	SEAN 1203 AFTN			○												○			
	1110211	SEAN 1504 AFFN			○												○			
	1110212	SEAN 1504 AFTN			○												○			
	1110219	SEHW 1204 AFEN			◬				◬			◬					◬		◬	
	1110222	SEHW 1204 AFTN			◬				◬			◬					◬		◬	
	1111146	SEHW 13T3 AGFN			◬												◬			
	1110224	SEHW 1504 AFSN			○												○			
	1110225	SEHW 1504 AFTN			○												○			
	1110226	SEKN 1203 AFEN			○												○			
	1110227	SEKN 1203 AFFN			○												○			
	1110228	SEKN 1203 AFSN			◬												◬			
	1110230	SEKN 1203 AFTN			○												○			
	1110794	SEKN 1204 AFFN			○												○			
	1110232	SEKN 1204 AFSN			◬												◬			
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	1110235	SEKN 1504 AFEN		◬	◬				◬			◬				◬	◬		◬	
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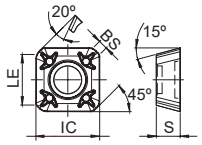
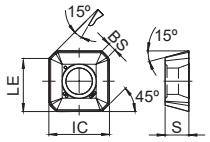
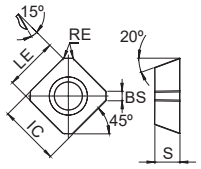
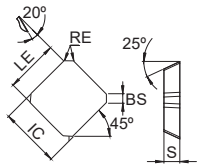
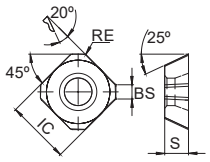
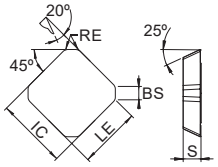
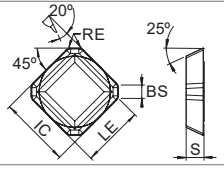
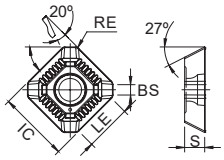
◬ First choice | 1ª Escolha | 1ª Opción
◬ Stock Itens | Itens de stock
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
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Insert Order Code: (1) Geometry code + (2) Grade code

palbit

OTHER MILLING INSERTS

Outras pastilhas para fresagem | Otras plaquitas para fresado

Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
IC | W1	S	INSL | LE	RE	BCH	BS	
0.500	0.187	0.394	-	-	0.071	
0.500	0.187	0.394	-	-	0.071	
0.500	0.187	0.394	-	-	0.071	
0.375	0.156	0.287	0.012	-	0.059	
0.375	0.156	0.287	0.012	-	0.059	
0.500	0.187	0.354	-	-	0.098	
0.500	0.187	0.354	-	-	0.098	
0.625	0.187	-	0.047		-	
0.500	0.125	0.362	0.031	-	0.094	
0.500	0.125	0.362	0.031	-	0.094	
0.500	0.125	0.362	0.047	-	0.094	
0.500	0.125	0.362	0.047	-	0.094	
0.625	0.187	0.457	0.039	-	0.094	
0.625	0.187	0.457	0.039	-	0.094	
0.500	0.187	0.500	-	-	0.110	
0.500	0.187	0.500	-	-	0.110	
0.526	0.156	0.394	-	-	0.079	
0.625	0.187	0.457	0.008	-	0.110	
0.625	0.187	0.457	0.008	-	0.110	
0.500	0.125	0.362	0.047	-	0.094	
0.500	0.125	0.362	0.047	-	0.094	
0.500	0.125	0.362	0.047	-	0.094	
0.500	0.125	0.362	0.047	-	0.094	
0.500	0.187	0.362	0.047	-	0.094	
0.500	0.187	0.362	0.047	-	0.094	
0.500	0.187	0.362	0.047	-	0.094	
0.625	0.187	0.484	0.039	-	0.094	
0.625	0.187	0.484	0.039	-	0.094	
0.500	0.125	0.362	0.047	-	0.094	
0.500	0.125	0.362	0.047	-	0.094	
0.500	0.187	0.362	0.047	-	0.094	
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OTHER MILLING INSERTS

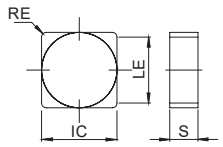
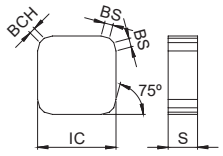
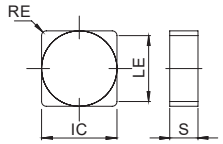
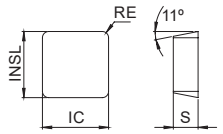
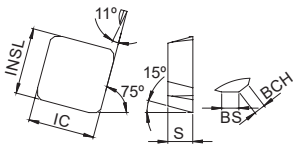
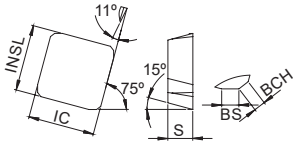
Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M			K							N
			PVD							PVD			CVD		PVD					UNC
		(2) Grade code	M6	54	68	66	78	86	I5	68	66	I5	L5	L9	D2	54	68	67	I5	10
			PH6103	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6930	PH6740	PH5705	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0910
	1110266	SNGN 120408			○												○			
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	1110590	SPGN 150408			○												○			
	1110304	SPGN 150412			○												○			
	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			○												○			

◎ First choice | 1ª Escolha | 1ª Opción
◎ Stock Itens | Itens de stock
◬ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

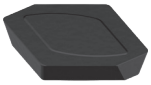
Insert Order Code: (1) Geometry code + (2) Grade code

OTHER MILLING INSERTS

Outras pastilhas para fresagem | Otras plaquitas para fresado

Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
IC | W1	S	INSL | LE	RE	BCH	BS	
0.500	0.187	-	0.031	-	-	
0.500	0.187	-	0.047	-	-	
0.750	0.187	-	0.047	-	-	
0.750	0.187	-	0.063	-	-	
						
0.500	0.187	-	-	0.059	0.031	
0.500	0.187	-	-	0.059	0.031	
						
0.500	0.187	0.437	0.016	-	-	
0.500	0.187	0.437	0.031	-	-	
0.500	0.187	0.437	0.047	-	-	
0.750	0.250	-	0.047	-	-	
0.375	0.125	-	0.047	-	-	
0.375	0.125	-	0.063	-	-	
0.500	0.125	-	0.031	-	-	
0.500	0.125	-	0.047	-	-	
0.500	0.187	-	0.031	-	-	
0.500	0.187	-	0.047	-	-	
0.625	0.187	-	0.031	-	-	
0.625	0.187	-	0.047	-	-	
0.500	0.125	0.500	-	0.039	0.059	
0.500	0.125	0.500	-	0.039	0.059	
0.500	0.187	0.500	-	0.039	0.059	
0.500	0.187	0.500	-	0.039	0.059	
0.500	0.187	0.500	-	0.039	0.059	
0.625	0.187	0.625	-	0.039	0.059	
0.625	0.187	0.625	-	0.039	0.059	
0.625	0.187	0.625	-	0.039	0.059	
0.625	0.187	0.625	-	0.039	0.059	
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0.625	0.187	0.625	-	0.039	0.059	

OTHER MILLING INSERTS

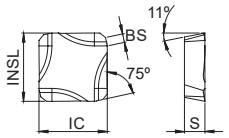
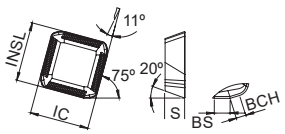
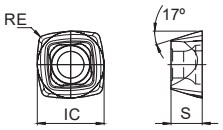
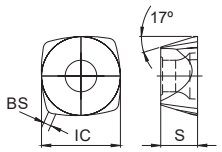
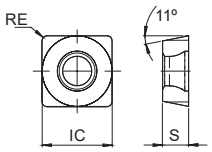
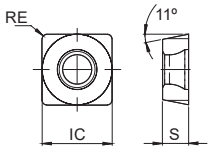
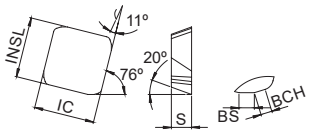
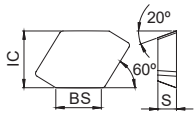
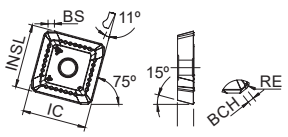
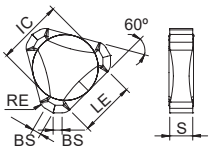
Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P							M		K							N	S
			PVD							PVD		CVD		PVD					UNC	PVD
		(2) Grade code	54	68	G4	78	86	I5	G6	68	I5	L5	L9	D2	54	68	67	I5	10	I5
			PH6910	PH6920	PH7920	PH6125	PH6135	PH6740	PH7740	PH6920	PH6740	PH5705	PH5740	PH6705	PH6910	PH6920	PH6325	PH6740	PH0910	PH6740
	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		◈		◇	◇									◈				
	1111609	SPMT 120408-MP		◈				◈		◈	◈					◈		◈		◈
	1120572	SPMW 120408		○				◈			◈			○		○		◈		
	1191186	SPXN 1906		○			○	○					○			○				
	1112384	SPXN 1906-W		○												○				
	1112134	SPXR 1203 EDSR-MP		◈	○			◈	○							◈	○	◈		
	1110393	TNHF 1204 AN-CA										◈	◈	◈	◈	○				
	1111333	TNHF 1204 AN-K										◈	◈		○	○				

◈ First choice | 1ª Escolha | 1ª Opción
◈ Stock Itens | Itens de stock
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

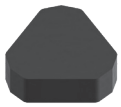
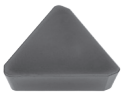
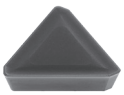
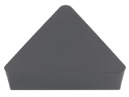
Insert Order Code: (1) Geometry code + (2) Grade code

OTHER MILLING INSERTS

Outras pastilhas para fresagem | Otras plaquitas para fresado

Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
IC | W1	S	INSL | LE	RE	BCH	BS	
0.500	0.125	0.500	-	0.039	0.055	
0.625	0.187	0.625	-	0.039	0.055	
0.625	0.187	0.625	-	0.039	0.055	
0.750	0.250	0.750	-	0.039	0.055	
0.335	0.159	-	0.031	-	-	
0.512	0.219	-	0.039	-	-	
0.335	0.156	-	0.031	-	-	
0.335	0.156	-	0.031	-	-	
0.512	0.219	-	0.039	-	-	
0.512	0.219	-	0.039	-	-	
0.512	0.219	-	0.039	-	-	
0.500	0.187	-	0.031	-	-	
0.500	0.187	-	0.031	-	-	
0.750	0.250	0.750	-	0.039	0.055	
0.750	0.250	-	-	-	0.472	
0.500	0.125	0.500	0.039	0.039	0.054	
0.500	0.187	0.472	0.079	-	0.067	
0.500	0.187	0.472	0.118	-	0.051	

OTHER MILLING INSERTS

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P								M			K						N
			PVD						CVD		PVD			CVD		PVD				UNC
		(2) Grade code	54	68	G4	66	I5	G6	L8	L9	68	66	I5	L5	L9	54	68	67	I5	10
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	1111911	TNJN 1204 ANEN		○													○			
	1110422	TPGN 110304															○			
	1110423	TPGN 110308		○													○			
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	1110426	TPGN 160308		◈													◈			
	1110431	TPGN 220408		○													○			
	1110432	TPGN 220412		○													○			
	1110450	TPKN 1603 PDEL		○													○			
	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		○													○			
	1110476	TPKR 1603 PDSR		◈			◈										◈		◈	
	1110921	TPKR 1603 PDTR		○													○			
	1110477	TPKR 2204 PDSR		◈			◈										◈		◈	
	1120761	TPUN 110304			○															
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	1120765	TPUN 160304			◈			○	◈	◈										
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	1120770	TPUN 160312			○			○	◈	◈										
	1120777	TPUN 220404			○			○	◈	◇										
	1120779	TPUN 220408			○			◈	◈	◈										
	1120783	TPUN 220412			◈			◈	◈	◈										
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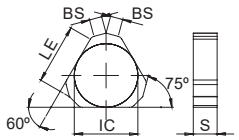
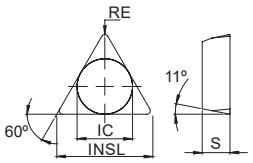
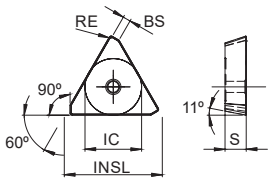
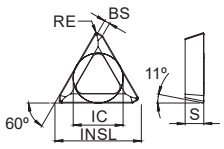
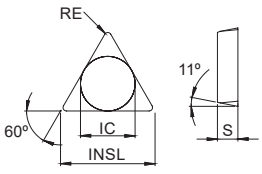
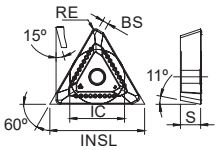
◈ First choice | 1ª Escolha | 1ª Opción
◈ Stock Itens | Itens de stock
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

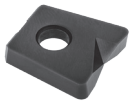
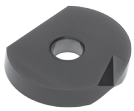
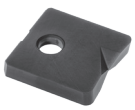
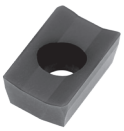
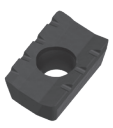
palbit

OTHER MILLING INSERTS

Outras pastilhas para fresagem | Otras plaquitas para fresado

Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
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0.500	0.187	0.472	-	-	0.098	
0.250	0.125	-	0.016	-	-	
0.250	0.125	-	0.016	-	-	
0.375	0.125	-	0.016	-	-	
0.375	0.125	-	0.031	-	-	
0.500	0.187	-	0.031	-	-	
0.500	0.187	-	0.047	-	-	
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	0.028	-	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	
0.375	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	

OTHER MILLING INSERTS

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	P						M			K								N	
			PVD						PVD			CVD		PVD						UNC	UNC
		(2) Grade code	M6	54	68	66	78	I5	68	66	I5	L5	L9	D2	54	68	67	I5	17	10
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	1110851	WPB 08	○	○	○										○	○					
	1110852	WPB 10	○	○	○										○	○					
	1110853	WPB 12	○	○	○										○	○					
	1110923	WPB 16	○	○	○										○	○					
	1111019	WPB 20	○	○	○										○	○					
	1111554	WPRX-2 08		○	○										○	○					
	1111331	WPRX-2 10		◎	◎										◎	◎					
	1111555	WPRX-2 12		◎	◎										◎	◎					
	1111329	WPRX-2 16		◎	◎										◎	◎					
	1111330	WPRX-2 20		◎	◎										◎	◎					
	1111556	WPRX-2 25		◎	◎										◎	◎					
	1111557	WPRX-2 32		◎	◎										◎	◎					
	1110820	WPV 08	△	△	○		○								○	○					
	1110821	WPV 10	△	△	○		○								○	○					
	1110822	WPV 12	△	△	○		○								○	○					
	1110948	WPV 16	△	△	○		○								○	○					
	1111020	WPV 20	○	○	○		○								○	○					
	1110543	WPZ 08	◎	○	○										○	○					
	1110551	WPZ 10	◎	○	○										○	○					
	1110552	WPZ 12	◎	○	○										○	○					
	1110544	WPZ 16	◎	○	○										○	○					
	1110553	WPZ 20	◎	△	○										△	○					
	1110661	WPZ 25	◎	◎	○										◎	○					
	1110662	WPZ 32	◎	◎	○										◎	○					
	1110910	XPHT 1604 PDTR			○											○					
	1111206	XPHT 160420 PPTR			○											○					
	1110926	XPHT 160432 PDSR			○											○					
	1110958	XPHT 160412-MR			○											○					

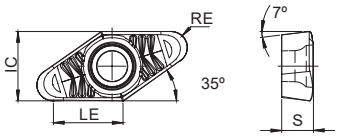
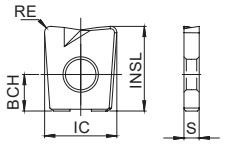
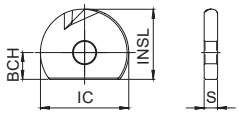
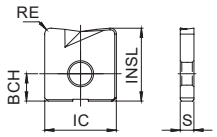
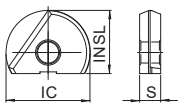
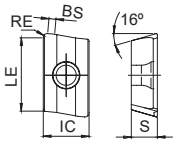
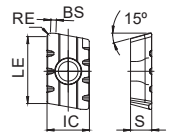
◎ First choice | 1ª Escolha | 1ª Opción
◎ Stock Itens | Itens de stock
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

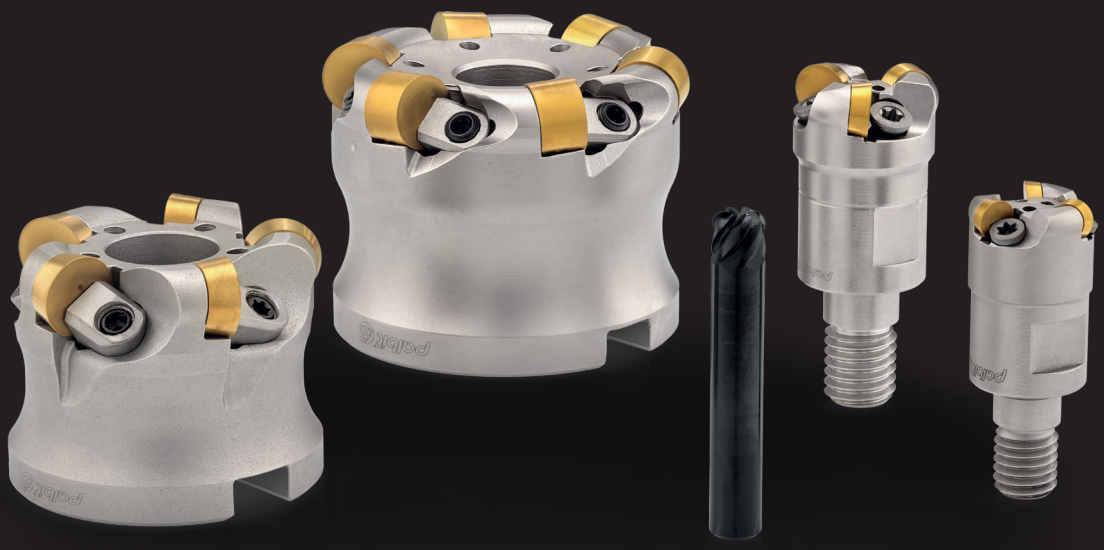
Insert Order Code: (1) Geometry code + (2) Grade code

palbit

OTHER MILLING INSERTS

Outras pastilhas para fresagem | Otras plaquitas para fresado

Dimensions (in) | Dimensões (in) | Dimensiones (in)						Drawing
IC | W1	S	INSL | LE	RE	BCH	BS	
0.500	0.220	0.500	0.118	-	-	
0.315	0.079	0.374	0.024	0.157	-	
0.394	0.098	0.453	0.031	0.197	-	
0.472	0.098	0.551	0.039	0.236	-	
0.630	0.118	0.630	0.051	0.236	-	
0.787	0.118	0.787	0.063	0.236	-	
0.315	0.079	0.374	-	0.098	-	
0.394	0.098	0.453	-	0.197	-	
0.472	0.098	0.469	-	0.236	-	
0.630	0.118	0.547	-	0.236	-	
0.787	0.118	0.626	-	0.236	-	
0.984	0.157	0.839	-	0.354	-	
1.260	0.197	1.016	-	0.394	-	
0.315	0.079	0.374	0.024	0.157	-	
0.394	0.098	0.453	0.031	0.197	-	
0.472	0.098	0.551	0.039	0.236	-	
0.630	0.118	0.630	0.051	0.236	-	
0.787	0.118	0.787	0.063	0.236	-	
0.315	0.094	0.276	-	0.118	-	
0.394	0.102	0.335	-	0.138	-	
0.472	0.118	0.394	-	0.157	-	
0.630	0.157	0.472	-	0.157	-	
0.787	0.197	0.591	-	0.197	-	
0.984	0.236	0.728	-	0.236	-	
1.260	0.276	0.925	-	0.295	-	
0.375	0.187	0.630	0.047	-	0.067	
0.375	0.187	0.630	0.079	-	0.028	
0.375	0.187	0.630	0.126	-	-	
0.375	0.187	0.630	0.047	-	0.067	



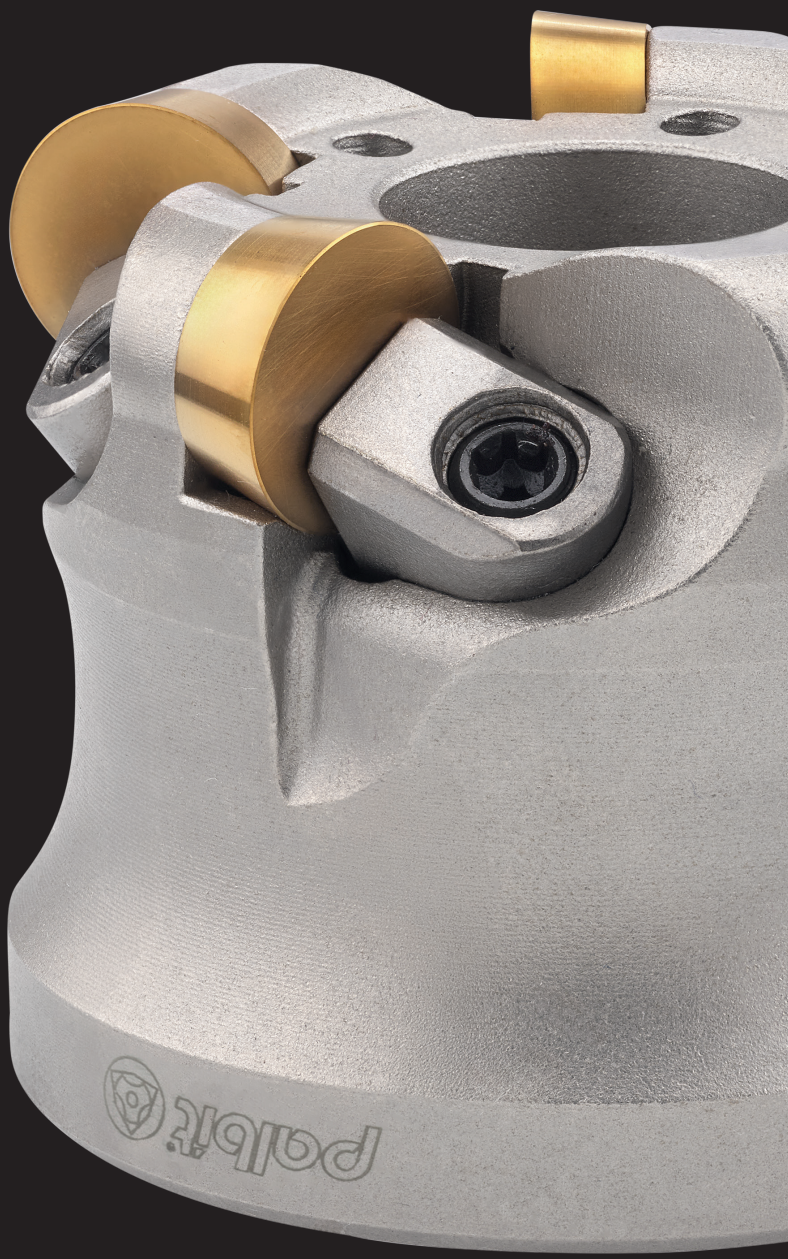
CERABOOST

The evolution of modern manufacturing has led to the increased use of difficult-to-machine materials, such as iron-based, nickel-based, cobalt-based, and titanium-based superalloys. While these materials offer superior performance, their high temperature properties, high hardness and wear resistance present significant challenges for traditional tools, often resulting in extremely low tool life. This drives the need for advanced tools to effectively overcome these machining difficulties.

Ceramic cutting tools have emerged as a revolutionary solution in machining technology, delivering exceptional performance in high speed and high temperature applications. Designed specifically for materials such as heat resistant superalloys and hardened steels, where traditional carbide tools struggle, ceramics redefine the efficiency of modern machining operations with exceptional thermal resistance, high hardness and the ability to maintain edge integrity at extreme speeds. Their use results in faster cycle times, increasing productivity and cost effectiveness.

With the introduction of the **CERABOOST** line, Palbit is taking an exciting step into the world of ceramic tools. Using our extensive expertise in cutting tool solutions, we have developed a range of ceramic tools designed to meet the most demanding machining challenges.

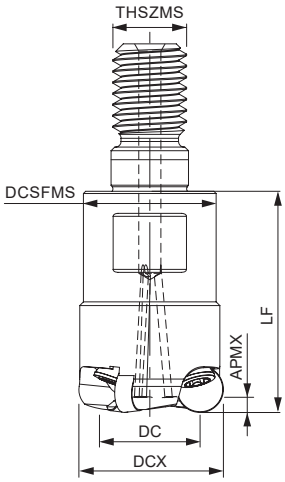
Redefining machining excellence with advanced ceramic solutions for challenging materials.



CERABOOST 44090 | 44190 | 44290

METRIC LINE



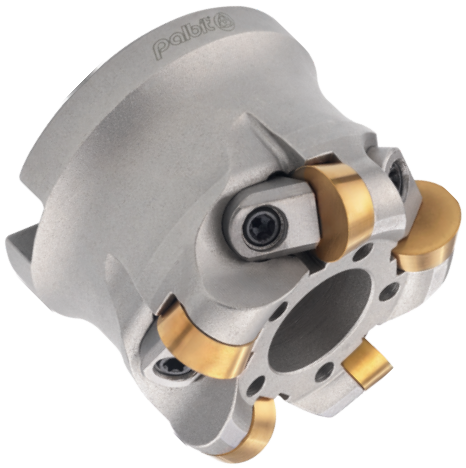


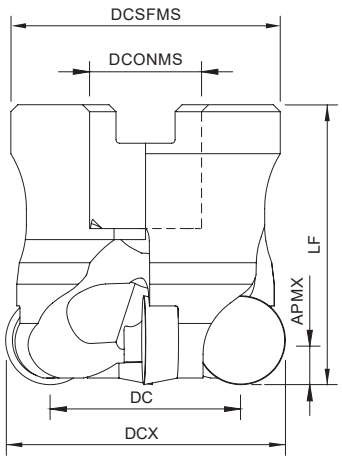
Threaded Coupling

KAPR=90° | GAMP=+5°~+5,5°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DCX	DC	THSZMS	DCSFMS	LF		APMX (in)		
					44090						
181208900	016R44090-02-04-M08023	2	0.630	0.382	M8	0.551	0.906	0.066	0.063	RPGN 0602..	ⓢ
181209000	020R44090-03-05-M10030	3	0.787	0.539	M10	0.709	1.181	0.132	0.063	RPGN 0602..	ⓢ
					44190						
181209100	025R44190-03-05-M12035	3	0.984	0.610	M12	0.827	1.378	0.198	0.098	RPGN 0903..	ⓢ
181209200	032R44190-04-05-M16043	4	1.260	0.886	M16	1.142	1.693	0.463	0.098	RPGN 0903..	ⓢ
					44290						
181209300	032R44290-03-00-M16043	3	1.260	0.764	M16	1.142	1.693	0.441	0.126	RPGN 1204..	ⓢ

ⓢ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)



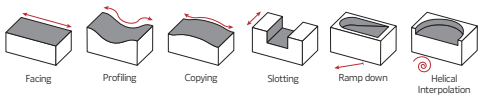


Arbor Mounting

KAPR=90° | GAMP=0°+5°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DCX	DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
						44290						
181208700	040B44290-04-00-016040	4	1.575	1.075	0.630	1.516	1.575	0.397	A	0.126	RPGN 1204..	ⓢ
181208800	050B44290-05-05-022040	5	1.969	1.472	0.866	1.929	1.575	0.619	A	0.126	RPGN 1204..	ⓢ

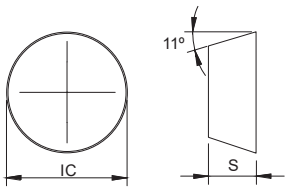
ⓢ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)



RPGN Inserts | Pastilhas | Plaquitas



RPGN



RPGN

		S	Dimensions Dimensões Dimensiones (in)	
		PVD		
	(2) Grade code	2J		
(1) Geometry code	ISO Reference	PCNY10	IC	S
1113539	RPGN 060200-T2010	●	0.250	0.094
1113540	RPGN 090300-T2010	●	0.375	0.125
1125066	RPGN 120400-T2010	●	0.500	0.187

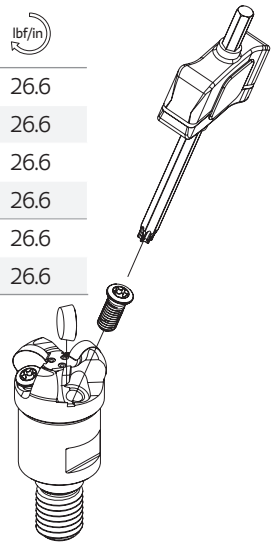
● First choice | Primeira opção | 1ª opción ● Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

SPARE PARTS Acessórios | Repuestos

Cutter DC	Screw Clamp	Wedge Screw	Wedge Clamp	Chuck Screw	Wrench (Order separately)	Key (Torx)	Key (Torx - Nm) (Order separately)	Torque Value
								lbf/in
R44090 – 0.630	P0401100	-	-	-	-	XT15-S35	DT1530	26.6
R44090 – 0.787	P0401100					XT15-S35	DT1530	26.6
R44190 – 0.984 - 1.260	P0501302	-	-	-	-	XT20-S40	DT2050	26.6
R44290 – 1.260	P0501302	-	-	-	-	XT20-S40	DT2050	26.6
B44290 – 1.575	-	F0601300	WA06000	D0803596	SS40	XT15-S35	DT1530	26.6
B44290 – 1.969	-	F0601300	WA06000	-	-	XT15-S35	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

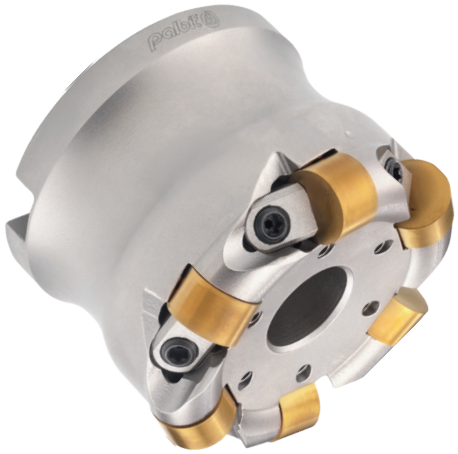


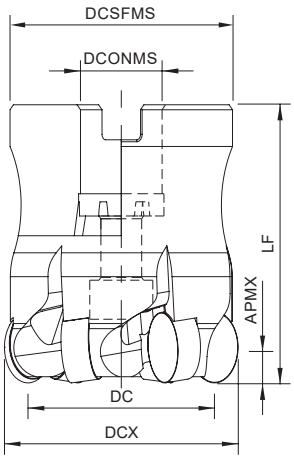
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (SFM)	Feed fz (in/t)		
				PCNY10	RPGN 0602..	RPGN 0903..	RPGN 1204..
S	11	Ni-based super alloys	200-450	1640-4264	0.002-0.005	0.002-0.006	0.002-0.008

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

CERABOOST 44590





Arbor Mounting

KAPR=90° | GAMP=-5°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DCX	DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
						44590						
181209400	050B44590-04-05-022040	4	1.969	1.474	0.866	1.929	1.575	0.705	A	0.126	RNGN 1207..	◈
181209500	063B44590-06-05-022050	6	2.480	1.980	0.866	2.362	1.969	1.521	A	0.126	RNGN 1207..	◈
181209600	080B44590-07-05-027050	7	3.150	2.659	1.063	2.520	1.969	2.204	A	0.126	RNGN 1207..	◈

◈ Stock item | Produto de stock | Itens de stock

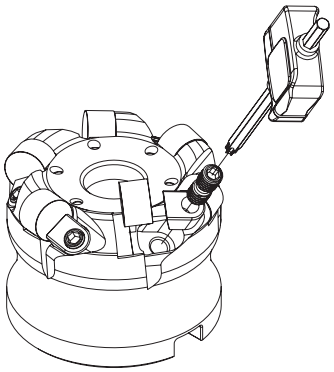
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

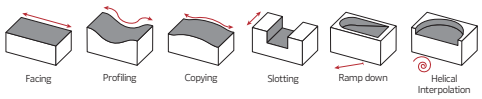
SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Wedge Screw	Wedge Clamp	Key (Torx)	Key (Torx - Nm)	Torque Value
B44590 – 1.969	F0601300	WA06000	XT15-S35	DT1530	26.6
B44590 – 2.480 - 3.150	F0601600	WA06000	XT15-S35	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

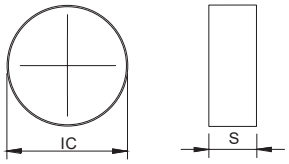




RNGN Inserts | Pastilhas | Plaquitas



RNGN



RNGN

		S	Dimensions Dimensões Dimensiones (in)	
		PVD		
	(2) Grade code	2J		
(1) Geometry code	ISO Reference	PCNY10	IC	S
1113541	RNGN 120700-T2010	◉	0.500	0.313

◉ First choice | Primeira opção | 1ª opción ◉ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM)	Feed fz (in/t)
				PCNY10	RNGN 1204..
S	11	Ni-based super alloys	200-450	1640-4264	0.002-0.008

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

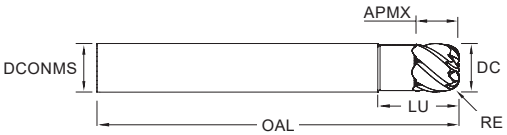
CERABOOST CR42SS

CR42SS Corner radius

S







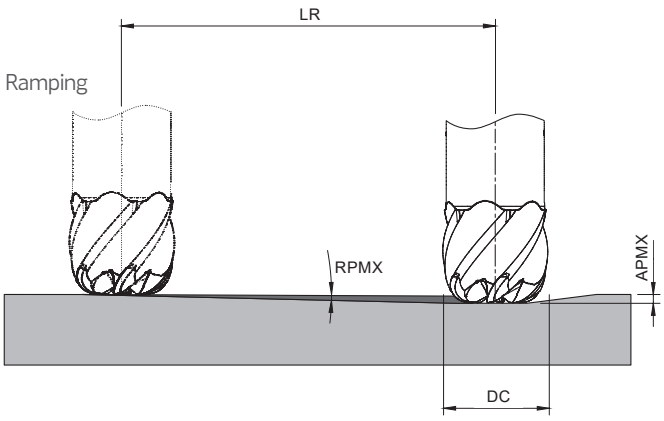
(1) Order code HA (Cylindrical)	(2) Grade code Reference Referência Referencia	NOF	1J PCN010	Dimensions | Dimensões | Dimensiones (in) DC	DCONMS	APMX	RE	LU	OAL
1182588	CR42SS 6 060 045 R200	6	◈	0.236	0.236	0.177	0.079	0.413	2.362
1182589	CR42SS 6 080 065 R200	6	◈	0.315	0.315	0.256	0.079	0.492	2.362
1182590	CR42SS 6 100 065 R200	6	◈	0.394	0.394	0.256	0.079	0.492	2.559
1182591	CR42SS 6 120 090 R200	6	◈	0.472	0.472	0.354	0.079	0.591	2.756
1182592	CR42SS 8 160 140 R200	8	◈	0.630	0.630	0.551	0.079	0.787	3.543

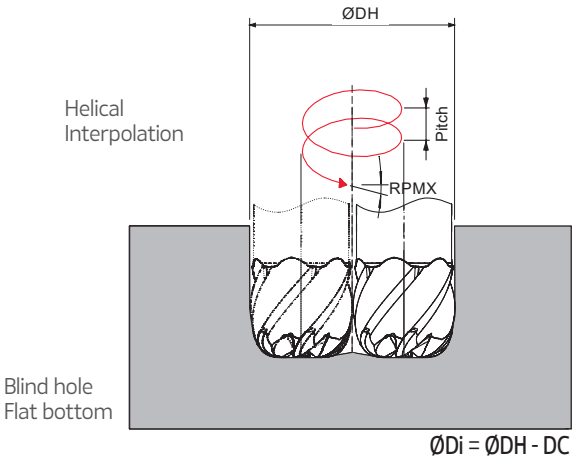
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request | Disponível sobre consulta | Disponible bajo consulta

End mill order code = (1) Geometry Code + (2) Grade Code

RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

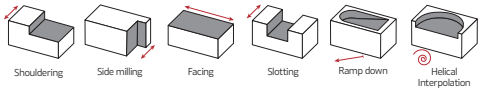




ØDi = ØDH - DC

DC	RPMX	Ramping APMX	Ramping Min LR	Helical Interpolation ØDHmin	Helical Interpolation ØDHmax	Helical Interpolation Max Pitch/Rev.
0.236	1.50	0.035	1.354	0.307 -	- 0.315	0.004 0.006
0.315	1.50	0.047	1.803	0.409 -	- 0.472	0.006 0.012
0.394	1.50	0.059	2.256	0.512 -	- 0.630	0.008 0.018
0.472	1.50	0.071	2.705	0.614 -	- 0.787	0.010 0.026
0.630	1.50	0.094	3.610	0.819 -	- 1.102	0.014 0.037

Note: During helical interpolation do not exceed APMX.



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

ISO	PSM	Material	HB	ae / DC = 10%					
				Vc (SFM)	fz (in/t)				
					0.236	0.315	0.394	0.472	0.630
S	11	Ni-based super alloys	200-450	1640-2460	0.0008-0.0016	0.0008-0.0016	0.0008-0.0024	0.0012-0.0024	0.0012-0.0024

ISO	PSM	Material	HB	ae / DC = 100%						
				Vc (SFM)	fz (in/t)					APMX
					0.236	0.315	0.394	0.472	0.630	
S	11	Ni-based super alloys	200-450	1148-1722	0.0008	0.0008	0.0012	0.0012	0.0012	0.15xDC

BEST PRACTICES	
Cutting speed	Maintaining a high cutting speed allows the cutting tool to minimize wear
Coolant	It is recommended not to use coolant or air blowing to prevent thermal cracking. Air blowing should only be used when superior chip evacuation is necessary.
Tool holder	A hydraulic chuck or precision milling chuck is highly recommended to ensure stable machining under the high temperatures generated during application. The heating chuck is disabled.
Milling Strategy	Climb milling is highly recommended due to the characteristics of the application. Conventional milling can result in accelerated wear of the cutting edge and may affect the hardened surface of the workpiece material.
Finishing	A finishing allowance of at least 0.012 in is recommended.
Built-up edge	Do not manually remove any built-up edge, as this may damage the cutting edge.



FACE MILLING

1 PLUS SN88-12

> Suitable for machining **P M K**

> See page A - 46

2 PLUS PN60-11

> Suitable for machining **P K**

> See page A - 50

3 PLUS ON45-05 | 90945 | 91245

> Suitable for machining **P M K N S**

> See page A - 54

4 LINEPRO 57045 metric line

> Suitable for machining **P M K N S**

> See page A - 68

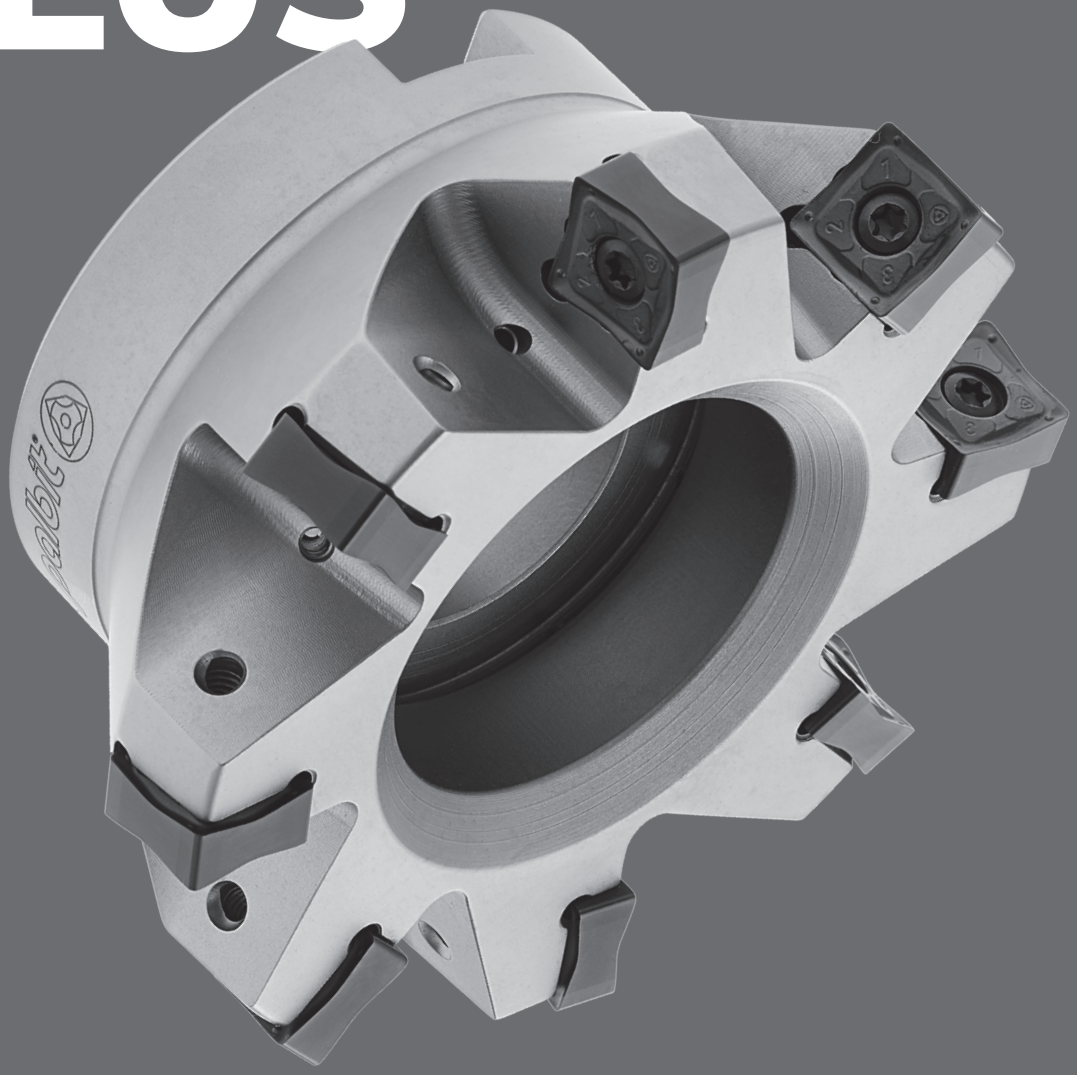
5 LINEPRO 06045 | 09945 metric line

> Suitable for machining **P M K S**

> See page A - 74

SN88-12

PLUS



The PLUS SN88-12 presents 8 cutting edges designed for rough to semi-finish face milling operations, providing high efficiency. The cutting edge angle (88º) of these mills enables them to perform face milling very close to the sidewall.

A linha PLUS SN88-12 apresenta 8 arestas de corte projetadas para operações de facejamento de desbaste a semi-acabamento, proporcionando alta eficiência. O ângulo da aresta de corte (88º) dessas fresas permite realizar facejamento muito próximo à parede lateral.

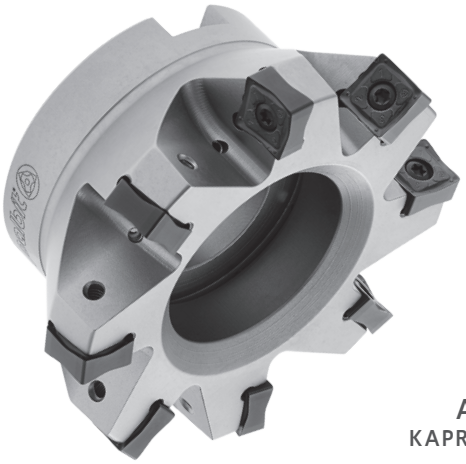
La línea PLUS SN88-12 presenta 8 filos de corte diseñados para operaciones de fresado de cara de desbaste a semiacabado, proporcionando alta eficiencia. El ángulo del filo de corte (88º) de estas fresas permite realizar el fresado de cara muy cerca de la pared lateral.

PLUS SN88-12 > page 48

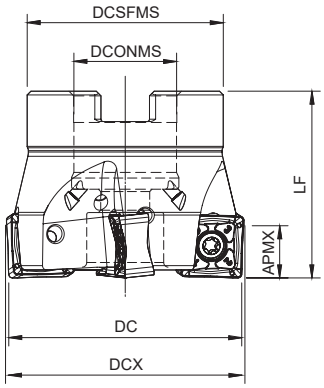


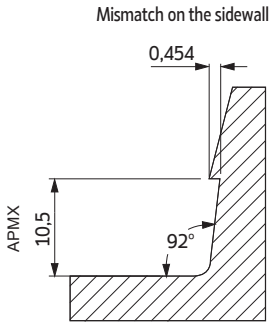
- From DC 2.000 in to 10.000 in
  De DC 2.000 in a 10.000 in | Desde DC 2.000 in hasta 10.000 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Negative inserts with 8 cutting-edges
  Pastilhas negativas com 8 arestas de corte | Insertos negativos con 8 filos de corte
- For higher depths of cut
  Para altas taxas de remoção em peças pequenas | Para una alta tasa de remoción en piezas pequeñas

PLUS SN88-12



Arbor Mounting
KAPR=88° | GAMP=-6°





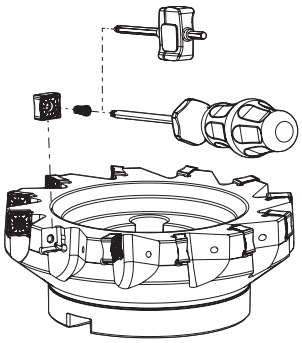
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCX	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181103400	SN88 D2.00-A.750/1.75-04-12	4	2.000	2.035	0.750	1.772	1.750	0.92	A	0.413	SN... 1206...	◈
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...	○
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...	○
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...	○
181104100	SN88 D4.00-A1.25/2.00-11-12	11	4.000	4.035	1.250	2.874	2.000	3.30	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

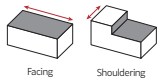
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Acessórios | Repuestos

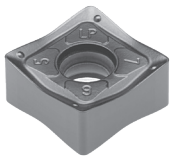
Cutter DC	Insert Screw	Key (Torx)	Order separately: Key (Torx - Nm)	Torque Value	Order separately: Screw	Order separately: DIN 6368 Wrench
SN88-A-12 - 2.00-3.00	P0401200	XT15	DT1530	26.6	-	-
SN88-A-12 - 4.00	P0401200	PT15	DT1530	26.6	J0164110	SD6368-16
SN88-A-12 - 5.00	P0401200	PT15	DT1530	26.6	J0204610	SD6368-20
SN88-A-12 - 6.00-10.00	P0401200	PT15	DT1530	26.6	-	-

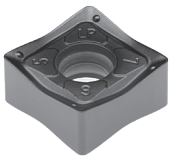


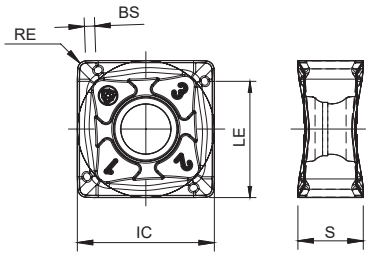
Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



SNH(K)U 1206 Inserts | Pastilhas | Plaquitas


SNHU-LP


SNKU-LP



		P					M		K								Dimensions Dimensões Dimensiones (in)				
		CVD	PVD				PVD		CVD				PVD								
	(2) Grade code	T9	G4	T1	P3	G6	P3	G6	L5	L6	L9	T9	G4	T1	P3	G6					
(1) Geometry code	ISO Reference	PHS740	PH7920	PHP920	PH7930	PH7740	PH7930	PH7740	PH5705	PH5320	PH5740	PHS740	PH7920	PHP920	PH7930	PH7740	IC	S	LE	RE	BS
1112020	SNHU 120608 ZNER-LP		◎	◉	◎	◎	◉	◎	◉		◎		◎	◎	◎	◎	0.524	0.250	0.457	0.031	0.039
1112278	SNKU 120608 ZNER-LP	◎	◎	◉	◎	◎	◉	◎	◉	◎	◎	◎	◎	◎	◎	◎	0.524	0.250	0.457	0.031	0.039

◉ First choice | Primeira opção | 1ª opción ◎ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance Toughness → PH5705	PH5320	PHP920	PH7920	PH7930	PH5740	PHS740	PH7740
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	200-330					✓			✓
M	6	SS - Austenitic-ferritic (Duplex)	230-260					✓			✓
K	7	Malleable Cast Iron	130-230	✓	✓	✓	✓	✓	✓		✓
K	8	Grey Cast Iron	180-245	✓	✓	✓	✓	✓	✓		✓
K	9	Nodular Cast iron	160-250	✓	✓	✓	✓	✓	✓		✓

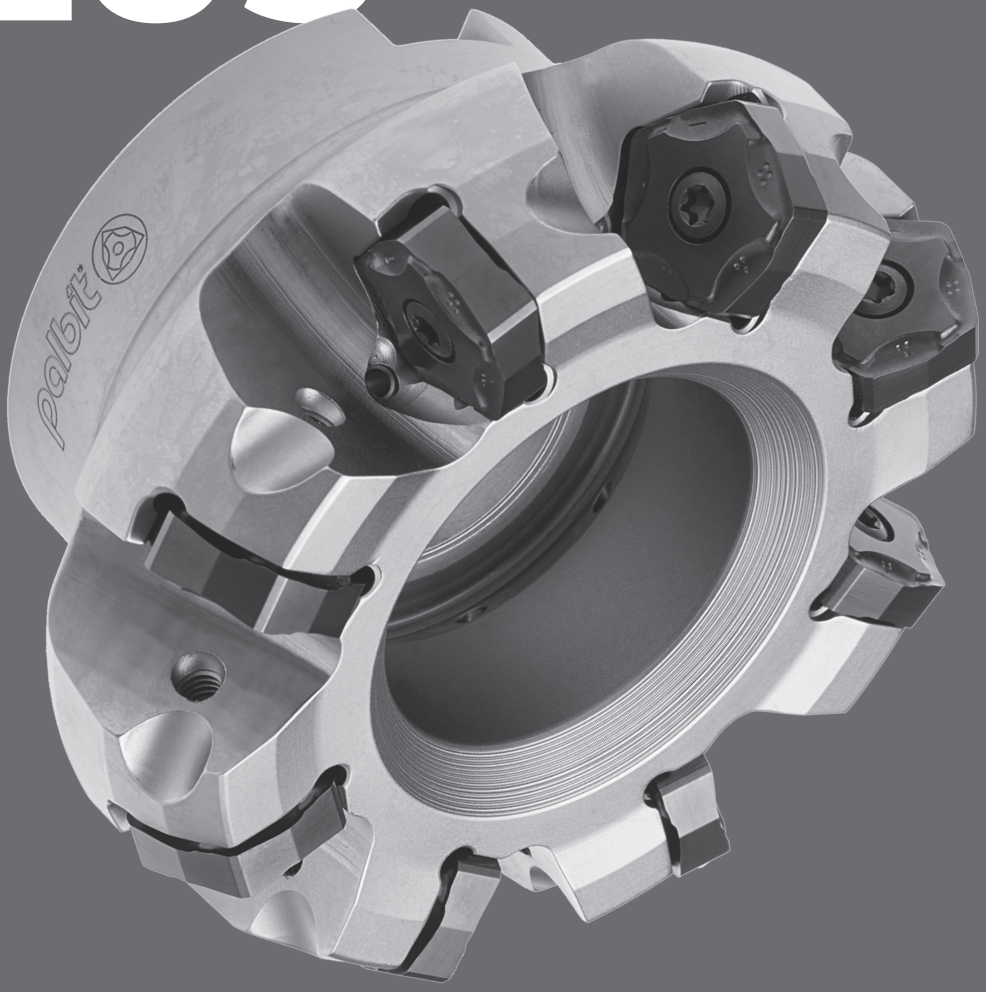
Good Conditions | Average Conditions | Difficult Conditions

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance Toughness → PH5705	PH5320	PHP920	PH7920	PH7930	PH5740	PHS740	PH7740	Feed fz (in/t) SNH(K)U 1206
P	1	Unalloyed Steel	125-220	-	-	590-820	590-787	525-722	-	459-722	459-656	0.004 **(0.010)** 0.014
P	2	Low-Alloyed Steel	220-280	-	-	525-754	525-722	459-656	-	394-656	426-590	0.004 **(0.010)** 0.014
P	3	High-Alloyed Steel	280-380	-	-	459-722	459-689	394-623	-	328-623	328-558	0.004 **(0.010)** 0.014
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	459-656	-	-	426-590	0.004 **(0.010)** 0.014
M	5	SS - Austenitic	200-330	-	-	-	-	394-525	-	-	361-525	0.004 **(0.010)** 0.014
M	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	328-459	-	-	295-492	0.004 **(0.010)** 0.014
K	7	Malleable Cast Iron	130-230	525-951	492-918	525-886	525-853	492-787	525-853	-	459-722	0.004 **(0.010)** 0.014
K	8	Grey Cast Iron	180-245	558-1050	525-1050	459-820	459-787	459-754	459-787	-	394-689	0.004 **(0.010)** 0.014
K	9	Nodular Cast iron	160-250	459-656	328-623	394-689	394-656	328-623	394-656	-	328-623	0.004 **(0.010)** 0.014

PN60-11

PLUS



PNK(H)X is an economical negative insert with 10 cutting edges, offering an improved insert design that effectively distributes cutting forces, making it an ideal solution for cast iron applications.

PNK(H)X é uma pastilha negativa económica com 10 arestas de corte, oferecendo um design de pastilha aprimorada que distribui efetivamente as forças de corte, tornando-a uma solução ideal para aplicações em ferro fundido.

PNK(H)X é uma plaquita negativa económica com 10 arestas de corte, oferecendo um design de plaquita aprimorada que distribui efetivamente as forças de corte, tornando-a uma solução ideal para aplicações em ferro fundido.

PLUS PN60-11 > page 52

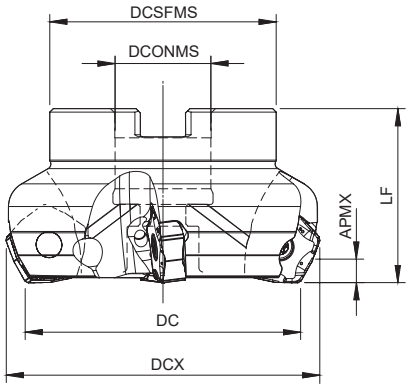
- From DC 2.000 in to 10.000 in
  De DC 2.000 in a 10.000 in | Desde DC 2.000 in hasta 10.000 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Negative inserts with 10 cutting edges
  Pastilhas negativas com 10 arestas de corte | Insertos negativos con 10 filos de corte
- Excellent solution for cast iron
  Excelente solução para ferro fundido | Excelente solución para hierro fundido



PLUS PN60-11

Proprietary milling line





Arbor Mounting
KAPR=60° | GAMP=-7°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCX	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
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...	◈

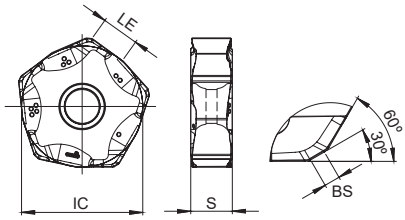
◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

PNH(K)X 1105 Inserts | Pastilhas | Plaquitas


PNHX-MK


PNHX-HK


PNKX-MK



		P		K				Dimensions Dimensões Dimensiones (in)				
		PVD		CVD		PVD						
	(2) Grade code	G1	G4	L5	L9	G1	G4					
(1) Geometry code	ISO Reference	PH7910	PH7920	PH5705	PH5740	PH7910	PH7920	IC	S	LE	RE	BS
1111374	PNHX 1105 ZNER-MK	◈	◈	◈	◈	◈	◈	0.650	0.223	0.224	-	0.051
1111998	PNHX 1105 ZNER-HK			◈	○			0.650	0.223	0.224	-	0.051
1112294	PNKX 1105 ZNER-MK	◈	◈	◈	○	◈	◈	0.650	0.223	0.224	-	0.051

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

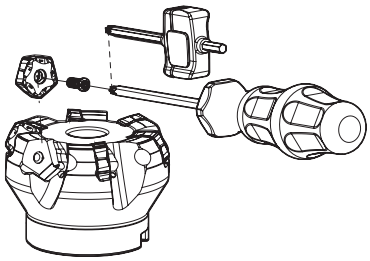
Insert order code = (1) Geometry Code + (2) Grade Code

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
PN60-A-11 - 2.00-3.00	P0401200	XT15	DT1530	26.6
PN60-A-11 - 4.00-10.00	P0401200	PT15	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

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 Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PH5705	PH7910	PH7920	PH5740	Feed fz (in/t) PNH(K)X 1105...
P	1	Unalloyed Steel	125-220	-	590-820	590-787	-	0.006-0.012
	2	Low-Alloyed Steel	220-280	-	525-754	525-722	-	0.006-0.012
	3	High-Alloyed Steel	280-380	-	459-722	459-689	-	0.006-0.010
K	7	Malleable Cast Iron	130-230	525-951	590-984	525-853	525-853	0.005-0.014
	8	Grey Cast Iron	180-245	558-1050	525-820	459-787	459-787	0.005-0.014
	9	Nodular Cast iron	160-250	459-656	492-656	394-656	394-656	0.005-0.012

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

ON45-05 | SN45-12 | SN45-16

PLUS



The PLUS line provides high-performance face milling suitable for a wide range of materials. It combines stability and process security with low power consumption. Featuring a negative insert, it ensures high productivity and low cost per edge, leading to significant cost-effectiveness.

A linha PLUS oferece facejamento de alta performance adequado para uma ampla gama de materiais. Combina estabilidade e segurança do processo com baixo consumo de energia. Apresentando uma pastilha negativa, garante alta produtividade e baixo custo por aresta, resultando em significativa economia de custos.

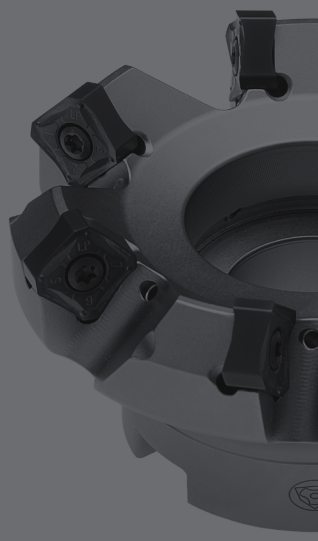
La línea PLUS ofrece fresado de alta rendimiento adecuado para una amplia gama de materiales. Combina estabilidad y seguridad del proceso con bajo consumo de energía. Al presentar una plaquita negativa, asegura alta productividad y bajo costo por filo, lo que resulta en una significativa economía de costos.

PLUS ON45-05 > page 56



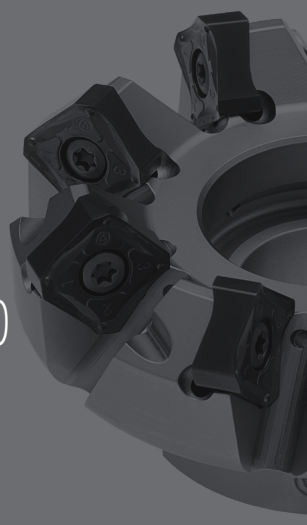
- From DC 2.000 in to 5.000 in
  De DC 2.000 in a 5.000 in | Desde DC 2.000 in hasta 5.000 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Two different geometries for same pocket (ON.. 0505.. and SN.. 1206..)
  Duas geometrias diferentes para o mesmo alojamento (ON.. 0505.. e SN.. 1206..) | Dos geometrías diferentes para el mismo alojamiento (ON.. 0505.. y SN.. 1206..)
- For high productivity and low cost per edge
  Para alta produtividade e baixo custo por aresta | Para alta productividad y bajo costo por filo

PLUS SN45-12 > page 60



- From DC 1.500 in to 10.000 in
  De DC 1.500 in a 10.000 in | Desde DC 1.500 in hasta 10.000 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Optimized line for SN.. 1206 Inserts
  Linha otimizada para pastilhas SN.. 1206 / Línea optimizada para pastillas SN.. 1206
- Designed for high stability and safety
  Projetada para alta estabilidade e segurança | Diseñada para alta estabilidad y seguridad

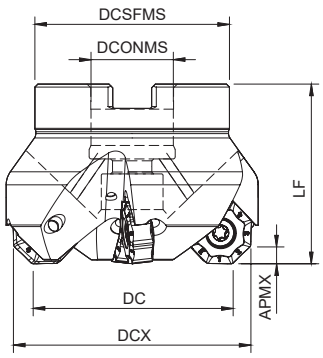
PLUS SN45-16 > page 64

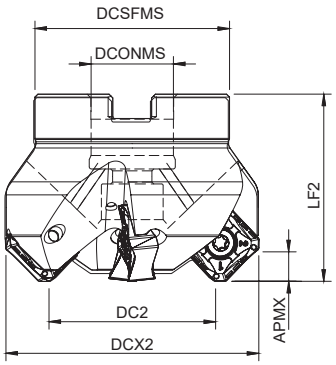


- From DC 2.500 in to 10.000 in
  De DC 2.500 in a 10.000 in | Desde DC 2.500 in hasta 10.000 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Two different geometries for same pocket (ON.. 0606.. and SN.. 1606..)
  Duas geometrias diferentes para o mesmo alojamento (ON.. 0606.. e SN.. 1206..) | Dos geometrías diferentes para el mismo alojamiento (ON.. 0606.. y SN.. 1206..)
- Excellent surface finishing
  Excelente acabamento de superfície | Excelente acabado superficial

PLUS ON45-05







Arbor Mounting

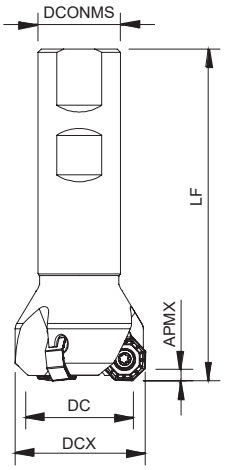
KAPR=44,5°~46° | GAMP=-6°

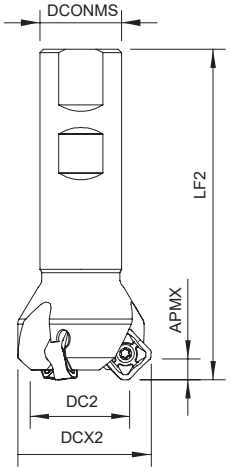
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)								WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCX	DC2	DCX2	DCONMS	DCSFMS	LF	LF2		Arbor Type	APMX (in)		
181185700	ON45 D2.00-A.750/1.75-04-05	4	2.000	2.299	1.886	2.473	0.750	1.770	1.750	1.809	0.844	A	0.138 | 0.236	ON...05 | SN...12	◈
181185800	ON45 D2.50-A1.00/1.75-06-05	6	2.500	2.799	2.386	2.973	1.000	2.200	1.750	1.809	1.157	A	0.138 | 0.236	ON...05 | SN...12	◈
181185900	ON45 D3.15-A1.00/2.00-07-05	7	3.150	3.449	3.036	3.623	1.000	2.200	2.000	2.059	1.865	A	0.138 | 0.236	ON...05 | SN...12	◈
181186000	ON45 D5.00-A1.50/2.50-10-05	10	5.000	5.229	4.886	5.473	1.500	3.380	2.500	2.559	6.548	A	0.138 | 0.236	ON...05 | SN...12	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

METRIC SHANK





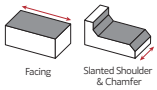


Weldon Shank

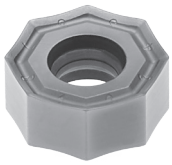
KAPR=44,5°~46° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)							WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCX	DC2	DCX2	DCONMS	LF	LF2		APMX (in)		
181118000	032W90845-03-06-025100	3	1.260	1.559	1.146	1.732	0.984	3.937	3.996	0.827	0.138 | 0.236	ON...05 | SN...12	◈
181118100	040W90845-04-06-032110	4	1.575	1.874	1.461	2.047	1.260	4.331	4.390	1.439	0.138 | 0.236	ON...05 | SN...12	◈

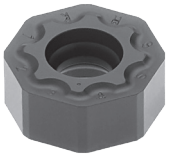
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

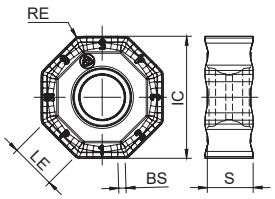


ONH(K)X 05 | SNH(K)X 12 Inserts | Pastilhas | Plaquitas


ONH(K)X-LP

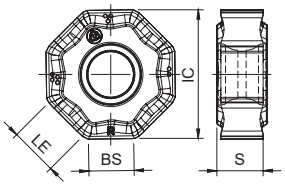

ONH(K)X-MP


ONH(K)X-MK

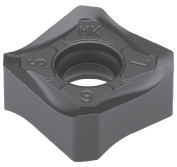


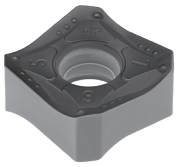
ONH(K)X-LP | MP | MK

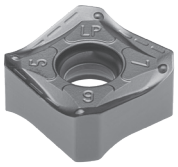

ONHX-W
8 Cutting Edges (8R)

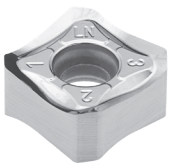


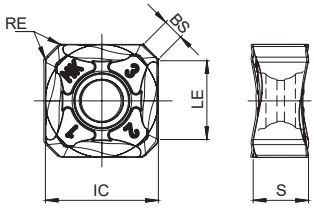
ONHX-W


SNH(K)X-MK


SNH(K)X-MP


SNHX-LP


SNHX-LN



SNH(K)X- MK | MP | LP | LN

		P							M		K									N	S		Dimensions Dimensões Dimensiones (in)				
		CVD	PVD						PVD		CVD				PVD						UNC	PVD						
	(2) Grade code	T9	X5	G4	T1	P3	P4	G6	X9	G6	L5	L6	L9	T9	X5	G4	T1	P3	P4	G6	10	X9	G6					
(1) Geometry code	ISO Reference	PHS740	PHP910	PH7920	PHP920	PH7930	PHP930	PH7740	PHH930	PH7740	PH5705	PH5320	PH5740	PHS740	PHP910	PH7920	PHP920	PH7930	PHP930	PH7740	PH0910	PHH930	PH7740	IC	S	LE	RE	BS
1112302	ONHX 050505 ANEN-LP				◉		◉	◉		◉							◉		◉	◉			◉	0.500	0.205	0.209	0.020	-
1112304	ONHX 050505 ANSN-MP				◉		◉										◉		◉					0.500	0.205	0.209	0.020	-
1112301	ONKX 050505 ANEN-LP	○		△	◉	△	◉	○	◉					○		△	◉	△	◉	○		◉	○	0.500	0.205	0.209	0.020	-
1112303	ONKX 050505 ANSN-MP	◉		△	◉	△	◉							◉		△	◉	△	◉					0.500	0.205	0.209	0.020	-
1112305	ONKX 050500 ANEN-MK										○	◉	◉					△						0.500	0.205	0.209	-	-
1112307	ONHX 050500 ANER-W			△	◉						◉					△	◉							0.500	0.205	0.209	-	0.169
1111452	SNHX 1206 ANEN-LP*				◉		◉		◉								◉		◉	○		◉	○	0.500	0.250	0.366	0.031	0.079
1111502	SNHX 1206 ANSN-MP*	◉	◉	◉	◉		◉							◉	◉		◉		◉	○		○	○	0.500	0.250	0.366	0.031	0.079
1111503	SNHX 1206 ANEN-MK*										◉		◉		◉	△	◉							0.500	0.250	0.366	0.031	0.079
1111504	SNHX 1206 ANFN-LN*																				◉			0.500	0.250	0.366	0.031	0.079
1112293	SNKX 1206 ANSN-MP*	◉		△	◉			◉					○	◉		△	◉			◉			◉	0.500	0.250	0.366	0.031	0.079
1112249	SNKX 1206 ANEN-MK*										◉	◉	◉											0.500	0.250	0.366	0.031	0.079

◉ First choice | 1ª Escolha | 1ª Opción
◉ Stock Itens | Itens de stock
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

* Right hand insert.

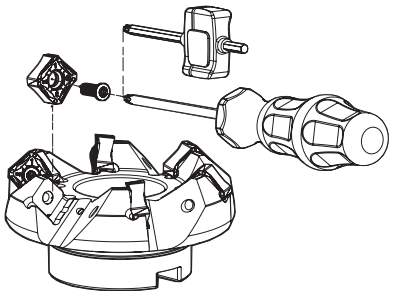
PLUS ON45-05

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
ON45-A-05 – 2.00-3.15	P0401200	XT15	DT1530	26.6
ON45-A-05 – 5.00	P0401200	PT15	DT1530	26.6
W90845 - 1.260 - 1.575	P0401200	XT15	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



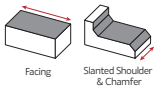
GRADES SELECTION GUIDE Guia para selecção de graus | Tabla para selección de calidades

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance Toughness → PH0910	PH5705	PH5320	PHP910	PHP920	PH7920	PHP930	PHH930	PH7930	PH5740	PHS740	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	200-330								✓	✓			✓
	6	SS - Austenitic-ferritic (Duplex)	230-260								✓	✓			✓
K	7	Malleable Cast Iron	130-230		✓	✓	✓	✓	✓	✓		✓	✓		✓
	8	Grey Cast Iron	180-245		✓	✓	✓	✓	✓	✓		✓	✓		✓
	9	Nodular Cast iron	160-250		✓	✓	✓	✓	✓	✓		✓	✓		✓
N	10	Aluminium and Non Ferrous	30-130	✓											
S	11	Heat Resistant Super Alloys	200-320								✓	✓			✓

Good Conditions Average Conditions Difficult Conditions

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	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	MP
	5	SS - Austenitic	200-330	LP	-
	6	SS - Austenitic-ferritic (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	-
N	10	Aluminium and Non Ferrous	30-130	LN	-
S	11	Heat Resistant Super Alloys	200-320	LP	-



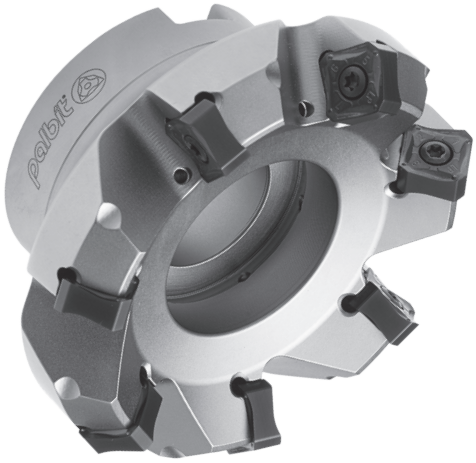
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

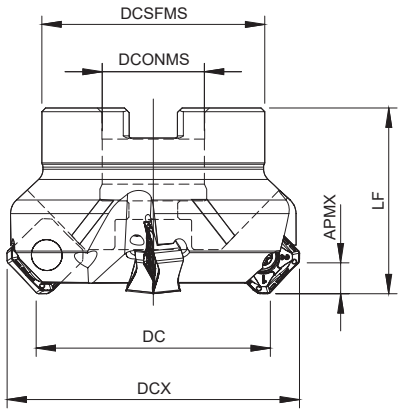
ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance						Toughness →
				PH0910	PH5705	PH5320	PHP910	PHP920	PH7920	PHP930
P	1	Unalloyed Steel	125-220	-	-	-	590-820	590-820	590-787	525-722
	2	Low-Alloyed Steel	220-280	-	-	-	525-787	525-754	525-722	459-656
	3	High-Alloyed Steel	280-380	-	-	-	459-754	459-722	459-689	394-623
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	-	459-722	459-656
	5	SS - Austenitic	200-330	-	-	-	-	-	426-590	394-525
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	-	394-525	328-459
K	7	Malleable Cast Iron	130-230	-	525-951	492-918	590-984	525-886	525-853	492-787
	8	Grey Cast Iron	180-245	-	558-1050	525-1050	525-820	459-820	459-787	459-754
	9	Nodular Cast iron	160-250	-	459-656	328-623	492-689	394-689	394-656	328-623
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	-	-	98-328

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance				Toughness →	Feed fz (in/t)	
				PHH930	PH7930	PH5740	PHS740	PH7740	SNH(K)X 12...	ONH(K)X 05...
P	1	Unalloyed Steel	125-220	-	525-722	-	459-722	459-656	0.004-0.014	0.004-0.014
	2	Low-Alloyed Steel	220-280	-	459-656	-	394-656	426-590	0.004-0.014	0.004-0.014
	3	High-Alloyed Steel	280-380	-	394-623	-	328-623	328-558	0.004-0.012	0.004-0.012
M	4	SS - Ferritic / Martensitic	200-330	459-689	459-656	-	-	426-590	0.004-0.012	0.004-0.012
	5	SS - Austenitic	200-330	394-558	394-525	-	-	361-525	0.004-0.012	0.004-0.012
	6	SS - Austenitic-ferritic (Duplex)	230-260	328-492	328-459	-	-	295-492	0.004-0.010	0.004-0.010
K	7	Malleable Cast Iron	130-230	-	492-787	525-853	-	459-722	0.004-0.014	0.004-0.014
	8	Grey Cast Iron	180-245	-	459-754	459-787	-	394-689	0.004-0.014	0.004-0.014
	9	Nodular Cast iron	160-250	-	328-623	394-656	-	328-623	0.004-0.012	0.004-0.012
N	10	Aluminium and Non Ferrous	30-130	-	-	-	-	-	0.004-0.014	-
S	11	Heat Resistant Super Alloys	200-320	98-361	98-328	-	-	98-328	0.003-0.008	0.003-0.007

(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.

PLUS SN45-12





Arbor Mounting

KAPR=44,5°~46° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCX	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
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	◉
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	◉
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	◉
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

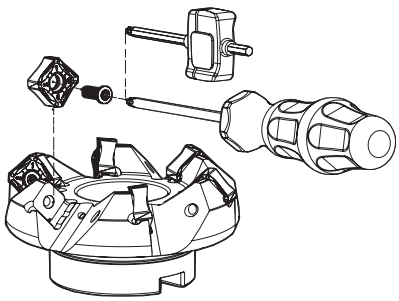
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

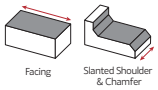
SPARE PARTS Acessórios | Repuestos

Order separately

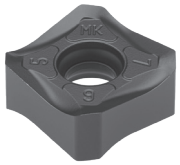
Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				
SN45-A-12 - 1.50-3.00	P0401200	XT15	DT1530	26.6
SN45-A-12 - 4.00-10.00	P0401200	PT15	DT1530	26.6

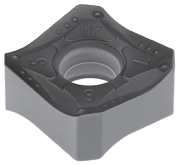
Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



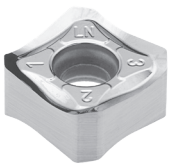


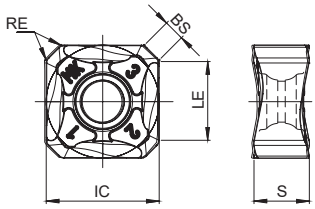
SNH(K)X 12 Inserts | Pastilhas | Plaquitas


SNH(K)X-MK


SNH(K)X-MP

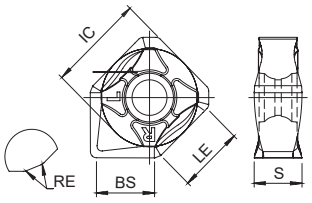

SNHX-LP


SNHX-LN



SNH(K)X- MK | LP | MP | LN


SNHX-W
4 Cutting edges (2R + 2L)



SNHX-W

		P							M		K										N	S		Dimensions Dimensões Dimensiones (in)				
		CVD	PVD						PVD		CVD				PVD						UNC	PVD						
	[2] Grade code	T9	X5	G4	T1	P3	P4	G6	X9	G6	L5	L6	L9	T9	X5	G4	T1	P3	P4	G6	10	X9	G6					
[1] Geometry code	ISO Reference	PHS740	PHP910	PH7920	PHP920	PH7930	PHP930	PH7740	PHH930	PH7740	PH5705	PH5320	PH5740	PHS740	PHP910	PH7920	PHP920	PH7930	PHP930	PH7740	PH0910	PHH930	PH7740	IC	S	LE	RE	BS
1112293	SNKX 1206 ANSN-MP*	●		◇	●			●					○	●		◇	●			●			●	0.500	0.250	0.366	0.031	0.079
1112249	SNKX 1206 ANEN-MK*										●	●	●											0.500	0.250	0.366	0.031	0.079
1111452	SNHX 1206 ANEN-LP*				●		●		●								●		●	○		●	○	0.500	0.250	0.366	0.031	0.079
1111502	SNHX 1206 ANSN-MP*	●	●	●	●		●							●	●		●		●	○		○	○	0.500	0.250	0.366	0.031	0.079
1111503	SNHX 1206 ANEN-MK*										●		●		●	◇	●							0.500	0.250	0.366	0.031	0.079
1111504	SNHX 1206 ANFN-LN*																				●			0.500	0.250	0.366	0.031	0.079
1111899	SNHX 1206 ANFN-W**		●		●										●		●							0.500	0.248	0.366	0.016	0.299

● First choice | 1ª Escolha | 1ª Opción
● Stock Itens | Itens de stock
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

Insert Order Code: [1] Geometry code + [2] Grade code

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

PLUS SN45-12

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance								Toughness →	
				PH0910	PH5705	PH5320	PHP910	PHP920	PH7920	PHP930	PHH930	PH7930	PH5740
P	1	Unalloyed Steel	125-220	-	-	-	590-820	590-820	590-787	525-722	-	525-722	-
	2	Low-Alloyed Steel	220-280	-	-	-	525-787	525-754	525-722	459-656	-	459-656	-
	3	High-Alloyed Steel	280-380	-	-	-	459-754	459-722	459-689	394-623	-	394-623	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	-	459-722	459-656	459-689	459-656	-
	5	SS - Austenitic	200-330	-	-	-	-	-	426-590	394-525	394-558	394-525	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	-	394-525	328-459	328-492	328-459	-
K	7	Malleable Cast Iron	130-230	-	525-951	492-918	590-984	525-886	525-853	492-787	-	492-787	525-853
	8	Grey Cast Iron	180-245	-	558-1050	525-1050	525-820	459-820	459-787	459-754	-	459-754	459-787
	9	Nodular Cast iron	160-250	-	459-656	328-623	492-689	394-689	394-656	328-623	-	328-623	394-656
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-	-	-	-	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	-	-	98-328	98-361	98-328	-

ISO	PSM	Material	HB (Brinell)	Vc (SFM) Toughness →		Feed fz (in/t)				
				PHS740	PH7740	SNHX 12.. LP	SNH(K)X 12.. MP	SNH(K)X.. 12 MK	SNHX 12.. LN	SNHX 12.. W
P	1	Unalloyed Steel	125-220	459-722	459-656	0.004-0.014	0.004-0.014	-	-	0.004-0.014
	2	Low-Alloyed Steel	220-280	394-656	426-590	0.004-0.014	0.004-0.014	-	-	0.004-0.014
	3	High-Alloyed Steel	280-380	328-623	328-558	0.004-0.012	0.004-0.012	-	-	0.004-0.012
M	4	SS - Ferritic / Martensitic	200-330	-	426-590	0.004-0.012	-	-	-	-
	5	SS - Austenitic	200-330	-	361-525	0.004-0.012	-	-	-	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	295-492	0.004-0.010	-	-	-	-
K	7	Malleable Cast Iron	130-230	-	459-722	0.004-0.014	-	0.004-0.014	-	0.004-0.016
	8	Grey Cast Iron	180-245	-	394-689	0.004-0.014	-	0.004-0.014	-	0.004-0.016
	9	Nodular Cast iron	160-250	-	328-623	0.004-0.012	-	0.004-0.012	-	0.004-0.016
N	10	Aluminium and Non Ferrous	30-130	-	-	-	-	-	0.004-0.014	-
S	11	Heat Resistant Super Alloys	200-320	-	98-328	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.

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance										Toughness →
				PH0910	PH5705	PH5320	PHP910	PHP920	PH7920	PHP930	PHH930	PH7930	PH5740	PHS740	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	200-330								✓	✓			✓
	6	SS - Austenitic-ferritic (Duplex)	230-260								✓	✓			✓
K	7	Malleable Cast Iron	130-230		✓	✓	✓	✓	✓	✓		✓	✓		✓
	8	Grey Cast Iron	180-245		✓	✓	✓	✓	✓	✓		✓	✓		✓
	9	Nodular Cast iron	160-250		✓	✓	✓	✓	✓	✓		✓	✓		✓
N	10	Aluminium and Non Ferrous	30-130	✓											
S	11	Heat Resistant Super Alloys	200-320								✓	✓			✓

● Good Conditions ● Average Conditions ● Difficult Conditions

Spare Parts: A - 288 Technical Data: A - 298

palbit

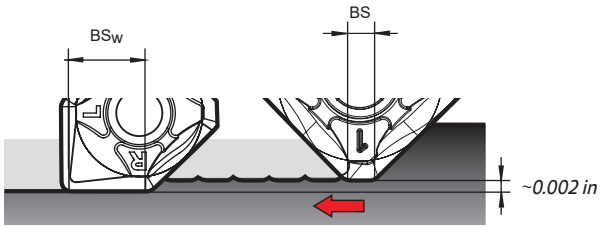
CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip breaker application	
				1st choice	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	200-330	SNHX 12... LP	-
	6	SS - Austenitic-ferritic (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	Aluminium and Non Ferrous	30-130	SNHX 12... LN	-
S	11	Heat Resistant Super Alloys	200-320	SNHX 12... LP	-

WIPER INSERTS

Recommended Cutting Conditions:

- f_n should be equal to 0,8 x BS_W
- Axial depth of cut is 0.020 to 0.031 in.



Example:

- The width of the parallel land (BS) of the insert is 0.079 in.
- To obtain a good surface finishing, the feed per revolution should be a maximum of 80% of 0.079 in = 0.063 in.
- The wiper insert will have a parallel land (BS_W) with a width of 0.299 in.
- Result: Feed per revolution (f_n) could be increased from 0.063 to 0.240 in (80% of 0.299 in).

Note:

- Other limitations, such as machine power, must be taken into consideration.
- $f_n \leq 0{,}8 \times BS_W = f_Z \leq 0{,}8 \times BS_W / Z$

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 workpiece cutting surface.

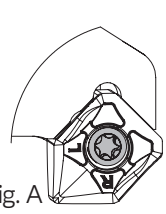


Fig. A

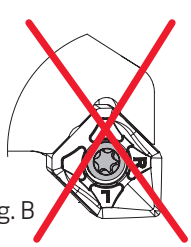
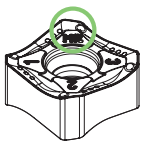
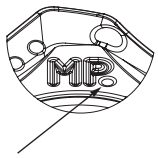


Fig. B

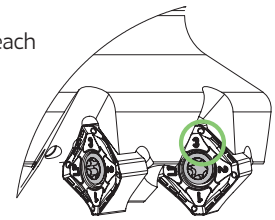
When using wiper insert, install the insert as shown on Fig. A if the insert is installed as shown on Fig. B breakage of the insert is inevitable and normal surface finish can not been obtained.



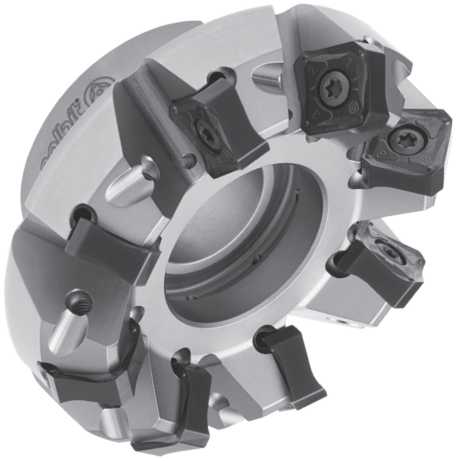


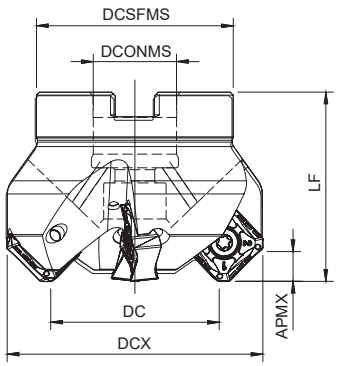
This point shows the SNKX insert difference to SNHX

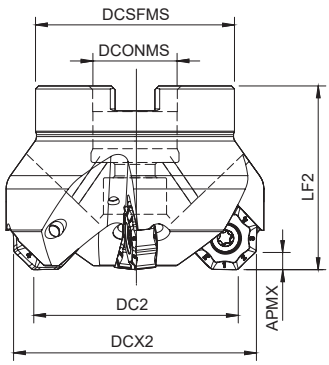
Put the same side of insert in each pocket for best radial and axial runout when using SNKX.



PLUS SN45-16







Arbor Mounting

KAPR=44,5°~46° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)								WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCX	DC2	DCX2	DCONMS	DCSFMS	LF	LF2		Arbor Type	APMX (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	◇
181102800	SN45 D4.00-A1.25/2.00-10-16	10	4.000	4.673	4.141	4.511	1.250	3.150	2.000	1.921	4.93	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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

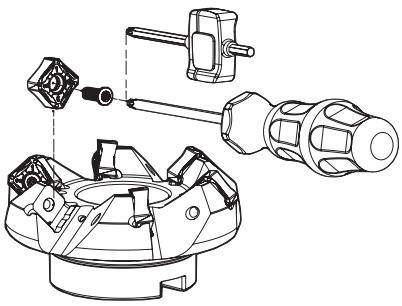
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

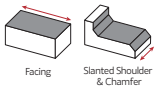
SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
SN45-A-16 - 2.50-3.00	P0451400	XT20	DT2050	44.3
SN45-A-16 - 4.00-10.00	P0451400	PT20	DT2050	44.3

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



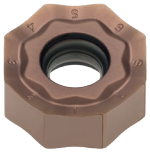


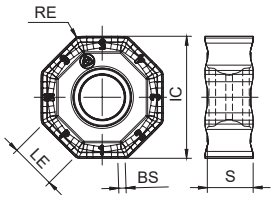
ONH(K)X 06 | SNH(K)X 16 Inserts | Pastilhas | Plaquitas


ONH(K)X-LP


ONH(K)X-MP

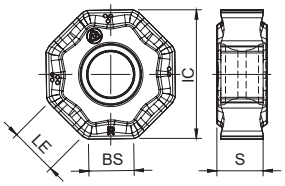

ONH(K)X-MK


ONHX-LS

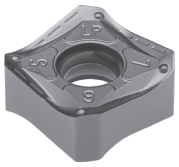


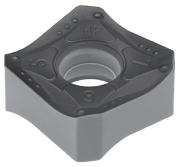
ONH(K)X-LP | MP | MK | LS

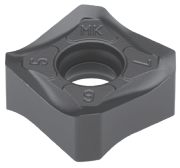

ONHX-W
8 Cutting Edges (8R)

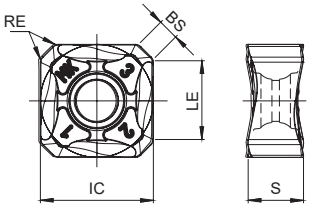


ONHX-W


SNHX-LP


SNH(K)X-MP


SNH(K)X-MK



SNH(K)X- MK | LP | MP

		P						M			K								S			Dimensions Dimensões Dimensiones (in)				
		CVD	PVD					PVD			CVD				PVD					PVD							
	(2) Grade code	T9	G4	T1	P3	P4	G6	P3	X9	G6	L5	L6	L9	T9	G4	T1	P3	P4	G6	P3	X9	G6					
(1) Geometry code	ISO Reference	PHS740	PH7920	PHP920	PH7930	PHP930	PH7740	PH7930	PHH930	PH7740	PH5705	PH5320	PH5740	PHS740	PH7920	PHP920	PH7930	PHP930	PH7740	PH7930	PHH930	PH7740	IC	S	LE	RE	BS
1111954	ONHX 0606 ANEN-LP			◈	◇	◈	◈	◇		◈						◈	◇	◈	◈	◇		◈	0.650	0.244	0.244	0.031	0.039
1112696	ONHX 0606 ANEN-LS	○					○		◈	○				○					○		◈	○	0.650	0.246	0.244	0.031	0.039
1111955	ONHX 0606 ANEN-MP			◈			◈			◈			○			◈			◈			◈	0.650	0.244	0.244	0.031	0.039
1111956	ONHX 0606 ANEN-MK										◈		◈										0.650	0.236	0.244	0.031	0.039
1112053	ONHX 0606 ANEN-W*		◇	◈							◈				◇	◈							0.650	0.235	0.244	-	0.236
1112284	ONKX 0606 ANEN-LP	○	◇	◈	◇	◈	◈	◇	◈	◈		◈		○	◇	◈	◇	◈	◈	◇	◈	◈	0.650	0.244	0.244	0.031	0.039
1112287	ONKX 0606 ANEN-MP	◈	◇	◈			◈			◈				◈	◇	◈			◈			◈	0.650	0.244	0.244	0.031	0.039
1112291	ONKX 0606 ANEN-MK										◈		◈										0.650	0.236	0.244	0.031	0.039
1111951	SNHX 1606 ANER-LP			◈		◈	◈			◈			○			◈	○	◈	◈	○		◈	0.650	0.250	0.492	0.031	0.087
1111952	SNHX 1606 ANER-MP	◈		◈			◈			◈		○		◈		◈			◈			◈	0.650	0.250	0.492	0.031	0.087
1111953	SNHX 1606 ANER-MK												◈										0.650	0.250	0.492	0.031	0.087
1112281	SNKX 1606 ANER-MP	◈	◇	◈			◈			◈				◈	◇	◈			◈			◈	0.650	0.250	0.492	0.031	0.087
1112282	SNKX 1606 ANER-MK											◈	◈										0.650	0.250	0.492	0.031	0.087

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

PLUS SN45-16

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance					Toughness →
				PH5705	PH5320	PHP920	PH7920	PHP930	PHH930
P	1	Unalloyed Steel	125-220	-	-	590-820	590-787	525-754	-
	2	Low-Alloyed Steel	220-280	-	-	525-754	525-722	459-689	-
	3	High-Alloyed Steel	280-380	-	-	459-722	459-689	394-656	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	-	459-689
	5	SS - Austenitic	200-330	-	-	-	-	-	394-558
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	-	328-492
K	7	Malleable Cast Iron	130-230	525-951	492-918	525-886	525-853	492-820	-
	8	Grey Cast Iron	180-245	558-1050	525-1050	459-820	459-787	459-754	-
	9	Nodular Cast iron	160-250	459-656	328-623	394-689	394-656	328-656	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	-	98-361

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance			Toughness →	Feed fz (in/t)
				PH7930	PH5740	PHS740	PH7740	SNH(K)X/ONH(K)X
P	1	Unalloyed Steel	125-220	525-722	-	459-722	459-656	0.006 **(0.010)** 0.016
	2	Low-Alloyed Steel	220-280	459-656	-	394-656	426-590	0.006 **(0.010)** 0.016
	3	High-Alloyed Steel	280-380	394-623	-	328-623	328-558	0.006 **(0.010)** 0.016
M	4	SS - Ferritic / Martensitic	200-330	459-656	-	-	426-590	0.004 **(0.008)** 0.012
	5	SS - Austenitic	200-330	394-525	-	-	361-525	0.004 **(0.008)** 0.012
	6	SS - Austenitic-ferritic (Duplex)	230-260	328-459	-	-	295-492	0.004 **(0.008)** 0.012
K	7	Malleable Cast Iron	130-230	492-787	525-853	-	459-722	0.006 **(0.010)** 0.016
	8	Grey Cast Iron	180-245	459-754	459-787	-	394-689	0.006 **(0.010)** 0.016
	9	Nodular Cast iron	160-250	328-623	394-656	-	328-623	0.006 **(0.010)** 0.016
S	11	Heat Resistant Super Alloys	200-320	98-328	-	-	98-328	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.

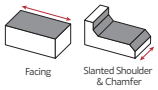
GRADES SELECTION GUIDE Guia para selecção de graus | Tabla para selección de calidades

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance									Toughness →
				PH5705	PH5320	PHP920	PH7920	PHP930	PHH930	PH7930	PH5740	PHS740	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	200-330						✓	✓			✓
	6	SS - Austenitic-ferritic (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

Spare Parts: A - 288 Technical Data: A - 298

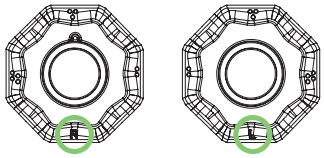
palbit



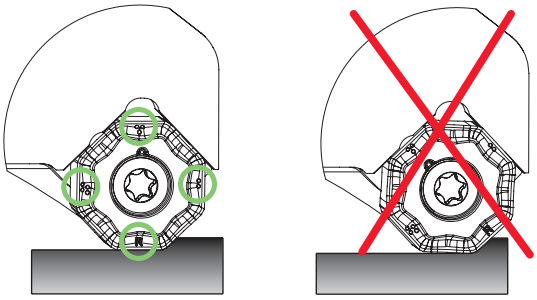
CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip breaker application	
				1st choice	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	LS	LP
	5	SS - Austenitic	200-330	LS	LP
	6	SS - Austenitic-ferritic (Duplex)	230-260	LS	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	LS	LP

WIPER INSERTS



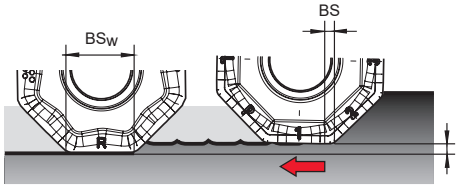
Wiper insert with 4 Right and 4 Left-hand cutting edges.
The side work of the insert it's indicated by the letter R (Right) & L (Left).



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

Recommended Cutting Conditions:

- f_n should be equal to 0,8 x BS_W
- Axial depth of cut is 0.020 to 0.031 in.



Example:

- The width of the parallel land (BS) of the insert is 0.039 in.
- 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 (BS_W) with a width of 0.236 in.
- Result: Feed per revolution (f_n) could be increased from 0.031 in to 0.189 in (80% of 0.236 in).

Note:

- Other limitations, such as machine power, must be taken into consideration.
- $f_n \leq 0,8 \times BS_W = f_Z \leq 0,8 \times BS_W / Z$

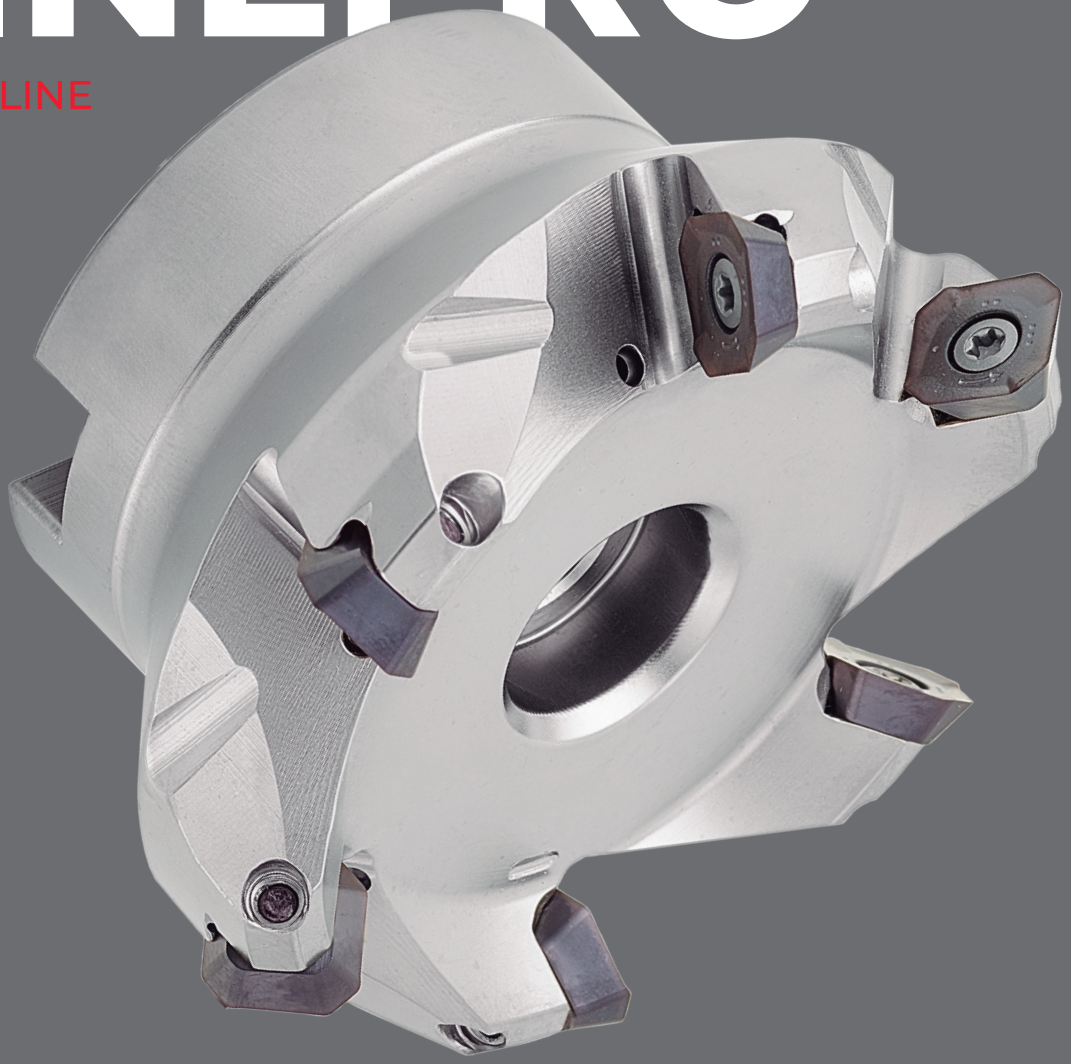
How to use a wiper insert:

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

57045

LINEPRO

METRIC LINE



The new LINEPRO 57045 is engineered for face milling operations on stainless steel and exotic materials. It features a high number of teeth, resulting in enhanced productivity. Available in both normal and fine pitches, its design ensures an extremely positive insert position upon mounting, facilitating smooth cutting and achieving a superior surface finish. Moreover, it offers versatility by accommodating the mounting of two different types of inserts on the same toolholder.

A nova linha LINEPRO 57045 é projetada para operações de facejamento em aço inoxidável e materiais exóticos. Ela possui um grande número de dentes, resultando em produtividade aprimorada. Disponível em passos normais e finos, o seu design garante uma posição da pastilha extremamente positiva ao ser montada, permitindo um corte suave e alcançando um acabamento superficial superior. Além disso, oferece versatilidade ao permitir a montagem de dois tipos diferentes de pastilhas no mesmo suporte.

La nueva línea LINEPRO 57045 está diseñada para operaciones de fresado en acero inoxidable y materiales exóticos. Cuenta con un gran número de dientes, lo que resulta en una productividad mejorada. Disponible en pasos normales y finos, su diseño garantiza una posición de la pastilla extremadamente positiva al ser montada, lo que permite un corte suave y un acabado superficial superior. Además, ofrece versatilidad al permitir el montaje de dos tipos diferentes de pastillas en el mismo porta-herramientas.

LINEPRO 57045 > page 70



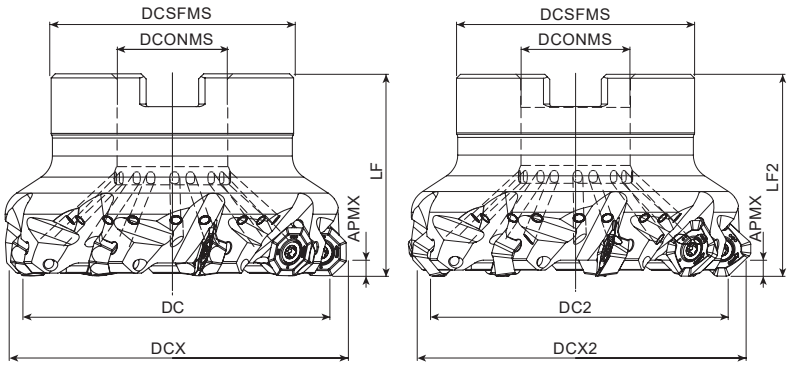
- From DC 0.787 in to 4.921 in
  De DC 0.787 in a 4.921 in | Desde DC 0.787 in hasta 4.921 in
- Available in arbor, threaded, weldon and cylindrical shank
  Disponível em montagem tipo árvore, acoplamento roscado, haste weldon e cilíndrica | Disponible en fijación con tornillo central, fijación roscada, mango tipo weldon y cilindrico
- Two different geometries for same pocket (OFHX 0403.. and SFHX 1004..)
  Duas geometrias diferentes para o mesmo alojamento (OFHX 0403.. e SFHX 1004..) / Dos geometrías diferentes para el mismo alojamiento (OFHX 0403.. y SFHX 1004..)
- Extremely positive rake angle
  Ângulo de ataque extremamente positivo | Ángulo de ataque extremadamente positivo

LINEPRO 57045

METRIC LINE

Proprietary milling line





Arbor Mounting

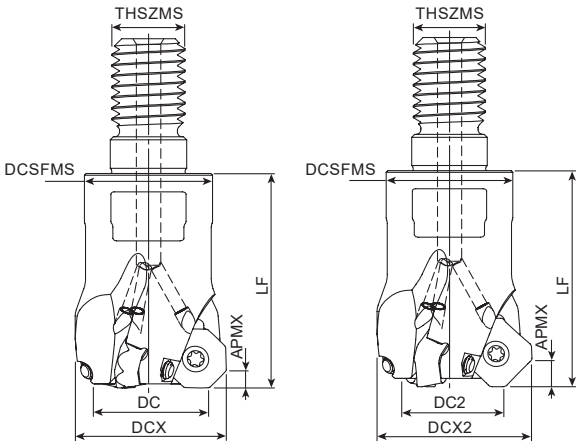
KAPR=45° | GAMP=+18°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)								WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCX	DC2	DCX2	DCONMS	DCSFMS	LF	LF2		Arbor Type	APMX (in)		
181164100	040A57045-04-18-016040	4	1.575	1.803	1.512	1.878	0.630	1.496	1.575	1.602	0.331	A	0.138|0.098	SF..10 | OF..04	○
181164200	040A57045-06-18-016040	6	1.575	1.803	1.512	1.878	0.630	1.496	1.575	1.602	0.397	A	0.138|0.098	SF..10 | OF..04	◈
181164300	050A57045-05-18-022040	5	1.969	2.197	1.906	2.272	0.866	1.890	1.575	1.602	0.727	A	0.138|0.098	SF..10 | OF..04	○
181164400	050A57045-07-18-022040	7	1.969	2.197	1.906	2.272	0.866	1.890	1.575	1.602	0.694	A	0.138|0.098	SF..10 | OF..04	◈
181164500	063A57045-06-18-022040	6	2.480	2.709	2.417	2.783	0.866	1.890	1.575	1.602	1.113	A	0.138|0.098	SF..10 | OF..04	◈
181164600	063A57045-09-18-022040	9	2.480	2.709	2.417	2.783	0.866	1.890	1.575	1.602	1.091	A	0.138|0.098	SF..10 | OF..04	○
181164700	080A57045-07-18-027050	7	3.150	3.378	3.087	3.453	1.063	2.283	1.969	1.996	2.535	B	0.138|0.098	SF..10 | OF..04	○
181164800	080A57045-11-18-027050	11	3.150	3.378	3.087	3.453	1.063	2.283	1.969	1.996	2.204	B	0.138|0.098	SF..10 | OF..04	○
181164900	100A57045-09-18-032050	9	3.937	4.165	3.874	4.240	1.260	3.071	1.969	1.996	3.637	B	0.138|0.098	SF..10 | OF..04	○
181165000	100A57045-13-18-032050	13	3.937	4.165	3.874	4.240	1.260	3.071	1.969	1.996	3.416	B	0.138|0.098	SF..10 | OF..04	○
181165100	125A57045-12-18-040063	12	4.921	5.150	4.858	5.224	1.575	3.465	2.480	2.508	5.951	B	0.138|0.098	SF..10 | OF..04	○

◈ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





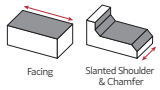
Threaded Coupling

KAPR=45° | GAMP=+18°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)								WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCX	DC2	DCX2	THSZMS	DCSFMS	LF	LF2		APMX (in)		
181163800	020R57045-03-18-M12035	3	0.787	1.008	0.732	1.079	M12	0.827	1.378	1.406	0.220	0.138|0.098	SF..10 | OF..04	○
181163900	025R57045-04-18-M12035	4	0.984	1.209	0.917	1.283	M12	0.827	1.378	1.406	0.419	0.138|0.098	SF..10 | OF..04	○
181164000	032R57045-05-18-M16035	5	1.260	1.488	1.197	1.563	M16	1.142	1.378	1.406	0.683	0.138|0.098	SF..10 | OF..04	○

◈ Stock item | Produto de stock | Itens de stock

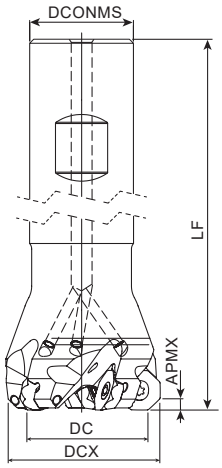
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

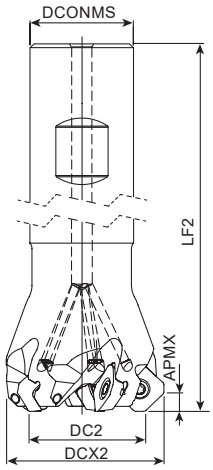




Weldon Shank

KAPR=45° | GAMP=+18°





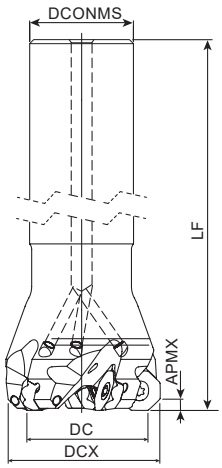
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)							WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCX	DC2	DCX2	DCONMS	LF	LF2		APMX (in)		
181165900	020W57045-03-18-020080	3	0.787	1.008	0.732	1.091	0.787	3.150	3.177	0.397	0.138|0.098	SF..10 | OF..04	◈
181166000	025W57045-04-18-020085	4	0.984	1.209	0.929	1.287	0.787	3.346	3.374	0.529	0.138|0.098	SF..10 | OF..04	◈
181166100	032W57045-05-18-025100	5	1.260	1.488	1.205	1.563	0.984	3.937	3.965	0.827	0.138|0.098	SF..10 | OF..04	◈

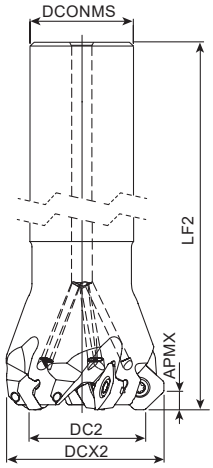
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)



Cilindrical Shank

KAPR=45° | GAMP=+18°





Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)							WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCX	DC2	DCX2	DCONMS	LF	LF2		APMX (in)		
181165200	020E57045-03-18-020080	3	0.787	1.008	0.732	1.091	0.787	3.150	3.177	0.397	0.138|0.098	SF..10 | OF..04	◈
181165300	025E57045-04-18-020085	4	0.984	1.209	0.929	1.287	0.787	3.346	3.374	0.529	0.138|0.098	SF..10 | OF..04	◈
181146500	032E57045-05-18-025100	5	1.260	1.488	1.205	1.563	0.984	3.937	3.965	0.827	0.138|0.098	SF..10 | OF..04	◈

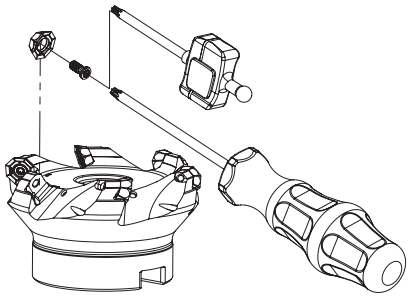
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

LINEPRO 57045 METRIC LINE

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value	Screw	DIN 6368 Wrench
A57045 - 5.157-10.315	P0300800	XT09	DT0914	12.4	-	-
A57045 - 3.937	P0300800	XT09	DT0914	12.4	J0164110	SD6368-16
A57045 - 4.921	P0300800	XT09	DT0914	12.4	J0204610	SD6368-20
R57045 - 0.787-1.260	P0300800	XT09	DT0914	12.4	-	-
W57045 - 0.787-1.260	P0300800	XT09	DT0914	12.4	-	-
E57045 - 0.787-1.260	P0300800	XT09	DT0914	12.4	-	-



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

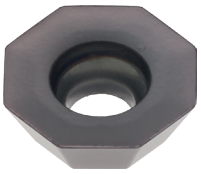
SFHX 100410 | OFHX 040305 Inserts | Pastilhas | Plaquitas



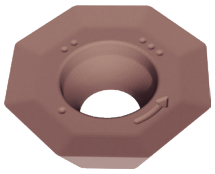
SFHX-LP



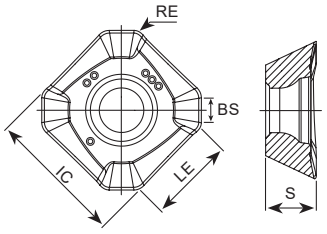
SFHX-LS



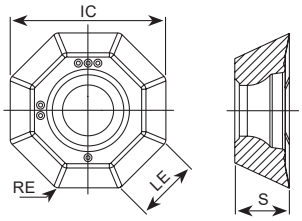
OFHX-LP



OFHX-LS



SFHX-LP | LS



OFHX-LP | LS

(1) Geometry code	ISO Reference	P			M		K			S		Dimensions Dimensões Dimensiones (in)				
		CVD	PVD		PVD		CVD	PVD		PVD						
	(2) Grade code	T9	T1	P4	X9	Z3	T9	T1	P4	X9	Z3					
		PHS740	PHP920	PHP930	PHH930	PHH530	PHS740	PHP920	PHP930	PHH930	PHH530	IC	S	LE	RE	BS
1112738	SFHX 100410 AFER-LS				◈	◈				◈	◈	0.398	0.146	0.256	0.039	0.098
1113485	SFHX 100410 AFSR-LP		◈					◈				0.398	0.146	0.256	0.039	0.098
1112737	OFHX 040305 AFEN-LS				◈	◈				◈	◈	0.394	0.136	0.161	0.020	-
1112739	OFHX 040305 AFSN-LP	○	◈	○			○	◈	○			0.394	0.136	0.161	0.020	-

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

Spare Parts: A - 288 Technical Data: A - 298

palbit

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHP920	PHP930	PHH530	PHH930	PHS740
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 - Austenitic-ferritic (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 → PHP920	PHP930	PHH530	PHH930	PHS740	Feed fz (in/t) OFHX 04..	SFHX 10..
P	1	Unalloyed steel	125-220	590-820	525-722	-	-	459-558	0.004-0.012	0.004-0.012
	2	Low-alloyed steel	220-280	558-689	492-590	-	-	426-525	0.004-0.012	0.004-0.012
	3	High-alloy steel	280-380	525-656	426-525	-	-	361-459	0.004-0.010	0.004-0.010
M	4	SS - Ferritic / Martensitic	200-330	-	-	394-590	328-525	-	0.004-0.010	0.004-0.010
	5	SS - Austenitic	200-330	-	-	328-525	295-492	-	0.004-0.010	0.004-0.010
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	230-459	197-426	-	0.004-0.008	0.004-0.008
K	7	Malleable cast iron	130-230	558-984	525-918	-	-	-	0.004-0.012	0.004-0.012
	8	Grey cast iron	180-245	492-820	459-787	-	-	-	0.004-0.012	0.004-0.012
	9	Nodular cast iron	160-250	295-689	295-656	-	-	-	0.004-0.010	0.004-0.010
S	11	Heat Resistant Super Alloys	200-320	-	-	98-246	82-230	-	0.003-0.006	0.003-0.006

(Note 1) Cutting conditions ae/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.

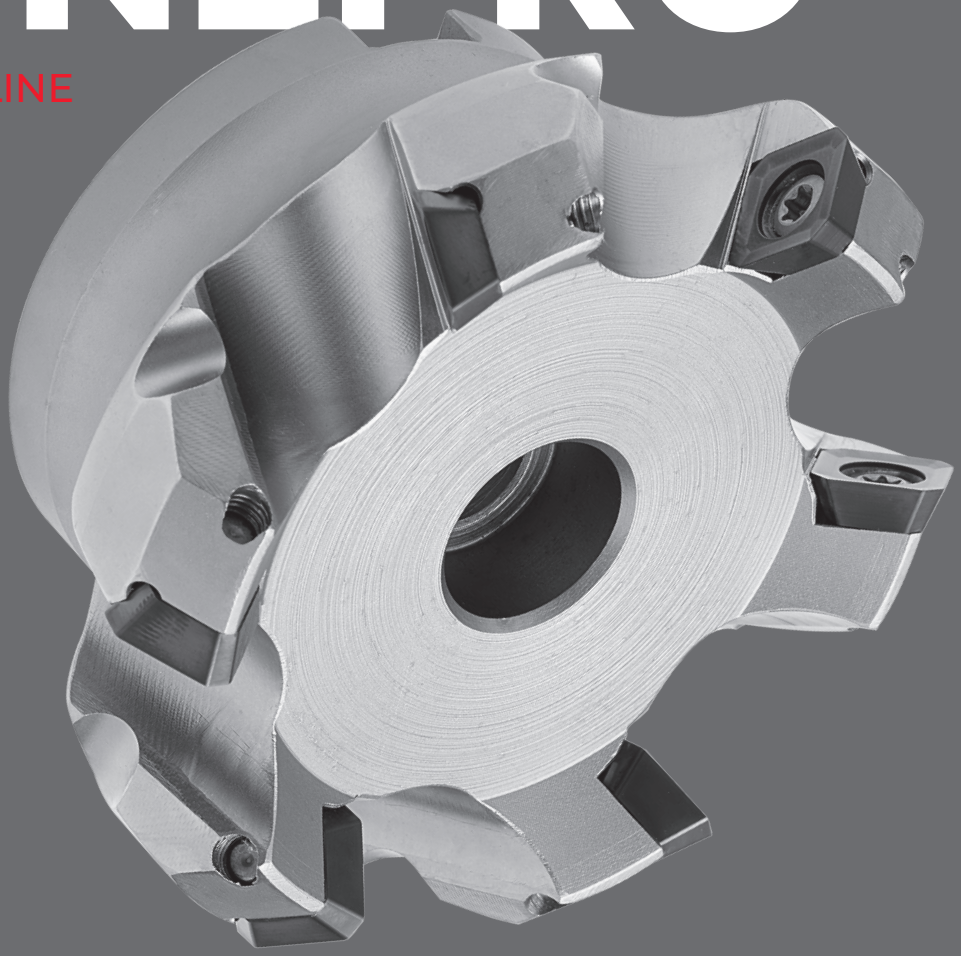
CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

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

06045 | 09945

LINEPRO

METRIC LINE

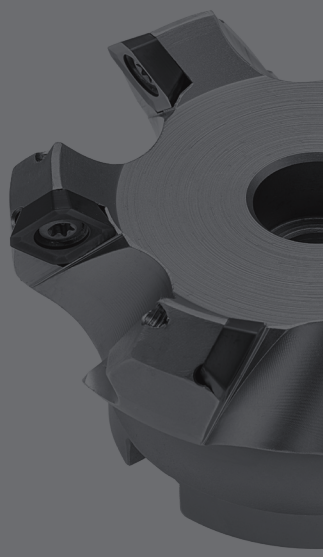


LINEPRO is a standard 45° face milling system designed for universal application. Its positive geometry ensures a sharp cutting edge that minimizes cutting forces while enhancing surface quality.

LINEPRO é um sistema padrão de facejamento a 45° projetada para aplicação universal. A sua geometria positiva garante uma aresta de corte afiada que minimiza as forças de corte, enquanto melhora a qualidade da superfície.

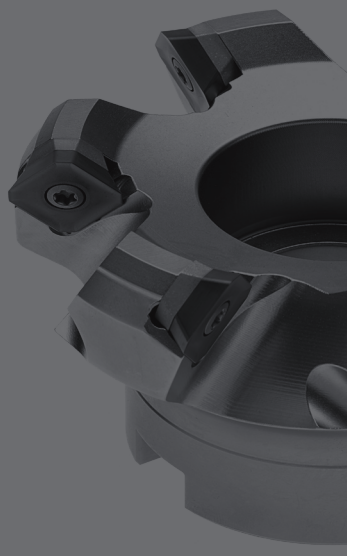
LINEPRO es un sistema estándar de fresado frontal a 45° diseñado para aplicación universal. Su geometría positiva garantiza un filo de corte afilado que minimiza las fuerzas de corte, mientras mejora la calidad de la superficie.

LINEPRO 06045 > page 76



- From DC 1.969 in to 6.299 in
  De DC 1.969 in a 6.299 in | Desde DC 1.969 in hasta 6.299 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Low cutting forces
  Baixas forças de corte | Bajas fuerzas de corte
- General application
  Aplicação geral | Aplicación general

LINEPRO 09945 > page 78

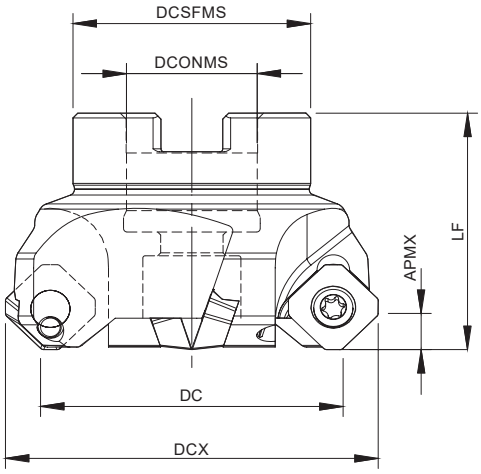


- From DC 1.969 in to 9.843 in
  De DC 1.969 in a 9.843 in | Desde DC 1.969 in hasta 9.843 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Excellent chip flow
  Excelente fluxo de aparas | Excelente flujo de virutas
- High rigidity due to carbide shim
  Alta rigidez devido ao calço de metal duro / Alta rigidez gracias al calce de carburo

LINEPRO 06045

METRIC LINE





Arbor Mounting

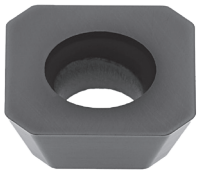
KAPR=45° | GAMP=+19°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCX	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181163200	050A06045-04-19-022040	4	1.969	2.441	0.866	1.654	1.575	0.771	A	0.236	SE...T/W 1204	○
181148800	063A06045-05-19-022050	5	2.480	2.953	0.866	1.654	1.969	1.763	A	0.236	SE...T/W 1204	○
181148900	080A06045-06-19-027050	6	3.150	3.622	1.063	1.969	1.969	2.535	A	0.236	SE...T/W 1204	○
181149000	100A06045-06-19-032050	6	3.937	4.409	1.260	2.520	1.969	3.747	A	0.236	SE...T/W 1204	○
181163300	125A06045-07-19-040063	7	4.921	5.197	1.575	3.346	2.480	6.061	B	0.236	SE...T/W 1204	○
181040300	160A06045-08-19-U040063	8	6.299	6.772	1.575	3.937	2.480	10.138	C	0.236	SE...T/W 1204	○

Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

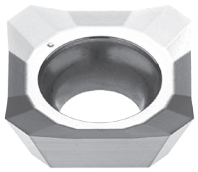
SEH... 1204 Inserts | Pastilhas | Plaquitas



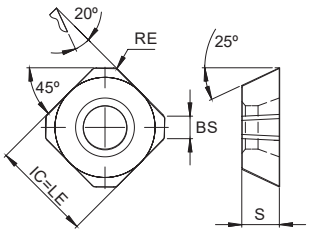
SEHW



SEHT



SEHT-LN



SEHW | SEHT | SEHT-LN

		P		M	K		N	Dimensions Dimensões Dimensiones (in)			
		PVD		PVD	PVD		UNC				
	(2) Grade code	68	I5	I5	68	I5	10				
(1) Geometry code	ISO Reference	PH6920	PH6740	PH6740	PH6920	PH6740	PH0910	IC	S	LE	BS
1110216	SEHT 1204 AFEN	◉	◉	◉	◉	◉		0.500	0.187	0.500	0.110
1110218	SEHT 1204 AFTN	◉	◉	◉	◉	◉		0.500	0.187	0.500	0.110
1112283	SEHT 1204 AFFN-LN						◉	0.500	0.187	0.500	0.079
1110219	SEHW 1204 AFEN	◉	◉	◉	◉	◉		0.500	0.187	0.500	0.110
1110222	SEHW 1204 AFTN	◉	◉	◉	◉	◉		0.500	0.187	0.500	0.110

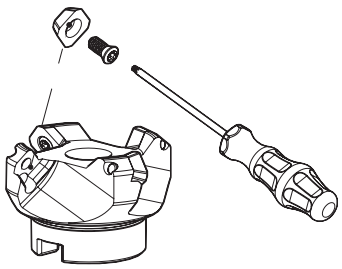
◉ First choice | Primeira opção | 1ª opción ◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm) (Order separately)	Torque Value
A06045 – 1.969 - 6.299	P0501100	PT20	DT2050	44.3

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PH6920	PH6740
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 - Austenitic-ferritic (Duplex)	230-260			✓
K	7	Malleable cast iron	130-230		✓	✓
	8	Grey cast iron	180-245		✓	✓
	9	Nodular cast iron	160-250		✓	✓
N	10	Aluminium and Non Ferrous	30-130	✓		

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 → PH0910	PH6920	PH6740	Feed fz (in/t) SEHT 1204...	SEHT 1204 LN	SEHW 1204...
P	1	Unalloyed steel	125-220	-	492-754	426-525	0.004-0.008	-	0.004-0.008
	2	Low-alloyed steel	220-280	-	459-722	394-492	0.004-0.008	-	0.004-0.008
	3	High-alloy steel	280-380	-	426-590	328-426	0.004-0.008	-	0.004-0.008
M	4	SS - Ferritic / Martensitic	200-330	-	-	328-394	0.004-0.006	-	0.004-0.008
	5	SS - Austenitic	200-330	-	-	262-361	0.004-0.006	-	0.004-0.008
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	230-328	0.004-0.006	-	0.004-0.008
K	7	Malleable cast iron	130-230	-	-	426-820	0.004-0.010	-	0.004-0.010
	8	Grey cast iron	180-245	-	-	361-722	0.004-0.010	-	0.004-0.010
	9	Nodular cast iron	160-250	-	-	262-558	0.004-0.010	-	0.004-0.010
N	10	Aluminium and Non Ferrous	30-130	1148-4592	-	-	-	0.004-0.010	-

(Note 1) Cutting conditions ae/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.

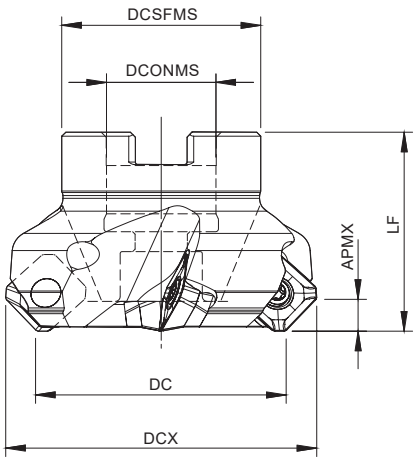
CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip breaker application 1st choice	Dificult Operations
P	1	Unalloyed Steel	125-220	SEHT 12... AFEN	SEHW 12... AFEN
	2	Low-Alloyed Steel	220-280	SEHT 12... AFTN	SEHW 12... AFTN
	3	High-Alloyed Steel	280-380	SEHT 12... AFTN	SEHW 12... AFTN
M	4	SS - Ferritic / Martensitic	200-330	SEHT 12... AFEN	SEHW 12... AFEN
	5	SS - Austenitic	200-330	SEHT 12... AFEN	SEHW 12... AFEN
	6	SS - Austenitic-ferritic (Duplex)	230-260	SEHW 12... AFEN	-
K	7	Malleable Cast Iron	130-230	SEHT 12... AFEN	SEHW 12... AFEN
	8	Grey Cast Iron	180-245	SEHT 12... AFEN	SEHW 12... AFEN
	9	Nodular Cast iron	160-250	SEHW 12... AFEN	SEHW 12... AFTN
N	10	Aluminium and Non Ferrous	30-130	SEHT 12... AFFN-LN	-

LINEPRO 09945

METRIC LINE





Arbor Mounting

KAPR=45° | GAMP=+20°~+21°

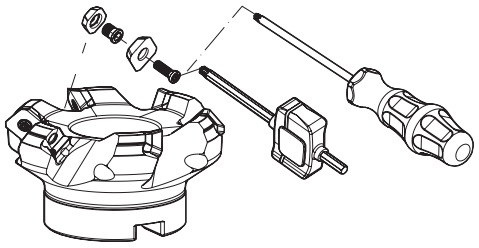
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCX	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181034700	050A09945-04-20-U022040	4	1.969	2.480	0.866	1.575	1.575	0.793	A	0.236	SE...13T3	◈
181024200	063A09945-05-21-U022040	5	2.480	2.992	0.866	1.890	1.575	1.300	A	0.236	SE...13T3	◈
181024300	080A09945-06-21-U027050	6	3.150	3.661	1.063	2.362	1.969	2.248	B	0.236	SE...13T3	◈
181024400	100A09945-07-21-U032050	7	3.937	4.449	1.260	2.756	1.969	3.350	B	0.236	SE...13T3	◈
181024500	125A09945-08-21-U040063	8	4.921	5.433	1.575	3.543	2.480	6.965	B	0.236	SE...13T3	◈
181024600	160A09945-10-21-U040063	10	6.299	6.811	1.575	4.331	2.480	10.160	C	0.236	SE...13T3	◈
181051400	250A09945-24-21-U060063L	24	9.843	10.354	2.362	6.772	2.480	30.614	C	0.236	SE...13T3	○
181024800	250A09945-24-21-U060063	24	9.843	10.354	2.362	6.772	2.480	30.614	C	0.236	SE...13T3	○

◈ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Order separately Key (Torx - Nm)	Torque Value	Order separately Shim	Shim Screw
A09945 – 1.969 - 3.150	P0351200	XT15	DT1530	26.6	CS130300	T0503509
A09945 – 3.937 - 9.843	P0351200	PT15	DT1530	26.6	CS130300	T0503509



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

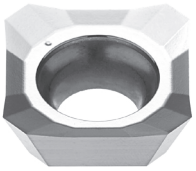
SE... 13T3 Inserts | Pastilhas | Plaquitas



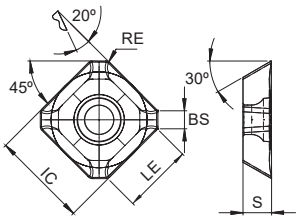
SEHT



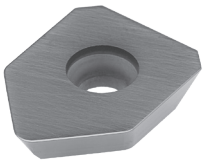
SEHW



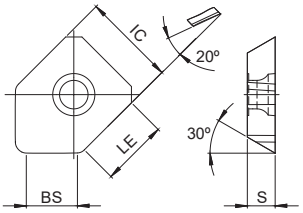
SEHT-LN



SEHT | SEHW | SEHT-LN



SEHT-W



SEHT-W

		P		M	K		N	Dimensions Dimensões Dimensiones (in)			
		PVD		PVD	PVD		UNC				
	(2) Grade code	68	15	15	68	15	10				
(1) Geometry code	ISO Reference	PH6920	PH6740	PH6740	PH6920	PH6740	PH0910	IC	S	LE	BS
1110559	SEHT 13T3 AGSN	●	◉	●	●	◉		0.526	0.156	0.394	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
1111146	SEHW 13T3 AGFN	●			●			0.526	0.156	0.394	0.079

● First choice | Primeira opção | 1ª opción ◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

LINEPRO 09945 METRIC LINE

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PH6920	PH6740
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 - Austenitic-ferritic (Duplex)	230-260			✓
K	7	Malleable cast iron	130-230		✓	✓
	8	Grey cast iron	180-245		✓	✓
	9	Nodular cast iron	160-250		✓	✓
N	10	Aluminium and Non Ferrous	30-130	✓		

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 → PH0910	PH6920	PH6740	Feed fz (in/t) SEHT 13T3 AGSN	SEHW 13T3 AGFN	SEHT 13T3 AGFN-LN	SEHT 13T3 AGSN-W
P	1	Unalloyed Steel	125-220	-	590-1115	590-787	0.004-0.010	-	-	0.004-0.012
	2	Low-Alloyed Steel	220-280	-	590-1115	525-722	0.004-0.008	-	-	0.004-0.012
	3	High-Alloyed Steel	280-380	-	590-1082	459-689	0.004-0.008	-	-	0.004-0.012
M	4	SS - Ferritic / Martensitic	200-330	-	-	459-722	0.004-0.008	-	-	-
	5	SS - Austenitic	200-330	-	-	426-590	0.004-0.008	-	-	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	394-525	0.004-0.008	-	-	-
K	7	Malleable Cast Iron	130-230	-	-	525-853	0.004-0.010	0.004-0.010	-	0.004-0.012
	8	Grey Cast Iron	180-245	-	-	459-787	0.004-0.010	0.004-0.010	-	0.004-0.012
	9	Nodular Cast iron	160-250	-	-	394-656	0.004-0.008	0.004-0.008	-	0.004-0.012
N	10	Aluminium and Non Ferrous	30-130	1148-4592	-	-	0.004-0.008	-	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) If chattering occurs, reduce ap and Vc by 30% and keep the same fz per tooth.

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	Dificult Operations
P	1	Unalloyed Steel	125-220	SEHT... AGSN	-
	2	Low-Alloyed Steel	220-280	SEHT... AGSN	-
	3	High-Alloyed Steel	280-380	SEHT... AGSN	-
M	4	SS - Ferritic / Martensitic	200-330	SEHT... AGSN	SEHW... AGFN
	5	SS - Austenitic	200-330	SEHT... AGSN	SEHW... AGFN
	6	SS - Austenitic-ferritic (Duplex)	230-260	SEHT... AGSN	SEHW... AGFN
K	7	Malleable Cast Iron	130-230	SEHW... AGFN	-
	8	Grey Cast Iron	180-245	SEHW... AGFN	-
	9	Nodular Cast iron	160-250	SEHW... AGFN	-
N	10	Aluminium and Non Ferrous	30-130	SEHT... AGFN-LN	-

WIPER INSERTS

Rec. Cutting Conditions
- BS_W at least 40% larger than fn (f_n=f_z x Z);
- Axial depth of cut is 0.020 in - 0.031 in;

Example:
- The width of parallel land (BS) of the SEHT insert is 0.079 in.
- With 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 0.118 in, i.e. 66% bigger than the parallel land.
- To obtain a good surface finishing, the feed per revolution should be a maximum 80% of 0.079 in = 0.063 in.
- The wiper insert will have a parallel land (BS_W) with a width of approximately 0.323 in.
- Result: Feed per revolution (f_n) could be increased from 0.063 in to 60% of 0.236 in = 0.193 in.

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

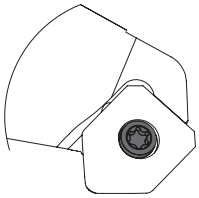


Fig. A

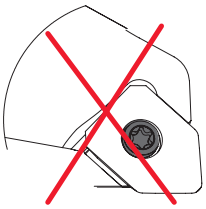


Fig. B

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.



HIGH FEED MILLING

HIGH FEED MILLING

1 TETRAFEED XN20-06

> Suitable for machining **P M K S**

> See page A - 84

2 HIFEED SO10-08 | 06690 | 06815

> Suitable for machining **P M K S**

> See page A - 92

3 HIFEED WD60-12 | WN60-12

> Suitable for machining **P M K S**

> See page A - 110

4 LINEPRO XP90-06 | XP90-10 (with XPET-HF insert)

> Suitable for machining **P M K S**

> See page A - 166

5 PENTA HIFEED 06320 metric line

> Suitable for machining **P K**

> See page A - 120

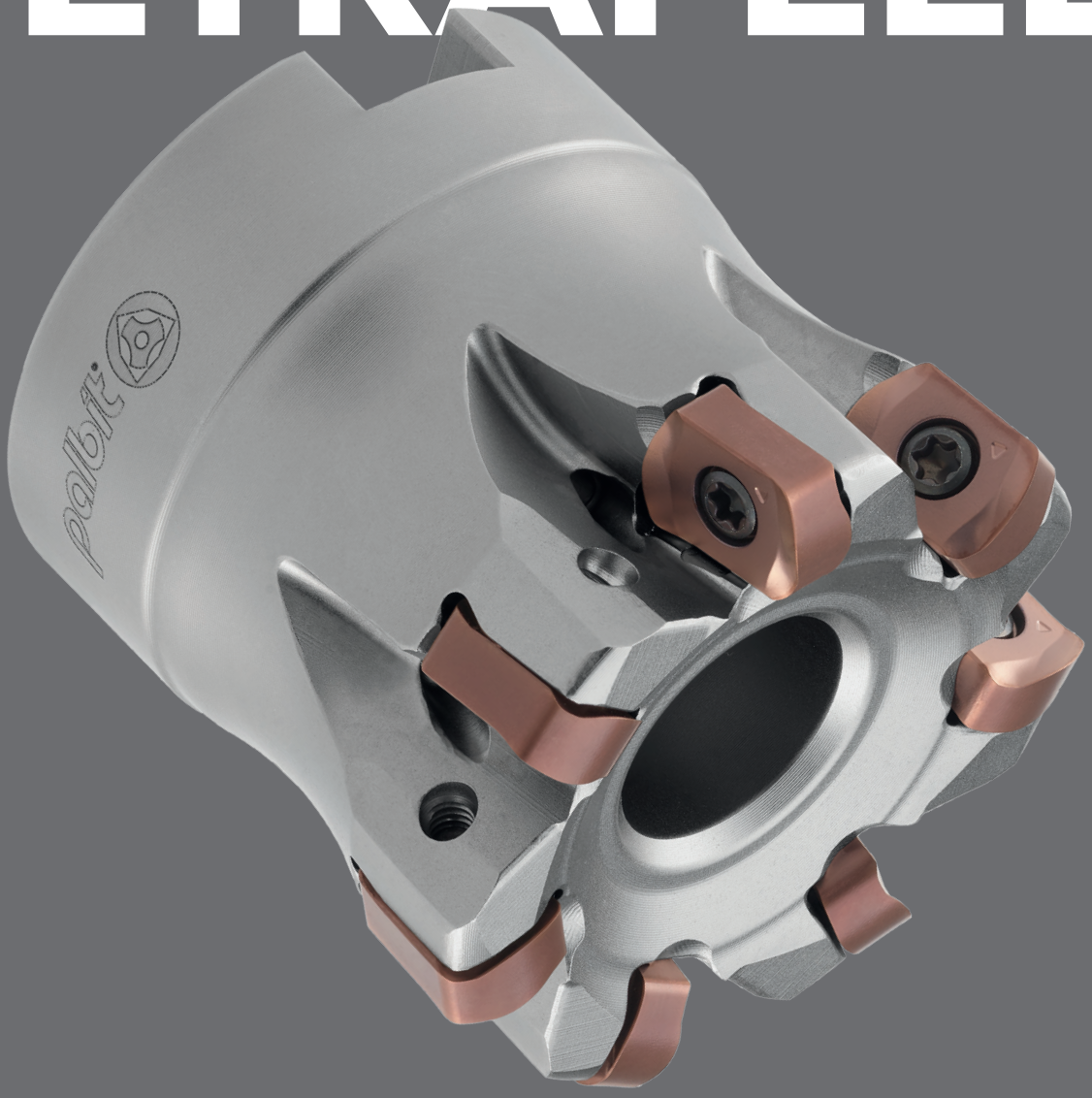
1 TETRAFEED 16420 metric line

> Suitable for machining **P M K S**

> See page A - 126

XN20-06

TETRAFEED



TETRAFEED XN20-06 is a line with a robust cutter body that provides higher fatigue and deformation resistance, ensuring a longer tool life. Thanks to its light-cutting action, combined with a robust shank design, TETRAFEED ensures secure and vibration-free machining, even with long overhangs. The progressive cutting insert edge permits a smoother cut, reducing cutting forces.

TETRAFEED XN20-06 é uma linha com um corpo de ferramenta robusto oferecendo maior resistência à fadiga e deformação, garantindo uma vida útil mais longa da ferramenta. Graças à sua ação de corte leve, combinada com um design de haste robusto, as TETRAFEED garantem fresagem segura e livre de vibrações, mesmo com balanços longos. A geometria curva da aresta de corte da pastilha permite um corte mais suave, reduzindo as forças de corte.

TETRAFEED XN20-06 es una linea con un cuerpo de herramienta robusto que ofrece una mayor resistencia a la fatiga y deformación, asegurando una vida útil más larga de la herramienta. Gracias a su acción de corte ligera, combinada con un diseño de mango robusto, las TETRAFEED garantizan un fresado seguro y libre de vibraciones, incluso con voladizos largos. La geometría curva del filo de corte de la plaquita permite un corte más suave, reduciendo las fuerzas de corte.

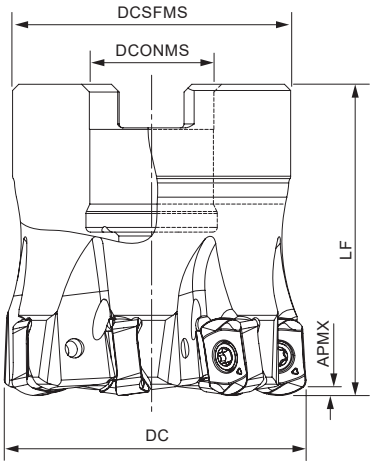
TETRAFEED XN20-06 > page 86



- From DC 0.625 in to 2.500 in
  De DC 0.625 in a 2.500 in | Desde DC 0.625 in hasta 2.500 in
- Available in arbor, threaded, weldon and cylindrical shank
  Disponível em montagem tipo árvore, acoplamento roscado, haste weldon e cilíndrica | Disponible en fijación con tornillo central, fijación roscada, mango tipo weldon y cilindrico
- Robust XNKU 06 insert with 4 cutting edges
  Pastilha XNKU 06 robusta com 4 arestas de corte | Plaquita XNKU 06 robusta con 4 filos de corte
- Close pitch cutter design for high productivity
  Passo fino para alta produtividade | Paso fino para alta productividad

TETRAFEED XN20-06





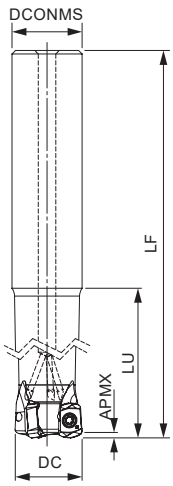
Arbor Mounting

KAPR=20° | GAMP=-7° | RP=0.071

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181169900	XN20 D1.50-A.500/1.50-07-06	7	1.500	0.500	1.417	1.500	0.434	0.040	A	XNKU 06...	◈
181170000	XN20 D2.00-A.750/1.50-08-06	8	2.000	0.750	1.772	1.500	0.725	0.040	A	XNKU 06...	◈
181170100	XN20 D2.50-A1.00/1.50-09-06	9	2.500	1.000	2.205	1.500	1.100	0.040	A	XNKU 06...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Cylindrical Shank

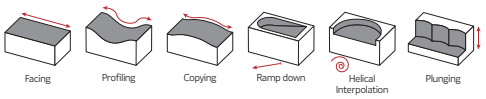
KAPR=20° | GAMP=-7° | RP=0.071

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181170600	XN20 D.625-C.625/6.00-02-06	2	0.625	0.625	6.000	2.000	0.458	0.040	XNKU 06...	◈
181170700	XN20 D.750-C.750/6.50-03-06	3	0.750	0.750	6.500	2.950	0.632	0.040	XNKU 06...	◈
181170800	XN20 D1.00-C1.00/7.00-04-06	4	1.000	1.000	7.000	4.000	1.106	0.040	XNKU 06...	◈
181170900	XN20 D1.25-C1.25/8.00-05-06	5	1.250	1.250	8.000	5.000	2.074	0.040	XNKU 06...	◈
181171000	XN20 D1.50-C1.50/5.00-06-06	6	1.500	1.500	5.000	2.250	1.973	0.040	XNKU 06...	◈

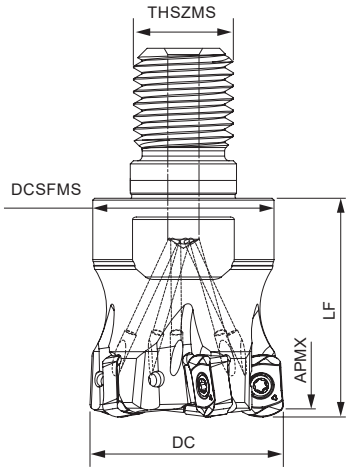
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

TETRAFEED XN20-06

XNKU 06







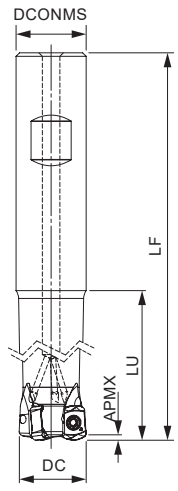
Threaded Coupling

KAPR=20° | GAMP=-7° | RP=0.071

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181169400	XN20 D.625-R-08/.984-02-06	2	0.625	M8	0.580	0.985	0.050	0.040	XNKU 06...	◉
181169500	XN20 D.750-R-10/1.18-03-06	3	0.750	M10	0.730	1.180	0.090	0.040	XNKU 06...	◉
181169600	XN20 D1.00-R-12/1.18-04-06	4	1.000	M12	0.905	1.180	0.145	0.040	XNKU 06...	◉
181169700	XN20 D1.25-R-16/1.38-05-06	5	1.250	M16	1.180	1.380	0.340	0.040	XNKU 06...	◉
181169800	XN20 D1.50-R-20/1.58-06-06	6	1.500	M20	1.440	1.575	0.455	0.040	XNKU 06...	◉

◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Weldon Shank

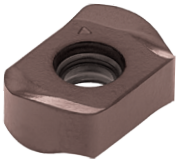
KAPR=20° | GAMP=-7° | RP=0.071

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert	Stock
			DC	DCONMS	LF	LU		APMX (in)		
1 81170200	XN20 D.625-W.625/3.50-02-06	2	0.625	0.625	3.500	1.250	0.224	0.040	XNKU 06...	◉
181170300	XN20 D.750-W.750/4.00-03-06	3	0.750	0.750	4.000	1.750	0.372	0.040	XNKU 06...	◉
181170400	XN20 D1.00-W1.00/5.00-04-06	4	1.000	1.000	5.000	2.500	0.782	0.040	XNKU 06...	◉
181170500	XN20 D1.25-W1.25/5.00-05-06	5	1.250	1.250	5.000	2.500	1.316	0.040	XNKU 06...	◉

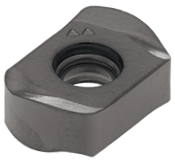
◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

TETRAFEED XN20-06

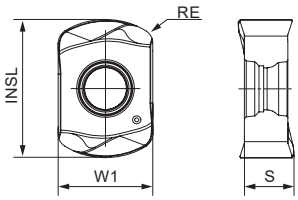
XNKU 06T3... Inserts | Pastilhas | Plaquitas



XNKU-MP



XNKU-MS



XNKU-MP | MS

		P					M				K		S			Dimensions Dimensões Dimensiones (in)			
		CVD	PVD				CVD	PVD			CVD	PVD	CVD	PVD					
	(2) Grade code	T9	X5	T1	P4	Z2	T9	X9	Z2	Z3	T9	T1	T9	X9	Z3				
(1) Geometry code	ISO Reference	PHS740	PHP910	PHP920	PHP930	PHP530	PHS740	PHH930	PHP530	PHH530	PHS740	PHP920	PHS740	PHH930	PHH530	W1	S	INSL	RE
1112802	XNKU 06T310-MP	◈	◈	◈	◈		◈	◈			◈	◈	◈	◈		0.270	0.142	0.394	0.039
1113209	XNKU 06T310-MS					◈			◈	◈					◈	0.270	0.142	0.394	0.039

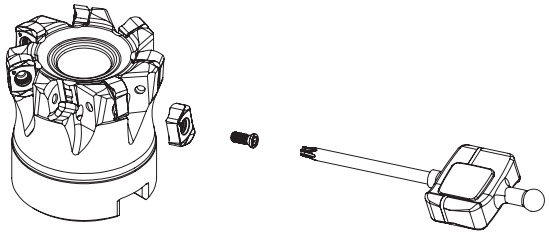
◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

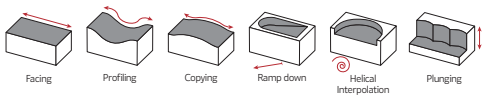
SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
XN-A-06 - 1.500-2.500	P0250704	XT08	DT0812	10.6
XN-R-06 - 0.625-1.500	P0250704	XT08	DT0812	10.6
XN-W-06 - 0.265-1.250	P0250704	XT08	DT0812	10.6
XN-C-06 - 0.625-1.500	P0250704	XT08	DT0812	10.6



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance					Toughness →		Feed fz (in/t)	
				PHP910	PHP920	PHP930	PHH930	PHS740	PHP530	PHH530	XNKU 06...-MP	XNKU 06...-MS
P	1	Unalloyed Steel	125-220	590-820	590-820	525-754	-	525-754	590-1115	-	0.020-0.059	0.020-0.059
	2	Low-Alloyed Steel	220-280	525-787	558-689	492-623	-	492-623	590-1115	-	0.020-0.059	0.020-0.059
	3	High-Alloyed Steel	280-380	459-754	525-656	459-590	-	459-590	590-1082	-	0.020-0.059	0.020-0.059
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	426-558	394-590	492-886	558-918	0.020-0.055	0.020-0.055
	5	SS - Austenitic	200-330	-	-	-	328-525	328-492	-	525-918	0.020-0.055	0.020-0.055
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	262-459	230-426	-	492-853	0.020-0.055	0.020-0.055
K	7	Malleable Cast Iron	130-230	590-984	590-1050	-	-	525-984	-	-	0.020-0.059	-
	8	Grey Cast Iron	180-245	525-820	558-918	-	-	492-853	-	-	0.020-0.059	-
	9	Nodular Cast iron	160-250	492-689	328-787	-	-	262-722	-	-	0.020-0.059	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	98-246	98-230	-	98-492	0.020-0.051	0.020-0.051

(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) When using DC=16mm apply 70% or less feed (fz) from the table.

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

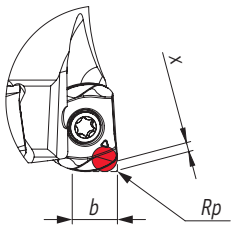
ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance					Toughness →	
				PHP910	PHP920	PHP930	PHH930	PHS740	PHP530	PHH530
P	1	Unalloyed Steel	125-220	✓	✓	✓		✓	✓	
	2	Low-Alloyed Steel	220-280	✓	✓	✓		✓	✓	
	3	High-Alloyed Steel	280-380	✓	✓	✓		✓	✓	
M	4	SS - Ferritic / Martensitic	200-330				✓	✓	✓	✓
	5	SS - Austenitic	200-330				✓	✓		✓
	6	SS - Austenitic-ferritic (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				✓	✓		✓

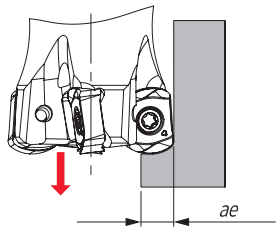
Good Conditions Average Conditions Difficult Conditions

TETRAFEED XN20-06

PROGRAMMING DATA Dados para programação | Datos para la programación

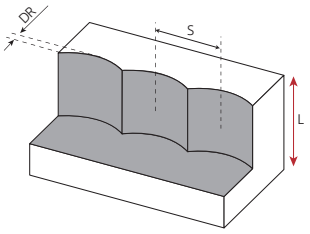
Insert	Programming Data			
	Rp	X	b	a_e
XNKU 06T3...	0.071	0.016	0.142	0.134





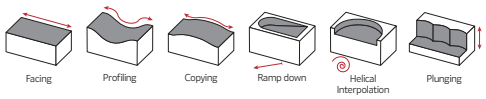
PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
f_z (in/t)		
0,003-0,006	0,002-0,004	$Smax = \sqrt{DC.Dr-Dr^2}$



S max and DR corresponding cutting diameter DC (in)							
DR (in)	DC (in) XNKU 06...						
	0.625	0.750	1.000	1.250	1.500	2.000	2.500
0.040	0.155	0.170	0.195	0.220	0.240	0.280	0.315
0.080	0.210	0.230	0.270	0.305	0.335	0.390	0.440
0.120	0.245	0.275	0.325	0.370	0.405	0.475	0.535

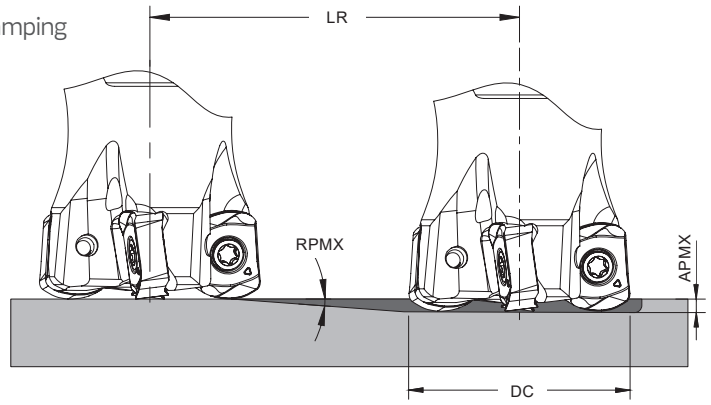
Note: Recommended for L ≤ 4 Dc for extra long tool this step and side cut must be reduced.



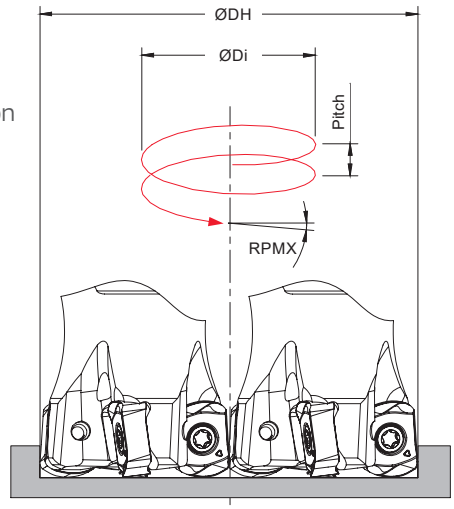
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



Blind hole
Flat bottom

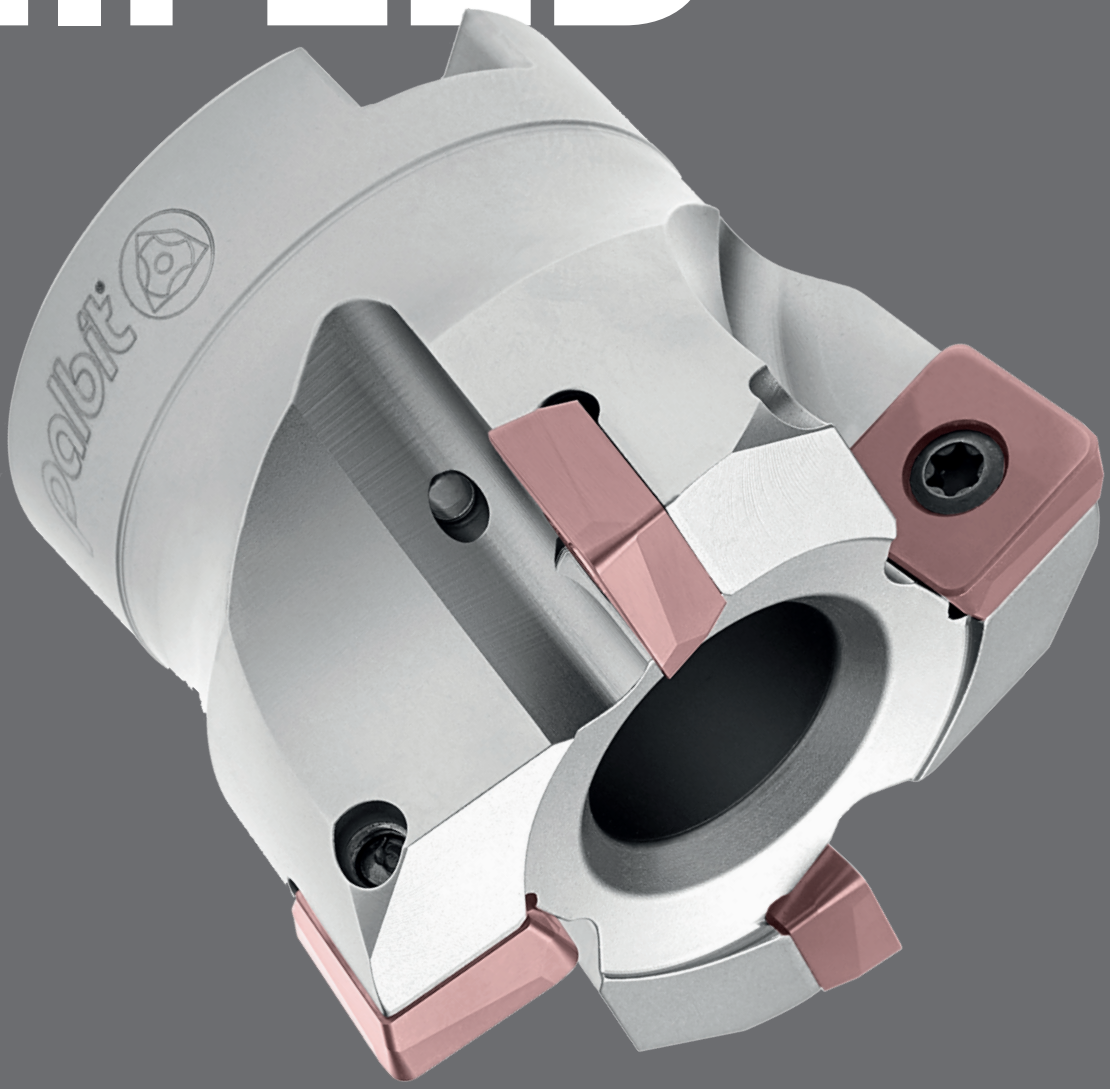
ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
0.625	0.5	0.040	4.510	0.970 -	- 1.171	0.009 0.014
0.750	0.5	0.040	4.510	1.220 -	- 1.421	0.012 0.018
1.000	0.8	0.040	2.820	1.720 -	- 1.921	0.030 0.040
1.250	0.8	0.040	2.820	2.220 -	- 2.421	0.040 0.040
1.500	0.4	0.040	5.635	2.720 -	- 2.921	0.026 0.030
2.000	0.3	0.040	7.520	3.720 -	- 3.921	0.028 0.030
2.500	0.25	0.040	9.025	4.720 -	- 4.921	0.030 0.033

Note: During helical interpolation do not exceed APMX.
(*) Down cutting is recommended, tool pass rotation should be counter-clockwise.
(*) In case of ramping and helical interpolation, apply 70% or less feed (fz) from recommended cutting conditions table.

SO10-08 | SO10-13 | SO15-16

HIFEED

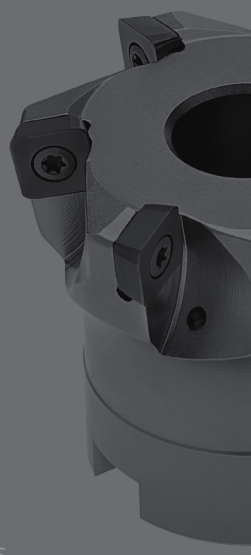


Designed for efficient rough milling across diverse materials in industries like die & mold, aerospace and automotive, HIFEED line spans a broad spectrum of applications. These applications include milling slots and pockets, helical interpolation strategies and plunging. Presenting an effective solution for boosting productivity in rough milling operations, excellent for mold and die industry.

Projetada para fresagem de desbaste eficiente em diversos materiais em indústrias como matrizes e moldes, aeroespacial e automóvel, a linha HIFEED abrange um amplo espectro de aplicações. Essas aplicações incluem fresagem de ranhuras e caixas, estratégias de interpolação helicoidal e fresagem em mergulho. Apresentando uma solução eficaz para aumentar a produtividade em operações de fresagem de desbaste é excelente para a indústria de moldes e matrizes.

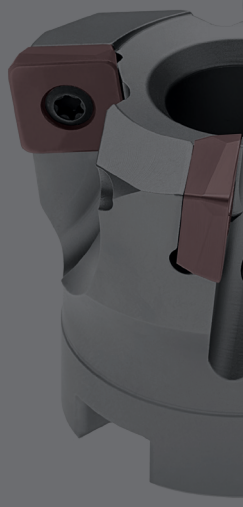
Diseñada para un fresado de desbaste eficiente en diversos materiales en industrias como matrices y moldes, aeroespacial y automotriz, la línea HIFEED abarca un amplio espectro de aplicaciones. Estas aplicaciones incluyen fresado de ranuras y cavidades, estrategias de interpolación helicoidal y fresado en rampa. Presentando una solución efectiva para aumentar la productividad en operaciones de fresado de desbaste, es excelente para la industria de matrices y moldes.

HIFEED SO10-08 > page 94



- From DC 0.750 in to 2.000 in
  De DC 0.750 in a 2.000 in | Desde DC 0.750 in hasta 2.000 in
- Available in arbor mounting, threaded coupling and weldon shank
  Disponível em montagem tipo árvore, acoplamento roscado e haste weldon | Disponible en fijación con tornillo central, fijación roscada y mango tipo weldon
- Small positive insert with 4 cutting edges (SO.. 0803..)
  Pequena pastilha positiva com 4 arestas de corte (SO.. 0803..) | Plaquita positiva pequeña con 4 filos de corte (SO.. 0803..)
- For high productivity in small workpieces
  Para alta produtividade em pequenas peças de trabalho | Para alta productividad en piezas de trabajo pequeñas

HIFEED SO10-13 > page 100



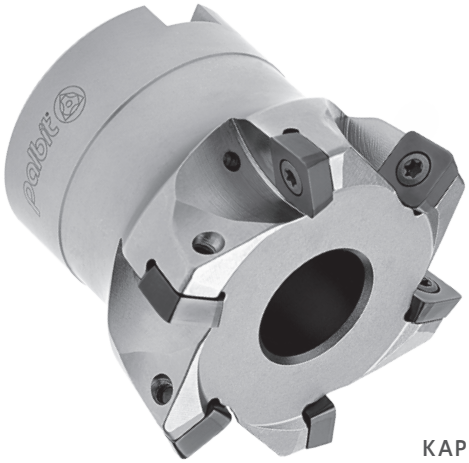
- From DC 1.260 in to 4.000 in
  De DC 1.260 in a 4.000 in | Desde DC 1.260 in hasta 4.000 in
- Available in arbor mounting (threaded coupling in metric line)
  Disponível em montagem tipo árvore (acoplamento roscado em métrico) | Disponible en fijación con tornillo central (acoplamiento roscado en métrico)
- Medium positive insert with 4 cutting edges (SO.. 13M5..)
  Pastilha positiva média com 4 arestas de corte (SO.. 13M5..) | Plaquita positiva media con 4 filos de corte (SO.. 13M5..)
- Strong and reliable insert
  Pastilha forte e fiável | Plaquita fuerte y confiable

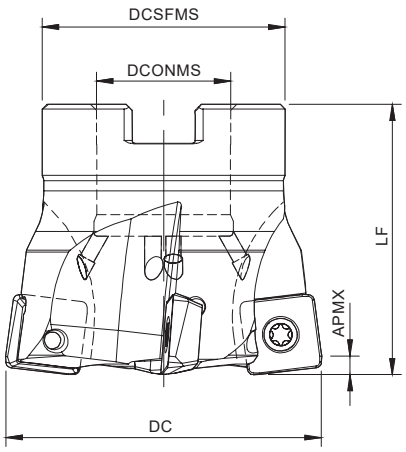
HIFEED SO15-16 > page 106



- From DC 2.500 in to 6.000 in
  De DC 2.500 in a 6.000 in | Desde DC 2.500 in hasta 6.000 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Large positive insert with 4 cutting edges (SO.. 1605..)
  Pastilha positiva grande com 4 arestas de corte (SO.. 1605..) | Plaquita positiva grande con 4 filos de corte (SO.. 1605..)
- For high removal rate materials
  Para altas taxas de remoção de material | Para una alta tasa de remoción de material

HIFEED SO10-08





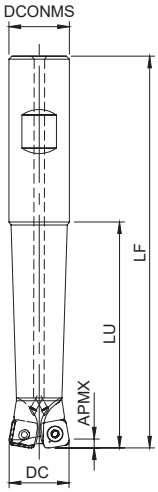
Arbor Mounting

KAPR=10° | GAMP=+2° | GAMF =+2° | RP=0.079

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181135300	SO10 D1.50-A.500/1.50-05-08	5	1.500	0.500	1.200	1.500	0.33	A	0.039	SO...0803...	⛭
181135400	SO10 D2.00-A.750/1.75-06-08	6	2.000	0.750	1.457	1.750	0.63	A	0.039	SO...0803...	⛭

⛭ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





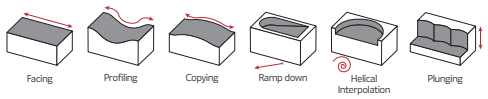
Weldon Shank

KAPR=10° | GAMP=+2° | GAMF =+2° | RP=0.079

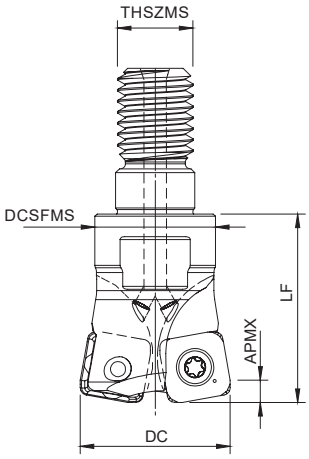
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181078700	SO10 D.750-W.750/5.00-02-08	2	0.750	0.750	5.000	2.835	0.79	0.039	SO...0803...	⛭
181078800	SO10 D.750-W.750/8.00-02-08	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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

HIFEED SO10-08
SOEW 08 | SOET 08







Threaded Coupling

KAPR=10° | GAMP=+2° | GAMF =+2° | RP=0.079

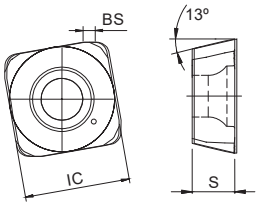
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181135000	SO10 D.750-R-10/.984-02-08	2	0.750	M10	0.630	0.984	0.088	0.039	SO...0803...	◈
181135100	SO10 D1.00-R-12/1.18-03-08	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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

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



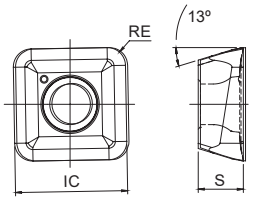
SOEW



SOEW



SOET



SOET

		P			M			K			S			Dimensions Dimensões Dimensiones (in)			
		PVD			PVD			PVD			PVD						
	(2) Grade code	X5	T1	G6	X9	4H	G6	X5	T1	G6	X9	4H	G6				
(1) Geometry code	ISO Reference	PHP910	PHP920	PH7740	PHH930	PHF530	PH7740	PHP910	PHP920	PH7740	PHH930	PHF530	PH7740	IC	S	RE	BS
1111884	SOEW 080310 S	◈	◈					◈	◈					0.339	0.137	0.039	0.039
1112149	SOET 080315-MS			◈	◈	◈	◈			◈	◈	◈	◈	0.339	0.137	0.059	-

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

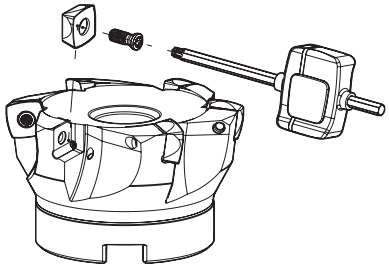
HIFEED SO10-08

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
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: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHP910	PHP920	PHH930	PHF530	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	200-330			✓	✓	✓
	6	SS - Austenitic-ferritic (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

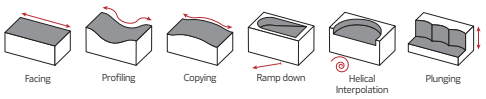
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PHP910	PHP920	PHH930	PHF530	PH7740	Feed fz (in/t) SOEW 08...	SOET 08...
P	1	Unalloyed Steel	125-220	590-820	590-820	-	-	459-656	0.016-0.071	0.016-0.071
	2	Low-Alloyed Steel	220-280	525-787	525-754	-	-	426-590	0.016-0.071	-
	3	High-Alloyed Steel	280-380	459-754	459-722	-	-	328-558	0.016-0.059	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	459-689	459-820	426-590	-	0.016-0.051
	5	SS - Austenitic	200-330	-	-	394-558	426-787	361-525	-	0.016-0.051
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	328-492	394-722	295-492	-	0.004-0.039
K	7	Malleable Cast Iron	130-230	590-984	525-886	-	-	-	0.016-0.071	0.016-0.071
	8	Grey Cast Iron	180-245	525-820	459-820	-	-	-	0.016-0.071	-
	9	Nodular Cast iron	160-250	492-689	394-689	-	-	-	0.016-0.071	-
S	11	Heat Resistant Super Alloys	200-320	-	-	98-361	98-492	98-328	-	0.016-0.039

(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) 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;
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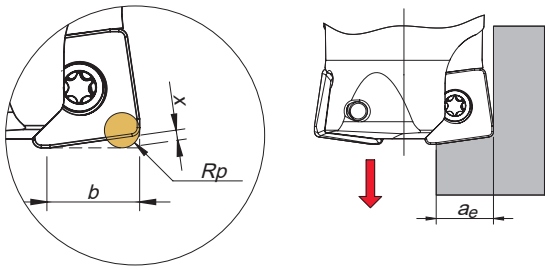


CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

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

PROGRAMMING DATA Dados para programação | Datos para la programación

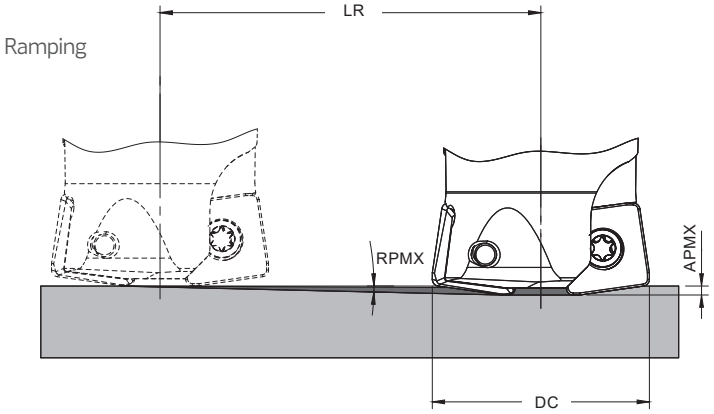
Insert	Programming Data			
	Rp	X	b	a_e
SOEW 080310 S	0.079	0.031	0.283	0.252
SOET 080315-MS	0.098	0.031	0.276	0.276

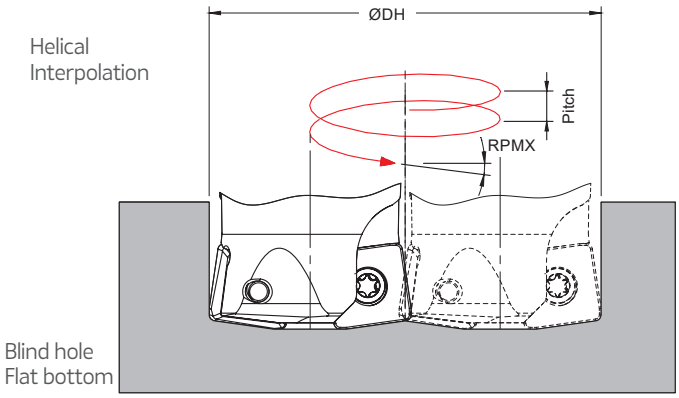


HIFEED SO10-08

RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

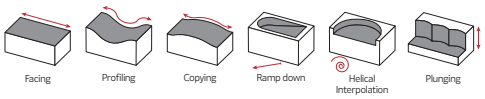




ØDi = ØDH - DC

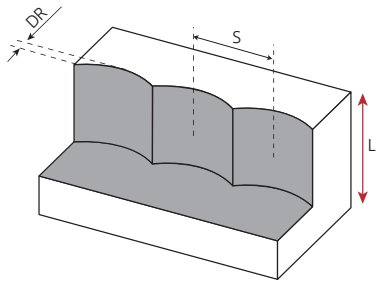
DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
0.750	15.0	0.039	0.146	0.964 -	- 1.421	0.039 0.039
1.000	9.5	0.039	0.233	1.464 -	- 1.921	0.039 0.039
1.250	5.5	0.039	0.405	1.964 -	- 2.421	0.039 0.039
1.500	4.0	0.039	0.558	2.464 -	- 2.921	0.039 0.039
2.000	2.5	0.039	0.893	3.464 -	- 3.921	0.039 0.039
1.654	0.138	0.039	0.642	2.772 -	- 3.228	0.197 0.276

Note: During helical interpolation do not exceed APMX.



PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
f_z (in/t)		
0.003-0.006	0.002-0.004	$Smax = \sqrt{DC.DR-DR^2}$

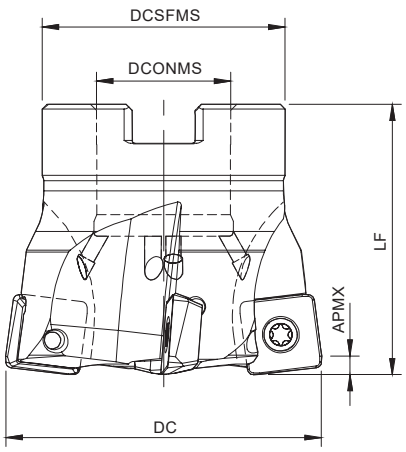


S max and DR corrsponding cutting diameter DC (in)					
DR (in)	DC (in)				
	0.750	1.000	1.250	1.500	2.000
0.039	0.167	0.194	0.217	0.239	0.277
0.079	0.230	0.270	0.304	0.335	0.390
0.118	0.273	0.323	0.365	0.404	0.471
0.157	0.305	0.364	0.414	0.459	0.538
0.197	0.330	0.398	0.455	0.507	0.596
0.236	0.348	0.425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





Arbor Mounting

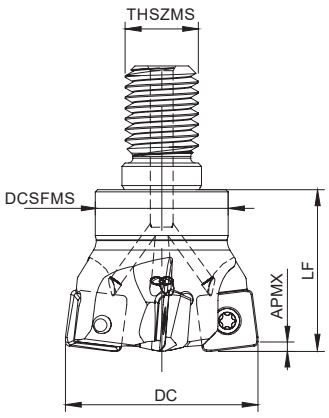
KAPR=10º | GAMP=+5º | RP=0.098

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181099300	SO10 D2.00-A.750/1.75-04-13	4	2.000	0.750	1.772	1.750	0.73	A	0.059	SO...13M5...	◈
181139300	SO10 D2.00-A.750/1.75-05-13	5	2.000	0.750	1.772	1.750	0.70	A	0.059	SO...13M5...	◈
181099400	SO10 D2.50-A1.00/2.00-05-13	5	2.500	1.000	2.205	2.000	1.32	A	0.059	SO...13M5...	◈
181099500	SO10 D3.00-A1.00/2.00-06-13	6	3.000	1.000	2.205	2.000	1.98	A	0.059	SO...13M5...	◈
181137800	SO10 D3.00-A1.25/2.00-06-13	6	3.000	1.250	2.441	2.000	1.82	A	0.059	SO...13M5...	◈
181137900	SO10 D4.00-A1.50/2.50-08-13	8	4.000	1.500	3.150	2.500	4.41	A	0.059	SO...13M5...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

METRIC SHANK



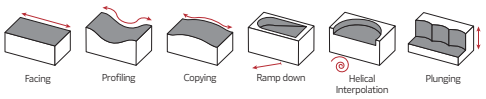


Threaded Coupling

KAPR=10º | GAMP=+5º | RP=0.098

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181038700	032R06690-03-05-M16035	3	1.260	M16	1.142	1.378	0.320	0.059	SO...13M5	◈
181064600	035R06690-03-05-M16035	3	1.378	M16	1.142	1.378	0.359	0.059	SO...13M5	◈
181038800	042R06690-04-05-M16035	4	1.654	M16	1.142	1.378	0.428	0.059	SO...13M5	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

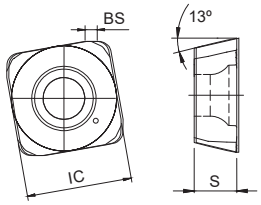


SO...13M5... Inserts | Pastilhas | Plaquitas


SOEW

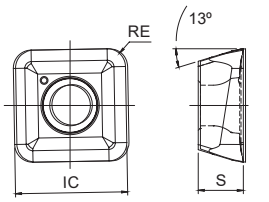

SOEW-MD


SOEW-MP



SOEW


SOET-MS



SOET

		P			M			K			S			Dimensions Dimensões Dimensiones (in)			
		PVD			PVD			PVD			PVD						
	(2) Grade code	X5	T1	G6	X9	4H	G6	X5	T1	G6	X9	4H	G6				
(1) Geometry code	ISO Reference	PHP910	PHP920	PH7740	PHH930	PHF530	PH7740	PHP910	PHP920	PH7740	PHH930	PHF530	PH7740	IC	S	RE	BS
1111906	SOEW 13M510 S	◈	◈	◈				◈	◈	◈				12,43	5,00	1,20	1,0
1112813	SOEW 13M510-MD		◈						◈					12,43	5,00	1,20	1,0
1113533	SOEW 13M520-MP		◈						◈					12,45	5,00	2,00	1,0
1112147	SOET 13M520-MS	○		◈	◈	◈	◈			◈	◈	◈	◈	12,43	5,00	2,00	-

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

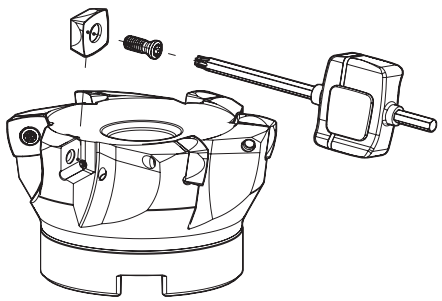
Insert order code = (1) Geometry Code + (2) Grade Code

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
SO10-A-13 - 2.00-3.00	P0401200	XT15	DT1530	26.6
SO10-A-13 - 4.00	P0401200	PT15	DT1530	26.6
R06690 – 1.260 - 1.654	P0401200	XT15	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



HIFEED SO10-13

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHP910	PHP920	PHH930	PHF530	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	200-330			✓	✓	✓
	6	SS - Austenitic-ferritic (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

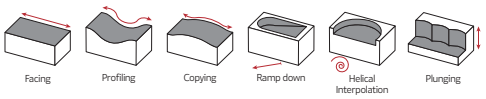
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PHP910	PHP920	PHH930	PHF530	PH7740	Feed fz (in/t) SOEW S	SOEW MD	SOEW MP	SOET MS
P	1	Unalloyed Steel	125-220	590-820	590-820	-	-	459-656	0.020-0.083	0.020-0.087	0.020-0.087	0.020-0.083
	2	Low-Alloyed Steel	220-280	525-787	525-754	-	-	426-590	0.020-0.083	0.020-0.087	0.020-0.087	-
	3	High-Alloyed Steel	280-380	459-754	459-722	-	-	328-558	0.020-0.079	0.020-0.083	0.020-0.083	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	459-689	459-820	426-590	-	-	-	0.020-0.071
	5	SS - Austenitic	200-330	-	-	394-558	426-787	361-525	-	-	-	0.020-0.071
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	328-492	394-722	295-492	-	-	-	0.020-0.059
K	7	Malleable Cast Iron	130-230	590-984	525-886	-	-	459-722	0.020-0.083	0.020-0.087	0.020-0.087	0.020-0.083
	8	Grey Cast Iron	180-245	525-820	459-820	-	-	394-689	0.020-0.083	0.020-0.087	0.020-0.087	-
	9	Nodular Cast iron	160-250	492-689	394-689	-	-	328-623	0.020-0.083	0.020-0.087	0.020-0.087	-
S	11	Heat Resistant Super Alloys	200-320	-	-	98-361	98-492	98-328	-	-	-	0.016-0.051

(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) 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.

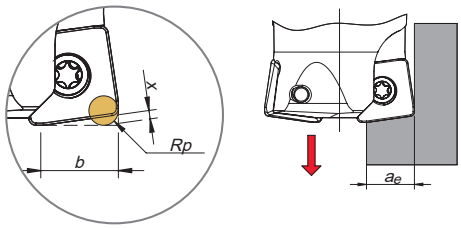


CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

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

PROGRAMMING DATA Dados para programação | Datos para la programación

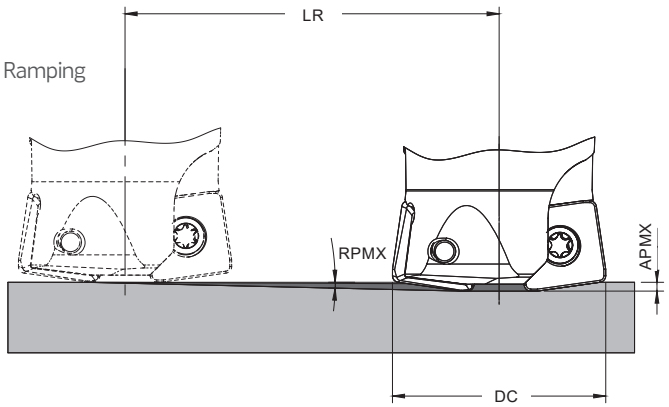
Insert	Programming Data			
	Rp	X	b	a_e
SOEW 13M510 S/-MD	0.098	0.043	0.398	0.378
SOEW 13M520-MP	0.118	0.035	0.362	0.343
SOET 13M520-MS	0.122	0.039	0.394	0.374

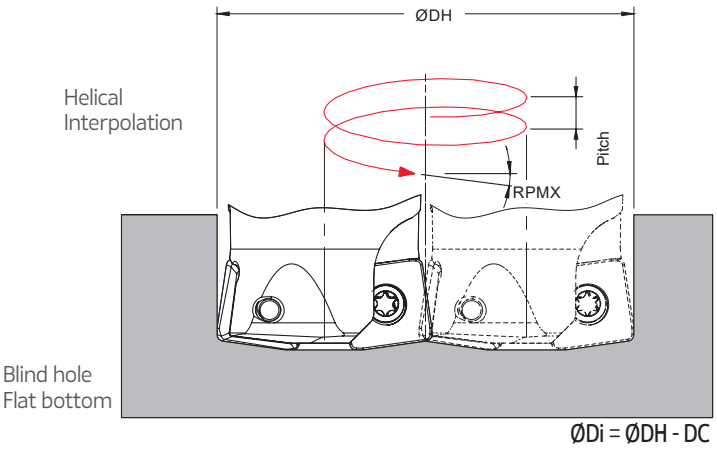


HIFEED SO10-13

RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

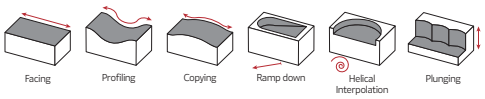




ØDi = ØDH - DC

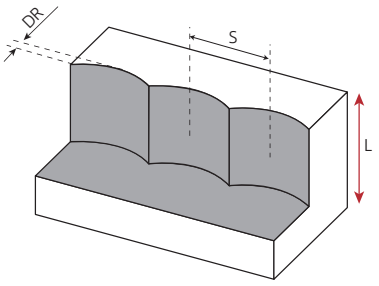
DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
2.000	4.3	0.059	0.785	3.924 -	- 3.921	0.059 0.059
2.500	3.0	0.059	1.126	4.924 -	- 4.921	0.059 0.059
3.000	2.0	0.059	1.690	5.924 -	- 5.921	0.059 0.059
4.000	0.7	0.059	4.829	7.924 -	- 7.921	0.059 0.059

Note: During helical interpolation do not exceed APMX.



PLUNGING Mergulho | Plunge

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

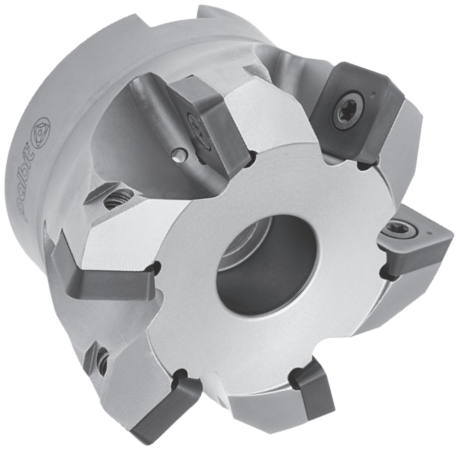


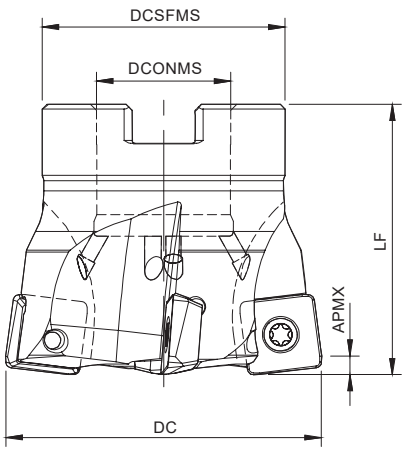
S max and DR corresponding cutting diameter DC (in)				
DR (in)	DC (in)			
	2.000	2.500	3.000	4.000
0.039	0.277	0.310	0.340	0.393
0.079	0.390	0.437	0.480	0.557
0.118	0.471	0.530	0.583	0.677
0.157	0.538	0.607	0.668	0.777
0.197	0.596	0.674	0.743	0.866
0.236	0.645	0.731	0.808	0.942
0.276	0.690	0.783	0.867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

HIFEED SO15-16

Proprietary milling line





Arbor Mounting

KAPR=15° | GAMP=+2° | RP=4,5

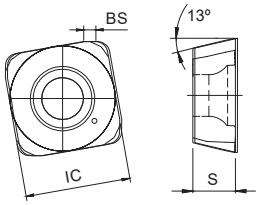
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181073900	SO15 D2.50-A1.00/1.75-05-16	5	2.500	1.000	2.205	1.750	1.42	A	0.138	SO...1605...	◈
181074000	SO15 D3.00-A1.00/2.00-06-16	6	3.000	1.000	2.205	2.000	1.69	A	0.138	SO...1605...	◈
181138400	SO15 D3.00-A1.25/2.00-06-16	6	3.000	1.250	2.441	2.000	1.69	A	0.138	SO...1605...	◈
181074100	SO15 D4.00-A1.25/2.00-08-16	8	4.000	1.250	2.874	2.000	3.19	A	0.138	SO...1605...	◇
181138500	SO15 D4.00-A1.50/2.50-08-16	8	4.000	1.500	3.150	2.500	3.19	A	0.138	SO...1605...	◈
181074200	SO15 D5.00-A1.50/2.50-10-16	10	5.000	1.500	3.386	2.500	6.92	A	0.138	SO...1605...	◈
181074300	SO15 D6.00-A2.00/2.50U-12-16	12	6.000	2.000	4.882	2.500	8.22	B	0.138	SO...1605...	◈

◈ Stock item | Produto de stock | Itens de stock
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

SO...1605... Inserts | Pastilhas | Plaquitas



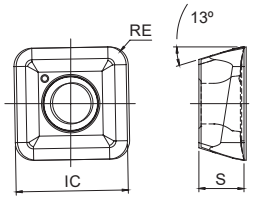
SOEW



SOEW



SOET

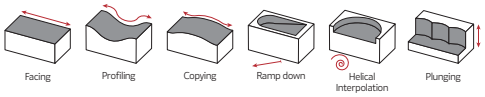


SOET

		P			M		K			S		Dimensions Dimensões Dimensiones (in)			
		PVD			PVD		PVD			PVD					
	(2) Grade code	X5	T1	G6	X9	G6	X5	T1	G6	X9	G6				
(1) Geometry code	ISO Reference	PHP910	PHP920	PH7740	PHH930	PH7740	PHP910	PHP920	PH7740	PHH930	PH7740	IC	S	RE	BS
1111907	SOEW 160512 S	◈	◈	◈		◈	◈	◈	◈			0.646	0.207	0.047	0.059
1112221	SOET 160520-MS			◈	◈	◈			◈	◈	◈	0.646	0.207	0.079	-

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

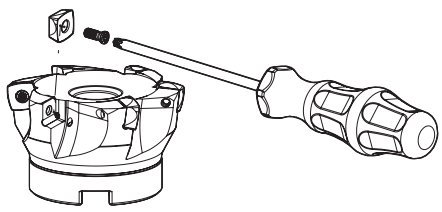


SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
SO15-A-16 - 2.50-6.00	P0501302	PT20	DT2050	44.3

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHP910	PHP920	PHH930	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	200-330			✓	✓
	6	SS - Austenitic-ferritic (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 → PHP910	PHP920	PHH930	PH7740	Feed fz (in/t) SOEW S...	SOET MS...
P	1	Unalloyed Steel	125-220	590-820	590-820	-	459-656	0.020-0.083	0.020-0.087
	2	Low-Alloyed Steel	220-280	525-787	525-754	-	426-590	0.020-0.083	0.020-0.087
	3	High-Alloyed Steel	280-380	459-754	459-722	-	328-558	0.020-0.079	0.020-0.071
M	4	SS - Ferritic / Martensitic	200-330	-	-	459-689	426-590	-	0.020-0.071
	5	SS - Austenitic	200-330	-	-	394-558	361-525	-	0.020-0.071
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	328-492	295-492	-	0.020-0.059
K	7	Malleable Cast Iron	130-230	590-984	525-886	-	459-722	0.020-0.083	0.020-0.079
	8	Grey Cast Iron	180-245	525-820	459-820	-	394-689	0.020-0.083	0.020-0.079
	9	Nodular Cast iron	160-250	492-689	394-689	-	328-623	0.020-0.083	0.020-0.071
S	11	Heat Resistant Super Alloys	200-320	-	-	98-361	98-328	-	0.016-0.051

(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) 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.

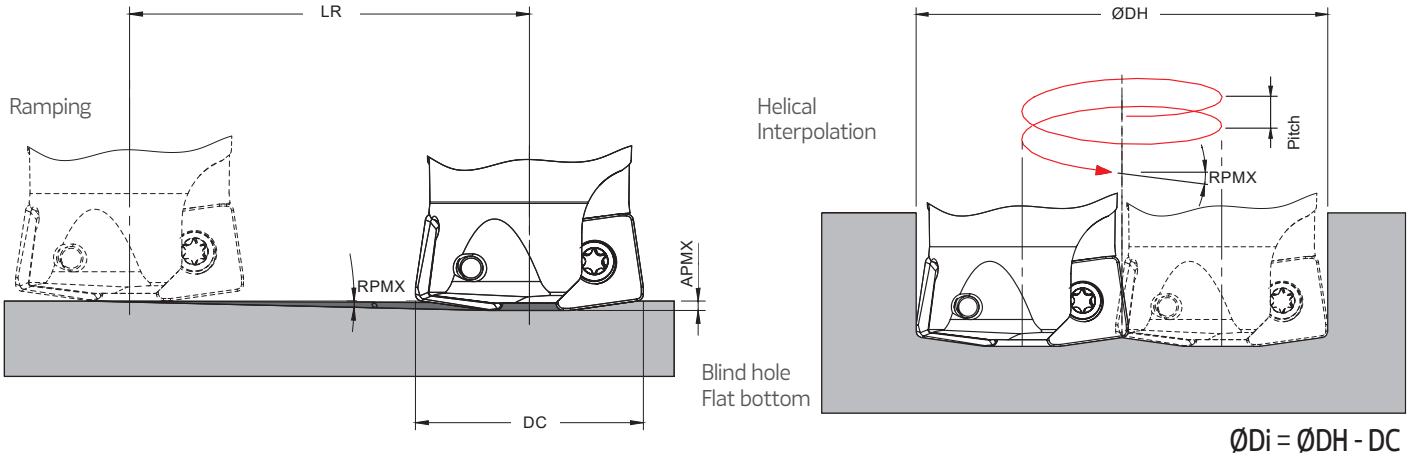
HIFEED SO15-16

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

ISO	PSM	Material	HB (Brinell)	Chip breaker application	
				1st choice	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	200-330	SOET 16...	-
	6	SS - Austenitic-ferritic (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...	-

RAMPING AND HELICAL INTERPOLATION

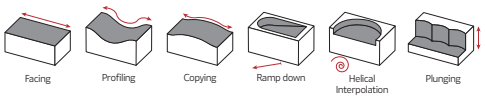
Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular



ØDi = ØDH - DC

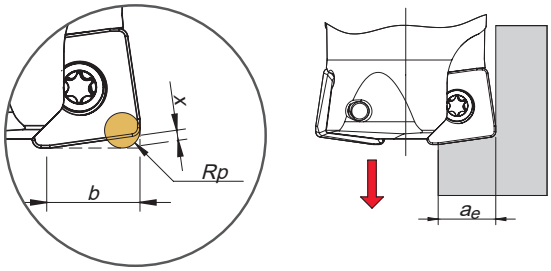
DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
2.500	3.5	0.138	2.256	3.938 -	- 4.921	0.138 0.138
3.000	2.0	0.138	3.952	4.938 -	- 5.921	0.138 0.138
4.000	1.5	0.138	5.270	6.938 -	- 7.921	0.138 0.138
5.000	1.0	0.138	7.906	8.938 -	- 9.921	0.138 0.138
6.000	0.5	0.138	15.813	10.938 -	- 11.921	0.130 0.138

Note: During helical interpolation do not exceed APMX.



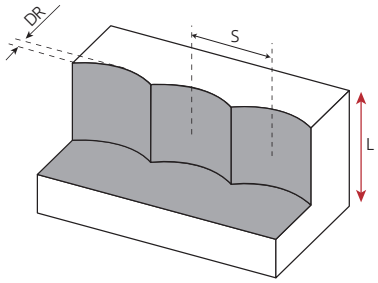
PROGRAMMING DATA Dados para programação | Datos para la programación

Insert	Programming Data			
	Rp	X	b	a_e
SOEW 160512 S	0.173	0.094	0.567	0.508
SOET 160520-MS	0.217	0.083	0.524	0.504



PLUNGING Mergulho | Plunge

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

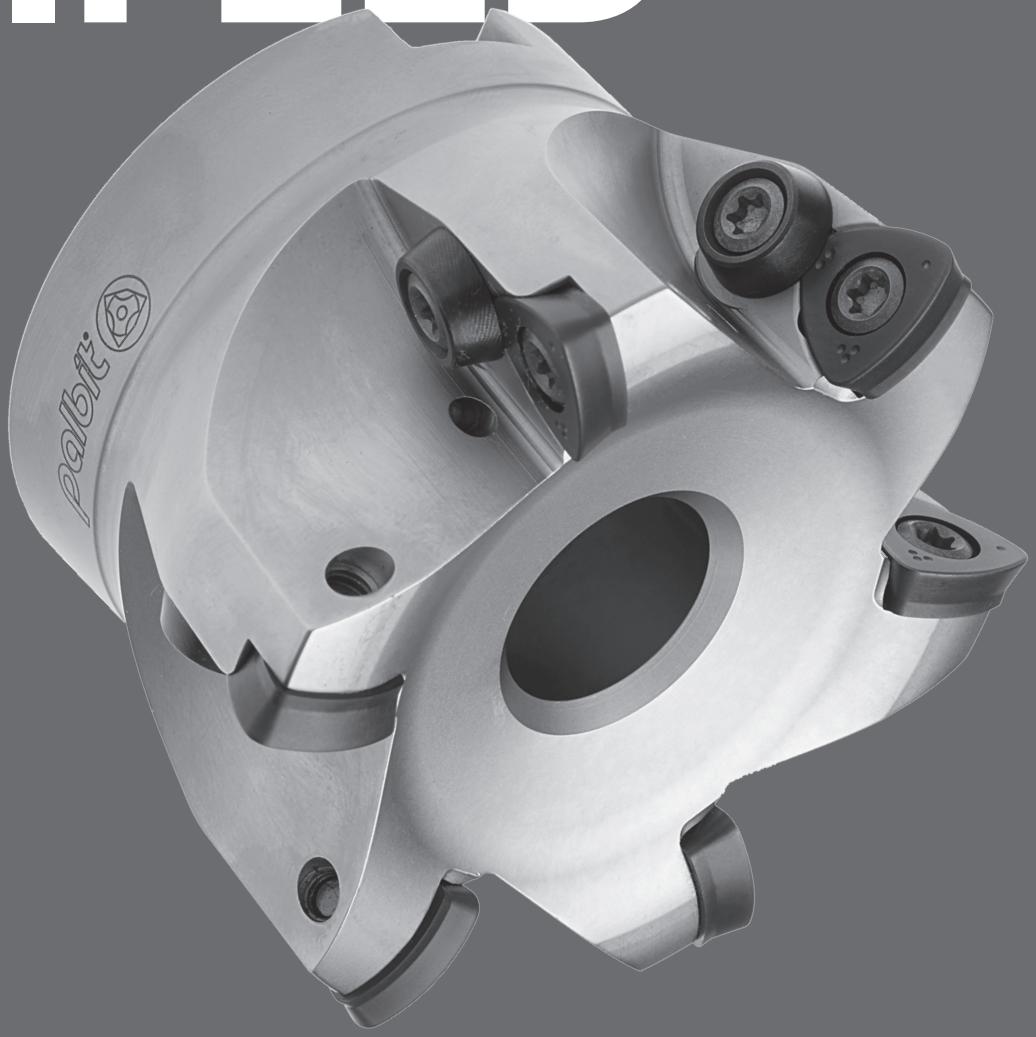


S max and DR corresponding cutting diameter DC (in)					
DR (in)	DC (in)				
	2.500	3.000	4.000	5.000	6.000
0.039	0.310	0.340	0.393	0.440	0.482
0.079	0.437	0.480	0.557	0.624	0.684
0.118	0.530	0.583	0.677	0.759	0.833
0.157	0.607	0.668	0.777	0.872	0.958
0.197	0.674	0.743	0.866	0.973	1.069
0.236	0.731	0.808	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.

WD60-12 | WN60-12

HIFEED



The HIFEED line featuring three cutting edges excels in high overhang applications, demonstrating exceptional stability and performance. Its curved design mitigates vibration and enhances tool longevity, making them ideal for challenging machining tasks.

A linha HIFEED, com três arestas de corte, destaca-se em aplicações de elevada profundidade, demonstrando estabilidade e desempenho excepcionais. Seu design curvo reduz a vibração e melhora a longevidade da ferramenta, tornando-as ideais para tarefas de fresagem desafiadoras.

La línea HIFEED, con tres filos de corte, sobresale en aplicaciones de alta profundidad, demostrando una estabilidad y rendimiento excepcionales. Su diseño curvado reduce la vibración y mejora la longevidad de la herramienta, haciéndolas ideales para tareas de fresado desafiantes.

HIFEED WD60-12 > page 112



- From DC 2.000 in to 3.000 in
  De DC 2.000 in a 3.000 in | Desde DC 2.000 in hasta 3.000 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Screw and Washer
  Parafuso e Anilha | Tornillo y Arandela

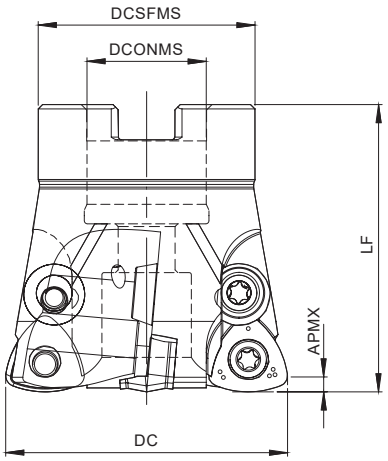
HIFEED WN60-12 > page 116



- From DC 2.000 in to 4.000 in
  De DC 2.000 in a 4.000 in | Desde DC 2.000 in hasta 4.000 in
- Available in arbor mounting and threaded coupling
  Disponível em montagem tipo árvore e acoplamento roscado | Disponible en fijación con tornillo central y roscada
- Excellent in high overhang aplications
  Excelente em aplicações de elevada profundidade | Excelente en aplicaciones con una gran longitud

HIFEED WD60-12





Arbor Mounting

KAPR=45° | GAMP=+20°~+21°

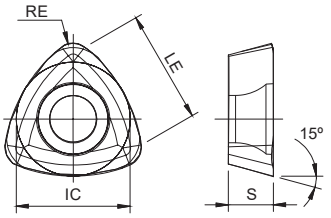
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181134700	WD60 D2.00-A.750/2.00-04-12	4	2.000	0.750	1.772	2.000	0.93	A	0.059	WD... 1204...	◈
181139800	WD60 D2.50-A1.00/2.00-05-12	5	2.500	1.000	1.772	2.000	1.39	A	0.059	WD... 1204...	◈
181139900	WD60 D3.00-A1.25/2.00-06-12	6	3.000	1.250	2.283	2.000	2.25	A	0.059	WD... 1204...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

WD... 1204... Inserts | Pastilhas | Plaquitas



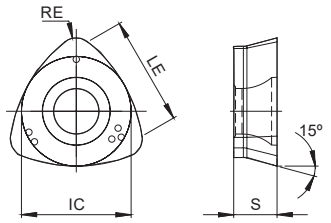
WDET



WDET



WDMW

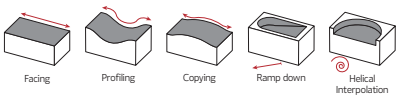


WDMW

		P			M		K		S		Dimensions Dimensões Dimensiones (in)			
		PVD			PVD		PVD		PVD					
	(2) Grade code	G4	P3	G6	P3	G6	G4	G6	P3	G6				
(1) Geometry code	ISO Reference	PH7920	PH7930	PH7740	PH7930	PH7740	PH7920	PH7740	PH7930	PH7740	IC	S	LE	RE
1112148	WDET 120420-MS		◈	◈	◈	◈			◈	◈	0.472	0.187	0.469	0.079
1111123	WDMW 120420-T	◈		◈			◈	◈			0.472	0.187	0.469	0.079

◈ First choice | 1ª Escolha | 1ª Opción ◈ Stock Itens | Itens de stock ◈ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

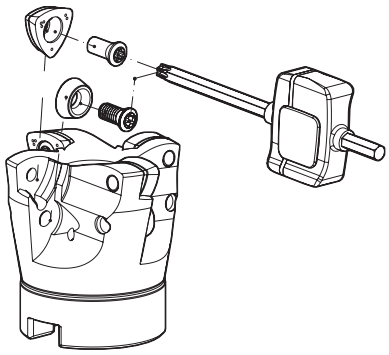
Insert Order Code: (1) Geometry code + (2) Grade code



SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm) (Order separately)	Torque Value	Washer (Order separately)	Washer Screw
WD60-A-12 - 2.00-3.00	P0451001	XT20	DT2050	44.3	HC01200	P0451001

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → 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	200-330			✓	✓
	6	SS - Austenitic-ferritic (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

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	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	200-330	WDET 12...	-
	6	SS - Austenitic-ferritic (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...	-

HIFEED WD60-12

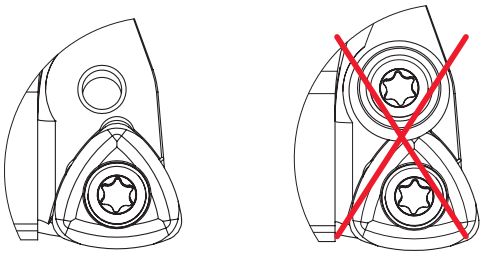
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance Toughness →				Feed fz (in/t)	
				PH7910	PH7920	PH7930	PH7740	WDMW 12...	WDET 12...
P	1	Unalloyed Steel	125-220	590-820	590-787	525-722	459-656	0.012-0.059	0.012-0.051
	2	Low-Alloyed Steel	220-280	525-754	525-722	459-656	426-590	0.012-0.059	0.012-0.051
	3	High-Alloyed Steel	280-380	459-722	459-689	394-623	328-558	0.012-0.051	0.012-0.039
M	4	SS - Ferritic / Martensitic	200-330			459-656	426-590	-	0.012-0.051
	5	SS - Austenitic	200-330			394-525	361-525	-	0.012-0.051
	6	SS - Austenitic-ferritic (Duplex)	230-260			328-459	295-492	-	0.012-0.039
K	7	Malleable Cast Iron	130-230	590-984	525-853		459-722	0.012-0.059	-
	8	Grey Cast Iron	180-245	525-820	459-787		394-689	0.012-0.059	-
	9	Nodular Cast iron	160-250	492-656	394-656		328-623	0.012-0.055	-
S	11	Heat Resistant Super Alloys	200-320	-	-	98-328	98-328	-	0.012-0.039

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

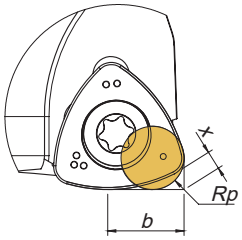
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

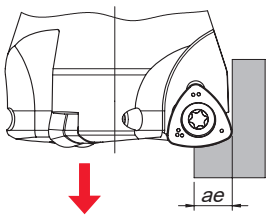
When using WDET insert, please remove the washer and the washer screw, otherwise it will break the insert.

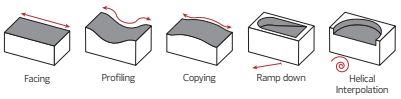


PROGRAMMING DATA Dados para programação | Datos para la programación

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

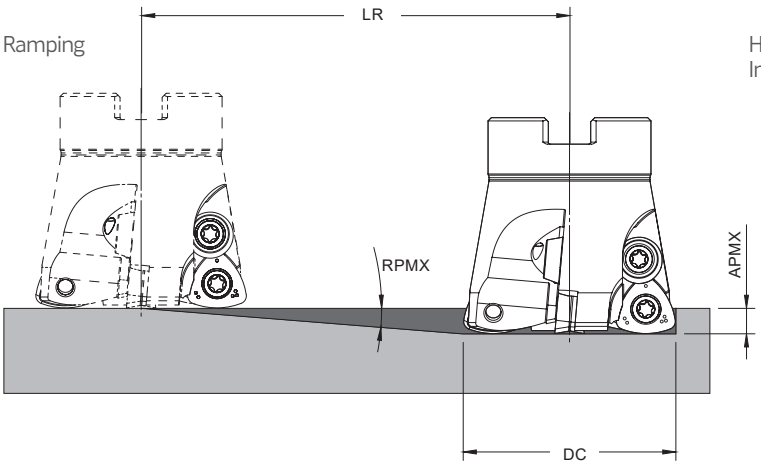


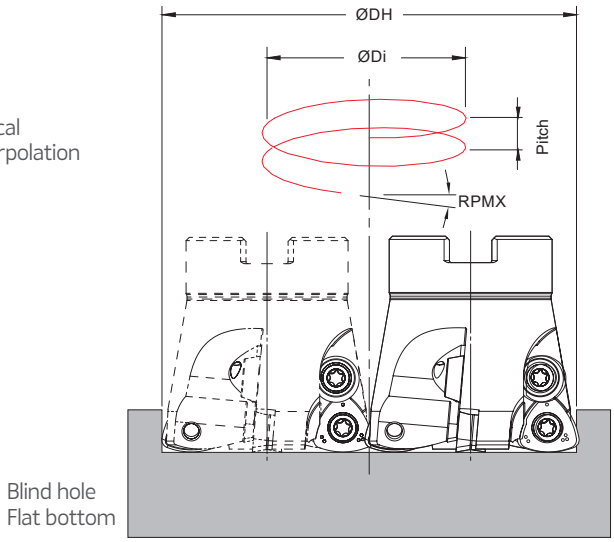




RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular



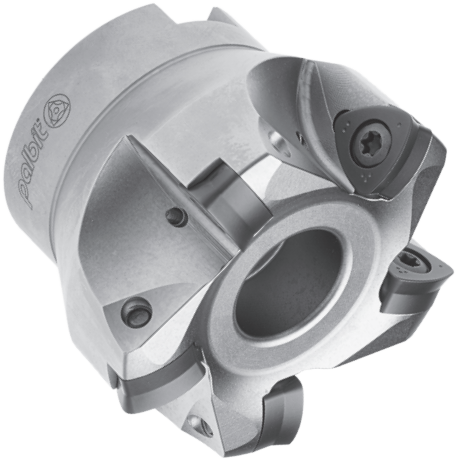


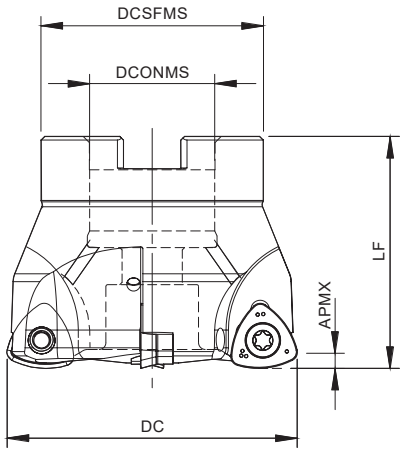
ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
2.000	0.8	0.059	4.225	3.434 -	- 3.921	0.059 0.059
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 APMX.

HIFEED WN60-12





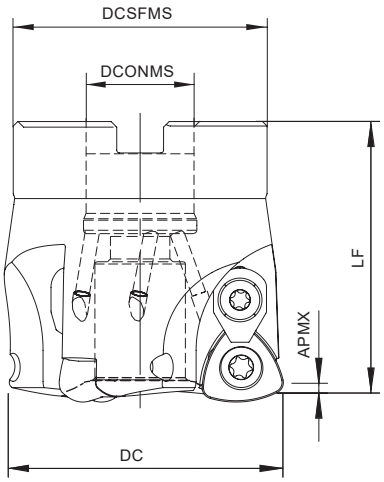
Arbor Mounting

GAMP=0° | RP=0.138

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

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Clamp Version

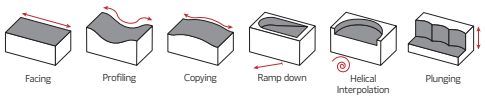
GAMP=0° | RP=0.138

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
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	◈

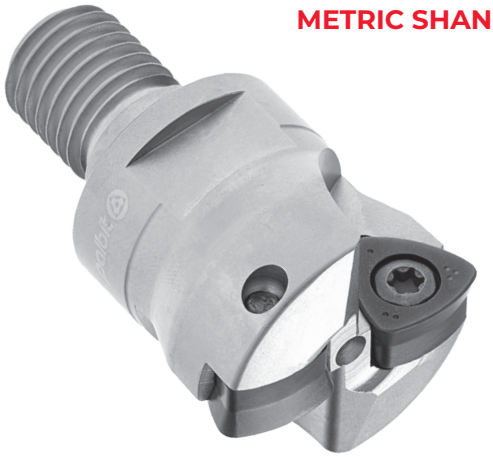
◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-16) | Disponível sobre consulta (consulte a página A-16) | Disponible bajo consulta (mire pagina A-16)

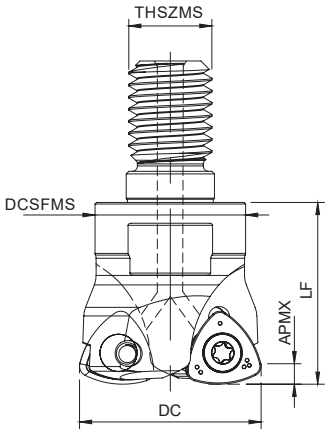
HIFEED WN60-12

WNMW 12



METRIC SHANK





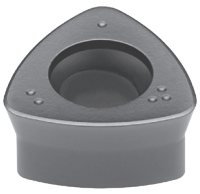
Threaded Coupling

GAMP=0° | RP=0.138

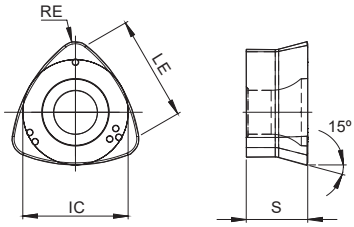
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181039000	035R50060-02-M16035	2	1.378	M16	1.142	1.378	0.366	0.071	WN... 1207	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

WNMW 1207 Inserts | Pastilhas | Plaquitas



WNMW



WNMW

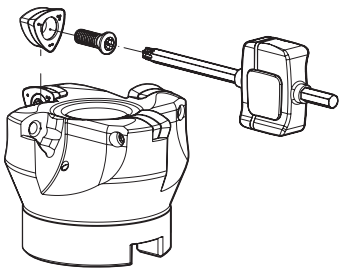
		P				K		Dimensions Dimensões Dimensiones (in)			
		PVD				PVD					
	(2) Grade code	G1	G4	78	86	G1	G4				
(1) Geometry code	ISO Reference	PH7910	PH7920	PH6125	PH6135	PH7910	PH7920	IC	S	LE	RE
1121148	WNMW 1207-SP	◈	◈	◈	◈	◈	◈	0.472	0.276	0.469	0.079

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Order separately: Key (Torx - Nm)	Torque Value	Clamp Version: Clamp Set	Clamp Key (Torx)
				lbf/in		
WN60-A-12 - 2.00-3.00	P0451400	XT20	DT2050	44.3	GS40140	XT15
WN60-A-12 - 4.00	P0451400	XT20	DT2050	44.3	GS40140	XT15
R50060 – 35	P0451400	XT20	DT2050	44.3	-	-



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

HIFEED WN60-12

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH7910	PH7920	PH6125	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

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

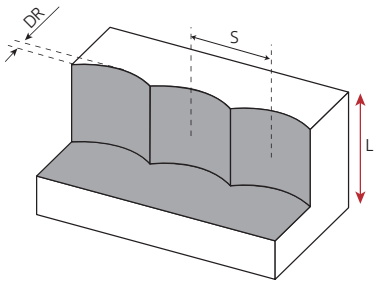
ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PH7910	PH7920	PH6125	PH6135	Feed fz (in/t) WNMW 12...
P	1	Unalloyed Steel	125-220	590-820	590-787	525-623	492-590	0.012-0.059
	2	Low-Alloyed Steel	220-280	525-754	525-722	459-590	459-558	0.012-0.059
	3	High-Alloyed Steel	280-380	459-722	459-689	426-525	394-492	0.012-0.051
K	7	Malleable Cast Iron	130-230	590-984	525-853	-	-	0.012-0.059
	8	Grey Cast Iron	180-245	525-820	459-787	-	-	0.012-0.059
	9	Nodular Cast iron	160-250	492-656	394-656	-	-	0.012-0.055

(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.

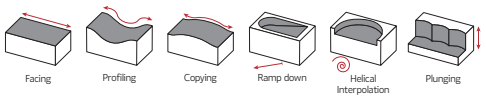
PLUNGING Mergulho | Plunge

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



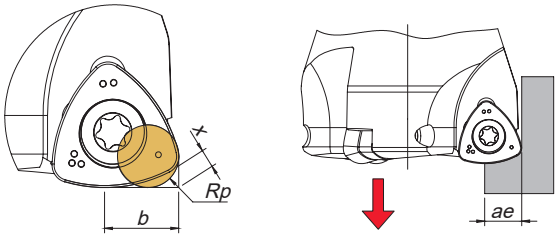
S max and DR corresponding cutting diameter DC (in)					
DR (in)	DC (in)				
	1,378	2.000	2.500	3.000	4.000
0.039	0.228	0.277	0.310	0.340	0.393
0.079	0.319	0.390	0.437	0.480	0.557
0.118	0.386	0.471	0.530	0.583	0.677
0.157	0.437	0.538	0.607	0.668	0.777
0.197	0.480	0.596	0.674	0.743	0.866
0.236	0.520	0.645	0.731	0.808	0.942
0.276	0.551	0.690	0.783	0.867	1.014
0.315	0.579	0.729	0.830	0.920	1.077

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



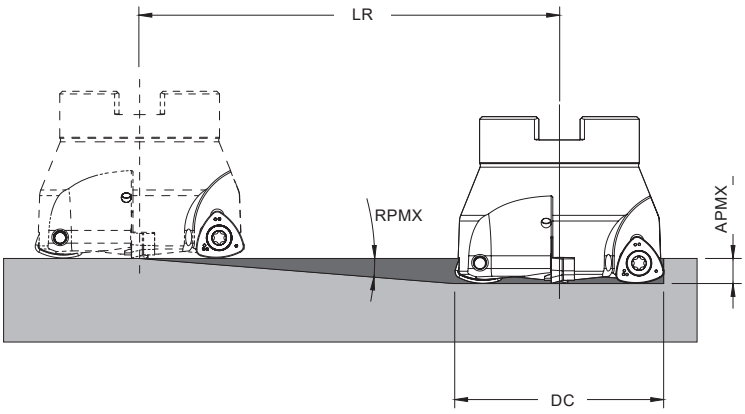
PROGRAMMING DATA Dados para programação | Datos para la programación

Insert	Programming Data			
	Rp	X	b	a_e
WNMW 12	3,5	0,9	8,4	8,0

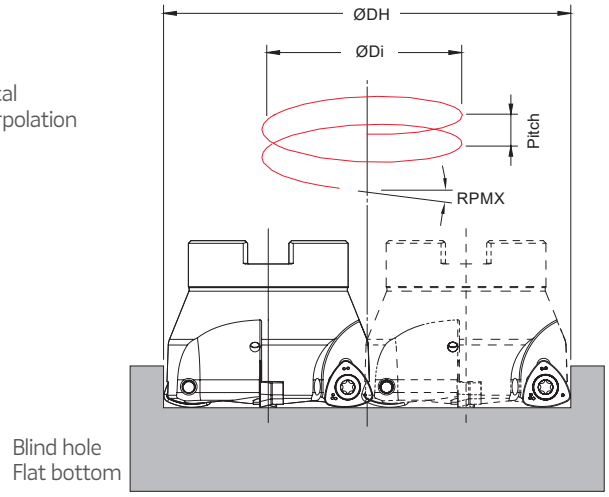


RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular



Helical Interpolation



Blind hole
Flat bottom

ØDi = ØDH - DC

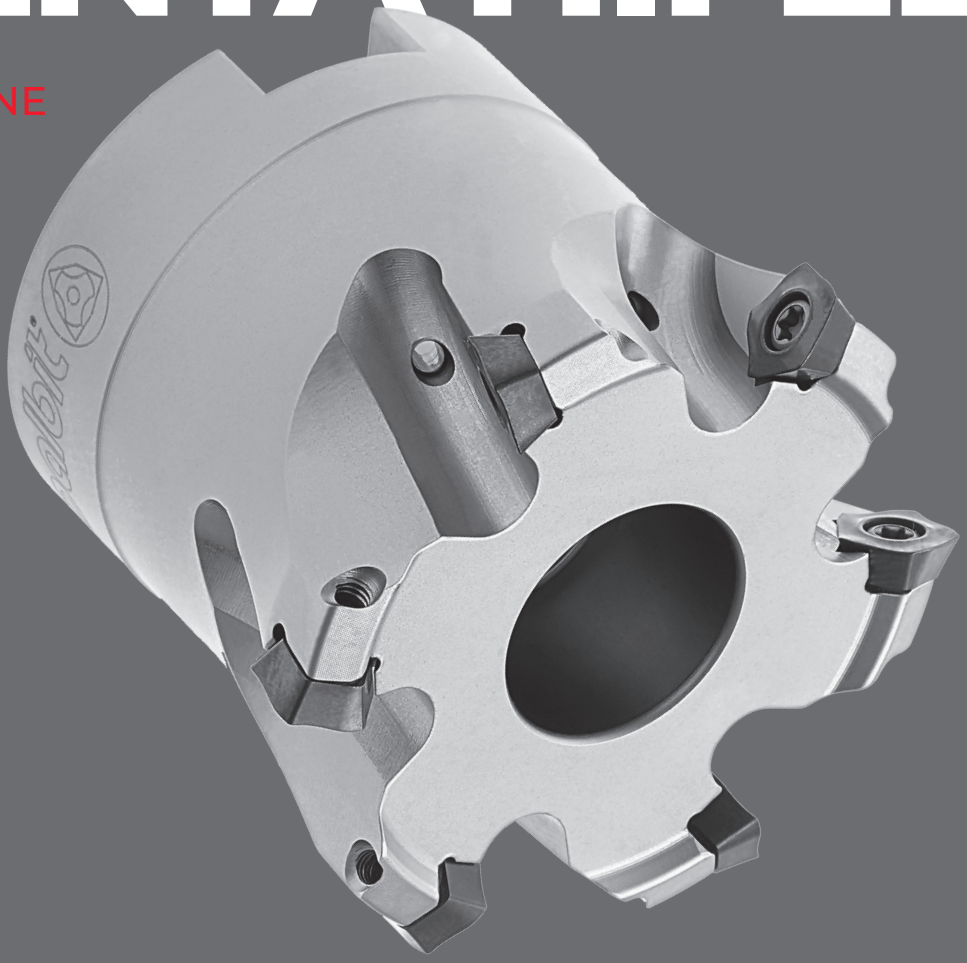
DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
2.000	1.8	0.138	4.391	3.338 -	- 3.921	0.130 0.138
2.500	1.2	0.138	6.588	4.338 -	- 4.921	0.120 0.138
3.000	0.9	0.138	8.785	5.338 -	- 5.921	0.110 0.138
4.000	0.4	0.138	19.767	7.338 -	- 7.921	0.070 0.080

Note: During helical interpolation do not exceed APMX.

06320

PENTA HIFEED

METRIC LINE



PENTA HIFEED features five positive cutting edges designed for high-feed applications with low cutting forces. This optimization enhances machining efficiency while also maintaining a long tool life.

A PENTA HIFEED possui cinco arestas de corte positivas projetadas para aplicações de alto avanço com baixas forças de corte. Essa otimização melhora a eficiência da fresagem, mantendo também uma longa vida útil da ferramenta.

PENTA HIFEED cuenta con cinco filos de corte positivos diseñados para aplicaciones de alto avance con bajas fuerzas de corte. Esta optimización mejora la eficiencia del fresado, manteniendo también una larga vida útil de la herramienta.

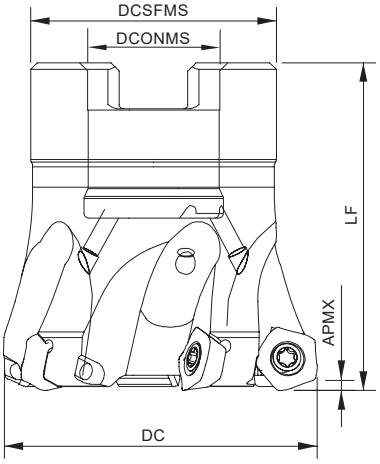
PENTA HIFEED 06320 > page 122



- From DC 0.630 in to 2.598 in
  De DC 0.630 in a 2.598 in | Desde DC 0.630 in hasta 2.598 in
- Available in arbor mounting, threaded coupling and cylindrical shank
  Disponível em montagem tipo árvore, acoplamento roscado e haste cilíndrica | Disponible en fijación con tornillo central, fijación roscada y mango cilíndrico
- Positive insert with 5 cutting edges
  Pastilhas positivas com 5 arestas de corte | Insertos positivas con 5 filos de corte
- Low cutting forces
  Baixas forças de corte | Bajas fuerzas de corte

PENTA HIFEED 06320 METRIC LINE





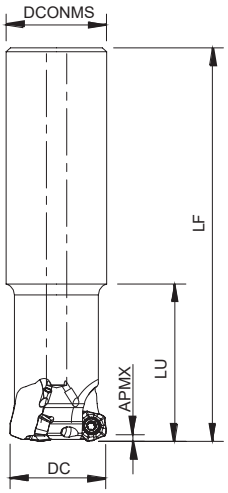
Arbor Mounting

KAPR=20° | GAMP=14° | RP=0.098

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert	Stock
			DC	DCONMS	DCSFMS	LF		APMX (in)	Arbor Type		
181129300	040A06320-05-14-016040	5	1.575	0.630	1.181	1.575	0.331	0.039	A	POKT 0403...	◈
181129400	050A06320-06-14-022045	6	1.969	0.866	1.575	1.772	0.419	0.039	A	POKT 0403...	◈
181129500	052A06320-06-14-022045	6	2.047	0.866	1.575	1.772	0.639	0.039	A	POKT 0403...	◈
181129600	063A06320-07-14-027050	7	2.480	1.063	1.890	1.969	1.102	0.039	A	POKT 0403...	○
181131300	066A06320-07-14-027050	7	2.598	1.063	1.890	1.969	1.212	0.039	A	POKT 0403...	○

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





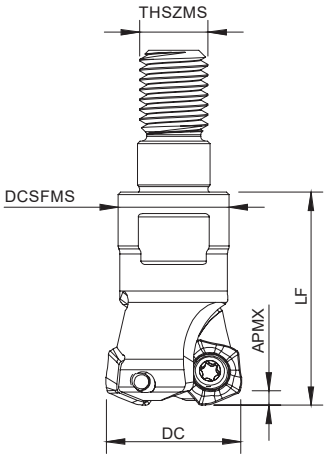
Cylindrical Shank

KAPR=20° | GAMP=14° | RP=0.098

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181147200	020E06320-02-14-020130	2	0.787	0.787	5.118	1.575	0.838	0.039	POKT 0403...	◈
181131000	025E06320-03-14-025150	3	0.984	0.984	5.906	1.575	0.904	0.039	POKT 0403...	◈
181131100	032E06320-05-14-032180	5	1.260	1.260	7.087	1.575	1.234	0.039	POKT 0403...	◈
181131200	040E06320-05-14-032180	5	1.575	1.260	7.087	1.969	1.543	0.039	POKT 0403...	○

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Threaded Coupling

KAPR=20° | GAMP=14° | RP=0.098

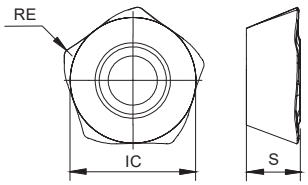
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181113500	016R06320-02-14-M08025	2	0.630	M08	0.512	0.984	0.044	0.039	POKT 0403...	◈
181113600	020R06320-02-14-M10025	2	0.787	M10	0.709	0.984	0.110	0.039	POKT 0403...	◈
181113700	025R06320-03-14-M12028	3	0.984	M12	0.827	1.102	0.154	0.039	POKT 0403...	◈
181129100	032R06320-05-14-M16035	5	1.260	M16	1.142	1.378	0.375	0.039	POKT 0403...	◈
181129200	035R06320-05-14-M16035	5	1.378	M16	1.142	1.378	0.419	0.039	POKT 0403...	◈
181130900	042R06320-05-14-M16035	5	1.654	M16	1.142	1.378	0.507	0.039	POKT 0403...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

POKT 0403... Inserts | Pastilhas | Plaquitas



POKT-MP



POKT-MP

		P				K		Dimensions Dimensões Dimensiones (in)		
		PVD				PVD				
	(2) Grade code	G1	G4	P3	G6	G1	G4			
(1) Geometry code	ISO Reference	PH7910	PH7920	PH7930	PH7740	PH7910	PH7920	IC	S	RE
1112365	POKT 040305 ZDSR-MP	◈	◈	◈	◈	◈	◈	0.276	0.118	0.020

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

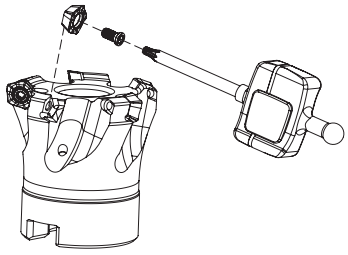
Insert order code = (1) Geometry Code + (2) Grade Code

PENTA HIFEED 06320 METRIC LINE

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
R06320 - 0.630-1.654	P0250503	XT08	DT0812	10,6
E06320 - 0.984-1.575	P0250503	XT08	DT0812	10,6
A06320 - 1.575-2.362	P0250503	XT08	DT0812	10,6



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH7910	PH7920	PH7930	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

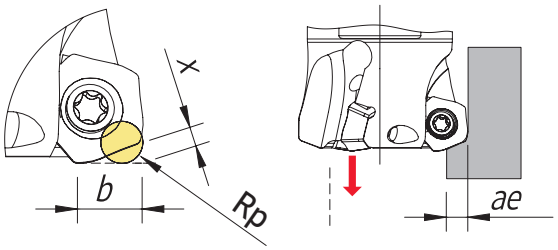
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PH7910	PH7920	PH7930	PH7740	Feed fz (in/t) POKT 04...-MP
P	1	Unalloyed Steel	125-220	590-820	590-787	525-722	459-656	0.020-0.059
	2	Low-Alloyed Steel	220-280	525-754	525-722	459-656	426-590	0.020-0.059
	3	High-Alloyed Steel	280-380	459-722	459-689	394-623	328-558	0.020-0.060
K	7	Malleable Cast Iron	130-230	590-984	525-853	-	-	0.020-0.060
	8	Grey Cast Iron	180-245	525-820	459-787	-	-	0.020-0.061
	9	Nodular Cast iron	160-250	492-656	394-656	-	-	0.020-0.061

(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.

PROGRAMMING DATA Dados para programação | Datos para la programación

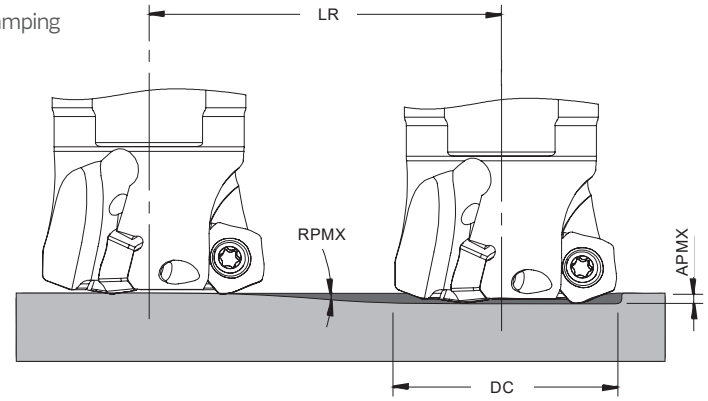
Insert	Programming Data Rp	X	b	a_e
POKT 0403...	0.098	0.047	0.169	0.157



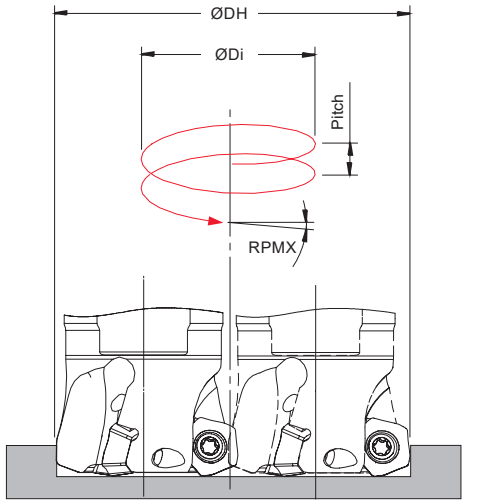
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



Blind hole
Flat bottom

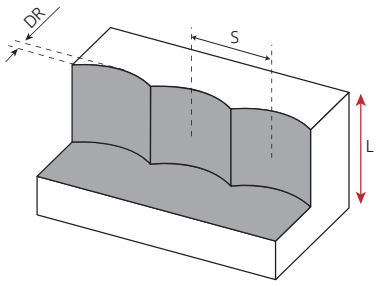
ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
0.630	15	0.039	0.146	0.921 -	- 1.181	0.236 0.433
0.787	9.0	0.039	0.248	1.236 -	- 1.496	0.197 0.315
0.984	5.0	0.039	0.449	1.630 -	- 1.890	0.157 0.236
1.260	3.4	0.039	0.661	2.181 -	- 2.441	0.157 0.197
1.378	3.0	0.039	0.752	2.417 -	- 2.677	0.157 0.197
1.575	2.0	0.039	1.126	2.811 -	- 3.071	0.118 0.157
1.654	2.0	0.039	1.126	3.307 -	- 3.228	0.157 0.157
1.969	2.0	0.039	1.126	3.598 -	- 3.858	0.157 0.197
2.047	2.0	0.039	1.126	3.756 -	- 4.016	0.157 0.197
2.480	2.0	0.039	1.126	4.622 -	- 4.882	0.197 0.236
2.598	1.8	0.039	1.252	4.858 -	- 5.118	0.197 0.236

Note: During helical interpolation do not exceed APMX.

PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
f_z (in/t)		
0.003-0.006	0.002-0.004	$Smax = \sqrt{DC.Dr-Dr^2}$



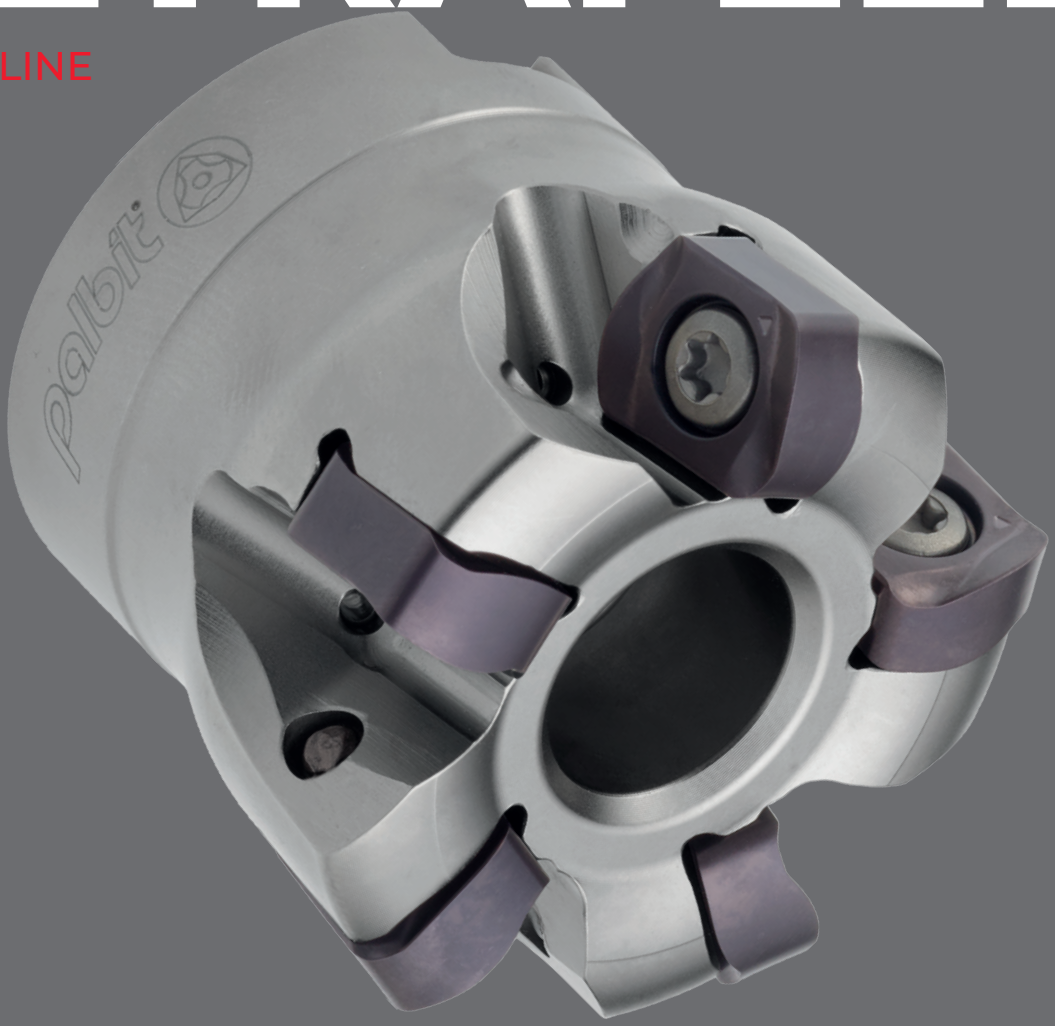
S max and DR corresponding cutting diameter DC (in)											
DR (in)	DC (in)										
	0.630	0.787	0.984	1.260	1.378	1.575	1.654	1.969	2.047	2.480	2.598
0.039	0.154	0.173	0.193	0.224	0.228	0.244	0.252	0.276	0.280	0.311	0.319
0.079	0.209	0.236	0.268	0.106	0.319	0.343	0.350	0.386	0.394	0.433	0.445
0.118	0.244	0.280	0.319	0.366	0.386	0.413	0.425	0.469	0.476	0.528	0.539
0.157	0.272	0.315	0.362	0.417	0.437	0.472	0.484	0.535	0.547	0.606	0.618

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

16420

TETRAFEED

METRIC LINE



TETRAFEED is a robust cutter body line that provides higher fatigue and deformation resistance, ensuring a longer tool life. Thanks to its light-cutting action and robust shank design, TETRAFEED enables secure, vibration-free machining, even with long overhangs. The progressive cutting insert edge enables a smoother cut and reduces cutting forces.

A linha TETRAFEED possui suportes robustos que oferecem maior resistência à fadiga e à deformação, garantindo uma vida útil mais longa da ferramenta. A ação de corte leve e o design robusto da haste permitem uma fresagem segura e sem vibrações, mesmo com longos avanços. A aresta de corte progressiva proporciona um corte mais suave e reduz as forças de corte.

La línea TETRAFEED cuenta con soportes robustos que ofrecen una mayor resistencia a la fatiga y la deformación, lo que garantiza una vida útil más larga de la herramienta. Su acción de corte suave y el diseño robusto del vástago permiten un fresado seguro y sin vibraciones, incluso con avances largos. El filo de corte progresivo proporciona un corte más suave y reduce las fuerzas de corte.

TETRAFEED 16420 > page 128



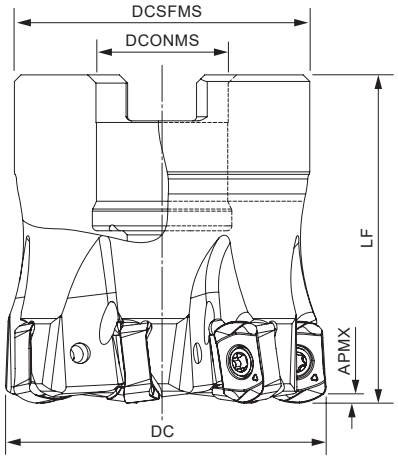
- From DC 1.260 in to 3.937 in
  De DC 1.260 in a 3.937 in | Desde DC 1.260 in hasta 3.937 in
- Available in arbor mounting and weldon shank
  Disponível em montagem tipo árvore e haste weldon | Disponible en fijación con tornillo central y mango tipo weldon
- Ideal for rough milling of medium to large-sized components
  Ideal para fresagem de desbaste de componentes de médio a grande porte| Ideal para el fresado de desbaste de componentes de tamaño mediano a grande.
- For high removal rate materials
  Para altas taxas de remoção de material | Para una alta tasa de remoción de material

TETRAFEED 16420

METRIC LINE

Proprietary milling line





Arbor Mounting

KAPR=20° | GAMP=-7° | RP=0.126

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181169300	050A16420-04-07-022045	4	1.969	0.866	1.654	1.772	0.617	A	0.059	XNKU 12...	◈
181180100	050A16420-05-07-022045	5	1.969	0.866	1.654	1.772	0.683	A	0.059	XNKU 12...	◈
181178400	052A16420-04-07-022045	4	2.047	0.866	1.654	1.772	0.727	A	0.059	XNKU 12...	◈
181180200	052A16420-05-07-022045	5	2.047	0.866	1.654	1.772	0.727	A	0.059	XNKU 12...	◈
181180300	063A16420-05-07-027050	5	2.480	1.063	1.890	1.969	1.124	A	0.059	XNKU 12...	◈
181180400	063A16420-06-07-027050	6	2.480	1.063	1.890	1.969	1.146	A	0.059	XNKU 12...	◈
181180500	066A16420-05-07-027050	5	2.598	1.063	1.890	1.969	1.190	A	0.059	XNKU 12...	◈
181180600	066A16420-06-07-027050	6	2.598	1.063	1.890	1.969	1.212	A	0.059	XNKU 12...	◈
181177900	080A16420-06-07-027050	6	3.150	1.063	2.362	1.969	2.072	A	0.059	XNKU 12...	◈
181180700	080A16420-08-07-027050	8	3.150	1.063	2.362	1.969	2.094	A	0.059	XNKU 12...	◈
181180800	100A16420-06-07-032050	6	3.937	1.260	3.150	1.969	2.667	A	0.059	XNKU 12...	○
181180900	100A16420-08-07-032050	8	3.937	1.260	3.150	1.969	2.733	A	0.059	XNKU 12...	◈

◈ Stock item | Produto de stock | Itens de stock

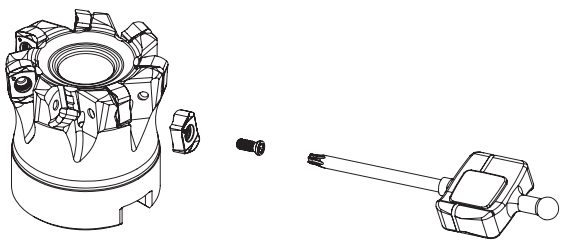
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

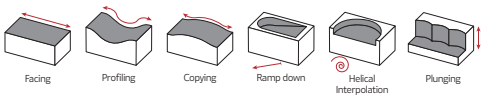
SPARE PARTS Acessórios | Repuestos

Order separately

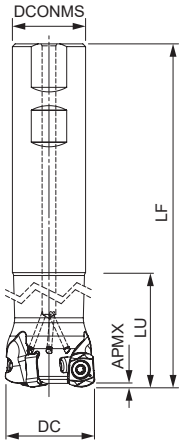
Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
A16420 - 1.969-3.150	P0451400	XT20	DT2050	44.3
A16420 - 3.937	P0451400	PT20	DT2050	44.3
W16420 - 1.260-1.575	P0451400	XT20	DT2050	44.3

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.









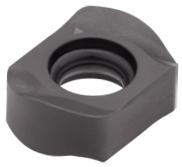
Weldon Shank

KAPR=20° | GAMP=-7° | RP=0.126

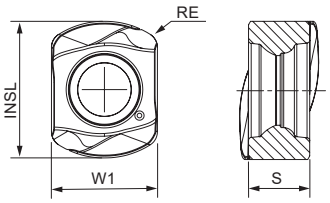
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181181000	032W16420-02-07-032150	2	1.260	1.260	5.906	2.756	1.763	0.059	XNKU 12...	◈
181181100	032W16420-02-07-032200	2	1.260	1.260	7.874	4.724	2.424	0.059	XNKU 12...	○
181181200	035W16420-02-07-032150	2	1.378	1.260	5.906	1.772	1.984	0.059	XNKU 12...	○
181181300	035W16420-02-07-032200	2	1.378	1.260	7.874	1.772	2.645	0.059	XNKU 12...	○
181181400	040W16420-03-07-032150	3	1.575	1.260	5.906	1.772	2.424	0.059	XNKU 12...	○
181181500	040W16420-03-07-032220	3	1.575	1.260	8.661	1.772	3.086	0.059	XNKU 12...	◈

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

XNKU 1205... Inserts | Pastilhas | Plaquitas



XNKU-MP



XNKU-MP | MS

		P					M				K		S			Dimensions Dimensões Dimensiones (in)			
		CVD	PVD				CVD	PVD			CVD	PVD	CVD	PVD					
	(2) Grade code	T9	X5	T1	P4	Z2	T9	X9	Z2	Z3	T9	T1	T9	X9	Z3				
(1) Geometry code	ISO Reference	PHS740	PHP910	PHP920	PHP930	PHP530	PHS740	PHH930	PHP530	PHH530	PHS740	PHP920	PHS740	PHH930	PHH530	W1	S	INSL	RE
1113071	XNKU 120516-MP	◈	◈	◈	○		◈	◈			◈	◈	◈	◈		0.461	0.232	0.591	0.063

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

TETRAFEED 16420

METRIC LINE

Proprietary milling line

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance				Toughness →	Feed fz (in/t)
				PHP910	PHP920	PHP930	PHH930	PHS740	XNKU 12...-MP
P	1	Unalloyed Steel	125-220	590-820	590-820	525-754	-	525-754	0.020-0.059
	2	Low-Alloyed Steel	220-280	525-787	558-689	492-623	-	492-623	0.020-0.059
	3	High-Alloyed Steel	280-380	459-754	525-656	459-590	-	459-590	0.020-0.059
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	426-558	394-590	0.020-0.055
	5	SS - Austenitic	200-330	-	-	-	328-525	328-492	0.020-0.055
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	262-459	230-426	0.020-0.055
K	7	Malleable Cast Iron	130-230	590-984	590-1050	-	-	525-984	0.020-0.059
	8	Grey Cast Iron	180-245	525-820	558-918	-	-	492-853	0.020-0.059
	9	Nodular Cast iron	160-250	492-689	328-787	-	-	262-722	0.020-0.059
S	11	Heat Resistant Super Alloys	200-320	-	-	-	98-246	98-230	0.020-0.051

(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) When using DC=16mm apply 70% or less feed (fz) from the table.

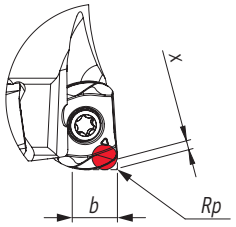
GRADES SELECTION GUIDE Guia para selecção de graus | Tabla para selección de calidades

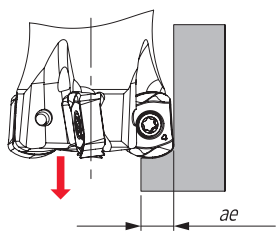
ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance				Toughness →
				PHP910	PHP920	PHP930	PHH930	PHS740
P	1	Unalloyed Steel	125-220	✓	✓	✓		✓
	2	Low-Alloyed Steel	220-280	✓	✓	✓		✓
	3	High-Alloyed Steel	280-380	✓	✓	✓		✓
M	4	SS - Ferritic / Martensitic	200-330				✓	✓
	5	SS - Austenitic	200-330				✓	✓
	6	SS - Austenitic-ferritic (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

PROGRAMMING DATA Dados para programação | Datos para la programación

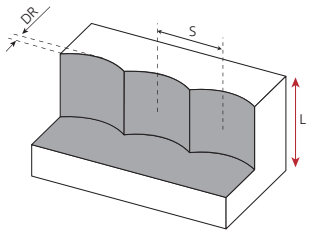
Insert	Programming Data			
	Rp	X	b	a_e
XNKU 1206...	0.126	0.026	0.295	0.280





PLUNGING Mergulho | Plunge

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



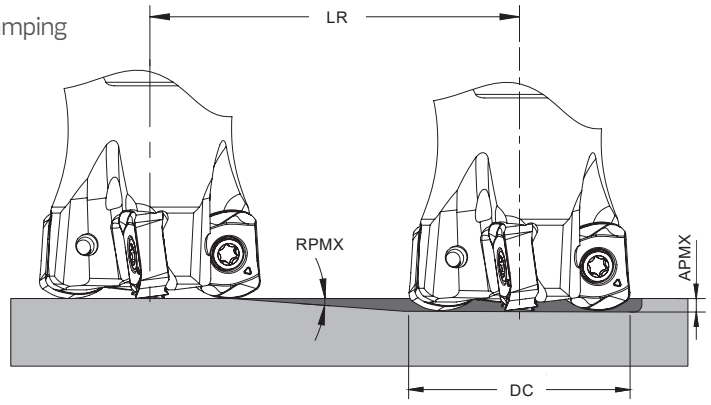
S max and DR corresponding cutting diameter DC (in)									
DR (in)	DC (in)								
	1.260	1.378	1.575	1.969	2.047	2.480	2.598	3.150	3.937
0.039	0.220	0.228	0.244	0.276	0.280	0.311	0.319	0.350	0.390
0.079	0.303	0.319	0.343	0.386	0.394	0.433	0.445	0.492	0.551
0.118	0.366	0.386	0.413	0.469	0.476	0.528	0.539	0.598	0.673
0.157	0.417	0.437	0.472	0.535	0.547	0.606	0.618	0.685	0.772
0.197	0.457	0.480	0.520	0.591	0.602	0.669	0.689	0.764	0.858
0.236	0.492	0.520	0.563	0.638	0.654	0.728	0.748	0.831	0.933
0.276	0.520	0.551	0.598	0.681	0.697	0.780	0.799	0.890	1.004

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

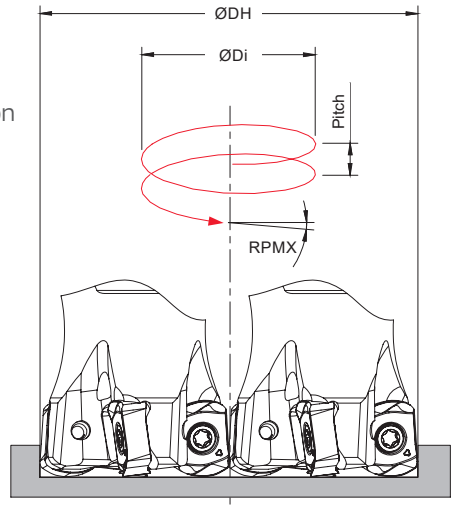
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



Blind hole
Flat bottom

ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
1.260	1.25	0.059	2.705	1.929 -	- 2.268	0.046 0.059
1.378	1.1	0.059	3.075	2.165 -	- 2.504	0.047 0.059
1.575	0.85	0.059	3.980	2.559 -	- 2.898	0.046 0.059
1.969	0.6	0.059	5.638	3.346 -	- 3.685	0.045 0.056
2.047	0.55	0.059	6.154	3.504 -	- 3.843	0.044 0.054
2.480	0.45	0.059	7.520	4.370 -	- 4.709	0.046 0.055
2.598	0.4	0.059	8.461	4.606 -	- 4.945	0.044 0.051
3.150	0.3	0.059	11.280	5.709 -	- 6.047	0.042 0.048
3.937	0.25	0.059	13.535	7.283 -	- 7.622	0.046 0.050

Note: During helical interpolation do not exceed APMX.
(*) Down cutting is recommended, tool pass rotation should be counter-clockwise.
(*) In case of ramping and helical interpolation, apply 70% or less feed (fz) from recommended cutting conditions table.



SHOULDER MILLING

1 **HEXAPLUS WN90-08**
> Suitable for machining **P K**
> See page A - 134

2 **PLUS WN90-04**
> Suitable for machining **P K**
> See page A - 140

3 **PLUS AN90-10 | AN90-12 | AN90-16**
> Suitable for machining **P M K N S**
> See page A - 144

4 **LINEPRO XP90-06 | 20190 | 20290**
> Suitable for machining **P M K N S H**
> See page A - 158

5 **ALUPRO XD90-15 | XD90-22**
> Suitable for machining **N**
> See page A - 180

6 **LINEPRO AP90-10 | AP90-16**
> Suitable for machining **P M K N**
> See page A - 190

7 **FINEPRO 21190 metric line**
> Suitable for machining **P M N S H**
> See page A - 202

8 **HELIPRO 20290 metric line**
> Suitable for machining **P M K N S H**
> See page A - 208

9 **TGPLUS 90090 | 90190 | 90390 metric line**
> Suitable for machining **P M K S**
> See page A - 214

10 **LINEPRO 06290 metric line**
> Suitable for machining **P M K S**
> See page A - 228

11 **HEXAPLUS 49490 | 49590 metric line**
> Suitable for machining **P M K S**
> See page A - 232

WN90-08

HEXAPLUS

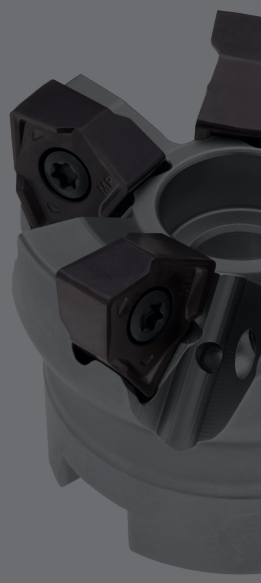


The HEXAPLUS line ensures a precise 90° square in a single milling operation, thus saving considerable production time by eliminating secondary operations. Additionally, it features a wiper edge on the secondary cutting edge, ensuring an excellent finish on the base surface.

A linha HEXAPLUS garante um quadrado preciso de 90° em uma única operação de fresagem, economizando assim considerável tempo de produção ao eliminar operações secundárias. Além disso, apresenta uma aresta de limpeza na aresta de corte secundária, garantindo um acabamento excelente na superfície base.

La línea HEXAPLUS asegura un cuadrado preciso de 90° en una sola operación de fresado, ahorrando considerable tiempo de producción al eliminar operaciones secundarias. Además, presenta un filo limpiador en el filo de corte secundario, garantizando un excelente acabado en la superficie base.

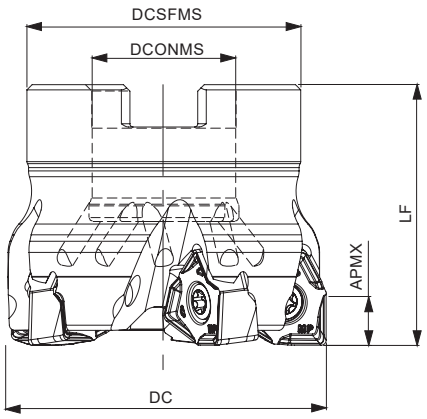
HEXAPLUS WN90-08 > page 136



- From DC 2.000 in to 3.000 in
  De DC 2.000 in a 3.000 in | Desde DC 2.000 in hasta 3.000 in
- Available in arbor mounting and weldon shank
  Disponível em montagem tipo árvore e haste weldon | Disponible en fijación con tornillo central y mango tipo weldon
- Negative inserts with 6 cutting-edges
  Pastilhas negativas com 6 arestas de corte | Insertos negativos con 6 filos de corte
- Full 90º main cutting edge
  Aresta de corte a 90º | Filo de corte a 90º

HEXAPLUS WN90-08





Arbor Mounting

KAPR=90° | GAMP=-6°

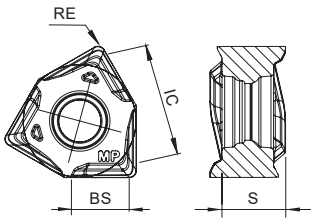
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181185300	WN90 D2.00-A.750/1.57-04-08	4	2.000	0.750	1.770	1.570	0.860	A	0.295	WNXT 0806...	◈
181185400	WN90 D2.00-A.750/1.57-05-08	5	2.000	0.750	1.770	1.570	0.838	A	0.295	WNXT 0806...	○
181185500	WN90 D2.50-A1.00/1.75-05-08	5	2.500	1.000	2.200	1.750	1.102	A	0.295	WNXT 0806...	◈
181185600	WN90 D3.00-A1.00/1.75-07-08	7	3.000	1.000	2.200	1.750	2.030	A	0.295	WNXT 0806...	◈

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

WNXT 0806... Inserts | Pastilhas | Plaquitas



WNXT

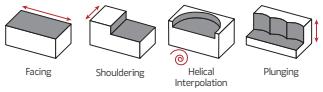


WNXT

		P		K		Dimensions Dimensões Dimensiones (in)			
		PVD		PVD					
	(2) Grade code	T1	P4	T1	P4				
(1) Geometry code	ISO Reference	PHP920	PHP930	PHP920	PHP930	IC	S	RE	BS
1113000	WNXT 080608 PNSR-MP	◈	◈	◈	◈	0.500	0.248	0.031	0.161

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

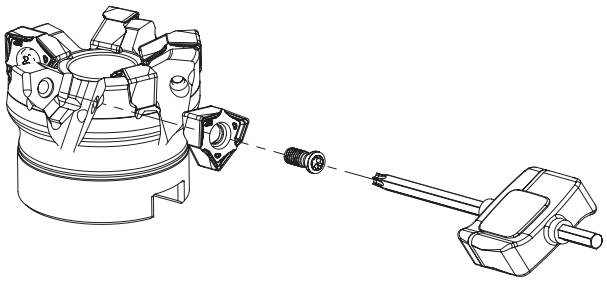


SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				
WN90-08 - 2.000-3.000	P0401200	XT15	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



HEXAPLUS WN90-08

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHP920	PHP930
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	✓	✓

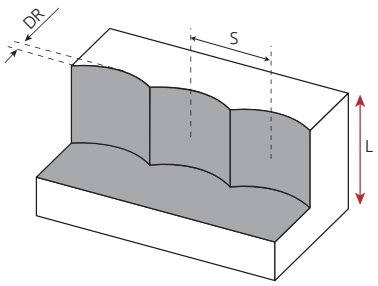
Good Conditions Average Conditions Difficult Conditions

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

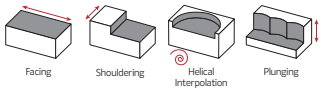
ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PHP920	PHP930	Feed fz (in/t) WNXT 0806
P	1	Unalloyed Steel	125-220	590-820	525-754	0.003-0.010
	2	Low-Alloyed Steel	220-280	525-754	459-689	0.003-0.010
	3	High-Alloyed Steel	280-380	459-722	394-656	0.003-0.008
K	7	Malleable Cast Iron	130-230	426-754	492-820	0.003-0.010
	8	Grey Cast Iron	180-245	590-804	459-754	0.003-0.010
	9	Nodular Cast iron	160-250	394-689	328-656	0.003-0.008

PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
fz (in/t)		
0.004-0.012	0.003-0.010	$Smax = \sqrt{DC.Dr - Dr^2}$



S max and DR corresponding cutting diameter DC (in)			
DR (in)	DC (in)		
	2.000	2.500	3.000
0.039	0.275	0.311	0.350
0.079	0.386	0.433	0.492
0.118	0.469	0.528	0.598
0.157	0.535	0.606	0.685



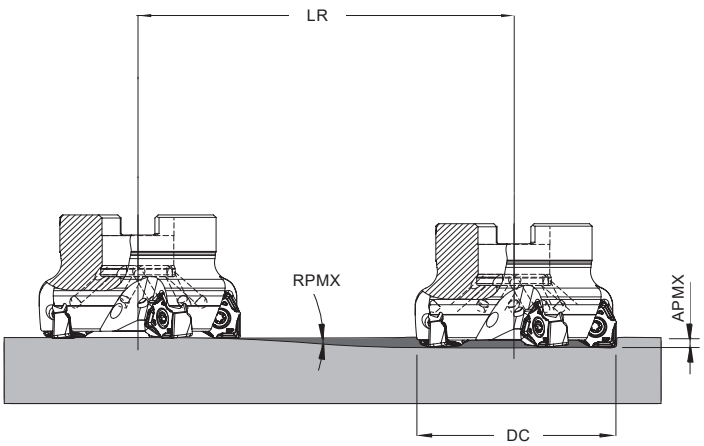
PROGRAMMING DATA Dados para programação | Datos para la programación

Insert	Programming Data		
	Insert radius (in)	Wiper edge (in)	APMX (in)
WNXT 080308 PNSR-MM	0.031	0.161	0.295

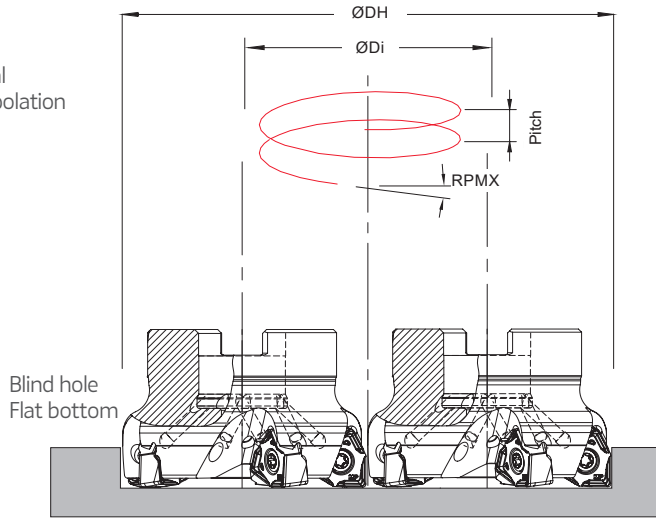
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
2.000	3.5	0.300	4.830	3.450 -	- 3.860	0.287 0.300
2.500	3.5	0.300	4.830	4.500 -	- 4.880	0.300 0.300
3.000	3.0	0.300	5.630	5.830 -	- 6.220	0.300 0.300

Note: During helical interpolation do not exceed APMX.
(*) Down cutting is recommended, tool pass rotation should be counter-clockwise.
(*) In case of ramping and helical interpolation, apply 70% or less feed (fz) from recommended cutting conditions table.

WN90-04

PLUS

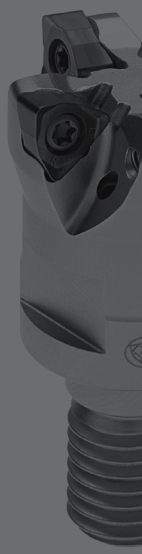


The PLUS WN90-04 is an ideal shoulder milling tool suited for small pieces or applications with high overhang. Additionally, a chip breaker is available for aluminum applications.

A PLUS WN90-04 é uma ferramenta de fresagem a 90º para peças pequenas ou aplicações com grande balanço. Além disso, tem um quebra-aparas disponível para aplicações em alumínio.

El PLUS WN90-04 es una herramienta de fresado de 90º ideal para piezas pequeñas o aplicaciones con gran voladizo. Además, hay disponible un rompevirutas para aplicaciones de aluminio.

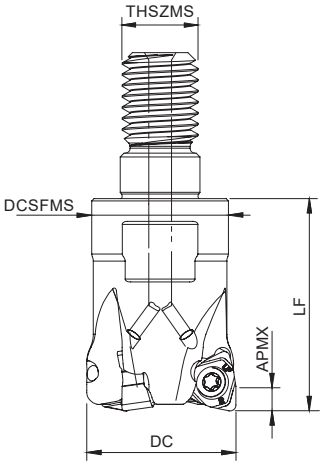
PLUS WN90-04 > page 142



- From DC 0.625 in to 1.000 in
  De DC 0.625 in a 1.000 in | Desde DC 0.625 in hasta 1.000 in
- Available in threaded coupling and cylindrical shank
  Disponível em acoplamento roscado e haste cilíndrica | Disponible en fijación roscada y mango cilíndrico
- Negative inserts with 6 cutting-edges
  Pastilhas negativas com 6 arestas de corte | Insertos negativos con 6 filos de corte
- Chip breaker for aluminium application
  Quebra-aparas para aplicação em alumínio | Rompevirutas para aplicación en aluminio

PLUS WN90-04





Threaded Coupling

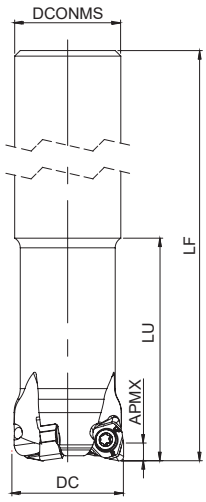
KAPR=90° | GAMP=-7°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specification	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181140000	WN90 D.625-R-08/.800-02-04	2	0.625	M8	0.512	0.800	0.09	0.118	WNHU 04T3..	○
181140100	WN90 D.750-R-10/1.00-03-04	3	0.750	M10	0.709	1.000	0.18	0.118	WNHU 04T3..	○
181140200	WN90 D1.00-R-12/1.25-04-04	4	1.000	M12	1.142	1.250	0.22	0.118	WNHU 04T3..	○

Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Cylindrical Shank

KAPR=90° | GAMP=-7°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specification	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181140300	WN90 D.625-C.625/4.00-02-04	2	0.625	0.625	4.000	2.000	0.53	0.118	WNHU 04T3..	○
181140400	WN90 D.750-C.750/5.00-03-04	3	0.750	0.750	5.000	3.000	0.62	0.118	WNHU 04T3..	○
181140500	WN90 D1.00-C1.00/6.00-04-04	4	1.000	1.000	6.000	3.750	0.77	0.118	WNHU 04T3..	○

Stock item | Produto de stock | Itens de stock

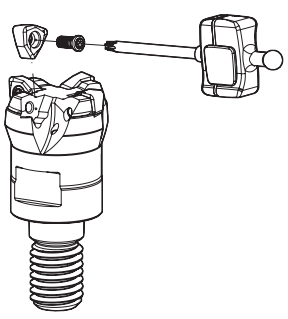
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Acessórios | Repuestos

Order separately

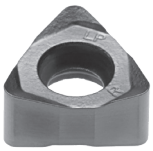
Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
WN90-R-04 - 0.625-1.00	P0250704	XT08	DT0812	10.6
WN90-C-04 - 0.625-1.00	P0250704	XT08	DT0812	10.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

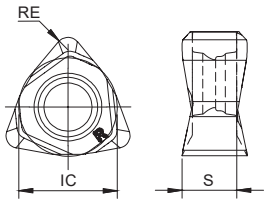




WNHU 04T3.. Inserts | Pastilhas | Plaquitas


WNHU-LP


WNHU-LN



WNHU-LP | LN

		P			K			N	Dimensions Dimensões Dimensiones (in)		
		PVD			PVD			UNC			
	(2) Grade code	X5	T1	P4	X5	T1	P4	10			
(1) Geometry code	ISO Reference	PHP910	PHP920	PHP930	PHP910	PHP920	PHP930	PH0910	IC	S	RE
1112277	WNHU 04T308 PNER-LP	◉	◉	◉	◉	◉	◉		0.250	0.138	0.031
1113167	WNHU 04T316 PNER-LP		◉			◉			0.250	0.134	0.063
1112988	WNHU 04T308 PNFR-LN							◉	0.250	0.138	0.031

◉ First choice | Primeira opção | 1ª opción ◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness →			
				PH0910	PHP910	PHP920	PHP930
P	1	Unalloyed Steel	125-220		✓	✓	✓
P	2	Low-Alloyed Steel	220-280		✓	✓	✓
P	3	High-Alloyed Steel	280-380		✓	✓	✓
K	7	Malleable Cast Iron	130-230		✓	✓	✓
K	8	Grey Cast Iron	180-245		✓	✓	✓
K	9	Nodular Cast iron	160-250		✓	✓	✓
N	10	Aluminium and Non Ferrous	30-130	✓			

Good Conditions | Average Conditions | Difficult Conditions

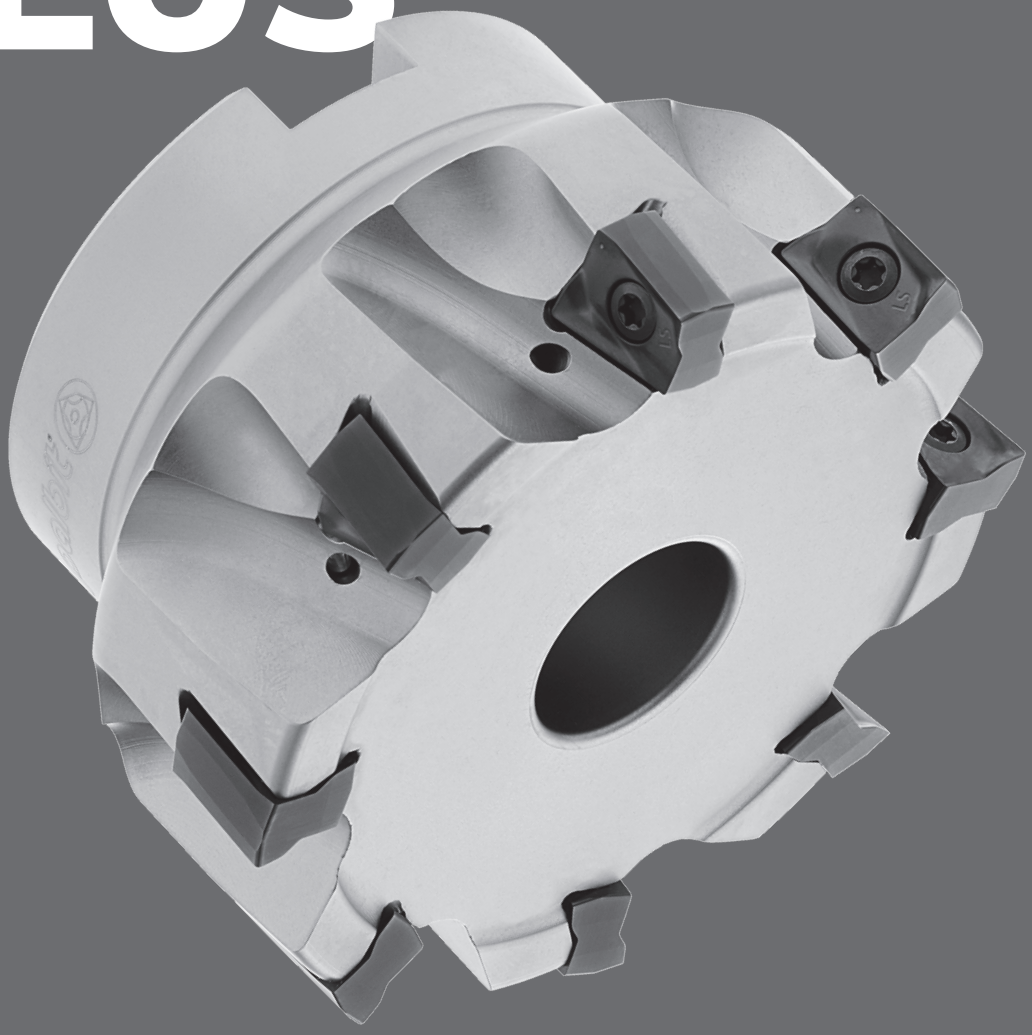
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness →				Feed fz (in/t)	
				PH0910	PHP910	PHP920	PHP930	WNHU 04T3..-LP	WNHU 04T3..-LN
P	1	Unalloyed Steel	125-220	-	590-820	590-820	525-754	0.004-0.012	-
P	2	Low-Alloyed Steel	220-280	-	525-787	525-754	459-689	0.004-0.012	-
P	3	High-Alloyed Steel	280-380	-	459-754	459-722	394-656	0.004-0.010	-
K	7	Malleable Cast Iron	130-230	-	590-984	525-886	492-820	0.004-0.012	-
K	8	Grey Cast Iron	180-245	-	525-820	459-820	459-754	0.004-0.012	-
K	9	Nodular Cast iron	160-250	-	492-689	394-689	328-656	0.004-0.010	-
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	0.004-0.012

Insert	Feed f_z (in/t)		AP Rec.
	Roughing	Finishing	
WNHU 04T3..	0.006-0.012	0.004-0.010	0.020-0.118

AN90-10 | AN90-12 | AN90-16

PLUS



The PLUS Line features strong and smooth cutting edges with exceptional wear resistance, ensuring longevity and consistent performance. Through optimized cutting edge integrity, it enhances productivity and sustains tool reliability. Committed to maximum machining efficiency and stability, this line stands as a guarantee for precision operations.

A Linha PLUS apresenta arestas de corte fortes e suaves com resistência excepcional ao desgaste, garantindo longevidade e desempenho consistente. Através da integridade otimizada da aresta de corte, ela melhora a produtividade e mantém a fiabilidade da ferramenta. Comprometida com a máxima eficiência e estabilidade na fresagem, esta linha se destaca como uma garantia para operações de precisão.

La línea PLUS presenta bordes de corte fuertes y suaves con resistencia excepcional al desgaste, garantizando longevidad y rendimiento consistente. A través de la integridad optimizada del borde de corte, mejora la productividad y mantiene la fiabilidad de la herramienta. Comprometida con la máxima eficiencia y estabilidad en el fresado, esta línea se destaca como una garantía para operaciones de precisión.

PLUS AN90-10 > page 146



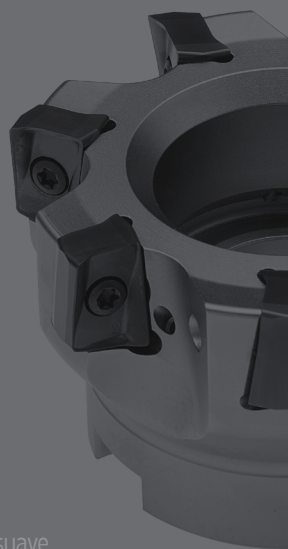
- From DC 0.750 in to 4.000 in
  De DC 0.750 in a 4.000 in | Desde DC 0.750 in hasta 4.000 in
- Available in arbor mounting and weldon shank
  Disponível em montagem tipo árvore e haste weldon | Disponible en fijación con tornillo central y mango tipo weldon
- Small negative insert with 4 cutting edges (ANHX 1004..)
  Pastilha negativa pequena com 4 arestas de corte (ANHX 1004..) | Plaquita negativa pequeña con 4 filos de corte (ANHX 1004..)
- Helical cutting edge for high wall accuracy
  Aresta de corte helicoidal para alta precisão a 90º | Filo de corte helicoidal para alta precisión a 90º

PLUS AN90-12 > page 150



- From DC 1.000 in to 4.000 in
  De DC 1.000 in a 4.000 in | Desde DC 1.000 in hasta 4.000 in
- Available in arbor, threaded, weldon and cylindrical shank
  Disponível em montagem tipo árvore, acoplamento roscado, haste weldon e cilíndrica | Disponible en fijación con tornillo central, fijación roscada, mango tipo weldon y cilindrico
- Medium negative insert with 4 cutting edges (ANHX 1206..)
  Pastilha negativa média com 4 arestas de corte (ANHX 1206..) | Plaquita negativa media con 4 filos de corte (ANHX 1206..)
- Reinforced cutting edges
  Arestas de corte reforçadas | Filos de corte reforzados

PLUS AN90-16 > page 154

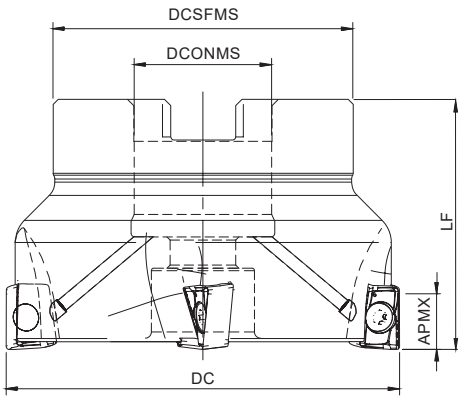


- From DC 1.250 in to 6.000 in
  De DC 1.250 in a 6.000 in | Desde DC 1.250 in hasta 6.000 in
- Available in arbor mounting, threaded coupling and weldon shank
  Disponível em montagem tipo árvore, acoplamento roscado e haste weldon | Disponible en fijación con tornillo central, fijación roscada y mango tipo weldon
- Large negative insert with 4 cutting edges (ANHX 1607..)
  Pastilha negativa grande com 4 arestas de corte (ANHX 1607..) | Plaquita negativa grande con 4 filos de corte (ANHX 1607..)
- Resistant insert for high productivity and smooth cutting
  Pastilha resistente para alta produtividade e corte suave | Pastilla resistente para alta productividad y corte suave

PLUS AN90-10

Proprietary milling line





Arbor Mounting

KAPR=90° | GAMP=-7°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
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...	◈
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...	◈
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

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

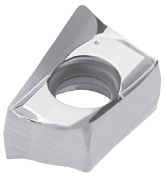
ANHX 1004 Inserts | Pastilhas | Plaquitas



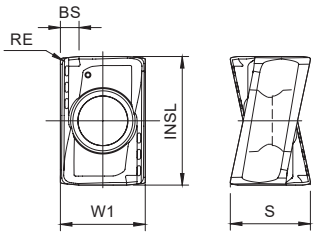
ANHX-LP



ANHX-LM



ANHX-LN



ANHX-LP | LM | LN

		P						M		K						N	S		Dimensions Dimensões Dimensiones (in)				
		CVD	PVD					PVD		CVD	PVD					UNC	PVD						
	(2) Grade code	T9	G1	X5	T1	P4	G6	X9	G6	T9	G1	X5	T1	P4	G6	10	X9	G6					
(1) Geometry code	ISO Reference	PHS740	PH7910	PHP910	PHP920	PHP930	PH7740	PHH930	PH7740	PHS740	PH7910	PHP910	PHP920	PHP930	PH7740	PH0910	PHH930	PH7740	W1	S	INSL	RE	BS
1111652	ANHX 100405 PNR-LP			◈	◈	◈		○				◈	◈	◈			○		0.260	0.244	0.394	0.020	0.033
1112106	ANHX 100408 PNR-LP				◈	◈	○		○				◈	◈	○			○	0.260	0.244	0.394	0.031	0.024
1111908	ANHX 100412 PNR-LP				◈	◈							◈	◈					0.260	0.244	0.394	0.047	0.012
1112021	ANHX 100416 PNER-LP				○								○						0.260	0.244	0.394	0.063	0.008
1112513	ANHX 100402 PNER-LM				○			○					○				○		0.260	0.244	0.394	0.008	0.043
1112005	ANHX 100405 PNER-LM				◈	◈	◈	◈	◈				◈	◈	◈		◈	◈	0.260	0.244	0.394	0.020	0.033
1112162	ANHX 100408 PNER-LM	○			◈	◈	◈	◈	◈	○			◈	◈	◈		◈	◈	0.260	0.244	0.394	0.031	0.024
1112103	ANHX 100412 PNER-LM				◈	◈	◈	◈	◈				◈	◈	◈		◈	◈	0.260	0.244	0.394	0.047	0.012
1111997	ANHX 100405 PNFR-LN															◈			0.260	0.244	0.394	0.020	0.033
1112102	ANHX 100412 PNR-LN															◈			0.260	0.244	0.394	0.047	0.012

First choice | Primeira opção | 1ª opción

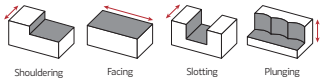
◈ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

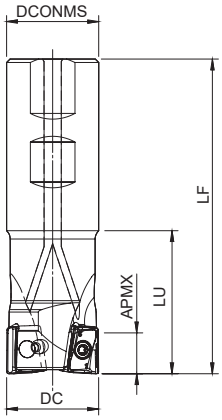
Insert order code = (1) Geometry Code + (2) Grade Code

PLUS AN90-10

ANHX 10







Weldon Shank

KAPR=90° | GAMP=-7° (-6°*)

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
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...	◈
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...	◈
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

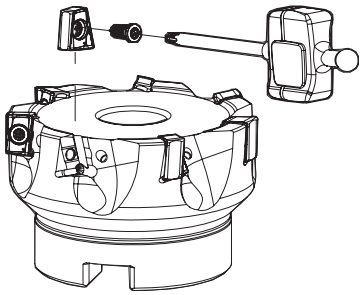
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				lbf/in
AN90-W-10 - 0.75-2.00	P0300800	XT09	DT0914	26.6
AN90-A-10 - 1.50-4.00	P0300800	XT09	DT0914	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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	PHP910	PHP920	PHP930	PHH930	PHS740	PH7740
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	200-330					✓		✓
M	6	SS - Austenitic-ferritic (Duplex)	230-260					✓		✓
K	7	Malleable Cast Iron	130-230		✓	✓	✓		✓	✓
K	8	Grey Cast Iron	180-245		✓	✓	✓		✓	✓
K	9	Nodular Cast iron	160-250		✓	✓	✓		✓	✓
N	10	Aluminium 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

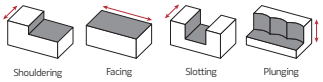
ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance						Toughness →	Feed fz (in/t)		
				PH0910	PHP910	PHP920	PHP930	PHH930	PHS740	PH7740	ANHX... LP	ANHX... LM	ANHX... LN
P	1	Unalloyed Steel	125-220	-	590-820	590-820	525-754	-	459-722	459-656	0.003-0.008	0.003-0.008	-
P	2	Low-Alloyed Steel	220-280	-	525-787	525-754	459-689	-	394-656	426-590	0.003-0.008	0.003-0.006	-
P	3	High-Alloyed Steel	280-380	-	459-754	459-722	394-656	-	328-623	328-558	0.003-0.006	0.003-0.006	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	459-689	-	426-590	-	0.003-0.008	-
M	5	SS - Austenitic	200-330	-	-	-	-	394-558	-	361-525	-	0.003-0.006	-
M	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	328-492	-	295-492	-	0.003-0.006	-
K	7	Malleable Cast Iron	130-230	-	590-984	525-886	492-820	-	525-984	459-722	0.003-0.010	0.003-0.008	-
K	8	Grey Cast Iron	180-245	-	525-820	459-820	459-754	-	492-853	394-689	0.003-0.008	0.003-0.008	-
K	9	Nodular Cast iron	160-250	-	492-689	394-689	328-656	-	262-722	328-623	0.003-0.008	0.003-0.006	-
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-	-	-	-	0.003-0.008
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	98-361	-	98-328	-	0.003-0.006	-

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

(Note 2)

Operation	a_e	Vc & fz	AP (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.

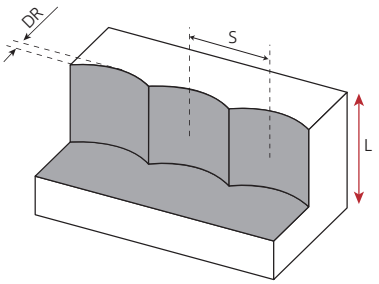


CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip breaker application	
				1st choice	Difficult Operations
P	1	Unalloyed Steel	125-220	ANHX 10... LM	ANHX 10... LP
	2	Low-Alloyed Steel	220-280	ANHX 10... LM	ANHX 10... LP
	3	High-Alloyed 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 - Austenitic-ferritic (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	Aluminium and Non Ferrous	30-130	ANHX 10... LN	-
S	11	Heat Resistant Super Alloys	200-320	ANHX 10... LM	-

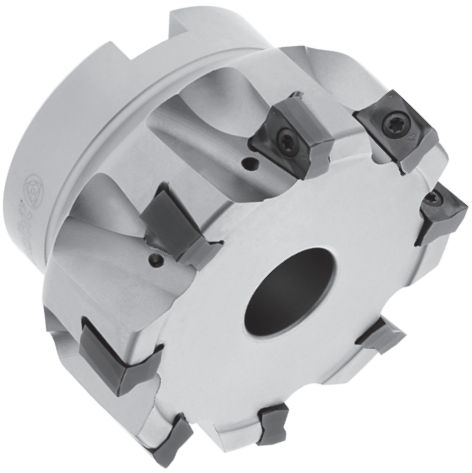
PLUNGING Mergulho | Plunge

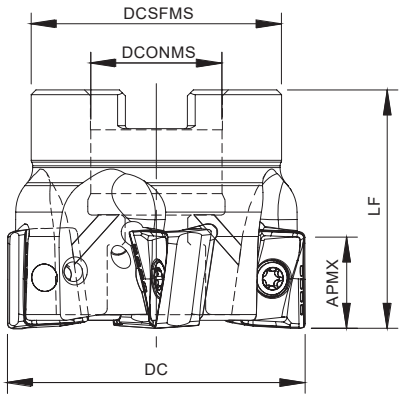
L≤3DC	L>3DC	S max.
f_z (in/t)		
0.004-0.008	0.004-0.006	$Smax = \sqrt{DC.Dr - Dr^2}$



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





Arbor Mounting

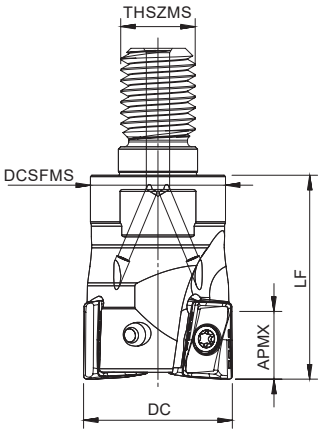
KAPR=90° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

More diameters on metric line.



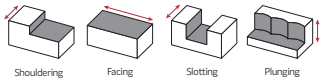


Threaded Coupling

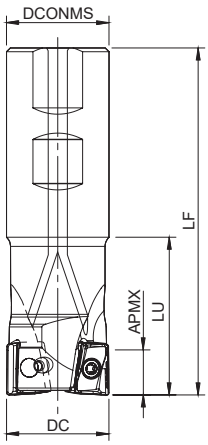
KAPR=90° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)







Weldon Shank

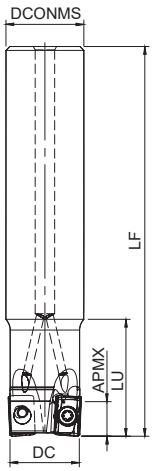
KAPR=90° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

METRIC SHANK





Cylindrical Shank

KAPR=90° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181116300	026E17590-02-06-025200	2	1.024	0.984	7.874	1.575	1.455	0.433	ANHX 1206...	◈
181116200	033E17590-03-06-032250	3	1.299	1.260	9.843	1.575	3.086	0.433	ANHX 1206...	◈

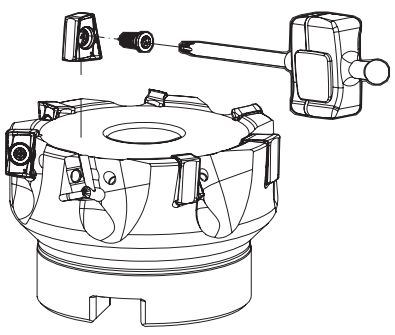
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Acessórios | Repuestos

Order separately

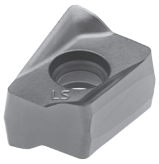
Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
AN90-A-12 - 2.00-3.00	P0350904	XT10	DT1020	17.7
AN90-A-12 - 4.00	P0350904	PT10	DT1020	17.7
AN90-R-12 - 1.00-1.50	P0350904	XT10	DT1020	17.7
AN90-W-12 - 1.00-1.50	P0350904	XT10	DT1020	17.7
E17590 - 1.024 - 1.299	P0350904	XT10	DT1020	17.7

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



PLUS AN90-12

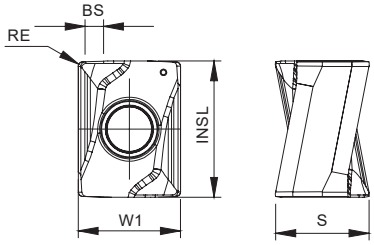
ANHX 1206... Inserts | Pastilhas | Plaquitas



ANHX-LS



ANHX-MP



ANHX-LS | MP

		P					M			K						S			Dimensions Dimensões Dimensiones (in)				
		CVD	PVD				PVD			CVD	PVD					PVD							
	(2) Grade code	T9	T1	P3	P4	G6	P3	X9	G6	T9	L6	T1	P3	P4	G6	P3	X9	G6					
(1) Geometry code	ISO Reference	PHS740	PHP920	PH7930	PHP930	PH7740	PH7930	PHH930	PH7740	PHS740	PH5320	PHP920	PH7930	PHP930	PH7740	PH7930	PHH930	PH7740	W1	S	INSL	RE	BS
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
1113476	ANHX 120620 PNSR-MP		○									○							0.354	0.327	0.472	0.079	-

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

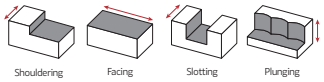
ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance Toughness →							Feed f_z (in/t)	
				PH5320	PHP920	PHH930	PHP930	PH7930	PHS740	PH7740	ANHX 12... LS	ANHX 12... MP
P	1	Unalloyed Steel	125-220	-	590-820	-	525-722	525-722	459-722	459-656	0.003-0.008	0.003-0.012
	2	Low-Alloyed Steel	220-280	-	525-754	-	459-656	459-656	394-656	426-590	0.003-0.008	0.003-0.010
	3	High-Alloyed Steel	280-380	-	459-722	-	394-623	394-623	328-623	328-558	0.003-0.006	0.003-0.008
M	4	SS - Ferritic / Martensitic	200-330	-	-	459-689	-	459-656	-	426-590	0.003-0.008	-
	5	SS - Austenitic	200-330	-	-	394-558	-	394-525	-	361-525	0.003-0.006	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	328-492	-	328-459	-	295-492	0.003-0.006	-
K	7	Malleable Cast Iron	130-230	492-918	525-886	-	492-787	492-787	525-984	459-722	0.003-0.008	0.003-0.012
	8	Grey Cast Iron	180-245	525-1050	459-820	-	459-754	459-754	492-853	394-689	0.003-0.008	0.003-0.010
	9	Nodular Cast iron	160-250	328-623	394-689	-	328-623	328-623	262-722	328-623	0.003-0.008	0.003-0.008
S	11	Heat Resistant Super Alloys	200-320	-	-	98-361	-	98-328	-	98-328	0.003-0.004	-

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

(Note 2)

Operation	a_e	Vc & fz	AP (in)
Slotting	100%	<20%	0.098-0.157
Shouldering	<50%	>8%	0.157-0.276
	≤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.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH5320	PHP920	PHH930	PH7930	PHS740	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	200-330			✓	✓		✓
	6	SS - Austenitic-ferritic (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				✓		✓

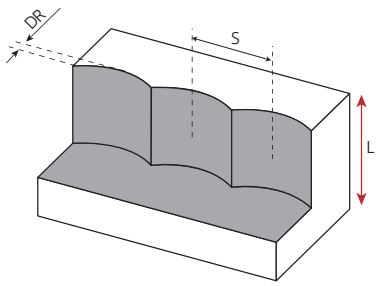
Good Conditions Average Conditions Difficult Conditions

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 12... LS	ANHX 12... MP
	2	Low-Alloyed Steel	220-280	ANHX 12... MP	-
	3	High-Alloyed 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 - Austenitic-ferritic (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	-

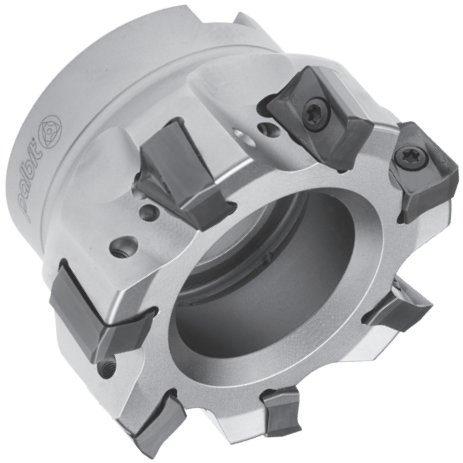
PLUNGING Mergulho | Plunge

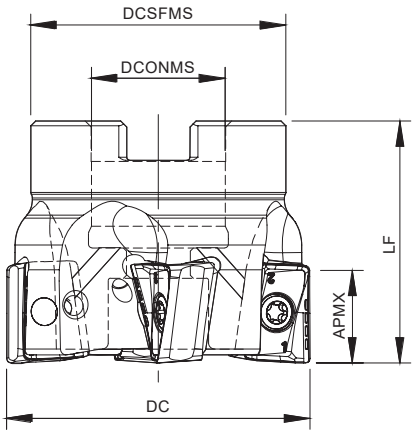
L≤3DC	L>3DC	S max.
f_z (in/t)		
0.004-0.008	0.004-0.006	$Smax = \sqrt{DC.Dr - Dr^2}$



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





Arbor Mounting

KAPR=90° | GAMP=-4°

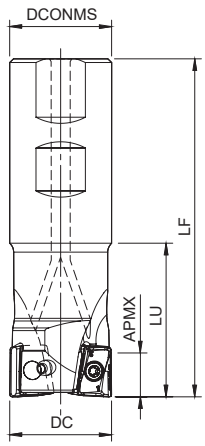
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181058900	AN90 D2.00-A.750/1.75-03-16	3	2.000	0.750	1.772	1.750	0.77	A	0.591	ANHX 1607...	◈
181059000	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...	◈
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...	◈
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

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





Weldon Shank

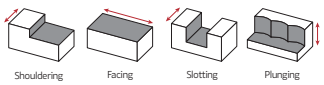
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Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181060100	AN90 D1.25-W1.25/4.92-02-16	2	1.250	1.250	4.921	1.575	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

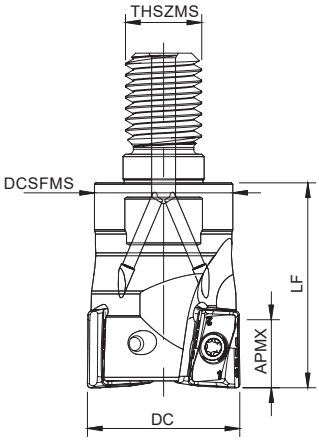
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

PLUS AN90-16
ANHX 16



METRIC SHANK





Threaded Coupling

KAPR=90° | GAMP=-4°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181082800	032R18190-02-04-M16043	2	1.260	M16	1.142	1.693	0.441	0.591	ANHX 1607...	◈
181082900	040R18190-03-04-M16043	3	1.575	M16	1.142	1.693	0.529	0.591	ANHX 1607...	◈

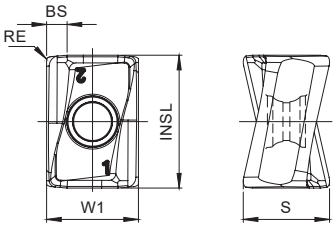
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

ANHX 1607... Inserts | Pastilhas | Plaquitas


ANHX-LP


ANHX-MP


ANHX-LN



ANHX-LP | MP | LN

		P							K							N	Dimensions Dimensões Dimensiones (in)				
		CVD	PVD						CVD	PVD						UNC					
	(2) Grade code	T9	G1	X5	G4	T1	P3	P4	T9	G1	X5	G4	T1	P3	P4	10					
(1) Geometry code	ISO Reference	PHS740	PH7910	PHP910	PH7920	PHP920	PH7930	PHP930	PHS740	PH7910	PHP910	PH7920	PHP920	PH7930	PHP930	PH0910	W1	S	INSL	RE	BS
1111519	ANHX 160708 PNR-LP		◇	◯		◈	◇	◈		◇	◯		◈	◇	◈		0.441	0.425	0.630	0.031	0.055
1111596	ANHX 160712 PNER-LP			◯		◈		◈			◯		◈		◈		0.441	0.413	0.630	0.047	0.047
1111595	ANHX 160708 PNER-MP	◈	◇	◯		◈		◈	◈	◇	◯		◈		◈		0.441	0.425	0.630	0.031	0.055
1111598	ANHX 160712 PNER-MP			◯		◈		◈			◯		◈		◈		0.441	0.413	0.630	0.047	0.047
1111659	ANHX 160708 PNFR-LN															◈	0.441	0.425	0.630	0.031	0.055
1111597	ANHX 160712 PNFR-LN															◈	0.441	0.413	0.630	0.047	0.047

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

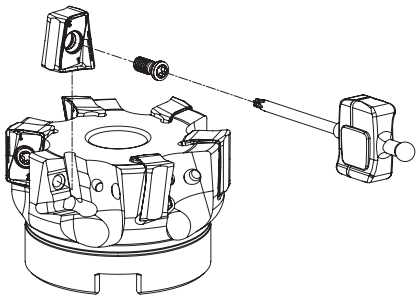
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

PLUS AN90-16

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Order separately Key (Torx - Nm)	Torque Value	Order separately Screw	DIN 6368 Wrench
AN90-A-16 - 2.00-3.00	P0401200	XT15	DT1530	26.6		
AN90-A-16 - 4.00-6.00	P0401200	XT15	DT1530	26.6		
AN90-W-16 - 1.25-2.00	P0401200	XT15	DT1530	26.6		
R18190 – 1.260 - 1.575	P0401200	XT15	DT1530	26.6	-	-

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

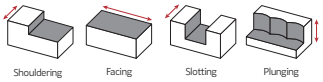
ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance					Toughness →		Feed f_z (in/t)		
				PH0910	PH7910	PHP920	PH7920	PHP930	PH7930	PHS740	ANHX 12.. LP	ANHX 12.. MP	ANHX 12.. LN
P	1	Unalloyed Steel	125-220	-	590-820	590-820	590-787	525-754	525-722	459-722	0.004-0.010	0.004-0.010	-
	2	Low-Alloyed Steel	220-280	-	525-754	525-754	525-722	459-689	459-656	394-656	0.004-0.010	0.004-0.010	-
	3	High-Alloyed Steel	280-380	-	459-722	459-722	459-689	394-656	394-623	328-623	0.004-0.008	0.004-0.008	-
K	7	Malleable Cast Iron	130-230	-	590-984	525-886	525-853	492-820	492-787	525-984	0.004-0.010	0.004-0.010	-
	8	Grey Cast Iron	180-245	-	525-820	459-820	459-787	459-754	459-754	492-853	0.004-0.010	0.004-0.010	-
	9	Nodular Cast iron	160-250	-	492-656	394-689	394-656	328-656	328-623	262-722	0.004-0.008	0.004-0.010	-
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-	-	-	-	0.004-0.016

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

(Note 2)

Operation	a_e	Vc & fz	AP (in)
Slotting	100%	<20%	0.098-0.177
Shouldering	<50%	>8%	0.236-0.315
	≤25%	>12%	0.315-0.591

(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.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PH7910	PHP920	PH7920	PHP930	PH7930	PHS740
P	1	Unalloyed Steel	125-220		✓	✓	✓	✓	✓	✓
P	2	Low-Alloyed Steel	220-280		✓	✓	✓	✓	✓	✓
P	3	High-Alloyed Steel	280-380		✓	✓	✓	✓	✓	✓
K	7	Malleable Cast Iron	130-230		✓	✓	✓	✓	✓	✓
K	8	Grey Cast Iron	180-245		✓	✓	✓	✓	✓	✓
K	9	Nodular Cast iron	160-250		✓	✓	✓	✓	✓	✓
N	10	Aluminium and Non Ferrous	30-130	✓						

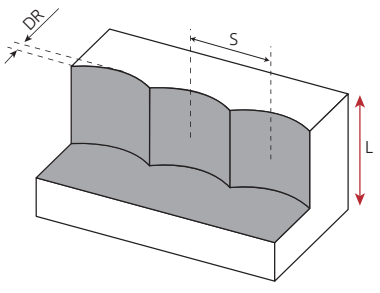
Good Conditions Average Conditions Difficult Conditions

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
P	2	Low-Alloyed Steel	220-280	ANHX 16... LP	ANHX 16... MP
P	3	High-Alloyed Steel	280-380	ANHX 16... LP	ANHX 16... MP
K	7	Malleable Cast Iron	130-230	ANHX 16... LP	ANHX 16... MP
K	8	Grey Cast Iron	180-245	ANHX 16... LP	ANHX 16... MP
K	9	Nodular Cast iron	160-250	ANHX 16... LP	ANHX 16... MP
N	10	Aluminium 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	0.004-0.006	$Smax = \sqrt{DC.DR - DR^2}$



S max and DR corresponding cutting diameter DC (in)								
DR (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

XP90-06 | XP90-10 | XP90-17

LINEPRO



The LINEPRO series comprises highly versatile tools designed for roughing, semi-finishing, and finishing operations, boasting extended tool life and high performance machining capabilities. Their design ensures efficient chip evacuation, while a wide array of chip breaker options, carbide grades, and corner radii enhance their adaptability and reliability across various materials.

A série LINEPRO é composta por ferramentas altamente versáteis projetadas para operações de desbaste, semi-acabamento e acabamento, proporcionando uma vida útil prolongada e capacidades de fresagem de alto desempenho. O seu design garante uma evacuação eficiente de aparas, enquanto uma ampla variedade de opções de quebra-aparas, graus de metal duro e raios de canto aumentam sua adaptabilidade e fiabilidade em diversos materiais.

La serie LINEPRO está compuesta por herramientas altamente versátiles diseñadas para operaciones de desbaste, semiacabado y acabado, proporcionando una vida útil prolongada y capacidades de fresado de alto rendimiento. Su diseño garantiza una evacuación eficiente de virutas, mientras que una amplia variedad de opciones de rompevirutas, grados de carburo y radios de esquina aumentan su adaptabilidad y fiabilidad en diversos materiales.

LINEPRO XP90-06 > page 160



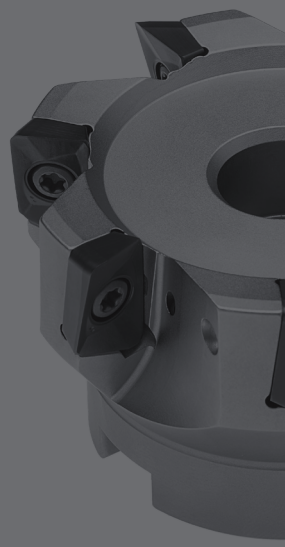
- From DC 0.375 in to 1.250 in
  De DC 0.375 in a 1.250 in | Desde DC 0.375 in hasta 1.250 in
- Available in threaded coupling and cylindrical shank
  Disponível em acoplamento roscado e haste cilíndrica | Disponible en fijación roscada y mango cilíndrico
- Small positive insert with 2 cutting edges (XP.. 0602..)
  Pastilha positiva pequena com 2 arestas de corte (XP.. 0602..) | Plaquita positiva pequeña con 2 filos de corte (XP.. 0602..)
- Wiper edge for excellent surface finish
  Face alisadora para excelente acabamento superficial | Faceta alisadora para un excelente acabado superficial

LINEPRO XP90-10 > page 166



- From DC 0.625 in to 2.500 in
  De DC 0.625 in a 2.500 in | Desde DC 0.625 in hasta 2.500 in
- Available in arbor, threaded, weldon and cylindrical shank
  Disponível em montagem tipo árvore, acoplamento roscado, haste weldon e cilíndrica | Disponible en fijación con tornillo central, fijación roscada, mango tipo weldon y cilindrico
- Medium positive insert with 2 cutting edges (XP.. 1003..)
  Pastilha positiva média com 2 arestas de corte (XP.. 1003..) | Plaquita positiva media con 2 filos de corte (XP.. 1003..)
- Radius from 0.008 in to 0.063 in
  Raio de 0.008 in a 0.063 in | Radio de 0.008 in a 0.063 in

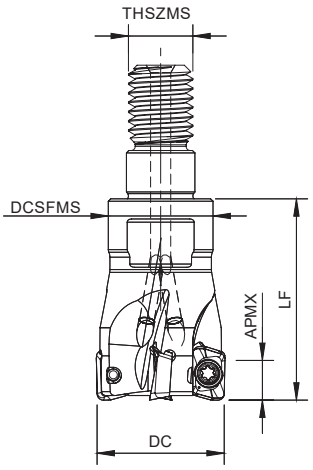
LINEPRO XP90-17 > page 174



- From DC 1.260 in to 4.921 in
  De DC 1.260 in a 4.921 in | Desde DC 1.260 in hasta 4.921 in
- Available in arbor mounting and weldon shank
  Disponível em montagem tipo árvore e haste weldon | Disponible en fijación con tornillo central y mango tipo weldon
- Large positive insert with 2 cutting edges (XP.. 1706..)
  Pastilha positiva grande com 2 arestas de corte (XP.. 1706..) | Plaquita positiva grande con 2 filos de corte (XP.. 1706..)
- Radius from 0.031 in to 0.126 in
  Raio de 0.031 in a 0.126 in | Radio de 0.031 in a 0.126 in

LINEPRO XP90-06





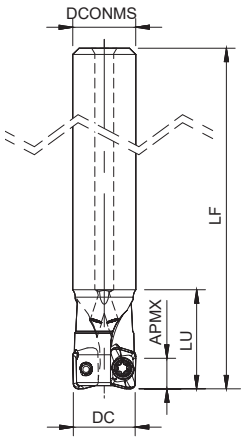
Threaded Coupling

KAPR=90° | GAMP=+4°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	APMX (in)			Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		LP|LN	HF	MH		
181105900	XP90 D.625-R-08/0.90-04-06	4	0.625	M08	0.531	0.906	0.13	0.157	0.012	0.079	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	0.079	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	0.079	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	0.079	XP.. 0602...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)



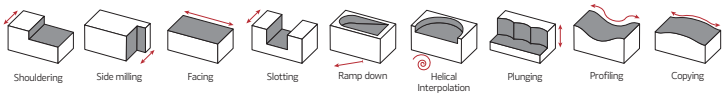


Cylindrical Shank

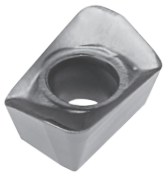
KAPR=90° | GAMP=+4°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	APMX (in)			Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		LP|LN	HF	MH		
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	0.079	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	0.079	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	0.079	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	0.079	XP.. 0602...	◈

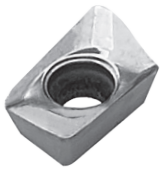
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8))



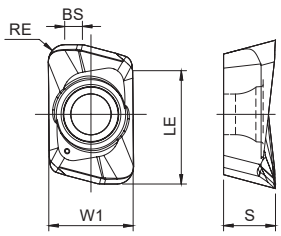
XP.. 0602... Inserts | Pastilhas | Plaquitas



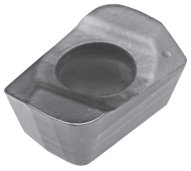
XPET-LP



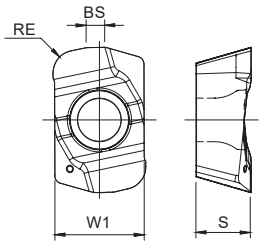
XPET-LN



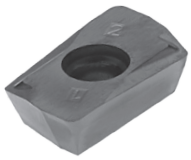
XPET-LP | LN



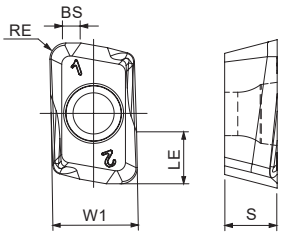
XPET-HF
(HiFeed geometry)



XPET-HF



XPHW-MH
(finishing geometry)



XPHW-MH

		P				M	K		N	S	H		Dimensions Dimensões Dimensiones (in)				
		PVD				PVD	PVD		UNC	PVD	PVD						
	(2) Grade code	X4	X6	T1	P4	X9	T1	P4	10	X9	X4	X6					
(1) Geometry code	ISO Reference	PHH603	PHH910	PHP920	PHP930	PHH930	PHP920	PHP930	PH0910	PHH930	PHH603	PHH910	W1	S	LE	RE	BS
1112520	XPET 060202 PDER-LP			○		○	○			○			0.154	0.094	0.201	0.008	0.039
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
1112579	XPET 060202 PDFR-LN								◎				0.154	0.094	0.201	0.008	0.037
1112580	XPET 060204 PDFR-LN								◎				0.154	0.094	0.201	0.016	0.031
1112581	XPET 060208 PDFR-LN								○				0.154	0.094	0.201	0.031	0.036
1112716	XPET 060212 PDFR-LN								○				0.154	0.094	0.201	0.047	0.023
1112049	XPET 060210 ZER-HF			◎	◎	◎	◎	◎		◎			0.154	0.094	-	0.039	0.031
1112259	XPHW 060208 ZER-MH	◎	◎								◎	◎	0.154	0.094	0.094	0.031	0.028

◎ First choice | Primeira opção | 1ª opción ◎ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

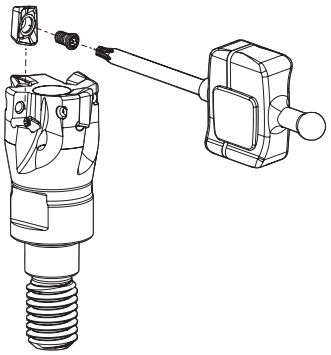
LINEPRO XP90-06

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				
XP90-C-06 - 0.375	P0180300	XT06IP	DT0606IP	5.3
XP90-C-06 - 0.500-0.625	P0180400	XT06IP	DT0606IP	5.3
XP90-R-06 - 0.625-1.250	P0180400	XT06IP	DT0606IP	5.3

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



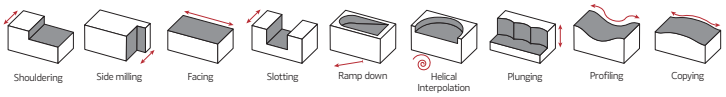
GRADES SELECTION GUIDE Guia para selecção de graus | Tabla para selección de calidades

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PHH603	PHH910	PHP920	PHP930	PHH930
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	200-330						✓
	6	SS - Austenitic-ferritic (Duplex)	230-260						✓
K	7	Malleable Cast Iron	130-230				✓	✓	
	8	Grey Cast Iron	180-245				✓	✓	
	9	Nodular Cast iron	160-250				✓	✓	
N	10	Aluminium and Non Ferrous	30-130	✓					
S	11	Heat Resistant Super Alloys	200-320						✓
H	12	Hardened Steels	40-55 HRC		✓	✓			

Good Conditions Average Conditions Difficult Conditions

Spare Parts: A - 288 Technical Data: A - 298

palbit



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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance					Toughness →
				PH0910	PHH603	PHH910	PHP920	PHP930	PHH930
P	1	Unalloyed Steel	125-220	-	-	-	590-820	525-754	-
	2	Low-Alloyed Steel	220-280	-	-	525-886	525-754	459-689	-
	3	High-Alloyed Steel	280-380	-	590-1017	459-754	459-722	394-656	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	-	459-689
	5	SS - Austenitic	200-330	-	-	-	-	-	394-558
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	-	328-492
K	7	Malleable Cast Iron	130-230	-	-	-	525-886	492-820	-
	8	Grey Cast Iron	180-245	-	-	-	459-820	459-754	-
	9	Nodular Cast iron	160-250	-	-	-	394-689	328-656	-
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	-	98-361
H	12	Hardened Steels	40-55 HRC	-	230-886	230-853	-	-	-

ISO	PSM	Material	HB (Brinell)	Feed fz (in/t)			
				XPET 06...LP	XPET 06...LN	XPET 06...HF	XPHW 06...MH
P	1	Unalloyed Steel	125-220	0.002-0.003	-	0.016-0.031	-
	2	Low-Alloyed Steel	220-280	0.002-0.003	-	0.016-0.031	0.002-0.005
	3	High-Alloyed Steel	280-380	0.002-0.003	-	0.016-0.024	0.002-0.005
M	4	SS - Ferritic / Martensitic	200-330	0.002-0.003	-	0.016-0.031	-
	5	SS - Austenitic	200-330	0.002-0.003	-	0.016-0.024	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	0.002-0.003	-	0.016-0.024	-
K	7	Malleable Cast Iron	130-230	0.002-0.003	-	0.016-0.031	-
	8	Grey Cast Iron	180-245	0.002-0.003	-	0.016-0.031	-
	9	Nodular Cast iron	160-250	0.002-0.003	-	0.016-0.031	-
N	10	Aluminium and Non Ferrous	30-130	-	0.002-0.003	-	-
S	11	Heat Resistant Super Alloys	200-320	0.002-0.003	-	0.016-0.024	-
H	12	Hardened Steels	40-55 HRC	-	-	-	0.001-0.004

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

(Note 2)

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

(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.

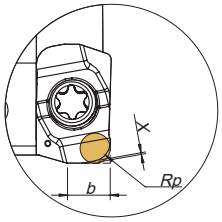
LINEPRO XP90-06

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	Dificult Operations
P	1	Unalloyed Steel	125-220	XPET 06... LP/HF	-
	2	Low-Alloyed Steel	220-280	XPET 06... LP/HF	XPHW 06... MH
	3	High-Alloyed Steel	280-380	XPET 06... LP/HF	XPHW 06... MH
M	4	SS - Ferritic / Martensitic	200-330	XPET 06... LP/HF	-
	5	SS - Austenitic	200-330	XPET 06... LP/HF	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	XPET 06... LP/HF	-
K	7	Malleable Cast Iron	130-230	XPET 06... LP/HF	-
	8	Grey Cast Iron	180-245	XPET 06... LP/HF	-
	9	Nodular Cast iron	160-250	XPET 06... LP/HF	-
N	10	Aluminium and Non Ferrous	30-130	XPET 06... LN	-
S	11	Heat Resistant Super Alloys	200-320	XPET 06... LP/HF	-
H	12	Hardened Steels	40-55 HRC	XPHW 06... MH	-

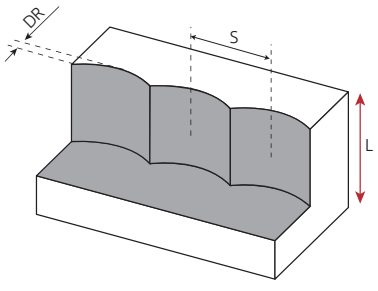
PROGRAMMING DATA Dados para programação | Datos para la programación

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



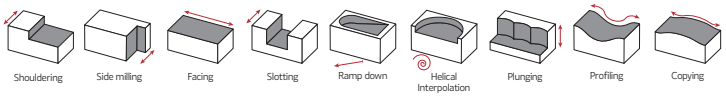
PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
f_z (in/t)		
0.002-0.003	0.001-0.002	$Smax = \sqrt{DC.DR - DR^2}$



S max and DR corresponding cutting diameter DC (in)						
DR (in)	DC (in)					
	0.375	0.500	0.625	0.750	1.000	1.250
0.020	0.084	0.097	0.109	0.120	0.139	0.156
0.039	0.115	0.135	0.152	0.167	0.194	0.218
0.079*	0.153	0.182	0.207	0.230	0.269	0.304

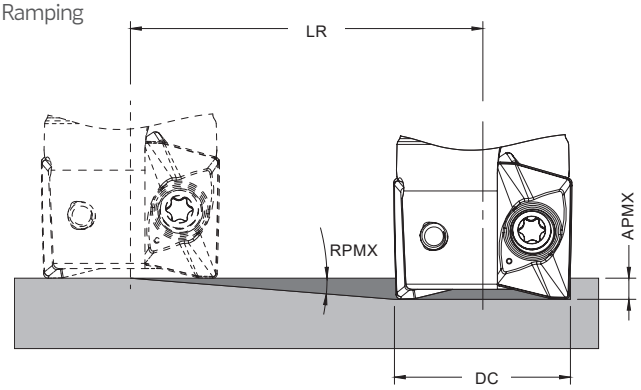
* only for radius above 1,6mm



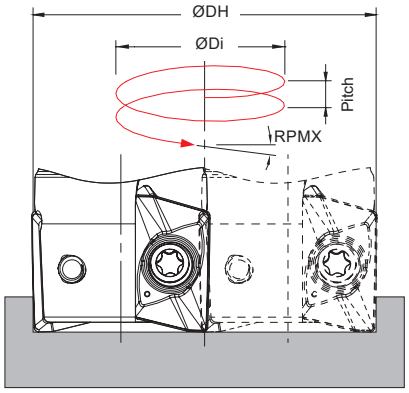
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



Blind hole
Flat bottom

ØDi = ØDH - DC

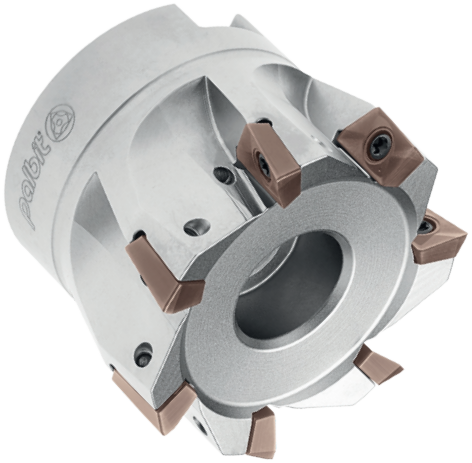
DC	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	
0.375	5.5	0.012	0.125	0.568 -	- 0.671	0.012 0.012
0.500	4.0	0.012	0.172	0.818 -	- 0.921	0.012 0.012
0.625	2.5	0.012	0.275	1.068 -	- 1.171	0.012 0.012
0.750	1.9	0.012	0.362	1.318 -	- 1.421	0.012 0.012
1.000	1.3	0.012	0.529	1.818 -	- 1.921	0.012 0.012
1.250	1.0	0.012	0.700	2.318 -	- 2.421	0.012 0.012

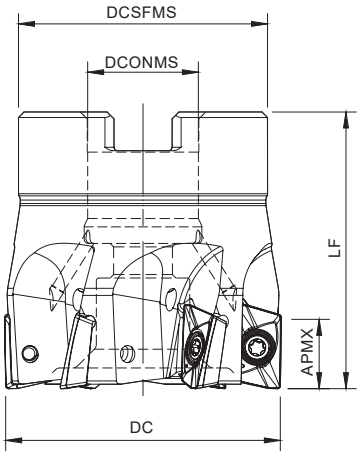
(1) using LP insert with radius 0.031 in

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 equation below:
- Minimum Diameter: ØDHmin = 2 x (DC - (R corner radius + F width of edge wiper)
- Maximum Diameter: ØDHmax = 2 x (DC - R corner radius)
(On HF insert the corner radius should be corner radius programming)

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Arbor Mounting

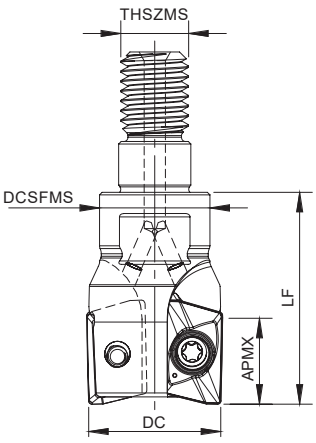
KAPR=90° | GAMP=+8°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Arbor Type	APMX (in)				Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF			LP/MP/LN	LS	HF	MH		
181107000	XP90 D1.50-A.500/1.57-06-10	6	1.500	0.500	1.417	1.575	0.22	A	0.394	0.394	0.031	0.118	XP.. 1003...	◈
181107100	XP90 D2.00-A.750/1.57-07-10	7	2.000	0.750	1.772	1.575	0.31	A	0.394	0.394	0.031	0.118	XP.. 1003...	◈
181107200	XP90 D2.50-A.750/1.57-08-10	8	2.500	0.750	2.205	1.575	0.43	A	0.394	0.394	0.031	0.118	XP.. 1003...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

Note: Cutters that mount inserts with radius between 0.079 in and 0.157 in are only available in the metric line.





Threaded Coupling

KAPR=90° | GAMP=+5°~+6°

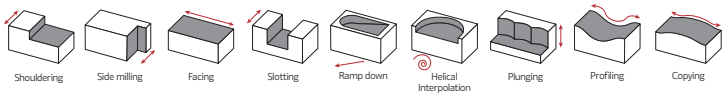
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	APMX (in)				Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		LP/MP/LN	LS	HF	MH		
181106600	XP90 D.625-R-08/1.00-02-10	2	0.625	M8	0.531	1.000	0.05	0.394	0.394	0.031	0.118	XP.. 1003...	◈
181106700	XP90 D.750-R-10/1.37-03-10	3	0.750	M10	0.728	1.378	0.23	0.394	0.394	0.031	0.118	XP.. 1003...	◈
181106800	XP90 D1.00-R-12/1.57-04-10	4	1.000	M12	0.906	1.575	0.27	0.394	0.394	0.031	0.118	XP.. 1003...	◈
181106900	XP90 D1.25-R-16/1.57-05-10	5	1.250	M16	1.181	1.575	0.47	0.394	0.394	0.031	0.118	XP.. 1003...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

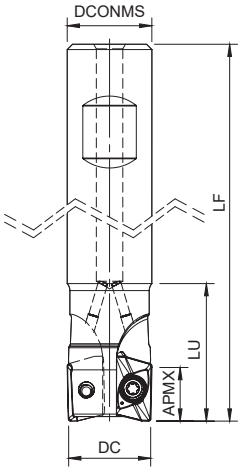
Note: Cutters that mount inserts with radius between 0.079 in and 0.157 in are only available in the metric line.

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XPET 10 | XPHW 10







Weldon Shank

KAPR=90° | GAMP=+5°~+8°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	APMX (in)				Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		LP/MP/LN	LS	HF	MH		
181106300	XP90 D.625-W.625/3.25-02-10	2	0.625	0.625	3.252	1.083	0.23	0.394	0.394	0.031	0.118	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	0.394	0.031	0.118	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	0.394	0.031	0.118	XP.. 1003...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

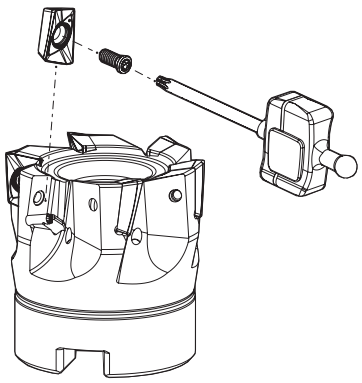
Note: Cutters that mount inserts with radius between 0.079 in and 0.157 in are only available in the metric line.

SPARE PARTS Acessórios | Repuestos

Order separately

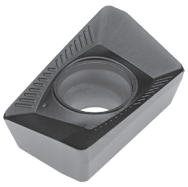
Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				
XP90-W-10 - 0.625-1.00	P0250704	XT08	DT0812	10.6
XP90-R-10 - 0.625-1.25	P0250704	XT08	DT0812	10.6
XP90-A-10 - 1.50-2.50	P0250704	XT08	DT0812	10.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

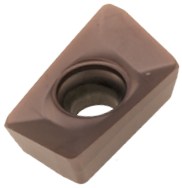


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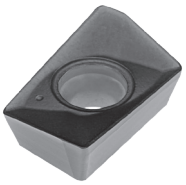
XPET 1003... Inserts | Pastilhas | Plaquitas



XPET-LP



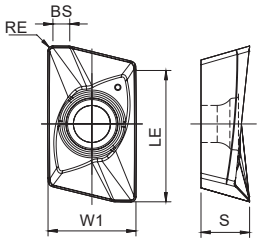
XPET-LS



XPET-MP



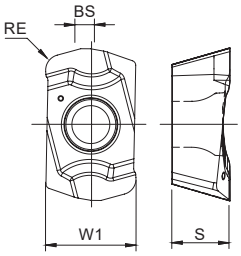
XPET-LN



XPET-LP | LS | MP | LN



XPET-HF
(HiFeed geometry)



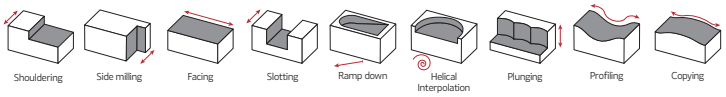
XPET-HF

		P					M		K					N		S		H		Dimensions Dimensões Dimensiones (in)				
		CVD	PVD				PVD		CVD		PVD			UNC	PCD	PVD		PVD						
	(2) Grade code	T9	G1	X5	T1	P4	X9	4H	L5	L9	X5	T1	P4	10	D6	X9	4H	X4	X6					
(1) Geometry code	ISO Reference	PHS740	PH7910	PHP910	PHP920	PHP930	PHH930	PHF530	PH5705	PH5740	PHP910	PHP920	PHP930	PH0910	PDP410	PHH930	PHF530	PHH603	PHH910	W1	S	LE	RE	BS
1113132	XPET 100302 PDER-LP						◈									◈				0.274	0.156	0.413	0.008	0.059
1111980	XPET 100304 PDER-LP				◈	◈	◈					◈	◈			◈				0.274	0.156	0.413	0.016	0.051
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	0.063	0.031
1113365	XPET 100304 PDER-LS				◈		◈					◈				◈				0.274	0.156	0.413	0.016	0.075
1112197	XPET 100308 PDER-LS				◈		◈	◈				◈				◈	◈			0.274	0.156	0.413	0.031	0.059
1113358	XPET 100312 PDER-LS				◈		◈					◈				◈				0.274	0.156	0.413	0.047	0.039
1113366	XPET 100316 PDER-LS				◈		◈					◈				◈				0.274	0.156	0.413	0.063	0.031
1113359	XPET 100320 PDER-LS*				◈		◈					◈				◈				0.274	0.156	0.413	0.079	0.063
1113360	XPET 100332 PDER-LS*				◈		◈					◈				◈				0.274	0.156	0.413	0.126	0.020
1113394	XPET 100340 PDER-LS*				○		○					○				○				0.274	0.156	0.413	0.157	0.008
1111982	XPET 100304 PDSR-MP			○	◈	◈			◈	◈	○	◈	◈							0.274	0.156	0.413	0.016	0.043
1111983	XPET 100308 PDSR-MP	◈		◈	◈	◈			◈	◈	◈	◈	◈							0.274	0.156	0.413	0.031	0.053
1111984	XPET 100304 PDFR-LN													◈						0.274	0.156	0.413	0.016	0.030
1112906	XPET 100308 PDFR-LN													◈						0.274	0.156	0.413	0.031	0.041
1111985	XPET 100312 PDFR-LN													◈						0.274	0.156	0.413	0.047	0.030
1112376	XPET 100312 ZDR-HF			◈	◈	◈	◈				◈	◈	◈			◈				0.274	0.156	-	0.047	0.059

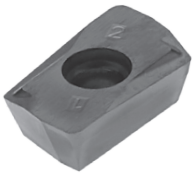
◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

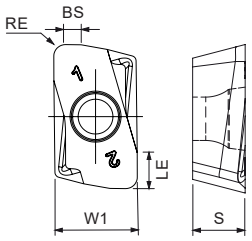
* Insert suitable for metric cutters only.



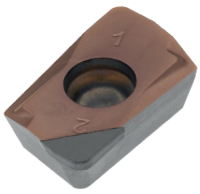
XPHW 1003... Inserts | Pastilhas | Plaquitas



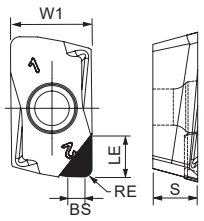
XPHW-MH
(finishing geometry)



XPHW-MH



XPHW-R Z1



XPHW-R Z1

		P					M	K					N		S	H		Dimensions Dimensões Dimensiones (in)				
		CVD	PVD				PVD	CVD		PVD			UNC	PCD	PVD	PVD						
	(2) Grade code	T9	G1	X5	T1	P4	X9	L5	L9	X5	T1	P4	10	D6	X9	X4	X6					
(1) Geometry code	ISO Reference	PHS740	PH7910	PHP910	PHP920	PHP930	PHH930	PH5705	PH5740	PHP910	PHP920	PHP930	PH0910	PDP410	PHH930	PHH603	PHH910	W1	S	LE	RE	BS
1112500	XPHW 100308 ZER-MH															●	◉	0.274	0.142	0.118	0.031	0.059
1112736	XPHW 100310 ZER-MH															●		0.274	0.142	0.118	0.039	0.051
1112735	XPHW 100320 ZER-MH															●		0.274	0.142	0.118	0.047	0.012
1112556	XPHW 100308 R Z1													◉				0.274	0.142	0.150	0.031	0.059

● First choice | Primeira opção | 1ª opción ◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance								Toughness →		PCD
				PH0910	PH5705	PHH603	PHP910	PHP920	PHP930	PHH930	PHF530	PH5740	PHS740	PDP410
P	1	Unalloyed Steel	125-220	-	-	-	590-820	590-820	525-754	-	-	-	459-722	-
	2	Low-Alloyed Steel	220-280	-	-	-	525-787	525-754	459-689	-	-	-	394-656	-
	3	High-Alloyed Steel	280-380	-	-	590-1017	459-754	459-722	394-656	-	-	-	328-623	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	-	-	459-689	459-820	-	-	-
	5	SS - Austenitic	200-330	-	-	-	-	-	-	394-558	426-787	-	-	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	-	-	328-492	394-722	-	-	-
K	7	Malleable Cast Iron	130-230	-	525-951	-	590-984	525-886	492-820	-	-	525-853	-	-
	8	Grey Cast Iron	180-245	-	558-1050	-	525-820	459-820	459-754	-	-	459-787	-	-
	9	Nodular Cast iron	160-250	-	459-656	-	492-689	394-689	328-656	-	-	394-656	-	-
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-	-	-	-	-	2624-9840
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	-	-	98-361	98-492	-	-	-
H	12	Hardened Steels	40-55 HRC	-	-	230-886	-	-	-	-	-	-	-	-

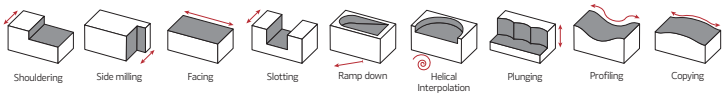
ISO	PSM	Material	HB (Brinell)	Feed fz (in/t)						
				XPET 10... LP	XPET 10... LS	XPET 10... MP	XPET 10... LN	XPET 10... HF	XPHW 10... R Z1	XPHW 10... MH
P	1	Unalloyed Steel	125-220	0.003-0.008	-	0.004-0.010	-	0.016-0.031	-	0.004-0.010
	2	Low-Alloyed Steel	220-280	0.003-0.008	-	0.004-0.008	-	0.016-0.031	-	0.004-0.010
	3	High-Alloyed Steel	280-380	0.003-0.006	-	0.004-0.008	-	0.016-0.024	-	0.004-0.010
M	4	SS - Ferritic / Martensitic	200-330	0.003-0.008	0.003-0.008	0.004-0.008	-	0.016-0.028	-	-
	5	SS - Austenitic	200-330	0.003-0.008	0.003-0.008	0.004-0.008	-	0.016-0.028	-	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	0.003-0.006	0.003-0.006	0.004-0.008	-	0.016-0.024	-	-
K	7	Malleable Cast Iron	130-230	0.003-0.008	-	0.004-0.010	-	0.020-0.031	-	-
	8	Grey Cast Iron	180-245	0.003-0.008	-	0.004-0.010	-	0.020-0.031	-	-
	9	Nodular Cast iron	160-250	0.003-0.008	-	0.004-0.008	-	0.020-0.024	-	-
N	10	Aluminium and Non Ferrous	30-130	-	-	-	0.003-0.010	-	0.004-0.010	-
S	11	Heat Resistant Super Alloys	200-320	0.002-0.003	0.002-0.003	-	-	0.016-0.024	-	-
H	12	Hardened Steels	40-55 HRC	-	-	-	-	-	-	0.003-0.006

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

(Note 2)

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

(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	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 ... LS	XPET 10 ... LP/HF
	5	SS - Austenitic	200-330	XPET 10 ... LS	XPET 10 ... LP/HF
	6	SS - Austenitic-ferritic (Duplex)	230-260	XPET 10 ... LS	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	Aluminium and Non Ferrous	30-130	XPET 10 ... LN/R Z1	-
S	11	Heat Resistant Super Alloys	200-320	XPET 10 ... LS	XPET 10 ... LP/HF
H	12	Hardened Steels	40-55 HRC	XPHW 10 ... MH	-

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

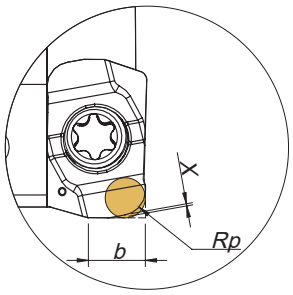
ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance						Toughness →			PCD
				PH0910	PH5705	PHH603	PHP910	PHP920	PHP930	PHH930	PHF530	PH5740	PHS740	PDP410
P	1	Unalloyed Steel	125-220				✓	✓	✓				✓	
	2	Low-Alloyed Steel	220-280				✓	✓	✓				✓	
	3	High-Alloyed Steel	280-380			✓	✓	✓	✓				✓	
M	4	SS - Ferritic / Martensitic	200-330							✓	✓			
	5	SS - Austenitic	200-330							✓	✓			
	6	SS - Austenitic-ferritic (Duplex)	230-260							✓	✓			
K	7	Malleable Cast Iron	130-230		✓		✓	✓	✓			✓		
	8	Grey Cast Iron	180-245		✓		✓	✓	✓			✓		
	9	Nodular Cast iron	160-250		✓		✓	✓	✓			✓		
N	10	Aluminium and Non Ferrous	30-130	✓										✓
S	11	Heat Resistant Super Alloys	200-320							✓	✓			
H	12	Hardened Steels	40-55 HRC			✓								

Good Conditions Average Conditions Difficult Conditions

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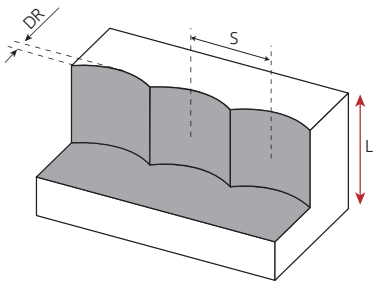
PROGRAMMING DATA Dados para programação | Datos para la programación

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



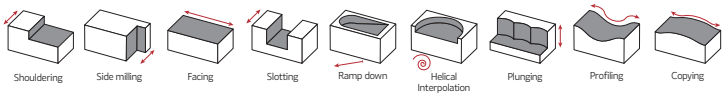
PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
f_Z (in/t)		
0.003-0.008	0.002-0.006	$Smax = \sqrt{DC.DR - DR^2}$



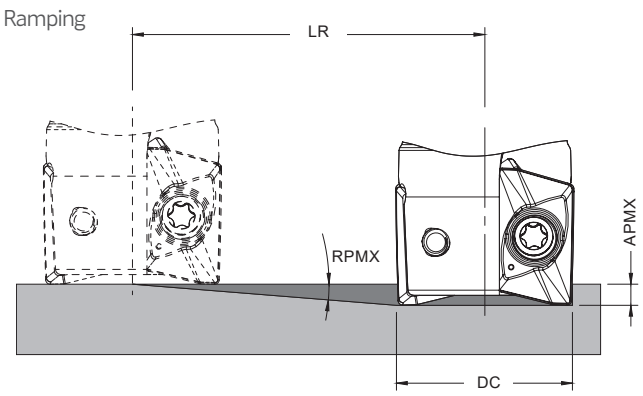
S max and DR corresponding cutting diameter DC (in)							
DR (in)	DC (in)						
	0.625	0.750	1.000	1.250	1.500	2.000	2.500
0.039	0.152	0.167	0.194	0.218	0.240	0.278	0.311
0.079	0.207	0.230	0.269	0.304	0.335	0.389	0.437
0.118*	0.245	0.273	0.323	0.366	0.404	0.471	0.530
0.157**	0.271	0.305	0.364	0.415	0.460	0.539	0.607

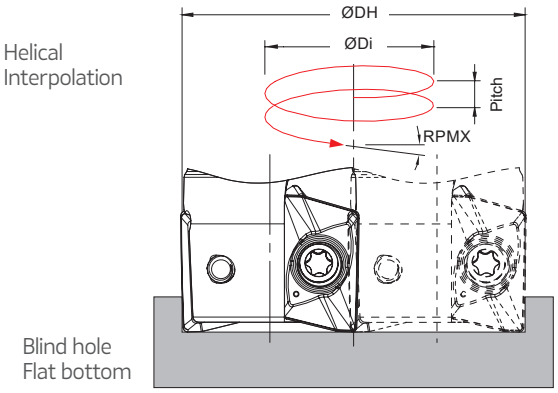
* only for radius above 0.079 in
** only for radius 0.157 in



RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular





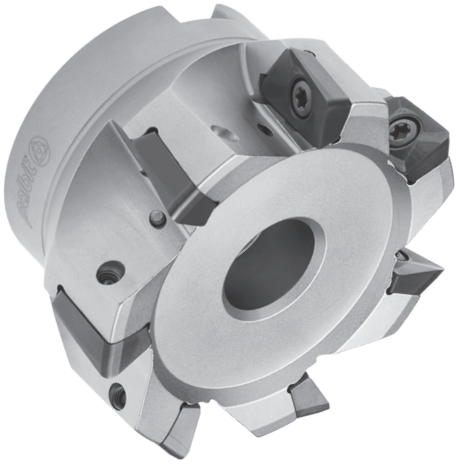
ØDi = ØDH - DC

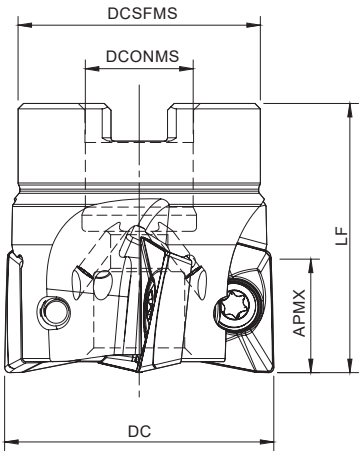
DC	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	
0.625	7.5	0.394	2.993	0.978 -	- 1.171	0.140 0.220
0.750	5.0	0.394	4.503	1.228 -	- 1.421	0.130 0.180
1.000	3.5	0.394	6.442	1.728 -	- 1.921	0.130 0.170
1.250	2.5	0.394	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 equation below:
- Minimum Diameter: ØDHmin = 2 x (DC - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (DC - R corner radius)

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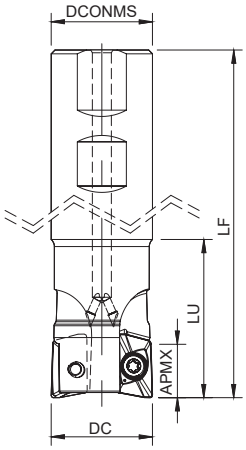
Arbor Mounting

KAPR=90° | GAMP=+7°~+8°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Arbor Type	APMX (in)		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF			LP | MP | LS | LN	LN Z1|Z1W		
181107700	XP90 D1.50-A.500/1.57-04-17	4	1.500	0.500	1.417	1.575	0.50	A	0.669	0.315	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	0.315	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	0.315	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	0.315	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	0.315	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	0.315	XPET 1706...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)



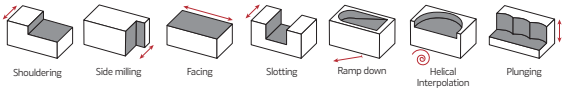


Weldon Shank

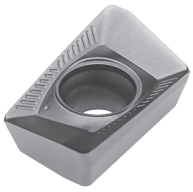
KAPR=90° | GAMP=+6°~+7°

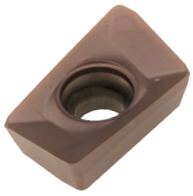
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	APMX (in)		Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		LP | MP | LS | LN	LN Z1|Z1W		
181107300	XP90 D1.25-W1.25/4.33-02-17	2	1.250	1.250	4.330	1.570	1.00	0.669	0.315	XPET 1706...	◈
181107400	XP90 D1.25-W1.25/4.33-03-17	3	1.250	1.250	4.330	1.570	1.00	0.669	0.315	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	0.315	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	0.315	XPET 1706...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

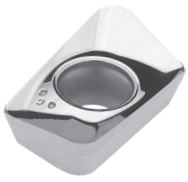


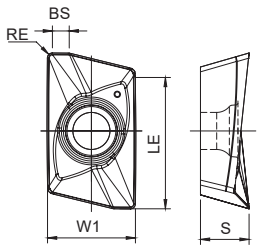
XPET 1706... Inserts | Pastilhas | Plaquitas


XPET-LP

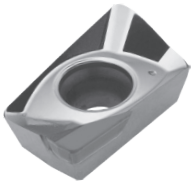

XPET-LS

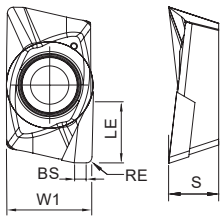

XPET-MP


XPET-LN

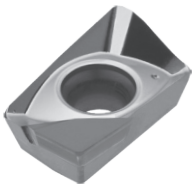


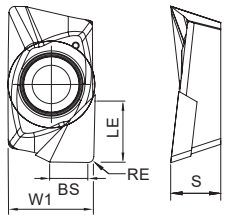
XPET-LP | LS | MP | LN


XPET-LN Z1



XPET-LN Z1


XPET-LN Z1W



XPET-LN Z1W

		P			M			K				N		S			Dimensions Dimensões Dimensiones (in)				
		CVD	PVD		PVD			CVD		PVD		UNC	PCD	PVD							
	(2) Grade code	T9	T1	G6	X9	4H	G6	L5	L9	T1	G6	10	D6	X9		G6					
(1) Geometry code	ISO Reference	PHS740	PHP920	PH7740	PHH930	PHF530	PH7740	PH5705	PH5740	PHP920	PH7740	PH0910	PDP410	PHH930		PH7740	W1	S	LE	RE	BS
1111986	XPET 170608 PDER-LP		◬	◭			◬			◬	◭					◬	0.445	0.250	0.689	0.031	0.071
1111987	XPET 170616 PDER-LP		◬	◭			◬			◬	◭					◬	0.445	0.250	0.689	0.063	0.047
1112223	XPET 170608 PDER-LS				◭	◬	◭							◭	◬	◭	0.445	0.250	0.689	0.031	0.071
1113373	XPET 170612 PDER-LS				○									○			0.445	0.250	0.689	0.047	0.061
1113361	XPET 170616 PDER-LS				◬									◬			0.445	0.250	0.689	0.063	0.047
1113362	XPET 170620 PDER-LS				◬									◬			0.445	0.250	0.689	0.079	0.083
1113363	XPET 170632 PDER-LS				◬									◬			0.445	0.250	0.689	0.126	0.038
1111988	XPET 170608 PDSR-MP	◭	◬	◭				◬	◭	◬	◭						0.445	0.250	0.689	0.031	0.071
1111989	XPET 170616 PDSR-MP		◬	◭				◬	◭	◬	◭						0.445	0.250	0.689	0.063	0.039
1111990	XPET 170608 PDFR-LN											◭					0.445	0.250	0.689	0.031	0.047
1111991	XPET 170620 PDFR-LN											◭					0.445	0.250	0.689	0.079	0.039
1111992	XPET 170632 PDFR-LN											◭					0.445	0.250	0.689	0.126	0.031
1113085	XPET 170608 PDFR-LN Z1												◭				0.441	0.256	0.315	0.031	0.059
1113086	XPET 170608 PDFR-LN Z1W												◭				0.441	0.256	0.315	0.031	0.193

◬ First choice | Primeira opção | 1ª opción ◭ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

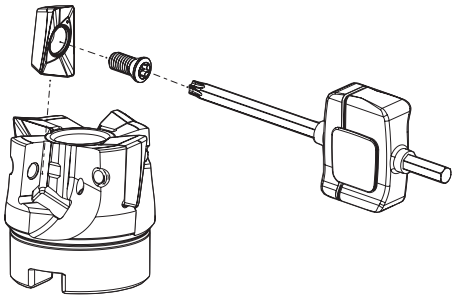
LINEPRO XP90-17

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
XP90-A-17 - 1.50-3.00	P0451001	XT20	DT2050	44.3
XP90-A-17 - 4.00-5.00	P0451001	PT20	DT2050	44.3
XP-90-W-17 - 1.25-1.50	P0451001	XT20	DT2050	44.3

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



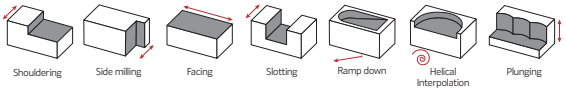
GRADES SELECTION GUIDE Guia para selecção de graus | Tabla para selección de calidades

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance … Toughness → PH0910	PH5705	PHP920	PHP930	PHH930	PHF530	PH5740	PHS740	PH7740	PCD PDP410
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	200-330					✓	✓			✓	
	6	SS - Austenitic-ferritic (Duplex)	230-260					✓	✓			✓	
K	7	Malleable Cast Iron	130-230		✓	✓	✓			✓		✓	
	8	Grey Cast Iron	180-245		✓	✓	✓			✓		✓	
	9	Nodular Cast iron	160-250		✓	✓	✓			✓		✓	
N	10	Aluminium and Non Ferrous	30-130	✓									✓
S	11	Heat Resistant Super Alloys	200-320					✓	✓			✓	

Good Conditions Average Conditions Difficult Conditions

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	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... LS	XPET 17... LP
	5	SS - Austenitic	200-330	XPET 17... LS	XPET 17... LP
	6	SS - Austenitic-ferritic (Duplex)	230-260	XPET 17... LS	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	Aluminium and Non Ferrous	30-130	XPET 17... LN | LN Z1 | LN Z1W	-
S	11	Heat Resistant Super Alloys	200-320	XPET 17... LS	XPET 17... LP



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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance							Toughness →		PCD
				PH0910	PH5705	PHP920	PHP930	PHH930	PHF530	PH5740	PHS740	PH7740	PDP410
P	1	Unalloyed Steel	125-220	-	-	590-820	525-754	-	-	-	459-722	459-656	-
	2	Low-Alloyed Steel	220-280	-	-	525-754	459-689	-	-	-	394-656	426-590	-
	3	High-Alloyed Steel	280-380	-	-	459-722	394-656	-	-	-	328-623	328-558	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	459-689	459-820	-	-	426-590	-
	5	SS - Austenitic	200-330	-	-	-	-	394-558	426-787	-	-	361-525	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	328-492	394-722	-	-	295-492	-
K	7	Malleable Cast Iron	130-230	-	525-951	525-886	-	-	-	525-853	-	459-722	-
	8	Grey Cast Iron	180-245	-	558-1050	459-820	-	-	-	459-787	-	394-689	-
	9	Nodular Cast iron	160-250	-	459-656	394-689	-	-	-	394-656	-	328-623	-
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-	-	-	-	2624-9840
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	98-361	98-492	-	-	98-328	-

ISO	PSM	Material	HB (Brinell)	Feed fz (in/t)					
				XPET 17... LP	XPET 17... LS	XPET 17... MP	XPET 17... LN	XPET 17... LN Z1	XPET 17... LN Z1W
P	1	Unalloyed Steel	125-220	0.004-0.014	-	0.004-0.014	-	-	-
	2	Low-Alloyed Steel	220-280	0.004-0.014	-	0.004-0.014	-	-	-
	3	High-Alloyed Steel	280-380	0.004-0.012	-	0.004-0.012	-	-	-
M	4	SS - Ferritic / Martensitic	200-330	0.004-0.012	0.004-0.014	-	-	-	-
	5	SS - Austenitic	200-330	0.004-0.012	0.004-0.012	-	-	-	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	0.004-0.010	0.394-0.010	-	-	-	-
K	7	Malleable Cast Iron	130-230	0.004-0.014	-	0.004-0.014	-	-	-
	8	Grey Cast Iron	180-245	0.004-0.014	-	0.004-0.014	-	-	-
	9	Nodular Cast iron	160-250	0.004-0.012	-	0.004-0.012	-	-	-
N	10	Aluminium and Non Ferrous	30-130	-	-	-	0.004-0.014	0.004-0.014	0.004-0.014
S	11	Heat Resistant Super Alloys	200-320	0.004-0.008	0.004-0.008	-	-	-	-

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

(Note 2)

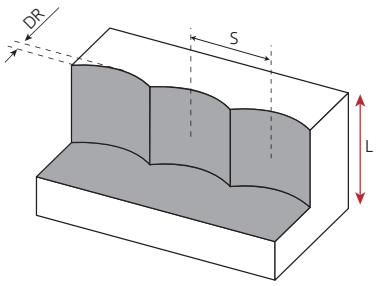
Operation	a_e	Vc & fz	AP (in)
Slotting	100%	<20%	0.079-0.236
Shouldering	<50%	>8%	0.276-0.512
	≤25%	>12%	0.512-0.630

(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.

LINEPRO XP90-17

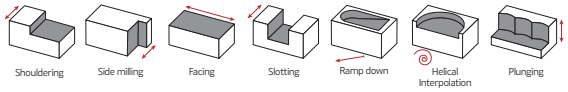
PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
f_z (in/t)		
0.004-0.012	0.003-0.010	$Smax = \sqrt{DC.DR - DR^2}$



S max and DR corresponding cutting diameter DC (in)							
DR (in)	DC (in)						
	1.250	1.500	2.000	2.500	3.000	4.000	5.000
0.039	0.218	0.240	0.278	0.311	0.341	0.395	0.442
0.079	0.304	0.335	0.389	0.437	0.480	0.556	0.622
0.118*	0.366	0.404	0.471	0.530	0.583	0.677	0.759
0.157*	0.415	0.460	0.539	0.607	0.669	0.778	0.873

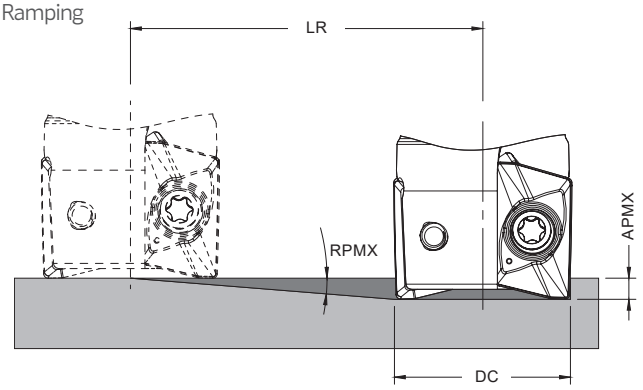
* only for radius above 0.079 in



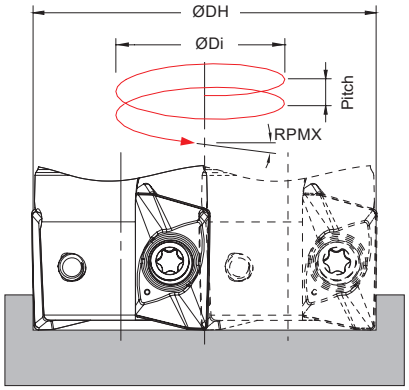
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



Blind hole
Flat bottom

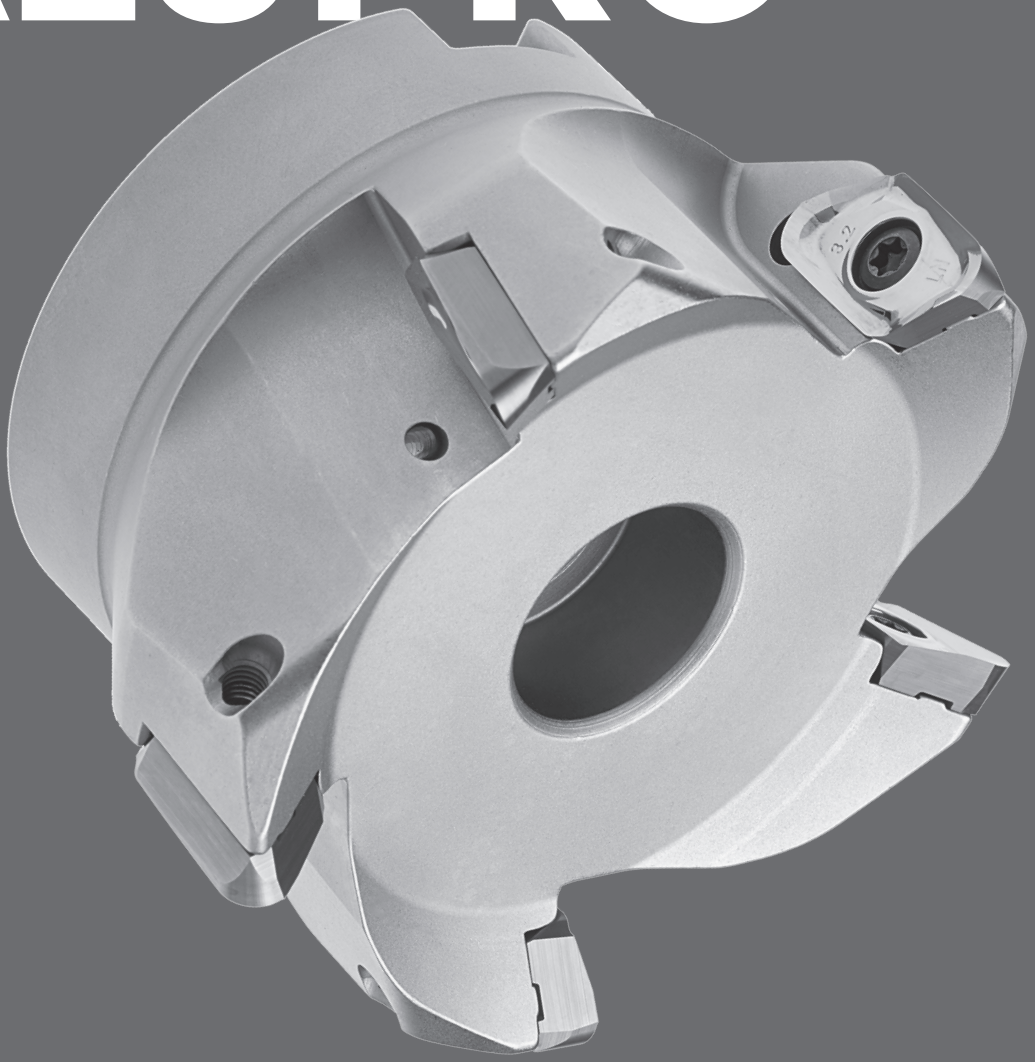
ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	
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 equation below:
- Minimum Diameter: ØDHmin = 2 x (DC - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (DC - R corner radius)

XD90-15 | XD90-22

ALUPRO



The ALUPRO lines are precision-engineered tools designed specifically for machining aluminum components. These tools feature specialized geometries optimized for the unique properties of aluminum, allowing for efficient material removal and extended tool life. With sharp cutting edges and low cutting forces, these tools deliver high-performance results in milling operations on aluminum workpieces.

As linhas ALUPRO são ferramentas de precisão projetadas especificamente para fresagem de componentes de alumínio. Essas ferramentas apresentam geometrias especializadas otimizadas para as propriedades únicas do alumínio, permitindo remoção eficiente de material e vida útil prolongada da ferramenta. Com arestas de corte afiadas e baixas forças de corte, essas ferramentas oferecem resultados de alto desempenho em operações de fresagem em peças de alumínio.

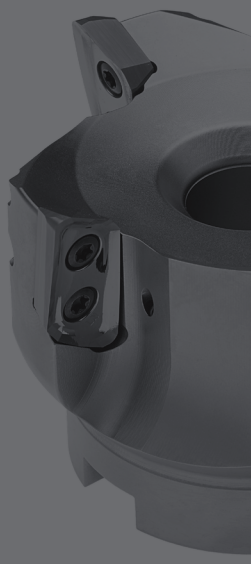
As linhas ALUPRO son herramientas de precisión diseñadas específicamente para el fresado de componentes de aluminio. Estas herramientas cuentan con geometrías especializadas optimizadas para las propiedades únicas del aluminio, lo que permite una remoción eficiente de material y una vida útil prolongada de la herramienta. Con bordes de corte afilados y bajas fuerzas de corte, estas herramientas ofrecen resultados de alto rendimiento en operaciones de fresado en piezas de aluminio.

ALUPRO XD90-15 > page 182



- From DC 0.750 in to 4.000 in
  De DC 0.750 in a 4.000 in | Desde DC 0.750 in hasta 4.000 in
- Available in arbor mounting and cylindrical shank
  Disponível em montagem tipo árvore e haste cilíndrica | Disponible en fijación con tornillo central y mango cilíndrico
- Small positive XDGX 15M5 insert with 2 cutting edges
  Pastilha positiva pequena XDGX 15M5 com 2 arestas de corte | Plaquita positiva pequeña XDGX 15M5 con 2 filos de corte
- Stable clamping conditions (Anti-fly)
  Condições de fixação estáveis (anti-voo) | Condiciones de sujeción estables (antivuelo)

ALUPRO XD90-22 > page 186

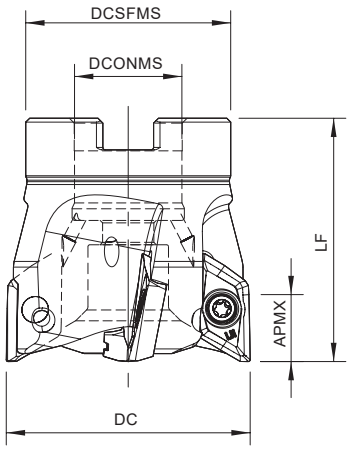


- From DC 1.250 in to 5.000 in
  De DC 1.250 in a 5.000 in | Desde DC 1.250 in hasta 5.000 in
- Available in arbor mounting and cylindrical shank
  Disponível em montagem tipo árvore e haste cilíndrica | Disponible en fijación con tornillo central y mango cilíndrico
- Large positive XDGX 22M7 insert with 2 cutting edges
  Pastilha positiva pequena XDGX 22M7 com 2 arestas de corte | Plaquita positiva pequeña XDGX 22M7 con 2 filos de corte
- High speed conditions with high metal remove rate
  Condições de alta velocidade com alta taxa de remoção de metal | Condiciones de alta velocidad con alta tasa de remoción de metal

ALUPRO XD90-15

Proprietary milling line





Arbor Mounting

KAPR=90° | GAMP=+11°

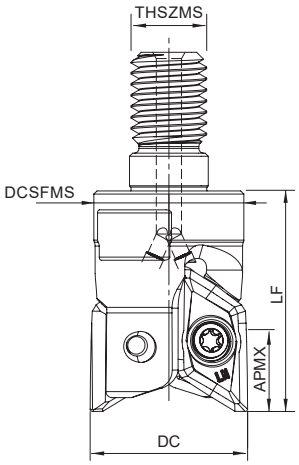
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications			Insert radius Raio da pastilha Rayo del Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Cutter Type	APMX (in)	RPM max		
181104600	XD90 D1.50-A.500/2.00-03-15	3	1.500	0.500	1.440	2.000	0.66	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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

Note: Cutters type B that mount inserts with radius between 0.157 in and 0.197 in are only available in the metric line.

METRIC SHANK





Threaded Coupling

KAPR=90° | GAMP=+6°~+11°

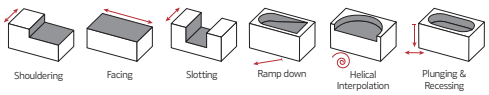
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications			Insert radius Raio da pastilha Rayo del Inserto	Stock
			DC	THSZMS	DCSFMS	LF		Cutter Type	APMX (in)	rpm max		
181202400	025R76090-02-06-M12035-A	2	0.984	M12	0.827	1.378	0.154	A	30.856	38 000	0.016~0.126	◈
181202500	032R76090-03-09-M16040-A	3	1.260	M16	1.142	1.575	0.309	A	30.856	33 000	0.016~0.126	◈
181202600	040R76090-03-11-M16045-A	3	1.575	M16	1.142	1.772	0.441	A	30.856	29 000	0.016~0.126	◈
181202700	025R76090-02-06-M12035-B	2	0.984	M12	0.827	1.378	0.154	B	30.856	38 000	0.157~0.197	◯
181202800	032R76090-03-09-M16040-B	3	1.260	M16	1.142	1.575	0.309	B	30.856	33 000	0.157~0.197	◯
181202900	040R76090-03-11-M16045-B	3	1.575	M16	1.142	1.772	0.441	B	30.856	29 000	0.157~0.197	◯

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

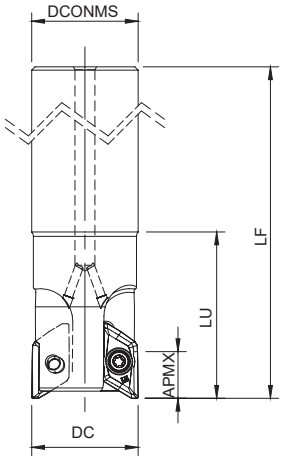
Note: Cutters type B that mount inserts with radius between 0.157 in and 0.197 in are only available in the metric line.

ALUPRO XD90-15

XDGX 15







Cylindrical Shank

KAPR=90° | GAMP=+6°~+11°

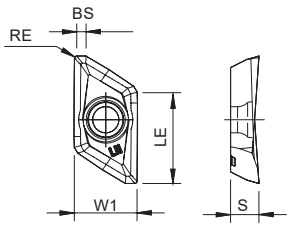
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications			Insert radius Raio da pastilha Rayo del Inserto	Stock
			DC	DCONMS	LF	LU		Cutter Type	APMX (in)	rpm max		
181105100	XD90 D0.75-C0.75/6.00-01-15	1	0.750	0.750	6.000	2.000	0.44	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	○

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

Note: Cutters type B that mount inserts with radius between 0.157 in and 0.197 in are only available in the metric line.

XDGX 15M5... Inserts | Pastilhas | Plaquitas





(1) Geometry code	(2) Grade code	N	Dimensions Dimensões Dimensiones (in)					Cutter Type
		UNC						
		10						
	ISO Reference	PH0910	W1	S	LE	RE	BS	
1111624	XDGX 15M504 PDFR-LN	◈	0.441	0.197	0.630	0.016	0.067	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

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

* Insert suitable for metric cutters only.

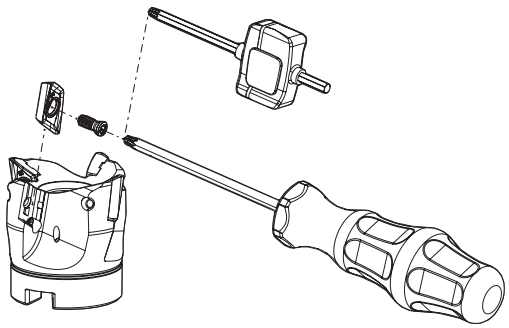
ALUPRO XD90-15

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
XD90-A-15 - 1.50-3.00	P0400900	XT15	DT1530	26.6
XD90-A-15 - 4.00	P0400900	PT15	DT1530	26.6
XD90-C-15 - 0.75-1.00	P0400803	XT15	DT1530	26.6
XD90-C-15 - 1.25-1.50	P0400900	XT15	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

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	Aluminium and Non Ferrous	30-130	1148-9840	≤ 25% DC	≤0.197	0.014-0.016
						0.197-0.394	0.012-0.014
						0.394-0.591	0.010-0.012
					< 50% DC	≤0.197	0.014-0.016
						0.197-0.394	0.012-0.014
						0.394-0.591	0.010-0.012
					≤ 75% DC	≤0.197	0.012-0.014
						0.197-0.394	0.010-0.012
						0.394-0.591	0.008-0.010

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	Aluminium and Non Ferrous	30-130	350-3000	100% DC	≤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 Guia operacional | Guía operativa

- 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:

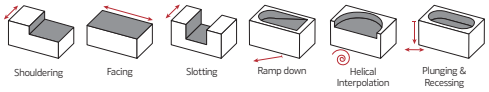
DC	0.787	0.984	1.260	1.575	1.969	2.480	3.150	13.937
RPM (min^{-1})	40000	38000	33000	29000	24000	21000	19000	16000

- 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:

DC	0.787	0.984	1.260	1.575	1.969	2.480	3.150	13.937
RPM (min^{-1})	15000	12000	9500	8500	7600	6800	6000	5400

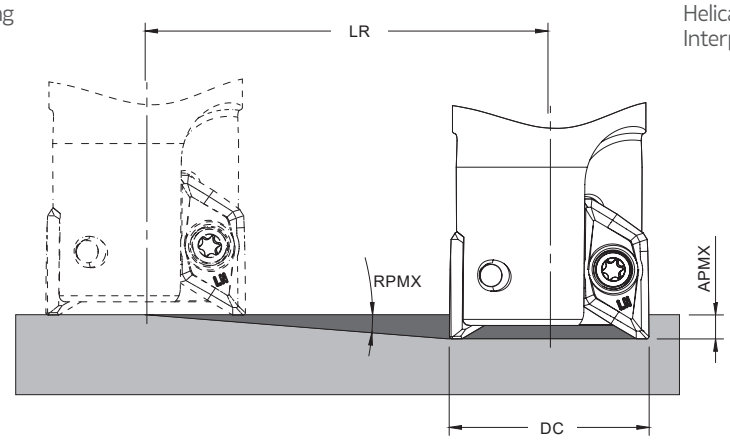
- When setting the spindle speed, take into consideration the maximum allowable revolutions of arbor or chuck.
- Use the specified set bolt when using the arbor type with internal coolant supply.



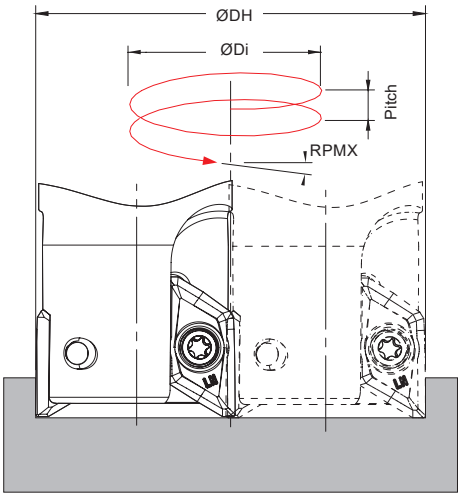
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



Blind hole
Flat bottom

ØDi = ØDH - DC

Cutter Type	DC	Ramping			Helical Interpolation		
					Diameter for Blind Hole. Flat Bottom Face (1)		Max Pitch/Rev.
		RPMX	APMX	Min LR	ØDHmin	ØDHmax	
A	0.787	0.906	0.591	1.390	1.425 -	- 1.512	0.850 0.965
	0.984	0.827	0.591	1.539	1.819 -	- 1.906	1.008 1.110
	1.260	0.591	0.591	2.205	2.370 -	- 2.457	0.933 1.008
	1.575	0.394	0.591	3.350	3.000 -	- 3.087	0.787 0.839
	1.969	0.315	0.591	4.201	3.787 -	- 3.874	0.803 0.843
	2.480	0.236	0.591	5.618	4.811 -	- 4.898	0.768 0.799
	3.150	0.157	0.591	8.445	6.150 -	- 6.236	0.657 0.677
	3.937	0.098	0.591	13.528	7.724 -	- 7.811	0.520 0.531

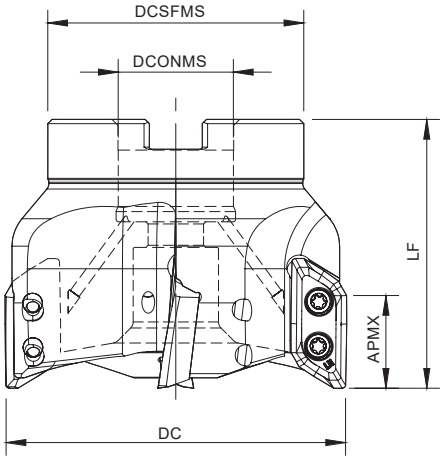
(1) using insert radius 0.031 in

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

ALUPRO XD90-22

Proprietary milling line





Arbor Mounting

KAPR=90° | GAMP=+7°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications			Insert radius Raio da pastilha Rayo del Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Cutter Type	APMX (in)	RPM max		
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	◈
181072600	XD90 D3.00-A1.00/2.00-04-22	4	3.000	1.000	2.205	2.000	1.82	A	0.846	23 000	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	◇
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

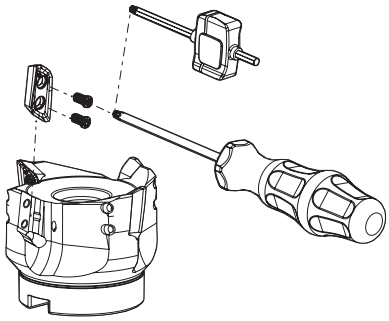
Note: Cutters type B that mount inserts with radius between 0.157 in and 0.197 in are only available in the metric line.

SPARE PARTS Acessórios | Repuestos

Order separately

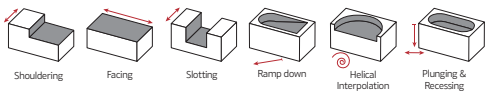
Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
XD90-A-22 - 2.00-3.00	P0401200	XT15	DT1530	26.6
XD90-A-22 - 4.00-5.00	P0401200	PT15	DT1530	26.6
XD90-C-22 - 1.25-1.50	P0401200	XT15	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

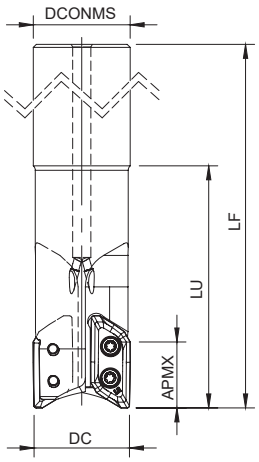


ALUPRO XD90-22

XDGX 22







Cylindrical Shank

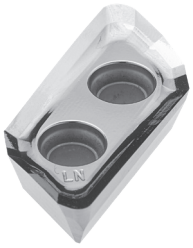
KAPR=90° | GAMP=+6°

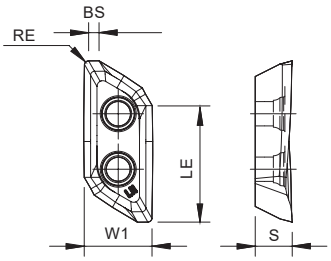
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications			Insert radius Raio da pastilha Rayo del Inserto	Stock
			DC	DCONMS	LF	LU		Cutter Type	APMX (in)	rpm max		
181069900	XD90 D1.25-C1.25/6.69-02-22	2	1.250	1.250	6.693	3.150	1.67	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	◈
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

Note: Cutters type B that mount inserts with radius between 0.157 in and 0.197 in are only available in the metric line.

XDGX 22M7... Inserts | Pastilhas | Plaquitas





		N	Dimensions Dimensões Dimensiones (in)					Cutter Type
		UNC						
	(2) Grade code	10						
(1) Geometry code	ISO Reference	PH0910	W1	S	LE	RE	BS	
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
1111622	XDGX 22M740 PDFR-LN	◈	0.512	0.276	0.866	0.157	0.035	B
1111623	XDGX 22M750 PDFR-LN	◈	0.512	0.276	0.866	0.197	0.016	B

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

ALUPRO XD90-22

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

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	Aluminium and Non Ferrous	30-130	1148-9840	≤ 25% DC	≤0.197	0.014-0.016
						0.197-0.394	0.012-0.014
						0.394-0.591	0.010-0.012
					< 50% DC	≤0.197	0.014-0.016
						0.197-0.394	0.012-0.014
						0.394-0.591	0.010-0.012
					≤ 75% DC	≤0.197	0.012-0.014
						0.197-0.394	0.010-0.012
						0.394-0.591	0.008-0.010

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	Aluminium and Non Ferrous	30-130	1148-9840	100% DC	≤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 Guia operacional | Guía operativa

- 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 31lbs.
- 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).

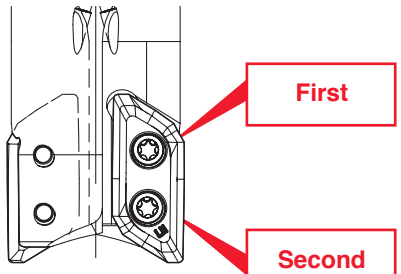


Figure 1

Table 1 - Maximum allowable revolutions:

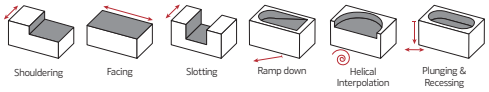
DC	1.260	1.575	1.969	2.480	3.150	3.937	4.921
RPM (min^{-1})	41000	36000	30000	25000	23000	19000	16000

- 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:

DC	1.260	1.575	1.969	2.480	3.150	3.937	4.921
RPM (min^{-1})	9500	7600	6000	4800	3800	3000	2400

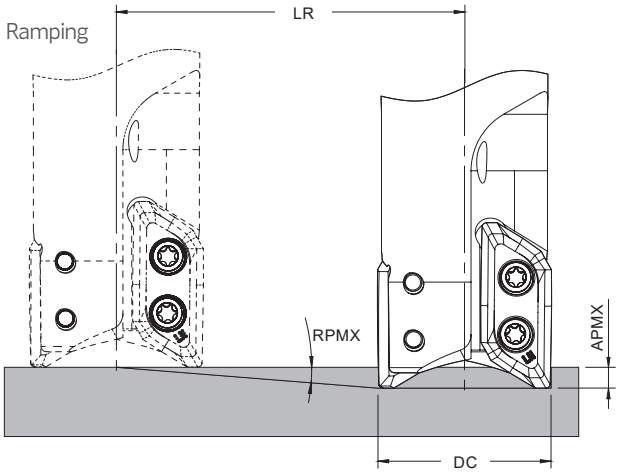
- When setting the spindle speed, take into consideration the maximum allowable revolutions of arbor or chuck.
- Use the specified set bolt when using the arbor type with internal coolant supply.



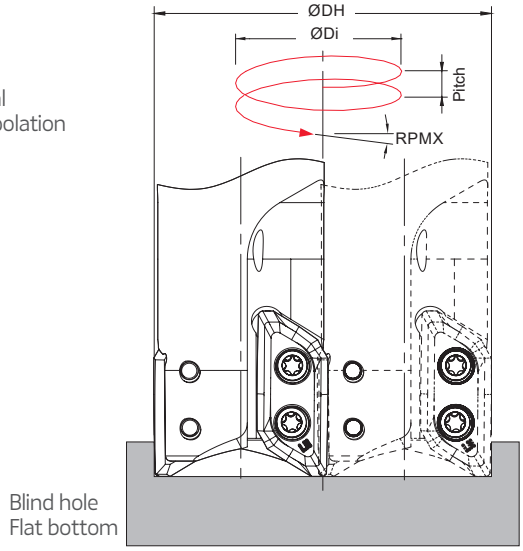
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	
1.250	19.0	0.827	2.401	2.303 -	- 2.421	0.827 0.827
1.500	13.0	0.827	3.581	2.803 -	- 2.921	0.827 0.827
2.000	9.0	0.827	5.220	3.803 -	- 3.921	0.827 0.827
2.500	7.0	0.827	6.734	4.803 -	- 4.921	0.827 0.827
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	0.827 0.827
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 equation below:
- Minimum Diameter: ØDHmin = 2 x (DC - (R corner radius + F width of edge wiper)
- Maximum Diameter: ØDHmax = 2 x (DC - R corner radius)

AP90-10 | AP90-16

LINEPRO



The LINEPRO excels in shoulder milling, featuring thicker inserts with reinforced cutting edges for enhanced tool longevity. Its high helix angle reduces cutting load, ensuring stable, smooth cutting performance, delivering consistent results in machining operations.

A LINEPRO destaca-se na fresagem a 90º, apresentando pastilhas mais espessas com arestas de corte reforçadas para uma vida útil da ferramenta prolongada. A sua elevada inclinação da hélice reduz o esforço de corte, garantindo um desempenho de corte estável e suave, proporcionando resultados consistentes em operações de fresagem.

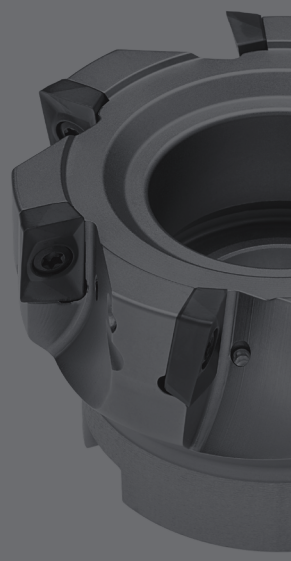
La LINEPRO destaca en el fresado a 90º, presentando plaquitas más gruesas con filos de corte reforzados para una vida útil de la herramienta prolongada. Su alta inclinación de hélice reduce el esfuerzo de corte, garantizando un rendimiento de corte estable y suave, proporcionando resultados consistentes en operaciones de fresado.

LINEPRO AP90-10 > page 192



- From DC 0.500 in to 1.500 in
  De DC 0.500 in a 1.500 in | Desde DC 0.500 in hasta 1.500 in
- Available in weldon shank
  Disponível em haste weldon | Disponible en mango tipo weldon
- Small positive insert with 2 cutting edges (AP.. 1003..)
  Pastilha positiva pequena com 2 arestas de corte (AP.. 1003..) | Plaquita positiva pequeña con 2 filos de corte (AP.. 1003..)
- Low cutting force
  Baixas forças de corte | Bajas fuerza de corte

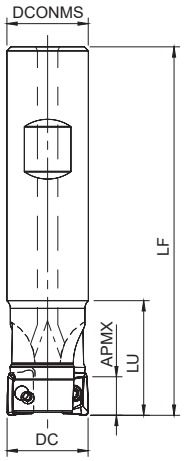
LINEPRO AP90-16 > page 198



- From DC 0.875 in to 6.000 in
  De DC 0.875 in a 6.000 in | Desde DC 0.875 in hasta 6.000 in
- Available in arbor mounting and weldon shank
  Disponível em montagem tipo árvore e haste weldon | Disponible en fijación con tornillo central y mango tipo weldon
- Large positive insert with 2 cutting edges (AP.. 1604..)
  Pastilha positiva grande com 2 arestas de corte (AP.. 1604..) | Plaquita positiva grande con 2 filos de corte (AP.. 1604..)
- Strong insert
  Pastilha forte | Plaquita fuerte

LINEPRO AP90-10





Weldon Shank

KAPR=90° | GAMP=+7°~+9°

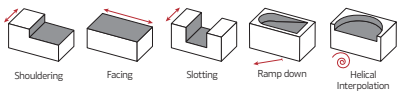
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181060400	AP90 D.500-W.500/3.94-01-10	1	0.500	0.500	3.937	0.850	0.40	0.354	AP... 1003...	○
181060500	AP90 D.625-W.625/3.94-02-10	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...	◈
181064500	AP90 D.750-W.750/3.94-03-10	3	0.750	0.750	3.937	1.181	0.37	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...	◈
181060900	AP90 D1.00-W1.00/5.91-03-10	3	1.000	1.000	5.910	1.432	1.08	0.354	AP... 1003...	○
181068900	AP90 D1.00-W1.00/4.53-04-10	4	1.000	1.000	4.528	1.378	0.83	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...	○
181061100	AP90 D1.25-W1.25/6.30-03-10	3	1.250	1.250	6.300	1.575	1.15	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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

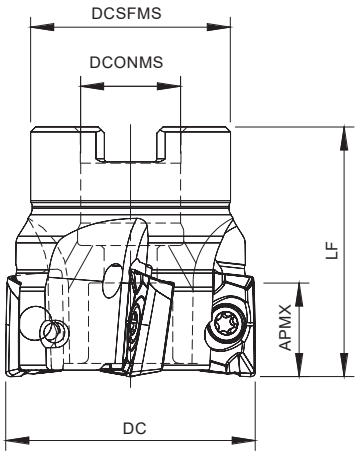
LINEPRO AP90-10

APET 10 | APKT 10



METRIC SHANK





Arbor Mounting

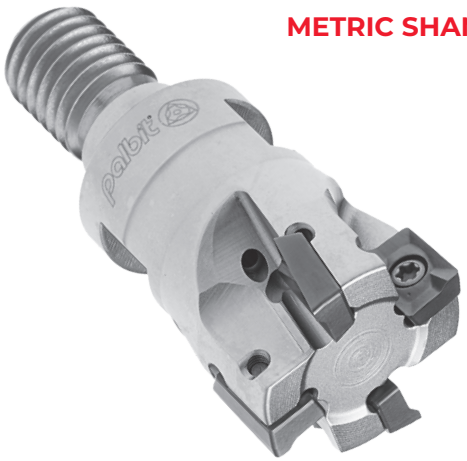
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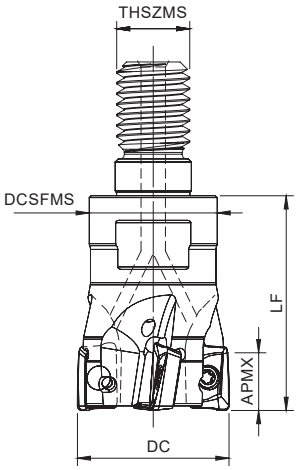
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181010200	040A17090-06-09-022040	6	1.575	0.866	1.535	1.575	0.463	A	0.354	AP.. 1003...	◈
181010300	050A17090-07-09-022040	7	1.969	0.866	1.575	1.575	0.705	A	0.354	AP.. 1003...	◈
181014300	063A17090-08-09-022040	8	2.480	0.866	1.890	1.575	1.234	A	0.354	AP.. 1003...	◈

◈ Stock item | Produto de stock | Itens de stock

◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

METRIC SHANK





Threaded Coupling

KAPR=90° | GAMP=+7°~+9°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181015100	016R17090-02-07-M08025	2	0.630	M8	0.512	0.984	0.066	0.354	AP.. 1003...	◈
181015200	020R17090-03-09-M10030	3	0.787	M10	0.709	1.181	0.128	0.354	AP.. 1003...	◈
181015300	025R17090-04-09-M12035	4	0.984	M12	0.827	1.378	0.242	0.354	AP.. 1003...	◈

◈ Stock item | Produto de stock | Itens de stock

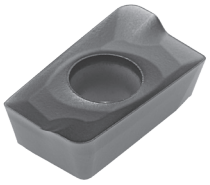
◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

LINEPRO AP90-10

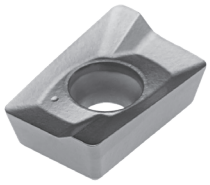
AP.. 1003... Inserts | Pastilhas | Plaquitas



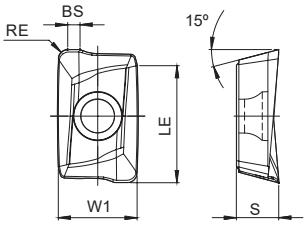
APET - LN



APKT - X



APKT - X1



APET-LN | APKT-X | APKT-X1

		P		M	K		N	Dimensions Dimensões Dimensiones (in)				
		PVD		PVD	PVD		UNC					
	(2) Grade code	68	66	66	68	66	10					
(1) Geometry code	ISO Reference	PH6920	PH6930	PH6930	PH6920	PH6930	PH0910	W1	S	LE	RE	BS
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	-

● First choice | Primeira opção | 1ª opción ○ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

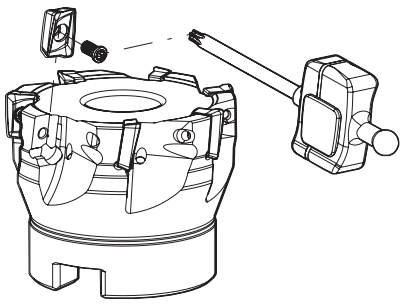
Insert order code = (1) Geometry Code + (2) Grade Code

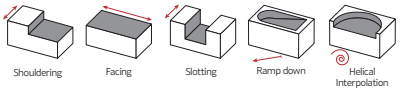
SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
AP90-W-10 - 0.50-1.50	P0250503	XT08	DT0812	10.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.





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

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	200-330			✓
	6	SS - Austenitic-ferritic (Duplex)	230-260			✓
K	7	Malleable Cast Iron	130-230		✓	✓
	8	Grey Cast Iron	180-245		✓	✓
	9	Nodular Cast iron	160-250		✓	✓
N	10	Aluminium and Non Ferrous	30-130	✓		

Good Conditions Average Conditions Difficult Conditions

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	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	200-330	APKT 10... PDER-X	-
	6	SS - Austenitic-ferritic (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	Aluminium and Non Ferrous	30-130	APET 10... PDFR-LN	-

LINEPRO AP90-10

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance		Toughness →
				PH0910	PH6920	PH6930
P	1	Unalloyed Steel	125-220	-	590-787	525-722
	2	Low-Alloyed Steel	220-280	-	525-722	459-656
	3	High-Alloyed Steel	280-380	-	459-689	394-623
M	4	SS - Ferritic / Martensitic	200-330	-	459-722	459-656
	5	SS - Austenitic	200-330	-	426-590	394-525
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	394-525	328-459
K	7	Malleable Cast Iron	130-230	-	525-853	492-787
	8	Grey Cast Iron	180-245	-	459-787	459-754
	9	Nodular Cast iron	160-250	-	394-656	328-623
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-

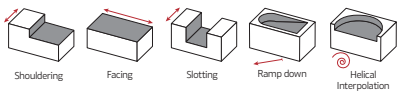
ISO	PSM	Material	HB (Brinell)	Feed fz (in/t)		
				APKT 10... PDER-X/X1	APKT 10... PDS(T)R-X/X1	APET 10... PDFR-LN
P	1	Unalloyed Steel	125-220	0.003-0.006	0.004-0.010	-
	2	Low-Alloyed Steel	220-280	0.003-0.004	0.004-0.008	-
	3	High-Alloyed Steel	280-380	0.003-0.004	0.004-0.008	-
M	4	SS - Ferritic / Martensitic	200-330	0.003-0.004	-	-
	5	SS - Austenitic	200-330	0.003-0.004	-	-
	6	SS - Austenitic-ferritic (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	Aluminium 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	AP (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.

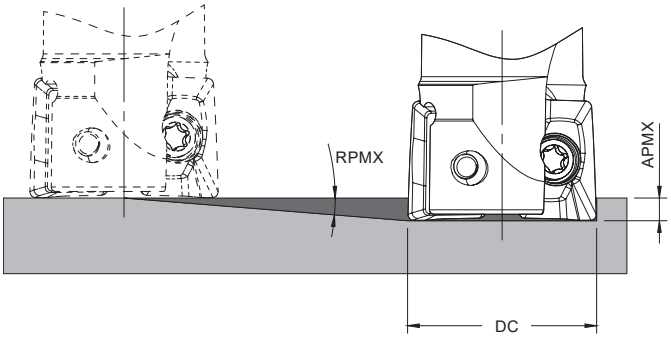
(Note 5) If chattering occurs, reduce ap and Vc by 30% and keep the same fz per tooth.



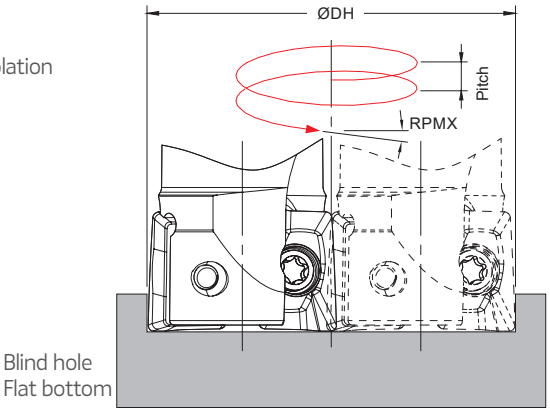
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation

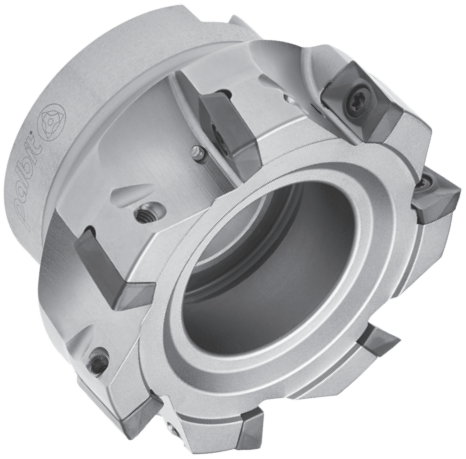


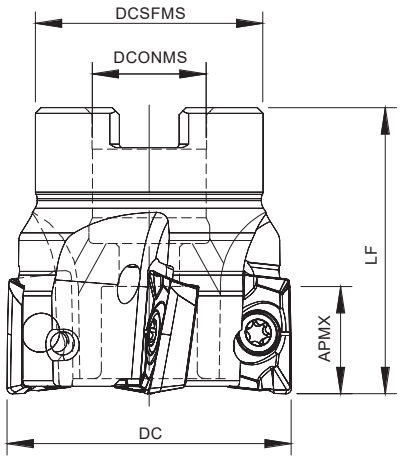
ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	RPMX	APMX	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 0.031 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 equation below:
- Minimum Diameter: ØDHmin = 2 x (DC - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (DC - R corner radius)

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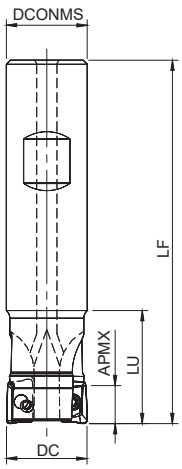
Arbor Mounting

KAPR=90° | GAMP=+8°~+10°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
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	○
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	◈
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	○
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	◈
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	◈
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	○
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)



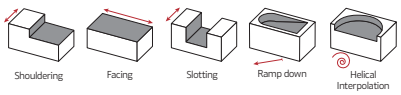


Weldon Shank

KAPR=90° | GAMP=+6°~+8°

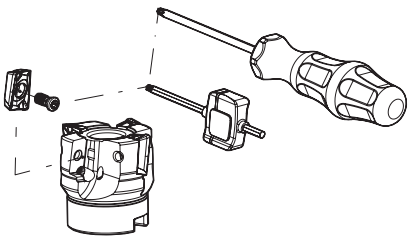
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181061500	AP90 D.875-W.750/3.94-02-16	2	0.875	0.750	3.937	1.378	0.39	0.571	AP... 1604	◈
181136800	AP90 D1.00-W1.00/4.00-02-16	2	1.000	1.000	4.000	1.750	0.67	0.571	AP... 1604	◈
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	◈
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	◈
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)



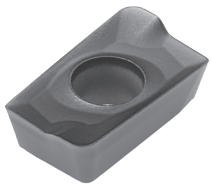
SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm) (Order separately)	Torque Value	Screw (Order separately)	DIN 6368 Wrench
A18090 - 40-63	P0400900	XT15	DT1530	26.6	-	-
A18090 - 80	P0400900	XT15	DT1530	26.6	J0123510	SD6368-12
A18090 - 100	P0400900	PT15	DT1530	26.6	J0164110	SD6368-16
A18090 - 125	P0400900	PT15	DT1530	26.6	J0204610	SD6368-20
W18090 - 25-40	P0400900	XT15	DT1530	26.6	-	-



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

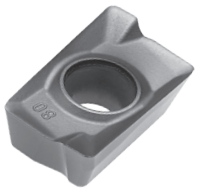
AP.. 1604... Inserts | Pastilhas | Plaquitas



APKT - X



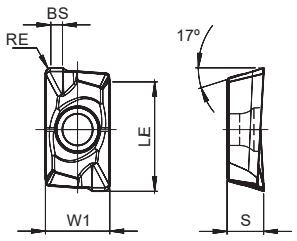
APKT - X1



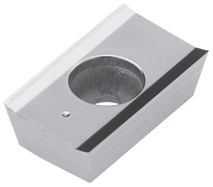
APKT - X2



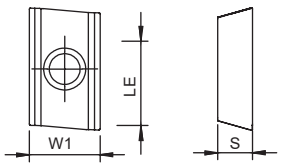
APKT - LN



APKT-X | X1 | X2 | LN



APHT - LN



APHT-LN

		P				M		K				N	Dimensions Dimensões Dimensiones (in)				
		PVD				PVD		PVD				UNC					
	(2) Grade code	68	G4	66	P3	66	P3	68	G4	66	P3	10					
(1) Geometry code	ISO Reference	PH6920	PH7920	PH6930	PH7930	PH6930	PH7930	PH6920	PH7920	PH6930	PH7930	PH0910	W1	S	LE	RE	BS
1112159	APKT 160408 PDER-X1	◬		◬		◬		◬		◬			0.372	0.211	0.630	0.031	0.071
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
1112367	APKT 160408 PDSR-X2		◬		◬				◬		◬		0.372	0.211	0.630	0.031	0.071
1111923	APKT 160408 PDFR-LN											◬	0.372	0.211	0.630	0.031	0.031
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	0.126	-
1111052	APKT 160432 PDSR-X	◬						◬					0.372	0.211	0.630	0.126	-
1111924	APHT 1604 PDFR-LN											◬	0.372	0.211	0.630	-	-

◬ First choice | Primeira opção | 1ª opción ◬ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

*For inserts with radius above 2.0 mm, the cutter must be adjusted

LINEPRO AP90-16

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

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	200-330			✓
	6	SS - Austenitic-ferritic (Duplex)	230-260			✓
K	7	Malleable Cast Iron	130-230		✓	✓
	8	Grey Cast Iron	180-245		✓	✓
	9	Nodular Cast iron	160-250		✓	✓
N	10	Aluminium and Non Ferrous	30-130	✓		

Good Conditions Average Conditions Difficult Conditions

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

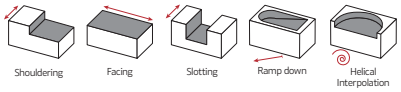
ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PH0910	PH7(6)920	PH7(6)930
P	1	Unalloyed Steel	125-220	-	590-787	525-722
	2	Low-Alloyed Steel	220-280	-	525-722	459-656
	3	High-Alloyed Steel	280-380	-	459-689	394-623
M	4	SS - Ferritic / Martensitic	200-330	-	-	459-656
	5	SS - Austenitic	200-330	-	-	394-525
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	328-459
K	7	Malleable Cast Iron	130-230	-	525-853	492-787
	8	Grey Cast Iron	180-245	-	459-787	459-754
	9	Nodular Cast iron	160-250	-	394-656	328-623
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-

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	200-330	0.003-0.004	-	-
	6	SS - Austenitic-ferritic (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	Aluminium 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	AP (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.

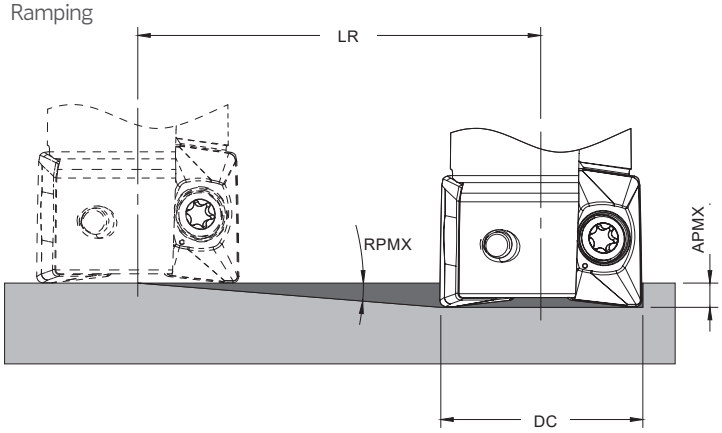


CHIP BREAKER SELECTION GUIDE
Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

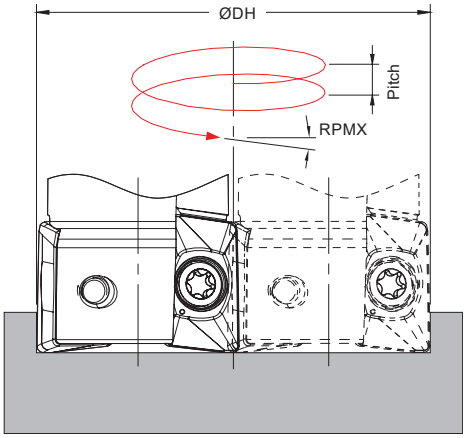
ISO	PSM	Material	HB (Brinell)	Chip breaker application	
				1st choice	Dificult Operations
P	1	Unalloyed Steel	125-220	APKT 16... PDER-X(X2)	APKT 16... PDSR-X(-X2)
	2	Low-Alloyed Steel	220-280	APKT 16... PDSR-X(X2)	-
	3	High-Alloyed Steel	280-380	APKT 16... PDSR-X(X2)	-
M	4	SS - Ferritic / Martensitic	200-330	APKT 16... PDER-X(X2)	-
	5	SS - Austenitic	200-330	APKT 16... PDER-X(X2)	-
	6	SS - Austenitic-ferritic (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	Aluminium and Non Ferrous	30-130	AP..T 16... PDFR-LN	APHT 16.... PDFR-LN

RAMPING AND HELICAL INTERPOLATION
Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	RPMX	APMX	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 0.031 in
Note: During helical interpolation do not exceed maximum pitch
When using different insert radius to calculate the ØDHmin and ØDHmax use the equation below:
- Minimum Diameter: ØDHmin = 2 x (DC - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (DC - R corner radius)

21190

FINEPRO

METRIC LINE



The FINEPRO 21190 ensures superior stability and precision in finishing applications. Designed to minimise vibration and enhance surface quality, it delivers exceptional performance and efficiency in mould and die machining.

A FINEPRO 21190 garante máxima estabilidade e precisão em operações de acabamento. Projetada para reduzir vibrações e melhorar a qualidade superficial, oferece desempenho e eficiência excecionais na maquinação de moldes e matrizes.

El FINEPRO 21190 asegura máxima estabilidad y precisión en operaciones de acabado. Diseñada para reducir vibraciones y mejorar la calidad superficial, ofrece un rendimiento y una eficiencia excepcionales en el mecanizado de moldes y matrices.

FINEPRO 21190 > page 204

- From DC 0.630 in to 1.575 in
  De DC 0.630 in a 1.575 in | Desde DC 0.630 in hasta 1.575 in
- Available in threaded coupling
  Disponível em acoplamento roscado | Disponible en fijación roscada
- Superior stability
  Estabilidade superior | Estabilidad superior
- Excellent surface finish
  Excelente acabamento superficial | Excelente calidad superficial

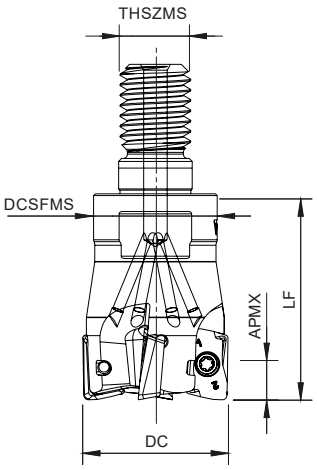


FINEPRO 21190

METRIC LINE

Proprietary milling line





Threaded Coupling

KAPR=90° | GAMP=+5°~8°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181198400	016R21190-02-05-M08025	2	0.630	M8	0.512	0.984	0.051	0.110	XPHW 10..	◈
181203700	020R21190-03-05-M10030	3	0.787	M10	0.709	1.181	0.106	0.110	XPHW 10..	◈
181203800	025R21190-04-05-M12035	4	0.984	M12	0.827	1.378	0.198	0.110	XPHW 10..	◈
181203900	032R21190-05-06-M16035	5	1.260	M16	0.827	1.378	0.375	0.110	XPHW 10..	◈
181204000	040R21190-06-08-M16043	6	1.575	M16	1.142	1.693	0.551	0.110	XPHW 10..	◈

◈ Stock item | Produto de stock | Itens de stock

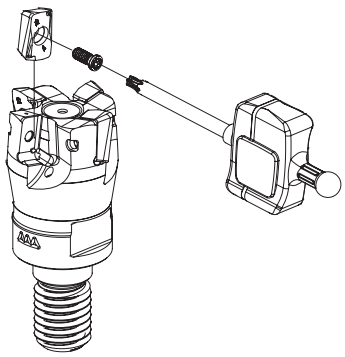
◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
R21190 - 16	P0250503	XT08	DT0812	10.6
R21190 - 20-40	P0250704	XT08	DT0812	10.6

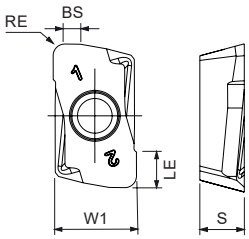
Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



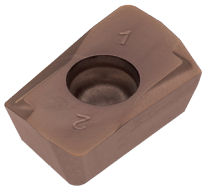
XPHW 1003... Inserts | Pastilhas | Plaquitas



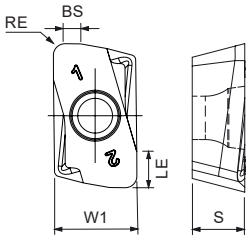
XPHW-MH2



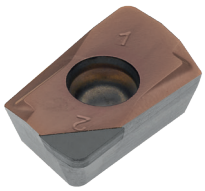
XPHW-MH2



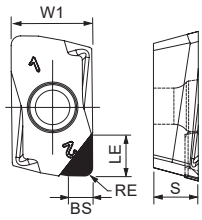
XPHW-MH



XPHW-MH



XPHW-R Z1



XPHW-R Z1

		P		M	N	S	H				Dimensions Dimensões Dimensiones (in)				
		PVD		PVD	PCD	PVD	PVD								
	(2) Grade code	8F	4F	4F	D6	4F	X4	8F	X6	4F					
(1) Geometry code	ISO Reference	PHF603	PHF910	PHF910	PDP410	PHF910	PHH603	PHF603	PHH910	PHF910	W1	S	LE	RE	BS
1113427	XPHW 100308 ZER-MH2	◬	◬	◬		◬		◬		◬	0.273	0.141	0.118	0.031	0.091
1113458	XPHW 100310 ZER-MH2	◬	◬	◬		◬		◬		◬	0.273	0.141	0.118	0.039	0.091
1113459	XPHW 100320 ZER-MH2	◬	◬	◬		◬		◬		◬	0.273	0.141	0.118	0.079	0.091
1112500	XPHW 100308 ZER-MH						◬		◬		0.274	0.142	0.118	0.031	0.059
1112736	XPHW 100310 ZER-MH						◬				0.274	0.142	0.118	0.039	0.051
1112735	XPHW 100320 ZER-MH						◬				0.274	0.142	0.118	0.047	0.012
1112556	XPHW 100308 R Z1				◬						0.274	0.142	0.150	0.031	0.059

◬ First choice | Primeira opção | 1ª opción ◬ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

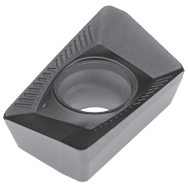
Insert order code = (1) Geometry Code + (2) Grade Code

FINEPRO 21190

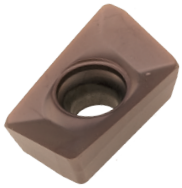
METRIC LINE

Proprietary milling line

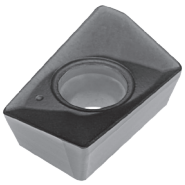
XPET 1003... Inserts | Pastilhas | Plaquitas



XPET-LP



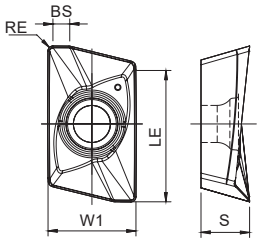
XPET-LS



XPET-MP



XPET-LN



XPET-LP | LS | MP | LN

		P				M	K					N	S	Dimensions Dimensões Dimensiones (in)				
		CVD	PVD			PVD	CVD		PVD			UNC	PVD					
	(2) Grade code	T9	X5	T1	P4	X9	L5	L9	X5	T1	P4	10	X9					
(1) Geometry code	ISO Reference	PHS740	PHP910	PHP920	PHP930	PHH930	PH5705	PH5740	PHP910	PHP920	PHP930	PH0910	PHH930	W1	S	LE	RE	BS
1113132	XPET 100302 PDER-LP					◈							◈	0.274	0.156	0.413	0.008	0.059
1111980	XPET 100304 PDER-LP			◈	◈	◈				◈	◈		◈	0.274	0.156	0.413	0.016	0.051
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	0.063	0.031
1113365	XPET 100304 PDER-LS			◈		◈				◈			◈	0.274	0.156	0.413	0.016	0.075
1112197	XPET 100308 PDER-LS			◈		◈				◈			◈	0.274	0.156	0.413	0.031	0.059
1113358	XPET 100312 PDER-LS			◈		◈				◈			◈	0.274	0.156	0.413	0.047	0.039
1113366	XPET 100316 PDER-LS			◈		◈				◈			◈	0.274	0.156	0.413	0.063	0.031
1111982	XPET 100304 PDSR-MP		○	◈	◈		◈	◈	○	◈	◈			0.274	0.156	0.413	0.016	0.043
1111983	XPET 100308 PDSR-MP	◈	◈	◈	◈		◈	◈	◈	◈	◈			0.274	0.156	0.413	0.031	0.053
1111984	XPET 100304 PDFR-LN											◈		0.274	0.156	0.413	0.016	0.030
1112906	XPET 100308 PDFR-LN											◈		0.274	0.156	0.413	0.031	0.041
1111985	XPET 100312 PDFR-LN											◈		0.274	0.156	0.413	0.047	0.030

◈ 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 Guia para selecção de graus | Tabla para selección de calidades

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHF603	PHH603	PHP910	PHF910	PHP920	PHP930	PHH930	PH5740	PHS740
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	200-330				✓			✓		
M	6	SS - Austenitic-ferritic (Duplex)	230-260				✓			✓		
K	7	Malleable Cast Iron	130-230			✓		✓	✓		✓	
K	8	Grey Cast Iron	180-245			✓		✓	✓		✓	
K	9	Nodular Cast iron	160-250			✓		✓	✓		✓	
N	10	Aluminium and Non Ferrous	30-130									
S	11	Heat Resistant Super Alloys	200-320				✓					
H	12	Hardened Steels	40-65 HRC	✓	✓		✓					

● 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 →
				PH0910	PHF603	PHH603	PHP910	PHF910	PHP920	PHP930	PHH930	PH5740	PHS740
P	1	Unalloyed Steel	125-220	-	-	-	590-820	590-820	590-820	525-754	-	-	459-722
	2	Low-Alloyed Steel	220-280	-	-	-	525-787	525-787	525-754	459-689	-	-	394-656
	3	High-Alloyed Steel	280-380	-	590-1017	590-1017	459-754	459-754	459-722	394-656	-	-	328-623
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	459-689	-	-	459-689	-	-
	5	SS - Austenitic	200-330	-	-	-	-	394-558	-	-	394-558	-	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	328-492	-	-	328-492	-	-
K	7	Malleable Cast Iron	130-230	-	-	-	590-984	-	525-886	492-820	-	525-853	-
	8	Grey Cast Iron	180-245	-	-	-	525-820	-	459-820	459-754	-	459-787	-
	9	Nodular Cast iron	160-250	-	-	-	492-689	-	394-689	328-656	-	394-656	-
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-	-	-	-	2624-9840
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	98-361	-	-	-	-	-
H	12	Hardened Steels	40-65 HRC	-	262-394	230-886	-	262-394	-	-	-	-	-

ISO	PSM	Material	HB (Brinell)	Feed fz (in/t)							
				XPET 10.. LP	XPET 10.. LS	XPET 10.. MP	XPET 10.. LN	XPET 10.. HF	XPHW 10..R Z1	XPHW 10..MH	XPHW 10..MH2
P	1	Unalloyed Steel	125-220	0.003-0.008	-	0.004-0.010	-	0.016-0.031	-	0.004-0.010	0.004-0.006
	2	Low-Alloyed Steel	220-280	0.003-0.008	-	0.004-0.008	-	0.016-0.031	-	0.004-0.010	0.004-0.006
	3	High-Alloyed Steel	280-380	0.003-0.006	-	0.004-0.008	-	0.016-0.024	-	0.004-0.010	0.004-0.005
M	4	SS - Ferritic / Martensitic	200-330	0.003-0.008	0.003-0.008	0.004-0.008	-	0.016-0.028	-	-	0.004-0.006
	5	SS - Austenitic	200-330	0.003-0.008	0.003-0.008	0.004-0.008	-	0.016-0.028	-	-	0.004-0.006
	6	SS - Austenitic-ferritic (Duplex)	230-260	0.003-0.006	0.003-0.006	0.004-0.008	-	0.016-0.024	-	-	0.004-0.006
K	7	Malleable Cast Iron	130-230	0.003-0.008	-	0.004-0.010	-	0.020-0.031	-	-	-
	8	Grey Cast Iron	180-245	0.003-0.008	-	0.004-0.010	-	0.020-0.031	-	-	-
	9	Nodular Cast iron	160-250	0.003-0.008	-	0.004-0.008	-	0.020-0.024	-	-	-
N	10	Aluminium and Non Ferrous	30-130	-	-	-	0.003-0.010	-	0.004-0.010	-	-
S	11	Heat Resistant Super Alloys	200-320	0.002-0.003	0.002-0.003	-	-	0.016-0.024	-	-	0.003-0.005
H	12	Hardened Steels	40-65 HRC	-	-	-	-	-	-	0,08-0,15	0,05-0,10

(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 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	2nd choice
P	1	Unalloyed Steel	125-220	XPHW 10 ... MH2	XPHW 10 ... MH
	2	Low-Alloyed Steel	220-280	XPHW 10 ... MH2	XPHW 10 ... MH
	3	High-Alloyed Steel	280-380	XPHW 10 ... MH2	-
M	4	SS - Ferritic / Martensitic	200-330	XPHW 10 ... MH2	XPHW 10 ... MH
	5	SS - Austenitic	200-330	XPHW 10 ... MH2	XPHW 10 ... MH
	6	SS - Austenitic-ferritic (Duplex)	230-260	XPHW 10 ... MH2	XPHW 10 ... MH
K	7	Malleable Cast Iron	130-230	XPET 10 ... LP	XPET 10 ... MP
	8	Grey Cast Iron	180-245	XPET 10 ... MP	-
	9	Nodular Cast iron	160-250	XPET 10 ... MP	-
N	10	Aluminium and Non Ferrous	30-130	XPET 10 ... LN/R Z1	-
S	11	Heat Resistant Super Alloys	200-320	XPHW 10 ... MH2	XPHW 10 ... MH
H	12	Hardened Steels	40-65 HRC	XPHW 10 ... MH2	XPHW 10 ... MH

20290

HELIPRO

METRIC LINE



The HELIPRO 20290 delivers large depths of cut, and high metal removal rates in shouldering and profiling applications. Engineered to outperform in large and heavy machining operations, due to high durability and cutting stability.

A HELIPRO 20290 proporciona grandes profundidades de corte e elevadas taxas de remoção de metal em aplicações de corte e perfilagem. Concebida para ter um desempenho superior em operações de maquinação grandes e pesadas, devido à elevada durabilidade e estabilidade de corte.

La HELIPRO 20290 proporciona grandes profundidades de corte y altas velocidades de arranque de metal en aplicaciones de corte y perfilado. Diseñada para un rendimiento superior en operaciones de mecanizado grandes y pesadas gracias a su gran durabilidad y estabilidad de corte.

HELIPRO 20290 > page 210

- From DC 1.969 in to 4.921 in
  De DC 1.969 in a 4.921 in | Desde DC 1.969 in hasta 4.921 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- High material removal rate
  Alta taxa de remoção de material | Alta tasa de remoción de material
- Superior stability
  Estabilidade superior | Estabilidad superior

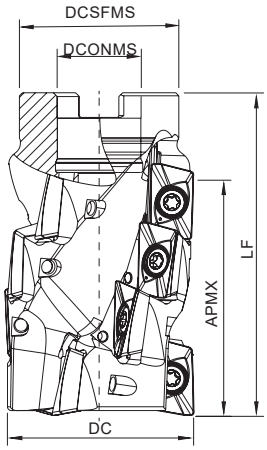


HELIPRO 20290

METRIC LINE

Proprietary milling line





Arbor Mounting

KAPR=90° | GAMP=+8°

Order code Código	Reference Referência Referencia	CICT	Nº Stages	Nº Flutes	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Insert Pastilha Inserto	Stock
					DC	DCONMS	DCSFMS	LF	APMX			
181100100	050A20290-03-08-022085-063-12	12	4	3	1.969	0.866	1.654	3.346	2.480	1.025	XP.. 1706...	◈
181133000	063A20290-04-08-027085-063-16	16	4	4	2.480	1.063	2.362	3.346	2.480	2.050	XP.. 1706...	◈
181126500	080A20290-05-08-032085-063-20	20	4	5	3.150	1.260	2.756	3.346	2.480	3.797	XP.. 1706...	◈
181126600	100A20290-06-08-040085-063-24	24	4	6	3.937	1.575	3.543	3.346	2.480	6.636	XP.. 1706...	◈
181133100	125A20290-06-08-040105-079-30	30	5	6	4.921	1.575	4.528	4.134	3.110	14.535	XP.. 1706...	◈

◈ Stock item | Produto de stock | Itens de stock

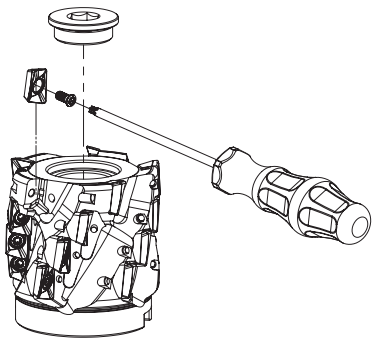
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Acessórios | Repuestos

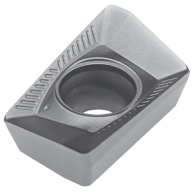
Order separately

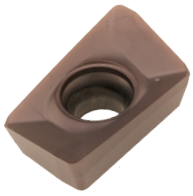
Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value	Sealing Cap
A20290 - 50	P0451001	PT20	DT2050	44.3	TRM2009S8
A20290 - 63	P0451001	PT20	DT2050	44.3	TRM2411S10
A20290 - 80	P0451001	PT20	DT2050	44.3	TRM3012S14
A20290 - 100-125	P0451001	PT20	DT2050	44.3	TRM3615S17

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

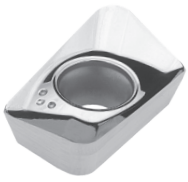


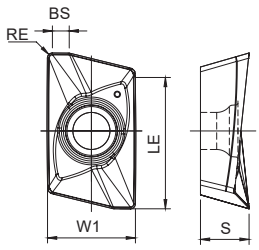
XPET 1706... Inserts | Pastilhas | Plaquitas


XPET-LP


XPET-LS


XPET-MP


XPET-LN



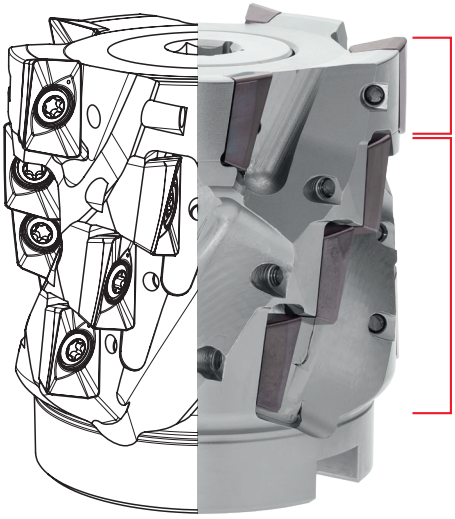
XPET-LP | LS | MP | LN

		P			M		K				N	S		Dimensions Dimensões Dimensiones (in)				
		CVD	PVD		PVD		CVD		PVD		UNC	PVD						
	(2) Grade code	T9	T1	G6	X9	G6	L5	L9	T1	G6	10	X9	G6					
(1) Geometry code	ISO Reference	PHS740	PHP920	PH7740	PHH930	PH7740	PH5705	PH5740	PHP920	PH7740	PH0910	PHH930	PH7740	W1	S	LE	RE	BS
1111986	XPET 170608 PDER-LP		◉	◈		◉			◉	◈			◉	0.445	0.250	0.689	0.031	0.071
1111987	XPET 170616 PDER-LP		◉	◈		◉			◉	◈			◉	0.445	0.250	0.689	0.063	0.047
1112223	XPET 170608 PDER-LS				◉	◈						◉	◈	0.445	0.250	0.689	0.031	0.076
1113373	XPET 170612 PDER-LS				○							○		0.445	0.250	0.689	0.047	0.061
1113361	XPET 170616 PDER-LS				◉							◉		0.445	0.250	0.689	0.063	0.047
1113362	XPET 170620 PDER-LS				◉							◉		0.445	0.250	0.689	0.079	0.083
1113363	XPET 170632 PDER-LS				◉							◉		0.445	0.250	0.689	0.126	0.038
1111988	XPET 170608 PDSR-MP	◈	◉	◈			◉	◈	◈	◈				0.445	0.250	0.689	0.031	0.071
1111989	XPET 170616 PDSR-MP		◉	◈			◉	◈	◈	◈				0.445	0.250	0.689	0.063	0.039
1111990	XPET 170608 PDFR-LN										◉			0.445	0.250	0.689	0.031	0.047
1111991	XPET 170620 PDFR-LN										◉			0.445	0.250	0.689	0.079	0.039
1111992	XPET 170632 PDFR-LN										◉			0.445	0.250	0.689	0.126	0.031

◉ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

PROCEDURES FOR MOUNTING INSERTS Procedimentos para pastilhas | Procedimientos para plaquitas



Radius from 0.031 in to 0.126 in

To minimize scallop only radius 0.031 in can be applied

HELIPRO 20290

METRIC LINE

Proprietary milling line

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH0910	PH5705	PHP920	PHP930	PHH930	PH5740	PHS740	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	200-330					✓			✓
	6	SS - Austenitic-ferritic (Duplex)	230-260					✓			✓
K	7	Malleable Cast Iron	130-230		✓	✓	✓		✓		✓
	8	Grey Cast Iron	180-245		✓	✓	✓		✓		✓
	9	Nodular Cast iron	160-250		✓	✓	✓		✓		✓
N	10	Aluminium 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 → PH0910	PH5705	PHP920	PHP930	PHH930	PH5740	PHS740	PH7740
P	1	Unalloyed Steel	125-220	-	-	590-820	525-754	-	-	459-722	459-656
	2	Low-Alloyed Steel	220-280	-	-	525-754	459-689	-	-	394-656	426-590
	3	High-Alloyed Steel	280-380	-	-	459-722	394-656	-	-	328-623	328-558
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	459-689	-	-	426-590
	5	SS - Austenitic	200-330	-	-	-	-	394-558	-	-	361-525
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	328-492	-	-	295-492
K	7	Malleable Cast Iron	130-230	-	525-951	525-886	-	-	525-853	-	459-722
	8	Grey Cast Iron	180-245	-	558-1050	459-820	-	-	459-787	-	394-689
	9	Nodular Cast iron	160-250	-	459-656	394-689	-	-	394-656	-	328-623
N	10	Aluminium and Non Ferrous	30-130	328-6560	-	-	-	-	-	-	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	98-361	-	-	98-328

ISO	PSM	Material	HB (Brinell)	Feed fz (in/t) XPET 17... LP	XPET 17... MP	XPET 17... LN	XPET 17... LS
P	1	Unalloyed Steel	125-220	0.004-0.014	0.004-0.014	-	-
	2	Low-Alloyed Steel	220-280	0.004-0.014	0.004-0.014	-	-
	3	High-Alloyed Steel	280-380	0.004-0.012	0.004-0.012	-	-
M	4	SS - Ferritic / Martensitic	200-330	0.004-0.012	-	-	0.004-0.014
	5	SS - Austenitic	200-330	0.004-0.012	-	-	0.004-0.012
	6	SS - Austenitic-ferritic (Duplex)	230-260	0.004-0.010	-	-	0.394-0.010
K	7	Malleable Cast Iron	130-230	0.004-0.014	0.004-0.014	-	-
	8	Grey Cast Iron	180-245	0.004-0.014	0.004-0.014	-	-
	9	Nodular Cast iron	160-250	0.004-0.012	0.004-0.012	-	-
N	10	Aluminium and Non Ferrous	30-130	-	-	0.004-0.014	-
S	11	Heat Resistant Super Alloys	200-320	0.004-0.008	-	-	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	AP (in)
Slotting	100%	<20%	0.512-1.654
Shouldering	<50%	>8%	1.181-2.480
	≤25%	>12%	1.654-3.110

(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.

Spare Parts: A - 288 Technical Data: A - 298

palbit

CHIP BREAKER SELECTION GUIDE

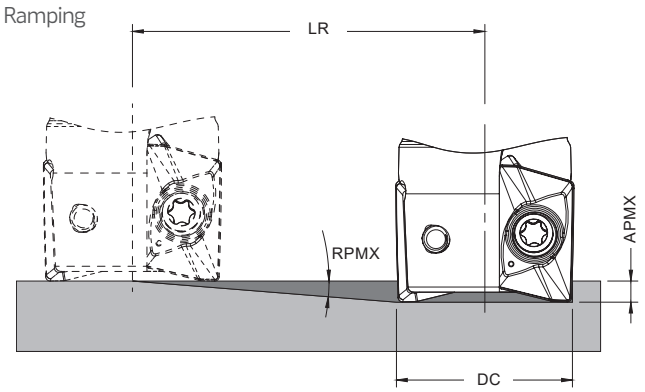
Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip breaker application	
				1st choice	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... LS	XPET 17... LP
	5	SS - Austenitic	200-330	XPET 17... LS	XPET 17... LP
	6	SS - Austenitic-ferritic (Duplex)	230-260	XPET 17... LS	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	Aluminium and Non Ferrous	30-130	XPET 17... LN	-
S	11	Heat Resistant Super Alloys	200-320	XPET 17... LS	XPET 17... LP

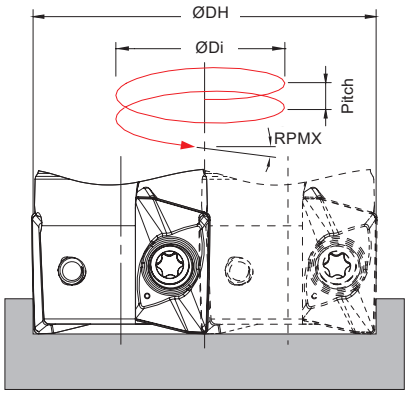
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



Blind hole
Flat bottom

ØDi = ØDH - DC

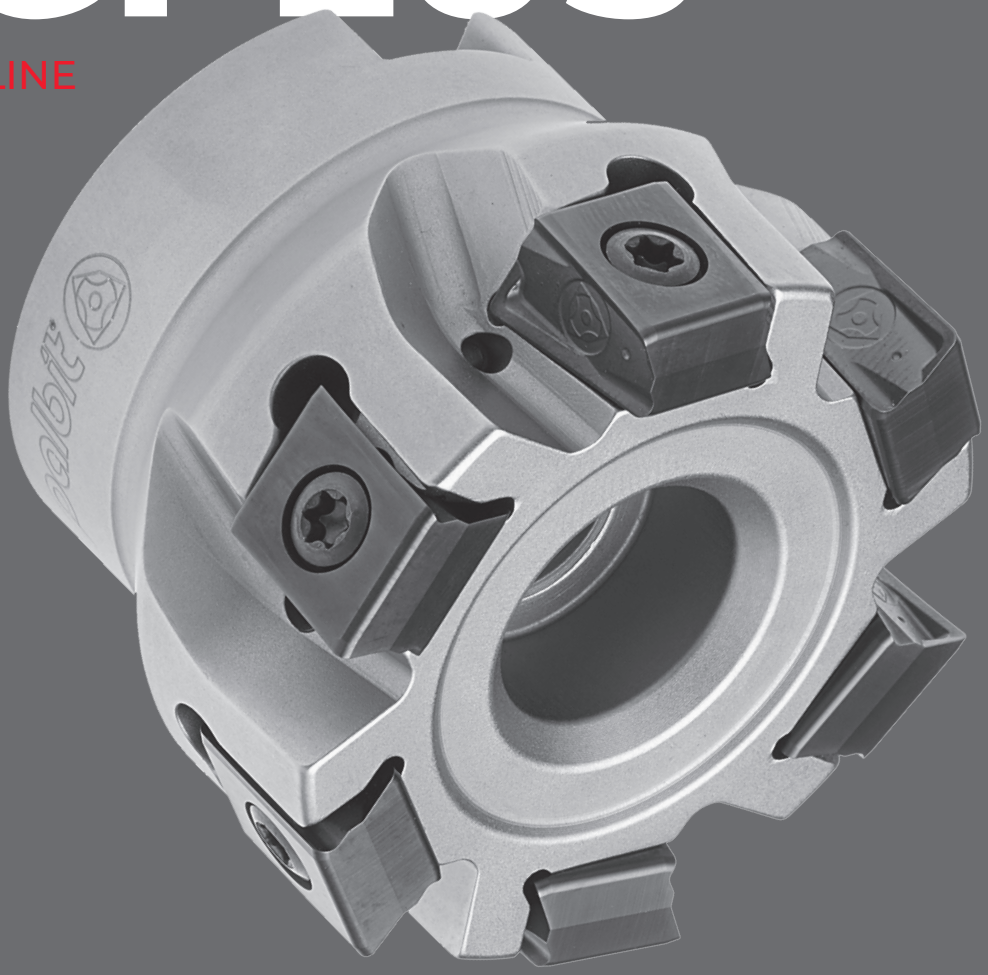
DC	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	
1.969	0.079	0.335	9.583	3.732 -	- 3.874	0.193 0.209
2.480	0.059	0.335	12.780	4.756 -	- 4.898	0.185 0.197
3.150	0.039	0.335	19.173	6.094 -	- 6.236	0.161 0.165
3.937	0.031	0.335	23.965	7.669 -	- 7.811	0.161 0.169
4.921	0.028	0.335	27.390	9.638 -	- 9.780	0.177 0.185

(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 equation below:
- Minimum Diameter: ØDHmin = 2 x (DC - (R corner radius + F width of edge wiper))
- Maximum Diameter: ØDHmax = 2 x (DC - R corner radius)

90090 | 90190 | 90390

TGPLUS

METRIC LINE

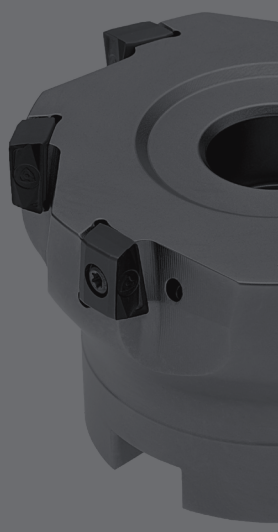


The TGPLUS series offers unparalleled reliability in rough shoulder milling, thanks to robust cutting edges and thicker cross-sections, complemented by a highly rigid cutter featuring a thicker core.The TGPLUS series design optimizes stability and surface area contact between the insert and the cutter body, promoting excellent surface finishes and clean 90-degree walls.

A série TGPLUS oferece uma fiabilidade incomparável no desbaste em fresagem a 90º, graças a arestas de corte robustas e seções transversais mais espessas, complementadas por uma ferramenta altamente rígida com núcleo mais espesso. O design da série TGPLUS otimiza a estabilidade e a área de contato superficial entre a pastilha e o corpo da ferramenta, promovendo excelentes acabamentos de superfície e paredes a 90º.

La serie TGPLUS ofrece una fiabilidad incomparable en el desbaste en fresado a 90º, gracias a sus robustos filos de corte y secciones transversales más gruesas, complementadas por una herramienta altamente rígida con un núcleo más grueso. El diseño de la serie TGPLUS optimiza la estabilidad y el área de contacto superficial entre la plaquita y el cuerpo de la herramienta, promoviendo excelentes acabados de superficie y paredes a 90º.

TGPLUS 90090 > page 216



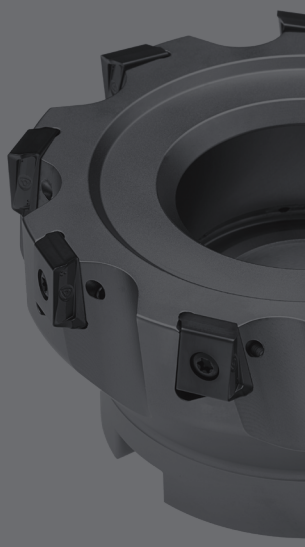
- From DC 0.630 in to 2.480 in
  De DC 0.630 in a 2.480 in | Desde DC 0.630 in hasta 2.480 in
- Available in arbor, threaded, weldon and cylindrical shank
  Disponível em montagem tipo árvore, acoplamento roscado, haste weldon e cilíndrica | Disponible en fijación con tornillo central, fijación roscada, mango tipo weldon y cilindrico
- Small tangential insert with 4 cutting edges (LNXT 0904..)
  Pastilha tangencial pequena com 4 arestas de corte (LNXT 0904..) | Plaquita tangencial pequeña con 4 filos de corte (LNXT 0904..)
- Excellent machining stability
  Excelente estabilidade de maquinação | Excelente estabilidad de mecanizado

TGPLUS 90190 > page 220



- From DC 0.984 in to 4.921 in
  De DC 0.984 in a 4.921 in | Desde DC 0.984 in hasta 4.921 in
- Available in arbor mounting, weldon and cylindrical shank
  Disponível em montagem tipo árvore, haste weldon e cilíndrica | Disponible en fijación con tornillo central, mango tipo weldon y cilindrico
- Medium tangential insert with 4 cutting edges (LNXT 1306..)
  Pastilha tangencial média com 4 arestas de corte (LNXT 1306..) | Plaquita tangencial media con 4 filos de corte (LNXT 1306..)
- High rake angle insert reduces cutting force
  Pastilha de alto ângulo de inclinação que reduz a força de corte | Plaquita de alto ángulo de incidencia que reduce la fuerza de corte

TGPLUS 90390 > page 224

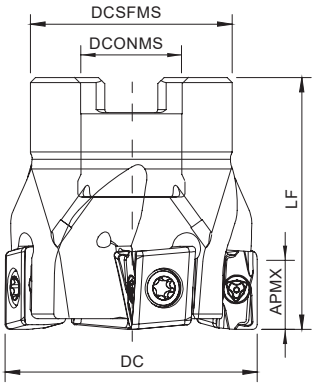


- From DC 1.969 in to 6.299 in
  De DC 1.969 in a 6.299 in | Desde DC 1.969 in hasta 6.299 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Large tangential insert with 2 cutting edges (LNXT 1506..)
  Pastilha tangencial grande com 4 arestas de corte (LNXT 1506..) | Plaquita tangencial grande con 4 filos de corte (LNXT 1506..)
- Heavy duty milling
  Fresagem pesada | Fresado pesado

TGPLUS 90090

METRIC LINE





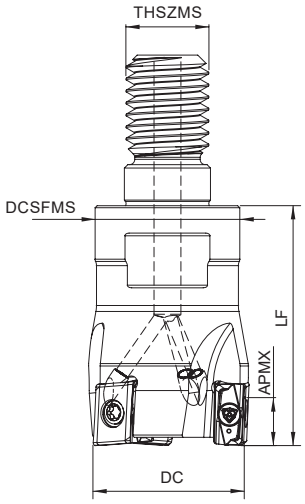
Arbor Mounting

KAPR=90° | GAMP=-4°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181144400	040A90090-04-04-016040	4	1.575	0.630	1.417	1.575	0.529	A	0.276	LNXT 0904...	◈
181144500	050A90090-05-04-022040	5	1.969	0.866	1.575	1.575	0.705	A	0.276	LNXT 0904...	◈
181144600	063A90090-07-04-022040	7	2.480	0.866	1.890	1.575	1.190	A	0.276	LNXT 0904...	◈
181146600	063A90090-10-04-022040	10	2.480	0.866	1.890	1.575	1.190	A	0.276	LNXT 0904...	◈

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





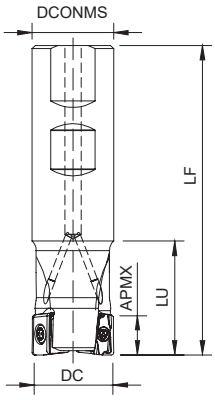
Threaded Coupling

KAPR=90° | GAMP=-4°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181144200	025R90090-03-04-M12035	3	0.984	0.472	0.827	1.378	0.220	0.276	LNXT 0904...	◈
181144300	032R90090-04-04-M16040	4	1.260	0.630	1.142	1.575	0.463	0.276	LNXT 0904...	◈

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Weldon Shank

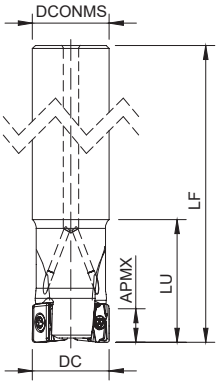
KAPR=90° | GAMP=-4°(*-6°)

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181109400	016W90090-02-06-016090*	2	0.630	0.630	3.543	0.984	0.12	0.276	LNXT 0904...	⛭
181109500	025W90090-03-04-025095	3	0.984	0.984	3.740	1.181	0.31	0.276	LNXT 0904...	⛭
181144100	032W90090-04-04-032110	4	1.260	1.260	4.331	1.181	0.61	0.276	LNXT 0904...	⛭

⛭ Stock item | Produto de stock | Itens de stock

◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Cylindrical Shank

KAPR=90° | GAMP=-4°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181158800	020E90090-02-04-020150	2	0.787	0.787	5.906	1.181	0.331	0.276	LNXT 0904...	⛭
181148100	025E90090-03-04-025200	3	0.984	0.984	7.874	1.181	0.683	0.276	LNXT 0904...	◯
181148200	032E90090-04-04-032250	4	1.260	1.260	9.843	1.181	1.719	0.276	LNXT 0904...	◯

⛭ Stock item | Produto de stock | Itens de stock

◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

TGPLUS 90090

METRIC LINE

Proprietary milling line

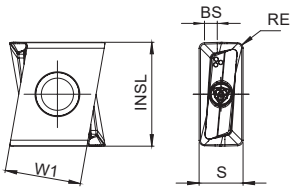
LNXT 0904... Inserts | Pastilhas | Plaquitas



LNXT-MP



LNXT-LS



LNXT-MP | LS

		P			M	K			S	Dimensions Dimensões Dimensiones (in)				
		CVD	PVD		PVD	CVD	PVD		PVD					
	(2) Grade code	T9	T1	G6	X9	L6	T1	G6	X9					
(1) Geometry code	ISO Reference	PHS740	PHP920	PH7740	PHH930	PH5320	PHP920	PH7740	PHH930	W1	S	INSL	RE	BS
1112225	LNXT 090404 PNER-MP	◉	◉	◉		◉	◉	◉		0.370	0.177	0.354	0.016	-
1112226	LNXT 090408 PNER-MP	◉	◉	◉		◉	◉	◉		0.370	0.177	0.354	0.031	-
1112868	LNXT 090404 PNER-LS				◉				◉	0.370	0.177	0.354	0.031	-

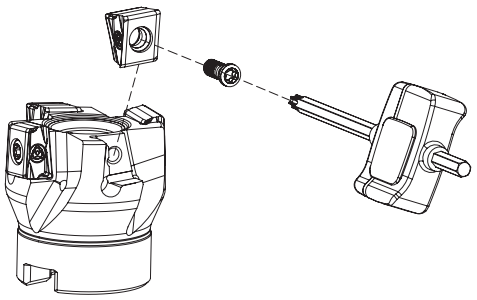
◉ First choice | Primeira opção | 1ª opción ◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
			Nm	lbf/in
A90090 - 40-63	P0250700	XT07	DT0709	10.6
R90090 - 25-32	P0250700	XT07	DT0709	10.6
W90090 - 16-32	P0250700	XT07	DT0709	10.6
E90090 - 25-32	P0250700	XT07	DT0709	10.6



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance				Toughness →
				PH5320	PHP920	PHH930	PHS740	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	200-330			✓		
	6	SS - Austenitic-ferritic (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 fz (in/t)	
				PH5320	PHP920	PHH930	PHS740	PH7740	LNXT 09... MP	LNXT 09... LS
P	1	Unalloyed Steel	125-220	-	590-820	-	459-722	459-656	0.003-0.010	-
	2	Low-Alloyed Steel	220-280	-	525-754	-	394-656	426-590	0.003-0.010	-
	3	High-Alloyed Steel	280-380	-	459-722	-	328-623	328-558	0.003-0.006	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	459-689	-	-	0.003-0.010	0.003-0.010
	5	SS - Austenitic	200-330	-	-	394-558	-	-	0.003-0.008	0.003-0.008
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	328-492	-	-	0.003-0.006	0.003-0.008
K	7	Malleable Cast Iron	130-230	492-918	525-886	-	-	459-722	0.003-0.012	-
	8	Grey Cast Iron	180-245	525-1050	459-820	-	-	394-689	0.003-0.010	-
	9	Nodular Cast iron	160-250	328-623	394-689	-	-	328-623	0.003-0.008	-
S	11	Heat Resistant Super Alloys	200-320	-	-	98-361	-	-	-	0.003-0.984

(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.

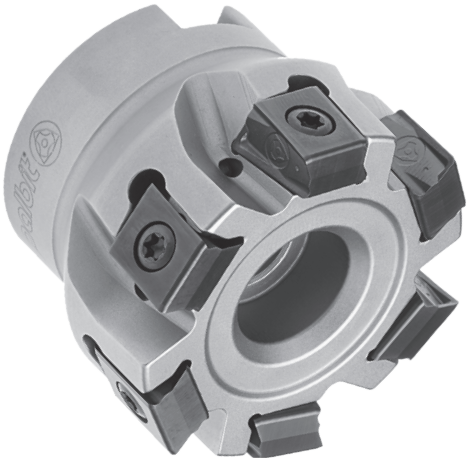
CHIP BREAKER SELECTION GUIDE Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

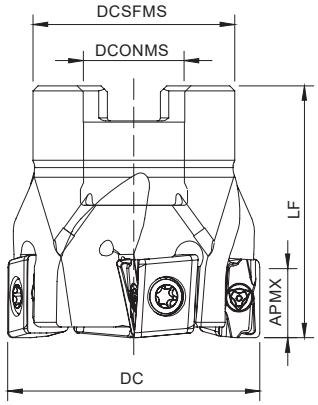
ISO	PSM	Material	HB (Brinell)	Chip breaker application
				1st choice
P	1	Unalloyed Steel	125-220	MP
	2	Low-Alloyed Steel	220-280	MP
	3	High-Alloyed Steel	280-380	MP
M	4	SS - Ferritic / Martensitic	200-330	LS
	5	SS - Austenitic	200-330	LS
	6	SS - Austenitic-ferritic (Duplex)	230-260	LS
K	7	Malleable 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	LS

TGPLUS 90190

METRIC LINE

Proprietary milling line





Arbor Mounting

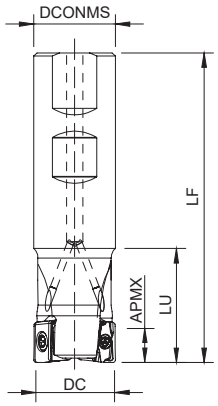
KAPR=90° | GAMP=-4°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181118800	040A90190-04-04-016040	4	1.575	0.630	1.260	1.575	0.375	A	0.433	LNXT 1306...	◎
181118900	040A90190-05-04-016040	5	1.575	0.630	1.260	1.575	0.397	A	0.433	LNXT 1306...	◎
181111200	050A90190-05-04-022040	5	1.969	0.866	1.575	1.575	0.595	A	0.433	LNXT 1306...	◎
181111300	050A90190-06-04-022040	6	1.969	0.866	1.575	1.575	0.617	A	0.433	LNXT 1306...	◎
181119000	063A90190-06-04-022040	6	2.480	0.866	2.047	1.575	1.146	A	0.433	LNXT 1306...	◎
181119100	063A90190-08-04-022040	8	2.480	0.866	2.047	1.575	1.146	A	0.433	LNXT 1306...	◎
181119200	080A90190-07-04-027050	7	3.150	1.063	2.362	1.969	1.940	B	0.433	LNXT 1306...	◎
181119300	080A90190-10-04-027050	10	3.150	1.063	2.362	1.969	1.895	B	0.433	LNXT 1306...	◎
181119400	100A90190-09-04-032050	9	3.937	1.260	3.150	1.969	3.438	B	0.433	LNXT 1306...	◎
181119500	100A90190-13-04-032050	13	3.937	1.260	3.150	1.969	3.438	B	0.433	LNXT 1306...	◎
181119600	125A90190-11-04-040063	11	4.921	1.575	3.543	2.480	6.325	B	0.433	LNXT 1306...	◎
181119700	125A90190-16-04-040063	16	4.921	1.575	3.543	2.480	6.303	B	0.433	LNXT 1306...	◎

◎ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Weldon Shank

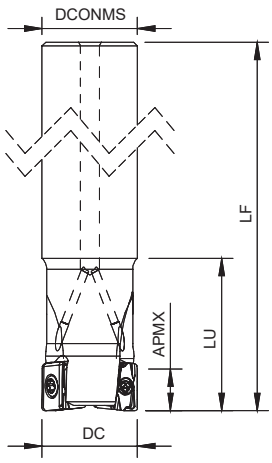
KAPR=90° | GAMP=-4°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181118300	025W90190-02-04-025095	2	0.984	0.984	3.740	1.772	0.639	0.433	LNXT 1306...	◎
181109800	032W90190-03-04-032110	3	1.260	1.260	4.331	1.969	1.212	0.433	LNXT 1306...	◎
181118400	040W90190-04-04-032110	4	1.575	1.260	4.331	1.969	1.322	0.433	LNXT 1306...	◎

◎ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Cylindrical Shank

KAPR=90° | GAMP=-4°

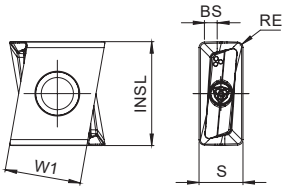
Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181118500	025E90190-02-04-025200	2	0.984	0.984	7.874	1.575	1.455	0.433	LNXT 1306...	◈
181118600	032E90190-03-04-032250	3	1.260	1.260	9.843	1.969	3.019	0.433	LNXT 1306...	◈
181118700	040E90190-04-04-032250	4	1.575	1.260	9.843	1.969	3.130	0.433	LNXT 1306...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

LNXT 1306... Inserts | Pastilhas | Plaquitas



LNXT-MP



LNXT-MP

		P			M	K		
		CVD	PVD		PVD	CVD	PVD	
	(2) Grade code	T9	T1	G6	G6	L6	T1	G6
(1) Geometry code	ISO Reference	PHS740	PHP920	PH7740	PH7740	PH5320	PHP920	PH7740

Dimensions Dimensões Dimensiones (in)				
W1	S	INSL	RE	BS
0.386	0.268	0.512	0.016	0.035
0.386	0.268	0.512	0.031	0.035

Geometry code	ISO Reference
1112242	LNXT 130604 PNER-MP
1112243	LNXT 130608 PNER-MP

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

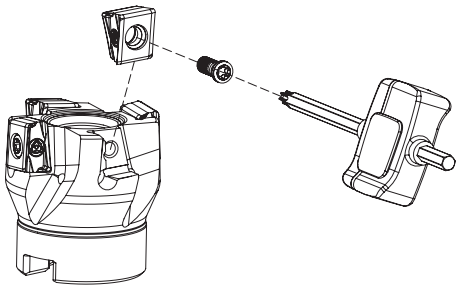
TGPLUS 90190

METRIC LINE

Proprietary milling line

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Order separately Key (Torx - Nm)	Torque Value	Order separately Screw	DIN 6368 Wrench
E90190 - 25	P04010IP	XT15IP-S35	DT1530	26.6	-	-
E90190 - 32-40	P0401200	XT15	DT1530	26.6	-	-
W90190 - 25	P04010IP	XT15IP-S35	DT1530	26.6	-	-
W90190 - 32-40	P0401200	XT15	DT1530	26.6	-	-
A90190 - 40-63	P0401200	XT15	DT1530	26.6	-	-
A90190 - 80	P0401200	XT15	DT1530	26.6	J0123510	SD6368-12
A90190 - 100	P0401200	XT15	DT1530	26.6	J0164110	SD6368-16
A90190 -125	P0401200	XT15	DT1530	26.6	J0204610	SD6368-20



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH5320	PHP920	PHS740	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	200-330				✓
	6	SS - Austenitic-ferritic (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 Condições de corte recomendadas | Condiciones de corte recomendables

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance			Toughness →	Feed fz (in/t)
				PH5320	PHP920	PHS740	PH7740	LNXT 09... MP
P	1	Unalloyed Steel	125-220	-	590-820	459-722	459-656	0.003-0.010
	2	Low-Alloyed Steel	220-280	-	525-754	394-656	426-590	0.003-0.010
	3	High-Alloyed Steel	280-380	-	459-722	328-623	328-558	0.003-0.006
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	426-590	0.003-0.010
	5	SS - Austenitic	200-330	-	-	-	361-525	0.003-0.008
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	295-492	0.003-0.006
K	7	Malleable Cast Iron	130-230	492-918	525-886	-	459-722	0.003-0.012
	8	Grey Cast Iron	180-245	525-1050	459-820	-	394-689	0.003-0.010
	9	Nodular Cast iron	160-250	328-623	394-689	-	328-623	0.003-0.008

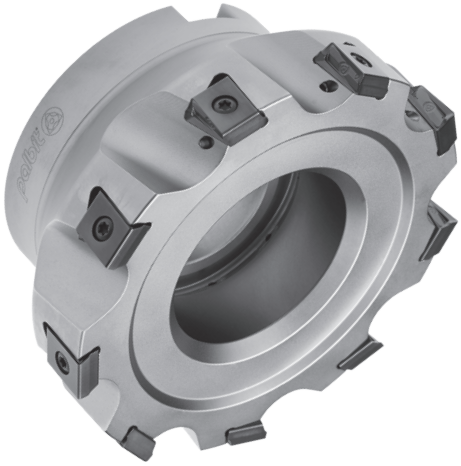
(Note 1) Cutting conditions $a_e/Dc=70\%$.

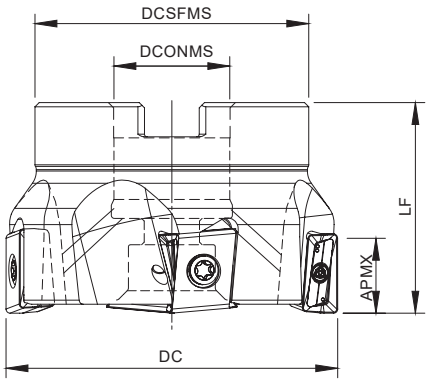
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

TGPLUS 90390

METRIC LINE

Proprietary milling line





Arbor Mounting

KAPR=90° | GAMP=-5°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181069200	050A90390-05-05-022040	5	1.969	0.866	1.575	1.575	0.315	A	1.214	LNXT 1506...	◈
181066400	063A90390-05-05-022040	5	2.480	0.866	2.047	1.575	0.524	A	1.214	LNXT 1506...	◈
181051000	063A90390-08-05-022040	8	2.480	0.866	2.047	1.575	0.550	A	1.214	LNXT 1506...	◈
181066500	080A90390-07-05-027050	7	3.150	1.063	2.362	1.969	0.936	A	1.214	LNXT 1506...	◈
181052000	080A90390-10-05-027050	10	3.150	1.063	2.362	1.969	0.939	B	1.214	LNXT 1506...	◈
181066600	100A90390-08-05-032050	8	3.937	1.260	3.150	1.969	1.586	B	1.214	LNXT 1506...	◈
181051100	100A90390-12-05-032050	12	3.937	1.260	3.150	1.969	1.690	B	1.214	LNXT 1506...	◈
181066700	125A90390-09-05-040063	9	4.921	1.575	3.543	2.480	3.001	B	1.214	LNXT 1506...	◈
181051200	125A90390-15-05-040063	15	4.921	1.575	3.543	2.480	3.113	B	1.214	LNXT 1506...	◈
181051300	160A90390-10-05-U040063	10	6.299	1.575	4.331	2.480	4.470	C	1.214	LNXT 1506...	◈
181066800	160A90390-20-05-U040063	20	6.299	1.575	4.331	2.480	4.580	C	1.214	LNXT 1506...	◈

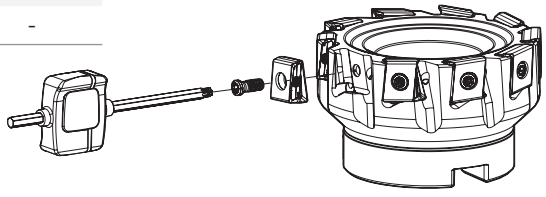
◈ Stock item | Produto de stock | Itens de stock

◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

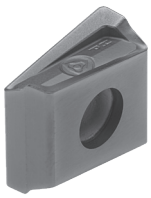
SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Order separately Key (Torx - Nm)	Torque Value	Order separately Screw	DIN 6368 Wrench
				lbf/in		
A90390 – 50 - 80	P0401200	XT15	DT1530	26.6	-	-
A90390 – 80	P0401200	XT15	DT1530	26.6	J0123510	SD6368-12
A90390 – 100	P0401200	XT15	DT1530	26.6	J0164110	SD6368-16
A90390 – 125	P0401200	XT15	DT1530	26.6	J0204610	SD6368-20
A90390 – 160	P0401200	XT15	DT1530	26.6	-	-

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



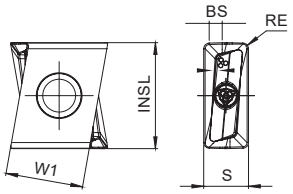
LNXT 1506... Inserts | Pastilhas | Plaquitas



LNXT-HP



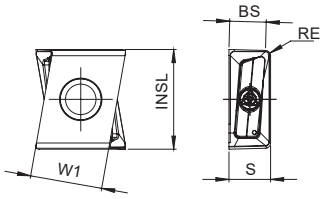
LNXT-MP



LNXT - MP | HP



LNXT-W



LNXT-W

		P					K						Dimensions Dimensões Dimensiones (in)				
		CVD	PVD				CVD		PVD								
	(2) Grade code	T9	G1	G4	T1	G6	L5	L9	G1	G4	T1	G6					
(1) Geometry code	ISO Reference	PHS740	PH7910	PH7920	PHP920	PH7740	PH5705	PH5740	PH7910	PH7920	PHP920	PH7740	W1	S	INSL	RE	BS
1111313	LNXT 150608 PNER-MP	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	0.433	0.250	0.591	0.031	0.071
1111590	LNXT 150612 PNER-MP			◈	◈	◈	◈	◈		◈	◈	◈	0.433	0.250	0.591	0.047	0.071
1111591	LNXT 150608 PNSR-HP			◈		◈				◈		◈	0.433	0.250	0.591	0.031	0.071
1111524	LNXT 150608 PNER-W		◈				◈		◈				0.433	0.250	0.598	0.031	0.217

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance Toughness →						
				PH5705 ●	PH7910 ●	PHP920 ◐	PH7920 ◐	PH5740 ✱	PHS740 ✱	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

TGPLUS 90390

METRIC LINE

Proprietary milling line

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance						Toughness →
				PH5705	PH7910	PHP920	PH7920	PH5740	PHS740	PH7740
P	1	Unalloyed Steel	125-220	-	590-820	590-820	590-787	-	459-722	459-656
	2	Low-Alloyed Steel	220-280	-	525-754	525-754	525-722	-	394-656	426-590
	3	High-Alloyed Steel	280-380	-	459-722	459-722	459-689	-	328-623	328-558
K	7	Malleable Cast Iron	130-230	525-951	590-984	525-886	525-853	525-853	-	459-722
	8	Grey Cast Iron	180-245	558-1050	525-820	459-820	459-787	459-787	-	394-689
	9	Nodular Cast iron	160-250	459-656	492-656	394-689	394-656	394-656	-	328-623

ISO	PSM	Material	HB (Brinell)	Feed fz (in/t)		
				LNXT 15... MP	LNXT 15... HP	LNXT 15... W
P	1	Unalloyed Steel	125-220	0.004-0.012	0.004-0.012	0.004-0.014
	2	Low-Alloyed Steel	220-280	0.004-0.012	0.004-0.012	0.004-0.014
	3	High-Alloyed Steel	280-380	0.004-0.010	0.004-0.010	0.004-0.014
K	7	Malleable Cast Iron	130-230	0.004-0.016	0.004-0.016	0.004-0.020
	8	Grey Cast Iron	180-245	0.004-0.014	0.004-0.014	0.004-0.020
	9	Nodular Cast iron	160-250	0.004-0.012	0.004-0.012	0.004-0.020

(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.

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

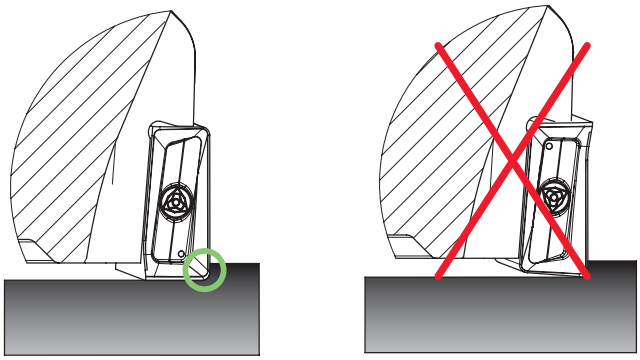
ISO	PSM	Material	HB (Brinell)	Chip breaker application	
				1st choice	Dificult Operations
P	1	Unalloyed Steel	125-220	LNXT 15... MP	LNXT 15... HP
	2	Low-Alloyed Steel	220-280	LNXT 15... MP	LNXT 15... HP
	3	High-Alloyed Steel	280-380	LNXT 15... MP	LNXT 15... HP
K	7	Malleable Cast Iron	130-230	LNXT 15... MP	LNXT 15... HP
	8	Grey Cast Iron	180-245	LNXT 15... MP	LNXT 15... HP
	9	Nodular Cast iron	160-250	LNXT 15... MP	LNXT 15... HP

WIPER INSERTS

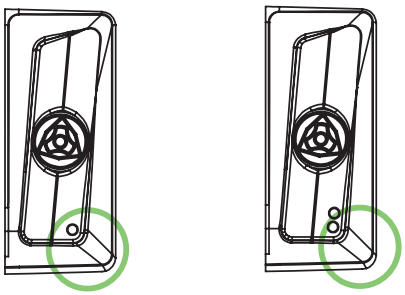
Rec. Cutting Conditions
- F_W at least 40% larger than f_n (f_n-f_2xZ);
- Axial depth of cut is 0.020 in - 0.031 in.

Example:
- The width of the parallel land (F) of the insert is 0.071 in.
- With 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 0.118 in, i.e. 40% bigger than the parallel land.
- To obtain a good surface finish, the feed per revolution should be a maximum of 80% of 0.071 in = 0.057 in.
- The wiper insert will have a parallel land (F_W) with a width of approximately 0.217 in.
- Result: Feed per revolution (f_n) could be increased from 0.031 in into 60% of 0.217 in = 0.130 in.

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



The points on the insert indicates the side that should be parallel to the workspace material.

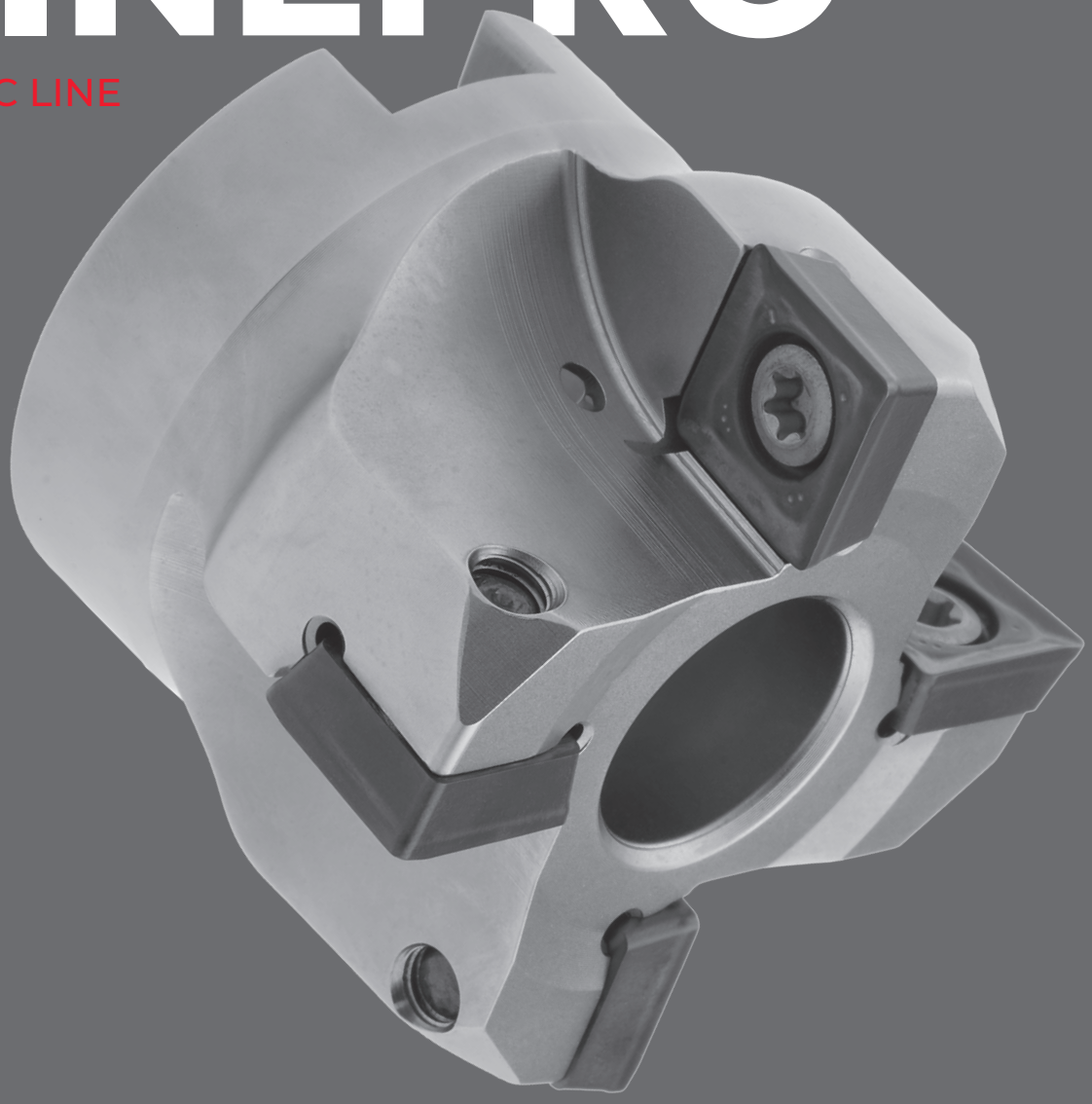


Wiper insert with 2 Right-hand cutting edges.
The side work of the insert it's indicated by points.

06290

LINEPRO

METRIC LINE



The LINEPRO 06290 is designed for general-purpose shoulder milling operations. Featuring a positive insert with four cutting edges, it ensures versatile and efficient performance across diverse material applications.

A LINEPRO 06290 é projetada para operações de fresagem a 90º de aplicação geral. Apresentando uma pastilha positiva com quatro arestas de corte, garante um desempenho versátil e eficiente em diversas aplicações de materiais.

La LINEPRO 06290 está diseñada para operaciones de fresado a 90º de aplicación general. Presentando una plaquita positiva con cuatro filos de corte, garantiza un rendimiento versátil y eficiente en diversas aplicaciones de materiales.

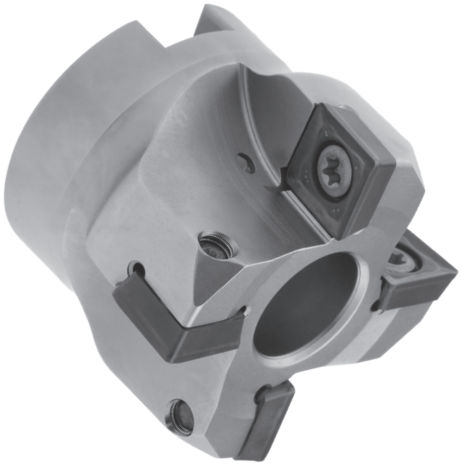
LINEPRO 06290 > page 230

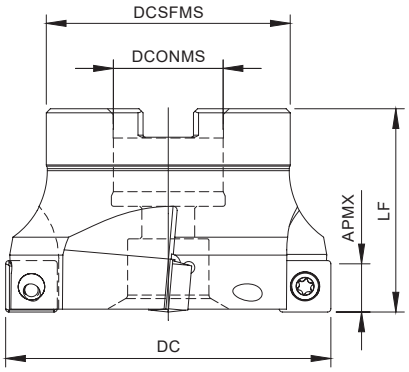
- From DC 1.575 in to 6.299 in
  De DC 1.575 in a 6.299 in | Desde DC 1.575 in hasta 6.299 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Positive inserts with 4 cutting edges
  Pastilhas positivas com 4 arestas de corte | Palquitas positivas con 4 filos de corte
- General application
  Aplicação geral | Aplicación general



LINEPRO 06290

METRIC LINE





Arbor Mounting

KAPR=90° | GAMP=+6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181167700	040A06290-03-06-016040	3	1.575	0.630	1.535	1.575	0.441	A	0.433	SP... 1204	◈
181167800	050A06290-04-06-022040	4	1.969	0.866	1.929	1.575	0.771	A	0.433	SP... 1204	◈
181167900	063A06290-05-06-027050	5	2.480	1.063	2.362	1.969	1.543	A	0.433	SP... 1204	◈
181168000	080A06290-06-06-027050	6	3.150	1.063	2.362	1.969	2.535	A	0.433	SP... 1204	◈
181168100	100A06290-08-06-032050	8	3.937	1.260	3.150	1.969	3.857	A	0.433	SP... 1204	◈
181168200	125A06290-08-06-040063	8	4.921	1.575	3.780	2.480	6.722	B	0.433	SP... 1204	◈
181065600	160A06290-10-06-U040063	10	6.299	1.575	3.937	2.480	9.257	C	0.433	SP... 1204	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

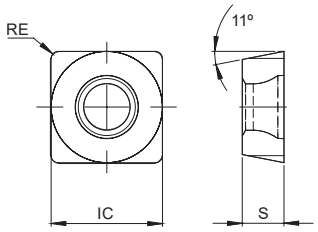
SP.. 1204... Inserts | Pastilhas | Plaquitas



SPG(M)X-MP



SPG(M)X-MS



SPG(M)X-MP | MS

		P	M	K	S	Dimensions Dimensões Dimensiones (in)		
		PVD	PVD	PVD	PVD			
	(2) Grade code	T1	X9	T1	X9			
(1) Geometry code	ISO Reference	PHP920	PHH930	PHP920	PHH930	IC	S	RE
1113002	SPGX 120408 PDSR-MP	◈		◈		0.500	0.187	0.031
1113003	SPGX 120408 PDSR-MS		◈		◈	0.500	0.187	0.031
1112916	SPMX 120408 PDSR-MP	◈		◈		0.500	0.187	0.031
1112999	SPMX 120408 PDSR-MS		◈		◈	0.500	0.187	0.031

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

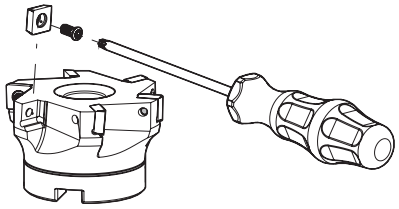
Note: It is possible to use other inserts - Page A - 30

SPMT 120408-MP	SPMW 120408
	

Page A - 30

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm) *Order separately*	Torque Value	Screw *Order separately*	DIN 6368 Wrench
A06290 – 40 - 160	P0501100	PT20	DT2050	5,00	J0204610	SD6368-20



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance / Toughness → PHP920	PHH930
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	200-330		✓
	6	SS - Austenitic-ferritic (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 fz (in/t)	
				PHP920	PHH930	SPG(M)X... MP	SPM(M)X ...MS
P	1	Unalloyed Steel	125-220	590-820	-	0.003-0.008	-
	2	Low-Alloyed Steel	220-280	558-689	-	0.003-0.008	-
	3	High-Alloyed Steel	280-380	525-656	-	0.003-0.008	-
M	4	SS - Ferritic / Martensitic	200-330	-	394-590	-	0.003-0.008
	5	SS - Austenitic	200-330	-	328-525	-	0.003-0.008
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	230-459	-	0.003-0.008
K	7	Malleable Cast Iron	130-230	558-984	-	0.004-0.012	-
	8	Grey Cast Iron	180-245	492-820	-	0.004-0.012	-
	9	Nodular Cast iron	160-250	295-689	-	0.004-0.012	-
S	11	Heat Resistant Super Alloys	200-320	-	98-246	-	0.003-0.006

(Note 1) Cutting conditions ae/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 Guia para aplicações do quebra-aparas | Guía para aplicación del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip breaker application 1st choice
P	1	Unalloyed Steel	125-220	... MP
	2	Low-Alloyed Steel	220-280	... MP
	3	High-Alloyed Steel	280-380	... MP
M	4	SS - Ferritic / Martensitic	200-330	... MS
	5	SS - Austenitic	200-330	... MS
	6	SS - Austenitic-ferritic (Duplex)	230-260	... MS
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	... MS

49490 | 49590

HEXAPLUS

METRIC LINE



The HEXAPLUS line ensures a precise 90° square in a single milling operation, thus saving considerable production time by eliminating secondary operations. Additionally, it features a wiper edge on the secondary cutting edge, ensuring an excellent finish on the base surface. The new HEXAPLUS 49490 introduces expanded cutting diameters and a new geometry tailored for machining stainless steels and achieving ramps of up to 2.5º.

A linha HEXAPLUS garante um quadrado preciso de 90° em uma única operação de fresagem, economizando assim considerável tempo de produção ao eliminar operações secundárias. Além disso, apresenta uma aresta de limpeza na aresta de corte secundária, garantindo um acabamento excelente na superfície base. A nova HEXAPLUS WN90-08 introduz diâmetros de corte expandidos e uma nova geometria adaptada para fresagem de aços inoxidáveis e para alcançar rampas de até 2,5º.

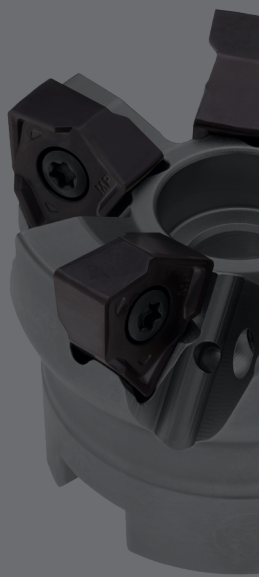
La línea HEXAPLUS asegura un cuadrado preciso de 90° en una sola operación de fresado, ahorrando considerable tiempo de producción al eliminar operaciones secundarias. Además, presenta un filo limpiador en el filo de corte secundario, garantizando un excelente acabado en la superficie base. La nueva HEXAPLUS WN90-08 introduce diámetros de corte expandidos y una nueva geometría adaptada para el fresado de aceros inoxidables y para lograr rampas de hasta 2,5º.

HEXAPLUS 49490 > page 234



- From DC 0.709 in to 2.480 in
  De DC 0.709 in a 2.480 in | Desde DC 0.709 in hasta 2.480 in
- Available in arbor mounting, threaded coupling and weldon shank
  Disponível em montagem tipo árvore, acoplamento roscado e haste weldon | Disponible en montage tipo tornillo, fijación roscada y mango tipo weldon
- Strong and high positive geometry
  Geometria forte e altamente positiva | Geometría fuerte y altamente positiva
- Suitable for ramp milling operations
  Adequado para operações de fresagem em rampa | Adecuado para operaciones de fresado en rampa

HEXAPLUS 49590 > page 240

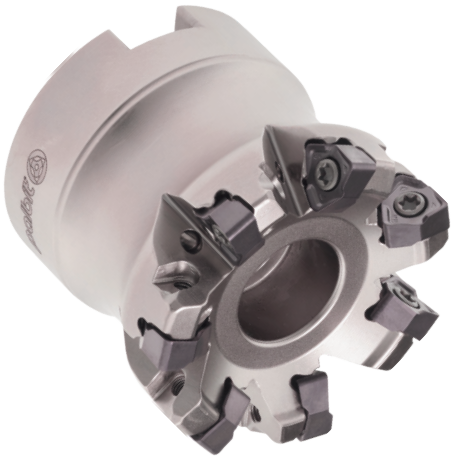


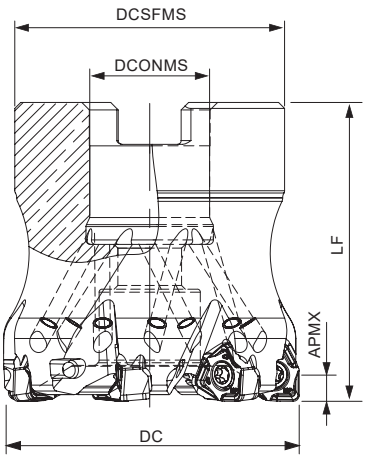
- From DC 1.260 in to 6.299 in
  De DC 1.260 in a 6.299 in | Desde DC 1.260 in hasta 6.299 in
- Available in arbor mounting and weldon shank
  Disponível em montagem tipo árvore e haste weldon | Disponible en fijación con tornillo central y mango tipo weldon
- Negative inserts with 6 cutting-edges
  Pastilhas negativas com 6 arestas de corte | Insertos negativos con 6 filos de corte
- Full 90º main cutting edge
  Aresta de corte a 90º | Filo de corte a 90º

HEXAPLUS 49490

METRIC LINE

Proprietary milling line





Arbor Mounting

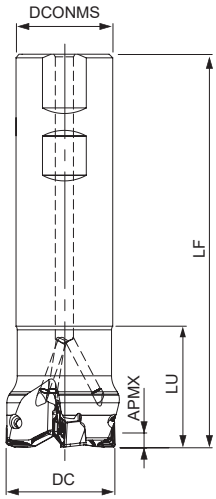
KAPR=90° | GAMP=-5°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181192200	032A49490-06-05-016040	6	1.260	0.630	1.181	1.575	0.273	A	0.138	WNXT 04 | WOXT 04	◈
181192300	040A49490-07-05-016040	7	1.575	0.630	1.417	1.575	0.450	A	0.138	WNXT 04 | WOXT 04	◈
181192400	050A49490-08-05-022040	8	1.969	0.866	1.654	1.575	0.628	A	0.138	WNXT 04 | WOXT 04	◈
181192500	050A49490-09-05-022040	9	1.969	0.866	1.654	1.575	0.617	A	0.138	WNXT 04 | WOXT 04	◈
181192600	063A49490-10-05-022040	10	2.480	0.866	1.890	1.575	1.223	A	0.138	WNXT 04 | WOXT 04	◈

◈ Stock item | Produto de stock | Ítens de stock

◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Weldon Shank

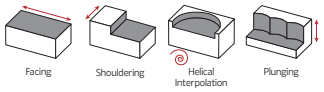
KAPR=90° | GAMP=-5°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181218900	020W49490-03-05-020090	3	0.787	0.787	3.543	1.142	0.683	0.138	WNXT 04 | WOXT 04	◈
181193300	020W49490-03-05-020150	3	0.787	0.787	5.906	1.142	0.683	0.138	WNXT 04 | WOXT 04	◬
181219000	025W49490-04-05-025100	4	0.984	0.787	3.937	1.142	1.245	0.138	WNXT 04 | WOXT 04	◈
181193400	025W49490-05-05-025100	4	0.984	0.787	6.693	1.142	1.245	0.138	WNXT 04 | WOXT 04	◬
181219100	025W49490-05-05-025170	5	0.984	0.787	3.937	1.142	1.303	0.138	WNXT 04 | WOXT 04	◈
181193500	025W49490-05-05-025170	5	0.984	0.787	6.693	1.142	1.303	0.138	WNXT 04 | WOXT 04	◬
181193600	032W49490-05-05-032110	5	1.260	1.260	4.331	1.220	2.612	0.138	WNXT 04 | WOXT 04	◯
181193700	032W49490-06-05-032110	6	1.260	1.260	4.331	1.220	2.495	0.138	WNXT 04 | WOXT 04	◯

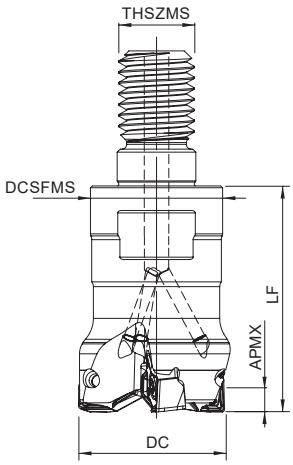
◈ Stock item | Produto de stock | Ítens de stock

◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

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







Threaded Coupling

KAPR=90° | GAMP=-5°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		
181192700	018R49490-02-05-M10028	2	0.709	M10	0.720	1.102	0.050	0.138	WNXT 04 | WOXT 04	○
181192800	020R49490-03-05-M10028	3	0.787	M10	0.720	1.102	0.045	0.138	WNXT 04 | WOXT 04	○
181192900	025R49490-04-05-M12030	4	0.984	M12	0.906	1.181	0.078	0.138	WNXT 04 | WOXT 04	○
181193000	025R49490-05-05-M12030	5	0.984	M12	0.906	1.181	0.070	0.138	WNXT 04 | WOXT 04	◈
181193100	032R49490-05-05-M16040	5	1.260	M16	1.181	1.575	0.160	0.138	WNXT 04 | WOXT 04	◈
181193200	032R49490-06-05-M16040	6	1.260	M16	1.181	1.575	0.150	0.138	WNXT 04 | WOXT 04	○

◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

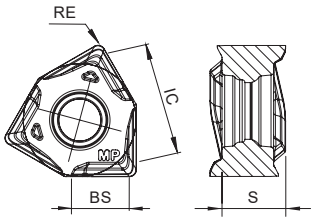
W..XT 0403... Inserts | Pastilhas | Plaquitas



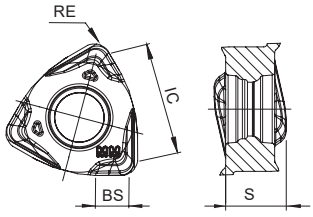
WNXT-MP



WOXT-MM



WNXT



WOXT

		P		M			K	S		Dimensions Dimensões Dimensiones (in)			
		PVD		PVD			PVD	PVD					
	(2) Grade code	T1	P4	P4	X9	4H	T1	X9	4H				
(1) Geometry code	ISO Reference	PHP920	PHP930	PHP930	PHH930	PHF530	PHP920	PHH930	PHF530	IC	S	RE	BS
1113158	WNXT 040308 PNSR-MP	◈	◈				◈			0.264	0.132	0.031	0.071
1113494	WOXT 040308 PNSR-MM	◈	◈	◈	◈	◈	◈	◈	◈	0.264	0.132	0.031	0.031

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

HEXAPLUS 49490

METRIC LINE

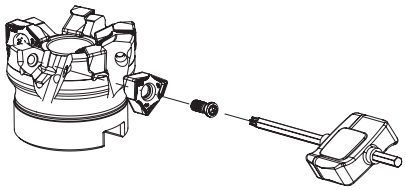
Proprietary milling line

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				lbf/in
A49490 - 32-63	P0250503	XT08	DT0812	10.6
W49490 - 20-32	P0250503	XT08	DT0812	10.6
R49490 - 18-32	P0250503	XT08	DT0812	10.6

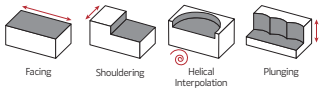
Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHP920	PHP930	PHH930	PHF530
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	200-330		✓	✓	✓
	6	SS - Austenitic-ferritic (Duplex)	220-260		✓	✓	✓
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 fz (in/t)	
				PHP920	PHP930	PHH930	PHF530	WNXT 04	WOXT 04
P	1	Unalloyed Steel	125-220	590-820	525-754	-	-	0.003-0.010	0.002-0.010
	2	Low-Alloyed Steel	220-280	558-689	492-623	-	-	0.003-0.010	0.002-0.010
	3	High-Alloyed Steel	280-380	525-656	459-590	-	-	0.003-0.008	0.002-0.008
M	4	SS - Ferritic / Martensitic	200-330	-	426-558	459-689	459-820	-	0.002-0.008
	5	SS - Austenitic	200-330	-	328-525	394-558	426-787	-	0.002-0.008
	6	SS - Austenitic-ferritic (Duplex)	220-260	-	262-459	328-492	394-722	-	0.002-0.006
K	7	Malleable Cast Iron	130-230	558-984	-	-	-	0.003-0.010	0.002-0.010
	8	Grey Cast Iron	180-245	492-820	-	-	-	0.003-0.010	0.002-0.010
	9	Nodular Cast iron	160-250	295-689	-	-	-	0.003-0.008	0.002-0.008
S	11	Heat Resistant Super Alloys	200-320	-	-	98-361	98-492	-	0.002-0.006

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
P	1	Unalloyed Steel	125-220	WNXT 04... -MP
	2	Low-Alloyed Steel	220-280	WNXT 04... -MP
	3	High-Alloyed Steel	280-380	WNXT 04... -MP
M	4	SS - Ferritic / Martensitic	200-330	WOXT 04.. -MM
	5	SS - Austenitic	200-330	WOXT 04.. -MM
	6	SS - Austenitic-ferritic (Duplex)	230-260	WOXT 04.. -MM
K	7	Malleable Cast Iron	130-230	WNXT 04... -MP
	8	Grey Cast Iron	180-245	WNXT 04... -MP
	9	Nodular Cast iron	160-250	WNXT 04... -MP
S	11	Heat Resistant Super Alloys	200-320	WOXT 04.. -MM

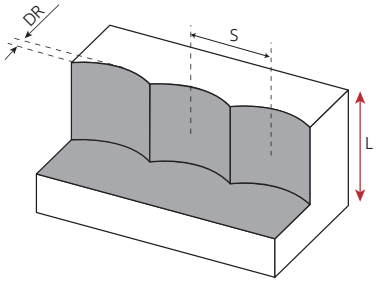
HEXAPLUS 49490 METRIC LINE

PROGRAMMING DATA Dados para programação | Datos para la programación

Insert	Programming Data		
	Insert radius (in)	Wiper edge (in)	APMX (in)
WNXT 040308 PNSR-MP	0.031	0.071	0.138
WOXT 040308 PNSR-MM	0.031	0.031	0.138

PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
f_z (in/t)		
0.004-0.012	0.003-0.010	$Smax = \sqrt{DC.Dr - Dr^2}$



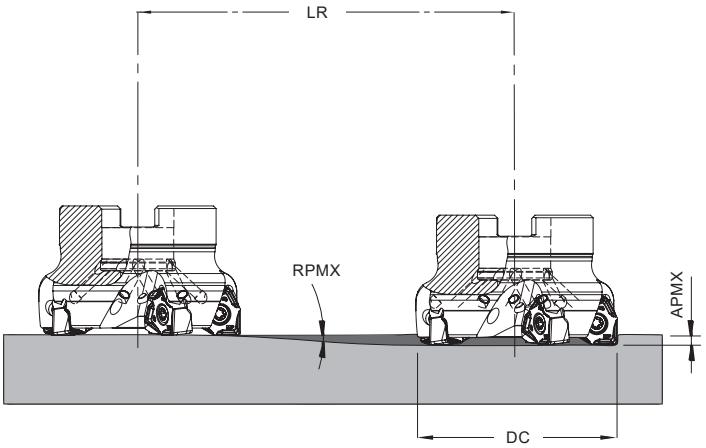
S max and DR corresponding cutting diameter DC (in)							
DR (in)	DC (in)						
	0.709	0.787	0.984	1.260	1.575	1.969	2.362
0.039	0.161	0.173	0.193	0.220	0.244	0.276	0.311
0.059	0.197	0.209	0.232	0.268	0.299	0.335	0.378
0.079	0.224	0.236	0.268	0.303	0.343	0.386	0.433
0.098	0.244	0.260	0.295	0.339	0.382	0.429	0.484

Note: This values are only for WNXT inserts.

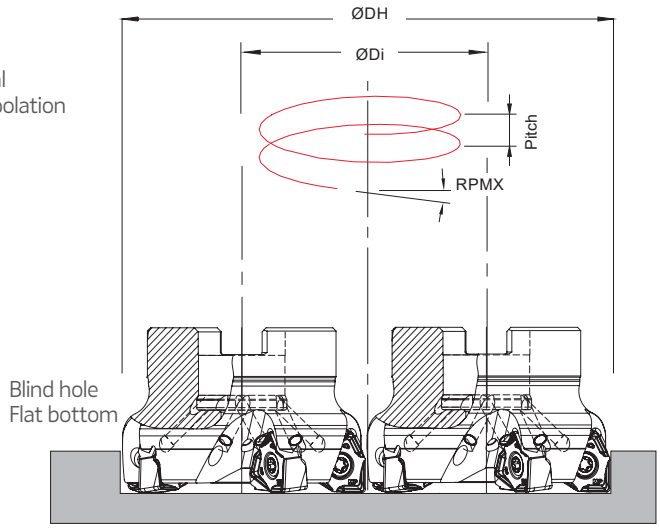
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



ØDi = ØDH - DC

DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
0.709	2.40	0.138	3.287	1.228 -	- 1.354	0.067 0.083
0.787	2.00	0.138	3.945	1.386 -	- 1.512	0.063 0.079
0.984	1.50	0.138	5.264	1.780 -	- 1.906	0.063 0.075
1.260	1.15	0.138	6.866	2.331 -	- 2.457	0.067 0.075
1.575	0.85	0.138	9.287	2.961 -	- 3.087	0.063 0.067
1.969	0.65	0.138	12.146	3.748 -	- 3.874	0.063 0.067
2.480	0.50	0.138	15.791	4.772 -	- 4.898	0.059 0.063

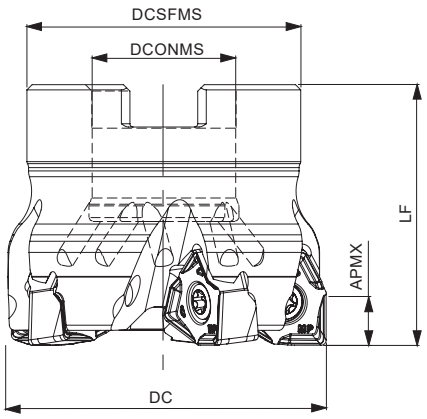
Note: This values are only for WOXT inserts.
During helical interpolation do not exceed APMX.
(*) Down cutting is recommended, tool pass rotation should be counter-clockwise.
(*) In case of ramping and helical interpolation, apply 70% or less feed (fz) from recommended cutting conditions table.

HEXAPLUS 49590

METRIC LINE

Proprietary milling line





Arbor Mounting

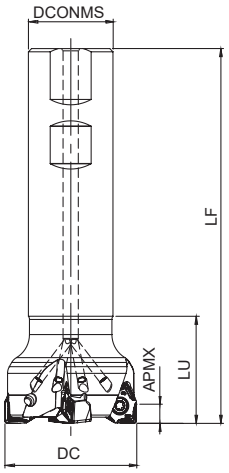
KAPR=90° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
181174900	040A49590-03-06-016040	3	1.575	0.630	1.260	1.575	0.331	A	0.295	WNXT 0806...	◉
181175000	040A49590-04-06-016040	4	1.575	0.630	1.260	1.575	0.287	A	0.295	WNXT 0806...	○
181173400	050A49590-04-06-022040	4	1.969	0.866	1.654	1.575	0.860	A	0.295	WNXT 0806...	◉
181165600	050A49590-05-06-022040	5	1.969	0.866	1.654	1.575	0.838	A	0.295	WNXT 0806...	◉
181173500	063A49590-05-06-022040	5	2.480	0.866	1.890	1.575	1.102	A	0.295	WNXT 0806...	◉
181173600	063A49590-06-06-022040	6	2.480	0.866	1.890	1.575	1.080	A	0.295	WNXT 0806...	◉
181173700	080A49590-07-06-027050	7	3.150	1.063	2.362	1.969	2.601	B	0.295	WNXT 0806...	◉
181173800	080A49590-09-06-027050	9	3.150	1.063	2.362	1.969	2.557	B	0.295	WNXT 0806...	○
181173900	100A49590-08-06-032050	8	3.937	1.260	3.150	1.969	3.570	B	0.295	WNXT 0806...	◉
181174000	100A49590-11-06-032050	11	3.937	1.260	3.150	1.969	3.416	B	0.295	WNXT 0806...	○
181174100	125A49590-11-06-040063	11	4.921	1.575	3.543	2.480	6.215	B	0.295	WNXT 0806...	◉
181174200	125A49590-14-06-040063	14	4.921	1.575	3.543	2.480	6.083	B	0.295	WNXT 0806...	○
181204200	160A49590-12-06-040063	12	6.299	1.575	3.543	2.480	8.375	B	0.295	WNXT 0806...	◉

◉ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Weldon Shank

KAPR=90° | GAMP=-6°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU		APMX (in)		
181174300	032W49590-02-06-032125	2	1.260	1.260	4.921	1.575	1.433	0.295	WNXT 0806...	◉
181174500	040W49590-03-06-032130	3	1.575	1.260	5.118	1.575	1.543	0.295	WNXT 0806...	◉
181174600	040W49590-04-06-032130	4	1.575	1.260	5.118	1.575	1.433	0.295	WNXT 0806...	○
181174700	050W49590-04-06-032140	4	1.969	1.260	5.512	1.772	1.895	0.295	WNXT 0806...	○
181174800	050W49590-05-06-032140	5	1.969	1.260	5.512	1.772	1.785	0.295	WNXT 0806...	○

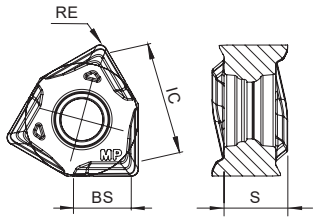
◉ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

WNXT 0806... Inserts | Pastilhas | Plaquitas



WNXT



WNXT

		P		K		Dimensions Dimensões Dimensiones (in)			
		PVD		PVD					
	(2) Grade code	T1	P4	T1	P4				
(1) Geometry code	ISO Reference	PHP920	PHP930	PHP920	PHP930	IC	S	RE	BS
1113000	WNXT 080608 PNSR-MP	◉	◉	◉	◉	0.500	0.248	0.031	0.161

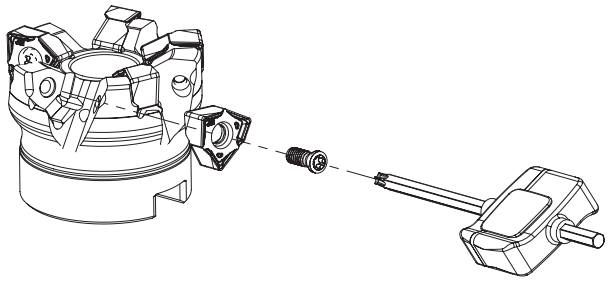
◉ First choice | Primeira opção | 1ª opción ◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value	Order separately: Screw	Order separately: DIN 6368 Wrench	Order separately: Retaining Screw
				lbf/in			
W49590 - 32 - 50	P0401200	XT15	DT1530	26.6	-	-	-
A49590 - 40	P0401200	XT15	DT1530	26.6	-	-	290087600
A49590 - 50 - 63	P0401200	XT15	DT1530	26.6	-	-	-
A49590 - 80	P0401200	XT15	DT1530	26.6	J0123510	SD6368-12	-
A49590 - 100	P0401200	PT15	DT1530	26.6	J0164110	SD6368-16	-
A49590 - 125 -160	P0401200	PT15	DT1530	26.6	J0204610	SD6368-20	-

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



HEXAPLUS 49590 METRIC LINE

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance Toughness → PHP920	PHP930
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	✓	✓

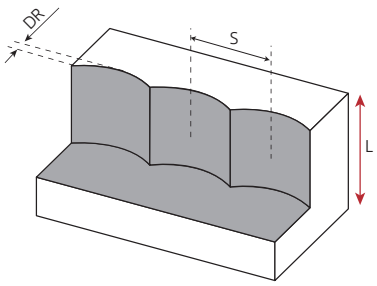
Good Conditions Average Conditions Difficult Conditions

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance Toughness → PHP920	PHP930	Feed fz (in/t) WNXT 0806
P	1	Unalloyed Steel	125-220	590-820	525-754	0.003-0.010
	2	Low-Alloyed Steel	220-280	525-754	459-689	0.003-0.010
	3	High-Alloyed Steel	280-380	459-722	394-656	0.003-0.008
K	7	Malleable Cast Iron	130-230	426-754	492-820	0.003-0.010
	8	Grey Cast Iron	180-245	590-804	459-754	0.003-0.010
	9	Nodular Cast iron	160-250	394-689	328-656	0.003-0.008

PLUNGING Mergulho | Plunge

L≤3DC	L>3DC	S max.
fz (in/t)		
0.004-0.012	0.003-0.010	$Smax = \sqrt{DC.Dr - Dr^2}$



S max and DR corresponding cutting diameter DC (in)								
DR (in)	DC (in)							
	1.260	1.575	1.969	2.480	3.150	3.937	4.921	6.299
0.039	0.220	0.244	0.276	0.311	0.350	0.390	0.437	0.496
0.079	0.303	0.343	0.386	0.433	0.492	0.551	0.618	0.701
0.118	0.366	0.413	0.469	0.528	0.598	0.673	0.752	0.854
0.157	0.417	0.472	0.535	0.606	0.685	0.772	0.866	0.984

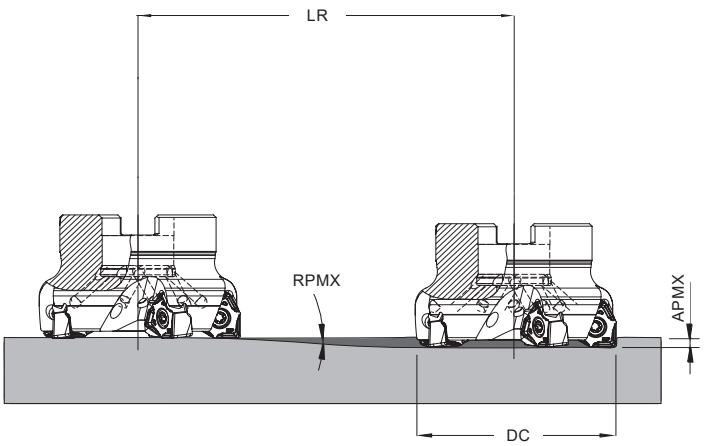
PROGRAMMING DATA Dados para programação | Datos para la programación

Insert	Programming Data		
	Insert radius (in)	Wiper edge (in)	APMX (in)
WNXT 080308 PNSR-MM	0.031	0.161	0.295

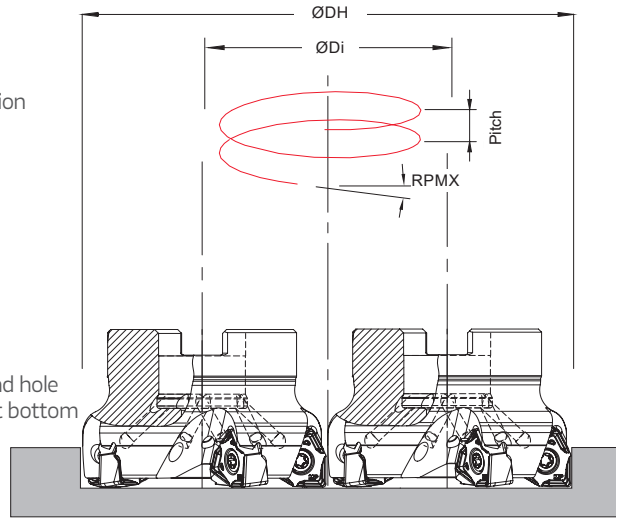
RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular

Ramping



Helical Interpolation



DC	Ramping			Helical Interpolation		
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
1.260	0.018	0.295	37.594	2.134 -	- 2.457	0.021 0.030
1.575	0.012	0.295	56.394	2.764 -	- 3.087	0.019 0.025
1.969	0.008	0.295	84.591	3.551 -	- 3.874	0.017 0.021
2.480	0.006	0.295	120.843	4.575 -	- 4.898	0.016 0.019
3.150	0.004	0.295	169.181	5.913 -	- 6.236	0.015 0.017
3.937	0.003	0.295	241.685	7.488 -	- 7.811	0.013 0.015
4.921	0.002	0.295	338.362	9.457 -	- 9.780	0.012 0.013
6.299	0.002	0.295	422.953	12.213 -	- 12.535	0.013 0.013

Note: During helical interpolation do not exceed APMX.
(*) Down cutting is recommended, tool pass rotation should be counter-clockwise.
(*) In case of ramping and helical interpolation, apply 70% or less feed (fz) from recommended cutting conditions table.



PROFILE MILLING

1 **TOROMILL RP90-10 | RP90-12 | RP90-16**

> Suitable for machining **P** **M** **S**

> See page A - 244

2 **TOROMILL RN90-12**

> Suitable for machining **P** **M** **K** **S**

> See page A - 252

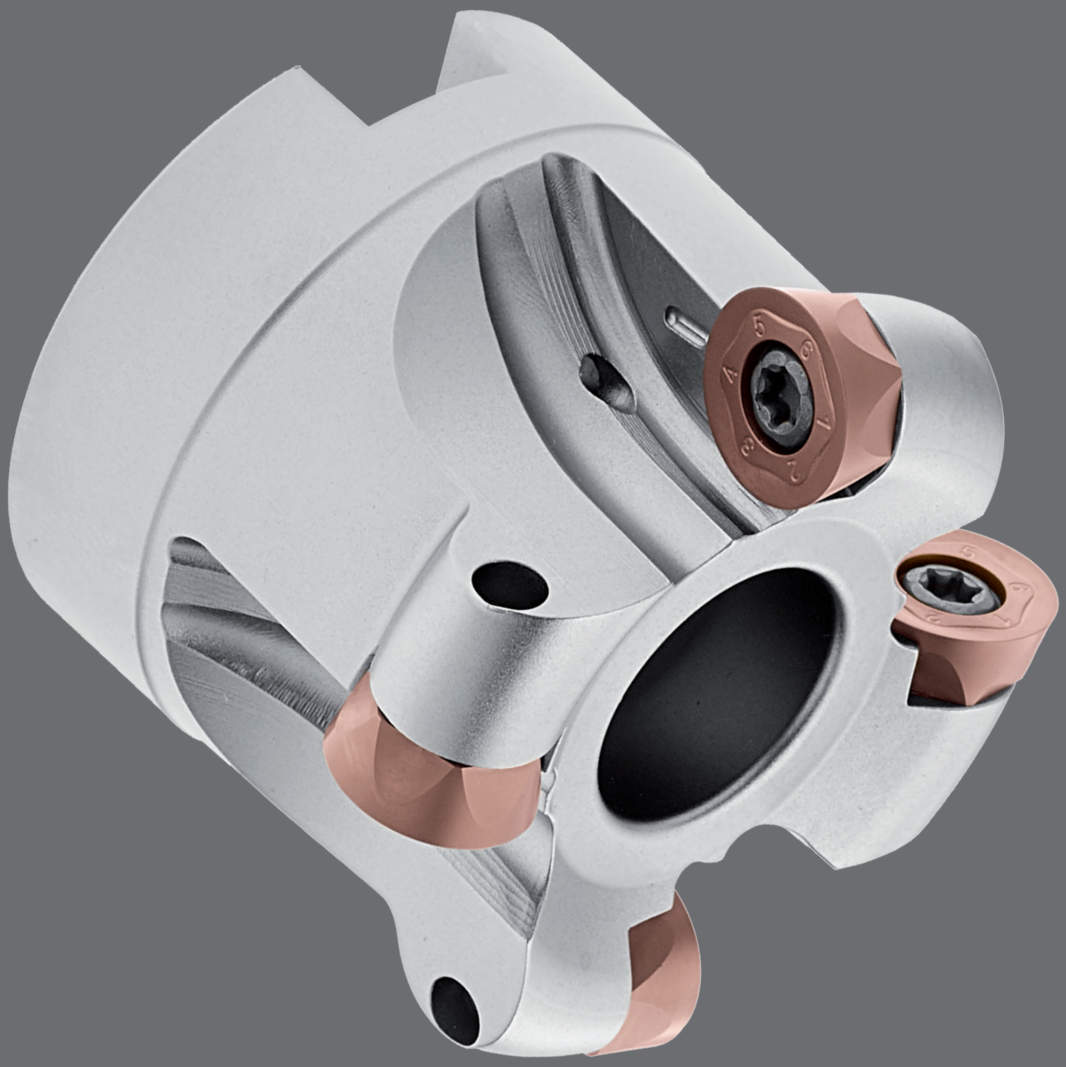
3 **W-PRO 62090 metric line**

> Suitable for machining **P** **M** **K** **S** **H**

> See page A - 258

RP90-10 | RP90-12 | RP90-16

TOROMILL



The TOROMILL line is designed for rough machining in challenging cutting materials, based on proven round insert copy milling principles.
It provides reliable performance for demanding applications, delivering consistent results when machining difficult materials under roughing conditions.

A linha TOROMILL foi concebida para operações de desbaste em materiais de corte exigentes, com base em princípios comprovados de fresagem em cópia com pastilhas redondas. Oferece um desempenho fiável em aplicações exigentes, garantindo resultados consistentes na maquinação de materiais difíceis em condições de desbaste.

La línea TOROMILL está diseñada para operaciones de desbaste en materiales de corte exigentes y se basa en los principios probados del fresado por copia con plaquitas redondas. Ofrece un rendimiento fiable en aplicaciones exigentes y garantiza resultados consistentes en el mecanizado de materiales difíciles en condiciones de desbaste.

TOROMILL RP90-10 | RP90-12 | RP90-16 > page 248

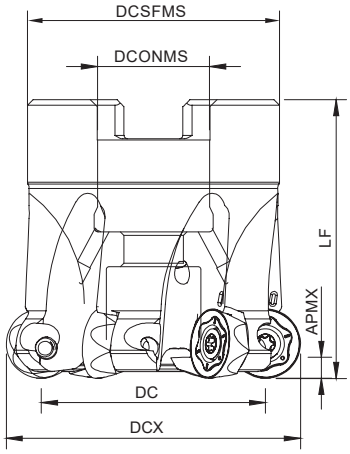


- From DC 1.000 in to 5.000 in
  De DC 16mm a 125mm | Desde DC 1.000 in hasta 5.000 in
- Available in arbor, threaded and cylindrical shank
  Disponível em montagem tipo árvore, acoplamento roscado e haste cilíndrica | Disponible en fijación con tornillo central, fijación roscada y mango cilíndrico
- Smooth cutting and low power requirement
  Corte suave e baixa potência requerida | Corte suave y bajo requisito de potencia
- For stainleess and HRSA applications
  Para aplicações em aço inoxidável e HRSA | Para aplicaciones de acero inoxidable y HRSA

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

Proprietary milling line





Arbor Mounting

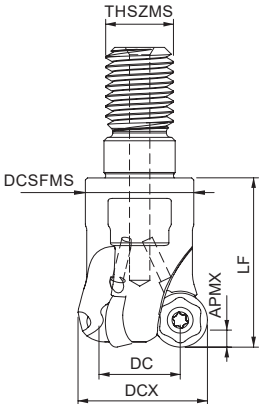
GAMP=+5º

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DCX	DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Threaded Coupling

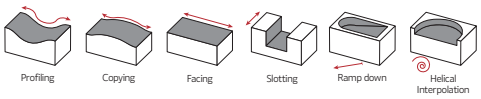
GAMP=+5º

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DCX	DC	THSZMS	DCSFMS	LF		APMX (in)		
RP90-10											
181142100	RP90 D1.00-R-12/1.25-03-10	3	1.000	0.610	M12	0.830	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	1.150	1.750	0.68	0.197	RP...10T3 M0E	○

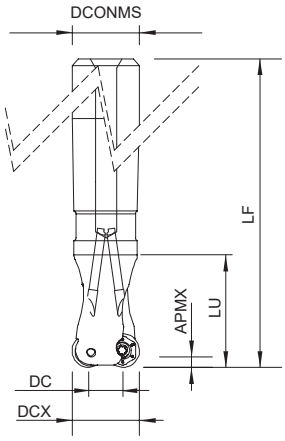
⛭ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

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







Cylindrical Shank

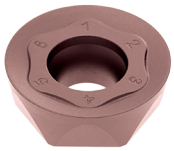
GAMP=+5°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DCX	DC	DCONMS	LF	LU		APMX (in)		
					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	◯

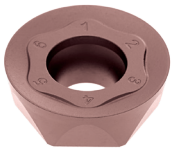
Stock item | Produto de stock | Itens de stock

◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

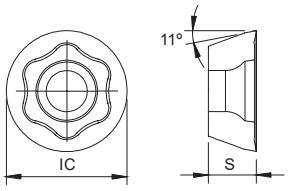
RPHT Inserts | Pastilhas | Plaquitas



RPHT-MS



RPHT-LS



RPHT

		P				M				S			Dimensions Dimensões Dimensiones (in)	
		CVD	PVD			PVD				PVD				
	(2) Grade code	T9	T1	Z1	Z2	X9	Y2	Z2	Z3	X9	Y2	Z3		
(1) Geometry code	ISO Reference	PHS740	PHP920	PHP808	PHP530	PHH930	PHH808	PHP530	PHH530	PHH930	PHH808	PHH530	IC	S
1112253	RPHT 10T3 M0E-MS		◉			◉				◉			0.394	0.156
1112772	RPHT 10T3 M0E-LS	◉		◉	◉		◉	◉	◉		◉	◉	0.394	0.156
1112186	RPHT 1204 M0E-MS		◉			◉				◉			0.472	0.187
1112766	RPHT 1204 M0E-LS	◉		◉	◉		◉	◉	◉		◉	◉	0.472	0.187
1112254	RPHT 1605 M0E-MS		◉			◉				◉			0.630	0.219
1112951	RPHT 1605 M0E-LS			◉	◉		◉	◉	◉		◉	◉	0.630	0.219

◉ First choice | Primeira opção | 1ª opción

◉ Stock item | Produto de stock | Itens de stock

◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

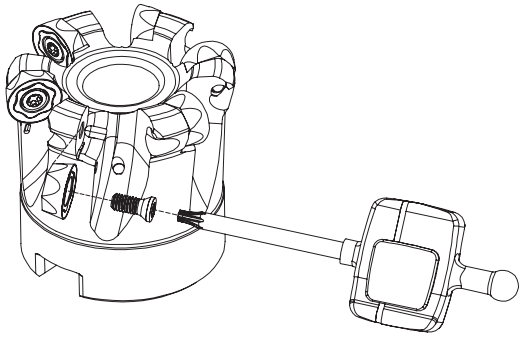
TOROMILL RP90-10 | RP90-12 | RP90-16

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				lbf/in
RP90-10				
RP90-A-10	P0300800	XT09	DT0914	12.4
RP90-R-10	P0300800	XT09	DT0914	12.4
RP90-E-10	P0300800	XT09	DT0914	12.4
RP90-12				
RP90-A-12	P0350800	XT15	DT1530	26.6
RP90-16				
RP90-A-16	P0451100	XT20	DT2050	44.3

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHP920	PHH930	PHP530	PHH530	PHP808	PHH808	PHS740
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	200-330		✓		✓		✓	
M	6	SS - Austenitic-ferritic (Duplex)	230-260		✓		✓		✓	
S	11	Heat Resistant Super Alloys	200-320		✓		✓		✓	

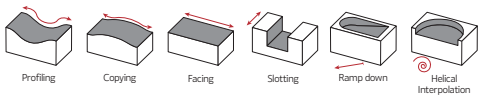
Good Conditions Average Conditions Difficult Conditions

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PHP920	PHH930	PHP530	PHH530	PHP808	PHH808	PHS740
P	1	Unalloyed Steel	125-220	590-820	-	590-1115	-	590-1115	-	590-1148
P	2	Low-Alloyed Steel	220-280	525-754	-	590-1115	-	590-1115	-	590-1115
P	3	High-Alloyed Steel	280-380	459-722	-	590-1082	-	590-1082	-	590-1115
M	4	SS - Ferritic / Martensitic	200-330	-	459-689	492-886	558-918	-	525-886	-
M	5	SS - Austenitic	200-330	-	394-558	-	525-918	-	525-886	-
M	6	SS - Austenitic-ferritic (Duplex)	230-260	-	328-492	-	492-853	-	492-820	-
S	11	Heat Resistant Super Alloys	200-320	-	98-361	-	98-492	-	98-459	-

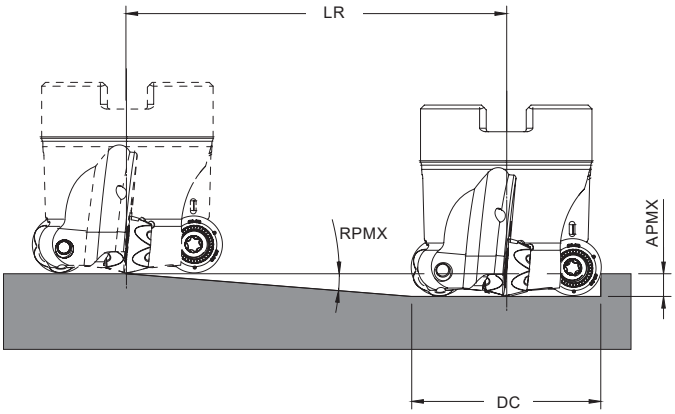
ISO	PSM	Material	HB (Brinell)	Feed fz (in/t) RDHT 08..	RPHT 10...	RPHT 12...	RPHT 16...	RPHT 20...
P	1	Unalloyed Steel	125-220	0.002-0.014	0.002-0.016	0.002-0.018	0.003-0.022	0.004-0.022
P	2	Low-Alloyed Steel	220-280	0.002-0.014	0.002-0.016	0.002-0.018	0.003-0.022	0.004-0.022
P	3	High-Alloyed Steel	280-380	0.002-0.012	0.002-0.014	0.002-0.016	0.003-0.020	0.004-0.022
M	4	SS - Ferritic / Martensitic	200-330	0.002-0.010	0.002-0.012	0.002-0.014	0.003-0.018	0.004-0.020
M	5	SS - Austenitic	200-330	0.002-0.010	0.002-0.012	0.002-0.014	0.003-0.018	0.004-0.020
M	6	SS - Austenitic-ferritic (Duplex)	230-260	0.002-0.010	0.002-0.012	0.002-0.014	0.003-0.018	0.004-0.018
S	11	Heat Resistant Super Alloys	200-320	0.002-0.008	0.002-0.010	0.002-0.012	0.003-0.014	0.004-0.016

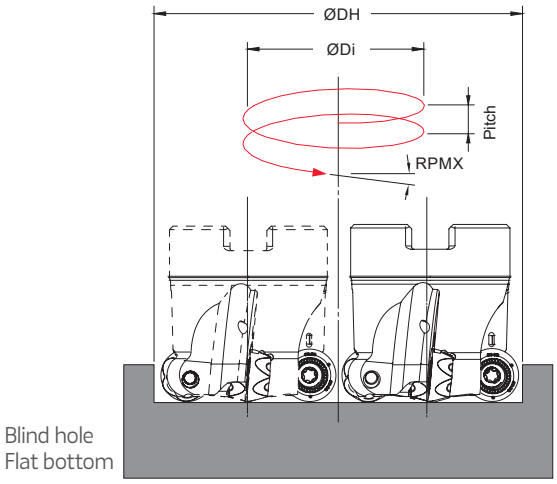
(Note 1) Cutting conditions a_e/DC=70%.



RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular





ØDi = ØDH - DC

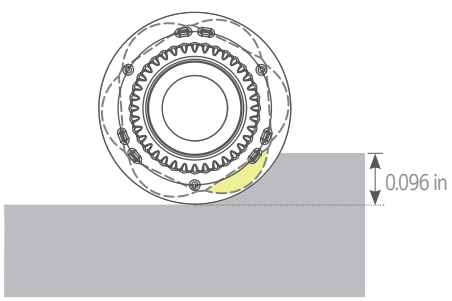
Insert	DC	Ramping			Helical Interpolation		
		RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.
				RP90-10			
RP... 10	1.00	6	0.197	1.874	1.606 -	- 2.0	0.197 0.197
	1.25	6	0.197	1.874	2.106 -	- 2.5	0.197 0.197
	1.50	5	0.197	2.252	2.606 -	- 3.0	0.197 0.197
	2.00	4	0.197	2.817	3.606 -	- 4.0	0.197 0.197
				RP90-12			
RP... 12	2.00	3.5	0.236	3.859	3.528 -	- 4.0	0.236 0.236
	2.50	2.5	0.236	5.405	4.528 -	- 5.0	0.236 0.236
	3.00	2	0.236	6.758	5.528 -	- 6.0	0.236 0.236
	4.00	1.5	0.236	9.012	7.528 -	- 8.0	0.236 0.236
				RP90-16			
RP... 16	3.00	3	0.315	6.011	5.370 -	- 6.0	0.315 0.315
	5.00	2.5	0.315	7.215	9.370 -	- 10.0	0.315 0.315

Note: During helical interpolation do not exceed APMX.

The maximum depth of cut using 6 cutting edges

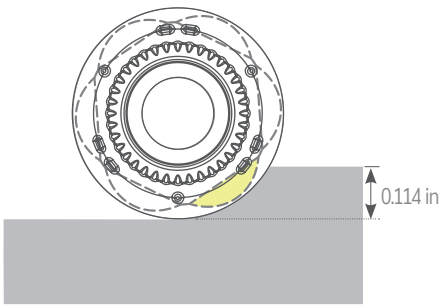
RP90-10

RPHT 10T3



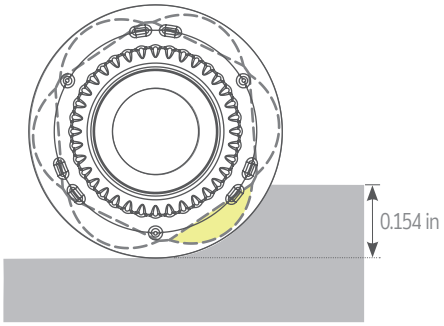
RP90-12

RPHT 1204



RP90-12

RPHT 1204



RN90-12

TOROMILL



The TOROMILL RN90-12 line is a double-sided inserts offer double the cost-effectiveness, boasting machining with high metal removal rates. With twice the number of cutting edges and an optimal depth of cut, they ensure efficient performance. This design not only enhances productivity but also reduces downtime for insert changes.

A linha TOROMILL RN90-12 é composta por pastilhas de dois lados que oferecem o dobro de economia, proporcionando fresagem com altas taxas de remoção de metal. Com o dobro de arestas de corte e uma profundidade de corte otimizada, elas garantem um desempenho eficiente. Esse design não apenas aumenta a produtividade, mas também reduz o tempo de troca de pastilhas.

La línea TOROMILL RN90-12 está compuesta por plaquitas de doble cara que ofrecen el doble de economía, permitiendo el fresado con altas tasas de remoción de metal. Con el doble de filos de corte y una profundidad de corte óptima, garantizan un rendimiento eficiente. Este diseño no solo aumenta la productividad, sino que también reduce el tiempo de cambio de plaquitas.

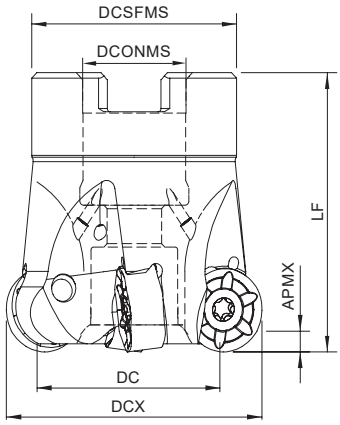
TOROMILL RN90-12 > page 254



- From DC 1.250 in to 3.000 in
  De DC 1.250 in a 3.000 in | Desde DC 1.250 in hasta 3.000 in
- Available in arbor mounting, threaded coupling and weldon shank
  Disponível em montagem tipo árvore, acoplamento roscado e haste weldon | Disponible en fijación con tornillo central, fijación roscada y mango tipo weldon
- Round negative insert with 12 cutting edges
  Pastilha negativa redonda com 12 arestas de corte | Pastilla negativa redonda con 12 filos de corte

TOROMILL RN90-12





Arbor Mounting

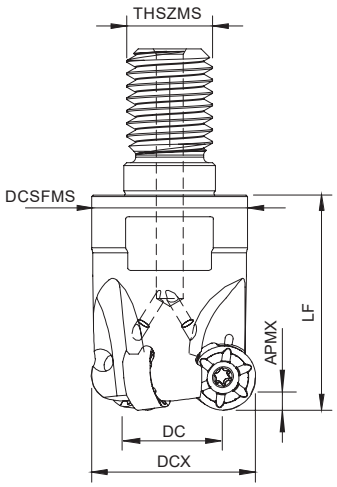
GAMP=-7°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DCX	DC	DCONMS	DCSFMS	LF		Arbor Type	APMX (in)		
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 (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Threaded Coupling

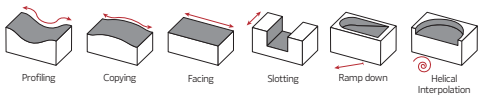
GAMP=-7°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DCX	DC	THSZMS	DCSFMS	LF		APMX (in)		
181143400	RN90 D1.25-R-M16/1.50-03-12	3	1.250	0.750	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	1.150	M16	1.142	1.500	0.44	0.118	RNHX 1204 M0E...	○

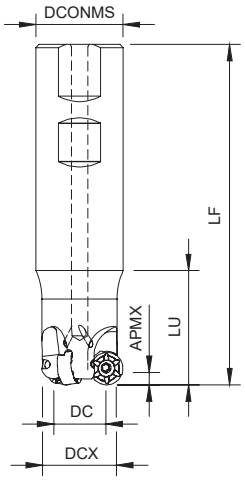
Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

TOROMILL RN90-12
RNHX 12







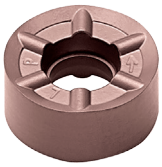
Weldon Shank
GAMP=-7°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications	Insert Pastilha Inserto	Stock
			DCX	DC	DCONMS	LF	LU		APMX (in)		
181143300	RN90 D1.25-W1.00/4.28-03-12	3	1.250	0.750	1.000	4.280	2.117	2.16	0.118	RNHX 1204 M0E...	◯

Stock item | Produto de stock | Itens de stock

◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

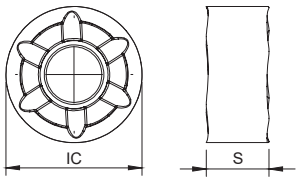
RNHX 1204... Inserts | Pastilhas | Plaquitas



RNHX-LP



RNHX-MP



RNHX-LP | MP

		P			M			K		S		Dimensions Dimensões Dimensiones (in)	
		PVD			PVD			PVD		PVD			
	(2) Grade code	T1	P4	Z2	X9	Z2	Z3	T1	P4	X9	Z3		
(1) Geometry code	ISO Reference	PHP920	PHP930	PHP530	PHH930	PHP530	PHH530	PHP920	PHP930	PHH930	PHH530	IC	S
1112030	RNHX 1204 M0E-LP	◬		◬	◬	◬	◬			◬	◬	0.472	0.187
1112052	RNHX 1204 M0E-MP	◬	◬					◬	◬			0.472	0.187

◬ First choice | Primeira opção | 1ª opción ◬ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

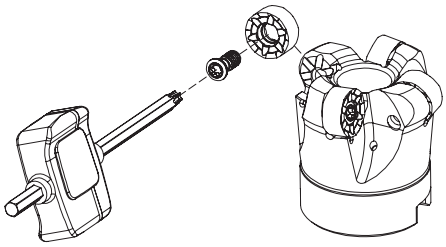
TOROMILL RN90-12

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				
RN90-A-12 - 1.50-3.00	P0401065	XT15	DT1530	26.6
RN90-R-12 - 1.25-1.50	P0401065	XT15	DT1530	26.6
RN90-W-12 - 1.25	P0401065	XT15	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHP920	PHP930	PHH930	PHP530	PHH530
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	200-330			✓		✓
	6	SS - Austenitic-ferritic (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			✓		✓

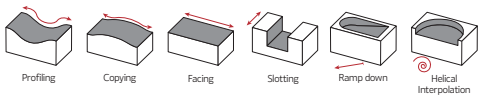
Good Conditions Average Conditions Difficult Conditions

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

ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance — Toughness → PHP920	PHP930	PHH930	PHP530	PHH530	Feed fz (in/t) RNHX 12... LP	RNHX 12... MP
P	1	Unalloyed Steel	125-220	590-820	525-754	-	590-1115	-	0.006-0.018	0.006-0.020
	2	Low-Alloyed Steel	220-280	525-754	459-689	-	590-1115	-	0.006-0.018	0.006-0.020
	3	High-Alloyed Steel	280-380	459-722	394-656	-	590-1082	-	0.006-0.018	0.006-0.018
M	4	SS - Ferritic / Martensitic	200-330	-	-	459-689	492-886	558-918	0.004-0.014	-
	5	SS - Austenitic	200-330	-	-	394-558	-	525-918	0.004-0.014	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	328-492	-	492-853	0.004-0.014	-
K	7	Malleable Cast Iron	130-230	-	492-918	-	-	-	-	0.006-0.022
	8	Grey Cast Iron	180-245	-	426-754	-	-	-	-	0.006-0.022
	9	Nodular Cast iron	160-250	-	262-623	-	-	-	-	0.006-0.020
S	11	Heat Resistant Super Alloys	200-320	-	-	98-361	-	98-492	0.002-0.012	-

Spare Parts: A - 288 Technical Data: A - 298

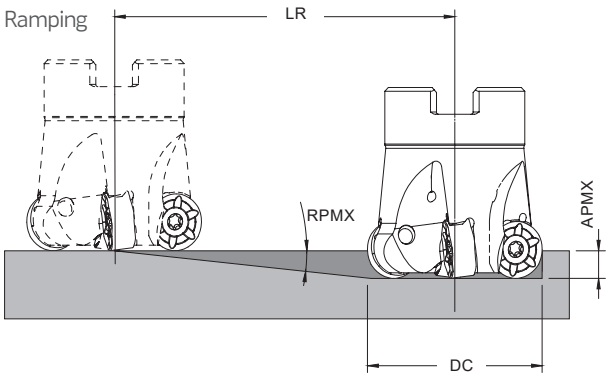
palbit



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	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	200-330	LP	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	LP	-
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	-

RAMPING Descida em rampa | Bajada en rampa



Insert	DC	Ramping		
		RPMX	APMX	Min LR
RNHX 1204	1.25	1.0	0.118	6.8
	1.50	0.8	0.118	8.5
	2.00	0.8	0.118	8.5
	2.50	0.6	0.118	11.3
	3.00	0.5	0.118	13.5

62090

W-PRO

METRIC LINE



W-PRO is a high precision finishing tool featuring a variety of shank options and two types of inserts, allowing each shank to accommodate either insert type. Its unique pocket design ensures secure insert clamping, precise edge positioning, and runout accuracy of 0.02mm or less.

A W-PRO é uma ferramenta de acabamento de alta precisão que apresenta uma variedade de opções de haste e dois tipos de pastilhas, permitindo que cada haste acomode qualquer tipo de pastilha. O seu design de alojamento garante fixação segura da pastilha, posicionamento preciso da aresta e precisão de concentricidade de 0,02 mm ou menos.

A W-PRO es una herramienta de acabado de alta precisión que presenta una variedad de opciones de vástago y dos tipos de plaquitas, permitiendo que cada vástago pueda alojar cualquier tipo de plaquita. Su diseño de alojamiento garantiza una sujeción segura de la plaquita, un posicionamiento preciso del filo y una precisión de concentricidad de 0,02 mm o menos.

W-PRO 62090 > page 260

- From DC 0.315 in to 0.787 in
  De DC 0.315 in a 0.787 in | Desde DC 0.315 in hasta 0.787 in
- Available in threaded steel coupling and cylindrical carbide shank
  Disponível em acoplamento roscado e haste cilíndrica | Disponible en fijación roscada y mango cilíndrico
- One toolholder for two types of inserts
  Um suporte para dois tipos de pastilhas | Un portaherramientas para dos tipos de plaquitas
- Ideal for finishing operations on hardened steels
  Ideal para operações de acabamento em aços endurecidos | Ideal para operaciones de acabado en aceros endurecidos

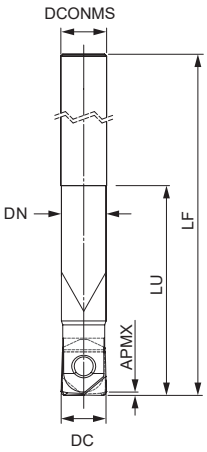


W-PRO 62090

METRIC LINE

Proprietary milling line





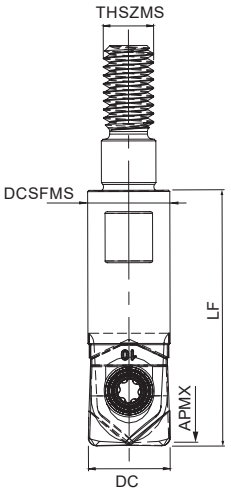
Cylindrical Carbide Shank

Tolerance R	Runout Tolerance
± 0.0006	R 0.0008

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Specifications				Insert Pastilha Inserto	Stock
			DC	DCONMS	DN	LF	LU		APMX (in)		Ae max (in)			
181156600	008E62090-02-U008140	2	0.315	0.315	0.303	5.512	1.378	0.198	0.157	0.098	0.031	0.031	WCR 08.../WCL 08...	◈
181156700	010E62090-02-U010150	2	0.394	0.394	0.382	5.906	1.772	0.331	0.197	0.118	0.039	0.039	WCR 10.../WCL 10...	◈
181156800	010E62090-02-U010180	2	0.394	0.394	0.382	7.087	1.772	0.397	0.197	0.118	0.039	0.039	WCR 10.../WCL 10...	◈
181155700	012E62090-02-U012165	2	0.472	0.472	0.461	6.496	2.165	0.529	0.236	0.157	0.047	0.047	WCR 12.../WCL 12...	◈
181156900	012E62090-02-U012200	2	0.472	0.472	0.461	7.874	2.165	0.639	0.236	0.157	0.047	0.047	WCR 12.../WCL 12...	◈
181157000	016E62090-02-U016200	2	0.630	0.630	0.618	7.874	2.559	1.124	0.315	0.197	0.063	0.063	WCR 16.../WCL 16...	◈
181157100	016E62090-02-U016250	2	0.630	0.630	0.618	9.843	2.559	1.477	0.315	0.197	0.063	0.063	WCR 16.../WCL 16...	◈
181157200	020E62090-02-U020220	2	0.787	0.787	0.776	8.661	2.756	1.917	0.394	0.236	0.079	0.079	WCR 20.../WCL 20...	◈
181157300	020E62090-02-U020250	2	0.787	0.787	0.776	9.843	2.756	2.204	0.394	0.236	0.079	0.079	WCR 20.../WCL 20...	◈
181157400	020E62090-02-U020300	2	0.787	0.787	0.776	11.811	2.756	2.711	0.394	0.236	0.079	0.079	WCR 20.../WCL 20...	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)





Threaded Steel Shank

Tolerance R	Runout Tolerance
± 0.0006	R 0.0020

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications				Insert Pastilha Inserto	Stock
			DC	THSZMS	DCSFMS	LF		APMX (in)		Ae max (in)			
181167000	010R62090-02-UM06030	2	0.394	M6	0.386	1.181	0.024	0.197	0.118	0.039	0.039	WCR 10.../WCL 10...	◈
181167100	012R62090-02-UM06030	2	0.472	M6	0.386	1.181	0.035	0.236	0.157	0.047	0.047	WCR 12.../WCL 12...	◈
181167200	016R62090-02-UM08030	2	0.630	M8	0.504	1.181	0.062	0.315	0.197	0.063	0.063	WCR 16.../WCL 16...	◈
181167300	020R62090-02-UM10035	2	0.787	M10	0.701	1.378	0.128	0.394	0.236	0.079	0.079	WCR 20.../WCL 20...	◈

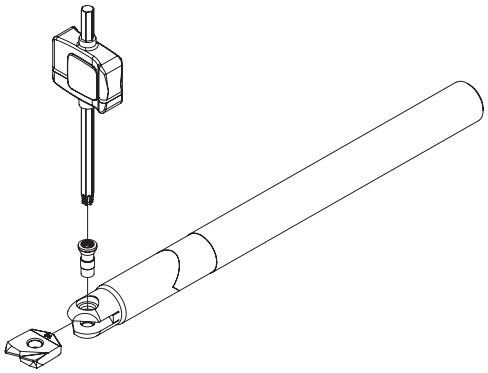
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
0.315	P0300726	XT08	DT0812	10.6
0.394	P0350825	XT10	DT1020	17.7
0.472	P0501025	XT20	DT2050	44.3
0.630	P0501326	XT20	DT2050	44.3
0.787	P0601725	XT25	-	61.1

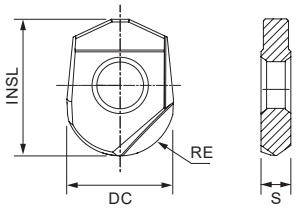
Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



WCR Inserts | Pastilhas | Plaquitas



WCR



WCR

		P				M				K				H				Dimensions Dimensões Dimensiones (in)			
		PVD				PVD				PVD				PVD							
	(2) Grade code	X4	8F	X6	4F	X4	8F	X6	4F	X4	8F	X6	4F	X4	8F	X6	4F				
(1) Geometry code	ISO Reference	PHH603	PHF603	PHH910	PHF910	PHH603	PHF603	PHH910	PHF910	PHH603	PHF603	PHH910	PHF910	PHH603	PHF603	PHH910	PHF910	INSL	RE	S	DC
1112900	WCR 08	△	◎	△	◎	△	◎	△	◎	△	◎	△	◎	△	◎	△	◎	0.382	0.157	0.083	0.315
1111914	WCR 10		◎	△	◎		◎	△	◎		◎	△	◎		◎	△	◎	0.472	0.197	0.106	0.394
1112099	WCR 12	△	◎	△	◎	△	◎	△	◎	△	◎	△	◎	△	◎	△	◎	0.575	0.236	0.126	0.472
1112100	WCR 16	△	◎		◎	△	◎		◎	△	◎		◎	△	◎		◎	0.654	0.315	0.165	0.630
1112101	WCR 20		◎		◎		◎		◎		◎		◎		◎		◎	0.787	0.394	0.205	0.787

◎ First choice | 1ª Escolha | 1ª Opción
◎ Stock Itens | Itens de stock
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock
○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

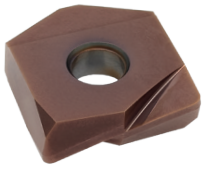
Insert Order Code: (1) Geometry code + (2) Grade code

W-PRO 62090

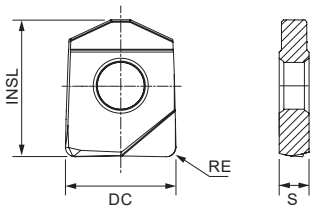
METRIC LINE

Proprietary milling line

WCL Inserts | Pastilhas | Plaquitas



WCL

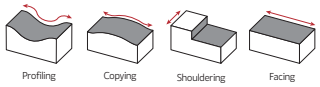


WCL

		P				M				K				H				Dimensions Dimensões Dimensiones (in)			
		PVD				PVD				PVD				PVD							
	(2) Grade code	X4	8F	X6	4F	X4	8F	X6	4F	X4	8F	X6	4F	X4	8F	X6	4F				
(1) Geometry code	ISO Reference	PHH603	PHF603	PHH910	PHF910	PHH603	PHF603	PHH910	PHF910	PHH603	PHF603	PHH910	PHF910	PHH603	PHF603	PHH910	PHF910	INSL	RE	S	DC
1112879	WCL-08 R0.3		●		●		●		●		●		●		●		●	0.382	0.012	0.083	0.315
1112880	WCL-08 R0.5		●		●		●		●		●		●		●		●	0.382	0.020	0.083	0.315
1112853	WCL-08 R1.0		●	○	●		●	○	●		●	○	●		●	○	●	0.382	0.039	0.083	0.315
1112881	WCL-10 R0.3	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	0.472	0.012	0.106	0.394
1112882	WCL-10 R0.5		●		●		●		●		●		●		●		●	0.472	0.020	0.106	0.394
1112848	WCL-10 R1.0	○	●		●	○	●		●	○	●		●	○	●		●	0.472	0.039	0.106	0.394
1112883	WCL-10 R1.5		●		●		●		●		●		●		●		●	0.472	0.059	0.106	0.394
1112884	WCL-10 R2.0		●	○	●		●	○	●		●	○	●		●	○	●	0.472	0.079	0.106	0.394
1112885	WCL-12 R0.3		●		●		●		●		●		●		●		●	0.575	0.012	0.126	0.472
1112886	WCL-12 R0.5		●		●		●		●		●		●		●		●	0.575	0.020	0.126	0.472
1112096	WCL-12 R1.0		●	○	●		●	○	●		●	○	●		●	○	●	0.575	0.039	0.126	0.472
1112887	WCL-12 R1.5	○	●		●	○	●		●	○	●		●	○	●		●	0.575	0.059	0.126	0.472
1112888	WCL-12 R2.0		●		●		●		●		●		●		●		●	0.575	0.079	0.126	0.472
1112889	WCL-12 R3.0		●		●		●		●		●		●		●		●	0.575	0.118	0.126	0.472
1112890	WCL-16 R0.3	○	●		●	○	●		●	○	●		●	○	●		●	0.654	0.012	0.165	0.630
1112891	WCL-16 R0.5		●		●		●		●		●		●		●		●	0.654	0.020	0.165	0.630
1112097	WCL-16 R1.0	○	●		●	○	●		●	○	●		●	○	●		●	0.654	0.039	0.165	0.630
1112892	WCL-16 R1.5		●		●		●		●		●		●		●		●	0.654	0.059	0.165	0.630
1112893	WCL-16 R2.0	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	0.654	0.079	0.165	0.630
1112894	WCL-16 R3.0	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	0.654	0.118	0.165	0.630
1112895	WCL-20 R0.3		●		●		●		●		●		●		●		●	0.787	0.012	0.205	0.787
1112896	WCL-20 R0.5		●		●		●		●		●		●		●		●	0.787	0.020	0.205	0.787
1112098	WCL-20 R1.0	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	0.787	0.039	0.205	0.787
1112897	WCL-20 R1.5		●	○	●		●	○	●		●	○	●		●	○	●	0.787	0.059	0.205	0.787
1112898	WCL-20 R2.0		●		●		●		●		●		●		●		●	0.787	0.079	0.205	0.787
1112899	WCL-20 R3.0	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	0.787	0.118	0.205	0.787

● First choice | Primeira opção | 1ª opción ● Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PHH603	PHF603	PHH910	PHF910
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	200-330	✓	✓	✓	✓
	6	SS - Austenitic-ferritic (Duplex)	230-260	✓	✓	✓	✓
K	7	Malleable Cast Iron	130-230	✓	✓	✓	✓
	8	Grey Cast Iron	180-245	✓	✓	✓	✓
	9	Nodular Cast iron	160-250	✓	✓	✓	✓
H	12	Hardened Steels	46-54 HRC	✓	✓	✓	✓
	13	Hardened Steels	55-62 HRC	✓	✓	✓	✓
	14	Hardened Steels	63-70 HRC	✓	✓	✓	✓

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 → PHH603	PHF603	PHH910	PHF910	Feed fz (in/t) WCR	WCL
P	1	Unalloyed Steel	125-220	590-1017	590-1017	459-886	459-886	0.006-0.018	0.004-0.012
	2	Low-Alloyed Steel	220-280	590-984	590-984	459-853	459-853	0.006-0.016	0.004-0.010
	3	High-Alloyed Steel	280-380	590-918	590-918	459-722	459-722	0.004-0.016	0.004-0.010
M	4	SS - Ferritic / Martensitic	200-330	558-984	558-984	426-853	426-853	0.006-0.014	0.004-0.010
	5	SS - Austenitic	200-330	525-951	525-951	394-820	394-820	0.006-0.014	0.004-0.010
	6	SS - Austenitic-ferritic (Duplex)	230-260	492-886	492-886	361-754	361-754	0.006-0.012	0.003-0.008
K	7	Malleable Cast Iron	130-230	656-1246	656-1246	590-1214	590-1214	0.004-0.020	0.004-0.014
	8	Grey Cast Iron	180-245	590-1181	590-1181	590-1148	590-1148	0.004-0.018	0.004-0.012
	9	Nodular Cast iron	160-250	525-1017	525-1017	525-951	525-951	0.004-0.016	0.004-0.012
H	12	Hardened Steels	46-54 HRC	295-886	295-886	262-853	262-853	0.002-0.008	0.002-0.006
	13	Hardened Steels	55-62 HRC	262-656	262-656	230-590	230-590	0.002-0.006	0.002-0.005
	14	Hardened Steels	63-70 HRC	230-590	230-590	230-525	230-525	0.002-0.005	0.002-0.004

Determine the APMX or a_e :

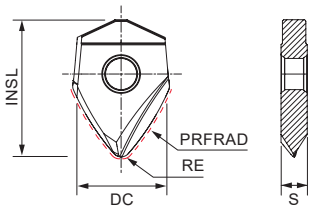
	WCR		WCL	
Insert size	APMX (in)	A_e max (in)	APMX (in)	A_e max (in)
0.315	0.157	0.031	0.098	0.031
0.394	0.197	0.039	0.118	0.039
0.472	0.236	0.047	0.157	0.047
0.630	0.315	0.063	0.197	0.063
0.787	0.394	0.079	0.236	0.079

W-PRO 62090

WCX-XT Inserts | Pastilhas | Plaquitas



Tangential



WCX XT

		P	M	K	H	Dimensions Dimensões Dimensiones (in)				
		PVD	PVD	PVD	PVD					
	(2) Grade code	4F	4F	4F	4F					
(1) Geometry code	ISO Reference	PHF910	PHF910	PHF910	PHF910	INSL	RE	PRFRAD	S	DC
1113527	WCX-12 XT 1.2-30.0	◈	◈	◈	◈	0.575	0.047	1.181	0.126	0.472
1113381	WCX-16 XT 1.6-40.0	◈	◈	◈	◈	0.654	0.063	1.575	0.165	0.630
1113528	WCX-20 XT 2.0-50.0	◈	◈	◈	◈	0.787	0.079	1.969	0.205	0.787

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

				Tangential Radius			
ISO	PSM	Material	HB (Brinell)	Vc (SFM)	fz (in/t)	APMX (in)	ae (in)
P	1	Unalloyed Steel	125-220	2460 (820-2952)	0.006 (0.004-0.016)	See the table in the next page	0.004 (0.002-0.012)
	2	Low-Alloyed Steel	220-280	2362 (656-2624)	0.006 (0.003-0.012)		0.004 (0.002-0.012)
	3	High-Alloyed Steel	280-380	1706 (656-2296)	0.006 (0.002-0.012)		0.004 (0.002-0.012)
M	4	SS - Ferritic / Martensitic	200-330	2132 (656-2624)	0.006 (0.002-0.012)		0.004 (0.002-0.012)
	5	SS - Austenitic	200-330	2132 (656-2624)	0.006 (0.002-0.012)		0.004 (0.002-0.012)
	6	SS - Austenitic-ferritic (Duplex)	230-260	2132 (656-2624)	0.006 (0.002-0.010)		0.004 (0.002-0.008)
K	7	Malleable Cast Iron	130-230	2362 (820-2952)	0.008 (0.004-0.012)		0.004 (0.002-0.012)
	8	Grey Cast Iron	180-245	2362 (820-2952)	0.008 (0.004-0.012)		0.004 (0.002-0.012)
	9	Nodular Cast iron	160-250	2362 (820-2952)	0.008 (0.004-0.012)		0.004 (0.002-0.012)
H	12	Hardened Steels	46-54 HRC	1050 (328-1312)	0.004 (0.002-0.008)		0.003 (0.001-0.008)
	13	Hardened Steels	55-62 HRC	918 (262-1050)	0.004 (0.002-0.006)		0.002 (0.0004-0.008)
	14	Hardened Steels	63-70 HRC	918 (230-1050)	0.004 (0.002-0.006)		0.002 (0.0004-0.008)

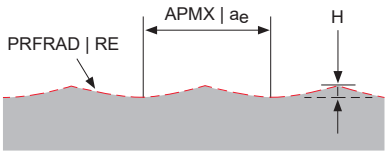
				Ball Radius			
ISO	PSM	Material	HB (Brinell)	Vc (SFM)	fz (in/t)	APMX (in)	ae (in)
P	1	Unalloyed Steel	125-220	2460 (2690-2952)	0.002 (0.001-0.008)	0.004 (0.002-0.012)	See the table in the next page
	2	Low-Alloyed Steel	220-280	2460 (656-2624)	0.002 (0.001-0.008)	0.004 (0.002-0.010)	
	3	High-Alloyed Steel	280-380	2296 (656-2296)	0.002 (0.001-0.008)	0.004 (0.002-0.010)	
M	4	SS - Ferritic / Martensitic	200-330	2460 (656-2624)	0.002 (0.001-0.008)	0.004 (0.002-0.010)	
	5	SS - Austenitic	200-330	2460 (656-2624)	0.002 (0.001-0.008)	0.004 (0.002-0.008)	
	6	SS - Austenitic-ferritic (Duplex)	230-260	2460 (656-2624)	0.002 (0.001-0.008)	0.004 (0.002-0.008)	
K	7	Malleable Cast Iron	130-230	2460 (2690-2952)	0.002 (0.001-0.008)	0.004 (0.002-0.012)	
	8	Grey Cast Iron	180-245	2460 (2690-2952)	0.002 (0.001-0.008)	0.004 (0.002-0.012)	
	9	Nodular Cast iron	160-250	2460 (2690-2952)	0.002 (0.001-0.008)	0.004 (0.002-0.012)	
H	12	Hardened Steels	46-54 HRC	1640 (328-1312)	0.002 (0.001-0.008)	0.003 (0.001-0.006)	
	13	Hardened Steels	55-62 HRC	1476 (262-1050)	0.002 (0.001-0.008)	0.002 (0.0004-0.006)	
	14	Hardened Steels	63-70 HRC	1476 (230-1050)	0.002 (0.001-0.008)	0.002 (0.0004-0.006)	

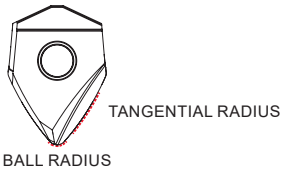
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

Determine the APMX or a_e according to the desired cusp height:

Insert	Tangential Radius (APMX)								Ball Radius (a_e)							
	PRFRAD	H - Cusp Height (in)							RE	H - Cusp Height (in)						
		0.00002	0.00004	0.00008	0.00012	0.00016	0.00020	0.00039		0.00002	0.00004	0.00008	0.00012	0.00016	0.00020	0.00039
WCX-12 XT 1.2-30.0	1,181	0.014	0.019	0.027	0.033	0.039	0.043	0.061	0.047	0.003	0.004	0.006	0.007	0.008	0.009	0.012
WCX-16 XT 1.6-40.0	1,575	0.016	0.022	0.031	0.039	0.044	0.050	0.070	0.063	0.003	0.004	0.006	0.008	0.009	0.010	0.014
WCX-20 XT 2.0-50.0	1,969	0.018	0.025	0.035	0.043	0.050	0.056	0.079	0.079	0.004	0.005	0.007	0.009	0.010	0.011	0.016

Tangential Radius	Ball Radius
$APMX = 2\sqrt{PRFRAD^2 - (PRFRAD - H)^2}$	$a_e = 2\sqrt{RE^2 - (RE - H)^2}$





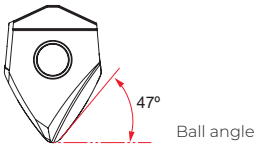
For high overhang conditions consider the next:

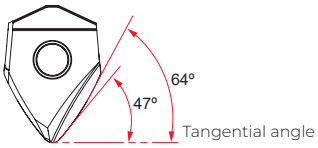
Vc1 = Vc x k

Vc1 - Recommended cutting speed for high overhang
Vc - Recommended cutting speed
k - Overhang factor

Overhang ratio	Factor (k)
3<DC	1,00
3<DC<5	0,70
5<DC<6	0,60
6<DC<7	0,50
DC>7	0,45

MACHINING METHODS Métodos de maquinação | Métodos de mecanizado





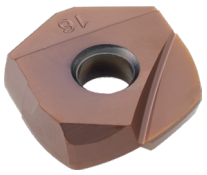
In 3-Axis machining usable range of:
- Ball angle: between 0° and 47°.
- Tangential angle: between 47° and 64°.

W-PRO 62090

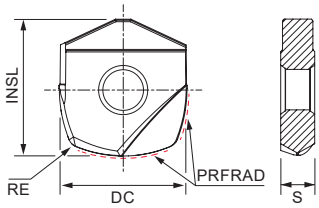
METRIC LINE

Proprietary milling line

WCX-LE Inserts | Pastilhas | Plaquitas



Lens



WCX LE

		P	M	K	H
		PVD	PVD	PVD	PVD
	(2) Grade code	4F	4F	4F	4F
(1) Geometry code	ISO Reference	PHF910	PHF910	PHF910	PHF910

Dimensions Dimensões Dimensiones (in)				
INSL	RE	PRFRAD	S	DC
0.654	0.059	0.630	0.165	0.630
0.654	0.197	0.630	0.165	0.630
0.787	0.075	0.787	0.205	0.787
0.787	0.236	0.787	0.205	0.787

Geometry code	ISO Reference	P PVD 4F PHF910	M PVD 4F PHF910	K PVD 4F PHF910	H PVD 4F PHF910
1113412	WCX-16 LE 1.5-16.0	◉	◉	◉	◉
1113529	WCX-16 LE 5.0-16.0	○	○	○	○
1113530	WCX-20 LE 1.9-20.0	◉	◉	◉	◉
1113531	WCX-20 LE 6.0-20.0	○	○	○	○

◉ First choice | Primeira opção | 1ª opción ◉ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

				Barrel Radius			
ISO	PSM	Material	HB (Brinell)	Vc (SFM)	fz (in/t)	APMX (in)	ae (in)
P	1	Unalloyed Steel	125-220	2132 (820-2952)	0.008 (0.006-0.018)	See the table in the next page	0.004 (0.002-0.012)
	2	Low-Alloyed Steel	220-280	1968 (656-2624)	0.008 (0.004-0.014)		0.004 (0.002-0.012)
	3	High-Alloyed Steel	280-380	1312 (656-2296)	0.008 (0.004-0.014)		0.004 (0.002-0.012)
M	4	SS - Ferritic / Martensitic	200-330	1640 (656-2624)	0.008 (0.004-0.014)		0.004 (0.002-0.012)
	5	SS - Austenitic	200-330	1640 (656-2624)	0.008 (0.004-0.014)		0.004 (0.002-0.012)
	6	SS - Austenitic-ferritic (Duplex)	230-260	1640 (656-2624)	0.008 (0.004-0.012)		0.004 (0.002-0.008)
K	7	Malleable Cast Iron	130-230	1968 (820-2952)	0.010 (0.008-0.020)		0.004 (0.002-0.012)
	8	Grey Cast Iron	180-245	1968 (820-2952)	0.010 (0.008-0.020)		0.004 (0.002-0.012)
	9	Nodular Cast iron	160-250	1968 (820-2952)	0.010 (0.008-0.020)		0.004 (0.002-0.012)
H	12	Hardened Steels	46-54 HRC	820 (328-1312)	0.006 (0.004-0.012)		0.003 (0.001-0.008)
	13	Hardened Steels	55-62 HRC	722 (262-1050)	0.006 (0.004-0.010)		0.002 (0.0004-0.008)
	14	Hardened Steels	63-70 HRC	722 (230-1050)	0.006 (0.004-0.010)		0.002 (0.0004-0.008)

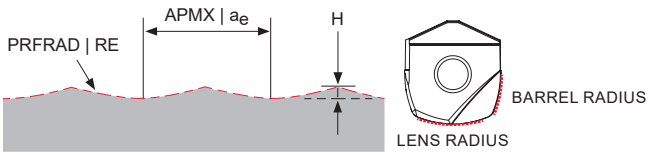
				Lens Radius			
ISO	PSM	Material	HB (Brinell)	Vc (SFM)	fz (in/t)	APMX (in)	ae (in)
P	1	Unalloyed Steel	125-220	2460 (820-2952)	0.010 (0.008-0.018)	0.004 (0.002-0.012)	See the table in the next page
	2	Low-Alloyed Steel	220-280	2362 (656-2620)	0.010 (0.006-0.014)	0.004 (0.002-0.012)	
	3	High-Alloyed Steel	280-380	1706 (656-2296)	0.010 (0.006-0.014)	0.004 (0.002-0.012)	
M	4	SS - Ferritic / Martensitic	200-330	2132 (656-2620)	0.010 (0.006-0.014)	0.004 (0.002-0.012)	
	5	SS - Austenitic	200-330	2132 (656-2620)	0.010 (0.006-0.014)	0.004 (0.002-0.012)	
	6	SS - Austenitic-ferritic (Duplex)	230-260	2132 (656-2620)	0.010 (0.004-0.012)	0.004 (0.002-0.008)	
K	7	Malleable Cast Iron	130-230	2362 (820-2952)	0.016 (0.008-0.020)	0.004 (0.002-0.012)	
	8	Grey Cast Iron	180-245	2362 (820-2952)	0.016 (0.008-0.020)	0.004 (0.002-0.012)	
	9	Nodular Cast iron	160-250	2362 (820-2952)	0.016 (0.008-0.020)	0.004 (0.002-0.012)	
H	12	Hardened Steels	46-54 HRC	1050 (328-1312)	0.008 (0.004-0.012)	0.003 (0.001-0.008)	
	13	Hardened Steels	55-62 HRC	2262 (262-1050)	0.008 (0.004-0.010)	0.002 (0.0004-0.008)	
	14	Hardened Steels	63-70 HRC	2262 (230-1050)	0.008 (0.004-0.010)	0.002 (0.0004-0.008)	

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

Determine the APMX or a_e according to the desired cusp height:

Insert	Barrel Radius (APMX)							Lens Radius (a_e)						
	PRFRAD	H - Cusp Height (in)						PRFRAD	H - Cusp Height (in)					
		0.00004	0.00008	0.00012	0.00016	0.00020	0.00039		0.00004	0.00008	0.00012	0.00016	0.00020	0.00039
WCX-16 LE 1.5-16.0 WCX-16 LE 5.0-16.0	0.630	0.014	0.020	0.024	0.028	0.031	0.061	0.630	0.014	0.020	0.024	0.028	0.031	0.061
WCX-20 LE 1.9-20.0 WCX-20 LE 6.0-20.0	0.787	0.016	0.022	0.027	0.031	0.035	0.050	0.787	0.016	0.022	0.027	0.031	0.035	0.050

Lens Radius	Barrel Radius
$APMX = 2\sqrt{PRFRAD^2 - (PRFRAD - H)^2}$	$a_e = 2\sqrt{PRFRAD^2 - (PRFRAD - H)^2}$



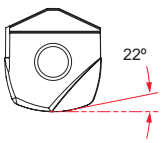
For high overhang conditions consider the next:

Vc1 = Vc x k

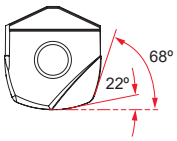
Vc1 - Recommended cutting speed for high overhang
Vc - Recommended cutting speed
k - Overhang factor

Overhang ratio	Factor (k)
3<DC	1,00
3<DC<5	0,70
5<DC<6	0,60
6<DC<7	0,50
DC>7	0,45

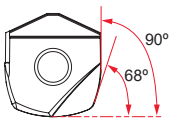
MACHINING METHODS Métodos de maquinação | Métodos de mecanizado



Lens angle

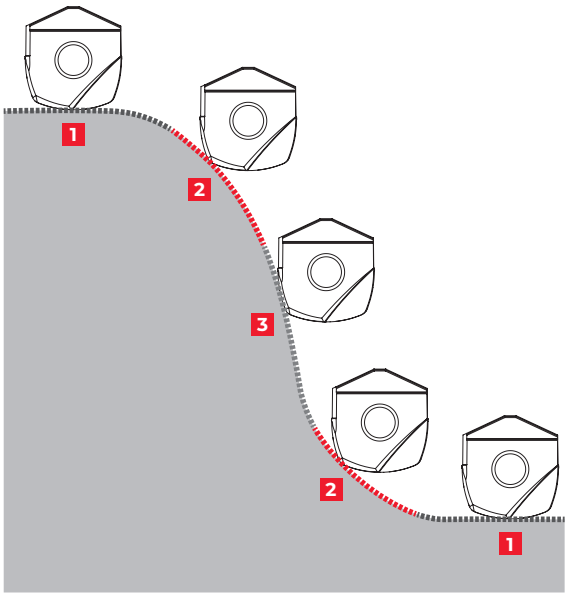


Corner angle



Barrel angle

In 3-Axis machining usable range of:
- Lens angle: between 0° and 22°.
- Corner angle: between 22° and 68°.
- Barrel angle: between 68° and 90°.



1 **WCX-LE** lens radius
cutting edge for bottom surfaces - large stepover

2 **WCX-LE** corner radius
cutting edge for inclined surfaces - small stepover

3 **WCX-LE** barrel radius
cutting edge for wall surfaces - large stepdown

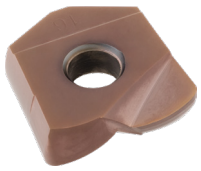
Note: In 5-axis machining, the tool must be tilted to avoid cutting into the center where Vc=0 SFM. This tilt angle should not exceed 22°.

W-PRO 62090

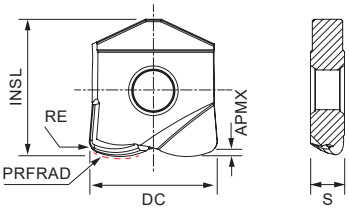
METRIC LINE

Proprietary milling line

WCX-HF Inserts | Pastilhas | Plaquitas



High feed



WCX HF

		P	M	K	H
		PVD	PVD	PVD	PVD
	(2) Grade code	4F	4F	4F	4F
(1) Geometry code	ISO Reference	PHF910	PHF910	PHF910	PHF910
		Dimensions Dimensões Dimensiones (in)			
		INSL	RE	PRFRAD	S	APMX	DC
1113376	WCX-08 HF 0.6-03.4	●	●	●	●	0.382	0.024	0.134	0.083	0.016	0.315
1113377	WCX-10 HF 0.8-04.6	●	●	●	●	0.472	0.031	0.181	0.106	0.020	0.394
1113378	WCX-12 HF 1.0-06.0	●	●	●	●	0.575	0.039	0.236	0.126	0.020	0.472
1113379	WCX-16 HF 1.4-08.0	●	●	●	●	0.654	0.055	0.315	0.165	0.022	0.630
1113380	WCX-20 HF 1.8-10.0	●	●	●	●	0.787	0.071	0.394	0.205	0.022	0.787

● First choice | Primeira opção | 1ª opción ● Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

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

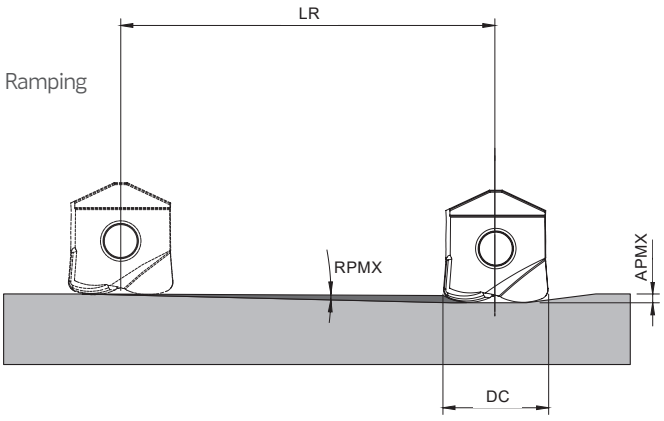
ISO	PSM	Material	HB (Brinell)	Vc (SFM)			Feed fz (in/t)			Plunging	
				ae=25%	ae=50%	ae=100%	ae=25%	ae=50%	ae=100%	Vc (SFM)	fz (in/t)
P	1	Unalloyed Steel	125-220	984	918	558	0.0017 x DC	0.0015 x DC	0,023 x DC	525	0.0002 x DC
	2	Low-Alloyed Steel	220-280	918	820	754	0.0017 x DC	0.0015 x DC	0,023 x DC	459	0.0002 x DC
	3	High-Alloyed Steel	280-380	656	590	492	0.0016 x DC	0.0014 x DC	0,020 x DC	394	0.0002 x DC
M	4	SS - Ferritic / Martensitic	200-330	590	525	492	0.0014 x DC	0.0014 x DC	0,018 x DC	361	0.0001 x DC
	5	SS - Austenitic	200-330	394	361	328	0.0014 x DC	0.0013 x DC	0,018 x DC	328	0.0001 x DC
	6	SS - Austenitic-ferritic (Duplex)	230-260	262	230	197	0.0013 x DC	0.0012 x DC	0,018 x DC	197	0.0001 x DC
K	7	Malleable Cast Iron	130-230	558	492	426	0.0013 x DC	0.0013 x DC	0.0008 x DC	361	0.0001 x DC
	8	Grey Cast Iron	180-245	722	656	590	0.0013 x DC	0.0014 x DC	0.0008 x DC	394	0.0001 x DC
	9	Nodular Cast iron	160-250	525	459	394	0.0013 x DC	0.0013 x DC	0.0008 x DC	361	0.0001 x DC
H	12	Hardened Steels	46-54 HRC	295	279	230	0.0010 x DC	0.0008 x DC	0.0006 x DC	230	0.0001 x DC
	13	Hardened Steels	55-62 HRC	295	279	230	0.0010 x DC	0.0008 x DC	0.0006 x DC	230	0.0001 x DC
	14	Hardened Steels	63-70 HRC	295	279	230	0.0010 x DC	0.0008 x DC	0.0006 x DC	230	0.0001 x DC

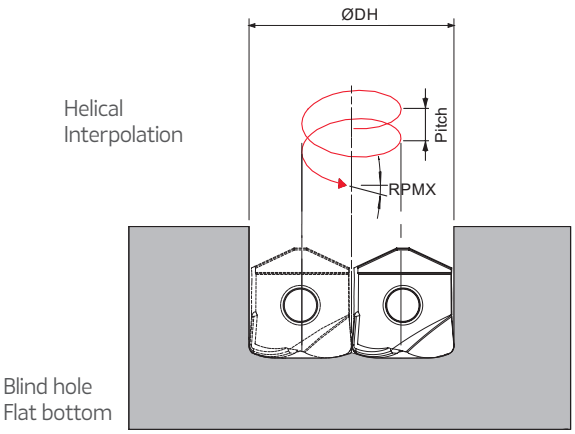
Determine the APMX

Insert size	APMX (in)
WCX-08 HF 0.6-03.4	0.016
WCX-10 HF 0.8-04.6	0.020
WCX-12 HF 1.0-06.0	0.020
WCX-16 HF 1.4-08.0	0.022
WCX-20 HF 1.8-10.0	0.022

RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular





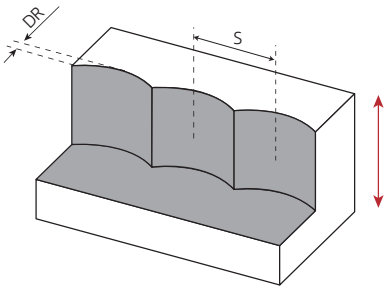
ØDi = ØDH - DC

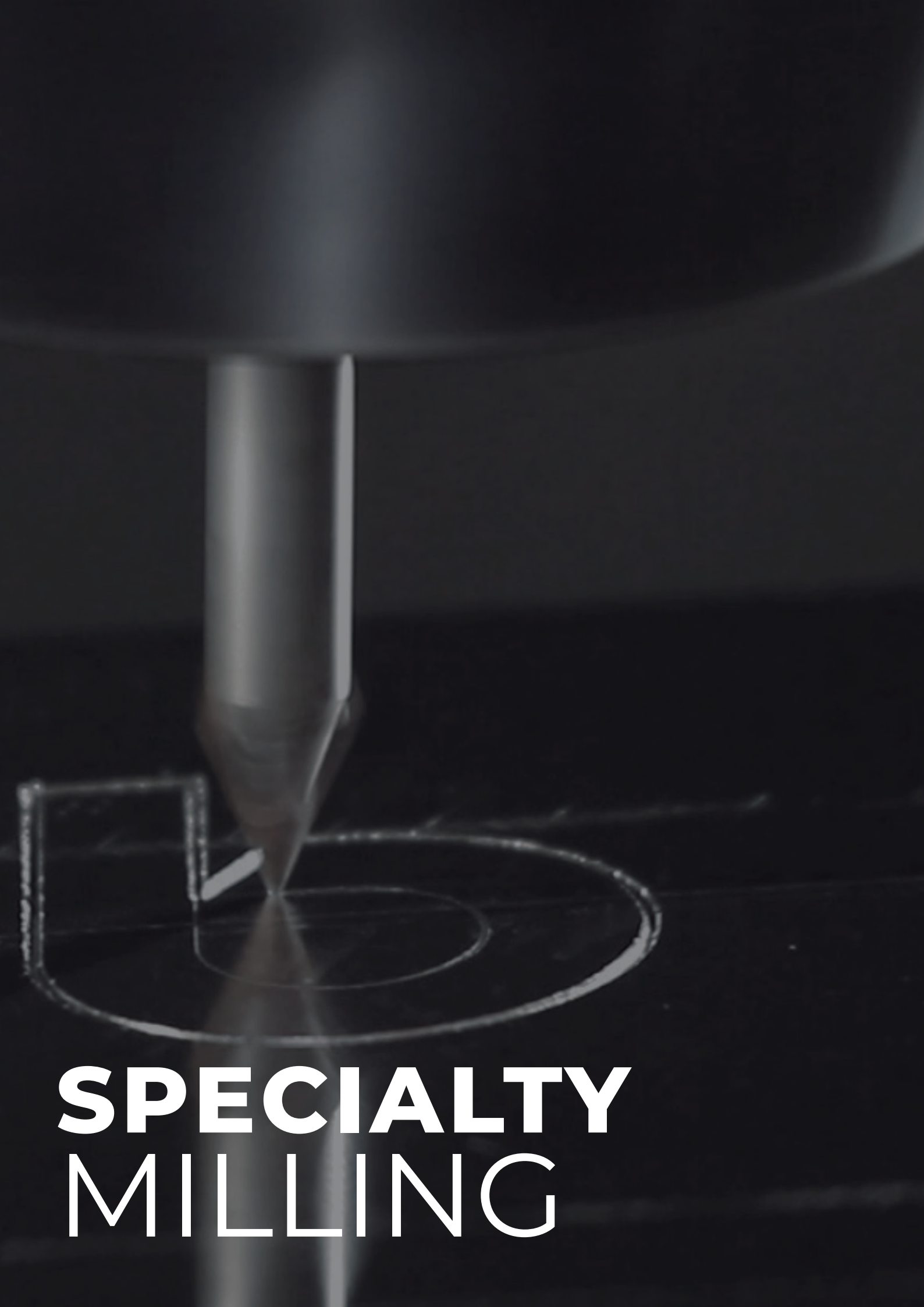
DC	Ramping			Helical Interpolation			Max Angle (°)
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.	
0.315	0.059	0.016	0.602	0.421 -	- 0.630	0.008 0.016	1.5 1.0
0.394	0.059	0.020	0.752	0.524 -	- 0.787	0.010 0.020	1.5 1.0
0.472	0.059	0.020	0.752	0.630 -	- 0.945	0.013 0.020	1.5 0.8
0.630	0.059	0.022	0.827	0.839 -	- 1.260	0.017 0.022	1.5 0.6
0.787	0.059	0.022	0.827	1.051 -	- 1.575	0.021 0.022	1.5 0.5

Note: During helical interpolation do not exceed APMX.

PLUNGING Mergulho | Plunge

S max and DR corresponding cutting diameter DC (in)					
DR (in)	DC (in)				
	0.315	0.394	0.472	0.630	0.787
0.039	0.102	0.118	0.130	0.154	0.173
0.079	0.138	0.157	0.177	0.209	0.236
0.118	-	0.181	0.205	0.244	0.280
0.157	-	-	0.224	0.272	0.315
0.197	-	-	-	0.291	0.343
0.236	-	-	-	0.303	0.362
0.276	-	-	-	-	0.374





SPECIALTY MILLING

1 HARDMILL XN90-12

> Suitable for machining **N**

> See page A - 272

2 CENTER & CHAMFER

> Suitable for machining **P M K**

> See page A - 276

3 ENGRAVING 64067 metric line

> Suitable for machining **P M N S**

> See page A - 280

4 SPOT FACE metric line

> Suitable for machining **P M K S**

> See page A - 284

XN90-12

HARDMILL

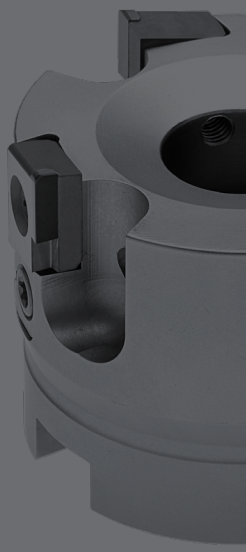


The HARDMILL XN90-12 is a specialized tool designed for specific applications in the automobile industry, such as gearbox housings. It features adjustment wedges for precise face milling on aluminum components.

A Hardmill XN90-12 é uma ferramenta especializada projetada para aplicações específicas na indústria automóvel, como caixas de velocidades. Apresenta cunhas de ajuste de parafuso para fresagem frontal precisa em componentes de alumínio.

La Hardmill XN90-12 es una herramienta especializada diseñada para aplicaciones específicas en la industria automotriz, como cajas de cambios. Presenta cuñas de ajuste de tornillo para fresado frontal preciso en componentes de aluminio.

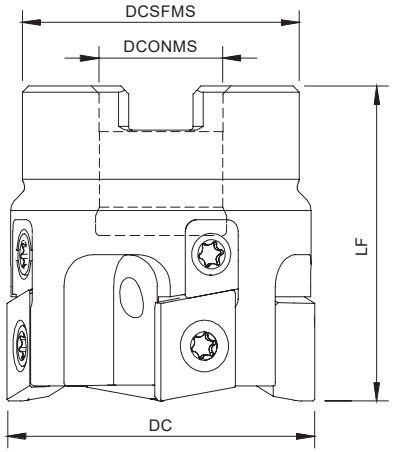
HARDMILL XN90-12 > page 274



- From DC 1.575 in to 6.299 in
  De DC 1.575 in a 6.299 in | Desde DC 1.575 in hasta 6.299 in
- Available in arbor mounting
  Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- Excellent solution for aluminium
  Excelente solução para alumínio | Excelente solución para aluminio
- PCD tipped insert
  Pastilha com ponta de PCD | Inserto con punta de PCD

HARDMILL XN90-12





Arbor Mounting

KAPR=90° | GAMP=0°

Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	RPM max		
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

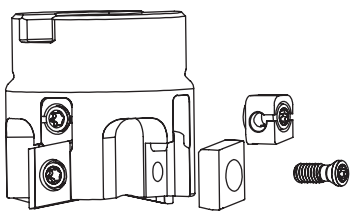
○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

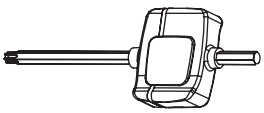
SPARE PARTS Acessórios | Repuestos

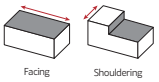
Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value	Wedge
					
XN90-A-12 - 1.50-4.00	P0401100	XT15	DT1530	26.6	SETDEV AS 04 00

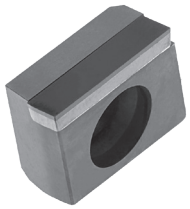
Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

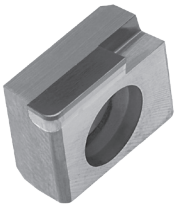


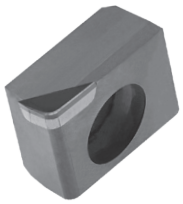


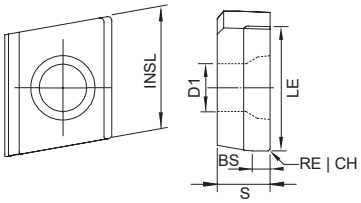


XNHW 1205... Inserts | Pastilhas | Plaquitas


XNHW 1205 PZFR-020120


XNHW 120508 PZTR-000080


XNHW 120508 PZTR-015045



XNHW

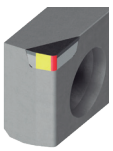
		N		Dimensions Dimensões Dimensiones (in)							
		PCD									
	(2) Grade code	I3	D6								
(1) Geometry code	ISO Reference	PDP403	PDP410	INSL	S	LE	D1	RE	CHW	KCH	BS
1112564	XNHW 120504 PZFR-015045	○	○	0.482	0.213	0.177	0.189	0.016	-	-	0.059
1112565	XNHW 120504 PZFR-000080	○	○	0.482	0.213	0.315	0.189	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	-	0.008	45º	0.079
1112567	XNHW 1205 PZFR-030045	○	○	0.482	0.213	0.177	0.189	-	0.008	45º	0.118
1112568	XNHW 1205 PZTR-030045	○	○	0.482	0.213	0.177	0.189	-	0.008	45º	0.118

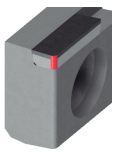
◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

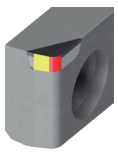
Insert order code = (1) Geometry Code + (2) Grade Code

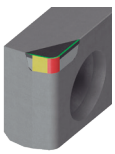
INSERTS CODIFICATION SYSTEM Sistema de codificação de pastilhas | Sistema de codificación de insertos

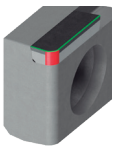
ISO CODE	Insert size	Insert thickness	Insert radius	Cutting edge position angle	Cutting edge relief angle	Cutting edge conditions	Cut direction		Wiper edge lenght	Máx. Ap
XNHW	12	05	04	P	Z	F	R	-	015	030

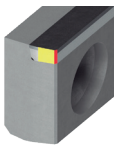

XNHW 120504 PZFR-0150045

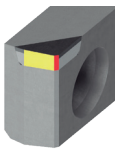

XNHW 120504 PZFR-000080

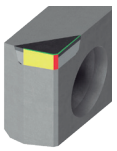

XNHW 120508 PZFR-015045


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) | Wiper cutting edge | Edge Preparation (F, T)

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

ISO	Material		HB (Brinell)	Vc (SFM)	Feed fz (in/t)
	Work piece material	Type of treatment / alloy		PDP403	XNHW 12...
N	Aluminium wrought alloys		80	984-13120	0.002-0.016
			90	984-4920	
	Aluminium cast alloys	< 12% Si	130	984-16400	
		< 12% Si	90	984-9840	
		> 12% Si	100	984-3280	
	Non-ferrous materials	brass, red bronze	100	328-2296	
		bronze	-	328-4920	
		lead-free copper and electrolytic copper	-	984-9840	
	Non-metallic materials	thermosetting plastics	-	262-984	
		fibre-reinforced plastics	200-320	262-984	
		hard rubber		262-984	

CENTER & CHAMFER



The CENTER & CHAMFER line are versatile tool suitable for a variety of milling applications, including chamfering, spot drilling, engraving, and even grooving.

A CENTER & CHAMFER é uma ferramenta versátil adequada para uma variedade de aplicações de fresagem, incluindo chanfragem, furação de ponto, gravação e até mesmo ranhuras.

La línea CENTER & CHAMFER es una herramienta versátil adecuada para una variedad de aplicaciones de fresado, incluyendo chaflanado, taladrado puntual, grabado e incluso ranurado.

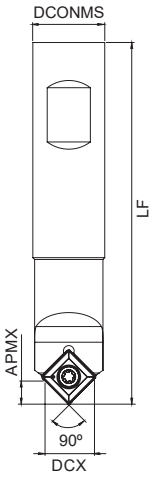
CENTER & CHAMFER > page 278

- Chamfering
  Chanfragem | Chaflanado
- Spot Drilling
  Furação de ponto| Taladrado puntual
- Grooving
  Ranhuras | Ranurado
- Engraving
  Gravação | Grabado



CENTER & CHAMFER







Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)						WT (lbs)	Insert Pastilha Inserto	Stock
			DCX	APMX	APMN	DCONMS	LF	KAPR			
181147600	CHT S.625H N11-45	1	0.512	0.256	0.039	5/8	3.937	45	0.322	SO.. 11T3..	◈
181147700	CHT S.625M N11-45	1	0.512	0.256	0.039	5/8	5.906	45	0.397	SO.. 11T3..	◈

METRIC LINE PACKS:

Order code Código	Reference Referência Referencia	Nº Toolholder	Holder designation	Nº inserts	Insert Pastilha Inserto	Stock
1410286G4	PK SOMT 11T308 CHTS16H	1	CHT S16H N11-45	10	SOMT 11T308	◈
1410287G4	PK SOMT 11T308 CHTS16M	1	CHT S16M N11-45	10	SOMT 11T308	◈
1410318G4	PK SOGT 11T303 CHTS16H	1	CHT S16H N11-45	10	SOGT 11T303	◈
1410317G4	PK SOGT 11T303 CHTS16M	1	CHT S16M N11-45	10	SOGT 11T303	◈

◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

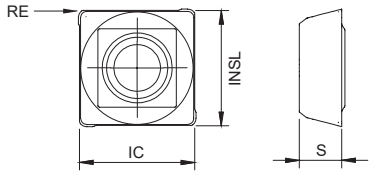
SO...T 11T3... Inserts | Pastilhas | Plaquitas



SOMT



SOGT



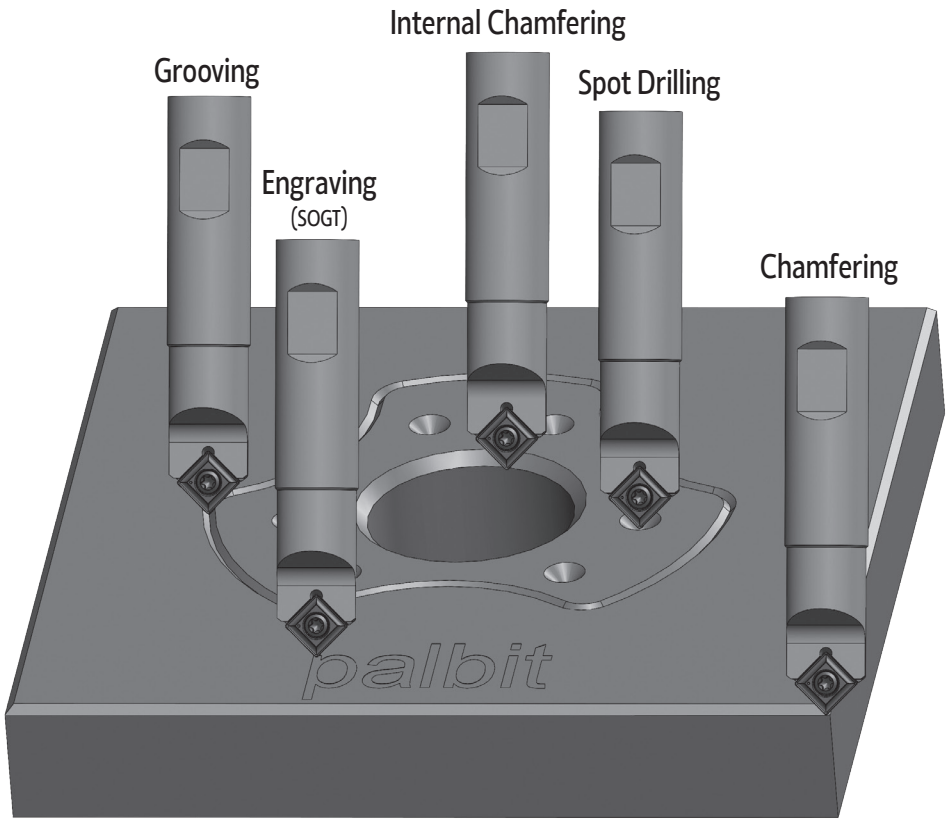
SOMT | SOGT

		P	M	K	Dimensions Dimensões Dimensiones (in)			
		PVD	PVD	PVD				
	(2) Grade code	G4	G4	G4				
(1) Geometry code	ISO Reference	PH7920	PH7920	PH7920	IC	S	INSL	RE
1112425	SOMT 11T308	◈	◈	◈	0.427	0.158	0.433	0.031
1112973	SOGT 11T303	◈	◈	◈	0.427	0.157	0.433	(0.012)

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

TOOL SELECTION Selecção de ferramenta | Selección de herramienta

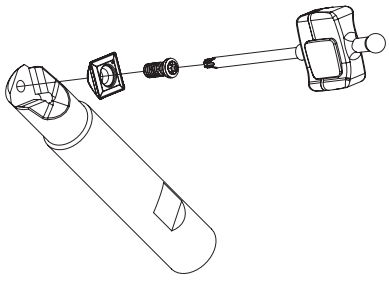


SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
CHT S16...	P0350800	XT15	DT1530	26.6

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.



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

ISO	PSM	Material	HB (Brinell)	Vc (SFM)	Feed fz (in/t)	
				PH7920	SOMT 11T308	SOGT 11T303
P	1	Unalloyed Steel	125-220	394-492	0.002-0.003	0.002-0.004
	2	Low-Alloyed Steel	220-280	328-394	0.001-0.003	0.002-0.004
	3	High-Alloyed Steel	280-380	197-328	0.001-0.002	0.002-0.003
M	4	SS - Ferritic / Martensitic	200-330	328-492	0.002-0.003	0.001-0.002
	5	SS - Austenitic	200-330	262-394	0.001-0.002	0.001-0.002
	6	SS - Austenitic-ferritic (Duplex)	230-260	164-295	0.001-0.002	0.001-0.003
K	7	Malleable Cast Iron	130-230	295-492	0.002-0.004	0.002-0.004
	8	Grey Cast Iron	180-245	262-394	0.002-0.003	0.002-0.003
	9	Nodular Cast iron	160-250	230-361	0.002-0.003	0.002-0.003

64067

ENGRAVING

METRIC LINE



The ENGRAVING 64047 features an indexable carbide insert, ensuring excellent repeatability while drastically reducing presetting time, and eliminates the need for resharpening. The high positive rake angle facilitates faster cutting and enhanced durability compared to traditional engravers, revolutionizing the engraving process with unmatched efficiency and longevity.

A ENGRAVING 64047 apresenta uma pastilha de metal duro indexável, garantindo excelente repetibilidade enquanto reduz drasticamente o tempo de pré-ajuste e elimina a necessidade de afiação. O alto ângulo de inclinação positivo facilita o corte mais rápido e aumenta a durabilidade em comparação com as ferramentas de gravação tradicionais, revolucionando o processo de gravação com eficiência e longevidade incomparáveis.

La ENGRAVING 64047 presenta una pastilla de metal duro indexable, garantizando una excelente repetibilidad al tiempo que reduce drásticamente el tiempo de ajuste previo y elimina la necesidad de afilado. El alto ángulo de inclinación positiva facilita el corte más rápido y aumenta la durabilidad en comparación con las herramientas de grabado tradicionales, revolucionando el proceso de grabado con eficiencia y longevidad incomparables.

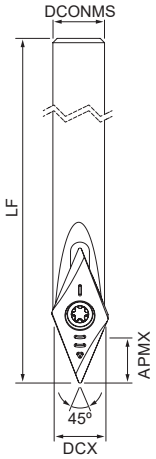
ENGRAVING 64067 > page 282

- 45º Engraving tool
  Ferramenta de gravação a 45º | Herramienta de grabado a 45º
- Fine engraving with 0.008 in bottom width
  Gravação fina com largura de fundo de 0.008 in | Grabado fino con un ancho de fondo de 0.008 in
- Suitable for engraving on steel, stainless steel, superalloys and aluminium
  Adequado para gravação em aço, aço inoxidável, superligas e alumínio | Adecuado para grabado en acero, acero inoxidable, superaleaciones y aluminio



ENGRAVING 64067 METRIC LINE







Type A: Steel Shank
Type B: Carbide Shank

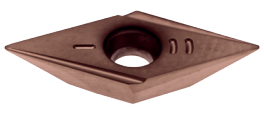
Order code Código	Reference Referência Referencia	CICT	Type	Dimensions | Dimensões | Dimensiones (in)							WT (lbs)	Insert Pastilha Inserto	Stock
				DCN	DCX	APMN	APMX	DCONMS	LF	KAPR			
181168500	002E64067-01-10-U006040	1	A	0.018~0.026	0.083	0.002~0.008	0.079	0.236	1.575	67,5º	0.024	VPGT 0602...	◈
181191300	002E64067-01-10-U006065	1	B	0.018~0.026	0.083	0.002~0.008	0.079	0.236	2.559	67,5º	0.053	VPGT 0602...	◈
181168700	002E64067-01-10-U006100*	1	B	0.018~0.026	0.083	0.002~0.008	0.079	0.236	3.937	67,5º	0.110	VPGT 0602...	◈

Order code Código	Reference Referência Referencia	Nº Toolholder	Holder designation	Nº inserts	Insert Pastilha Inserto	Stock
1410321Y3	PK VPGT 060202-45LM E64067-006040	1	002E64067-01-10-U006040	10	VPGT 060202-45LM	◈
1410322Y3	PK VPGT 060202-45LM E64067-006065	1	002E64067-01-10-U006065	10	VPGT 060202-45LM	◈
1410324Z5	PK VPGT 060202-45LN E64067-006040	1	002E64067-01-10-U006040	10	VPGT 060202-45LN	◈
1410325Z5	PK VPGT 060202-45LN E64067-006065	1	002E64067-01-10-U006065	10	VPGT 060202-45LN	◈
1410326Z5	PK VPGT 060202-45LN E64067-006100	1	002E64067-01-10-U006100*	10	VPGT 060202-45LN	◈

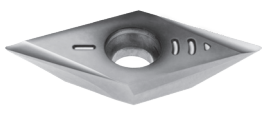
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

***Note:** Recommended only for non-ferrous materials machinning

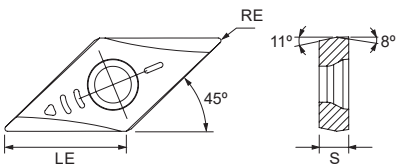
VPGT 0602... Inserts | Pastilhas | Plaquitas



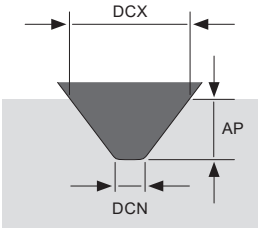
VPGT-45LM



VPGT-45LN



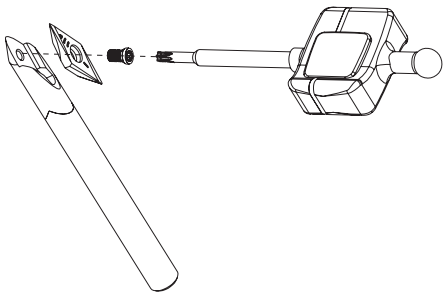
VPGT-45LM | 45LN



		P	M	N	S	Dimensions Dimensões Dimensiones (in)						
		PVD	PVD	UNC	PVD							
	(2) Grade code	Y3	Y3	Z5	Y3							
(1) Geometry code	ISO Reference	PHH920	PHH920	PH0610	PHH920	LE	S	RE	DCN	DCX	APMN	APMX
1113054	VPGT 060202-45LM	◈	◈		◈	0.250	0.079	0.008	0.026	0.083	0.008	0.079
1113055	VPGT 060202-45LN			◈	◯	0.250	0.079	0.008	0.018	0.083	0.002	0.079

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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



SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
002E64067	P0220401	XT06	DT0606	5.3

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

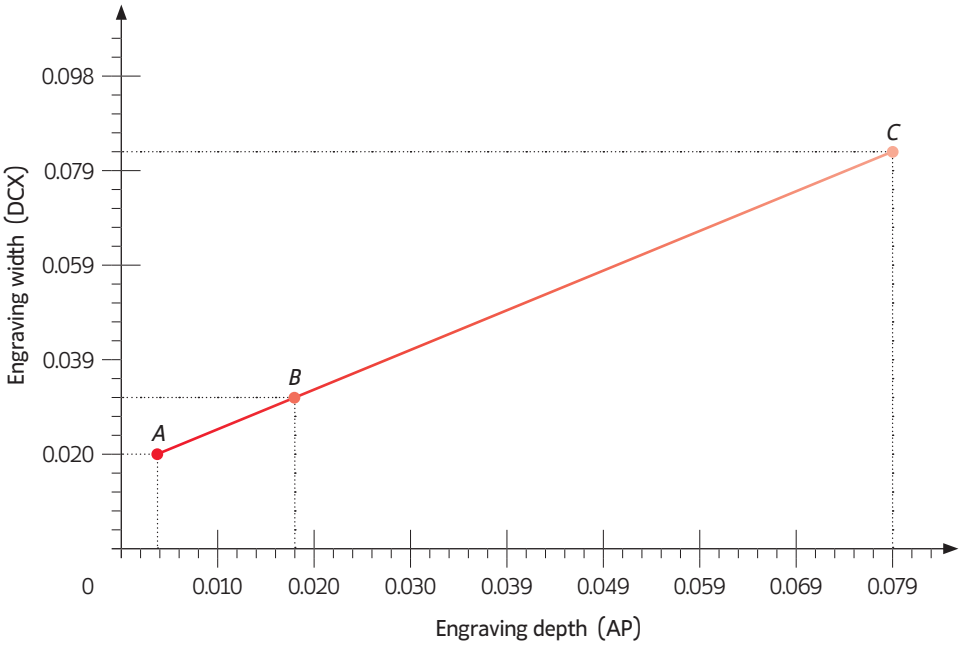
ISO	PSM	Material	n (RPM)	f (in/rev)	
				VPGT 060602-45LM	VPGT 060602-45LN
P	1	Carbon Steel	5 000 - 40 000	0.0003-0.002	-
	3	Alloy Steel	5 000 - 40 000	0.0003-0.001	-
M	5	SS - Austenitic	5 000 - 40 000	0.0003-0.002	-
N	10	Aluminium and Non Ferrous	5 000 - 40 000	-	0.0003-0.002
S	11	Heat Resistant Super Alloys	5 000 - 30 000	0.0002-0.001	-

a_p per step:

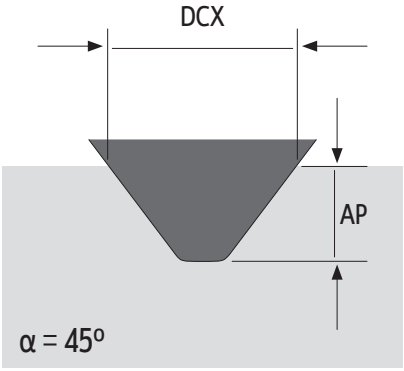
ISO	PSM	Material	AP (in)							APMX: 0.079 in
			1st	2nd	3rd	4th	5th	6th	Next steps	Fine finishing
P	1	Carbon Steel	0.028	0.028	0.012	0.008	0.004	-	-	0.004
	3	Alloy Steel	0.020	0.016	0.012	0.012	0.008	0.008	0.004	0.004
M	5	SS - Austenitic	0.020	0.016	0.008	0.012	0.008	0.008	0.004	0.002
N	10	Aluminium and Non Ferrous	0.039	0.031	0.008	-	-	-	-	0.004
S	11	Heat Resistant Super Alloys	0.020	0.016	0.008	0.012	0.008	0.008	0.004	0.002

(Note 1) It is recommended to start engraving by steps according to the parameters on the table above.
(Note 2) Whenever possible, infeed should be done starting outside the workpiece being machined.

REFERENCE CHART Gráfico de referência | Tabla de referencia



- *Point A:* Width= 0.020 in x Depth = 0.003 in
- *Point B:* Width= 0.031 in x Depth = 0.018 in
- *Point C:* Width= 0.083 in x Depth = 0.079 in



SPOT FACE

METRIC LINE



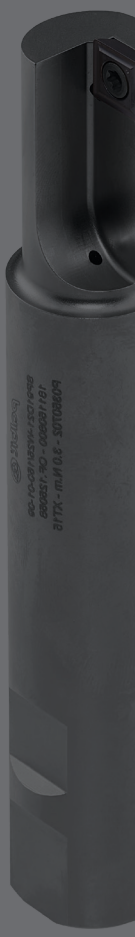
Spot face milling is a precision machining process crucial in crafting components for high-performance applications, particularly in the automotive and aerospace industries.

A fresagem de caixa é um processo de maquinação de precisão crucial nao fabrico de componentes para aplicações de alto desempenho, especialmente nas indústrias automóvel e aeroespacial.

El fresado de caja es un proceso de mecanizado de precisión crucial en la fabricación de componentes para aplicaciones de alto rendimiento, especialmente en las industrias automotriz y aeroespacial.

SPOT FACE > page 286

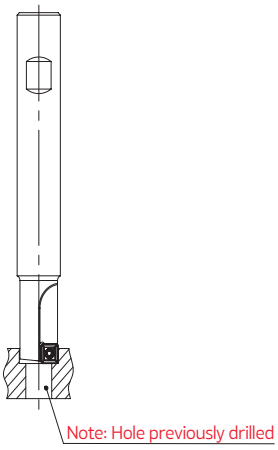
- From DC 0.394 in to 0.984 in
  De DC 0.394 in a 0.984 in | Desde DC 0.394 in hasta 0.984 in
- Counterbore hole
  Furo de rebaixo | Orificio avellanado
- Smooth cutting
  Corte suave | Corte suave



SPOT FACE

METRIC LINE





Order code Código	Reference Referência Referencia	CICT	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU			
181150100	SP91 D10-W10/100-01-05	1	0.394	0.394	3.937	1.181	0.106	SPKX 05T104	◈
181150200	SP91 D11-W12/100-01-05	1	0.433	0.472	3.937	1.181	0.154	SPKX 05T104	◈
181150300	SP91 D13-W16/100-01-06	1	0.512	0.630	3.937	1.181	0.256	SPKX 060204	◈
181150400	SP91 D14-W16/120-01-06	1	0.551	0.630	4.724	1.181	0.271	SPKX 060204	◈
181150500	SP91 D17-W20/120-01-07	1	0.669	0.787	4.724	1.378	0.494	SPKX 070308	◈
181150600	SP91 D18-W20/140-01-07	1	0.709	0.787	5.512	1.378	0.599	SPKX 070308	◈
181150700	SP91 D20-W20/140-01-09	1	0.787	0.787	5.512	1.575	0.668	SPKX 090308	◈
181150800	SP91 D21-W25/150-01-09	1	0.827	0.984	5.906	1.575	0.990	SPKX 090308	◈
181150900	SP91 D25-W25/150-01-11	1	0.984	0.984	5.906	1.575	1.042	SPKX 110408	◈

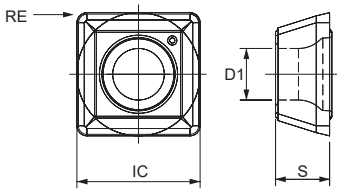
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPKX Inserts | Pastilhas | Plaquitas





(PHL grade)



SPKX

		P			M			K			S			Dimensions Dimensões Dimensiones (in)			
		PVD			PVD			PVD			PVD						
	(2) Grade code	68	66	3B	68	66	3B	68	66	3B	68	66	3B				
(1) Geometry code	ISO Reference	PH6920	PH6930	PHL930	PH6920	PH6930	PHL930	PH6920	PH6930	PHL930	PH6920	PH6930	PHL930	IC	S	D1	RE
1111635	SPKX 05T104	◈			◈			◈			◈			0.197	0.078	0.087	0.016
1111282	SPKX 060204	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	0.236	0.094	0.100	0.016
1111636	SPKX 070308	◈			◈			◈			◈			0.313	0.125	0.112	0.031
1111637	SPKX 090308	◈			◈			◈			◈			0.386	0.125	0.161	0.031
1111282	SPKX 110408	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	◈	0.453	0.189	0.173	0.031

◈ First choice | Primeira opção | 1ª opción ◈ Stock item | Produto de stock | Itens de stock ◯ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

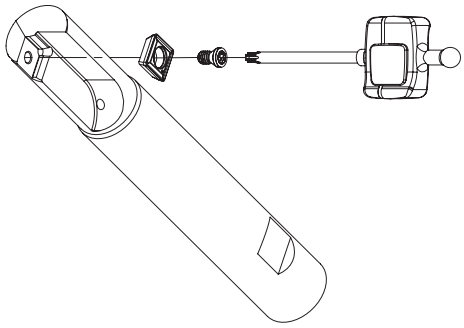
Insert order code = (1) Geometry Code + (2) Grade Code

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

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				lbf/in
0.394-0.433	P0200400	XT06	DT0606	5.3
0.512-0.551	P0220500	XT07	DT0709	8.0
0.669-0.709	P0250704	XT08	DT0812	10.6
0.787-0.827	P0350702	XT15	DT1530	26.6
0.984	P0400900	XT15	DT1530	26.6



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-297.
Check the procedures for the clamping screws on the page A-297.

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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH6920	PH6930	PHC930	PHL930
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	200-330	✓	✓	✓	✓
	6	SS - Austenitic-ferritic (Duplex)	230-260	✓	✓	✓	✓
K	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 → PH6920	PH6930	PHC930	PHC930
P	1	Unalloyed Steel	125-220	590-820	525-787	525-787	525-787
	2	Low-Alloyed Steel	220-280	525-722	459-656	459-656	459-656
	3	High-Alloyed Steel	280-380	426-590	361-525	361-525	361-525
M	4	SS - Ferritic / Martensitic	200-330	558-754	459-689	459-689	459-689
	5	SS - Austenitic	200-330	525-656	426-656	426-656	426-656
	6	SS - Austenitic-ferritic (Duplex)	230-260	459-590	394-623	394-623	394-623
K	8	Grey Cast Iron	180-245	590-820	492-722	492-722	492-722
	9	Nodular Cast iron	160-250	426-656	361-590	361-590	361-590
S	11	Heat Resistant Super Alloys	200-320	131-394	98-328	98-328	98-328

ISO	PSM	Material	HB (Brinell)	Feed fz (in/t) SPKX 05...	SPKX 06...	SPKX 07...	SPKX 09...	SPKX 11...
P	1	Unalloyed Steel	125-220	0,002-0,003	0,0024-0,004	0,0024-0,005	0,003-0,005	0,003-0,006
	2	Low-Alloyed Steel	220-280	0,002-0,005	0,0031-0,006	0,0039-0,007	0,005-0,009	0,005-0,010
	3	High-Alloyed Steel	280-380	0,002-0,004	0,0031-0,006	0,0039-0,008	0,005-0,009	0,005-0,010
M	4	SS - Ferritic / Martensitic	200-330	0,002-0,004	0,0024-0,005	0,0031-0,006	0,004-0,006	0,004-0,008
	5	SS - Austenitic	200-330	0,002-0,003	0,0020-0,004	0,0024-0,005	0,003-0,005	0,003-0,007
	6	SS - Austenitic-ferritic (Duplex)	230-260	0,002-0,003	0,002-0,004	0,002-0,005	0,003-0,006	0,003-0,007
K	8	Grey Cast Iron	180-245	0,002-0,005	0,003-0,006	0,005-0,008	0,006-0,010	0,006-0,012
	9	Nodular Cast iron	160-250	0,002-0,004	0,003-0,006	0,004-0,007	0,005-0,008	0,006-0,010
S	11	Heat Resistant Super Alloys	200-320	0,002-0,003	0,002-0,004	0,002-0,005	0,003-0,005	0,003-0,007



SPARE PARTS

SPARE PARTS

1 SHANKS

> See page A - 290

2 SCREWS

> See page A - 294

3 KEYS

> See page A - 296

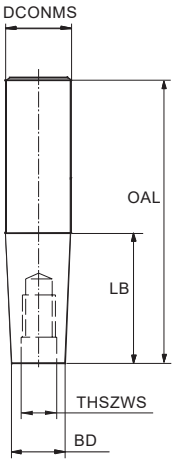
4 OTHERS

> See page A - 296

SPARE PARTS

MULTIFIT DENSIMET ANTI-VIBRATION Shank | Adaptador | Fijación





Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Stock
		DCONMS	LB	OAL	BD	THSZWS	
1191008A0	AC-RI-D12-M06-L040-AV	0.472	1.575	3.543	0.386	M6	◍
1191009A0	AC-RI-D12-M06-L060-AV	0.472	2.362	4.331	0.386	M6	◍
1191021A0	AC-RI-D12-M06-L080-AV	0.472	3.150	5.118	0.386	M6	◍
1191010A0	AC-RI-D16-M08-L040-AV	0.630	1.575	3.740	0.504	M8	◍
1191011A0	AC-RI-D16-M08-L060-AV	0.630	2.362	4.528	0.504	M8	◍
1191012A0	AC-RI-D16-M08-L080-AV	0.630	3.150	5.315	0.504	M8	◍
1191013A0	AC-RI-D16-M08-L100-AV	0.630	3.937	6.102	0.504	M8	◍
1191022A0	AC-RI-D16-M08-L120-AV	0.630	4.724	6.890	0.504	M8	◍
1191014A0	AC-RI-D20-M10-L040-AV	0.787	1.575	3.937	0.622	M10	◍
1191015A0	AC-RI-D20-M10-L060-AV	0.787	2.362	4.724	0.622	M10	◍
1191016A0	AC-RI-D20-M10-L080-AV	0.787	3.150	5.512	0.622	M10	○
1191017A0	AC-RI-D20-M10-L100-AV	0.787	3.937	6.299	0.622	M10	○
1191018A0	AC-RI-D20-M10-L120-AV	0.787	4.724	7.087	0.622	M10	○
1191026A0	AC-RI-D20-M10-L080-D17,8-AV	0.787	3.150	5.512	0.701	M10	◍
1191027A0	AC-RI-D20-M10-L100-D17,8-AV	0.787	3.937	6.299	0.701	M10	◍
1191028A0	AC-RI-D20-M10-L120-D17,8-AV	0.787	4.724	7.087	0.701	M10	◍
1191023A0	AC-RI-D25-M12-L060-AV	0.984	2.362	4.921	0.819	M12	◍
1191024A0	AC-RI-D25-M12-L080-AV	0.984	3.150	5.709	0.819	M12	◍
1191025A0	AC-RI-D25-M12-L100-AV	0.984	3.937	6.496	0.819	M12	◍

◍ Stock item | Produto de stock | Itens de stock

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

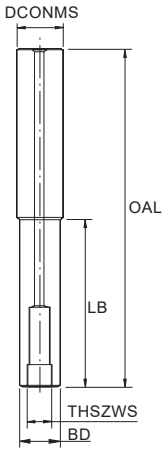
MULTIFIT CARBIDE ANTI-VIBRATION Shank | Adaptador | Fijación







Standard Version



Customized Version

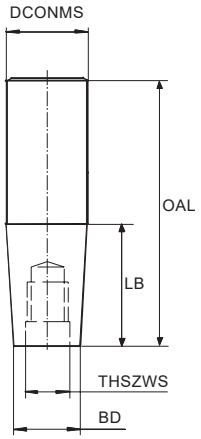
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Stock
		DCONMS	OAL	THSZWS	BD*	LB*	
219102600	AC-RI-D12-M06-L100-HW	0.472	3.937	M6	-	-	◈
219102700	AC-RI-D12-M06-L150-HW	0.472	5.906	M6	-	-	◈
219102800	AC-RI-D16-M08-L100-HW	0.630	3.937	M8	-	-	◈
219102900	AC-RI-D16-M08-L150-HW	0.630	5.906	M8	-	-	◈
219103000	AC-RI-D20-M10-L150-HW	0.787	5.906	M10	-	-	◈
219103100	AC-RI-D20-M10-L200-HW	0.787	7.874	M10	-	-	◈
219103200	AC-RI-D25-M12-L150-HW	0.984	5.906	M12	-	-	◈
219103300	AC-RI-D25-M12-L200-HW	0.984	7.874	M12	-	-	◈
219103400	AC-RI-D32-M16-L250-HW	1.260	9.843	M16	-	-	◈

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

SPARE PARTS

MULTIFIT CYLINDRICAL IN STEEL Shank | Adaptador | Fijación



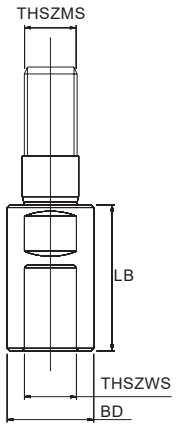


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Stock
		DCONMS	LB	OAL	BD	THSZWS	
181179000	AC-RI-D12-M06-L020	0.472	0.787	2.559	0.386	M6	⚙
181179100	AC-RI-D16-M08-L040	0.630	1.575	3.465	0.504	M8	⚙
181179200	AC-RI-D20-M10-L045	0.787	1.772	3.740	0.701	M10	⚙
181179300	AC-RI-D25-M12-L050	0.984	1.969	4.173	0.819	M12	⚙
181179400	AC-RI-D32-M16-L050	1.260	1.969	4.331	1.134	M16	⚙

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

MULTIFIT EXTENSIONS FOR THREADED TYPE CUTTER Shank | Adaptador | Fijación



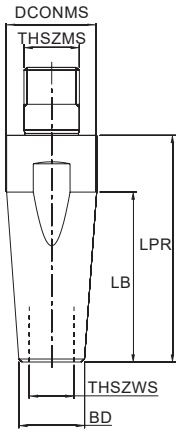


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				Stock
		BD	THSZMS	THSZWS	LB	
181186100	AL-M08-L040-M08	0.543	M8	M8	1.575	⚙
181182900	AL-M10-L060-M10	0.709	M10	M10	2.362	⚙
181191000	AL-M12-L060-M12	0.827	M12	M12	2.362	⚙
181191100	AL-M16-L060-M16	1.142	M16	M16	2.362	⚙

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

MULTIFIT REDUCERS FOR THREADED TYPE CUTTER Shank | Adaptador | Fijación





Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)						Stock
		THSZMS	THSZWS	DCONMS	BD	LPR	LB	
181186200	AL-M08-L040-M06	M8	M6	0.543	0.394	1.575	0.984	⛭
181190700	AL-M10-L040-M08	M10	M8	0.709	0.543	1.575	0.984	⛭
181190800	AL-M12-L040-M10	M12	M10	0.827	0.709	1.575	0.591	⛭
181190900	AL-M16-L040-M12	M16	M12	1.142	0.827	1.575	0.748	⛭

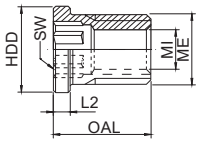
⛭ Stock item | Produto de stock | Itens de stock

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

SPARE PARTS

SHIM SCREW

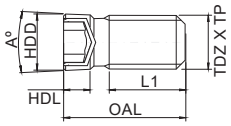




Order code Código	Screw Parafuso Tornillo	Dimensions | Dimensões | Dimensiones (in)					
		SW	MI (mm)	ME (mm)	HDD	OAL	L2
290030400	T0503509	0.138	M3,5 x 0,6	M5,0 x 0,5	0.248	0.276	0.047

ADJUSTMENT SCREW

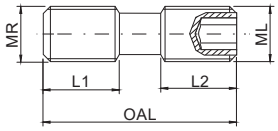




Order code Código	Screw Parafuso Tornillo	T (torx)	Dimensions | Dimensões | Dimensiones (in)					
			TDZ x TP (mm)	HDD	A°	OAL	L1	HDL
290051500	F0601441	T-20	M6 x 1,0	0.248	5°	0.535	0.335	0.126

DIFFERENTIAL SCREW

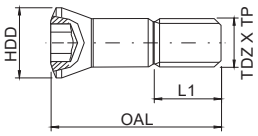




Order code Código	Screw Parafuso Tornillo	T (torx)	Dimensions | Dimensões | Dimensiones (in)				
			MR (mm)	ML (mm)	OAL	L1	L2
290016300	F0701800	T-20	M7 x 0,75	M7 x 0,75	0.709	0.295	0.295

INSERT SCREW

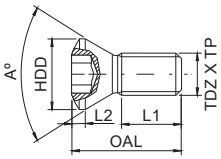




Order code Código	Screw Parafuso Tornillo	T (torx)	Dimensions | Dimensões | Dimensiones (in)			
			TDZ x TP (mm)	HDD	OAL	L1
290013900	P0400925	T-15	M4 x 0,5	0.228	0.339	0.138
290010600	P0500925	T-20	M5 x 0,5	0.264	0.374	0.134
290014400	P0501325	T-20	M5 x 0,5	0.295	0.504	0.177
290014000	P0501525	T-20	M5 x 0,5	0.295	0.610	0.177

INSERT SCREW



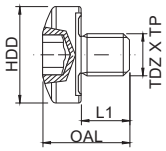


Order code Código	Screw Parafuso Tornillo	T (torx)	Dimensions | Dimensões | Dimensiones (in)					
			TDZ x TP (mm)	HDD	A°	OAL	L1	L2
290078800	P0180300	T-GIP	M1,8 x 0,35	0.096	60°	0.134	0.059	0.020
290058400	P0180400	T-GIP	M1,8 x 0,35	0.096	60°	0.146	0.071	0.020
290011300	P0180401	T-6	M1,8 x 0,35	0.108	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
290013400	P0250700	T-8	M2,5 x 0,45	0.130	55°	0.276	0.157	0.031
290031300	P0250704	T-8	M2,5 x 0,45	0.136	60°	0.256	0.157	0.028
290084200	P0300726	T-8	M3 x 0,35	0.173	60°	0.264	0.067	0.028
290009100	P0300800	T-9	M3 x 0,5	0.173	60°	0.291	0.165	0.031
290081700	P0350702	T-15	M3,5	0.209	55°	0.276	0.122	0.079
290019900	P0350800	T-15	M3,5 x 0,6	0.217	60°	0.303	0.146	0.039
290084300	P0350825	T-10	M3,5 x 0,35	0.224	54°	0.331	0.110	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-10	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
290094600	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
290075600	P0401065	T-15	M4 x 0,7	0.224	60°	0.394	0.236	0.039
290007000	P0401100	T-15	M4 x 0,7	0.209	55°	0.433	0.315	0.079
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
290017600	P0451100	T-20	M4,5 x 0,75	0.270	55°	0.433	0.260	0.028
290006700	P0451400	T-20	M4,5 x 0,75	0.283	60°	0.551	0.354	0.039
290084400	P0501025	T-20	M5 x 0,5	0.276	60°	0.390	0.102	0.035
290084500	P0501326	T-20	M5 x 0,5	0.264	42°	0.524	0.150	0.045
290017500	P0501100	T-20	M5 x 0,8	0.252	43°	0.433	0.232	0.020
290031700	P0501300	T-20	M5 x 0,8	0.276	60°	0.504	0.315	0.051
290078900	P0501302	T-20	M5 x 0,8	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
290084600	P0601725	T-25	M6 x 0,75	0.313	44°	0.661	0.224	0.045

SPARE PARTS

ADJUSTMENT SCREW

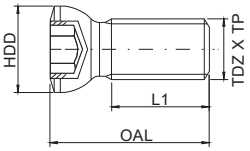




Order code Código	Screw Parafuso Tornillo	T (torx)	Dimensions | Dimensões | Dimensiones (in)			
			TDZ x TP (mm)	HDD	OAL	L1
290014200	P0350750	T-15	M3,5 x 0,6	0.315	0.283	0.157

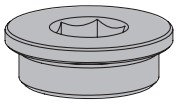
WASHER SCREW



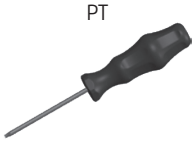
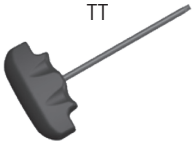


Order code Código	Screw Parafuso Tornillo	Dimensions | Dimensões | Dimensiones (in)			
		TDZ x TP (mm)	HDD	OAL	L1
290075600	P0401065	M4 x 0,7	0.224	0.394	0.236
290018500	P0601265	M6 x 1,0	0.354	0.488	0.256
290011000	P0601765	M6 x 1,0	0.354	0.669	0.433
290028400	P0802265	M8 x 1,25	0.433	0.866	0.591

OTHERS

Sealing Cap	Order Code	Reference
	119236000	TRM2009S8
	119237600	TRM2411S10
	119235900	TRM3012S14
	119236600	TRM3615S17

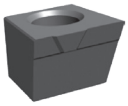
Washer	Order Code	Reference
	290012100	HC01200
	290060200	HC01400
	290002900	HC01800

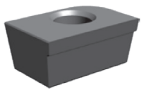
Torx Keys	Order Code	Reference
XT 	290058600	XT 06IP
	290011400	XT 06
	290012900	XT07
PT 	290011700	XT 08
	290025700	XT 09
	290013100	XT 10
TT 	290012400	XT 15
	290013200	XT 20
	290014800	PT 15
LT 	290014900	PT 20
	290089000	TT 20
	290059500	LT 30

Cartridge Screw	Order Code	Reference
	119169600	D0602096

Shim	Order Code	Reference
	116022223	CS130300
	290060400	CT160300
	290060300	CT220300

Spring Pin	Order Code	Reference
	290060600	BE02500
	290060500	BE04000

Wedge (Insert)	Order Code	Reference
	290060900	WA7001
	290061100	WA7003
	119200100	SETDEV AS 04 00

Wedge (Cartridge)	Order Code	Reference
	290061000	WA7002
	290061200	WA7004

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

Screw for Coolant Supply	Order Code	Reference	TDZ	HDD (in)
	119163000	J0123510	M12	1.492
	119163100	J0164110	M16	1.772
	119163200	J0204610	M20	2.157

Retaining Screw	Order Code	Reference
	290074600	GS40140

Dynamometric Torque Key	Order Code	Reference	Torx	Nm
	290078300	DT0606IP	6IP	0,6
	290059600	DT0606	6	0,6
Nm 	290059700	DT0709	7	0,9
	290059800	DT0812	8	1,2
	290059900	DT0914	9	1,4
(Predefined torque)	290060000	DT1020	10	2,0
	290047800	DT1530	15	3,0
	290078400	DT2050	20	5,0

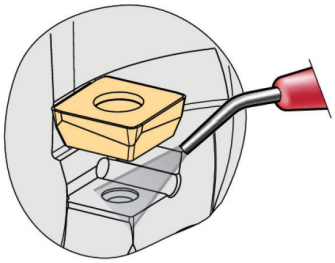
DIN 6368 Wrench	Order Code	Reference
	290058000	SD6368-12
	290058100	SD6368-16
	290058200	SD6368-20

Retaining Screw	Order Code	Reference
	290087700	D1603500
	290087800	D2004000

PROCEDURES FOR CLAMPING SCREWS



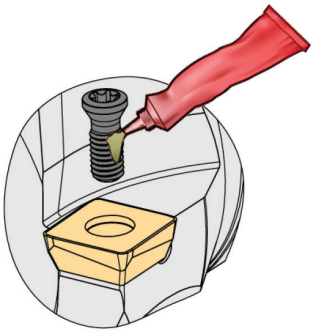
1. Always use a torque wrench to ensure that screws are correctly tightened (please confirm torques data on catalogue). Torque that is too high will negatively affect the performance of the tool and can cause screw and insert breakage. Torque that is too low will cause insert movement, vibration and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



TECHNICAL DATA

TECHNICAL DATA

1 MILLING GRADES

> See page A - 300

2 CUTTING DATA CALCULATION

> See page A - 304

3 POWER REQUIREMENT CALCULATION

> See page A - 305

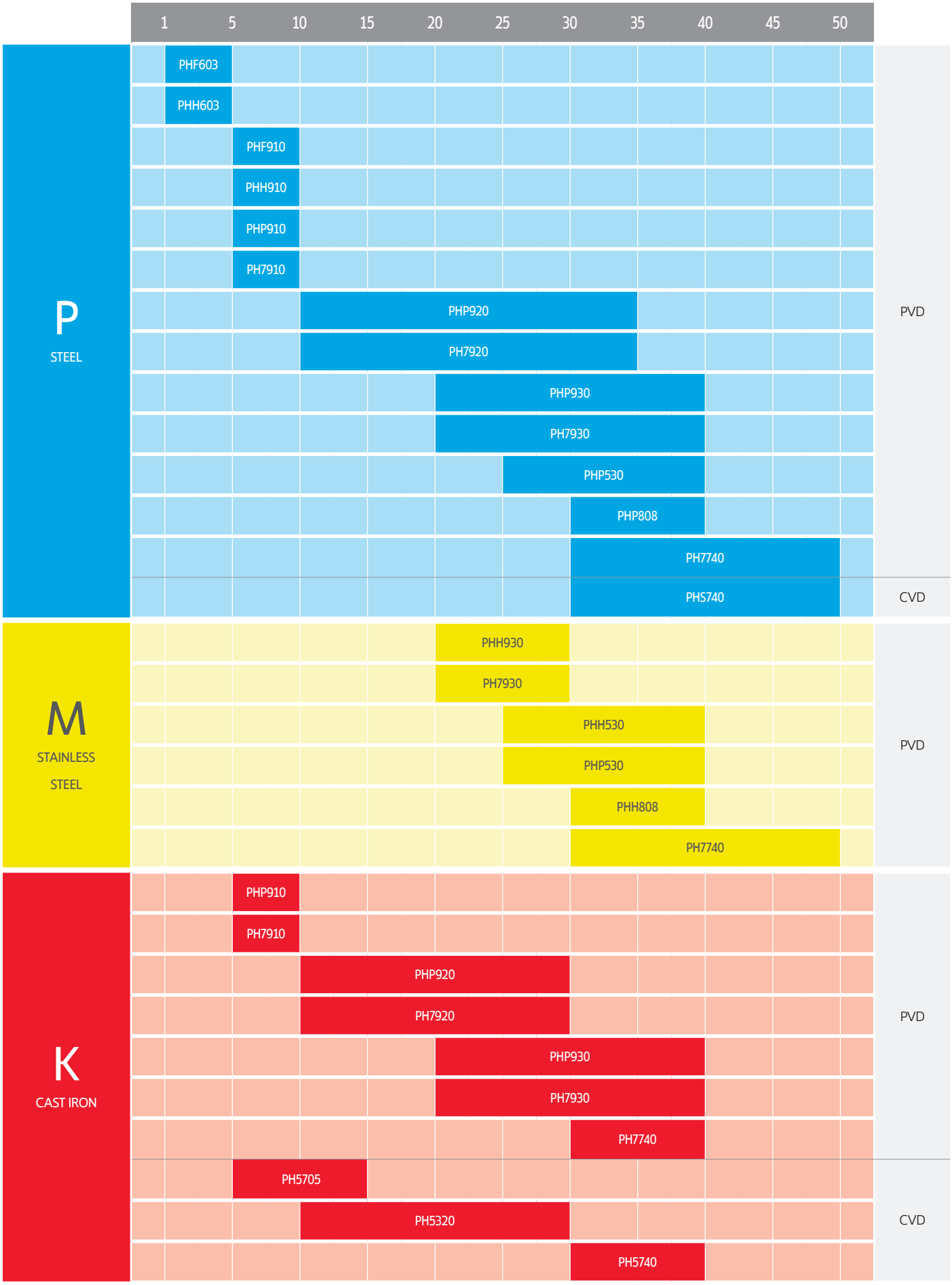
4 MILLING TECHNICAL DATA

> See page A - 310

5 TROUBLESHOOTING

> See page A - 312

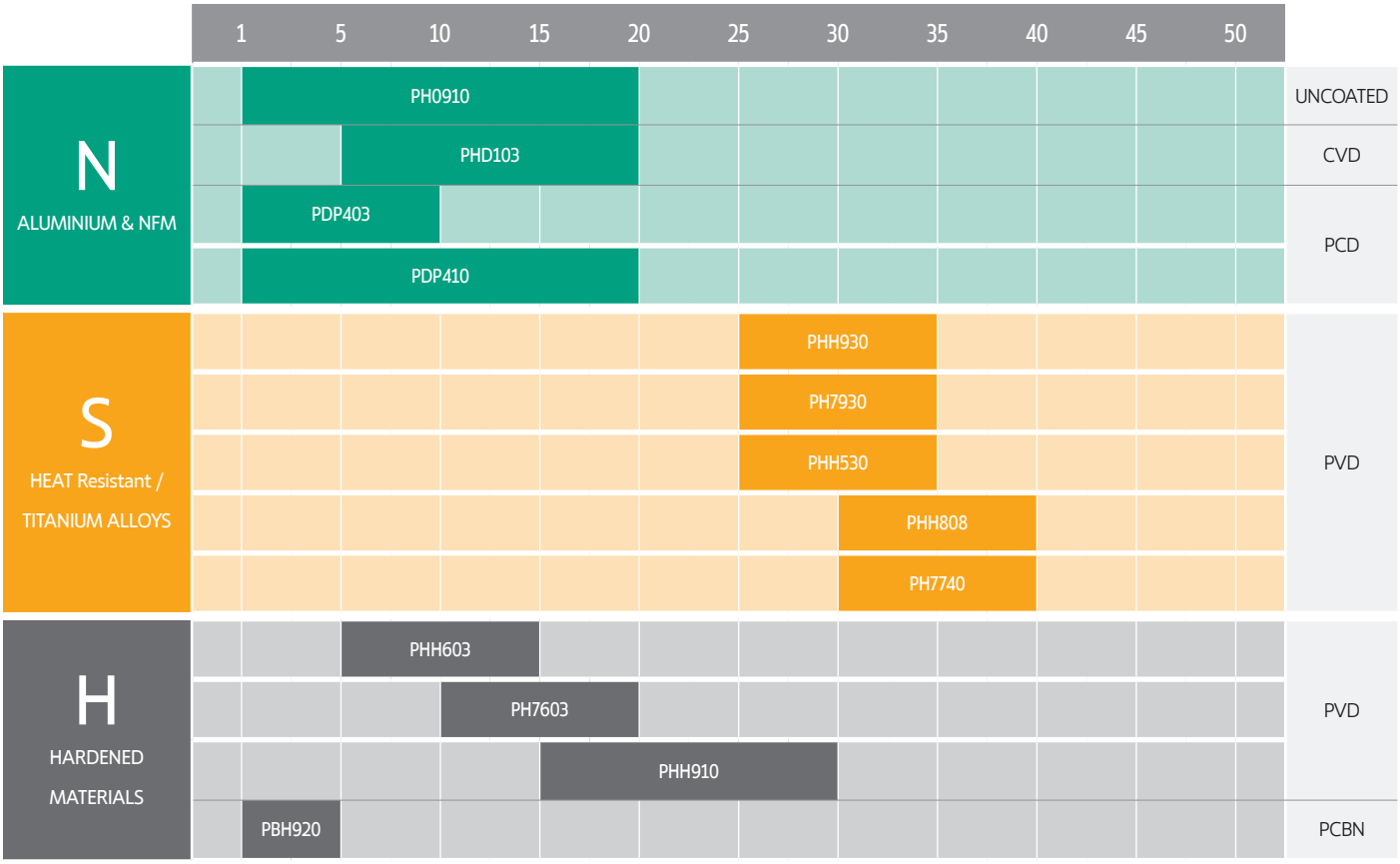
MILLING GRADES



palbit

MILLING GRADES

Graus para fresagem | Calidades para fresado

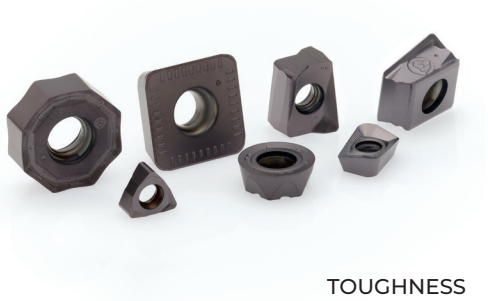


MILLING GRADES DESCRIPTION

PVD GRADES

PHP..

Product of the latest coating technology, the new PHP coating comes to revolutionize the milling of Steel and Cast Iron.
PHP is a balanced PVD coating that combines high hardness and high cracking resistance.
It's composition and structure ensure an optimal adhesion which results in a very smooth surface preventing built-up edge, coating worn-out and keeps the insert in a lubricated-like condition.



WEAR RESISTANCE ⟷ TOUGHNESS

PHP910	PHP920	PHP930	PHP530	PHP808
P05-P10 K05-K10	P10-P35 K10-K30	P20-P40 K20-K40	P25-P40 M25-M40	P30-P40
Recommended for light operations in steels.	Recommended for General Steel & Cast Iron Milling.	Recommended for medium to roughing operations in steels and cast irons.	Extremely heat resistant grade. First choice in cold-section turbine blade milling.	High heat resistance grade. Economic choice for cold-section turbine blade milling.

PHH...

Product of the latest coating technology, the new PHH coating comes to revolutionize the milling of stainless steel, HRSA as well and hardened steel.
PHH is a stable PVD coating that merges both high hardness and an uncomparable heat resistance.
It's structure contains refractory materials which allows it to work at the highest temperature and the hardest conditions.



WEAR RESISTANCE ⟷ TOUGHNESS

PHH603	PHF603	PHH910	PHF910	PHH930	PHH530	PHH808
P01-P05 H05-H15	P01-P05 H05-H15	P05-P10 H15-H30	P05-P10 H15-H30	M20-M40 S20-S30	M25-M40 S25-S35	M30-M40 S30-S40
Recommended for finishing operations in steels and hardened steels.	Recommended for finishing operations in steels and hardened steels. First choice for finishing applications.	Recommended for finishing operations in steels and hardened steels in unstable conditions.	Recommended for finishing operations in hardened steels ensuring superior surface quality, wear resistance, and thermal stability.	Recommended for general purpose milling of stainless steels and HRSA.	Extremely heat resistant grade. First choice in hot-section turbine blade milling.	High heat resistance grade. Economic choice in hot-section turbine blade milling

PH7... | PH6...

A medium thickness PVD coating with good compatibility with steels, stainless steels, cast irons and HRSA.

WEAR RESISTANCE ⟷ TOUGHNESS

PH7603 (PH6103)	PH7910 (PH6910)	PH7920 (PH6920)	PH7930 (PH6930)	PH7740 (PH6740)
H01-H20	P05-P10 K05-K10	P10-P35 K10-K30	P20-P40 M20-M30 K20-K40 S25-S35	P30-P50 M30-M50 K30-K40 S30-S40

Note: PH6... grades are very similar to PH7... The difference being that PH7 is mostly used in proprietary milling lines while PH6... is used on interchangeable inserts.

CVD GRADES

PHS740...

A though substract combined with a thin CVD coating with excellent thermical resistance and hardness at high temperature. 1st choice solution for removal of oxide layer from workpiece surface and for unstable conditions where a lot of heat is generated (ex: heavy duty aplications).

PHS740
P30-P50



PH5...

A thick CVD coating with very smooth surface. Can be used wet or dry. Ideal for machining cast irons.

WEAR RESISTANCE ⟷ TOUGHNESS

PH5705
K05-K10

PH5320
K10-K30

PH5740
K20-K40

PHD103

A carbide substract with high abrasion resistance coated with crystalline diamond CVD coating. Ideal for graphite machining.

PHD103
N05-N15

PH0910 - UNCOATED GRADE

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

PH0910
N01-N05

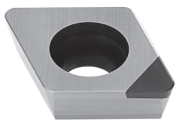


PCBN GRADE

PBH920

Carbide insert with Polycrystaline Cubic Boron Nitride tip for finishing operations on hardened steels.

PBH920
H01-N05





PCD GRADE

PDP4...

Carbide insert with Polycrystaline Diamond tip for finishing operations on aluminums and non-ferrous metallic materials.

PDP403
N01-N10

PDP410
N01-N20



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	P01	**PH7603 PH6103**	GC1010	KC505M KC510M KC515M	IC903				ATH80D JP4105			TT2510 TT5505	JC8003	
P	P10	**PH7910 PH6910 PHP910**	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	P20	**PH7920 PH6920 PH6125 PHP920**	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	P30	**PHP808 PHP530 PH7930 PH6930 PH6135 PHP930**	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	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	M01		GC1010		IC907 IC903			ACM100 ACK300	PCS08M					
M	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	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
STAINESS STEEL	M30	**PH7930 PH6930 PH6135 PHH530 PHH930**	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
STAINESS STEEL	M40	**PH7740 PH6740 PHH808**	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	K01		GC1010		IC380 IC900		MP8010		ATH80D JP4105		PR1510	TT6080	JC8003	AMZ
CAST IRON	K10	**PH7910 PH6910 PHP910**	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
CAST IRON	K20	**PHP920 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
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	N01			KC410M KC510M KC5410								TT6080		AMZ
N	N10		GC1025 GC1030	KC410M KC510M KC5410 KC620M				DL1000	SD5010 HD7010	WXN15		TT6080 TT8020		AMZ
N	N20		GC1025 GC1030	KC422M KC620M		F15M	LC15TF	DL1000	SD5010 HD7010	WXN15		TT8020		
S	S01		GC1010	KC510M	IC808 IC907 IC908			ACM100 ACK300			PR905 PR1210 PR1535		JC8003 JC8015	AMZ
S	S10	**PH7910 PH6910**	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	S20	**PH7920 PH6920**	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	S30	**PH7930 PH6930 PHH930 PHH530**	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	S40	**PH7740 PH6740 PHH808**	GC2040 GC1040	KC725M	IC830 IC928	MS2050 F40M				WSP45 WSP46			JC5118 JC8050 JC7560	
H	H01	**PH7603 PH6103 PHH603**	GC1010	KC510M	IC903		MP8010					TT2510 TT5505	DH102 JC6102 JC8003 JC8008	
H	H10	**PHH603 PH7603 PH6103 PH7910 PHH910**	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	H20		GC1025 GC1030	KC635M	IC808 IC907 IC908 IC380 IC900	F15M	VP15TF		JP4105	WHH15		TT5515 TT6080	JC8015 JC5118	CTP6215
H	K10				IC380 IC900 IC1008	MP3000 F30M								

COMPARATIVE GRADES CHART

Tabela comparativa de graus | Tabla de comparación de calidad

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
P STEEL	P40	**PHS740**				MP2500				WKP35S				
M STAINESS STEEL	M10		GC2015	KCPM20	IC9250 IC520M IC9350			ACM200					JC730U	
	M20		GC4230	KCPM20 KCPM30 KC927M	IC9250 IC520M IC9350 IC4050 IC635	MP2500 T350M T25M	F7030	ACM200			CA6535	TT7800	JC730U	CTC5235 GM226+
	M30		GC2040 GC4230 GC4240 S40T	KCPM30 KC927M	IC9350 IC4050 IC635	MP2500 T350M T25M	F7030	ACM200	GX2160		CA6535	TT7800	JC730U	CTC5235 CTC5240 GM226+ GM246 GM43+
	M40		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
	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+
	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+
	K30	**PH5740**	GC3330 GC3040 GC4220 GC4230 GC4240	KCPM20 KCPK30 KC927M	IC520M IC4050	MK1500 MP1500	MC5020		GX2140	WKP25 WKP35 WKP35S			JC610	

palbit

COMPARATIVE GRADES CHART

Tabela comparativa de graus | Tabla de comparación de calidad

UNCOATED GRADES | GRAUS NÃO REVESTIDOS | GRADOS SÍN RECUBRIMIENTO

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

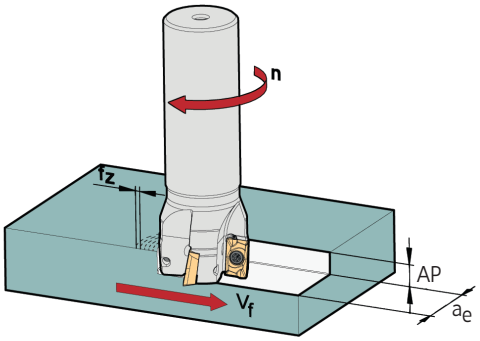
> Formulas

Spindle Speed (rev/min)

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

Cutting Speed (ft/min)

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



Feed Speed (in/min)

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

Feed per Revolution (in/rev)

$$f = Z_n \cdot f_z$$

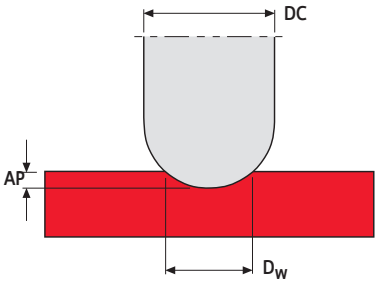
Feed per Tooth (in/tooth)

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

Metal removal Rate (in³/min)

$$Q = a_e \cdot AP \cdot v_f$$

> Cutting Speed and Spindle Speed for Copying



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

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

$$D_w = 2 \cdot \sqrt{a_p\,(DC\text{-}AP)} \quad \text{(in)}$$

NOMENCLATURE

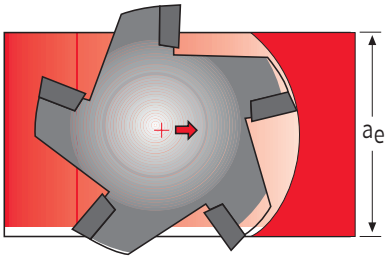
a_e	- Width of cut mm/radial depth of cut	(in)
AP	- Depth of cut mm/axial depth of cut	(in)
DC	- Cutter diameter	(in)
D_W	- Effective diameter in cut	(in)
f	- Feed per Revolution	(in/rev)
f_z	- Feed per Tooth	(in/tooth)
n	- Spindle Speed	(rev/min)
Q	- Material removal Rate	(in³/min)
V_c	- Cutting Speed	(ft/min)
V_f	- Feed Speed	(in/min)
Z_n	- Nº of teeth	

POWER REQUIREMENT CALCULATION

Cálculo de potência requerida | Cálculo del requerimiento de potencia

> Calculating the power demand

$$P_{req}\,(kW) = \frac{AP \times a_e \times v_f \times k_c}{531\,000 \times \eta}$$



P_{req} - Required spindle power (kW)
AP - Axial depth of cut (in)
a_e - Radial width of cut / stepover (in)
v_f - Feed speed (in/min)
η - Overall efficiency
k_c - Specific cutting force (psi = lbf/in²)

> Calculating average chip thickness (h_m) and cutting force per mm² (k_c)

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

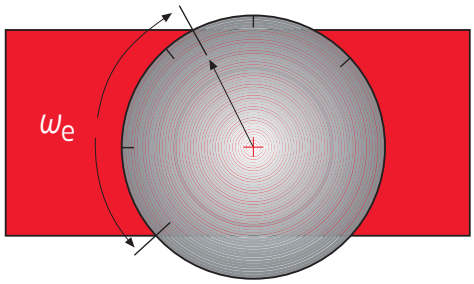
h_m - Average chip thickness (in)
f_z - Feed per tooth (in/tooth)
DC - Cutter diameter (in)
ω_e - Engagement angle(°)
k_r - Lead angle(°)

$$k_c = \frac{1}{h_m^{m_c}} \times k_c x$$

m_c* - Exponent
$k_c x$* - Specific cutting force at 1 in chip thickness (psi)

* Please see these values on the last page of the catalogue.

> Engagement angle

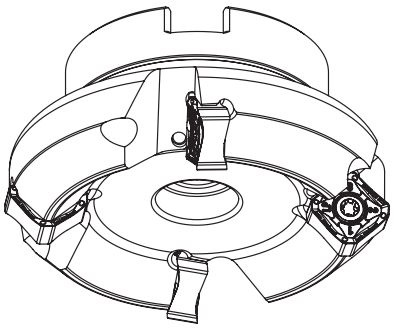
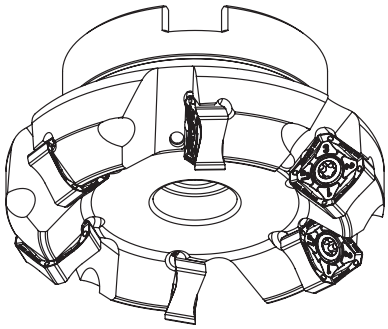
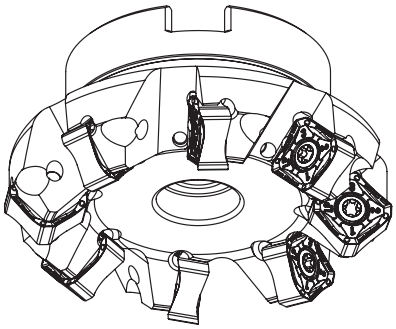


Engagement a_e / DC	Engagement angle ω_e
70%	89°
100%	180°

Engagement a_e / DC	Engagement angle ω_e
5%	26°
10%	37°
75%	60°

MILLING TECHNICAL DATA

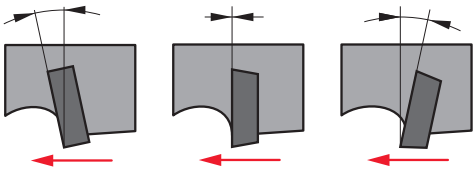
Dados técnicos | Datos técnicos

Coarse Pitch Type	Normal Pitch Type	Fine Pitch Type
First choice for cutting aluminium (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	(+) Axial Rake Angle Radial Rake Angle (+)	(-) Axial Rake Angle Radial Rake Angle (-)	(+) Axial Rake Angle Radial Rake Angle (-)
		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	●	–	●
	Cast Iron	–	●	●
	Aluminium Alloy	●	–	–
	Hardened Materials	●	–	●

palbit

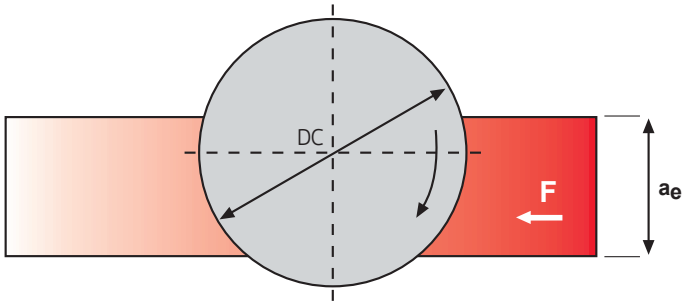
MILLING TECHNICAL DATA

Dados técnicos | Datos técnicos

> Choosing Cutter Diameter

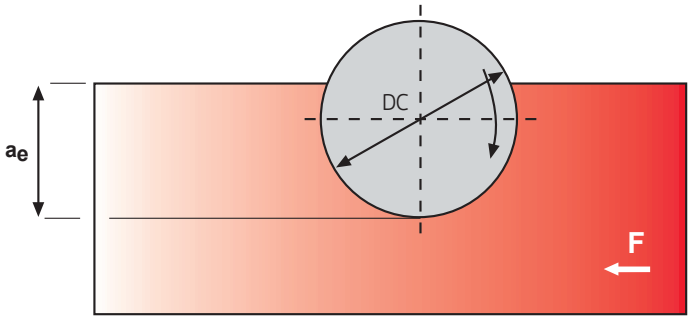
The Best Cutter Diameter (DC) should be selected upon the workpiece dimensions

$DC = 1{,}3 - 1{,}5\ a_e$



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.

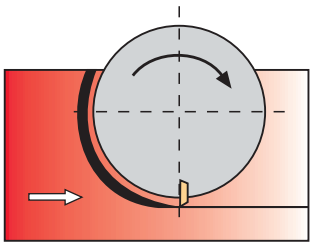
$a_e = 3/4\ DC$



> Cutter Position

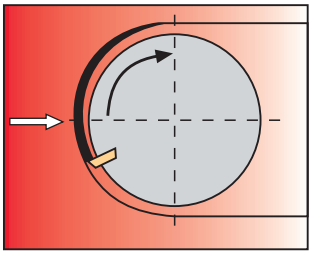
Conventional Milling (Up Milling)

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.



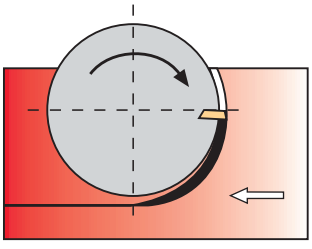
Channel Milling (Up and Down Milling)

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)

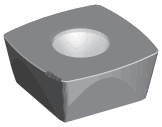
Climb Milling is normally recommended.
The feed direction of workpiece is the same as that of cutter rotation. So the chip thickness starts from the maximum and decreases to zero at the end of cut. The tool life is long with less heat and minimum work hardening of workpiece.



MILLING TROUBLESHOOTING

Solução de problemas | Solucción de problemas

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

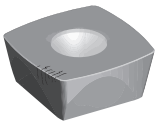
DEFORMAÇÃO ARESTA

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
- 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

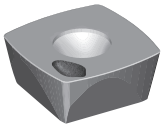
FENDAS TÉRMICAS

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
- Apply coolant

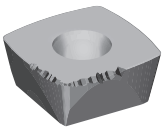
CRATERA FACE ATAQUE

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:
- Use a tougher grade
- Consider edge preparation
- Check rigidity of system
- Increase lead angle

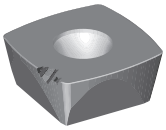
ESMILHAMENTO

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

FILOS ASTILLADOS

Solución posible:
- 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

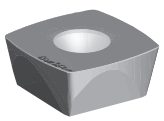
FRACTURA

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
- Use coolant
- Edge preparation (smaller hone)

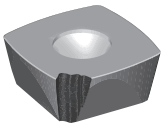
ARESTA POSTIÇA CORTE

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

FILOS RECRECIDOS

Solución posible:
- Aumentar 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

MILLING TROUBLESHOOTING

Solução de problemas | Solucción de problemas

PROBLEMS | PROBLEMAS | PROBLEMAS	Possible causes and areas of investigation Causas possíveis e áreas de intervenção Possibles causas y las áreas de 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 | espessura 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 (condiciónes)	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 | sobreendeudamiento excessivo	spindle bearings | rolamentos do eixo | cojinetes del husillo	turret | torreta | torreta	machine anchored | fundações da máquina | anclada de la maquina	workholding | fixação da peça | sujeción pieca	rigidity | rigidez | estabilidad	chatter | vibração | vibraciones
• UNACCEPTABLE CHIPS • APARA DESADEQUADA • VIRUTA INACEPTABLE	• stringer / ribbons (light silver colo) • demasiado longas (cor de prata suave) • mucho larga (color plata suave)	P↑	P↑	◎		◎	◎	◎	◎		P			◎	◎				◎									
	• scorrugated / tight (dark blue or black color) • ondulado / firme (cor azul escuro ou preto) • corrugado / firme (azul / negra)	◎	P↓	◎	◎	◎	◎	◎	◎	◎	P			◎	◎													
• WORKEPIECE CONCERNS • MATERIAL • MATERIAL	• finish / rms tolerance • tolerância e rugosidades • tolerancia y rugosidades	P	P	◎	◎	◎	◎	◎	◎	◎		◎		P			◎	◎										
	• interrupted cuts • corte interrompido • corte interrumpido	P↑	P↓	P↓	◎		◎	◎	◎		◎		◎	◎	▲		◎		◎	◎	◎			◎	◎	◎		
• MACHINE CONCERNS • MÁQUINA FERRAMENTA • MAQUINA HERRAMIENTA	• areas of investigation • áreas de intervenção • áreas de intervención	◎	◎	◎	◎	◎				◎							◎		◎	◎	◎	◎	◎	◎	◎	P		
• INSERTS FAILURE MODES • MODOS DE RUPTURA DA PASTILHA • MODOS DE RUPTURA DE INSERTO	• edge wear • desgaste da aresta • desgaste de flanco	P	P	◎	P	◎				◎																		
	• heat deformation (upset) • deformação plástica • deformación plástic	P↓	P↓	P↓	◎	◎	◎						◎	◎														
	• thermal cracking • fendas térmicas • fissuras térmicas	◎	◎	◎	P	P	◎						◎															
	• crater • cratera na face de ataque • cráter en la pared de ataque	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 | Las flechas indican la dirección de ajuste*

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



SOLID CARBIDE
END MILLS

SOLID CARBIDE END MILLS

1 PCD TIPPED END MILLS

> See page A - 316

2 CHOOSE BY MATERIAL

> See page A - 322

3 CHOOSE BY APPLICATION

> See page A - 330

4 INTEG GRADES

> See page A - 340

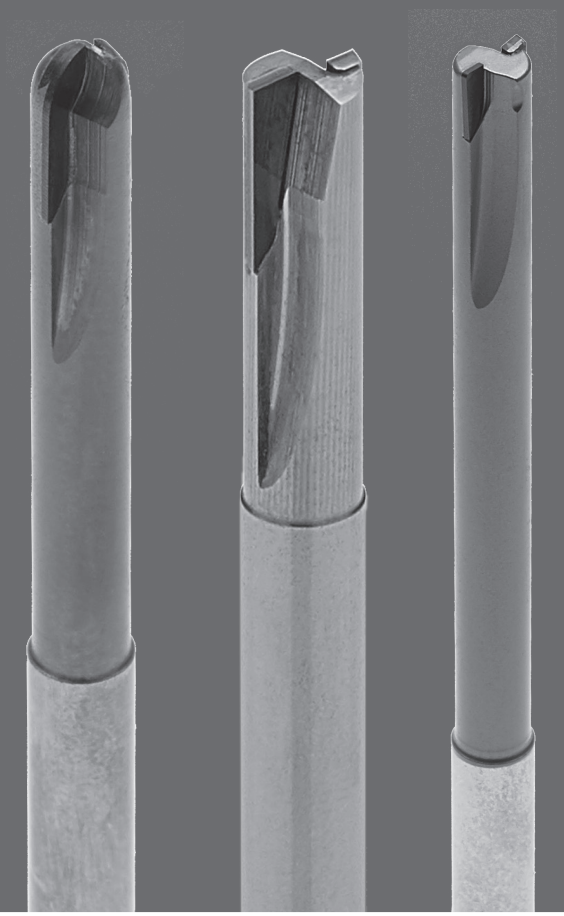
5 TROUBLESHOOTING

> See page A - 342

END MILLS

PCD TIPPED

METRIC LINE

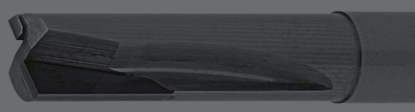


PCD end mills are brazed-tipped tools specifically designed for non-ferrous applications. PCD withstands abrasion wear, significantly prolonging tool life. PCD end mills operate at higher speeds than traditional carbide end mills, resulting in improved surface finish and extended tool life.

Fresas de topo PCD são ferramentas com ponta brasada especificamente projetadas para aplicações não ferrosas. O PCD suporta desgaste por abrasão, prolongando significativamente a vida útil da ferramenta. As fresas de topo PCD operam em velocidades mais altas do que as fresas de metal duro integral de topo tradicionais, resultando em melhor acabamento de superfície e vida útil estendida

Las fresas de punta PCD son herramientas con punta soldada diseñadas específicamente para aplicaciones no ferrosas. El PCD soporta el desgaste por abrasión, prolongando significativamente la vida útil de la herramienta. Las fresas de punta PCD operan a velocidades más altas que las fresas de punta de carburo tradicionales, lo que resulta en un mejor acabado superficial y una vida útil prolongada.

STRAIGHT EDGE > page 319



- From DC 0.157in to 0.630in
  De DC 0.157in a 0.630in | Desde DC 0.157in hasta 0.630in
- 2 or 3 cutting edges
  2 ou 3 arestas de corte | 2 o 3 aristas de corte
- Flat top geometry
  Dísponivel com geometria em topo raso | Disponible con geometría en topo plano
- Short version
  Disponível em versão curta | Disponible en versión corta

BULL NOSE > page 320



- From DC 0.118in to 0.472in
  De DC 0.118in a 0.472in | Desde DC 0.118in hasta 0.472in
- 1 or 2 cutting edges
  1 ou 2 arestas de corte | 1 o 2 aristas de corte
- 5º dish angle
  Ângulo de topo de 5º | Ángulo de la punta de 5º
- Short and long version
  Disponível em versão curta e longa | Disponible en versión corta y larga

BALL NOSE > page 321



- From DC 0.118in to 0.472in
  De DC 0.118in a 0.472in | Desde DC 0.118in hasta 0.472in
- 1 or 2 cutting edges
  1 ou 2 arestas de corte | 1 o 2 aristas de corte
- Spheric geometry
  Dísponivel com geometria esférica | Disponible con geometría esférica
- Short version
  Disponível em versão curta | Disponible en versión corta

CODIFICATION SYSTEM FOR PCD TIPPED END MILLS

Sistema de codificação para fresas de metal duro com pontas de PCD | Sistema de codificación para fresas de carburo con puntas de PCD

Straight Flute example:

D	S	N	S	2	050	080	010	060
1	2	3	4	5	6	7	8	9

1 - Tool type

D - Diamond (PCD tipped)

2 - Design

B - Ball nose
S - Straight

3 - Application

N - Non-ferrous materials

4 - Length of Shank

S - Short length
L - Long length
XL - Extra long length

5 - Flutes number (NOF)

Example: NOF = 1 ; NOF = 2 ; NOF = 3

6 - Cutting diameter (DC)

Example: 120 = 12,0 mm (0.472 in) ; 008 = 0,8 mm (0.031 in)

7 - Max cutting depth
(APMX - on straight flute solid carbide)

060 = 6 mm (0.236 in) ; 080 = 8 mm (0.315 in)

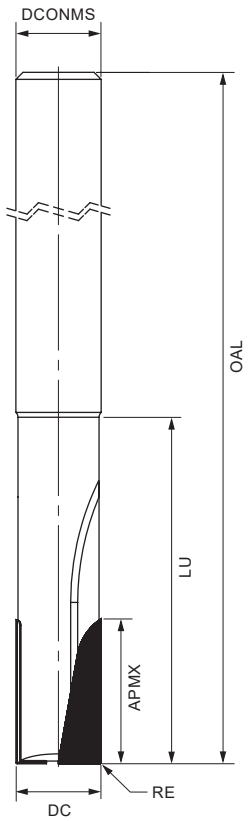
8 - Corner radius (Suppressed when it doesn't exist)

R... Example: R150 = 1,5 mm (0.059 in) ; R015 = 0,15 mm (0.059 in)

9 - Shank diameter (only on straight flute solid carbide)

Example: 060 = 6 mm (0.059 in)

Straight Flute
technical drawing example

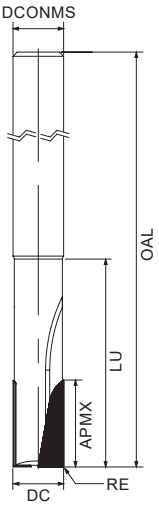


DC	Tool diameter
DCONMS	Shank diameter
OAL	Overall length
LU	Neck length
APMX	Tip length
RE	Corner form (radius or chamfer)

HARDMILL STRAIGHT EDGE

METRIC LINE





(1) Geometry code	(2) Grade code: Reference / Referência / Referencia	NOF	N / PCD / D6: PDP410	Dimensions | Dimensões | Dimensiones (in): DC	DCONMS	OAL	LU	APMX	RE
1180011	DSNS 2 040 060 010 060	2	●	0.157	0.236	2.008	0.563	0.236	0.004
1180012	DSNS 2 050 080 010 060	2	●	0.197	0.236	2.008	0.591	0.315	0.004
1180006	DSNS 2 060 080 010 060	2	●	0.236	0.236	2.244	1.024	0.315	0.004
1180013	DSNS 2 080 080 010 080	2	●	0.315	0.315	2.480	1.063	0.315	0.004
1180014	DSNS 2 080 120 010 080	2	●	0.315	0.315	2.480	1.102	0.472	0.004
1180015	DSNS 2 100 080 010 100	2	●	0.394	0.394	2.835	1.299	0.315	0.004
1180016	DSNS 2 100 160 010 100	2	●	0.394	0.394	2.835	1.299	0.630	0.004
1180017	DSNS 2 120 080 010 120	2	●	0.472	0.472	3.268	1.496	0.315	0.004
1180018	DSNS 2 120 160 010 120	2	●	0.472	0.472	3.268	1.496	0.630	0.004
1180019	DSNS 3 140 080 010 140	3	●	0.551	0.551	3.268	1.496	0.315	0.004
1180020	DSNS 3 140 160 010 140	3	●	0.551	0.551	3.268	1.496	0.630	0.004
1180021	DSNS 3 160 120 010 160	3	●	0.630	0.630	3.937	2.047	0.472	0.004
1180022	DSNS 3 160 200 010 160	3	●	0.630	0.630	3.937	2.047	0.787	0.004

● 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

NON-FERROUS MATERIALS Materiais não ferrosos | Materiales no ferrosos

ISO	Workpiece Material	Vc (SFM) min	Vc (SFM) max	fz (in/t) min	fz (in/t) max	Coolant
N	Aluminium <6%Si	656	19680	0.002	0.012	Emulsion / MQL
	Aluminium <12%Si	656	13120	0.002	0.010	
	Aluminium >12%Si	656	6560	0.002	0.008	
	Cooper/Cooper Alloys	820	9840	0.001	0.012	

SYNTHETICS MATERIALS Materiais sintéticos | Materiales sintéticos

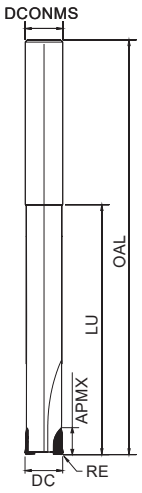
ISO	Workpiece Material	Vc (SFM) min	Vc (SFM) max	fz (in/t) min	fz (in/t) max	Coolant
N	Graphit	492	8200	0.002	0.016	Dry/ Air
	GFRP, CFRP	656	9840	0.002	0.016	Dry/ Air
	Plastics (Termo/Duroplast)	328	8200	0.002	0.012	Emulsion/MQL
	Acrylic (PMMA)	328	3936	0.0004	0.010	Emulsion /MQL
	Laminate	328	3936	0.001	0.020	Dry/Air

These recommended parameters are only approximate values. It can be necessary to adjust them regarding to the specific machining operation.

HARDMILL BULL NOSE

METRIC LINE





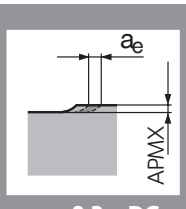
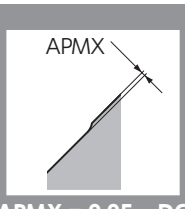
(1) Geometry code	(2) Grade code: Reference Referência Referencia	NOF	N PCD D6 PDP410	Dimensions | Dimensões | Dimensiones (in) DC	DCONMS	OAL	LU	APMX	RE
1180073	DSNS 1 030 050 030 040	1	◈	0.118	0.157	2.362	1.181	0.197	0.012
1180075	DSNL 2 040 050 030 040	2	◈	0.157	0.157	2.953	1.772	0.197	0.012
1180076	DSNL 2 060 060 030 060	2	◈	0.236	0.236	3.937	2.362	0.236	0.012
1180077	DSNL 2 080 060 030 080	2	◈	0.315	0.315	4.921	3.150	0.236	0.012
1180074	DSNL 2 100 060 050 100	2	◈	0.394	0.394	5.906	3.937	0.236	0.012
1180078	DSNL 2 120 070 050 120	2	◈	0.472	0.472	5.906	3.937	0.276	0.012

◈ Stock item | Produto de stock | Itens de stock

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

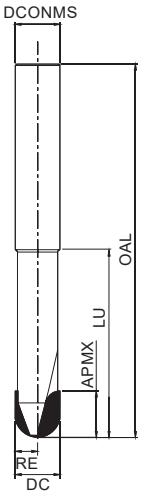
Order code = (1) Geometry Code + (2) Grade Code

Material Group	Correction factor	V_C (SFM)
Aluminium cast alloys 5% < Si ≤ 12%	1.6	2591-3280
Aluminium cast alloys 12% < Si	1.5	2591-3280
Fibre-reinforced synthetics	1.0	1312-1640
Graphite	1.0	2296-2788

DC	 a_e = 0,2 x DC; APMX = 0,1 x DC	 APMX = 0,05 x DC
	f_z (in/t)	f_z (in/t)
0.118	0.001	0.001
0.157	0.001	0.001
0.236	0.001	0.002
0.315	0.002	0.002
0.394	0.002	0.003
0.472	0.003	0.003

Please note that the value fz from the table above must be multiplied with the corresponding correction factor.



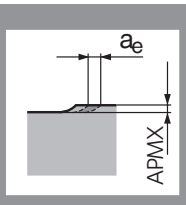
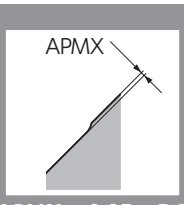


(1) Geometry code	(2) Grade code: Reference Referência Referencia	NOF	N PCD D6 PDP410	Dimensions | Dimensões | Dimensiones (in): DC	DCONMS	OAL	LU	APMX	RE
1180079	DBNS 1 030 050 150 060	1	◈	0.118	0.118	2.362	1.181	0.197	0.059
1180080	DBNS 1 040 100 200 040	1	◈	0.157	0.157	2.362	1.181	0.394	0.079
1180081	DBNS 2 060 100 300 060	2	◈	0.236	0.236	3.150	1.575	0.394	0.118
1180082	DBNS 2 080 100 400 080	2	◈	0.315	0.315	3.150	1.575	0.394	0.157
1180083	DBNS 2 100 100 500 100	2	◈	0.394	0.394	3.150	1.575	0.394	0.197
1180084	DBNS 2 120 100 600 120	2	○	0.472	0.472	3.937	2.362	0.394	0.236

◈ 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

Material Group	Correction factor	V_C (SFM)
Aluminium cast alloys 5% < Si ≤ 12%	1.6	2591-3280
Aluminium cast alloys 12% < Si	1.5	2591-3280
Fibre-reinforced synthetics	1.0	1312-1640
Graphite	1.0	2296-2788

DC	 a_e = 0,2 x DC APMX = 0,1 x DC	 APMX = 0,05 x DC
	f_z (in/t)	f_z (in/t)
0.118	0.001	0.001
0.157	0.001	0.001
0.236	0.001	0.002
0.315	0.002	0.002
0.394	0.002	0.003
0.472	0.003	0.003

Please note that the value fz from the table above must be multiplied with the corresponding correction factor.

CHOOSE BY

MATERIAL

METRIC LINE



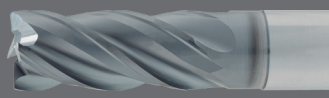
A high-performance solid carbide end mills designed for specific workpiece materials, offering improved productivity, extended tool life, and providing high process security for demanding parts production in industries such as aerospace, automotive, mold and die, and power generation.

Fresas de metal duro integral de alto desempenho projetadas para materiais de peças específicas, oferecendo produtividade aprimorada, vida útil estendida e alta segurança de processo para produção de peças exigentes em indústrias como aeroespacial, automóvel, moldes e matrizes e geração de energia.

Fresas de carburo integral de alto rendimiento diseñadas para materiales específicos de piezas, ofreciendo productividad mejorada, vida útil prolongada y alta seguridad del proceso para la producción de piezas exigentes en industrias como aeroespacial, automotriz, moldes y matrices, y generación de energía.

STEEL INTEG > page 326

- Steel specialized end mills
  Fresas especiais para aço | Fresas especiales para acero
- From DC 0.079in to 0.984in
  De DC 0.079in a 0.984in | Desde DC 0.079in hasta 0.984in
- Chamfer or radius geometry
  Dísponivel com geometria em chanfro ou raio | Disponible con geometría en chaflán o radio
- Short and long version
  Disponível em versão curta e longa | Disponible en versión corta y larga



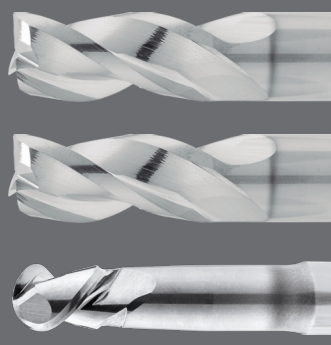
INOX INTEG > page 327

- Stainless steel specialized end mills
  Fresas especiais para aço inox | Fresas especiales para acero inoxidable
- From DC 0.079in to 0.787in
  De DC 0.079in a 0.787in | Desde DC 0.079in hasta 0.787in
- Chamfer or radius geometry
  Dísponivel com geometria em chanfro ou raio | Disponible con geometría en chaflán o radio
- Short version
  Disponível em versão curta | Disponible en versión corta



AL INTEG > page 328

- Aluminium specialized end mills
  Fresas especiais para alumínio | Fresas especiales para aluminio
- From DC 0.079in to 0.787in
  De DC 0.079in a 0.787in | Desde DC 0.079in hasta 0.787in
- Chamfer, radius, ball nose or flat top geometry
  Dísponivel com geometria em chanfro, raio, topo redondo ou topo raso | Disponible con geometría en chaflán, radio, topo redondeado o plano
- Short version
  Disponível em versão curta | Disponible en versión corta



CODIFICATION SYSTEM FOR SOLID CARBIDE END MILLS

Sistema de codificação para fresas de metal duro para acabamento | Sistema de codificación para fresas de carburo para acabado

Integral Solid Carbide example:	H	C	35	-	P	S	4	090	22	XR100	90	-	W
	1	2	3	4	5	6	7	8	9	10	11		12

1 - Tool type

H - Solid carbide end mill (Hard metal)

2 - Design

F - Square form (Flat top)
R - Square form with corner radius
C - Square form with corner chamfer
B - Ball nose
CH – Conical Top
XC – Conical Segment
XT - Tangential Segment
XR - Special Radius
RO - Rougher

3 - Helix Angle (Suppressed when it is 90°)

... - Degree of helix rounded to nearest 5 degree

4 - Machining Method (Suppressed when it doesn't exist)

HF - High Feed
HP - High Performance
TS - Trochoidal miling

5 - Application

A - Aluminium
G - General application
F - Finishing
P - Steel
S - Stainless steel
H - Hard materials
MIN - Micro milling

6 - Length of Shank

S - Short length
L - Long length
XL - Extra long length

7 - Flutes number (NOF)

Example: NOF = 1 ; NOF = 2 ; NOF = 3

8 - Cutting diameter (DC)

Example: 120 = 12,0mm (0.472in) ; 008 = 0,8mm (0.315in)

9 - Max cutting depth (APMX)

Example for APMX ≥ 1mm (0.039in): 04 = 4mm (0.157in);
Example for APMX < 1mm (0.039in): 002 = 0,2mm (0.008in)

10 - Shank diameter (only on straight flute solid carbide)

For corner radius: R150 = 1,5mm (0.059in) ; R015=0,15mm (0.006in)
For special radius : XR100 = 1,0mm (0.039in)
For conical segment: 18RM120 - α/2 = 18° , RM = 1200mm (47.244in)
For tangential segment: RM090 - RM = 90mm (3.543 in)

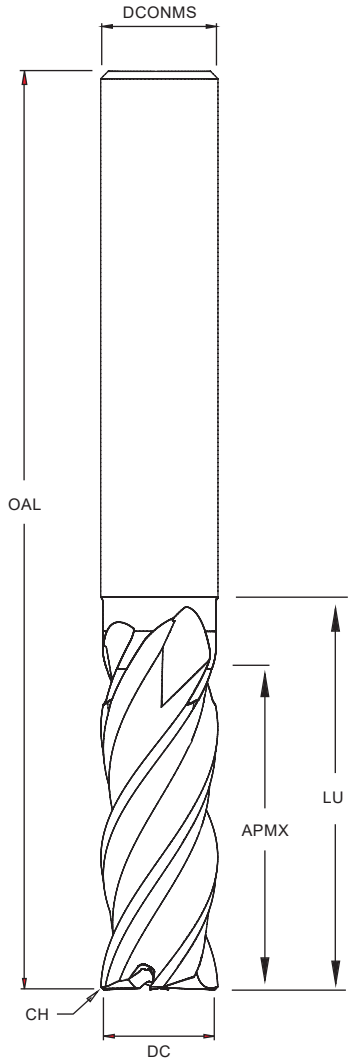
11 - Angle (Only for chamfering end mills)

Example: 90 = 90°

12 - Shank (Suppressed when cylindrical)

W - Weldon

Integral Solid Carbide technical drawing example



SELECTION GUIDE FOR SOLID CARBIDE END MILLS

Guia de seleção para fresas de metal duro integral | Guía para fresas en carburo monobloque

METRIC LINE	DC	NOF	HELIX ANGLE	GEOMETRY	FINISHING	ROUGHING	MATERIAL	DESCRIPTION	PAGE
 STEEL INTEG HC35PS	0.079 to 0.984	4	35° 38°	 Corner chamfer	■■□□□	■■■■■	P K	Steel Specialized End mills	A-326
 INOX INTEG HR37SS	0.079 to 0.787	4	38° 39°	 Corner radius	■■□□□	■■■■□	M	Stainless Steel Specialized End mills	A-327
 AL INTEG HR35HPAS	0.079 to 0.787	3	35°	 Corner radius	■■■□□	■■■■□	N	Aluminium Specialized End mills	A-328
 AL INTEG HF45HPAS	0.079 to 0.787	3	45°	 Square	■■■■□	■■■□□	N		A-328
 AL INTEG HB50HPAS	0.079 to 0.787	2	50°	 Ball nose	■■■■■	■■■□□	N		A-329

STEEL INTEG Steel Specialized End mills

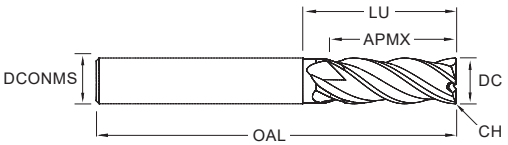
METRIC LINE

HC35PS Corner chamfer



P K





(1) Order code		(2) Grade code		2A	Dimensions | Dimensões | Dimensiones (in)						
HA (Cylindrical)	HB (Weldon)	Reference Referência Referencia	NOF	PHU910	DC	DCONMS	APMX	CHW	KCH	LU	OAL
1182241	1182240	HC35PS 4 020 05	4	◈	0.079	0.236	0.197	0.003	45º	0.315	2.244
1182242	1181829	HC35PS 4 030 08	4	◈	0.118	0.236	0.315	0.004	45º	0.472	2.244
1182243	1181749	HC35PS 4 040 08	4	◈	0.157	0.236	0.315	0.004	45º	0.472	2.244
1182244	1181750	HC35PS 4 050 10	4	◈	0.197	0.236	0.394	0.006	45º	0.591	2.244
1182245	1181751	HC35PS 4 060 13	4	◈	0.236	0.236	0.512	0.008	45º	0.827	2.244
1182246	1181834	HC35PS 4 070 19	4	◈	0.276	0.315	0.748	0.008	45º	1.063	2.480
1182247	1181752	HC35PS 4 080 19	4	◈	0.315	0.315	0.748	0.008	45º	1.063	2.480
1182248	1181830	HC35PS 4 090 22	4	◈	0.354	0.394	0.866	0.008	45º	1.260	2.835
1182249	1181753	HC35PS 4 100 22	4	◈	0.394	0.394	0.866	0.008	45º	1.260	2.835
1182250	1181831	HC35PS 4 110 26	4	○	0.433	0.472	1.024	0.008	45º	1.496	3.268
1182180	1181828	HC35PS 4 120 26	4	◈	0.472	0.472	1.024	0.008	45º	1.496	3.268
1182251	1181832	HC35PS 4 130 26	4	○	0.512	0.551	1.024	0.012	45º	1.496	3.268
1182252	1181754	HC35PS 4 140 26	4	◈	0.551	0.551	1.024	0.012	45º	1.496	3.268
1182253	1181755	HC35PS 4 160 32	4	◈	0.630	0.630	1.260	0.012	45º	1.732	3.622
1182254	1181756	HC35PS 4 180 32	4	◈	0.709	0.709	1.260	0.012	45º	1.732	3.622
1182255	1181757	HC35PS 4 200 38	4	◈	0.787	0.787	1.496	0.012	45º	1.969	4.094
1182256	1181833	HC35PS 4 250 42	4	○	0.984	0.984	1.654	0.012	45º	2.205	4.764

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

End mill order code = (1) Geometry Code + (2) Grade Code

Note: For HB (Weldon) end mills, the reference ends with "-W "
Example: "HC35PS 4 030 08-W"

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

ISO	Material	f_z (in/t)			Vc (SFM)		
		a_e = 25%	a_e = 40%	a_e = 100%	a_e = 25%	a_e = 40%	a_e = 100%
P	Unalloyed Steel	0.0003 x DC	0.0002 x DC	0.0002 x DC	623	590	492
	Low-Alloyed Steel	0.0003 x DC	0.0002 x DC	0.0001 x DC	590	524	426
	High-Alloyed Steel	0.0002 x DC	0.0002 x DC	0.0001 x DC	524	492	393
K	Malleable Cast Iron	0.0003 x DC	0.0002 x DC	0.0002 x DC	754	688	590
	Grey Cast Iron	0.0003 x DC	0.0002 x DC	0.0002 x DC	754	688	557
	Nodular Cast Iron	0.0003 x DC	0.0002 x DC	0.0002 x DC	688	623	524

Note[1]: Recommended feed values for maximum a_p. For reduced a_p, consider increasing F_z up to 25%.
Note[2]: Cutting speeds selected for an economic use of the tool, for higher productivity consider increasing up to 70%.

palbit

INOX INTEG Stainless Steel Specialized End mills

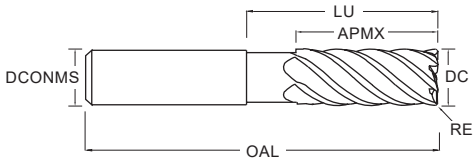
METRIC LINE

HR37SS Corner radius



M





(1) Order code		(2) Grade code		1F	Dimensions | Dimensões | Dimensiones (in)					
HA (Cylindrical)	HB (Weldon)	Reference Referência Referencia	NOF	PHF920	DC	DCONMS	APMX	RE	LU	OAL
-	1182351	HR37SS 4 020 05 R020-W	4	◎	0.079	0.236	0.197	0.008	0.433	2.244
-	1182352	HR37SS 4 030 08 R020-W	4	◎	0.118	0.236	0.315	0.008	0.630	2.244
-	1182353	HR37SS 4 040 08 R020-W	4	◎	0.157	0.236	0.315	0.008	0.748	2.244
-	1182354	HR37SS 4 050 10 R020-W	4	◎	0.197	0.236	0.394	0.008	0.827	2.244
-	1182355	HR37SS 4 060 13 R030-W	4	◎	0.236	0.236	0.512	0.012	0.906	2.244
-	1182356	HR37SS 4 080 19 R050-W	4	◎	0.315	0.315	0.748	0.020	1.220	2.480
-	1181510	HR37SS 4 100 22 R050-W	4	◎	0.394	0.394	0.866	0.020	1.299	2.835
-	1182357	HR37SS 4 120 26 R100-W	4	◎	0.472	0.472	1.024	0.039	1.457	3.268
-	1182358	HR37SS 4 160 32 R100-W	4	◎	0.630	0.630	1.260	0.039	1.732	3.622
-	1182359	HR37SS 4 200 38 R100-W	4	◎	0.787	0.787	1.496	0.039	2.165	4.094

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

End mill order code = (1) Geometry Code + (2) Grade Code

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

ISO	Material	f_z (in/t)			Vc (SFM)		
		a_e = 25%	a_e = 40%	a_e = 100%	a_e = 25%	a_e = 40%	a_e = 100%
M	SS - Ferritic / Martensitic	0.0002 x DC	0.0002 x DC	0.0002 x DC	459	426	360
	SS – Austenitic	0.0002 x DC	0.0002 x DC	0.0001 x DC	426	393	360
	SS - Austenitic-ferritic (Duplex)	0.0002 x DC	0.0002 x DC	0.0001 x DC	393	360	328

Note[1]: Feed valid for when the end mill works with its whole ap, for when the end mill is working with lower depths of cut consider increasing the feed up to 25%.
Note[2]: Cutting speeds selected for an economic use of the tool, for higher productivity consider increasing up to 70%.

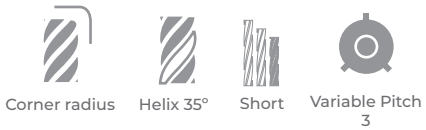
AL INTEG Aluminium Specialized End mills

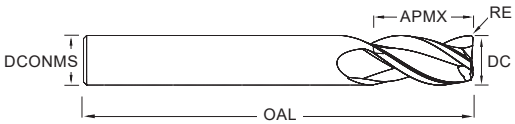
METRIC LINE

HR35HPAS Corner radius



N





(1) Order code		(2) Grade code		H3	Dimensions | Dimensões | Dimensiones (in)				
HA (Cylindrical)	HB (Weldon)	Reference Referência Referencia	NOF	PHT910	DC	APMX	RE	DCONMS	OAL
1182443	-	HR35HPAS 3 020 04 R050	3	○	0.079	0.157	0.020	0.236	2.244
1182444	-	HR35HPAS 3 030 06 R050	3	◈	0.118	0.236	0.020	0.236	2.244
1182445	-	HR35HPAS 3 040 08 R050	3	◈	0.157	0.315	0.020	0.236	2.244
1182446	-	HR35HPAS 3 050 10 R050	3	○	0.197	0.394	0.020	0.236	2.244
1182182	-	HR35HPAS 3 060 13 R050	3	◈	0.236	0.512	0.020	0.236	2.244
1181710	-	HR35HPAS 3 080 19 R050	3	◈	0.315	0.748	0.020	0.315	2.480
1182183	-	HR35HPAS 3 100 22 R050	3	◈	0.394	0.866	0.020	0.394	2.835
1182184	-	HR35HPAS 3 120 26 R050	3	◈	0.472	1.024	0.020	0.472	3.268
1182447	-	HR35HPAS 3 140 28 R050	3	○	0.551	1.102	0.020	0.551	3.268
1182292	-	HR35HPAS 3 160 32 R050	3	◈	0.630	1.260	0.020	0.630	3.622
1182448	-	HR35HPAS 3 180 36 R050	3	○	0.709	1.417	0.020	0.709	3.622
1182449	-	HR35HPAS 3 200 40 R050	3	◈	0.787	1.575	0.020	0.787	4.094

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

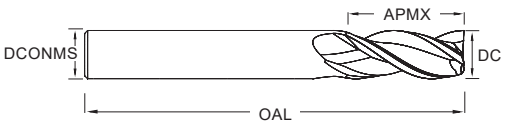
End mill order code = (1) Geometry Code + (2) Grade Code

HF45HPAS Flat top



N





(1) Order code		(2) Grade code		H3	Dimensions | Dimensões | Dimensiones (in)			
HA (Cylindrical)	HB (Weldon)	Reference Referência Referencia	NOF	PHT910	DC	APMX	DCONMS	OAL
1182450	-	HF45HPAS 3 020 04	3	◈	0.079	0.157	0.236	2.244
1182451	-	HF45HPAS 3 030 06	3	◈	0.118	0.236	0.236	2.244
1182333	-	HF45HPAS 3 040 08	3	◈	0.157	0.315	0.236	2.244
1182452	-	HF45HPAS 3 050 08	3	◈	0.197	0.394	0.236	2.244
1182334	-	HF45HPAS 3 060 13	3	◈	0.236	0.512	0.236	2.244
1182335	-	HF45HPAS 3 080 19	3	◈	0.315	0.748	0.315	2.480
1182336	-	HF45HPAS 3 100 22	3	◈	0.394	0.866	0.394	2.835
1182337	-	HF45HPAS 3 120 26	3	◈	0.472	1.024	0.472	3.268
1182453	-	HF45HPAS 3 140 28	3	○	0.551	1.102	0.551	3.268
1182338	-	HF45HPAS 3 160 32	3	◈	0.630	1.260	0.630	3.622
1182454	-	HF45HPAS 3 180 36	3	○	0.709	1.417	0.709	3.622
1182455	-	HF45HPAS 3 200 40	3	◈	0.787	1.575	0.787	4.094

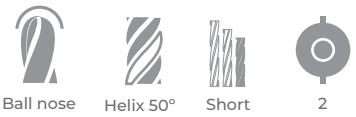
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

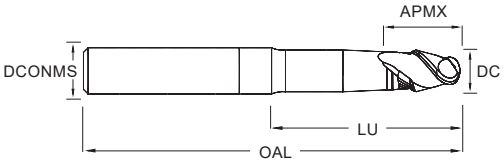
End mill order code = (1) Geometry Code + (2) Grade Code

HB50HPAS Ball nose



N





(1) Order code		(2) Grade code		H3	Dimensions | Dimensões | Dimensiones (in)				
HA (Cylindrical)	HB (Weldon)	Reference Referência Referencia	NOF	PHT910	DC	APMX	DCONMS	LU	OAL
1182456	-	HB50HPAS 2 020 02	2	◈	0.079	0.079	0.236	0.394	2.244
1182457	-	HB50HPAS 2 030 03	2	○	0.118	0.118	0.236	0.472	2.244
1182339	-	HB50HPAS 2 040 04	2	◈	0.157	0.157	0.236	0.787	2.244
1182458	-	HB50HPAS 2 050 05	2	○	0.197	0.197	0.236	0.984	2.244
1182340	-	HB50HPAS 2 060 06	2	◈	0.236	0.236	0.236	0.984	2.244
1182341	-	HB50HPAS 2 080 08	2	◈	0.315	0.315	0.315	1.181	2.480
1182342	-	HB50HPAS 2 100 10	2	◈	0.394	0.394	0.394	1.378	2.835
1182343	-	HB50HPAS 2 120 12	2	◈	0.472	0.472	0.472	1.575	3.268
1182459	-	HB50HPAS 2 140 14	2	○	0.551	0.551	0.551	1.575	3.268
1182460	-	HB50HPAS 2 160 16	2	○	0.630	0.630	0.630	1.969	3.622
1182461	-	HB50HPAS 2 180 18	2	○	0.709	0.709	0.709	1.969	3.622
1182462	-	HB50HPAS 2 200 20	2	○	0.787	0.787	0.787	1.969	4.094

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

End mill order code = (1) Geometry Code + (2) Grade Code

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

ISO	Material	f_z (in/t)			Vc (SFM)		
		a_e = 25%	a_e = 40%	a_e = 100%	a_e = 25%	a_e = 40%	a_e = 100%
N	Aluminium <6%Si	0.0004 x DC	0.0004 x DC	0.0002 x DC	754	721	623
	Aluminium <12%Si	0.0004 x DC	0.0003 x DC	0.0002 x DC	688	656	590
	Aluminium >12%Si	0.0003 x DC	0.0003 x DC	0.0002 x DC	656	623	557

Note[1]: Recommended feed values for maximum a_p. For reduced a_p, consider increasing f_z up to 25%.
Note[2]: Cutting speeds selected for an economic use of the tool, for higher productivity consider increasing up to 70%.

CHOOSE BY

APPLICATION

METRIC LINE



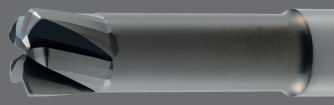
Exceptional performance solid carbide end mills designed for specific applications. The high quality is a direct outcome of specialized end mill geometry for each type of application, including optimized flute design, specialized edge honing, and wear-resistant coatings.

Fresas de metal duro integral de alto desempenho projetadas para aplicações específicas. A alta qualidade é resultado direto da geometria especializada da fresa para cada tipo de aplicação, incluindo design de flutes otimizado, afiação de aresta especializada e revestimentos resistentes ao desgaste.

Fresas de carburo integral de alto rendimiento diseñadas para aplicaciones específicas. La alta calidad es el resultado directo de la geometría especializada de la fresa para cada tipo de aplicación, incluido el diseño optimizado de las ranuras, el afilado especializado de los bordes y los recubrimientos resistentes al desgaste.

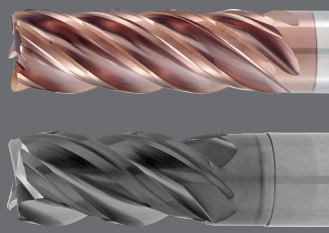
HIFEED INTEG > page 334

- High feed milling
  Fresagem de alto avanço | Fresado de alta avance
- Special radius roughing end mills
  Fresas especiais de raio para desbaste | Fresas especiales de radio para desbaste



DYN INTEG > page 336

- Trochoidal milling
  Fresagem trocoidal | Fresado trocoidal
- For steel, stainless steel and superalloys aplications
  Para aço, aço inoxidável e aplicações em superligas | Para acero, acero inoxidable y aplicaciones en superaleaciones



RAD INTEG > page 338

- 5-Axis milling
  Fresagem a 5 eixos | Fresado de 5 ejes
- Conical or tangential end mills
  Fresas cónicas e tangenciais | Fresas cónicas ou tangenciais



CODIFICATION SYSTEM FOR SOLID CARBIDE END MILLS

Sistema de codificação para fresas de metal duro para acabamento | Sistema de codificación para fresas de carburo para acabado

Integral Solid Carbide example:

H	C	40	TS	P	L	5	120	41	XR100	90	-	W
1	2	3	4	5	6	7	8	9	10	11		12

1 - Tool type

H - Solid carbide end mill (Hard metal)

2 - Design

F - Square form (Flat top)
R - Square form with corner radius
C - Square form with corner chamfer
B - Ball nose
CH – Conical Top
XC – Conical Segment
XT - Tangential Segment
XR - Special Radius
RO - Rougher

3 - Helix Angle (Suppressed when it is 90°)

... - Degree of helix rounded to nearest 5 degree

4 - Machining Method (Suppressed when it doesn't exist)

HF - High Feed
HP - High Performance
TS - Trochoidal miling

5 - Application

A - Aluminium
S - Stainless steel
G - General application
H - Hard materials
F - Finishing
MIN - Micro milling
P - Steel

6 - Length of Shank

S - Short length
L - Long length
XL - Extra long length

7 - Flutes number (NOF)

Example: NOF = 1 ; NOF = 2 ; NOF = 3

8 - Cutting diameter (DC)

Example: 120 = 12,0mm (0.472in) ; 008 = 0,8mm (0.315in)

9 - Max cutting depth (APMX)

Example for APMX ≥ 1mm (0.039in): 04 = 4mm (0.157in);
Example for APMX < 1mm (0.039in): 002 = 0,2mm (0.008in)

10 - Shank diameter (only on straight flute solid carbide)

For corner radius: R150 = 1,5mm (0.059in) ; R015=0,15mm (0.006in)
For special radius : XR100 = 1,0mm (0.039in)
For conical segment: 18RM120 - α/2 = 18° , RM = 1200mm (47.244in)
For tangential segment: RM090 - RM = 90mm (3.543 in)

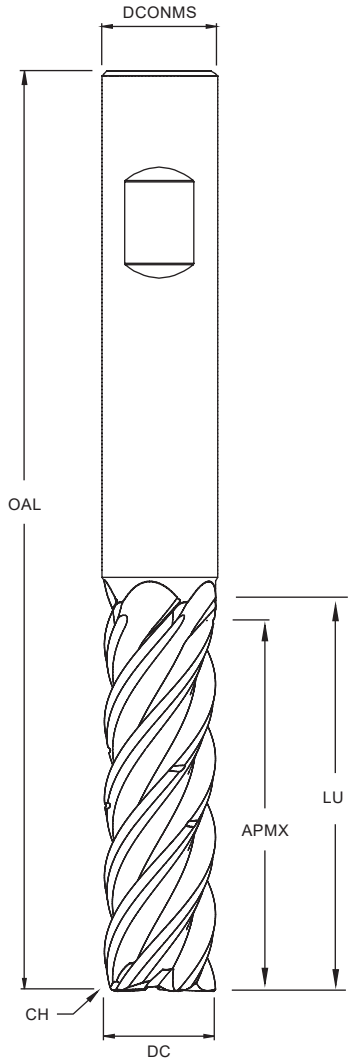
11 - Angle (Only for chamfering end mills)

Example: 90 = 90°

12 - Shank (Suppressed when cylindrical)

W - Weldon

Integral Solid Carbide technical drawing example



palbit

SELECTION GUIDE FOR SOLID CARBIDE END MILLS

Guia de seleção para fresas de metal duro integral | Guía para fresas en carburo monobloque

METRIC LINE	DC	NOF	HELIX ANGLE	GEOMETRY	FINISHING	ROUGHING	MATERIAL	DESCRIPTION	PAGE
 HIFEED INTEG HXR30HFGS	0.118 to 0.472	4-5	-	 Special radius	■□□□□	■■■■■	P M K S H	Special radius Roughing End mills	A-334
 DYN INTEG HR38TSM	0.236 to 0.787	5	38°	 Corner radius	■■■□□	■■■■□	M S	Trochoidal Milling	A-336
 DYN INTEG HC40TSP	0.236 to 0.787	5	40° 41° 42°	 Corner chamfer	■■■□□	■■■■□	P K		A-337
 RAD INTEG HXC30GL	0.315 to 0.630	4	30°	 Radial segment	■■■■■	■□□□□	P M K S	Radial Segment End mills	A-338
 RAD INTEG HXT30GL	0.236 to 0.630	4	30°	 Radial segment	■■■■■	■□□□□	P M K S		A-338

HIFEED INTEG High Feed End mills

METRIC LINE

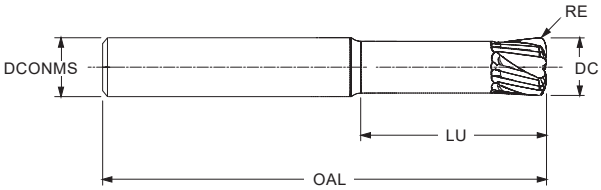
HXR30HFGS Special radius roughing



All order codes are cylindrical shank,
Weldon shank available under request.

P M K S H





(1) Geometry code	(2) Grade code: Reference / Referência / Referencia	NOF	2A PHU910	Dimensions | Dimensões | Dimensiones (in) DC	DCONMS	APMX	RE	PR*	LU	OAL
1181449	HXR30HFGS 4 030 002 XR020	4	◎	0.118	0.236	0.008	0.008	0.016	0.354	2.480
1181450	HXR30HFGS 4 040 003 XR030	4	◎	0.157	0.236	0.012	0.012	0.020	0.472	2.480
1181451	HXR30HFGS 4 050 003 XR040	4	◎	0.197	0.236	0.012	0.016	0.024	0.591	2.480
1181452	HXR30HFGS 4 060 004 XR050	4	◎	0.236	0.236	0.016	0.020	0.031	0.945	2.480
1181453	HXR30HFGS 5 080 004 XR060	5	◎	0.315	0.315	0.016	0.024	0.035	1.260	2.953
1181430	HXR30HFGS 5 100 005 XR080	5	◎	0.394	0.394	0.020	0.031	0.047	1.260	2.953
1181454	HXR30HFGS 5 120 005 XR100	5	◎	0.472	0.472	0.020	0.039	0.055	1.417	3.268

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

End mill order code = (1) Geometry Code + (2) Grade Code

*Programming radius

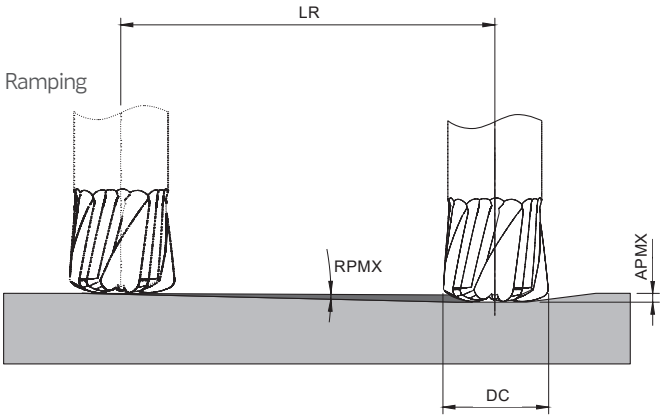
RECOMMENDED CUTTING CONDITIONS Condições de corte recomendadas | Condiciones de corte recomendables

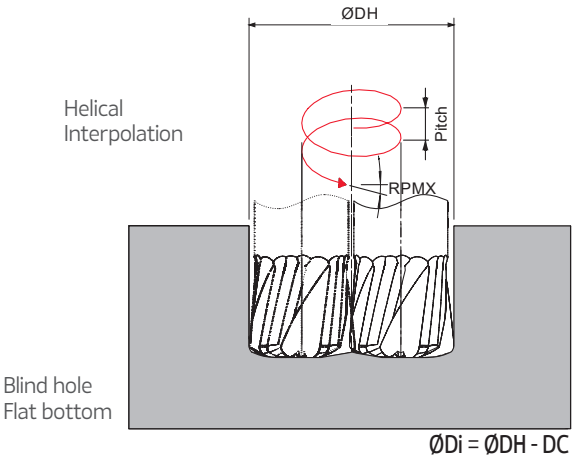
ISO	Workpiece Material	f_z (in/t) a_e = 25%	a_e = 50%	a_e = 100%	V_c (SFM) a_e = 25%	a_e = 50%	a_e = 100%	Plunging f_z (in/t)	V_c (SFM)
P	Unalloyed Steel	0.0017 x DC	0.0015 x DC	0.0009 x DC	984	918	885	0.0002 x DC	524
	Low-Alloyed Steel	0.0017 x DC	0.0015 x DC	0.0009 x DC	918	820	754	0.0002 x DC	459
	High-Alloyed Steel	0.0016 x DC	0.0014 x DC	0.0008 x DC	656	590	492	0.0002 x DC	393
M	Stainless Steel (Ferritic / Martensitic)	0.0014 x DC	0.0014 x DC	0.0007 x DC	590	524	492	0.0001 x DC	360
	Stainless Steel (Austenitic)	0.0014 x DC	0.0013 x DC	0.0007 x DC	393	360	328	0.0001 x DC	328
	Stainless Steel (Austenitic/Ferritic/Duplex)	0.0013 x DC	0.0012 x DC	0.0007 x DC	262	229	196	0.0001 x DC	196
K	Malleable Cast Iron	0.0013 x DC	0.0013 x DC	0.0008 x DC	557	492	426	0.0001 x DC	360
	Grey Cast Iron	0.0014 x DC	0.0014 x DC	0.0008 x DC	721	656	590	0.0001 x DC	393
	Nodular Cast Iron	0.0013 x DC	0.0013 x DC	0.0008 x DC	524	459	393	0.0001 x DC	360
S	Heat Resistant Super Alloys	0.0009 x DC	0.0007 x DC	0.0006 x DC	131	114	98	0.0001 x DC	98
H	Hardened Steels	0.0010 x DC	0.0008 x DC	0.0006 x DC	295	278	229	0.0001 x DC	229

Note: Plunge Depth = 2 x DC
Ae Stepover = 0,2 x DC

RAMPING AND HELICAL INTERPOLATION

Descida em rampa e interpolação helicoidal | Bajada en rampa e interpolación circular





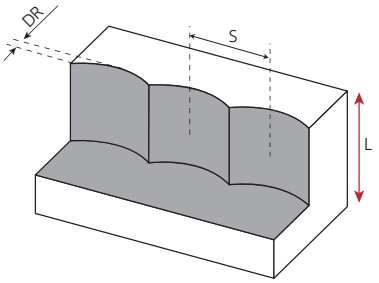
ØDi = ØDH - DC

DC	Ramping			Helical Interpolation			Max Angle (°)
	RPMX	APMX	Min LR	ØDHmin	ØDHmax	Max Pitch/Rev.	
0.118	0.059	0.008	0.299	0.157 -	- 0.236	0.003 0.008	0.059 0.059
0.157	0.059	0.012	0.453	0.209 -	- 0.315	0.004 0.012	0.059 0.051
0.197	0.059	0.012	0.453	0.264 -	- 0.394	0.004 0.012	0.059 0.039
0.236	0.059	0.016	0.602	0.315 -	- 0.472	0.006 0.016	0.059 0.047
0.315	0.059	0.016	0.602	0.421 -	- 0.630	0.008 0.016	0.059 0.035
0.394	0.059	0.020	0.752	0.524 -	- 0.787	0.010 0.020	0.059 0.035
0.472	0.059	0.020	0.752	0.630 -	- 0.945	0.012 0.020	0.059 0.028

Note: During helical interpolation do not exceed APMX.

PLUNGING Mergulho | Plunge

Cutting Conditions	
Vc (SFM)	fz (in/t)
70%	35%



S max and DR corresponding cutting diameter DC (in)							
DR (in)	DC (in)						
	0.118	0.157	0.197	0.236	0.315	0.394	0.472
0.020	0.043	0.051	0.059	0.067	0.075	0.087	0.094
0.039	0.055	0.067	0.079	0.087	0.102	0.118	0.130
0.059	-	-	0.091	0.102	0.122	0.142	0.157
0.079	-	-	-	-	0.138	0.157	0.177
0.118	-	-	-	-	-	0.181	0.205

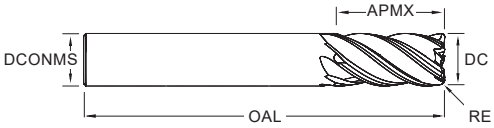
DYN INTEG Trochoidal Milling

HR38TSM Corner radius



M S





(1) Order code		(2) Grade code		4F	Dimensions | Dimensões | Dimensiones (in)				
HA (Cylindrical)	HB (Weldon)	Reference Referência Referencia	NOF	PHF910	DC	DCONMS	APMX	RE	OAL
		HR38TSMS							
1182476	1182501	HR38TSMS 5 060 12 R100	5	○	0.236	0.236	0.472	0.039	2.244
1182477	1182502	HR38TSMS 5 060 12 R050	5	◈	0.236	0.236	0.472	0.020	2.244
1182478	1182503	HR38TSMS 5 080 16 R100	5	○	0.315	0.315	0.630	0.039	2.480
1182479	1182504	HR38TSMS 5 080 16 R050	5	◈	0.315	0.315	0.630	0.020	2.480
1182480	1182505	HR38TSMS 5 100 20 R100	5	◈	0.394	0.394	0.787	0.039	2.835
1182481	1182506	HR38TSMS 5 100 20 R050	5	○	0.394	0.394	0.787	0.020	2.835
1182332	1182507	HR38TSMS 5 120 24 R100	5	◈	0.472	0.472	0.945	0.039	3.268
1182482	1182508	HR38TSMS 5 120 24 R050	5	○	0.472	0.472	0.945	0.020	3.268
1182331	1182509	HR38TSMS 5 160 32 R100	5	◈	0.630	0.630	1.260	0.039	3.622
1182483	1182510	HR38TSMS 5 160 32 R200	5	○	0.630	0.630	1.260	0.079	3.622
1182484	1182511	HR38TSMS 5 180 36 R100	5	○	0.709	0.709	1.417	0.039	3.622
1182485	1182512	HR38TSMS 5 180 36 R200	5	○	0.709	0.709	1.417	0.079	3.622
1182486	1182513	HR38TSMS 5 200 40 R100	5	○	0.787	0.787	1.575	0.039	4.094
1182487	1182514	HR38TSMS 5 200 40 R200	5	○	0.787	0.787	1.575	0.079	4.094
		HR38TSML							
1182488	1182515	HR38TSML 5 060 18 R100	5	○	0.236	0.236	0.709	0.039	2.244
1182489	1182516	HR38TSML 5 060 18 R050	5	◈	0.236	0.236	0.709	0.020	2.244
1182490	1182517	HR38TSML 5 080 24 R100	5	○	0.315	0.315	0.945	0.039	2.480
1182491	1182518	HR38TSML 5 080 24 R050	5	◈	0.315	0.315	0.945	0.020	2.480
1182492	1182519	HR38TSML 5 100 30 R100	5	◈	0.394	0.394	1.181	0.039	2.835
1182493	1182520	HR38TSML 5 100 30 R050	5	◈	0.394	0.394	1.181	0.020	2.835
1182494	1182521	HR38TSML 5 120 36 R100	5	◈	0.472	0.472	1.417	0.039	3.268
1182495	1182522	HR38TSML 5 120 36 R050	5	◈	0.472	0.472	1.417	0.020	3.268
1182390	1182523	HR38TSML 5 160 48 R100	5	◈	0.630	0.630	1.890	0.039	3.937
1182496	1182524	HR38TSML 5 160 48 R200	5	○	0.630	0.630	1.890	0.079	3.937
1182497	1182525	HR38TSML 5 180 54 R100	5	○	0.709	0.709	2.126	0.039	4.094
1182498	1182526	HR38TSML 5 180 54 R200	5	○	0.709	0.709	2.126	0.079	4.094
1182499	1182527	HR38TSML 5 200 60 R100	5	○	0.787	0.787	2.362	0.039	4.331
1182500	1182528	HR38TSML 5 200 60 R200	5	○	0.787	0.787	2.362	0.079	4.331

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

End mill order code = (1) Geometry Code + (2) Grade Code

Note: For HB (Weldon) end mills, the reference ends with "-W "

Example: "HR38TSMS 5 080 16 R100-W"

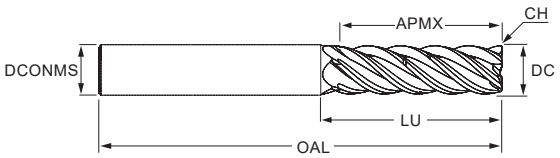
DYN INTEG Trochoidal Milling

HC40TSP Corner chamfer



P K





(1) Order code		(2) Grade code		T1	Dimensions | Dimensões | Dimensiones (in)						
HA (Cylindrical)	HB (Weldon)	Reference Referência Referencia	NOF	PHP920	DC	DCONMS	APMX	CHW	KCH	LU	OAL
			HC40TSPL								
1180118	1180456	HC40TSPL 5 060 20	5	◈	0.236	0.236	0.787	0.006	45°	1.024	2.480
1180119	1180457	HC40TSPL 5 080 25	5	◈	0.315	0.315	0.984	0.006	45°	1.260	2.756
1180225	1180458	HC40TSPL 5 100 32	5	◈	0.394	0.394	1.260	0.008	45°	1.496	3.110
1180690	1180689	HC40TSPL 5 120 41	5	◈	0.472	0.472	1.614	0.008	45°	1.890	3.937
1180226	1180460	HC40TSPL 5 160 50	5	◈	0.630	0.630	1.969	0.010	45°	2.362	4.331
1180123	1180461	HC40TSPL 5 180 60	5	◈	0.709	0.709	2.362	0.012	45°	2.598	5.118
1180462	1180463	HC40TSPL 5 200 64	5	◈	0.787	0.787	2.520	0.014	45°	2.756	5.118
			HC40TSPXL								
-	1180514	HC40TSPXL 5 060 30	5	◈	0,236	0,236	1,181	0,006	45°	1,417	2,953
1180508	1180515	HC40TSPXL 5 080 40	5	◈	0,315	0,315	1,575	0,006	45°	1,811	3,189
-	1180516	HC40TSPXL 5 100 50	5	◈	0,394	0,394	1,969	0,008	45°	2,323	3,937
-	1180517	HC40TSPXL 5 120 60	5	◈	0,472	0,472	2,362	0,008	45°	2,638	4,724
-	1180520	HC40TSPXL 5 200 100	5	◈	0,787	0,787	3,937	0,014	45°	4,094	6,378

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

End mill order code = (1) Geometry Code + (2) Grade Code

Note: For HB (Weldon) end mills, the reference ends with "-W "

Example: "HR38TSMS 5 080 16 R100-W"

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

ISO	Workpiece Material	fz (in/t)			Vc (SFM)		
		ae = 5,0%	ae = 15%	ae = 30%	ae = 5,0%	ae = 15%	ae = 30%
P	Unalloyed Steel	0.0004 x DC	0.0004 x DC	0.0003 x DC	590	557	557
	Low-Alloyed Steel	0.0003 x DC	0.0003 x DC	0.0003 x DC	524	524	492
	High-Alloyed Steel	0.0003 x DC	0.0003 x DC	0.0002 x DC	459	459	459
M	SS - Ferritic / Martensitic	0.0004 x DC	0.0003 x DC	0.0002 x DC	524	492	393
	SS – Austenitic	0.0004 x DC	0.0003 x DC	0.0002 x DC	492	459	360
	SS - Austenitic-ferritic (Duplex)	0.0003 x DC	0.0002 x DC	0.0002 x DC	426	393	328
K	Malleable Cast Iron	0.0004 x DC	0.0004 x DC	0.0003 x DC	688	688	656
	Grey Cast Iron	0.0004 x DC	0.0004 x DC	0.0003 x DC	688	656	656
	Nodular Cast Iron	0.0004 x DC	0.0003 x DC	0.0003 x DC	623	623	590
S	Heat Resistant Super Alloys	0.0002 x DC	0.0002 x DC	0.0001 x DC	262	196	131

Note[1]: Feed valid for when the end mill works with its whole ap, for when the end mill is working with lower depths of cut consider increasing the feed up to 25%.
Note[2]: Cutting speeds selected for an economic use of the tool, for higher productivity consider increasing up to 70%.

RAD INTEG Conical and Tangential Segment End mills

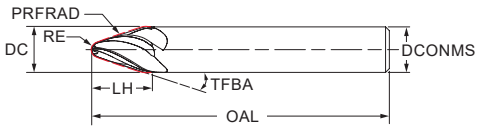
HXC30GL Conical



P M K S



All order codes are cylindrical shank.
Weldon shank available under request.



(1) Geometry code	(2) Grade code: Reference Referência Referencia	NOF	T1 PHP920	Y3 PHH920	Dimensions | Dimensões | Dimensiones (in) DC	DCONMS	TFBA	PRFRAD	RE	LH	OAL
1180046	HXC30GL 4 080 10 18RM030	4	◈	◈	0.315	0.315	0.709	11.811	0.039	0.394	2.953
1180047	HXC30GL 4 120 14 18RM045	4	◈	◈	0.472	0.472	0.709	17.717	0.079	0.551	3.268
1180048	HXC30GL 4 160 18 18RM120	4	◈	◈	0.630	0.630	0.709	47.244	0.118	0.709	3.740
1180049	HXC30GL 4 160 12 28RM080	4	◈	◈	0.630	0.630	1.102	31.496	0.118	0.472	3.740
1180050	HXC30GL 4 160 16 18RM120	4	◈	◈	0.630	0.630	0.709	47.244	0.157	0.630	4.331
1180051	HXC30GL 4 160 11 28RM080	4	◈	◈	0.630	0.630	1.102	31.496	0.157	0.433	4.331

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

End mill order code = (1) Geometry Code + (2) Grade Code

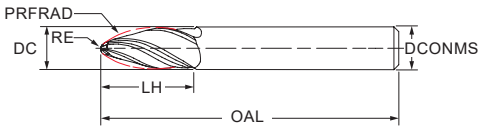
HXT30GL Tangential



P M K S



All order codes are cylindrical shank.
Weldon shank available under request.



(1) Geometry code	(2) Grade code: Reference Referência Referencia	NOF	T1 PHP920	Y3 PHH920	Dimensions | Dimensões | Dimensiones (in) DC	DCONMS	PRFRAD	RE	LH	OAL
1180045	HXT30GL 4 060 22 RM095	4	◈	◈	0.236	0.236	3.740	0.039	0.866	2.480
1180037	HXT30GL 4 080 24 RM095	4	◈	◈	0.315	0.315	3.740	0.039	0.945	2.756
1180038	HXT30GL 4 100 28 RM085	4	◈	◈	0.394	0.394	3.346	0.079	1.102	2.835
1180039	HXT30GL 4 120 28 RM090	4	◈	◈	0.472	0.472	3.543	0.079	1.102	3.268
1180691	HXT30GL 4 160 30 RM080	4	◈	◈	0.630	0.630	3.150	0.118	1.181	4.331

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

End mill order code = (1) Geometry Code + (2) Grade Code

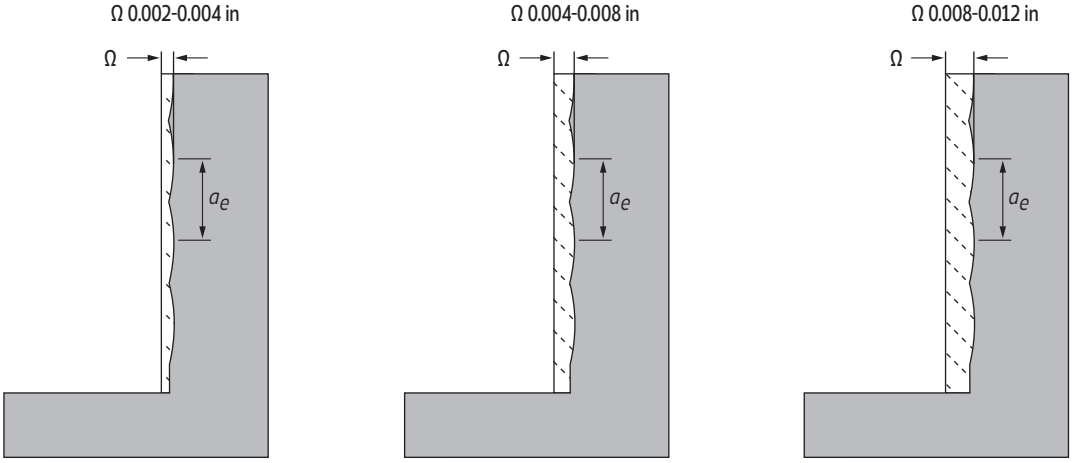
RAD INTEG Conical and Tangential Segment End mills

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

ISO	Material	Grades	
		PHP920	PHH920
P	Unalloyed Steel	✓	
	Low-Alloyed Steel	✓	
	High-Alloyed Steel	✓	
M	Stainless Steel (Ferritic / Martensitic)		✓
	Stainless Steel (Austenitic)		✓
	Stainless Steel (Austenitic/Ferritic/Duplex)		✓
K	Malleable Cast Iron	✓	
	Grey Cast Iron	✓	
	Nodular Cast Iron	✓	
S	Heat Resistant Super Alloys		✓

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

Ω - Allowance
a_e - Stepover



Fine Finishing | **Finishing** | **Semi-Finishing**

ISO	Workpiece Material	Vc (SFM)	fz (in/t)				
			HXC30GL - Conical		HXT30GL - Tangential		
			Ω 0.002-0.004 in	Ω 0.004-0.008 in	Ω 0.002-0.004 in	Ω 0.004-0.008 in	Ω 0.008-0.012 in
P	Unalloyed Steel	590	0.0003 x DC	0.0002 x DC	0.0003 x DC	0.0002 x DC	0.0002 x DC
	Low-Alloyed Steel	524	0.0002 x DC	0.0002 x DC	0.0002 x DC	0.0002 x DC	0.0002 x DC
	High-Alloyed Steel	492	0.0002 x DC	0.0002 x DC	0.0002 x DC	0.0002 x DC	0.0002 x DC
M	Stainless Steel (Ferritic / Martensitic)	393	0.0002 x DC	0.0002 x DC	0.0002 x DC	0.0002 x DC	0.0002 x DC
	Stainless Steel (Austenitic)	393	0.0002 x DC	0.0001 x DC	0.0002 x DC	0.0001 x DC	0.0001 x DC
	Stainless Steel (Austenitic/Ferritic/Duplex)	360	0.0001 x DC	0.0001 x DC	0.0001 x DC	0.0001 x DC	0.0001 x DC
K	Malleable Cast Iron	721	0.0003 x DC	0.0002 x DC	0.0003 x DC	0.0002 x DC	0.0002 x DC
	Grey Cast Iron	688	0.0003 x DC	0.0002 x DC	0.0003 x DC	0.0002 x DC	0.0002 x DC
	Nodular Cast Iron	623	0.0002 x DC	0.0002 x DC	0.0002 x DC	0.0002 x DC	0.0002 x DC
S	Heat Resistant Super Alloys	196	0.0001 x DC	0.0001 x DC	0.0001 x DC	0.0001 x DC	0.0001 x DC

SOLID CARBIDE END MILLS GRADES

Graus de fresas de metal duro integral | Calidades de fresas en carburo monobloque

COATINGS

PHP

- Perfect coating adhesion;
- Smoothest surface;
- Suitable for dry and wet machining;
- Color: Black;



The PHP is the recommended coating for general machining on steel and cast iron.
Because of its smoothness at medium temperatures, the chips are able to flow effortlessly, maintaining the flutes clean and a long tool life even in dry conditions.

PHH

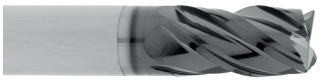
- Highest thermal stability;
- Smooth surface;
- High performance in dry machining;
- Color: Light brown;



The PHH is the recommended coating for Hardened steels, as well as stainless steels and HRSA.
Because of its high performance at high temperatures the coating successfully protect the cutting edges allowing the tool to work for long periods of time.

PHU

- High thermal shock resistance;
- Carefully engineered surface quality;
- Suitable for dry and wet machining;
- Color: Grey;



Combining both excellent thermal resistance and excellent surface quality, the PHU coating is recommended for stainless steels, while also being suitable for steels and cast iron.
Because of its surface quality and thermal resistance it is able to prevent built-up-edge in both low-alloy steels and stainless steels, making it a very versatile coating.

PHF

- High resistance wear and thermal stability;
- Superior surface quality;
- Suitable for dry and wet machining;
- Color: Red gold;



PHF boasts high resistance to wear, combining this with exceptional adhesion and very homogeneous wear behavior. Additionally, its dense layer structure and high silicon doping contribute to its superior thermal stability, facilitating heat dissipation in the chip and consequently increasing process stability.

PHT

- Optimum chip removal;
- Excellent protection against built-up edges;
- Top performance on aluminum applications;
- Color: Silver;



PHT is a unique nanocrystalline coating, exceptionally dense yet smooth, with maximum adhesion even on sharp cutting edges. It effectively prevents the formation of built-up edges and ensures excellent machining results in non-ferrous metals, even at high operating temperatures.

SOLID CARBIDE END MILLS GRADES

Graus de fresas de metal duro integral | Calidades de fresas en carburo monobloque

SUBSTRATE

PH0910

A micrograin substrate that combines wear resistance and toughness.
Higher rigidity contributes to a longer tool life.
Recommended for semi-finishing to roughing on stable to slightly unstable conditions.

PH0920

Universal substrate with great balance between toughness and wear resistance.
Outstanding heat dissipation properties.
Recommended for semi-finishing to roughing on most materials.

PH0603

Harder grade with extreme wear resistance.
Excellent thermal stability.
Recommended for finishing applications and hardened steels.

SOLID CARBIDE END MILLS TROUBLESHOOTING

Solução de problemas de fresas de metal duro integral | Solución de problemas de fresas en carburo monobloque

Trouble | Problema	Cause | Causa | Fuente	Possible Solution | Solução | Solución
Breaking of tool Quebra da ferramenta Ruptura de la herramienta	• At time of engaging with work material • No ínicio da maquinação • Al principio del mecanizado	• 1. Decrease feed rate. • 2. Decrease projection amount. • 3. Shorten cutting edge length to required minimum limit. • 1. Diminuir a taxa de avanço. • 2. Diminuir quantidade de projeção. • 3. Encurtar comprimento da aresta de corte para limite mínimo exigido. • 1. Diminuir a taxa de avanço. • 2. Disminuir la cantidad de proyección. • 3. Acortar la longitud de la arista de corte para el límite mínimo.
	• When ending cut • No final da maquinação • Al final del mecanizado	
	• During normal cutting • Durante o corte normal • Durante el corte normal	• 1. Decrease feed rate. • 2. Control wear - replace tool early. • 3. Replace chuck or collet. • 4. Decrease projection amount. • 5. Carry out honing. • 6. If 4 flute, reduce to 2 flute (clogging of chipping). • 7. If dry cutting change to wet cutting utilize cutting fluid. In case of wet cutting flow oil supplied from the front, change to from rear angle of side top. Use ample with rate. • 1. Diminuir a taxa de avanço. • 2. Controlar desgaste - substituir ferramenta atempadamente. • 3. Substitua mandril ou porta-pinça. • 4. Diminuir quantidade de projeção • 5. Criar boleamento • 6. Se tiver 4 navalhas, reduzir para 2 (obstrução da apara). • 7. Se utilizou corte seco alterar para corte com utilização de fluído. No caso de utilização de fluído frontal, alterar para utilização do fornecimento do fluído pela parte traseira. • 1. Diminuir a taxa de avanço. • 2. Controlar Desgaste - substituir herramienta atempadamente. • 3. Reemplace plato o el portaherramienta. • 4. Disminuir la cantidad de proyección. • 5. Crear redondeo. • 6. Si 4 hélices, reducir a 2 hélices (obstrucción de viruta). • 7. Si se utiliza corte en seco cambie para corte con uso del fluido. En caso de el uso de frente de fluido cambie para suministro de fluido desde la parte trasera.
	• When changing direction of feed • Ao mudar do direcção do avanço • Al cambiar la dirección de avance	• 1. Utilize circular interpolation (in case of NC machine) or temporarily stop feed (Dowelling). • 2. Reduce feed rate before and after change of directions. • 3. Replace chuck or collect. • 1. Utilização de interpolação helicoidal (no caso de máquina CNC). • 2. Reduzir avanço antes ou depois de mudar de direcção. • 3. Substitua mandril ou porta-pinças. • 1. Utilización de interpolación helicoidal (para máquina CNC). • 2. Reducir avance antes o después de cambiar de dirección. • 3. Reemplace plato o el portaherramienta.
Fracture of cutting edge Fratura da aresta de corte Fractura de la arista de corte	• Fracture of corners • Fratura dos cantos • Fratura dos cantos	• 1. Carry out chamfering or nose with hand lapper. • 2. Down cut - Up cut. • 1. Criar chanfro. • 2. Corte inferior - Corte Superior. • 1. Criar chanfro. • 2. Corte inferior - Corte Superior.
	• Fracture at boundary of depth of cut • Fratura no limite de profundidade de corte • Fractura en el límite de profundidad de corte	• 1. Down cut - Up cut. • 2. Reduce cutting speed. • 1. Corte inferior - Corte Superior. • 2. Reduzir velocidade de corte. • 1. Corte inferior - Corte Superior. • 2. Reducir la velocidad de corte.
	• Chipping at center part or overall • Esmilhar na parte central ou global • Astillado en parte central o general	• 1. Carry out honing or enlarge. • 2. Change number of rotation (in case machine vibrates). • 3. Increase cutting speed. • 4. In ease of squeaking noise during cutting, increase feed. • 5. It dry cutting use cutting fluid or blow air. • 6. Replace chuck or collet. • 7. Reduce cutting speed. • 1. Criar ou aumentar boleamento. • 2. Alterar rotação (no caso da maquina vibrar). • 3. Aumentar velocidade de corte. • 4. No caso de barulho de esmagamento durante o corte, aumentar avanço. • 5. Se estiver a maquinar a seco, utilizar fluído de corte ou ar comprimido. • 6. Substitua mandril ou porta-pinça. • 7. Reduzir velocidade de corte. • 1. Crear o aumentar redondeo. • 2. Cambie la rotación (en el caso de la máquina vibrar). • 3. Aumento de la velocidad de corte. • 4. En el caso de ruido de trituración durante el corte, aumentar avance. • 5. Si mecanizado en seco, utilizar un fluido de corte o aire comprimido. • 6. Reemplace plato o el portaherramienta. • 7. Reducir la velocidad de corte.
	• Large fracturing of cutting edge • Grande fratura da aresta de corte • Gran fractura de la arista de corte	• 1. Decrease feed rate. • 2. If 4 flute reduce to 2 flute. • 3. Carry out honing or enlarge. • 4. Replace chuck or collet. • 5. Reduce cutting speed. • 6. If dry cutting, change to wet cutting. In case oil supply in wet cutting is from the front, change to rear at an angle or from side top. Use ample supply. • 1. Diminuir a taxa de avanço. • 2. Se tiver 4 navalhas, reduzir para 2 (obstrução da apara). • 3. Criar ou aumentar boleamento. • 4. Substitua mandril ou porta-pinça. • 5. Reduzir velocidade de corte. • 6. Se utilizou corte seco alterar para corte com utilização de fluído. No caso de utilização de fluído frontal, alterar para utilização do fornecimento do fluído pela parte traseira. Use amplo fornecimento de fluído de corte. • 1. Disminuir la velocidad de avance. • 2. Si 4 hélices, reducir a 2 hélices (obstrucción de viruta) • 3. Crear o aumentar redondeo. • 4. Reemplace plato o el portaherramienta. • 5. Reducir la velocidad de corte. • 6. Si se utiliza corte en seco cambie para corte con uso del fluido. En caso de el uso de frente de fluido cambie para suministro de fluido desde la parte trasera. Utilice amplio suministro.

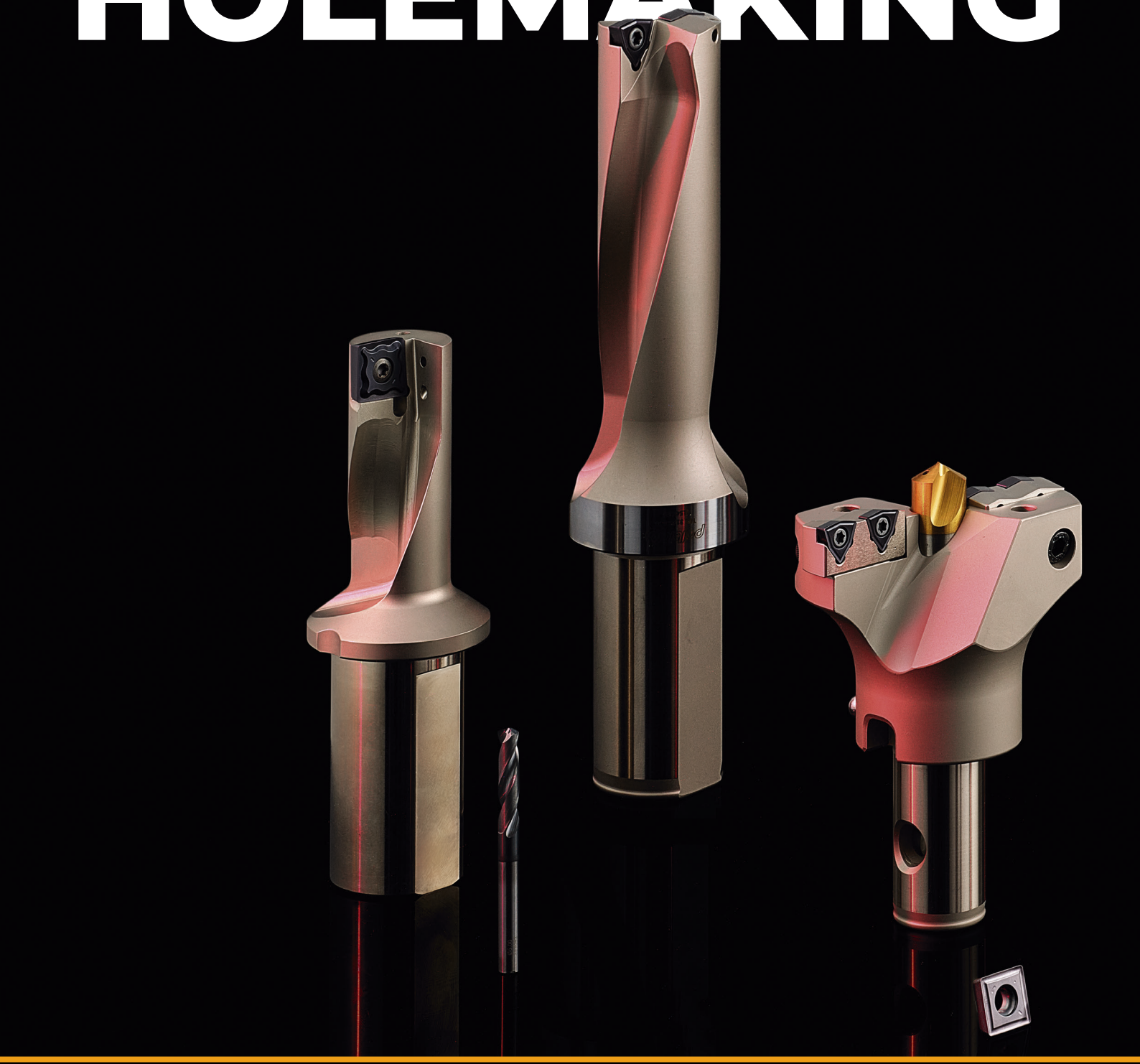
SOLID CARBIDE END MILLS TROUBLESHOOTING

Solução de problemas de fresas de metal duro integral | Solución de problemas de fresas en carburo monobloque

Trouble | Problema	Cause | Causa | Fuente	Possible Solution | Solução | Solución
Rapid tool wear Desgaste prematuro da ferramenta Desgaste prematuro de la herramienta		• 1. Reduce cutting speed. • 2. Up cut - Down cut • 3. Increase feed. • 4. Utilize wet cutting or air. • 5. If reground tool, improve surface roughness of flank. • 1. Reducir la velocidad de corte. • 2. Corte Superior - Corte Inferior. • 3. Aumentar avanço. • 4. Utilize fluído de corte ou ar comprimido. • 5. Se utilizar uma ferramenta afiada, melhora a rugosidade da superfície ou flanco. • 1. Reducir la velocidad de corte. • 2. Corte Superior - Corte Inferior. • 3. Aumento del avance. • 4. Utilice corte en mojado o el aire comprimido. • 5. Se utiliza una herramienta afilada, mejora la rugosidad de la superficie o arista.
Inferior finished surface Fraco acabamento da superfície Acabado superficial deficiente	• Surface is good but rough • Superfície boa mas irregular • Buena superficie, pero irregular	• 1. Decrease feed. • 2. In case using 2 flute, increse to 4 flute. • 1. Diminuir avanço. • 2. No caso de usar 2 hélices, aumentar para 4. • 1. Reducir avance. • 2. En caso de utilizar 2 filos de corte, aumentar para 4.
	• Small chip welding • Soldadura de pequenas aparas • Soldadura de pequeñas virutas	• 1. Increase cutting speed. • 2. Utilize wet cutting air blow (ample supply). • 3. Carry out fine honing. • 4. Up cut - Down cut. • 5. Increase feed or enlarge finish allowance. • 1. Aumente velocidade de corte. • 2. Utilize fluído de corte e ar comprimido. • 3. Aumentar boleamento. • 4. Corte Superior - Corte Inferior. • 5. Aumento o avanço ou alargue as tolerâncias no acabamento. • 1. Aumento de la velocidad de corte. • 2. Utilice fluidos de corte y aire comprimido. • 3. Aumentar redondeo. • 4. Corte Superior - Corte Inferior. • 5. Aumente el avance o ampliación de las tolerancias en el acabado.
	• With transverse streaks • Com as raias transversais • Con rayas transversales	• 1. Carry out fine honing. • 2. Use water insoluble cutting fluid. • 3. Down cut - Up cut. • 1. Aumentar boleamento. • 2. Utilize fluídos de corte. • 3. Corte Inferior - Corte Superior. • 1. Aumentar redondeo. • 2. Utilice fluidos de corte. • 3. Corte Inferior - Corte Superior.
	• Signs of excessive cutting • Sinais de corte excessivo • Señales de corte excesivo	• 1. Reduce finishing depth of cut. • 2. Increase cutting speed. • 3. Reduce feed. • 1. Reduzir profundidade de corte no acabamento. • 2. Aumente velocidade de corte. • 3. Diminuir avanço. • 1. Reducir la profundidad de corte en el acabado. • 2. Aumento de la velocidad de corte. • 3. Reducir avance.
Poor machining accuracy Fraca precisão na maquinação Pobre precisión en el mecanizado	• Finish dimensions are on minus side • Dimensões do acabamento estão inferiores ao previsto • Las dimensiones del acabado están terminando abajo de lo esperado	• 1. Up cut - Down cut. • 2. Reduce finishing depth of cut. • 3. Replace chuck or collet. • 4. Reduce projection amount. • 5. Increase cutting speed. • 1. Corte Superior - Corte Inferior. • 2. Reduzir profundidade de corte no acabamento. • 3. Substitua mandril ou porta-pinça. • 4. Diminuir quantidade de projeção. • 5. Aumentar velocidade de corte. • 1. Corte Superior - Corte Inferior. • 2. Reducir la profundidad de corte en el acabado. • 3. Reemplace plato o el portaherramienta. • 4. Disminuir la cantidad de proyección. • 5. Aumento de la velocidad de corte.
	• Poor perpendicularity • Fraca perpendicularidade • Fraca perpendicularidade	• 1. Reduce finishing depth of cut. • 2. Replace chuck or collet. • 3. Reduce projection amont. • 4. Increase cutting speed. • 5. 2 Flute - 4 Flute. • 6. Reduce feed. • 7. Check wear rate - Replace tool. • 1. Reduzir profundidade de corte no acabamento. • 2. Substitua mandril ou porta-pinça. • 3. Diminuir quantidade de projeção. • 4. Aumentar velocidade de corte. • 5. 2 hélices - 4 hélices. • 6. Diminuir avanço. • 7. Verifique o desgaste - Substitua a ferramenta. • 1. Reducir la profundidad de corte en el acabado. • 2. Reemplace plato o el portaherramienta. • 3. Disminuir la cantidad de proyección. • 4. Aumento de la velocidad de corte. • 5. 2 hélices - 4 hélices. • 6. Reducir avance. • 7. Revise el desgaste Reemplace la herramienta.
		• 1. Increase feed rate (in case over 0.05 mm/Zahn, try reducing). • 2. Change cutting speed. • 3. Replace chuck or collet. • 4. Reduce projection amount. • 5. Use 2 flute cutter for rough cutting and 4 flute for finishing. • 6. Down cut - Up cut. • 1. Aumente o avanço (no caso de mais de 0,05 mm / Zahn, tente reduzir). • 2. Alterar velocidade de corte. • 3. Substitua mandril ou porta-pinça. • 4. Diminuir quantidade de projeção. • 5. Usar 2 hélices para desbaste e 4 para acabamento. • 6. Corte Inferior - Corte Superior. • 1. Aumento del avance (en caso de más de 0,05 mm / Zahn, intente reducir). • 2. Cambie de la velocidad de corte. • 3. Reemplace plato o el portaherramienta. • 4. Disminuir la cantidad de proyección • 5. Utilice 2 filos de corte para desbaste y 4 para acabado. • 6. Corte Inferior - Corte Superior.

CUTTING TOOLS FOR

HOLEMAKING



B

B - HOLEMAKING

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B - 398 | Technical Data
B - 412 | Solid Carbide Drills



2D | 3D | 4D | 5D METRIC LINE

MAXPRO DRILL

Maximum performance to a great drilling experience

see the product line on page B-360

2D | 3D | 4D | 5D

MAXPRO DRILL

Maximum performance to a great drilling experience



METRIC LINE

Palbit's MaxPro Drill is a versatile, high-performance indexable drilling solution designed for a wide range of holemaking operations. Covering diameters from Ø0.551in to Ø2.362in and lengths from 2xDC to 5xDC, it ensures precise, efficient performance on various surfaces and materials. With specialized inserts, a modular design, and quick-change capabilities, the MaxPro Drill delivers excellent chip control, long tool life, and superior hole quality, whether machining steels, stainless steels, non-ferrous materiala, or heat resistant superalloys.

KEY BENEFITS

- Flexible drilling options with 2D, 3D, 4D and 5D lengths for the same diameter
- Improved cooling and chip evacuation with helical coolant holes
- Better chip control and reduced heat through optimized blade design
- Greater stability and accuracy using specialized insert grades
- Longer tool life from advanced anti-chipping and wear-resistant materials



PRODUCT RANGE

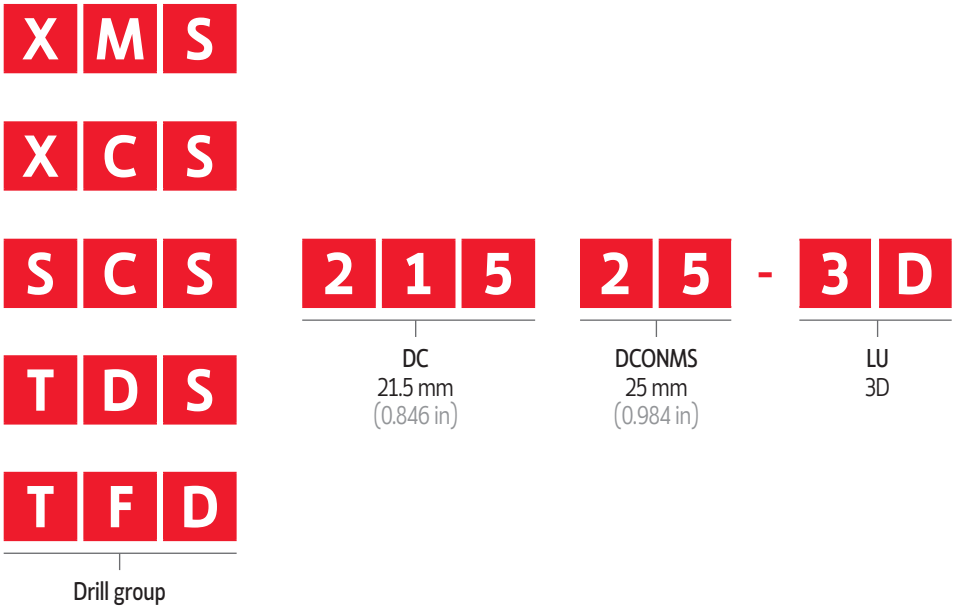
- DC 0.551in to Ø2.362in
- 2xDC, 3xDC, 4xDC, and 5xDC length
- 3 chipbreaker insert geometries

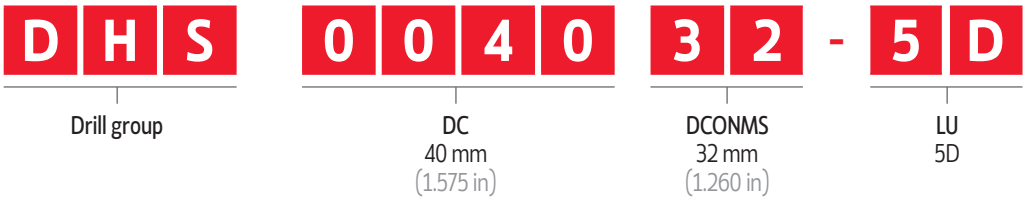
	-MP	-MS	-LN
SOK(H)X OUTER INSERT			
XOK(H)X INNER INSERT			

A perfect balance of adaptability, accuracy, and productivity for modern drilling demands.

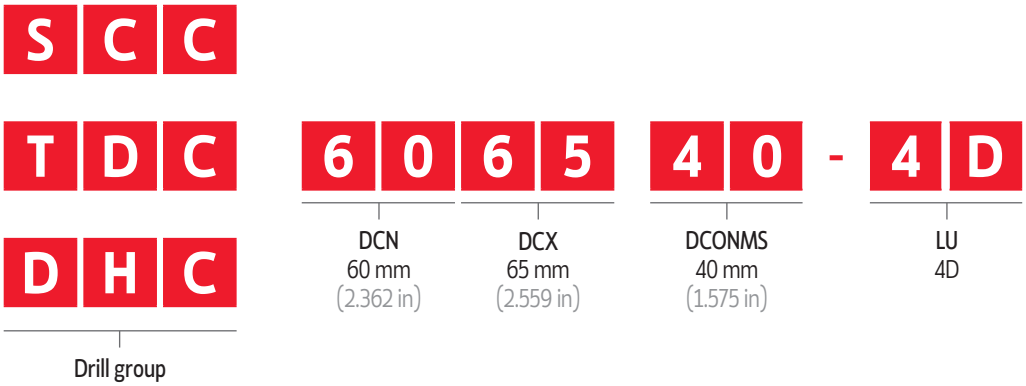
DRILLS CODE KEY Sistema de codificação para brocas | Sistema de codificación para brocas

DRILLS WITHOUT CARTRIDGE Brocas sem Cartucho | Brocas sin Cartucho



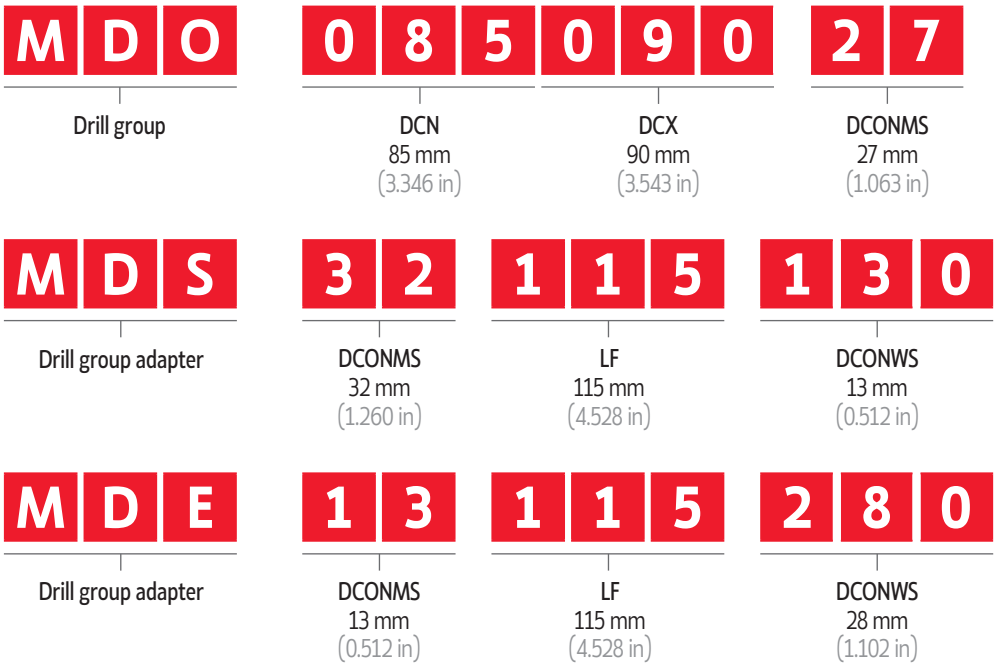


DRILLS WITH CARTRIDGE Brocas com Cartucho | Brocas con Cartucho

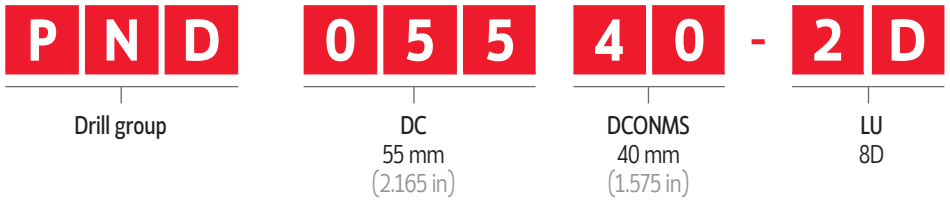


DRILLS CODE KEY
Sistema de codificação para brocas | Sistema de codificación para brocas

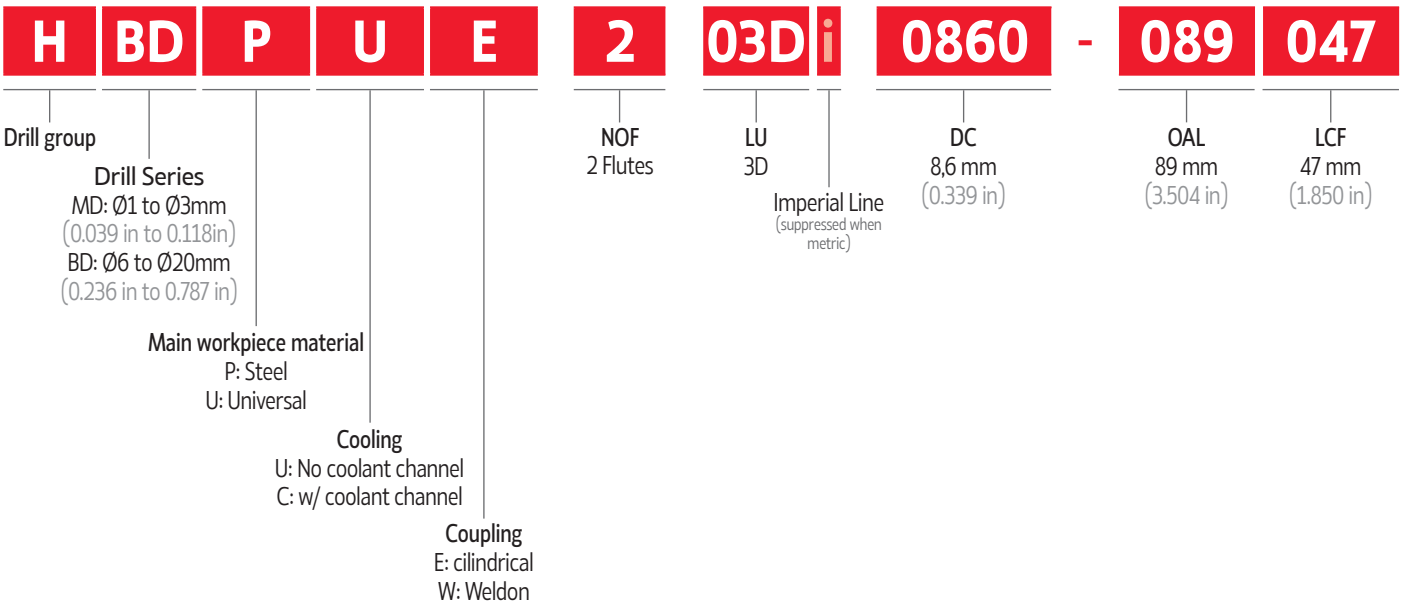
VORTEX DRILLS Brocas Vortex | Brocas Vortex



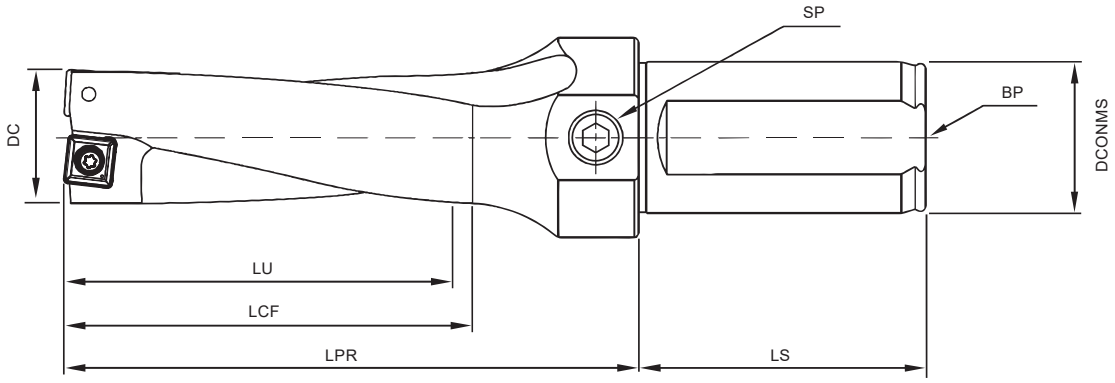
TREPANNING DRILLS Brocas de Trepanação | Brocas de Trepanación



SOLID CARBIDE DRILLS Brocas de Metal Duro | Brocas en Metal Duro



NOMENCLATURE Nomenclatura | Nomenclatura



DC - Drill diameter
LPR - Length
LU - Cut length
SP - Side plug

DCONMS - Shank diameter
LS - Shank Length
LCF - Safety cut length
BP - Back plug

COOLANT SUPPLY Furos de refrigeração | Agujeros de refrigeración

New version / Standard version*

Type	BP	SP
SCI	✓ / ✓	✗ / ✓
MDO	✓ / ✓	✓ / ✓

BP - Back Plug

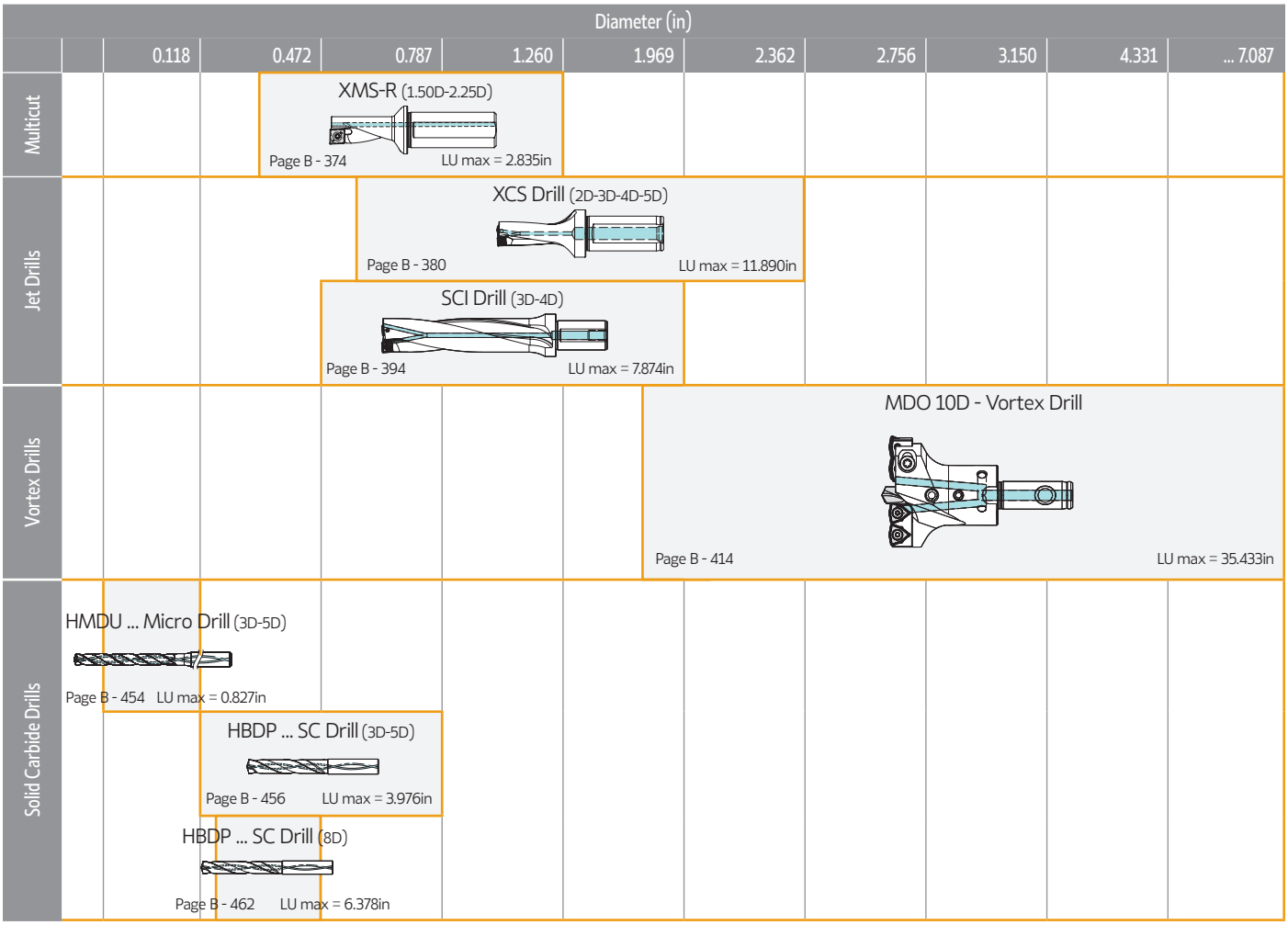
SP - Side Plug

✓ - Available

✗ - Not Available

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

OVERVIEW Vista genérica | Información general



ALL-IN-ONE

MULTICUT

METRIC LINE

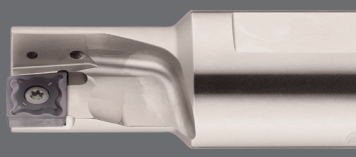


A multipurpose tool designed to enhance productivity and reduce setup times is capable of executing internal, external, and face turning, as well as drilling with either a stationary or rotating tool.

Uma ferramenta multifuncional projetada para aumentar a produtividade e reduzir os tempos de configuração. Capaz de executar torneamento interno, externo e facejamento, e até mesmo furação com uma ferramenta estacionária ou giratória.

Una herramienta multifuncional diseñada para aumentar la productividad y reducir los tiempos de configuración. Capaz de realizar torneado interno, externo y frontal, e incluso perforación con una herramienta estacionaria o giratoria.

XMS 1.50D > page 354



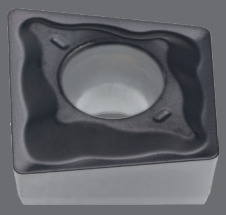
- From DC 0.315 in to 1.260 in
  De DC 0.315 in a 1.260 in | Desde DC 0.315 in hasta 1.260 in
- With length of 1,50xDC
  Com comprimento de 1.50xDC | Con longitud de 1.50xDC

XMS 2.25D > page 355



- From DC 0.315 in to 1.260 in
  De DC 0.315 in a 1.260 in | Desde DC 0.315 in hasta 1.260 in
- With length of 2,25xDC
  Com comprimento de 2,25xDC | Con longitud de 2,25xDC

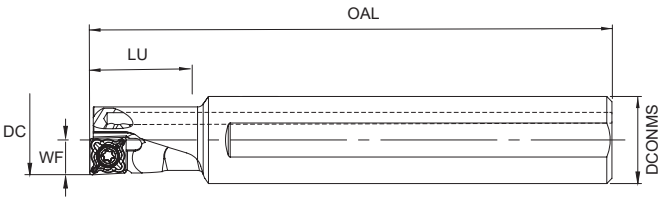
XCMT INSERTS > page 356



- From sizes 0.157 in to 0.669 in
  De tamanhos de 0.157 in a 0.669 in | De tamaños de 0.157 in a 0.669 in
- Available in grades PH7920 and PHS225
  Disponível nos graus PH7920 e PHS225 | Disponible en las calidades PH7920 y PHS225
- Suitable for machining steels, stainless steels and HRSA
  Adequado para maquinação de aços, aços inoxidáveis e HRSA | Adecuado para el mecanizado de aceros, aceros inoxidables y HRSA

XMS 1.50D





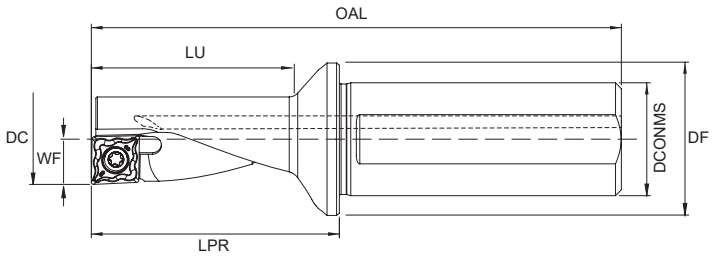
*Right hand style show

Order code Código	Reference Referência Referencia	Hand		Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Insert	Stock
				DC	DCONMS	WF	OAL	LU			
182024900	XMS-R 08010-1.50D	Right	1	0.315	0.394	0.157	3.150	0.472	0.117	XCMT 0401.. ER	◈
182025000	XMS-R 10012-1.50D	Right	1	0.394	0.472	0.197	3.543	0.591	0.137	XCMT 0502..	◈
182025100	XMS-R 12016-1.50D	Right	1	0.472	0.630	0.236	3.937	0.709	0.264	XCMT 0602..	◈
182025200	XMS-R 14016-1.50D	Right	1	0.551	0.630	0.276	4.331	0.827	0.295	XCMT 0703..	◈
182025300	XMS-R 16020-1.50D	Right	1	0.630	0.787	0.315	4.921	0.945	0.520	XCMT 0803..	◈
182025400	XMS-R 18025-1.50D	Right	1	0.709	0.984	0.354	5.315	1.063	0.882	XCMT 09T3..	◈
182025500	XMS-R 20025-1.50D	Right	1	0.787	0.984	0.394	5.906	1.181	0.994	XCMT 10T3..	◈
182025600	XMS-R 25032-1.50D	Right	1	0.984	1.260	0.492	7.087	1.476	1.940	XCMT 1304..	◈
182025700	XMS-R 32040-1.50D	Right	1	1.260	1.575	0.630	7.874	1.890	3.330	XCMT 1705..	◈

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

XMS 2.25D





*Right hand style show

Order code Código	Reference Referência Referencia	Hand		Dimensions | Dimensões | Dimensiones (mm)							WT (lbs)	Insert	Stock
				DC	DCONMS	DF	WF	OAL	LU	LPR			
182021200	XMS-R 08010-2.25D	Right	1	0.315	0.394	0.591	0.157	2.362	0.709	0.866	0,060	XCMT 0401.. ER	◈
182021300	XMS-R 10012-2.25D	Right	1	0.394	0.472	0.709	0.197	2.736	0.886	1.083	0,101	XCMT 0502..	◈
182021400	XMS-R 12016-2.25D	Right	1	0.472	0.630	0.866	0.236	3.071	1.063	1.299	0,196	XCMT 0602..	◈
182021500	XMS-R 14016-2.25D	Right	1	0.551	0.630	0.866	0.276	3.287	1.240	1.516	0,207	XCMT 0703..	◈
182021600	XMS-R 16020-2.25D	Right	1	0.630	0.787	1.102	0.315	3.701	1.417	1.732	0,339	XCMT 0803..	◈
182021700	XMS-R 18025-2.25D	Right	1	0.709	0.984	1.417	0.354	4.311	1.594	2.106	0,646	XCMT 09T3..	◈
182021800	XMS-R 20025-2.25D	Right	1	0.787	0.984	1.417	0.394	4.370	1.772	2.165	0,685	XCMT 10T3..	◈
182021900	XMS-R 25032-2.25D	Right	1	0.984	1.260	1.732	0.492	5.079	2.224	2.717	1,241	XCMT 1304..	◈
182022000	XMS-R 32040-2.25D	Right	1	1.260	1.575	2.126	0.630	6.220	2.835	3.465	2,462	XCMT 1705..	◈
182022100	XMS-L 08010-2.25D	Left	1	0.315	0.394	0.591	0.157	2.362	0.709	0.866	0,060	XCMT 0401.. EL	◈
182022200	XMS-L 10012-2.25D	Left	1	0.394	0.472	0.709	0.197	2.736	0.886	1.083	0,101	XCMT 0502..	◈
182022300	XMS-L 12016-2.25D	Left	1	0.472	0.630	0.866	0.236	3.071	1.063	1.299	0,196	XCMT 0602..	○
182022400	XMS-L 14016-2.25D	Left	1	0.551	0.630	0.866	0.276	3.287	1.240	1.516	0,207	XCMT 0703..	○
182022500	XMS-L 16020-2.25D	Left	1	0.630	0.787	1.102	0.315	3.701	1.417	1.732	0,339	XCMT 0803..	○
182022600	XMS-L 18025-2.25D	Left	1	0.709	0.984	1.417	0.354	4.311	1.594	2.106	0,646	XCMT 09T3..	○
182022700	XMS-L 20025-2.25D	Left	1	0.787	0.984	1.417	0.394	4.370	1.772	2.165	0,685	XCMT 10T3..	○
182022800	XMS-L 25032-2.25D	Left	1	0.984	1.260	1.732	0.492	5.079	2.224	2.717	1,241	XCMT 1304..	○
182022900	XMS-L 32040-2.25D	Left	1	1.260	1.575	2.126	0.630	6.220	2.835	3.465	2,462	XCMT 1705..	◈

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

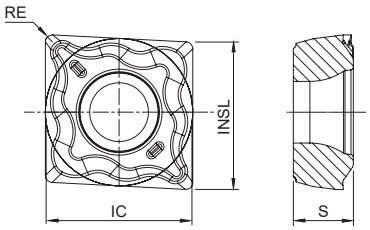
XCMT Inserts | Pastilhas | Plaquitas



XCMT-MP
(PH7 grade)



XCMT-MP
(PHS grade)



XCMT-MP

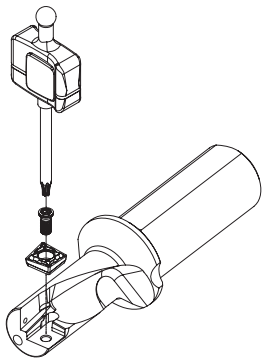
		P	M		S	Dimensions | Dimensões | Dimensiones (in)				Hand
		PVD	CVD	PVD	PVD					
	(2) Grade code	G4	U5	G4	G4					
(1) Geometry code	ISO Reference	PH7920	PHS225	PH7920	PH7920	IC	S	INSL	RE	
1124790	XCMT 040104-MP ER	●	●	●	●	0.173	0.074	0.157	0.016	Right
1124791	XCMT 040104-MP EL	●	●	●	●	0.173	0.074	0.157	0.016	Left
1124792	XCMT 050204-MP EN	●	●	●	●	0.222	0.084	0.197	0.016	Neutral
1123788	XCMT 060204-MP EN	●	●	●	●	0.252	0.097	0.236	0.016	Neutral
1124784	XCMT 070304-MP EN	●	●	●	●	0.295	0.128	0.276	0.016	Neutral
1124785	XCMT 080304-MP EN	●	●	●	●	0.331	0.128	0.315	0.016	Neutral
1124786	XCMT 09T304-MP EN	●	●	●	●	0.372	0.157	0.354	0.016	Neutral
1124787	XCMT 10T308-MP EN	●	●	●	●	0.409	0.157	0.394	0.031	Neutral
1124788	XCMT 130408-MP EN	●	●	●	●	0.526	0.191	0.492	0.031	Neutral
1124789	XCMT 170508-MP EN	●	●	●	●	0.681	0.220	0.630	0.031	Neutral

● 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 Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Order separately Key (Torx - Nm)	Torque Value
				lbf/in
XMS-R 08010-1.50D/2.25D	P0180400	XT06IP	DT0606IP	5.3
XMS-R 10012-1.50D/2.25D	P0200500	XT06	DT0606	5.3
XMS-R 12016-1.50D/2.25D	P0220500	XT07	DT0709	8.0
XMS-R 14016-1.50D/2.25D	P0250704	XT08	DT0812	10.6
XMS-R 16020-1.50D/2.25D	P0300701	XT08	DT0812	10.6
XMS-R 18025-1.50D/2.25D	P0300701	XT08	DT0812	10.6
XMS-R 20025-1.50D/2.25D	P0350800	PT15	DT1530	26.6
XMS-R 25032-1.50D/2.25D	P0500900	PT20	DT2050	35.4
XMS-R 32040-1.50D/2.25D	P0501302	PT20	DT2050	35.4



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance Toughness → PH7920	PHS225
P	1	Unalloyed Steel	125-170	✓	
	2	Low-Alloyed Steel	180-350	✓	
	3	High-Alloyed Steel	200-325	✓	
M	4	SS - Ferritic / Martensitic	200-330	✓	✓
	5	SS - Austenitic	180-330	✓	✓
	6	SS - Austenitic-ferritic (Duplex)	230-260	✓	✓
S	11	Heat Resistant Super Alloys	200-320	✓	

● Good Conditions
● Average Conditions
● Difficult Conditions

palbit

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

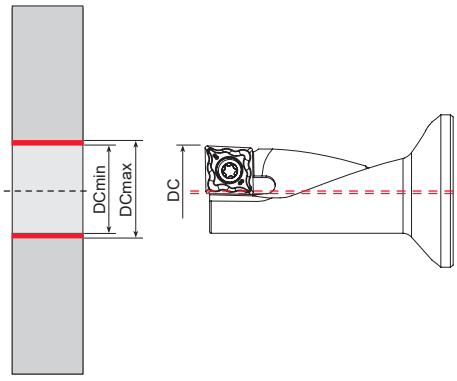
ISO	PSM	Material	HB (Brinell)	Vc (SFM) ← Wear Resistance Toughness →	
				PH7920	PHS225
P	1	Unalloyed Steel	125-170	361-722	-
	2	Low-Alloyed Steel	180-350	328-689	-
	3	High-Alloyed Steel	200-325	279-624	-
M	4	SS - Ferritic / Martensitic	200-330	312-689	230-755
	5	SS - Austenitic	180-330	279-673	214-738
	6	SS - Austenitic-ferritic (Duplex)	230-260	263-640	181-706
S	11	Heat Resistant Super Alloys	200-320	82-689	-

Reference	FN (in/rev)			AP (in)	
	Face Turning	Int/Ext Turning	Holemaking	Face Turning	Int/Ext Turning
XCMT 040104-MP ER/L	0.001-0.004	0.001-0.006	0.001-0.002	0.020-0.075	0.020-0.107
XCMT 050204-MP EN	0.001-0.005	0.001-0.006	0.001-0.002	0.020-0.087	0.020-0.126
XCMT 060204-MP EN	0.001-0.006	0.001-0.007	0.001-0.003	0.028-0.107	0.028-0.146
XCMT 070304-MP EN	0.001-0.007	0.001-0.008	0.001-0.004	0.032-0.119	0.032-0.158
XCMT 080304-MP EN	0.002-0.008	0.002-0.008	0.001-0.004	0.036-0.134	0.036-0.166
XCMT 09T304-MP EN	0.002-0.008	0.002-0.009	0.002-0.004	0.036-0.150	0.036-0.186
XCMT 10T308-MP EN	0.002-0.009	0.002-0.010	0.002-0.004	0.040-0.166	0.040-0.209
XCMT 130408-MP EN	0.002-0.010	0.002-0.011	0.002-0.005	0.040-0.197	0.040-0.256
XCMT 170508-MP EN	0.002-0.011	0.002-0.012	0.002-0.006	0.040-0.237	0.040-0.276

Note: For additional details on drilling operations check the page B-377.

Off-center drilling:

Thanks to MultiCut's unique geometry, it is possible to perform off-center drilling. Therefore, with slight deviations from the center of the workpiece, it is possible to make holes with diameters different from the nominal diameter, as shown in the table below.



Reference	Drilling (in)		
	DC nominal	DCmin	DCmax
XMS-R 08010-2.25D	0.315	0.309	0.327
XMS-R 10012-2.25D	0.394	0.388	0.413
XMS-R 12016-2.25D	0.472	0.467	0.492
XMS-R 14016-2.25D	0.551	0.543	0.571
XMS-R 16020-2.25D	0.630	0.622	0.650
XMS-R 18025-2.25D	0.709	0.701	0.728
XMS-R 20025-2.25D	0.787	0.778	0.807
XMS-R 25032-2.25D	0.984	0.974	1.016
XMS-R 32040-2.25D	1.260	1.250	1.299

JET DRILLS

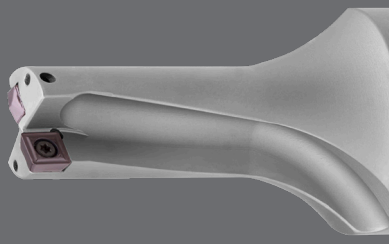


Jet drills offer an indexable solution for a wide range of diameters and lengths, with or without cartridges. The versatile XCS drill performs on any surface, featuring chip breakers for steel, cast iron, stainless steel, superalloys, and now non-ferrous materials like aluminium.

As brocas Jet oferecem uma solução indexável para uma ampla gama de diâmetros e comprimentos, com ou sem cartuchos. A versátil broca XCS atua em qualquer superfície, com quebra-aparas para aço, ferro fundido, aço inoxidável, superligas e agora também para materiais não ferrosos como o alumínio.

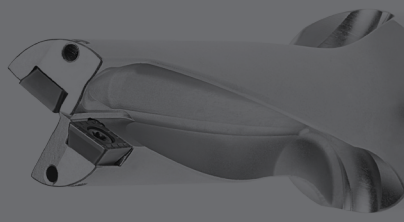
Las brocas Jet ofrecen una solución indexable para una amplia gama de diámetros y longitudes, con o sin cartuchos. La versátil broca XCS trabaja en cualquier superficie, con rompevirutas para acero, hierro fundido, acero inoxidable, superaleaciones y ahora también para materiales no ferrosos como el aluminio.

XCS DRILL METRIC LINE > page 360



- From DC 0.551 in to 2.362 in
  De DC 0.551 in a 2.362 in | Desde DC 0.551 in hasta 2.362 in
- Available in 2D, 3D, 4D and 5D
  Disponível em 2D, 3D, 4D e 5D | Disponible en 2D, 3D, 4D y 5D
- Inserts XOKX and SOKX
  Pastilhas XOKX e SOKX | Plaquitas XOKX y SOKX

SCI DRILL > page 374



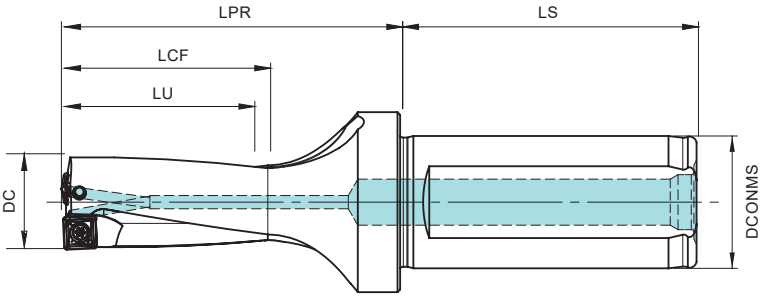
- From DC 0.531 in to 1.938 in
  De DC 0.531 in a 1.938 in | Desde DC 0.531 in hasta 1.938 in
- Available in 3D and 4D
  Disponível em 3D e 4D | Disponible en 3D y 4D
- Insert SPKX
  Pastilha SPKX | Plaquita SPKX

XCS 2D Jet drills | Brocas jet | Brocas jet

METRIC LINE







DCONMS	LS	BP
0.787	1.969	PT - 1/8
0.984	2.205	PT - 1/8
1.260	2.362	PT - 1/4
1.575	2.756	PT - 1/4

2D		
DC	Drill tolerance	Hole tolerance
0.551-1.161	0/-0.006	-0.004/+0.008
1.181-1.654	0/-0.006	-0.004/+0.010
1.693-2.362	0/-0.006	-0.004/+0.011

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inner Insert	Outer Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR					
184316800	XCS 14020-2D	0.551	0.787	1.102	1.220	2.008	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184316900	XCS 14520-2D	0.571	0.787	1.142	1.260	2.047	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184317000	XCS 15020-2D	0.591	0.787	1.181	1.299	2.087	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184317100	XCS 15520-2D	0.610	0.787	1.220	1.339	2.126	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184317200	XCS 16020-2D	0.630	0.787	1.260	1.378	2.165	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184317300	XCS 16525-2D	0.650	0.984	1.299	1.417	2.402	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184317400	XCS 17025-2D	0.669	0.984	1.339	1.457	2.441	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184317500	XCS 17525-2D	0.689	0.984	1.378	1.496	2.480	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184317600	XCS 18025-2D	0.709	0.984	1.417	1.535	2.520	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184317700	XCS 18525-2D	0.728	0.984	1.457	1.575	2.559	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184317800	XCS 19025-2D	0.748	0.984	1.496	1.614	2.598	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184317900	XCS 19525-2D	0.768	0.984	1.535	1.654	2.638	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184318000	XCS 20025-2D	0.787	0.984	1.575	1.693	2.677	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184318100	XCS 20525-2D	0.807	0.984	1.614	1.732	2.717	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184318200	XCS 21025-2D	0.827	0.984	1.654	1.772	2.756	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184318300	XCS 21525-2D	0.846	0.984	1.693	1.811	2.795	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184318400	XCS 22025-2D	0.866	0.984	1.732	1.850	2.835	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184318500	XCS 22525-2D	0.886	0.984	1.772	1.890	2.874	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184318600	XCS 23025-2D	0.906	0.984	1.811	1.929	2.913	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184318700	XCS 23525-2D	0.925	0.984	1.850	1.969	2.953	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●

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

Continue next page

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inner Insert	Outer Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR					
184318800	XCS 24032-2D	0.945	1.260	1.890	2.008	3.189	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184318900	XCS 24532-2D	0.965	1.260	1.929	2.047	3.228	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319000	XCS 25032-2D	0.984	1.260	1.969	2.087	3.268	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319100	XCS 25532-2D	1.004	1.260	2.008	2.126	3.307	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319200	XCS 26032-2D	1.024	1.260	2.047	2.165	3.346	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319300	XCS 26532-2D	1.043	1.260	2.087	2.205	3.386	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319400	XCS 27032-2D	1.063	1.260	2.126	2.244	3.425	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319500	XCS 27532-2D	1.083	1.260	2.165	2.283	3.465	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319600	XCS 28032-2D	1.102	1.260	2.205	2.323	3.504	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319700	XCS 28532-2D	1.122	1.260	2.244	2.362	3.543	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319800	XCS 29032-2D	1.142	1.260	2.283	2.402	3.583	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184319900	XCS 29532-2D	1.161	1.260	2.323	2.441	3.622	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184320000	XCS 30032-2D	1.181	1.260	2.362	2.559	3.740	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184320100	XCS 31032-2D	1.220	1.260	2.441	2.638	3.819	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184320200	XCS 32032-2D	1.260	1.260	2.520	2.717	3.898	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184320300	XCS 33032-2D	1.299	1.260	2.598	2.795	3.976	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184320400	XCS 34032-2D	1.339	1.260	2.677	2.874	4.055	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184320500	XCS 35032-2D	1.378	1.260	2.756	2.953	4.134	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184320600	XCS 36040-2D	1.417	1.575	2.835	3.031	4.409	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184320700	XCS 37040-2D	1.457	1.575	2.913	3.110	4.488	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184320800	XCS 38040-2D	1.496	1.575	2.992	3.189	4.567	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184320900	XCS 39040-2D	1.535	1.575	3.071	3.268	4.646	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184321000	XCS 40040-2D	1.575	1.575	3.150	3.346	4.724	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184321100	XCS 41040-2D	1.614	1.575	3.228	3.425	4.803	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184321200	XCS 42040-2D	1.654	1.575	3.307	3.504	4.882	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184321300	XCS 43040-2D	1.693	1.575	3.386	3.583	4.961	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184321400	XCS 44040-2D	1.732	1.575	3.465	3.661	5.039	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184321500	XCS 45040-2D	1.772	1.575	3.543	3.740	5.118	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184321600	XCS 46040-2D	1.811	1.575	3.622	3.819	5.197	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184321700	XCS 47040-2D	1.850	1.575	3.701	3.898	5.276	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184321800	XCS 48040-2D	1.890	1.575	3.780	3.976	5.354	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184321900	XCS 49040-2D	1.929	1.575	3.858	4.055	5.433	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184322000	XCS 50040-2D	1.969	1.575	3.937	4.134	5.512	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184340200	XCS 51040-2D	2.008	1.575	4.016	4.213	5.591	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184340300	XCS 52040-2D	2.047	1.575	4.094	4.291	5.669	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184340400	XCS 53040-2D	2.087	1.575	4.173	4.370	5.748	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184340500	XCS 54040-2D	2.126	1.575	4.252	4.449	5.827	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184340600	XCS 55040-2D	2.165	1.575	4.331	4.528	5.906	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184340700	XCS 56040-2D	2.205	1.575	4.409	4.606	5.984	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184340800	XCS 57040-2D	2.244	1.575	4.488	4.685	6.063	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184340900	XCS 58040-2D	2.283	1.575	4.567	4.764	6.142	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341000	XCS 59040-2D	2.323	1.575	4.646	4.843	6.220	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341100	XCS 60040-2D	2.362	1.575	4.724	4.921	6.299	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●

● Stock item | Produto de stock | Itens de stock

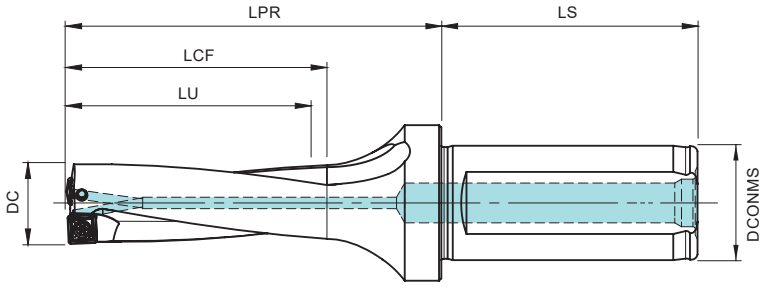
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

XCS 3D Jet drills | Brocas jet | Brocas jet

METRIC LINE







DCONMS	LS	BP
0.787	1.969	PT - 1/8
0.984	2.205	PT - 1/8
1.260	2.362	PT - 1/4
1.575	2.756	PT - 1/4

2D		
DC	Drill tolerance	Hole tolerance
0.551-1.161	0/-0.006	-0.004/+0.008
1.181-1.654	0/-0.006	-0.004/+0.010
1.693-2.362	0/-0.006	-0.004/+0.011

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inner Insert	Outer Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR					
184322100	XCS 14020-3D	0.551	0.787	1.654	1.772	2.559	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184322200	XCS 14520-3D	0.571	0.787	1.732	1.850	2.638	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184322300	XCS 15020-3D	0.591	0.787	1.772	1.890	2.677	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184322400	XCS 15520-3D	0.610	0.787	1.850	1.969	2.756	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184322500	XCS 16020-3D	0.630	0.787	1.890	2.008	2.795	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184322600	XCS 16525-3D	0.650	0.984	1.969	2.087	3.071	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184322700	XCS 17025-3D	0.669	0.984	2.008	2.126	3.110	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184322800	XCS 17525-3D	0.689	0.984	2.087	2.205	3.189	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184322900	XCS 18025-3D	0.709	0.984	2.126	2.244	3.228	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184323000	XCS 18525-3D	0.728	0.984	2.205	2.323	3.307	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184323100	XCS 19025-3D	0.748	0.984	2.244	2.362	3.346	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184323200	XCS 19525-3D	0.768	0.984	2.323	2.441	3.425	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184323300	XCS 20025-3D	0.787	0.984	2.362	2.480	3.465	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184323400	XCS 20525-3D	0.807	0.984	2.441	2.559	3.543	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184323500	XCS 21025-3D	0.827	0.984	2.480	2.598	3.583	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184323600	XCS 21525-3D	0.846	0.984	2.559	2.677	3.661	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184323700	XCS 22025-3D	0.866	0.984	2.598	2.717	3.701	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184323800	XCS 22525-3D	0.886	0.984	2.677	2.795	3.780	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184323900	XCS 23025-3D	0.906	0.984	2.717	2.835	3.819	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184324000	XCS 23525-3D	0.925	0.984	2.795	2.913	3.898	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●

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

Continue next page

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inner Insert	Outer Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR					
184324100	XCS 24032-3D	0.945	1.260	2.835	2.953	4.134	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184324200	XCS 24532-3D	0.965	1.260	2.913	3.031	4.213	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184324300	XCS 25032-3D	0.984	1.260	2.953	3.071	4.252	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184324400	XCS 25532-3D	1.004	1.260	3.031	3.150	4.331	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184324500	XCS 26032-3D	1.024	1.260	3.071	3.189	4.370	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184324600	XCS 26532-3D	1.043	1.260	3.150	3.268	4.449	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184324700	XCS 27032-3D	1.063	1.260	3.189	3.307	4.488	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184324800	XCS 27532-3D	1.083	1.260	3.268	3.386	4.567	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184324900	XCS 28032-3D	1.102	1.260	3.307	3.425	4.606	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184325000	XCS 28532-3D	1.122	1.260	3.386	3.504	4.685	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184325100	XCS 29032-3D	1.142	1.260	3.425	3.543	4.724	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184325200	XCS 29532-3D	1.161	1.260	3.504	3.622	4.803	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184325300	XCS 30032-3D	1.181	1.260	3.622	3.740	4.921	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184325400	XCS 31032-3D	1.220	1.260	3.740	3.858	5.039	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184325500	XCS 32032-3D	1.260	1.260	3.858	3.976	5.157	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184325600	XCS 33032-3D	1.299	1.260	3.976	4.094	5.276	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184325700	XCS 34032-3D	1.339	1.260	4.094	4.213	5.394	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184325800	XCS 35032-3D	1.378	1.260	4.213	4.331	5.512	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184325900	XCS 36040-3D	1.417	1.575	4.331	4.449	5.827	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184326000	XCS 37040-3D	1.457	1.575	4.449	4.567	5.945	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184326100	XCS 38040-3D	1.496	1.575	4.567	4.685	6.063	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184326200	XCS 39040-3D	1.535	1.575	4.685	4.803	6.181	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184326300	XCS 40040-3D	1.575	1.575	4.803	4.921	6.299	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184326400	XCS 41040-3D	1.614	1.575	4.921	5.039	6.417	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184326500	XCS 42040-3D	1.654	1.575	5.039	5.157	6.535	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184326600	XCS 43040-3D	1.693	1.575	5.157	5.276	6.654	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184326700	XCS 44040-3D	1.732	1.575	5.276	5.394	6.772	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184310700	XCS 45040-3D	1.772	1.575	5.394	5.512	6.890	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184310800	XCS 46040-3D	1.811	1.575	5.512	5.630	7.008	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184326800	XCS 47040-3D	1.850	1.575	5.630	5.748	7.126	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184326900	XCS 48040-3D	1.890	1.575	5.748	5.866	7.244	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184327000	XCS 49040-3D	1.929	1.575	5.866	5.984	7.362	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184327100	XCS 50040-3D	1.969	1.575	5.984	6.102	7.480	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184341200	XCS 51040-3D	2.008	1.575	6.102	6.220	7.598	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341300	XCS 52040-3D	2.047	1.575	6.220	6.339	7.717	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341400	XCS 53040-3D	2.087	1.575	6.339	6.457	7.835	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341500	XCS 54040-3D	2.126	1.575	6.457	6.575	7.953	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341600	XCS 55040-3D	2.165	1.575	6.575	6.693	8.071	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341700	XCS 56040-3D	2.205	1.575	6.693	6.811	8.189	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341800	XCS 57040-3D	2.244	1.575	6.811	6.929	8.307	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184341900	XCS 58040-3D	2.283	1.575	6.929	7.047	8.425	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342000	XCS 59040-3D	2.323	1.575	7.047	7.165	8.543	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342100	XCS 60040-3D	2.362	1.575	7.165	7.283	8.661	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●

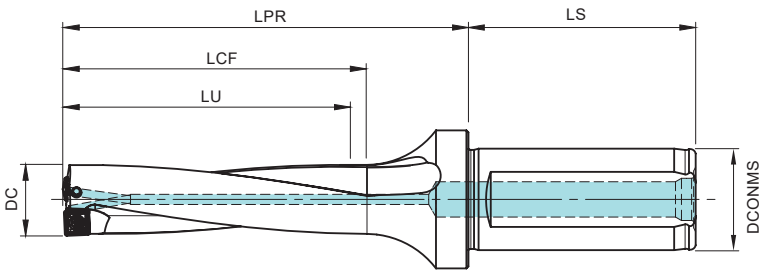
● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

XCS 4D Jet drills | Brocas jet | Brocas jet

METRIC LINE







DCONMS	LS	BP
0.787	1.969	PT - 1/8
0.984	2.205	PT - 1/8
1.260	2.362	PT - 1/4
1.575	2.756	PT - 1/4

4D		
DC	Drill tolerance	Hole tolerance
0.551-1.161	0/-0.006	-0.002/+0.010
1.181-1.654	0/-0.006	-0.002/+0.012
1.693-2.362	0/-0.006	-0. 002/+0.013

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inner Insert	Outer Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR					
184327200	XCS 14020-4D	0.551	0.787	2.205	2.323	3.110	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184327300	XCS 14520-4D	0.571	0.787	2.283	2.402	3.189	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184327400	XCS 15020-4D	0.591	0.787	2.362	2.480	3.268	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184327500	XCS 15520-4D	0.610	0.787	2.441	2.559	3.346	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184327600	XCS 16020-4D	0.630	0.787	2.520	2.638	3.425	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184327700	XCS 16525-4D	0.650	0.984	2.598	2.717	3.701	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184327800	XCS 17025-4D	0.669	0.984	2.677	2.795	3.780	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184327900	XCS 17525-4D	0.689	0.984	2.756	2.874	3.858	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184328000	XCS 18025-4D	0.709	0.984	2.835	2.953	3.937	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184328100	XCS 18525-4D	0.728	0.984	2.913	3.031	4.016	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184328200	XCS 19025-4D	0.748	0.984	2.992	3.110	4.094	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184328300	XCS 19525-4D	0.768	0.984	3.071	3.189	4.173	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184328400	XCS 20025-4D	0.787	0.984	3.150	3.268	4.252	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184328500	XCS 20525-4D	0.807	0.984	3.228	3.346	4.331	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184328600	XCS 21025-4D	0.827	0.984	3.307	3.425	4.409	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184328700	XCS 21525-4D	0.846	0.984	3.386	3.504	4.488	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184328800	XCS 22025-4D	0.866	0.984	3.465	3.583	4.567	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184328900	XCS 22525-4D	0.886	0.984	3.543	3.661	4.646	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184329000	XCS 23025-4D	0.906	0.984	3.622	3.740	4.724	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184329100	XCS 23525-4D	0.925	0.984	3.701	3.819	4.803	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●

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

Continue next page

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inner Insert	Outer Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR					
184329200	XCS 24032-4D	0.945	1.260	3.780	3.898	5.079	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184329300	XCS 24532-4D	0.965	1.260	3.858	3.976	5.157	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184329400	XCS 25032-4D	0.984	1.260	3.937	4.055	5.236	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184329500	XCS 25532-4D	1.004	1.260	4.016	4.134	5.315	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184329600	XCS 26032-4D	1.024	1.260	4.094	4.213	5.394	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184329700	XCS 26532-4D	1.043	1.260	4.173	4.291	5.472	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184329800	XCS 27032-4D	1.063	1.260	4.252	4.370	5.551	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184329900	XCS 27532-4D	1.083	1.260	4.331	4.449	5.630	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184330000	XCS 28032-4D	1.102	1.260	4.409	4.528	5.709	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184330100	XCS 28532-4D	1.122	1.260	4.488	4.606	5.787	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184330200	XCS 29032-4D	1.142	1.260	4.567	4.685	5.866	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184330300	XCS 29532-4D	1.161	1.260	4.646	4.764	5.945	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184330400	XCS 30032-4D	1.181	1.260	4.724	4.921	6.102	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184330500	XCS 31032-4D	1.220	1.260	4.882	5.079	6.260	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184330600	XCS 32032-4D	1.260	1.260	5.039	5.236	6.417	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184330700	XCS 33032-4D	1.299	1.260	5.197	5.394	6.575	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184330800	XCS 34032-4D	1.339	1.260	5.354	5.551	6.732	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184330900	XCS 35032-4D	1.378	1.260	5.512	5.709	6.890	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184331000	XCS 36040-4D	1.417	1.575	5.669	5.866	7.244	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184331100	XCS 37040-4D	1.457	1.575	5.827	6.024	7.402	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184331200	XCS 38040-4D	1.496	1.575	5.984	6.181	7.559	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184331300	XCS 39040-4D	1.535	1.575	6.142	6.339	7.717	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184331400	XCS 40040-4D	1.575	1.575	6.299	6.496	7.874	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184331500	XCS 41040-4D	1.614	1.575	6.457	6.654	8.031	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184331600	XCS 42040-4D	1.654	1.575	6.614	6.811	8.189	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184331700	XCS 43040-4D	1.693	1.575	6.772	6.969	8.346	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184331800	XCS 44040-4D	1.732	1.575	6.929	7.126	8.504	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184331900	XCS 45040-4D	1.772	1.575	7.087	7.283	8.661	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184332000	XCS 46040-4D	1.811	1.575	7.244	7.441	8.819	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184332100	XCS 47040-4D	1.850	1.575	7.402	7.598	8.976	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184332200	XCS 48040-4D	1.890	1.575	7.559	7.756	9.134	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184332300	XCS 49040-4D	1.929	1.575	7.717	7.913	9.291	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184332400	XCS 50040-4D	1.969	1.575	7.874	8.071	9.449	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184342200	XCS 51040-4D	2.008	1.575	8.031	8.228	9.606	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342300	XCS 52040-4D	2.047	1.575	8.189	8.386	9.764	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342400	XCS 53040-4D	2.087	1.575	8.346	8.543	9.921	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342500	XCS 54040-4D	2.126	1.575	8.504	8.701	10.079	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342600	XCS 55040-4D	2.165	1.575	8.661	8.858	10.236	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342700	XCS 56040-4D	2.205	1.575	8.819	9.016	10.394	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342800	XCS 57040-4D	2.244	1.575	8.976	9.173	10.394	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184342900	XCS 58040-4D	2.283	1.575	9.134	9.331	10.709	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343000	XCS 59040-4D	2.323	1.575	9.291	9.488	10.866	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343100	XCS 60040-4D	2.362	1.575	9.449	9.646	11.024	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●

● Stock item | Produto de stock | Itens de stock

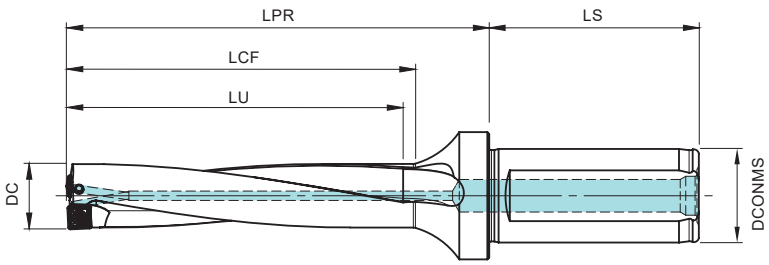
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

XCS 5D Jet drills | Brocas jet | Brocas jet

METRIC LINE







DCONMS	LS	BP
0.787	1.969	PT - 1/8
0.984	2.205	PT - 1/8
1.260	2.362	PT - 1/4
1.575	2.756	PT - 1/4

5D		
DC	Drill tolerance	Hole tolerance
0.551-1.161	0/-0.006	-0.002/+0.010
1.181-1.654	0/-0.006	-0.002/+0.012
1.693-2.362	0/-0.006	-0.002/+0.013

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inner Insert	Outer Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR					
184332500	XCS 14020-5D	0.551	0.787	2.756	2.874	3.465	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184332600	XCS 14520-5D	0.571	0.787	2.874	2.992	3.583	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184332700	XCS 15020-5D	0.591	0.787	2.953	3.071	3.661	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184332800	XCS 15520-5D	0.610	0.787	3.071	3.189	3.780	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184332900	XCS 16020-5D	0.630	0.787	3.150	3.268	3.858	XOKX 050204	SOKX 050204	P02004IP	XT06IP	●
184333000	XCS 16525-5D	0.650	0.984	3.268	3.386	4.173	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184333100	XCS 17025-5D	0.669	0.984	3.346	3.465	4.252	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184333200	XCS 17525-5D	0.689	0.984	3.465	3.583	4.370	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184333300	XCS 18025-5D	0.709	0.984	3.543	3.661	4.449	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184333400	XCS 18525-5D	0.728	0.984	3.661	3.780	4.567	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184333500	XCS 19025-5D	0.748	0.984	3.740	3.858	4.646	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184333600	XCS 19525-5D	0.768	0.984	3.858	3.976	4.764	XOKX 060204	SOKX 060205	P02205IP	XT06IP	●
184333700	XCS 20025-5D	0.787	0.984	3.937	4.055	4.843	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184333800	XCS 20525-5D	0.807	0.984	4.055	4.173	4.961	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184333900	XCS 21025-5D	0.827	0.984	4.134	4.252	5.039	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184334000	XCS 21525-5D	0.846	0.984	4.252	4.370	5.157	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184334100	XCS 22025-5D	0.866	0.984	4.331	4.449	5.236	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184334200	XCS 22525-5D	0.886	0.984	4.449	4.567	5.354	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184334300	XCS 23025-5D	0.906	0.984	4.528	4.646	5.433	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●
184334400	XCS 23525-5D	0.925	0.984	4.646	4.764	5.551	XOKX 07T205	SOKX 07T208	P02507IP	XT08IP	●

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

Continue next page

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inner Insert	Outer Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR					
184334500	XCS 24032-5D	0.945	1.260	4.724	4.843	5.827	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184334600	XCS 24532-5D	0.965	1.260	4.843	4.961	5.945	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184334700	XCS 25032-5D	0.984	1.260	4.921	5.039	6.024	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184334800	XCS 25532-5D	1.004	1.260	5.039	5.157	6.142	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184334900	XCS 26032-5D	1.024	1.260	5.118	5.236	6.220	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184335000	XCS 26532-5D	1.043	1.260	5.236	5.354	6.339	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184335100	XCS 27032-5D	1.063	1.260	5.315	5.433	6.417	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184335200	XCS 27532-5D	1.083	1.260	5.433	5.551	6.929	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184335300	XCS 28032-5D	1.102	1.260	5.512	5.630	6.614	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184335400	XCS 28532-5D	1.122	1.260	5.630	5.748	6.732	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184335500	XCS 29032-5D	1.142	1.260	5.709	5.827	6.811	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184335600	XCS 29532-5D	1.161	1.260	5.827	5.945	6.929	XOKX 090305	SOKX 090308	P03007IP	XT08IP	●
184335700	XCS 30032-5D	1.181	1.260	5.906	6.102	7.087	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184335800	XCS 31032-5D	1.220	1.260	6.102	6.299	7.283	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184335900	XCS 32032-5D	1.260	1.260	6.299	6.496	7.480	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184336000	XCS 33032-5D	1.299	1.260	6.496	6.693	7.677	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184336100	XCS 34032-5D	1.339	1.260	6.693	6.890	7.874	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184336200	XCS 35032-5D	1.378	1.260	6.890	7.087	8.071	XOKX 11T306	SOKX 11T308	P03508IP	XT15IP-S35	●
184336300	XCS 36040-5D	1.417	1.575	7.087	7.283	8.465	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184336400	XCS 37040-5D	1.457	1.575	7.283	7.480	8.661	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184336500	XCS 38040-5D	1.496	1.575	7.480	7.677	8.858	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184336600	XCS 39040-5D	1.535	1.575	7.677	7.874	9.055	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184336700	XCS 40040-5D	1.575	1.575	7.874	8.071	9.252	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184336800	XCS 41040-5D	1.614	1.575	8.071	8.268	9.449	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184336900	XCS 42040-5D	1.654	1.575	8.268	8.465	9.646	XOKX 130406	SOKX 130410	P04010IP	XT15IP-S35	●
184337000	XCS 43040-5D	1.693	1.575	8.465	8.661	9.843	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184337100	XCS 44040-5D	1.732	1.575	8.661	8.858	10.039	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184337200	XCS 45040-5D	1.772	1.575	8.858	9.055	10.236	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184337300	XCS 46040-5D	1.811	1.575	9.055	9.252	10.433	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184337400	XCS 47040-5D	1.850	1.575	9.252	9.449	10.630	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184337500	XCS 48040-5D	1.890	1.575	9.449	9.646	10.827	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184337600	XCS 49040-5D	1.929	1.575	9.646	9.843	11.024	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184337700	XCS 50040-5D	1.969	1.575	9.843	10.039	11.220	XOKX 150508	SOKX 150510	P05013IP	XT20IP-S40	●
184343200	XCS 51040-5D	2.008	1.575	10.039	10.236	11.417	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343300	XCS 52040-5D	2.047	1.575	10.236	10.433	11.614	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343400	XCS 53040-5D	2.087	1.575	10.433	10.630	11.811	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343500	XCS 54040-5D	2.126	1.575	10.630	10.827	12.008	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343600	XCS 55040-5D	2.165	1.575	10.827	11.024	12.205	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343700	XCS 56040-5D	2.205	1.575	11.024	11.220	12.402	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343800	XCS 57040-5D	2.244	1.575	11.220	11.417	12.598	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184343900	XCS 58040-5D	2.283	1.575	11.417	11.614	12.795	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184344000	XCS 59040-5D	2.323	1.575	11.614	11.811	12.992	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●
184344100	XCS 60040-5D	2.362	1.575	11.811	12.008	13.189	XOKX 180508	SOKX 180510	P05013IP	XT20IP-S40	●

● Stock item | Produto de stock | Itens de stock

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

SOK(H)X OUTER INSERT



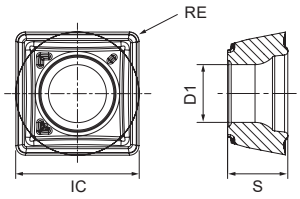
SOKX-MP



SOKX-MS



SOHX-LN



SOK(H)X-MP | MS | LN

		P		M	K		N		S	Dimensions | Dimensões | Dimensiones (in)			
		PVD	CVD	PVD	PVD	CVD	UNC	PVD	PVD				
	(2) Grade code	T1	2C	Y3	T1	2C	12	W1	Y3				
(1) Geometry code	ISO Reference	PHP920	PHS130	PHH920	PHP920	PHS130	PH0920	PHT920	PHH920	IC	S	D1	RE
1142113	SOKX 050204-MP	●	●		●	●				0.201	0.098	0.094	0.016
1142115	SOKX 060205-MP	●	●		●	●				0.244	0.102	0.102	0.020
1142117	SOKX 07T208-MP	●	●		●	●				0.295	0.114	0.114	0.031
1142119	SOKX 090308-MP	●	●		●	●				0.362	0.138	0.138	0.031
1142121	SOKX 11T308-MP	●	●		●	●				0.433	0.165	0.161	0.031
1142123	SOKX 130410-MP	●	●		●	●				0.512	0.186	0.181	0.039
1142125	SOKX 150510-MP	●	●		●	●				0.598	0.209	0.220	0.039
1142160	SOKX 180510-MP	●	●		●	●				0.717	0.209	0.220	0.039
1142127	SOKX 050204-MS			●					●	0.201	0.098	0.094	0.016
1142129	SOKX 060205-MS			●					●	0.244	0.102	0.102	0.020
1142131	SOKX 07T208-MS			●					●	0.295	0.114	0.114	0.031
1142133	SOKX 090308-MS			●					●	0.362	0.138	0.138	0.031
1142135	SOKX 11T308-MS			●					●	0.433	0.165	0.161	0.031
1142137	SOKX 130410-MS			●					●	0.512	0.186	0.181	0.039
1142139	SOKX 150510-MS			●					●	0.598	0.209	0.220	0.039
1142162	SOKX 180510-MS			●					●	0.717	0.209	0.220	0.039
1142163	SOHX 050204-LN						●	●		0.201	0.098	0.094	0.016
1142171	SOHX 060205-LN						●	●		0.244	0.102	0.102	0.020
1142173	SOHX 07T208-LN						●	●		0.295	0.114	0.114	0.031
1142175	SOHX 090308-LN						●	●		0.362	0.138	0.138	0.031
1142177	SOHX 11T308-LN						●	●		0.433	0.165	0.161	0.031
1142179	SOHX 130410-LN						●	●		0.512	0.186	0.181	0.039
1142181	SOHX 150510-LN						●	●		0.598	0.209	0.220	0.039
1142183	SOHX 180510-LN						●	●		0.717	0.209	0.220	0.039

● 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

palbit

XOK(H)X INNER INSERT



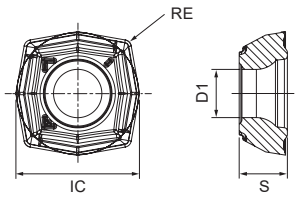
XOKX-MP



XOHX-MS



XOHX-LN



XOK(H)X-MP | MS | LN

		P	M	K	N		S	Dimensions | Dimensões | Dimensiones (in)			
		PVD	PVD	PVD	UNC	PVD	PVD				
	(2) Grade code	P4	X9	P4	12	W1	X9				
(1) Geometry code	ISO Reference	PHP930	PHH930	PHP930	PHO920	PHT920	PHH930	IC	S	D1	RE
1142112	XOKX 050204-MP	◎		◎				0.213	0.098	0.094	0.016
1142114	XOKX 060204-MP	◎		◎				0.258	0.098	0.102	0.016
1142116	XOKX 07T205-MP	◎		◎				0.307	0.114	0.114	0.020
1142118	XOKX 090305-MP	◎		◎				0.378	0.138	0.138	0.020
1142120	XOKX 11T306-MP	◎		◎				0.448	0.163	0.161	0.024
1142122	XOKX 130406-MP	◎		◎				0.535	0.184	0.181	0.024
1142124	XOKX 150508-MP	◎		◎				0.626	0.209	0.220	0.031
1142159	XOKX 180508-MP	◎		◎				0.717	0.209	0.220	0.031
1142126	XOKX 050204-MS		◎				◎	0.213	0.098	0.094	0.016
1142128	XOKX 060204-MS		◎				◎	0.258	0.098	0.102	0.016
1142130	XOKX 07T205-MS		◎				◎	0.307	0.114	0.114	0.020
1142132	XOKX 090305-MS		◎				◎	0.378	0.138	0.138	0.020
1142134	XOKX 11T306-MS		◎				◎	0.448	0.165	0.161	0.024
1142136	XOKX 130406-MS		◎				◎	0.535	0.184	0.181	0.024
1142138	XOKX 150508-MS		◎				◎	0.626	0.209	0.220	0.031
1142161	XOKX 180508-MS		◎				◎	0.717	0.209	0.220	0.031
1142164	XOHX 050204-LN				◎	◎		0.213	0.098	0.094	0.016
1142172	XOHX 060204-LN				◎	◎		0.258	0.098	0.102	0.016
1142174	XOHX 07T205-LN				◎	◎		0.307	0.114	0.114	0.020
1142176	XOHX 090305-LN				◎	◎		0.378	0.138	0.138	0.020
1142178	XOHX 11T306-LN				◎	◎		0.448	0.165	0.161	0.024
1142180	XOHX 130406-LN				◎	◎		0.535	0.184	0.181	0.024
1142182	XOHX 150508-LN				◎	◎		0.626	0.209	0.220	0.031
1142184	XOHX 180508-LN				◎	◎		0.717	0.209	0.220	0.031

◎ 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

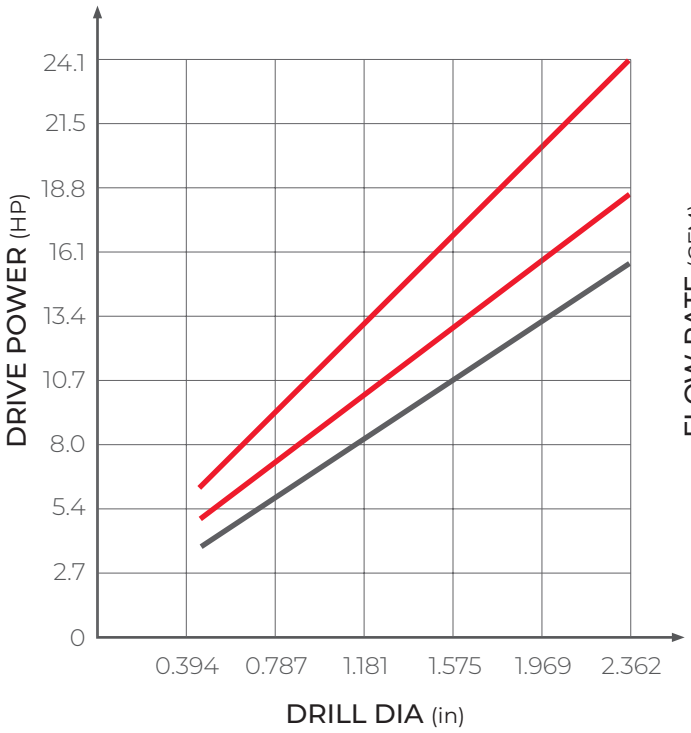
CUTTING CONDITIONS Condições de corte | Condiciones de corte

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

ISO	Material Group	Vc (sfm)	fn (in/rev)				
			Ø0.551~Ø0.630	Ø0.650~Ø0.925	Ø0.945~Ø1.161	Ø1.181~Ø1.654	Ø1.693~Ø2.362
P	Unalloyed steel (-0,25%)	525-820	0.002-0.003	0.002-0.003	0.002-0.004	0.002-0.005	0.002-0.006
	Low-alloy steel (0,25%-)	460-722	0.002-0.004	0.002-0.005	0.002-0.001	0.003-0.007	0.004-0.008
	Low-alloy steel	394-722	0.002-0.004	0.002-0.004	0.002-0.005	0.002-0.007	0.002-0.008
	High-alloy steel	394-591	0.002-0.005	0.002-0.005	0.003-0.006	0.003-0.007	0.003-0.008
M	Stainless steel	427-722	0.002-0.004	0.002-0.005	0.002-0.006	0.002-0.006	0.002-0.007
K	Grey cast iron	492-820	0.002-0.004	0.002-0.006	0.002-0.007	0.003-0.008	0.003-0.010
	Cast iron with nodular cast	328-656	0.002-0.005	0.002-0.005	0.002-0.006	0.002-0.006	0.002-0.007
N	Wrought alloys	492-2296	0.003-0.008	0.005-0.010	0.008-0.012	0.008-0.014	0.008-0.014
	Cast alloys (<5% Si)	492-2296	0.003-0.008	0.005-0.010	0.008-0.012	0.008-0.014	0.008-0.014
	cast alloys (>5% Si)	394-1476	0.003-0.008	0.005-0.010	0.008-0.012	0.008-0.014	0.008-0.014
S	Super-alloys and titanium	99-296	0.002-0.003	0.002-0.003	0.002-0.004	0.003-0.005	0.003-0.006

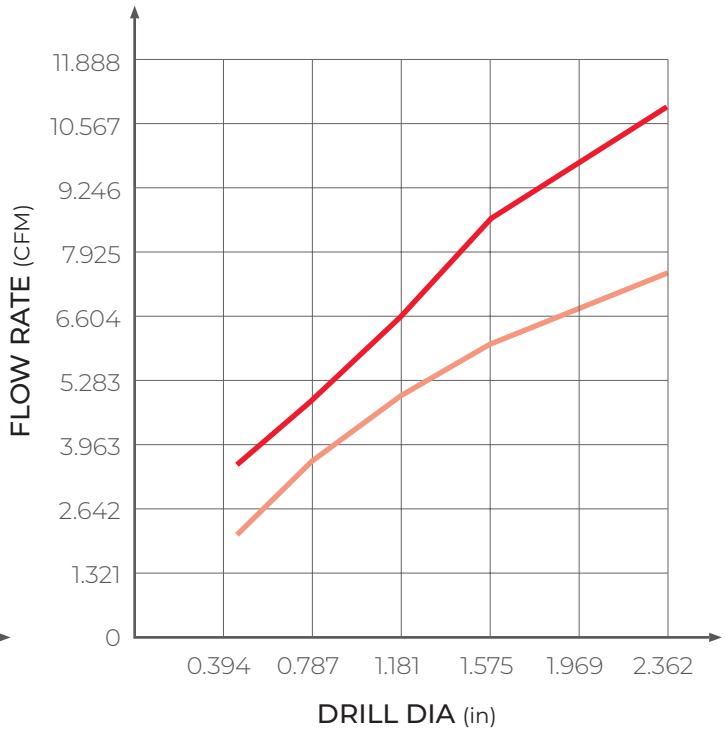
NOTES
When working on irregular surfaces, please reduce the feed rate by 30%~50%. To ensure the best performance, make sure to use the proper oil pressure (over 5kg/cm2) and follow the cutting data parameters.

Power requirements



F = 0.005 in/r
F = 0.004 in/r
F = 0.003 in/r

Cutting oil quantity



Recommended cutting oil quantity
Min. cutting oil quantity

NOTES
Minimum pressure coolant: 5bar (72.5 psi)

GRADE SELECTION INNER INSERT

PVD

Due to the reduced cutting speed in the central area of the drill, a tougher grade is recommended for the inner insert.

PHP930
P20-P40
K10-K30

PHH930
M20-M40
S20-S30

PHT920
N10-N30

UNCOATED

Uncoated carbide with polished surface.

PH0920
N10-N30

GRADE SELECTION OUTER INSERT

PVD

First choice for stable machining and improved surface finish.
Recommended for outer edge if chattering occurs.

PHP920
P10-P35
K10-K30

PHH920
M10-M25
S15-S30

PHT920
N10-N30

CVD

First choice for high speeds and high efficiency machining, abrasion resistance and longer tool life.

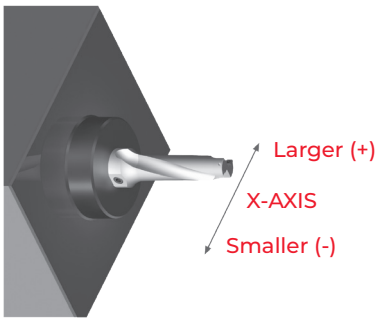
PHS130
P10-P35
K20-K40

UNCOATED

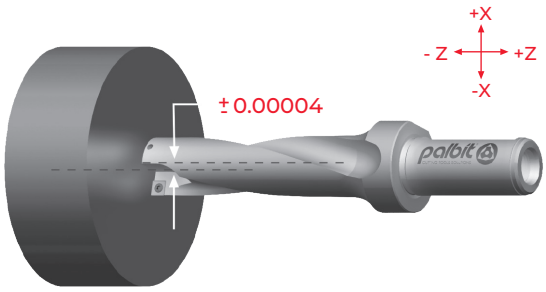
Uncoated carbide with polished surface.

PH0920
N10-N30

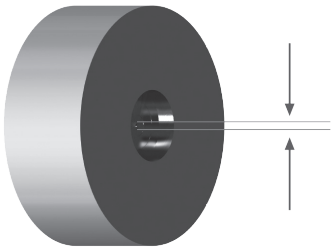
TECHNICAL INFORMATION FOR LATHE APPLICATIONS



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.



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.



To check up the setting of drill before use, test it by drilling about 0.197 in depth and then measure the core size if it is around 0.008 in - 0.028 in.

WARNING
In the course of through-hole operations, a slug or disc is formed as the tool breaks through the workpiece. When the drill is stationary while the workpiece is rotating, centrifugal force may eject this slug from the chuck. It is essential to have appropriate shielding in position to ensure the safety of bystanders.

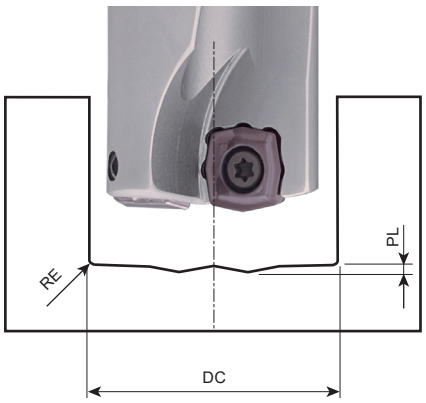
RADIAL ADJUSTMENT Ajuste radial | Ajuste radial

Drill diameter (in)	Diameter range (in)
0.551	0.535-0.571
0.571	0.555-0.591
0.591	0.575-0.610
0.610	0.594-0.630
0.630	0.614-0.650
0.650	0.630-0.669
0.669	0.650-0.689
0.689	0.669-0.709
0.709	0.689-0.728
0.728	0.709-0.748
0.748	0.728-0.768
0.768	0.748-0.787
0.787	0.764-0.811
0.807	0.783-0.831
0.827	0.803-0.850
0.846	0.823-0.870
0.866	0.843-0.890
0.886	0.862-0.909
0.906	0.882-0.929
0.925	0.902-0.949
0.945	0.921-0.969
0.965	0.941-0.988
0.984	0.961-1.008
1.004	0.980-1.028
1.024	1.000-1.047
1.043	1.020-1.067
1.063	1.039-1.087
1.083	1.059-1.106

Drill diameter (in)	Diameter range (in)
1.102	1.079-1.126
1.122	1.098-1.146
1.142	1.118-1.165
1.161	1.138-1.185
1.181	1.154-1.209
1.201	1.173-1.228
1.220	1.193-1.248
1.240	1.213-1.268
1.260	1.232-1.287
1.280	1.252-1.307
1.299	1.272-1.327
1.319	1.291-1.346
1.339	1.311-1.366
1.358	1.331-1.386
1.378	1.350-1.406
1.398	1.370-1.425
1.417	1.390-1.445
1.437	1.409-1.465
1.457	1.429-1.484
1.476	1.449-1.504
1.496	1.469-1.524
1.516	1.488-1.543
1.535	1.508-1.563
1.555	1.528-1.583
1.575	1.547-1.602
1.594	1.567-1.622
1.614	1.587-1.642
1.634	1.606-1.661

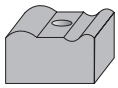
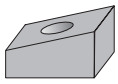
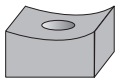
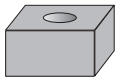
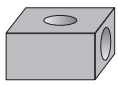
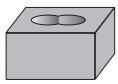
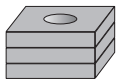
Drill diameter (in)	Diameter range (in)
1.654	1.626-1.681
1.673	1.646-1.701
1.693	1.661-1.720
1.713	1.681-1.740
1.732	1.701-1.760
1.752	1.720-1.780
1.772	1.740-1.799
1.791	1.760-1.819
1.811	1.780-1.839
1.831	1.799-1.858
1.850	1.819-1.878
1.870	1.839-1.898
1.890	1.858-1.917
1.909	1.878-1.937
1.929	1.898-1.957
1.949	1.917-1.976
1.969	1.937-1.996
2.008	1.976-2.035
2.047	2.016-2.075
2.087	2.055-2.114
2.126	2.094-2.154
2.165	2.134-2.193
2.205	2.173-2.232
2.244	2.213-2.272
2.283	2.252-2.311
2.323	2.291-2.350
2.362	2.331-2.390

BOTTOM OF BLIND HOLE Fundo do furo cego | Fondo del agujero ciego



Drill diameter (in)	Outer insert	Inner insert	PL	RE
0.551-0.630	SOKX 050204	XOKX 050204	0.016	0.016
0.650-0.768	SOKX 060205	XOKX 060205	0.020	0.020
0.787-0.945	SOKX 07T208	XOKX 07T208	0.020	0.031
0.965-1.181	SOKX 090308	XOKX 090308	0.028	0.031
1.220-1.378	SOKX 11T308	XOKX 11T308	0.031	0.031
1.417-1.654	SOKX 130410	XOKX 130410	0.039	0.039
1.693-1.969	SOKX 150510	XOKX 150508	0.043	0.039
2.008-2.362	SOKX 180510	XOKX 180508	0.047	0.039

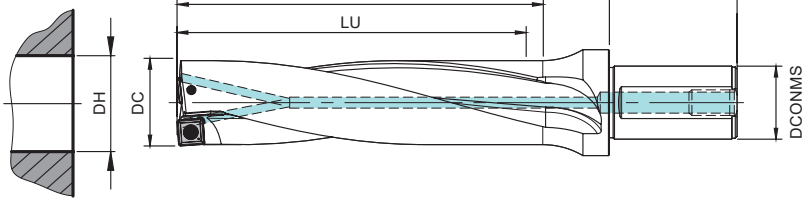
RULES & TIPS Regras e dicas | Reglas y consejos

Workpiece	Machining
 **Irregular surface**	· Decrease the feed by 25%; · Potential chipping and fracture;
 **Inclined surface**	· Decrease the feed by 50%.
 **Convex / Concave surface**	· Decrease the feed by 50% until both inserts are engaged; · Potential initial contact with the central insert identified (convex surface);
 **Boring**	· Decrease the feed by 50%.
 **Crossing holes**	· Decrease the feed by 50% in the overlapped section.
 **Chain holemaking**	· Decrease the feed by 50%.
 **Stack holemaking**	· Decrease the feed by 25%; · Potential chipping and fracture;

SCI 3D Jet drills | Brocas jet | Brocas jet







DCONMS	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)	
DC	3D
0.531 - 0.844	-0.004 / +0.006
0.875 - 1.938	-0.005 / +0.008

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR				
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	●
184199100	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

Continue next page

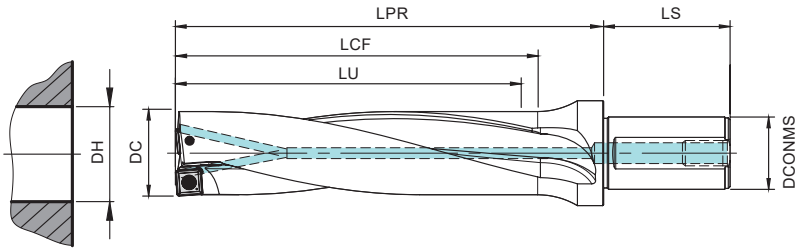
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR				
184200000	SCI 12501125-3D	1.125	1.250	3.375	3.504	4.882	SPKX 090408	P0350903	XT15	●
184200100	SCI 12501156-3D	1.156	1.250	3.468	3.583	4.961	SPKX 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

SCI 4D Jet drills | Brocas jet | Brocas jet





DCONMS	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)	
DC	3D
0.531 - 0.844	-0.005 / +0.008
0.875 - 1.938	-0.005 / +0.010

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR				
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

Continue next page

SCI 4D

Jet drills | Brocas jet | Brocas jet

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert	Insert Screw	Torx key	Stock
		DC	DCONMS	LU	LCF	LPR				
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

DRILLS

VORTEX

METRIC LINE



Vortex drills offer the best solution for drilling extensive dimensions in both diameter and length. The drilling depth can be adjusted using extensions and reducers, while the diameter adjustment is accomplished by shortening the outer cartridge.

As brocas Vortex oferecem a melhor solução para perfurar dimensões extensas tanto em diâmetro quanto em comprimento. A profundidade de perfuração pode ser ajustada usando extensões e redutores, enquanto o ajuste de diâmetro é realizado encurtando o cartucho externo.

Las brocas Vortex ofrecen la mejor solución para perforar dimensiones extensas tanto en diámetro como en longitud. La profundidad de perforación puede ajustarse utilizando extensiones y reductores, mientras que el ajuste de diámetro se logra acortando el cartucho exterior.

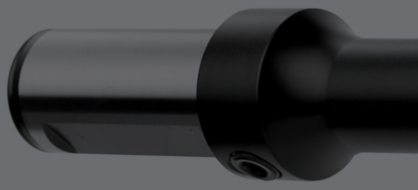
MDO > page 380

- From DC 1.772 in to 7.087 in
  De DC 1.772 in a 7.087 in | Desde DC 1.772 in hasta 7.087 in
- 2 or 3 WCKX inserts per cartridge
  2 ou 3 pastilhas WCKX por cartucho | 2 o 3 plaquitas WCKX por cartucho
- Pilot drill
  Broca piloto | Taladro piloto



MDS > page 382

- Shank
  Encabadouro | Caña



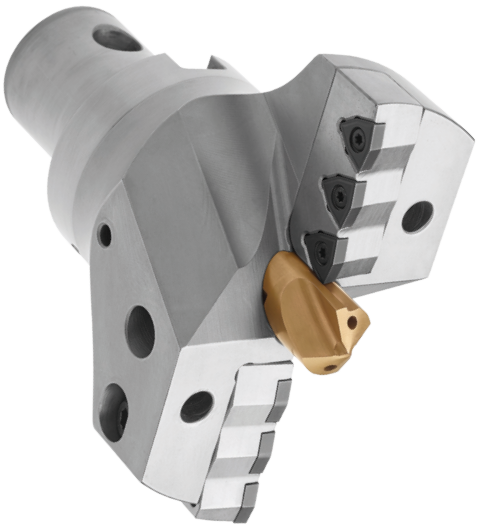
MDE > page 383

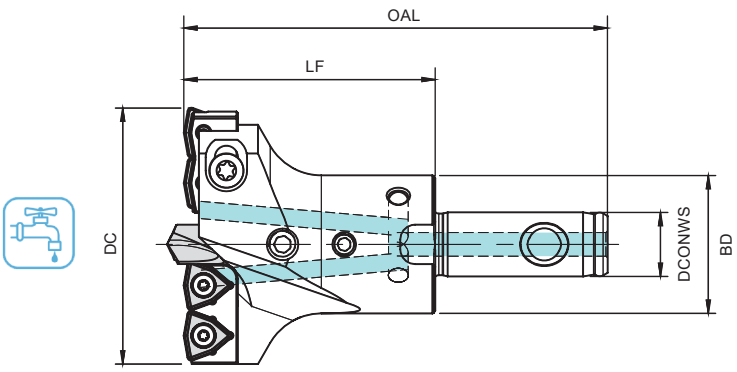
- Extension
  Extensor | Extensor



MDO 10D Vortex drills | Brocas vortex | Brocas vortex

METRIC LINE





*Order seperately

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Cartridge	Insert	Insert Screw	Torx key	Pilot drill*	Stock
		DC	DCONWS	LF	OAL	BD						
2 INSERTS PER CARTRIDGE												
184031000	MDO 04505013	1.772-1.969	0.512	1.969	3.346	1.102	MDC 045050-I/O	WCKX 030204	P0220500	XT07	MDP 3510	◎
184031100	MDO 05005513	1.969-2.165	0.512	1.969	3.346	1.102	MDC 050055-I/O	WCKX 030204	P0220500	XT07	MDP 3510	◎
184031200	MDO 05506016	2.165-2.362	0.630	2.362	3.937	1.260	MDC 055060-I/O	WCKX 040204	P0250503	XT08	MDP 3812	◎
184031300	MDO 06006516	2.362-2.559	0.630	2.362	3.937	1.260	MDC 060065-I/O	WCKX 050308	P0300701	XT08	MDP 3812	◎
184031500	MDO 06507016	2.559-2.756	0.630	2.362	3.937	1.260	MDC 065070-I/O	WCKX 050308	P0300701	XT08	MDP 3812	◎
184032400	MDO 07007522	2.756-2.953	0.866	2.756	4.528	1.575	MDC 070075-I/O	WCKX 050308	P0300701	XT08	MDP 3812	◎
184032500	MDO 07508022	2.953-3.150	0.866	2.756	4.528	1.575	MDC 075080-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184032600	MDO 08008522	3.150-3.346	0.866	2.756	4.528	1.575	MDC 080085-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184032700	MDO 08509027	3.346-3.543	1.063	2.756	4.724	1.890	MDC 085090-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184032800	MDO 09009527	3.543-3.740	1.063	2.756	4.724	1.890	MDC 090095-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎
184032900	MDO 09510027	3.740-3.937	1.063	2.756	4.724	1.890	MDC 095100-I/O	WCKX 06T308	P0350903	XT15	MDP 4516	◎

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

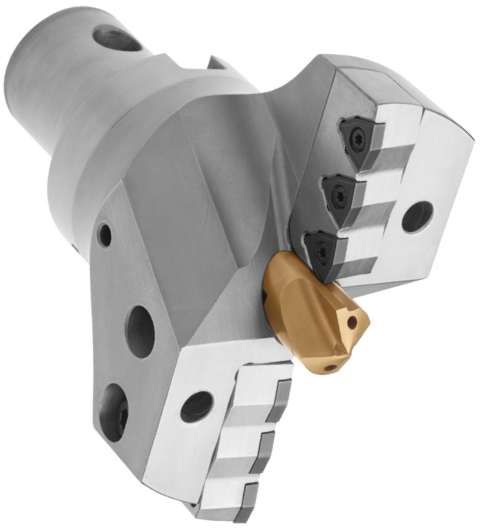
Drills with larger diameter available under request with a minimum order quantity.

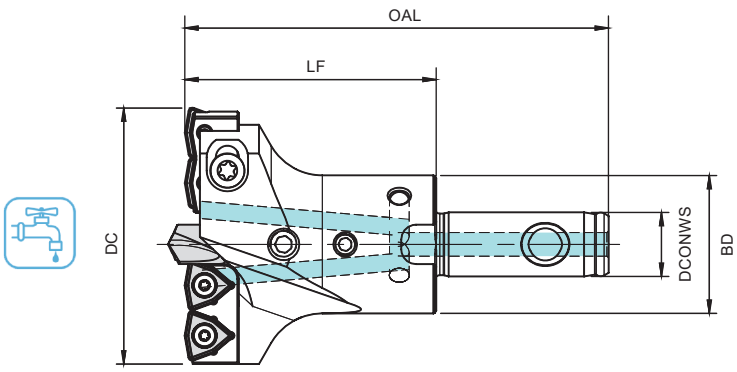
Note:This type of drills are supplied without pilot drills. Please order them separately.

Please see Page B - 392 for setting pilot drill.

Pilot Drill mounting procedure

palbit





*Order seperately

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Cartridge	Insert	Insert Screw	Torx key	Pilot drill*	Stock
		DC	DCONWS	LF	OAL	BD						
3 INSERTS PER CARTRIDGE												
184033000	MDO 10010532	3.937-4.134	1.260	3.150	5.118	2.283	MDC 100105-I/O	WCKX 050308	P0300701	XT08	MDP 4520	◎
184066400	MDO 10511032	4.134-4.331	1.260	3.150	5.118	2.283	MDC 105110-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	◎
184066500	MDO 11011532	4.331-4.528	1.260	3.150	5.118	2.283	MDC 110115-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	◎
184066600	MDO 11512040	4.528-4.724	1.575	3.543	5.709	2.756	MDC 115120-I/O	WCKX 06T308	P0350903	XT15	MDP 4520	◎
184066700	MDO 12012540	4.724-4.921	1.575	3.543	5.709	2.756	MDC 120125-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	◎
184066800	MDO 12513040	4.921-5.118	1.575	3.543	5.709	2.756	MDC 125130-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	◎
184066900	MDO 13013540	5.118-5.315	1.575	3.543	5.709	2.756	MDC 130135-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	◎
184067000	MDO 13514040	5.315-5.512	1.575	3.543	5.709	2.756	MDC 135140-I/O	WCKX 06T308	P0350903	XT15	MDP 5625	◎
184067100	MDO 14015050	5.512-5.906	1.969	3.937	6.299	3.150	MDC 140150-I/O	WCKX 080408	P0401101	XT15	MDP 5625	◎
184067200	MDO 15016050	5.906-6.299	1.969	3.937	6.299	3.150	MDC 150160-I/O	WCKX 080408	P0401101	XT15	MDP 5625	◎
184067300	MDO 16017050	6.299-6.693	1.969	3.937	6.299	3.150	MDC 160170-I/O	WCKX 080408	P0401101	XT15	MDP 6830	◎
184067400	MDO 17018050	6.693-7.087	1.969	3.937	6.299	3.150	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

Drills with larger diameter available under request with a minimum order quantity.

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

Please see Page B - 392 for setting pilot drill.

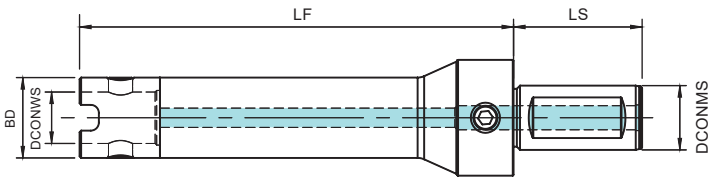
Pilot Drill mounting procedure

MDS SHANK Vortex drills accessories | Acessórios de brocas vortex | Accesorios de brocas vortex

METRIC LINE







New version / Standard version*

DCONWS	LS	BP / SP
1.260	2.756	PT - 1/4
1.575	3.150	PT - 1/4
1.969	3.150 / 3.937	PT - 1/4

*Order seperately

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				Drive Ring*	Stock
		DCONMS	DCONWS	BD	LF		
184121900	MDS 32115130	1.260	0.512	1.102	4.528	MDR 1028	⊛
184253700	MDS 32200130	1.260	0.512	1.102	7.874	MDR 1028	⊛
184255400	MDS 32300130	1.260	0.512	1.102	11.811	MDR 1028	⊛
184122100	MDS 40125160	1.575	0.630	1.260	4.921	MDR 1032	⊛
184253800	MDS 40200160	1.575	0.630	1.260	7.874	MDR 1032	⊛
184255500	MDS 40300160	1.575	0.630	1.260	11.811	MDR 1032	⊛
184122300	MDS 40148220	1.575	0.866	1.575	5.827	MDR 1240	⊛
184122400	MDS 40200220	1.575	0.866	1.575	7.874	MDR 1240	⊛
184122500	MDS 40300220	1.575	0.866	1.575	11.811	MDR 1240	⊛
184122600	MDS 40168270	1.575	1.063	1.890	6.614	MDR 1248	⊛
184122700	MDS 40300270	1.575	1.063	1.890	11.811	MDR 1248	⊛
184122800	MDS 40186320	1.575	1.260	2.283	7.323	MDR 1458	⊛
184122900	MDS 40300320	1.575	1.260	2.283	11.811	MDR 1458	⊛
184123000	MDS 50186400	1.969	1.575	2.756	7.323	MDR 1470	⊛
184123100	MDS 50300400	1.969	1.575	2.756	11.811	MDR 1470	⊛
184123200	MDS 50184500	1.969	1.969	3.150	7.244	MDR 1680	⊛
184123300	MDS 50300500	1.969	1.969	3.150	11.811	MDR 1680	⊛

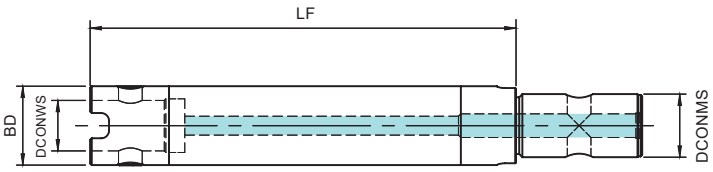
⊛ Stock item | Produto de stock | Itens de stock ◯ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

palbit

MDE EXTENSION Vortex drills accessories | Acessórios de brocas vortex | Accessorios de brocas vortex METRIC LINE





*Order seperately

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				Drive Ring*	Stock
		DCONMS	DCONWS	BD	LF		
184023500	MDE 13115280	0.512	0.512	1.102	4.528	MDR 1028	●
184023600	MDE 13150280	0.512	0.512	1.102	5.906	MDR 1028	●
184023700	MDE 13200280	0.512	0.512	1.102	7.874	MDR 1028	●
184021800	MDE 13300280	0.512	0.512	1.102	11.811	MDR 1028	●
184023800	MDE 16115320	0.630	0.630	1.260	4.528	MDR 1032	●
184021900	MDE 16200320	0.630	0.630	1.260	7.874	MDR 1032	●
184023900	MDE 16300320	0.630	0.630	1.260	11.811	MDR 1032	●
184024000	MDE 22113400	0.866	0.866	1.575	4.449	MDR 1240	●
184024100	MDE 22200400	0.866	0.866	1.575	7.874	MDR 1240	●
184024200	MDE 22300400	0.866	0.866	1.575	11.811	MDR 1240	●
184024300	MDE 27113480	1.063	1.063	1.890	4.449	MDR 1248	●
184024400	MDE 27200480	1.063	1.063	1.890	7.874	MDR 1248	●
184024500	MDE 27300480	1.063	1.063	1.890	11.811	MDR 1248	●
184024600	MDE 32186580	1.260	1.260	2.283	7.323	MDR 1458	●
184024700	MDE 32300580	1.260	1.260	2.283	11.811	MDR 1458	●
184024800	MDE 40186700	1.575	1.575	2.756	7.323	MDR 1470	●
184024900	MDE 40300700	1.575	1.575	2.756	11.811	MDR 1470	●
184025000	MDE 40500700	1.575	1.575	2.756	19.685	MDR 1470	●
184025100	MDE 50204800	1.969	1.969	3.150	8.031	MDR 1680	●
184025200	MDE 50300800	1.969	1.969	3.150	11.811	MDR 1680	●
184025300	MDE 50500800	1.969	1.969	3.150	19.685	MDR 1680	●

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

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

INSERTS



Drilling inserts, specialized for various applications and materials, optimize cutting processes by providing precise geometries and coatings, resulting in improved chip evacuation, surface finish, and overall tool performance.

As pastilhas de furação, especializadas para diversas aplicações e materiais, otimizam os processos de corte fornecendo geometrias e revestimentos precisos, resultando numa melhor evacuação de aparas, acabamento de superfície e desempenho geral da ferramenta.

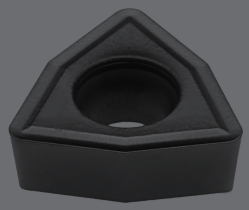
Las plaquitas de furacción, especializadas para diversas aplicaciones y materiales, optimizan los procesos de corte al proporcionar geometrías y recubrimientos precisos, lo que resulta en una mejor evacuación de rompevirutas, acabado superficial y rendimiento general de la herramienta.

SP...X > page 388



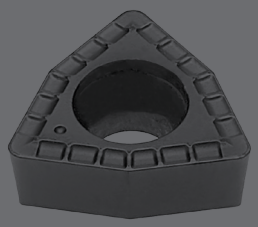
- From sizes 0.197 to 0.551
  De tamanhos de 0.197 a 0.551 | De tamaños de 0.197 a 0.551
- Available in grades PH6920, PH6930, PHC930, PHL930 and PH0910
  Disponível nos graus PH6920, PH6930, PHC930, PHL930 e PH0910 | Disponible en las calidades PH6920, PH6930, PHC930, PHL930 y PH0910
- Suitable for machining steels, stainless steels, cast iron, HRSA and non-ferrous
  Adequado para maquinação de aços, aços inoxidáveis, ferro fundido, HRSA e não ferrosos | Adecuado para el mecanizado de aceros, aceros inoxidables, hierro fundido, HRSA y no ferrosos

WCKX > page 388



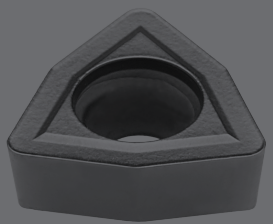
- From sizes 0.079 to 0.315
  De tamanhos de 0.079 a 0.315 | De tamaños de 0.079 a 0.315
- Available in grades PH6920 and PH6930
  Disponível nos graus PH6920 e PH6930 | Disponible en las calidades PH6920 y PH6930
- Suitable for machining steels, stainless steels, cast iron and HRSA
  Adequado para maquinação de aços, aços inoxidáveis, ferro fundido e HRSA | Adecuado para el mecanizado de aceros, aceros inoxidables, hierro fundido y HRSA

WCKX-LC > page 389



- From sizes 0.197 to 0.236
  De tamanhos de 0.197 a 0.236 | De tamaños de 0.197 a 0.236
- Available in grades PH6920 and PH6930
  Disponível nos graus PH6920 e PH6930 | Disponible en las calidades PH6920 y PH6930
- Suitable for machining steels
  Adequado para maquinação de aços | Adecuado para el mecanizado de aceros

WCMX > page 389



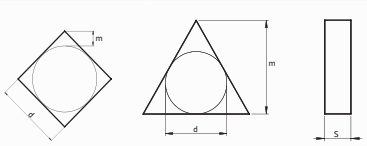
- From sizes 0.118 to 0.315
  De tamanhos de 0.118 a 0.315 | De tamaños de 0.118 a 0.315
- Available in grades PH6920, PHC930 and PHL930
  Disponível nos graus PH6920, PHC930 e PHL930 | Disponible en las calidades PH6920, PHC930 y PHL930
- Suitable for machining steels, stainless steels, cast iron and HRSA
  Adequado para maquinação de aços, aços inoxidáveis, ferro fundido e HRSA | Adecuado para el mecanizado de aceros, aceros inoxidables, hierro fundido y HRSA

ISO HOLEMAKING INSERTS CODE KEY

Sistema de codificação para pastilhas de furação ISO | Codificación para plaquitas de furacción ISO

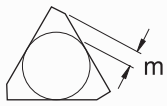
H	120°	M	86°
O	135°	V	35°
P	108°	W	80°
S	90°	L	90°
T	60°	A	85°
C	80°	B	82°
D	55°	K	55°
E	75°	R	
F	50°	X	Special

1- Insert shape symbol



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

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



Triangular inserts with a facet (secondary cutting edge)

Detailed dimension of M class insert
Insert height Tolerances (mm)

Inscribed circle	T	S	C	D	V
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.11	±0.10	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed circle Tolerances (mm)

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

3 - Tolerances symbol

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

2 - Normal clearance symbol

ISO **W C K X**

4 - Insert symbol

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

palbit

ISO HOLEMAKING INSERTS CODE KEY

Sistema de codificação para pastilhas de furação ISO | Codificación para plaquitas de furacción ISO

R's	V's (35°)	D's (55°)	C's (80°)	S's (90°)	T's (60°)	W's (80°)	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	

5 - Insert size symbol

* 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

6 - Insert thickness symbol

06 T3 08 E - LC
AN

10 - Chipbreaker geometries

LC



7 - Insert corner symbol

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

7.1* - Insert edges symbol

For inserts having secondary edges two digits are used:

1st digit is secondary edge		2nd digit is secondary edges 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
*only when required.		G	30º
		N	0º
		P	11º
		Z	special

8 - Cutting edge information

Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfered with honing	S
*only when required.		

SP..X Inserts | Pastilhas | Plaquitas



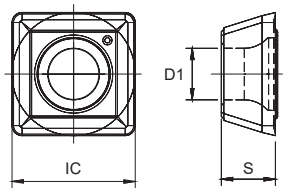
SPKX



SPKX
(PHC | PHL grade)



SPHX-LN

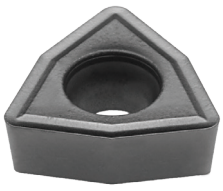


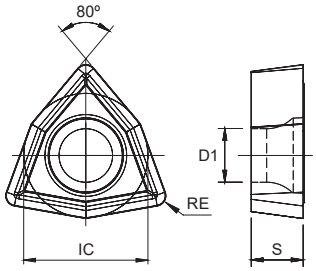
		P				M				K			S				N	Dimensions Dimensões Dimensiones (in)			
		PVD				PVD				PVD			PVD				UNC				
	(2) Grade code	68	66	J3	3B	68	66	J3	3B	68	66	3B	68	66	J3	3B	10				
(1) Geometry code	ISO Reference	PH6920	PH6930	PHC930	PHL930	PH6920	PH6930	PHC930	PHL930	PH6920	PH6930	PHL930	PH6920	PH6930	PHC930	PHL930	PH0910	IC	S	D1	RE
1111281	SPKX 050204	◈	◈	◇		◈	◈	◇		◈	◈		◈	◈	◇			0.197	0.094	0.087	0.016
1111282	SPKX 060204	◈	◈		◈	◈	◈		◈	◈	◈	◈	◈	◈		◈		0.236	0.094	0.100	0.016
1142099	SPHX 060204-LN																◈	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 | Ítens de stock
◯ Available under request | Disponível sobre consulta | Disponible bajo consulta
◇ Available until sold out | Disponível até acabar o stock | Disponible hasta acabar el stock

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

WCKX Inserts | Pastilhas | Plaquitas





		P				M		K		S	
		PVD				PVD		CVD		PVD	
	(2) Grade code	68	66	I5	78	68	66	68	66	68	66
(1) Geometry code	ISO Reference	PH6920	PH6930	PH6740	PH6125	PH6920	PH6930	PH6920	PH6930	PH6920	PH6930
1140300	WCKX 02T104	◈	◈	◯	◯	◈	◈	◈	◈	◈	◈
1140276	WCKX 030204	◈	◈	◯	◯	◈	◈	◈	◈	◈	◈
1140277	WCKX 040204	◈	◈	◯	◯	◈	◈	◈	◈	◈	◈
1140278	WCKX 050308	◈	◈	◯	◯	◈	◈	◈	◈	◈	◈
1140279	WCKX 06T308	◈	◈	◯	◯	◈	◈	◈	◈	◈	◈
1140280	WCKX 080408	◈	◈	◯	◯	◈	◈	◈	◈	◈	◈

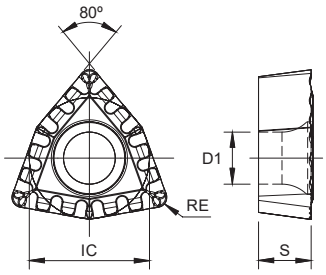
Dimensions Dimensões Dimensiones (in)			
IC	S	D1	RE
0.187	0.078	0.079	0.016
0.219	0.094	0.100	0.016
0.250	0.094	0.112	0.016
0.313	0.125	0.138	0.031
0.376	0.156	0.161	0.031
0.500	0.187	0.220	0.031

◈ 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

WCKX-LC FOR LOW CARBON STEELS Inserts | Pastilhas | Plaquitas





		P		Dimensions Dimensões Dimensiones (in)			
		PVD					
	(2) Grade code	68	66				
(1) Geometry code	ISO Reference	PH6920	PH6930	IC	S	D1	RE
1142068	WCKX 050308-LC	◈	◈	0.313	0.125	0.138	0.031
1142069	WCKX 06T308-LC	◈	◈	0.376	0.156	0.161	0.031

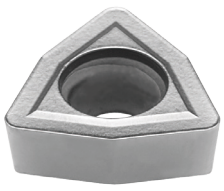
◈ Stock item | Produto de stock | Itens de stock ◯ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

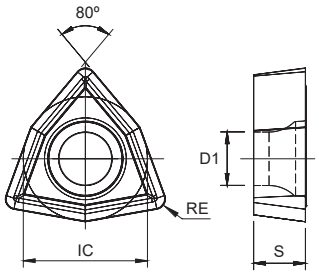
WCMX Inserts | Pastilhas | Plaquitas

ISO references for other holemaking systems

(PHC | PHL grade)







		P			M			K			S			Dimensions Dimensões Dimensiones (in)			
		PVD			PVD			PVD			PVD						
	(2) Grade code	68	J3	3B	68	J3	3B	68	J3	3B	68	J3	3B				
(1) Geometry code	ISO Reference	PH6920	PHC930	PHL930	PH6920	PHC930	PHL930	PH6920	PHC930	PHL930	PH6920	PHC930	PHL930	IC	S	D1	RE
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	◈	◬	◈	◈	◬	◈	◈	◬	◈	◈	◬	◈	0,376	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 ◬ Available until sold out | Disponível até acabar o stock Disponible hasta acabar el stock

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



SPARE PARTS

SPARE PARTS

1 PILOT DRILL AND RDS

> See page B - 392

2 SCREWS AND KEYS

> See page B - 393

3 MDO CARTRIDGE

> See page B - 394

4 VORTEX SCREWS

> See page B - 395

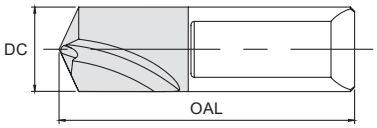
5 MDM AND DRIVE RING

> See page B - 397

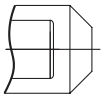
SPARE PARTS

PILOT DRILL





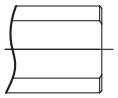
Shank Type



A (with cone)



B (with chamfer)



C

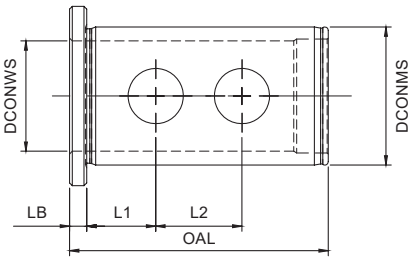
Order Code	Reference	Dimensions | Dimensões | Dimensiones (in)		Type	Oil Hole	For Drill	Stock
		DC	OAL				
184033100	MDP 3510	0.394	1.378	B	✓	MDO (Ø1.772-Ø2.165)	⚙
184033200	MDP 3812	0.472	1.496	B	✓	MDO (Ø2.165-Ø2.953)	⚙
184033300	MDP 4516	0.630	1.772	B	✓	MDO (Ø2.953-Ø3.937)	⚙
184033400	MDP 4520	0.787	1.772	C	✓	MDO (Ø3.937-Ø4.724)	⚙
184033500	MDP 5625	0.984	2.205	C	✓	MDO (Ø4.724-Ø6.299)	⚙
184033600	MDP 6830	1.181	2.677	C	✓	MDO (Ø6.299-Ø7.087)	⚙

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

Pilot Drill mounting procedure

RDS - DRILL SLEEVE



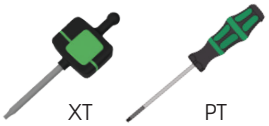


Order Code	Reference	Dimensions | Dimensões | Dimensiones (in)						Stock
		DCONMS	DCONWS	OAL	L1	L2	LB	
184258900	RDS 203265	1.260	0.787	2.559	0.787	-	0.197	◯
184259000	RDS 253265	1.260	0.984	2.559	0.787	0.787	0.197	◯
184259100	RDS 204075	1.575	0.787	2.953	0.787	-	0.197	◯
184259200	RDS 254075	1.575	0.984	2.953	0.787	0.984	0.197	◯
184259300	RDS 324075	1.575	1.260	2.953	0.787	0.984	0.197	◯
184259400	RDS 205095	1.969	0.787	3.740	1.378	-	0.197	◯
184259500	RDS 255095	1.969	0.984	3.740	1.378	-	0.197	◯
184259600	RDS 325095	1.969	1.260	3.740	1.378	1.378	0.197	◯
184259700	RDS 405095	1.969	1.575	3.740	1.378	1.378	0.197	◯

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

SCREWS & KEYS

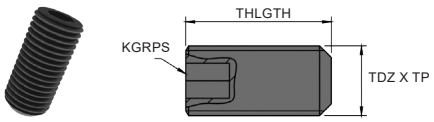




Order Code Código	Reference Referência Referencia
290058400	P0180400
290025800	P0180500
290095800	P02004IP
290031400	P0200500
290095900	P02205IP
290030600	P0220500
290033100	P0250503
290096000	P02507IP
290031300	P0250704
290096100	P03007IP
290030800	P0300701
290096200	P03508IP
290030900	P0350903
290096300	P04010IP
290031000	P0401101
290047500	P0401200
290095600	P0500900
290096400	P05013IP
290031700	P0501300
290078900	P0501302

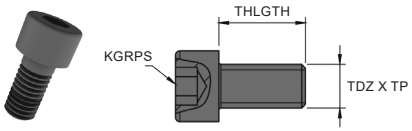
Order Code	Reference Referência Referencia
290058600	XT06IP
290011400	XT06
290012900	XT07
290096500	XT08IP
290011700	XT08
290025700	XT09
290097300	XT15IP-S35
290012400	XT15
290097400	XT20IP-S40
290013200	XT20
290014800	PT15
290014900	PT20

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



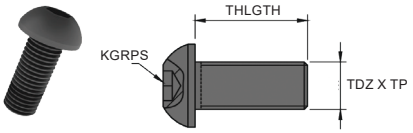
Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290040100	P0400875	M4 x 0,7	0.315	0.079
290040200	P0500875	M5 x 0,8	0.315	0.098
290040300	P0501075	M5 x 0,8	0.394	0.098
290040400	P0601075	M6 x 1,0	0.394	0.118
290040500	P0601275	M6 x 1,0	0.472	0.118
290040600	P0801275	M8 x 1,25	0.472	0.157
290040700	P0801575	M8 x 1,25	0.591	0.157
290040800	P1001575	M10 x 1,5	0.591	0.197
290040900	P1002075	M10 x 1,5	0.787	0.197
290041000	P1202075	M12 x 1,75	0.787	0.236
290041100	P1202575	M12 x 1,75	0.984	0.236
290041200	P1402575	M14 x 2,0	0.984	0.236
290041300	P1602575	M16 x 2,0	0.984	0.315

Screw for Cartridge (DIN 912)



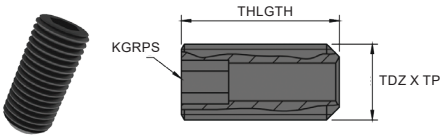
Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290042800	P0501079	M4 x 0,7	0.394	0.079
290042900	P0501279	M5 x 0,8	0.472	0.098
290043000	P0601279	M6 x 1,0	0.472	0.098
290043100	P0601479	M6 x 1,0	0.551	0.118
290043600	P0601679	M6 x 1,0	0.630	0.118
290043300	P0801879	M8 x 1,25	0.709	0.157
290043400	P0802079	M8 x 1,25	0.787	0.157
290043500	P0802579	M8 x 1,25	0.984	0.157

Screw for Cartridge (ISO 7380)



Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290042500	P0401078	M4 x 0,7	0.394	0.079
290042600	P0501078	M5 x 0,8	0.394	0.098
290042700	P0501278	M5 x 0,8	0.472	0.098

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



Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290041400	P0601076	M6 x 1,0	0.394	0.118
290041500	P0801576	M8 x 1,25	0.591	0.157
290097100	P1001576	M10 x 1,5	0.591	0.197
290041800	P1202076	M12 x 1,75	0.787	0.236
290041900	P1402076	M14 x 2,0	0.787	0.236

SPARE PARTS

VORTEX SPARE PARTS - MDO CARTRIDGE



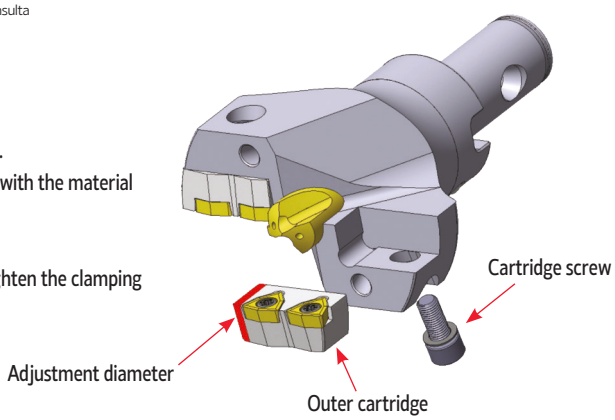
DC	Inner Cartridge		Outer Cartridge		Insert	Insert Screw	Torx key	For Drill	Stock
	Order Code	Reference	Order Code	Reference					
2 INSERTS PER CARTRIDGE									
1.772-1.969	184062000	MDC 045050-I	184252600	MDC 045050-O	WC... 030204	P0220500	XT07	MDO 04505013	◎
1.969-2.165	184250400	MDC 050055-I	184252700	MDC 050055-O	WC... 030204	P0220500	XT07	MDO 05005513	◎
2.165-2.362	184250500	MDC 055060-I	184252800	MDC 055060-O	WC... 040204	P0250503	XT08	MDO 05506016	◎
2.362-2.559	184250600	MDC 060065-I	184252900	MDC 060065-O	WC... 050308	P0300701	XT08	MDO 06006516	◎
2.559-2.756	184250700	MDC 065070-I	184253000	MDC 065070-O	WC... 050308	P0300701	XT08	MDO 06507016	◎
2.756-2.953	184250800	MDC 070075-I	184063700	MDC 070075-O	WC... 050308	P0300701	XT08	MDO 07007522	◎
2.953-3.150	184250900	MDC 075080-I	184063800	MDC 075080-O	WC... 06T308	P0350903	XT15	MDO 07508022	◎
3.150-3.346	184251000	MDC 080085-I	184063900	MDC 080085-O	WC... 06T308	P0350903	XT15	MDO 08008522	◎
3.346-3.543	184251100	MDC 085090-I	184064000	MDC 085090-O	WC... 06T308	P0350903	XT15	MDO 08509027	◎
3.543-3.740	184251200	MDC 090095-I	184064100	MDC 090095-O	WC... 06T308	P0350903	XT15	MDO 09009527	◎
3.740-3.937	184251300	MDC 095100-I	184064200	MDC 095100-O	WC... 06T308	P0350903	XT15	MDO 09510027	◎
3 INSERTS PER CARTRIDGE									
3.937-4.134	184251400	MDC 100105-I	184064300	MDC 100105-O	WC... 050308	P0300701	XT08	MDO 10010532	◎
4.134-4.331	184251500	MDC 105110-I	184253100	MDC 105110-O	WC... 06T308	P0350903	XT15	MDO 10511032	◎
4.331-4.528	184251600	MDC 110115-I	184253200	MDC 110115-O	WC... 06T308	P0350903	XT15	MDO 11011532	◎
4.528-4.724	184251700	MDC 115120-I	184253300	MDC 115120-O	WC... 06T308	P0350903	XT15	MDO 11512040	◎
4.724-4.921	184251800	MDC 120125-I	184253400	MDC 120125-O	WC... 06T308	P0350903	XT15	MDO 12012540	◎
4.921-5.118	184251900	MDC 125130-I	184253500	MDC 125130-O	WC... 06T308	P0350903	XT15	MDO 12513040	◎
5.118-5.315	184252000	MDC 130135-I	184068900	MDC 130135-O	WC... 06T308	P0350903	XT15	MDO 13013540	◎
5.315-5.512	184252100	MDC 135140-I	184069000	MDC 135140-O	WC... 06T308	P0350903	XT15	MDO 13514040	◎
5.512-5.906	184252200	MDC 140150-I	184253600	MDC 140150-O	WC... 080408	P0401101	XT15	MDO 14015050	◎
5.906-6.299	184252300	MDC 150160-I	184069200	MDC 150160-O	WC... 080408	P0401101	XT15	MDO 15016050	◎
6.299-6.693	184252400	MDC 160170-I	184069300	MDC 160170-O	WC... 080408	P0401101	XT15	MDO 16017050	◎
6.693-7.087	184252500	MDC 170180-I	184069400	MDC 170180-O	WC... 080408	P0401101	XT15	MDO 17018050	◎

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

Adjusting the cutting diameter of Vortex MDO 10D

1 - Unscrew the clamping bolt that holds the outer cartridge in place and remove it from the drill body.
2 - Use a milling tool to carefully cut out the section of the outer cartridge that will come into contact with the material being drilled, making sure to calculate the correct diameter beforehand.
3 - Smooth out any sharp edges on the cartridge.
4 - Attach the cartridge securely to the drill body, ensuring there are no gaps between the two, and tighten the clamping bolt firmly to keep it in place.

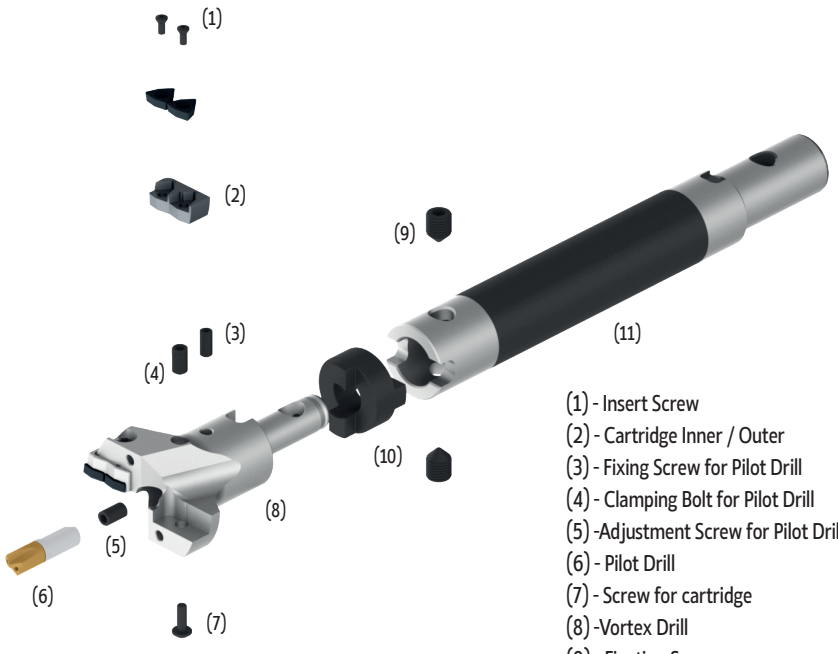
Example: for a standard diameter of Ø4.724in and you want Ø.,567in you should cut 0.079in.



VORTEX SPARE PARTS - 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	290097100	P1001676	290043000	P0601279
MDO 08008522	290040400	P0601075	290040900	P1002075	290097100	P1001676	290043100	P0601479
MDO 08509027	290040400	P0601075	290040900	P1002075	290097100	P1001876	290043600	P0601679
MDO 09009527	290040400	P0601075	290040900	P1002075	290097100	P1001876	290043600	P0601679
MDO 09510027	290040400	P0601075	290040900	P1002075	290097100	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 MDS Shank, MDE Extension, MDM Reducer		
DC / BD	Order Code Código	Screw
1.102	290032400	P0801280
1.260	290032400	P0801280
1.575	290032500	P1001580
1.890	290032600	P1201880
2.283	290039600	P1202080
2.756	290032800	P1602780
3.150	290032800	P1602780

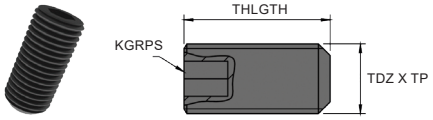


(1) - Insert Screw
(2) - Cartridge Inner / Outer
(3) - Fixing Screw for Pilot Drill
(4) - Clamping Bolt for Pilot Drill
(5) -Adjustment Screw for Pilot Drill
(6) - Pilot Drill
(7) - Screw for cartridge
(8) -Vortex Drill
(9) - Fixation Screw
(10) - Drive Ring
(11) - MDS Shank or MDE Extension

SPARE PARTS

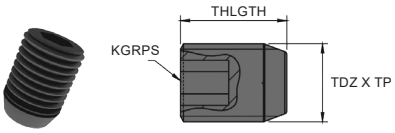
VORTEX SPARE PARTS - SCREWS

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



Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290040100	P0400875	M4 x 0,7	0.315	0.079
290040200	P0500875	M5 x 0,8	0.315	0.098
290040400	P0601075	M6 x 1,0	0.394	0.118
290040500	P0601275	M6 x 1,0	0.472	0.118
290040700	P0801575	M8 x 1,25	0.591	0.157
290040900	P1002075	M10 x 1,5	0.787	0.197
290041000	P1202075	M12 x 1,75	0.787	0.236
290041100	P1202575	M12 x 1,75	0.984	0.236
290041200	P1402575	M14 x 2,0	0.984	0.236
290041300	P1602575	M16 x 2,0	0.984	0.315

Fixation Screw for MDS Shank, MDE Extension, MDM Reducer



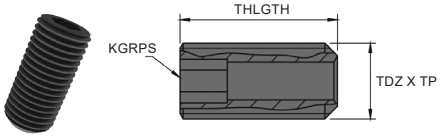
Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290032400	P0801280	M8	0.472	0.157
290032500	P1001580	M10	0.591	0.197
290032600	P1201880	M12	0.709	0.236
290039600	P1202080	M12	0.787	0.236
290032800	P1602780	M16	1.063	0.315

Insert Screw



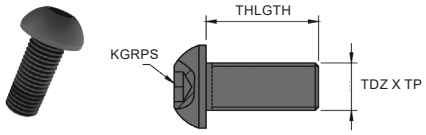
Order Code	Screw
290030600	P0220500
290033100	P0250503
290030800	P0300701
290030900	P0350903
290031000	P0401101

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



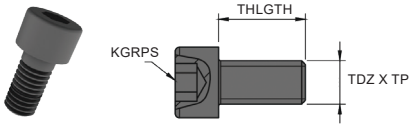
Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290041400	P0601076	M6 x 1,0	0.394	0.118
290041500	P0801576	M8 x 1,25	0.591	0.157
290097100	P1001676	M10 x 1,5	0.630	0.197
290097100	P1001876	M10 x 1,5	0.709	0.197
290041800	P1202076	M12 x 1,75	0.787	0.236
290041900	P1402076	M14 x 2,0	0.787	0.236

Screw for Cartridge (ISO 7380)



Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290042500	P0401078	M4 x 0,7	0.394	0.079
290042700	P0501278	M5 x 0,8	0.472	0.098

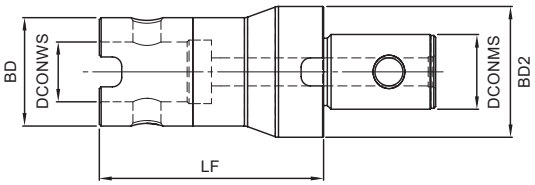
Screw for Cartridge (DIN 912)



Order Code Código	Screw	Dimensions | Dimensões | Dimensiones (in)		
		TDZ x TP (mm)	THLGTH	KGRPS
290043000	P0601279	M6 x 1,0	0.472	0.098
290043100	P0601479	M6 x 1,0	0.551	0.118
290043600	P0601679	M6 x 1,0	0.630	0.118
290043300	P0801879	M8 x 1,25	0.709	0.157
290043400	P0802079	M8 x 1,25	0.787	0.157
290043500	P0802579	M8 x 1,25	0.984	0.157

MDM - REDUCER



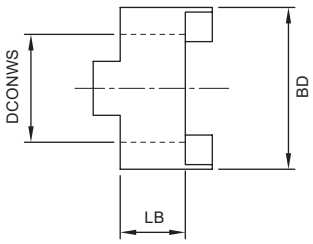


Order Code	Reference	Dimensions | Dimensões | Dimensiones (in)					Drive Ring D1	Drive Ring D2	Stock
		DCONWS	DCONMS	BD	BD2	LF			
184253900	MDM 16100130	0.512	0.630	1.102	1.260	3.937	MDR 1028	MDR 1032	◈
184254000	MDM 22100160	0.630	0.866	1.260	1.575	3.937	MDR 1032	MDR 1240	◈
184254100	MDM 27100220	0.866	1.063	1.575	1.890	3.937	MDR 1240	MDR 1248	◈
184254200	MDM 32100130	0.512	1.260	1.102	2.283	3.937	MDR 1028	MDR 1458	○
184254300	MDM 32100160	0.630	1.260	1.260	2.283	3.937	MDR 1032	MDR 1458	◈
184254400	MDM 32100220	0.866	1.260	1.575	2.283	3.937	MDR 1240	MDR 1458	○
184254500	MDM 32100270	1.063	1.260	1.890	2.283	3.937	MDR 1248	MDR 1458	○
184254600	MDM 40100320	1.260	1.575	2.283	2.756	3.937	MDR 1458	MDR 1470	◈
184254700	MDM 50080130	0.512	1.969	1.102	3.150	3.150	MDR 1028	MDR 1680	○
184254800	MDM 50080160	0.630	1.969	1.260	3.150	3.150	MDR 1032	MDR 1680	○
184254900	MDM 50080220	0.866	1.969	1.575	3.150	3.150	MDR 1240	MDR 1680	○
184255000	MDM 50080270	1.063	1.969	1.890	3.150	3.150	MDR 1248	MDR 1680	◈
184255100	MDM 50080320	1.260	1.969	2.283	3.150	3.150	MDR 1458	MDR 1680	○
184250200	MDM 50150400	1.575	1.969	2.756	3.150	5.906	MDR 1470	MDR 1680	◈

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

DRIVE RING





Order Code	Reference	Dimensions | Dimensões | Dimensiones (in)			Stock
		BD	DCONWS	LB	
184021600	MDR 1028	1.102	0.512	0.394	○
184021700	MDR 1032	1.260	0.630	0.394	○
184022100	MDR 1240	1.575	0.866	0.472	○
184022200	MDR 1248	1.890	1.063	0.472	○
184022300	MDR 1458	2.283	1.260	0.551	○
184022400	MDR 1470	2.756	1.575	0.551	○
184022500	MDR 1680	3.150	1.969	0.630	○

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



TECHNICAL DATA

1 HOLEMAKING GRADES

> See page B - 400

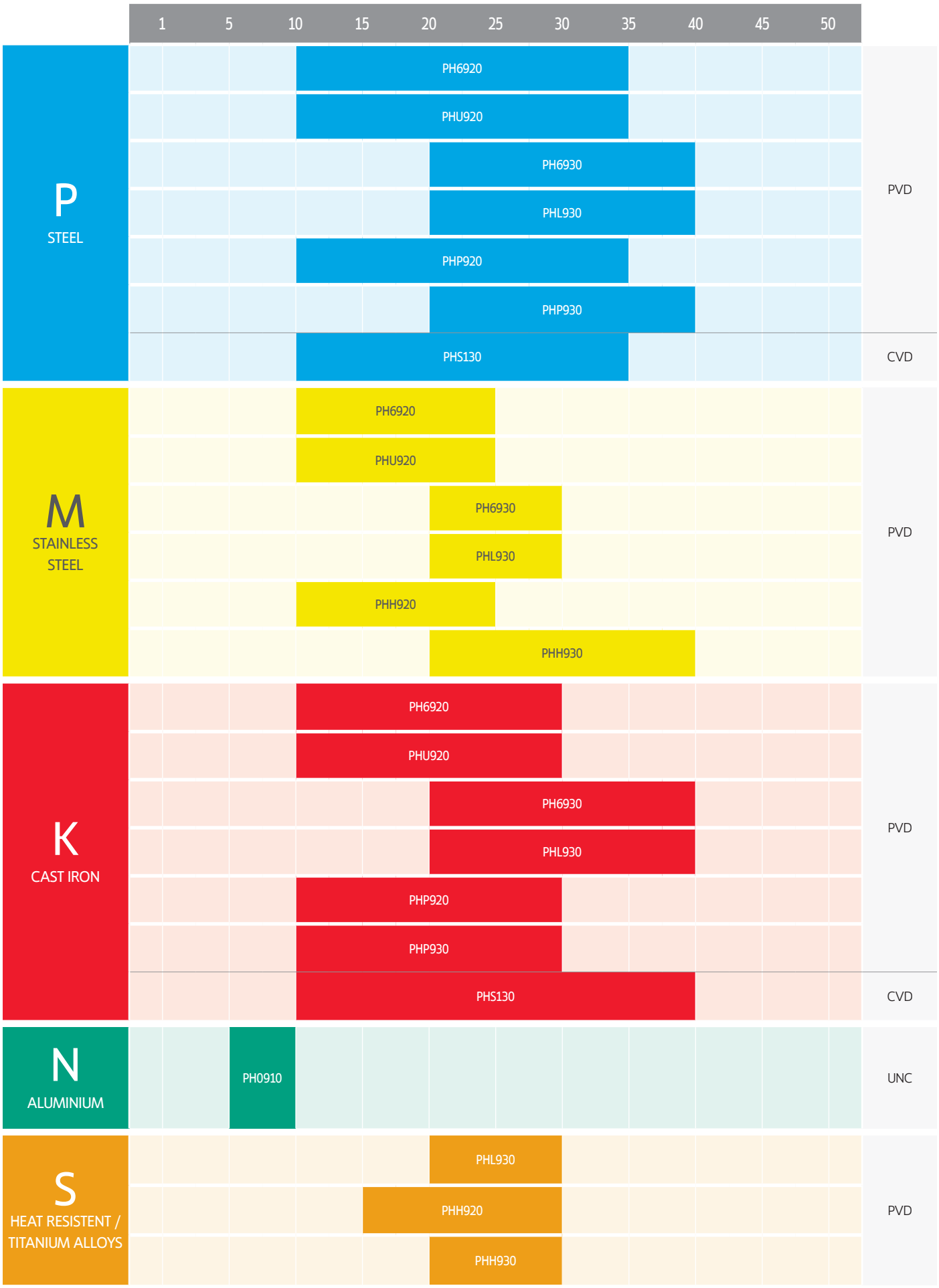
2 SCI DRILL TYPE

> See page B - 403

3 VORTEX DRILL - CUTTING PARAMETERS AND ADJUSTMENTS

> See page B - 408

TECHNICAL DATA Dados técnicos | Datos técnicos



palbit

PVD GRADES

PH6920
P10-P35
M10-M25
K10-K30

Coated grade over a tough wear resistance substrate for general purpose machining.

PHU920
P10-P35
M10-M25
K10-K30

With high thermal shock resistance and suitable for dry and wet machining, the PHU920 grade is recommended for steels, stainless steels and cast iron.

PH6930
P20-P40
M20-M30
K20-K40

Grade suitable for applications with instability conditions. Excellent solution for medium cutting speed applications.

PHL930
P20-P40
M20-M30
K20-K40
S20-S30

Grade suitable for applications with instability conditions. Excellent solution for medium cutting speed applications. Coated in Yellow to be visually distinguishable.

PHP930
P20-P40
K10-K30

PHH930
M20-M40
S20-S30

Due to the reduced cutting speed in the central area of the drill, a tougher grade is recommended for the inner insert.
(Inner Insert)

PHP920
P10-P35
K10-K30

PHH920
M10-M25
S15-S30

First choice for stable machining and improved surface finish. Recommended for outer edge if chattering occurs.
(Outer Insert)

CVD GRADE

PHS130
P10-P35
K20-K40

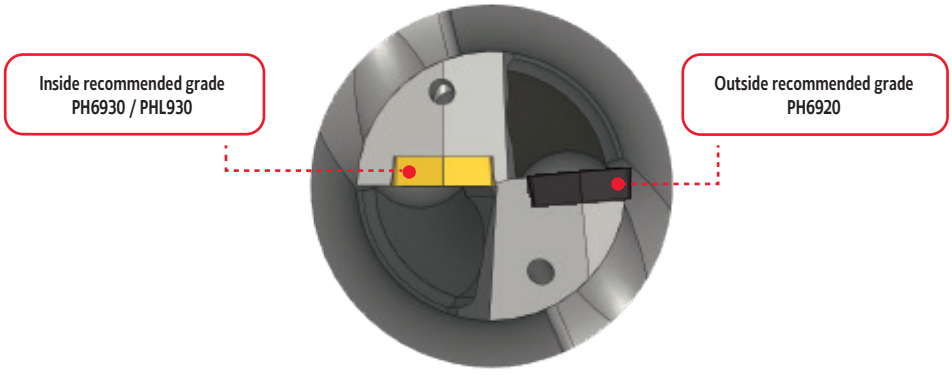
First choice for high speeds and high efficiency machining, abrasion resistance and longer tool life.
(Outer Insert)

UNCOATED GRADE

PH0910
N05-N10

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

GRADES RECOMMENDATION FOR HOLEMAKING SYSTEMS

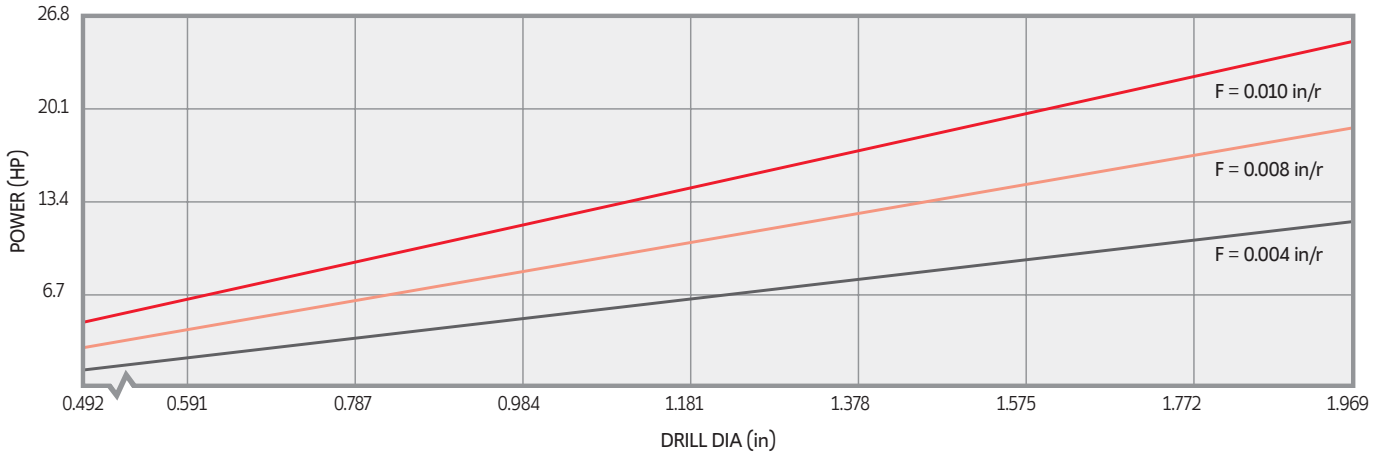


Note: This recommendation should be applied on High Alloy Steels, Stainless Steels and HRSA materials.

RECOMMENDED SPEEDS AND FEEDS

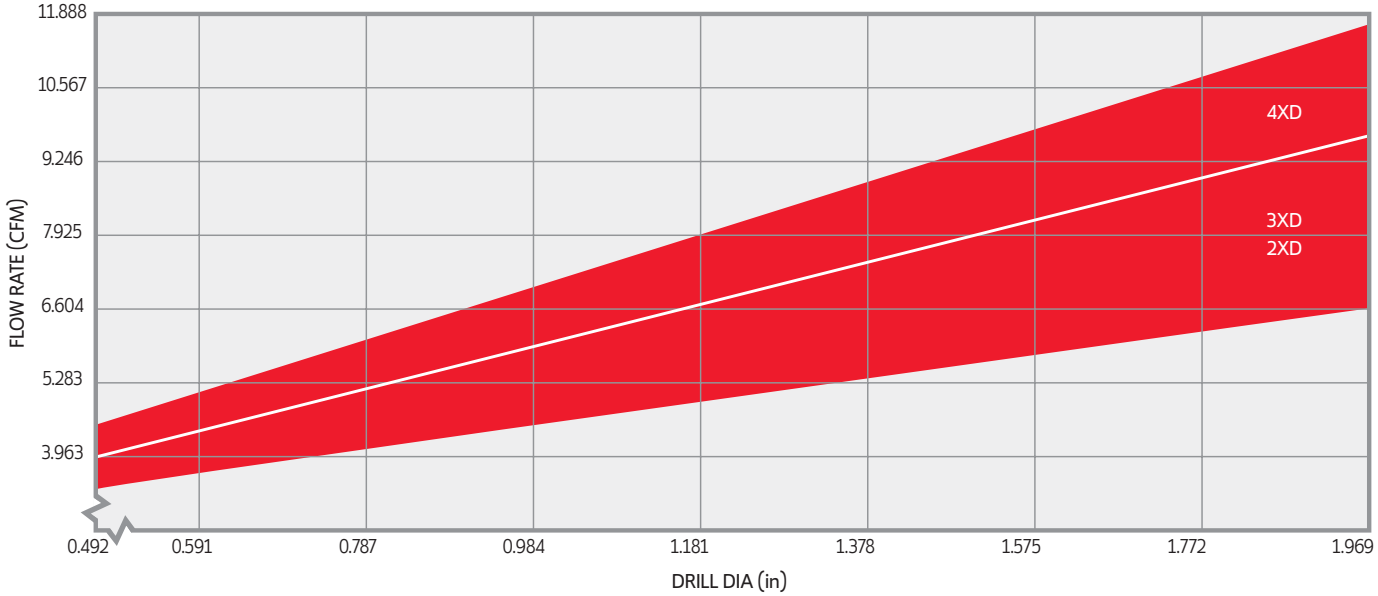
ISO	Material Group Grupo Materiais Grupo Materiales	Vc (SFM)	f (in/rev)								
			Ø0.492-0.591	Ø0.610-0.846	Ø0.866-1.083	Ø1.102-1.299	Ø1.339-1.614	Ø1.654-1.969	Ø1.969-2.362	Ø2.362-2.953	Ø2.953-3.150
P	Unalloyed steel (-0,25%)	591-820	0.002-0.003	0.002-0.004	0.002-0.005	0.003-0.005	0.003-0.006	0.003-0.006	0.002-0.005	0.003-0.005	0.003-0.005
	Low-alloy steel (0,25%-)	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	0.004-0.006	0.005-0.007	0.004-0.007
	Low-alloy steel	492-722	0.002-0.005	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.009	0.003-0.006	0.004-0.007	0.004-0.007
	High-alloy steel	427-591	0.002-0.004	0.003-0.006	0.004-0.008	0.005-0.009	0.005-0.009	0.005-0.010	0.003-0.006	0.004-0.006	0.004-0.006
M	Stainless steel	558-788	0.002-0.004	0.002-0.005	0.003-0.006	0.004-0.006	0.004-0.007	0.004-0.007	0.002-0.005	0.003-0.006	0.003-0.006
K	Grey cast iron	591-820	0.002-0.005	0.003-0.006	0.005-0.008	0.006-0.010	0.006-0.011	0.007-0.012	0.005-0.008	0.006-0.008	0.006-0.008
	Cast iron with nodular cast	427-656	0.002-0.004	0.003-0.006	0.004-0.007	0.005-0.008	0.006-0.009	0.006-0.010	0.004-0.006	0.004-0.007	0.004-0.007

POWER REQUIREMENTS



• 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



HOLE TOLERANCE AND MAXIMUM HOLE SIZE WITH RADIAL ADJUSTMENT

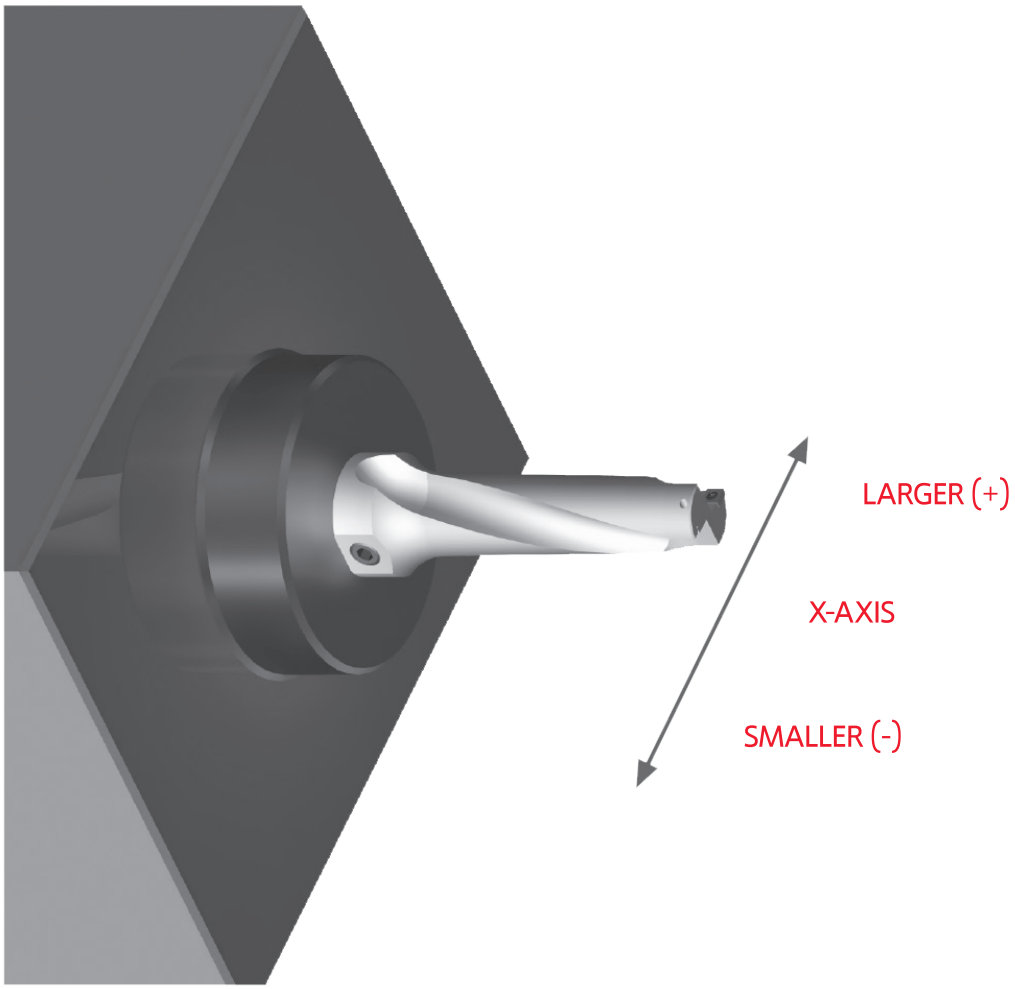
Drill DC	3xD		
	Normal	Radial Adjust	Max. Hole D
0.512	0.518	0.020	0.551
0.551	0.555	0.020	0.591
0.591	0.594	0.020	0.630
0.630	0.633	0.020	0.669
0.669	0.672	0.020	0.709
0.709	0.711	0.020	0.748
0.748	0.751	0.020	0.787
0.787	0.790	0.020	0.827
0.827	0.826	0.010	0.846
0.866	0.864	0.020	0.906
0.906	0.909	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 DC	4xD		
	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

JET DRILLS TECHNICAL INFORMATION FOR LATHE APPLICATIONS

Informação técnica para aplicações | Información técnica para aplicaciones

INITIAL DRILL SET UP AND CHECK

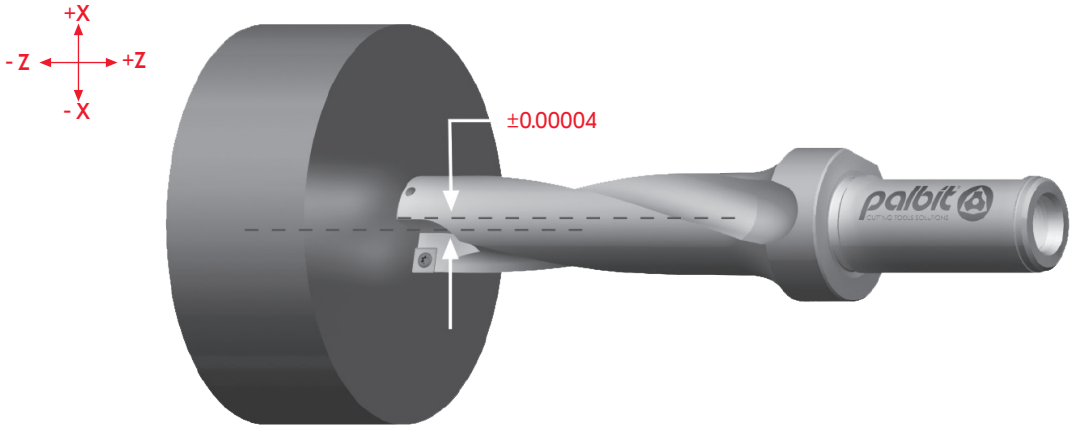


- The cutting edge of insert should be parallel to X-axis to make it possible to do offset cutting. Since a flat part on shank for side lock clamping has been made parallel with the cutting edge line of insert, operator can set the drill as per flat part of shank.

- 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.

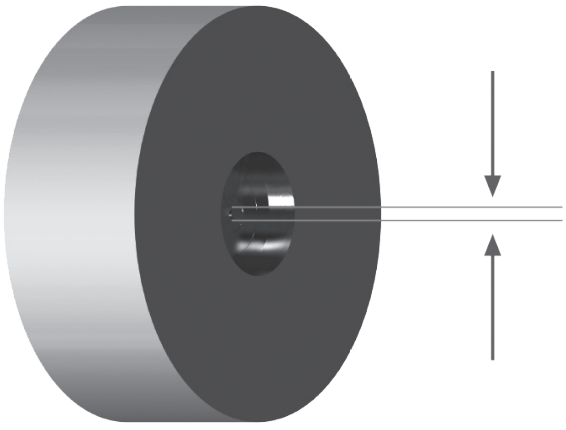
INITIAL DRILL SET UP AND CHECK



- 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 holemaking about 0.197 in depth and then measure the core size if it is around 0.008 in to 0.028 in.

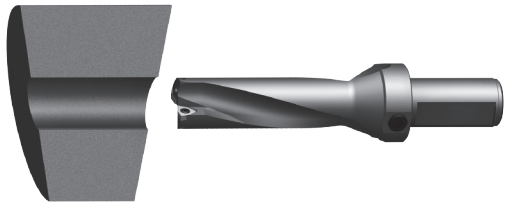
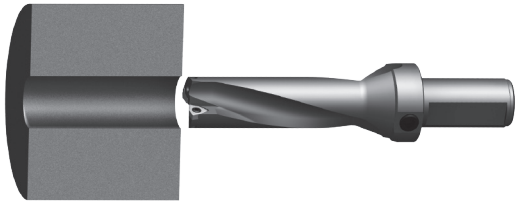
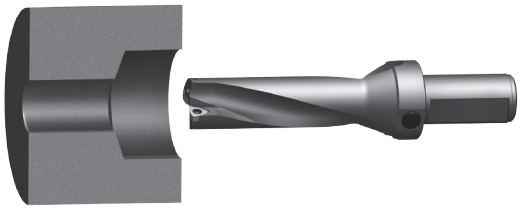
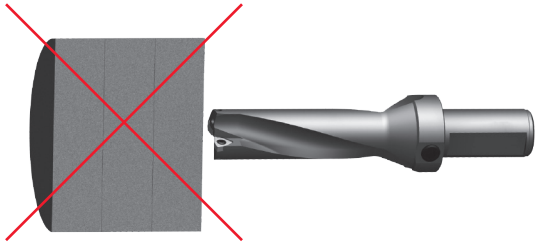
- Para verificar o ajuste faça o teste furando cerca de 0.197 in de profundidade medindo depois o núcleo verificando se este tem aproximadamente 0.008 in a 0.028 in.

- Para comprobar el ajuste hacer un taladro de cerca de 0.197 in de profundidad, medido después su núcleo si se trata de 0.008 in a 0.028 in.

JET DRILLS TROUBLESHOOTING

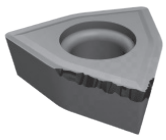
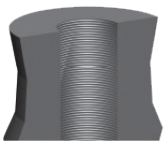
Solução de problemas | Solucción de problemas

RULES & TIPS

Operation | Operação | Operación	Description | Descrição | Descrición
• SPOT HOLEMAKING THROUGH ON INCLINED SURFACES • FURAÇÃO LOCALIZADA E FURAÇÃO ATRAVÉS DE SUPERFICIES INCLINADAS • PERFORACIÓN LOCALIZADA Y PERFORACION SOBRE SUPERFICIES INCLINADAS 	• Up to a 30º inclination angle is possible without reducing the cutting parameters. For angles between 30-40º, reduce feed force at incline surface by 50% • Até um ângulo de 30º é possivel sem a redução dos parametros de corte. Para ângulos entre 30-40º, reduza o avanço na superfície inclinada em 50%. • Hasta un ângulo de inclinación de 30º és posible sin la redución de los parametros de corte. En ângulos entre 30~40º, reduzca el avance en 50%.
• INTERRUPTED CUTS • CORTE INTERROMPIDO • CORTE INTERRUMPIDO 	• For problem-free holemaking in interrupted custs (croos holemaking, etc.), reduce the cutting force and feed by 30% to maintain maximum stability of the machine and clamping mechanisms. • Para furação em corte interrompido, reduza a velocidade de corte e o avanço em 30% para manter a estabilidade máxima da máquina e sistemas de aperto. • En perfuración en corte interrumpido, reduzca la velocidad de corte e el avance en 30% para mantener la estabilidade.
• BORING • MADRILAGEM • MANDRILAGEM 	• Used as boring tool, oofset the drill in the direction of the cutter insert. Watch the outer insert for wear because is cutting more metal than the inner insert and may require more frequent indexing. • Usadas para operações de mandrilamento oriente a broca pela pastilha exterior. Observe o desgaste da pastilha exterior uma vez que esta debasta mais metal que a pastilha interior e poderá requerer uma indexação mais frequente. • En operaciones de mandrilage, oriente el inserto exterior. Se deve observar el desgaste del inserto interior una vez que podrá necessitar de una indexación mas regular.
• HOLEMAKING OF STACKED PLATES • FURAÇÃO DE CHAPAS EMPILHADAS • PERFURACIÓN DE PLACAS APILADAS 	• This is not possible with the standart TDI drills. A final disc will form when the drill breaks through. • Esta operação não é possível com as brocas standard TDI. Um disco forma-se e poderá saltar no final da operação quando trespassa a peça. • Esta operación no és posible com brocas standart TDI.

JET DRILLS TROUBLESHOOTING

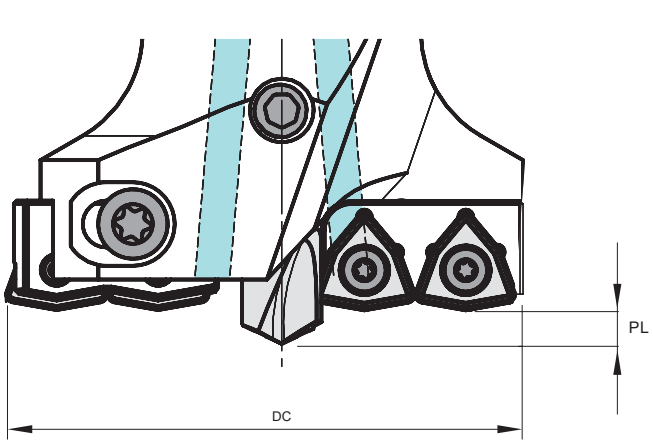
Solução de problemas | Solucción de problemas

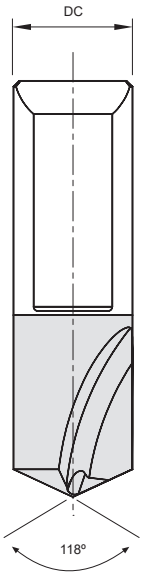
Problem | Problema	Corrective Action	Possível Solução	Solución Posible
INNER CUTTING EDGE CRACKING 	**On Lathes:** • Check machine alignment. • Check clamping accuracy. If tool clamping cannot be improved and/or optimum machine stability is doubtful, reduce feed by 30%. • User tougher carbide grade. **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.

VORTEX DRILLS CUTTING PARAMETERS AND ADJUSTMENTS

Parâmetros de corte e ajustes | Condiciones de corte y ajustes

PILOT DRILL ADJUSTEMENT



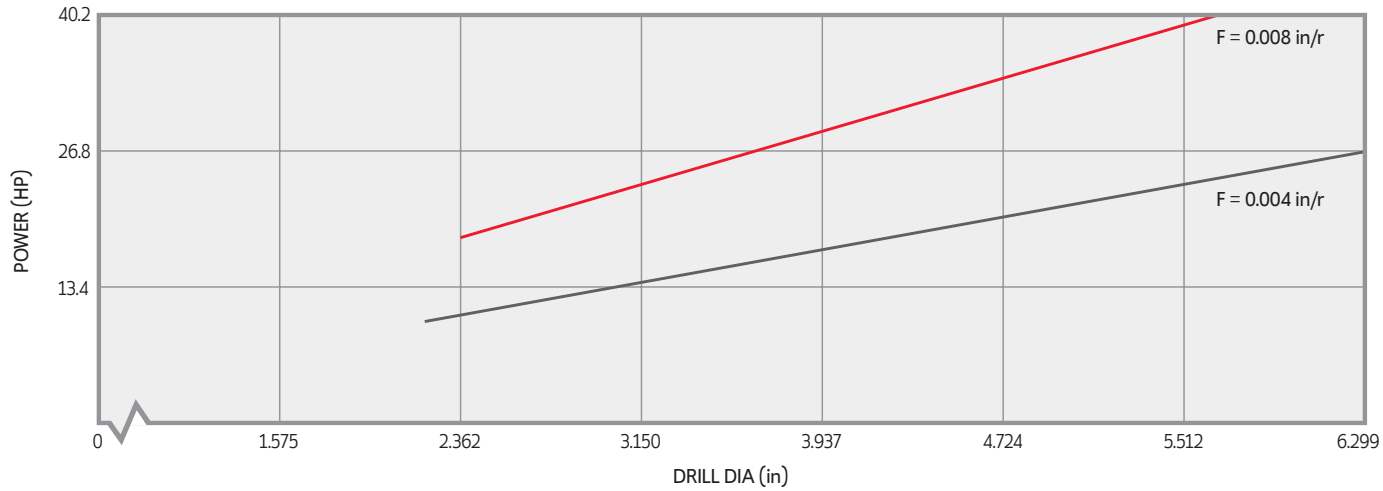


DC (in)	2D to 4D	4D to 6D	> 6D
	PL	PL	PL
1.772-2.165	0.157	0.165	0.173
2.165-2.953	0.213	0.220	0.228
2.953-3.937	0.256	0.268	0.280
3.937-4.724	0.303	0.319	0.335
4.724-6.693	0.390	0.406	0.421
6.693-7.087	0.480	0.496	0.512

RECOMMENDED SPEEDS AND FEEDS

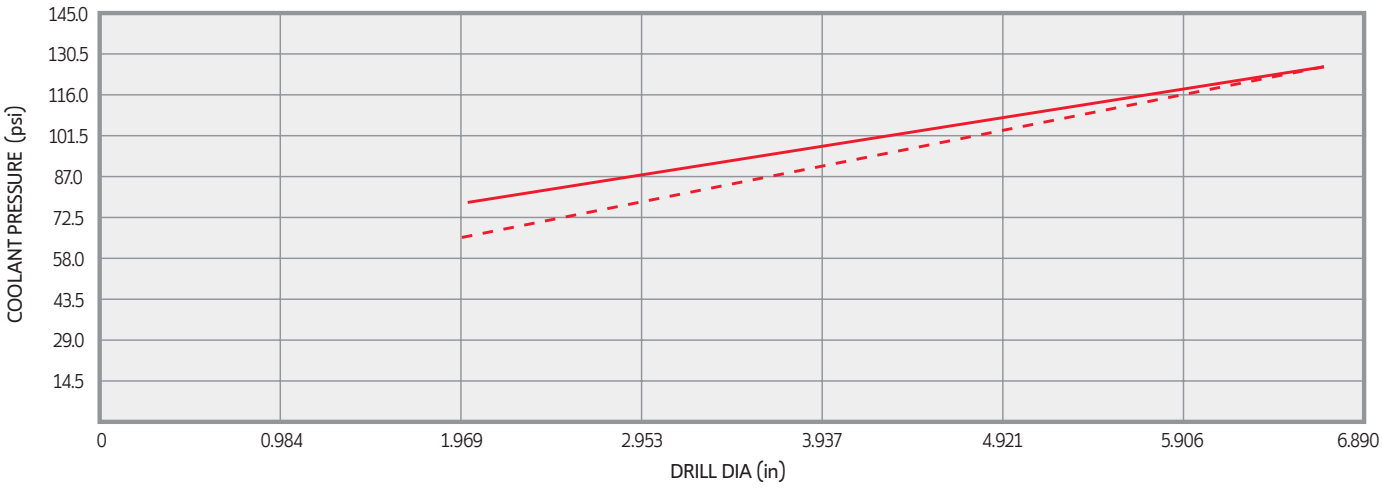
ISO	Material Group Grupo Materiais Grupo Materiales	Vc (SFM)	f (in/rev)						
			Ø1.772-2.165	Ø2.165-2.362	Ø2.362-2.953	Ø2.953-3.937	Ø3.937-4.134	Ø4.134-5.906	Ø5.906-7.087
P	Unalloyed steel (-0,25%)	394-591	0.002-0.004	0.003-0.004	0.003-0.005	0.004-0.006	0.006-0.008	0.003-0.005	0.004-0.006
	Low-alloy steel (0,25%-)	361-558	0.002-0.004	0.003-0.004	0.003-0.005	0.004-0.006	0.005-0.007	0.003-0.005	0.004-0.006
	Low-alloy steel (-HB300)	296-427	0.002-0.004	0.003-0.004	0.003-0.005	0.004-0.006	0.005-0.007	0.003-0.005	0.004-0.006
	High-alloy steel (HB300-)	197-328	0.002-0.003	0.002-0.003	0.002-0.003	0.002-0.004	0.004-0.005	0.002-0.003	0.002-0.004
M	Stainless steel	197-361	0.002-0.003	0.002-0.004	0.002-0.005	0.003-0.006	0.004-0.007	0.002-0.005	0.003-0.006
K	Grey cast iron	394-591	0.003-0.005	0.003-0.006	0.003-0.006	0.004-0.007	0.005-0.009	0.003-0.006	0.004-0.007
	Cast iron with nodular cast	328-591	0.002-0.005	0.003-0.006	0.003-0.006	0.004-0.010	0.005-0.010	0.003-0.006	0.004-0.010

POWER REQUIREMENTS



• These chart is based on machining experiences using steels with a hardness of 200-250HB and cutting speed of 328 SFM.

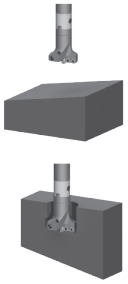
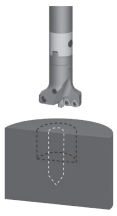
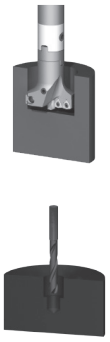
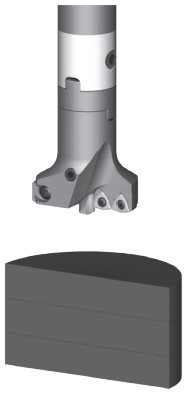
COOLANT APPLICATION CHART



VORTEX DRILLS CUTTING PARAMETERS AND ADJUSTMENTS

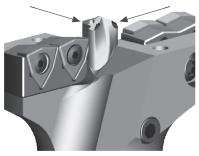
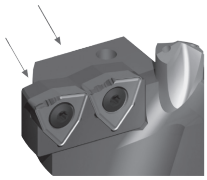
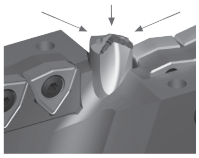
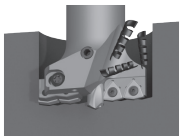
Parâmetros de corte e ajustes | Condiciones de corte y ajustes

RULES & TIPS

WRONG	CORRECT	EN	PT	ES
		**Spot Holemaking** For plain/straight surfaces, no spot holemaking is required. For centering, the center drill diameter should be considerably smaller than the pilot drill diameter.	**Furação Localizada** Para superfícies planas a furação 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 holemaking and holemaking throughon inclined surfaces.** Up to an 8º inclination angle is possible. Holemaking through at a maximum of 4º is possible; otherwise, a pre-facing operation is required.	**Furação localizada e furação através de superfícies inclinadas.** Até 8 º ângulo de inclinação é possível. Furação 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.
		**Holemaking 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.	**Furação 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.

VORTEX DRILLS TROUBLESHOOTING

Solução de problemas | Solucción de problemas

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 (ferramenta 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 holemaking through, a small shoulder will be produced on breakthrough as the pilot drill is no longer cutting.

SOLID CARBIDE

DRILLS



Solid carbide drills represent an excellent choice for ensuring excellent process security and achieving high-quality holes. They offer an optimal combination of feed rate and precision. This includes micro drills and optimized drills.

As brocas de metal duro representam uma excelente escolha para garantir segurança no processo e alcançar furos de alta qualidade. Oferecem uma combinação ideal de taxa de avanço e precisão. Inclui microbrocas e brocas otimizadas.

Las brocas de carburo sólido representan una excelente opción para garantizar seguridad del proceso y lograr orificios de alta calidad. Ofrecen una combinación óptima de velocidad de avance y precisión. Incluye microbrocas y brocas optimizadas.

HBDPE(U)E/W > page 414

- From DC 1/8 in to 3/4 in
  De DC 1/8 in a 3/4 in | Desde DC 1/8 in hasta 3/4 in
- Available in 3D, 5D and 8D
  Disponível em 3D, 5D e 8D | Disponible en 3D, 5D y 8D
- With or without coolant
  Com ou sem refrigeração | Con o sin refrigeración



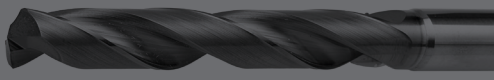
HMDUC(U)E METRIC LINE > page 416

- From DC 0.039 in to 0.114 in
  De DC 0.039 in a 0.114 in | Desde DC 0.039 in hasta 0.114 in
- Available in 3D and 5D
  Disponível em 3D e 5D | Disponible en 3D y 5D
- With or without coolant
  Com ou sem refrigeração | Con o sin refrigeración



HBDPE(U)E/W METRIC LINE > page 418

- From DC 0.118 in to 0.787 in
  De DC 1/8 in a 3/4 in | Desde DC 1/8 in hasta 3/4 in
- Available in 3D, 5D and 8D
  Disponível em 3D, 5D e 8D | Disponible en 3D, 5D y 8D
- With or without coolant
  Com ou sem refrigeração | Con o sin refrigeración



SOLID CARBIDE DRILLS WITH COOLANT

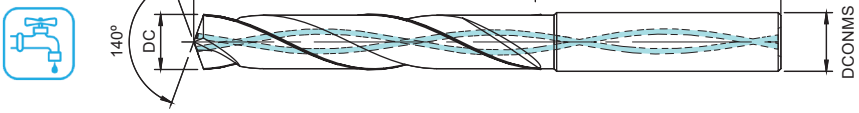
Brocas de metal duro com refrigeração | Brocas en metal duro con refrigeración



P K

HRC ≤ 60|48

IT8~9 IT class



Order code	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Tolerances Tolerâncias Tolerancias	HRC	Stock PHU920
HA (Cylindrical)			DC	DCONMS	LCF	OAL			HA (Cylindrical)
				3D					
118164Z9	HBDPCE 2 03Di 0318-060020	2	1/8	0.236	0.787	2.362	+0.016/+0.004	≤ 60	◎
118164Z9	HBDPCE 2 03Di 0635-075034	2	1/4	0.315	1.339	2.953	+0.021/+0.006		◎
118164Z9	HBDPCE 2 03Di 0953-090047	2	3/8	0.394	1.850	3.543	+0.021/+0.006		◎
118164Z9	HBDPCE 2 03Di 1270-100060	2	1/2	0.551	2.362	3.937	+0.025/+0.007		◎
118164Z9	HBDPCE 2 03Di 1588-108065	2	5/8	0.630	2.559	4.252	+0.025/+0.007		◎
118164Z9	HBDPCE 2 03Di 1905-120079	2	3/4	0.787	3.110	4.724	+0.029/+0.008		◎
				5D					
118164Z9	HBDPCE 2 05Di 0318-075028	2	1/8	0.236	1.102	2.953	+0.016/+0.004	≤ 60	◎
118164Z9	HBDPCE 2 05Di 0635-092053	2	1/4	0.315	2.087	3.622	+0.021/+0.006		◎
118165Z9	HBDPCE 2 05Di 0953-105061	2	3/8	0.394	2.402	4.134	+0.021/+0.006		◎
118165Z9	HBDPCE 2 05Di 1270-126077	2	1/2	0.551	3.031	4.961	+0.025/+0.007		◎
118165Z9	HBDPCE 2 05Di 1588-135083	2	5/8	0.630	3.268	5.315	+0.025/+0.007		◎
118165Z9	HBDPCE 2 05Di 1905-156101	2	3/4	0.787	3.976	6.142	+0.029/+0.008		◎
				8D					
118165Z9	HBDPCE 2 08Di 0318-083040	2	1/8	0.236	1.339	2.835	+0.016/+0.004	≤ 48	◎
118165Z9	HBDPCE 2 08Di 0635-105067	2	1/4	0.315	2.992	4.488	+0.021/+0.006		◎
118165Z9	HBDPCE 2 08Di 0953-135092	2	3/8	0.394	3.740	5.591	+0.021/+0.006		
118165Z9	HBDPCE 2 08Di 1270-163128	2	1/2	0.551	4.488	6.378	+0.025/+0.007		◎
118165Z9	HBDPCE 2 08Di 1588-197146	2	5/8	0.630	5.748	7.756	+0.025/+0.007		◎

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

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SOLID CARBIDE DRILLS WITHOUT COOLANT

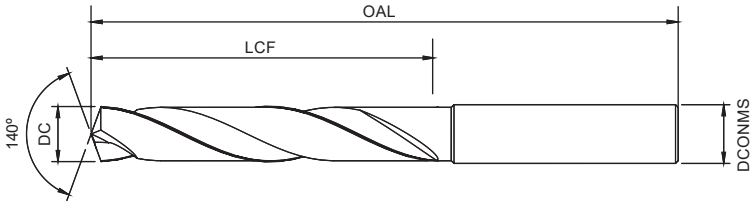
Brocas de metal duro sem refrigeração | Brocas en metal duro sin refrigeración

P K

HRC ≤ 60|48

IT8~9 IT class





Order code	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (in)				Tolerances Tolerâncias Tolerancias	HRC	Stock PHU920
HA (Cylindrical)			DC	DCONMS	LCF	OAL			HA (Cylindrical)
				3D					
1181659Z9	HBDPUE 2 03Di 0318-060020	2	1/8	0.236	0.787	2.362	+0.016/+0.004	≤ 60	◎
1181660Z9	HBDPUE 2 03Di 0635-075034	2	1/4	0.315	1.339	2.953	+0.021/+0.006		◎
1181661Z9	HBDPUE 2 03Di 0953-090047	2	3/8	0.394	1.850	3.543	+0.021/+0.006		◎
1181662Z9	HBDPUE 2 03Di 1270-100060	2	1/2	0.551	2.362	3.937	+0.025/+0.007		◎
1181663Z9	HBDPUE 2 03Di 1588-110065	2	5/8	0.630	2.559	4.331	+0.025/+0.007		◎
1181664Z9	HBDPUE 2 03Di 1905-120079	2	3/4	0.787	3.110	4.724	+0.029/+0.008		◎
				5D					
1181665Z9	HBDPUE 2 05Di 0318-075028	2	1/8	0.236	1.102	2.953	+0.016/+0.004	≤ 60	◎
1181666Z9	HBDPUE 2 05Di 0635-092053	2	1/4	0.315	2.087	3.622	+0.021/+0.006		◎
1181667Z9	HBDPUE 2 05Di 0953-100061	2	3/8	0.394	2.402	3.937	+0.021/+0.006		◎
1181668Z9	HBDPUE 2 05Di 1270-126077	2	1/2	0.551	3.031	4.961	+0.025/+0.007		◎
1181669Z9	HBDPUE 2 05Di 1588-135083	2	5/8	0.630	3.268	5.315	+0.025/+0.007		◎
1181670Z9	HBDPUE 2 05Di 1905-156101	2	3/4	0.787	3.976	6.142	+0.029/+0.008		◎

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

HMDUUE 2 03D Solid carbide drills | Brocas de metal duro | Brocas en metal duro

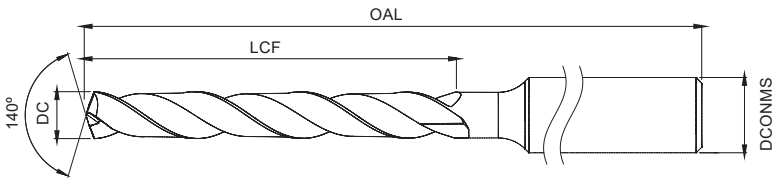
METRIC LINE



P K

HRC ≤ 60

IT8~9 IT class



Order code	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920
HA (Cylindrical)		DC	DCONMS	LCF	OAL		HA (Cylindrical)
118230Z9	HMDUUE 2 03D 0100-045005	0.039	0.157	0.197	1.772	2	◎
118179Z9	HMDUUE 2 03D 0110-045007	0.043	0.157	0.276	1.772	2	◎
118179Z9	HMDUUE 2 03D 0120-045007	0.047	0.157	0.276	1.772	2	◎
118179Z9	HMDUUE 2 03D 0130-045007	0.051	0.157	0.276	1.772	2	◎
118180Z9	HMDUUE 2 03D 0140-045007	0.055	0.157	0.276	1.772	2	◎
118180Z9	HMDUUE 2 03D 0150-045007	0.059	0.157	0.276	1.772	2	◎
118180Z9	HMDUUE 2 03D 0160-055014	0.063	0.157	0.551	2.165	2	◎
118180Z9	HMDUUE 2 03D 0170-055014	0.067	0.157	0.551	2.165	2	◎
118180Z9	HMDUUE 2 03D 0180-055014	0.071	0.157	0.551	2.165	2	◎
118181Z9	HMDUUE 2 03D 0190-055014	0.075	0.157	0.551	2.165	2	◎
118150Z9	HMDUUE 2 03D 0200-055020	0.079	0.157	0.787	2.165	2	◎
118230Z9	HMDUUE 2 03D 0210-055020	0.083	0.157	0.787	2.165	2	◎
118181Z9	HMDUUE 2 03D 0220-055020	0.087	0.157	0.787	2.165	2	◎
118181Z9	HMDUUE 2 03D 0230-055020	0.091	0.157	0.787	2.165	2	◎
118181Z9	HMDUUE 2 03D 0240-055020	0.094	0.157	0.787	2.165	2	◎
118230Z9	HMDUUE 2 03D 0250-055020	0.098	0.157	0.787	2.165	2	◎
118182Z9	HMDUUE 2 03D 0260-055020	0.102	0.157	0.787	2.165	2	◎
118182Z9	HMDUUE 2 03D 0270-055020	0.106	0.157	0.787	2.165	2	◎
118230Z9	HMDUUE 2 03D 0280-055020	0.110	0.157	0.787	2.165	2	◎
118231Z9	HMDUUE 2 03D 0290-055020	0.114	0.157	0.787	2.165	2	◎

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

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HMDUCE 2 05D Solid carbide drills | Brocas de metal duro | Brocas en metal duro

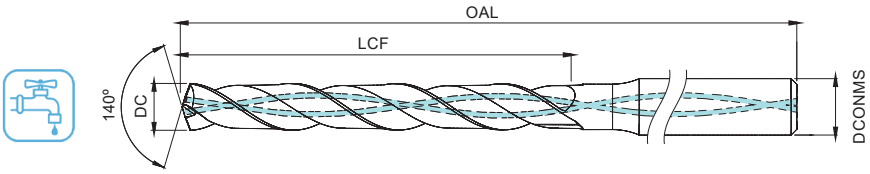
METRIC LINE



P K

HRC ≤ 60

IT8~9 IT class



Order code	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920
HA (Cylindrical)		DC	DCONMS	LCF	OAL		HA (Cylindrical)
118183829	HMDUCE 2 05D 0100-055010	0.039	0.118	0.394	2.165	2	◈
118183929	HMDUCE 2 05D 0110-055012	0.043	0.118	0.472	2.165	2	◈
118184029	HMDUCE 2 05D 0120-055012	0.047	0.118	0.472	2.165	2	◈
118184129	HMDUCE 2 05D 0130-055012	0.051	0.118	0.472	2.165	2	◈
118184229	HMDUCE 2 05D 0140-055012	0.055	0.118	0.472	2.165	2	◈
118184329	HMDUCE 2 05D 0150-055012	0.059	0.118	0.472	2.165	2	◈
118184429	HMDUCE 2 05D 0160-055016	0.063	0.118	0.630	2.165	2	◈
118184529	HMDUCE 2 05D 0170-055016	0.067	0.118	0.630	2.165	2	◈
118184629	HMDUCE 2 05D 0180-055016	0.071	0.118	0.630	2.165	2	◈
118184729	HMDUCE 2 05D 0190-055016	0.075	0.118	0.630	2.165	2	◈
118184829	HMDUCE 2 05D 0200-055016	0.079	0.118	0.630	2.165	2	◈
118184929	HMDUCE 2 05D 0210-055021	0.083	0.118	0.827	2.165	2	◈
118185029	HMDUCE 2 05D 0220-055021	0.087	0.118	0.827	2.165	2	◈
118231129	HMDUCE 2 05D 0230-055021	0.091	0.118	0.827	2.165	2	◈
118231229	HMDUCE 2 05D 0240-055021	0.094	0.118	0.827	2.165	2	◈
118231329	HMDUCE 2 05D 0250-055021	0.098	0.118	0.827	2.165	2	◈
118231429	HMDUCE 2 05D 0260-055021	0.102	0.118	0.827	2.165	2	◈
118185529	HMDUCE 2 05D 0270-055021	0.106	0.118	0.827	2.165	2	◈
118231529	HMDUCE 2 05D 0280-055021	0.110	0.118	0.827	2.165	2	◈
118231629	HMDUCE 2 05D 0290-055021	0.114	0.118	0.827	2.165	2	◈

◈ Stock item | Produto de stock | Itens de stock

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

HBDPCE/W 2 03D Solid carbide drills | Brocas de metal duro | Brocas en metal duro

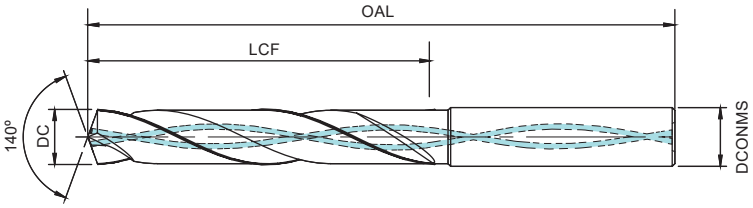
METRIC LINE



P K

HRC ≤ 60

IT8~9 IT class



Drill Dia. DC (in)	DC 0.118	0.118<DC≤0.236	0.236<DC≤0.394	0.394<DC≤0.709	0.709<DC≤0.787
Hole Tolerances	+0.0001	+0.0002	+0.0002	+0.0003	+0.0003
	+0.0005	+0.0006	+0.0008	+0.0010	+0.0011

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1180956Z9	1181963Z9	HBDPCE/W 2 03D 0300-062020	0.118	0.236	0.787	2.441	2	●	●
1180957Z9	1181964Z9	HBDPCE/W 2 03D 0310-062020	0.122	0.236	0.787	2.441	2	●	●
1180958Z9	1181965Z9	HBDPCE/W 2 03D 0320-062020	0.126	0.236	0.787	2.441	2	●	●
1181791Z9	1181966Z9	HBDPCE/W 2 03D 0325-062020	0.128	0.236	0.787	2.441	2	●	○
1180959Z9	1181967Z9	HBDPCE/W 2 03D 0330-062020	0.130	0.236	0.787	2.441	2	●	●
1180960Z9	1181968Z9	HBDPCE/W 2 03D 0340-062020	0.134	0.236	0.787	2.441	2	●	○
1180961Z9	1181969Z9	HBDPCE/W 2 03D 0350-062020	0.138	0.236	0.787	2.441	2	●	●
1180962Z9	1181970Z9	HBDPCE/W 2 03D 0360-062020	0.142	0.236	0.787	2.441	2	●	●
1180963Z9	1181971Z9	HBDPCE/W 2 03D 0370-062020	0.146	0.236	0.787	2.441	2	●	○
1180964Z9	1181972Z9	HBDPCE/W 2 03D 0380-066024	0.150	0.236	0.945	2.598	2	●	○
1180965Z9	1181973Z9	HBDPCE/W 2 03D 0390-066024	0.154	0.236	0.945	2.598	2	●	●
1180966Z9	1181974Z9	HBDPCE/W 2 03D 0400-066024	0.157	0.236	0.945	2.598	2	●	○
1180967Z9	1181975Z9	HBDPCE/W 2 03D 0410-066024	0.161	0.236	0.945	2.598	2	●	●
1180968Z9	1181976Z9	HBDPCE/W 2 03D 0420-066024	0.165	0.236	0.945	2.598	2	●	●
1180969Z9	1181977Z9	HBDPCE/W 2 03D 0430-066024	0.169	0.236	0.945	2.598	2	●	●
1180970Z9	1181978Z9	HBDPCE/W 2 03D 0440-066024	0.173	0.236	0.945	2.598	2	●	●
1180971Z9	1181979Z9	HBDPCE/W 2 03D 0450-066024	0.177	0.236	0.945	2.598	2	●	○
1180972Z9	1181980Z9	HBDPCE/W 2 03D 0460-066024	0.181	0.236	0.945	2.598	2	●	○
1181793Z9	1181981Z9	HBDPCE/W 2 03D 0465-066024	0.183	0.236	0.945	2.598	2	●	○
1180973Z9	1181982Z9	HBDPCE/W 2 03D 0470-066024	0.185	0.236	0.945	2.598	2	●	●
1180974Z9	1181983Z9	HBDPCE/W 2 03D 0480-066028	0.189	0.236	1.102	2.598	2	●	○
1180975Z9	1181984Z9	HBDPCE/W 2 03D 0490-066028	0.193	0.236	1.102	2.598	2	●	●
1180976Z9	1181985Z9	HBDPCE/W 2 03D 0500-066028	0.197	0.236	1.102	2.598	2	●	○
1180977Z9	1181986Z9	HBDPCE/W 2 03D 0510-066028	0.201	0.236	1.102	2.598	2	●	○
1180978Z9	1181987Z9	HBDPCE/W 2 03D 0520-066028	0.205	0.236	1.102	2.598	2	●	○
1180979Z9	1181988Z9	HBDPCE/W 2 03D 0530-066028	0.209	0.236	1.102	2.598	2	●	●

● Stock item | Produto de stock | Itens de stock

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

Continue next page

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Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1180980Z9	1181989Z9	HBDPCE/W 2 03D 0540-066028	0.213	0.236	1.102	2.598	2	●	●
1180981Z9	1181990Z9	HBDPCE/W 2 03D 0550-066028	0.217	0.236	1.102	2.598	2	●	○
1181795Z9	1181991Z9	HBDPCE/W 2 03D 0555-066028	0.219	0.236	1.102	2.598	2	●	●
1180982Z9	1181992Z9	HBDPCE/W 2 03D 0560-066028	0.220	0.236	1.102	2.598	2	●	○
1180983Z9	1181993Z9	HBDPCE/W 2 03D 0570-066028	0.224	0.236	1.102	2.598	2	●	●
1180984Z9	1181994Z9	HBDPCE/W 2 03D 0580-066028	0.228	0.236	1.102	2.598	2	●	○
1180985Z9	1181995Z9	HBDPCE/W 2 03D 0590-066028	0.232	0.236	1.102	2.598	2	●	●
1180986Z9	1181996Z9	HBDPCE/W 2 03D 0600-066028	0.236	0.236	1.102	2.598	2	●	○
1180987Z9	1181997Z9	HBDPCE/W 2 03D 0610-079034	0.240	0.315	1.339	3.110	2	●	○
1180988Z9	1181998Z9	HBDPCE/W 2 03D 0620-079034	0.244	0.315	1.339	3.110	2	●	●
1180989Z9	1181999Z9	HBDPCE/W 2 03D 0630-079034	0.248	0.315	1.339	3.110	2	●	●
1180990Z9	1182000Z9	HBDPCE/W 2 03D 0640-079034	0.252	0.315	1.339	3.110	2	●	●
1180991Z9	1182001Z9	HBDPCE/W 2 03D 0650-079034	0.256	0.315	1.339	3.110	2	●	○
1180792Z9	1182002Z9	HBDPCE/W 2 03D 0660-079034	0.260	0.315	1.339	3.110	2	●	●
1180992Z9	1182003Z9	HBDPCE/W 2 03D 0670-079034	0.264	0.315	1.339	3.110	2	●	●
1180993Z9	1182004Z9	HBDPCE/W 2 03D 0680-079034	0.268	0.315	1.339	3.110	2	●	●
1180994Z9	1182005Z9	HBDPCE/W 2 03D 0690-079034	0.272	0.315	1.339	3.110	2	●	●
1180995Z9	1182006Z9	HBDPCE/W 2 03D 0700-079034	0.276	0.315	1.339	3.110	2	●	●
1180996Z9	1182007Z9	HBDPCE/W 2 03D 0710-079041	0.280	0.315	1.614	3.110	2	●	●
1180997Z9	1182008Z9	HBDPCE/W 2 03D 0720-079041	0.283	0.315	1.614	3.110	2	●	●
1180998Z9	1182009Z9	HBDPCE/W 2 03D 0730-079041	0.287	0.315	1.614	3.110	2	●	●
1180999Z9	1182010Z9	HBDPCE/W 2 03D 0740-079041	0.291	0.315	1.614	3.110	2	●	●
1181000Z9	1182011Z9	HBDPCE/W 2 03D 0750-079041	0.295	0.315	1.614	3.110	2	●	●
1181001Z9	1182012Z9	HBDPCE/W 2 03D 0760-079041	0.299	0.315	1.614	3.110	2	●	●
1181002Z9	1182013Z9	HBDPCE/W 2 03D 0770-079041	0.303	0.315	1.614	3.110	2	●	●
1181003Z9	1182014Z9	HBDPCE/W 2 03D 0780-079041	0.307	0.315	1.614	3.110	2	●	●
1181004Z9	1182015Z9	HBDPCE/W 2 03D 0790-079041	0.311	0.315	1.614	3.110	2	●	○
1181005Z9	1182016Z9	HBDPCE/W 2 03D 0800-079041	0.315	0.315	1.614	3.110	2	●	○
1181006Z9	1182017Z9	HBDPCE/W 2 03D 0810-089047	0.319	0.394	1.850	3.504	2	●	●
1181007Z9	1182018Z9	HBDPCE/W 2 03D 0820-089047	0.323	0.394	1.850	3.504	2	●	○
1181008Z9	1182019Z9	HBDPCE/W 2 03D 0830-089047	0.327	0.394	1.850	3.504	2	●	●
1181009Z9	1182020Z9	HBDPCE/W 2 03D 0840-089047	0.331	0.394	1.850	3.504	2	●	●
1181010Z9	1182021Z9	HBDPCE/W 2 03D 0850-089047	0.335	0.394	1.850	3.504	2	●	○
1181011Z9	1182022Z9	HBDPCE/W 2 03D 0860-089047	0.339	0.394	1.850	3.504	2	●	○
1181012Z9	1182023Z9	HBDPCE/W 2 03D 0870-089047	0.343	0.394	1.850	3.504	2	●	●
1181013Z9	1182024Z9	HBDPCE/W 2 03D 0880-089047	0.346	0.394	1.850	3.504	2	●	●
1181014Z9	1182025Z9	HBDPCE/W 2 03D 0890-089047	0.350	0.394	1.850	3.504	2	●	●
1181015Z9	1182026Z9	HBDPCE/W 2 03D 0900-089047	0.354	0.394	1.850	3.504	2	●	●
1181016Z9	1182027Z9	HBDPCE/W 2 03D 0910-089047	0.358	0.394	1.850	3.504	2	●	○
1181017Z9	1182028Z9	HBDPCE/W 2 03D 0920-089047	0.362	0.394	1.850	3.504	2	●	●
1181018Z9	1182029Z9	HBDPCE/W 2 03D 0930-089047	0.366	0.394	1.850	3.504	2	●	○
1181019Z9	1182030Z9	HBDPCE/W 2 03D 0940-089047	0.370	0.394	1.850	3.504	2	●	●
1181020Z9	1182031Z9	HBDPCE/W 2 03D 0950-089047	0.374	0.394	1.850	3.504	2	●	●
1181021Z9	1182032Z9	HBDPCE/W 2 03D 0960-089047	0.378	0.394	1.850	3.504	2	●	●
1181022Z9	1182033Z9	HBDPCE/W 2 03D 0970-089047	0.382	0.394	1.850	3.504	2	●	●
1181023Z9	1182034Z9	HBDPCE/W 2 03D 0980-089047	0.386	0.394	1.850	3.504	2	●	○

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

Continue next page

HBDPCE/W 2 03D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1181024Z9	1182035Z9	HBDPCE/W 2 03D 0990-089047	0.390	0.394	1.850	3.504	2	◉	◉
1181025Z9	1182036Z9	HBDPCE/W 2 03D 1000-089047	0.394	0.394	1.850	3.504	2	◉	○
1181026Z9	-	HBDPCE/W 2 03D 1010-102055	0.398	0.472	2.165	4.016	2	◉	-
1181027Z9	1182037Z9	HBDPCE/W 2 03D 1020-102055	0.402	0.472	2.165	4.016	2	◉	◉
1181028Z9	1182038Z9	HBDPCE/W 2 03D 1030-102055	0.406	0.472	2.165	4.016	2	◉	◉
1181029Z9	-	HBDPCE/W 2 03D 1040-102055	0.409	0.472	2.165	4.016	2	◉	-
1181030Z9	1182039Z9	HBDPCE/W 2 03D 1050-102055	0.413	0.472	2.165	4.016	2	○	○
1181031Z9	-	HBDPCE/W 2 03D 1060-102055	0.417	0.472	2.165	4.016	2	◉	-
1181032Z9	-	HBDPCE/W 2 03D 1070-102055	0.421	0.472	2.165	4.016	2	○	-
1181033Z9	1182040Z9	HBDPCE/W 2 03D 1080-102055	0.425	0.472	2.165	4.016	2	○	◉
1181034Z9	-	HBDPCE/W 2 03D 1090-102055	0.429	0.472	2.165	4.016	2	◉	-
1181035Z9	1182041Z9	HBDPCE/W 2 03D 1100-102055	0.433	0.472	2.165	4.016	2	○	○
1181036Z9	-	HBDPCE/W 2 03D 1110-102055	0.437	0.472	2.165	4.016	2	◉	-
1181037Z9	1182042Z9	HBDPCE/W 2 03D 1120-102055	0.441	0.472	2.165	4.016	2	○	◉
1181038Z9	-	HBDPCE/W 2 03D 1130-102055	0.445	0.472	2.165	4.016	2	◉	-
1181039Z9	-	HBDPCE/W 2 03D 1140-102055	0.449	0.472	2.165	4.016	2	○	-
1181040Z9	1182043Z9	HBDPCE/W 2 03D 1150-102055	0.453	0.472	2.165	4.016	2	◉	◉
1181041Z9	-	HBDPCE/W 2 03D 1160-102055	0.457	0.472	2.165	4.016	2	○	-
1181042Z9	-	HBDPCE/W 2 03D 1170-102055	0.461	0.472	2.165	4.016	2	○	-
1181043Z9	1182044Z9	HBDPCE/W 2 03D 1180-102055	0.465	0.472	2.165	4.016	2	◉	○
1181044Z9	-	HBDPCE/W 2 03D 1190-102055	0.469	0.472	2.165	4.016	2	○	-
1181045Z9	1182045Z9	HBDPCE/W 2 03D 1200-102055	0.472	0.472	2.165	4.016	2	◉	○
1181046Z9	1182046Z9	HBDPCE/W 2 03D 1250-107060	0.492	0.551	2.362	4.213	2	◉	○
1181770Z9	1182047Z9	HBDPCE/W 2 03D 1280-107060	0.504	0.551	2.362	4.213	2	◉	○
1181047Z9	1182048Z9	HBDPCE/W 2 03D 1300-107060	0.512	0.551	2.362	4.213	2	◉	◉
1182399Z9	1182402Z9	HBDPCE/W 2 03D 1320-107060	0.520	0.551	2.362	4.213	2	◉	○
1181048Z9	1182049Z9	HBDPCE/W 2 03D 1350-107060	0.531	0.551	2.362	4.213	2	◉	○
1181772Z9	1182050Z9	HBDPCE/W 2 03D 1380-107060	0.543	0.551	2.362	4.213	2	◉	◉
1181049Z9	1182051Z9	HBDPCE/W 2 03D 1400-107060	0.551	0.551	2.362	4.213	2	◉	◉
1181774Z9	1182052Z9	HBDPCE/W 2 03D 1420-115065	0.559	0.630	2.559	4.528	2	◉	○
1181050Z9	1182053Z9	HBDPCE/W 2 03D 1450-115065	0.571	0.630	2.559	4.528	2	◉	○
1181776Z9	1182054Z9	HBDPCE/W 2 03D 1480-115065	0.583	0.630	2.559	4.528	2	◉	◉
1181051Z9	1182055Z9	HBDPCE/W 2 03D 1500-115065	0.591	0.630	2.559	4.528	2	◉	◉
1181052Z9	1182056Z9	HBDPCE/W 2 03D 1550-115065	0.610	0.630	2.559	4.528	2	◉	◉
1181778Z9	1182057Z9	HBDPCE/W 2 03D 1580-115065	0.622	0.630	2.559	4.528	2	◉	◉
1181053Z9	1182058Z9	HBDPCE/W 2 03D 1600-115065	0.630	0.630	2.559	4.528	2	◉	○
1181054Z9	1182059Z9	HBDPCE/W 2 03D 1650-123073	0.650	0.709	2.874	4.843	2	◉	◉
1181055Z9	1182060Z9	HBDPCE/W 2 03D 1700-123073	0.669	0.709	2.874	4.843	2	◉	○
1181056Z9	1182061Z9	HBDPCE/W 2 03D 1750-123073	0.689	0.709	2.874	4.843	2	◉	○
1181057Z9	1182062Z9	HBDPCE/W 2 03D 1800-123073	0.709	0.709	2.874	4.843	2	◉	○
1181058Z9	1182063Z9	HBDPCE/W 2 03D 1850-131079	0.728	0.787	3.110	5.157	2	◉	◉
1181059Z9	1182064Z9	HBDPCE/W 2 03D 1900-131079	0.748	0.787	3.110	5.157	2	◉	◉
1181060Z9	1182065Z9	HBDPCE/W 2 03D 1950-131079	0.768	0.787	3.110	5.157	2	◉	◉
1181061Z9	1182066Z9	HBDPCE/W 2 03D 2000-131079	0.787	0.787	3.110	5.157	2	◉	○

◉ Stock item | Produto de stock | Itens de stock

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

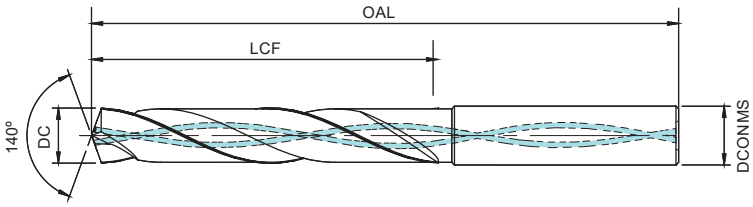
HBDPCE/W 2 05D Solid carbide drills | Brocas de metal duro | Brocas en metal duro

P K

HRC ≤ 60

IT8~9 IT class





Drill Dia. DC (in)	DC 0.118	0.118<DC≤0.236	0.236<DC≤0.394	0.394<DC≤0.709	0.709<DC≤0.787
Hole Tolerances	+0.0001	+0.0002	+0.0002	+0.0003	+0.0003
	+0.0005	+0.0006	+0.0008	+0.0010	+0.0011

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1180788Z9	1182067Z9	HBDPCE/W 2 05D 0300-066028	0.118	0.236	1.102	2.598	2	●	●
1181160Z9	1182068Z9	HBDPCE/W 2 05D 0310-066028	0.122	0.236	1.102	2.598	2	●	○
1181161Z9	1182069Z9	HBDPCE/W 2 05D 0320-066028	0.126	0.236	1.102	2.598	2	●	○
1181825Z9	1182070Z9	HBDPCE/W 2 05D 0325-066028	0.128	0.236	1.102	2.598	2	●	●
1181162Z9	1182071Z9	HBDPCE/W 2 05D 0330-066028	0.130	0.236	1.102	2.598	2	●	●
1180797Z9	1182072Z9	HBDPCE/W 2 05D 0340-066028	0.134	0.236	1.102	2.598	2	●	○
1181163Z9	1182073Z9	HBDPCE/W 2 05D 0350-066028	0.138	0.236	1.102	2.598	2	●	●
1181164Z9	1182074Z9	HBDPCE/W 2 05D 0360-066028	0.142	0.236	1.102	2.598	2	●	○
1180798Z9	1182075Z9	HBDPCE/W 2 05D 0370-066028	0.146	0.236	1.102	2.598	2	●	●
1181165Z9	1182076Z9	HBDPCE/W 2 05D 0380-074036	0.150	0.236	1.417	2.913	2	●	○
1181166Z9	1182077Z9	HBDPCE/W 2 05D 0390-074036	0.154	0.236	1.417	2.913	2	●	○
1181167Z9	1182078Z9	HBDPCE/W 2 05D 0400-074036	0.157	0.236	1.417	2.913	2	●	●
1181168Z9	1182079Z9	HBDPCE/W 2 05D 0410-074036	0.161	0.236	1.417	2.913	2	●	●
1180799Z9	1182080Z9	HBDPCE/W 2 05D 0420-074036	0.165	0.236	1.417	2.913	2	●	●
1180800Z9	1182081Z9	HBDPCE/W 2 05D 0430-074036	0.169	0.236	1.417	2.913	2	●	●
1181169Z9	1182082Z9	HBDPCE/W 2 05D 0440-074036	0.173	0.236	1.417	2.913	2	●	●
1181170Z9	1182083Z9	HBDPCE/W 2 05D 0450-074036	0.177	0.236	1.417	2.913	2	●	●
1181171Z9	1182084Z9	HBDPCE/W 2 05D 0460-074036	0.181	0.236	1.417	2.913	2	●	●
1181535Z9	1182085Z9	HBDPCE/W 2 05D 0465-074036	0.183	0.236	1.417	2.913	2	●	●
1181172Z9	1182086Z9	HBDPCE/W 2 05D 0470-074036	0.185	0.236	1.417	2.913	2	●	●
1181173Z9	1182087Z9	HBDPCE/W 2 05D 0480-082044	0.189	0.236	1.732	3.228	2	●	○
1181174Z9	1182088Z9	HBDPCE/W 2 05D 0490-082044	0.193	0.236	1.732	3.228	2	●	●
1180801Z9	1182089Z9	HBDPCE/W 2 05D 0500-082044	0.197	0.236	1.732	3.228	2	●	●
1181175Z9	1182090Z9	HBDPCE/W 2 05D 0510-082044	0.201	0.236	1.732	3.228	2	●	●
1181176Z9	1182091Z9	HBDPCE/W 2 05D 0520-082044	0.205	0.236	1.732	3.228	2	●	●
1181177Z9	1182092Z9	HBDPCE/W 2 05D 0530-082044	0.209	0.236	1.732	3.228	2	●	●

● Stock item | Produto de stock | Itens de stock

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

Continue next page

HBDPCE/W 2 05D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1181178Z9	1182093Z9	HBDPCE/W 2 05D 0540-082044	0.213	0.236	1.732	3.228	2	●	●
1181179Z9	1182094Z9	HBDPCE/W 2 05D 0550-082044	0.217	0.236	1.732	3.228	2	●	●
1181536Z9	1182095Z9	HBDPCE/W 2 05D 0555-082044	0.219	0.236	1.732	3.228	2	●	●
1181180Z9	1182096Z9	HBDPCE/W 2 05D 0560-082044	0.220	0.236	1.732	3.228	2	●	●
1181181Z9	1182097Z9	HBDPCE/W 2 05D 0570-082044	0.224	0.236	1.732	3.228	2	●	○
1180802Z9	1182098Z9	HBDPCE/W 2 05D 0580-082044	0.228	0.236	1.732	3.228	2	●	●
1181182Z9	1182099Z9	HBDPCE/W 2 05D 0590-082044	0.232	0.236	1.732	3.228	2	●	○
1181183Z9	1182100Z9	HBDPCE/W 2 05D 0600-082044	0.236	0.236	1.732	3.228	2	●	●
1181184Z9	1182101Z9	HBDPCE/W 2 05D 0610-091053	0.240	0.315	2.087	3.583	2	●	●
1181185Z9	1182102Z9	HBDPCE/W 2 05D 0620-091053	0.244	0.315	2.087	3.583	2	●	●
1181186Z9	1182103Z9	HBDPCE/W 2 05D 0630-091053	0.248	0.315	2.087	3.583	2	●	○
1181187Z9	1182104Z9	HBDPCE/W 2 05D 0640-091053	0.252	0.315	2.087	3.583	2	●	○
1180787Z9	1182105Z9	HBDPCE/W 2 05D 0650-091053	0.256	0.315	2.087	3.583	2	●	●
1181188Z9	1182106Z9	HBDPCE/W 2 05D 0660-091053	0.260	0.315	2.087	3.583	2	●	●
1181189Z9	1182107Z9	HBDPCE/W 2 05D 0670-091053	0.264	0.315	2.087	3.583	2	●	●
1180803Z9	1182108Z9	HBDPCE/W 2 05D 0680-091053	0.268	0.315	2.087	3.583	2	●	●
1181190Z9	1182109Z9	HBDPCE/W 2 05D 0690-091053	0.272	0.315	2.087	3.583	2	●	●
1180804Z9	1182110Z9	HBDPCE/W 2 05D 0700-091053	0.276	0.315	2.087	3.583	2	●	●
1181191Z9	1182111Z9	HBDPCE/W 2 05D 0710-091053	0.280	0.315	2.087	3.583	2	●	●
1181192Z9	1182112Z9	HBDPCE/W 2 05D 0720-091053	0.283	0.315	2.087	3.583	2	●	●
1181193Z9	1182113Z9	HBDPCE/W 2 05D 0730-091053	0.287	0.315	2.087	3.583	2	●	●
1180805Z9	1182114Z9	HBDPCE/W 2 05D 0740-091053	0.291	0.315	2.087	3.583	2	●	●
1181194Z9	1182115Z9	HBDPCE/W 2 05D 0750-091053	0.295	0.315	2.087	3.583	2	●	●
1181195Z9	1182116Z9	HBDPCE/W 2 05D 0760-091053	0.299	0.315	2.087	3.583	2	●	●
1181196Z9	1182117Z9	HBDPCE/W 2 05D 0770-091053	0.303	0.315	2.087	3.583	2	●	●
1181197Z9	1182118Z9	HBDPCE/W 2 05D 0780-091053	0.307	0.315	2.087	3.583	2	●	●
1181198Z9	1182119Z9	HBDPCE/W 2 05D 0790-091053	0.311	0.315	2.087	3.583	2	●	●
1181199Z9	1182120Z9	HBDPCE/W 2 05D 0800-091053	0.315	0.315	2.087	3.583	2	●	●
1181200Z9	1182121Z9	HBDPCE/W 2 05D 0810-103061	0.319	0.394	2.402	4.055	2	●	○
1181201Z9	1182122Z9	HBDPCE/W 2 05D 0820-103061	0.323	0.394	2.402	4.055	2	●	●
1181202Z9	1182123Z9	HBDPCE/W 2 05D 0830-103061	0.327	0.394	2.402	4.055	2	●	○
1181203Z9	1182124Z9	HBDPCE/W 2 05D 0840-103061	0.331	0.394	2.402	4.055	2	●	●
1180806Z9	1182125Z9	HBDPCE/W 2 05D 0850-103061	0.335	0.394	2.402	4.055	2	●	●
1181204Z9	1182126Z9	HBDPCE/W 2 05D 0860-103061	0.339	0.394	2.402	4.055	2	●	●
1181205Z9	1182127Z9	HBDPCE/W 2 05D 0870-103061	0.343	0.394	2.402	4.055	2	●	●
1181206Z9	1182128Z9	HBDPCE/W 2 05D 0880-103061	0.346	0.394	2.402	4.055	2	●	●
1181207Z9	1182129Z9	HBDPCE/W 2 05D 0890-103061	0.350	0.394	2.402	4.055	2	●	○
1180807Z9	1182130Z9	HBDPCE/W 2 05D 0900-103061	0.354	0.394	2.402	4.055	2	●	●
1181208Z9	1182131Z9	HBDPCE/W 2 05D 0910-103061	0.358	0.394	2.402	4.055	2	●	●
1181209Z9	1182132Z9	HBDPCE/W 2 05D 0920-103061	0.362	0.394	2.402	4.055	2	●	○
1181210Z9	1182133Z9	HBDPCE/W 2 05D 0930-103061	0.366	0.394	2.402	4.055	2	●	●
1181211Z9	1182134Z9	HBDPCE/W 2 05D 0940-103061	0.370	0.394	2.402	4.055	2	●	●
1181212Z9	1182135Z9	HBDPCE/W 2 05D 0950-103061	0.374	0.394	2.402	4.055	2	●	●
1181213Z9	1182136Z9	HBDPCE/W 2 05D 0960-103061	0.378	0.394	2.402	4.055	2	●	●
1181214Z9	1182137Z9	HBDPCE/W 2 05D 0970-103061	0.382	0.394	2.402	4.055	2	●	●
1181215Z9	1182138Z9	HBDPCE/W 2 05D 0980-103061	0.386	0.394	2.402	4.055	2	●	●

● Stock item | Produto de stock | Itens de stock

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

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palbit

HBDPCE/W 2 05D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1181216Z9	1182139Z9	HBDPCE/W 2 05D 0990-103061	0.390	0.394	2.402	4.055	2	◉	○
1181217Z9	1182140Z9	HBDPCE/W 2 05D 1000-103061	0.394	0.394	2.402	4.055	2	◉	◉
1181218Z9	1182141Z9	HBDPCE/W 2 05D 1010-118071	0.398	0.472	2.795	4.646	2	◉	◉
1180808Z9	1182142Z9	HBDPCE/W 2 05D 1020-118071	0.402	0.472	2.795	4.646	2	◉	○
1181219Z9	1182143Z9	HBDPCE/W 2 05D 1030-118071	0.406	0.472	2.795	4.646	2	◉	◉
1181220Z9	1182144Z9	HBDPCE/W 2 05D 1040-118071	0.409	0.472	2.795	4.646	2	◉	○
1180809Z9	1182145Z9	HBDPCE/W 2 05D 1050-118071	0.413	0.472	2.795	4.646	2	◉	◉
1180810Z9	-	HBDPCE/W 2 05D 1060-118071	0.417	0.472	2.795	4.646	2	◉	-
1181221Z9	-	HBDPCE/W 2 05D 1070-118071	0.421	0.472	2.795	4.646	2	◉	-
1181222Z9	1182146Z9	HBDPCE/W 2 05D 1080-118071	0.425	0.472	2.795	4.646	2	◉	◉
1181223Z9	-	HBDPCE/W 2 05D 1090-118071	0.429	0.472	2.795	4.646	2	◉	-
1180811Z9	1182147Z9	HBDPCE/W 2 05D 1100-118071	0.433	0.472	2.795	4.646	2	◉	◉
1181224Z9	1182148Z9	HBDPCE/W 2 05D 1110-118071	0.437	0.472	2.795	4.646	2	◉	◉
1181225Z9	1182149Z9	HBDPCE/W 2 05D 1120-118071	0.441	0.472	2.795	4.646	2	◉	◉
1181226Z9	1182150Z9	HBDPCE/W 2 05D 1130-118071	0.445	0.472	2.795	4.646	2	◉	◉
1181227Z9	-	HBDPCE/W 2 05D 1140-118071	0.449	0.472	2.795	4.646	2	◉	-
1180812Z9	1182151Z9	HBDPCE/W 2 05D 1150-118071	0.453	0.472	2.795	4.646	2	◉	○
1181228Z9	-	HBDPCE/W 2 05D 1160-118071	0.457	0.472	2.795	4.646	2	◉	-
1181229Z9	-	HBDPCE/W 2 05D 1170-118071	0.461	0.472	2.795	4.646	2	◉	-
1181230Z9	1182152Z9	HBDPCE/W 2 05D 1180-118071	0.465	0.472	2.795	4.646	2	◉	◉
1181231Z9	-	HBDPCE/W 2 05D 1190-118071	0.469	0.472	2.795	4.646	2	◉	-
1180813Z9	1182153Z9	HBDPCE/W 2 05D 1200-118071	0.472	0.472	2.795	4.646	2	◉	○
1181805Z9	1182154Z9	HBDPCE/W 2 05D 1220-124077	0.480	0.551	3.031	4.882	2	◉	○
1181232Z9	1182155Z9	HBDPCE/W 2 05D 1250-124077	0.492	0.551	3.031	4.882	2	◉	○
1181806Z9	1182156Z9	HBDPCE/W 2 05D 1280-124077	0.504	0.551	3.031	4.882	2	◉	○
1180814Z9	1182157Z9	HBDPCE/W 2 05D 1300-124077	0.512	0.551	3.031	4.882	2	◉	◉
1182267Z9	-	HBDPCE/W 2 05D 1320-124077	0.520	0.551	3.031	4.882	2	◉	-
1181233Z9	1182158Z9	HBDPCE/W 2 05D 1350-124077	0.531	0.551	3.031	4.882	2	◉	◉
1181807Z9	1182159Z9	HBDPCE/W 2 05D 1380-124077	0.543	0.551	3.031	4.882	2	◉	◉
1181808Z9	1182160Z9	HBDPCE/W 2 05D 1390-124077	0.547	0.551	3.031	4.882	2	◉	◉
1181234Z9	1182161Z9	HBDPCE/W 2 05D 1400-124077	0.551	0.551	3.031	4.882	2	◉	◉
1181809Z9	1182162Z9	HBDPCE/W 2 05D 1420-133083	0.559	0.630	3.268	5.236	2	◉	○
1181235Z9	1182163Z9	HBDPCE/W 2 05D 1450-133083	0.571	0.630	3.268	5.236	2	◉	◉
1181810Z9	1182164Z9	HBDPCE/W 2 05D 1480-133083	0.583	0.630	3.268	5.236	2	◉	◉
1181236Z9	1182165Z9	HBDPCE/W 2 05D 1500-133083	0.591	0.630	3.268	5.236	2	◉	◉
1181811Z9	1182166Z9	HBDPCE/W 2 05D 1520-133083	0.598	0.630	3.268	5.236	2	◉	○
1181237Z9	1182167Z9	HBDPCE/W 2 05D 1550-133083	0.610	0.630	3.268	5.236	2	◉	◉
1181812Z9	1182168Z9	HBDPCE/W 2 05D 1570-133083	0.618	0.630	3.268	5.236	2	◉	◉
1180815Z9	1182169Z9	HBDPCE/W 2 05D 1580-133083	0.622	0.630	3.268	5.236	2	◉	◉
1181238Z9	1182170Z9	HBDPCE/W 2 05D 1600-133083	0.630	0.630	3.268	5.236	2	◉	◉
1181239Z9	1182171Z9	HBDPCE/W 2 05D 1650-143093	0.650	0.709	3.661	5.630	2	◉	◉
1181240Z9	1182172Z9	HBDPCE/W 2 05D 1700-143093	0.669	0.709	3.661	5.630	2	◉	◉
1180816Z9	1182173Z9	HBDPCE/W 2 05D 1750-143093	0.689	0.709	3.661	5.630	2	◉	○
1181241Z9	1182174Z9	HBDPCE/W 2 05D 1800-143093	0.709	0.709	3.661	5.630	2	◉	○
1181242Z9	1182175Z9	HBDPCE/W 2 05D 1850-153101	0.728	0.787	3.976	6.024	2	◉	○
1181243Z9	1182176Z9	HBDPCE/W 2 05D 1900-153101	0.748	0.787	3.976	6.024	2	◉	◉
1181244Z9	1182177Z9	HBDPCE/W 2 05D 1950-153101	0.768	0.787	3.976	6.024	2	◉	◉
1181245Z9	1182178Z9	HBDPCE/W 2 05D 2000-153101	0.787	0.787	3.976	6.024	2	◉	◉

◉ Stock item | Produto de stock | Itens de stock

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

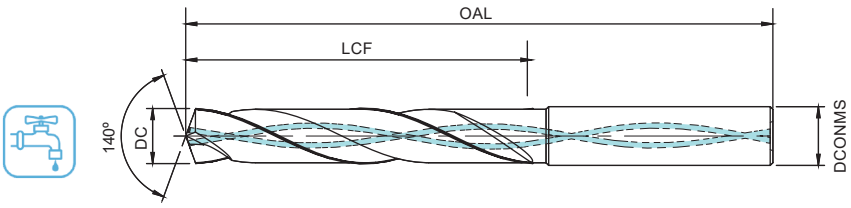
HBDPCE/W 2 08D Solid carbide drills | Brocas de metal duro | Brocas en metal duro



P K

HRC ≤ 48

IT8~9 IT class



Drill Dia. DC	0.118≤DC≤ 0.197	0.197<DC≤0.236	0.236DC≤0.394	0.394<DC≤0.472
Hole Tolerances	+0.0001	+0.0002	+0.0002	+0.0003
	+0.0005	+0.0006	+0.0008	+0.0010

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1181246Z9	-	HBDPCE/W 2 08D 0300-072034	0.118	0.236	1.339	2.835	2	◎	-
1181247Z9	-	HBDPCE/W 2 08D 0310-072034	0.122	0.236	1.339	2.835	2	○	-
1181248Z9	-	HBDPCE/W 2 08D 0320-072034	0.126	0.236	1.339	2.835	2	○	-
1181249Z9	-	HBDPCE/W 2 08D 0330-072034	0.130	0.236	1.339	2.835	2	◎	-
1181250Z9	-	HBDPCE/W 2 08D 0340-072034	0.134	0.236	1.339	2.835	2	◎	-
1181251Z9	-	HBDPCE/W 2 08D 0350-072034	0.138	0.236	1.339	2.835	2	○	-
1181252Z9	-	HBDPCE/W 2 08D 0360-072034	0.142	0.236	1.339	2.835	2	○	-
1181253Z9	-	HBDPCE/W 2 08D 0370-072034	0.146	0.236	1.339	2.835	2	◎	-
1181254Z9	-	HBDPCE/W 2 08D 0380-081043	0.150	0.236	1.693	3.189	2	○	-
1181255Z9	-	HBDPCE/W 2 08D 0390-081043	0.154	0.236	1.693	3.189	2	○	-
1181256Z9	-	HBDPCE/W 2 08D 0400-081043	0.157	0.236	1.693	3.189	2	◎	-
1181257Z9	-	HBDPCE/W 2 08D 0410-081043	0.161	0.236	1.693	3.189	2	○	-
1181258Z9	-	HBDPCE/W 2 08D 0420-081043	0.165	0.236	1.693	3.189	2	◎	-
1181259Z9	-	HBDPCE/W 2 08D 0430-081043	0.169	0.236	1.693	3.189	2	◎	-
1181260Z9	-	HBDPCE/W 2 08D 0440-081043	0.173	0.236	1.693	3.189	2	○	-
1181261Z9	-	HBDPCE/W 2 08D 0450-081043	0.177	0.236	1.693	3.189	2	○	-
1181262Z9	-	HBDPCE/W 2 08D 0460-081043	0.181	0.236	1.693	3.189	2	○	-
1181263Z9	-	HBDPCE/W 2 08D 0470-081043	0.185	0.236	1.693	3.189	2	○	-
1181264Z9	-	HBDPCE/W 2 08D 0480-095057	0.189	0.236	2.244	3.740	2	◎	-
1181265Z9	-	HBDPCE/W 2 08D 0490-095057	0.193	0.236	2.244	3.740	2	○	-
1181266Z9	-	HBDPCE/W 2 08D 0500-095057	0.197	0.236	2.244	3.740	2	◎	-
1181267Z9	-	HBDPCE/W 2 08D 0510-095057	0.201	0.236	2.244	3.740	2	◎	-
1181268Z9	-	HBDPCE/W 2 08D 0520-095057	0.205	0.236	2.244	3.740	2	○	-
1181269Z9	-	HBDPCE/W 2 08D 0530-095057	0.209	0.236	2.244	3.740	2	○	-
1181270Z9	-	HBDPCE/W 2 08D 0540-095057	0.213	0.236	2.244	3.740	2	○	-
1181271Z9	-	HBDPCE/W 2 08D 0550-095057	0.217	0.236	2.244	3.740	2	◎	-

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

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HBDPCE/W 2 08D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1181272Z9	-	HBDPCE/W 2 08D 0560-095057	0.220	0.236	2.244	3.740	2	○	-
1181273Z9	-	HBDPCE/W 2 08D 0570-095057	0.224	0.236	2.244	3.740	2	○	-
1181274Z9	-	HBDPCE/W 2 08D 0580-095057	0.228	0.236	2.244	3.740	2	○	-
1181275Z9	-	HBDPCE/W 2 08D 0590-095057	0.232	0.236	2.244	3.740	2	○	-
1181276Z9	-	HBDPCE/W 2 08D 0600-095057	0.236	0.236	2.244	3.740	2	◈	-
1181277Z9	-	HBDPCE/W 2 08D 0610-114076	0.240	0.315	2.992	4.488	2	○	-
1181278Z9	-	HBDPCE/W 2 08D 0620-114076	0.244	0.315	2.992	4.488	2	○	-
1181279Z9	-	HBDPCE/W 2 08D 0630-114076	0.248	0.315	2.992	4.488	2	○	-
1181280Z9	-	HBDPCE/W 2 08D 0640-114076	0.252	0.315	2.992	4.488	2	○	-
1181281Z9	-	HBDPCE/W 2 08D 0650-114076	0.256	0.315	2.992	4.488	2	◈	-
1181282Z9	-	HBDPCE/W 2 08D 0660-114076	0.260	0.315	2.992	4.488	2	○	-
1181283Z9	-	HBDPCE/W 2 08D 0670-114076	0.264	0.315	2.992	4.488	2	○	-
1181284Z9	-	HBDPCE/W 2 08D 0680-114076	0.268	0.315	2.992	4.488	2	◈	-
1181285Z9	-	HBDPCE/W 2 08D 0690-114076	0.272	0.315	2.992	4.488	2	○	-
1181286Z9	-	HBDPCE/W 2 08D 0700-114076	0.276	0.315	2.992	4.488	2	◈	-
1181287Z9	-	HBDPCE/W 2 08D 0710-114076	0.280	0.315	2.992	4.488	2	○	-
1181288Z9	-	HBDPCE/W 2 08D 0720-114076	0.283	0.315	2.992	4.488	2	○	-
1181289Z9	-	HBDPCE/W 2 08D 0730-114076	0.287	0.315	2.992	4.488	2	○	-
1181290Z9	-	HBDPCE/W 2 08D 0740-114076	0.291	0.315	2.992	4.488	2	○	-
1181291Z9	-	HBDPCE/W 2 08D 0750-114076	0.295	0.315	2.992	4.488	2	○	-
1181292Z9	-	HBDPCE/W 2 08D 0760-114076	0.299	0.315	2.992	4.488	2	○	-
1181293Z9	-	HBDPCE/W 2 08D 0770-114076	0.303	0.315	2.992	4.488	2	○	-
1181294Z9	-	HBDPCE/W 2 08D 0780-114076	0.307	0.315	2.992	4.488	2	◈	-
1181295Z9	-	HBDPCE/W 2 08D 0790-114076	0.311	0.315	2.992	4.488	2	○	-
1181296Z9	-	HBDPCE/W 2 08D 0800-114076	0.315	0.315	2.992	4.488	2	◈	-
1181297Z9	-	HBDPCE/W 2 08D 0810-142095	0.319	0.394	3.740	5.591	2	○	-
1181298Z9	-	HBDPCE/W 2 08D 0820-142095	0.323	0.394	3.740	5.591	2	○	-
1181299Z9	-	HBDPCE/W 2 08D 0830-142095	0.327	0.394	3.740	5.591	2	○	-
1181300Z9	-	HBDPCE/W 2 08D 0840-142095	0.331	0.394	3.740	5.591	2	○	-
1181301Z9	-	HBDPCE/W 2 08D 0850-142095	0.335	0.394	3.740	5.591	2	◈	-
1181302Z9	-	HBDPCE/W 2 08D 0860-142095	0.339	0.394	3.740	5.591	2	○	-
1181303Z9	-	HBDPCE/W 2 08D 0870-142095	0.343	0.394	3.740	5.591	2	◈	-
1181304Z9	-	HBDPCE/W 2 08D 0880-142095	0.346	0.394	3.740	5.591	2	◈	-
1181305Z9	-	HBDPCE/W 2 08D 0890-142095	0.350	0.394	3.740	5.591	2	○	-
1181306Z9	-	HBDPCE/W 2 08D 0900-142095	0.354	0.394	3.740	5.591	2	○	-
1181307Z9	-	HBDPCE/W 2 08D 0910-142095	0.358	0.394	3.740	5.591	2	○	-
1181308Z9	-	HBDPCE/W 2 08D 0920-142095	0.362	0.394	3.740	5.591	2	○	-
1181309Z9	-	HBDPCE/W 2 08D 0930-142095	0.366	0.394	3.740	5.591	2	○	-
1181310Z9	-	HBDPCE/W 2 08D 0940-142095	0.370	0.394	3.740	5.591	2	○	-
1181311Z9	-	HBDPCE/W 2 08D 0950-142095	0.374	0.394	3.740	5.591	2	○	-
1181312Z9	-	HBDPCE/W 2 08D 0960-142095	0.378	0.394	3.740	5.591	2	○	-
1181313Z9	-	HBDPCE/W 2 08D 0970-142095	0.382	0.394	3.740	5.591	2	○	-
1181314Z9	-	HBDPCE/W 2 08D 0980-142095	0.386	0.394	3.740	5.591	2	○	-
1181315Z9	-	HBDPCE/W 2 08D 0990-142095	0.390	0.394	3.740	5.591	2	○	-
1181316Z9	-	HBDPCE/W 2 08D 1000-142095	0.394	0.394	3.740	5.591	2	○	-
1181317Z9	-	HBDPCE/W 2 08D 1010-162114	0.398	0.472	4.488	6.378	2	○	-

◈ Stock item | Produto de stock | Itens de stock

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

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HBDPCE/W 2 08D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1181318Z9	-	HBDPCE/W 2 08D 1020-162114	0.402	0.472	4.488	6.378	2	◎	-
1181319Z9	-	HBDPCE/W 2 08D 1030-162114	0.406	0.472	4.488	6.378	2	○	-
1181320Z9	-	HBDPCE/W 2 08D 1040-162114	0.409	0.472	4.488	6.378	2	○	-
1181321Z9	-	HBDPCE/W 2 08D 1050-162114	0.413	0.472	4.488	6.378	2	◎	-
1181322Z9	-	HBDPCE/W 2 08D 1060-162114	0.417	0.472	4.488	6.378	2	○	-
1181323Z9	-	HBDPCE/W 2 08D 1070-162114	0.421	0.472	4.488	6.378	2	○	-
1181324Z9	-	HBDPCE/W 2 08D 1080-162114	0.425	0.472	4.488	6.378	2	○	-
1181325Z9	-	HBDPCE/W 2 08D 1090-162114	0.429	0.472	4.488	6.378	2	○	-
1181326Z9	-	HBDPCE/W 2 08D 1100-162114	0.433	0.472	4.488	6.378	2	○	-
1181327Z9	-	HBDPCE/W 2 08D 1110-162114	0.437	0.472	4.488	6.378	2	○	-
1181328Z9	-	HBDPCE/W 2 08D 1120-162114	0.441	0.472	4.488	6.378	2	○	-
1181329Z9	-	HBDPCE/W 2 08D 1130-162114	0.445	0.472	4.488	6.378	2	○	-
1181330Z9	-	HBDPCE/W 2 08D 1140-162114	0.449	0.472	4.488	6.378	2	○	-
1181331Z9	-	HBDPCE/W 2 08D 1150-162114	0.453	0.472	4.488	6.378	2	○	-
1181332Z9	-	HBDPCE/W 2 08D 1160-162114	0.457	0.472	4.488	6.378	2	○	-
1181333Z9	-	HBDPCE/W 2 08D 1170-162114	0.461	0.472	4.488	6.378	2	○	-
1181334Z9	-	HBDPCE/W 2 08D 1180-162114	0.465	0.472	4.488	6.378	2	◎	-
1181335Z9	-	HBDPCE/W 2 08D 1190-162114	0.469	0.472	4.488	6.378	2	○	-
1181336Z9	-	HBDPCE/W 2 08D 1200-162114	0.472	0.472	4.488	6.378	2	○	-

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

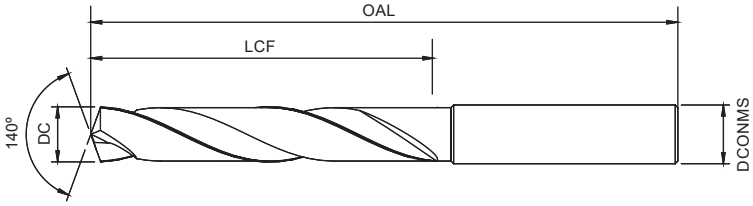
HBDPUE/W 2 03D Solid carbide drills | Brocas de metal duro | Brocas en metal duro

P K

HRC ≤ 60

IT8~9 IT class





Drill Dia. DC (in)	DC 0.118	0.118<DC≤0.236	0.236<DC≤0.394	0.394<DC≤0.709	0.709<DC≤0.787
Hole Tolerances	+0.0001	+0.0002	+0.0002	+0.0003	+0.0003
	+0.0005	+0.0006	+0.0008	+0.0010	+0.0011

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1180784Z9	1181859Z9	HBDPUE/W 2 03D 0300-062020	0.118	0.236	0.787	2.441	2	●	●
1180852Z9	1181860Z9	HBDPUE/W 2 03D 0310-062020	0.122	0.236	0.787	2.441	2	●	●
1180853Z9	1181861Z9	HBDPUE/W 2 03D 0320-062020	0.126	0.236	0.787	2.441	2	●	●
1181790Z9	1181862Z9	HBDPUE/W 2 03D 0325-062020	0.128	0.236	0.787	2.441	2	●	●
1180854Z9	1181863Z9	HBDPUE/W 2 03D 0330-062020	0.130	0.236	0.787	2.441	2	●	○
1180790Z9	1181864Z9	HBDPUE/W 2 03D 0340-062020	0.134	0.236	0.787	2.441	2	●	○
1180855Z9	1181865Z9	HBDPUE/W 2 03D 0350-062020	0.138	0.236	0.787	2.441	2	●	○
1180856Z9	1181866Z9	HBDPUE/W 2 03D 0360-062020	0.142	0.236	0.787	2.441	2	●	●
1180857Z9	1181867Z9	HBDPUE/W 2 03D 0370-062020	0.146	0.236	0.787	2.441	2	●	●
1180858Z9	1181868Z9	HBDPUE/W 2 03D 0380-066024	0.150	0.236	0.945	2.598	2	●	○
1180859Z9	1181869Z9	HBDPUE/W 2 03D 0390-066024	0.154	0.236	0.945	2.598	2	●	○
1180860Z9	1181870Z9	HBDPUE/W 2 03D 0400-066024	0.157	0.236	0.945	2.598	2	●	●
1180861Z9	1181871Z9	HBDPUE/W 2 03D 0410-066024	0.161	0.236	0.945	2.598	2	●	●
1180862Z9	1181872Z9	HBDPUE/W 2 03D 0420-066024	0.165	0.236	0.945	2.598	2	●	●
1180863Z9	1181873Z9	HBDPUE/W 2 03D 0430-066024	0.169	0.236	0.945	2.598	2	●	●
1180864Z9	1181874Z9	HBDPUE/W 2 03D 0440-066024	0.173	0.236	0.945	2.598	2	●	●
1180865Z9	1181875Z9	HBDPUE/W 2 03D 0450-066024	0.177	0.236	0.945	2.598	2	●	○
1180866Z9	1181876Z9	HBDPUE/W 2 03D 0460-066024	0.181	0.236	0.945	2.598	2	●	○
1181792Z9	1181877Z9	HBDPUE/W 2 03D 0465-066024	0.183	0.236	0.945	2.598	2	○	●
1180867Z9	1181878Z9	HBDPUE/W 2 03D 0470-066024	0.185	0.236	0.945	2.598	2	●	○
1180868Z9	1181879Z9	HBDPUE/W 2 03D 0480-066028	0.189	0.236	1.102	2.598	2	●	●
1180869Z9	1181880Z9	HBDPUE/W 2 03D 0490-066028	0.193	0.236	1.102	2.598	2	●	●
1180870Z9	1181881Z9	HBDPUE/W 2 03D 0500-066028	0.197	0.236	1.102	2.598	2	●	○
1180871Z9	1181882Z9	HBDPUE/W 2 03D 0510-066028	0.201	0.236	1.102	2.598	2	●	●
1180872Z9	1181883Z9	HBDPUE/W 2 03D 0520-066028	0.205	0.236	1.102	2.598	2	●	○
1180873Z9	1181884Z9	HBDPUE/W 2 03D 0530-066028	0.209	0.236	1.102	2.598	2	●	○

● Stock item | Produto de stock | Itens de stock

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

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HBDPUE/W 2 03D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1180874Z9	1181885Z9	HBDPUE/W 2 03D 0540-066028	0.213	0.236	1.102	2.598	2	●	●
1180875Z9	1181886Z9	HBDPUE/W 2 03D 0550-066028	0.217	0.236	1.102	2.598	2	●	○
1181794Z9	1181887Z9	HBDPUE/W 2 03D 0555-066028	0.219	0.236	1.102	2.598	2	●	●
1180791Z9	1181888Z9	HBDPUE/W 2 03D 0560-066028	0.220	0.236	1.102	2.598	2	●	●
1180876Z9	1181889Z9	HBDPUE/W 2 03D 0570-066028	0.224	0.236	1.102	2.598	2	●	●
1180877Z9	1181890Z9	HBDPUE/W 2 03D 0580-066028	0.228	0.236	1.102	2.598	2	●	●
1180878Z9	1181891Z9	HBDPUE/W 2 03D 0590-066028	0.232	0.236	1.102	2.598	2	●	○
1180879Z9	1181892Z9	HBDPUE/W 2 03D 0600-066028	0.236	0.236	1.102	2.598	2	●	●
1180880Z9	1181893Z9	HBDPUE/W 2 03D 0610-079034	0.240	0.315	1.339	3.110	2	●	●
1180881Z9	1181894Z9	HBDPUE/W 2 03D 0620-079034	0.244	0.315	1.339	3.110	2	●	○
1180882Z9	1181895Z9	HBDPUE/W 2 03D 0630-079034	0.248	0.315	1.339	3.110	2	●	○
1180883Z9	1181896Z9	HBDPUE/W 2 03D 0640-079034	0.252	0.315	1.339	3.110	2	●	○
1180884Z9	1181897Z9	HBDPUE/W 2 03D 0650-079034	0.256	0.315	1.339	3.110	2	●	●
1180885Z9	1181898Z9	HBDPUE/W 2 03D 0660-079034	0.260	0.315	1.339	3.110	2	●	○
1180886Z9	1181899Z9	HBDPUE/W 2 03D 0670-079034	0.264	0.315	1.339	3.110	2	●	●
1180887Z9	1181900Z9	HBDPUE/W 2 03D 0680-079034	0.268	0.315	1.339	3.110	2	●	○
1180888Z9	1181901Z9	HBDPUE/W 2 03D 0690-079034	0.272	0.315	1.339	3.110	2	●	○
1180889Z9	1181902Z9	HBDPUE/W 2 03D 0700-079034	0.276	0.315	1.339	3.110	2	●	●
1180890Z9	1181903Z9	HBDPUE/W 2 03D 0710-079041	0.280	0.315	1.614	3.110	2	●	○
1180891Z9	1181904Z9	HBDPUE/W 2 03D 0720-079041	0.283	0.315	1.614	3.110	2	●	●
1180892Z9	1181905Z9	HBDPUE/W 2 03D 0730-079041	0.287	0.315	1.614	3.110	2	●	●
1180893Z9	1181906Z9	HBDPUE/W 2 03D 0740-079041	0.291	0.315	1.614	3.110	2	●	○
1180894Z9	1181907Z9	HBDPUE/W 2 03D 0750-079041	0.295	0.315	1.614	3.110	2	●	○
1180895Z9	1181908Z9	HBDPUE/W 2 03D 0760-079041	0.299	0.315	1.614	3.110	2	●	○
1180896Z9	1181909Z9	HBDPUE/W 2 03D 0770-079041	0.303	0.315	1.614	3.110	2	●	●
1180897Z9	1181910Z9	HBDPUE/W 2 03D 0780-079041	0.307	0.315	1.614	3.110	2	●	●
1180898Z9	1181911Z9	HBDPUE/W 2 03D 0790-079041	0.311	0.315	1.614	3.110	2	●	●
1180899Z9	1181912Z9	HBDPUE/W 2 03D 0800-079041	0.315	0.315	1.614	3.110	2	●	●
1180900Z9	1181913Z9	HBDPUE/W 2 03D 0810-089047	0.319	0.394	1.850	3.504	2	●	●
1180901Z9	1181914Z9	HBDPUE/W 2 03D 0820-089047	0.323	0.394	1.850	3.504	2	●	○
1180902Z9	1181915Z9	HBDPUE/W 2 03D 0830-089047	0.327	0.394	1.850	3.504	2	●	○
1180903Z9	1181916Z9	HBDPUE/W 2 03D 0840-089047	0.331	0.394	1.850	3.504	2	●	●
1180904Z9	1181917Z9	HBDPUE/W 2 03D 0850-089047	0.335	0.394	1.850	3.504	2	●	○
1180905Z9	1181918Z9	HBDPUE/W 2 03D 0860-089047	0.339	0.394	1.850	3.504	2	●	●
1180906Z9	1181919Z9	HBDPUE/W 2 03D 0870-089047	0.343	0.394	1.850	3.504	2	●	○
1180907Z9	1181920Z9	HBDPUE/W 2 03D 0880-089047	0.346	0.394	1.850	3.504	2	●	○
1180908Z9	1181921Z9	HBDPUE/W 2 03D 0890-089047	0.350	0.394	1.850	3.504	2	○	●
1180909Z9	1181922Z9	HBDPUE/W 2 03D 0900-089047	0.354	0.394	1.850	3.504	2	●	●
1180910Z9	1181923Z9	HBDPUE/W 2 03D 0910-089047	0.358	0.394	1.850	3.504	2	●	○
1180911Z9	1181924Z9	HBDPUE/W 2 03D 0920-089047	0.362	0.394	1.850	3.504	2	●	●
1180912Z9	1181925Z9	HBDPUE/W 2 03D 0930-089047	0.366	0.394	1.850	3.504	2	●	●
1180913Z9	1181926Z9	HBDPUE/W 2 03D 0940-089047	0.370	0.394	1.850	3.504	2	●	●
1180914Z9	1181927Z9	HBDPUE/W 2 03D 0950-089047	0.374	0.394	1.850	3.504	2	●	○
1180915Z9	1181928Z9	HBDPUE/W 2 03D 0960-089047	0.378	0.394	1.850	3.504	2	●	●
1180916Z9	1181929Z9	HBDPUE/W 2 03D 0970-089047	0.382	0.394	1.850	3.504	2	●	●
1180917Z9	1181930Z9	HBDPUE/W 2 03D 0980-089047	0.386	0.394	1.850	3.504	2	●	●
1180918Z9	1181931Z9	HBDPUE/W 2 03D 0990-089047	0.390	0.394	1.850	3.504	2	●	○
1180919Z9	1181932Z9	HBDPUE/W 2 03D 1000-089047	0.394	0.394	1.850	3.504	2	●	●

● Stock item | Produto de stock | Itens de stock

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

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palbit

HBDPUE/W 2 03D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1180920Z9	-	HBDPUE/W 2 03D 1010-102055	0.398	0.472	2.165	4.016	2	◈	-
1180921Z9	1181933Z9	HBDPUE/W 2 03D 1020-102055	0.402	0.472	2.165	4.016	2	◈	◈
1180922Z9	1181934Z9	HBDPUE/W 2 03D 1030-102055	0.406	0.472	2.165	4.016	2	◈	○
1180923Z9	-	HBDPUE/W 2 03D 1040-102055	0.409	0.472	2.165	4.016	2	◈	-
1180924Z9	1181935Z9	HBDPUE/W 2 03D 1050-102055	0.413	0.472	2.165	4.016	2	◈	◈
1180925Z9	-	HBDPUE/W 2 03D 1060-102055	0.417	0.472	2.165	4.016	2	○	-
1180926Z9	-	HBDPUE/W 2 03D 1070-102055	0.421	0.472	2.165	4.016	2	○	-
1180927Z9	1181936Z9	HBDPUE/W 2 03D 1080-102055	0.425	0.472	2.165	4.016	2	◈	◈
1180928Z9	-	HBDPUE/W 2 03D 1090-102055	0.429	0.472	2.165	4.016	2	○	-
1180929Z9	1181937Z9	HBDPUE/W 2 03D 1100-102055	0.433	0.472	2.165	4.016	2	◈	◈
1180930Z9	-	HBDPUE/W 2 03D 1110-102055	0.437	0.472	2.165	4.016	2	◈	-
1180931Z9	1181938Z9	HBDPUE/W 2 03D 1120-102055	0.441	0.472	2.165	4.016	2	◈	◈
1180932Z9	-	HBDPUE/W 2 03D 1130-102055	0.445	0.472	2.165	4.016	2	○	-
1180933Z9	-	HBDPUE/W 2 03D 1140-102055	0.449	0.472	2.165	4.016	2	○	-
1180934Z9	1181939Z9	HBDPUE/W 2 03D 1150-102055	0.453	0.472	2.165	4.016	2	◈	◈
1180935Z9	-	HBDPUE/W 2 03D 1160-102055	0.457	0.472	2.165	4.016	2	○	-
1180936Z9	-	HBDPUE/W 2 03D 1170-102055	0.461	0.472	2.165	4.016	2	○	-
1180937Z9	1181940Z9	HBDPUE/W 2 03D 1180-102055	0.465	0.472	2.165	4.016	2	◈	◈
1180938Z9	-	HBDPUE/W 2 03D 1190-102055	0.469	0.472	2.165	4.016	2	◈	-
1180939Z9	1181941Z9	HBDPUE/W 2 03D 1200-102055	0.472	0.472	2.165	4.016	2	◈	◈
1180940Z9	1181942Z9	HBDPUE/W 2 03D 1250-107060	0.492	0.551	2.362	4.213	2	◈	○
1181769Z9	1181943Z9	HBDPUE/W 2 03D 1280-107060	0.504	0.551	2.362	4.213	2	◈	◈
1180941Z9	1181944Z9	HBDPUE/W 2 03D 1300-107060	0.512	0.551	2.362	4.213	2	◈	◈
1182437Z9	-	HBDPUE/W 2 03D 1310-107060	0.516	0.551	2.362	4.213	2	○	-
1182400Z9	1182401Z9	HBDPUE/W 2 03D 1320-107060	0.520	0.551	2.362	4.213	2	◈	○
1180942Z9	1181945Z9	HBDPUE/W 2 03D 1350-107060	0.531	0.551	2.362	4.213	2	◈	○
1181771Z9	1181946Z9	HBDPUE/W 2 03D 1380-107060	0.543	0.551	2.362	4.213	2	◈	◈
1180943Z9	1181947Z9	HBDPUE/W 2 03D 1400-107060	0.551	0.551	2.362	4.213	2	◈	◈
1181773Z9	1181948Z9	HBDPUE/W 2 03D 1420-115065	0.559	0.630	2.559	4.528	2	◈	◈
1180944Z9	1181949Z9	HBDPUE/W 2 03D 1450-115065	0.571	0.630	2.559	4.528	2	◈	○
1181775Z9	1181950Z9	HBDPUE/W 2 03D 1480-115065	0.583	0.630	2.559	4.528	2	◈	◈
1180945Z9	1181951Z9	HBDPUE/W 2 03D 1500-115065	0.591	0.630	2.559	4.528	2	◈	○
1180946Z9	1181952Z9	HBDPUE/W 2 03D 1550-115065	0.610	0.630	2.559	4.528	2	◈	◈
1181777Z9	1181953Z9	HBDPUE/W 2 03D 1580-115065	0.622	0.630	2.559	4.528	2	◈	◈
1180947Z9	1181954Z9	HBDPUE/W 2 03D 1600-115065	0.630	0.630	2.559	4.528	2	◈	◈
1180948Z9	1181955Z9	HBDPUE/W 2 03D 1650-123073	0.650	0.709	2.874	4.843	2	◈	○
1180949Z9	1181956Z9	HBDPUE/W 2 03D 1700-123073	0.669	0.709	2.874	4.843	2	◈	◈
1180950Z9	1181957Z9	HBDPUE/W 2 03D 1750-123073	0.689	0.709	2.874	4.843	2	◈	○
1180951Z9	1181958Z9	HBDPUE/W 2 03D 1800-123073	0.709	0.709	2.874	4.843	2	◈	◈
1180952Z9	1181959Z9	HBDPUE/W 2 03D 1850-131079	0.728	0.787	3.110	5.157	2	◈	◈
1180953Z9	1181960Z9	HBDPUE/W 2 03D 1900-131079	0.748	0.787	3.110	5.157	2	◈	◈
1180954Z9	1181961Z9	HBDPUE/W 2 03D 1950-131079	0.768	0.787	3.110	5.157	2	◈	◈
1180955Z9	1181962Z9	HBDPUE/W 2 03D 2000-131079	0.787	0.787	3.110	5.157	2	◈	◈

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

HBDPUE/W 2 05D Solid carbide drills | Brocas de metal duro | Brocas en metal duro

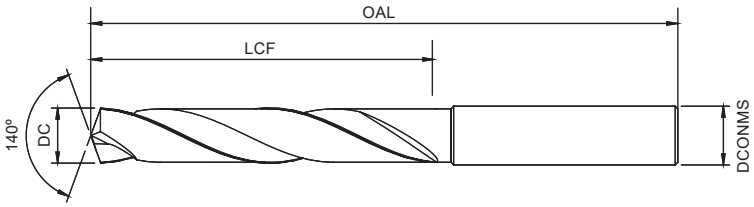
METRIC LINE



P K

HRC ≤ 60

IT8~9 IT class



Drill Dia. DC (in)	DC 0.118	0.118<DC≤0.236	0.236<DC≤0.394	0.394<DC≤0.709	0.709<DC≤0.787
Hole Tolerances	+0.0001	+0.0002	+0.0002	+0.0003	+0.0003
	+0.0005	+0.0006	+0.0008	+0.0010	+0.0011

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
118079Z9	-	HBDPUE/W 2 05D 0300-066028	0.118	0.236	1.102	2.598	2	◎	-
118079Z9	-	HBDPUE/W 2 05D 0310-066028	0.122	0.236	1.102	2.598	2	◎	-
118106Z9	-	HBDPUE/W 2 05D 0320-066028	0.126	0.236	1.102	2.598	2	◎	-
118106Z9	-	HBDPUE/W 2 05D 0330-066028	0.130	0.236	1.102	2.598	2	◎	-
118078Z9	-	HBDPUE/W 2 05D 0340-066028	0.134	0.236	1.102	2.598	2	◎	-
118106Z9	-	HBDPUE/W 2 05D 0350-066028	0.138	0.236	1.102	2.598	2	○	-
118106Z9	-	HBDPUE/W 2 05D 0360-066028	0.142	0.236	1.102	2.598	2	○	-
118106Z9	-	HBDPUE/W 2 05D 0370-066028	0.146	0.236	1.102	2.598	2	○	-
118106Z9	-	HBDPUE/W 2 05D 0380-074036	0.150	0.236	1.417	2.913	2	◎	-
118079Z9	-	HBDPUE/W 2 05D 0390-074036	0.154	0.236	1.417	2.913	2	○	-
118106Z9	-	HBDPUE/W 2 05D 0400-074036	0.157	0.236	1.417	2.913	2	◎	-
118106Z9	-	HBDPUE/W 2 05D 0410-074036	0.161	0.236	1.417	2.913	2	◎	-
118078Z9	-	HBDPUE/W 2 05D 0420-074036	0.165	0.236	1.417	2.913	2	◎	-
118107Z9	-	HBDPUE/W 2 05D 0430-074036	0.169	0.236	1.417	2.913	2	◎	-
118107Z9	-	HBDPUE/W 2 05D 0440-074036	0.173	0.236	1.417	2.913	2	○	-
118107Z9	-	HBDPUE/W 2 05D 0450-074036	0.177	0.236	1.417	2.913	2	◎	-
118107Z9	-	HBDPUE/W 2 05D 0460-074036	0.181	0.236	1.417	2.913	2	○	-
118153Z9	-	HBDPUE/W 2 05D 0465-074036	0.183	0.236	1.417	2.913	2	○	-
118078Z9	-	HBDPUE/W 2 05D 0470-074036	0.185	0.236	1.417	2.913	2	◎	-
118107Z9	-	HBDPUE/W 2 05D 0480-082044	0.189	0.236	1.732	3.228	2	◎	-
118107Z9	-	HBDPUE/W 2 05D 0490-082044	0.193	0.236	1.732	3.228	2	○	-
118078Z9	-	HBDPUE/W 2 05D 0500-082044	0.197	0.236	1.732	3.228	2	◎	-
118107Z9	-	HBDPUE/W 2 05D 0510-082044	0.201	0.236	1.732	3.228	2	◎	-
118107Z9	-	HBDPUE/W 2 05D 0520-082044	0.205	0.236	1.732	3.228	2	◎	-
118107Z9	-	HBDPUE/W 2 05D 0530-082044	0.209	0.236	1.732	3.228	2	○	-
118107Z9	-	HBDPUE/W 2 05D 0540-082044	0.213	0.236	1.732	3.228	2	○	-

◎ Stock item | Produto de stock | Itens de stock

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

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palbit

HBDPUE/W 2 05D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1181080Z9	-	HBDPUE/W 2 05D 0550-082044	0.217	0.236	1.732	3.228	2	○	-
1181081Z9	-	HBDPUE/W 2 05D 0560-082044	0.220	0.236	1.732	3.228	2	◎	-
1181082Z9	-	HBDPUE/W 2 05D 0570-082044	0.224	0.236	1.732	3.228	2	○	-
1181083Z9	-	HBDPUE/W 2 05D 0580-082044	0.228	0.236	1.732	3.228	2	◎	-
1181084Z9	-	HBDPUE/W 2 05D 0590-082044	0.232	0.236	1.732	3.228	2	○	-
1181085Z9	-	HBDPUE/W 2 05D 0600-082044	0.236	0.236	1.732	3.228	2	◎	-
1181086Z9	-	HBDPUE/W 2 05D 0610-091053	0.240	0.315	2.087	3.583	2	○	-
1181087Z9	-	HBDPUE/W 2 05D 0620-091053	0.244	0.315	2.087	3.583	2	○	-
1181088Z9	-	HBDPUE/W 2 05D 0630-091053	0.248	0.315	2.087	3.583	2	○	-
1181089Z9	-	HBDPUE/W 2 05D 0640-091053	0.252	0.315	2.087	3.583	2	◎	-
1181090Z9	-	HBDPUE/W 2 05D 0650-091053	0.256	0.315	2.087	3.583	2	◎	-
1181091Z9	-	HBDPUE/W 2 05D 0660-091053	0.260	0.315	2.087	3.583	2	○	-
1181092Z9	-	HBDPUE/W 2 05D 0670-091053	0.264	0.315	2.087	3.583	2	○	-
1180781Z9	-	HBDPUE/W 2 05D 0680-091053	0.268	0.315	2.087	3.583	2	◎	-
1181093Z9	-	HBDPUE/W 2 05D 0690-091053	0.272	0.315	2.087	3.583	2	◎	-
1181094Z9	-	HBDPUE/W 2 05D 0700-091053	0.276	0.315	2.087	3.583	2	◎	-
1181095Z9	-	HBDPUE/W 2 05D 0710-091053	0.280	0.315	2.087	3.583	2	○	-
1181096Z9	-	HBDPUE/W 2 05D 0720-091053	0.283	0.315	2.087	3.583	2	◎	-
1181097Z9	-	HBDPUE/W 2 05D 0730-091053	0.287	0.315	2.087	3.583	2	○	-
1181098Z9	-	HBDPUE/W 2 05D 0740-091053	0.291	0.315	2.087	3.583	2	○	-
1181099Z9	-	HBDPUE/W 2 05D 0750-091053	0.295	0.315	2.087	3.583	2	○	-
1181100Z9	-	HBDPUE/W 2 05D 0760-091053	0.299	0.315	2.087	3.583	2	○	-
1181101Z9	-	HBDPUE/W 2 05D 0770-091053	0.303	0.315	2.087	3.583	2	○	-
1181102Z9	-	HBDPUE/W 2 05D 0780-091053	0.307	0.315	2.087	3.583	2	◎	-
1181103Z9	-	HBDPUE/W 2 05D 0790-091053	0.311	0.315	2.087	3.583	2	○	-
1181104Z9	-	HBDPUE/W 2 05D 0800-091053	0.315	0.315	2.087	3.583	2	◎	-
1181105Z9	-	HBDPUE/W 2 05D 0810-103061	0.319	0.394	2.402	4.055	2	○	-
1181106Z9	-	HBDPUE/W 2 05D 0820-103061	0.323	0.394	2.402	4.055	2	○	-
1181107Z9	-	HBDPUE/W 2 05D 0830-103061	0.327	0.394	2.402	4.055	2	◎	-
1181108Z9	-	HBDPUE/W 2 05D 0840-103061	0.331	0.394	2.402	4.055	2	○	-
1181109Z9	-	HBDPUE/W 2 05D 0850-103061	0.335	0.394	2.402	4.055	2	◎	-
1181110Z9	-	HBDPUE/W 2 05D 0860-103061	0.339	0.394	2.402	4.055	2	○	-
1181111Z9	-	HBDPUE/W 2 05D 0870-103061	0.343	0.394	2.402	4.055	2	○	-
1181112Z9	-	HBDPUE/W 2 05D 0880-103061	0.346	0.394	2.402	4.055	2	○	-
1181113Z9	-	HBDPUE/W 2 05D 0890-103061	0.350	0.394	2.402	4.055	2	○	-
1181114Z9	-	HBDPUE/W 2 05D 0900-103061	0.354	0.394	2.402	4.055	2	◎	-
1181115Z9	-	HBDPUE/W 2 05D 0910-103061	0.358	0.394	2.402	4.055	2	○	-
1181116Z9	-	HBDPUE/W 2 05D 0920-103061	0.362	0.394	2.402	4.055	2	○	-
1181117Z9	-	HBDPUE/W 2 05D 0930-103061	0.366	0.394	2.402	4.055	2	○	-
1181118Z9	-	HBDPUE/W 2 05D 0940-103061	0.370	0.394	2.402	4.055	2	○	-
1181119Z9	-	HBDPUE/W 2 05D 0950-103061	0.374	0.394	2.402	4.055	2	◎	-
1181120Z9	-	HBDPUE/W 2 05D 0960-103061	0.378	0.394	2.402	4.055	2	○	-
1181121Z9	-	HBDPUE/W 2 05D 0970-103061	0.382	0.394	2.402	4.055	2	○	-
1181122Z9	-	HBDPUE/W 2 05D 0980-103061	0.386	0.394	2.402	4.055	2	◎	-
1181123Z9	-	HBDPUE/W 2 05D 0990-103061	0.390	0.394	2.402	4.055	2	○	-
1181124Z9	-	HBDPUE/W 2 05D 1000-103061	0.394	0.394	2.402	4.055	2	◎	-
1181125Z9	-	HBDPUE/W 2 05D 1010-118071	0.398	0.472	2.795	4.646	2	○	-
1181126Z9	-	HBDPUE/W 2 05D 1020-118071	0.402	0.472	2.795	4.646	2	◎	-

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

Continue next page

HBDPUE/W 2 05D

Solid carbide drills | Brocas de metal duro | Brocas en metal duro

Order code		Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				NOF	Stock PHU920	
HA (Cylindrical)	HB (Weldon)		DC	DCONMS	LCF	OAL		HA	HB
1181127Z9	-	HBDPUE/W 2 05D 1030-118071	0.406	0.472	2.795	4.646	2	○	-
1181128Z9	-	HBDPUE/W 2 05D 1040-118071	0.409	0.472	2.795	4.646	2	○	-
1180796Z9	-	HBDPUE/W 2 05D 1050-118071	0.413	0.472	2.795	4.646	2	◎	-
1181129Z9	-	HBDPUE/W 2 05D 1060-118071	0.417	0.472	2.795	4.646	2	○	-
1181130Z9	-	HBDPUE/W 2 05D 1070-118071	0.421	0.472	2.795	4.646	2	○	-
1181131Z9	-	HBDPUE/W 2 05D 1080-118071	0.425	0.472	2.795	4.646	2	○	-
1181132Z9	-	HBDPUE/W 2 05D 1090-118071	0.429	0.472	2.795	4.646	2	○	-
1181133Z9	-	HBDPUE/W 2 05D 1100-118071	0.433	0.472	2.795	4.646	2	◎	-
1181134Z9	-	HBDPUE/W 2 05D 1110-118071	0.437	0.472	2.795	4.646	2	○	-
1181135Z9	-	HBDPUE/W 2 05D 1120-118071	0.441	0.472	2.795	4.646	2	○	-
1181136Z9	-	HBDPUE/W 2 05D 1130-118071	0.445	0.472	2.795	4.646	2	○	-
1181137Z9	-	HBDPUE/W 2 05D 1140-118071	0.449	0.472	2.795	4.646	2	○	-
1181138Z9	-	HBDPUE/W 2 05D 1150-118071	0.453	0.472	2.795	4.646	2	◎	-
1181139Z9	-	HBDPUE/W 2 05D 1160-118071	0.457	0.472	2.795	4.646	2	○	-
1181140Z9	-	HBDPUE/W 2 05D 1170-118071	0.461	0.472	2.795	4.646	2	○	-
1181141Z9	-	HBDPUE/W 2 05D 1180-118071	0.465	0.472	2.795	4.646	2	○	-
1181142Z9	-	HBDPUE/W 2 05D 1190-118071	0.469	0.472	2.795	4.646	2	○	-
1181143Z9	-	HBDPUE/W 2 05D 1200-118071	0.472	0.472	2.795	4.646	2	◎	-
1181144Z9	-	HBDPUE/W 2 05D 1250-124077	0.492	0.551	3.031	4.882	2	○	-
1181145Z9	-	HBDPUE/W 2 05D 1300-124077	0.512	0.551	3.031	4.882	2	◎	-
1181146Z9	-	HBDPUE/W 2 05D 1350-124077	0.531	0.551	3.031	4.882	2	○	-
1181147Z9	-	HBDPUE/W 2 05D 1400-124077	0.551	0.551	3.031	4.882	2	◎	-
1181148Z9	-	HBDPUE/W 2 05D 1450-133083	0.571	0.630	3.268	5.236	2	◎	-
1181149Z9	-	HBDPUE/W 2 05D 1500-133083	0.591	0.630	3.268	5.236	2	○	-
1181150Z9	-	HBDPUE/W 2 05D 1550-133083	0.610	0.630	3.268	5.236	2	○	-
1181151Z9	-	HBDPUE/W 2 05D 1600-133083	0.630	0.630	3.268	5.236	2	○	-
1181152Z9	-	HBDPUE/W 2 05D 1650-143093	0.650	0.709	3.661	5.630	2	○	-
1181153Z9	-	HBDPUE/W 2 05D 1700-143093	0.669	0.709	3.661	5.630	2	○	-
1181154Z9	-	HBDPUE/W 2 05D 1750-143093	0.689	0.709	3.661	5.630	2	○	-
1181155Z9	-	HBDPUE/W 2 05D 1800-143093	0.709	0.709	3.661	5.630	2	○	-
1181156Z9	-	HBDPUE/W 2 05D 1850-153101	0.728	0.787	3.976	6.024	2	○	-
1181157Z9	-	HBDPUE/W 2 05D 1900-153101	0.748	0.787	3.976	6.024	2	○	-
1181158Z9	-	HBDPUE/W 2 05D 1950-153101	0.768	0.787	3.976	6.024	2	○	-
1181159Z9	-	HBDPUE/W 2 05D 2000-153101	0.787	0.787	3.976	6.024	2	○	-

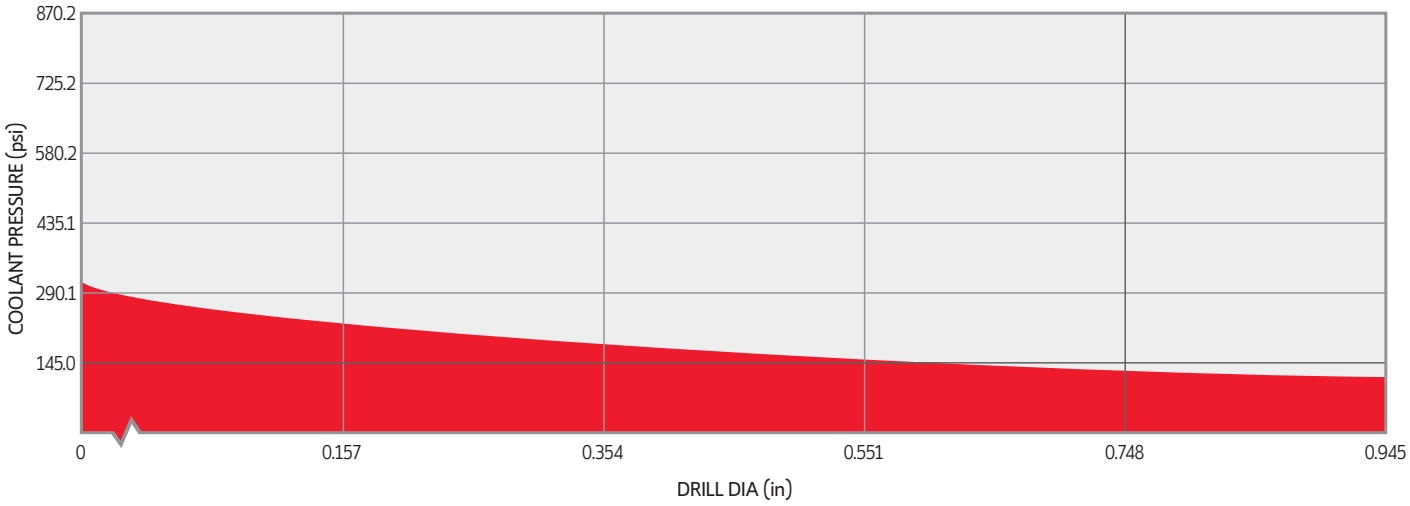
◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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RECOMMENDED SPEEDS AND FEEDS

ISO	Material Group Grupo Materiais Grupo Materiales	Vc (SFM)	f (in/rev)			
			0.118-0.315	0.315-0.472	0.472-0.630	0.630-0.787
P	Unalloyed steel (-0,25%)	263-328	0.004-0.008	0.006-0.010	0.008-0.016	0.010-0.020
	Low-alloy steel (0,25%-)	230-328	0.004-0.008	0.008-0.012	0.008-0.014	0.010-0.016
	High-alloy steel	132-230	0.003-0.006	0.005-0.009	0.008-0.016	0.010-0.016
M	Stainless steel	115-164	0.003-0.006	0.005-0.010	0.006-0.012	0.008-0.014
K	Maleable cast iron	230-328	0.004-0.012	0.008-0.016	0.010-0.016	0.010-0.020
	Grey cast iron	230-328	0.004-0.010	0.008-0.014	0.012-0.018	0.014-0.022

COOLANT APPLICATION CHART



SOLID CARBIDE DRILLS TROUBLESHOOTING

Solução de problemas | Solucción de problemas

Problem | Problema	Cause | Causa | Fuente	Possible Solution | Solução | Solución
Heavy wear on the cutting corners Desgaste profundo das arestas de corte Desgaste profundo de los gavilanse	• Spintering on the cutting corners • Estilhamento das esquinas de corte • Astillado en las esquinas de corte	• Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides. • Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos os lados. • Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno,aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfríe desde ambos lados.
	• Cutting conditions • Condições de corte • Condiciones de corte	• Reduce cutting speed, increase feed. • Reduza a velocidade de corte, aumente o avanço. • Reduzca la velocidad de corte, aumente el avance.
Splintering on the chisel edge Estilhamento do fio de corte transversal Astillado del filo de corte transversal	• Clamping chuck • Sistema de amarre • Sistema amarre	• Check clamping accuracy. Use hydraulic clamping chuck or high-precision chucking system. • Comprove a precisão da fixação utilize uma pinça de fixação hidraulica ou um sistema de aperto de alta precisão. • Compruebe la precisión de la fijación. Utilice una pinza de fijación hidráulica o un sistema de amarre de alta precisión.
	• Cutting conditions • Condições de corte • Condiciones de corte	• Increase feed. • Aumente o avanço. • Aumente el avance.
Built-up edge Acrescimo do fio de corte Recrecimiento del filo de corte	• Insufficient coolant. • Refrigeração insuficiente • Refrigerante insuficiente	• Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides. .• Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados. • Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfríe desde ambos lados
	• Cutting conditions • Condições de corte • Condiciones de corte	• Increase speed 20-30%. • Aumente a velocidade em uns 20% a 30%. • Aumente la velocidad en un 20-30%.
Splintering on the cutting edges Estinhamento do fio de corte principal Astillado del filo de corte principal	• Clamping chuck • Sistema de amarre • Sistema amarre	• Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system. • Comprove a precisão da fixação utilize uma pinça de fixação hidraulica ou um sistema de aperto de alta precisão. • Compruebe la precisión de la fijación y la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarre de alta precisión.
	• Cutting conditions caused by built-up edge • Condições de corte provocadas por acrescimos no fio de corte • Condiciones de corte provocadas por recrecimiento del filo de corte	• Check cutting values and, possibly increase cutting speed. Examine regularly for built-up edge. • Veja os valores de corte e a ser possível aumente a velocidade de corte. Examine regularmente o aumento do fio de corte. • Compruebe los valores de corte y a ser posible aumente la velocidad de corte. Examine regularmente el recrecimiento del filo de corte.
Thermal checking / Comb cracking Desgaste / Rotura dos chanfros Desgaste / Rotura de los chaflanes	• Cutting conditions • Condições de corte • Condiciones de corte	• Inconsistent / insufficient coolant supply. • Fornecimento de refrigeração, inconsistente/insuficiente. • Suministro de refrigerante inconsistente/insuficiente.
Heavy wear on the cutting corners Desgaste profundo dos chanfros Desgaste profundo de los chaflanes	• Workpiece movement • Movimento das peças de trabalho • Movimiento de piezas de trabajo	• Stabilize workpiece chucking and check stability of machine tool. • Estabilize a fixação da peça de trabalho e veja a estabilidade da máquina ferramenta. • Estabilice la fijación de la pieza de trabajo y compruebe la estabilidad de la máquina herramienta
	• Insufficient coolant • Refrigeração insuficiente • Refrigerante insuficiente	• Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjust positioning of coolant jet. Cool from both sides. •Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamentodo jorro do refrigerante, esfrie ambos lados. • Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante. En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfríe desde ambos lados.
	• Wrong drill • Broca incorrecta • Broca incorrecta	• Check drill type, holemaking depth, cooling system, and workpiece material. • Veja o tipo de broca, a profundidade do furo, o sistema de refrigeração e o material de trabalho. • Compruebe el tipo de broca, la profundidad de taladrado, el sistema de refrigeración y el material de trabajo.
	• Cutting conditions • Condições de corte • Condiciones de corte	• Check cutting parameters at exit. Reduce feed 15-20% prior to breakout. • Revise os parâmetros de corte de saída. Reduza o avanço em uns 15% a 20% antes da rotura. • Revise los parámetros de corte de la salida. Reduzca el avance en un 15-20% antes de la rotura.
Hole too big Furo demasiado grande Orificio demasiado grande	• Cutting conditions • Condições de corte • Condiciones de corte	• Check cutting values, increase cutting speed, or reduce feed. • Comprove os valores de corte, aumente a velocidade de corte e reduza o avanço. • Compruebe los valores de corte, aumente la velocidad de corte o reduzca el avance.
	• Clamping chuck • Sistema de amarre • Sistema amarre	• Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system. • Comprove a precisão da fixação utilize uma pinça de fixação hidraulica ou um sistema de aperto de alta precisão. • Compruebe la precisión de la fijación y la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarre de alta precisión.
	• Wrong drill • Broca incorrecta • Broca incorrecta	• Check drill diameter. Please notice that drills are ground to a positive tolerance. Check concentric running. • Veja o diâmetro da broca. Assegure-se que as brocas estão ligadas a uma tolerância positiva. Comprove que o funcionamento é concêntrico. • Compruebe el diámetro de la broca. Asegúrese de que las brocas están conectadas a una tolerancia positiva. Compruebe el funcionamiento concéntrico.

SOLID CARBIDE DRILLS TROUBLESHOOTING

Solução de problemas | Solucción de problemas

Problem | Problema	Cause | Causa | Fuente	Possible Solution | Solução | Solución
Hole too small **Furo demasiado pequeno** **Orificio demasiado pequeño**	• Insufficient coolant • Refrigeração insuficiente • Refrigerante insuficiente	• Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjusting positioning of coolant jet. Cool from both sides. • Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados. • Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante .En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfríe desde ambos lados.
	• Cutting conditions • Condições de corte • Condiciones de corte	• Reduce cutting speed; increase feed. • Reduza a velocidade de corte, aumente o avanço. • Reduzca la velocidad de corte, aumente el avance.
	• Wrong drill • Broca incorrecta • Broca incorrecta	• Check cutting-edge diameter. • Veja o diâmetro do fio de corte. • Compruebe el diámetro del filo de corte.
Hole not cylindrical Furo não está recto Orificio no es recto	• Clamping chuck • Sistema de amarre • Sistema amarre	• Check clamping accuracy and torque transmission. Use hydraulic clamping chuck or high-precision chucking system. • Veja a precisão da fixação e a transmição do par. Utilize uma pinça de fixação hidraulica ou um sistema de aperto de alta precisão. • Compruebe la precisión de la fijación y la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarre de alta precisión.
	• Workpiece movement • Movimento das peças de trabalho • Movimiento de piezas de trabajo	• Stabilize workpiece chucking and check stability of machine tool. • Estabilize a fixação da peça de trabalho e veja a estabilidade da maquina ferramenta. • Estabilice la fijación de la pieza de trabajo y compruebe la estabilidad de la máquina herramienta.
	• Wrong drill • Broca incorreta • Broca incorrecta	• Check drill type and holemaking depth. Use longer drills • Veja o tipo de broca e a profundidade do furo. Utilize brocas mais largas. • Compruebe el tipo de broca y la profundidad de taladrado. Utilice brocas más largas.
	• Cutting conditions • Condições de corte • Condiciones de corte	• Reduce feed at entry. • Reduza o avanço de entrada. • Reduzca el avance de la entrada.
	• Clamping chuck • Sistema de amarre • Sistema amarre	• Check clamping accuracy and torque transmission.Use hydraulic clamping chuck or high-precision chucking system. • Veja a precisão da fixação e a transmição do par. Utilize uma pinça de fixação hidraulica ou um sistema de aperto de alta precisão. • Compruebe la precisión de la fijación y la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarre de alta precisión.
Drill Breakage Rotura da broca Rotura de broca	• Workpiece movement • Movimento das peças de trabalho • Movimiento de piezas de trabajo	• Stabilize workpiece chucking and check stability of machine tool. • Estabilize a fixação da peça de trabalho e veja a estabilidade da maquina ferramenta. • Estabilice la fijación de la pieza de trabajo y compruebe la estabilidad de la máquina herramienta.
	• Wrong drill • Broca incorreta • Broca incorrecta	• Check drill type, holemaking depth, cooling system, and workpiece material. • Veja o tipo de broca, a profundidade do furo, o sistema de refrigeração e o material de trabalho. • Compruebe el tipo de broca, la profundidad de taladrado, el sistema de refrigeración y el material de trabajo.
	• Insufficient coolant • Refrigeração insuficiente • Refrigerante insuficiente	• Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjusting positioning of coolant jet. Cool from both sides. • Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados. • Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante .En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfríe desde ambos lados.
	• Cutting conditions • Condições de corte • Condiciones de corte	• Check cutting values, and possibly reduce feed. • Comprove os valores de corte, aumente a velocidade de corte e reduza o avanço. • Compruebe los valores de corte y a ser posible reduzca el avance.
	• Clamping chuck • Sistema de amarre • Sistema amarre	• Check torque transmission. Use hydraulic clamping chuck or high-precision chucking system. • Comprove a transmissão do par. Utilize uma pinça de fixação hidraulica ou um sistema de aperto de alta precisão. • Compruebe la transmisión de par. Utilice una pinza de fijación hidráulica o un sistema de amarre de alta precisión.
Splintering on the cutting corners Estilhamento das esquinas de corte Astillado en las esquinas de corte	• Workpiece movement • Movimento das peças de trabalho • Movimiento de piezas de trabajo	• Stabilize workpiece chucking and check stability of machine tool. • Estabilize a fixação da peça de trabalho e veja a estabilidade da maquina ferramenta. • Estabilice la fijación de la pieza de trabajo y compruebe la estabilidad de la máquina herramienta.
	• Wrong drill • Broca incorreta • Broca incorrecta	• Check drill type, holemaking depth, cooling system, and workpiece material. Possibly, use longer drill. • Comprove o tipo de broca, a profundidade do furo, sistema de refrigeração e o material de trabalho. A ser possível utilize uma broca mais larga. • Compruebe el tipo de broca, la profundidad de taladrado, sistema de refrigeración y material de trabajo. A ser posible, utilice una broca más larga.
	• Insufficient coolant • Refrigeração insuficiente • Refrigerante insuficiente	• Check cooling lubricant. In the case of internal coolant supply, increase coolant pressure. In the case of external coolant supply, adjusting positioning of coolant jet. Cool from both sides. • Veja o lubrificante. No caso de fornecimento interno, aumente a pressão da refrigeração, no caso de fornecimento externo, ajuste o posicionamento do jorro do refrigerante, esfrie ambos lados. • Compruebe el lubricante de refrigeración. En caso de suministro de refrigerante interno, aumente la presión del refrigerante .En caso de suministro de refrigerante externo, ajuste el posicionamiento del chorro de refrigerante. Enfríe desde ambos lados.
	• Cutting conditions • Condições de corte • Condiciones de corte	• Check cutting values, and possibly reduce feed. • Comprove os valores de corte, aumente a velocidade de corte e reduza o avanço. • Compruebe los valores de corte y a ser posible reduzca el avance.

CUTTING TOOLS FOR

TURNING



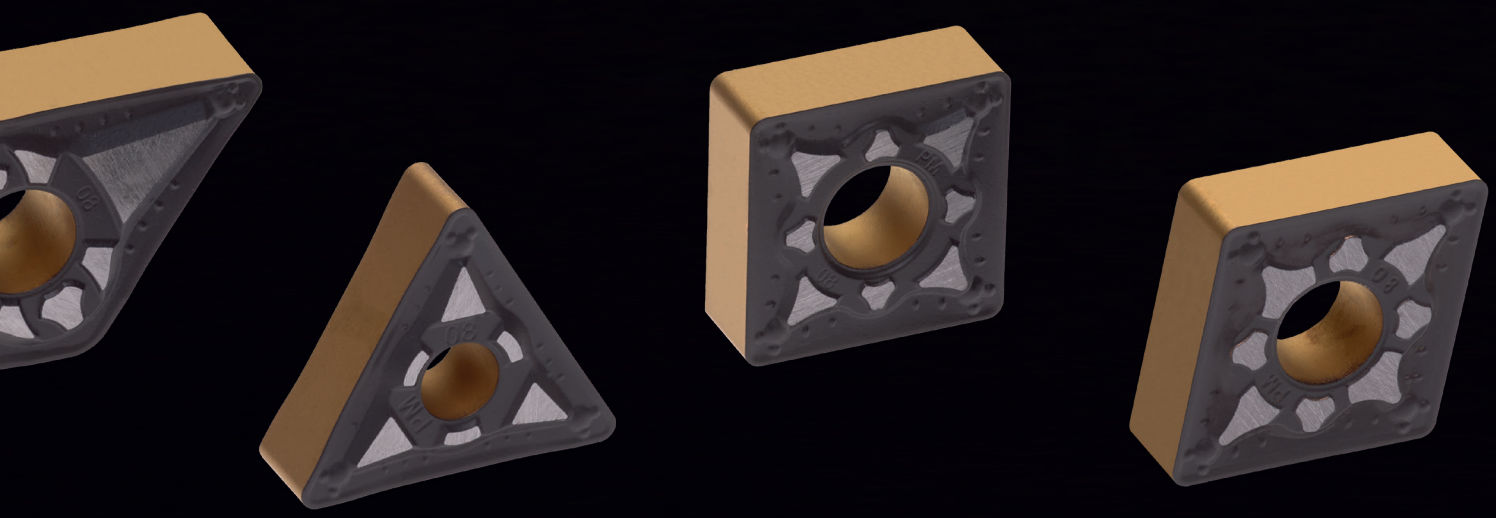
C

C - TURNING

C - 438 | Phoenix Shield
C - 440 | DOMX® HRSA Turning
C - 446 | Multicut



C - 452 | Turning Overview
C - 454 | ISO Ourning Inserts Code Key
C - 464 | Inserts Overview
C - 468 | Negative Turning Inserts
C - 506 | Positive Turning Inserts
C - 540 | PCBN Inserts
C - 564 | PCD Inserts
C - 586 | Heavy Turning Inserts
C - 610 | Technical Data



Why
Phoenix Shield

Palbit's Phoenix Shield series offers you cutting edge performance across the board in every steel turning operation.

PH2G grade series is an innovative combination of a highly dense and hard nanostructured coating base material, including new Al_2O_3 layer with improved wear resistance which provides superior performance during high-speed turning operations.

This new grade series features nanolayer optimization and cutting edge stability, achieved with pre- and post-coating process technologies, designed to improve adhesion between layers and fine-tune tensile stress within coating.

Despite the high wear resistance, the new grades also display enhanced performance on chipping prevention throughout instabilities. This greatly boosts strength, wear and heat resistance as well as tool life when compared to the previous generation coating.

The ultimate goal is machining process optimization, in order to address market demand for greater efficiency and higher cutting speeds. In addition, the increased use of high-strength materials in automotive components also demands for cutting tools with greater wear resistance.

Longer lasting and more reliable, the new Phoenix Shield series are sure to give you a step up in productivity and process security.

Unleash the power of your turning operations with **Phoenix**



WEBSITE PAGE

BROCHURE DOWNLOAD

TECHNICAL VIDEO

HRSA TURNING

DOMX

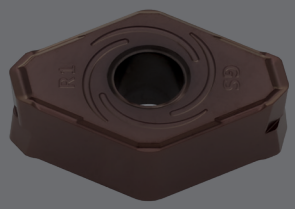


Designed specifically for the turning of HRSA, the DOMX insert offers exceptional performance when working with these difficult to machine materials. This novel geometry, combined with the advanced PHH coating, is sure to improve your productivity even in the toughest of challenges.

Desenvolvido especificamente para a maquinação de HRSA, a pastilha DOMX oferece um desempenho excepcional ao trabalhar com estes materiais de difícil maquinação. Esta geometria inovadora, combinada com o revestimento avançado PHH, certamente irá melhorar a sua produtividade mesmo nos desafios mais difíceis.

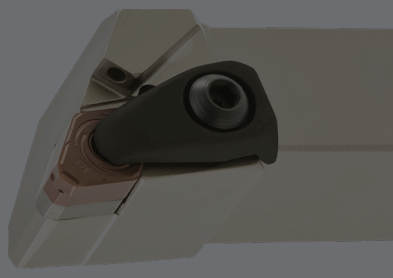
Diseñado específicamente para el torneado de HRSA, el plaquita DOMX ofrece un rendimiento excepcional al trabajar con estos materiales difíciles de mecanizar. Esta geometría novedosa, combinada con el avanzado recubrimiento PHH, seguramente mejorará su productividad incluso en los desafíos más difíciles.

DOMX 1506 > page 443



- Available in size 15 and right or left
  Disponível no tamanho 15 e para mãos direita ou esquerda | Disponible en talla 15 y para manos derecha o izquierda.
- Available in PHH910 and PHH920
  Disponivel nos graus PHH910 e PHH920 |Disponible en las calidades PHH910 y PHH920
- First choice for HRSA medium to rough turning
  Primeira escolha para torneamento médio a desbaste de superligas | Primera elección para torneado medio a desbaste de superaleaciones

A - DDJN-BAN-DX1 45° > page 444



- External toolholder with internal coolant
  Suporte de torneamento externo com refrigeração interna | Porta-herramienta de torneado externo con refrigeración interna
- With length from 4.921 in to 6.693 in
  Com comprimento de 4.921 in até 6.693 in | Con longitud de 4.921 in hasta 6.693 in

PSC-DDJN-DX1 45° > page 445



- PSC toolholder with internal coolant
  Suporte PSC com refrigeração interna | Porta-herramienta PSC con refrigeración interna
- With PSC size from 1.575 in to 3.150 in
  Com tamanho de PSC de 1.575 in até 3.150 in | Con talla de PSC de 1.575 in hasta 3.150 in

DOMX® - the revolution in HRSA medium to rough turning

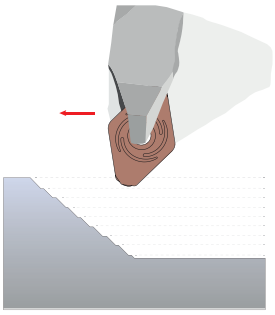
Proprietary turning line

Designed especially for HRSA, the DOMX® combined with PHH technology, offers exceptional performance in exotic materials machining. When your material has high Ni or Co content DOMX® is the choice!

- First choice for HRSA medium to rough turning;
- **4 positive cutting edges on double sided negative insert.**

DOMX®

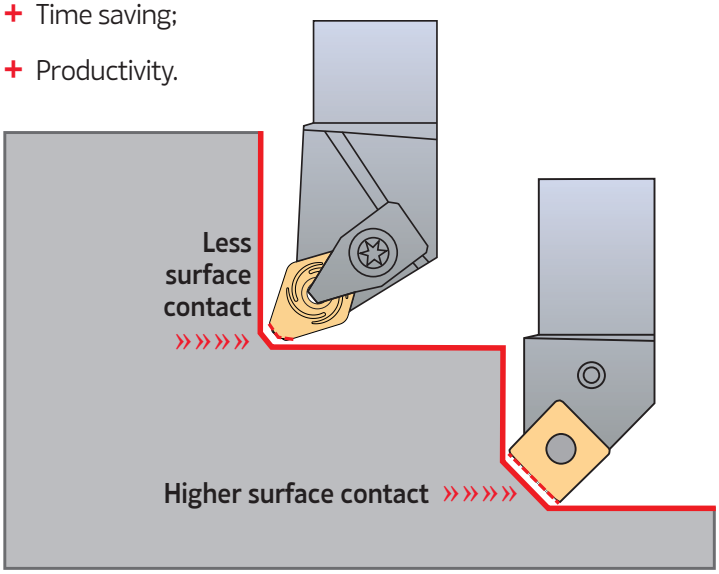




- Machine at 45º with a 93º holder;
- **Up to + 140% tool life improvement.**

DOMX VS SNMG

- Surface contact;
- Heating;
- Vibration;
- Cutting effort;
- \+ Time saving;
- \+ Productivity.



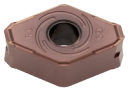
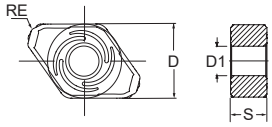
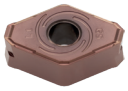
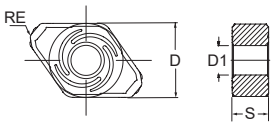
COMERCIAL VIDEO

TECHNICAL VIDEO

APPLICATION GUIDE

palbit

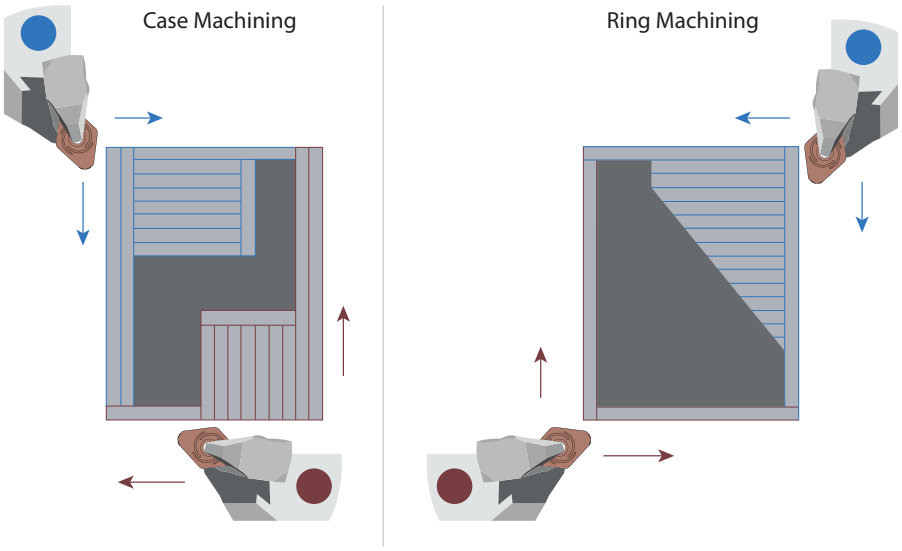
INSERTS | Pastilhas | Plaquitas

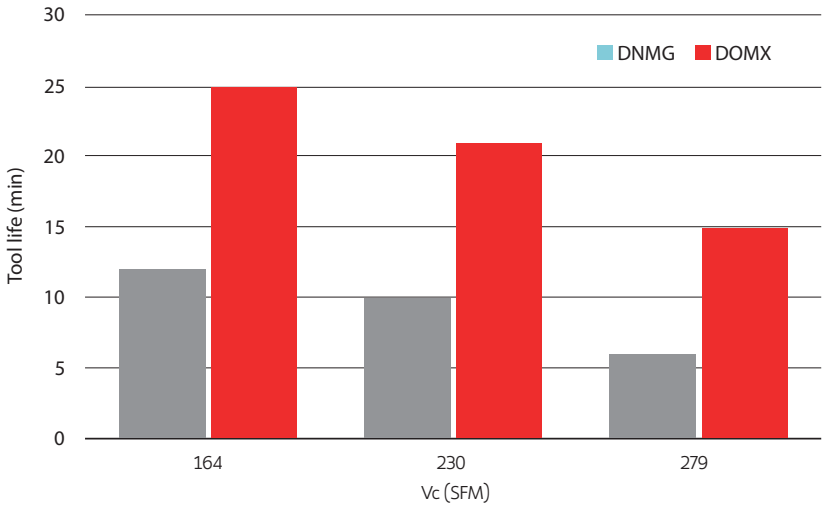
Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code ISO/ANSI Reference	S PVD X6 PHH910	S PVD Y3 PHH920	Dimensions (in) Dimensões (in) Dimensiones (in) D	S	RE	D1	Cutting Conditions Condições de Corte Condiciones de Corte AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX	Technical drawing Desenho técnico Dibujo técnico
DOMX-GS 	1124595	DOMX 1506R1-GS	◉	◉	1/2	1/4	0.031	0.203	0.059	0.012	0.059	0.012	0.008	0.020	
DOMX-GS 	1124493	DOMX 1506L1-GS	◉	◉	1/2	1/4	0.031	0.203	0.059	0.012	0.059	0.012	0.008	0.020	

◉ First choice | 1ª Escolha | 1ª Opción ◉ Stock Itens | Itens de stock

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

DOMX® can be used in several types of turning operations, from facing, external/internal turning to case and ring machining as seen in the examples below:





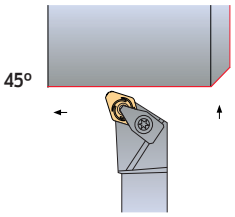
Tool life test – Inconel 625, AP 0.059 in, FN 0.059 in/r

A - DDJN-BAN-DX1 45° Toolholders

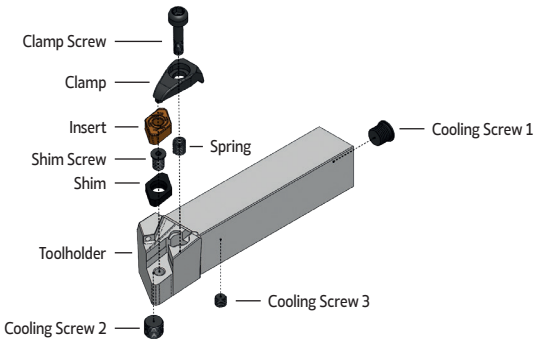
Proprietary turning line

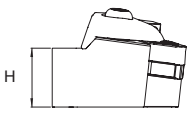
(D) Dimple lock toolholders

Roughing to Heavy Roughing	Roughing to Heavy Roughing
DOMX (L1)	DOMX (R1)
	
(15)	(15)

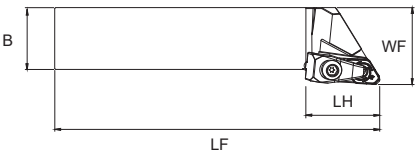


Axial: -6,25°
Radial: -6,75°









Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert Pastilha Inserto	WT (lbs)	Stock
		HF = H	B	LF	LH	WF			
Right toolholder									
182020400	DDJN R 124 BAN-DX1	0.750	0.750	4.500	1.535	1.000	DOMX 1506..	0.88	◎
182020500	DDJN R 164 DAN-DX1	1.000	1.000	6.000	1.535	1.250	DOMX 1506..	1.54	◎
182020600	DDJN R 204 DAN-DX1	1.250	1.250	6.000	1.535	1.500	DOMX 1506..	2.76	◎
Left toolholder									
182020700	DDJN L 124 BAN-DX1	0.750	0.750	4.500	1.535	1.000	DOMX 1506..	0.88	◎
182020800	DDJN L 164 DAN-DX1	1.000	1.000	6.000	1.535	1.250	DOMX 1506..	1.54	◎
182020900	DDJN L 204 DAN-DX1	1.250	1.250	6.000	1.535	1.500	DOMX 1506..	2.76	◎

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

A - DDJN-DX1 45° Toolholders

METRIC LINE

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert Pastilha Inserto	WT (lbs)	Stock
		HF = H	B	LF	LH	WF			
Right toolholder									
182000900	DDJN R 2020 K15-A-DX1	0.787	0.787	4.921	1.654	0.984	DOMX 1506R1	0.882	◎
182001000	DDJN R 2525 M15-A-DX1	0.984	0.984	5.906	1.654	1.260	DOMX 1506R1	1.653	◎
182001100	DDJN R 3232 P15-A-DX1	1.260	1.260	6.693	1.654	1.575	DOMX 1506R1	2.865	◎
Left toolholder									
182001200	DDJN L 2020 K15-A-DX1	0.787	0.787	4.921	1.654	0.984	DOMX 1506L1	0.882	◎
182001300	DDJN L 2525 M15-A-DX1	0.984	0.984	5.906	1.654	1.260	DOMX 1506L1	1.653	◎
182001400	DDJN L 3232 P15-A-DX1	1.260	1.260	6.693	1.654	1.575	DOMX 1506L1	2.865	◎

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

SPARE PARTS Acessórios | Repuestos

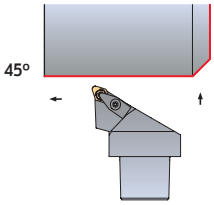
Cutter Reference	Shim R	Shim L	Shim Screw	Spring	Clamp	Clamp Screw	Wrench	Coolant Screw 1	Coolant Screw 2	Coolant Screw 3
										
DDJN R/L 2020 K15-A-DX1	CD150503	CD150502	T06010000	M09513	GA07002	D0602900	SS40	H0600475	H1000875	T1000875
DDJN R/L 2525 M15-A-DX1	CD150503	CD150502	T06010000	M09513	GA07002	D0602900	SS40	H0600475	H1000875	T1000875
DDJN R/L 3232 P15-A-DX1	CD150503	CD150502	T06010000	M09513	GA07002	D0602900	SS40	-	H1000875	-

PSC - DDJN-DX1 45° Toolholders

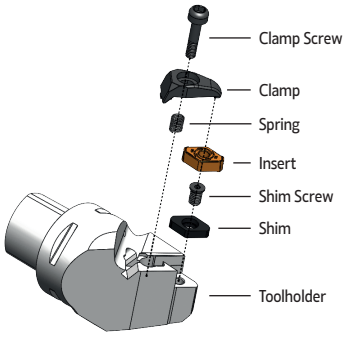
(D) Dimple lock toolholders

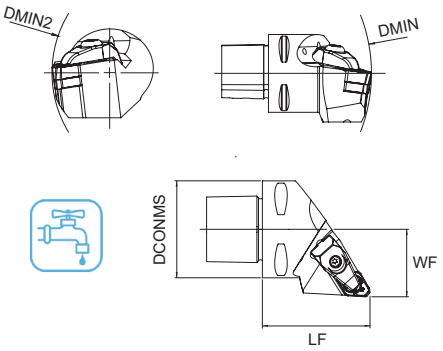
Roughing to Heavy Roughing	Roughing to Heavy Roughing
DOMX (L1)	DOMX (R1)
	
(15)	(15)

METRIC LINE



Axial: -6°
Radial: -7°





Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert Pastilha Inserto	WT (lbs)	Stock
		DCONMS	DMIN	DMIN2	WF	LF			
Right toolholder									
182000100	PSC40-DDJN R 27055-15-DX1	1.575	4.331	5.709	1.063	2.165	DOMX 1506R1	0.926	⚙
182000200	PSC50-DDJN R 35060-15-DX1	1.969	4.331	6.496	1.378	2.362	DOMX 1506R1	1.763	⚙
182000300	PSC63-DDJN R 45065-15-DX1	2.480	4.331	7.480	1.772	2.559	DOMX 1506R1	2.424	⚙
182000400	PSC80-DDJN R 55080-15-DX1	3.150	4.331	9.843	2.165	3.150	DOMX 1506R1	6.039	⚙
Left toolholder									
182000500	PSC40-DDJN L 27055-15-DX1	1.575	4.331	5.709	1.063	2.165	DOMX 1506L1	0.926	⚙
182000600	PSC50-DDJN L 35060-15-DX1	1.969	4.331	6.496	1.378	2.362	DOMX 1506L1	1.763	⚙
182000700	PSC63-DDJN L 45065-15-DX1	2.480	4.331	7.480	1.772	2.559	DOMX 1506L1	2.424	⚙
182000800	PSC80-DDJN L 55080-15-DX1	3.150	4.331	9.843	2.165	3.150	DOMX 1506L1	6.039	⚙

⚙ Stock item | Produto de stock | Itens de stock

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

SPARE PARTS Acessórios | Repuestos

Cutter Reference	Shim R	Shim L	Shim Screw	Spring	Clamp	Clamp Screw	Wrench
							
PSC40-DDJNR/L27055-15-DX1	CD150503	CD150502	T06010000	M09513	GA07002	D0602900	SS40
PSC50-DDJNR/L35060-15-DX1	CD150503	CD150502	T06010000	M09513	GA07002	D0602900	SS40
PSC63-DDJNR/L45065-15-DX1	CD150503	CD150502	T06010000	M09513	GA07002	D0602900	SS40
PSC80-DDJNR/L55080-15-DX1	CD150503	CD150502	T06010000	M09513	GA07002	D0602900	SS40

ALL-IN-ONE

MULTICUT

METRIC LINE

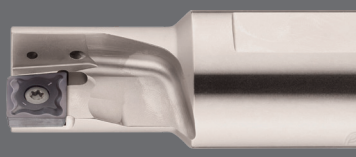


A multipurpose tool designed to enhance productivity and reduce setup times is capable of executing internal, external, and face turning, as well as drilling with either a stationary or rotating tool.

Uma ferramenta multifuncional projetada para aumentar a produtividade e reduzir os tempos de configuração. Capaz de executar torneamento interno, externo e facejamento, e até mesmo furação com uma ferramenta estacionária ou giratória.

Una herramienta multifuncional diseñada para aumentar la productividad y reducir los tiempos de configuración. Capaz de realizar torneado interno, externo y frontal, e incluso perforación con una herramienta estacionaria o giratoria.

XMS 1.50D > page 448



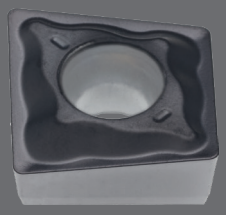
- From DC 0.315 in to 1.260 in
  De DC 0.315 in a 1.260 in | Desde DC 0.315 in hasta 1.260 in
- With length of 1,50xDC
  Com comprimento de 1.50xDC | Con longitud de 1.50xDC

XMS 2.25D > page 449



- From DC 0.315 in to 1.260 in
  De DC 0.315 in a 1.260 in | Desde DC 0.315 in hasta 1.260 in
- With length of 2,25xDC
  Com comprimento de 2,25xDC | Con longitud de 2,25xDC

XCMT INSERTS > page 450

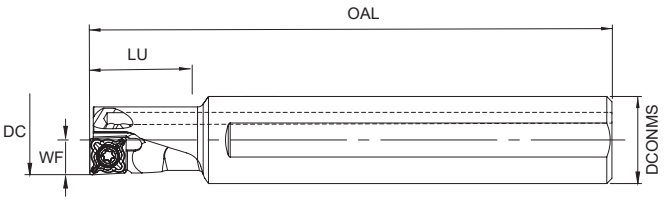


- From sizes 0.157 in to 0.669 in
  De tamanhos de 0.157 in a 0.669 in | De tamaños de 0.157 in a 0.669 in
- Available in grades PH7920 and PHS225
  Disponível nos graus PH7920 e PHS225 | Disponible en las calidades PH7920 y PHS225
- Suitable for machining steels, stainless steels and HRSA
  Adequado para maquinação de aços, aços inoxidáveis e HRSA | Adecuado para el mecanizado de aceros, aceros inoxidables y HRSA

MULTICUT

XMS 1.50D





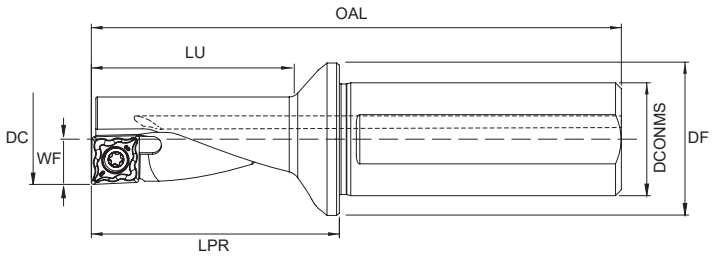
*Right hand style show

Order code Código	Reference Referência Referencia	Hand		Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Insert	Stock
				DC	DCONMS	WF	OAL	LU			
182024900	XMS-R 08010-1.50D	Right	1	0.315	0.394	0.157	3.150	0.472	0.117	XCMT 0401.. ER	◈
182025000	XMS-R 10012-1.50D	Right	1	0.394	0.472	0.197	3.543	0.591	0.137	XCMT 0502..	◈
182025100	XMS-R 12016-1.50D	Right	1	0.472	0.630	0.236	3.937	0.709	0.264	XCMT 0602..	◈
182025200	XMS-R 14016-1.50D	Right	1	0.551	0.630	0.276	4.331	0.827	0.295	XCMT 0703..	◈
182025300	XMS-R 16020-1.50D	Right	1	0.630	0.787	0.315	4.921	0.945	0.520	XCMT 0803..	◈
182025400	XMS-R 18025-1.50D	Right	1	0.709	0.984	0.354	5.315	1.063	0.882	XCMT 09T3..	◈
182025500	XMS-R 20025-1.50D	Right	1	0.787	0.984	0.394	5.906	1.181	0.994	XCMT 10T3..	◈
182025600	XMS-R 25032-1.50D	Right	1	0.984	1.260	0.492	7.087	1.476	1.940	XCMT 1304..	◈
182025700	XMS-R 32040-1.50D	Right	1	1.260	1.575	0.630	7.874	1.890	3.330	XCMT 1705..	◈

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

XMS 2.25D





*Right hand style show

Order code Código	Reference Referência Referencia	Hand		Dimensions | Dimensões | Dimensiones (mm)							WT (lbs)	Insert	Stock
				DC	DCONMS	DF	WF	OAL	LU	LPR			
182021200	XMS-R 08010-2.25D	Right	1	0.315	0.394	0.591	0.157	2.362	0.709	0.866	0,060	XCMT 0401.. ER	◉
182021300	XMS-R 10012-2.25D	Right	1	0.394	0.472	0.709	0.197	2.736	0.886	1.083	0,101	XCMT 0502..	◉
182021400	XMS-R 12016-2.25D	Right	1	0.472	0.630	0.866	0.236	3.071	1.063	1.299	0,196	XCMT 0602..	◉
182021500	XMS-R 14016-2.25D	Right	1	0.551	0.630	0.866	0.276	3.287	1.240	1.516	0,207	XCMT 0703..	◉
182021600	XMS-R 16020-2.25D	Right	1	0.630	0.787	1.102	0.315	3.701	1.417	1.732	0,339	XCMT 0803..	◉
182021700	XMS-R 18025-2.25D	Right	1	0.709	0.984	1.417	0.354	4.311	1.594	2.106	0,646	XCMT 09T3..	◉
182021800	XMS-R 20025-2.25D	Right	1	0.787	0.984	1.417	0.394	4.370	1.772	2.165	0,685	XCMT 10T3..	◉
182021900	XMS-R 25032-2.25D	Right	1	0.984	1.260	1.732	0.492	5.079	2.224	2.717	1,241	XCMT 1304..	◉
182022000	XMS-R 32040-2.25D	Right	1	1.260	1.575	2.126	0.630	6.220	2.835	3.465	2,462	XCMT 1705..	◉
182022100	XMS-L 08010-2.25D	Left	1	0.315	0.394	0.591	0.157	2.362	0.709	0.866	0,060	XCMT 0401.. EL	◉
182022200	XMS-L 10012-2.25D	Left	1	0.394	0.472	0.709	0.197	2.736	0.886	1.083	0,101	XCMT 0502..	◉
182022300	XMS-L 12016-2.25D	Left	1	0.472	0.630	0.866	0.236	3.071	1.063	1.299	0,196	XCMT 0602..	○
182022400	XMS-L 14016-2.25D	Left	1	0.551	0.630	0.866	0.276	3.287	1.240	1.516	0,207	XCMT 0703..	○
182022500	XMS-L 16020-2.25D	Left	1	0.630	0.787	1.102	0.315	3.701	1.417	1.732	0,339	XCMT 0803..	○
182022600	XMS-L 18025-2.25D	Left	1	0.709	0.984	1.417	0.354	4.311	1.594	2.106	0,646	XCMT 09T3..	○
182022700	XMS-L 20025-2.25D	Left	1	0.787	0.984	1.417	0.394	4.370	1.772	2.165	0,685	XCMT 10T3..	○
182022800	XMS-L 25032-2.25D	Left	1	0.984	1.260	1.732	0.492	5.079	2.224	2.717	1,241	XCMT 1304..	○
182022900	XMS-L 32040-2.25D	Left	1	1.260	1.575	2.126	0.630	6.220	2.835	3.465	2,462	XCMT 1705..	◉

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

MULTICUT

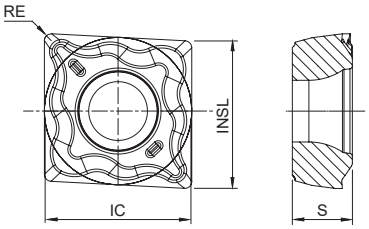
XCMT Inserts | Pastilhas | Plaquitas



XCMT-MP
(PH7 grade)



XCMT-MP
(PHS grade)



XCMT-MP

		P	M		S	Dimensions | Dimensões | Dimensiones (in)				Hand
		PVD	CVD	PVD	PVD					
	(2) Grade code	G4	U5	G4	G4					
(1) Geometry code	ISO Reference	PH7920	PHS225	PH7920	PH7920	IC	S	INSL	RE	
1124790	XCMT 040104-MP ER	●	●	●	●	0.173	0.074	0.157	0.016	Right
1124791	XCMT 040104-MP EL	●	●	●	●	0.173	0.074	0.157	0.016	Left
1124792	XCMT 050204-MP EN	●	●	●	●	0.222	0.084	0.197	0.016	Neutral
1123788	XCMT 060204-MP EN	●	●	●	●	0.252	0.097	0.236	0.016	Neutral
1124784	XCMT 070304-MP EN	●	●	●	●	0.295	0.128	0.276	0.016	Neutral
1124785	XCMT 080304-MP EN	●	●	●	●	0.331	0.128	0.315	0.016	Neutral
1124786	XCMT 09T304-MP EN	●	●	●	●	0.372	0.157	0.354	0.016	Neutral
1124787	XCMT 10T308-MP EN	●	●	●	●	0.409	0.157	0.394	0.031	Neutral
1124788	XCMT 130408-MP EN	●	●	●	●	0.526	0.191	0.492	0.031	Neutral
1124789	XCMT 170508-MP EN	●	●	●	●	0.681	0.220	0.630	0.031	Neutral

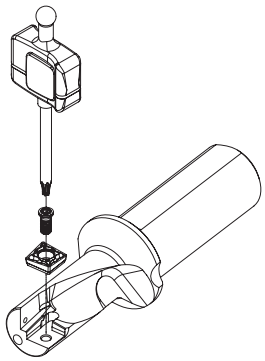
● First choice | Primeira opção | 1ª opción ● Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

SPARE PARTS Acessórios | Repuestos

Order separately

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				lbf/in
XMS-R 08010-1.50D/2.25D	P0180400	XT06IP	DT0606IP	5.3
XMS-R 10012-1.50D/2.25D	P0200500	XT06	DT0606	5.3
XMS-R 12016-1.50D/2.25D	P0220500	XT07	DT0709	8.0
XMS-R 14016-1.50D/2.25D	P0250704	XT08	DT0812	10.6
XMS-R 16020-1.50D/2.25D	P0300701	XT08	DT0812	10.6
XMS-R 18025-1.50D/2.25D	P0300701	XT08	DT0812	10.6
XMS-R 20025-1.50D/2.25D	P0350800	PT15	DT1530	26.6
XMS-R 25032-1.50D/2.25D	P0500900	PT20	DT2050	35.4
XMS-R 32040-1.50D/2.25D	P0501302	PT20	DT2050	35.4



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

ISO	PSM	Material	HB (Brinell)	Grades ← Wear Resistance — Toughness → PH7920	PHS225
P	1	Unalloyed Steel	125-170	✓	
	2	Low-Alloyed Steel	180-350	✓	
	3	High-Alloyed Steel	200-325	✓	
M	4	SS - Ferritic / Martensitic	200-330	✓	✓
	5	SS - Austenitic	180-330	✓	✓
	6	SS - Austenitic-ferritic (Duplex)	230-260	✓	✓
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 → PH7920	PHS225
P	1	Unalloyed Steel	125-170	361-722	-
	2	Low-Alloyed Steel	180-350	328-689	-
	3	High-Alloyed Steel	200-325	279-624	-
M	4	SS - Ferritic / Martensitic	200-330	312-689	230-755
	5	SS - Austenitic	180-330	279-673	214-738
	6	SS - Austenitic-ferritic (Duplex)	230-260	263-640	181-706
S	11	Heat Resistant Super Alloys	200-320	82-689	-

Reference	FN (in/rev)			AP (in)	
	Face Turning	Int/Ext Turning	Holemaking	Face Turning	Int/Ext Turning
XCMT 040104-MP ER/L	0.001-0.004	0.001-0.006	0.001-0.002	0.020-0.075	0.020-0.107
XCMT 050204-MP EN	0.001-0.005	0.001-0.006	0.001-0.002	0.020-0.087	0.020-0.126
XCMT 060204-MP EN	0.001-0.006	0.001-0.007	0.001-0.003	0.028-0.107	0.028-0.146
XCMT 070304-MP EN	0.001-0.007	0.001-0.008	0.001-0.004	0.032-0.119	0.032-0.158
XCMT 080304-MP EN	0.002-0.008	0.002-0.008	0.001-0.004	0.036-0.134	0.036-0.166
XCMT 09T304-MP EN	0.002-0.008	0.002-0.009	0.002-0.004	0.036-0.150	0.036-0.186
XCMT 10T308-MP EN	0.002-0.009	0.002-0.010	0.002-0.004	0.040-0.166	0.040-0.209
XCMT 130408-MP EN	0.002-0.010	0.002-0.011	0.002-0.005	0.040-0.197	0.040-0.256
XCMT 170508-MP EN	0.002-0.011	0.002-0.012	0.002-0.006	0.040-0.237	0.040-0.276

Note: For additional details on drilling operations check the page B-357.



TURNING
OVERVIEW

TURNING OVERVIEW

1 NEGATIVE INSERTS
> See page C - 468

2 POSITIVE INSERTS
> See page C - 506

3 PCBN INSERTS
> See page C - 540

4 PCD INSERTS
> See page C - 564

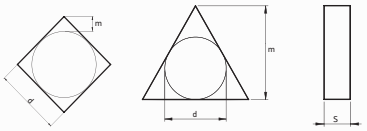
5 HEAVY TURNING
> See page C - 586

6 TECNHICAL DATA
> See page C - 610

TURNING INSERTS ISO IDENTIFICATION SYSTEM

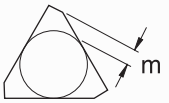
H	120°	M	86°
O	135°	V	35°
P	108°	W	80°
S	90°	L	90°
T	60°	A	85°
C	80°	B	82°
D	55°	K	55°
E	75°	R	
F	50°	X	Special

1 - Insert shape symbol



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

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



Triangular inserts with a facet (secondary cutting edge)

Detailed dimension of M class insert Insert height Tolerances (mm)

Inscribed circle	T	S	C	D	V
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.11	±0.10	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed circle Tolerances (mm)

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

3 - Tolerances symbol

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

2 - Normal clearance symbol

ISO	T	N	M	G
ANSI	T	N	M	G

4 - Insert symbol

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

TURNING INSERTS ISO IDENTIFICATION SYSTEM

Sistema de identificação ISO para pastilhas | Codificación ISO para plaquitas

R's	V's (35°)	D's (55°)	C's (80°)	S's (90°)	T's (60°)	W's (80°)	IC mm	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	

5 - Insert size symbol

* 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

6 - Insert thickness symbol

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

10 - Chip breaker geometries

	FLAT	ST	MA	
NEGATIVE Chip breakers				(...)

	FLAT	GS	RR	
POSITIVE Chip breakers				(...)

7 - Insert corner symbol

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

7.1* - Insert edges symbol

For inserts having secondary edges two digits are used:

1st digit is secondary edge		2nd digit is secondary edges relief angle	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	special	F	25°
*only when required.		G	30°
		N	0°
		P	11°
		Z	special

8* - Cutting edge information

Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfered with honing	S

*only when required.

9* - Cutting direction

Shape	Hand	Symbol
	Right	R
	Left	L
	None	N

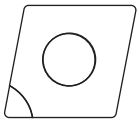
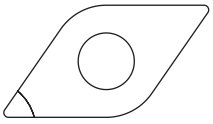
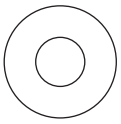
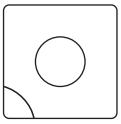
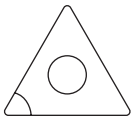
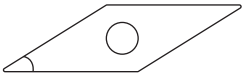
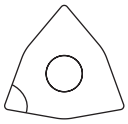
*only when required.

INSERTS RECOMENDATION

EXTERNAL MACHINING Maquinação externa | Maquinación externa

General Recommendation:

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

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

●● Recomended Insert Shape ● Alternative Insert Shape

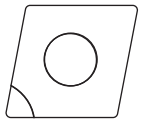
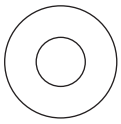
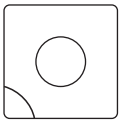
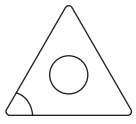
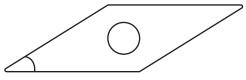
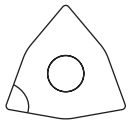
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INSERTS RECOMENDATION
Recomendações de maquinação | Recomendaciones de maquinación

INTERNAL MACHINING Maquinação interna | Maquinación interna

General Recommendation:

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

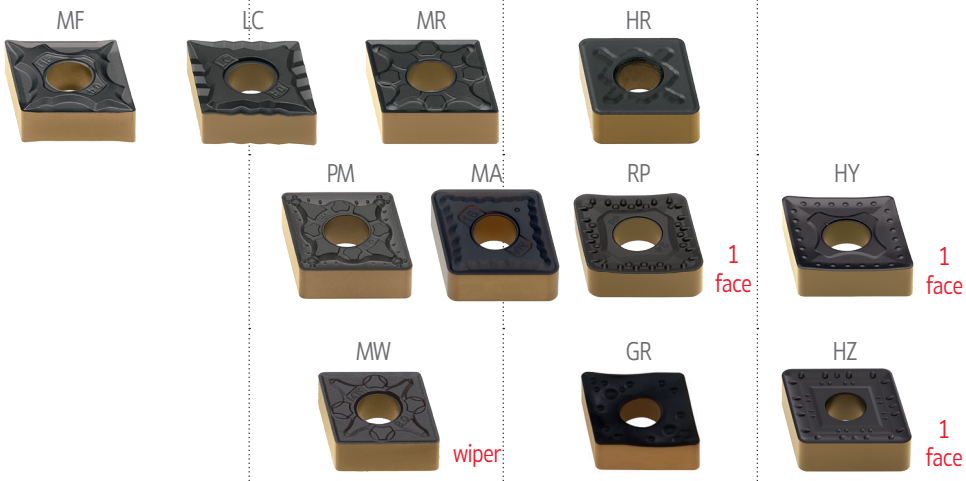
Insert Shape \ Operation	Longitudinal turning	Profiling	Facing
 Rhombic 80º	●		●●
 Rhombic 55º	●	●●	●
 Parallelogram 55º	●●		
 Round	●		●
 Square 90º	●		
 Triangular 60º	●●	●	●
 Rhombic 35º		●	
 Trigon 80º	●		●

●● Recomended Insert Shape ● Alternative Insert Shape

NEGATIVE TURNING Application Range Overview

P

Fine finishing	Finishing	Medium	Roughing	Heavy roughing
	MF, LC	MR, PM, MA	HR, RP (1 face), MW (wiper), GR	HY (1 face), HZ (1 face)



CVD Grades

PHG105	PHG115	PHG125	PHG140
P05-P10	P10-P25	P20-P35	P25-P45

PH2G115	PH2G125
P10-P25	P20-P35

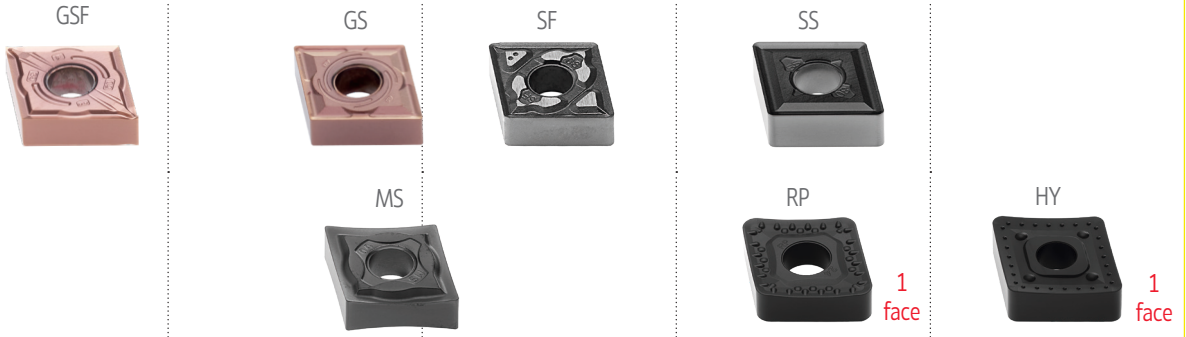
PVD Grades

PH7910
P05-P10

Continuous cut ← → Interrupted cut

M

Fine finishing	Finishing	Medium	Roughing	Heavy roughing
GSF	GS, MS	SF	SS, RP (1 face)	HY (1 face)



CVD Grades

PHS215	PHS225	PHS240
M10-M25	M15-M30	M25-M45

PVD Grades

PH7910	PHH910	PH7920	PHH920
M05-M10	M05-M10	M10-M25	M10-M25

Continuous cut ← → Interrupted cut

palbit

NEGATIVE TURNING APPLICATION RANGE OVERVIEW

Vista geral de aplicações | Vista general de aplicaciones

K

Fine finishing	Finishing	Medium	Roughing	Heavy roughing
		ST	FLAT HR	
		MW wiper		HZ 1 face
CVD Grades				
	PH5705 K05-K15		PH5320 K10-K25	PH5740 K20-K40
Continuous cut ⟷ Interrupted cut				

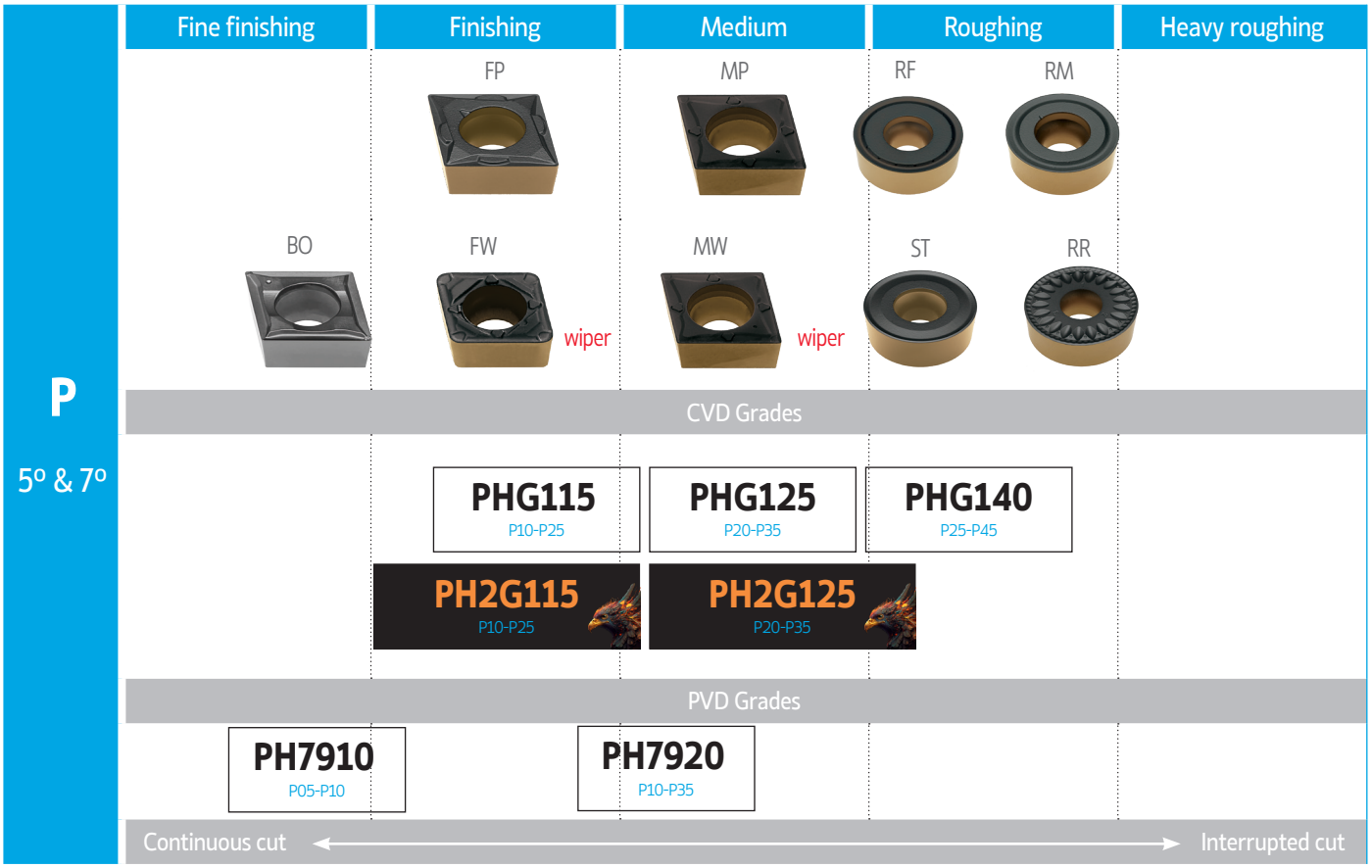
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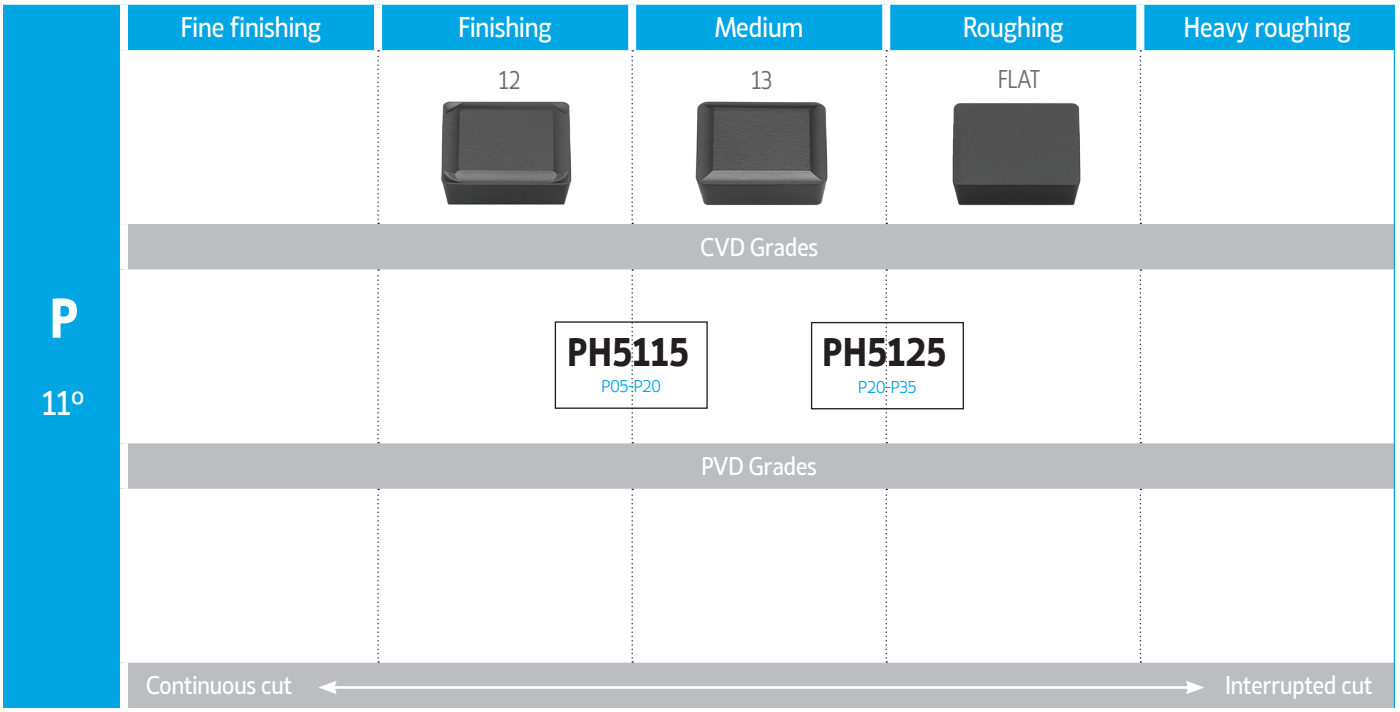
Fine finishing	Finishing	Medium	Roughing	Heavy roughing
		MS		
Uncoated Grades				
		PH0910 N01-N20		
Continuous cut ⟷ Interrupted cut				

S

Fine finishing	Finishing	Medium	Roughing	Heavy roughing
GSF	GS	SF	SS	
		MS		DOMX
PVD Grades				
	PH7910 S05-S10	PHH910 S10-S25	PH7920 S10-S25	PHH920 S10-S25
Continuous cut ⟷ Interrupted cut				

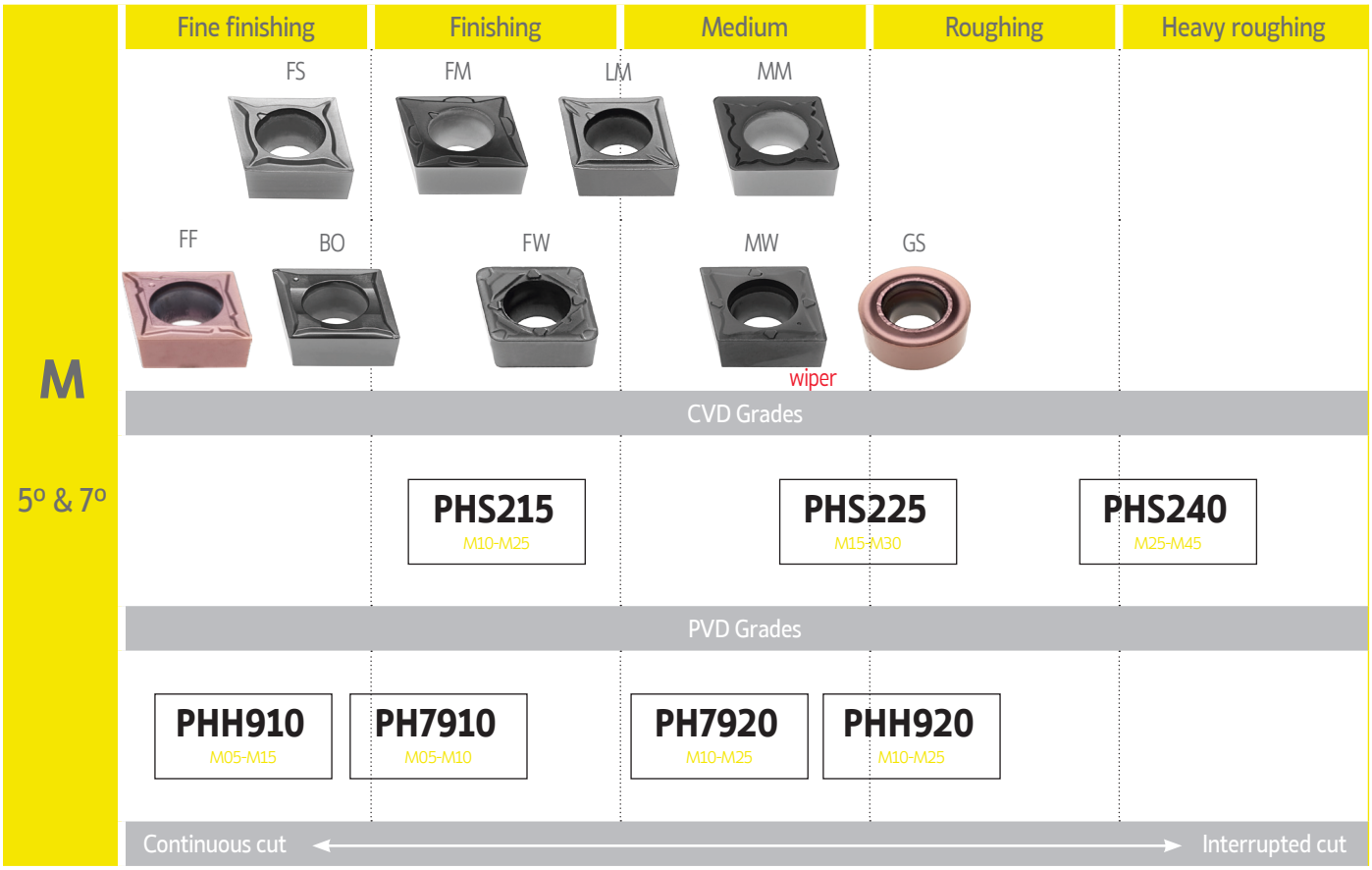
POSITIVE TURNING Application Range Overview

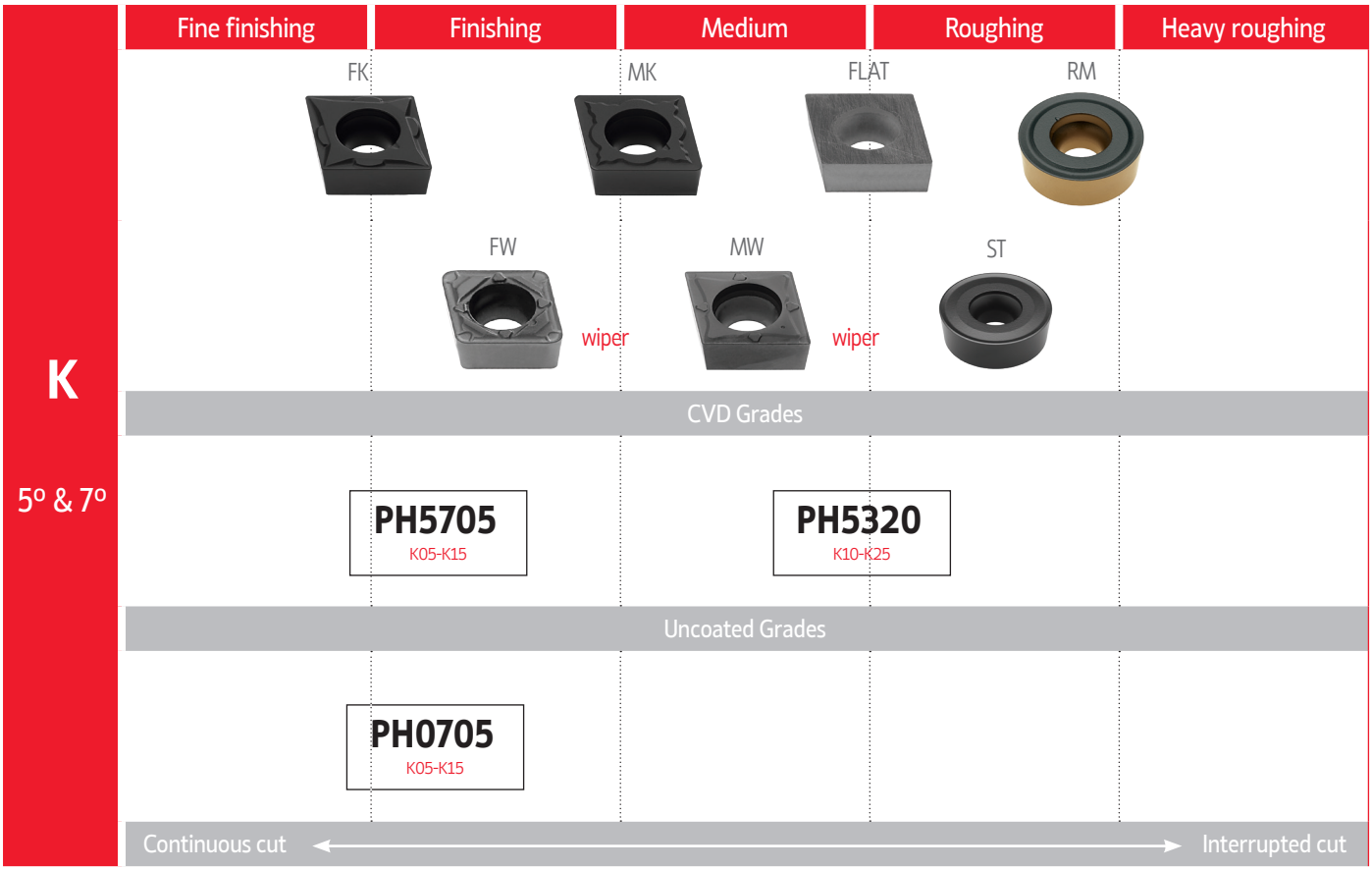




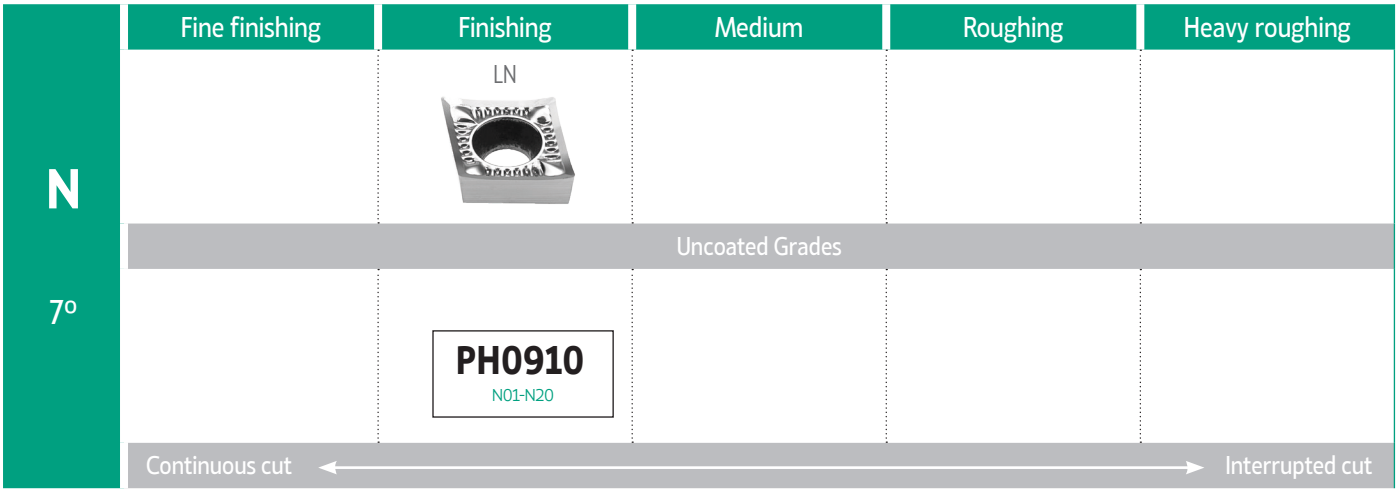
POSITIVE TURNING APPLICATION RANGE OVERVIEW

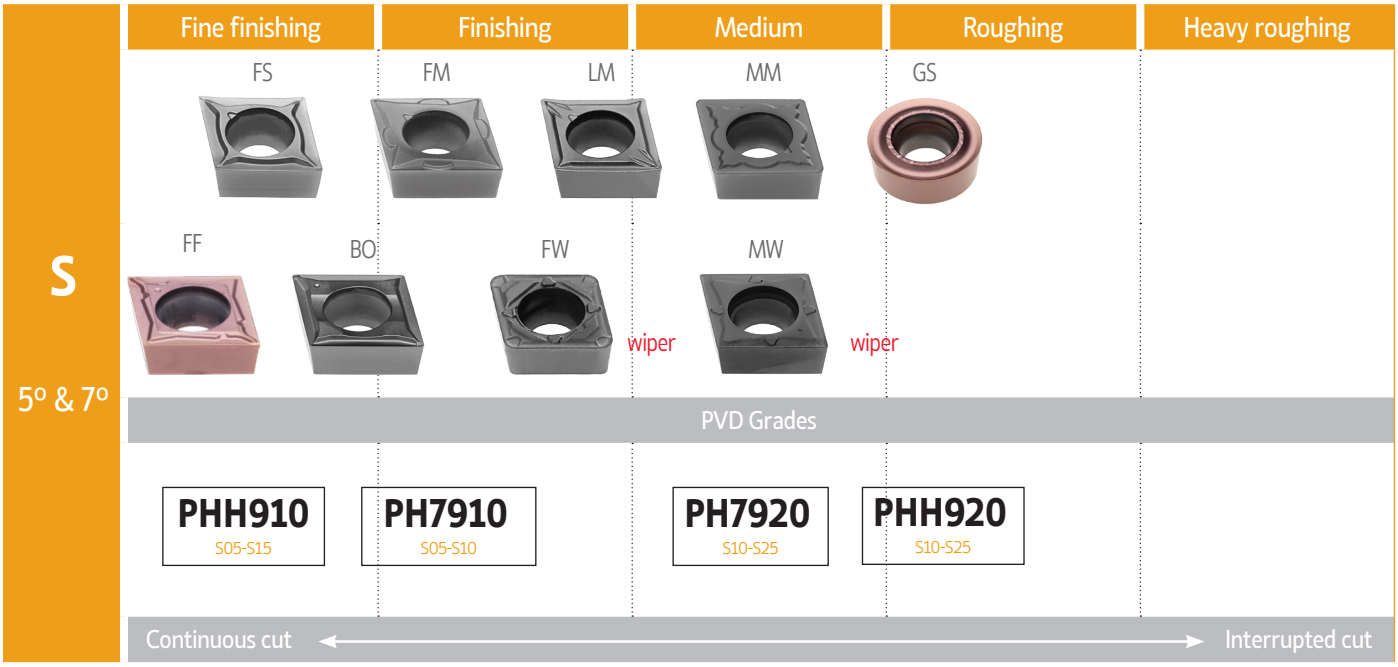
Vista geral de aplicações | Vista general de aplicaciones





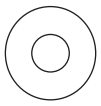
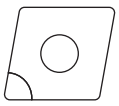
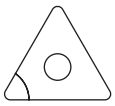
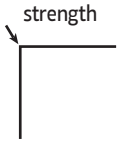
POSITIVE TURNING Application Range Overview





INSERT SHAPE SELECTION

Selecção de geometria para pastilha | Selección de geometria para plaquita

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

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.

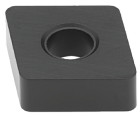
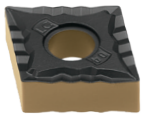
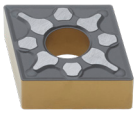
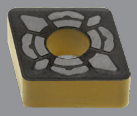
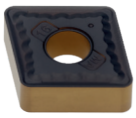
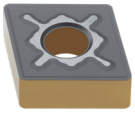
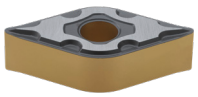
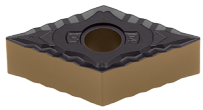
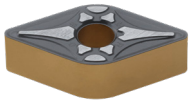
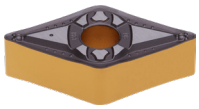
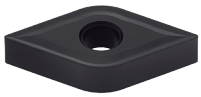
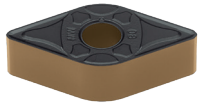
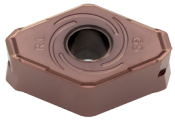
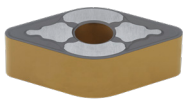
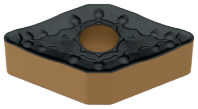
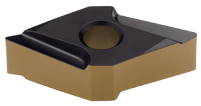
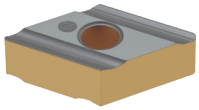
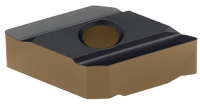
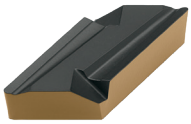
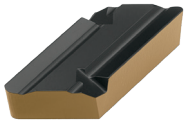
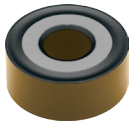
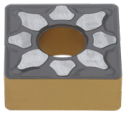
A large nose angle is strong, but requires more machine power and has a higher tendency for vibration.

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.

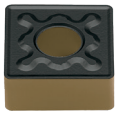
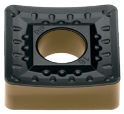
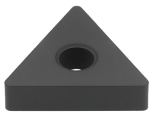
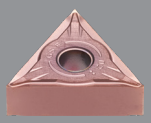
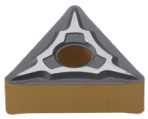
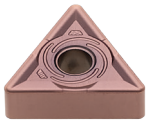
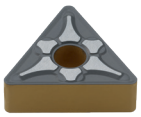
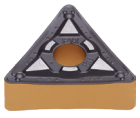
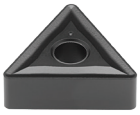
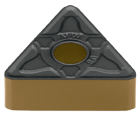
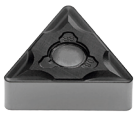
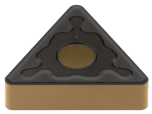
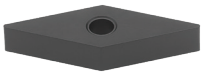
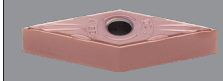
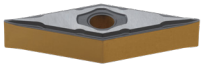
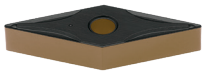
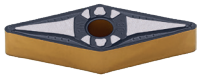
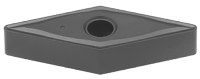
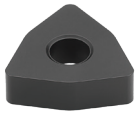
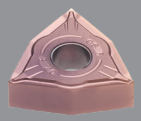
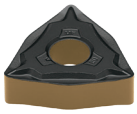
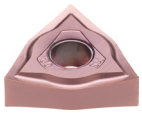
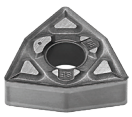
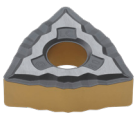
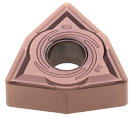
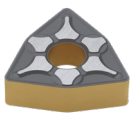
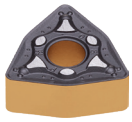
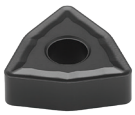
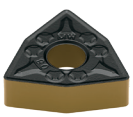
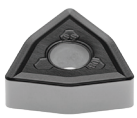
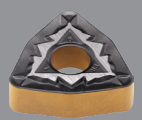
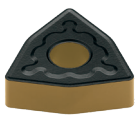
NEGATIVE TURNING INSERTS OVERVIEW

CNMA  Roughing Page C - 470 Rhombic 80°	**NEW CNMG-GSF**  Fine Finishing Page C - 470 Rhombic 80°	**CNMG-MF**  Finishing Page C - 470 Rhombic 80°	**CNMG-MS**  Medium to Finishing Page C - 470 Rhombic 80°	**CNMG-SF**  Medium to Finishing Page C - 470 Rhombic 80°	**CNMG-LC**  Medium to Finishing Page C - 470 Rhombic 80°
CNMG-GS  Medium Page C - 470 Rhombic 80°	**CNMG-MR**  Medium Page C - 472 Rhombic 80°	**CNMG-PM**  Medium Page C - 472 Rhombic 80°	**NEW CNMG-KM**  Medium Page C - 472 Rhombic 80°	**CNMG-ST**  Medium Page C - 472 Rhombic 80°	**CNMG-MW**  Medium wiper Page C - 472 Rhombic 80°
CNMG-MA  Medium to Roughing Page C - 474 Rhombic 80°	**CNMG-SS**  Roughing to Medium Page C - 474 Rhombic 80°	**CNMG-HR**  Roughing Page C - 474 Rhombic 80°	**CNMM-RP**  Roughing Page C - 476 Rhombic 80°	**CNMM-GR**  Roughing Page C - 476 Rhombic 80°	**CNMM-HY**  Heavy to Roughing Page C - 476 Rhombic 80°
CNMM-HZ  Heavy to Roughing Page C - 476 Rhombic 80°	**DNMA**  Roughing Page C - 478 Rhombic 55°	**DNMG-MF**  Finishing Page C - 478 Rhombic 55°	**DNMG-MS**  Medium to Finishing Page C - 478 Rhombic 55°	**DNMG-SF**  Medium to Finishing Page C - 478 Rhombic 55°	**DNMG-LC**  Medium to Finishing Page C - 480 Rhombic 55°
DNMG-GS  Medium Page C - 480 Rhombic 55°	**DNMG-MR**  Medium Page C - 480 Rhombic 55°	**DNMG-PM**  Medium Page C - 480 Rhombic 55°	**DNMG-ST**  Medium Page C - 482 Rhombic 55°	**DNMG-MW**  Medium wiper Page C - 482 Rhombic 55°	**DNMG-SS**  Roughing to Medium Page C - 482 Rhombic 55°
DOMX-GS  Roughing Page C - 482 Rhombic 55°	**DNMG-HR**  Roughing Page C - 482 Rhombic 55°	**DNMM-RP**  Roughing Page C - 482 Rhombic 55°	**DNMX-02**  Medium to Finishing Page C - 484 Rhombic 55°	**DNMX-03**  Medium Page C - 484 Rhombic 55°	**DNMX-01**  Roughing to Medium Page C - 484 Rhombic 55°
KNUX-01  Finishing Page C - 486 Parallelogram 55°	**KNUX-02**  Medium Page C - 486 Parallelogram 55°		**RNMG-ST**  Medium Page C - 486 Round R°		
SNMA  Roughing Page C - 488 Square 90°	**SNMG-MF**  Finishing Page C - 488 Square 90°	**SNMG-SF**  Medium to Finishing Page C - 488 Square 90°	**SNMG-GS**  Medium to Finishing Page C - 488 Square 90°	**SNMG-MR**  Medium Page C - 488 Square 90°	**SNMG-PM**  Medium Page C - 488 Square 90°

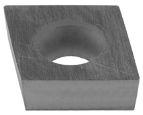
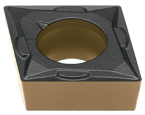
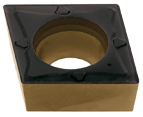
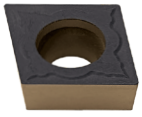
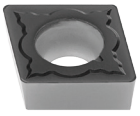
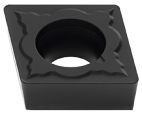
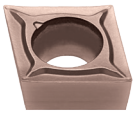
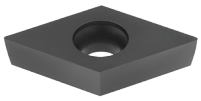
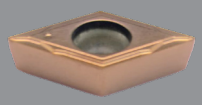
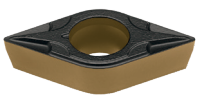
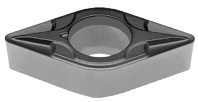
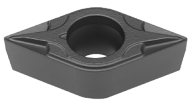
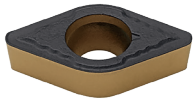
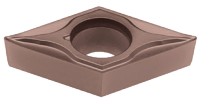
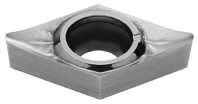
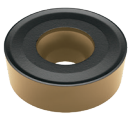
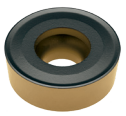
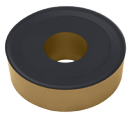
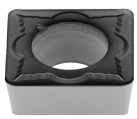
palbit

NEGATIVE TURNING INSERTS OVERVIEW

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

SNMG-ST  Medium Page C - 490 Square 90°	**SNMG-SS**  Roughing to Medium Page C - 490 Square 90°	**SNMG-HR**  Roughing Page C - 490 Square 90°	**SNMM-RP**  Roughing Page C - 492 Square 90°	**SNMM-HY**  Heavy to Roughing Page C - 492 Square 90°	**SNMM-HZ**  Heavy to Roughing Page C - 492 Square 90°
TNMA  Roughing Page C - 494 Triangular 60°	**NEW TNMG-GSF**  Fine Finishing Page C - 494 Triangular 60°	**TNMG-MF**  Finishing Page C - 494 Triangular 60°	**TNMG-MS**  Medium to Finishing Page C - 494 Triangular 60°	**TNMG-SF**  Medium to Finishing Page C - 494 Triangular 60°	**TNMG-LC**  Medium to Finishing Page C - 494 Triangular 60°
TNMG-GS  Medium Page C - 496 Triangular 60°	**TNMG-MR**  Medium Page C - 496 Triangular 60°	**TNMG-PM**  Medium Page C - 496 Triangular 60°	**TNMG-ST**  Medium Page C - 496 Triangular 60°	**TNMG-MW**  Medium wiper Page C - 498 Triangular 60°	**TNMG-SS**  Roughing to Medium Page C - 498 Triangular 60°
TNMG-HR  Roughing Page C - 498 Triangular 60°	**TNMX-01**  Medium to Finishing Page C - 498 Triangular 60°		**VNMA**  Roughing Page C - 500 Rhombic 35°	**NEW VNMG-GSF**  Fine Finishing Page C - 500 Rhombic 35°	**VNMG-MF**  Finishing Page C - 500 Rhombic 35°
VNMG-MS  Medium to Finishing Page C - 500 Rhombic 35°	**VNMG-SF**  Medium to Finishing Page C - 500 Rhombic 35°	**VNMG-LC**  Medium to Finishing Page C - 500 Rhombic 35°	**VNMG-GS**  Medium Page C - 500 Rhombic 35°	**VNMG-MR**  Medium Page C - 500 Rhombic 35°	**VNMG-PM**  Medium Page C - 500 Rhombic 35°
VNMG-ST  Medium Page C - 500 Rhombic 35°	**VNMG-SS**  Roughing to Medium Page C - 500 Rhombic 35°	**WNMA**  Roughing Page C - 502 Trigon 80°	**NEW WNMG-GSF**  Fine Finishing Page C - 502 Trigon 80°	**WNMG-MF**  Finishing Page C - 502 Trigon 80°	**WNMG-MS**  Medium Page C - 502 Trigon 80°
WNMG-SF  Medium to Finishing Page C - 502 Trigon 80°	**WNMG-LC**  Medium to Finishing Page C - 502 Trigon 80°	**WNMG-GS**  Medium Page C - 502 Trigon 80°	**WNMG-MR**  Medium Page C - 504 Trigon 80°	**WNMG-PM**  Medium Page C - 504 Trigon 80°	**WNMG-ST**  Medium Page C - 504 Trigon 80°
WNMG-MW  Medium wiper Page C - 504 Trigon 80°	**WNMG-SS**  Roughing to Medium Page C - 504 Trigon 80°	**NEW WNMG-PR**  Roughing Page C - 504 Trigon 80°	**WNMG-HR**  Roughing Page C - 504 Trigon 80°		

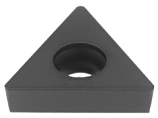
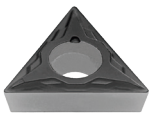
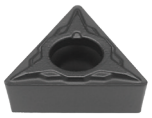
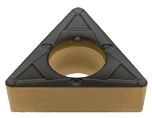
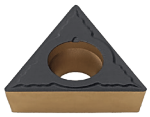
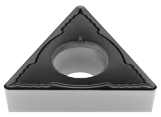
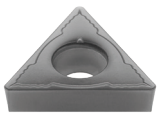
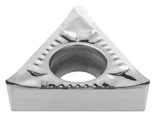
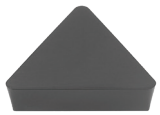
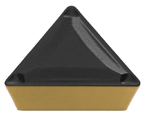
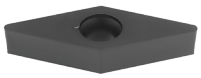
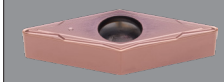
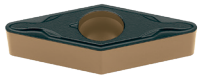
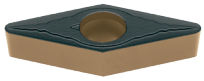
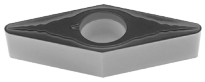
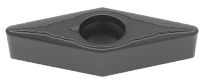
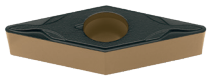
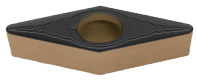
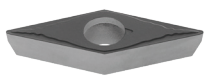
POSITIVE TURNING INSERTS OVERVIEW

CCMW  Finishing Page C - 508 Rhombic 80°	**NEW CCMT-FF**  Fine Finishing Page C - 508 Rhombic 80°	**CCMT-FP**  Finishing Page C - 508 Rhombic 80°	**CCMT-BO**  Finishing Page C - 508 Rhombic 80°	**CCMT-FM**  Finishing Page C - 508 Rhombic 80°	**CCMT-FK**  Finishing Page C - 508 Rhombic 80°
CCMT-FW  Finishing wiper Page C - 510 Rhombic 80°	**CCMT-LM**  Medium to Finishing Page C - 510 Rhombic 80°	**CCMT-MW**  Medium to Finishing wiper Page C - 510 Rhombic 80°	**CCMT-MP**  Medium Page C - 510 Rhombic 80°	**CCMT-MM**  Medium Page C - 510 Rhombic 80°	**CCMT-MK**  Medium Page C - 510 Rhombic 80°
CCGT-FS  Finishing to Fine finishing Page C - 512 Rhombic 80°	**CCGT-LN**  Medium to Finishing Page C - 512 Rhombic 80°				
DCMW  Finishing Page C - 514 Rhombic 55°	**NEW DCMT-FF**  Fine Finishing Page C - 514 Rhombic 55°	**DCMT-FP**  Finishing Page C - 514 Rhombic 55°	**DCMT-FM**  Finishing Page C - 514 Rhombic 55°	**DCMT-FK**  Finishing Page C - 514 Rhombic 55°	**DCMT-FW**  Finishing wiper Page C - 514 Rhombic 55°
DCMT-LM  Medium to Finishing Page C - 514 Rhombic 55°	**DCMT-MW**  Medium to Finishing wiper Page C - 514 Rhombic 55°	**DCMT-MP**  Medium Page C - 516 Rhombic 55°	**DCMT-MM**  Medium Page C - 516 Rhombic 55°	**DCMT-MK**  Medium Page C - 516 Rhombic 55°	**DCGT-FS**  Finishing to Fine finishing Page C - 516 Rhombic 55°
DCGT-LN  Medium to Finishing Page C - 516 Rhombic 55°		**RCGT-LN**  Finishing to Fine finishing Page C - 518 Round R°	**RCMT-GS**  Medium Page C - 518 Round R°	**RCMT-CP**  Medium Page C - 518 Round R°	**RCMT-ST**  Roughing to Medium Page C - 518 Round R°
RCMT-RF  Roughing to Medium Page C - 518 Round R°	**RCMT-RM**  Roughing to Medium Page C - 518 Round R°	**RCMX-ST**  Roughing to Medium Page C - 518 Round R°	**RCMX-RM**  Roughing to Medium Page C - 518 Round R°	**RCMX-RR**  Roughing to Medium Page C - 518 Round R°	
SCMW  Finishing Page C - 520 Square 90°	**SCMT-FP**  Finishing Page C - 520 Square 90°	**SCMT-FM**  Finishing Page C - 520 Square 90°	**SCMT-FK**  Finishing Page C - 520 Square 90°	**SCMT-MP**  Medium Page C - 520 Square 90°	**SCMT-MM**  Medium Page C - 520 Square 90°

palbit

POSITIVE TURNING INSERTS OVERVIEW

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

SCMT-MK  Medium Page C - 520 Square 90°	**SCGT-LN**  Medium to Finishing Page C - 520 Square 90°		**SPUN**  Medium to Finishing Page C - 522 Square 90°	**SPMR-12**  Finishing to Fine finishing Page C - 522 Square 90°	**SPMR-13**  Medium Page C - 522 Square 90°
TCMW  Finishing Page C - 524 Triangular 60°	**TCMT-FP**  Finishing Page C - 524 Triangular 60°	**TCMT-FM**  Finishing Page C - 524 Triangular 60°	**TCMT-FK**  Finishing Page C - 526 Triangular 60°	**TCMT-FW**  Finishing wiper Page C - 526 Triangular 60°	**TCMT-MW**  Medium to Finishing wiper Page C - 526 Triangular 60°
TCMT-MP  Medium Page C - 528 Triangular 60°	**TCMT-MM**  Medium Page C - 528 Triangular 60°	**TCMT-MK**  Medium Page C - 528 Triangular 60°	**TCGT-FS**  Finishing to Fine finishing Page C - 530 Triangular 60°	**TCGT-LN**  Medium to Finishing Page C - 530 Triangular 60°	
TPUN  Medium to Finishing Page C - 532 Triangular 60°	**TPMR-12**  Finishing to Fine finishing Page C - 532 Triangular 60°	**TPMR-13**  Medium Page C - 532 Triangular 60°			
VBMW  Finishing Page C - 534 Rhombic 35°	**NEW VBMT-FF**  Finishing Page C - 534 Rhombic 35°	**VBMT-FP**  Finishing Page C - 534 Rhombic 35°	**VBMT-FM**  Finishing Page C - 534 Rhombic 35°	**VBMT-FK**  Finishing Page C - 534 Rhombic 35°	**VBMT-MP**  Medium Page C - 534 Rhombic 35°
VBMT-MM  Medium Page C - 534 Rhombic 35°	**VBMT-MK**  Medium Page C - 534 Rhombic 35°				
VCMW  Finishing Page C - 536 Rhombic 35°	**VCMT-FP**  Finishing Page C - 5 536 72 Rhombic 35°	**VCMT-FM**  Finishing Page C - 536 Rhombic 35°	**VCMT-FK**  Finishing Page C - 536 Rhombic 35°	**VCMT-MP**  Medium Page C - 536 Rhombic 35°	**VCMT-MM**  Medium Page C - 536 Rhombic 35°
VCMT-MK  Medium Page C - 536 Rhombic 35°	**VCGT-FS**  Finishing to Fine finishing Page C - 538 Rhombic 35°	**VCGT-LN**  Medium to Finishing Page C - 538 Rhombic 35°			

INSERTS

NEGATIVE

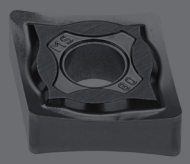


Negative inserts have a 0° clearance angle, lending them increased strength and durability. They are ideal for external turning, or any time heavy cutting conditions are required. Additionally, they are often double-sided, making them a more economical choice.

Pastilhas negativas têm um ângulo de folga de 0°, conferindo-lhes maior resistência e durabilidade. São ideais para torneamento externo, ou sempre que são necessárias condições de corte pesadas. Além disso, são frequentemente de dupla face, tornando-as uma escolha mais económica.

Plaquitas negativas tienen un ángulo de despeje de 0°, lo que les confiere mayor resistencia y durabilidad. Son ideales para el torneado externo, o en cualquier momento que se requieran condiciones de corte pesadas. Además, a menudo son de doble cara, lo que las convierte en una opción más económica.

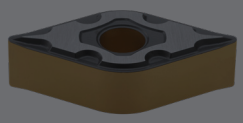
CN.. > page 470



> Rhombic 80° inserts are very popular thanks to their versatility

Rhombic 80° inserts são muito populares devido à sua versatilidade | Las plaquitas de 80° rómbicas son muy populares gracias a su versatilidad

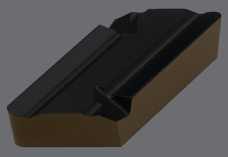
DN.. > page 478



> Rhombic 55° inserts offer balanced roughing and finishing capabilities

Pastilhas rômbicas de 55° oferecem capacidades equilibradas de desbaste e acabamento | Las plaquitas rómbicas de 55° ofrecen capacidades equilibradas para desbaste y acabado

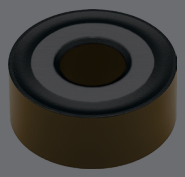
KN.. > page 486



> Parallelogram 55º inserts for profile turning

Pastilhas em paralelogramo de 55º para torneamento de perfil | Plaquitas en paralelogramo de 55º para torneado de perfil

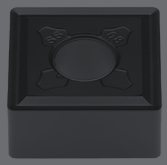
RN.. > page 486



> Round inserts are extremely tough, and well suited for high feed turning

Pastilhas redondas são extremamente resistentes e adequadas para tornear em alto avanço | Las plaquitas redondas son extremadamente resistentes y adecuadas para el torneado de alto avance

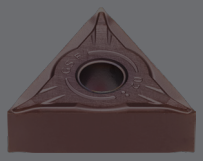
SN.. > page 488



> Square inserts excel in roughing, especially at a shallow angle

Pastilhas quadradas destacam-se no desbaste, especialmente a um ângulo raso | Plaquitas cuadradas destacan en el desbaste, especialmente a un ángulo bajo

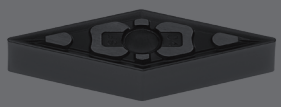
TN.. > page 494



> Triangular inserts are versatile, suitable for both finishing and roughing

As pastilhas triangulares são versáteis, adequadas tanto para acabamento quanto para desbaste | Las plaquitas triangulares son versátiles, adecuadas tanto para acabado como para desbaste

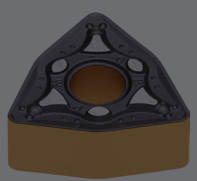
VN.. > page 500



> Rhombic 35° inserts are best suited for finishing operations

Pastilhas rômbicass de 35° são mais adequadas para operações de acabamento | Las plaquitas rómbicas de 35° son más adecuadas para operaciones de acabado

WN.. > page 502



> Trigon 80° inserts perform like rhombic 80° inserts, with extra edges

Pastilhas em formato W de 80° têm desempenho semelhante às pastilhas rômbicas de 80° mas com arestas adicionais | Las plaquitas formato W de 80° tienen un rendimiento similar a las plaquitas rómbicas de 80°, con bordes adicionales

CN - RHOMBIC 80° NEGATIVE

RÔMBICA 80° NEGATIVA | RÓMBICA 80° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
CNMA	1120219	CNMA 431																	●	●						
	1120220	CNMA 432																	●	●						
	1120221	CNMA 433																	●	●						
Roughing	1120223	CNMA 434																	●	●						
	1120224	CNMA 542																	●	●						
	1120225	CNMA 543																	●	●						
	1121470	CNMA 544																	●	●						
	1120226	CNMA 643																	●	●						
	1120227	CNMA 644																	●	●						
	1121471	CNMA 646																		●						
NEW CNMG-GSF  Fine Finishing	1124855	CNMG 430.5-GSF													●		●							●		●
CNMG-MF	1121472	CNMG 321-MF		●	○	●	○																			
	1121318	CNMG 322-MF			●		●																			
	1121320	CNMG 32.51-MF		●	○																					
Finishing	1121317	CNMG 32.52-MF		●	○																					
	1121478	CNMG 431-MF	●	●	●	●	●																			
	1121480	CNMG 432-MF		●	●	●	●																			
	1121482	CNMG 433-MF		●	○	●	○																			
CNMG-MS	1124854	CCGT 430.5-MS													●		●							●		●
	1121479	CNMG 431-MS													●		●					●		●		●
	1121481	CNMG 432-MS													●		●					●		●		●
Medium to Finishing	1121483	CNMG 433-MS													●		●					●		●		●
	1121486	CNMG 434-MS															●					○				●
CNMG-SF	1123747	CNMG 431-SF									●	●			●	●	●							●		●
	1123717	CNMG 432-SF									●	●			●	●	●							●		●
	1123748	CNMG 433-SF									●	●			●	●	●							●		●
Medium to Finishing																										
CNMG-LC	1122024	CNMG 431-LC		●	●		●																			
	1122021	CNMG 432-LC	●	●	●	●	●																			
	1124029	CNMG 433-LC			●	●	○																			
Medium to Finishing																										
CNMG-GS	1124514	CNMG 431-GS													●		●							●		●
	1124502	CNMG 432-GS													●		●							●		●
	1124515	CNMG 433-GS													●		●							●		●
Medium to Finishing																										

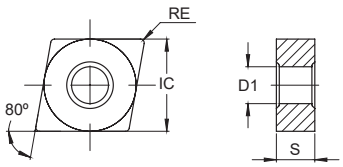
● First choice | 1ª Escolha | 1ª Opción

● Stock Itens | Itens de stock

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

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

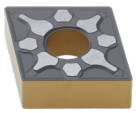
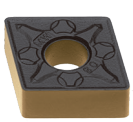
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
CNMA 431	CNMA 120404	1/2	3/16	0.016	0.203	0.098	0.008	0.197	0.008	0.004	0.012
CNMA 432	CNMA 120408	1/2	3/16	0.031	0.203	0.157	0.008	0.315	0.014	0.006	0.024
CNMA 433	CNMA 120412	1/2	3/16	0.047	0.203	0.157	0.012	0.315	0.018	0.008	0.031
CNMA 434	CNMA 120416	1/2	3/16	0.063	0.203	0.157	0.012	0.315	0.022	0.008	0.039
CNMA 542	CNMA 160608	5/8	1/4	0.031	0.250	0.197	0.012	0.394	0.018	0.008	0.031
CNMA 543	CNMA 160612	5/8	1/4	0.047	0.250	0.197	0.012	0.394	0.018	0.008	0.031
CNMA 544	CNMA 160616	5/8	1/4	0.063	0.250	0.197	0.012	0.394	0.022	0.008	0.039
CNMA 643	CNMA 190612	3/4	1/4	0.047	0.313	0.236	0.012	0.472	0.018	0.008	0.031
CNMA 644	CNMA 190616	3/4	1/4	0.063	0.313	0.236	0.012	0.472	0.022	0.008	0.039
CNMA 646	CNMA 190624	3/4	1/4	0.094	0.313	0.236	0.016	0.472	0.024	0.008	0.055
CNMG 430.5-GSF	CNMG 120402-GSF	1/2	3/16	0.008	0.203	0.051	0.004	0.098	0.005	0.003	0.006
CNMG 321-MF	CNMG 090304-MF	3/8	1/8	0.016	0.150	0.020	0.004	0.059	0.006	0.002	0.010
CNMG 322-MF	CNMG 090308-MF	3/8	1/8	0.031	0.150	0.022	0.004	0.059	0.008	0.004	0.016
CNMG 32.51-MF	CNMG 09T304-MF	3/8	5/32	0.016	0.150	0.020	0.004	0.059	0.006	0.002	0.010
CNMG 32.52-MF	CNMG 09T308-MF	3/8	5/32	0.031	0.150	0.022	0.004	0.059	0.008	0.004	0.016
CNMG 431-MF	CNMG 120404-MF	1/2	3/16	0.016	0.203	0.031	0.008	0.059	0.006	0.002	0.010
CNMG 432-MF	CNMG 120408-MF	1/2	3/16	0.031	0.203	0.039	0.010	0.059	0.008	0.004	0.016
CNMG 433-MF	CNMG 120412-MF	1/2	3/16	0.047	0.203	0.049	0.020	0.098	0.010	0.006	0.020
CCGT 430.5-MS	CNMG 120402-MS	1/2	3/16	0.008	0.203	0.039	0.004	0.142	0.004	0.003	0.006
CNMG 431-MS	CNMG 120404-MS	1/2	3/16	0.016	0.203	0.059	0.008	0.142	0.006	0.004	0.008
CNMG 432-MS	CNMG 120408-MS	1/2	3/16	0.031	0.203	0.079	0.012	0.142	0.010	0.004	0.016
CNMG 433-MS	CNMG 120412-MS	1/2	3/16	0.047	0.203	0.094	0.016	0.142	0.012	0.006	0.024
CNMG 434-MS	CNMG 120416-MS	1/2	3/16	0.063	0.203	0.094	0.016	0.142	0.016	0.006	0.031
CNMG 431-SF	CNMG 120404-SF	1/2	3/16	0.016	0.203	0.059	0.024	0.118	0.006	0.004	0.009
CNMG 432-SF	CNMG 120408-SF	1/2	3/16	0.031	0.203	0.059	0.024	0.118	0.010	0.005	0.015
CNMG 433-SF	CNMG 120412-SF	1/2	3/16	0.047	0.203	0.059	0.024	0.118	0.014	0.006	0.022
CNMG 431-LC	CNMG 120404-LC	1/2	3/16	0.016	0.203	0.039	0.016	0.098	0.004	0.003	0.012
CNMG 432-LC	CNMG 120408-LC	1/2	3/16	0.031	0.203	0.059	0.016	0.098	0.006	0.004	0.016
CNMG 433-LC	CNMG 120412-LC	1/2	3/16	0.047	0.203	0.059	0.016	0.098	0.008	0.006	0.016
CNMG 431-GS	CNMG 120404-GS	1/2	3/16	0.016	0.203	0.059	0.006	0.098	0.008	0.004	0.012
CNMG 432-GS	CNMG 120408-GS	1/2	3/16	0.031	0.203	0.079	0.008	0.118	0.010	0.004	0.014
CNMG 433-GS	CNMG 120412-GS	1/2	3/16	0.047	0.203	0.098	0.012	0.157	0.012	0.004	0.018

CN - RHOMBIC 80° NEGATIVE

RÔMBICA 80° NEGATIVA | RÓMBICA 80° NEGATIVA

			P								M							K						N	S	
			CVD							PVD	CVD			PVD				UNC	CVD					UNC	PVD	
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	1K	L6	3G	L9	10	X6	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH2G705	PH5320	PH2G320	PH5740	PH0910	PHH910	PHH920
CNMG-MR  Medium	1121473	CNMG 321-MR			○	◈	●																			
	1121293	CNMG 322-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  Medium	1123919	CNMG 431-PM	◈	◈	◈	◈	●																			
	1123790	CNMG 432-PM	◈	◈	◈	◈	●																			
	1123920	CNMG 433-PM	◈	◈	◈	◈	●																			
	1123921	CNMG 434-PM		◇	◈	◇	●																			
NEW CNMG-KM  Medium	1125094	CNMG 433-KM																	◈		●					
CNMG-ST  Medium	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-MW  Medium Wiper	1121339	CNMG 432-MW		◇	●	◈	○														●		◈			
	1121191	CNMG 433-MW			●	◈	○														●		◈			
	1125061	CNMG 443-MW			●		◈																			

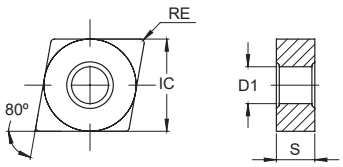
● First choice | 1ª Escolha | 1ª Opción

◈ Stock Itens | Itens de stock

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

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

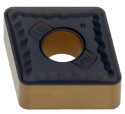
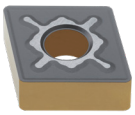
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
CNMG 321-MR	CNMG 090304-MR	3/8	1/8	0.016	0.150	0.079	0.016	0.157	0.008	0.004	0.012
CNMG 322-MR	CNMG 090308-MR	3/8	1/8	0.031	0.150	0.079	0.020	0.157	0.012	0.006	0.020
CNMG 431-MR	CNMG 120404-MR	1/2	3/16	0.016	0.203	0.118	0.016	0.217	0.008	0.004	0.012
CNMG 432-MR	CNMG 120408-MR	1/2	3/16	0.031	0.203	0.118	0.020	0.217	0.012	0.006	0.020
CNMG 433-MR	CNMG 120412-MR	1/2	3/16	0.047	0.203	0.118	0.031	0.217	0.014	0.007	0.024
CNMG 434-MR	CNMG 120416-MR	1/2	3/16	0.063	0.203	0.118	0.039	0.217	0.016	0.009	0.026
CNMG 542-MR	CNMG 160608-MR	5/8	1/4	0.031	0.250	0.157	0.020	0.283	0.012	0.006	0.020
CNMG 543-MR	CNMG 160612-MR	5/8	1/4	0.047	0.250	0.157	0.031	0.283	0.014	0.007	0.024
CNMG 544-MR	CNMG 160616-MR	5/8	1/4	0.063	0.250	0.157	0.039	0.283	0.016	0.009	0.026
CNMG 643-MR	CNMG 190612-MR	3/4	1/4	0.047	0.313	0.157	0.031	0.339	0.014	0.007	0.024
CNMG 644-MR	CNMG 190616-MR	3/4	1/4	0.063	0.313	0.157	0.039	0.339	0.016	0.009	0.026
CNMG 431-PM	CNMG 120404-PM	1/2	3/16	0.016	0.203	0.118	0.016	0.217	0.008	0.004	0.012
CNMG 432-PM	CNMG 120408-PM	1/2	3/16	0.031	0.203	0.118	0.020	0.217	0.012	0.006	0.020
CNMG 433-PM	CNMG 120412-PM	1/2	3/16	0.047	0.203	0.118	0.031	0.217	0.014	0.007	0.024
CNMG 434-PM	CNMG 120416-PM	1/2	3/16	0.063	0.203	0.118	0.039	0.217	0.016	0.009	0.026
CNMG 433-KM	CNMG 120412-KM	1/2	3/16	0.047	0.203	0.079	0.020	0.157	0.014	0.008	0.022
CNMG 431-ST	CNMG 120404-ST	1/2	3/16	0.016	0.203	0.098	0.008	0.197	0.009	0.006	0.010
CNMG 432-ST	CNMG 120408-ST	1/2	3/16	0.031	0.203	0.118	0.008	0.236	0.014	0.006	0.020
CNMG 433-ST	CNMG 120412-ST	1/2	3/16	0.047	0.203	0.118	0.012	0.236	0.016	0.006	0.024
CNMG 434-ST	CNMG 120416-ST	1/2	3/16	0.063	0.203	0.118	0.012	0.236	0.018	0.008	0.028
CNMG 542-ST	CNMG 160608-ST	5/8	1/4	0.031	0.250	0.157	0.008	0.315	0.014	0.006	0.020
CNMG 543-ST	CNMG 160612-ST	5/8	1/4	0.047	0.250	0.157	0.012	0.315	0.016	0.006	0.024
CNMG 544-ST	CNMG 160616-ST	5/8	1/4	0.063	0.250	0.157	0.012	0.315	0.018	0.008	0.028
CNMG 643-ST	CNMG 190612-ST	3/4	1/4	0.047	0.313	0.177	0.012	0.354	0.016	0.006	0.024
CNMG 644-ST	CNMG 190616-ST	3/4	1/4	0.063	0.313	0.177	0.012	0.354	0.018	0.008	0.028
CNMG 432-MW	CNMG 120408-MW	1/2	3/16	0.031	0.203	0.118	0.020	0.197	0.012	0.006	0.024
CNMG 433-MW	CNMG 120412-MW	1/2	3/16	0.047	0.203	0.138	0.031	0.236	0.020	0.008	0.035
CNMG 443-MW	CNMG 120612-MW	1/2	1/4	0.047	0.203	0.138	0.031	0.236	0.020	0.008	0.035

CN - RHOMBIC 80° NEGATIVE

RÔMBICA 80° NEGATIVA | RÓMBICA 80° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
CNMG-MA  Medium to Roughing	1124504	CNMG 543-MA		◬	●	●	●																			
	1123785	CNMG 544-MA	○	◬	●	●	●																			
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										●				●									●	
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					○		●																	

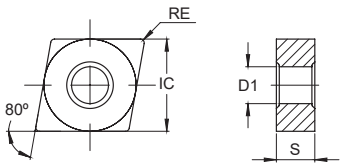
● First choice | 1ª Escolha | 1ª Opción

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

● Stock Itens | Itens de stock

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

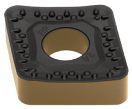
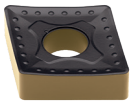
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
CNMG 543-MA	CNMG 160612-MA	5/8	1/4	0.047	0.250	0.157	0.059	0.315	0.016	0.008	0.026
CNMG 544-MA	CNMG 160616-MA	5/8	1/4	0.063	0.250	0.197	0.063	0.315	0.020	0.010	0.028
CNMG 321-SS	CNMG 090304-SS	3/8	1/8	0.016	0.150	0.079	0.020	0.098	0.008	0.004	0.010
CNMG 322-SS	CNMG 090308-SS	3/8	1/8	0.031	0.150	0.079	0.020	0.098	0.010	0.005	0.018
CNMG 431-SS	CNMG 120404-SS	1/2	3/16	0.016	0.203	0.118	0.020	0.224	0.008	0.004	0.010
CNMG 432-SS	CNMG 120408-SS	1/2	3/16	0.031	0.203	0.118	0.020	0.224	0.010	0.005	0.018
CNMG 433-SS	CNMG 120412-SS	1/2	3/16	0.047	0.203	0.118	0.020	0.224	0.012	0.006	0.024
CNMG 434-SS	CNMG 120416-SS	1/2	3/16	0.063	0.203	0.118	0.020	0.224	0.015	0.007	0.026
CNMG 542-SS	CNMG 160608-SS	5/8	1/4	0.031	0.250	0.157	0.020	0.283	0.010	0.005	0.018
CNMG 543-SS	CNMG 160612-SS	5/8	1/4	0.047	0.250	0.157	0.020	0.283	0.012	0.006	0.024
CNMG 643-SS	CNMG 190612-SS	3/4	1/4	0.047	0.313	0.157	0.020	0.335	0.012	0.006	0.024
CNMG 644-SS	CNMG 190616-SS	3/4	1/4	0.063	0.313	0.157	0.020	0.335	0.015	0.007	0.026
CNMG 432-HR	CNMG 120408-HR	1/2	3/16	0.031	0.203	0.157	0.039	0.276	0.014	0.008	0.022
CNMG 433-HR	CNMG 120412-HR	1/2	3/16	0.047	0.203	0.157	0.039	0.276	0.016	0.010	0.024
CNMG 434-HR	CNMG 120416-HR	1/2	3/16	0.063	0.203	0.157	0.059	0.276	0.020	0.013	0.030
CNMG 542-HR	CNMG 160608-HR	5/8	1/4	0.031	0.250	0.197	0.039	0.315	0.014	0.008	0.022
CNMG 543-HR	CNMG 160612-HR	5/8	1/4	0.047	0.250	0.197	0.039	0.315	0.016	0.010	0.024
CNMG 544-HR	CNMG 160616-HR	5/8	1/4	0.063	0.250	0.197	0.059	0.315	0.020	0.013	0.030
CNMG 643-HR	CNMG 190612-HR	3/4	1/4	0.047	0.313	0.217	0.079	0.394	0.016	0.010	0.028
CNMG 644-HR	CNMG 190616-HR	3/4	1/4	0.063	0.313	0.217	0.079	0.394	0.020	0.013	0.031
CNMG 866-HR	CNMG 250924-HR	1	3/8	0.094	0.359	0.236	0.079	0.591	0.024	0.016	0.039

CN - RHOMBIC 80° NEGATIVE

RÔMBICA 80° NEGATIVA | RÓMBICA 80° NEGATIVA

			P								M							K				N	S			
			CVD						PVD	CVD		PVD					UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
CNMM-RP  Roughing	1124054	CNMM 542-RP		◈	○	◈	○																			
	1124055	CNMM 543-RP		◈	◈	◈	◈																			
	1124056	CNMM 544-RP	○	◈	○	◈	◈					◈														
	1124000	CNMM 643-RP		◈	○	◈	○																			
	1123999	CNMM 644-RP		◈	○	◈	◈																			
	1123676	CNMM 646-RP			○	◈	○																			
CNMM-GR  Roughing	1124597	CNMM 432-GR			◈	◈	◈										◈									◈
	1124596	CNMM 433-GR			◈	◈	◈																			
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		◇	○		◈		◈											◈						

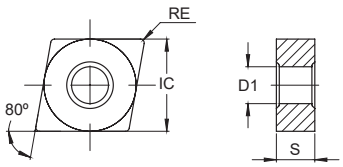
◈ First choice | 1ª Escolha | 1ª Opción

◈ Stock Itens | Itens de stock

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

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

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



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
CNMM 542-RP	CNMM 160608-RP	5/8	1/4	0.031	0.250	0.138	0.039	0.315	0.014	0.008	0.022
CNMM 543-RP	CNMM 160612-RP	5/8	1/4	0.047	0.250	0.138	0.039	0.315	0.010	0.010	0.024
CNMM 544-RP	CNMM 160616-RP	5/8	1/4	0.063	0.250	0.138	0.059	0.315	0.020	0.013	0.030
CNMM 643-RP	CNMM 190612-RP	3/4	1/4	0.047	0.313	0.217	0.079	0.394	0.016	0.010	0.028
CNMM 644-RP	CNMM 190616-RP	3/4	1/4	0.063	0.313	0.217	0.079	0.394	0.020	0.013	0.031
CNMM 646-RP	CNMM 190624-RP	3/4	1/4	0.094	0.313	0.236	0.079	0.472	0.024	0.014	0.047
CNMM 432-GR	CNMM 120408-GR	1/2	3/16	0.031	0.203	0.157	0.039	0.315	0.016	0.010	0.026
CNMM 433-GR	CNMM 120412-GR	1/2	3/16	0.047	0.203	0.197	0.059	0.335	0.020	0.012	0.028
CNMM 643-HY	CNMM 190612-HY	3/4	1/4	0.047	0.313	0.236	0.079	0.472	0.020	0.014	0.031
CNMM 644-HY	CNMM 190616-HY	3/4	1/4	0.063	0.313	0.236	0.079	0.472	0.024	0.014	0.039
CNMM 646-HY	CNMM 190624-HY	3/4	1/4	0.094	0.313	0.236	0.079	0.472	0.024	0.014	0.047
CNMM 866-HY	CNMM 250924-HY	1	3/8	0.094	0.359	0.315	0.098	0.591	0.028	0.016	0.055
CNMM 643-HZ	CNMM 190612-HZ	3/4	1/4	0.047	0.313	0.394	0.094	0.472	0.026	0.020	0.031
CNMM 644-HZ	CNMM 190616-HZ	3/4	1/4	0.063	0.313	0.394	0.094	0.472	0.031	0.020	0.043
CNMM 646-HZ	CNMM 190624-HZ	3/4	1/4	0.094	0.313	0.394	0.126	0.472	0.039	0.024	0.063
CNMM 866-HZ	CNMM 250924-HZ	1	3/8	0.094	0.359	0.394	0.126	0.669	0.039	0.024	0.063

DN - RHOMBIC 55° NEGATIVE

RÔMBICA 55° NEGATIVA | RÓMBICA 55° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
DNMA Roughing	1120975	DNMA 331																	●	●						
	1120312	DNMA 431																	●	●						
	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-MF1 Finishing	1125073	DNMG 333-MF1			●		◈																			
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									●	◈			◈	◈	◈							●	◈	◈

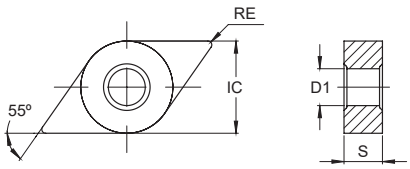
● First choice | 1ª Escolha | 1ª Opción

◈ Stock Itens | Itens de stock

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

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

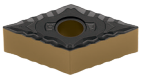
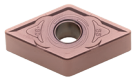
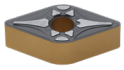
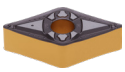
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
DNMA 331	DNMA 110404	3/8	3/16	0.016	0.150	0.079	0.008	0.138	0.006	0.004	0.012
DNMA 431	DNMA 150404	1/2	3/16	0.016	0.203	0.118	0.008	0.157	0.006	0.004	0.012
DNMA 433	DNMA 150412	1/2	3/16	0.047	0.203	0.118	0.012	0.236	0.018	0.008	0.031
DNMA 434	DNMA 150416	1/2	3/16	0.063	0.203	0.118	0.012	0.236	0.022	0.008	0.039
DNMA 441	DNMA 150604	1/2	1/4	0.016	0.203	0.118	0.008	0.157	0.006	0.004	0.012
DNMA 442	DNMA 150608	1/2	1/4	0.031	0.203	0.118	0.008	0.236	0.014	0.006	0.024
DNMA 443	DNMA 150612	1/2	1/4	0.047	0.203	0.118	0.012	0.236	0.018	0.008	0.031
DNMA 444	DNMA 150616	1/2	1/4	0.063	0.203	0.118	0.012	0.236	0.022	0.008	0.039
DNMG 331-MF	DNMG 110404-MF	3/8	3/16	0.016	0.150	0.016	0.004	0.059	0.006	0.002	0.010
DNMG 332-MF	DNMG 110408-MF	3/8	3/16	0.031	0.150	0.016	0.004	0.059	0.008	0.004	0.016
DNMG 431-MF	DNMG 150404-MF	1/2	3/16	0.016	0.203	0.016	0.006	0.059	0.006	0.002	0.010
DNMG 432-MF	DNMG 150408-MF	1/2	3/16	0.031	0.203	0.016	0.008	0.059	0.008	0.004	0.016
DNMG 433-MF	DNMG 150412-MF	1/2	3/16	0.047	0.203	0.031	0.010	0.098	0.010	0.006	0.020
DNMG 441-MF	DNMG 150604-MF	1/2	1/4	0.016	0.203	0.016	0.004	0.059	0.006	0.002	0.010
DNMG 442-MF	DNMG 150608-MF	1/2	1/4	0.031	0.203	0.016	0.004	0.059	0.008	0.004	0.016
DNMG 443-MF	DNMG 150612-MF	1/2	1/4	0.047	0.203	0.031	0.008	0.098	0.010	0.006	0.020
DNMG 333-MF1	DNMG 110412-MF1	3/8	3/16	0.047	0.150	0.031	0.012	0.098	0.008	0.004	0.012
DNMG 431-MS	DNMG 150404-MS	1/2	3/16	0.016	0.203	0.059	0.008	0.142	0.006	0.004	0.008
DNMG 432-MS	DNMG 150408-MS	1/2	3/16	0.031	0.203	0.079	0.012	0.150	0.010	0.004	0.016
DNMG 433-MS	DNMG 150412-MS	1/2	3/16	0.047	0.203	0.098	0.016	0.157	0.012	0.006	0.024
DNMG 434-MS	DNMG 150416-MS	1/2	3/16	0.063	0.203	0.110	0.016	0.177	0.016	0.006	0.031
DNMG 441-MS	DNMG 150604-MS	1/2	1/4	0.016	0.203	0.059	0.008	0.142	0.006	0.004	0.008
DNMG 442-MS	DNMG 150608-MS	1/2	1/4	0.031	0.203	0.079	0.012	0.157	0.010	0.004	0.016
DNMG 443-MS	DNMG 150612-MS	1/2	1/4	0.047	0.203	0.110	0.016	0.177	0.012	0.006	0.024
DNMG 331-SF	DNMG 110404-SF	3/8	3/16	0.016	0.150	0.059	0.024	0.118	0.006	0.004	0.009
DNMG 332-SF	DNMG 110408-SF	3/8	3/16	0.031	0.150	0.059	0.024	0.118	0.010	0.005	0.015
DNMG 431-SF	DNMG 150404-SF	1/2	3/16	0.016	0.203	0.059	0.024	0.118	0.006	0.004	0.009
DNMG 432-SF	DNMG 150408-SF	1/2	3/16	0.031	0.203	0.059	0.024	0.118	0.010	0.005	0.015
DNMG 433-SF	DNMG 150412-SF	1/2	3/16	0.047	0.203	0.059	0.024	0.118	0.014	0.006	0.022
DNMG 441-SF	DNMG 150604-SF	1/2	1/4	0.016	0.203	0.059	0.024	0.118	0.006	0.004	0.009
DNMG 442-SF	DNMG 150608-SF	1/2	1/4	0.031	0.203	0.059	0.024	0.118	0.010	0.005	0.015
DNMG 443-SF	DNMG 150612-SF	1/2	1/4	0.047	0.203	0.059	0.024	0.118	0.014	0.006	0.022

DN - RHOMBIC 55° NEGATIVE

RÔMBICA 55° NEGATIVA | RÓMBICA 55° NEGATIVA

			P								M							K				N	S			
			CVD						PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
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		●	○	◆	○																			
DNMG-GS  Medium to Finishing	1124688	DNMG 331-GS													◆		◆							◆		◆
	1124689	DNMG 332-GS													◆		◆							◆		◆
	1124511	DNMG 431-GS													◆		◆							◆		◆
	1124512	DNMG 432-GS													◆		◆							◆		◆
	1124513	DNMG 433-GS													◆		◆							◆		◆
	1124682	DNMG 441-GS													◆		◆							◆		◆
	1124683	DNMG 442-GS													◆		◆							◆		◆
	1124684	DNMG 443-GS													◆		◆							◆		◆
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  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	◆	◆	◆	◆	◆																			
	1124082	DNMG 444-PM		◆	◆	◆	◆																			

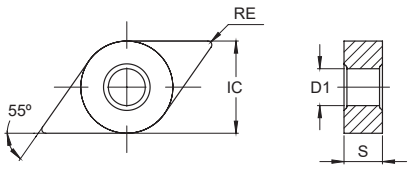
◆ First choice | 1ª Escolha | 1ª Opción

● Stock Itens | Itens de stock

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

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

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



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
DNMG 431-LC	DNMG 150404-LC	1/2	3/16	0.016	0.203	0.039	0.016	0.098	0.006	0.003	0.012
DNMG 432-LC	DNMG 150408-LC	1/2	3/16	0.031	0.203	0.059	0.016	0.098	0.008	0.004	0.016
DNMG 433-LC	DNMG 150412-LC	1/2	3/16	0.047	0.203	0.079	0.031	0.118	0.010	0.006	0.020
DNMG 441-LC	DNMG 150604-LC	1/2	1/4	0.016	0.203	0.059	0.016	0.118	0.006	0.003	0.012
DNMG 442-LC	DNMG 150608-LC	1/2	1/4	0.031	0.203	0.079	0.016	0.118	0.008	0.004	0.016
DNMG 443-LC	DNMG 150612-LC	1/2	1/4	0.047	0.203	0.098	0.031	0.138	0.010	0.006	0.020
DNMG 331-GS	DNMG 110404-GS	3/8	3/16	0.016	0.150	0.059	0.006	0.079	0.008	0.004	0.010
DNMG 332-GS	DNMG 110408-GS	3/8	3/16	0.031	0.150	0.079	0.008	0.098	0.010	0.004	0.012
DNMG 431-GS	DNMG 150404-GS	1/2	3/16	0.016	0.203	0.059	0.006	0.079	0.008	0.004	0.010
DNMG 432-GS	DNMG 150408-GS	1/2	3/16	0.031	0.203	0.079	0.008	0.098	0.010	0.004	0.012
DNMG 433-GS	DNMG 150412-GS	1/2	3/16	0.047	0.203	0.098	0.012	0.118	0.012	0.004	0.014
DNMG 441-GS	DNMG 150604-GS	1/2	1/4	0.016	0.203	0.059	0.006	0.079	0.008	0.004	0.010
DNMG 442-GS	DNMG 150608-GS	1/2	1/4	0.031	0.203	0.079	0.008	0.098	0.010	0.004	0.012
DNMG 443-GS	DNMG 150612-GS	1/2	1/4	0.047	0.203	0.098	0.012	0.118	0.012	0.004	0.014
DNMG 331-MR	DNMG 110404-MR	3/8	3/16	0.016	0.150	0.079	0.016	0.197	0.008	0.004	0.012
DNMG 332-MR	DNMG 110408-MR	3/8	3/16	0.031	0.150	0.079	0.020	0.197	0.012	0.006	0.020
DNMG 431-MR	DNMG 150404-MR	1/2	3/16	0.016	0.203	0.118	0.016	0.236	0.008	0.004	0.012
DNMG 432-MR	DNMG 150408-MR	1/2	3/16	0.031	0.203	0.118	0.020	0.236	0.012	0.006	0.020
DNMG 433-MR	DNMG 150412-MR	1/2	3/16	0.047	0.203	0.118	0.031	0.236	0.014	0.007	0.024
DNMG 441-MR	DNMG 150604-MR	1/2	1/4	0.016	0.203	0.118	0.016	0.236	0.008	0.004	0.012
DNMG 442-MR	DNMG 150608-MR	1/2	1/4	0.031	0.203	0.118	0.020	0.236	0.012	0.006	0.020
DNMG 443-MR	DNMG 150612-MR	1/2	1/4	0.047	0.203	0.118	0.031	0.236	0.014	0.007	0.024
DNMG 444-MR	DNMG 150616-MR	1/2	1/4	0.063	0.203	0.118	0.039	0.236	0.016	0.009	0.026
DNMG 431-PM	DNMG 150404-PM	1/2	3/16	0.016	0.203	0.118	0.016	0.236	0.008	0.004	0.012
DNMG 432-PM	DNMG 150408-PM	1/2	3/16	0.031	0.203	0.118	0.020	0.236	0.012	0.006	0.020
DNMG 433-PM	DNMG 150412-PM	1/2	3/16	0.047	0.203	0.118	0.031	0.236	0.014	0.007	0.024
DNMG 434-PM	DNMG 150416-PM	1/2	3/16	0.063	0.203	0.118	0.039	0.236	0.016	0.009	0.026
DNMG 441-PM	DNMG 150604-PM	1/2	1/4	0.016	0.203	0.098	0.020	0.197	0.010	0.006	0.016
DNMG 442-PM	DNMG 150608-PM	1/2	1/4	0.031	0.203	0.118	0.020	0.236	0.012	0.006	0.020
DNMG 443-PM	DNMG 150612-PM	1/2	1/4	0.047	0.203	0.138	0.020	0.276	0.014	0.008	0.024
DNMG 444-PM	DNMG 150616-PM	1/2	1/4	0.063	0.203	0.118	0.039	0.236	0.016	0.009	0.026

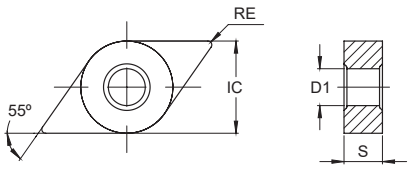
DN - RHOMBIC 55° NEGATIVE

RÔMBICA 55° NEGATIVA | RÓMBICA 55° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
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																	●	●						
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										●				●									●	○
DOMX-GS Roughing	1124595	DOMX44R1-GS	See our complete solution on pages C-440 to C-445																					●		●
	1124493	DOMX 44L1-GS																						●		●
DNMG-HR Roughing	1121253	DNMG 432-HR		●	○	△	○		●										●	●						
	1121506	DNMG 433-HR		●	○	●	○		○										●	●	●					
	1121254	DNMG 442-HR		●	●	●	●		●										●	●						
	1121362	DNMG 443-HR		●	○	●	●		●										●	●						
	1121340	DNMG 444-HR			○	●	●		●										●	●	△					
DNMM-RP Roughing	1124205	DNMM 443-RP		●	○	●	○																			

● First choice | 1ª Escolha | 1ª Opción
● Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

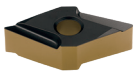
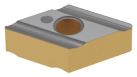
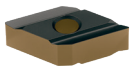
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
DNMG 331-ST	DNMG 110404-ST	3/8	3/16	0.016	0.150	0.079	0.008	0.138	0.008	0.006	0.012
DNMG 332-ST	DNMG 110408-ST	3/8	3/16	0.031	0.150	0.079	0.008	0.138	0.014	0.006	0.020
DNMG 431-ST	DNMG 150404-ST	1/2	3/16	0.016	0.203	0.098	0.008	0.197	0.008	0.006	0.012
DNMG 432-ST	DNMG 150408-ST	1/2	3/16	0.031	0.203	0.098	0.020	0.197	0.014	0.006	0.020
DNMG 433-ST	DNMG 150412-ST	1/2	3/16	0.047	0.203	0.118	0.020	0.236	0.020	0.010	0.028
DNMG 434-ST	DNMG 150416-ST	1/2	3/16	0.063	0.203	0.118	0.012	0.236	0.024	0.010	0.039
DNMG 441-ST	DNMG 150604-ST	1/2	1/4	0.016	0.203	0.098	0.008	0.197	0.008	0.006	0.012
DNMG 442-ST	DNMG 150608-ST	1/2	1/4	0.031	0.203	0.098	0.008	0.197	0.014	0.006	0.020
DNMG 443-ST	DNMG 150612-ST	1/2	1/4	0.047	0.203	0.118	0.012	0.236	0.020	0.006	0.028
DNMG 444-ST	DNMG 150616-ST	1/2	1/4	0.063	0.203	0.118	0.012	0.236	0.024	0.010	0.039
DNMG 432-MW	DNMG 150408-MW	1/2	3/16	0.031	0.203	0.098	0.012	0.157	0.014	0.006	0.024
DNMG 433-MW	DNMG 150412-MW	1/2	3/16	0.047	0.203	0.118	0.020	0.197	0.020	0.010	0.035
DNMG 442-MW	DNMG 150608-MW	1/2	1/4	0.031	0.203	0.118	0.012	0.177	0.014	0.006	0.024
DNMG 443-MW	DNMG 150612-MW	1/2	1/4	0.047	0.203	0.138	0.020	0.217	0.020	0.010	0.035
DNMG 332-SS	DNMG 110408-SS	1/2	3/16	0.031	0.150	0.079	0.020	0.173	0.010	0.005	0.018
DNMG 431-SS	DNMG 150404-SS	1/2	3/16	0.016	0.203	0.118	0.012	0.236	0.010	0.004	0.012
DNMG 432-SS	DNMG 150408-SS	1/2	3/16	0.031	0.203	0.118	0.020	0.252	0.010	0.005	0.018
DNMG 433-SS	DNMG 150412-SS	1/2	3/16	0.047	0.203	0.118	0.020	0.252	0.012	0.006	0.024
DNMG 441-SS	DNMG 150604-SS	1/2	1/4	0.016	0.203	0.118	0.012	0.236	0.010	0.004	0.012
DNMG 442-SS	DNMG 150608-SS	1/2	1/4	0.031	0.203	0.118	0.020	0.252	0.010	0.005	0.018
DNMG 443-SS	DNMG 150612-SS	1/2	1/4	0.047	0.203	0.118	0.020	0.252	0.012	0.006	0.024
DNMG 444-SS	DNMG 150616-SS	1/2	1/4	0.063	0.203	0.118	0.020	0.252	0.020	0.008	0.039
DOMX44R1-GS	DOMX 1506R1-GS	1/2	1/4	0.031	0.203	0.059	0.012	0.059	0.012	0.008	0.020
DOMX 44L1-GS	DOMX 1506L1-GS	1/2	1/4	0.031	0.203	0.059	0.012	0.059	0.012	0.008	0.020
DNMG 432-HR	DNMG 150408-HR	1/2	3/16	0.031	0.203	0.157	0.031	0.236	0.014	0.008	0.022
DNMG 433-HR	DNMG 150412-HR	1/2	3/16	0.047	0.203	0.157	0.039	0.236	0.016	0.010	0.028
DNMG 442-HR	DNMG 150608-HR	1/2	1/4	0.031	0.203	0.157	0.031	0.236	0.014	0.008	0.022
DNMG 443-HR	DNMG 150612-HR	1/2	1/4	0.047	0.203	0.157	0.039	0.236	0.016	0.010	0.028
DNMG 444-HR	DNMG 150616-HR	1/2	1/4	0.063	0.203	0.157	0.059	0.236	0.020	0.012	0.031
DNMM 443-RP	DNMM 150612-RP	1/2	1/4	0.047	0.203	0.157	0.039	0.236	0.016	0.010	0.028

DN - RHOMBIC 55° NEGATIVE

RÔMBICA 55° NEGATIVA | RÓMBICA 55° NEGATIVA

			P								M							K				N	S			
			CVD						PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
DNMX-02  Medium to Finishing	1120351	DNMX 441-L02			◉	◉	◉																			
	1120353	DNMX 441-R02		◉	◉	◉	◉																			
	1120355	DNMX 442-L02		◉	○	◉	◉																			
	1120357	DNMX 442-R02		◉	◉	◉	◉																			
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			○	◉	○																			

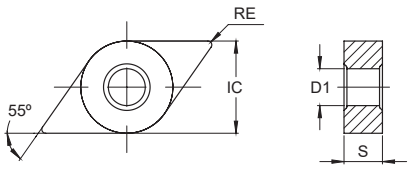
◉ First choice | 1ª Escolha | 1ª Opción

◉ Stock Itens | Itens de stock

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

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

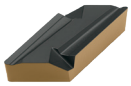
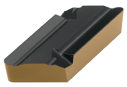
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
DNMX 441-L02	DNMX 150604-L02	1/2	1/4	0.016	0.203	0.098	0.028	0.197	0.008	0.006	0.010
DNMX 441-R02	DNMX 150604-R02	1/2	1/4	0.016	0.203	0.098	0.028	0.197	0.008	0.006	0.010
DNMX 442-L02	DNMX 150608-L02	1/2	1/4	0.031	0.203	0.118	0.031	0.197	0.014	0.006	0.020
DNMX 442-R02	DNMX 150608-R02	1/2	1/4	0.031	0.203	0.118	0.031	0.197	0.014	0.006	0.020
DNMX 441-L03	DNMX 150604-L03	1/2	1/4	0.016	0.203	0.106	0.031	0.217	0.008	0.006	0.010
DNMX 441-R03	DNMX 150604-R03	1/2	1/4	0.016	0.203	0.106	0.031	0.217	0.008	0.006	0.010
DNMX 442-L03	DNMX 150608-L03	1/2	1/4	0.031	0.203	0.126	0.039	0.236	0.014	0.006	0.020
DNMX 442-R03	DNMX 150608-R03	1/2	1/4	0.031	0.203	0.126	0.039	0.236	0.014	0.006	0.020
DNMX 432-L01	DNMX 150408-L01	1/2	3/16	0.031	0.203	0.098	0.039	0.197	0.014	0.008	0.020
DNMX 432-R01	DNMX 150408-R01	1/2	3/16	0.031	0.203	0.098	0.039	0.197	0.014	0.008	0.020
DNMX 441-L01	DNMX 150604-L01	1/2	1/4	0.016	0.203	0.118	0.059	0.236	0.010	0.006	0.012
DNMX 441-R01	DNMX 150604-R01	1/2	1/4	0.016	0.203	0.118	0.059	0.236	0.010	0.006	0.012
DNMX 442-L01	DNMX 150608-L01	1/2	1/4	0.031	0.203	0.138	0.079	0.256	0.014	0.008	0.020
DNMX 442-R01	DNMX 150608-R01	1/2	1/4	0.031	0.203	0.138	0.079	0.256	0.014	0.008	0.020

KN - PARALLELOGRAM 55° NEGATIVE

PARALELOGRAMA 55° NEGATIVA | PARALELOGRAMO 55° NEGATIVA

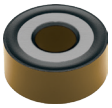
			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
KNUX-01  Finishing	1120368	KNUX 160405-L01			◉	◈	○																			
	1120371	KNUX 160405-R01		◈	◉	◈	◈	○																		
KNUX-02  Medium	1120374	KNUX 160410-L02		◈	○	◈	◉																			
	1120376	KNUX 160410-R02		◈	○	◈	◉																			

◉ First choice | 1ª Escolha | 1ª Opción
◈ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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

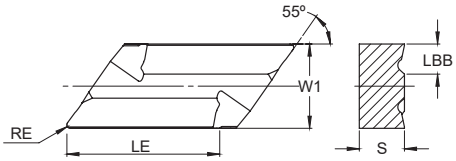
RN - ROUND NEGATIVE

REDONDA NEGATIVA | REDONDA NEGATIVA

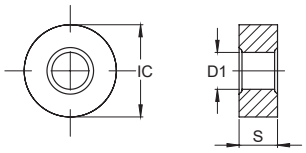
			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
RNMG-ST  Medium	1120439	RNMG 320-ST				◈	◉																			
	1120440	RNMG 430-ST					◉																			
	1120441	RNMG 540-ST					○																			
	1120442	RNMG 640-ST				◈	○																			
	1120443	RNMG 860-ST					○													◈						

◉ First choice | 1ª Escolha | 1ª Opción
◈ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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



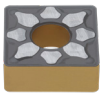
ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)					Cutting Conditions Condições de Corte Condiciones de Corte					
		LE	W1	RE	S	LBB	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
KNUX 160405-L01	KNUX 160405-L01	2/3	3/8	0.020	0.187	0.098	0.118	0.039	0.236	0.012	0.008	0.014
KNUX 160405-R01	KNUX 160405-R01	2/3	3/8	0.020	0.187	0.098	0.118	0.039	0.236	0.012	0.008	0.014
KNUX 160410-L02	KNUX 160410-L02	2/3	3/8	0.039	0.187	0.126	0.157	0.059	0.236	0.020	0.016	0.028
KNUX 160410-R02	KNUX 160410-R02	2/3	3/8	0.039	0.187	0.126	0.157	0.059	0.236	0.020	0.016	0.028



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
RNMG 320-ST	RNMG 090300-ST	3/8	1/8	-	0.150	0.091	0.035	0.177	0.012	0.004	0.035
RNMG 430-ST	RNMG 120400-ST	1/2	3/16	-	0.203	0.118	0.047	0.189	0.016	0.005	0.047
RNMG 540-ST	RNMG 150600-ST	5/8	1/4	-	0.250	0.150	0.059	0.295	0.020	0.006	0.059
RNMG 640-ST	RNMG 190600-ST	3/4	1/4	-	0.313	0.177	0.075	0.299	0.026	0.008	0.075
RNMG 860-ST	RNMG 250900-ST	1	3/8	-	0.359	0.248	0.098	0.394	0.031	0.010	0.098

SN - SQUARE 90° NEGATIVE

QUADRADA 90° NEGATIVA | ESQUADRA 90° NEGATIVA

			P								M							K				N	S				
			CVD						PVD	CVD			PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
SNMA  Roughing	1121070	SNMA 321																	●	●						
	1120474	SNMA 322																	●	●						
	1120475	SNMA 431																	◇	◇						
	1120476	SNMA 432																	●	●						
	1120478	SNMA 433																	●	●						
	1120479	SNMA 434																	●	●						
	1120481	SNMA 533																	●	●						
	1121525	SNMA 543																	●	●						
	1120482	SNMA 643																	●	●						
	1120483	SNMA 644																	●	●						
	1120485	SNMA 646																	●	●						
	1120486	SNMA 856																○	●	●						
SNMG-MF  Finishing	1121528	SNMG 431-MF		●	○	●	●																			
	1121530	SNMG 432-MF		●	○	●	○																			
	1121531	SNMG 433-MF		●	●	●	○																			
SNMG-SF  Medium to Finishing	1123874	SNMG 431-SF									●	●		◇	●		●						◇	●		●
	1123875	SNMG 432-SF									●	●		◇	●	●	●						◇	●	●	●
	1123876	SNMG 433-SF									●	●		●	●	●	●						●	●	●	●
SNMG-GS  Medium to Finishing	1124556	SNMG 432-GS													●		●							●		●
	1124557	SNMG 433-GS													●		●							●		●
	1124558	SNMG 434-GS													●		●							●		●
SNMG-MR  Medium	1121529	SNMG 431-MR		●	○	◇	●														●					
	1121179	SNMG 432-MR		●	●	●	●		●												◇					
	1121311	SNMG 433-MR		●	●	◇	●		●																	
	1121357	SNMG 434-MR			○	●	●														●					
	1121533	SNMG 542-MR		●	○	●	○		●																	
	1121536	SNMG 543-MR		●	●	●	●		●																	
	1121540	SNMG 534-MR					○																			
	1121543	SNMG 643-MR			○		●		●												◇					
	1121546	SNMG 644-MR			○	◇	●		●																	
SNMG-PM  Medium	1124083	SNMG 431-PM	●		●	●	●																			
	1124084	SNMG 432-PM	●	●	●	●	●																			
	1124085	SNMG 433-PM	●	●	●	●	●																			

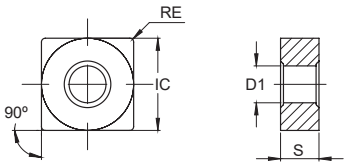
● First choice | 1ª Escolha | 1ª Opción

◈ Stock Itens | Itens de stock

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

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

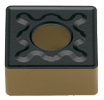
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
SNMA 321	SNMA 090304	3/8	1/8	0.016	0.150	0.098	0.008	0.177	0.008	0.006	0.012
SNMA 322	SNMA 090308	3/8	1/8	0.031	0.150	0.098	0.016	0.177	0.016	0.008	0.024
SNMA 431	SNMA 120404	1/2	3/16	0.016	0.203	0.157	0.008	0.315	0.008	0.006	0.012
SNMA 432	SNMA 120408	1/2	3/16	0.031	0.203	0.157	0.008	0.315	0.016	0.008	0.024
SNMA 433	SNMA 120412	1/2	3/16	0.047	0.203	0.157	0.012	0.315	0.018	0.008	0.031
SNMA 434	SNMA 120416	1/2	3/16	0.063	0.203	0.157	0.012	0.315	0.022	0.008	0.039
SNMA 533	SNMA 150412	5/8	3/16	0.047	0.250	0.197	0.012	0.354	0.018	0.008	0.031
SNMA 543	SNMA 150612	5/8	1/4	0.047	0.250	0.197	0.012	0.394	0.018	0.008	0.031
SNMA 643	SNMA 190612	3/4	1/4	0.047	0.313	0.236	0.012	0.472	0.018	0.008	0.031
SNMA 644	SNMA 190616	3/4	1/4	0.063	0.313	0.236	0.012	0.472	0.022	0.008	0.039
SNMA 646	SNMA 190624	3/4	1/4	0.094	0.313	0.236	0.012	0.472	0.024	0.008	0.047
SNMA 856	SNMA 250724	1	5/16	0.094	0.359	0.236	0.016	0.472	0.024	0.008	0.055
SNMG 431-MF	SNMG 120404-MF	1/2	3/16	0.016	0.203	0.016	0.006	0.059	0.004	0.002	0.010
SNMG 432-MF	SNMG 120408-MF	1/2	3/16	0.031	0.203	0.020	0.008	0.059	0.008	0.004	0.016
SNMG 433-MF	SNMG 120412-MF	1/2	3/16	0.047	0.203	0.031	0.010	0.098	0.012	0.008	0.024
SNMG 431-SF	SNMG 120404-SF	1/2	3/16	0.016	0.203	0.079	0.039	0.157	0.006	0.004	0.009
SNMG 432-SF	SNMG 120408-SF	1/2	3/16	0.031	0.203	0.079	0.039	0.157	0.008	0.005	0.015
SNMG 433-SF	SNMG 120412-SF	1/2	3/16	0.047	0.203	0.098	0.039	0.157	0.010	0.006	0.022
SNMG 432-GS	SNMG 120408-GS	1/2	3/16	0.031	0.203	0.079	0.008	0.118	0.012	0.006	0.016
SNMG 433-GS	SNMG 120412-GS	1/2	3/16	0.047	0.203	0.098	0.020	0.138	0.014	0.008	0.020
SNMG 434-GS	SNMG 120416-GS	1/2	3/16	0.063	0.203	0.118	0.020	0.157	0.016	0.008	0.020
SNMG 431-MR	SNMG 120404-MR	1/2	3/16	0.016	0.203	0.118	0.016	0.236	0.008	0.004	0.012
SNMG 432-MR	SNMG 120408-MR	1/2	3/16	0.031	0.203	0.118	0.020	0.236	0.012	0.006	0.020
SNMG 433-MR	SNMG 120412-MR	1/2	3/16	0.047	0.203	0.118	0.031	0.236	0.014	0.007	0.024
SNMG 434-MR	SNMG 120416-MR	1/2	3/16	0.063	0.203	0.118	0.039	0.236	0.016	0.009	0.026
SNMG 542-MR	SNMG 150608-MR	5/8	1/4	0.031	0.250	0.157	0.024	0.295	0.012	0.006	0.020
SNMG 543-MR	SNMG 150612-MR	5/8	1/4	0.047	0.250	0.157	0.031	0.295	0.014	0.007	0.024
SNMG 534-MR	SNMG 150616-MR	5/8	1/4	0.063	0.250	0.157	0.039	0.295	0.016	0.008	0.028
SNMG 643-MR	SNMG 190612-MR	3/4	1/4	0.047	0.313	0.197	0.031	0.354	0.014	0.007	0.024
SNMG 644-MR	SNMG 190616-MR	3/4	1/4	0.063	0.313	0.197	0.039	0.354	0.016	0.009	0.026
SNMG 431-PM	SNMG 120404-PM	1/2	3/16	0.016	0.203	0.118	0.016	0.236	0.008	0.004	0.012
SNMG 432-PM	SNMG 120408-PM	1/2	3/16	0.031	0.203	0.118	0.020	0.236	0.012	0.006	0.020
SNMG 433-PM	SNMG 120412-PM	1/2	3/16	0.047	0.203	0.118	0.031	0.236	0.014	0.007	0.024

SN - SQUARE 90° NEGATIVE

QUADRADA 90° NEGATIVA | ESQUADRA 90° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
SNMG-ST  Medium	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-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-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				◈	○		◈												○					

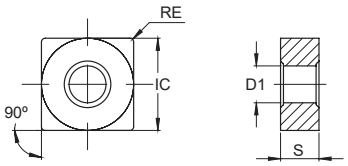
◈ First choice | 1ª Escolha | 1ª Opción

◈ Stock Itens | Itens de stock

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

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

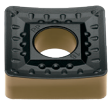
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
SNMG 322-ST	SNMG 090308-ST	3/8	1/8	0.031	0.150	0.098	0.008	0.177	0.014	0.006	0.020
SNMG 431-ST	SNMG 120404-ST	1/2	3/16	0.016	0.203	0.118	0.008	0.236	0.008	0.006	0.012
SNMG 432-ST	SNMG 120408-ST	1/2	3/16	0.031	0.203	0.118	0.008	0.236	0.014	0.006	0.020
SNMG 433-ST	SNMG 120412-ST	1/2	3/16	0.047	0.203	0.118	0.012	0.236	0.016	0.006	0.024
SNMG 434-ST	SNMG 120416-ST	1/2	3/16	0.063	0.203	0.118	0.012	0.236	0.018	0.008	0.028
SNMG 543-ST	SNMG 150612-ST	5/8	1/4	0.047	0.250	0.157	0.012	0.315	0.016	0.006	0.025
SNMG 544-ST	SNMG 150616-ST	5/8	1/4	0.063	0.250	0.157	0.012	0.315	0.020	0.008	0.030
SNMG 643-ST	SNMG 190612-ST	3/4	1/4	0.047	0.313	0.177	0.012	0.354	0.016	0.006	0.024
SNMG 644-ST	SNMG 190616-ST	3/4	1/4	0.063	0.313	0.177	0.012	0.354	0.018	0.008	0.028
SNMG 321-SS	SNMG 090304-SS	3/8	1/8	0.016	0.150	0.079	0.020	0.177	0.008	0.004	0.012
SNMG 322-SS	SNMG 090308-SS	3/8	1/8	0.031	0.150	0.079	0.020	0.177	0.010	0.005	0.018
SNMG 431-SS	SNMG 120404-SS	1/2	3/16	0.016	0.203	0.118	0.020	0.252	0.008	0.005	0.012
SNMG 432-SS	SNMG 120408-SS	1/2	3/16	0.031	0.203	0.118	0.020	0.252	0.010	0.005	0.018
SNMG 433-SS	SNMG 120412-SS	1/2	3/16	0.047	0.203	0.118	0.020	0.252	0.012	0.006	0.024
SNMG 434-SS	SNMG 120416-SS	1/2	3/16	0.063	0.203	0.118	0.020	0.252	0.018	0.006	0.031
SNMG 542-SS	SNMG 150608-SS	5/8	1/4	0.031	0.250	0.157	0.020	0.315	0.010	0.005	0.018
SNMG 543-SS	SNMG 150612-SS	5/8	1/4	0.047	0.250	0.157	0.020	0.315	0.012	0.006	0.024
SNMG 644-SS	SNMG 190616-SS	3/4	1/4	0.063	0.313	0.157	0.020	0.315	0.018	0.006	0.031
SNMG 432-HR	SNMG 120408-HR	1/2	3/16	0.031	0.203	0.157	0.031	0.276	0.014	0.008	0.022
SNMG 433-HR	SNMG 120412-HR	1/2	3/16	0.047	0.203	0.157	0.039	0.276	0.016	0.010	0.028
SNMG 434-HR	SNMG 120416-HR	1/2	3/16	0.063	0.203	0.157	0.059	0.276	0.020	0.013	0.031
SNMG 543-HR	SNMG 150612-HR	5/8	1/4	0.047	0.250	0.157	0.039	0.315	0.016	0.010	0.028
SNMG 544-HR	SNMG 150616-HR	5/8	1/4	0.063	0.250	0.157	0.059	0.315	0.020	0.013	0.031
SNMG 643-HR	SNMG 190612-HR	3/4	1/4	0.047	0.313	0.197	0.039	0.394	0.016	0.010	0.028
SNMG 644-HR	SNMG 190616-HR	3/4	1/4	0.063	0.313	0.197	0.059	0.394	0.020	0.013	0.031
SNMG 856-HR	SNMG 250724-HR	1	5/16	0.094	0.359	0.236	0.079	0.591	0.039	0.016	0.047
SNMG 866-HR	SNMG 250924-HR	1	3/8	0.094	0.359	0.236	0.079	0.591	0.039	0.016	0.047

SN - SQUARE 90° NEGATIVE

QUADRADA 90° NEGATIVA | ESQUADRA 90° NEGATIVA

			P								M							K				N	S			
			CVD						PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
SNMM-RP  Roughing	1124057	SNMG 542-RP		◈	○	◉	○																			
	1124058	SNMG 543-RP		◈	○		◉																			
	1124059	SNMG 544-RP		◈	◈		◉																			
	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			○		○		◈				◉													
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		◈	○	◉	○		◈											◉	○					

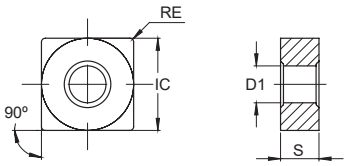
◉ First choice | 1ª Escolha | 1ª Opción

◈ Stock Itens | Itens de stock

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

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

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



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
SNMG 542-RP	SNMM 150608-RP	5/8	1/4	0.031	0.250	0.157	0.039	0.315	0.012	0.006	0.020
SNMG 543-RP	SNMM 150612-RP	5/8	1/4	0.047	0.250	0.157	0.039	0.315	0.016	0.010	0.028
SNMG 544-RP	SNMM 150616-RP	5/8	1/4	0.063	0.250	0.157	0.039	0.315	0.020	0.014	0.035
SNMM 643-RP	SNMM 190612-RP	3/4	1/4	0.047	0.313	0.217	0.079	0.472	0.024	0.012	0.033
SNMM 644-RP	SNMM 190616-RP	3/4	1/4	0.063	0.313	0.236	0.079	0.472	0.024	0.014	0.039
SNMM 646-RP	SNMM 190624-RP	3/4	1/4	0.094	0.313	0.236	0.079	0.472	0.031	0.020	0.059
SNMM 643-HY	SNMM 190612-HY	3/4	1/4	0.047	0.313	0.236	0.079	0.472	0.024	0.014	0.035
SNMM 644-HY	SNMM 190616-HY	3/4	1/4	0.063	0.313	0.236	0.079	0.472	0.024	0.014	0.047
SNMM 646-HY	SNMM 190624-HY	3/4	1/4	0.094	0.313	0.236	0.079	0.472	0.039	0.024	0.063
SNMM 856-HY	SNMM 250724-HY	1	5/16	0.094	0.359	0.335	0.098	0.591	0.039	0.024	0.063
SNMM 866-HY	SNMM 250924-HY	1	3/8	0.094	0.359	0.335	0.118	0.591	0.039	0.024	0.063
SNMM 643-HZ	SNMM 190612-HZ	3/4	1/4	0.047	0.313	0.394	0.094	0.512	0.024	0.014	0.035
SNMM 644-HZ	SNMM 190616-HZ	3/4	1/4	0.063	0.313	0.394	0.094	0.512	0.024	0.014	0.047
SNMM 646-HZ	SNMM 190624-HZ	3/4	1/4	0.094	0.313	0.394	0.126	0.512	0.039	0.024	0.063
SNMM 856-HZ	SNMM 250724-HZ	1	5/16	0.094	0.359	0.394	0.126	0.669	0.039	0.024	0.063
SNMM 858-HZ	SNMM 250732-HZ	1	5/16	0.126	0.359	0.394	0.126	0.669	0.047	0.031	0.071
SNMM 866-HZ	SNMM 250924-HZ	1	3/8	0.094	0.359	0.394	0.126	0.669	0.039	0.024	0.063

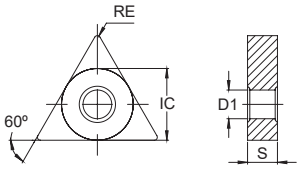
TN - TRIANGULAR 60° NEGATIVE

TRIANGULAR 60° NEGATIVA | TRIANGULAR 60° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
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																	●	◎						
	1121554	TNMA 542																	●	◎						
	1121555	TNMA 543																	●	◎						
	1120639	TNMA 544																	●	◎						
	1120640	TNMA 656																	●	◎						
NEW TNMG-GSF Fine Finishing	1124857	TNMG 330.5-GSF													◎		◎							◎		◎
TNMG-MF Finishing	1121556	TNMG 331-MF	◎		●	△	◎			△																
	1121558	TNMG 332-MF	◎		●	△	◎			△																
	1121560	TNMG 333-MF		●	○	◎	○																			
	1121369	TNMG 432-MF			○																					
TNMG-MS Medium to Finishing	1124856	TNMG 330.5-MS													◎		◎							◎		◎
	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			○		○																			

● First choice | 1ª Escolha | 1ª Opción
◎ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

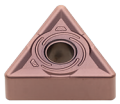
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
TNMA 221	TNMA 110304	1/4	1/8	0.016	0.089	0.079	0.006	0.157	0.008	0.004	0.012
TNMA 222	TNMA 110308	1/4	1/8	0.031	0.089	0.079	0.006	0.157	0.014	0.006	0.024
TNMA 321	TNMA 160304	3/8	1/8	0.016	0.150	0.098	0.008	0.197	0.008	0.004	0.012
TNMA 322	TNMA 160308	3/8	1/8	0.031	0.150	0.098	0.008	0.197	0.014	0.006	0.024
TNMA 331	TNMA 160404	3/8	3/16	0.016	0.150	0.098	0.008	0.197	0.008	0.004	0.012
TNMA 332	TNMA 160408	3/8	3/16	0.031	0.150	0.138	0.008	0.276	0.014	0.006	0.024
TNMA 333	TNMA 160412	3/8	3/16	0.047	0.150	0.138	0.012	0.276	0.018	0.008	0.031
TNMA 334	TNMA 160416	3/8	3/16	0.063	0.150	0.138	0.012	0.276	0.022	0.008	0.039
TNMA 431	TNMA 220404	1/2	3/16	0.016	0.203	0.157	0.008	0.394	0.008	0.004	0.012
TNMA 432	TNMA 220408	1/2	3/16	0.031	0.203	0.197	0.008	0.394	0.014	0.006	0.024
TNMA 433	TNMA 220412	1/2	3/16	0.047	0.203	0.197	0.012	0.394	0.018	0.008	0.031
TNMA 434	TNMA 220416	1/2	3/16	0.063	0.203	0.197	0.012	0.394	0.022	0.008	0.039
TNMA 542	TNMA 270608	5/8	1/4	0.031	0.250	0.197	0.012	0.472	0.014	0.006	0.024
TNMA 543	TNMA 270612	5/8	1/4	0.047	0.250	0.197	0.012	0.472	0.018	0.008	0.031
TNMA 544	TNMA 270616	5/8	1/4	0.063	0.250	0.197	0.012	0.472	0.022	0.008	0.039
TNMA 656	TNMA 330724	3/4	5/16	0.094	0.313	0.256	0.012	0.591	0.024	0.012	0.079
TNMG 330.5-GSF	TNMG 160402-GSF	3/8	3/16	0.008	0.150	0.061	0.004	0.118	0.007	0.003	0.012
TNMG 331-MF	TNMG 160404-MF	3/8	3/16	0.016	0.150	0.016	0.004	0.059	0.006	0.002	0.010
TNMG 332-MF	TNMG 160408-MF	3/8	3/16	0.031	0.150	0.016	0.004	0.059	0.008	0.004	0.016
TNMG 333-MF	TNMG 160412-MF	3/8	3/16	0.047	0.150	0.039	0.008	0.098	0.012	0.006	0.024
TNMG 432-MF	TNMG 220408-MF	1/2	3/16	0.031	0.203	0.059	0.010	0.098	0.008	0.004	0.016
TNMG 330.5-MS	TNMG 160402-MS	3/8	3/16	0.008	0.150	0.059	0.008	0.150	0.004	0.003	0.006
TNMG 331-MS	TNMG 160404-MS	3/8	3/16	0.016	0.150	0.079	0.012	0.150	0.006	0.004	0.008
TNMG 332-MS	TNMG 160408-MS	3/8	3/16	0.031	0.150	0.079	0.012	0.150	0.010	0.004	0.016
TNMG 333-MS	TNMG 160412-MS	3/8	3/16	0.047	0.150	0.079	0.016	0.150	0.012	0.006	0.024
TNMG 331-SF	TNMG 160404-SF	3/8	3/16	0.016	0.150	0.059	0.024	0.118	0.006	0.004	0.009
TNMG 332-SF	TNMG 160408-SF	3/8	3/16	0.031	0.150	0.059	0.024	0.118	0.010	0.005	0.015
TNMG 333-SF	TNMG 160412-SF	3/8	3/16	0.047	0.150	0.059	0.024	0.118	0.014	0.006	0.022
TNMG 431-SF	TNMG 220404-SF	1/2	3/16	0.016	0.203	0.059	0.024	0.118	0.008	0.004	0.014
TNMG 432-SF	TNMG 220408-SF	1/2	3/16	0.031	0.203	0.059	0.024	0.118	0.010	0.005	0.016
TNMG 433-SF	TNMG 220412-SF	1/2	3/16	0.047	0.203	0.059	0.024	0.118	0.014	0.006	0.022
TNMG 331-LC	TNMG 160404-LC	3/8	3/16	0.016	0.150	0.039	0.016	0.098	0.006	0.003	0.012
TNMG 332-LC	TNMG 160408-LC	3/8	3/16	0.031	0.150	0.059	0.016	0.098	0.008	0.004	0.016
TNMG 333-LC	TNMG 160412-LC	3/8	3/16	0.047	0.150	0.079	0.031	0.118	0.010	0.006	0.020
TNMG 432-LC	TNMG 220408-LC	1/2	3/16	0.031	0.203	0.079	0.016	0.118	0.008	0.004	0.016
TNMG 433-LC	TNMG 220412-LC	1/2	3/16	0.047	0.203	0.098	0.031	0.138	0.010	0.006	0.020

TN - TRIANGULAR 60° NEGATIVE

TRIANGULAR 60° NEGATIVA | TRIANGULAR 60° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
TNMG-GS  Medium to Finishing	1124508	TNMG 331-GS													●		●							●		●
	1124509	TNMG 332-GS													●		●							●		●
	1124510	TNMG 333-GS													●		●							●		●
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  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-ST  Medium	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																	●	●						
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	1121354	TNMG 433-ST																	●	●						
	1121351	TNMG 434-ST																	●	●						

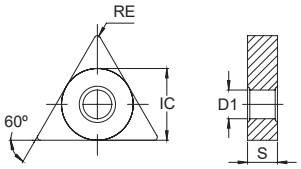
● First choice | 1ª Escolha | 1ª Opción

● Stock Itens | Itens de stock

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

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

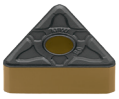
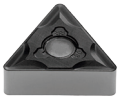
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
TNMG 331-GS	TNMG 160404-GS	3/8	3/16	0.016	0.150	0.079	0.006	0.118	0.008	0.004	0.012
TNMG 332-GS	TNMG 160408-GS	3/8	3/16	0.031	0.150	0.098	0.008	0.118	0.010	0.004	0.012
TNMG 333-GS	TNMG 160412-GS	3/8	3/16	0.047	0.150	0.118	0.012	0.138	0.012	0.006	0.014
TNMG 322-MR	TNMG 160308-MR	3/8	1/8	0.031	0.150	0.110	0.012	0.197	0.012	0.006	0.020
TNMG 331-MR	TNMG 160404-MR	3/8	3/16	0.016	0.150	0.118	0.016	0.197	0.008	0.004	0.012
TNMG 332-MR	TNMG 160408-MR	3/8	3/16	0.031	0.150	0.118	0.020	0.197	0.012	0.006	0.020
TNMG 333-MR	TNMG 160412-MR	3/8	3/16	0.047	0.150	0.118	0.031	0.197	0.014	0.007	0.024
TNMG 334-MR	TNMG 160416-MR	3/8	3/16	0.047	0.150	0.120	0.032	0.200	0.016	0.009	0.025
TNMG 431-MR	TNMG 220404-MR	1/2	3/16	0.016	0.203	0.157	0.016	0.260	0.008	0.004	0.012
TNMG 432-MR	TNMG 220408-MR	1/2	3/16	0.031	0.203	0.157	0.020	0.260	0.012	0.006	0.020
TNMG 433-MR	TNMG 220412-MR	1/2	3/16	0.047	0.203	0.157	0.031	0.260	0.014	0.007	0.024
TNMG 434-MR	TNMG 220416-MR	1/2	3/16	0.063	0.203	0.157	0.039	0.260	0.016	0.009	0.028
TNMG 331-PM	TNMG 160404-PM	3/8	3/16	0.016	0.150	0.118	0.016	0.197	0.008	0.004	0.012
TNMG 332-PM	TNMG 160408-PM	3/8	3/16	0.031	0.150	0.118	0.020	0.197	0.012	0.006	0.020
TNMG 333-PM	TNMG 160412-PM	3/8	3/16	0.047	0.150	0.118	0.031	0.197	0.014	0.007	0.024
TNMG 334-PM	TNMG 160416-PM	3/8	3/16	0.063	0.150	0.118	0.039	0.197	0.016	0.009	0.026
TNMG 431-PM	TNMG 220404-PM	1/2	3/16	0.016	0.203	0.157	0.016	0.260	0.008	0.004	0.012
TNMG 432-PM	TNMG 220408-PM	1/2	3/16	0.031	0.203	0.157	0.020	0.260	0.012	0.006	0.020
TNMG 433-PM	TNMG 220412-PM	1/2	3/16	0.047	0.203	0.157	0.031	0.260	0.014	0.007	0.024
TNMG 434-PM	TNMG 220416-PM	1/2	3/16	0.063	0.203	0.157	0.039	0.260	0.016	0.009	0.024
TNMG 222-ST	TNMG 110308-ST	1/4	1/8	0.031	0.089	0.079	0.006	0.177	0.014	0.006	0.020
TNMG 321-ST	TNMG 160304-ST	3/8	1/8	0.016	0.150	0.118	0.008	0.217	0.009	0.006	0.012
TNMG 322-ST	TNMG 160308-ST	3/8	1/8	0.031	0.150	0.118	0.008	0.217	0.014	0.006	0.020
TNMG 331-ST	TNMG 160404-ST	3/8	3/16	0.016	0.150	0.118	0.008	0.217	0.009	0.006	0.012
TNMG 332-ST	TNMG 160408-ST	3/8	3/16	0.031	0.150	0.118	0.008	0.217	0.014	0.006	0.020
TNMG 333-ST	TNMG 160412-ST	3/8	3/16	0.047	0.150	0.118	0.012	0.217	0.016	0.006	0.024
TNMG 334-ST	TNMG 160416-ST	3/8	3/16	0.063	0.150	0.118	0.012	0.217	0.016	0.006	0.024
TNMG 431-ST	TNMG 220404-ST	1/2	3/16	0.016	0.203	0.157	0.008	0.315	0.009	0.006	0.012
TNMG 432-ST	TNMG 220408-ST	1/2	3/16	0.031	0.203	0.157	0.008	0.315	0.014	0.006	0.020
TNMG 433-ST	TNMG 220412-ST	1/2	3/16	0.047	0.203	0.157	0.012	0.315	0.016	0.006	0.024
TNMG 434-ST	TNMG 220416-ST	1/2	3/16	0.063	0.203	0.157	0.012	0.315	0.018	0.008	0.028

TN - TRIANGULAR 60° NEGATIVE

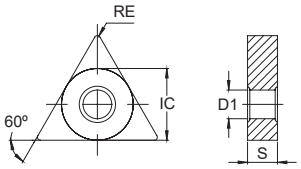
TRIANGULAR 60° NEGATIVA | TRIANGULAR 60° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
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										◉				◈									◉	
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			◈	◈	◉	○													○					
	1123822	TNMX 431-R01					◉																			
	1123823	TNMX 431-L01					◉																			
	1123824	TNMX 432-R01					◉																			
	1123825	TNMX 432-L01					◉																			

◉ First choice | 1ª Escolha | 1ª Opción
◈ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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

Technical Data: C - 610



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
TNMG 332-MW	TNMG 160408-MW	3/8	3/16	0.031	0.150	0.079	0.020	0.177	0.014	0.006	0.024
TNMG 333-MW	TNMG 160412-MW	3/8	3/16	0.047	0.150	0.098	0.020	0.197	0.020	0.010	0.035
TNMG 331-SS	TNMG 160404-SS	3/8	3/16	0.016	0.150	0.079	0.020	0.157	0.008	0.004	0.012
TNMG 332-SS	TNMG 160408-SS	3/8	3/16	0.031	0.150	0.118	0.020	0.189	0.010	0.005	0.018
TNMG 333-SS	TNMG 160412-SS	3/8	3/16	0.047	0.150	0.118	0.020	0.189	0.012	0.006	0.024
TNMG 432-SS	TNMG 220408-SS	1/2	3/16	0.031	0.203	0.157	0.020	0.260	0.010	0.005	0.018
TNMG 433-SS	TNMG 220412-SS	1/2	3/16	0.047	0.203	0.157	0.020	0.260	0.012	0.006	0.024
TNMG 332-HR	TNMG 160408-HR	3/8	3/16	0.031	0.150	0.118	0.031	0.236	0.014	0.008	0.022
TNMG 333-HR	TNMG 160412-HR	3/8	3/16	0.047	0.150	0.118	0.039	0.236	0.016	0.010	0.028
TNMG 432-HR	TNMG 220408-HR	1/2	3/16	0.031	0.203	0.157	0.031	0.256	0.014	0.008	0.022
TNMG 433-HR	TNMG 220412-HR	1/2	3/16	0.047	0.203	0.157	0.039	0.276	0.016	0.010	0.028
TNMG 434-HR	TNMG 220416-HR	1/2	3/16	0.063	0.203	0.157	0.059	0.276	0.024	0.010	0.035
TNMG 543-HR	TNMG 270612-HR	5/8	1/4	0.047	0.250	0.236	0.079	0.394	0.016	0.010	0.028
TNMG 544-HR	TNMG 270616-HR	5/8	1/4	0.063	0.250	0.236	0.079	0.394	0.024	0.014	0.035
TNMG 666-HR	TNMG 330924-HR	3/4	3/8	0.094	0.313	0.276	0.079	0.472	0.031	0.016	0.047
TNMX 331-L01	TNMX 160404-L01	3/8	3/16	0.016	0.150	0.098	0.039	0.138	0.006	0.005	0.012
TNMX 331-R01	TNMX 160404-R01	3/8	3/16	0.016	0.150	0.098	0.039	0.138	0.006	0.005	0.012
TNMX 332-L01	TNMX 160408-L01	3/8	3/16	0.031	0.150	0.098	0.051	0.138	0.012	0.006	0.020
TNMX 332-R01	TNMX 160408-R01	3/8	3/16	0.031	0.150	0.098	0.051	0.138	0.012	0.006	0.020
TNMX 431-R01	TNMX 220404-R01	1/2	3/16	0.016	0.203	0.157	0.059	0.276	0.008	0.006	0.012
TNMX 431-L01	TNMX 220404-L01	1/2	3/16	0.016	0.203	0.157	0.059	0.276	0.008	0.006	0.012
TNMX 432-R01	TNMX 220408-R01	1/2	3/16	0.031	0.203	0.157	0.059	0.276	0.012	0.007	0.022
TNMX 432-L01	TNMX 220408-L01	1/2	3/16	0.031	0.203	0.157	0.059	0.276	0.012	0.007	0.022

VN - RHOMBIC 35° NEGATIVE

RÔMBICA 35° NEGATIVA | RÓMBICA 35° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
VNMA Roughing	1120819	VNMA 331																	●	●						
	1121077	VNMA 332																	●	●						
NEW VNMG-GSF Fine Finishing	1124861	VNMG 330.5-GSF													●		●							●		●
VNMG-MF Finishing	1123635	VNMG 331-MF		●	●	●	●				○															
	1123636	VNMG 332-MF	●	●	●	●	●				○															
VNMG-MS Medium to Finishing	1124860	VNMG 330.5-MS													●		●							●		●
	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-GS Medium to Finishing	1124562	VNMG 331-GS													●		●							●		●
	1124563	VNMG 332-GS													●		●							●		●
	1124564	VNMG 333-GS													●		●							●		●
VNMG-MR Medium	1121278	VNMG 331-MR		●	●	△	●		●																	
	1121279	VNMG 332-MR		●	●	●	●		●																	
	1121581	VNMG 432-MR		●	○	●	●		△												△					
VNMG-PM Medium	1124086	VNMG 331-PM	●	●	●	●	●																			
	1124087	VNMG 332-PM	●		●	●	●																			
	1124600	VNMG 333-PM			●		●																			
VNMG-ST Medium	1121276	VNMG 331-ST																	●	●						
	1121277	VNMG 332-ST																	●	●						
VNMG-SS Roughing to Medium	1121367	VNMG 331-SS										●		△		●							△		●	
	1121295	VNMG 332-SS										●		△		●							△		●	

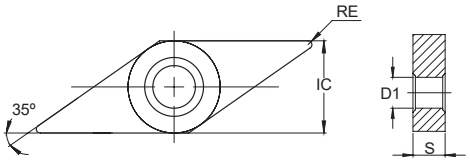
● First choice | 1ª Escolha | 1ª Opción

● Stock Itens | Itens de stock

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

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

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



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
VNMA 331	VNMA 160404	3/8	3/16	0.016	0.150	0.008	0.004	0.130	0.006	0.003	0.010
VNMA 332	VNMA 160408	3/8	3/16	0.031	0.150	0.008	0.004	0.130	0.012	0.004	0.020
VNMG 330.5-GSF	VNMG 160402-GSF	3/8	3/16	0.008	0.150	0.043	0.008	0.079	0.006	0.002	0.010
VNMG 331-MF	VNMG 160404-MF	3/8	3/16	0.016	0.150	0.020	0.006	0.059	0.006	0.002	0.010
VNMG 332-MF	VNMG 160408-MF	3/8	3/16	0.031	0.150	0.031	0.008	0.059	0.008	0.004	0.016
VNMG 330.5-MS	VNMG 160404-MS	3/8	3/16	0.008	0.150	0.059	0.008	0.157	0.004	0.003	0.006
VNMG 331-MS	VNMG 160404-MS	3/8	3/16	0.016	0.150	0.079	0.008	0.157	0.006	0.004	0.008
VNMG 332-MS	VNMG 160408-MS	3/8	3/16	0.031	0.150	0.098	0.008	0.157	0.010	0.006	0.016
VNMG 331-SF	VNMG 160404-SF	3/8	3/16	0.016	0.150	0.059	0.024	0.118	0.006	0.004	0.009
VNMG 332-SF	VNMG 160408-SF	3/8	3/16	0.031	0.150	0.059	0.024	0.118	0.010	0.005	0.015
VNMG 333-SF	VNMG 160412-SF	3/8	3/16	0.047	0.150	0.059	0.024	0.118	0.014	0.006	0.022
VNMG 332-LC	VNMG 160408-LC	3/8	3/16	0.031	0.150	0.039	0.014	0.079	0.005	0.003	0.014
VNMG 331-GS	VNMG 160404-GS	3/8	3/16	0.016	0.150	0.059	0.006	0.079	0.008	0.003	0.010
VNMG 332-GS	VNMG 160408-GS	3/8	3/16	0.031	0.150	0.079	0.008	0.098	0.010	0.004	0.012
VNMG 333-GS	VNMG 160412-GS	3/8	3/16	0.047	0.150	0.098	0.012	0.118	0.012	0.005	0.014
VNMG 331-MR	VNMG 160404-MR	3/8	3/16	0.016	0.150	0.118	0.039	0.157	0.010	0.004	0.012
VNMG 332-MR	VNMG 160408-MR	3/8	3/16	0.031	0.150	0.118	0.039	0.157	0.012	0.006	0.020
VNMG 432-MR	VNMG 220408-MR	1/2	3/16	0.031	0.203	0.157	0.059	0.197	0.014	0.006	0.020
VNMG 331-PM	VNMG 160404-PM	3/8	3/16	0.016	0.150	0.118	0.039	0.157	0.010	0.004	0.012
VNMG 332-PM	VNMG 160408-PM	3/8	3/16	0.031	0.150	0.118	0.039	0.157	0.012	0.006	0.020
VNMG 333-PM	VNMG 160412-PM	3/8	3/16	0.047	0.150	0.118	0.039	0.157	0.014	0.008	0.020
VNMG 331-ST	VNMG 160404-ST	3/8	3/16	0.016	0.150	0.079	0.008	0.138	0.012	0.006	0.016
VNMG 332-ST	VNMG 160408-ST	3/8	3/16	0.031	0.150	0.079	0.012	0.138	0.014	0.006	0.020
VNMG 331-SS	VNMG 160404-SS	3/8	3/16	0.016	0.150	0.059	0.020	0.157	0.008	0.004	0.012
VNMG 332-SS	VNMG 160408-SS	3/8	3/16	0.031	0.150	0.079	0.020	0.157	0.010	0.005	0.018

WN - TRIGON 80° NEGATIVE

TRIGONAL 80° NEGATIVA | TRIGONA 80° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD				UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
WNMA Roughing	1122002	WNMA 332																	●	●						
	1120834	WNMA 431																	●	●						
	1120835	WNMA 432																	●	●						
	1121076	WNMA 433																	●	●						
	1121582	WNMA 434																	●	●						
NEW WNMG-GSF Fine Finishing	1124859	WNMG 430.5-GSF													●		●							●		●
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															◬									◬
	1124858	WNMG 430.5-MS													●		◬							●		◬
	1124574	WNMG 431-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-GS Medium to Finishing	1124690	WNMG 331-GS													◬		●							●		◬
	1124691	WNMG 332-GS													◬		●							●		◬
	1124559	WNMG 431-GS													◬		●							●		◬
	1124560	WNMG 432-GS													◬		●							●		◬
	1124561	WNMG 433-GS													◬		●							●		◬

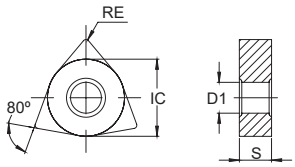
● First choice | 1ª Escolha | 1ª Opción

◬ Stock Itens | Itens de stock

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

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

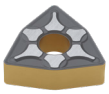
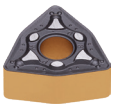
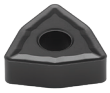
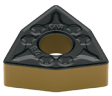
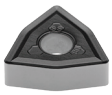
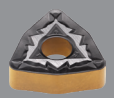
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
WNMA 332	WNMA 060408	3/8	3/16	0.031	0.150	0.098	0.008	0.157	0.014	0.006	0.024
WNMA 431	WNMA 080404	1/2	3/16	0.016	0.203	0.110	0.008	0.197	0.009	0.006	0.012
WNMA 432	WNMA 080408	1/2	3/16	0.031	0.203	0.118	0.008	0.197	0.014	0.006	0.024
WNMA 433	WNMA 080412	1/2	3/16	0.047	0.203	0.118	0.012	0.197	0.018	0.008	0.031
WNMA 434	WNMA 080416	1/2	3/16	0.063	0.203	0.118	0.012	0.197	0.022	0.008	0.039
WNMG 430.5-GSF	WNMG 080402-GSF	1/2	3/16	0.008	0.203	0.051	0.004	0.098	0.007	0.003	0.010
WNMG 32.51-MF	WNMG 06T304-MF	3/8	5/32	0.016	0.150	0.016	0.004	0.059	0.006	0.002	0.012
WNMG 32.52-MF	WNMG 06T308-MF	3/8	5/32	0.031	0.150	0.016	0.004	0.059	0.008	0.004	0.016
WNMG 32.53-MF	WNMG 06T312-MF	3/8	5/32	0.047	0.150	0.016	0.006	0.059	0.012	0.006	0.024
WNMG 331-MF	WNMG 060404-MF	3/8	3/16	0.016	0.150	0.016	0.004	0.059	0.006	0.002	0.012
WNMG 332-MF	WNMG 060408-MF	3/8	3/16	0.031	0.150	0.016	0.004	0.059	0.008	0.004	0.016
WNMG 333-MF	WNMG 060412-MF	3/8	3/16	0.047	0.150	0.016	0.006	0.059	0.012	0.006	0.024
WNMG 431-MF	WNMG 080404-MF	1/2	3/16	0.016	0.203	0.024	0.004	0.079	0.006	0.002	0.012
WNMG 432-MF	WNMG 080408-MF	1/2	3/16	0.031	0.203	0.024	0.004	0.079	0.008	0.004	0.016
WNMG 433-MF	WNMG 080412-MF	1/2	3/16	0.047	0.203	0.024	0.006	0.079	0.012	0.006	0.024
WNMG 331-MS	WNMG 060404-MS	3/8	3/16	0.016	0.150	0.047	0.012	0.087	0.006	0.004	0.008
WNMG 332-MS	WNMG 060408-MS	3/8	3/16	0.031	0.150	0.047	0.012	0.087	0.010	0.008	0.016
WNMG 430.5-MS	WNMG 080402-MS	1/2	3/16	0.008	0.203	0.079	0.008	0.157	0.004	0.003	0.008
WNMG 431-MS	WNMG 080404-MS	1/2	3/16	0.016	0.203	0.098	0.028	0.157	0.006	0.004	0.012
WNMG 432-MS	WNMG 080408-MS	1/2	3/16	0.031	0.203	0.098	0.028	0.157	0.010	0.008	0.016
WNMG 433-MS	WNMG 080412-MS	1/2	3/16	0.047	0.203	0.098	0.039	0.157	0.012	0.010	0.022
WNMG 331-SF	WNMG 060404-SF	3/8	3/16	0.016	0.150	0.059	0.024	0.118	0.006	0.004	0.009
WNMG 332-SF	WNMG 060408-SF	3/8	3/16	0.031	0.150	0.059	0.024	0.118	0.010	0.005	0.015
WNMG 333-SF	WNMG 060412-SF	3/8	3/16	0.047	0.150	0.059	0.024	0.118	0.014	0.006	0.022
WNMG 431-SF	WNMG 080404-SF	1/2	3/16	0.016	0.203	0.059	0.024	0.118	0.006	0.004	0.009
WNMG 432-SF	WNMG 080408-SF	1/2	3/16	0.031	0.203	0.059	0.024	0.118	0.010	0.005	0.015
WNMG 433-SF	WNMG 080412-SF	1/2	3/16	0.047	0.203	0.059	0.024	0.118	0.014	0.006	0.022
WNMG 432-LC	WNMG 080408-LC	1/2	3/16	0.016	0.203	0.059	0.016	0.098	0.006	0.004	0.014
WNMG 331-GS	WNMG 060404-GS	3/8	3/16	0.016	0.150	0.079	0.006	0.098	0.008	0.004	0.012
WNMG 332-GS	WNMG 060408-GS	3/8	3/16	0.031	0.150	0.098	0.010	0.118	0.010	0.004	0.014
WNMG 431-GS	WNMG 080404-GS	1/2	3/16	0.016	0.203	0.079	0.006	0.098	0.008	0.004	0.012
WNMG 432-GS	WNMG 080408-GS	1/2	3/16	0.031	0.203	0.098	0.010	0.118	0.010	0.004	0.014
WNMG 433-GS	WNMG 080412-GS	1/2	3/16	0.047	0.203	0.118	0.012	0.138	0.012	0.006	0.016

WN - TRIGON 80° NEGATIVE

TRIGONAL 80° NEGATIVA | TRIGONA 80° NEGATIVA

			P								M							K				N	S				
			CVD						PVD	CVD			PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
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		●	○		○														●					
WNMG-PM  Medium	1124088	WNMG 331-PM	●	◬	●	●	●																			
	1124089	WNMG 332-PM	●	●	●	●	●																			
	1123988	WNMG 431-PM	●	●	●	●	●																			
	1123918	WNMG 432-PM	●	●	●	●	●																			
	1123989	WNMG 433-PM	●	●	●	●	●		●																	
	1123990	WNMG 434-PM	●	●	●	●	●																			
WNMG-ST  Medium	1121162	WNMG 431-ST																	●	●						
	1121163	WNMG 432-ST																	●	●						
	1121164	WNMG 433-ST																	●	●						
	1121593	WNMG 434-ST																	●	●						
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									●	●	●			●								●		
NEW WNMG-PR  Roughing	1124741	WNMG 434-PR		○		●																				
WNMG-HR  Roughing	1121127	WNMG 432-HR	●	●	●	●	●		●										●	●						
	1121128	WNMG 433-HR		●	●	●	●		●										●	●						

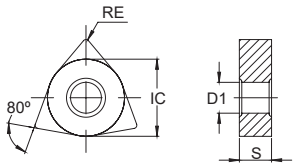
● First choice | 1ª Escolha | 1ª Opción

● Stock Itens | Itens de stock

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

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

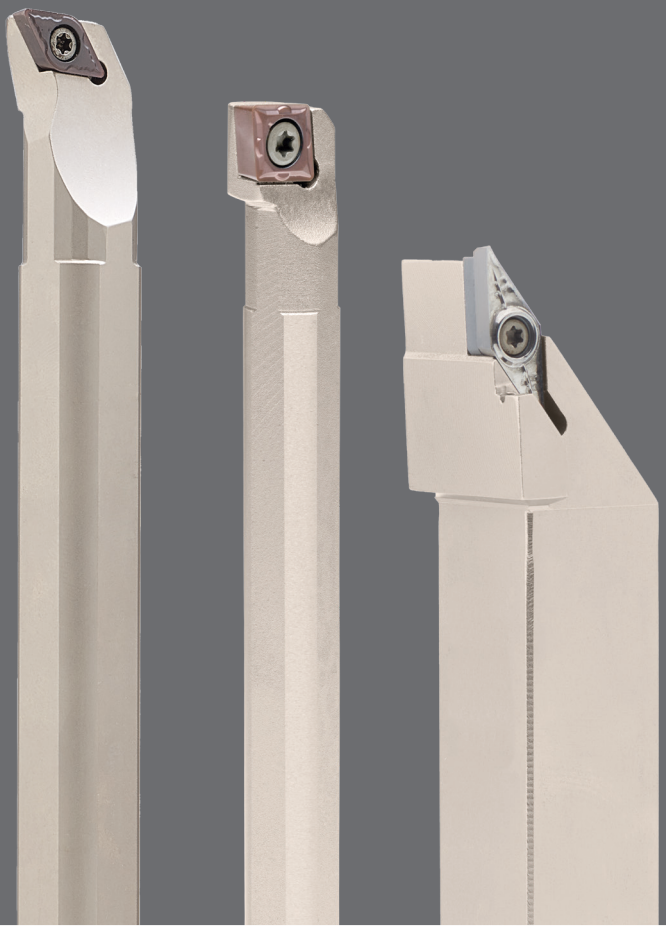
Insert Order Code: (1) Geometry code + (2) Grade code



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
WNMG 32.51-MR	WNMG 06T304-MR	3/8	5/32	0.016	0.150	0.079	0.020	0.118	0.009	0.004	0.012
WNMG 32.52-MR	WNMG 06T308-MR	3/8	5/32	0.031	0.150	0.079	0.020	0.118	0.012	0.006	0.020
WNMG 32.53-MR	WNMG 06T312-MR	3/8	5/32	0.047	0.150	0.079	0.031	0.118	0.014	0.007	0.024
WNMG 331-MR	WNMG 060404-MR	3/8	3/16	0.016	0.150	0.079	0.020	0.118	0.009	0.004	0.012
WNMG 332-MR	WNMG 060408-MR	3/8	3/16	0.031	0.150	0.079	0.020	0.118	0.012	0.006	0.020
WNMG 333-MR	WNMG 060412-MR	3/8	3/16	0.047	0.150	0.079	0.031	0.118	0.014	0.007	0.024
WNMG 431-MR	WNMG 080404-MR	1/2	3/16	0.016	0.203	0.098	0.020	0.157	0.009	0.004	0.012
WNMG 432-MR	WNMG 080408-MR	1/2	3/16	0.031	0.203	0.098	0.020	0.157	0.012	0.006	0.020
WNMG 433-MR	WNMG 080412-MR	1/2	3/16	0.047	0.203	0.098	0.031	0.157	0.014	0.007	0.024
WNMG 434-MR	WNMG 080416-MR	1/2	3/16	0.063	0.203	0.118	0.039	0.157	0.016	0.009	0.026
WNMG 331-PM	WNMG 060404-PM	3/8	3/16	0.016	0.150	0.098	0.020	0.118	0.009	0.004	0.012
WNMG 332-PM	WNMG 060408-PM	3/8	3/16	0.031	0.150	0.098	0.020	0.118	0.012	0.006	0.020
WNMG 431-PM	WNMG 080404-PM	1/2	3/16	0.016	0.203	0.098	0.020	0.157	0.009	0.004	0.012
WNMG 432-PM	WNMG 080408-PM	1/2	3/16	0.031	0.203	0.098	0.020	0.157	0.012	0.006	0.020
WNMG 433-PM	WNMG 080412-PM	1/2	3/16	0.047	0.203	0.098	0.031	0.157	0.014	0.007	0.024
WNMG 434-PM	WNMG 080416-PM	1/2	3/16	0.063	0.203	0.118	0.039	0.177	0.014	0.008	0.026
WNMG 431-ST	WNMG 080404-ST	1/2	3/16	0.016	0.203	0.098	0.008	0.197	0.009	0.006	0.012
WNMG 432-ST	WNMG 080408-ST	1/2	3/16	0.031	0.203	0.098	0.008	0.197	0.014	0.006	0.020
WNMG 433-ST	WNMG 080412-ST	1/2	3/16	0.047	0.203	0.098	0.012	0.197	0.016	0.006	0.024
WNMG 434-ST	WNMG 080416-ST	1/2	3/16	0.063	0.203	0.098	0.012	0.197	0.018	0.008	0.028
WNMG 332-MW	WNMG 060408-MW	3/8	3/16	0.031	0.150	0.059	0.020	0.138	0.012	0.006	0.024
WNMG 333-MW	WNMG 060412-MW	3/8	3/16	0.047	0.150	0.059	0.031	0.138	0.020	0.008	0.035
WNMG 432-MW	WNMG 080408-MW	1/2	3/16	0.031	0.203	0.118	0.020	0.197	0.012	0.006	0.024
WNMG 433-MW	WNMG 080412-MW	1/2	3/16	0.047	0.203	0.138	0.031	0.236	0.020	0.008	0.035
WNMG 32.51-SS	WNMG 06T304-SS	3/8	5/32	0.016	0.150	0.079	0.020	0.118	0.008	0.005	0.012
WNMG 32.52-SS	WNMG 06T308-SS	3/8	5/32	0.031	0.150	0.079	0.020	0.118	0.010	0.005	0.018
WNMG 331-SS	WNMG 060404-SS	3/8	3/16	0.016	0.150	0.079	0.020	0.118	0.008	0.005	0.012
WNMG 332-SS	WNMG 060408-SS	3/8	3/16	0.031	0.150	0.079	0.020	0.118	0.010	0.005	0.018
WNMG 431-SS	WNMG 080404-SS	1/2	3/16	0.016	0.203	0.079	0.020	0.118	0.008	0.005	0.012
WNMG 432-SS	WNMG 080408-SS	1/2	3/16	0.031	0.203	0.098	0.020	0.157	0.010	0.005	0.018
WNMG 433-SS	WNMG 080412-SS	1/2	3/16	0.047	0.203	0.098	0.020	0.157	0.012	0.006	0.024
WNMG 434-PR	WNMG 080416-PR	1/2	3/16	0.063	0.203	0.118	0.020	0.157	0.014	0.005	0.020
WNMG 432-HR	WNMG 080408-HR	1/2	3/16	0.031	0.203	0.157	0.031	0.197	0.014	0.008	0.022
WNMG 433-HR	WNMG 080412-HR	1/2	3/16	0.047	0.203	0.157	0.059	0.197	0.016	0.010	0.028

INSERTS

POSITIVE

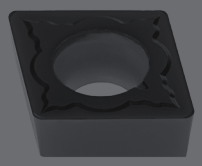


Positive inserts feature positive clearance angles. Their significant advantage lies in the lower cutting forces they generate, consequently reducing vibration compared to negative inserts. This makes them ideal for internal turning, external turning of slender parts, and general finishing operations.

As pastilhas positivas possuem ângulos de alívio positivos. A sua vantagem significativa reside nas menores forças de corte que geram, reduzindo consequentemente a vibração em comparação com as pastilhas negativas. Isso torna-as ideais para torneamento interno, torneamento externo de peças delgadas e operações gerais de acabamento.

Las plaquitas positivas cuentan con ángulos de despeje positivos. Su ventaja significativa radica en las menores fuerzas de corte que generan, reduciendo así la vibración en comparación con las plaquitas negativas. Esto las hace ideales para el torneado interno, torneado externo de piezas delgadas y operaciones generales de acabado.

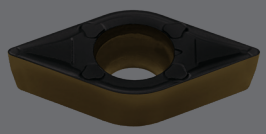
CC.. > page 508



> Rhombic 80° inserts are very popular thanks to their versatility

Rhombic 80° inserts são muito populares devido à sua versatilidade | Las plaquitas de 80° rómbicas son muy populares gracias a su versatilidad

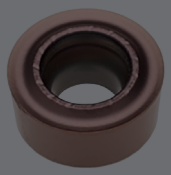
DC.. > page 514



> Rhombic 55° inserts offer balanced roughing and finishing capabilities

Pastilhas rômbicas de 55° oferecem capacidades equilibradas de desbaste e acabamento | Las plaquitas rómbicas de 55° ofrecen capacidades equilibradas para desbaste y acabado

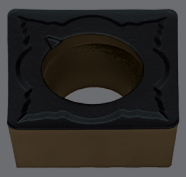
RC.. > page 518



> Round inserts are extremely tough, and well suited for high feed turning

Pastilhas redondas são extremamente resistentes e adequadas para tornear em alto avanço | Las plaquitas redondas son extremadamente resistentes y adecuadas para el torneado de alto avance

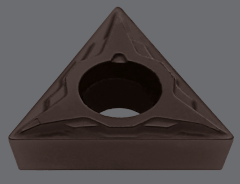
SC.. | SP.. > page 520 | 522



> Square inserts excel in roughing, especially at a shallow angle

Pastilhas quadradas destacam-se no desbaste, especialmente a um ângulo raso | Plaquitas cuadradas destacan en el desbaste, especialmente a un ángulo bajo

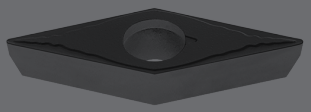
TC.. | TP.. > page 524 | 532



> Triangular inserts are versatile, suitable for both finishing and roughing

As pastilhas triangulares são versáteis, adequadas tanto para acabamento quanto para desbaste | Las plaquitas triangulares son versátiles, adecuadas tanto para acabado como para desbaste

VB.. | VC.. > page 534 | 536

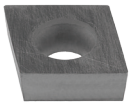
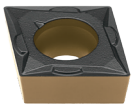


> Rhombic 35° inserts are best suited for finishing operations

Pastilhas rômbicass de 35° são mais adequadas para operações de acabamento | Las plaquitas rómbicas de 35° son más adecuadas para operaciones de acabado

CC - RHOMBIC 80° POSITIVE

RÔMBICA 80° POSITIVA | RÓMBICA 80° POSITIVA

			P											M						K				N	S				
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
CCMW  Finishing	1120206	CCMW 21.51																			●							
	1120212	CCMW 32.51																			●							
	1120214	CCMW 431																				●						
NEW CCMT-FF  Fine Finishing	1124850	CCMT 32.50.5-FF															●		◯							●		◯
	1124669	CCMT 32.51-FF															●		◯							●		◯
	1124851	CCMT 32.52-FF															●		◯							●		◯
CCMT-FP  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  Finishing	1121620	CCMT 21.50.5-BO								◯		●				◯		●							●		●	
	1121621	CCMT 21.51-BO								◯		●				◯		●							●		●	
	1124090	CCMT 21.52-BO										●						●									●	
	1124091	CCMT 21.50.5-BO										●						●									●	
	1121601	CCMT 32.51-BO								◯		●				◯		●							●		●	
	1121622	CCMT 32.52-BO								◯		●				◯		●							●		●	
	1121624	CCMT 431-BO								◯		●				◯		●							●		●	
	1121623	CCMT 432-BO								◯		●				◯		●							●		●	
CCMT-FM  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  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																			●							

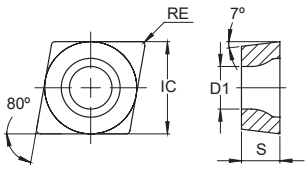
● First choice | 1ª Escolha | 1ª Opción

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

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

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

RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
CCMW 21.51	CCMW 060204	1/4	3/32	0.016	0.110	0.059	0.002	0.118	0.008	0.003	0.010
CCMW 32.51	CCMW 09T304	3/8	5/32	0.016	0.173	0.091	0.002	0.177	0.008	0.003	0.010
CCMW 431	CCMW 120404	1/2	3/16	0.016	0.217	0.122	0.002	0.236	0.008	0.003	0.010
CCMT 32.50.5-FF	CCMT 09T302-FF	3/8	5/32	0.008	0.173	0.039	0.003	0.079	0.004	0.002	0.005
CCMT 32.51-FF	CCMT 09T304-FF	3/8	5/32	0.016	0.173	0.049	0.003	0.079	0.005	0.001	0.009
CCMT 32.52-FF	CCMT 09T308-FF	3/8	5/32	0.031	0.173	0.059	0.006	0.079	0.011	0.003	0.018
CCMT 21.50.5-FP	CCMT 060202-FP	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.004
CCMT 21.51-FP	CCMT 060204-FP	1/4	3/32	0.016	0.110	0.012	0.004	0.067	0.003	0.002	0.007
CCMT 32.50.5-FP	CCMT 09T302-FP	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.005
CCMT 32.51-FP	CCMT 09T304-FP	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
CCMT 32.52-FP	CCMT 09T308-FP	3/8	5/32	0.031	0.173	0.014	0.006	0.079	0.008	0.003	0.018
CCMT 431-FP	CCMT 120404-FP	1/2	3/16	0.016	0.217	0.017	0.006	0.094	0.006	0.003	0.011
CCMT 21.50.5-BO	CCMT 060202-BO	1/4	3/32	0.008	0.110	0.020	0.012	0.039	0.003	0.002	0.005
CCMT 21.51-BO	CCMT 060204-BO	1/4	3/32	0.016	0.110	0.020	0.012	0.039	0.005	0.003	0.008
CCMT 21.52-BO	CCMT 060208-BO	1/4	3/32	0.031	0.110	0.020	0.012	0.039	0.008	0.004	0.012
CCMT 21.50.5-BO	CCMT 09T302-BO	3/8	5/32	0.008	0.173	0.031	0.016	0.047	0.005	0.003	0.008
CCMT 32.51-BO	CCMT 09T304-BO	3/8	5/32	0.016	0.173	0.031	0.020	0.047	0.005	0.003	0.008
CCMT 32.52-BO	CCMT 09T308-BO	3/8	5/32	0.031	0.173	0.031	0.020	0.047	0.008	0.004	0.012
CCMT 431-BO	CCMT 120404-BO	1/2	3/16	0.016	0.217	0.039	0.020	0.059	0.005	0.003	0.008
CCMT 432-BO	CCMT 120408-BO	1/2	3/16	0.031	0.217	0.039	0.020	0.059	0.008	0.004	0.012
CCMT 21.50.5-FM	CCMT 060202-FM	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.004
CCMT 21.51-FM	CCMT 060204-FM	1/4	3/32	0.016	0.110	0.012	0.004	0.067	0.003	0.002	0.007
CCMT 32.50.5-FM	CCMT 09T302-FM	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.005
CCMT 32.51-FM	CCMT 09T304-FM	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
CCMT 32.52-FM	CCMT 09T308-FM	3/8	5/32	0.031	0.173	0.014	0.006	0.079	0.008	0.003	0.018
CCMT 431-FM	CCMT 120404-FM	1/2	3/16	0.016	0.217	0.017	0.006	0.094	0.006	0.003	0.011
CCMT 21.50.5-FK	CCMT 060202-FK	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.004
CCMT 21.51-FK	CCMT 060204-FK	1/4	3/32	0.016	0.110	0.012	0.004	0.067	0.003	0.002	0.007
CCMT 32.50.5-FK	CCMT 09T302-FK	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.005
CCMT 32.51-FK	CCMT 09T304-FK	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
CCMT 431-FK	CCMT 120404-FK	1/2	3/16	0.016	0.217	0.017	0.006	0.094	0.006	0.003	0.011

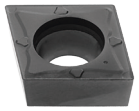
CC - RHOMBIC 80° POSITIVE

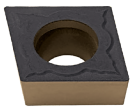
RÔMBICA 80° POSITIVA | RÓMBICA 80° POSITIVA

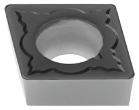
			P											M						K				N	S				
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3	
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920	
CCMT-FW	1121398	CCMT 21.51-FW		◉	○							◈						◉			◉						◉		
	1121743	CCMT 21.52-FW		◉	○							◈						◉			○						◉		
	1121399	CCMT 32.51-FW			○							◉						◉			◉						◈		
	1121744	CCMT 32.52-FW			○							◉						◉			◉						◉		
CCMT-LM	1123801	CCMT 21.51-LM															◈		◉										
	1123773	CCMT 32.51-LM															◈		◉										
	1123804	CCMT 431-LM															◈		◉										
CCMT-MW	1121462	CCMT 21.52-MW			○							◉						◉				◉					◉		
	1121400	CCMT 32.51-MW			○							◉						◉				◉					◉		
	1121411	CCMT 32.52-MW			○							◉						◉				◉					◉		
	1121412	CCMT 431-MW			○																	◉							
	1121413	CCMT 432-MW		◉	○																	◉							
CCMT-MP	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	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	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																			◈	◉							

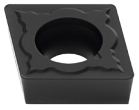

Finishing Wiper


Medium to Finishing


Medium to Finishing Wiper


Medium

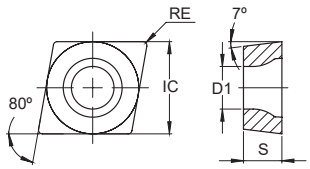

Medium


Medium

◉ First choice | 1ª Escolha | 1ª Opción
◈ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
◬ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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

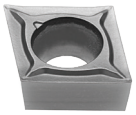
RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
CCMT 21.51-FW	CCMT 060204-FW	1/4	3/32	0.016	0.110	0.031	0.012	0.079	0.005	0.002	0.012
CCMT 21.52-FW	CCMT 060208-FW	1/4	3/32	0.031	0.110	0.031	0.012	0.079	0.006	0.004	0.014
CCMT 32.51-FW	CCMT 09T304-FW	3/8	5/32	0.016	0.173	0.039	0.012	0.118	0.008	0.003	0.012
CCMT 32.52-FW	CCMT 09T308-FW	3/8	5/32	0.031	0.173	0.039	0.012	0.118	0.010	0.005	0.020
CCMT 21.51-LM	CCMT 060204-LM	1/4	3/32	0.016	0.110	0.020	0.008	0.079	0.004	0.003	0.008
CCMT 32.51-LM	CCMT 09T304-LM	3/8	5/32	0.016	0.173	0.020	0.010	0.098	0.006	0.004	0.012
CCMT 431-LM	CCMT 120404-LM	1/2	3/16	0.016	0.217	0.031	0.012	0.118	0.007	0.005	0.014
CCMT 21.52-MW	CCMT 060208-MW	1/4	3/32	0.031	0.110	0.047	0.020	0.098	0.008	0.004	0.016
CCMT 32.51-MW	CCMT 09T304-MW	3/8	5/32	0.016	0.173	0.059	0.020	0.157	0.010	0.005	0.016
CCMT 32.52-MW	CCMT 09T308-MW	3/8	5/32	0.031	0.173	0.059	0.028	0.157	0.012	0.006	0.020
CCMT 431-MW	CCMT 120404-MW	1/2	3/16	0.016	0.217	0.079	0.020	0.157	0.010	0.006	0.016
CCMT 432-MW	CCMT 120408-MW	1/2	3/16	0.031	0.217	0.079	0.028	0.157	0.012	0.006	0.020
CCMT 21.51-MP	CCMT 060204-MP	1/4	3/32	0.016	0.110	0.025	0.008	0.094	0.004	0.002	0.007
CCMT 21.52-MP	CCMT 060208-MP	1/4	3/32	0.031	0.110	0.025	0.016	0.094	0.007	0.003	0.014
CCMT 32.51-MP	CCMT 09T304-MP	3/8	5/32	0.016	0.173	0.025	0.010	0.118	0.006	0.003	0.009
CCMT 32.52-MP	CCMT 09T308-MP	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.008	0.004	0.016
CCMT 431-MP	CCMT 120404-MP	1/2	3/16	0.016	0.217	0.038	0.012	0.142	0.007	0.004	0.011
CCMT 432-MP	CCMT 120408-MP	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.009	0.005	0.018
CCMT 433-MP	CCMT 120412-MP	1/2	3/16	0.047	0.217	0.038	0.028	0.142	0.014	0.006	0.024
CCMT 21.51-MM	CCMT 060204-MM	1/4	3/32	0.016	0.110	0.025	0.008	0.094	0.004	0.002	0.007
CCMT 21.52-MM	CCMT 060208-MM	1/4	3/32	0.031	0.110	0.025	0.016	0.094	0.007	0.003	0.014
CCMT 32.51-MM	CCMT 09T304-MM	3/8	5/32	0.016	0.173	0.025	0.010	0.118	0.006	0.003	0.009
CCMT 32.52-MM	CCMT 09T308-MM	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.008	0.004	0.016
CCMT 431-MM	CCMT 120404-MM	1/2	3/16	0.016	0.217	0.038	0.012	0.142	0.007	0.004	0.011
CCMT 432-MM	CCMT 120408-MM	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.009	0.005	0.018
CCMT 433-MM	CCMT 120412-MM	1/2	3/16	0.047	0.217	0.038	0.028	0.142	0.014	0.006	0.024
CCMT 21.51-MK	CCMT 060204-MK	1/4	3/32	0.016	0.110	0.025	0.008	0.094	0.004	0.002	0.007
CCMT 21.52-MK	CCMT 060208-MK	1/4	3/32	0.031	0.110	0.025	0.016	0.094	0.007	0.003	0.014
CCMT 32.51-MK	CCMT 09T304-MK	3/8	5/32	0.016	0.173	0.025	0.010	0.118	0.006	0.003	0.009
CCMT 32.52-MK	CCMT 09T308-MK	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.008	0.004	0.016
CCMT 431-MK	CCMT 120404-MK	1/2	3/16	0.016	0.217	0.038	0.012	0.142	0.007	0.004	0.011
CCMT 432-MK	CCMT 120408-MK	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.009	0.005	0.018

CC - RHOMBIC 80° POSITIVE

RÔMBICA 80° POSITIVA | RÓMBICA 80° POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
CCGT-FS  Finishing to Fine Finishing	1121725	CCGT 21.50.2-FS															●		●							●		●
	1121726	CCGT 21.50.5-FS															●		●							●		●
	1121727	CCGT 21.51-FS															●		●							●		●
	1121455	CCGT 32.50.2-FS								◇						◇	●		●						◇	●		●
	1121456	CCGT 32.50.5-FS								◇						◇	●		●						◇	●		●
	1121457	CCGT 32.51-FS															●		●							●		●
CCGT-LN  Medium to 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																						●				

● First choice | 1ª Escolha | 1ª Opción

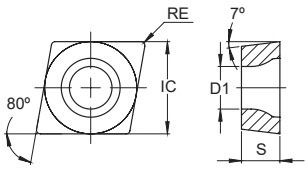
● Stock Itens | Itens de stock

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

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

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

RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
CCGT 21.50.2-FS	CCGT 060201-FS	1/4	3/32	0.004	0.110	0.012	0.004	0.039	0.001	0.000	0.002
CCGT 21.50.5-FS	CCGT 060202-FS	1/4	3/32	0.008	0.110	0.020	0.004	0.059	0.003	0.001	0.005
CCGT 21.51-FS	CCGT 060204-FS	1/4	3/32	0.016	0.110	0.031	0.006	0.059	0.008	0.003	0.010
CCGT 32.50.2-FS	CCGT 09T301-FS	3/8	5/32	0.004	0.173	0.020	0.004	0.059	0.001	0.000	0.002
CCGT 32.50.5-FS	CCGT 09T302-FS	3/8	5/32	0.008	0.173	0.039	0.004	0.079	0.003	0.001	0.005
CCGT 32.51-FS	CCGT 09T304-FS	3/8	5/32	0.016	0.173	0.049	0.006	0.098	0.006	0.003	0.010
CCGT 21.50.5-LN	CCGT 060202-LN	1/4	3/32	0.008	0.110	0.039	0.002	0.118	0.003	0.002	0.005
CCGT 21.51-LN	CCGT 060204-LN	1/4	3/32	0.016	0.110	0.061	0.004	0.118	0.006	0.004	0.008
CCGT 32.50.5-LN	CCGT 09T302-LN	3/8	5/32	0.008	0.173	0.060	0.002	0.118	0.003	0.002	0.005
CCGT 32.51-LN	CCGT 09T304-LN	3/8	5/32	0.016	0.173	0.100	0.004	0.197	0.006	0.004	0.009
CCGT 32.52-LN	CCGT 09T308-LN	3/8	5/32	0.031	0.173	0.100	0.004	0.197	0.009	0.006	0.018
CCGT 430.5-LN	CCGT 120402-LN	1/2	3/16	0.008	0.217	0.080	0.002	0.157	0.003	0.002	0.005
CCGT 431-LN	CCGT 120404-LN	1/2	3/16	0.016	0.217	0.100	0.004	0.197	0.007	0.004	0.010
CCGT 432-LN	CCGT 120408-LN	1/2	3/16	0.031	0.217	0.110	0.004	0.217	0.010	0.006	0.020

DC - RHOMBIC 55° POSITIVE

RÔMBICA 55° POSITIVA | RÓMBICA 55° POSITIVA

Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
			PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
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																			●							
NEW DCMT-FF Fine Finishing	1121389	DCMT 32.50.5-FF															●		◆							●		◆
	1121390	DCMT 32.51-FF															●		◆							●		◆
	1121391	DCMT 32.52-FF															●		◆							●		◆
DCMT-FP 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 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 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 Finishing Wiper	1121749	DCMT 21.51-FW			○							●						●			●						●	
	1121750	DCMT 21.52-FW		●	○							◆						◆			●						◆	
	1121745	DCMT 32.51-FW			●							◆						●			●						●	
	1121755	DCMT 32.52-FW			●							◆						◆			●						◆	
DCMT-LM Medium to Finishing	1123802	DCMT 32.51-LM															●		◆							●		◆
	1123803	DCMT 32.52-LM															◆		◆							◆		◆
DCMT-MW Medium to Finishing Wiper	1121414	DCMT 32.51-MW			○							●						●				●					●	
	1121756	DCMT 32.52-MW		●	○							◆						◆				◆					◆	

● First choice | 1ª Escolha | 1ª Opción

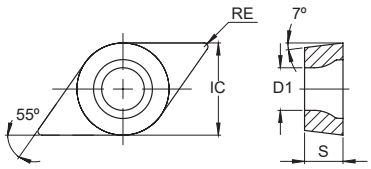
◆ Stock Itens | Itens de stock

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

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

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

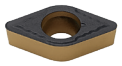
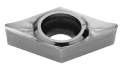
RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
DCMW 21.50.5	DCMW 070202	1/4	3/32	0.008	0.110	0.063	0.002	0.126	0.004	0.002	0.005
DCMW 21.51	DCMW 070204	1/4	3/32	0.016	0.110	0.063	0.002	0.126	0.008	0.003	0.010
DCMW 21.52	DCMW 070208	1/4	3/32	0.031	0.110	0.063	0.002	0.126	0.016	0.006	0.021
DCMW 32.50.5	DCMW 11T302	3/8	5/32	0.008	0.173	0.094	0.002	0.189	0.004	0.002	0.005
DCMW 32.51	DCMW 11T304	3/8	5/32	0.016	0.173	0.094	0.002	0.189	0.008	0.003	0.010
DCMW 32.52	DCMW 11T308	3/8	5/32	0.031	0.173	0.094	0.002	0.189	0.016	0.006	0.021
DCMW 431	DCMW 150404	1/2	3/16	0.016	0.217	0.110	0.004	0.217	0.008	0.004	0.010
DCMT 32.50.5-FF	DCMT 11T302-FF	3/8	5/32	0.008	0.173	0.012	0.003	0.079	0.003	0.002	0.006
DCMT 32.51-FF	DCMT 11T304-FF	3/8	5/32	0.016	0.173	0.020	0.004	0.079	0.004	0.002	0.009
DCMT 32.52-FF	DCMT 11T308-FF	3/8	5/32	0.031	0.173	0.031	0.006	0.079	0.006	0.003	0.012
DCMT 21.50.5-FP	DCMT 070202-FP	1/4	3/32	0.008	0.110	0.010	0.002	0.059	0.002	0.001	0.004
DCMT 21.51-FP	DCMT 070204-FP	1/4	3/32	0.016	0.110	0.010	0.003	0.059	0.003	0.002	0.007
DCMT 32.50.5-FP	DCMT 11T302-FP	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.006
DCMT 32.51-FP	DCMT 11T304-FP	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
DCMT 32.52-FP	DCMT 11T308-FP	3/8	5/32	0.031	0.173	0.014	0.006	0.079	0.006	0.003	0.012
DCMT 21.50.5-FM	DCMT 070202-FM	1/4	3/32	0.008	0.110	0.010	0.002	0.059	0.002	0.001	0.004
DCMT 21.51-FM	DCMT 070204-FM	1/4	3/32	0.016	0.110	0.010	0.003	0.059	0.003	0.002	0.007
DCMT 32.50.5-FM	DCMT 11T302-FM	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.006
DCMT 32.51-FM	DCMT 11T304-FM	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
DCMT 32.52-FM	DCMT 11T308-FM	3/8	5/32	0.031	0.173	0.014	0.006	0.079	0.006	0.003	0.012
DCMT 21.50.5-FK	DCMT 070202-FK	1/4	3/32	0.008	0.110	0.010	0.002	0.059	0.002	0.001	0.004
DCMT 21.51-FK	DCMT 070204-FK	1/4	3/32	0.016	0.110	0.010	0.003	0.059	0.003	0.002	0.007
DCMT 32.50.5-FK	DCMT 11T302-FK	3/8	5/32	0.008	0.173	0.014	0.003	0.079	0.003	0.002	0.006
DCMT 32.51-FK	DCMT 11T304-FK	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
DCMT 21.51-FW	DCMT 070204-FW	1/4	3/32	0.016	0.110	0.028	0.012	0.079	0.005	0.002	0.010
DCMT 21.52-FW	DCMT 070208-FW	1/4	3/32	0.031	0.110	0.028	0.012	0.079	0.006	0.004	0.014
DCMT 32.51-FW	DCMT 11T304-FW	3/8	5/32	0.016	0.173	0.039	0.012	0.118	0.008	0.003	0.012
DCMT 32.52-FW	DCMT 11T308-FW	3/8	5/32	0.031	0.173	0.039	0.012	0.118	0.010	0.005	0.016
DCMT 32.51-LM	DCMT 11T304-LM	3/8	5/32	0.016	0.173	0.020	0.006	0.098	0.006	0.003	0.010
DCMT 32.52-LM	DCMT 11T308-LM	3/8	5/32	0.031	0.173	0.020	0.008	0.098	0.008	0.004	0.014
DCMT 32.51-MW	DCMT 11T304-MW	3/8	5/32	0.016	0.173	0.059	0.020	0.157	0.010	0.005	0.016
DCMT 32.52-MW	DCMT 11T308-MW	3/8	5/32	0.031	0.173	0.059	0.020	0.157	0.012	0.006	0.020

DC - RHOMBIC 55° POSITIVE

RÔMBICA 55° POSITIVA | RÓMBICA 55° POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
DCMT-MP  Medium	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		◉	○		◉																						
	1124783	DCMT 32.53-MP1			○		◉																						
DCMT-MM  Medium	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  Medium	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																			◉	◉						
DCGT-FS  Finishing to Fine Finishing	1121747	DCGT 21.50.2-FS															◉		◉							◉		◉
	1121748	DCGT 21.50.5-FS															◉		◉							◉		◉
	1121872	DCGT 21.51-FS															◉		◉							◉		◉
	1121873	DCGT 32.50.2-FS															◉		◉							◉		◉
	1121874	DCGT 32.50.5-FS															◉		◉							◉		◉
	1121875	DCGT 32.51-FS															◉		◉							◉		◉
	1124101	DCGT 32.52-FS															◉		◉							◉		◉
DCGT-LN  Medium to 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																						◉				

◉ First choice | 1ª Escolha | 1ª Opción

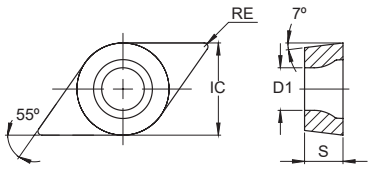
◉ Stock Itens | Itens de stock

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

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

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

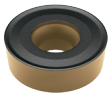
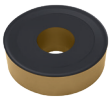
RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
DCMT 21.51-MP	DCMT 070204-MP	1/4	3/32	0.016	0.110	0.024	0.007	0.089	0.004	0.002	0.007
DCMT 21.52-MP	DCMT 070208-MP	1/4	3/32	0.031	0.110	0.024	0.015	0.089	0.008	0.003	0.014
DCMT 32.51-MP	DCMT 11T304-MP	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.009
DCMT 32.52-MP	DCMT 11T308-MP	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.010	0.004	0.016
DCMT 32.53-MP	DCMT 11T312-MP	3/8	5/32	0.047	0.173	0.031	0.024	0.118	0.014	0.005	0.024
DCMT 32.53-MP1	DCMT 11T312-MP1	3/8	5/32	0.047	0.173	0.031	0.024	0.118	0.014	0.005	0.024
DCMT 21.51-MM	DCMT 070204-MM	1/4	3/32	0.016	0.110	0.024	0.007	0.089	0.004	0.002	0.007
DCMT 21.52-MM	DCMT 070208-MM	1/4	3/32	0.031	0.110	0.024	0.015	0.089	0.008	0.003	0.014
DCMT 32.51-MM	DCMT 11T304-MM	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.009
DCMT 32.52-MM	DCMT 11T308-MM	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.010	0.004	0.016
DCMT 32.53-MM	DCMT 11T312-MM	3/8	5/32	0.047	0.173	0.031	0.024	0.118	0.014	0.005	0.024
DCMT 21.51-MK	DCMT 070204-MK	1/4	3/32	0.016	0.110	0.024	0.007	0.089	0.004	0.002	0.007
DCMT 21.52-MK	DCMT 070208-MK	1/4	3/32	0.031	0.110	0.024	0.015	0.089	0.008	0.003	0.014
DCMT 32.51-MK	DCMT 11T304-MK	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.009
DCMT 32.52-MK	DCMT 11T308-MK	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.010	0.004	0.016
DCMT 32.53-MK	DCMT 11T312-MK	3/8	5/32	0.047	0.173	0.031	0.020	0.118	0.014	0.005	0.024
DCGT 21.50.2-FS	DCGT 070201-FS	1/4	3/32	0.004	0.110	0.012	0.004	0.039	0.001	0.000	0.002
DCGT 21.50.5-FS	DCGT 070202-FS	1/4	3/32	0.008	0.110	0.020	0.004	0.059	0.003	0.001	0.005
DCGT 21.51-FS	DCGT 070204-FS	1/4	3/32	0.016	0.110	0.031	0.006	0.059	0.006	0.003	0.010
DCGT 32.50.2-FS	DCGT 11T301-FS	3/8	5/32	0.004	0.173	0.020	0.004	0.059	0.001	0.000	0.002
DCGT 32.50.5-FS	DCGT 11T302-FS	3/8	5/32	0.008	0.173	0.039	0.004	0.079	0.003	0.001	0.005
DCGT 32.51-FS	DCGT 11T304-FS	3/8	5/32	0.016	0.173	0.059	0.006	0.118	0.006	0.003	0.010
DCGT 32.52-FS	DCGT 11T308-FS	3/8	5/32	0.031	0.173	0.079	0.008	0.138	0.007	0.004	0.012
DCGT 21.50.5-LN	DCGT 070202-LN	1/4	3/32	0.008	0.110	0.039	0.002	0.118	0.003	0.002	0.005
DCGT 21.51-LN	DCGT 070204-LN	1/4	3/32	0.016	0.110	0.081	0.004	0.157	0.006	0.004	0.008
DCGT 32.50.5-LN	DCGT 11T302-LN	3/8	5/32	0.008	0.173	0.080	0.002	0.157	0.003	0.002	0.005
DCGT 32.51-LN	DCGT 11T304-LN	3/8	5/32	0.016	0.173	0.100	0.004	0.197	0.006	0.004	0.009
DCGT 32.52-LN	DCGT 11T308-LN	3/8	5/32	0.031	0.173	0.100	0.004	0.197	0.009	0.006	0.020
DCGT 32.53-LN	DCGT 11T312-LN	3/8	5/32	0.047	0.173	0.106	0.006	0.197	0.014	0.006	0.028

RC - ROUND Rº POSITIVE

REDONDA Rº POSITIVA | REDONDA Rº POSITIVA

			P											M							K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
RCGT-LN  Finishing to Fine Finishing	1124005	RCGT 0602M0-LN																						●				
	1124006	RCGT 0803M0-LN																						●				
	1124007	RCGT 1003M0-LN																						●				
	1123684	RCGT 1204M0-LN																						●				
RCMT-GS  Medium to Finishing	1125011	RCMT 0602M0-GS															●									●		
	1124495	RCMT 0803M0-GS															●									●		
	1124496	RCMT 1003M0-GS															●									●		
	1125010	RCMT 1204M0-GS															●									●		
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  Roughing to Medium	1123848	RCMT 2507M0-RF		◈	○		●																					
RCMT-RM  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			◈	●	○																					
	1123910	RCMX 3209M0-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				◈	●		◈																				

● First choice | 1ª Escolha | 1ª Opción

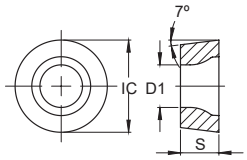
◈ Stock Itens | Itens de stock

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

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

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

RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
RCGT 0602M0-LN	RCGT 0602M0-LN	1/4	3/32	-	0.110	0.049	0.020	0.079	0.005	0.002	0.008
RCGT 0803M0-LN	RCGT 0803M0-LN	1/3	1/8	-	0.134	0.059	0.020	0.098	0.006	0.002	0.010
RCGT 1003M0-LN	RCGT 1003M0-LN	2/5	1/8	-	0.173	0.079	0.039	0.118	0.008	0.004	0.012
RCGT 1204M0-LN	RCGT 1204M0-LN	1/2	3/16	-	0.173	0.089	0.039	0.138	0.009	0.004	0.014
RCMT 0602M0-GS	RCMT 0602M0-GS	1/4	3/32	-	0.110	0.035	0.012	0.059	0.010	0.006	0.016
RCMT 0803M0-GS	RCMT 0803M0-GS	1/3	1/8	-	0.134	0.047	0.016	0.079	0.011	0.006	0.016
RCMT 1003M0-GS	RCMT 1003M0-GS	2/5	1/8	-	0.173	0.059	0.020	0.098	0.012	0.006	0.018
RCMT 1204M0-GS	RCMT 1204M0-GS	1/2	3/16	-	0.173	0.071	0.024	0.118	0.014	0.006	0.020
RCMT 0602M0-CP	RCMT 0602M0-CP	1/4	3/32	-	0.110	0.059	0.020	0.094	0.006	0.002	0.007
RCMT 0803M0-ST	RCMT 0803M0-ST	1/3	1/8	-	0.134	0.079	0.031	0.126	0.008	0.004	0.031
RCMT 1003M0-ST	RCMT 1003M0-ST	2/5	1/8	-	0.134	0.098	0.039	0.157	0.010	0.005	0.039
RCMT 10T3M0-ST	RCMT 10T3M0-ST	2/5	5/32	-	0.173	0.098	0.039	0.157	0.010	0.006	0.055
RCMT 1204M0-ST	RCMT 1204M0-ST	1/2	3/16	-	0.173	0.118	0.047	0.189	0.012	0.008	0.071
RCMT 1606M0-ST	RCMT 1606M0-ST	5/8	1/4	-	0.217	0.138	0.063	0.252	0.015	0.010	0.091
RCMT 2006M0-ST	RCMT 2006M0-ST	4/5	1/4	-	0.256	0.157	0.079	0.315	0.018	0.012	0.118
RCMT 2507M0-RF	RCMT 2507M0-RF	1	5/16	-	0.283	0.248	0.098	0.394	0.031	0.010	0.098
RCMT 2006M0-RM	RCMT 2006M0-RM	4/5	1/4	-	0.256	0.157	0.079	0.315	0.018	0.005	0.025
RCMX 1003M0-ST	RCMX 1003M0-ST	2/5	1/8	-	0.142	0.098	0.039	0.157	0.013	0.004	0.039
RCMX 1204M0-ST	RCMX 1204M0-ST	1/2	3/16	-	0.165	0.118	0.047	0.189	0.015	0.005	0.047
RCMX 1606M0-ST	RCMX 1606M0-ST	5/8	1/4	-	0.205	0.157	0.063	0.252	0.020	0.006	0.063
RCMX 2006M0-ST	RCMX 2006M0-ST	4/5	1/4	-	0.256	0.197	0.079	0.315	0.025	0.008	0.079
RCMX 2507M0-ST	RCMX 2507M0-ST	1	5/16	-	0.283	0.248	0.098	0.394	0.031	0.010	0.098
RCMX 3209M0-ST	RCMX 3209M0-ST	1 1/6	3/8	-	0.394	0.276	0.118	0.433	0.033	0.012	0.110
RCMX 3209M0-ST	RCMX 3209M0-ST	1 1/4	3/8	-	0.374	0.315	0.126	0.504	0.040	0.013	0.126
RCMX 3209M0-RM	RCMX 3209M0-RM	1 1/4	3/8	-	0.374	0.256	0.126	0.512	0.071	0.031	0.098
RCMX 2507M0-RR	RCMX 2507M0-RR	1	5/16	-	0.283	0.197	0.126	0.315	0.071	0.031	0.098
RCMX 3209M0-RR	RCMX 3209M0-RR	1 1/4	3/8	-	0.374	0.256	0.126	0.512	0.071	0.031	0.098

SC - SQUARE 90° POSITIVE

QUADRADA 90° POSITIVA | ESCUADRA 90° POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
SCMW  Finishing	1120469	SCMW 32.51																			●							
	1120470	SCMW 32.52																			●							
	1120472	SCMW 432																			●							
SCMT-FP  Finishing	1121759	SCMT 32.51-FP		●	○		◈																					
	1121765	SCMT 32.52-FP			●	◈	○																					
SCMT-FM  Finishing	1121758	SCMT 32.51-FM													◈				●									●
	1121764	SCMT 32.52-FM													●				◈									●
SCMT-FK  Finishing	1121757	SCMT 32.51-FK																			●							
	1121763	SCMT 32.52-FK																			●							
SCMT-MP  Medium	1121762	SCMT 32.51-MP			●	◈	◈																					
	1121768	SCMT 32.52-MP		●	○	◈	◈																					
	1121770	SCMT 431-MP		●	○	◈	○																					
	1121783	SCMT 432-MP		●	○		◈																					
	1121785	SCMT 433-MP		●	○	◈	○																					
SCMT-MM  Medium	1121761	SCMT 32.51-MM										●		●				◈	◈								◈	●
	1121767	SCMT 32.52-MM										●		●				◈	◈								◈	●
	1121769	SCMT 431-MM										●		●				◈	◈								◈	●
	1121782	SCMT 432-MM										●		●				◈	◈								◈	●
	1121784	SCMT 433-MM												●					◈									●
SCMT-MK  Medium	1121760	SCMT 32.51-MK																			●	◈						
	1121766	SCMT 32.52-MK																			●	◈						
	1121781	SCMT 432-MK																			◈	●	◈					
SCGT-LN  Medium to Finishing	1124008	SCGT 32.51-LN																						●				
	1124009	SCGT 32.52-LN																						●				
	1124743	SCGT 430.5-LN																						○				
	1124010	SCGT 431-LN																						●				
	1123685	SCGT 432-LN																						●				

● First choice | 1ª Escolha | 1ª Opción

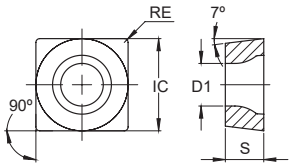
◈ Stock Itens | Itens de stock

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

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

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

RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
SCMW 32.51	SCMW 09T304	3/8	5/32	0.016	0.173	0.094	0.002	0.185	0.008	0.003	0.010
SCMW 32.52	SCMW 09T308	3/8	5/32	0.031	0.173	0.094	0.002	0.185	0.016	0.006	0.021
SCMW 432	SCMW 120408	1/2	3/16	0.031	0.217	0.126	0.002	0.248	0.016	0.006	0.021
SCMT 32.51-FP	SCMT 09T304-FP	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
SCMT 32.52-FP	SCMT 09T308-FP	3/8	5/32	0.031	0.173	0.014	0.006	0.079	0.006	0.003	0.012
SCMT 32.51-FM	SCMT 09T304-FM	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
SCMT 32.52-FM	SCMT 09T308-FM	3/8	5/32	0.031	0.173	0.014	0.006	0.079	0.006	0.003	0.012
SCMT 32.51-FK	SCMT 09T304-FK	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
SCMT 32.52-FK	SCMT 09T308-FK	3/8	5/32	0.031	0.173	0.014	0.006	0.079	0.006	0.003	0.012
SCMT 32.51-MP	SCMT 09T304-MP	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.009
SCMT 32.52-MP	SCMT 09T308-MP	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.010	0.004	0.016
SCMT 431-MP	SCMT 120404-MP	1/2	3/16	0.016	0.217	0.038	0.012	0.142	0.007	0.004	0.011
SCMT 432-MP	SCMT 120408-MP	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.010	0.005	0.018
SCMT 433-MP	SCMT 120412-MP	1/2	3/16	0.047	0.217	0.038	0.028	0.142	0.014	0.006	0.024
SCMT 32.51-MM	SCMT 09T304-MM	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.009
SCMT 32.52-MM	SCMT 09T308-MM	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.010	0.004	0.016
SCMT 431-MM	SCMT 120404-MM	1/2	3/16	0.016	0.217	0.038	0.012	0.142	0.007	0.004	0.011
SCMT 432-MM	SCMT 120408-MM	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.010	0.005	0.018
SCMT 433-MM	SCMT 120412-MM	1/2	3/16	0.047	0.217	0.038	0.028	0.142	0.014	0.006	0.024
SCMT 32.51-MK	SCMT 09T304-MK	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.009
SCMT 32.52-MK	SCMT 09T308-MK	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.010	0.004	0.016
SCMT 432-MK	SCMT 120408-MK	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.010	0.005	0.018
SCGT 32.51-LN	SCGT 09T304-LN	3/8	5/32	0.016	0.173	0.081	0.004	0.157	0.006	0.004	0.010
SCGT 32.52-LN	SCGT 09T308-LN	3/8	5/32	0.031	0.173	0.100	0.004	0.197	0.009	0.006	0.016
SCGT 430.5-LN	SCGT 120402-LN	1/2	3/16	0.008	0.217	0.098	0.004	0.177	0.006	0.003	0.010
SCGT 431-LN	SCGT 120404-LN	1/2	3/16	0.016	0.217	0.100	0.004	0.197	0.008	0.004	0.010
SCGT 432-LN	SCGT 120408-LN	1/2	3/16	0.031	0.217	0.100	0.004	0.197	0.012	0.006	0.020

SP - SQUARE 90° POSITIVE

QUADRADA 90° POSITIVA | ESCUADRA 90° POSITIVA

			P								M						K				N	S			
			CVD				PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	L7	R2	L8	R3	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PH5115	PHG115	PH5125	PHG125	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
SPUN  Medium to Finishing	1120580	SPUN 421			◉																				
	1120581	SPUN 422	◉		◉																				
	1120583	SPUN 423			◉																				
SPMR-12  Finishing to Fine Finishing	1120561	SPMR 322-12	◉		◈																				
	1120563	SPMR 421-12	◉																						
	1120565	SPMR 422-12	◇																						
SPMR-13  Medium	1120562	SPMR 322-13	◉																						
	1120564	SPMR 421-13	◇		◉																				
	1120566	SPMR 422-13	◇		◉																				
	1120567	SPMR-423-13	◈		◉																				

◉ First choice | 1ª Escolha | 1ª Opción

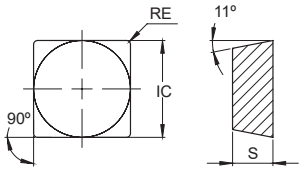
◈ Stock Itens | Itens de stock

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

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

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

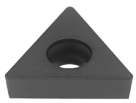
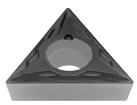
RELIEF ANGLE 11°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
SPUN 421	SPUN 120304	1/2	1/8	0.016	-	0.118	0.039	0.197	0.008	0.004	0.012
SPUN 422	SPUN 120308	1/2	1/8	0.031	-	0.118	0.039	0.197	0.010	0.006	0.016
SPUN 423	SPUN 120312	1/2	1/8	0.047	-	0.118	0.039	0.197	0.014	0.008	0.020
SPMR 322-12	SPMR 090308-12	3/8	1/8	0.031	-	0.039	0.012	0.079	0.008	0.004	0.012
SPMR 421-12	SPMR 120304-12	1/2	1/8	0.016	-	0.051	0.020	0.079	0.006	0.003	0.010
SPMR 422-12	SPMR 120308-12	1/2	1/8	0.031	-	0.051	0.020	0.079	0.009	0.004	0.012
SPMR 322-13	SPMR 090308-13	3/8	1/8	0.031	-	0.087	0.039	0.138	0.010	0.004	0.016
SPMR 421-13	SPMR 120304-13	1/2	1/8	0.016	-	0.102	0.059	0.157	0.004	0.003	0.008
SPMR 422-13	SPMR 120308-13	1/2	1/8	0.031	-	0.102	0.059	0.157	0.012	0.008	0.016
SPMR-423-13	SPMR 120312-13	1/2	1/8	0.047	-	0.102	0.059	0.157	0.016	0.010	0.022

TC - TRIANGULAR 60° POSITIVE

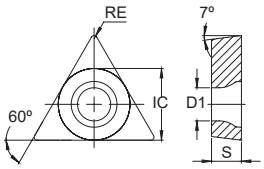
TRIANGULAR 60° POSITIVA | TRIANGULAR 60° POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
TCMW  Finishing	1120620	TCMW 21.51																			●			○				
	1120622	TCMW 32.51																			●			○				
	1120623	TCMW 32.52																			●			○				
	1121846	TCMT 432																		△	○							
TCMT-FP  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  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													●		◉		◉								●	◉

● First choice | 1ª Escolha | 1ª Opción
◉ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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

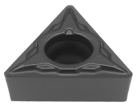
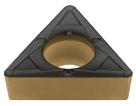
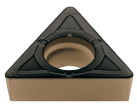
RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
TCMW 21.51	TCMW 110204	1/4	3/32	0.016	0.110	0.059	0.002	0.122	0.008	0.003	0.010
TCMW 32.51	TCMW 16T304	3/8	5/32	0.016	0.173	0.091	0.002	0.185	0.008	0.003	0.010
TCMW 32.52	TCMW 16T308	3/8	5/32	0.031	0.173	0.091	0.002	0.185	0.016	0.006	0.021
TCMT 432	TCMT 220408	1/2	3/16	0.031	0.217	0.091	0.002	0.248	0.013	0.006	0.021
TCMT 1.21.20.5-FP	TCMT 06T102-FP	1/6	6/77	0.008	0.085	0.010	0.002	0.059	0.002	0.001	0.004
TCMT 1.21.21-FP	TCMT 06T104-FP	1/6	6/77	0.016	0.085	0.010	0.003	0.059	0.003	0.002	0.007
TCMT 1.21.22-FP	TCMT 06T108-FP	1/6	6/77	0.031	0.085	0.010	0.004	0.059	0.004	0.002	0.009
TCMT 1.81.50.5-FP	TCMT 090202-FP	2/9	3/32	0.008	0.098	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 1.81.51-FP	TCMT 090204-FP	2/9	3/32	0.016	0.098	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 21.50.5-FP	TCMT 110202-FP	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 21.51-FP	TCMT 110204-FP	1/4	3/32	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 21.52-FP	TCMT 110208-FP	1/4	3/32	0.031	0.110	0.012	0.005	0.067	0.005	0.003	0.010
TCMT 220.5-FP	TCMT 110302-FP	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 221-FP	TCMT 110304-FP	1/4	1/8	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 222-FP	TCMT 110308-FP	1/4	1/8	0.031	0.110	0.012	0.005	0.067	0.005	0.003	0.010
TCMT 32.51-FP	TCMT 16T304-FP	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
TCMT 1.21.20.5-FM	TCMT 06T102-FM	1/6	6/77	0.008	0.085	0.010	0.002	0.059	0.002	0.001	0.004
TCMT 1.21.21-FM	TCMT 06T104-FM	1/6	6/77	0.016	0.085	0.010	0.003	0.059	0.003	0.002	0.007
TCMT 1.21.22-FM	TCMT 06T108-FM	1/6	6/77	0.031	0.085	0.010	0.004	0.059	0.004	0.002	0.009
TCMT 1.81.50.5-FM	TCMT 090202-FM	2/9	3/32	0.008	0.098	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 1.81.51-FM	TCMT 090204-FM	2/9	3/32	0.016	0.098	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 21.50.5-FM	TCMT 110202-FM	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 21.51-FM	TCMT 110204-FM	1/4	3/32	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 21.52-FM	TCMT 110208-FM	1/4	3/32	0.031	0.110	0.012	0.005	0.067	0.005	0.003	0.010
TCMT 220.5-FM	TCMT 110302-FM	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 221-FM	TCMT 110304-FM	1/4	1/8	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 222-FM	TCMT 110308-FM	1/4	1/8	0.031	0.110	0.012	0.005	0.067	0.005	0.003	0.010
TCMT 32.51-FM	TCMT 16T304-FM	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009

TC - TRIANGULAR 60° POSITIVE

TRIANGULAR 60° POSITIVA | TRIANGULAR 60° POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
TCMT-FK  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  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-MW  Medium to Finishing Wiper	1121974	TCMT 21.52-MW		○								◉						◉				◉					◉	
	1121828	TCMT 222-MW		○								◉						◉				◉					◉	
	1121841	TCMT 32.52-MW		○								◉						◉				◉					◉	

◉ First choice | 1ª Escolha | 1ª Opción

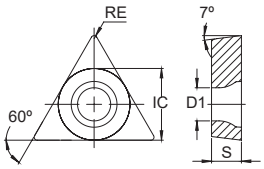
◈ Stock Itens | Itens de stock

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

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

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

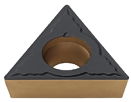
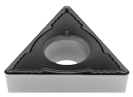
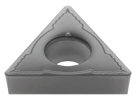
RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
TCMT 1.21.20.5-FK	TCMT 06T102-FK	1/6	6/77	0.008	0.085	0.010	0.002	0.059	0.002	0.001	0.004
TCMT 1.21.21-FK	TCMT 06T104-FK	1/6	6/77	0.016	0.085	0.010	0.003	0.059	0.003	0.002	0.007
TCMT 1.21.22-FK	TCMT 06T108-FK	1/6	6/77	0.031	0.085	0.010	0.004	0.059	0.004	0.002	0.009
TCMT 1.81.50.5-FK	TCMT 090202-FK	2/9	3/32	0.008	0.098	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 1.81.51-FK	TCMT 090204-FK	2/9	3/32	0.016	0.098	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 21.50.5-FK	TCMT 110202-FK	1/4	3/32	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 21.51-FK	TCMT 110204-FK	1/4	3/32	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 220.5-FK	TCMT 110302-FK	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
TCMT 221-FK	TCMT 110304-FK	1/4	1/8	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
TCMT 32.51-FK	TCMT 16T304-FK	3/8	5/32	0.016	0.173	0.014	0.004	0.079	0.004	0.002	0.009
TCMT 1.81.51-FW	TCMT 090204-FW	2/9	3/32	0.016	0.098	0.028	0.012	0.079	0.005	0.002	0.012
TCMT 1.81.52-FW	TCMT 090208-FW	2/9	3/32	0.031	0.098	0.028	0.012	0.079	0.010	0.004	0.014
TCMT 21.51-FW	TCMT 110204-FW	1/4	3/32	0.016	0.110	0.039	0.012	0.098	0.008	0.003	0.012
TCMT 21.52-FW	TCMT 110208-FW	1/4	3/32	0.031	0.110	0.039	0.012	0.098	0.010	0.005	0.016
TCMT 221-FW	TCMT 110304-FW	1/4	1/8	0.016	0.110	0.039	0.012	0.098	0.008	0.003	0.012
TCMT 222-FW	TCMT 110308-FW	1/4	1/8	0.031	0.110	0.039	0.012	0.098	0.010	0.005	0.016
TCMT 32.51-FW	TCMT 16T304-FW	3/8	5/32	0.016	0.173	0.047	0.012	0.138	0.008	0.003	0.014
TCMT 32.52-FW	TCMT 16T308-FW	3/8	5/32	0.031	0.173	0.047	0.012	0.138	0.010	0.005	0.020
TCMT 21.52-MW	TCMT 110208-MW	1/4	3/32	0.031	0.110	0.047	0.020	0.118	0.012	0.006	0.020
TCMT 222-MW	TCMT 110308-MW	1/4	1/8	0.031	0.110	0.047	0.020	0.118	0.012	0.006	0.020
TCMT 32.52-MW	TCMT 16T308-MW	3/8	5/32	0.031	0.173	0.059	0.020	0.157	0.012	0.006	0.020

TC - TRIANGULAR 60° POSITIVE

TRIANGULAR 60° POSITIVA | TRIANGULAR 60° POSITIVA

			P												M						K				N	S				
			CVD							PVD					CVD		PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3		
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920		
TCMT-MP	1121703	TCMT 1.81.51-MP		◬	●	●	●					●					●	●	●											
	1121812	TCMT 1.81.52-MP			○		●																							
Medium	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		●	○	●	○		●																					
TCMT-MM	1121702	TCMT 1.81.51-MM												●			●	●	●							●	●	●		
	1121811	TCMT 1.81.52-MM												●			●	●	●							●	●	●		
Medium	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	1121701	TCMT 1.81.51-MK																			●	●								
	1121810	TCMT 1.81.52-MK																			●	●								
Medium	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																			●	●								

● First choice | 1ª Escolha | 1ª Opción

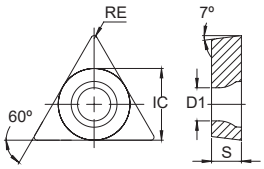
● Stock Itens | Itens de stock

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

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

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

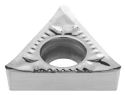
RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
TCMT 1.81.51-MP	TCMT 090204-MP	2/9	3/32	0.016	0.098	0.024	0.007	0.089	0.004	0.002	0.007
TCMT 1.81.52-MP	TCMT 090208-MP	2/9	3/32	0.031	0.098	0.024	0.015	0.089	0.006	0.003	0.009
TCMT 21.51-MP	TCMT 110204-MP	1/4	3/32	0.016	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 21.52-MP	TCMT 110208-MP	1/4	3/32	0.031	0.110	0.026	0.017	0.098	0.007	0.004	0.010
TCMT 21.53-MP	TCMT 110212-MP	1/4	3/32	0.047	0.110	0.026	0.020	0.098	0.008	0.004	0.016
TCMT 221-MP	TCMT 110304-MP	1/4	1/8	0.016	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 222-MP	TCMT 110308-MP	1/4	1/8	0.031	0.110	0.026	0.017	0.098	0.008	0.004	0.016
TCMT 223-MP	TCMT 110312-MP	1/4	1/8	0.047	0.110	0.026	0.020	0.098	0.012	0.004	0.020
TCMT 32.51-MP	TCMT 16T304-MP	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.010
TCMT 32.52-MP	TCMT 16T308-MP	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.009	0.004	0.018
TCMT 32.53-MP	TCMT 16T312-MP	3/8	5/32	0.047	0.173	0.031	0.024	0.118	0.014	0.005	0.024
TCMT 432-MP	TCMT 220408-MP	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.010	0.005	0.018
TCMT 1.81.51-MM	TCMT 090204-MM	2/9	3/32	0.016	0.098	0.024	0.007	0.089	0.004	0.002	0.007
TCMT 1.81.52-MM	TCMT 090208-MM	2/9	3/32	0.031	0.098	0.024	0.015	0.089	0.006	0.003	0.009
TCMT 21.51-MM	TCMT 110204-MM	1/4	3/32	0.016	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 21.52-MM	TCMT 110208-MM	1/4	3/32	0.031	0.110	0.026	0.017	0.098	0.007	0.004	0.010
TCMT 221-MM	TCMT 110304-MM	1/4	1/8	0.016	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 222-MM	TCMT 110308-MM	1/4	1/8	0.031	0.110	0.026	0.017	0.098	0.008	0.004	0.016
TCMT 32.51-MM	TCMT 16T304-MM	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.009
TCMT 32.52-MM	TCMT 16T308-MM	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.009	0.004	0.018
TCMT 32.53-MM	TCMT 16T312-MM	3/8	5/32	0.047	0.173	0.031	0.024	0.118	0.014	0.005	0.024
TCMT 432-MM	TCMT 220408-MM	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.010	0.005	0.018
TCMT 1.81.51-MK	TCMT 090204-MK	2/9	3/32	0.016	0.098	0.024	0.007	0.089	0.004	0.002	0.007
TCMT 1.81.52-MK	TCMT 090208-MK	2/9	3/32	0.031	0.098	0.024	0.015	0.089	0.006	0.003	0.009
TCMT 21.51-MK	TCMT 110204-MK	1/4	3/32	0.016	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 21.52-MK	TCMT 110208-MK	1/4	3/32	0.031	0.110	0.026	0.017	0.098	0.007	0.004	0.010
TCMT 221-MK	TCMT 110304-MK	1/4	1/8	0.016	0.110	0.026	0.008	0.098	0.005	0.002	0.007
TCMT 222-MK	TCMT 110308-MK	1/4	1/8	0.031	0.110	0.026	0.017	0.098	0.008	0.004	0.016
TCMT 32.51-MK	TCMT 16T304-MK	3/8	5/32	0.016	0.173	0.031	0.010	0.118	0.006	0.003	0.009
TCMT 32.52-MK	TCMT 16T308-MK	3/8	5/32	0.031	0.173	0.031	0.020	0.118	0.009	0.004	0.018
TCMT 32.53-MK	TCMT 16T312-MK	3/8	5/32	0.047	0.173	0.031	0.024	0.118	0.014	0.005	0.024
TCMT 432-MK	TCMT 220408-MK	1/2	3/16	0.031	0.217	0.038	0.024	0.142	0.010	0.005	0.018

TC - TRIANGULAR 60° POSITIVE

TRIANGULAR 60° POSITIVA | TRIANGULAR 60° POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
TCGT-FS  Finishing to Fine Finishing	1123865	TCGT 1.81.50.5-FS														◬	●		●						◬	●		●
	1123866	TCGT 1.81.51-FS														◬	●		●						◬	●		●
	1123867	TCGT 21.50.2-FS														◬	●	◬	●						◬	●	◬	●
	1123868	TCGT 21.50.5-FS														◬	●	◬	●						◬	●	◬	●
	1123869	TCGT 21.51-FS															●	◬	●							●	◬	●
	1123870	TCGT 220.2-FS															●		●							●		●
	1123871	TCGT 220.5-FS															●		●							●		●
	1123872	TCGT 221-FS														◬	●	◬	●						◬	●	◬	●
TCGT-LN  Medium to 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																						●				

● First choice | 1ª Escolha | 1ª Opción

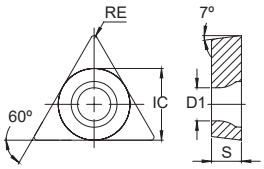
● Stock Itens | Itens de stock

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

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

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

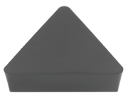
RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
TCGT 1.81.50.5-FS	TCGT 090202-FS	2/9	3/32	0,008	0,098	0,020	0,004	0,059	0,003	0,001	0,005
TCGT 1.81.51-FS	TCGT 090204-FS	2/9	3/32	0,016	0,098	0,039	0,020	0,079	0,006	0,003	0,010
TCGT 21.50.2-FS	TCGT 110201-FS	1/4	3/32	0,004	0,110	0,012	0,004	0,039	0,001	0,000	0,003
TCGT 21.50.5-FS	TCGT 110202-FS	1/4	3/32	0,008	0,110	0,020	0,004	0,059	0,003	0,001	0,005
TCGT 21.51-FS	TCGT 110204-FS	1/4	3/32	0,016	0,110	0,051	0,012	0,098	0,006	0,003	0,010
TCGT 220.2-FS	TCGT 110301-FS	3/8	1/8	0,004	0,110	0,012	0,004	0,039	0,001	0,000	0,003
TCGT 220.5-FS	TCGT 110302-FS	3/8	1/8	0,008	0,110	0,020	0,004	0,059	0,003	0,001	0,005
TCGT 221-FS	TCGT 110304-FS	3/8	1/8	0,016	0,110	0,051	0,020	0,098	0,006	0,003	0,010
TCGT 1.81.50.5-LN	TCGT 090202-LN	2/9	3/32	0,008	0,098	0,039	0,002	0,098	0,004	0,003	0,006
TCGT 1.81.51-LN	TCGT 090204-LN	2/9	3/32	0,016	0,098	0,039	0,002	0,098	0,006	0,004	0,008
TCGT 21.50.5-LN	TCGT 110202-LN	1/4	3/32	0,008	0,110	0,080	0,002	0,157	0,005	0,003	0,006
TCGT 21.51-LN	TCGT 110204-LN	1/4	3/32	0,016	0,110	0,081	0,004	0,157	0,006	0,004	0,008
TCGT 21.52-LN	TCGT 110208-LN	1/4	3/32	0,031	0,110	0,081	0,004	0,157	0,010	0,006	0,020
TCGT 32.50.5-LN	TCGT 16T302-LN	3/8	5/32	0,008	0,173	0,100	0,002	0,197	0,004	0,003	0,006
TCGT 32.51-LN	TCGT 16T304-LN	3/8	5/32	0,016	0,173	0,110	0,004	0,217	0,006	0,004	0,008
TCGT 32.52-LN	TCGT 16T308-LN	3/8	5/32	0,031	0,173	0,110	0,004	0,217	0,010	0,006	0,020
TCGT 32.53-LN	TCGT 16T312-LN	3/8	5/32	0,047	0,173	0,118	0,006	0,217	0,018	0,006	0,028
TCGT 32.54-LN	TCGT 16T316-LN	3/8	5/32	0,063	0,173	0,118	0,006	0,217	0,026	0,008	0,035

TP - TRIANGULAR 60° POSITIVE

TRIANGULAR 60° POSITIVA | TRIANGULAR 60° POSITIVA

			P									M					K				N	S			
			CVD					PVD				CVD		PVD				UNC	CVD				UNC	PVD			
		(2) Grade code	L7	R2	L8	R3	L9	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PH5115	PHG115	PH5125	PHG125	PH5740	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
TPUN  Medium to Finishing	1120765	TPUN 321			●		●			●																
	1120766	TPUN 322			●		●			●																
	1120770	TPUN 323			●		●																			
	1120777	TPUN 431			●		●																			
	1120779	TPUN 432			●		●																			
	1120783	TPUN 433			●		●			●																
TPMR-12  Finishing to Fine Finishing	1120740	TPMR 221-12	●		●																					
	1120743	TPMR 222-12	●		●																					
	1120745	TPMR 321-12	●		●	●																				
	1120748	TPMR 322-12	●		●	○																				
TPMR-13  Medium	1120734	TPMR 1.81.51-13	●		●																					
	1120741	TPMR 221-13	●		●																					
	1120744	TPMR 222-13	●		●																					
	1120746	TPMR 321-13	●		●																					
	1120749	TPMR 322-13	●		●																○					
	1120752	TPMR 323-13	◇		◇																					
	1120753	TPMR 432-13	●		●																○					

● First choice | 1ª Escolha | 1ª Opción

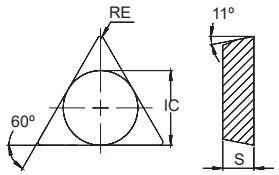
● Stock Itens | Itens de stock

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

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

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

RELIEF ANGLE 11°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
TPUN 321	TPUN 160304	3/8	1/8	0.016	-	0.138	0.039	0.197	0.006	0.004	0.012
TPUN 322	TPUN 160308	3/8	1/8	0.031	-	0.138	0.039	0.197	0.012	0.006	0.016
TPUN 323	TPUN 160312	3/8	1/8	0.047	-	0.138	0.059	0.197	0.014	0.008	0.020
TPUN 431	TPUN 220404	1/2	3/16	0.016	-	0.177	0.059	0.276	0.006	0.004	0.012
TPUN 432	TPUN 220408	1/2	3/16	0.031	-	0.177	0.059	0.276	0.012	0.006	0.016
TPUN 433	TPUN 220412	1/2	3/16	0.047	-	0.177	0.059	0.276	0.014	0.008	0.020
TPMR 221-12	TPMR 110304-12	1/4	1/8	0.016	-	0.035	0.012	0.059	0.004	0.002	0.008
TPMR 222-12	TPMR 110308-12	1/4	1/8	0.031	-	0.035	0.012	0.059	0.008	0.002	0.014
TPMR 321-12	TPMR 160304-12	3/8	1/8	0.016	-	0.051	0.020	0.079	0.005	0.003	0.008
TPMR 322-12	TPMR 160308-12	3/8	1/8	0.031	-	0.059	0.020	0.118	0.009	0.003	0.014
TPMR 1.81.51-13	TPMR 090204-13	2/9	3/32	0.016	-	0.039	0.008	0.059	0.004	0.003	0.008
TPMR 221-13	TPMR 110304-13	1/4	1/8	0.016	-	0.079	0.039	0.118	0.005	0.004	0.008
TPMR 222-13	TPMR 110308-13	1/4	1/8	0.031	-	0.079	0.039	0.118	0.010	0.005	0.016
TPMR 321-13	TPMR 160304-13	3/8	1/8	0.016	-	0.118	0.039	0.197	0.006	0.004	0.008
TPMR 322-13	TPMR 160308-13	3/8	1/8	0.031	-	0.118	0.039	0.197	0.012	0.005	0.016
TPMR 323-13	TPMR 160312-13	3/8	1/8	0.047	-	0.118	0.039	0.197	0.016	0.006	0.022
TPMR 432-13	TPMR 220408-13	1/2	3/16	0.031	-	0.197	0.059	0.276	0.012	0.006	0.016

VB - RHOMBIC 35° POSITIVE

RÔMBICA 35° POSITIVA | RÓMBICA 35° POSITIVA

			P											M						K			N	S				
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
VBMW Finishing	1120804	VBMW 331																			●							
	1120805	VBMW 332																			●							
NEW VBMT-FF Fine Finishing	1124852	VBMT 330.5-FF																										
	1124672	VBMT 331-FF															◉		◉							◉		◉
	1124853	VBMT 332-FF																										
VBMT-FP 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 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 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 Medium	1121868	VBMT 331-MP		◉	◉	◉	●			◉		◉																
	1121791	VBMT 332-MP		◉	◉	◉	●			◉		◉																
	1121796	VBMT 333-MP		◉	◉	◉	●																					
VBMT-MM Medium	1121867	VBMT 331-MM												●				◉	◉							△	●		
	1121790	VBMT 332-MM												●				◉	◉							△	●		
	1121795	VBMT 333-MM												●				◉	◉								●		
VBMT-MK Medium	1121866	VBMT 331-MK																			◉	●						
	1121871	VBMT 332-MK																			◉	●						
	1121794	VBMT 333-MK																			◉	●						

● First choice | 1ª Escolha | 1ª Opción

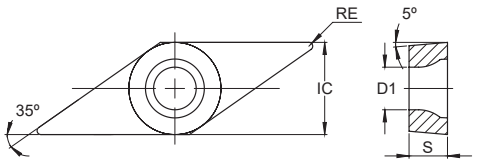
◉ Stock Itens | Itens de stock

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

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

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

RELIEF ANGLE 5°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
VBMW 331	VBMW 160404	3/8	3/16	0.016	0.173	0.091	0.002	0.185	0.008	0.004	0.010
VBMW 332	VBMW 160408	3/8	3/16	0.031	0.173	0.091	0.002	0.185	0.016	0.006	0.021
VBMT 330.5-FF	VBMT 160402-FF	3/8	3/16	0.008	0.173	0.039	0.003	0.071	0.004	0.002	0.006
VBMT 331-FF	VBMT 160404-FF	3/8	3/16	0.016	0.173	0.047	0.004	0.071	0.005	0.002	0.008
VBMT 332-FF	VBMT 160408 -FF	3/8	3/16	0.031	0.173	0.063	0.006	0.071	0.007	0.003	0.011
VBMT 220.5-FP	VBMT 110302-FP	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
VBMT 221-FP	VBMT 110304-FP	1/4	1/8	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
VBMT 222-FP	VBMT 110308-FP	1/4	1/8	0.031	0.110	0.012	0.005	0.067	0.005	0.003	0.010
VBMT 223-FP	VBMT 110312-FP	1/4	1/8	0.047	0.110	0.012	0.005	0.067	0.006	0.003	0.012
VBMT 330.5-FP	VBMT 160402-FP	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VBMT 331-FP	VBMT 160404-FP	3/8	3/16	0.016	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VBMT 332-FP	VBMT 160408-FP	3/8	3/16	0.031	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VBMT 333-FP	VBMT 160412-FP	3/8	3/16	0.047	0.173	0.013	0.006	0.071	0.006	0.004	0.013
VBMT 220.5-FM	VBMT 110302-FM	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
VBMT 221-FM	VBMT 110304-FM	1/4	1/8	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
VBMT 222-FM	VBMT 110308-FM	1/4	1/8	0.031	0.110	0.012	0.005	0.067	0.005	0.003	0.010
VBMT 330.5-FM	VBMT 160402-FM	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VBMT 331-FM	VBMT 160404-FM	3/8	3/16	0.016	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VBMT 332-FM	VBMT 160408-FM	3/8	3/16	0.031	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VBMT 333-FM	VBMT 160412-FM	3/8	3/16	0.047	0.173	0.013	0.006	0.071	0.006	0.004	0.013
VBMT 220.5-FK	VBMT 110302-FK	1/4	1/8	0.008	0.110	0.012	0.002	0.067	0.002	0.001	0.005
VBMT 221-FK	VBMT 110304-FK	1/4	1/8	0.016	0.110	0.012	0.004	0.067	0.004	0.002	0.007
VBMT 222-FK	VBMT 110308-FK	1/4	1/8	0.031	0.110	0.012	0.005	0.067	0.005	0.003	0.010
VBMT 330.5-FK	VBMT 160402-FK	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VBMT 331-FK	VBMT 160404-FK	3/8	3/16	0.016	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VBMT 332-FK	VBMT 160408-FK	3/8	3/16	0.031	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VBMT 331-MP	VBMT 160404-MP	3/8	3/16	0.016	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VBMT 332-MP	VBMT 160408-MP	3/8	3/16	0.031	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VBMT 333-MP	VBMT 160412-MP	3/8	3/16	0.047	0.173	0.028	0.021	0.106	0.009	0.004	0.013
VBMT 331-MM	VBMT 160404-MM	3/8	3/16	0.016	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VBMT 332-MM	VBMT 160408-MM	3/8	3/16	0.031	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VBMT 333-MM	VBMT 160412-MM	3/8	3/16	0.047	0.173	0.028	0.021	0.106	0.009	0.004	0.013
VBMT 331-MK	VBMT 160404-MK	3/8	3/16	0.016	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VBMT 332-MK	VBMT 160408-MK	3/8	3/16	0.031	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VBMT 333-MK	VBMT 160412-MK	3/8	3/16	0.047	0.173	0.028	0.021	0.106	0.009	0.004	0.013

VC - RHOMBIC 35° POSITIVE

RÔMBICA 35° POSITIVA | RÓMBICA 35° POSITIVA

			P											M						K				N	S				
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
VCMW Finishing	1120816	VCMW 331																			●							
VCMT-FP 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 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 Finishing	1121777	VCMT 221-FK																			●							
	1121985	VCMT 330.5-FK																			●							
	1121986	VCMT 331-FK																			●							
	1121987	VCMT 332-FK																			●							
VCMT-MP Medium	1121754	VCMT 221-MP		◎	●		○																					
	1121752	VCMT 222-MP		◎	○	◎	●																					
	1121988	VCMT 331-MP		◇	◎	◎	●																					
	1121989	VCMT 332-MP		◎	◎	◎	●																					
	1121990	VCMT 333-MP			○		●																					
VCMT-MM Medium	1121780	VCMT 221-MM												●			◎	◎	◎							●	◎	◎
	1121751	VCMT 222-MM												●			◎	◎	◎							●	◎	◎
	1121991	VCMT 331-MM												●			◎	◎	◎							●	◎	◎
	1121992	VCMT 332-MM												●			◎	◎	◎							●	◎	◎
	1121993	VCMT 333-MM												●			◎	◎	◎							●	◎	◎
VCMT-MK Medium	1121753	VCMT 222-MK																			◎	●						
	1121994	VCMT 331-MK																			◎	●						
	1121995	VCMT 332-MK																			◎	●						
	1121996	VCMT 333-MK																			◎	●						

● First choice | 1ª Escolha | 1ª Opción

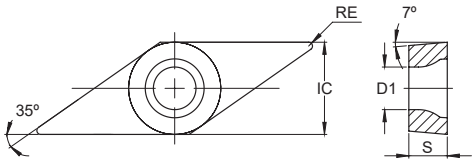
◎ Stock Itens | Itens de stock

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

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

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

RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
VCMW 331	VCMW 160404	3/8	3/16	0.016	0.173	0.091	0.002	0.185	0.008	0.003	0.010
VCMT 220.5-FP	VCMT 110302-FP	1/4	1/8	0.008	0.110	0.012	0.003	0.059	0.003	0.001	0.005
VCMT 221-FP	VCMT 110304-FP	1/4	1/8	0.016	0.110	0.012	0.004	0.059	0.004	0.002	0.008
VCMT 330.5-FP	VCMT 160402-FP	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VCMT 331-FP	VCMT 160404-FP	3/8	3/16	0.016	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VCMT 332-FP	VCMT 160408-FP	3/8	3/16	0.031	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VCMT 333-FP	VCMT 160412-FP	3/8	3/16	0.047	0.173	0.013	0.006	0.071	0.006	0.004	0.013
VCMT 220.5-FM	VCMT 110302-FM	1/4	1/8	0.008	0.110	0.012	0.003	0.059	0.003	0.001	0.005
VCMT 221-FM	VCMT 110304-FM	1/4	1/8	0.016	0.110	0.012	0.004	0.059	0.004	0.002	0.008
VCMT 330.5-FM	VCMT 160402-FM	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VCMT 331-FM	VCMT 160404-FM	3/8	3/16	0.016	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VCMT 332-FM	VCMT 160408-FM	3/8	3/16	0.031	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VCMT 333-FM	VCMT 160412-FM	3/8	3/16	0.047	0.173	0.013	0.006	0.071	0.006	0.004	0.013
VCMT 221-FK	VCMT 110304-FK	1/4	1/8	0.016	0.110	0.012	0.004	0.059	0.004	0.002	0.008
VCMT 330.5-FK	VCMT 160402-FK	3/8	3/16	0.008	0.173	0.013	0.003	0.071	0.003	0.002	0.006
VCMT 331-FK	VCMT 160404-FK	3/8	3/16	0.016	0.173	0.013	0.004	0.071	0.004	0.002	0.008
VCMT 332-FK	VCMT 160408-FK	3/8	3/16	0.031	0.173	0.013	0.006	0.071	0.006	0.003	0.011
VCMT 221-MP	VCMT 110304-MP	1/4	1/8	0.016	0.110	0.030	0.012	0.100	0.006	0.004	0.010
VCMT 222-MP	VCMT 110308-MP	1/4	1/8	0.031	0.110	0.030	0.024	0.100	0.008	0.005	0.013
VCMT 331-MP	VCMT 160404-MP	3/8	3/16	0.016	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VCMT 332-MP	VCMT 160408-MP	3/8	3/16	0.031	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VCMT 333-MP	VCMT 160412-MP	3/8	3/16	0.047	0.173	0.028	0.021	0.106	0.009	0.004	0.013
VCMT 221-MM	VCMT 110304-MM	1/4	1/8	0.016	0.110	0.030	0.012	0.100	0.006	0.004	0.010
VCMT 222-MM	VCMT 110308-MM	1/4	1/8	0.031	0.110	0.030	0.024	0.100	0.008	0.005	0.013
VCMT 331-MM	VCMT 160404-MM	3/8	3/16	0.016	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VCMT 332-MM	VCMT 160408-MM	3/8	3/16	0.031	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VCMT 333-MM	VCMT 160412-MM	3/8	3/16	0.047	0.173	0.028	0.021	0.106	0.009	0.004	0.013
VCMT 222-MK	VCMT 110308-MK	1/4	1/8	0.031	0.110	0.030	0.024	0.100	0.008	0.005	0.013
VCMT 331-MK	VCMT 160404-MK	3/8	3/16	0.016	0.173	0.028	0.009	0.106	0.006	0.003	0.008
VCMT 332-MK	VCMT 160408-MK	3/8	3/16	0.031	0.173	0.028	0.018	0.106	0.007	0.004	0.011
VCMT 333-MK	VCMT 160412-MK	3/8	3/16	0.047	0.173	0.028	0.021	0.106	0.009	0.004	0.013

VC - RHOMBIC 35° POSITIVE

RÔMBICA 35° POSITIVA | RÓMBICA 35° POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
VCGT-FS  Finishing to Fine Finishing	1123861	VCGT 220.2-FS								◇						◇	◈		◈						◇	◈		◈
	1123862	VCGT 220.5-FS															◈		◈							◈		◈
	1123863	VCGT 221-FS								◇						◇	◈		◈						◇	◈		◈
VCGT-LN  Medium to Finishing	1124779	VCGT 21.51-LN																						◈				
	1123689	VCGT 220.2-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																						◈				
	1124677	VCGT 2.522-LN																						◈				
	1111878	VCGT 330.5-LN																						◈		◈		
	1111533	VCGT 331-LN																						◈		◈		
	1121893	VCGT 332-LN																						◈	◇	◈		
	1121894	VCGT 333-LN																						◈		○		
	1121929	VCGT 43.57.5-LN																						◈				

◈ First choice | 1ª Escolha | 1ª Opción

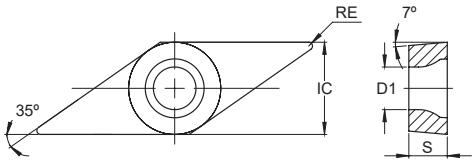
◈ Stock Itens | Itens de stock

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

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

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

RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
VCGT 220.2-FS	VCGT 110301-FS	1/4	1/8	0.004	0.110	0.012	0.004	0.039	0.001	0.000	0.003
VCGT 220.5-FS	VCGT 110302-FS	1/4	1/8	0.008	0.110	0.020	0.004	0.059	0.003	0.001	0.005
VCGT 221-FS	VCGT 110304-FS	1/4	1/8	0.016	0.110	0.039	0.012	0.098	0.006	0.003	0.010
VCGT 21.51-LN	VCGT 110204-LN	1/4	2/21	0.016	0.110	0.060	0.002	0.118	0.006	0.004	0.010
VCGT 220.2-LN	VCGT 110301-LN	1/4	1/8	0.004	0.110	0.060	0.002	0.118	0.002	0.001	0.002
VCGT 220.5-LN	VCGT 110302-LN	1/4	1/8	0.008	0.110	0.060	0.002	0.118	0.003	0.002	0.005
VCGT 221-LN	VCGT 110304-LN	1/4	1/8	0.016	0.110	0.060	0.002	0.118	0.006	0.004	0.010
VCGT 222-LN	VCGT 110308-LN	1/4	1/8	0.031	0.110	0.060	0.002	0.118	0.009	0.006	0.018
VCGT 2.520.5-LN	VCGT 130302-LN	1/3	1/8	0.008	0.134	0.079	0.004	0.157	0.003	0.002	0.005
VCGT 2.521-LN	VCGT 130304-LN	1/3	1/8	0.016	0.134	0.079	0.004	0.157	0.006	0.004	0.010
VCGT 2.522-LN	VCGT 130308-LN	1/3	1/8	0.031	0.134	0.098	0.006	0.177	0.007	0.004	0.012
VCGT 330.5-LN	VCGT 160402-LN	3/8	3/16	0.008	0.173	0.091	0.004	0.197	0.003	0.002	0.005
VCGT 331-LN	VCGT 160404-LN	3/8	3/16	0.016	0.173	0.100	0.004	0.197	0.006	0.004	0.010
VCGT 332-LN	VCGT 160408-LN	3/8	3/16	0.031	0.173	0.100	0.004	0.197	0.009	0.006	0.018
VCGT 333-LN	VCGT 160412-LN	3/8	3/16	0.047	0.173	0.100	0.004	0.197	0.016	0.006	0.024
VCGT 43.57.5-LN	VCGT 220530-LN	1/2	7/32	0.118	0.217	0.140	0.004	0.276	0.031	0.006	0.063

INSERTS

PCBN

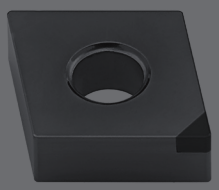


Polycrystalline Cubic Boron Nitride (PCBN) is extremely hard, surpassed only by diamond. However, unlike PCD, PCBN can safely be used for machining ferrous alloys. This material is unrivaled for finishing hardened steels and cast irons and can also be used for turning powder metal alloys and HRSA components.

O Nitreto de Boro Cúbico Policristalino (PCBN) é extremamente duro, apenas superado pelo diamante. No entanto, ao contrário do Diamante Policristalino (PCD), o PCBN pode ser usado com segurança para maquinar ligas ferrosas. Este material é incomparável para o acabamento de aços endurecidos e ferros fundidos, e também pode ser usado para torneamento de ligas de metal em pó e componentes de HRSA.

El Nitruro de Boro Cúbico Policristalino (PCBN) es extremadamente duro, solo superado por el diamante. Sin embargo, a diferencia del Diamante Policristalino (PCD), el PCBN se puede utilizar de manera segura para mecanizar aleaciones ferrosas. Este material es incomparable para el acabado de aceros endurecidos y hierros fundidos, y también se puede utilizar para el torneado de aleaciones de metal en polvo y componentes de HRSA.

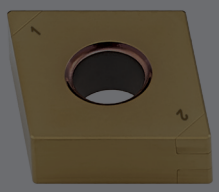
SINGLE TIP > page 550



> 1 cutting edge
1 aresta de corte | 1 arista de corte

> Available in negative and positive inserts
Disponível em pastilhas negativas e positivas | Disponible en plaquitas negativas y positivas

MULTIPLE TIPS > page 550 | 560



> 2, 3, 4 or 6 cutting edges
2, 3, 4 ou 6 arestas de corte | 2, 3, 4 o 6 aristas de corte

> Available in negative and positive inserts
Disponível em pastilhas negativas e positivas | Disponible en plaquitas negativas y positivas

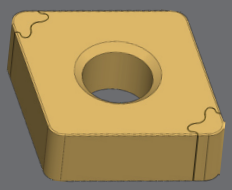
NEW INTEGRAL TIPS > under request



> 2, 3, 4 or 6 CBN tips without carbide base cutting edges
2, 3, 4 ou 6 arestas de corte em CBN sem base de metal duro | 2, 3, 4 o 6 aristas de corte en CBN sin base de metal duro

> Available in negative and positive inserts
Disponível em pastilhas negativas e positivas | Disponible en plaquitas negativas y positivas

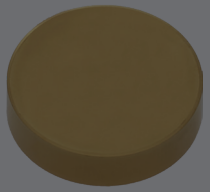
NEW SOLID TIPS > page 554



> 2, 3, 4 or 6 cutting edges
2, 3, 4 ou 6 arestas de corte | 2, 3, 4 o 6 aristas de corte

> Available in negative and positive inserts
Disponível apenas em pastilhas negativas | Disponible solo en plaquitas negativas

SOLID CBN > page 556



> Round inserts from size 06 to 12
Pastilhas redondas de tamanho 06 a 12 | Plaquitas redondas de talla 06 hasta 12

> Possibility of regrinding
Possibilidade de retificação | Posibilidad de rectificación

PCBN GRADES SELECTION

Selecção de graus | Selección de calidades

PCBN (Polycristaline-Cubic-Boron-Nitride) is not found in nature, it is a synthetic material which is the result of an high temperature and high pressure process (HTHP). When PCBN tips are brazed to a carbide insert a powerful cutting tool is born.

PCBN inserts excel in the finishing and semi-finishing process of hardened steels (45-68 HRc) as well as hard cast iron and heat-resistant super alloys (HRSA).

Grades description Descrição de graus | Descripción de calidades

Grade	Code	Characteristics	Application
PBY603	Y5	Low PCBN content grade with medium grain size and ceramic binder. Great wear and abrasion resistance.	· For continuously and lightly interrupted cutting of Hardened Steel (H01-H10); · Finishing abrasive high strength cast irons; · Can also be used to machine HRSA (S01-S10);
PBY620	Y4	Low PCBN content grade with medium grain size which provides enhanced crater and flank wear resistance with an excellent balance of toughness.	· For moderately to heavily interrupted turning of all hardened steels (H10-H20).
PBY625	4C	Low PCBN content grade with very fine grain size for improved toughness.	NEW · Heavily interrupted machining of hardened steels.
PBH920	S4	High PCBN content with excellent abrasion resistance.	· For machining all types of cast iron (K01-K30); · First choice for machining ferrous powder metals; · Can also be used to machine HRSA (S20-S30);
PBY930	W3	High abrasive wear resistance; High impact toughness;	· For Cast Iron with high Niquel and Chrome content (pumps and engine blocks).
PBY940	W4	High fracture toughness; High thermal conductivity;	· For Alloy steels with high content of Cr, grey cast irons and hardened steels with Ni.

PBY603 H01 - H10

PBY620 H01 - H20

NEW

PBY625 H01 - H20

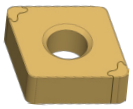
PBY930 K10-K30 H05-H15

PBY940 K10-K30 H10-H20

PBH920 K01-K30 H20-H40

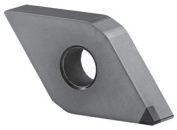


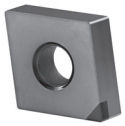












GEOMETRY SELECTION

Selecção da geometria | Selección de la geometria

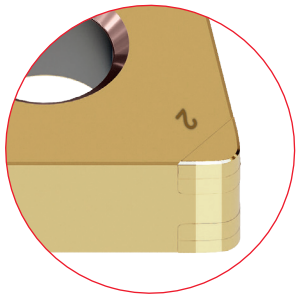
The insert geometry and edge preparation are extremely important in hard part turning since they have a significant influence on tool life and productivity. Palbit product range includes standard and wiper inserts. The standard nose radius generates the lowest cutting forces and has the lowest stability requirements while wiper gives an unbeatable combination of high productivity and excellent surface finish.

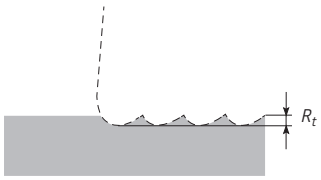
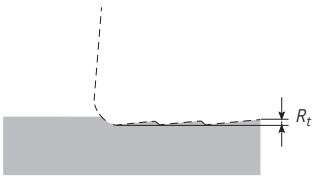
A large nose radius provides a greater edge strength and therefore extended tool life. For this reason, it is advised to use the largest allowed nose radius to each process requirements.

Wiper insert Pastilha wiper | Plaquita wiper

Wiper inserts provide two possibilities for process improvement:

- Improved surface finish with standard cutting data;
- Maintained surface finish at substantially higher feed rate;



	Standard (RE = 1/32 in)	**Wiper** (RE= 1/32 in)
Insert type		
Surface Roughness (R_a)	32 µin	16 µin

Note

This values were achieved with the next cutting conditions:
H Steel HRC60 | V_c = 426 in/min | f_n = 0.005 in/rev | a_p = 0.098 in | λ = 2,5 mm / ISO 4287

Formulas for surface roughness calculation

Fórmulas para calculo da rugosidade da superfície | Fórmulas para calcular la rugosidad de la superficie

$$R_a = 0.032 \times \frac{f_n^2}{r_\varepsilon} \times 1000 \text{ µin}$$

$$R_t = 3.91 \times R_a \text{ µin}$$

R_a	- Mean Surface Roughness	(µin)
R_t	- Roughness Total Height	(µin)
f_n	- Feed Rate	(in/rev)
r_ε	- Insert Radius	(in)

EDGE PREPARATION SELECTION

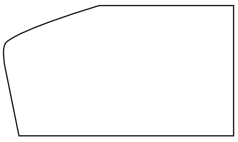
Selecção da preparação de aresta | Selección de la preparación del filo

The most important criteria for the stability and cutting edge tool-life is to define the correct cutting edge preparation. Its choice is mainly required in order to achieve the best economical result.

Edge preparation Preparação de aresta | Preparación del filo

Cutting forces
edge strength
+
-

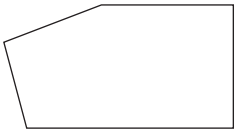
S - Land



S | Preparation with chamfer and honing - Standard

- First choice for hard part turning;
- Stronger edge than T - land, with more resistance to chipping and fracture, resulting in more predictable tool life;
- Generates consistent surface finish;
- Critical in interrupted cutting and when using large depth of cut;
- Feed rate must be greater than hone size;

T - Land



T | Preparation with chamfer

- T - land is a common edge preparation for PCBN;
- Preferred choice for cast iron;
- Good alternative to S - land in hard part turning when reduced cutting forces and tighter tolerances are required;

E - Land



E | Preparation with edge honing

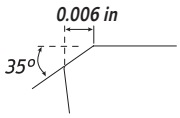
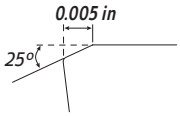
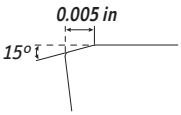
- Recommended for HRSA finishing operation;
- Honing helps strengthen the edge, giving resistance to chipping and fracturing;
- Feed rates must be greater than the hone size to allow actual cutting action to take place and prevent rubbing;

F - Land



F | Preparation without honing

- Sharp cutting edge;
- F - Standard is a common edge preparation for PCD;
- Recommended for aluminium or other non-ferrous materials;

Honing Types	Specifications	
S3515 For interrupted machining		Difficult Conditions
S2513 For general purpose machining		Average Conditions
S1513 For stable continuous machining		Good Conditions

Note

Based on our experience sometimes it is necessary to define edge preparation during several tests to provide the best possible solution for each application.

CHIP BREAKER TAILOR-MADE

Quebra-aparas personalizados | Rompevirutas personalizados

Our laser machining and grinding machining technology can reach a wide range of tailor-made solutions. The chip breakers can be customized according to our customer's needs and still remain with a high cutting edge quality.

PCBN recommended cutting data

Condições de corte recomendadas para PCBN | Datos de corte recomiendadas para PCBN

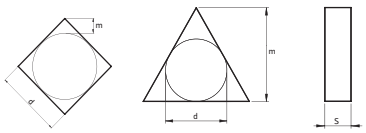
Workpiece material	Recommend grade for PCBN				Vc (SFM)	
	PBH920	PBY603	PBY620	PBY625		
Hardened Steel (HRC 45-68) Tool-Steel, Case Hardened Steel, Continuous Cut (recommended without Coolants)		◉			Semi-finish Finish	263 - 656 263 - 591
Hardened Steel (HRC 45-68) Tool-Steel, Case Hardened Steel, Interrupted Cut (recommended without Coolants)	○		◉	NEW ◉	Semi-finish Finish	230 - 591 230 - 525
Grey Cast Iron	◉				Semi-finish Finish	1640 - 3280 1968 - 6560
High Temperature Alloys (Inconel, Waspoloy, Hasteloy) Exotic and High Nickel + Cobalt basis	◉	◉			Finish	164 - 984

◉ Recommended ○ Second choice

TURNING PCBN INSERTS ISO IDENTIFICATION SYSTEM

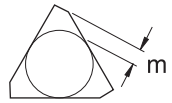
H	120°	M	86°
O	135°	V	35°
P	108°	W	80°
S	90°	L	90°
T	60°	A	85°
C	80°	B	82°
D	55°	K	55°
E	75°	R	
F	50°	X	Special

1- Insert shape symbol



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

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



Triangular inserts with a facet (secondary cutting edge)

Detailed dimension of M class insert
Insert height Tolerances (mm)

Inscribed circle	T	S	C	D	V
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.11	±0.10	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed circle Tolerances (mm)

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

3 - Tolerances symbol

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

2 - Normal clearance symbol

ISO	C	N	G	A
ANSI	C	N	G	A

4 - Insert symbol

symbol	Type	Hole type	Chip breaker	Shape
W	with hole	Round hole one countersink (40°~60°)	Without chip breaker	
T			Chip breaker on one side	
A	with hole	Round hole	Without chip breaker	
M			Chip breaker on one side	

symbol	Type	Hole type	Chip breaker	Shape
G	with hole	Round hole	Chip breaker on both sides	
N	without hole	-	Without chip breaker	
R		-	Chip breaker on one side	
X	-	-	-	On request

TURNING PCBN INSERTS ISO IDENTIFICATION SYSTEM

Sistema de identificação ISO para pastilhas de PCBN | Codificación ISO para plaquitas de PCBN

R's	V's (35°)	D's (55°)	C's (80°)	S's (90°)	T's (60°)	W's (80°)	IC mm	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	

5 - Insert size symbol

* 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

6 - Insert thickness symbol

12	04	08	-	S	25	13		WG		Z4
4	3	2	-	S	25	13		WG		Z4

12 - Tip type	
Z1 (1 tip)	Z4S (2 solid tips)
Z2 (2 tips)	Z6S (3 solid tips)
Z3 (3 tips)	S - Solid CBN
Z4 (4 tips)	Z2I (2 integral tips)
Z5 (5 tips)	Z3I (3 integral tips)
Z6 (6 tips)	Z4I (4 integral tips)
Z8 (8 tips)	Z6I (6 integral tips)

*11 - Wiper	
WG	General Wiper
*Used only when required	

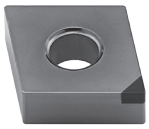
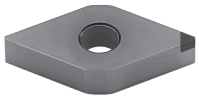
7 - Insert corner symbol			
ISO	mm	inch	ANSI
00	Sharp nose		0
01	0.10	.004	0.2
02	0.20	.008	0.5
04	0.40	.015	1
08	0.80	.032	2
12	1.2	.047	3
16	1.6	.062	4
20	2.0	.078	5
24	2.4	.094	6
28	2.8	.109	7
32	3.2	.125	8
00 (inch or M0/ metric)	Round insert		0

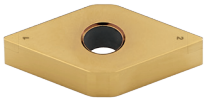
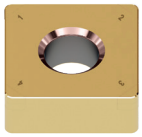
8 - Cutting edge information		
Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfered with honing	S

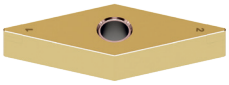
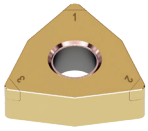
9 - Angle of Chamfer (α)	
05	05°
10	10°
15	15°
20	20°
25	25°
30	30°
35	35°

10 - Width of Chamfer	
05	0,05 mm
10	0,10 mm
13	0,13 mm
15	0,15 mm
20	0,20 mm
25	0,25 mm
30	0,30 mm
35	0,35 mm
40	0,40 mm

NEGATIVE PCBN INSERTS OVERVIEW

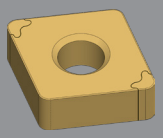
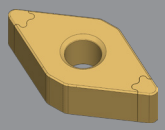
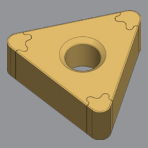
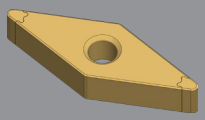
CNGA Z1 Single Tip	DNGA Z1 Single Tip
	
Size 12	Size 15
Page C - 550	Page C - 550

CNGA Z2 | Z4 Multiple Tips	DNGA Z2 | Z4 Multiple Tips	SNGA Z4 Multiple Tips
		
Size 12	Size 11 | 15	Size 12
Page C - 550	Page C - 550	Page C - 552

TNGA Z3 | Z6 Multiple Tips	VNGA Z2 Multiple Tips	WNGA Z3 | Z6 Multiple Tips
		
Size 16	Size 16	Size 08
Page C - 552	Page C - 522	Page C - 522

NEGATIVE PCBN INSERTS OVERVIEW

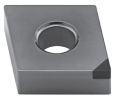
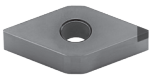
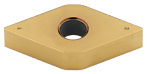
Vista genérica de pastilhas negativas PCBN | Visión general de plaquitas negativas de PCBN

CNGA Z4S Solid Tips	DNGA Z4S Solid Tips	TNGA Z6S Solid Tips	VNGA Z4S Solid Tips
NEW	NEW	NEW	NEW
			
Size 12	Size 11 | 15	Size 16	Size 16
Page C - 554	Page C - 554	Page C - 554	Page C - 554

RNGN S Solid CBN

Size 06 | 09 | 12
Page C - 556

PCBN NEGATIVE INSERTS

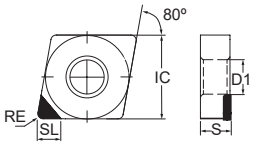
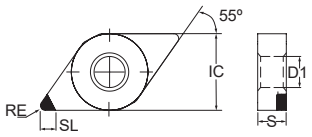
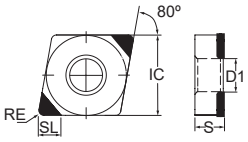
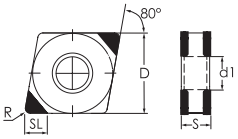
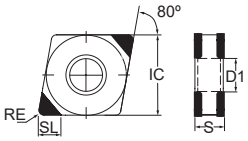
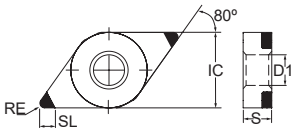
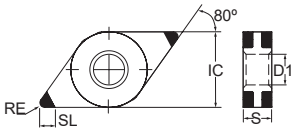
				K	H	
		(2) Grade code		S4	Y5	Y4
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PBH920	PBY603	PBY620
			SINGLE TIP			
CNGA Z1 	1124300	CNGA 431-S2513 Z1	CNGA 120404-S2513 Z1	○		
	1124111	CNGA 432-S2513 Z1	CNGA 120408-S2513 Z1	◎		
	1124301	CNGA 433-S2513 Z1	CNGA 120412-S2513 Z1	○		
	1124302	CNGA 434-S2513 Z1	CNGA 120416-S2513 Z1	○		
DNGA Z1 	1124306	DNGA 431-S2513 Z1	DNGA 150404-S2513 Z1	○		○
	1124112	DNGA 432-S2513 Z1	DNGA 150408-S2513 Z1	◎		○
	1124536	DNGA 433-S2513 Z1	DNGA 150412-S2513 Z1	○		○
	1124307	DNGA 442-S2513 Z1	DNGA 150608-S2513 Z1	○		
	1124308	DNGA 443-S2513 Z1	DNGA 150612-S2513 Z1	○		
			MULTIPLE TIP			
CNGA Z2 	1124343	CNGA 431.5-S2513 Z2	CNGA 120402-S2513 Z2	○		
	1124344	CNGA 431-S2513 Z2	CNGA 120404-S2513 Z2	◎	◎	◎
	1124175	CNGA 432-S2513 Z2	CNGA 120408-S2513 Z2	◎	◎	◎
	1124568	CNGA 432-S3515 Z2	CNGA 120408-S3515 Z2			◎
	1124468	CNGA 433-S2513 Z2	CNGA 120412-S2513 Z2	◎	◎	◎
	1124569	CNGA 433-S3515 Z2	CNGA 120412-S3515 Z2			○
CNGA Z4 	1124474	CNGA 431-S2513 Z4	CNGA 120404-S2513 Z4		◎	○
	1124692	CNGA 432-S1513 Z4	CNGA 120408-S1513 Z4		○	
	1124134	CNGA 432-S2513 Z4	CNGA 120408-S2513 Z4	○	◎	○
	1124570	CNGA 432-S3515 Z4	CNGA 120408-S3515 Z4			○
	1124475	CNGA 433-S2513 Z4	CNGA 120412-S2513 Z4		◎	○
	1124571	CNGA 433-S3515 Z4	CNGA 120412-S3515 Z4			○
CNGA WG Z4  Wiper	1124534	CNGA 431-S1513 WG Z4	CNGA 120404-S1513 WG Z4		○	○
	1124535	CNGA 431-S2513 WG Z4	CNGA 120404-S2513 WG Z4		○	◎
	1124517	CNGA 432-S1513 WG Z4	CNGA 120408-S1513 WG Z4		◎	○
	1124518	CNGA 432-S2513 WG Z4	CNGA 120408-S2513 WG Z4		◎	◎
	1125024	CNGA 433-S1513 WG Z4	CNGA 120412-S1513 WG Z4		◎	
DNGA Z2 	1124616	DNGA 331-S2513 Z2	DNGA 110404-S2513 Z2		◎	◎
	1124615	DNGA 332-S2513 Z2	DNGA 110408-S2513 Z2		◎	◎
	1124617	DNGA 333-S2513 Z2	DNGA 110412-S2513 Z2		◎	◎
	1124482	DNGA 431-S2513 Z2	DNGA 150404-S2513 Z2		◎	◎
	1124483	DNGA 432-S2513 Z2	DNGA 150408-S2513 Z2		◎	◎
	1124537	DNGA 433-S2513 Z2	DNGA 150412-S2513 Z2		○	◎
	1124348	DNGA 441-S2513 Z2	DNGA 150604-S2513 Z2	◎	◎	◎
	1124177	DNGA 442-S2513 Z2	DNGA 150608-S2513 Z2	◎	◎	◎
	1124572	DNGA 442-S3515 Z2	DNGA 150608-S3515 Z2			○
	1124377	DNGA 443-S2513 Z2	DNGA 150612-S2513 Z2	◎	◎	◎
	1124573	DNGA 443-S3515 Z2	DNGA 150612-S3515 Z2			○
DNGA Z4 	1124479	DNGA 441-S2513 Z4	DNGA 150604-S2513 Z4		◎	○
	1124133	DNGA 442-S2513 Z4	DNGA 150608-S2513 Z4	○	◎	○
	1124575	DNGA 442-S3515 Z4	DNGA 150608-S3515 Z4			○
	1124480	DNGA 443-S2513 Z4	DNGA 150612-S2513 Z4		◎	○
	1124576	DNGA 443-S3515 Z4	DNGA 150612-S3515 Z4			○

◎ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

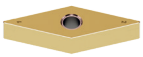
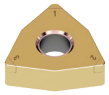
Insert Order Code: (1) Geometry code + (2) Grade code

PCBN NEGATIVE INSERTS

Single tip | Multiple tips

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
CDEC	IC	S	RE	D1	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
SINGLE TIP												
1	1/2	3/16	0.016	0.203	0.098	0.006	0.003	0.020	0.003	0.002	0.008	
1	1/2	3/16	0.031	0.203	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
1	1/2	3/16	0.047	0.203	0.091	0.010	0.003	0.020	0.005	0.003	0.012	
1	1/2	3/16	0.063	0.203	0.087	0.012	0.002	0.020	0.006	0.003	0.012	
1	1/2	3/16	0.016	0.203	0.098	0.006	0.003	0.020	0.003	0.002	0.008	
1	1/2	3/16	0.031	0.203	0.098	0.008	0.003	0.020	0.004	0.003	0.012	
1	1/2	3/16	0.047	0.203	0.087	0.010	0.003	0.020	0.005	0.003	0.012	
1	1/2	1/4	0.031	0.203	0.098	0.008	0.003	0.020	0.004	0.003	0.012	
1	1/2	1/4	0.047	0.203	0.087	0.010	0.003	0.020	0.005	0.003	0.012	
MULTIPLE TIP												
2	1/2	3/16	0.008	0.203	0.102	0.006	0.003	0.015	0.002	0.002	0.008	
2	1/2	3/16	0.016	0.203	0.098	0.006	0.003	0.016	0.003	0.002	0.008	
2	1/2	3/16	0.031	0.203	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
2	1/2	3/16	0.031	0.203	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
2	1/2	3/16	0.047	0.203	0.091	0.010	0.003	0.020	0.005	0.003	0.012	
2	1/2	3/16	0.047	0.203	0.091	0.010	0.003	0.020	0.005	0.003	0.012	
4	1/2	3/16	0.016	0.203	0.098	0.006	0.003	0.016	0.003	0.002	0.008	
4	1/2	3/16	0.031	0.203	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.031	0.203	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.031	0.203	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.047	0.203	0.091	0.010	0.003	0.020	0.005	0.003	0.012	
4	1/2	3/16	0.047	0.203	0.091	0.010	0.003	0.020	0.005	0.003	0.012	
4	1/2	3/16	0.016	0.203	0.094	0.006	0.003	0.020	0.003	0.002	0.008	
4	1/2	3/16	0.016	0.203	0.094	0.006	0.003	0.020	0.003	0.002	0.008	
4	1/2	3/16	0.031	0.203	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.031	0.203	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.031	0.203	0.094	0.010	0.003	0.020	0.005	0.003	0.012	
2	3/8	3/16	0.016	0.150	0.098	0.004	0.003	0.016	0.003	0.002	0.008	
2	3/8	3/16	0.031	0.150	0.079	0.006	0.003	0.016	0.004	0.003	0.012	
2	3/8	3/16	0.047	0.150	0.079	0.008	0.003	0.016	0.006	0.003	0.012	
2	1/2	3/16	0.016	0.203	0.098	0.006	0.003	0.020	0.003	0.002	0.008	
2	1/2	3/16	0.031	0.203	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
2	1/2	3/16	0.047	0.203	0.087	0.010	0.003	0.020	0.005	0.003	0.012	
2	1/2	1/4	0.016	0.203	0.098	0.006	0.003	0.020	0.003	0.002	0.008	
2	1/2	1/4	0.031	0.203	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
2	1/2	1/4	0.031	0.203	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
2	1/2	1/4	0.047	0.203	0.079	0.010	0.003	0.020	0.005	0.003	0.012	
2	1/2	1/4	0.047	0.203	0.079	0.010	0.003	0.020	0.005	0.003	0.012	
4	1/2	1/4	0.016	0.203	0.098	0.006	0.003	0.016	0.003	0.002	0.008	
4	1/2	1/4	0.031	0.203	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	1/4	0.031	0.203	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	1/4	0.047	0.203	0.067	0.010	0.003	0.020	0.005	0.003	0.012	
4	1/2	1/4	0.047	0.203	0.067	0.010	0.003	0.020	0.005	0.003	0.012	

PCBN NEGATIVE INSERTS

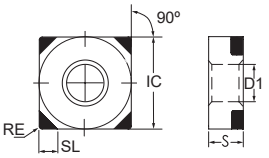
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Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PBH920	PBY603	PBY620
		MULTIPLE TIP				
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	1124538	SNGA 431-T2513 Z4	SNGA 120404-T2513 Z4	○		
	1124354	SNGA 432-S2513 Z4	SNGA 120408-S2513 Z4	○	○	◎
	1124577	SNGA 432-S3515 Z4	SNGA 120408-S3515 Z4			○
	1124433	SNGA 432-T2513 Z4	SNGA 120408-T2513 Z4	◎		
	1124539	SNGA 433-S2513 Z4	SNGA 120412-S2513 Z4		○	◎
	1124578	SNGA 433-S3515 Z4	SNGA 120412-S3515 Z4			○
	1124540	SNGA 433-T2513 Z4	SNGA 120412-T2513 Z4	○		
TNGA Z3 	1124357	TNGA 331-S2513 Z3	TNGA 160404-S2513 Z3	○	◎	◎
	1124179	TNGA 332-S2513 Z3	TNGA 160408-S2513 Z3	○	◎	◎
	1124579	TNGA 332-S3515 Z3	TNGA 160408-S3515 Z3			○
	1124469	TNGA 333-S2513 Z3	TNGA 160412-S2513 Z3	○	◎	◎
	1124746	TNGA 333-S3515 Z3	TNGA 160412-S3515 Z3			◎
	1124603	TNGA 334-S2513 Z3	TNGA 160416-S2513 Z3		◎	◎
	1124604	TNGA 335-S2513 Z3	TNGA 160420-S2513 Z3		◎	◎
TNGA Z6 	1124477	TNGA 331-S2513 Z6	TNGA 160404-S2513 Z6	◎	◎	○
	1124097	TNGA 332-S2513 Z6	TNGA 160408-S2513 Z6	◎	◎	○
	1124581	TNGA 332-S3515 Z6	TNGA 160408-S3515 Z6			○
	1125023	TNGA 333-S1513 Z6	TNGA 160412-S1513 Z6		◎	
	1124478	TNGA 333-S2513 Z6	TNGA 160412-S2513 Z6		◎	○
	1124582	TNGA 333-S3515 Z6	TNGA 160412-S3515 Z6			○
VNGA Z2 	1124361	VNGA 331.5-S2513 Z2	VNGA 160402-S2513 Z2	○		
	1124163	VNGA 331-S2513 Z2	VNGA 160404-S2513 Z2	○	◎	◎
	1124098	VNGA 332-S2513 Z2	VNGA 160408-S2513 Z2	○	◎	◎
	1124470	VNGA 333-S2513 Z2	VNGA 160412-S2513 Z2	○	◎	◎
WNGA Z3 	1124471	WNGA 431-S2513 Z3	WNGA 080404-S2513 Z3	○	◎	◎
	1124472	WNGA 432-S2513 Z3	WNGA 080408-S2513 Z3	○	◎	◎
	1124583	WNGA 432-S3515 Z3	WNGA 080408-S3515 Z3			○
	1124473	WNGA 433-S2513 Z3	WNGA 080412-S2513 Z3	○	◎	◎
	1124584	WNGA 433-S3515 Z3	WNGA 080412-S3515 Z3			○
WNGA Z6 	1124589	WNGA 431-S2513 Z6	WNGA 080404-S2513 Z6		○	○
	1124588	WNGA 432-S2513 Z6	WNGA 080408-S2513 Z6		○	○
	1124585	WNGA 432-S3515 Z6	WNGA 080408-S3515 Z6			○
	1124587	WNGA 433-S2513 Z6	WNGA 080412-S2513 Z6		○	○
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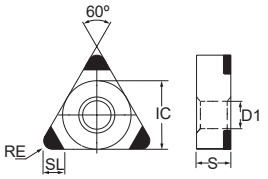
◎ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

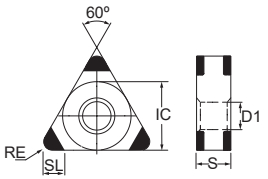
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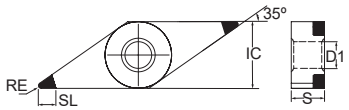
PCBN NEGATIVE INSERTS
Multiple tips

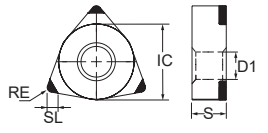
Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
CDEC	IC	S	RE	D1	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
MULTIPLE TIP												
4	1/2	3/16	0.016	0.203	0.094	0.006	0.003	0.016	0.003	0.002	0.008	
4	1/2	3/16	0.016	0.203	0.094	0.006	0.003	0.016	0.003	0.002	0.008	
4	1/2	3/16	0.031	0.203	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.031	0.203	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.031	0.203	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.047	0.203	0.091	0.010	0.003	0.020	0.005	0.003	0.012	
4	1/2	3/16	0.047	0.203	0.091	0.010	0.003	0.020	0.005	0.003	0.012	
4	1/2	3/16	0.047	0.203	0.091	0.010	0.003	0.020	0.005	0.003	0.012	
3	3/8	3/16	0.016	0.150	0.091	0.006	0.003	0.020	0.003	0.002	0.008	
3	3/8	3/16	0.031	0.150	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
3	3/8	3/16	0.031	0.150	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
3	3/8	3/16	0.047	0.150	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
3	3/8	3/16	0.047	0.150	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
3	3/8	3/16	0.063	0.150	0.118	0.012	0.003	0.028	0.006	0.004	0.014	
3	3/8	8/43	0.079	0.150	0.118	0.014	0.004	0.022	0.006	0.004	0.016	
6	3/8	3/16	0.016	0.150	0.091	0.006	0.003	0.020	0.003	0.002	0.008	
6	3/8	3/16	0.031	0.150	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
6	3/8	3/16	0.031	0.150	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
6	3/8	3/16	0.047	0.150	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
6	3/8	3/16	0.047	0.150	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
6	3/8	3/16	0.047	0.150	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
2	3/8	3/16	0.787	0.150	0.118	0.005	0.003	0.020	0.002	0.002	0.008	
2	3/8	3/16	0.016	0.150	0.110	0.006	0.003	0.020	0.003	0.002	0.008	
2	3/8	3/16	0.031	0.150	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	3/16	0.047	0.150	0.075	0.010	0.003	0.020	0.005	0.003	0.012	
3	1/2	3/16	0.016	0.203	0.091	0.006	0.003	0.016	0.003	0.002	0.008	
3	1/2	3/16	0.031	0.203	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
3	1/2	3/16	0.031	0.203	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
3	1/2	3/16	0.047	0.203	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
3	1/2	3/16	0.047	0.203	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
6	1/2	3/16	0.047	0.203	0.079	0.010	0.003	0.016	0.005	0.003	0.012	
6	1/2	3/16	0.031	0.203	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
6	1/2	3/16	0.031	0.203	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
6	1/2	3/16	0.016	0.203	0.091	0.006	0.003	0.024	0.003	0.002	0.008	
6	1/2	3/16	0.047	0.203	0.079	0.010	0.003	0.024	0.005	0.003	0.012	

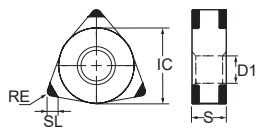






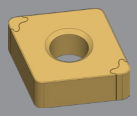
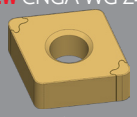
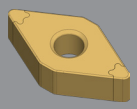
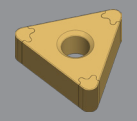
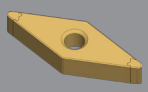






NEW PCBN NEGATIVE INSERTS

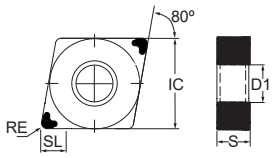
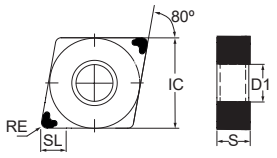
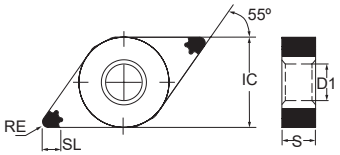
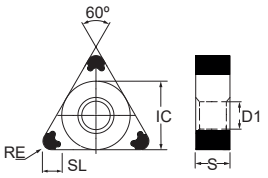
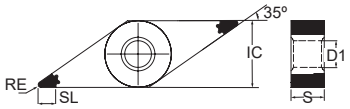
Solid tips

				H		
		(2) Grade code		Y5	Y4	4C
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PBY603	PBY620	PBY625
		SOLID TIPS				
NEW CNGA Z4S 	1124982	CNGA 431-S2515 Z4S	CNGA 120404-S2515 Z4S			○
	1124983	CNGA 432-S2515 Z4S	CNGA 120408-S2515 Z4S			◎
	1124804	CNGA 433-S2513 Z4S	CNGA 120412-S2513 Z4S			◎
NEW CNGA WG Z4S  Wiper	1125025	CNGA 433-S1513 WG Z4S	CNGA 120412-S1513 WG Z4S	○		
NEW DNGA Z4S 	1124992	DNGA 331-S2515 Z4S	DNGA 110404-S2515 Z4S			○
	1124993	DNGA 332-S2515 Z4S	DNGA 110408-S2515 Z4S			◎
	1124994	DNGA 333-S2515 Z4S	DNGA 110412-S2515 Z4S			◎
	1124986	DNGA 431-S2515 Z4S	DNGA 150404-S2515 Z4S			○
	1124987	DNGA 432-S2515 Z4S	DNGA 150408-S2515 Z4S			◎
	1124988	DNGA 433-S2515 Z4S	DNGA 150412-S2515 Z4S			◎
NEW TNGA Z6S 	1124984	TNGA 331-S2515 Z6S	TNGA 160404-S2515 Z6S			○
	1124985	TNGA 332-S2515 Z6S	TNGA 160408-S2515 Z6S			◎
	1124960	TNGA 333-S1513 Z6S	TNGA 160412-S1513 Z6S	◎		
	1124836	TNGA 333-S2513 Z6S	TNGA 160412-S2513 Z6S			◎
	1125026	TNGA 335-S2513 Z6S	TNGA 160420-S2513 Z6S	◎	◎	
NEW VNGA Z4S 	1124995	VNGA 331-S2515 Z4S	VNGA 160404-S2515 Z4S			○
	1124996	VNGA 332-S2515 Z4S	VNGA 160408-S2515 Z4S			◎
	1124997	VNGA 333-S2515 Z4S	VNGA 160412-S2515 Z4S			◎

◎ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

PCBN NEGATIVE INSERTS
Solid tips

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
CDEC	IC	S	RE	D1	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
SOLID TIPS												
4	1/2	3/16	0.016	0.203	0.087	0.006	0.003	0.020	0.003	0.002	0.008	
4	1/2	3/16	0.031	0.203	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.047	0.203	0.079	0.010	0.003	0.020	0.005	0.003	0.012	
4	1/2	3/16	0.047	0.203	0.083	0.010	0.003	0.020	0.005	0.003	0.012	
4	3/8	3/16	0.016	0.150	0.087	0.004	0.003	0.016	0.003	0.002	0.008	
4	3/8	3/16	0.031	0.150	0.083	0.006	0.003	0.016	0.004	0.003	0.012	
4	3/8	3/16	0.047	0.150	0.079	0.008	0.003	0.016	0.006	0.003	0.012	
4	1/2	3/16	0.016	0.203	0.087	0.006	0.003	0.020	0.003	0.002	0.008	
4	1/2	3/16	0.031	0.203	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
4	1/2	3/16	0.047	0.203	0.079	0.010	0.003	0.020	0.005	0.003	0.012	
6	3/8	3/16	0.016	0.150	0.087	0.006	0.003	0.020	0.003	0.002	0.008	
6	3/8	3/16	0.031	0.150	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
6	3/8	3/16	0.047	0.150	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
6	3/8	3/16	0.047	0.150	0.079	0.010	0.003	0.024	0.005	0.003	0.012	
6	3/8	3/16	0.079	0.150	0.098	0.014	0.004	0.028	0.006	0.004	0.016	
4	3/8	3/16	0.016	0.150	0.087	0.006	0.003	0.020	0.003	0.002	0.008	
4	3/8	3/16	0.031	0.150	0.083	0.008	0.003	0.020	0.004	0.003	0.012	
4	3/8	3/16	0.047	0.150	0.079	0.010	0.003	0.020	0.005	0.003	0.012	

CBN SOLID INSERTS

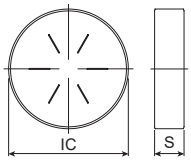
Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code ANSI Reference	(2) Grade code ISO Reference	H W3 PBY930	H W4 PBY940
SOLID INSERT					
RNGN S 	1124631	RNGN 220-S2020 S	RNGN 060300-S2020 S	○	◈
	1124630	RNGN 320-S2020 S	RNGN 090300-S2020 S	○	◈
	1124629	RNGN 420-S2020 S	RNGN 120300-S2020 S	○	◈
	1124699	RNGN 430-S2020 S	RNGN 120400-S2020 S	○	◈

◈ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta **Insert Order Code:** (1) Repair code + (2) Grade code

(1) Repair code	(2) Grade code Reference Referência Referencia	H W3 PBY930	H W4 PBY940
3120072	RNGN 06 (2.18) 00-S2020S (0603)	○	○
3120058	RNGN 060200-S2020 S (0903)	○	○
3120068	RNGN 060300-S2020 S (0903)	○	○
3120071	RNGN 060300-S2020 S (1203)	○	○
3120057	RNGN 090300-S2020 S (1203)	○	○
3120070	RNGN 090400-S2020 S (1204)	○	○
3120056	RNGN 120300-S2020 S (1204)	○	○

◈ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta **Insert Order Code:** (1) Repair code + (2) Grade code

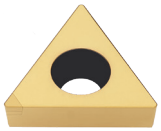
CBN SOLID INSERTS
Reground Inserts

Dimensions (in) Dimensões (in) Dimensiones (in)		Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
IC	S	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
SOLID INSERT								
1/4	1/8	0.006	0.003	0.016	0.003	0.002	0.008	
3/8	1/8	0.006	0.003	0.016	0.003	0.002	0.008	
1/2	1/8	0.008	0.003	0.020	0.004	0.003	0.012	
1/2	3/16	0.010	0.003	0.024	0.005	0.003	0.012	

Final Dimensions (in) Dimensões Finais (in) Dimensiones Finales (in)		Raw Material Matéria-prima Materia prima
IC	S	
1/4	3/35	RNGN 060300-S2020 S
1/4	3/32	RNGN 090300-S2020 S
1/4	1/8	RNGN 090300-S2020 S
1/4	1/8	RNGN 120300-S2020 S
3/8	1/8	RNGN 120300-S2020 S
3/8	3/16	RNGN 120400-S2020 S
1/2	1/8	RNGN 120400-S2020 S

POSITIVE PCBN INSERTS OVERVIEW

TPGW Z1
Single Tip



Size 11

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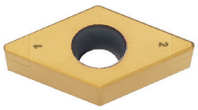
CCGW Z2
Multiple Tips



Size 06 | 09

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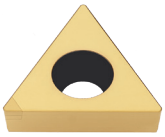
DCGW Z2
Multiple Tips



Size 07 | 11

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TCGW | TPGW Z3
Multiple Tips



Size 09 | 11

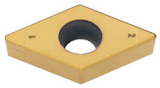
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POSITIVE PCBN INSERTS OVERVIEW

Vista genérica de pastilhas positivas PCBN | Visión general de plaquitas positivas de PCBN

VBGW Z2 Multiple Tips	VCGW Z2 Multiple Tips
	
Size 11 | 16	Size 16
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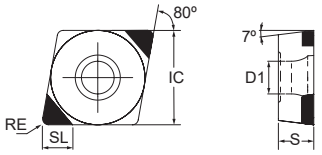
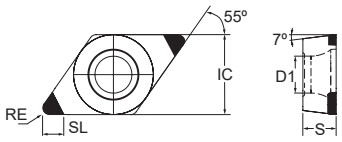
PCBN POSITIVE INSERTS

				H	
		(2) Grade code		Y5	Y4
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PBY603	PBY620
CCGW Z2 	1124605	CCGW 21.50.5-S1513 Z2	CCGW 060202-S1513 Z2	●	●
	1124635	CCGW 21.50.5-S2513 Z2	CCGW 060202-S2513 Z2	●	●
	1124606	CCGW 21.51-S1513 Z2	CCGW 060204-S1513 Z2	●	●
	1124555	CCGW 21.51-S2513 Z2	CCGW 060204-S2513 Z2	●	●
	1124607	CCGW 21.52-S1513 Z2	CCGW 060208-S1513 Z2	●	●
	1124636	CCGW 21.52-S2513 Z2	CCGW 060208-S2513 Z2	●	●
	1124638	CCGW 32.50.5-S2513 Z2	CCGW 09T302-S2513 Z2	●	●
	1124640	CCGW 32.51-S2513 Z2	CCGW 09T304-S2513 Z2	●	●
	1124632	CCGW 32.52-S2513 Z2	CCGW 09T308-S2513 Z2	●	●
	1124637	CCGW 32.50.5-S2513 WG Z2	CCGW 09T302-S2513 WG Z2	○	○
	1124639	CCGW 32.51-S2513 WG Z2	CCGW 09T304-S2513 WG Z2	●	●
	1124641	CCGW 32.52-S2513 WG Z2	CCGW 09T308-S2513 WG Z2	●	●
	1124608	CCGW 32.50.5-S1513 Z2	CCGW 09T302-S1513 Z2	●	●
	1124609	CCGW 32.51-S1513 Z2	CCGW 09T304-S1513 Z2	●	●
	1124610	CCGW 32.52-S1513 Z2	CCGW 09T308-S1513 Z2	●	●
DCGW Z2 	1124642	DCGW 21.50.5-S1513 Z2	DCGW 070202-S1513 Z2	●	○
	1124611	DCGW 21.50.5-S2513 Z2	DCGW 070202-S2513 Z2	●	●
	1124643	DCGW 21.51-S1513 Z2	DCGW 070204-S1513 Z2	●	○
	1124436	DCGW 21.51-S2513 Z2	DCGW 070204-S2513 Z2	●	●
	1124644	DCGW 21.52-S1513 Z2	DCGW 070208-S1513 Z2	○	○
	1124612	DCGW 21.52-S2513 Z2	DCGW 070208-S2513 Z2	●	●
	1124613	DCGW 32.50.5-S2513 Z2	DCGW 11T302-S2513 Z2	●	●
	1124554	DCGW 32.51-S2513 Z2	DCGW 11T304-S2513 Z2	●	●
	1124744	DCGW 32.51-S3515 Z2	DCGW 11T304-S3515 Z2		●
	1124614	DCGW 32.52-S2513 Z2	DCGW 11T308-S2513 Z2	●	●
	1124745	DCGW 32.52-S3515 Z2	DCGW 11T308-S3515 Z2		●
	1124645	DCGW 32.50.5-S1513 Z2	DCGW 11T302-S1513 Z2	●	○
	1124647	DCGW 32.51-S1513 Z2	DCGW 11T304-S1513 Z2	●	●
	1124649	DCGW 32.52-S1513 Z2	DCGW 11T308-S1513 Z2	●	○

● Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

PCBN POSITIVE INSERTS
Multiple tips

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
CDEC	IC	S	RE	D1	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
2	1/4	3/32	0.008	0.110	0.079	0.006	0.002	0.008	0.003	0.002	0.008	
2	1/4	3/32	0.008	0.110	0.094	0.006	0.002	0.008	0.003	0.002	0.008	
2	1/4	3/32	0.016	0.110	0.079	0.006	0.002	0.016	0.003	0.002	0.010	
2	1/4	3/32	0.016	0.110	0.079	0.006	0.002	0.016	0.003	0.002	0.010	
2	1/4	3/32	0.031	0.110	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
2	1/4	3/32	0.031	0.110	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	5/32	0.008	0.173	0.098	0.006	0.002	0.008	0.003	0.002	0.008	
2	3/8	5/32	0.016	0.173	0.098	0.008	0.003	0.016	0.004	0.002	0.010	
2	3/8	5/32	0.031	0.173	0.098	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	5/32	0.008	0.173	0.094	0.006	0.002	0.008	0.003	0.002	0.008	
2	3/8	5/32	0.016	0.173	0.094	0.008	0.003	0.016	0.004	0.002	0.010	
2	3/8	5/32	0.031	0.173	0.094	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	5/32	0.008	0.173	0.079	0.006	0.002	0.008	0.003	0.002	0.008	
2	3/8	5/32	0.016	0.173	0.079	0.008	0.003	0.016	0.004	0.002	0.010	
2	3/8	5/32	0.031	0.173	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
2	1/4	3/32	0.008	0.110	0.098	0.006	0.003	0.008	0.003	0.002	0.008	
2	1/4	3/32	0.008	0.110	0.079	0.006	0.003	0.008	0.003	0.002	0.008	
2	1/4	3/32	0.016	0.110	0.098	0.006	0.003	0.016	0.003	0.002	0.010	
2	1/4	3/32	0.016	0.110	0.094	0.006	0.003	0.016	0.003	0.002	0.010	
2	1/4	3/32	0.031	0.110	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
2	1/4	3/32	0.031	0.110	0.098	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	5/32	0.008	0.173	0.106	0.006	0.003	0.008	0.003	0.002	0.008	
2	3/8	5/32	0.016	0.173	0.098	0.008	0.003	0.016	0.004	0.002	0.010	
2	3/8	5/32	0.016	0.173	0.098	0.008	0.003	0.016	0.004	0.002	0.010	
2	3/8	5/32	0.031	0.173	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	5/32	0.031	0.173	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	5/32	0.008	0.173	0.106	0.006	0.003	0.008	0.003	0.002	0.008	
2	3/8	5/32	0.016	0.173	0.098	0.008	0.003	0.016	0.004	0.002	0.010	
2	3/8	5/32	0.031	0.173	0.079	0.008	0.003	0.020	0.004	0.003	0.012	

PCBN POSITIVE INSERTS

				H	
		(2) Grade code		Y5	Y4
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PBY603	PBY620
TCGW Z3 	1124715	TCGW 21.51-S2513 Z3	TCGW 110204-S2513 Z3	○	
	1124434	TCGW 32.51-S2513 Z3	TCGW 16T304-S2513 Z3	◈	◈
	1124651	TCGW 32.52-S2513 Z3	TCGW 16T308-S2513 Z3	◈	◈
TPGW Z1 	1124657	TPGW 220.5-S2513 Z1	TPGW 110302-S2513 Z1	○	○
	1124660	TPGW 221-S2513 Z1	TPGW 110304-S2513 Z1	◈	○
	1124598	TPGW 222-S2513 Z1	TPGW 110308-S2513 Z1	◈	◈
TPGW Z3 	1124653	TPGW 1.81.50.5-S2513 Z3	TPGW 090202-S2513 Z3	◈	○
	1124655	TPGW 1.81.51-S2513 Z3	TPGW 090204-S2513 Z3	◈	◈
	1124652	TPGW 1.81.50.5-S1513 Z3	TPGW 090202-S1513 Z3	◈	○
	1124654	TPGW 1.81.51-S1513 Z3	TPGW 090204-S1513 Z3	◈	○
	1124658	TPGW 220.5-S2513 Z3	TPGW 110302-S2513 Z3	◈	◈
	1124661	TPGW 221-S2513 Z3	TPGW 110304-S2513 Z3	◈	◈
	1124663	TPGW 222-S2513 Z3	TPGW 110308-S2513 Z3	○	◈
	1124656	TPGW 220.5-S1513 Z3	TPGW 110302-S1513 Z3	◈	○
	1124659	TPGW 221-S1513 Z3	TPGW 110304-S1513 Z3	◈	○
	1124662	TPGW 222-S1513 Z3	TPGW 110308-S1513 Z3	○	○
VBGW Z2 	1124664	VBGW 220.5-S2513 Z2	VBGW 110302-S2513 Z2	◈	◈
	1124665	VBGW 221-S2513 Z2	VBGW 110304-S2513 Z2	◈	◈
	1124666	VBGW 222-S2513 Z2	VBGW 110308-S2513 Z2	○	◈
	1124618	VBGW 330.5-S2513 Z2	VBGW 160402-S2513 Z2	◈	◈
	1124619	VBGW 331-S2513 Z2	VBGW 160404-S2513 Z2	◈	◈
	1124620	VBGW 332-S2513 Z2	VBGW 160408-S2513 Z2	◈	◈
	1124621	VBGW 330.5-S1513 Z2	VBGW 160402-S1513 Z2	◈	◈
	1124622	VBGW 331-S1513 Z2	VBGW 160404-S1513 Z2	◈	◈
	1124623	VBGW 332-S1513 Z2	VBGW 160408-S1513 Z2	◈	◈
VCGW Z2 	1124667	VCGW 331-S2513 Z2	VCGW 160404-S2513 Z2	◈	◈
	1124668	VCGW 332-S2513 Z2	VCGW 160408-S2513 Z2	◈	◈

◈ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

PCBN POSITIVE INSERTS
Multiple tips

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
CDEC	IC	S	RE	D1	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
3	1/4	3/32	0.008	0.173	0.098	0.006	0.003	0.016	0.003	0.002	0.008	
3	3/8	5/32	0.016	0.173	0.098	0.006	0.003	0.018	0.003	0.002	0.008	
3	3/8	5/32	0.031	0.173	0.079	0.008	0.003	0.018	0.004	0.003	0.012	
1	1/4	1/8	0.008	0.110	0.094	0.006	0.003	0.008	0.003	0.002	0.006	
1	1/4	1/8	0.016	0.110	0.091	0.006	0.003	0.016	0.003	0.002	0.008	
1	1/4	1/8	0.031	0.110	0.094	0.008	0.003	0.018	0.004	0.003	0.008	
3	7/32	3/32	0.008	0.098	0.098	0.004	0.002	0.008	0.003	0.002	0.006	
3	7/32	3/32	0.016	0.098	0.091	0.006	0.003	0.016	0.003	0.002	0.006	
3	7/32	3/32	0.008	0.098	0.098	0.004	0.003	0.008	0.003	0.002	0.006	
3	7/32	3/32	0.016	0.098	0.091	0.006	0.003	0.016	0.003	0.002	0.006	
3	1/4	1/8	0.008	0.110	0.094	0.006	0.003	0.008	0.003	0.002	0.006	
3	1/4	1/8	0.016	0.110	0.091	0.006	0.003	0.016	0.003	0.002	0.008	
3	1/4	1/8	0.031	0.110	0.079	0.008	0.003	0.020	0.004	0.003	0.008	
3	1/4	1/8	0.008	0.110	0.094	0.006	0.003	0.008	0.003	0.002	0.006	
3	1/4	1/8	0.016	0.110	0.091	0.006	0.003	0.016	0.003	0.002	0.008	
3	1/4	1/8	0.031	0.110	0.079	0.008	0.003	0.020	0.004	0.003	0.008	
2	1/4	1/8	0.008	0.110	0.126	0.004	0.003	0.008	0.002	0.002	0.006	
2	1/4	1/8	0.016	0.110	0.110	0.006	0.003	0.016	0.003	0.002	0.008	
2	1/4	1/8	0.031	0.110	0.079	0.006	0.003	0.020	0.004	0.003	0.010	
2	3/8	3/16	0.008	0.173	0.079	0.004	0.003	0.008	0.003	0.002	0.006	
2	3/8	3/16	0.016	0.173	0.079	0.006	0.003	0.016	0.003	0.002	0.008	
2	3/8	3/16	0.031	0.173	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	3/16	0.008	0.173	0.079	0.004	0.003	0.008	0.003	0.002	0.006	
2	3/8	3/16	0.016	0.173	0.079	0.006	0.003	0.016	0.003	0.002	0.008	
2	3/8	3/16	0.031	0.173	0.079	0.008	0.003	0.020	0.004	0.003	0.012	
2	3/8	3/16	0.016	0.173	0.110	0.006	0.003	0.016	0.003	0.002	0.008	
2	3/8	3/16	0.031	0.173	0.079	0.008	0.003	0.020	0.004	0.003	0.012	

INSERTS

PCD

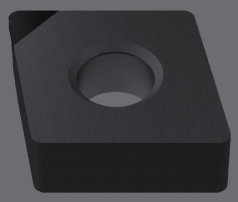


Polycrystalline Diamond is exceptionally hard and resistant to abrasion. It is most effective for machining non-ferrous materials, particularly aluminum and copper alloys, achieving unparalleled productivity and tool longevity. However, it is also the preferred option for machining composites and ceramics.

Polycrystalline Diamond é excepcionalmente duro e resistente à abrasão. É mais eficaz para a maquinação de materiais não ferrosos, especialmente ligas de alumínio e cobre, alcançando uma produtividade e longevidade da ferramenta incomparáveis. No entanto, também é a opção preferida para a maquinação de compósitos e cerâmicas.

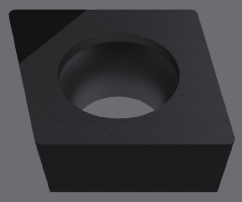
Polycrystalline Diamond es excepcionalmente duro y resistente a la abrasión. Es más efectivo para mecanizar materiales no ferrosos, especialmente aleaciones de aluminio y cobre, logrando una productividad y longevidad de herramienta incomparables. Sin embargo, también es la opción preferida para mecanizar compuestos y cerámicas.

NEGATIVE INSERTS > page 572



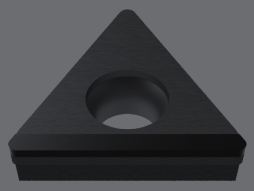
- 1 cutting edge
  1 aresta de corte | 1 arista de corte
- Neutral rake angle
  Ângulo de ataque neutro | Ángulo de ataque neutro

POSITIVE INSERTS > page 576



- 1 cutting edge
  1 aresta de corte | 1 arista de corte
- Neutral or high positive rake angle
  Ângulo de ataque neutro ou altamente positivo | Ángulo de ataque neutro o altamente positivo

FULL EDGE TIPS > page 584



- 1 cutting edge
  1 aresta de corte | 1 arista de corte
- Neutral or high positive rake angle
  Ângulo de ataque neutro ou altamente positivo | Ángulo de ataque neutro o altamente positivo
- For higher depth of cut
  Para uma maior profundidade de corte | Para mayor profundidad de corte

PCD GRADES SELECTION

Selecção de graus | Selección de calidades

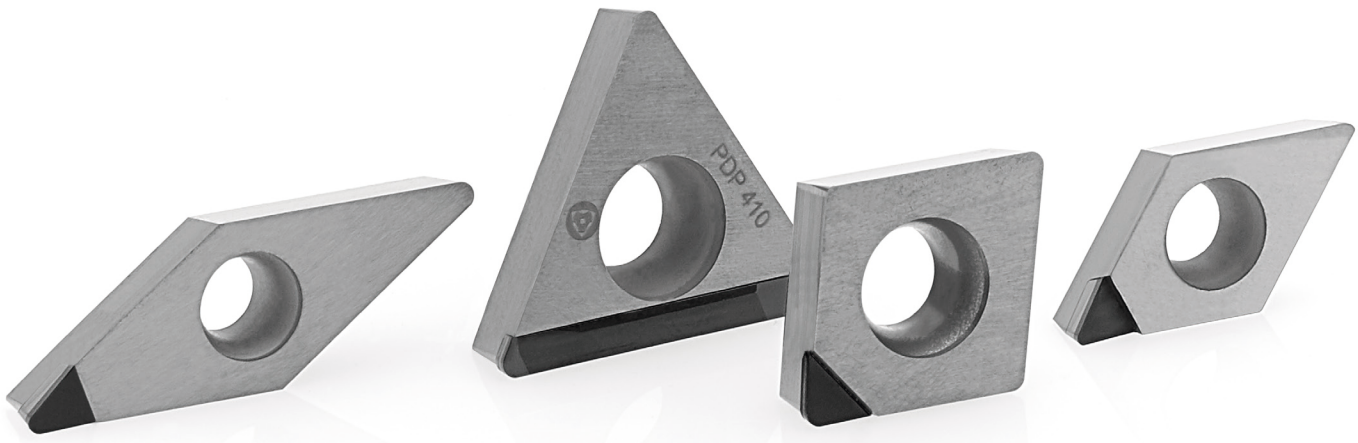
PCD (Polycristalline Diamond) is a composite of diamond particles that are sintered with a metallic binder creating the hardest and one of the most abrasion resistant materials used in cutting tools.
Its development achieved an extremely significance for the machining of Non-Ferrous Materials, such as high-silicon aluminium, metal matrix composites (MMC) and carbon fibre reinforced plastics (CFRP).

Grades description Descrição de graus | Descripción de calidades

Grade	Code	Characteristics	Application
PDP410	D6	General purpose Fine surface finishing	· <14% silicon aluminium alloy - automotive industry · Graphite and graphite composites · Wood composites · Copper alloy
PDP403	I3	Highest abrasion resistance Bimodal grain structure for increased diamond percentage content	· >14% silicon aluminium alloy · Fiber glass, fiberboard · Wood laminates · Metal matrix composites · Stone sawing · Ceramics · Sintered tungsten carbide (10-16% Co)

PDP410
<14% silicon aluminium alloy

PDP403
>14% silicon aluminium alloy



GEOMETRY SELECTION

Selecção da geometria | Selección de la geometria

The insert geometry and nose radius are very important on turning operation having direct influence on the tool life and productivity.

Insert nose radius is an important performance parameter:

· For good chip breaking, must be used a small nose radius: 0.008 - 0.016 inch (0,2 - 0,4 mm);

· A large nose radius: 0.031 - 0.047 inch (0,8 - 1,2 mm) generates better surface finishing and produces thinner chips, which reduces the degree of crater wear in hard part turning operations

· The machining with large nose radius and small depth of cut results in reduced entry and exit forces.

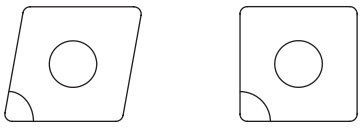
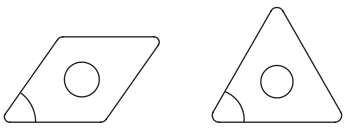
In general, a large nose radius provides greater edge strength and therefore extended tool life. For this reason, it is advised to use the largest and allowed nose radius based on the requirements of each process.

Finishing and semi-finishing:

In these cases, there are special requirements on the surface and tolerances.

Roughing:

For the evaluation of the cutting edge radius in roughing operations it is recommended to use the following formula, in order to calculate the minimum radius vs feed:

Insert shape	Formula
	Radius >1,6 x feed per rev.
	Radius >2,5 x feed per rev.

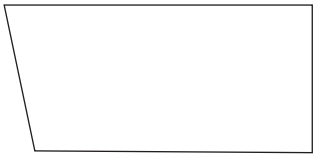
EDGE PREPARATION SELECTION

Selecção da preparação de aresta | Selección de la preparación de arista

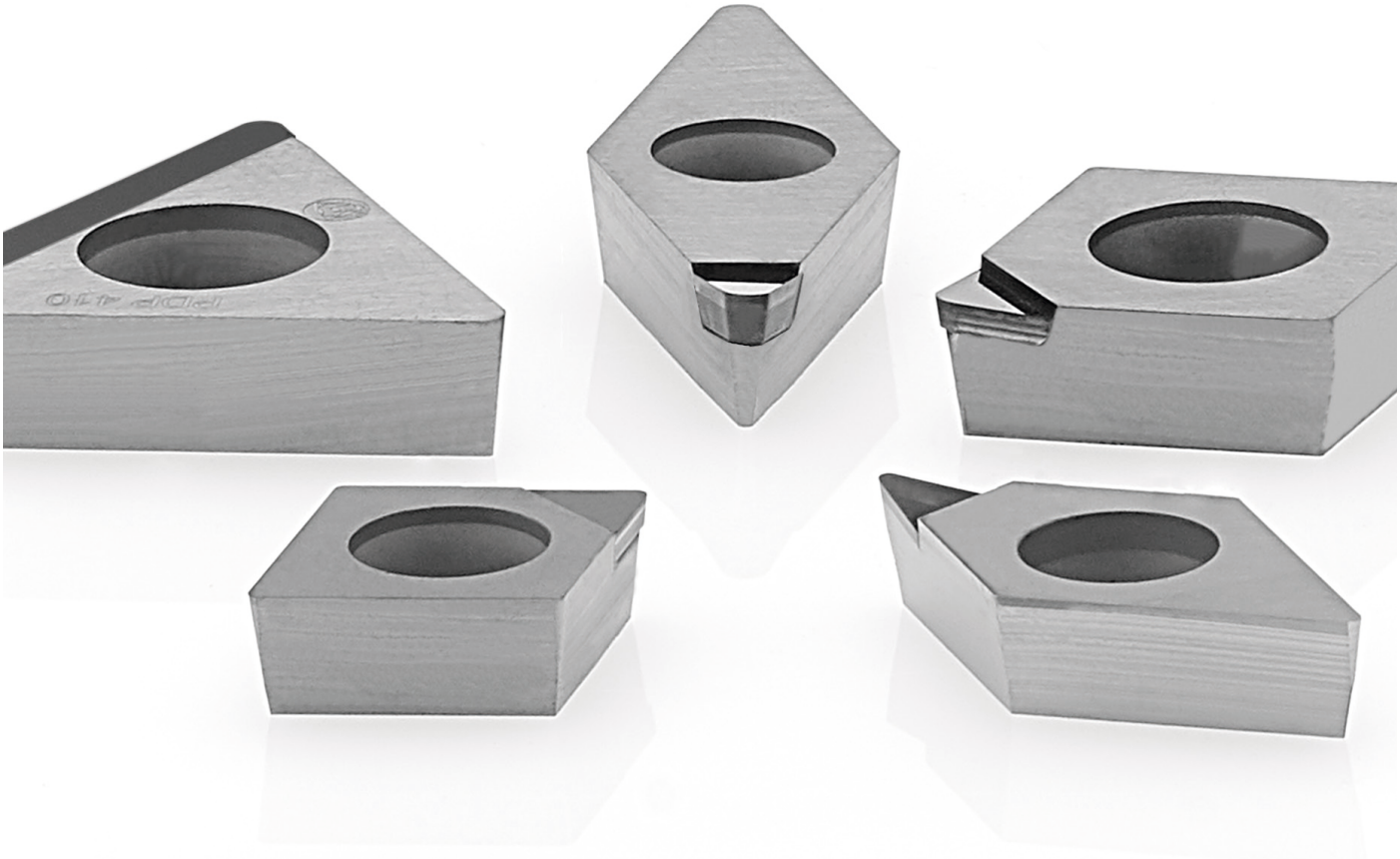
The most important criteria for the stability and cutting edge tool-life is to define the correct cutting edge preparation. Its choice is mainly required in order to achieve the best economical result.

Edge preparation:

PCD: F type cutting edge preparation:

Cutting forces Edge strength + - 	**F – Standard preparation without honing - Standard** · Sharp cutting edge; · Standard and recommended edge preparation for aluminium or other non-ferrous materials.

Note:
Based on our experience sometimes is necessary to define edge preparation during several tests to provide the best possible solution for each application.



PCD RECOMMENDED CUTTING DATA

Condições de corte recomendadas para PCD | Datos de corte recomiendadas para PCD

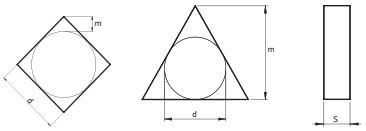
Workpiece material	Vc (SFM)		Recommend grade for PCD	
			PDP 410	PDP 403
Aluminium alloys: Aluminium, Si<14%	Roughing Finishing	2624-9484 2624-9484	◉ ◉	
Aluminium: Aluminium, Si≥14%	Roughing Finishing	984-2296 820-2296	○ ○	◉ ◉
Copper alloys: Copper, Zinc, Brass	Roughing Finishing	1968-3936 2296-4920	◉ ◉	
Metal matrix composites: Al (10-20%) SiC	Roughing Finishing	984-3772 1312-4133		◉ ◉
Tungsten carbide 10-16% Co: Unsintered	Roughing Finishing	164-656 197-722		◉ ◉
Tungsten carbide 10-16% Co: Sintered	Roughing Finishing	66-131 82-148		◉ ◉
Ebonite, Fiberglass, Plastic materials, Graphite, Glass.	Roughing Finishing	656-4920 984-6560	◉ ◉	◉ ◉
Ceramic: Unsintered	Roughing Finishing	164-492 164-656		◉ ◉
Ceramic: Sintered	Roughing Finishing	66-115 66-131		◉ ◉
Wood	Finishing	3280-13120	◉	

◉ Recomended ○ Second choice

TURNING PCD INSERTS ISO IDENTIFICATION SYSTEM

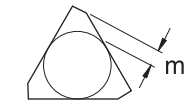
H	120°	M	86°
O	135°	V	35°
P	108°	W	80°
S	90°	L	90°
T	60°	A	85°
C	80°	B	82°
D	55°	K	55°
E	75°	R	
F	50°	X	Special

1- Insert shape symbol



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

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



Triangular inserts with a facet (secondary cutting edge)

Detailed dimension of M class insert
Insert height Tolerances (mm)

Inscribed circle	T	S	C	D	V
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.11	±0.10	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed circle Tolerances (mm)

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

3 - Tolerances symbol

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

2 - Normal clearance symbol

ISO	D	C	G	W
ANSI	D	C	G	W

4 - Insert symbol

symbol	Type	Hole type	Chip breaker	Shape
W	with hole	Round hole one countersink (40°~60°)	Without chip breaker	
T			Chip breaker on one side	
A	with hole	Round hole	Without chip breaker	
M			Chip breaker on one side	

symbol	Type	Hole type	Chip breaker	Shape
G	with hole	Round hole	Chip breaker on both sides	
N	without hole	-	Without chip breaker	
R		-	Chip breaker on one side	
X	-	-	-	On request

TURNING PCD INSERTS ISO IDENTIFICATION SYSTEM

Sistema de identificação ISO para pastilhas de PCD | Codificación ISO para plaquitas de PCD

R's	V's (35°)	D's (55°)	C's (80°)	S's (90°)	T's (60°)	W's (80°)	IC mm	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	

5 - Insert size symbol

* 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

6 - Insert thickness symbol

11	T3	04 / AN	T	NF	Z1
3	2.5	1	T	NF	Z1

10 - Tip type	
Z1 (1 tip)	Z6 (6 tips)
Z2 (2 tips)	Z8 (8 tips)
Z3 (3 tips)	FL (Full edge left)
Z4 (4 tips)	FR (Full edge right)
Z5 (5 tips)	O (other)

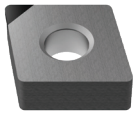
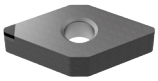
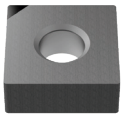
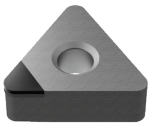
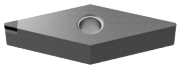
7 - Insert corner symbol			
ISO	mm	inch	ANSI
00	Sharp nose		0
01	0.10	.004	0.2
02	0.20	.008	0.5
04	0.40	.015	1
08	0.80	.032	2
12	1.2	.047	3
16	1.6	.062	4
20	2.0	.078	5
24	2.4	.094	6
28	2.8	.109	7
32	3.2	.125	8
00 (inch or M0/ metric)	Round insert		0

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

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

9 - Chip breaker geometries	
NF	Finishing

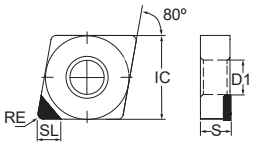
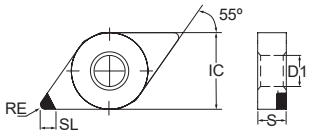
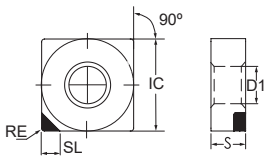
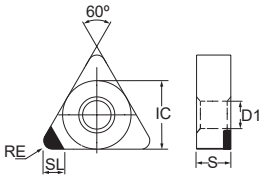
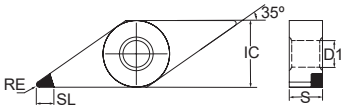
PCD NEGATIVE INSERTS

				N	
		(2) Grade code		D6	I3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PDP410	PDP403
		SINGLE TIP			
CNGA Z1 	1124228	CNGA 431 Z1	CNGA 120404 Z1	⚙	⚙
	1124110	CNGA 432 Z1	CNGA 120408 Z1	⚙	○
	1124229	CNGA 433 Z1	CNGA 120412 Z1	○	○
	1124230	CNGA 434 Z1	CNGA 120416 Z1	○	○
DNGA Z1 	1124235	DNGA 431 Z1	DNGA 150404 Z1	○	○
	1124236	DNGA 432 Z1	DNGA 150408 Z1	○	○
	1124362	DNGA 442 Z1	DNGA 150608 Z1	○	○
	1124363	DNGA 443 Z1	DNGA 150612 Z1	○	○
SNGA Z1 	1124243	SNGA 321 Z1	SNGA 090304 Z1	○	○
	1124244	SNGA 322 Z1	SNGA 090308 Z1	○	○
	1124245	SNGA 431 Z1	SNGA 120404 Z1	○	○
	1124246	SNGA 432 Z1	SNGA 120408 Z1	○	○
TNGA Z1 	1124256	TNGA 221 Z1	TNGA 110304 Z1	○	○
	1124257	TNGA 222 Z1	TNGA 110308 Z1	○	○
	1124258	TNGA 331 Z1	TNGA 160404 Z1	⚙	○
	1124259	TNGA 332 Z1	TNGA 160408 Z1	○	○
	1124385	TNGA 333 Z1	TNGA 160412 Z1	○	○
VNGA Z1 	1124285	VNGA 331 Z1	VNGA 160404 Z1	○	○
	1124286	VNGA 332 Z1	VNGA 160408 Z1	○	○
	1124287	VNGA 333 Z1	VNGA 160412 Z1	○	○

⚙ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

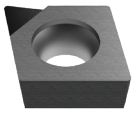
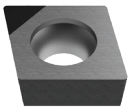
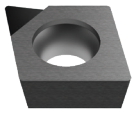
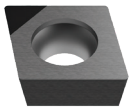
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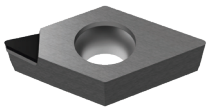
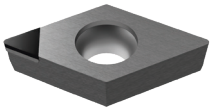
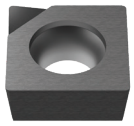
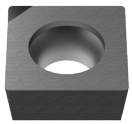
PCD NEGATIVE INSERTS
Single tip

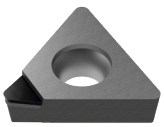
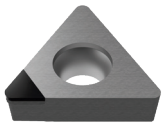
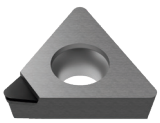
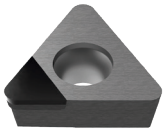
Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
IC	S	RE	D1	AN	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
SINGLE TIP												
1/2	3/16	0.016	0.203	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
1/2	3/16	0.031	0.203	-	0.138	0.006	0.003	0.031	0.006	0.003	0.012	
1/2	3/16	0.047	0.203	-	0.138	0.010	0.003	0.047	0.012	0.004	0.016	
1/2	3/16	0.063	0.203	-	0.138	0.020	0.003	0.063	0.014	0.004	0.020	
1/2	3/16	0.016	0.203	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
1/2	3/16	0.031	0.203	-	0.138	0.006	0.003	0.031	0.006	0.002	0.010	
1/2	1/4	0.031	0.203	-	0.138	0.006	0.003	0.031	0.006	0.002	0.010	
1/2	1/4	0.047	0.203	-	0.138	0.008	0.003	0.047	0.008	0.002	0.012	
3/8	1/8	0.016	0.150	-	0.138	0.004	0.003	0.016	0.004	0.003	0.008	
3/8	1/8	0.031	0.150	-	0.138	0.008	0.003	0.031	0.005	0.003	0.010	
1/2	3/16	0.016	0.203	-	0.138	0.004	0.003	0.016	0.005	0.003	0.010	
1/2	3/16	0.031	0.203	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/4	1/8	0.016	0.089	-	0.138	0.004	0.003	0.016	0.003	0.001	0.006	
1/4	1/8	0.031	0.089	-	0.138	0.006	0.004	0.031	0.004	0.002	0.010	
3/8	3/16	0.016	0.150	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	3/16	0.031	0.150	-	0.138	0.008	0.004	0.031	0.006	0.003	0.012	
3/8	3/16	0.047	0.150	-	0.138	0.008	0.004	0.031	0.006	0.003	0.012	
3/8	3/16	0.016	0.150	-	0.138	0.004	0.003	0.016	0.004	0.003	0.008	
3/8	3/16	0.031	0.150	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	3/16	0.047	0.150	-	0.138	0.010	0.004	0.047	0.007	0.004	0.014	

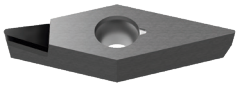
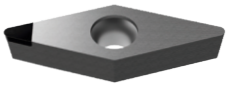
PCD POSITIVE INSERTS OVERVIEW

SINGLE TIP

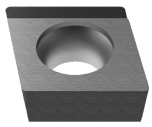
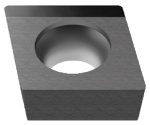
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Size 06 | 09 | 12	Size 06 | 09 | 12	Size 06 | 09 | 12	Size 06 | 09 | 12
Page C - 576	Page C - 576	Page C - 576	Page C - 576

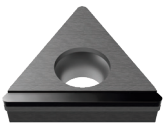
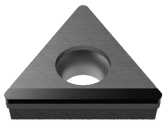
DCGT Z1	DCGW Z1	SCGT Z1	SCGW Z1
			
Size 07 | 11	Size 07 | 11 | 15	Size 06 | 09 | 12	Size 06 | 09 | 12
Page C - 578	Page C - 578	Page C - 578	Page C - 578

TCGT Z1	TCGW Z1	TPGT Z1	TPGW Z1
			
Size 09 | 11 | 16	Size 09 | 11 | 16	Size 11 | 16	Size 11 | 16
Page C - 580	Page C - 580	Page C - 580	Page C - 580

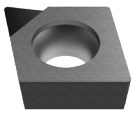
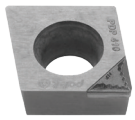
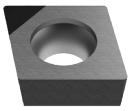
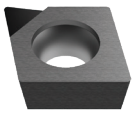
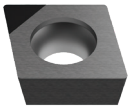
VCGT Z1	VCGW Z1
	
Size 07 | 11 | 16	Size 07 | 11 | 16
Page C - 582	Page C - 582

FULL EDGE

CCGT FR/FL	CCGW FR/FL
	
Size 06 | 09 | 12	Size 06 | 09 | 12
Page C - 584	Page C - 584

TCGT FL	TCGW FL
	
Size 11 | 16	Size 11 | 16 | 22
Page C - 584	Page C - 584

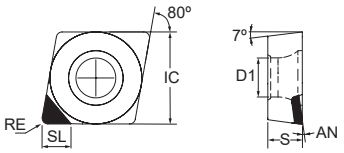
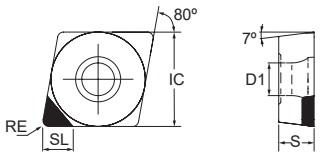
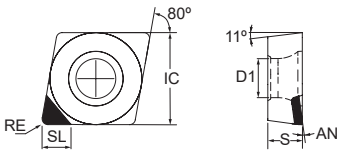
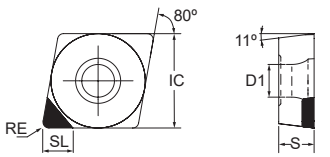
PCD POSITIVE INSERTS

				N	
		(2) Grade code		D6	I3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PDP410	PDP403
		SINGLE TIP			
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	1124209	CCGT 21.51 Z1	CCGT 060204 Z1	○	○
	1124487	CCGT 21.55 Z1	CCGT 060220 Z1	○	○
	1112592	CCGT 32.51 Z1	CCGT 09T304 Z1	◈	○
	1124210	CCGT 32.52 Z1	CCGT 09T308 Z1	○	○
	1124211	CCGT 431 Z1	CCGT 120404 Z1	◈	○
	1112630	CCGT 432 Z1	CCGT 120408 Z1	◈	○
CCGT- NF Z1 	1124465	CCGT 32.51-NF Z1	CCGT 09T304-NF Z1	◈	○
	1124726	CCGT 32.52-NF Z1	CCGT 09T308-NF Z1	◈	○
CCGW Z1 	1124114	CCGW 21.50.5 Z1	CCGW 060202 Z1	◈	○
	1124218	CCGW 21.51 Z1	CCGW 060204 Z1	◈	○
	1124793	CCGW 21.55 Z1	CCGW 060220 Z1	◈	○
	1124219	CCGW 32.50.5 Z1	CCGW 09T302 Z1	○	○
	1112593	CCGW 32.51 Z1	CCGW 09T304 Z1	◈	○
	1124220	CCGW 32.2 Z1	CCGW 09T308 Z1	○	○
	1124221	CCGW 431 Z1	CCGW 120404 Z1	◈	○
	1112631	CCGW 432 Z1	CCGW 120408 Z1	◈	○
CPGT Z1 	1124392	CCGT 21.50.5 Z1	CPGT 060202 Z1	○	○
	1124393	CCGT 21.51 Z1	CPGT 060204 Z1	○	○
	1124394	CCGT 32.51 Z1	CPGT 09T304 Z1	○	○
	1124395	CCGT 32.52 Z1	CPGT 09T308 Z1	○	○
	1124396	CCGT 431 Z1	CPGT 120404 Z1	○	○
	1124397	CCGT 432 Z1	CPGT 120408 Z1	○	○
CPGW Z1 	1124398	CPGW 21.50.5 Z1	CPGW 060202 Z1	○	○
	1124399	CPGW 21.51 Z1	CPGW 060204 Z1	○	○
	1124400	CPGW 32.50.5 Z1	CPGW 09T302 Z1	○	○
	1124401	CPGW 32.51 Z1	CPGW 09T304 Z1	◈	○
	1124402	CPGW 32.52 Z1	CPGW 09T308 Z1	○	○
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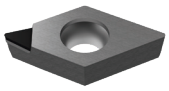
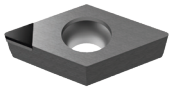
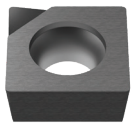
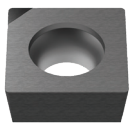
◈ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

PCD POSITIVE INSERTS
Single tip

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
IC	S	RE	D1	AN	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
SINGLE TIP												
1/4	3/32	0.008	0.110	7°	0.138	0.003	0.002	0.008	0.003	0.002	0.006	
1/4	3/32	0.016	0.110	7°	0.138	0.004	0.003	0.016	0.005	0.003	0.010	
1/4	3/32	0.079	0.110	10°	0.124	0.008	0.004	0.020	0.006	0.004	0.012	
3/8	5/32	0.016	0.173	10°	0.138	0.004	0.003	0.016	0.005	0.003	0.010	
3/8	5/32	0.031	0.173	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/2	3/16	0.016	0.217	10°	0.138	0.004	0.003	0.016	0.005	0.003	0.010	
1/2	3/16	0.031	0.217	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	5/32	0.016	0.173	-	0.157	0.005	0.003	0.016	0.006	0.003	0.010	
3/8	5/32	0.031	0.173	-	0.157	0.008	0.003	0.031	0.008	0.003	0.012	
1/4	3/32	0.008	0.110	-	0.138	0.003	0.002	0.008	0.003	0.002	0.005	
1/4	3/32	0.016	0.110	-	0.138	0.004	0.003	0.016	0.004	0.003	0.009	
1/4	3/32	0.079	0.110	-	0.126	0.031	0.016	0.079	0.006	0.004	0.016	
3/8	5/32	0.008	0.173	-	0.138	0.003	0.002	0.008	0.003	0.002	0.006	
3/8	5/32	0.016	0.173	-	0.138	0.004	0.003	0.016	0.005	0.002	0.010	
3/8	5/32	0.031	0.173	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/2	3/16	0.016	0.217	-	0.138	0.004	0.003	0.016	0.005	0.002	0.010	
1/2	3/16	0.031	0.217	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/4	3/32	0.008	0.110	7°	0.138	0.003	0.002	0.008	0.003	0.002	0.006	
1/4	3/32	0.016	0.110	7°	0.138	0.004	0.003	0.016	0.005	0.003	0.010	
3/8	5/32	0.016	0.173	10°	0.138	0.004	0.003	0.016	0.005	0.003	0.010	
3/8	5/32	0.031	0.173	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/2	3/16	0.016	0.217	10°	0.138	0.004	0.003	0.016	0.005	0.003	0.010	
1/2	3/16	0.031	0.217	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/4	3/32	0.008	0.110	-	0.138	0.003	0.002	0.008	0.003	0.002	0.005	
1/4	3/32	0.016	0.110	-	0.138	0.004	0.003	0.016	0.004	0.003	0.009	
3/8	5/32	0.008	0.173	-	0.138	0.003	0.002	0.008	0.003	0.002	0.006	
3/8	5/32	0.016	0.173	-	0.138	0.004	0.003	0.016	0.005	0.002	0.010	
3/8	5/32	0.031	0.173	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/2	3/16	0.016	0.217	-	0.138	0.004	0.003	0.016	0.005	0.002	0.010	
1/2	3/16	0.031	0.217	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	

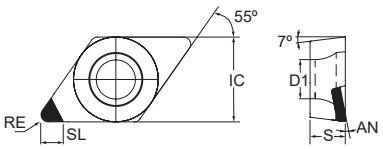
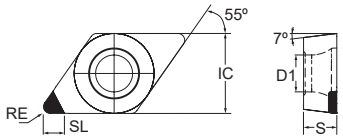
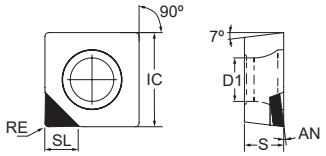
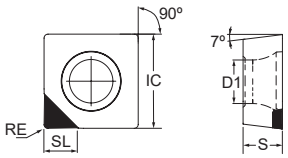
PCD POSITIVE INSERTS

				N	
		(2) Grade code		D6	I3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PDP410	PDP403
		SINGLE TIP			
DCGT Z1 	1124116	DCGT 21.50.5 Z1	DCGT 070202 Z1	◈	○
	1124231	DCGT 21.51 Z1	DCGT 070204 Z1	◈	○
	1112634	DCGT 32.501 Z1	DCGT 11T304 Z1	◈	○
	1124380	DCGT 32.52 Z1	DCGT 11T308 Z1	◈	◈
	1124529	DCGT 432 Z1	DCGT 150408 Z1	◈	○
DCGW Z1 	1124232	DCGW 21.50.5 Z1	DCGW 070202 Z1	◈	○
	1124233	DCGW 21.51 Z1	DCGW 070204 Z1	◈	○
	1124458	DCGW 32.50.5 Z1	DCGW 11T302 Z1	◈	○
	1112635	DCGW 32.51 Z1	DCGW 11T304 Z1	◈	○
	1124168	DCGW 32.52 Z1	DCGW 11T308 Z1	◈	○
	1124234	DCGW 431 Z1	DCGW 150404 Z1	○	○
	1124117	DCGW 432 Z1	DCGW 150408 Z1	◈	○
SCGT Z1 	1124386	SCGT 21.50.5 Z1	SCGT 060202 Z1	○	○
	1124387	SCGT 21.51 Z1	SCGT 060204 Z1	○	○
	1124388	SCGT 32.51 Z1	SCGT 09T304 Z1	○	○
	1124389	SCGT 32.52 Z1	SCGT 09T308 Z1	◈	○
	1124390	SCGT 431 Z1	SCGT 120404 Z1	○	○
	1124391	SCGT 432 Z1	SCGT 120408 Z1	◈	○
SCGW Z1 	1124237	SCGW 21.50.5 Z1	SCGW 060202 Z1	○	○
	1124238	SCGW 21.51 Z1	SCGW 060204 Z1	○	○
	1124239	SCGW 32.51 Z1	SCGW 09T304 Z1	○	○
	1124240	SCGW 32.52 Z1	SCGW 09T308 Z1	○	○
	1124794	SCGW 32.53 Z1	SCGW 09T312 Z1	○	○
	1124241	SCGW 431 Z1	SCGW 120404 Z1	○	○
	1124242	SCGW 432 Z1	SCGW 120408 Z1	○	○

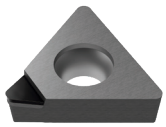
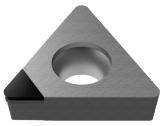
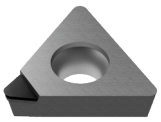
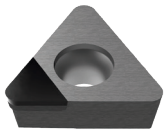
◈ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

PCD POSITIVE INSERTS
Single tip

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
IC	S	RE	D1	AN	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
SINGLE TIP												
1/4	3/32	0.008	0.110	7°	0.138	0.003	0.002	0.008	0.003	0.002	0.006	
1/4	3/32	0.016	0.110	7°	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.016	0.173	10°	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.031	0.173	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/2	3/16	0.031	0.217	10°	0.138	0.024	0.004	0.047	0.010	0.004	0.016	
1/4	3/32	0.008	0.110	-	0.138	0.003	0.002	0.008	0.003	0.002	0.006	
1/4	3/32	0.016	0.110	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.008	0.173	-	0.138	0.004	0.002	0.014	0.004	0.002	0.006	
3/8	5/32	0.016	0.173	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.031	0.173	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/2	3/16	0.016	0.217	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
1/2	3/16	0.031	0.217	-	0.138	0.008	0.004	0.031	0.006	0.003	0.012	
1/4	3/32	0.008	0.110	7°	0.138	0.003	0.002	0.008	0.003	0.002	0.006	
1/4	3/32	0.016	0.110	7°	0.138	0.004	0.002	0.016	0.004	0.002	0.008	
3/8	5/32	0.016	0.173	10°	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.031	0.173	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/2	3/16	0.016	0.217	10°	0.138	0.005	0.003	0.016	0.004	0.002	0.008	
1/2	3/16	0.031	0.217	10°	0.138	0.009	0.003	0.031	0.006	0.003	0.012	
1/4	3/32	0.008	0.250	-	0.138	0.003	0.002	0.008	0.003	0.002	0.006	
1/4	3/32	0.016	0.250	-	0.138	0.004	0.002	0.016	0.004	0.002	0.008	
3/8	5/32	0.016	0.375	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.031	0.375	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/4	12/77	0.047	0.250	-	0.138	0.012	0.004	0.047	0.008	0.004	0.016	
1/2	3/16	0.016	0.500	-	0.138	0.005	0.003	0.016	0.004	0.002	0.008	
1/2	3/16	0.031	0.500	-	0.138	0.009	0.003	0.031	0.006	0.003	0.012	

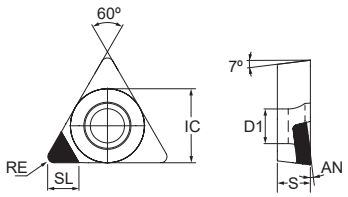
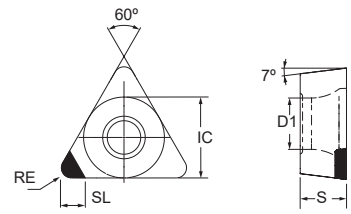
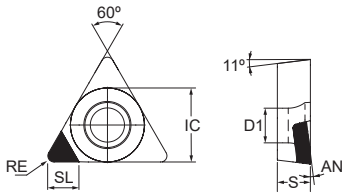
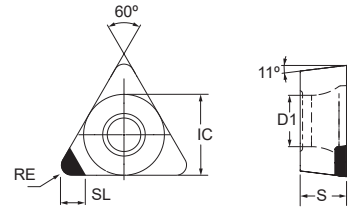
PCD POSITIVE INSERTS

				N	
		(2) Grade code		D6	I3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PDP410	PDP403
		SINGLE TIP			
TCGT Z1 	1124186	TCGT 1.81.50.5 Z1	TCGT 090202 Z1	◈	○
	1124188	TCGT 1.81.51 Z1	TCGT 090204 Z1	◈	○
	1124501	TCGT 1.81.52 Z1	TCGT 090208 Z1	◈	○
	1124119	TCGT 21.51 Z1	TCGT 110204 Z1	◈	○
	1124190	TCGT 21.52 Z1	TCGT 110208 Z1	◈	○
	1124247	TCGT 32.51 Z1	TCGT 16T304 Z1	◈	○
	1112637	TCGT 32.52 Z1	TCGT 16T308 Z1	◈	○
TCGW Z1 	1124185	TCGW 1.81.50.5 Z1	TCGW 090202 Z1	◈	○
	1124187	TCGW 1.81.51 Z1	TCGW 090204 Z1	◈	○
	1124507	TCGW 21.50.5 Z1	TCGW 110202 Z1	◈	○
	1124192	TCGW 21.51 Z1	TCGW 110204 Z1	◈	○
	1124189	TCGW 21.52 Z1	TCGW 110208 Z1	◈	○
	1124251	TCGW 32.51 Z1	TCGW 16T304 Z1	◈	○
	1112638	TCGW 32.52 Z1	TCGW 16T308 Z1	◈	○
TPGT Z1 	1124260	TPGT 220.5 Z1	TPGT 110302 Z1	○	○
	1124261	TPGT 221 Z1	TPGT 110304 Z1	○	○
	1124262	TPGT 222 Z1	TPGT 110308 Z1	○	○
	1124263	TPGT 32.51 Z1	TPGT 16T304 Z1	○	○
	1124174	TPGT 32.52 Z1	TPGT 16T308 Z1	○	○
	1124264	TPGT 331 Z1	TPGT 160404 Z1	○	○
	1124265	TPGT 332 Z1	TPGT 160408 Z1	○	○
TPGW Z1 	1124266	TPGW 21.50.5 Z1	TPGW 110202 Z1	○	○
	1124267	TPGW 21.51 Z1	TPGW 110204 Z1	○	○
	1124268	TPGW 21.52 Z1	TPGW 110208 Z1	○	○
	1124269	TPGW 220.5 Z1	TPGW 110302 Z1	○	○
	1124270	TPGW 221 Z1	TPGW 110304 Z1	◈	○
	1124379	TPGW 222 Z1	TPGW 110308 Z1	◈	○
	1124271	TPGW 32.51 Z1	TPGW 16T304 Z1	○	○
	1124272	TPGW 32.52 Z1	TPGW 16T308 Z1	○	○
	1124273	TPGW 331 Z1	TPGW 160404 Z1	○	○
	1124274	TPGW 332 Z1	TPGW 160408 Z1	○	○

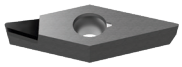
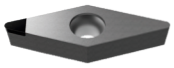
◈ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

PCD POSITIVE INSERTS
Single tip

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
IC	S	RE	D1	AN	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
SINGLE TIP												
7/32	3/32	0.008	0.098	7°	0.118	0.003	0.002	0.008	0.003	0.001	0.004	
7/32	3/32	0.016	0.098	7°	0.118	0.004	0.003	0.016	0.004	0.002	0.008	
19/64	3/32	0.031	0.098	7°	0.118	0.018	0.004	0.031	0.007	0.003	0.012	
1/4	3/32	0.016	0.110	7°	0.118	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	3/32	0.031	0.110	7°	0.118	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	5/32	0.016	0.173	10°	0.118	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.031	0.173	10°	0.118	0.008	0.003	0.031	0.006	0.003	0.012	
7/32	3/32	0.008	0.098	-	0.118	0.003	0.002	0.008	0.003	0.001	0.004	
7/32	3/32	0.016	0.098	-	0.118	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	3/32	0.008	0.110	-	0.118	0.003	0.002	0.008	0.003	0.001	0.004	
1/4	3/32	0.016	0.110	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	3/32	0.031	0.110	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	5/32	0.016	0.173	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.031	0.173	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/4	1/8	0.008	0.134	10°	0.138	0.003	0.002	0.008	0.003	0.002	0.004	
1/4	1/8	0.016	0.134	10°	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	1/8	0.031	0.134	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	5/32	0.016	0.169	10°	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.031	0.169	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	3/16	0.016	0.169	10°	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	3/16	0.031	0.169	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/4	3/32	0.008	0.110	-	0.138	0.003	0.002	0.008	0.003	0.002	0.004	
1/4	3/32	0.016	0.110	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	3/32	0.031	0.110	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
1/4	1/8	0.008	0.110	-	0.138	0.003	0.002	0.008	0.003	0.002	0.004	
1/4	1/8	0.016	0.110	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	1/8	0.031	0.110	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	5/32	0.016	0.169	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	5/32	0.031	0.169	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	3/16	0.016	0.169	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	3/16	0.031	0.169	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	

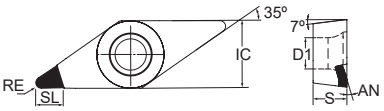
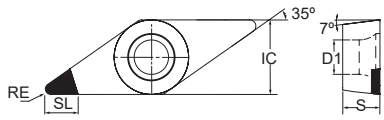
PCD POSITIVE INSERTS

				N	
		(2) Grade code		D6	I3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	ISO Reference	PDP410	PDP403
		SINGLE TIP			
VCGT Z1 	1124275	VCGT 1.31.50.5 Z1	VCGT 070202 Z1	○	○
	1124276	VCGT 1.31.51 Z1	VCGT 070204 Z1	○	○
	1124277	VCGT 220.5 Z1	VCGT 110302 Z1	◈	○
	1124071	VCGT 221 Z1	VCGT 110304 Z1	◈	○
	1124278	VCGT 331 Z1	VCGT 160404 Z1	◈	○
	1112640	VCGT 332 Z1	VCGT 160408 Z1	◈	○
	1124279	VCGT 333 Z1	VCGT 160412 Z1	○	○
VCGW Z1 	1124280	VCGW 1.31.50.5 Z1	VCGW 070202 Z1	○	○
	1124281	VCGW 1.31.51 Z1	VCGW 070204 Z1	◈	○
	1124796	VCGW 220.5 Z1	VCGW 110302 Z1	◈	○
	1124378	VCGW 221 Z1	VCGW 110304 Z1	◈	○
	1124282	VCGW 222 Z1	VCGW 110308 Z1	◈	○
	1124795	VCGW 330.5 Z1	VCGW 160402 Z1	◈	○
	1124283	VCGW 331 Z1	VCGW 160404 Z1	◈	○
	1112641	VCGW 332 Z1	VCGW 160408 Z1	◈	○
	1124284	VCGW 333 Z1	VCGW 160412 Z1	◈	○

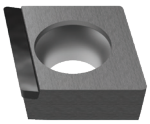
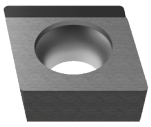
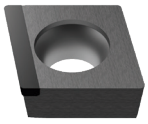
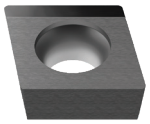
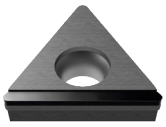
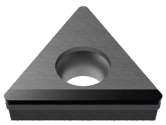
◈ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

PCD POSITIVE INSERTS
Single tip

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
IC	S	RE	D1	AN	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
SINGLE TIP												
5/32	3/32	0.008	0.087	7°	0.118	0.003	0.002	0.008	0.003	0.001	0.004	
5/32	3/32	0.016	0.087	7°	0.118	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	1/8	0.008	0.110	10°	0.138	0.003	0.002	0.008	0.003	0.001	0.004	
1/4	1/8	0.016	0.110	10°	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	3/16	0.016	0.173	10°	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	3/16	0.031	0.173	10°	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	3/16	0.047	0.173	10°	0.138	0.012	0.004	0.047	0.007	0.003	0.014	
5/32	3/32	0.008	0.087	-	0.118	0.003	0.002	0.008	0.003	0.001	0.004	
5/32	3/32	0.016	0.087	-	0.118	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	1/8	0.008	0.110	-	0.138	0.005	0.002	0.008	0.004	0.002	0.006	
1/4	1/8	0.016	0.110	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
1/4	1/8	0.031	0.110	-	0.138	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	3/16	0.008	0.173	-	0.138	0.007	0.002	0.012	0.004	0.002	0.006	
3/8	3/16	0.016	0.173	-	0.138	0.004	0.003	0.016	0.004	0.002	0.008	
3/8	3/16	0.031	0.173	-	0.157	0.008	0.003	0.031	0.006	0.003	0.012	
3/8	3/16	0.047	0.173	-	0.138	0.012	0.004	0.047	0.007	0.003	0.014	

PCD POSITIVE INSERTS

Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code ANSI Reference	(2) Grade code ISO Reference	N D6 PDP410	N I3 PDP403
		FULL EDGE			
CCGT FR 	1124212	CCGT 32.50.5 FR	CCGT 09T302 FR	○	○
	1124165	CCGT 32.51 FR	CCGT 09T304 FR	◎	○
	1124213	CCGT 431 FR	CCGT 120404 FR	○	○
	1124214	CCGT 432 FR	CCGT 120408 FR	○	○
CCGT FL 	1124215	CCGT 32.50.5 FL	CCGT 09T302 FL	○	○
	1124166	CCGT 32.51 FL	CCGT 09T304 FL	◎	○
	1124216	CCGT 431 FL	CCGT 120404 FL	◎	○
	1124217	CCGT 432 FL	CCGT 120408 FL	◎	○
CCGW FR 	1124547	CCGW 21.51 FR	CCGW 060204 FR	◎	○
	1124170	CCGW 32.51 FR	CCGW 09T304 FR	○	○
	1124222	CCGW 32.52 FR	CCGW 09T308 FR	○	○
	1124223	CCGW 431 FR	CCGW 120404 FR	○	○
	1124224	CCGW 432 FR	CCGW 120408 FR	○	○
CCGW FL 	1124548	CCGW 21.51 FL	CCGW 060204 FL	◎	○
	1124171	CCGW 32.51 FL	CCGW 09T304 FL	○	○
	1124225	CCGW 32.52 FL	CCGW 09T308 FL	○	○
	1124226	CCGW 431 FL	CCGW 120404 FL	○	○
	1124227	CCGW 432 FL	CCGW 120408 FL	◎	○
TCGT FL 	1124173	TCGT 21.51 FL	TCGT 110204 FL	◎	○
	1124248	TCGT 21.52 FL	TCGT 110208 FL	○	○
	1124249	TCGT 32.51 FL	TCGT 16T304 FL	◎	○
	1124250	TCGT 32.52 FL	TCGT 16T308 FL	◎	○
TCGW FL 	1124252	TCGW 21.50.5 FL	TCGW 110202 FL	○	○
	1112777	TCGW 21.51 FL	TCGW 110204 FL	◎	○
	1124253	TCGW 32.51 FL	TCGW 16T304 FL	◎	○
	1124254	TCGW 32.52 FL	TCGW 16T308 FL	◎	○
	1124255	TCGW 431 FL	TCGW 220404 FL	○	○
	1124382	TCGW 432 FL	TCGW 220408 FL	◎	○

◎ Stock Itens | Itens de stock ○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

PCD POSITIVE INSERTS
Full edge

Dimensions (in) Dimensões (in) Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte						Technical drawing Desenho técnico Dibujo técnico
IC	S	RE	D1	AN	SL	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
FULL EDGE												
3/8	5/32	0.008	0.173	10°	0.382	0.191	0.008	0.252	0.003	0.002	0.006	
3/8	5/32	0.016	0.173	10°	0.382	0.191	0.016	0.252	0.005	0.003	0.010	
1/2	3/16	0.016	0.217	10°	0.508	0.254	0.016	0.335	0.006	0.003	0.012	
1/2	3/16	0.031	0.217	10°	0.508	0.254	0.031	0.335	0.012	0.004	0.016	
3/8	5/32	0.008	0.173	10°	0.382	0.191	0.008	0.252	0.003	0.002	0.006	
3/8	5/32	0.016	0.173	10°	0.382	0.191	0.016	0.252	0.005	0.003	0.010	
1/2	3/16	0.016	0.217	10°	0.508	0.254	0.016	0.335	0.006	0.003	0.012	
1/2	3/16	0.031	0.217	10°	0.508	0.254	0.031	0.335	0.012	0.004	0.016	
3/8	5/32	0.016	0.173	-	0.382	0.191	0.016	0.252	0.005	0.003	0.010	
3/8	5/32	0.016	0.173	-	0.382	0.191	0.016	0.252	0.005	0.003	0.010	
3/8	5/32	0.031	0.173	-	0.382	0.191	0.031	0.252	0.006	0.004	0.014	
1/2	3/16	0.016	0.217	-	0.508	0.254	0.016	0.335	0.006	0.003	0.012	
1/2	3/16	0.031	0.217	-	0.508	0.254	0.031	0.335	0.012	0.004	0.016	
1/4	3/32	0.016	0.110	-	0.256	0.128	0.016	0.165	0.003	0.003	0.010	
3/8	5/32	0.016	0.173	-	0.382	0.191	0.016	0.252	0.005	0.003	0.010	
3/8	5/32	0.031	0.173	-	0.382	0.191	0.031	0.252	0.006	0.004	0.014	
1/2	3/16	0.016	0.217	-	0.508	0.254	0.016	0.335	0.006	0.003	0.012	
1/2	3/16	0.031	0.217	-	0.508	0.254	0.031	0.335	0.012	0.004	0.016	
1/4	3/32	0.016	0.110	7°	0.410	0.205	0.016	0.272	0.004	0.002	0.008	
1/4	3/32	0.031	0.110	7°	0.387	0.194	0.031	0.256	0.006	0.003	0.012	
3/8	5/32	0.016	0.173	10°	0.626	0.313	0.016	0.413	0.004	0.002	0.008	
3/8	5/32	0.031	0.173	10°	0.604	0.302	0.031	0.400	0.006	0.003	0.012	
1/4	3/32	0.008	0.110	-	0.422	0.205	0.016	0.272	0.004	0.002	0.008	
1/4	3/32	0.016	0.110	-	0.410	0.205	0.031	0.256	0.006	0.003	0.012	
3/8	5/32	0.016	0.173	-	0.626	0.313	0.016	0.413	0.004	0.002	0.008	
3/8	5/32	0.031	0.173	-	0.604	0.302	0.031	0.400	0.006	0.003	0.012	
1/2	3/16	0.016	0.217	-	0.843	0.315	0.016	0.421	0.004	0.003	0.008	
1/2	3/16	0.031	0.217	-	0.820	0.309	0.031	0.411	0.006	0.004	0.012	

INSERTS FOR

HEAVY TURNING



Heavy turning entails precisely shaping large-scale components using robust machinery and specialized techniques. This process tackles formidable tasks such as shaping massive shafts, cylinders, and gears utilized in sectors like aerospace, energy, and transportation. It requires expertise, precision, and rigorous quality control.

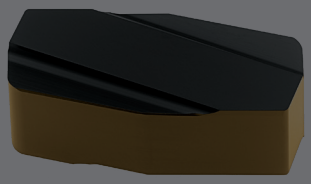
O torneamento pesado envolve a modelagem precisa de componentes em grande escala usando maquinaria robusta e técnicas especializadas. Este processo enfrenta tarefas formidáveis, como moldar eixos, cilindros e engrenagens maciças utilizadas em setores como aeroespacial, energia e transporte. Exige experiência, precisão e rigoroso controlo de qualidade.

El torneado pesado implica la modelación precisa de componentes a gran escala utilizando maquinaria robusta y técnicas especializadas. Este proceso aborda tareas formidables como la conformación de ejes, cilindros y engranajes masivos utilizados en sectores como el aeroespacial, energético y de transporte. Requiere experiencia, precisión y un riguroso control de calidad.

BAR PEELING > page 588

Inserts for refining blanks into polished bars, suitable for diverse applications. Versatile across materials, it streamlines production with specialized tools

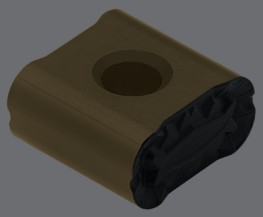
Pastilhas para refinar peças brutas em barras polidas, adequadas para diversas aplicações. Versátil em diferentes materiais, otimiza a produção com ferramentas especializadas | Plaquitas para refinar piezas en bruto en barras pulidas, adecuadas para diversas aplicaciones. Versátil en diferentes materiales, optimiza la producción con herramientas especializadas



RAILWAY > page 594

Inserts are designed to meet diverse railway machining needs, covering tasks such as handling new rails, re-profiling, managing crossings, joints, wheel-set production, and maintenance

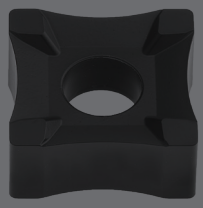
As pastilhas são projetadas para atender às diversas necessidades de maquinação ferroviária, abrangendo tarefas como o manuseio de carris novos, o reperfilamento, a gestão de cruzamentos, juntas, produção de conjuntos de rodas e manutenção | As pastilhas están diseñados para satisfacer las diversas necesidades de mecanizado ferroviario, cubriendo tareas como el manejo de rieles nuevos, el reperfilado, la gestión de cruces, juntas, la producción de conjuntos de ruedas y mantenimiento



SCARFING > page 604

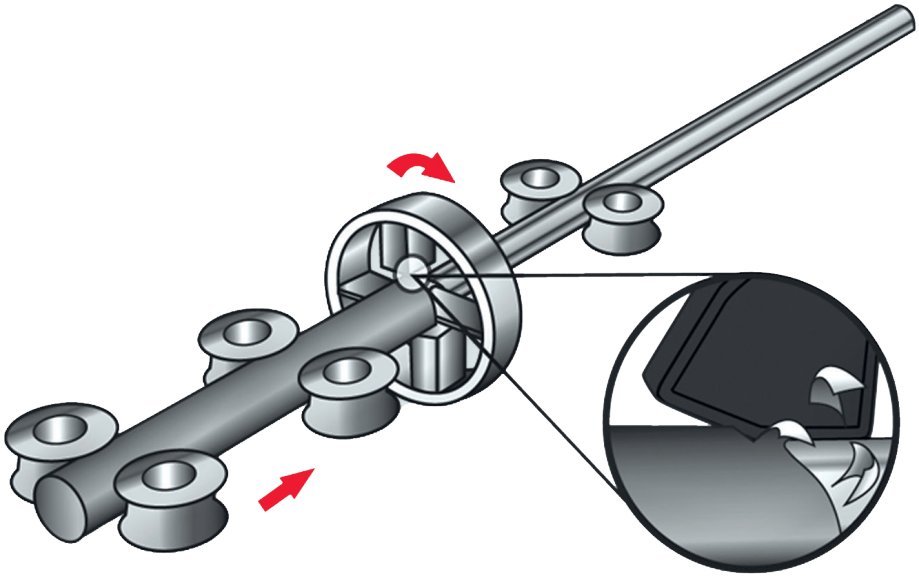
Scarfing is common in steel, pipeline, and metal industries for welded component quality. Inserts remove surface imperfections, ensuring smooth surfaces

Scarfing é comum nas indústrias de aço, tubulações e metalurgia para garantir a qualidade dos componentes soldados. As pastilhas removem imperfeições superficiais, garantindo superfícies lisas | Scarfing es común en las industrias del acero, tuberías y metalurgia para garantizar la calidad de los componentes soldados. Las pastillas eliminan imperfecciones superficiales, asegurando superficies lisas



BAR PEELING INSERTS

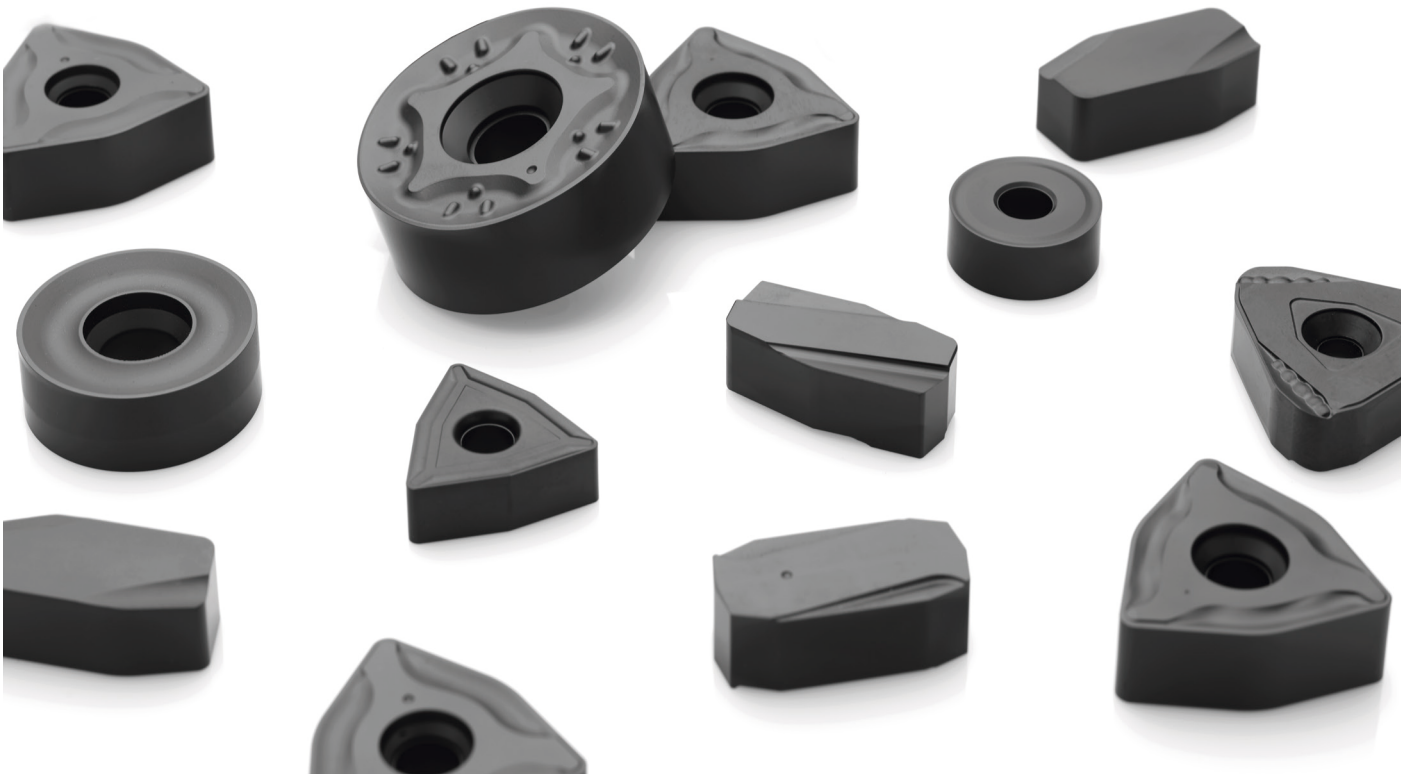
Bar Peeling is the machining process by which a raw forged blank is converted into a polished bar. During this peeling process, surface cracks and oxide layers are removed giving a perfect roundness with good surface and dimensional accuracy to the bar.
The range of materials that can be machined with these tools is vast and goes from all kind of Steels to Cast Iron parts.



The size of blank bar can go from 157inch (4 mm) to over 15.75inch (400mm) in diameter.

The surface quality and dimensional tolerances are also high, which leads to less machining at later stages.

Our aim is at the same time improving your productivity (by removing maximal chips volume) and, at the same time, matching or surpassing your surface quality requirements. This is why our Bar Peeling program is vast, comprising both standard tools and also special custom-made solutions to every customer needs. Please don't hesitate to contact us regarding other possible geometries that we may have although not presented in this catalogue.

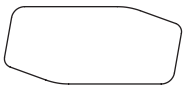
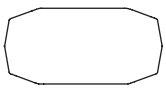
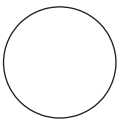
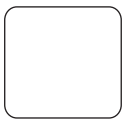
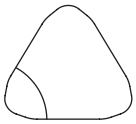
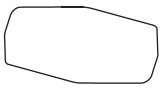
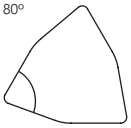
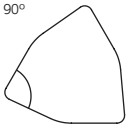


BAR PEELING INSERTS IDENTIFICATION SYSTEM

Sistema de identificação para pastilhas de torneamento de barra | Codificación para plaquitas de torneado de barra

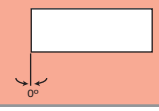
L	N	G	F	20	10	35	-	MP
1	2	3	4	5	6	7		8

1 - Insert Shape

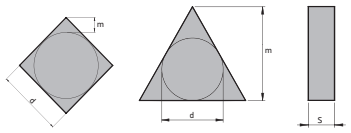
 I	 J	 L	 R	 S
60°  T	 U	75° / 80°  W	85° / 90°  X	

2 - Clearance Angle

N



3 - Tolerances



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

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

4 - Insert type

symbol	Type	Type of hole	Chip breaker	Shape
W	with hole	Round hole / one countersink (40°~60°)	Without chip breaker	
T	with hole		Chip breaker on one side	
Q	with hole	Round hole / one countersink (40°~60°)	Without chip breaker	
U	with hole		Chip breaker on both sides	
B	with hole	Round hole / one countersink (70°~90°)	Without chip breaker	
H	with hole		Chip breaker on one side	
C	with hole	Round hole / double countersink (70°~90°)	Without chip breaker	
J	with hole		Chip breaker on both sides	
A	with hole	Round hole	Without chip breaker	
M	with hole		Chip breaker on one side	
G	with hole		Chip breaker on both sides	
N	without hole	--	Without chip breaker	
R	without hole	--	Chip breaker on one side	
F	without hole	--	Chip breaker on both sides	
X	-	-	--	On request

5 - Length of Cutting Edge (LE)

The length of the secondary cutting edge is indicated in mm

13 mm	25 mm
14 mm	27 mm
15 mm	28 mm
17 mm	38 mm
20 mm	44 mm
22 mm	50 mm

6 - Thickness (S)

The length of the secondary cutting edge is indicated in mm

08 = 8,00 mm
09 = 9,52 mm
10 = 10,00 mm
12 = 12,00 mm
12 = 12,70 mm
13 = 13,00 mm
14 = 14,00 mm
18 = 18,00 mm

7 - Deph of Cut (AP)

Maximum depth of cut

20 = 2,00 mm
25 = 2,50 mm
35 = 3,50 mm
40 = 4,00 mm
80 = 8,00 mm

8 - Chip Breaker

Chip breaker according to Palbit geometries

FP	MH
ST	RP
MP	LH

BAR PEELING INSERTS RANGE

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO / ANSI Reference	(2) Grade code	P										M							K		
				CVD										CVD							CVD		
				L7	R2	L8	R3	U5	P1	V8	N2	S9	L9	U4	L8	U5	N2	P1	V8	V6	L5	L6	L9
				PH5115	PHG115	PH5125	PHG125	PHS225	PH5228	PHS228	PH5135	PHG135	PH5740	PHS215	PH5125	PHS225	PH5135	PH5228	PHS228	PHS240	PH5705	PH5320	PH5740
INGR-MP Rectangular 90º	1123828	INGR 221240-MP		◉	○	○									○								
JNGF-MP Rectangular 90º	1123830	JNGF 201220-MP		○		◉	○					○			◉								
	1123996	JNGF 201220-MP SP1				○									○								
	1123997	JNGF 201220-MP SP2		◈		◉									◉							○	
	1124043	JNGF 271220-MP				◉							○		◉								○
JNGF-PM Rectangular 90º	1124452	JNGF 201220-PM			○									◉									
	1124567	JNGF 201220-PM SP			○																		
LNGF-MP Rectangular 90º	1123826	LNGF 201035-MP		○	◉	○			○						○			○				◉	
	1123827	LNGF 201235-MP		○	○	○									○								
UNGF-MP Rectangular 90º	1123829	UNGF 171240-MP		○		○	◉								○								
TNMJ-MP Triangular 60º	1123838	TNMJ 201025-MP		◬	◈	◬	◈	◉							◬	◉							
	1123843	TNMJ 201425-MP				◉	○								◉								
TNGM-MP Triangular 60º	1124104	TNGM 220812-MP				◉					◬				◉		◬						
TNMM-LH Triangular 60º	1124102	TNMM 441116-LH									○	◉					○						

◉ First choice | 1ª Escolha | 1ª Opción

◈ Stock Itens | Itens de stock

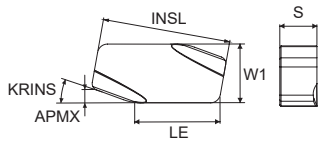
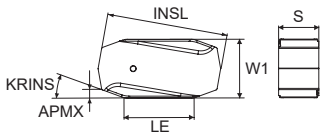
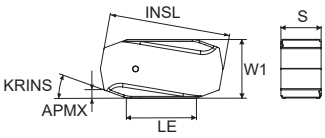
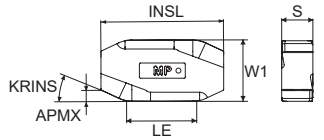
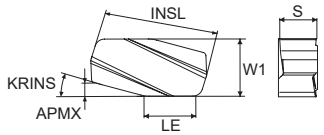
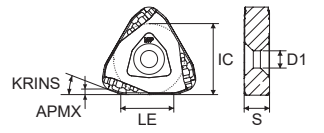
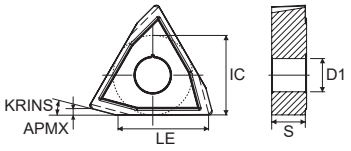
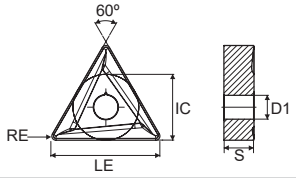
○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

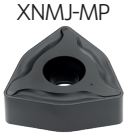
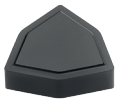
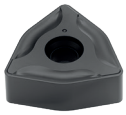
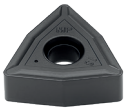
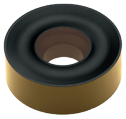
Insert Order Code: (1) Geometry code + (2) Grade code

BAR PEELING INSERTS RANGE

Negative inserts | Pastilhas negativas | Plaquitas negativas

Dimensions (in) Dimensões (in) Dimensiones (in)									Cutting Conditions Condições de Corte Condiciones de Corte						Technical Drawing Desenho Técnico Diseño Técnico
INSL	IC	LE	W1	S1	D1	RE	APMX	KRINS	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
1.506	-	0.866	0.689	0.472	-	-	0.157	20	0.079	0.016	0.157	0.138	0.039	0.315	
1.453	-	0.787	0.709	0.486	-	-	0.079	20	0.059	0.039	0.079	0.138	0.059	0.236	
1.429	-	0.787	0.709	0.490	-	-	0.079	20	0.059	0.039	0.079	0.138	0.059	0.236	
1.437	-	0.787	0.709	0.490	-	-	0.079	20	0.059	0.039	0.079	0.138	0.059	0.236	
1.453	-	1.063	0.709	0.490	-	-	0.079	20	0.059	0.039	0.079	0.138	0.059	0.236	
1.477	-	0.827	0.709	0.490	-	-	0.118	20	0.059	0.039	0.079	0.157	0.079	0.236	
1.477	-	0.827	0.709	0.490	-	-	0.118	20	0.059	0.039	0.079	0.157	0.079	0.236	
1.575	-	0.787	0.787	0.394	-	-	0.138	25	0.079	0.031	0.138	0.098	0.039	0.256	
1.575	-	0.787	0.787	0.472	-	-	0.138	25	0.079	0.031	0.138	0.098	0.039	0.256	
1.437	-	0.669	0.709	0.472	-	-	0.157	15	0.059	0.014	0.157	0.079	0.039	0.197	
-	1.126	0.787	-	0.394	0.276	-	0.098	20	0.039	0.028	0.098	0.118	0.039	0.217	
-	1.126	0.787	-	0.551	0.276	-	0.098	20	0.039	0.028	0.098	0.118	0.039	0.217	
-	0.750	0.866	-	0.315	0.313	-	0.047	15	0.028	0.008	0.051	0.551	0.197	0.709	
-	1.000	1.642	-	0.453	0.362	0.063	-	-	0.472	0.079	0.984	0.031	0.020	0.063	

BAR PEELING INSERTS RANGE

Inserts Pastilhas Plaquitas	(1) Geometry code	ISO / ANSI Reference	(2) Grade code	P										M							K		
				CVD										CVD							CVD		
				L7	R2	L8	R3	U5	P1	V8	N2	S9	L9	U4	L8	U5	N2	P1	V8	V6	L5	L6	L9
				PH5115	PHG115	PH5125	PHG125	PHS225	PH5228	PHS228	PH5135	PHG135	PH5740	PHS215	PH5125	PHS225	PH5135	PH5228	PHS228	PHS240	PH5705	PH5320	PH5740
XNMJ-MP																							
 Special 85º	1123835	XNMJ 151380-MP		○		◉			◉		○				◉		○	◉					
XNMJ-MH																							
 Special 85º	1123836	XNMJ 151380-MH		○	○	◉			◉				○		◉			◉					○
XNGF-FP																							
 Special 85º	1123837	XNGF 150980-FP				○					○				○		○	◉					
XNGJ-RP																							
 Special 85º	1123834	XNGJ 151380-RP				○									○			◉					
WNGJ-MP																							
 Special 75º	1124041	WNGJ 130950-MP				◉	○		◉						◉			◉			○	◉	
RNMX-MP																							
 Round Rº	1123831	RNMX 381200-MP		○		○	◉			○					○			◉	○				
	1123832	RNMX 5018M0-MP		○		○				◉					○			○	◉				
RNMX-RP																							
 Round Rº	1123833	RNMX 5018M0-RP		○		○				○					○			◉	○				

◉ First choice | 1ª Escolha | 1ª Opción

◉ Stock Itens | Itens de stock

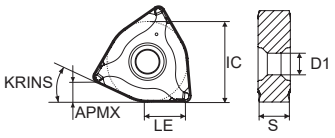
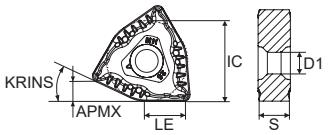
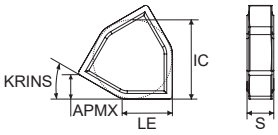
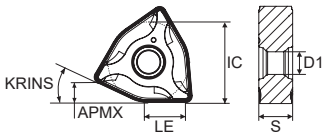
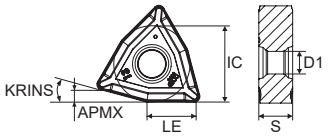
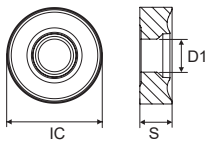
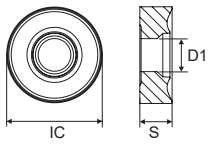
○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

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

BAR PEELING INSERTS RANGE

Negative inserts | Pastilhas negativas | Plaquitas negativas

Dimensions (in) Dimensões (in) Dimensiones (in)									Cutting Conditions Condições de Corte Condiciones de Corte						Technical Drawing Desenho Técnico Diseño Técnico
INSL	IC	LE	W1	S1	D1	RE	APMX	KRINS	AP (in)	MIN	MAX	FN (in/r)	MIN	MAX	
-	1.250	0.591	-	0.512	0.354	-	0.315	25	0.118	0.039	0.256	0.236	0.157	0.472	
-	1.250	0.591	-	0.512	0.354	-	0.315	25	0.118	0.039	0.256	0.236	0.157	0.472	
-	1.125	0.591	-	0.350	-	-	0.315	30	0.118	0.039	0.177	0.236	0.157	0.472	
-	1.250	0.591	-	0.512	0.354	-	0.315	25	0.118	0.039	0.256	0.236	0.157	0.472	
-	0.875	0.512	-	0.376	0.312	-	0.197	15	0.118	0.020	0.197	0.236	0.118	0.433	
-	1.500	-	-	0.500	0.512	-	-	-	0.157	0.079	0.315	0.079	0.039	0.157	
-	1.969	-	-	0.709	0.500	-	-	-	0.236	0.079	0.472	0.138	0.098	0.256	
-	1.969	-	-	0.709	0.500	-	-	-	0.236	0.079	0.472	0.236	0.157	0.413	



RAILWAY TURNING

Palbit is constantly investing in new technologies, research and development of cutting tools for the railway industry.

We supply a complete range of tooling solutions based on a wide experience and know-how to achieve high efficiency machining on new rails and weels as well as re-profiling, crossing rails, joints and more.

FACE TURNING



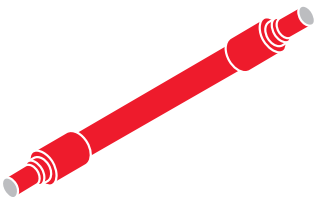
Inserts with MT-CVD coating grade and high wear resistance for the machining of forged steels providing longer tool file.



WHEEL TURNING

Inserts with special design geometry for wheel re-profiling providing productivity through a better chip evacuation. High built-up edge resistance and wear providing efficiency and increasing tool life.

EXTERNAL TURNING

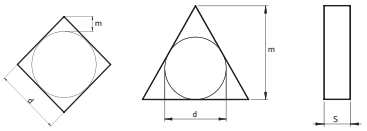


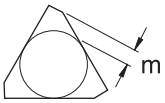
MT-CVD coating inserts with high wear resistance for turning long axle shafts.

RAILWAY 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

1- Insert shape symbol





Triangular inserts with a facet (secondary cutting edge)

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

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

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

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

3 - Tolerances symbol

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

2 - Normal clearance symbol

ISO	C	N	M	M
ANSI	C	N	M	M

4 - Insert symbol

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

RAILWAY INSERTS ISO IDENTIFICATION SYSTEM

Sistema de identificação ISO para pastilhas para a indústria ferroviária | Codificación ISO para plaquitas para ferrocarril

R's	V's (35°)	D's (55°)	C's (80°)	S's (90°)	T's (60°)	W's (80°)	IC mm	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	

5 - Insert size symbol

* 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

6 - Insert thickness symbol

19	06	12 / AN	E	N	-	HY	-	T
6	4	3	E	N	-	HY	-	T

10 - Chip breaker geometries

	HY	HZ	RMM	RRM	RHR
NEGATIVE Chip breakers					
POSITIVE Chip breakers	RM	RR	ST		
					

T	Tangential
*only when required.	

7 - Insert corner symbol

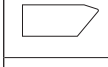
ISO	mm	inch	ANSI
00	Sharp nose		0
01	0.10	.004	0.2
02	0.20	.008	0.5
04	0.40	.015	1
08	0.80	.032	2
12	1.2	.047	3
16	1.6	.062	4
20	2.0	.078	5
24	2.4	.094	6
28	2.8	.109	7
32	3.2	.125	8
00 (inch or M0/ metric)	Round insert		0

7.1* - Insert edges symbol

For inserts having secondary edges two digits are used:

1st digit is secondary edge		2nd digit is secondary edges relief angle	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	special	F	25°
*only when required.		G	30°
		N	0°
		P	11°
		Z	special

8* - Cutting edge information

Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfered with honing	S

*only when required.

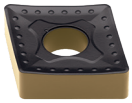
9* - Cutting direction

Shape	Hand	Symbol
	Right	R
	Left	L
	None	N

*only when required.

CN - RHOMBIC 80° NEGATIVE

RÔMBICA 80° NEGATIVA | RÓMBICA 80° NEGATIVA

			P								M							K				N	S				
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
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		△	○		🔴		🟢											🔴						

🔴 First choice | 1ª Escolha | 1ª Opción

🟢 Stock Itens | Itens de stock

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

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

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

SN - SQUARE 90° NEGATIVE

QUADRADA 90° NEGATIVA | ESQUADRA 90° NEGATIVA

			P								M							K				N	S				
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD				
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
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			○		○		🟢				🔴													
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		🟢	○	🔴	○		🟢											🔴	○					

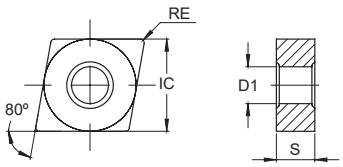
🔴 First choice | 1ª Escolha | 1ª Opción

🟢 Stock Itens | Itens de stock

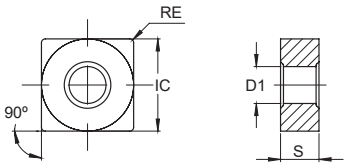
○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

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



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
CNMM 643-HY	CNMM 190612-HY	3/4	1/4	0.047	0.313	0.236	0.079	0.472	0.020	0.014	0.031
CNMM 644-HY	CNMM 190616-HY	3/4	1/4	0.063	0.313	0.236	0.079	0.472	0.024	0.014	0.039
CNMM 646-HY	CNMM 190624-HY	3/4	1/4	0.094	0.313	0.236	0.079	0.472	0.024	0.014	0.047
CNMM 866-HY	CNMM 250924-HY	1	3/8	0.094	0.359	0.315	0.098	0.591	0.028	0.016	0.055
CNMM 643-HZ	CNMM 190612-HZ	3/4	1/4	0.047	0.313	0.394	0.094	0.472	0.026	0.020	0.031
CNMM 644-HZ	CNMM 190616-HZ	3/4	1/4	0.063	0.313	0.394	0.094	0.472	0.031	0.020	0.043
CNMM 646-HZ	CNMM 190624-HZ	3/4	1/4	0.094	0.313	0.394	0.126	0.472	0.039	0.024	0.063
CNMM 866-HZ	CNMM 250924-HZ	1	3/8	0.094	0.359	0.394	0.126	0.669	0.039	0.024	0.063



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
SNMM 643-HY	SNMM 190612-HY	3/4	1/4	0.047	0.313	0.236	0.079	0.472	0.024	0.014	0.035
SNMM 644-HY	SNMM 190616-HY	3/4	1/4	0.063	0.313	0.236	0.079	0.472	0.024	0.014	0.047
SNMM 646-HY	SNMM 190624-HY	3/4	1/4	0.094	0.313	0.236	0.079	0.472	0.039	0.024	0.063
SNMM 856-HY	SNMM 250724-HY	1	5/16	0.094	0.359	0.335	0.098	0.591	0.039	0.024	0.063
SNMM 866-HY	SNMM 250924-HY	1	3/8	0.094	0.359	0.335	0.118	0.591	0.039	0.024	0.063
SNMM 643-HZ	SNMM 190612-HZ	3/4	1/4	0.047	0.313	0.394	0.094	0.512	0.024	0.014	0.035
SNMM 644-HZ	SNMM 190616-HZ	3/4	1/4	0.063	0.313	0.394	0.094	0.512	0.024	0.014	0.047
SNMM 646-HZ	SNMM 190624-HZ	3/4	1/4	0.094	0.313	0.394	0.126	0.512	0.039	0.024	0.063
SNMM 856-HZ	SNMM 250724-HZ	1	5/16	0.094	0.359	0.394	0.126	0.669	0.039	0.024	0.063
SNMM 858-HZ	SNMM 250732-HZ	1	5/16	0.126	0.359	0.394	0.126	0.669	0.047	0.031	0.071
SNMM 866-HZ	SNMM 250924-HZ	1	3/8	0.094	0.359	0.394	0.126	0.669	0.039	0.024	0.063

LNUX - RECTANGULAR 90° NEGATIVE

RECTANGULAR 90° NEGATIVA | RETANGULAR 90° NEGATIVA

			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
LNUX-RMM	1123640	LNUX 321248-RMM			○		○																			
Medium																										
LNUX-RRM	1123639	LNUX 321248-RRM		◈	○		○														○					
Roughing																										
LNUX-RHR	1123643	LNUX 321248-RHR			○		○																			
Heavy Roughing																										

◈ First choice | 1ª Escolha | 1ª Opción
◈ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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

○

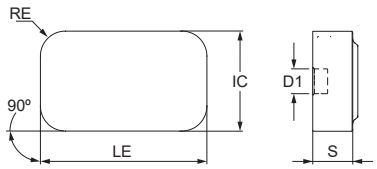
LNUX-T - TANGENTIAL 90° NEGATIVE

TANGENCIAL 90° NEGATIVA | TANGENCIAL 90° NEGATIVA

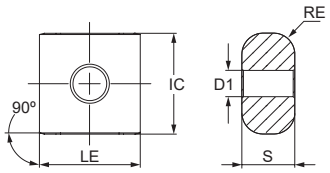
			P								M							K				N	S			
			CVD							PVD	CVD			PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	U4	U5	V6	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHS215	PHS225	PHS240	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
LNUX-RMM-T	1121953	LNUX 191940-RMM-T		◈	○	◈	○																			
	1122005	LNUX 301940-RMM-T		◈	○	◈	◈																			
Medium																										
LNUX-RRM-T	1120404	LNUX 191940-RRM-T		◈	○	◈	○																			
	1123985	LNUX 301940-RRM-T		◈	○	△	◈																			
Roughing																										
LNUX-RHR-T	1191628	LNUX 191940-RHR-T		◈	○	◈	◈																			
	1191969	LNUX 301940-RHR-T		◈	○	◈	○																			
Heavy Roughing																										

◈ First choice | 1ª Escolha | 1ª Opción
◈ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)					Cutting Conditions Condições de Corte Condiciones de Corte					
		LE	IC	RE	S	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
LNUX 321248-RMM	LNUX 321248-RMM	1 1/4	3/4	0.187	0.500	0.310	0.118	0.059	0.709	0.031	0.012	0.059
LNUX 321248-RRM	LNUX 321248-RRM	1 1/4	3/4	0.187	0.500	0.310	0.118	0.059	0.709	0.039	0.031	0.059
LNUX 321248-RHR	LNUX 321248-RHR	1 1/4	3/4	0.187	0.500	0.310	0.118	0.059	0.709	0.047	0.020	0.071



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)					Cutting Conditions Condições de Corte Condiciones de Corte					
		LE	IC	RE	S	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
LNUX 191940-RMM-T	LNUX 191940-RMM-T	3/4	3/4	0.157	0.394	0.250	0.098	0.063	0.315	0.031	0.012	0.059
LNUX 301940-RMM-T	LNUX 301940-RMM-T	1 1/6	3/4	0.157	0.472	0.250	0.118	0.063	0.472	0.031	0.012	0.059
LNUX 191940-RRM-T	LNUX 191940-RRM-T	3/4	3/4	0.157	0.394	0.250	0.217	0.098	0.394	0.039	0.031	0.059
LNUX 301940-RRM-T	LNUX 301940-RRM-T	1 1/6	3/4	0.157	0.472	0.250	0.177	0.098	0.512	0.039	0.020	0.079
LNUX 191940-RHR-T	LNUX 191940-RHR-T	3/4	3/4	0.157	0.394	0.250	0.217	0.098	0.394	0.047	0.020	0.071
LNUX 301940-RHR-T	LNUX 301940-RHR-T	1 1/6	3/4	0.157	0.472	0.250	0.256	0.118	0.591	0.047	0.020	0.071

RC - ROUND Rº POSITIVE

REDONDA Rº POSITIVA | REDONDA Rº POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	L7	5D	L8	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PH5115	PH2G115	PH5125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
RCMR-RR  Roughing to Medium	1122009	RCMR 2507M0-RR		◇		◇																						
	1122008	RCMR 3209M0-RR		◇		◇																						

◉ First choice | 1ª Escolha | 1ª Opción
◉ Stock Itens | Itens de stock
◯ Available under request | Disponível sob consulta | Disponible bajo consulta
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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

RC - ROUND Rº POSITIVE

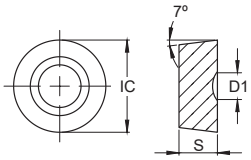
REDONDA Rº POSITIVA | REDONDA Rº POSITIVA

			P											M						K				N	S			
			CVD							PVD				CVD		PVD				UNC	CVD			UNC	PVD			
		(2) Grade code	T6	R2	5D	R3	1D	S9	V5	G1	X5	G4	T1	U4	U5	G1	X6	G4	Y3	25	L5	L6	L9	10	G1	X6	G4	Y3
Inserts Pastilhas Plaquitas	(1) Geometry code	ANSI Reference	PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG135	PHG140	PH7910	PHP910	PH7920	PHP920	PHS215	PHS225	PH7910	PHH910	PH7920	PHH920	PH0705	PH5705	PH5320	PH5740	PH0910	PH7910	PHH910	PH7920	PHH920
RCMX-ST  Roughing to Medium	1121428	RCMX 2006M0-ST		◉	◯	◉	◯	◉	◉												◉							
	1121429	RCMX 2507M0-ST			◉	◉	◯																					
	1123910	RCMX 3009M0-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				◉	◉		◉																			

◉ First choice | 1ª Escolha | 1ª Opción
◉ Stock Itens | Itens de stock
◯ Available under request | Disponível sob consulta | Disponible bajo consulta
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

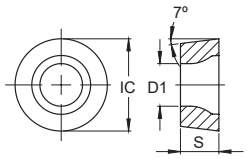
Insert Order Code: (1) Geometry code + (2) Grade code

RELIEF ANGLE 7°



ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
RCMR 2507M0-RR	RCMR 2507M0-RR	1	5/16	-	0.354	0.197	0.126	0.315	0.071	0.031	0.098
RCMR 3209M0-RR	RCMR 3209M0-RR	1 1/4	3/8	-	0.472	0.256	0.126	0.512	0.071	0.031	0.098

RELIEF ANGLE 7°

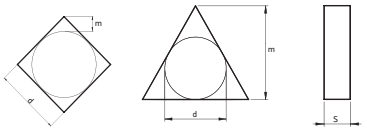


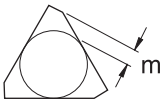
ANSI Reference	ISO Reference	Dimensions (in) Dimensões (in) Dimensiones (in)				Cutting Conditions Condições de Corte Condiciones de Corte					
		IC	S	RE	D1	AP (in)	MIN	MAX	FN (in/rev)	MIN	MAX
RCMX 2006M0-ST	RCMX 2006M0-ST	4/5	1/4	-	0.256	0.197	0.079	0.315	0.025	0.008	0.079
RCMX 2507M0-ST	RCMX 2507M0-ST	1	5/16	-	0.283	0.248	0.098	0.394	0.031	0.010	0.098
RCMX 3209M0-ST	RCMX 3209M0-ST	1 1/6	3/8	-	0.394	0.276	0.118	0.433	0.033	0.012	0.110
RCMX 3209M0-ST	RCMX 3209M0-ST	1 1/4	3/8	-	0.374	0.315	0.126	0.504	0.040	0.013	0.126
RCMX 3209M0-RM	RCMX 3209M0-RM	1 1/4	3/8	-	0.374	0.256	0.126	0.512	0.071	0.031	0.098
RCMX 2507M0-RR	RCMX 2507M0-RR	1	5/16	-	0.283	0.197	0.126	0.315	0.071	0.031	0.098
RCMX 3209M0-RR	RCMX 3209M0-RR	1 1/4	3/8	-	0.374	0.256	0.126	0.512	0.071	0.031	0.098

SCARFING 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

1- Insert shape symbol





Triangular inserts with a facet (secondary cutting edge)

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

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

Detailed dimension of M class insert
Insert height Tolerances (mm)

Inscribed circle	T	S	C	D	V
6.35	±0.08	-	-	-	-
9.525	±0.08	±0.08	±0.11	±0.10	±0.13
12.70	±0.13	±0.13	±0.13	±0.15	-
15.875	±0.15	±0.15	±0.15	±0.18	-
19.05	±0.15	±0.15	±0.15	±0.18	-
25.40	-	±0.18	-	-	-
31.75	-	±0.25	-	-	-

Inscribed circle Tolerances (mm)

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

3 - Tolerances symbol

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

2 - Normal clearance symbol

ISO	S	N	M	A
ANSI	S	N	M	A

4 - Insert symbol

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

SCARFING INSERTS ISO IDENTIFICATION SYSTEM

Sistema de identificação ISO para pastilhas de Scarfing | Codificación ISO para plaquitas de Scarfing

R's	V's (35°)	D's (55°)	C's (80°)	S's (90°)	T's (60°)	W's (80°)	IC mm	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	

5 - Insert size symbol

* 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

6 - Insert thickness symbol

15	06	12 / AN	E	N	-	R025
5	4	3	E	N	-	R025

10 - Profiling Radius

Example: R025	PRFRAD = 25

7 - Insert corner symbol

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

7.1* - Insert edges symbol

For inserts having secondary edges two digits are used:

1st digit is secondary edge		2nd digit is secondary edges relief angle	
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	special	F	25°
*only when required.		G	30°
		N	0°
		P	11°
		Z	special

8* - Cutting edge information

Shape	Honing	Symbol
	No honing	F
	With honing	E
	Chamfered No honing	T
	Chamfered with honing	S

*only when required.

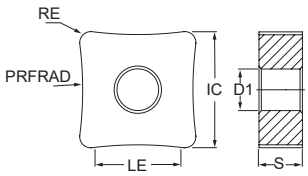
9* - Cutting direction

Shape	Hand	Symbol
	Right	R
	Left	L
	None	N

*only when required.

SCARFING - SNMA

NEGATIVE INSERTS | PASTILHAS NEGATIVAS | PLAQUITAS NEGATIVAS



				P	M	Dimensions (in) Dimensões (in) Dimensiones (in)						Tube Diameter (in)
				CVD	CVD							
		(2) Grade code		L8	L8							
Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	ANSI Reference	PH5125	PH5125	IC	S	LE	RE	D1	PRFRAD	
SNMA  Roughing	1123927	SNMA 150612-R020	SNMA 543-R020	○	○	5/8	1/4	0.394	0.047	0.250	20	0.906-1.142
	1123928	SNMA 150612-R022	SNMA 543-R022	○	○	5/8	1/4	0.394	0.047	0.250	22	0.984-1.260
	1123929	SNMA 150612-R025	SNMA 543-R025	○	○	5/8	1/4	0.394	0.047	0.250	25	1.142-1.417
	1123930	SNMA 150612-R027	SNMA 543-R027	○	○	5/8	1/4	0.394	0.047	0.250	27	1.22-1.535
	1123931	SNMA 150612-R030	SNMA 543-R030	○	○	5/8	1/4	0.394	0.047	0.250	30	1.378-1.732
	1123932	SNMA 150612-R035	SNMA 543-R035	○	○	5/8	1/4	0.394	0.047	0.250	35	1.575-2.008
	1123933	SNMA 150612-R040	SNMA 543-R040	○	○	5/8	1/4	0.394	0.047	0.250	40	1.811-2.283
	1123934	SNMA 150612-R050	SNMA 543-R050	○	○	5/8	1/4	0.394	0.047	0.250	50	2.283-2.874
	1123935	SNMA 150612-R060	SNMA 543-R060	○	○	5/8	1/4	0.394	0.047	0.250	60	2.717-3.425
	1123936	SNMA 150612-R070	SNMA 543-R070	○	○	5/8	1/4	0.394	0.047	0.250	70	3.150-3.740
	1123937	SNMA 190612-R030	SNMA 643-R030	○	○	3/4	1/4	0.472	0.047	0.313	30	1.378-1.732
	1123938	SNMA 190612-R040	SNMA 643-R040	○	○	3/4	1/4	0.472	0.047	0.313	40	1.811-2.283
	1123939	SNMA 190612-R050	SNMA 643-R050	○	○	3/4	1/4	0.472	0.047	0.313	50	2.283-2.874
	1123940	SNMA 190612-R060	SNMA 643-R060	○	○	3/4	1/4	0.472	0.047	0.313	60	2.717-3.425
	1123941	SNMA 190612-R070	SNMA 643-R070	○	○	3/4	1/4	0.472	0.047	0.313	70	3.150-3.740
	1123942	SNMA 190612-R080	SNMA 643-R080	○	○	3/4	1/4	0.472	0.047	0.313	80	3.622-0.630
	1123943	SNMA 190612-R090	SNMA 643-R090	○	○	3/4	1/4	0.472	0.047	0.313	90	0.394-1.220
	1123944	SNMA 250924-R000	SNMA 866-R000	○	○	1	3/8	0.669	0.094	0.359	0	-
	1123945	SNMA 250924-R060	SNMA 866-R060	○	○	1	3/8	0.669	0.094	0.359	60	2.717-3.425
	1123946	SNMA 250924-R070	SNMA 866-R070	○	○	1	3/8	0.669	0.094	0.359	70	3.150-3.740
	1123947	SNMA 250924-R080	SNMA 866-R080	○	○	1	3/8	0.669	0.094	0.359	80	3.622-0.630
	1123948	SNMA 250924-R100	SNMA 866-R100	○	○	1	3/8	0.669	0.094	0.359	100	0.433-1.772
	1123949	SNMA 250924-R150	SNMA 866-R150	○	○	1	3/8	0.669	0.094	0.359	150	0.630-0.591
	1123950	SNMA 250924-R200	SNMA 866-R200	○	○	1	3/8	0.669	0.094	0.359	200	0.906-3.543

First choice | 1ª Escolha | 1ª Opción

Stock Itens | Itens de stock

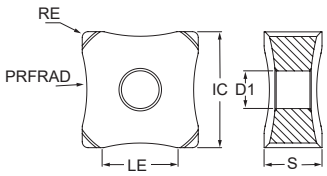
○ Available under request | Disponível sob consulta | Disponible bajo consulta

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

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

SCARFING - SNMX

NEGATIVE INSERTS | PASTILHAS NEGATIVAS | PLAQUITAS NEGATIVAS



Inserts Pastilhas Plaquitas	(1) Geometry code	(2) Grade code ISO Reference	(2) Grade code ANSI Reference	P CVD L8 PH5125	M CVD L8 PH5125	Dimensions (in) Dimensões (in) Dimensiones (in) IC	S	LE	RE	D1	PRFRAD	Tube Diameter (in)
	1123879	SNMX 150708-R000	SNMX 552-R000	○	○	5/8	5/16	0.394	0.031	0.203	0	-
	1123880	SNMX 150708-R007	SNMX 552-R007	○	○	5/8	5/16	0.394	0.031	0.203	7	0.315-0.394
	1123881	SNMX 150708-R009	SNMX 552-R009	○	○	5/8	5/16	0.394	0.031	0.203	9	0.394-0.512
	1123882	SNMX 150708-R011	SNMX 552-R011	○	○	5/8	5/16	0.394	0.031	0.203	11	0.512-0.630
	1123883	SNMX 150708-R013	SNMX 552-R013	○	○	5/8	5/16	0.394	0.031	0.203	13	0.591-0.748
	1123884	SNMX 150708-R015	SNMX 552-R015	○	○	5/8	5/16	0.394	0.031	0.203	15	0.669-0.866
	1123885	SNMX 150708-R018	SNMX 552-R018	○	○	5/8	5/16	0.394	0.031	0.203	18	0.827-1.024
	1123886	SNMX 150708-R020	SNMX 552-R020	◬	◬	5/8	5/16	0.394	0.031	0.203	20	0.906-1.142
	1123887	SNMX 150708-R022	SNMX 552-R022	○	○	5/8	5/16	0.394	0.031	0.203	22	0.984-1.260
	1123888	SNMX 150708-R025	SNMX 552-R025	○	○	5/8	5/16	0.394	0.031	0.203	25	1.142-1.417
	1123889	SNMX 150708-R027	SNMX 552-R027	○	○	5/8	5/16	0.394	0.031	0.203	27	1.22-1.535
	1123890	SNMX 150708-R030	SNMX 552-R030	○	○	5/8	5/16	0.394	0.031	0.203	30	1.378-1.732
	1123891	SNMX 150708-R035	SNMX 552-R035	○	○	5/8	5/16	0.394	0.031	0.203	35	1.575-2.008
	1123892	SNMX 150708-R040	SNMX 552-R040	○	○	5/8	5/16	0.394	0.031	0.203	40	1.811-2.283
	1123893	SNMX 150708-R045	SNMX 552-R045	○	○	5/8	5/16	0.394	0.031	0.203	45	2.047-2.559
	1123894	SNMX 150708-R050	SNMX 552-R050	○	○	5/8	5/16	0.394	0.031	0.203	50	2.283-2.874
	1123895	SNMX 150708-R060	SNMX 552-R060	○	○	5/8	5/16	0.394	0.031	0.203	60	2.717-3.425
SNMX	1124461	SNMX 150708-R070	SNMX 552-R070	○	○	5/8	5/16	0.394	0.031	0.203	70	3.150-3.740
	1124462	SNMX 150708-R075	SNMX 552-R075	○	○	5/8	5/16	0.394	0.031	0.203	75	3.386-0.079
	1123896	SNMX 190912-R000	SNMX 663-R000	○	○	3/4	14/39	0.472	0.047	0.250	0	-
	1122012	SNMX 190912-R020	SNMX 663-R020	◬	◬	3/4	14/39	0.472	0.047	0.250	20	0.906-1.142
	1123897	SNMX 190912-R030	SNMX 663-R030	◬	◬	3/4	14/39	0.472	0.047	0.250	30	1.378-1.732
	1123898	SNMX 190912-R040	SNMX 663-R040	◬	◬	3/4	14/39	0.472	0.047	0.250	40	1.811-2.283
	1123899	SNMX 190912-R050	SNMX 663-R050	◬	◬	3/4	14/39	0.472	0.047	0.250	50	2.283-2.874
	1122013	SNMX 190912-R060	SNMX 663-R060	○	○	3/4	14/39	0.472	0.047	0.250	60	2.717-3.425
	1123900	SNMX 190912-R070	SNMX 663-R070	○	○	3/4	14/39	0.472	0.047	0.250	70	3.150-3.740
	1123901	SNMX 190912-R080	SNMX 663-R080	○	○	3/4	14/39	0.472	0.047	0.250	80	3.622-0.630
	1123902	SNMX 190912-R090	SNMX 663-R090	○	○	3/4	14/39	0.472	0.047	0.250	90	0.394-1.220
	1123903	SNMX 190912-R100	SNMX 663-R100	○	○	3/4	14/39	0.472	0.047	0.250	100	0.433-1.772
	1123864	SNMX 251216-R000	SNMX 884-R000	◬	◬	1	1/2	0.669	0.063	0.359	0	-
	1123904	SNMX 251216-R050	SNMX 884-R050	◬	◬	1	1/2	0.669	0.063	0.359	50	2.283-2.874
	1122015	SNMX 251216-R080	SNMX 884-R080	◬	◬	1	1/2	0.669	0.063	0.359	80	3.622-0.630
	1123905	SNMX 251216-R090	SNMX 884-R090	◬	◬	1	1/2	0.669	0.063	0.359	90	0.394-1.220
	1123906	SNMX 251216-R100	SNMX 884-R100	◬	◬	1	1/2	0.669	0.063	0.359	100	0.433-1.772
	1122016	SNMX 251216-R120	SNMX 884-R120	◬	◬	1	1/2	0.669	0.063	0.359	120	0.512-2.913
	1123907	SNMX 251216-R150	SNMX 884-R150	◬	◬	1	1/2	0.669	0.063	0.359	150	0.630-0.591
	1123908	SNMX 251216-R200	SNMX 884-R200	◬	◬	25.40	12.70	17	1.6	9.12	200	0.906-3.543
	1123909	SNMX 251216-R250	SNMX 884-R250	◬	◬	25.40	12.70	17	1.6	9.12	250	1.063-0.591



Medium to Finishing

◬ First choice | 1ª Escolha | 1ª Opción

◬ Stock Itens | Itens de stock

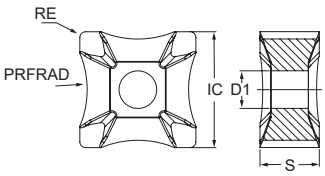
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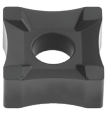
◬ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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

SCARFING - SNMG

NEGATIVE INSERTS | PASTILHAS NEGATIVAS | PLAQUITAS NEGATIVAS



				P	M	Dimensions (in) Dimensões (in) Dimensiones (in)						Tube Diameter (in)
				CVD	CVD							
		(2) Grade code		L7	L8							
Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	ANSI Reference	PH5115	PH5125	IC	S	A	Re	D1	PRFRAD	
SNMG  Finishing	1123951	SNMG 15M808-R000	SNMG 55.12-R000	○	○	5/8	17/53	0.394	0.031	0.203	0	-
	1123952	SNMG 15M808-R007	SNMG 55.12-R007	○	○	5/8	17/53	0.394	0.031	0.203	7	0.315-0.394
	1123953	SNMG 15M808-R009	SNMG 55.12-R009	○	○	5/8	17/53	0.394	0.031	0.203	9	0.394-0.512
	1123954	SNMG 15M808-R011	SNMG 55.12-R011	◎	○	5/8	17/53	0.394	0.031	0.203	11	0.512-0.630
	1123955	SNMG 15M808-R013	SNMG 55.12-R013	◎	○	5/8	17/53	0.394	0.031	0.203	13	0.591-0.748
	1123956	SNMG 15M808-R015	SNMG 55.12-R015	◎	○	5/8	17/53	0.394	0.031	0.203	15	0.669-0.866
	1123957	SNMG 15M808-R018	SNMG 55.12-R018	◎	○	5/8	17/53	0.394	0.031	0.203	18	0.827-1.024
	1123958	SNMG 15M808-R020	SNMG 55.12-R020	◎	○	5/8	17/53	0.394	0.031	0.203	20	0.906-1.142
	1123959	SNMG 15M808-R022	SNMG 55.12-R022	○	○	5/8	17/53	0.394	0.031	0.203	22	0.984-1.260
	1123960	SNMG 15M808-R025	SNMG 55.12-R025	◎	○	5/8	17/53	0.394	0.031	0.203	25	1.142-1.417
	1123961	SNMG 15M808-R027	SNMG 55.12-R027	◎	○	5/8	17/53	0.394	0.031	0.203	27	1.22-1.535
	1123962	SNMG 15M808-R030	SNMG 55.12-R030	◎	○	5/8	17/53	0.394	0.031	0.203	30	1.378-1.732
	1123963	SNMG 15M808-R035	SNMG 55.12-R035	◎	○	5/8	17/53	0.394	0.031	0.203	35	1.575-2.008
	1123964	SNMG 15M808-R040	SNMG 55.12-R040	◎	○	5/8	17/53	0.394	0.031	0.203	40	1.811-2.283
	1123965	SNMG 15M808-R045	SNMG 55.12-R045	◎	○	5/8	17/53	0.394	0.031	0.203	45	2.047-2.559
	1123966	SNMG 15M808-R050	SNMG 55.12-R050	○	○	5/8	17/53	0.394	0.031	0.203	50	2.283-2.874
	1123967	SNMG 15M808-R060	SNMG 55.12-R060	◎	○	5/8	17/53	0.394	0.031	0.203	60	2.717-3.425
	1123968	SNMG 19M808-R000	SNMG 65.13-R000	○	○	3/4	17/53	0.472	0.031	0.315	20	-
	1123969	SNMG 19M808-R010	SNMG 65.13-R010	○	○	3/4	17/53	0.472	0.031	0.315	10	0.472-0.591
	1123970	SNMG 19M808-R020	SNMG 65.13-R020	◎	○	3/4	17/53	0.472	0.031	0.315	20	0.906-1.142
	1123971	SNMG 19M808-R030	SNMG 65.13-R030	◎	○	3/4	17/53	0.472	0.031	0.315	30	1.378-1.732
	1123972	SNMG 19M808-R040	SNMG 65.13-R040	○	○	3/4	17/53	0.472	0.031	0.315	40	1.811-2.283
	1123973	SNMG 19M808-R050	SNMG 65.13-R050	○	○	3/4	17/53	0.472	0.031	0.315	50	2.283-2.874
	1123974	SNMG 19M808-R060	SNMG 65.13-R060	○	○	3/4	17/53	0.472	0.031	0.315	60	2.717-3.425
	1123975	SNMG 19M808-R070	SNMG 65.13-R070	○	○	3/4	17/53	0.472	0.031	0.315	70	3.150-3.740
	1123976	SNMG 19M808-R080	SNMG 65.13-R080	○	○	3/4	17/53	0.472	0.031	0.315	80	3.622-0.630
	1123977	SNMG 19M808-R090	SNMG 65.13-R090	○	○	3/4	17/53	0.472	0.031	0.315	90	0.394-1.220
	1123978	SNMG 19M808-R100	SNMG 65.13-R100	○	○	3/4	17/53	0.472	0.031	0.315	100	0.433-1.772

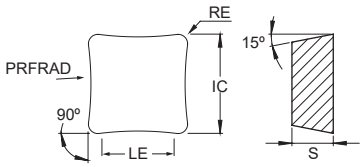
◎ First choice | 1ª Escolha | 1ª Opción
◎ Stock Itens | Itens de stock
○ Available under request | Disponível sob consulta | Disponible bajo consulta
◇ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

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

SCARFING - SDMX

POSITIVE INSERTS | PASTILHAS POSITIVAS | PLAQUITAS POSITIVAS

RELIEF ANGLE 15°



				P	M	Dimensions (in) Dimensões (in) Dimensiones (in)						Tube Diameter (in)
				CVD	CVD							
		(2) Grade code		L8	9B							
Inserts Pastilhas Plaquitas	(1) Geometry code	ISO Reference	ANSI Reference	PH5125	PHY125	IC	S	LE	RE	D1	PRFRAD	
SDMX  Medium to Finishing	1124752	SDMX 250616-R000	SDMX 250616-R000	○	○	1	1/4	0.787	0.063	-	0	-
	1124822	SDMX 250616-R080	SDMX 250616-R080	○	◬	1	1/4	0.787	0.063	-	80	3.622-0.630
	1124753	SDMX 250616-R180	SDMX 250616-R180	○	○	1	1/4	0.787	0.063	-	180	8.268-10.630
	1124754	SDMX 250616-R300	SDMX 250616-R300	○	◬	1	1/4	0.787	0.063	-	300	13.386-16.142
	1124755	SDMX 250616-R400	SDMX 250616-R400	○	○	1	1/4	0.787	0.063	-	400	17.323-20.472
	1124756	SDMX 250616-R550	SDMX 250616-R550	○	○	1	1/4	0.787	0.063	-	550	23.622-27.559
	1124757	SDMX 350900-R000	SDMX 350900-R000	○	○	1 3/8	17/45	1.181	-	-	0	-
	1124758	SDMX 350900-R105	SDMX 350900-R105	○	○	1 3/8	17/45	1.181	-	-	105	4.528-5.709
	1124759	SDMX 350900-R145	SDMX 350900-R145	○	○	1 3/8	17/45	1.181	-	-	145	6.299-8.268
	1124760	SDMX 350900-R300	SDMX 350900-R300	○	○	1 3/8	17/45	1.181	-	-	300	13.386-16.142
	1124761	SDMX 350900-R400	SDMX 350900-R400	○	○	1 3/8	17/45	1.181	-	-	400	17.323-20.472
	1124762	SDMX 350900-R550	SDMX 350900-R550	○	○	1 3/8	17/45	1.181	-	-	550	23.622-27.559

First choice | 1ª Escolha | 1ª Opción

Stock Itens | Itens de stock

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

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

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



TECHNICAL DATA

TECHNICAL DATA

1 TURNING GRADES
> See page C - 612

2 TURNING GRADES DESCRIPTION
> See page C - 614

3 GRADE COMPARATIVE CHART
> See page C - 616

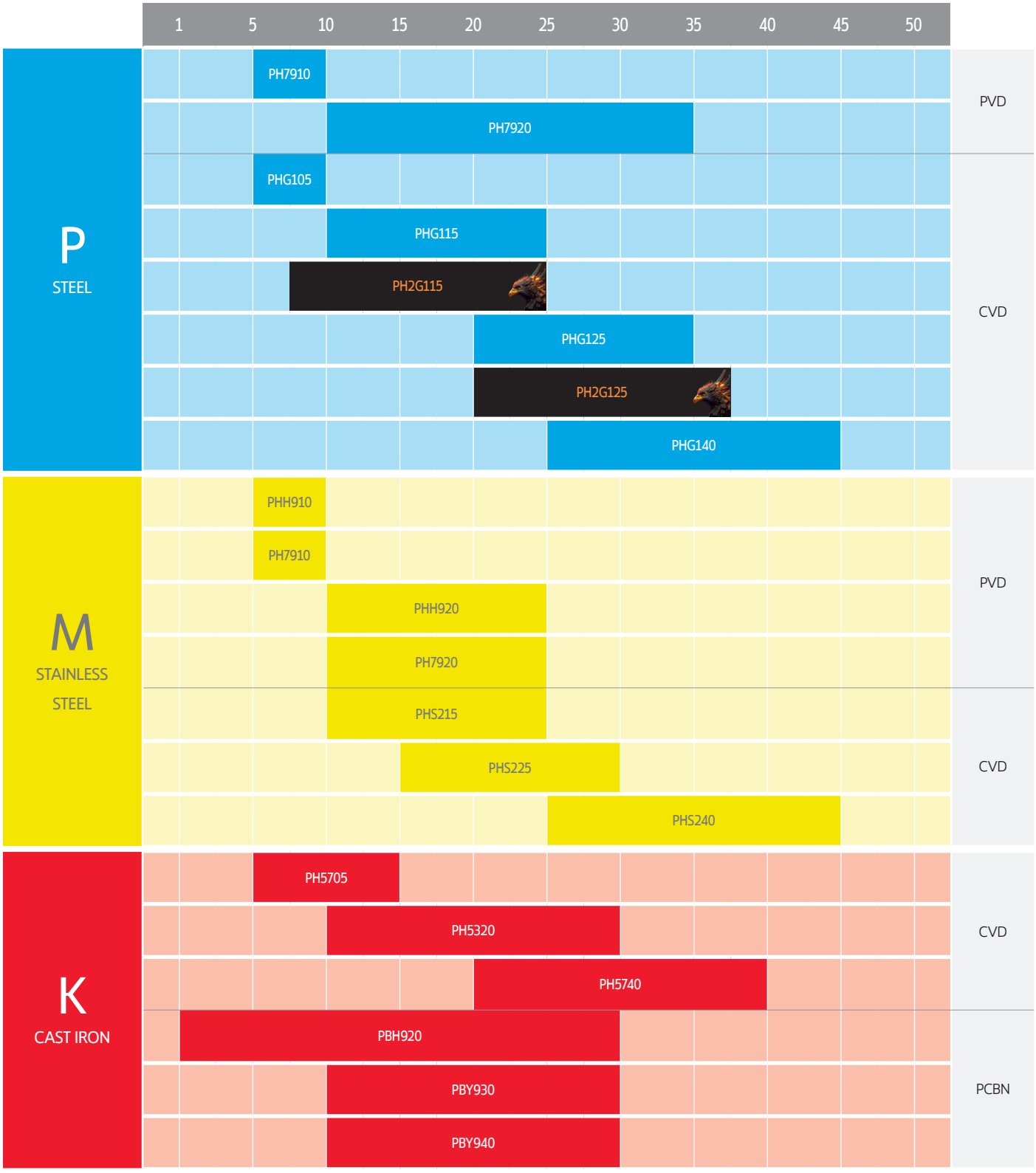
4 CHIP BREAKER SPECIFICATIONS
> See page C - 620

5 CHIP BREAKER COMPARATIVE CHART
> See page C - 630

6 WIPER CONCEPT
> See page C - 632

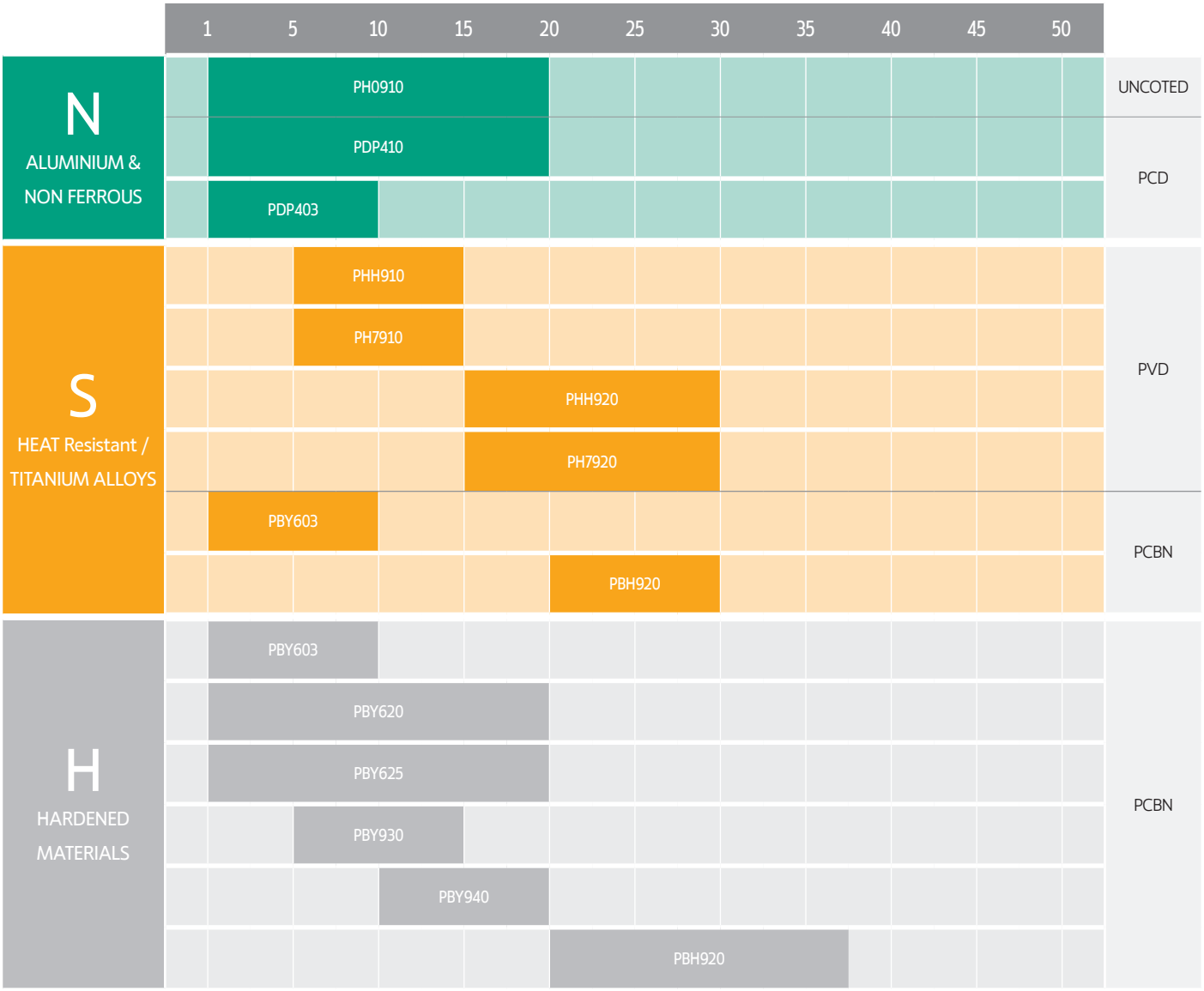
7 CUTTING SPEED
> See page C - 633

TURNING GRADES



TURNING GRADES

Graus para torneamento | Calidades para torneado



TURNING GRADES DESCRIPTION

PVD GRADES

PHH...



An exceptionally durable PVD coating boasts superior thermal stability, ensuring outstanding wear resistance and performance.
1st choice for finishing operations on stainless steels and HRSA materials.

WEAR RESISTANCE — TOUGHNESS

PHH910
M05-M10
S05-S15

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

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

PHH920
M10-M25
S15-S30

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

Solution for general turning of stainless steels and HRSA.

PH7...

A thin PVD coating is recommended for finishing operations on steel and suitable for stainless steels and HRSA.

WEAR RESISTANCE — TOUGHNESS

PH7910
P05-P10
M05-M10
S05-S15

PH7920
P10-P35
M10-M25
S15-S30

UNCOATED

PH0910

Uncoated carbide micro-grain grade, characterized by excellent resistance to abrasive wear and toughness, making it suitable for a wide range of machining operations, from rough to finishing, specifically tailored for aluminum alloys.

PH0910
N01-N20

CVD GRADES

PHS...



CVD coating with excellent resistance to thermal and mechanical shock, providing exceptional performance for both continuous and interrupted turning.
1st Choice for stainless steel turning from semi-finishing to roughing.

WEAR RESISTANCE — TOUGHNESS

PHS215
M10-M25

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

PHS225
M15-M30

First choice for general application on turning of stainless steel.

PHS240
M25-M45

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

TURNING GRADES DESCRIPTION

Descrição de graus para torneamento | Descripción de calidades para torneado

PHG... | PH2G...

PH2G grade series is an innovative combination of a highly dense and hard nanostructured coating base material, including new Al_2O_3 layer with improved wear resistance which provides superior performance during high-speed turning operations.
1st choice for steel turning operations.



WEAR RESISTANCE → TOUGHNESS

PHG105	PHG115	PH2G115	PHG125	PH2G125	PHG140
P05-P10	P10-P25	P10-P25	P20-P35	P20-P35	P25-P45
First option for continuous cut with hardness higher than 38HRC.	Suitable for high to medium cutting speeds on steels.	For finishing to roughing operations with high cutting speeds in continuous cutting applications.	Ideal for general application in all kind of steels.	Ideal for general applications in all kind of steels with high metal removal rates.	First choice for roughing to heavy roughing operations with interrupted cut at medium to low cutting speeds.

PH5...

CVD coating with excellent flank wear resistance, ensuring excellent performance during continuous and interrupted cutting processes on cast iron materials.

WEAR RESISTANCE → TOUGHNESS

PH5705	PH5320	PH5115	PH5125	PH5740
K05-K15	P01-P15 K10-K30	P10-P25	P20-P35	K20-K40

PCBN

PCBN sets new benchmarks in continuous and intermittent cutting with its exceptional wear resistance. It provides unmatched performance in hot hardness, toughness, and chemical stability.
1st choice for operations on hard and/or abrasive highly abrasive materials.



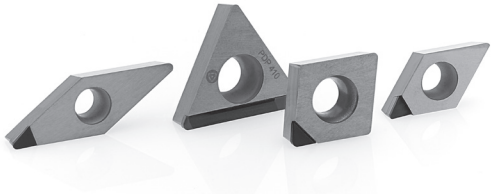


PBY603	PBY620	PBY930	PBY940	PBH920
S01-S10 H01-H10	H10-H20	H20-H30	H20-H30	K01-K30 S20-S30
Machining of hardened materials in high continuous cut up to 180m/min cutting speed.	Machining of hardened materials in light to heavy interrupted cuts.	High wear resistance and impact thougness. Excels in white iron and steel rolls machining.	For machinning high chrome alloy steels and Ni-hard cast iron.	For machining all types of cast iron. First choice for machining ferrous powder metals.

PCD

Diamond particles sintered into a polycrystalline structure yield a robust, wear-resistant material with excellent thermal conductivity.
1st choice for operations on non-ferrous materials, such as high-silicon aluminium. Metal matrix composites (MMC) and carbon fiber reinforced plastics (CRFP).

PDP410	PDP403
N01-N20	N01-N10
General purpose Fine surface finishing. <14% silicon aluminium alloy	Highest abrasion resistance Bimodal grain structure for increased diamond percentage content. >14% silicon aluminium alloy



GRADES COMPARATIVE CHART

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	P05	**PHG105**	GC4305	KCP05B KC9105	IC9150 IS8080 IC428	TP0500 TP1500	UE6105 MC6005	ACP810P AC700G	T9105 T9005	WPP01	CA510 CA5505	TT1300 TT8105	NC3010	
	P10	**PHG105** **PHG115** **PH2G115**	GC4215 GC4315 GC4415	KCP10B KCP10 KCP25 KCP25C KC9110	IC9150 IC9015 IC8150 IC8250	TP1500 TP1501 TP2500	UE6105 MC6015 MC6115 UE6110 MY5015	AC810P AC8015P AC700G AC820P AC2000	T6215 T9105 T9005 T9115 T9215	WPP05 WPP10S WPP10G	CAS510 CA115P CA5505 CA515 CA5515	TT1300 TT7310 TT7400 TT8115 TT8115B	NC3215	CTC1110 CTC1115 CTC3110 TCC410
	P20	**PHG115** **PH2G115** **PHG125** **PH2G125**	GC4215 GC4315 GC4415 GC4225 GC4325 GC4425	KCP25B KCP25 KCP25C KC9125	IC9015 IC8250 IC9050 IC9250 IC8350	TP1501 TP2500 TP2501	MC6015 MC6115 UE6110 MC6025 MC6125 UE6020 MY5015	AC8015P AC8025P AC820P AC2000 AC830P	T6215 T6225 T9115 T9215 T9125 T9225	WPP10S WPP10G WPP20S WPP20G	CA115P CA515 CA5515 CA525 CA5525 CA6525 CR9025	TT3500 TT5100 TT7400 KT7300 TT7800 TT8115B	NC3220 NC3220 NC3120	CTC1110 CTC1115 CTC1125 CTC1130 CTC1425
	P30	**PHG125** **PH2G125**	GC4225 GC4325 GC4425 GC4335	KCP25B KCP25C KCP30 KCP40 KCP8050	IC8250 IC8350 IC9250 IC9350	TP2500 TP2501 TP3500 TP3000	MC6025 MC6125 UE6020 UE6035 UH6400	AC8025P AC830P AC630M	T6225 T9125 T9225 T9135 T9035	WPP20S WPP20G WPP30S WPP30G	CA525 CA5525 CA6525 CA530 CA5335 CR9025	TT3500 TT5100 TT7400 TT8125B KT7300	NC3215 NC3225 NC3120	CTC1125 CTC1130 CTC1135 CTC1425
	P40	**PH5740** **PHG140**	GC4235 GC4335	KCP30B KCP40B KC9140 KC9040 KC9240 KC9245	IC8350 IC9350	TP3500 TP3000	MC6030 UE6035 UH6400	AC630M	T9135 T9035	WPP30S	CA530 CA5535	TT5100 TT7100 TT8135 KT7300 TT7800	NC500H NC5330	CTC1135 CTC1435 CTC2135
M STAINESS STEEL	M10	**PHS215**	GC2015	KCM15	IC9250 IC6015 IC8250	TM2000	MC7015 US7020	AC610M AC620M	T6120 T9115 T9215	WMP10S WAM20	CA6515		NC9020	CTC1110 CTC1115
	M20	**PHS215** **PHS225**	GC2015 GC2220	KCM15 KCM25 KC9225	IC9250 IC6015 IC6025 IC9025 IC656	TM2000 TM4000	MC7015 US7020 MC7025	AC610M AC620M AC6030M AC630M	T6020 T6120 T6130 T9125 T9215	WMP10S WMP20S	CA6515 CA6525	TT5100 TT9225	NC9020	CTC1115 CTC1125 CTC1130 CTC1135
	M30	**PHS225** **PHS240**	GC2025 GC2220	KCM25 KCM35 KC9230	IC9350 IC6025 IC635	TM4000	MC7025 MC7035 US735	AC6030M AC6040M AC630M	T6030 T6130	WMP20S WMP30	CA6525	TT5100 TT7100 TT9225 TT9235	NC9025	CTC1125 CTC1135 CTC1425 CTC1435 CTC2135
	M40	**PHS240**	GC2025	KCM35 KC9240 KC9245	IC6025 IC9350	TM4000	MC7035 US735	AC6030M AC6040M AC630M		WMP30		TT7100 TT9235	NC9025	CTC2135
	M50	**PHS228**	GC2035	KC9245	IC9350								NC9035	
K CAST IRON	K05	**PH5705**	GC3205 GC3210	KCK05 KC9315	IC5005 IC9007	TH1500 TK1001 TK1000 TK1501	MC5005 UC5105	AC405K AC4010K	T5105	WAK10 WVK10	CA310 CA4505 CA4010	TT7005		
	K10	**PH5705** **PH5320**	GC3205 GC3210 GC3215	KCK15B KCK15B KC920 KC9315 KC9325	IC5005 IC5010 IC9150 IC428 IC4028	TK1001 TK1000 TK1501 TK2000 TK2001 TK2501	MC5015 UC5105 UC5115 MY5015	AC405K AC4010K AC4015K AC420K AC700G	T5105 T5115	WVK10 WAK20 WVK20	CA310 CA315 CA320 CA4515 CA4110 CA4115	TT7005 TT7015 TT3100 TT7310 TT8115	NC6205 NC6210 NC6215	CTC1110 CTC1115 CTC3110 TCC410 CTC3215
	K20	**PH5320**	GC3215	KCK20 KC9110 KC9325	IC5010 IC8150 IC9150 IC9015 IC418	TK2001 TK2000 TK2501	MC5015 UC5115 UE6110 MY5015	AC4015K AC420K AC700G AC820P	T5115 T5125	WVK20 WAK30	CA315 CA320 CA4515 CA4115 CA4120	TT7310 TT7015 TT8115	NC6215	CTC1115 CTC1125 CTC1130 CTC1425 CTC3215
	K30	**PH5740**		KC9125 KC9325	IC9015 IC418		UE6110	AC820P	T5125					TSC30

palbit

GRADES COMPARATIVE CHART

Tabela comparativa de graus | Tabla de comparación de calidades

UNCOATED GRADES | Graus não revestidos | Calidades sin recubrimiento

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

GRADES COMPARATIVE CHART

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
M STAINESS STEEL	M01	**PH7910** **PHH910**	GC1005		IC520	TS2000 CP200	VP10MF			WSM10S	PR915	TT5080		
	M10	**PH7910** **PHH910**	GC1005 GC1025 GC1115 GC1125 GC1105	KC5010 KC5510 KC6005 KC6015	IC330 IC354 IC507 IC520 IC570 IC807 IC907 IC3028	CP200 TS2000	VP10MF		AH710	WSM20S	PR915 PR1025 PR1225 PR1425	TT5030 PV3010 PV3030 TT9030	PC8110 PC9030	
	M20	**PH7920** **PHH920**	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	WSM30S	PR1025 PR1125 PR1225 PR915 PR930	TT5030 PV3030 TT9020 TT9030	PC9030 PC8110 PC8115	CTP2120 CTP1235 SR226 GM127
	M30	**PH7920** **PHH920**	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

palbit

GRADES COMPARATIVE CHART

Tabela comparativa de graus | Tabla de comparación de calidades

ISO		Palbit	Sandvik	Kennametal	Iscar	Seco	Mitsubishi	Sumitomo	Tungaloy	Walter	Kyocera	Taegutec	Korloy	Ceratizit
Material														
S	S01	**PH7910 PHH910**			IC507 IC907		MP9005 VP05RT		AH905 AH905 SH730	WDSM10S	PR915		PC8110	
	S10	**PH7910 PHH910**	GC1105 GC1115 GC1005 GC1025	KC5010 KC5410 KC5510	IC507 IC903 IC300 IC808	CP200 CP250 TS2000 TS2500 CP250	MP9015 VP10RT MP9015	AC510U	AH110 AH120	WSM20S	PR915	TT5030 TT5030	PC8110 PC8115 PC8105	CM40 SR226 CM45
HRSA	S20	**PH7920 PHH920**	GC1025 GC1125	KC5025 KC5525	IC908 IC928 IC3028 IC806	TS2500 CP500	MT9015 VP20RT	AC510U AC520U	AH120 AH720	WSM30S	PR1125	TT8020 TT8030	PC8815 PC5300	CTP2440 GM127
	S30	**PH7920 PHH920**	GC1125				VP15TF	AC520U	AH725		PR1125	TT8020	PC5400	CTP2135

CHIP BREAKER SPECIFICATIONS

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 (in/rev)	Cutting Conditions** Deph of cut DOC (in)	Available Shapes KN__ 55°	CN__ 80°	DN__ 55°	RN__	SN__ 90°	TN__ 60°	VN__ 35°	WN__ 80°
Knux´s	Finishing	U	P M K	01	2,6 4°	1 12°	0.008 to 0.014	0.039 to 0.236	●							
	Medium	U	P M K	02	3,7 4°	0,30 12°	0.016 to 0.028	0.059 to 0.236	●							
NEGATIVES - double side	Medium to Finishing	M	P M	01	6°	12°	0.005 to 0.020	0.039 to 0.256			●			●		
	Roughing to Medium	M	P M	02	10°	12°	0.006 to 0.020	0.028 to 0.197			●					
	Medium to Finishing	M	P M	03	0,20 15°	0,20 15°	0.006 to 0.020	0.031 to 0.236			●					
	Fine Finishing	M	M S	NEW GSF	14°	0,125 24°	0.003 to 0.006	0.004 to 0.098		●				●	●	●
	Finishing	M	P	MF	15°	0,22 12°	0.002 to 0.024	0.004 to 0.098		●	●		●	●	●	●
	Medium to Finishing	M	M N S	MS	13°	13°	0.003 to 0.031	0.008 to 0.177		●	●			●	●	●
		M	M S	SF	0,3 20° 10°	0,3 20° 10°	0.004 to 0.022	0.024 to 0.118		●	●		●	●	●	●
		M	P	LC	0,15 18°	0,2 10°	0.003 to 0.020	0.024 to 0.118		●	●			●	●	●
	Medium		M S	GS	0,4 15°	0,4 15°	0.004 to 0.024	0.016 to 0.079		●	●		●	●	●	●
	Medium Finishing	M	K	ST	0,2 15°	0,2 15°	0.004 to 0.020	0.006 to 0.413		●	●	●	●	●	●	●
	Medium Finishing	M	P	MR	0,2 22° 6°	0,2 22° 6°	0.004 to 0.028	0.012 to 0.354		●	●		●	●	●	●

* T-Land varies according to the IC (IC reference used: 1/2in)
** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

CHIP BREAKER SPECIFICATIONS

Especificações de quebra-aparas | Especificaciones de rompevirutas

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 (in/rev)	Cutting Conditions** Deph of cut DOC (in)	Available Shapes KN__ 55°	CN__ 80°	DN__ 55°	RN__	SN__ 90°	TN__ 60°	VN__ 35°	WN__ 80°
NEGATIVES - double side	Medium	M	P	PM	0.25, 15° 7°	0.25, 15° 7°	0.004 to 0.024	0.012 to 0.354		●	●			●		●
	Medium Wiper	M	P K	MW	0,3, 16°	0,3, 16°	0.006 to 0.035	0.012 to 0.236		●	●			●		●
	Roughing	M	K	Flat	0°	0°	0.003 to 0.098	0.004 to 0.591		●	●	●	●	●	●	●
	Roughing to Medium	M	P	MA	0,3, 25°	0,3, 25°	0.012 to 0.028	0.047 to 0.315		●						
		M	M S	SS	0,3, 20° 10°	0,3, 20° 10°	0.004 to 0.039	0.012 to 0.335		●	●		●	●	●	●
	Roughing	M	P M K	HR	0,32, 18°	0,32, 18°	0.008 to 0.047	0.031 to 0.591		●	●		●	●		●
		M	P M	RP	0,25, 20°	0,30, 20°	0.012 to 0.059	0.079 to 0.472		●			●			
NEGATIVES - Single side		M	P	GR	0,25, 20°	0,30, 20°	0.008 to 0.059	0.031 to 0.315		●						
	Heavy to Roughing	M	P M	HY	0,5, 0,2, 17° 8°	0,5, 0,2, 17° 8°	0.014 to 0.063	0.079 to 0.591		●			●			
		M	P K	HZ	0,53, 0,2, 18° 15°	0,53, 0,2, 18° 15°	0.014 to 0.063	0.094 to 0.669		●			●			

* T-Land varies according to the IC (IC reference used: 1/2in)
** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

CHIP BREAKER SPECIFICATIONS

POSITIVES | Positivas | Positivas

Insert Type	Application	Tolerance Class	Major field of Application	Geometry	Cutting Edge* at the nose radius	Cutting Edge* at the flank	Cutting Conditions** Feed Fn (in/rev)	Cutting Conditions** Depth of cut DOC (in)	Available Shapes CC __ 80°	DC __ 55°	RC __	SC __ 90°	TC __ 60°	VC __ 35°	VB __ 35°
POSITIVES - Clearance angle 5° and 7°	Fine Finishing	M	M S	NEW FF	5°	15°	0.002 to 0.018	0.003 to 0.079	●	●					●
	Finishing to Fine finishing	G	P M S	FS	0,13 20° 8°	6°	0.000 to 0.010	0.004 to 0.118	●	●			●	●	
	Finishing	M	K	Flat	0°	0°	0.002 to 0.031	0.002 to 0.248	●	●		●	●	●	●
		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	0,07 18°	0,1 18°	0.002 to 0.020	0.012 to 0.138	●	●			●		
	Finishing	M	M S	LM	0,10 20° 8°	6°	0.003 to 0.014	0.008 to 0.118	●	●					
	Finishing Wiper	M	P M K S	MW	0,15 18°	0,2 18°	0.004 to 0.020	0.020 to 0.157	●	●			●		
	Medium to Finishing	M	M S	GS	15°	15°	0.002 to 0.157	0.016 to 0.197			●				
		G	N	LN	~25°	20°	0.002 to 0.063	0.002 to 0.276	●	●	●	●	●	●	
	Medium	M	P	MP	0,12 24° 8°	7°	0.002 to 0.024	0.007 to 0.142	●	●		●	●	●	●

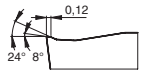
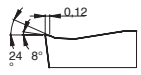
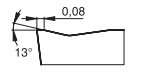
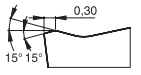
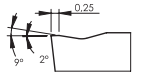
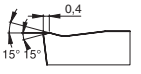
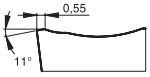
* T-Land varies according to the IC (IC reference used: 1/2in)
** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

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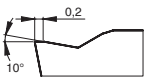
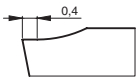
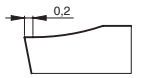
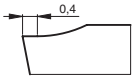
CHIP BREAKER SPECIFICATIONS

Especificações de quebra-aparas | Especificaciones de rompevirutas

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 (in/rev)	Cutting Conditions** Deph of cut DOC (in)	Available Shapes CC _ _ 80°	DC _ _ 55°	RC _ _	SC _ _ 90°	TC _ _ 60°	VC _ _ 35°	VB _ _ 35°
POSITIVES - Clearance angle 5º and 7º	Medium	M	M S	MM			0.002 to 0.024	0.007 to 0.142	●	●		●	●	●	●
		M	K	MK			0.002 to 0.024	0.007 to 0.142	●	●		●	●	●	●
		M	P M S	CP			0.002 to 0.007	0.020 to 0.094			●				
	Roughing to Medium	M	P M K	ST			0.002 to 0.126	0.031 to 0.504			●				
			P M	RF			0.010 to 0.098	0.098 to 0.394			●				
			P M K	RM			0.031 to 0.098	0.126 to 0.512			●				
			P M	RR			0.031 to 0.098	0.126 to 0.512			●				

* T-Land varies according to the IC (IC reference used: 1/2in)
** 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 (in/rev)	Cutting Conditions** Deph of cut DOC (in)	Available Shapes CC _ _ 80°	DC _ _ 55°
POSITIVES - Clearance angle 11º	Medium to Finishing	U	P M K S	Flat			0.002 to 0.087	0.039 to 0.394	●	●
	Finishing to Fine Finishing	M	P M K	12			0.001 to 0.022	0.004 to 0.118	●	●
	Medium	M	P M	13			0.001 to 0.022	0.008 to 0.276	●	●

* T-Land varies according to the IC (IC reference used: 1/2in)
** Cutting Conditions varies according to the Insert shape, IC and Nose Radius

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

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

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

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

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

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

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
P	Unalloyed steel HB 110 DIN C15 C45 C60	●	MF	PH5115 PHG115	LC	PH5115 PHG115	MR PM	PH5115 PHG115	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		●	MF	PH5115 PHG115	LC	PH5125 PHG125	MR PM	PH5125 PHG125				
		●	MF	PH5125 PHG125	LC	PH5125 PHG125	MR	PH5740 PHG140				
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115				
		●	MW	PH5125 PHG125	MW	PH5125 PHG125	MW	PH5740 PHG140			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 PHG115	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		●	MF	PH5115 PHG115	MR PM	PH5125 PHG125	HR	PH5125 PHG125				
		●	MF	PH5125 PHG125	MR / PM	PH5740 PHG140	HR	PH5740 PHG140				
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115				
		●	MW	PH5125 PHG125	MW	PH5125 PHG125	MW	PH5740 PHG140			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 PHG115	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		●	MF	PH5115 PHG115	MR / PM	PH5125 PHG125	HR	PH5125 PHG125				
		●	MF	PH5125 PHG125	MR / PM	PH5740 PHG140	HR	PH5740 PHG140				
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115				
		●	MW	PH5125 PHG125	MW	PH5125 PHG125	MW	PH5740 PHG140			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 PHG115	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		●	MF ST	PH5115 PHG115 PH5320 PHG105	MR PM	PH5115 PHG125	HR	PH5115 PHG115				
		●	MF	PH5115 PHG115	MR PM	PH5125 PHG125	HR	PH5125 PHG125				
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5115 PHG115				
		●	MW	PH5115 PHG115	MW	PH5115 PHG115	MW	PH5125 PHG125			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
M	Ferritic/ martensitic stainless steel DIN X12CrMoS17 X6CrMo17	●	SF, GS	PH7920 PHH920	SS	PH7920	HR	PHS225	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K
		●	SF, GS	PH7920 PHH920	SS	PH7920	HR	PHS225				
		●	SF, GS	PH7920 PHH920	SS	PH7920	HR	PHS240				
		●	MW	PHS215	MW	PHS215	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		●	MW	PHS215	MW	PHS225	-	-				
		●	MW	PHS225	MW	PHS240	-	-			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°

● 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

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

ISO	Material workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
M	Austenitic stainless steel	●	GS, SF	PH7920 PHH910	SS	PH7920	HR	PHS225	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	GS, GS	PH7910 PHH7920	SS	PH7920	HR	PHS225				
		✱	GS, SF	PH7920 PHH920	SS	PH7920	HR	PHS240				
	DIN X5CrNi189 X5CrNiMo18 X15CrNiSi20	●	MW	PHS215	MW	PHS215	-	-	Negative double side	Wiper Nose Radius	CNMG WNMG	D##N 95° M##N 95° M##N-K 95° P##N 95°
		◐	MW	PHS215	MW	PHS225	-	-				
		✱	MW	PHS225	MW	PHS240	-	-			DNMG TNMG	D##N 93° M##N 93° M##N-K 93° P##N 93°
	Duplex stainless steel	●	GS, SF	PH7920 PHH920	SS	PH7910	HR	PHS225	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	GS, SF	PH7920 PHH920	SS	PH7920	HR	PHS225				
		✱	GS, SF	PH7920 PHH920	SS HR	PHS240	HR	PHS240				
	DIN X2CrNiMoSi19 X8CrNiMo27 X2CrNiMoN22	●	MW	PHS215	-	-	-	-	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	●	GS, SF	PH7910 PHH910	MS	PH7910 PHH910	SS	PH7920	Negative double side	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◐	GS, SF	PH7910 PHH910	MS	PH7910 PHH910	SS	PH7920				
		✱	GS, SF	PH7910 PHH910	MS	PH7910 PHH910	SS	PH7920				

● Stable cutting ◐ General cutting ✱ Unstable cutting

palbit

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 - DOUBLE SIDE ...NMM'S

ISO	Material Workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
S	Super Alloys DIN NiCr19Co11MoTi NiFe35Cr14MoTi CoCr20W15Ni	●	GS, SF	PH7910 PHH910	MS	PH7910 PHH910	SS	PH7920	Negative double side 0°	Conventional Nose Radius	#NMG	D##N M##N M##N-K P##N
		◕	GS, SF	PH7910 PHH910	MS SS	PH7910 PHH910	SS	PH7920				
		✱	GS, SF	PH7910 PHH910	MS SS	PH7910 PHH910	SS	PH7920				
N	Aluminium Alloys DIN AW7075 AlSi12 CuZn37	●	MS	PH0910	MS	PH0910	-	-	Negative double side 0°	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

SELECTION GUIDE FOR POSITIVE INSERTS - SINGLE SIDE...CMT'S, BMT'S, CGT'S, RCMX'S, RCMT'S

ISO	Material Workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
P	Unalloyed steel HB 110 DIN C15 C45 C60	●	FP	PH5115 PHG115	MP	PH5115 PHG115	MP	PH5115 PHG115	Positive single side x°	Conventional nose radius	#CMT #BMT	S##C S##B
		◕	FP	PH5115 PHG115	MP	PH5125 PHG125	MP	PH5125 PHG125				
		✱	FP	PH5125 PHG125	MP	PH5125 PHG125	MP	PH5125 PHG125				
		●	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-	Positive single side x°	Wiper nose radius	CCMT	S##C 95º
		◕	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-			DCMT TCMT	S##C 93º
		✱	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-				
	Low alloyed Steel HB 180 DIN 21NiCrMo2 36CrNiMo4 34CrMo4	●	FP	PH5115 PHG115	MP	PH5115 PHG115	MP	PH5115 PHG115	Positive single side x°	Conventional nose radius	#CMT #BMT	S##C S##B
		◕	FP	PH5115 PHG115	MP	PH5125 PHG125	MP	PH5125 PHG125				
		✱	FP	PH5125 PHG125	MP	PH5125 PHG125	MP	PH5125 PHG125				
		●	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-	Positive single side x°	Wiper nose radius	CCMT	S##C 95º
		◕	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-			DCMT TCMT	S##C 93º
		✱	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-				
	High alloyed Steel HB 200 DIN 34CrNiMo6 42CrMo4	●	FP	PH5115 PHG115	MP	PH5115 PHG115	MP	PH5115 PHG115	Positive single side x°	Conventional nose radius	#CMT #BMT	S##C S##B
		◕	FP	PH5115 PHG115	MP	PH5125 PHG125	MP	PH5125 PHG125				
		✱	FP	PH5125 PHG125	MP	PH5125 PHG125	MP	PH5125 PHG125				
		●	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-	Positive single side x°	Wiper nose radius	CCMT	S##C 95º
		◕	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-			DCMT TCMT	S##C 93º
		✱	FW	PH5115 PHG115	MW	PH5115 PHG115	-	-				

● Stable cutting ◕ General cutting ✱ Unstable cutting

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

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

SELECTION GUIDE FOR POSITIVE INSERTS - SINGLE SIDE...CMT'S, BMT'S, CGT'S, RCMX'S, RCMT'S

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

● Stable cutting ● General cutting ✱ Unstable cutting

palbit

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

SELECTION GUIDE FOR POSITIVE INSERTS - SINGLE SIDE ...CMT'S, BMT'S, CGT'S, RCMX'S, RCMT'S

ISO	Material Workplace	Stability	Medium		Roughing		Medium roughing		Insert			Holders
			Chip-breaker	Grade	Chip-breaker	Grade	Chip-breaker	Grade	Type			Type
K	Grey cast iron HB 220 DIN GG15 GG25 GG35	●	FK	PH5705	MK	PH5705	MK	PH5705	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◉	FK	PH5705	MK	PH5705	MK	PH5320				
		✱	MK	PH5320	MK	PH5320	MK	PH5320				
		●	FW	PH5705	MW	PH5320	-	-	Positive single side	Wiper nose radius	CCMT	S##C 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	PHH910	FM	PHH910	MM	PH7920	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◉	FM	PH7920	MM	PH7920	MM	PH7920				
		✱	MM	PH7920	MM	PH7920	MM	PH7920				
		●	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	PHH910	FM	PHH910	MM	PHH920	Positive single side	Conventional nose radius	#CMT #BMT	S##C S##B
		◉	FM	PHH920	FM	PHH920	FM	PHH920				
		✱	MM	PHH920	MM	PHH920	MM	PHH920				
		●	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	Aluminium 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

CHIP BREAKER COMPARATIVE CHART

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, GR, MA**	PM, QM, XM , XRM	P, MN	M3P, M3M, PP, TF, GN	MR7, MR6, M5, M6	TM , AM, DM, ZM All-round	MA, MH, MP	GU GE , UX	NMT, NM4	HS, PT, GT, CS, PS	PC , MT MC , MG-	VM	TMF , TMM M50
	Roughing	**HR, RP", GR, MA**	HM , PR MR	RN , RP MR	NR MR	MR6, R5	TH, THS	RP, GH HZ, HL	MU , ME HG	NM5, NM6 NM9	PH All-round	RT	GR, HR	TM, TRM
	Heavy Roughing	**RP", HY", HZ"**	PR , MR, HR , QR	RM RH	R3P, NM	R4, RR6	TU, TRS, TUS	HM, HX HV	HG , HP HU, HW HF	NR6, NRF NRR	PX	HT , HD RX , RH HY , HZ	GH, VT	TRR , TR, R28 , R58 R88
M STAINLESS STEEL	Fine Finishing	**GSF**												
	Finishing	**SF, GS**	MF, SM, XF, LC, R/L-K	FP	TF, VL	FF2, FF1, MF1	SF, SA, SS	GM, MS, SH, LM	EX, EG, SU, EF	NF4 NMS	GU, MQ	EA, SF, SU, FG	VP2	CF , F30 M34 F32 , TF
	Medium	**MS, SF, GS**	MM , QM, SM XM , XRM	MP, P	M3M , PP	MF2, FF2, MF5	SM S	MM, MA ES	GU HM	NM4	TK MU	EM , ET	VP3, HS	TMF , M42 M30 , M52
	Roughing	**SS, RP, HZ"**	MR HM, PR	UP, RP	MR , MH	M5, M6, R8, RS, R6	TH , SH, TU	GH , RM, HZ	EM , MU	NR4, NRT, NRS	MS		"GR, VM, VH, GH"	TM, M60, TRM, TMR, TRR R80
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 chip breaker	Without chip breaker		MR7, M5	CH Without chip breaker	RK Without chip breaker	Without chip breaker	Without chip breaker	GC Without chip breaker	RT	GR	TMR , TR R28, R58, R88
N ALUMINIUM	Medium	**MS**	MF, QM	MS , MP MG	PP	-	P		AX		AH , A3	ML	HA	F32
S HRSA	Finishing	**GS, SF, MS**	SF, SM 01	FS , LS MS		MF1, M1	HRF	FJ , LS	EF EX	NFT NF4	MQ	SF	VP1	
	Medium	**SF, SS, DOMX**	MM, QM SMR	UP , P, NGP RP	PP	MR3, MR4	HRM, HMM, SA	MS RS GJ	EG MU	NMS NM4, NRS, NR4	TK MS MU	SU	VP2, VP3	M34 , M52

* = Wiper
" = Single face insert

CHIP BREAKER COMPARATIVE CHART

Tabela comparativa de quebra-aparas | Tabla de comparación de rompevirutas

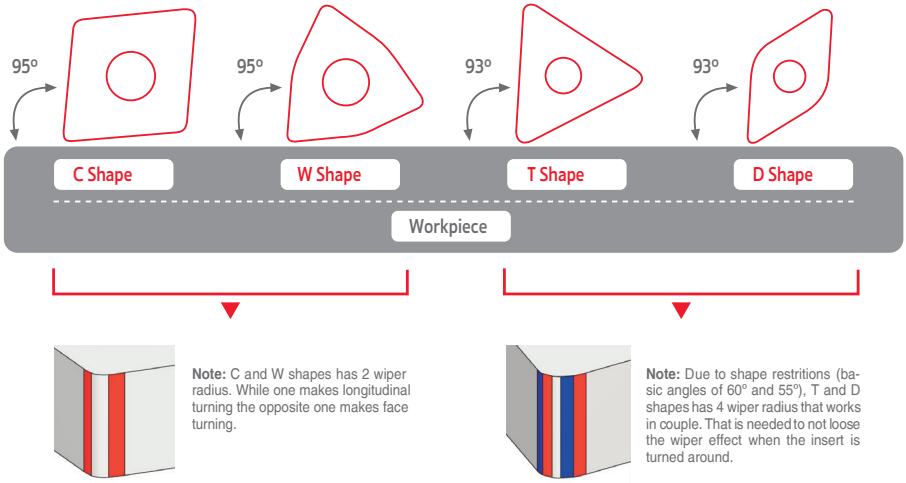
POSITIVES - CLEARANCE ANGLE 5°, 7° AND 11° | Positivas - Alívio 5°, 7° e 11° | Positivas - Alivio 5°, 7° y 11°

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, FF**	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 ALUMINIUM	Medium	**LN**	AL	HP, GT	AF, AS	AL	AL, PP	AZ, R/L-F	AG, AX, AY	PF2, PM2	AH, A3	FL	AK, AR	23P, 25P, 27
S HRSA	Fine Finishing	**FS, FF**	UM	LF	SM	F1, MF2	PSF, PF, SS PS, PSS, TS	FJ	FC	PF2	GQ		HFP	SF
	Finishing	**FM, LM**	MF, UF, R/L-K	GM	PF, 14	F1	PSS, PS	FV	FX, FY	PF4	MQ	FA	HFP	F23, F43, SM
	Finishing Wiper	**FW***	WF	FW	WF					PF				
	Finishing to Medium	**MM, LM**	MM, XM	MF	SM		PM	MV	SI	PM5	MQ	FG	HMP	SM, 25P 29
	Finishing to Medium Wiper	**MW***	WM	MW	WG					PM				
	Medium to Roughing	**GS**												

WIPER CONCEPT

Conceito Wiper | Concepto Wiper

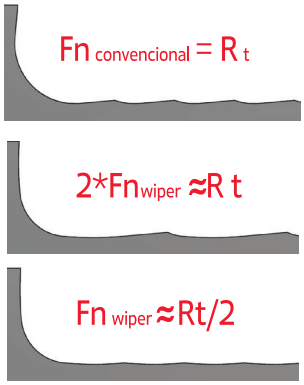
THE ANGLE POSITION (KR°)



Note: C and W shapes has 2 wiper radius. While one makes longitudinal turning the opposite one makes face turning.

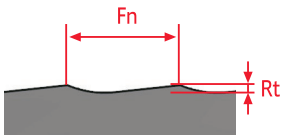
Note: Due to shape restritions (basic angles of 60° and 55°), T and D shapes has 4 wiper radius that works in couple. That is needed to not loose the wiper effect when the insert is turned around.

THE WIPER PURPOSE IS BASED ON PRODUCTIVITY:

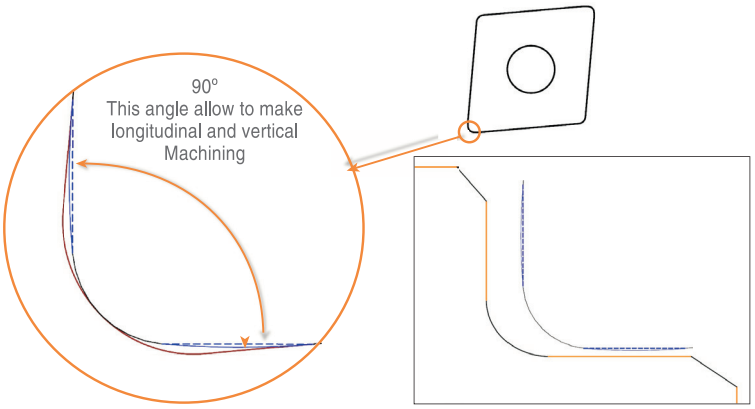


CNMG 432-##
VS
CNMG 432-MW

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.

CUTTING SPEED (SFM)

Velocidade de corte (SFM) | Velocidad de corte (SFM)

ISO	Material	Grade fn (in/r) / HB (brinell)	CVD Coating														
			← Wear Resistence									Toughness →					
			PHG105			PHG115			PH2G115			PHG125			PH2G125		
			0.008	0.016	0.031	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	918-1246	689-984	656-820	820-1148	590-886	558-722	935-1312	672-1017	640-820	656-968	558-787	492-705	754-1099	640-902	558-804
	Low-alloy steel	180-350	722-918	656-853	558-689	623-820	558-754	459-590	705-935	640-853	525-672	558-754	459-689	394-623	640-853	525-787	443-705
	High-alloy steel	200-325	541-820	492-771	459-754	443-722	394-672	361-656	508-820	443-771	410-754	410-705	361-607	328-558	459-804	410-689	377-640

ISO	Material	Grade fn (in/r) / HB (brinell)	CVD Coating						PVD Coating					
			← Wear Resistence			Toughness →			← Wear Resistence			Toughness →		
			PHG140			PH5740			PH7910			PH7920		
			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	443-754	394-689	377-656	410-722	361-656	344-623	459-804	426-738	377-722	426-754	394-722	361-689
	Low-alloy steel	180-350	410-672	344-607	312-607	377-640	312-574	279-574	426-754	410-738	410-705	410-722	377-689	328-656
	High-alloy steel	200-325	344-672	246-574	164-443	312-640	213-541	131-410	-	-	-	-	-	-

ISO	Material	Grade fn (in/r) / HB (brinell)	CVD Coating								
			← Wear Resistence						Toughness →		
			PHS215			PHS225			PHS240		
			0.008	0.016	0.024	0.008	0.016	0.024	0.008	0.016	0.024
M	SS - Ferritic/martensitic	200-330	410-853	328-722	262-656	377-754	295-590	230-525	361-754	279-574	230-459
	SS - Austenitic	180-330	394-836	312-705	246-640	361-738	279-574	213-508	344-738	262-558	213-443
	SS - Austenitic-ferritic (Duplex)	230-260	361-804	279-672	213-607	328-705	246-541	180-476	312-705	230-525	180-410

ISO	Material	Grade fn (in/r) / HB (brinell)	PVD Coating											
			← Wear Resistence											Toughness →
			PH7910			PHH910			PH7920			PHH920		
			0.008	0.016	0.024	0.008	0.016	0.024	0.008	0.016	0.024	0.008	0.016	0.024
M	SS - Ferritic/martensitic	200-330	394-722	361-689	344-672	426-754	394-722	377-705	361-689	328-656	312-640	394-722	361-689	344-672
	SS - Austenitic	180-330	377-705	344-672	312-640	410-738	377-705	344-672	344-672	312-640	279-607	377-705	344-672	312-640
	SS - Austenitic-ferritic (Duplex)	230-260	344-663	328-640	295-607	377-695	361-672	328-640	312-630	295-607	262-574	344-663	328-640	295-607

ISO	Material	Grade fn (in/r) / 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	459-918	394-771	492-1082	426-787	361-722	361-754	328-705	328-623
	Grey cast iron	180-220	722-1246	623-1082	492-951	656-1082	558-918	492-754	492-754	459-722	361-689
	Nodular cast iron	160-380	492-918	443-869	394-722	459-820	410-754	361-722	410-722	377-672	344-607

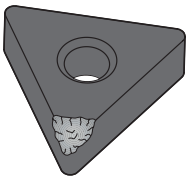
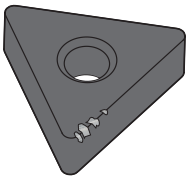
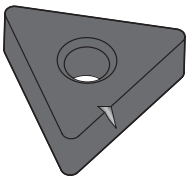
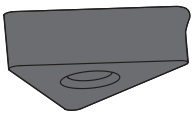
ISO	Material	Grade fn (in/r) / HB (brinell)	Uncoated	
			PH0910	
			0.006	0.031
N	Aluminium alloys	60-130	1230-7872	131-787
	Cooper and cooper alloys	90-110	1230-2066	115-213

ISO	Material	Grade fn (in/r) / HB (brinell)	PVD Coating											
			← Wear Resistence											Toughness →
			PH7910			PHH910			PH7920			PHH920		
			0.004	0.012	0.020	0.008	0.016	0.024	0.004	0.012	0.020	0.008	0.016	0.024
S	Heat Resistant super alloys (Iron base)	200-280	213-459	197-426	164-361	246-492	230-459	197-394	197-443	180-410	148-344	230-476	213-443	180-377
	Heat Resistant super alloys (Nickel base)	250-320	148-394	131-361	98-328	180-426	164-394	131-361	131-377	115-344	82-312	164-410	148-377	115-344
	Heat Resistant super alloys (Cobalt base)	200-320	148-377	131-344	98-295	180-410	164-377	131-328	131-361	115-328	82-279	164-394	148-361	115-312
	Titanium alloys (400<or<1050[MPa])	-	164-426	148-394	131-328	197-459	180-426	164-361	148-410	131-377	115-312	180-443	164-410	148-344

TURNING TROUBLESHOOTING

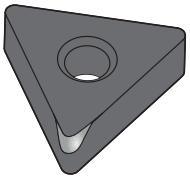
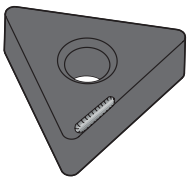
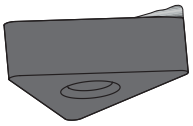
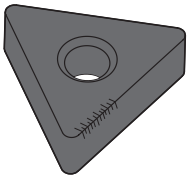
Solução de problemas | Solucción de problemas

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

Problem | Problema	Possible Solution | Solução | 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). • Reduce the depth of cut (Ap). • Select a tougher grade (ex: P10 -> ... -> P40). • Use a more rigid toolholder. • Increase nose radius (Re). • Select a stronger chipbreaker. • Reduce the toolholder length. • Select larger shank size. • Reduza o avanço/rotação (Fn). • Reduza a profundidade de corte (Ap). • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Use um suporte mais rigido. • Aumente o raio de canto (Re). • Selecione um quebra-aparas mais resistente. • Reduza o comprimento do suporte. • Escolha uma largura de haste superior. • Reducir el avance (Fn). • Reducir la profundidad de corte (Ap). • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40). • Utilice un portaherramientas más rígido. • Aumente el radio de punta (Re). • Seleccionar un rompevirutas más robusto. • Reducir la longitud del portaherramientas. • Elija un ancho de vara superior.
• Edge chipping • Fragmentação da aresta • Fragmentación de la arista 	• Increase the cutting speed (Vc). • Reduce the feed rate (Fn). • Select a stronger chipbreaker. • Select a tougher grade (ex: P10 -> ... -> P40). • Reduce the rake angle. • Increase honing edges. • Reduce the toolholder length. • Select larger shank size. • Aumente a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Selecione um quebra-aparas mais resistente. • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Diminua o ângulo de ataque. • Aumente arestas boleadas. • Reduza o comprimento do suporte. • Escolha uma largura de haste superior. • Reducir el ángulo de ataque. • Aumentar aristas redondeadas. • Reducir la longitud del portaherramientas. • Elija un ancho de vara superior. • Aumentar la velocidad de corte (Vc). • Reducir el avance (Fn). • Seleccionar un rompevirutas más robusto. • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40).
• Notch wear • Desgaste de entalhe • Mellado 	• Reduce the cutting speed (Vc). • Reduce the feed rate (Fn). • Select a tool with a smaller setting angle (Kr°). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Reduza a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Selecione uma ferramenta com um ângulo de posição menor (Kr°). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Reducir la velocidad de corte (Vc). • Reducir el avance (Fn). • Seleccionar una herramienta con un ángulo de posición menor (Kr°). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10).
• Plastic deformation • Deformação plástica • Deformación plástica 	• Reduce the cutting speed (Vc). • Reduce the feed rate (Fn). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Use more coolant and correct it volume/accuracy. • Choose grade with better heat conductivity. • Increase the rake angle. • Increase nose radius (Re). • Increase relief angle. • Reduza a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Utilize refrigeração em abundância e corrija o seu volume/precisão. • Escolha um grau com melhor condutividade térmica. • Aumente o ângulo de ataque. • Aumente o raio de canto (Re). • Aumente o ângulo de alívio superior. • Reducir la velocidad de corte (Vc). • Reducir el avance (Fn). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10). • Usar abundante caudal de refrigerante y corregir el volumen / precisión. • Elija un grado con una mejor conductividad térmica. • Aumente el ángulo de ataque. • Aumente el radio de punta (Re). • Aumente el ángulo de alivio superior.

TURNING TROUBLESHOOTING
Solução de problemas | Solucción de problemas

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

Problem | Problema	Possible Solution | Solução | Solución		
• Flank wear • Desgaste do flanco • Desgaste de la superficíe 	• Reduce the cutting speed (Vc). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Select a toolholder or chipbreaker which allow a bigger relief angle. • Increase the rake angle. • Increase nose radius (Re). • Reduce honing edges.	• Reduza a velocidade de corte (Vc). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Selecione um suporte ou quebra-aparas que permita um ângulo de alívio superior. • Aumente o ângulo de ataque. • Aumente o raio de canto (Re). • Reduza arestas boleadas.	• Reducir la velocidad de corte (Vc). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10). • Seleccione un portaherramientas o rompevirutas que permiten un ángulo de alivio superior. • Aumente el ángulo de ataque. • Aumente el radio de punta (Re). • Reducir aristas redondeadas.
• Crater wear • Craterização • Craterización 	• Reduce the cutting speed (Vc). • Reduce the feed rate (Fn). • Select a more wear-resistant grade (ex: P40 -> ... -> P10). • Use coolant. • Increase the rake angle. • Increase nose radius (Re).	• Reduza a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Selecione uma classe mais resistente ao desgaste (ex: P40 -> ... -> P10). • Utilize refrigeração. • Aumente o ângulo de ataque. • Aumente o raio de canto (Re).	• Reducir la velocidad de corte (Vc). • Reducir el avance (Fn). • Seleccionar una calidad más resistente al desgaste (ex: P40 -> ... -> P10). • Usar refrigerante. • Aumente el ángulo de ataque. • Aumente el radio de punta (Re).
• Built-up edge • Aresta postiça • Recrecimiento del filo 	• Increase the cutting speed (Vc). • Reduce the feed rate (Fn). • Use water-insoluble coolant fluid. • Select a more easy-cutting chipbreaker. • Increase the rake angle. • Reduce honing edges. • Select grade with low tendency to adhesion.	• Aumente a velocidade de corte (Vc). • Reduza o avanço/rotação (Fn). • Utilize fluido refrigerante insolúvel em água. • Selecione um quebra-aparas mais positivo. • Aumente o ângulo de ataque. • Reduza arestas boleadas. • Selecione um grau com baixa tendência a aderência.	• Aumentar la velocidad de corte (Vc). • Reducir el avance (Fn). • Utilice fluido refrigerante insoluble en agua. • Seleccionar un rompevirutas de corte más suave. • Aumente el ángulo de ataque. • Reducir aristas redondeadas. • Seleccione un grado con baja tendencia a la adhesión.
• Thermal cracks • Trincas térmicas • Grietas en el filo 	• Reduce the cutting speed (Vc). • Increase the feed rate (Fn). • Use more coolant and correct it volume/accuracy. • Reduce honing edges. • Select a tougher grade (ex: P10 -> ... -> P40). • Increase the rake angle.	• Reduza a velocidade de corte (Vc). • Aumente o avanço/rotação (Fn). • Utilize refrigeração em abundância e corrija o seu volume/precisão. • Reduza arestas boleadas. • Selecione uma classe mais tenaz (ex: P10 -> ... -> P40). • Aumente o ângulo de ataque.	• Reducir la velocidad de corte (Vc). • Aumentar el avance (Fn). • Usar abundante caudal de refrigerante y corregir el volumen / precisión. • Reducir aristas redondeadas. • Seleccionar una calidad más tenaz (ex: P10 -> ... -> P40). • Aumente el ángulo de ataque.

CUTTING TOOLS FOR

GROOVING & PARTING OFF



D

D - GROOVING & PARTING OFF

D - 638 | News
D - 640 | Inserts Overview



D - 642 | Master Grooving
D - 666 | Grooving Plus
D - 678 | Grooving & Parting Off
D - 692 | SAL (Swiss automatic lathes)
D - 702 | Light Grooving
D - 708 | Forming Grooving
D - 714 | Spare Parts
D - 716 | Technical Data



MASTER GROOVING

PRECISION & VERSATILITY FOR GROOVING OPERATIONS

METRIC LINE

see the product line on page G-642

MASTER

GROOVING

For Precision & Versatility

METRIC LINE



The Master Grooving line is the latest external grooving solution, engineered to ensure exceptional accuracy, stability, and reliability in the most demanding grooving and parting-off operations.

This comprehensive range, including grooving inserts, toolholders, blades, and complementary accessories, is designed to deliver superior chip control, extended tool life, and consistent dimensional precision.

KEY BENEFITS

- High stability and rigidity for consistent results
- Wide versatility with multiple geometries and holders
- Advanced chip control and reduced cutting forces
- Quick changeover systems for higher productivity
- Extended tool life with PHL coating and coolant options
- Compatible with modern interfaces: available for PSC systems



PRODUCT RANGE

- **Inserts:** 5 chipbreaker geometries
- **Toolholders:** monoblock, modular, and PSC systems
- **Blades & Cartridges:** flexible solutions for parting-off & face grooving
- **Modular Systems:** interchangeable components to reduce inventory

-UG
P K M S



-LG
P K M S



-CG
P K



-MG
M S

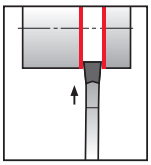
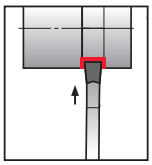
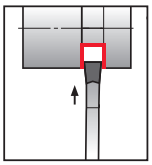
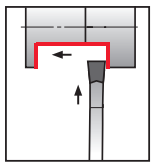
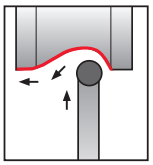
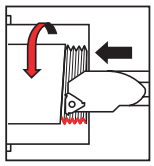
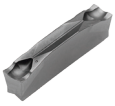


-PG
P K



Master every groove and elevate your machining operations with innovative, high-performance solutions that maximize results and minimize downtime

GENERAL INSERTS OVERVIEW Visão geral | Visión general

Insert Type + Chipbreaker / Operation		Parting Off	Light Grooving	General Grooving	Groove Turning	Profiling	Threading
							
	MG...-N02-UG				●		
	MG...-N02-LG MG...-R02-LG MG...-L02-LG		●				
	MG...-N01-CG MG...-R01-CG MG...-L01-CG	●					
	MG...-N02-CG MG...-R02-CG MG...-L02-CG	●					
	MG...-N01-MG MG...-R01-MG MG...-L01-MG			●			
	MG...-N02-MG MG...-R02-MG MG...-L02-MG			●			
	MG...-N02-PG					●	
	GP...-N01-MC GP...-R01-MC GP...-L01-MC	●		○			
	GP...-N02-MC GP...-R02-MC GP...-L02-MC	●		○			
	GP...-N02-MG	○		●			
	GP...-N02-MM	○		○	●		
	GP...-N02-MP					●	
	GP...-N02-NP					●	

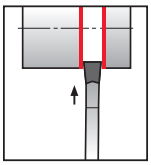
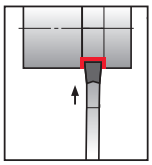
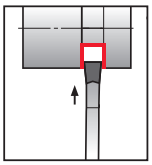
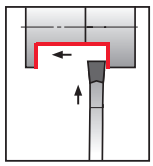
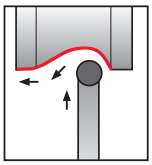
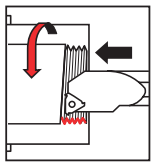
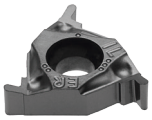
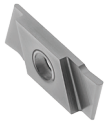
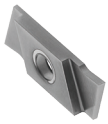
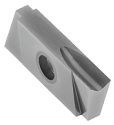
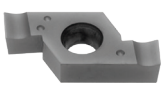
● First choice | Primeira opção | Primera opción

○ Alternative | Alternativa

palbit

GENERAL INSERTS OVERVIEW

Visão geral | Visión general

Insert Type + Chipbreaker / Operation		Parting Off	Light Grooving	General Grooving	Groove Turning	Profiling	Threading
							
	GTN...	●			○		
	SANCAR...	●			○		
	TRIGON			●			●
	SAL GS			●			
	SAL GR			●		●	
	SAL P	●					
	SAL PT						●
	SAL TP				○		
	LG			●			
	FG					●	

● First choice | Primeira opção | Primera opción

○ Alternative | Alternativa

NEW

MASTER GROOVING

METRIC LINE

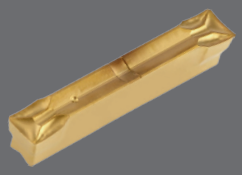


Maximize grooving performance with robust toolholders. From monoblock to modular systems, including PSC and face grooving options, delivering flexible, high-precision solutions for diverse materials and applications.

Maximize o desempenho em operações de corte com suportes robustos. De sistemas monobloco a sistemas modulares, incluindo opções PSC e de canais frontais, a linha Master Grooving oferece soluções flexíveis e de alta precisão para diversos materiais e aplicações.

Maximiza el rendimiento en operaciones de ranurado con portaherramientas robustos. Desde sistemas monobloque hasta sistemas modulares, incluyendo opciones PSC y de ranurado frontal, la línea Master Grooving ofrece soluciones flexibles y de alta precisión para diversos materiales y aplicaciones.

INSERTS > page 646



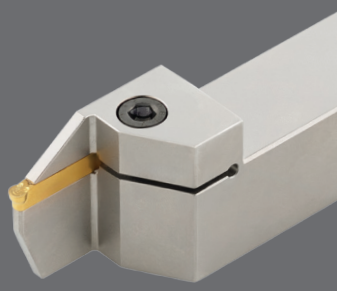
- Cutting width from 0.059 in to 2.236 in
  Largura de corte de 0.059 in a 2.236 in | Ancho de corte de 0.059 in a 2.236 in
- 1 or 2 cutting edges
  1 ou 2 arestas de corte | 1 o 2 filos de corte
- Left, neutral, right and round inserts
  Pastilhas esquerdas, neutras, direitas e redondas | Plaquitas izquierdas, neutras, derechas y redondas

BLADES > page 653



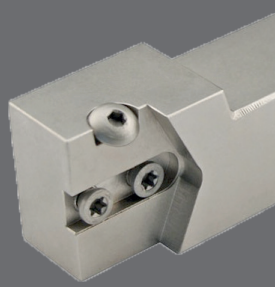
- Blade MGNC
  Lâmina MGNC | Lama MGNC
- Toolholders CPTS and DPTS
  Suportes CPTS e DPTS | Herramientas CPTS y DPTS

MONOBLOCK SYSTEM > page 654



- Monoblock design ensures maximum rigidity and stability
  Design monobloco que garante máxima rigidez e estabilidade | Diseño monobloque que garantiza la máxima rigidez y estabilidad
- Right and Left
  Esquerdo e Direito | Izquierdo y derecho

MODULAR SYSTEM > page 658



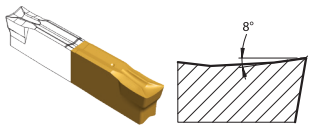
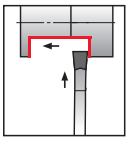
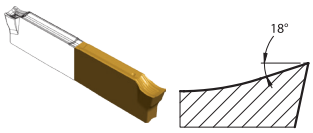
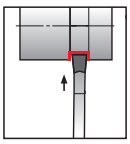
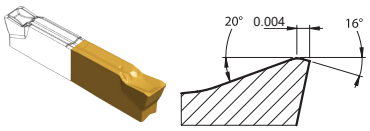
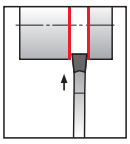
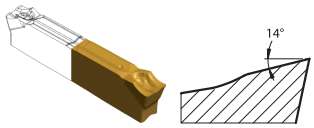
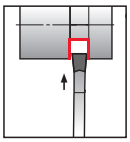
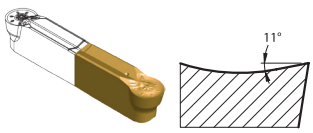
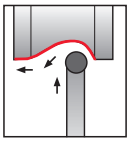
- Adaptable modular design for versatile applications
  Design modular adaptável para aplicações versáteis | Diseño modular adaptable para aplicaciones versátiles
- Right and Left
  Esquerdo e Direito | Izquierdo y derecho

INSERTS Pastilhas | Plaquitas

Master Grooving inserts deliver high-performance machining through advanced chipbreaker designs and PHL coating.

Engineered for precision and durability, they ensure excellent chip control, reduced cutting forces, and extended tool life across a wide range of grooving operations and materials.

5 CHIPBREAKER GEOMETRIES FOR MAXIMUM EFFICIENCY

Chipbreaker	Specifications: Cutting edges	Specifications: Insert width (in)	Material	Properties	Main application
-UG 	1	0.059 0.079 0.118 0.157 0.197 0.236	P K	Recommended for machining several material types. true universal grooving performance; Designed for both grooving and turning applications; Consistent and efficient chip control.	 Groove Turning
	2	0.059 0.079 0.118 0.157 0.197 0.236	M S		
-LG 	1	0.059 0.079 0.118 0.157 0.197 0.236	P K	Sharp cutting geometry for lower cutting forces; Optimized to reduce built-up edge formation. even in low-feed applications; Well-suited for thin-walled components.	 Light Grooving
	2	0.059 0.079 0.118 0.157 0.197 0.236	M S		
-CG 	1	0.059 0.079 0.118 0.157 0.197 0.236	P K	Designed with a negative chamfer for increased edge toughness; Handles interrupted cuts even on materials with high strength; First choice for parting off operations.	 Parting Off
	2	0.059 0.079 0.118 0.157 0.197 0.236			
-MG 	1	0.059 0.079 0.118 0.157 0.197 0.236	M S	Ideal for stainless steel machining; Sharp geometry for smooth cutting; Optimized to reduce built-up edge formation. even in low-feed applications.	 General Grooving
	2	0.059 0.079 0.118 0.157 0.197 0.236			
-PG 	1	0.059 0.079 0.118 0.157 0.197 0.236	P K	Versatile chip breaker adapts to varying depths of cut and feed rates; Round-profile geometry that ensures smooth contouring for accurate profiles; Low cutting forces reduce tool deflection during profiling.	 Profiling
	2	0.059 0.079 0.118 0.157 0.197 0.236			

Choose your chipbreaker:

Chipbreaker	Specifications: Grooving: External	Specifications: Grooving: Face	Specifications: Turning: External	Specifications: Parting Off
-UG	●	●	●	○
-LG	●	●		
-CG	○	○		●
-MG	●	●		●
-PG			●	

● Recommended ○ Suitable



palbit

MG INSERTS CODE KEY

Chave de codificação para pastilhas MG | Llave de codificación para plaquitas MG

For R or L Insert type

MG	0300	B	020	-	050	R	02	-	MC
1	2	3	4		5	6	7		8

For N Insert type

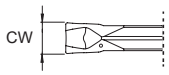
MG	0300	B	020	-	N	02	-	MC
1	2	3	4		6	7		8

1 - Product Line

MG - Grooving Plus

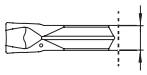
2 - Cutting Width

0200 - 2,00mm (0.079 in) | 0300 - 3,00mm (0.118 in) | 0400 - 4,00mm (0.157 in) | 0500 - 5,00mm (0.197 in) | 0600 - 6,00mm (0.236 in)



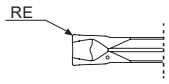
3 - Seat Size

A – MG0200 | B – MG0300 | C – MG0400 | D – MG0500 | E – MG0600



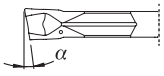
4 - Cutting Radius

020 - 0,20mm (0.008 in) | 025 - 0,25mm (0.010 in) | 040 - 0,40mm (0.016 in) | 600 - 6,00mm (0.0236 in)

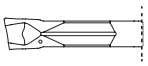
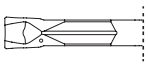
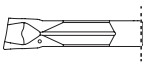


5 - Relief Angle (Suppressed on Neutral inserts)

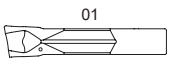
040 – 4º | 060 – 6º | 150 – 15º

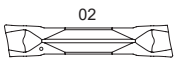


6 - Insert Type

R - Right  N - Neutral  L - Left 

7 - Number of Cutting Edges





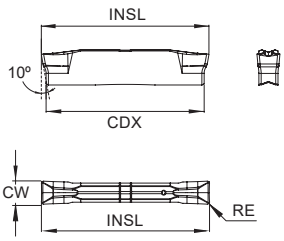
8 - Chipbreaker

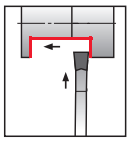
CG – Cutting Grooving | UG – Universal Grooving | MG – Medium Grooving | LG – Light Grooving | PG – Profiling Grooving

INSERTS Pastilhas | Plaquitas

MG...02-UG Multifunctional Grooving







		P			K			M			S		
		PVD			PVD			PVD			PVD		
	(2) Grade code	6F	5C	3B	6F	5C	3B	6F	5C	3B	6F	5C	3B
(1) Geometry code	ISO/ANSI Reference	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930
1130844	MG0200A020-N02-UG	◈	◈		◈	◈		◈	◈		◈	◈	
1130828	MG0300B030-N02-UG		◈	◈		◈	◈		◈	◈		◈	◈
1130885	MG0400C020-N02-UG		○	○		○	○		○	○		○	○
1130845	MG0400C040-N02-UG		◈	◈		◈	◈		◈	◈		◈	◈
1130886	MG0400C080-N02-UG		○	○		○	○		○	○		○	○
1130846	MG0500D040-N02-UG		◈	◈		◈	◈		◈	◈		◈	◈
1130887	MG0500D080-N02-UG		△	△		△	△		△	△		△	△
1130847	MG0600E040-N02-UG		◈	◈		◈	◈		◈	◈		◈	◈
1130888	MG0600E080-N02-UG		○	○		○	○		○	○		○	○

Dimensions Dimensões Dimensiones (in)					Cutting conditions Condições de corte Condiciones de corte					
CW	RE	INSL	CDX	Seat[2] Size	AP (in)	Min	Max	fn (in/r)	Min	Max
0.079	0.008	0.866	0.787	A	0.020	0.008	0.031	0.003	0.001	0.005
0.118	0.012	0.866	0.787	B	0.039	0.012	0.067	0.006	0.002	0.010
0.157	0.008	0.984	0.906	C	0.059	0.008	0.106	0.004	0.002	0.006
0.157	0.016	0.984	0.906	C	0.063	0.016	0.106	0.007	0.003	0.011
0.157	0.031	0.984	0.906	C	0.059	0.008	0.106	0.006	0.002	0.009
0.197	0.016	0.984	0.906	D	0.071	0.016	0.122	0.007	0.003	0.010
0.197	0.031	0.984	0.906	D	0.071	0.020	0.122	0.006	0.002	0.009
0.236	0.016	0.984	0.906	E	0.071	0.016	0.126	0.007	0.004	0.011
0.236	0.031	0.984	0.906	E	0.075	0.024	0.126	0.007	0.004	0.011

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

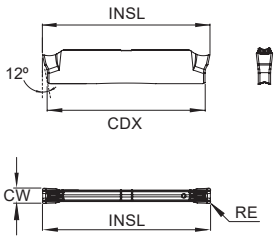
△ Stock available soon | Produto de stock disponível brevemente | Producto en stock disponible en breve

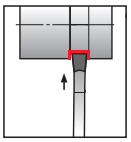
Insert order code = (1) Geometry Code + (2) Grade Code

2 - Correspond to a Specific Holder

MG...02-LG Light Grooving







		P			K			M			S		
		PVD			PVD			PVD			PVD		
	(2) Grade code	6F	5C	3B	6F	5C	3B	6F	5C	3B	6F	5C	3B
(1) Geometry code	ISO/ANSI Reference	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930
1130853	MG0200A020-N02-LG	◈	◈		◈	◈		◈	◈		◈	◈	
1130921	MG0200A020-150R02-LG	○	○		○	○		○	○		○	○	
1130922	MG0200A020-150L02-LG	○	○		○	○		○	○		○	○	

Dimensions Dimensões Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte			
CW	RE	INSL	PSIRR/L	CDX	Seat[2] Size	fn (in/r)	Min	Max
0.079	0.008	0.866	-	0.787	A	0.003	0.001	0.004
0.079	0.008	0.866	0.591	0.787	A	0.002	0.001	0.003
0.079	0.008	0.866	0.591	0.787	A	0.002	0.001	0.003

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

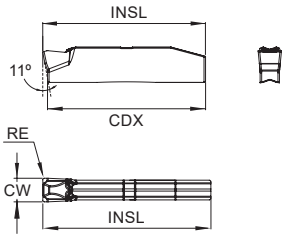
△ Stock available soon | Produto de stock disponível brevemente | Producto en stock disponible en breve

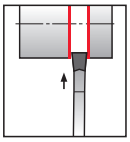
Insert order code = (1) Geometry Code + (2) Grade Code

2 - Correspond to a Specific Holder

MG...01-CG Parting Off







		P			K			Dimensions Dimensões Dimensiones (in)					Cutting conditions Condições de corte Condiciones de corte		
		PVD			PVD										
	(2) Grade code	6F	5C	3B	6F	5C	3B								
(1) Geometry code	ISO/ANSI Reference	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930	CW	RE	INSL	PSIRR/L	Seat² Size	fn (in/r)	Min	Max
1130889	MG0200A020-N01-CG	◬	◬		◬	◬		0.079	0.008	0.866	-	A	0.004	0.001	0.006
1130849	MG0300B020-N01-CG		◈	◈		◈	◈	0.118	0.008	0.866	-	B	0.005	0.002	0.008
1130890	MG0300B020-060R01-CG		◬	◬		◬	◬	0.118	0.008	0.866	0.236	B	0.004	0.002	0.006
1130891	MG0300B020-060L01-CG		◬	◬		◬	◬	0.118	0.008	0.866	0.236	B	0.004	0.002	0.006
1130892	MG0400C030-N01-CG		○	○		○	○	0.157	0.012	0.984	-	C	0.006	0.003	0.009
1130893	MG0400C030-040R01-CG		○	○		○	○	0.157	0.012	0.984	0.157	C	0.006	0.002	0.009
1130894	MG0400C030-040L01-CG		○	○		○	○	0.157	0.012	0.984	0.157	C	0.006	0.002	0.009
1130895	MG0500D030-N01-CG		◬	◬		◬	◬	0.197	0.012	0.984	-	D	0.007	0.003	0.011

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

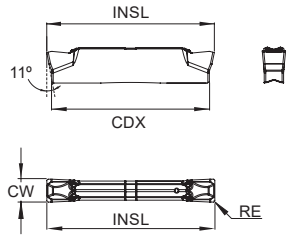
Insert order code = (1) Geometry Code + (2) Grade Code

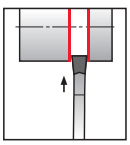
◬ Stock available soon | Produto de stock disponível brevemente | Producto en stock disponible en breve

2 - Correspond to a Specific Holder

MG...02-CG Parting Off







		P			K			Dimensions Dimensões Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte		
		PVD			PVD											
	(2) Grade code	6F	5C	3B	6F	5C	3B									
(1) Geometry code	ISO/ANSI Reference	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930	CW	RE	INSL	PSIRR/L	CDX	Seat² Size	fn (in/r)	Min	Max
1130850	MG0200A020-N02-CG	◈	◈		◈	◈		0.079	0.008	0.866	-	0.787	A	0.004	0.001	0.006
1130896	MG0200A015-060R02-CG	○	○		○	○		0.079	0.006	0.866	0.236	0.787	A	0.003	0.002	0.005
1130897	MG0200A015-060L02-CG	○	○		○	○		0.079	0.006	0.866	0.236	0.787	A	0.003	0.002	0.005
1130898	MG0200A020-150R02-CG	◬	◬		◬	◬		0.079	0.008	0.866	0.591	0.787	A	0.003	0.001	0.004
1130899	MG0200A020-150L02-CG	◬	◬		◬	◬		0.079	0.008	0.866	0.591	0.787	A	0.003	0.001	0.004
1130851	MG0300B020-N02-CG		◈	◈		◈	◈	0.118	0.008	0.866	-	0.787	B	0.005	0.002	0.008
1130900	MG0300B015-060R02-CG		◬	◬		◬	◬	0.118	0.006	0.866	0.236	0.787	B	0.004	0.002	0.006
1130901	MG0300B015-060L02-CG		◬	◬		◬	◬	0.118	0.006	0.866	0.236	0.787	B	0.004	0.002	0.006
1130869	MG0400C020-N02-CG		◈	◈		◈	◈	0.157	0.008	0.984	-	0.906	C	0.006	0.003	0.009
1130902	MG0400C030-N02-CG		○	○		○	○	0.157	0.012	0.984	-	0.906	C	0.006	0.003	0.009
1130903	MG0400C020-040R02-CG		○	○		○	○	0.157	0.008	0.984	0.157	0.906	C	0.006	0.002	0.009
1130904	MG0400C020-040L02-CG		○	○		○	○	0.157	0.008	0.984	0.157	0.906	C	0.006	0.002	0.009
1130852	MG0500D040-N02-CG		◈	◈		◈	◈	0.197	0.016	0.984	-	0.906	D	0.007	0.003	0.011
1130905	MG0600E040-N02-CG		○	○		○	○	0.236	0.016	0.984	-	0.906	E	0.008	0.004	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

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

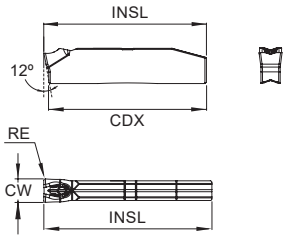
◬ Stock available soon | Produto de stock disponível brevemente | Producto en stock disponible en breve

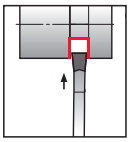
2 - Correspond to a Specific Holder

INSERTS Pastilhas | Plaquitas

MG...01-MG Stable Grooving







		M			S			Dimensions Dimensões Dimensiones (in)					Cutting conditions Condições de corte Condiciones de corte		
		PVD			PVD										
	(2) Grade code	6F	5C	3B	6F	5C	3B								
(1) Geometry code	ISO/ANSI Reference	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930	CW	RE	INSL	PSIRR/L	Seat² Size	fn (in/r)	Min	Max
1130841	MG0300B020-N01-MG		◉	◉		◉	◉	0.118	0.008	0.866	-	B	0.006	0.003	0.009
1130906	MG0300B020-060R01-MG		◬	◬		◬	◬	0.118	0.008	0.866	0.236	B	0.004	0.002	0.006
1130907	MG0300B020-060L01-MG		◬	◬		◬	◬	0.118	0.008	0.866	0.236	B	0.004	0.002	0.006
1130908	MG0400C040-N01-MG		○	○		○	○	0.157	0.016	0.984	-	C	0.007	0.003	0.010
1130909	MG0400C040-040R01-MG		○	○		○	○	0.157	0.016	0.984	0.157	C	0.005	0.002	0.007
1130910	MG0400C040-040L01-MG		○	○		○	○	0.157	0.016	0.984	0.157	C	0.005	0.002	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

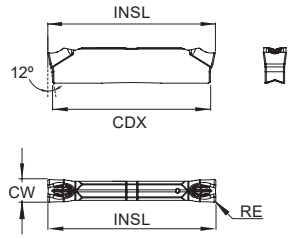
Insert order code = (1) Geometry Code + (2) Grade Code

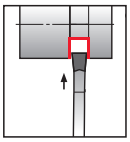
◬ Stock available soon | Produto de stock disponível brevemente | Producto en stock disponible en breve

2 - Correspond to a Specific Holder

MG...02-MG Stable Grooving







		M			S			Dimensions Dimensões Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte		
		PVD			PVD											
	(2) Grade code	6F	5C	3B	6F	5C	3B									
(1) Geometry code	ISO/ANSI Reference	PHL910	PHL920	PHL930	PHL910	PHL920	PHL930	CW	RE	INSL	PSIRR/L	CDX	Seat² Size	fn (in/r)	Min	Max
1130911	MG0200A015-N02-MG	◬	◬		◬	◬		0.079	0.006	0.866	-	0.787	A	0.003	0.001	0.004
1130842	MG0300B015-N02-MG		◉	◉		◉	◉	0.118	0.006	0.866	-	0.787	B	0.003	0.001	0.004
1130843	MG0300B030-N02-MG		○	○		○	○	0.118	0.012	0.866	-	0.787	B	0.006	0.003	0.009
1130912	MG0300B020-060R02-MG		◬	◬		◬	◬	0.118	0.008	0.866	0.236	0.787	B	0.004	0.002	0.006
1130913	MG0300B020-060L02-MG		◬	◬		◬	◬	0.118	0.008	0.866	0.236	0.787	B	0.004	0.002	0.006
1130914	MG0300B018-150R02-MG		○	○		○	○	0.118	0.007	0.866	0.591	0.787	B	0.003	0.002	0.005
1130915	MG0300B018-150L02-MG		○	○		○	○	0.118	0.007	0.866	0.591	0.787	B	0.003	0.002	0.005
1130868	MG0400C020-N02-MG		◉	◉		◉	◉	0.157	0.008	0.984	-	0.906	C	0.005	0.002	0.007
1130916	MG0400C040-N02-MG		○	○		○	○	0.157	0.016	0.984	-	0.906	C	0.007	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

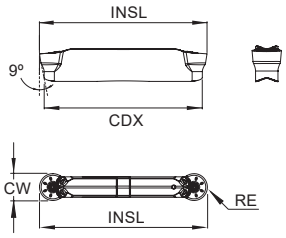
◬ Stock available soon | Produto de stock disponível brevemente | Producto en stock disponible en breve

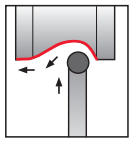
2 - Correspond to a Specific Holder

palbit

MG...02-PG Profiling







(1) Geometry code	ISO/ANSI Reference	P PVD (2) Grade code 6F	P PVD 5C	P PVD 3B	K PVD 6F	K PVD 5C	K PVD 3B	Dimensions Dimensões Dimensiones (in) CW	RE	INSL	CDX	Seat² Size	Cutting conditions Condições de corte Condiciones de corte AP (in)	Min	Max	fn (in/r) Min	Max
		PHL910	PHL920	PHL930	PHL910	PHL920	PHL930										
1130917	MG0200A100-N02-PG	○	○		○	○		0.079	0.039	0.866	0.787	A	0.020	0.008	0.031	0.003	0.001	0.005
1130918	MG0300B150-N02-PG		○	○		○	○	0.118	0.059	0.866	0.787	B	0.039	0.016	0.063	0.004	0.002	0.006
1130848	MG0400C200-N02-PG		◈	◈		◈	◈	0.157	0.079	0.984	0.906	C	0.051	0.024	0.079	0.005	0.002	0.008
1130919	MG0500D250-N02-PG		○	○		○	○	0.197	0.098	0.984	0.906	D	0.059	0.028	0.087	0.005	0.002	0.008
1130920	MG0600E300-N02-PG		△	△		△	△	0.236	0.118	0.984	0.906	E	0.071	0.031	0.110	0.005	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

△ Stock available soon | Produto de stock disponível brevemente | Producto en stock disponible en breve

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

2 - Correspond to a Specific Holder

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

ISO	Material	HB (Brinell)	Vc (sfm) ← Wear Resistance		Toughness →
			PHL910	PHL920	PHL930
P	Unalloyed steel	125-170	328-870	296-853	246-820
P	Low-alloy steel	180-350	263-788	230-755	214-722
P	High-alloy steel	200-325	214-738	197-689	197-656
M	SS - Ferritic / Martensitic	200-330	296-542	263-525	230-492
M	SS - Austenitic / Duplex	180-330	230-492	230-460	197-427
M	SS - Ferritic / Duplex	230-260	181-460	164-427	164-394
K	Marble cast iron	130-230	361-738	345-722	328-689
K	Grey cast iron	180-220	345-656	328-656	328-624
K	Nodular cast iron	160-380	345-591	328-591	328-525
S	Heat resistant super alloys (Nickel base)	250-320	-	99-230	82-197
S	Heat resistant super alloys (Cobalt base)	200-320	-	66-197	66-164
S	Heat Resistant Super Alloys	200-320	-	82-214	82-148

TOOLHOLDERS & MODULAR TOOLHOLDERS CODE KEY

Chave de codificação para suportes e suportes modulares | Llave de codificación de portaherramientas y portaherramientas modulares

For Toolholders

MG	L	C	-	100	012	16.16	.A	.1	-	A
1	2	3		4	5	6	7	8		9

For Modular Toolholders

MG	L	C	-	100	16.16	-	A
1	2	3		4	6		9

1 - Product Line

MG - Master Grooving

2 - Work Side

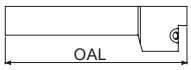
R - Right  N - Neutral  L - Left 

3 - Tool Type

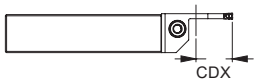
C - Frontal | L - Lateral | MC - Modular Frontal | ML - Modular Lateral | M - Modular (for blades)

4 - Total toolholder lenght (mm)



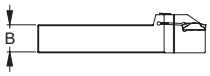


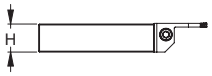
5 - Maximum Depth of Cut (mm) (Suppressed on modular systems)



6 - Shaft | Cutting Unit Dimension

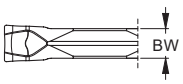
Example for 16.16 on the toolholder :
B=16mm (0.630 in) | H=16mm (0.630 in)



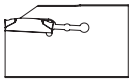
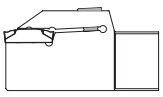


7 - Seat Size (Suppressed on modular systems)

A - 1,50mm (0.059 in) | B - 2,50mm (0.098 in) | C - 3,05mm (0.120 in) | D - 4,00mm (0.157 in) |
E - 5,00mm (0.197 in)



8 - Clamping System (Suppressed on modular systems)

0 - Spring  1 - Screw 

9 - Coolant System (Suppressed if does not exist)

A - With coolant system

palbit

PSC TOOLHOLDERS & MODULAR PSC TOOLHOLDERS CODE KEY

Chave de codificação para suportes PSC e suportes PSC modulares | Llave de codificación de portaherramientas PSC y portaherramientas PSC modulares

For PSC Toolholders

PSC	32	-	MG	L	C	-	015	22	055	A	.1	-	A
1	2		3	4	5		6	7	8	9	10		11

For Modular PSC Toolholders

PSC	32	-	MG	L	ML	18	040	-	A
1	2		3	4	5	7	8		11

1 - Modular System	2 - Size
PSC - Polygonal Shank Coupling	32 (1.260 in) | 40 (1.575 in) | 50 (1.969 in) | 63 (2.480 in)

3 - Product Line

MG - Master Grooving

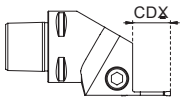
4 - Work Side

R - Right  N - Neutral  L - Left 

5 - Tool Type

C - Frontal | L - Lateral | MC - Modular Frontal | ML - Modular Lateral | M - Modular (for blades)

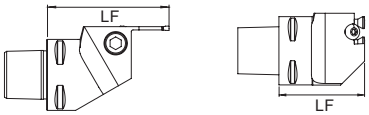
6 - Maximum Depth of Cut (mm)



7 - Functional width (mm)

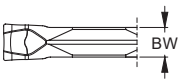


8 - Functional lenght (mm)

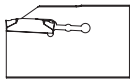
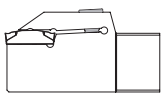


9 - Seat Size (Suppressed on modular systems)

A - 1,50mm (0.059 in) | B - 2,50mm (0.098 in) | C - 3,05mm (0.120 in) | D - 4,00mm (0.157 in) | E - 5,00mm (0.197 in)



10 - Clamping System (Suppressed on modular systems)

0 - Spring  1 - Screw 

11 - Coolant System (Suppressed if does not exist)

A - With coolant system

BLADES & MODULAR CARTRIDGES CODE KEY

Chave de codificação para lâminas e cartuchos modulares | Llave de codificación de lamas y cartuchos modulares

For Blades

MG	N	C	-	020	21	.A	.0	-	A
1	2	3		4	5	7	8		9

For Modular Cartridges

MG	L	M	-	012	040-055	.A	.1	-	A
1	2	3		4	6	7	8		9

1 - Product Line

MG - Master Grooving

2 - Work Side

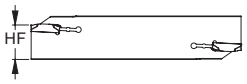
R - Right  N - Neutral  L - Left 

4 - Tool Type

C - Frontal | L - Lateral | MC - Modular Frontal | ML - Modular Lateral | M - Modular (for blades)

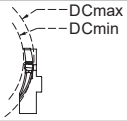
5 - Cutting Unit Dimension (for blades)

21 : HF=21mm (0.827 in)



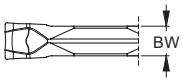
6 - Diameter range (for face grooving cartridges)

040-055 : 40 mm (1.575 in) to 55mm (1.969 in)

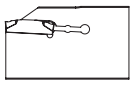
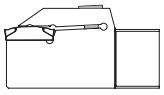


7 - Seat Size

A - 1,50mm (0.059 in) | B - 2,50mm (0.098 in) | C - 3,05mm (0.120 in) | D - 4,00mm (0.157 in) | E - 5,00mm (0.197 in)



8 - Clamping System

0 - Spring  1 - Screw 

9 - Coolant System (Suppressed if does not exist)

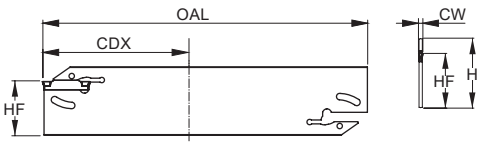
A - With coolant system

palbit

MGNC

METRIC LINE





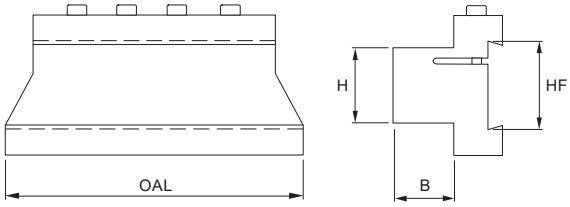
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Seat Size	Insert	Number of inserts	Toolholder		Wrench	Stock
		CDX	OAL	H	HF	CW					CPTS	DPTS		
183043900	MGNC-038 21.A.0	1.496	4.331	1.024	0.843	2	0.132	A	MG.. 02	1	CPTS 26...	DPTS 26...	290079600	⚙
183044100	MGNC-062 25.A.0	2.441	5.906	1.260	0.984	2	0.198	A	MG.. 02	2	CPTS 32...	DPTS 32...	290079600	⚙
183044000	MGNC-038 21.B.0	1.496	4.331	1.024	0.843	3	0.154	B	MG.. 03	1	CPTS 26...	DPTS 26...	290079600	⚙
183044200	MGNC-062 25.B.0	2.441	5.906	1.260	0.984	3	0.220	B	MG.. 03	2	CPTS 32...	DPTS 32...	290079600	⚙
183044300	MGNC-062 25.C.0	2.441	5.906	1.260	0.984	4	0.276	C	MG.. 04	2	CPTS 32...	DPTS 32...	290079600	⚙

⚙ 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 CDX is defined by the insert

CPTS

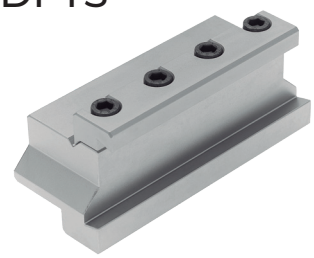


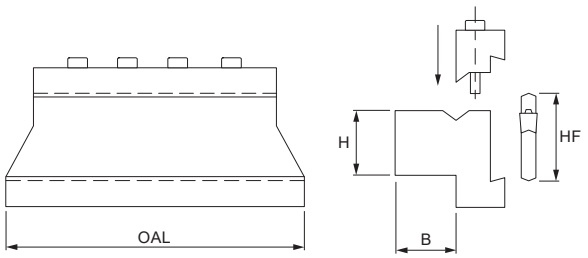


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Screw	Wrench	Stock
		HF	OAL	H	B				
290007600	CPTS 1026	1.020	3.430	0.625	0.625	0.990	D0603600	SS50	○
290086900	CPTS 1226	1.020	3.430	0.750	0.750	1.100	D0603600	SS50	○
290007700	CPTS 1232	1.250	3.940	0.750	0.750	1.540	D0603600	SS50	○
290007800	CPTS 1632	1.250	4.330	1.000	1.000	2.090	D0603600	SS50	○
290087100	CPTS 2032	1.250	4.750	1.250	1.250	3.080	D0603600	SS50	○
213033300	CPTS 2432	1.250	4.750	1.500	1.640	3.080	D0603600	SS50	○

⚙ 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)				WT (lbs)	Screw	Wrench	Stock
		HF	OAL	H	B				
213032200	DPTS 1026	1.020	3.430	0.625	0.625	1.210	D0603600	SS50	○
213032300	DPTS 1226	1.020	3.430	0.750	0.750	1.540	D0603600	SS50	○
213033000	DPTS 1232	1.250	3.940	0.750	0.750	1.650	D0603600	SS50	○
213032400	DPTS 1632	1.250	4.330	1.000	1.000	2.200	D0603600	SS50	○
213033100	DPTS 2032	1.250	4.750	1.250	1.250	3.190	D0603600	SS50	○
213033200	DPTS 2432	1.250	4.750	1.500	1.640	3.190	D0603600	SS50	○

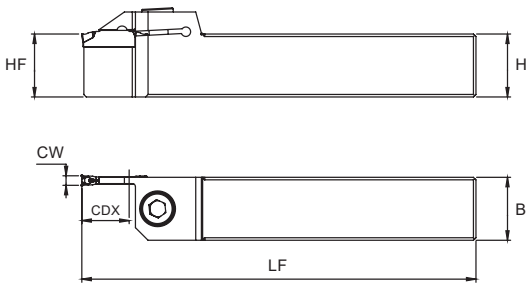
⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

TOOLHOLDERS Suportes | Herramientas

MGLC

METRIC LINE





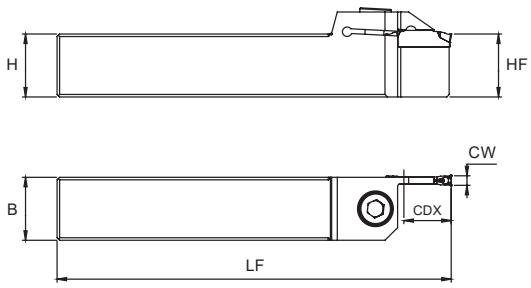
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)						WT (lbs)	Seat Size	Insert	Screw	Wrench	lbf/in	Stock
		CDX	LF	B	H	HF	CW							
183041100	MGLC-100 012 16.16.A.1	0.472	3.937	0.630	0.630	0.630	0.079	0.397	A	MG .. 02	290098600	290021300	17.7	●
183041700	MGLC-125 012 20.20.A.1	0.472	4.921	0.787	0.787	0.787	0.079	0.815	A	MG .. 02	290087400	290021300	17.7	●
183041300	MGLC-100 012 16.16.B.1	0.472	3.937	0.630	0.630	0.630	0.118	0.397	B	MG .. 03	290098600	290021300	17.7	●
183041500	MGLC-100 020 16.16.B.1	0.787	3.937	0.630	0.630	0.630	0.118	0.375	B	MG .. 03	290098600	290021300	17.7	○
183041900	MGLC-125 012 20.20.B.1	0.472	4.921	0.787	0.787	0.787	0.118	0.815	B	MG .. 03	290087400	290021300	17.7	○
183042100	MGLC-125 020 20.20.B.1	0.787	4.921	0.787	0.787	0.787	0.118	0.771	B	MG .. 03	290087400	290021300	17.7	●
183042600	MGLC-150 012 25.25.B.1	0.472	5.906	0.984	0.984	0.984	0.118	1.499	B	MG .. 03	290087400	290021300	17.7	●
183042800	MGLC-150 020 25.25.B.1	0.787	5.906	0.984	0.984	0.984	0.118	1.433	B	MG .. 03	290087400	290021300	17.7	●
183042200	MGLC-125 012 20.20.C.1	0.472	4.921	0.787	0.787	0.787	0.157	0.815	C	MG .. 04	290087400	290021300	26.6	○
183042400	MGLC-125 020 20.20.C.1	0.787	4.921	0.787	0.787	0.787	0.157	0.771	C	MG .. 04	290087400	290021300	26.6	○
183042900	MGLC-150 012 25.25.C.1	0.472	5.906	0.984	0.984	0.984	0.157	1.499	C	MG .. 04	290087400	290021300	26.6	●
183043100	MGLC-150 020 25.25.C.1	0.787	5.906	0.984	0.984	0.984	0.157	1.433	C	MG .. 04	290087400	290021300	26.6	●
183043300	MGLC-150 012 25.25.D.1	0.472	5.906	0.984	0.984	0.984	0.197	1.499	D	MG .. 05	290087400	290021300	26.6	●
183043500	MGLC-150 022 25.25.D.1	0.866	5.906	0.984	0.984	0.984	0.197	1.433	D	MG .. 05	290087400	290021300	26.6	●
183043700	MGLC-150 022 25.25.E.1	0.866	5.906	0.984	0.984	0.984	0.236	1.433	E	MG .. 06	290087400	290021300	35.4	○

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

MGRC

METRIC LINE





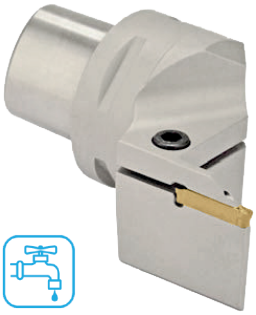
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)						WT	Seat Size	Insert	Screw	Wrench	lbf/in	Stock
		CDX	LF	B	H	HF	CW							
183041200	MGRC-100 012 16.16.A.1	0.472	3.937	0.630	0.630	0.630	0.079	0.397	A	MG .. 02	290098600	290021300	17.7	○
183041800	MGRC-125 012 20.20.A.1	0.472	4.921	0.787	0.787	0.787	0.079	0.815	A	MG .. 02	290087400	290021300	17.7	◈
183041400	MGRC-100 012 16.16.B.1	0.472	3.937	0.630	0.630	0.630	0.118	0.397	B	MG .. 03	290098600	290021300	17.7	○
183041600	MGRC-100 020 16.16.B.1	0.787	3.937	0.630	0.630	0.630	0.118	0.375	B	MG .. 03	290098600	290021300	17.7	◈
183042000	MGRC-125 012 20.20.B.1	0.472	4.921	0.787	0.787	0.787	0.118	0.815	B	MG .. 03	290087400	290021300	17.7	◈
183040800	MGRC-125 020 20.20.B.1	0.787	4.921	0.787	0.787	0.787	0.118	0.771	B	MG .. 03	290087400	290021300	17.7	◈
183042700	MGRC-150 012 25.25.B.1	0.472	5.906	0.984	0.984	0.984	0.118	1.499	B	MG .. 03	290087400	290021300	17.7	◈
183040900	MGRC-150 020 25.25.B.1	0.787	5.906	0.984	0.984	0.984	0.118	1.433	B	MG .. 03	290087400	290021300	17.7	◈
183042300	MGRC-125 012 20.20.C.1	0.472	4.921	0.787	0.787	0.787	0.157	0.815	C	MG .. 04	290087400	290021300	26.6	◈
183042500	MGRC-125 020 20.20.C.1	0.787	4.921	0.787	0.787	0.787	0.157	0.771	C	MG .. 04	290087400	290021300	26.6	◈
183043000	MGRC-150 012 25.25.C.1	0.472	5.906	0.984	0.984	0.984	0.157	1.499	C	MG .. 04	290087400	290021300	26.6	◈
183043200	MGRC-150 020 25.25.C.1	0.787	5.906	0.984	0.984	0.984	0.157	1.433	C	MG .. 04	290087400	290021300	26.6	◈
183043400	MGRC-150 012 25.25.D.1	0.472	5.906	0.984	0.984	0.984	0.197	1.499	D	MG .. 05	290087400	290021300	26.6	◈
183043600	MGRC-150 022 25.25.D.1	0.866	5.906	0.984	0.984	0.984	0.197	1.433	D	MG .. 05	290087400	290021300	26.6	◈
183043800	MGRC-150 022 25.25.E.1	0.866	5.906	0.984	0.984	0.984	0.236	1.433	E	MG .. 06	290087400	290021300	35.4	◈

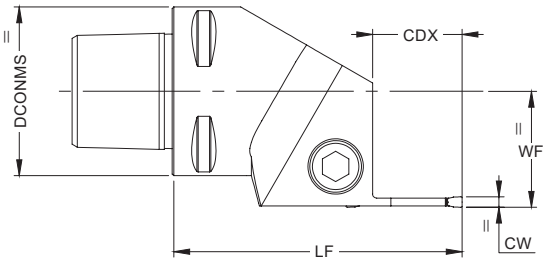
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

PSC TOOLHOLDERS Suportes PSC | Herramientas PSC

PSC L

METRIC LINE



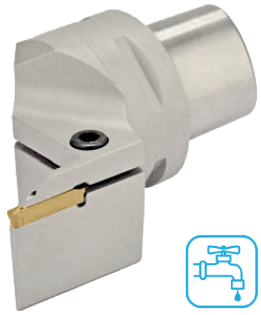


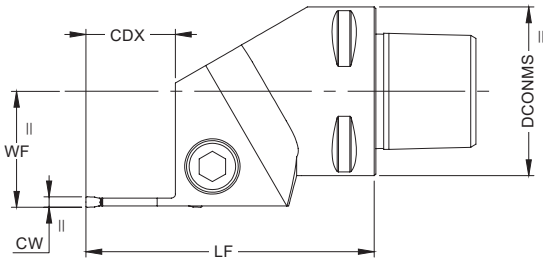
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Seat Size	Insert	Screw	Wrench	lbf/in	Stock
		DCONMS	WF	LF	CDX	CW							
183052000	PSC32-MGLC 015 22055 A.1-A	1.260	0.866	2.165	0.591	0.079	0.551	A	MG.. 02	290062800	290021300	17.7	○
183052200	PSC40-MGLC 015 27055 A.1-A	1.575	1.063	2.165	0.591	0.079	0.948	A	MG.. 02	290087500	290021300	17.7	○
183052400	PSC50-MGLC 015 35060 A.1-A	1.969	1.378	2.362	0.591	0.079	1.763	A	MG.. 02	290087500	290021300	17.7	○
183052600	PSC32-MGLC 020 22055 B.1-A	1.260	0.866	2.165	0.787	0.118	0.551	B	MG.. 03	290062800	290021300	17.7	○
183052800	PSC40-MGLC 020 27060 B.1-A	1.575	1.063	2.362	0.787	0.118	1.058	B	MG.. 03	290087500	290021300	17.7	○
183053000	PSC50-MGLC 020 35060 B.1-A	1.969	1.378	2.362	0.787	0.118	1.763	B	MG.. 03	290087500	290021300	17.7	○
183053200	PSC63-MGLC 020 45065 B.1-A	2.480	1.772	2.559	0.787	0.118	2.424	B	MG.. 03	290087500	290021300	17.7	○
183053400	PSC32-MGLC 020 22060 C.1-A	1.260	0.866	2.362	0.787	0.157	0.573	C	MG.. 04	290062800	290021300	26.6	○
183053600	PSC40-MGLC 025 27067 C.1-A	1.575	1.063	2.638	0.984	0.157	0.970	C	MG.. 04	290087500	290021300	26.6	○
183053800	PSC50-MGLC 025 35067 C.1-A	1.969	1.378	2.638	0.984	0.157	1.763	C	MG.. 04	290087500	290021300	26.6	○
183054000	PSC63-MGLC 025 45070 C.1-A	2.480	1.772	2.756	0.984	0.157	2.975	C	MG.. 04	290087500	290021300	26.6	○
183054200	PSC40-MGLC 025 27067 D.1-A	1.575	1.063	2.638	0.984	0.197	0.970	D	MG.. 05	290087500	290021300	26.6	○
183054400	PSC50-MGLC 025 35067 D.1-A	1.969	1.378	2.638	0.984	0.197	1.763	D	MG.. 05	290087500	290021300	26.6	○
183054600	PSC63-MGLC 025 45070 D.1-A	2.480	1.772	2.756	0.984	0.197	2.975	D	MG.. 05	290087500	290021300	26.6	○
183054800	PSC40-MGLC 025 27070 E.1-A	1.575	1.063	2.756	0.984	0.236	0.970	E	MG.. 06	290087500	290021300	35.4	○
183055000	PSC50-MGLC 025 35070 E.1-A	1.969	1.378	2.756	0.984	0.236	1.719	E	MG.. 06	290087500	290021300	35.4	○
183055200	PSC63-MGLC 025 45075 E.1-A	2.480	1.772	2.953	0.984	0.236	3.152	E	MG.. 06	290087500	290021300	35.4	○

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

PSC R

METRIC LINE





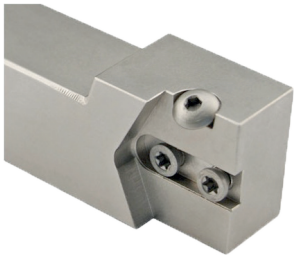
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					WT (lbs)	Seat Size	Insert	Screw	Wrench	lbf/in	Stock
		DCONMS	WF	LF	CDX	CW							
183052100	PSC32-MGRC 015 22055 A.1-A	1.260	0.866	2.165	0.591	0.079	0.551	A	MG.. 02	290062800	290021300	17.7	○
183052300	PSC40-MGRC 015 27055 A.1-A	1.575	1.063	2.165	0.591	0.079	0.948	A	MG.. 02	290087500	290021300	17.7	○
183052500	PSC50-MGRC 015 35060 A.1-A	1.969	1.378	2.362	0.591	0.079	1.763	A	MG.. 02	290087500	290021300	17.7	○
183052700	PSC32-MGRC 020 22055 B.1-A	1.260	0.866	2.165	0.787	0.118	0.551	B	MG.. 03	290062800	290021300	17.7	○
183052900	PSC40-MGRC 020 27060 B.1-A	1.575	1.063	2.362	0.787	0.118	1.058	B	MG.. 03	290087500	290021300	17.7	○
183053100	PSC50-MGRC 020 35060 B.1-A	1.969	1.378	2.362	0.787	0.118	1.763	B	MG.. 03	290087500	290021300	17.7	○
183053300	PSC63-MGRC 020 45065 B.1-A	2.480	1.772	2.559	0.787	0.118	2.424	B	MG.. 03	290087500	290021300	17.7	○
183053500	PSC32-MGRC 020 22060 C.1-A	1.260	0.866	2.362	0.787	0.157	0.573	C	MG.. 04	290062800	290021300	26.6	○
183053700	PSC40-MGRC 025 27067 C.1-A	1.575	1.063	2.638	0.984	0.157	0.970	C	MG.. 04	290087500	290021300	26.6	○
183053900	PSC50-MGRC 025 35067 C.1-A	1.969	1.378	2.638	0.984	0.157	1.763	C	MG.. 04	290087500	290021300	26.6	○
183054100	PSC63-MGRC 025 45070 C.1-A	2.480	1.772	2.756	0.984	0.157	2.975	C	MG.. 04	290087500	290021300	26.6	○
183054300	PSC40-MGRC 025 27067 D.1-A	1.575	1.063	2.638	0.984	0.197	0.970	D	MG.. 05	290087500	290021300	26.6	○
183054500	PSC50-MGRC 025 35067 D.1-A	1.969	1.378	2.638	0.984	0.197	1.763	D	MG.. 05	290087500	290021300	26.6	○
183054700	PSC63-MGRC 025 45070 D.1-A	2.480	1.772	2.756	0.984	0.197	2.975	D	MG.. 05	290087500	290021300	26.6	○
183054900	PSC40-MGRC 025 27070 E.1-A	1.575	1.063	2.756	0.984	0.236	0.970	E	MG.. 06	290087500	290021300	35.4	○
183055100	PSC50-MGRC 025 35070 E.1-A	1.969	1.378	2.756	0.984	0.236	1.719	E	MG.. 06	290087500	290021300	35.4	○
183055300	PSC63-MGRC 025 45075 E.1-A	2.480	1.772	2.953	0.984	0.236	3.152	E	MG.. 06	290087500	290021300	35.4	○

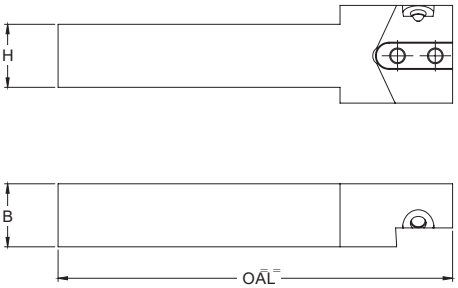
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

MODULAR TOOLHOLDERS Suportes modulares | Herramientas modulares

MGLMC

METRIC LINE



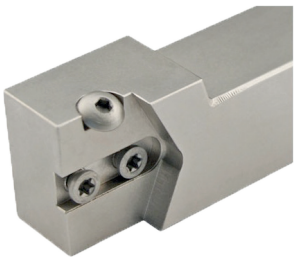


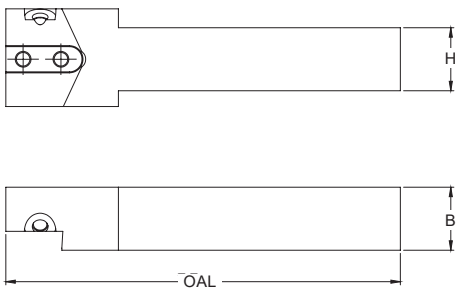
Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (in)				WT (lbs)	Allen Screw	Allen Wrench	lbf/in	Torx Screw	Torx Wrench	lbf/in	Stock
		H	B	OAL	CW								
183044400	MGLMC-125 20.20	0.787	0.787	4.921	0.079-0.236	0.683	290029900	290038400	62.0	290078500	290013200	26.6	⚙
183044600	MGLMC-150 25.25	0.984	0.984	5.906	0.079-0.236	1.344	290029900	290038400	62.0	290029900	290013200	26.6	⚙
183044800	MGLMC-170 32.32	1.260	1.260	6.693	0.079-0.236	2.865	290029900	290038400	62.0	290029900	290013200	26.6	⚙

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

MGRMC

METRIC LINE



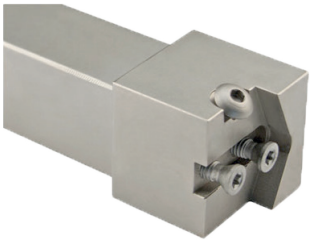


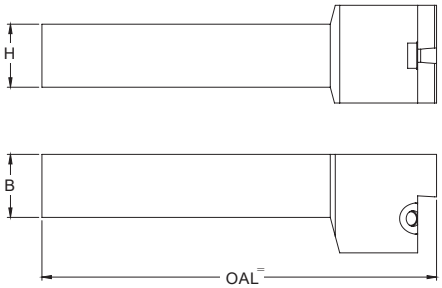
Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (in)				WT (lbs)	Allen Screw	Allen Wrench	lbf/in	Torx Screw	Torx Wrench	lbf/in	Stock
		H	B	OAL	CW								
183044500	MGRMC-125 20.20	20	20	125	0.079-0.236	0.683	290029900	290038400	62.0	290029900	290013200	26.6	⚙
183044700	MGRMC-150 25.25	25	25	150	0.079-0.236	1.344	290029900	290038400	62.0	290029900	290013200	26.6	⚙
183044900	MGRMC-170 32.32	32	32	170	0.079-0.236	2.865	290029900	290038400	62.0	290029900	290013200	26.6	⚙

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

MGLML

METRIC LINE



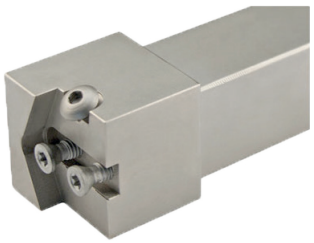


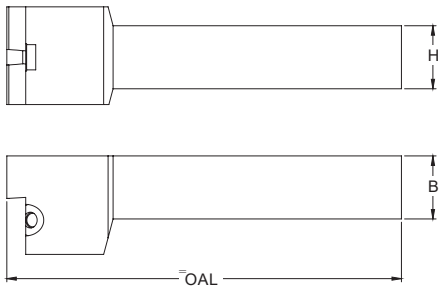
Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (in)				WT (lbs)	Allen Screw	Allen Wrench	lbf/in	Torx Screw	Torx Wrench	lbf/in	Stock
		H	B	OAL	CW								
183045000	MGLML-125 20.20	0.787	0.787	4.921	0.079-0.236	0.992	290029900	290038400	62.0	290029900	290013200	26.6	◈
183045200	MGLML-150 25.25	0.984	0.984	5.906	0.079-0.236	1.719	290029900	290038400	62.0	290029900	290013200	26.6	◈
183045400	MGLML-170 32.32	1.260	1.260	6.693	0.079-0.236	3.086	290029900	290038400	62.0	290029900	290013200	26.6	◈

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

MGRML

METRIC LINE





Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (in)				WT (lbs)	Allen Screw	Allen Wrench	lbf/in	Torx Screw	Torx Wrench	lbf/in	Stock
		H	B	OAL	CW								
183045100	MGRML-125 20.20	0.787	0.787	4.921	0.079-0.236	0.992	290029900	290038400	62.0	290029900	290013200	26.6	◈
183045300	MGRML-150 25.25	0.984	0.984	5.906	0.079-0.236	1.719	290029900	290038400	62.0	290029900	290013200	26.6	◈
183045500	MGRML-170 32.32	1.260	1.260	6.693	0.079-0.236	3.086	290029900	290038400	62.0	290029900	290013200	26.6	◈

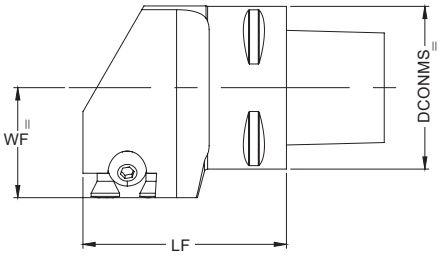
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

MODULAR PSC TOOLHOLDERS Suportes PSC modulares | Herramientas PSC modulares

PSC-MGLMC

METRIC LINE





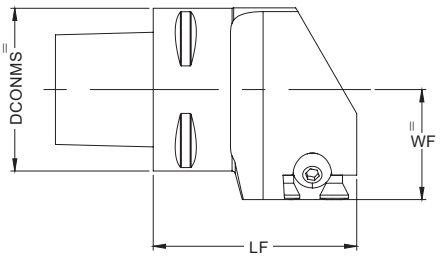
Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (in)				WT (lbs)	Allen Screw	Allen Wrench	lbf/in	Torx Screw	Torx Wrench	lbf/in	Stock
		DCONMS	WF	LF	CW								
183056200	PSC32-MGLMC 22042	1.260	0.866	1.654	0.079-0.236	0.280	290029900	290038400	62.0	290078500	290013200	17.7	○
183056400	PSC40-MGLMC 27050	1.575	1.063	1.969	0.079-0.236	0.490	290029900	290038400	62.0	290078500	290013200	17.7	○
183056600	PSC50-MGLMC 30050	1.969	1.181	1.969	0.079-0.236	0.740	290029900	290038400	62.0	290078500	290013200	17.7	○
183056800	PSC63-MGLMC 45055	2.480	1.772	2.165	0.079-0.236	1.240	290029900	290038400	62.0	290078500	290013200	17.7	○

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

PSC-MGRMC

METRIC LINE





Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (in)				WT (lbs)	Allen Screw	Allen Wrench	lbf/in	Torx Screw	Torx Wrench	lbf/in	Stock
		DCONMS	WF	LF	CW								
183056300	PSC32-MGRMC 22042	1.260	0.866	1.654	0.079-0.236	0.280	290029900	290038400	62.0	290078500	290013200	17.7	○
183056500	PSC40-MGRMC 27050	1.575	1.063	1.969	0.079-0.236	0.490	290029900	290038400	62.0	290078500	290013200	17.7	○
183056700	PSC50-MGRMC 30050	1.969	1.181	1.969	0.079-0.236	0.740	290029900	290038400	62.0	290078500	290013200	17.7	○
183056900	PSC63-MGRMC 45055	2.480	1.772	2.165	0.079-0.236	1.240	290029900	290038400	62.0	290078500	290013200	17.7	○

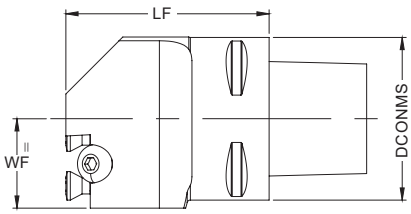
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

MODULAR PSC TOOLHOLDERS Suportes PSC modulares | Herramientas PSC modulares

PSC-MGLML

METRIC LINE





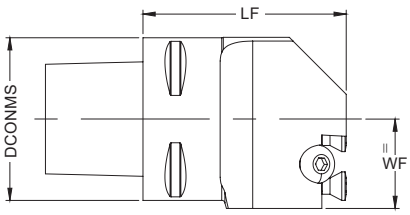
Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (in)				WT (lbs)	Allen Screw	Allen Wrench	lbf/in	Torx Screw	Torx Wrench	lbf/in	Stock
		DCONMS	WF	LF	CW								
183055400	PSC32-MGLML 18040	1.260	0.709	1.575	0.079-0.236	0.250	290029900	290038400	62.0	290078500	290013200	17.7	◯
183055600	PSC40-MGLML 22050	1.575	0.866	1.969	0.079-0.236	0.470	290029900	290038400	62.0	290078500	290013200	17.7	◯
183055800	PSC50-MGLML 27060	1.969	1.063	2.362	0.079-0.236	0.860	290029900	290038400	62.0	290078500	290013200	17.7	◯
183056000	PSC63-MGLML 34065	2.480	1.339	2.559	0.079-0.236	1.440	290029900	290038400	62.0	290078500	290013200	17.7	◯

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

PSC-MGRML

METRIC LINE





Order code Código	Reference Referência Referencia	Dimensions | Dimensões Dimensiones (in)				WT (lbs)	Allen Screw	Allen Wrench	lbf/in	Torx Screw	Torx Wrench	lbf/in	Stock
		DCONMS	WF	LF	CW								
183055500	PSC32-MGRML 18040	1.260	0.709	1.575	0.079-0.236	0.250	290029900	290038400	62.0	290078500	290013200	17.7	◯
183055700	PSC40-MGRML 22050	1.575	0.866	1.969	0.079-0.236	0.470	290029900	290038400	62.0	290078500	290013200	17.7	◯
183055900	PSC50-MGRML 27060	1.969	1.063	2.362	0.079-0.236	0.860	290029900	290038400	62.0	290078500	290013200	17.7	◯
183056100	PSC63-MGRML 34065	2.480	1.339	2.559	0.079-0.236	1.440	290029900	290038400	62.0	290078500	290013200	17.7	◯

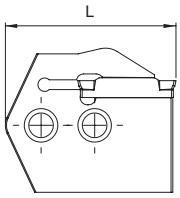
Stock item | Produto de stock | Itens de stock ◯ Available under request | Disponível sobre consulta | Disponible bajo consulta

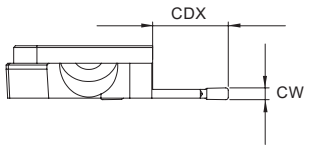
MODULAR CARTRIDGES Cartuchos modulares | Cartuchos modulares

MGLM

METRIC LINE







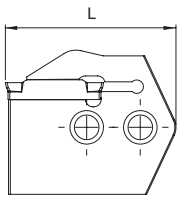
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)			WT (lbs)	Seat Size	Insert	Stock
		CDX	L	CW				
183045600	MGLM 012 A.1	0.472	1.496	0.079	0.088	A	MG.. 02	○
183045800	MGLM 020 A.1	0.787	1.811	0.079	0.088	A	MG.. 02	○
183046000	MGLM 012 B.1	0.472	1.496	0.118	0.088	B	MG.. 03	○
183046200	MGLM 020 B.1	0.787	1.811	0.118	0.088	B	MG.. 03	○
183046400	MGLM 012 C.1	0.472	1.496	0.157	0.088	C	MG.. 04	○
183046600	MGLM 020 C.1	0.787	1.811	0.157	0.088	C	MG.. 04	○
183046800	MGLM 012 D.1	0.472	1.496	0.197	0.088	D	MG.. 05	○
183047000	MGLM 022 D.1	0.866	1.890	0.197	0.088	D	MG.. 05	○
183047200	MGLM 012 E.1	0.472	1.496	0.236	0.088	E	MG.. 06	○
183047400	MGLM 022 E.1	0.866	1.890	0.236	0.088	E	MG.. 06	○

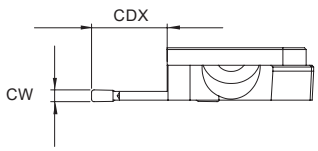
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

MGRM

METRIC LINE







Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)			WT (lbs)	Seat Size	Insert	Stock
		CDX	L	CW				
183045700	MGRM 012 A.1	0.472	1.496	0.079	0.088	A	MG.. 02	○
183045900	MGRM 020 A.1	0.787	1.811	0.079	0.088	A	MG.. 02	○
183046100	MGRM 012 B.1	0.472	1.496	0.118	0.088	B	MG.. 03	○
183046300	MGRM 020 B.1	0.787	1.811	0.118	0.088	B	MG.. 03	○
183046500	MGRM 012 C.1	0.472	1.496	0.157	0.088	C	MG.. 04	○
183046700	MGRM 020 C.1	0.787	1.811	0.157	0.088	C	MG.. 04	○
183046900	MGRM 012 D.1	0.472	1.496	0.197	0.088	D	MG.. 05	○
183047100	MGRM 022 D.1	0.866	1.890	0.197	0.088	D	MG.. 05	○
183047300	MGRM 012 E.1	0.472	1.496	0.236	0.088	E	MG.. 06	○
183047500	MGRM 022 E.1	0.866	1.890	0.236	0.088	E	MG.. 06	○

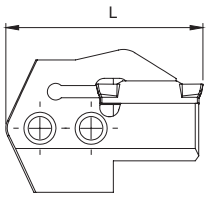
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

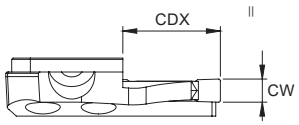
MODULAR CARTRIDGES Cartuchos modulares | Cartuchos modulares

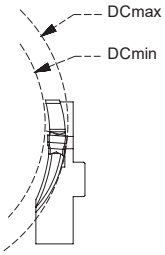
MGLM Face Grooving

METRIC LINE









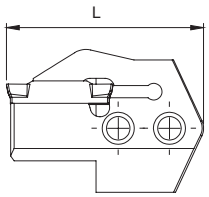
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)			WT (lbs)	Seat Size	Diameter Range (in)	Insert	Stock
		CDX	L	CW					
183047600	MGLM 012 040-055 B.1	0.472	1.496	0.118	0.088	B	1.575-2.165	MG.. 03	○
183047800	MGLM 015 055-070 B.1	0.591	1.614	0.118	0.088	B	2.165-2.756	MG.. 03	○
183048000	MGLM 018 070-098 B.1	0.709	1.732	0.118	0.088	B	2.756-3.858	MG.. 03	○
183048200	MGLM 018 090-140 B.1	0.709	1.732	0.118	0.088	B	3.543-5.512	MG.. 03	○
183048400	MGLM 018 130-300 B.1	0.709	1.732	0.118	0.088	B	5.118-11.811	MG.. 03	○
183048600	MGLM 018 300-999 B.1	0.709	1.732	0.118	0.088	B	11.811-39.331	MG.. 03	○
183048800	MGLM 018 040-055 C.1	0.709	1.732	0.157	0.088	C	1.575-2.165	MG.. 04	○
183049000	MGLM 018 055-070 C.1	0.709	1.732	0.157	0.088	C	2.165-2.756	MG.. 04	○
183049200	MGLM 018 070-098 C.1	0.709	1.732	0.157	0.088	C	2.756-3.858	MG.. 04	○
183049400	MGLM 018 090-140 C.1	0.709	1.732	0.157	0.088	C	3.543-5.512	MG.. 04	○
183049600	MGLM 018 130-300 C.1	0.709	1.732	0.157	0.088	C	5.118-11.811	MG.. 04	○
183049800	MGLM 018 300-999 C.1	0.709	1.732	0.157	0.088	C	11.811-39.331	MG.. 04	○
183050000	MGLM 020 050-070 D.1	0.787	1.811	0.197	0.088	D	2.165-2.756	MG.. 05	○
183050200	MGLM 020 070-098 D.1	0.787	1.811	0.197	0.088	D	2.756-3.858	MG.. 05	○
183050400	MGLM 020 090-140 D.1	0.787	1.811	0.197	0.088	D	3.543-5.512	MG.. 05	○
183050600	MGLM 020 130-300 D.1	0.787	1.811	0.197	0.088	D	5.118-11.811	MG.. 05	○
183050800	MGLM 020 300-999 D.1	0.787	1.811	0.197	0.088	D	11.811-39.331	MG.. 05	○
183051000	MGLM 020 050-070 E.1	0.787	1.811	0.236	0.088	E	2.165-2.756	MG.. 06	○
183051200	MGLM 020 070-098 E.1	0.787	1.811	0.236	0.088	E	2.756-3.858	MG.. 06	○
183051400	MGLM 020 090-140 E.1	0.787	1.811	0.236	0.088	E	3.543-5.512	MG.. 06	○
183051600	MGLM 020 130-300 E.1	0.787	1.811	0.236	0.088	E	5.118-11.811	MG.. 06	○
183051800	MGLM 020 300-999 E.1	0.787	1.811	0.236	0.088	E	11.811-39.331	MG.. 06	○

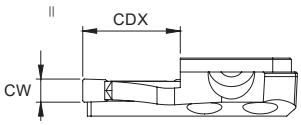
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

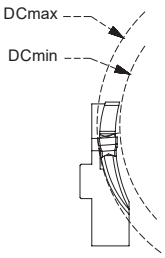
MGRM Face Grooving

METRIC LINE





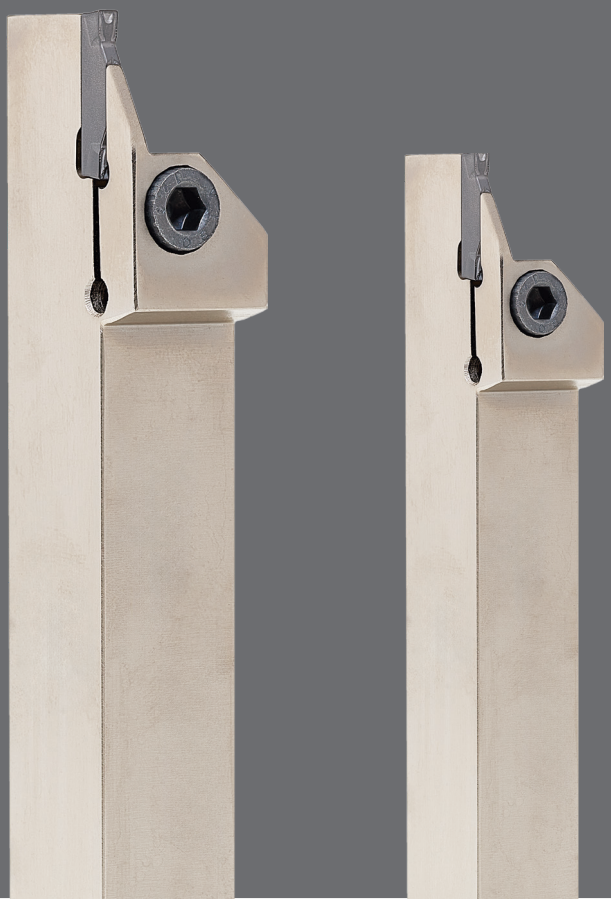




Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)			WT (lbs)	Seat Size	Diameter Range (in)	Insert	Stock
		CDX	L	CW					
183047700	MGRM 012 040-055 B.1	0.472	1.496	0.118	0.088	B	1.575-2.165	MG.. 03	○
183047900	MGRM 015 055-070 B.1	0.591	1.614	0.118	0.088	B	2.165-2.756	MG.. 03	○
183048100	MGRM 018 070-098 B.1	0.709	1.732	0.118	0.088	B	2.756-3.858	MG.. 03	○
183048300	MGRM 018 090-140 B.1	0.709	1.732	0.118	0.088	B	3.543-5.512	MG.. 03	○
183048500	MGRM 018 130-300 B.1	0.709	1.732	0.118	0.088	B	5.118-11.811	MG.. 03	○
183048700	MGRM 018 300-999 B.1	0.709	1.732	0.118	0.088	B	11.811-39.331	MG.. 03	○
183048900	MGRM 018 040-055 C.1	0.709	1.732	0.157	0.088	C	1.575-2.165	MG.. 04	○
183049100	MGRM 018 055-070 C.1	0.709	1.732	0.157	0.088	C	2.165-2.756	MG.. 04	○
183049300	MGRM 018 070-098 C.1	0.709	1.732	0.157	0.088	C	2.756-3.858	MG.. 04	○
183049500	MGRM 018 090-140 C.1	0.709	1.732	0.157	0.088	C	3.543-5.512	MG.. 04	○
183049700	MGRM 018 130-300 C.1	0.709	1.732	0.157	0.088	C	5.118-11.811	MG.. 04	○
183049900	MGRM 018 300-999 C.1	0.709	1.732	0.157	0.088	C	11.811-39.331	MG.. 04	○
183050100	MGRM 020 050-070 D.1	0.787	1.811	0.197	0.088	D	2.165-2.756	MG.. 05	○
183050300	MGRM 020 070-098 D.1	0.787	1.811	0.197	0.088	D	2.756-3.858	MG.. 05	○
183050500	MGRM 020 090-140 D.1	0.787	1.811	0.197	0.088	D	3.543-5.512	MG.. 05	○
183050700	MGRM 020 130-300 D.1	0.787	1.811	0.197	0.088	D	5.118-11.811	MG.. 05	○
183050900	MGRM 020 300-999 D.1	0.787	1.811	0.197	0.088	D	11.811-39.331	MG.. 05	○
183051100	MGRM 020 050-070 E.1	0.787	1.811	0.236	0.088	E	2.165-2.756	MG.. 06	○
183051300	MGRM 020 070-098 E.1	0.787	1.811	0.236	0.088	E	2.756-3.858	MG.. 06	○
183051500	MGRM 020 090-140 E.1	0.787	1.811	0.236	0.088	E	3.543-5.512	MG.. 06	○
183051700	MGRM 020 130-300 E.1	0.787	1.811	0.236	0.088	E	5.118-11.811	MG.. 06	○
183051900	MGRM 020 300-999 E.1	0.787	1.811	0.236	0.088	E	11.811-39.331	MG.. 06	○

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

GROOVING PLUS



Grooving Plus is designed to address the specific requirements of parting and grooving applications, offering a new level of process security and productivity for machining operation.

O Grooving Plus foi projetado para atender às exigências específicas de aplicações de corte e canais, oferecendo um novo nível de segurança de processo e produtividade para operações de fresagem.

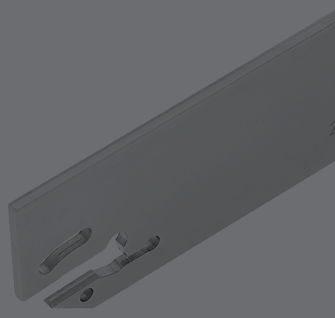
Grooving Plus está diseñado para abordar los requisitos específicos de aplicaciones de tronzado y ranurado, ofreciendo un nuevo nivel de seguridad y productividad para operaciones de fresado.

INSERTS > page 668



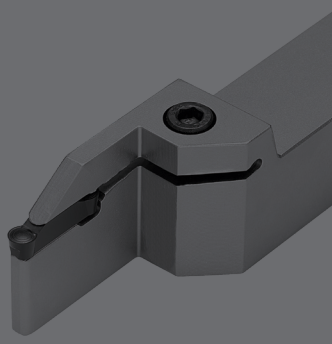
- Cutting width from 0,079 in to 0,236 in
  Largura de corte de 0,079 in a 0,236 in | Ancho de corte de 0,079 in a 0,236 in
- 1 or 2 cutting edges
  1 ou 2 arestas de corte | 1 o 2 filos de corte
- Left, neutral, right and round inserts
  Pastilhas esquerdas, neutras, direitas e redondas | Plaquitas izquierdas, neutras, derechas y redondas

BLADES & TOOLHOLDERS > page 672



- Blade GPNC
  Lâmina GPNC | Lama GPNC
- Toolholders CPTS and DPTS
  Suportes CPTS e DPTS | Herramientas CPTS y DPTS

GROOVING TOOLHOLDERS > page 674



- Monoblock
  Monobloco | Monobloque
- Right and Left
  Esquerdo e Direito | Izquierdo y derecho

GP INSERTS CODE KEY

Chave de codificação para pastilhas GP | Llave de codificación para plaquitas GP

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

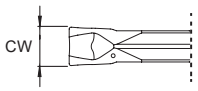
GP	0300	B	020	-	N	02	-	MC
1	2	3	4		6	7		8

1 - Product Line

GP - Grooving Plus

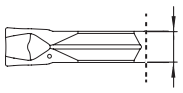
2 - Cutting Width

0200 - 2,00mm (0.079 in) | 0300 - 3,00mm (0.118 in) | 0400 - 4,00mm (0.157 in) | 0500 - 5,00mm (0.197 in) | 0600 - 6,00mm (0.236 in)



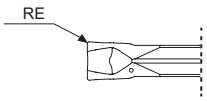
3 - Seat Size

A - GP0200 | B - GP0300 | C - GP0400 | D - GP0500 | E - GP0600

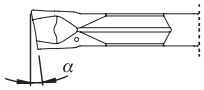


4 - Cutting Radius

020 - 0,20mm (0.008 in) | 025 - 0,25mm (0.010 in) | 040 - 0,40mm (0.016 in) | 600 - 6,00mm (0.0236 in)

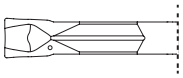


5 - Relief Angle

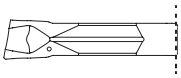


6 - Insert Type

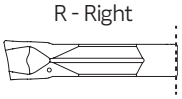
N - Neutral



L - Left

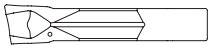


R - Right

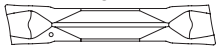


7 - Nº of Cutting Edges

01



02

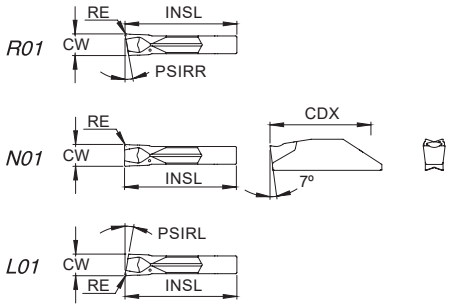


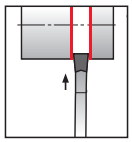
8 - Chipbreaker

MC - Medium Cut Off | MG - Medium Grooving | MM - Medium Multi Function | MP - Medium Profiling | NP - Non-Ferrous Profiling

GP...01-MC Medium Cut Off







		P				M			K			S	
		CVD		PVD		CVD	PVD		CVD			PVD	
	(2) Grade code	N2	U6	G4	P4	U6	G4	P4	L6	N2	U6	G4	P4
(1) Geometry code	ISO/ANSI Reference	PH5135	PHS135	PH7920	PHP930	PHS135	PH7920	PHP930	PH5320	PH5135	PHS135	PH7920	PHP930
1130422	GP0200A020-N01-MC	△	◉	△	◉	◉	△	◉	◉	△	◉	△	◉
1130423	GP0300B020-N01-MC	△	◉	△	◉	◉	△	◉	◉	△	◉	△	◉
1130424	GP0400C020-N01-MC	△	◉	△	◉	◉	△	◉	◉	△	◉	△	◉
1130425	GP0200A020-050R01-MC		○		○	○		○	○		○		○
1130426	GP0300B020-050R01-MC		○		○	○		○	○		○		○
1130427	GP0400C020-050R01-MC		○		○	○		○	○		○		○
1130428	GP0200A020-050L01-MC		○		○	○		○	○		○		○
1130429	GP0300B020-050L01-MC		○		○	○		○	○		○		○
1130430	GP0400C020-050L01-MC		○		○	○		○	○		○		○

Dimensions | Dimensões | Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte		
CW	RE	INSL	PSIRR/L	CDX[1]	Seat[2] Size	fn (in/r)	Min	Max
0.079	0.008	0.795	-	-	A	0.002	0.002	0.004
0.118	0.008	0.791	-	-	B	0.003	0.002	0.006
0.157	0.008	0.807	-	-	C	0.005	0.002	0.010
0.079	0.008	0.795	0.197	-	A	0.002	0.002	0.003
0.118	0.008	0.791	0.197	-	B	0.003	0.002	0.005
0.157	0.008	0.807	0.197	-	C	0.004	0.002	0.008
0.079	0.008	0.795	0.197	-	A	0.002	0.002	0.003
0.118	0.008	0.791	0.197	-	B	0.003	0.002	0.005
0.157	0.008	0.807	0.197	-	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

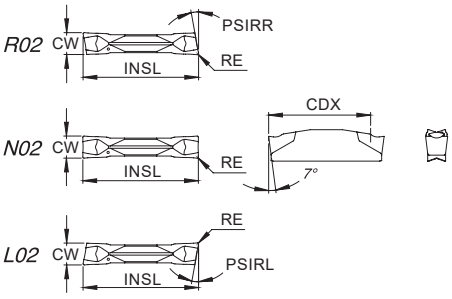
△ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

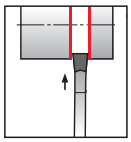
Insert order code = (1) Geometry Code + (2) Grade Code

1 - When using inserts with 1 Cutting edge, the "CDX" measure is given by the Toolholder | 2 - Correspond to a Specific Holder

GP...02-MC Medium Cut Off







		P				M			K			S	
		CVD		PVD		CVD	PVD		CVD			PVD	
	(2) Grade code	N2	U6	G4	P4	U6	G4	P4	L6	N2	U6	G4	P4
(1) Geometry code	ISO/ANSI Reference	PH5135	PHS135	PH7920	PHP930	PHS135	PH7920	PHP930	PH5320	PH5135	PHS135	PH7920	PHP930
1130383	GP0200A020-N02-MC				◉			◉	◉				◉
1130384	GP0300B020-N02-MC		◉		◉	◉		◉	◉		◉		◉
1130397	GP0400C020-N02-MC		◉		◉	◉		◉	◉		◉		◉
1130416	GP0200A020-050R02-MC		◉	△	◉	◉	△	◉	○		◉	△	◉
1130417	GP0300B020-050R02-MC	△	◉		◉	◉		◉	○	△	◉		◉
1130418	GP0400C020-050R02-MC		○			○		○	○		○		○
1130419	GP0200A020-050L02-MC	△	◉	△	◉	◉	△	◉	○	△	◉	△	◉
1130420	GP0300B020-050L02-MC	△	◉	△	◉	◉	△	◉	○	△	◉	△	◉
1130421	GP0400C020-050L02-MC		○		○	○		○	○		○		○

Dimensions | Dimensões | Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte		
CW	RE	INSL	PSIRR/L	CDX	Seat[2] Size	fn (in/r)	Min	Max
0.079	0.008	0.807	-	0.728	A	0.002	0.002	0.004
0.118	0.008	0.803	-	0.728	B	0.003	0.002	0.006
0.157	0.008	0.827	-	0.728	C	0.005	0.002	0.010
0.079	0.008	0.807	0.197	0.728	A	0.002	0.002	0.003
0.118	0.008	0.803	0.197	0.728	B	0.003	0.002	0.005
0.157	0.008	0.827	0.197	0.728	C	0.004	0.002	0.008
0.079	0.008	0.807	0.197	0.728	A	0.002	0.002	0.003
0.118	0.008	0.803	0.197	0.728	B	0.003	0.002	0.005
0.157	0.008	0.827	0.197	0.728	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

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

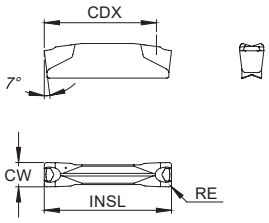
Insert order code = (1) Geometry Code + (2) Grade Code

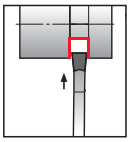
2 - Correspond to a Specific Holder

INSERTS Pastilhas | Plaquitas

GP...02-MG Medium Grooving







		P				M				K			S			Dimensions | Dimensões | Dimensiones (in)					Cutting conditions Condições de corte Condiciones de corte		
		CVD		PVD		CVD	PVD			CVD			PVD										
	(2) Grade code	L8	U6	G4	T1	U6	G4	T1		L6	U6		G4	T1									
(1) Geometry code	ISO/ANSI Reference	PH5125	PHS135	PH7920	PHP920	PHS135	PH7920	PHP920		PH5320	PHS135		PH7920	PHP920		CW	RE	INSL	CDX	Seat[2] Size	fn (in/r)	Min	Max
1130398	GP0300B020-N02-MG		●	◊	◉	◉	◊	●		●	◉		◉	●		0.118	0.008	0.827	0.728	B	0.002	0.002	0.004
1130399	GP0400C040-N02-MG	◊	●	◊	◉	◉	◊	●		●	◉		◉	●		0.157	0.016	0.827	0.728	C	0.003	0.002	0.006
1130400	GP0500D040-N02-MG	◊	●	◊	◉	◉	◊	●		●	◉		◉	●		0.197	0.016	0.827	0.728	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

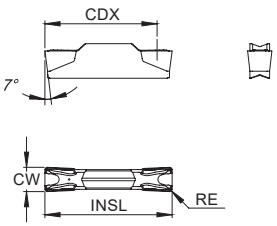
Insert order code = (1) Geometry Code + (2) Grade Code

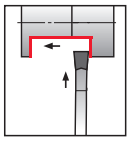
◊ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

2 - Correspond to a Specific Holder

GP...02-MM Medium Multi Function







		P					M				K				S				Dimensions Dimensões Dimensiones (in)						Cutting conditions Condições de corte Condiciones de corte					
		CVD	PVD			CVD	PVD			CVD		UNC	PVD																
	(2) Grade code	U6	G4	T1	P4	U6	G4	T1	P4	L6	U6	25	G4	T1	P4														
(1) Geometry code	ISO/ANSI Reference	PHS135	PH7920	PHP920	PHP930	PHS135	PH7920	PHP920	PHP930	PH5320	PHS135	PH0705	PH7920	PHP920	PHP930	CW	RE	INSL	CDX[1]	Seat[2] Size	AP (in)	Min	Max	fn (in/r)	Min	Max			
1130401	GP0300B040-N02-MM	●	◊	◉	◉	◉	◊	◉	●	●	◉	◊	◊	◉	●	0.118	0.016	0.827	0.728	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	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	D	0.059	0.031	0.098	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

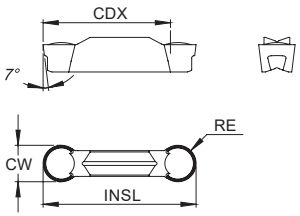
◊ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

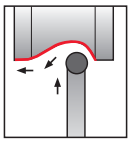
1 - When using inserts with 1 Cutting edge, the "CDX" measure is given by the Toolholder | 2 - Correspond to a Specific Holder

palbit

GP...02-MP Medium Profiling







		P		M		K	S		Dimensions Dimensões Dimensiones (in)					Cutting conditions Condições de corte Condiciones de corte					
		PVD		PVD		CVD	PVD												
	(2) Grade code	G4	T1	G4	T1	L6	G4	T1											
(1) Geometry code	ISO/ANSI Reference	PH7920	PHP920	PH7920	PHP920	PH5320	PH7920	PHP920	CW	RE	INSL	CDX	Seat[2] Size	AP (in)	Min	Max	fn (in/r)	Min	Max
1130607	GP0300B150-N02-MP		●		●			●	0.118	0.059	0.831	0.728	B	0.028	0.002	0.043	0.004	0.002	0.005
1130404	GP0600E300-N02-MP	◬	●	◬	●	◬	◉	●	0.236	0.118	0.992	0.827	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

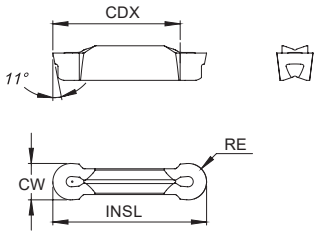
Insert order code = (1) Geometry Code + (2) Grade Code

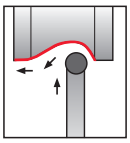
◬ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

2 - Correspond to a Specific Holder

GP...02-NP Non-Ferrous Profiling







		N	Dimensions | Dimensões | Dimensiones (in)					Cutting conditions Condições de corte Condiciones de corte					
		UNC											
	(2) Grade code	10											
(1) Geometry code	ISO/ANSI Reference	PH0910	CW	RE	INSL	CDX	Seat[2] Size	AP (in)	Min	Max	fn (in/r)	Min	Max
1130405	GP0600E300-N02-NP	◉	0.236	0.118	1.000	0.728	E	0.051	0.020	0.098	0.008	0.006	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

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

2 - Correspond to a Specific Holder

BLADES & TOOLHOLDERS CODE KEY

Chave de codificação para lâminas | Llave de codificación de lamas

Proprietary grooving line

For Blades

GP	N	C	-	080	25	.A	.0
1	2	3		5	6	7	8

ForToolholders

GP	R	C	-	100	010	25.25	.A	.1
1	2	3		4	5	6	7	8

1 - Product Line

GP - Grooving Plus

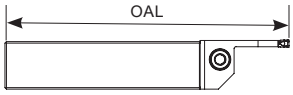
2 - Work Side

R - Right  N - Neutral  L - Left 

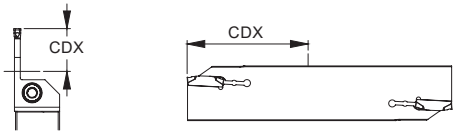
3 - Tool Type

C - Frontal

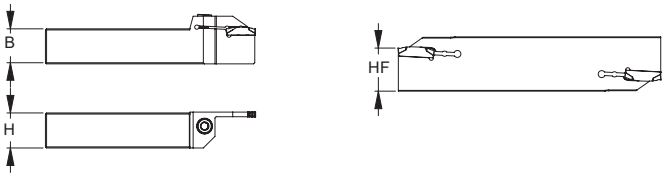
4 - Total toolholder lenght



5 - Maximum Depth of Cut

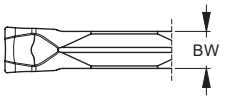


6 - Shaft | Cutting Unit Dimension

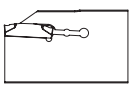
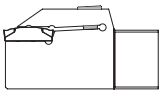


7 - Seat Size

A - 1,60mm (0.063 in) | B - 2,30mm (0.091 in) | C - 3,30mm (0.130 in) | D - 4,30mm (0.169 in) | E - 4,30mm (0.169 in)



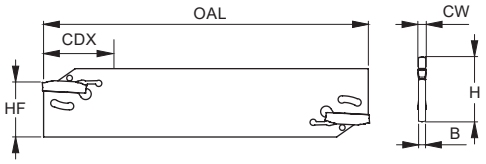
8 - Clamping System

0 - Spring  1 - Screw 

palbit

GPNC





GP02... | GP03... | GP04...



MC MG MM

Seat Size A, B, C

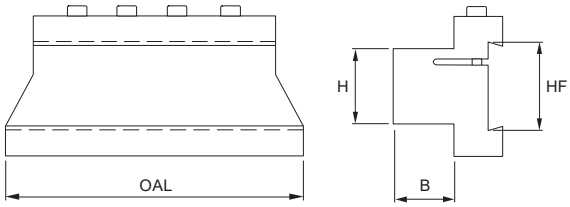
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)							Insert	Toolholder		Wrench	Stock
		CDX	OAL	H	HF	B	CW	Seat Size		CPTS	DPTS		
213010000	GPNC-020 25.A.0	0.787	5.906	1.260	0.984	0.059	0.079	A	GP02...	CPTS 32...	DPTS 32...	LE25-30	◈
213009900	GPNC-055 25.B.0	2.165	5.906	1.260	0.984	0.091	0.118	B	GP03...	CPTS 32...	DPTS 32...	LE25-30	◈
213009700	GPNC-055 25.C.0	2.165	5.906	1.260	0.984	0.130	0.157	C	GP04...	CPTS 32...	DPTS 32...	LE25-30	◈

◈ 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

CPTS



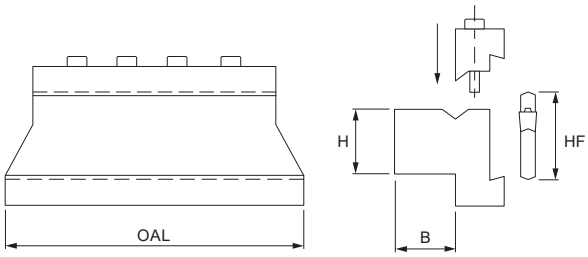


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Screw	Wrench	Stock
		HF	OAL	H	B				
290007700	CPTS 1232	1.250	3.940	0.750	0.750	1.540	D0603600	SS50	◯
290007800	CPTS 1632	1.250	4.330	1.000	1.000	2.090	D0603600	SS50	◯
290087100	CPTS 2032	1.250	4.750	1.250	1.250	3.080	D0603600	SS50	◯
213033300	CPTS 2432	1.250	4.750	1.500	1.640	3.080	D0603600	SS50	◯

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

DPTS





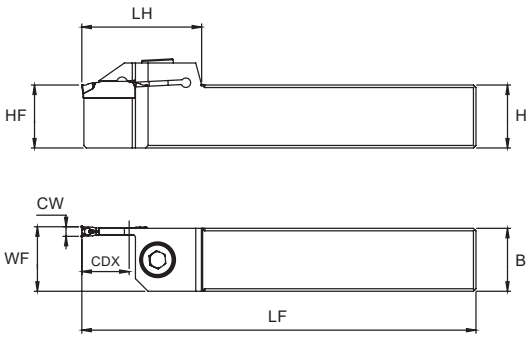
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Screw	Wrench	Stock
		HF	OAL	H	B				
213033000	DPTS 1232	1.250	3.940	0.750	0.750	1.650	D0603600	SS50	◯
213032400	DPTS 1632	1.250	4.330	1.000	1.000	2.200	D0603600	SS50	◯
213033100	DPTS 2032	1.250	4.750	1.250	1.250	3.190	D0603600	SS50	◯
213033200	DPTS 2432	1.250	4.750	1.500	1.640	3.190	D0603600	SS50	◯

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

GROOVING TOOLHOLDERS Suportes | Herramientas

GPLC





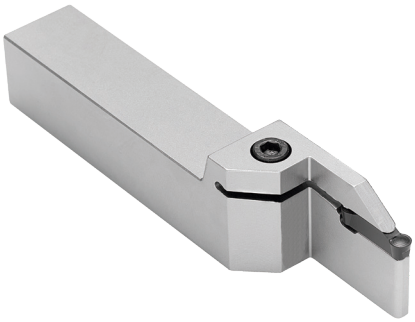
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)								Seat Size	Insert	Screw	Wrench	lbf/in	Stock
		CDX	LF	B	H	HF	LH	WF	CW						
183027100	GPLC-4.00 0.59 0.625.0.625.A.1	0.59	4.00	0.625	0.625	0.625	1.496	0.635	0.079	A	GP02...	D0602200	SS50	18.0	○
183027200	GPLC-5.00 0.59 0.750.0.750.A.1	0.59	5.00	0.750	0.750	0.750	1.535	0.760	0.079		GP02...	D0602600	SS50	18.0	○
183027300	GPLC-6.00 0.39 1.000.1.000.A.1	0.39	6.00	1.000	1.000	1.000	1.260	1.010	0.079		GP02...	D0603100	SS50	18.0	○
183027400	GPLC-6.00 0.79 1.000.1.000.A.1	0.79	6.00	1.000	1.000	1.000	1.654	1.010	0.079		GP02...	D0603100	SS50	18.0	○
183027500	GPLC-4.00 0.59 0.625.0.625.B.1	0.59	4.00	0.625	0.625	0.625	1.496	0.640	0.118	B	GP03...	D0602200	SS50	18.0	○
183027600	GPLC-5.00 0.59 0.750.0.750.B.1	0.59	5.00	0.750	0.750	0.750	1.496	0.765	0.118		GP03...	D0602600	SS50	18.0	○
183027700	GPLC-6.00 0.39 1.000.1.000.B.1	0.39	6.00	1.000	1.000	1.000	1.260	1.015	0.118		GP03...	D0603100	SS50	18.0	○
183027800	GPLC-6.00 0.79 1.000.1.000.B.1	0.79	6.00	1.000	1.000	1.000	1.654	1.015	0.118		GP03...	D0603100	SS50	18.0	○
183027900	GPLC-5.00 0.75 0.750.0.750.C.1	0.75	5.00	0.750	0.750	0.750	1.496	0.765	0.157	C	GP04...	D0602600	SS50	26.0	○
183028000	GPLC-6.00 0.51 1.000.1.000.C.1	0.51	6.00	1.000	1.000	1.000	1.260	1.015	0.157		GP04...	D0603100	SS50	26.0	○
183028100	GPLC-6.00 0.91 1.000.1.000.C.1	0.91	6.00	1.000	1.000	1.000	1.654	1.015	0.157		GP04...	D0603100	SS50	26.0	○
1830282.00	GPLC-5.00 0.75 0.750.0.750.D.1	0.75	5.00	0.750	0.750	0.750	1.496	0.765	0.197	D	GP05...	D0602600	SS50	26.0	○
183028300	GPLC-6.00 0.51 1.000.1.000.D.1	0.51	6.00	1.000	1.000	1.000	1.260	1.015	0.197		GP05...	D0603100	SS50	26.0	○
183028400	GPLC-6.00 0.91 1.000.1.000.D.1	0.91	6.00	1.000	1.000	1.000	1.654	1.015	0.197		GP05...	D0603100	SS50	26.0	○
183028500	GPLC-6.00 0.59 1.000.1.000.E.1	0.59	6.00	1.000	1.000	1.000	1.339	1.054	0.236	E	GP06...	D0603100	SS50	35.0	○
183028600	GPLC-6.00 0.91 1.000.1.000.E.1	0.91	6.00	1.000	1.000	1.000	1.654	1.035	0.236		GP06...	D0603100	SS50	35.0	○

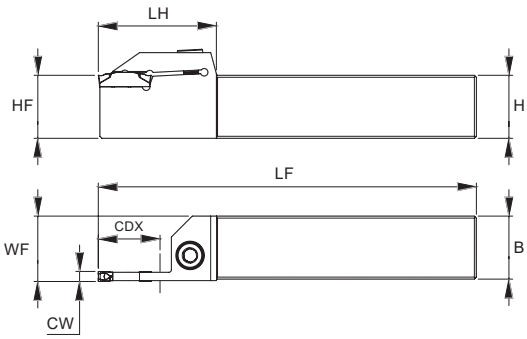
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: For inserts with 2 cutting edges, the ar is defined by the insert

GP02... | GP03... | GP04... | GP05...				GP06...	
					
MC		MG	MM	MP	NP
Seat Size A, B, C, D				Seat Size E	

GPRC





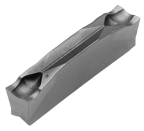
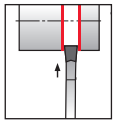
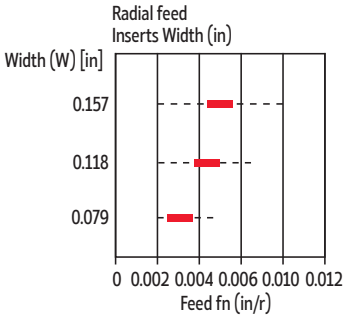
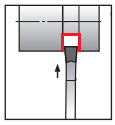
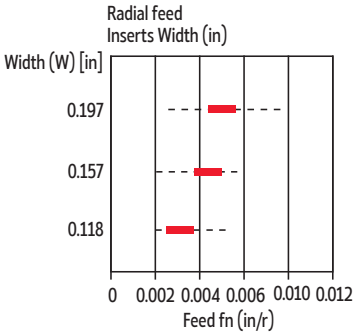
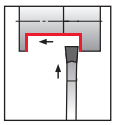
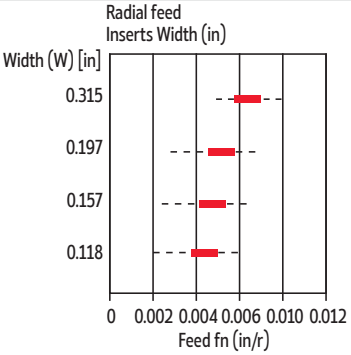
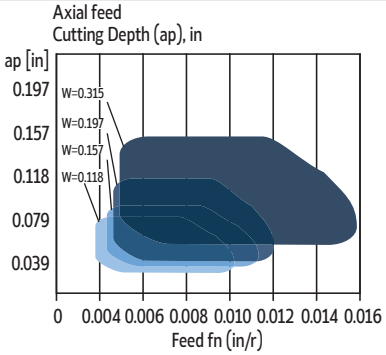
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)								Seat Size	Insert	Screw	Wrench	lbf/in	Stock
		CDX	LF	B	H	HF	LH	WF	CW						
183025500	GPRC-4.00 0.59 0.625.0.625.A.1	0.59	4.00	0.625	0.625	0.625	1.496	0.635	0.079	A	GP02...	D0602200	SS50	18.0	○
183025600	GPRC-5.00 0.59 0.750.0.750.A.1	0.59	5.00	0.750	0.750	0.750	1.535	0.760	0.079		GP02...	D0602600	SS50	18.0	○
183025700	GPRC-6.00 0.39 1.000.1.000.A.1	0.39	6.00	1.000	1.000	1.000	1.260	1.010	0.079		GP02...	D0603100	SS50	18.0	○
183025800	GPRC-6.00 0.79 1.000.1.000.A.1	0.79	6.00	1.000	1.000	1.000	1.654	1.010	0.079		GP02...	D0603100	SS50	18.0	○
183025900	GPRC-4.00 0.59 0.625.0.625.B.1	0.59	4.00	0.625	0.625	0.625	1.496	0.640	0.118	B	GP03...	D0602200	SS50	18.0	○
183026000	GPRC-5.00 0.59 0.750.0.750.B.1	0.59	5.00	0.750	0.750	0.750	1.496	0.765	0.118		GP03...	D0602600	SS50	18.0	○
183026100	GPRC-6.00 0.39 1.000.1.000.B.1	0.39	6.00	1.000	1.000	1.000	1.260	1.015	0.118		GP03...	D0603100	SS50	18.0	○
183026200	GPRC-6.00 0.79 1.000.1.000.B.1	0.79	6.00	1.000	1.000	1.000	1.654	1.015	0.118		GP03...	D0603100	SS50	18.0	○
183026300	GPRC-5.00 0.75 0.750.0.750.C.1	0.75	5.00	0.750	0.750	0.750	1.496	0.765	0.157	C	GP04...	D0602600	SS50	26.0	○
183026400	GPRC-6.00 0.51 1.000.1.000.C.1	0.51	6.00	1.000	1.000	1.000	1.260	1.015	0.157		GP04...	D0603100	SS50	26.0	○
183026500	GPRC-6.00 0.91 1.000.1.000.C.1	0.91	6.00	1.000	1.000	1.000	1.654	1.015	0.157		GP04...	D0603100	SS50	26.0	○
183026600	GPRC-5.00 0.75 0.750.0.750.D.1	0.75	5.00	0.750	0.750	0.750	1.496	0.765	0.197	D	GP05...	D0602600	SS50	26.0	○
183026700	GPRC-6.00 0.51 1.000.1.000.D.1	0.51	6.00	1.000	1.000	1.000	1.260	1.015	0.197		GP05...	D0603100	SS50	26.0	○
183026800	GPRC-6.00 0.91 1.000.1.000.D.1	0.91	6.00	1.000	1.000	1.000	1.654	1.015	0.197		GP05...	D0603100	SS50	26.0	○
183026900	GPRC-6.00 0.59 1.000.1.000.E.1	0.59	6.00	1.000	1.000	1.000	1.339	1.054	0.236	E	GP06...	D0603100	SS50	35.0	○
183027000	GPRC-6.00 0.91 1.000.1.000.E.1	0.91	6.00	1.000	1.000	1.000	1.654	1.035	0.236		GP06...	D0603100	SS50	35.0	○

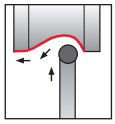
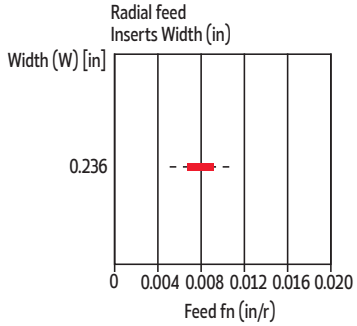
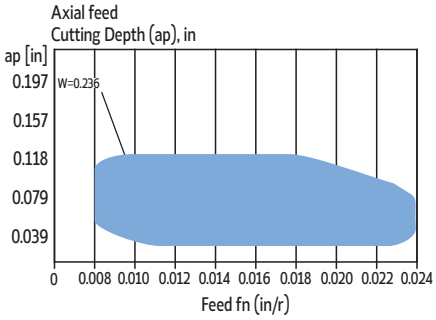
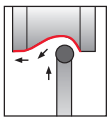
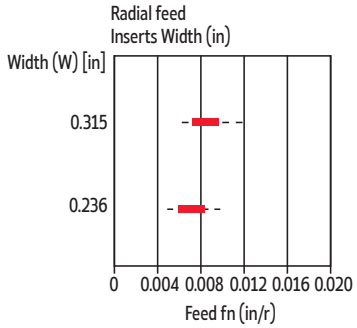
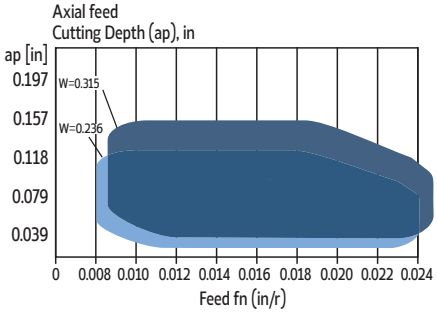
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: For inserts with 2 cutting edges, the ar is defined by the insert

GP02... | GP03... | GP04... | GP05...			GP06...	
				
MC	MG	MM	MP	NP
Seat Size A, B, C, D			Seat Size E	

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 reduced vibration.
GP...02-MG   	**Medium Grooving** Outstanding chip control. Reduces chip width, resulting in improved surface finish. For all materials.
GP...02-MM    	**Medium Multi Function (Grooving & Turning)** For grooving and turning in all materials. Good chip control.

Feed recommendations and geometry descriptions			Grooving & Parting Off
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 Aluminium profiling** First choice for profiling in non-ferrous materials. Good chip flow provides a better surface finishing. Sharp cutting edge.

GROOVING & PARTING OFF

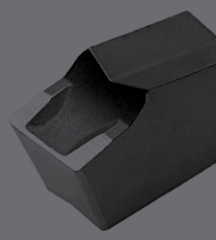


These are standard tools for grooving and parting off applications. With trigon inserts, it is possible to perform internal and external grooving.

Estas são ferramentas padrão para aplicações de corte e canal. Com pastilhas trigonais é possível realizar canais internos e externos.

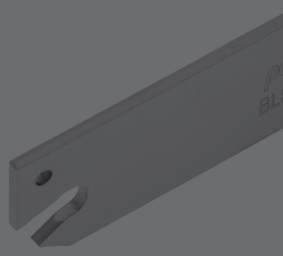
Estas son herramientas estándar para aplicaciones de ranurado y tronzado. Con las plaquitas trigon es posible realizar ranurados interiores y exteriores.

INSERTS > page 680



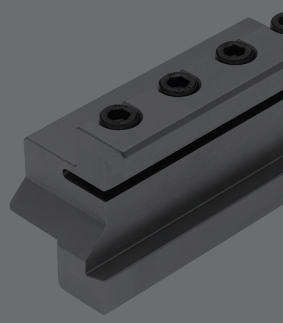
- GTN- L/N/R and SANCAR
  GTN-L/N/R e SANCAR | GTN-L/N/R y SANCAR
- 1 cutting edge
  1 aresta de corte | 1 filo de corte

BLADES > page 605



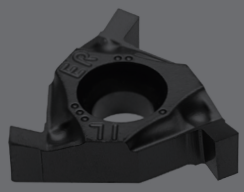
- BLST and BLS
  Lâminas BLST e BLS | Lamas BLST y BLS
- Toolholders CPTS and DPTS
  Suportes CPTS e DPTS | Herramientas CPTS y DPTS

TOOLHOLDERS > page 688



- CPTS and DPTS
  Suportes CPTS e DPTS | Herramientas CPTS y DPTS

TRIGON INSERTS > page 689



- Flat and Full Radius Grooving inserts
  Pastilhas para canais planos e de raio completo| Plaquitas de ranurado de radio plano y completo
- External and Internal
  Externo e Interno | Externo e interno
- From sizes 11 to 16
  De tamanhos de 11 a 16 | De tamaños de 11 a 16

GTN & SANCAR INSERTS CODE KEY

Chave de codificação para pastilhas | Llave de codificación para plaquitas

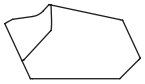
For GTN Inserts

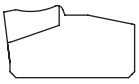
GTN	-	3	R	15
1		2	3	4

For SANCAR Inserts

SANCAR	-	3	R	5
1		2	3	4

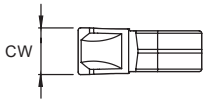
1 - Product Line

GTN 

SANCAR 

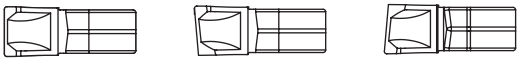
2 - Cutting Width

2mm (0.079 in) | 2,4mm (0.094 in) | 3mm (0.118 in) | 4mm (0.157 in) | 4,8mm (0.189 in) | 5mm (0.197 in) | 6mm (0.236 in)



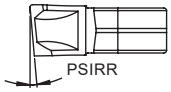
3 - Inserts Type

N - Neutral | R - Right | L - Left

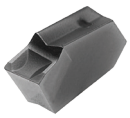


4 - Relief Angle

4 - 4º | 5 - 5º | 8 - 8º | 15 - 15º



INSERTS OVERVIEW Visão geral | Visión general

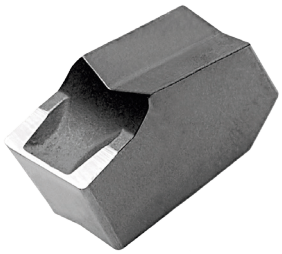
Insert Type + Chipbreaker / Operation		Parting Off	General Grooving	Turning	Profiling
	GTN-...	●	○		
	SANCAR-...	●	○		

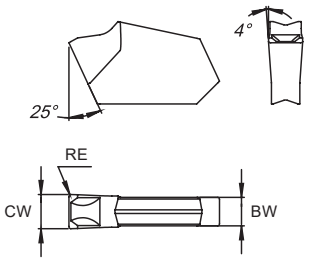
● First choice | Primeira opção | Primera opción

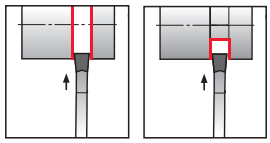
○ Alternative | Alternativa

palbit

GTN-N







			P		M	K		Dimensions Dimensões Dimensiones (in)			Cutting conditions Condições de corte Condiciones de corte		
	(2) Grade code		CVD-MT		CVD-MT	CVD-MT							
			L7	N2	N2	L6	N2						
(1) Geometry code	ANSI Reference	ISO Reference	PH5115	PH5135	PH5135	PH5320	PH5135	CW	BW	RE	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

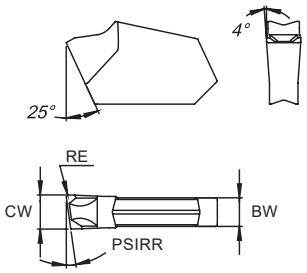
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

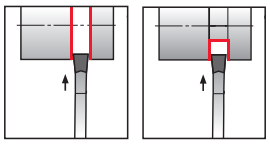
Insert order code = (1) Geometry Code + (2) Grade Code

INSERTS Pastilhas | Plaquitas

GTN-R







			P		M	K		Dimensions Dimensões Dimensiones (in)				Cutting conditions Condições de corte Condiciones de corte		
	(2) Grade code		CVD-MT		CVD-MT	CVD-MT								
			L7	N2	N2	L6	N2							
(1) Geometry code	ANSI Reference	ISO Reference	PH5115	PH5135	PH5135	PH5320	PH5135	CW	BW	RE	PSIRR	fn (in/r)	Min	Max
1130166	GTN-2R 4	GCMX-2R 4	○	○	○	○	○	0.087	0.071	0.006	4°	0.003	0.002	0.005
1130167	GTN-2R 8	GCMX-2R 8	○	○	○	○	○	0.087	0.071	0.006	8°	0.002	0.002	0.004
1130255	GTN-2R 15	GCMX-2R 15	○	○	○	○	○	0.087	0.071	0.006	15°	0.002	0.002	0.004
1130257	GTN-2.4R 4	GCMX-2.4R 4	○	○	○	○	○	0.094	0.079	0.006	4°	0.003	0.002	0.006
1130233	GTN-2.4R 8	GCMX-2.4R 8	○	○	○	○	○	0.094	0.079	0.006	8°	0.003	0.002	0.005
1130258	GTN-2.4R 15	GCMX-2.4R 15	○	○	○	○	○	0.094	0.079	0.006	15°	0.002	0.002	0.004
1130170	GTN-3R 4	GCMX-3R 4	○	○	○	○	○	0.122	0.102	0.008	4°	0.003	0.002	0.006
1130171	GTN-3R 8	GCMX-3R 8	○	○	○	○	○	0.122	0.102	0.008	8°	0.003	0.002	0.005
1130253	GTN-3R 15	GCMX-3R 15	○	○	○	○	○	0.122	0.102	0.008	15°	0.002	0.002	0.004
1130261	GTN-4R 4	GCMX-4R 4	○	○	○	○	○	0.161	0.138	0.010	4°	0.005	0.003	0.008
1130222	GTN-4R 8	GCMX-4R 8	○	○	○	○	○	0.161	0.138	0.010	8°	0.004	0.003	0.005
1130262	GTN-4R 15	GCMX-4R 15	○	○	○	○	○	0.161	0.138	0.010	15°	0.004	0.003	0.005
1130264	GTN-4.8R 4	GCMX-4.8R 4	○	○	○	○	○	0.189	0.165	0.011	4°	0.007	0.004	0.010
1130230	GTN-4.8R 8	GCMX-4.8R 8	○	○	○	○	○	0.189	0.165	0.011	8°	0.005	0.004	0.007
1130265	GTN-4.8R 15	GCMX-4.8R 15	○	○	○	○	○	0.189	0.165	0.011	15°	0.005	0.004	0.006
1130268	GTN-5R 4	GCMX-5R 4	○	○	○	○	○	0.201	0.177	0.011	4°	0.007	0.004	0.010
1130224	GTN-5R 8	GCMX-5R 8	○	○	○	○	○	0.201	0.177	0.011	8°	0.005	0.004	0.007
1130269	GTN-5R 15	GCMX-5R 15	○	○	○	○	○	0.201	0.177	0.011	15°	0.005	0.004	0.006
1130272	GTN-6R 4	GCMX-6R 4	○	○	○	○	○	0.252	0.217	0.014	4°	0.008	0.004	0.012
1130227	GTN-6R 8	GCMX-6R 8	○	○	○	○	○	0.252	0.217	0.014	8°	0.007	0.005	0.008
1130276	GTN-6R 15	GCMX-6R 15	○	○	○	○	○	0.252	0.217	0.014	15°	0.006	0.004	0.007

First choice | Primeira opção | 1ª opción

Stock item | Produto de stock | Itens de stock

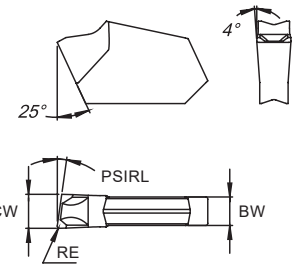
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

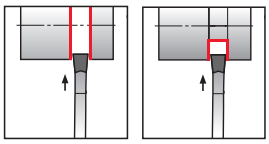
Insert order code = (1) Geometry Code + (2) Grade Code

palbit

GTN-L







			P		M	K		Dimensions Dimensões Dimensiones (in)				Cutting conditions Condições de corte Condiciones de corte		
	(2) Grade code		CVD-MT		CVD-MT	CVD-MT								
			L7	N2	N2	L6	N2							
(1) Geometry code	ANSI Reference	ISO Reference	PH5115	PH5135	PH5135	PH5320	PH5135	CW	BW	RE	PSIRL	fn (in/r)	Min	Max
1130164	GTN-2L 4	GCMX-2L 4	○	○	○	○	○	0.087	0.071	0.006	4°	0.003	0.002	0.005
1130220	GTN-2L 8	GCMX-2L 8	○	○	○	○	○	0.087	0.071	0.006	8°	0.002	0.002	0.004
1130256	GTN-2L 15	GCMX-2L 15	○	○	○	○	○	0.087	0.071	0.006	15°	0.002	0.002	0.004
1130259	GTN-2.4L 4	GCMX-2.4L 4	○	○	○	○	○	0.094	0.079	0.006	4°	0.003	0.002	0.006
1130232	GTN-2.4L 8	GCMX-2.4L 8	○	○	○	○	○	0.094	0.079	0.006	8°	0.003	0.002	0.005
1130260	GTN-2.4L 15	GCMX-2.4L 15	○	○	○	○	○	0.094	0.079	0.006	15°	0.002	0.002	0.004
1130221	GTN-3L 4	GCMX-3L 4	○	○	○	○	○	0.122	0.102	0.008	4°	0.003	0.002	0.006
1130168	GTN-3L 8	GCMX-3L 8	○	○	○	○	○	0.122	0.102	0.008	8°	0.003	0.002	0.005
1130254	GTN-3L 15	GCMX-3L 15	○	○	○	○	○	0.122	0.102	0.008	15°	0.002	0.002	0.004
1130173	GTN-4L 4	GCMX-4L 4	○	○	○	○	○	0.161	0.138	0.010	4°	0.005	0.003	0.008
1130223	GTN-4L 8	GCMX-4L 8	○	○	○	○	○	0.161	0.138	0.010	8°	0.004	0.003	0.005
1130263	GTN-4L 15	GCMX-4L 15	○	○	○	○	○	0.161	0.138	0.010	15°	0.004	0.003	0.005
1130266	GTN-4.8L 4	GCMX-4.8L 4	○	○	○	○	○	0.189	0.165	0.011	4°	0.007	0.004	0.010
1130231	GTN-4.8L 8	GCMX-4.8L 8	○	○	○	○	○	0.189	0.165	0.011	8°	0.005	0.004	0.007
1130267	GTN-4.8L 15	GCMX-4.8L 15	○	○	○	○	○	0.189	0.165	0.011	15°	0.005	0.004	0.006
1130270	GTN-5L 4	GCMX-5L 4	○	○	○	○	○	0.201	0.177	0.011	4°	0.007	0.004	0.010
1130225	GTN-5L 8	GCMX-5L 8	○	○	○	○	○	0.201	0.177	0.011	8°	0.005	0.004	0.007
1130271	GTN-5L 15	GCMX-5L 15	○	○	○	○	○	0.201	0.177	0.011	15°	0.005	0.004	0.006
1130274	GTN-6L 4	GCMX-6L 4	○	○	○	○	○	0.252	0.217	0.014	4°	0.008	0.004	0.012
1130226	GTN-6L 8	GCMX-6L 8	○	○	○	○	○	0.252	0.217	0.014	8°	0.007	0.005	0.008
1130275	GTN-6L 15	GCMX-6L 15	○	○	○	○	○	0.252	0.217	0.014	15°	0.006	0.004	0.007

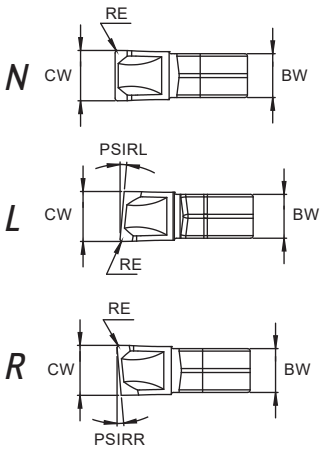
First choice | Primeira opção | 1ª opción — Stock item | Produto de stock | Itens de stock — ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

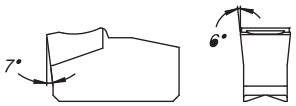
Insert order code = (1) Geometry Code + (2) Grade Code

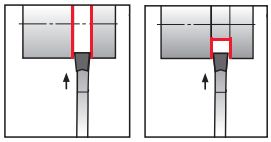
INSERTS Pastilhas | Plaquitas

SANCAR









(1) Geometry code	ISO Reference	ANSI Reference	P CVD-MT L7 PH5115	P CVD-MT N2 PH5135	M CVD-MT N2 PH5135	K CVD-MT L6 PH5320	K CVD-MT N2 PH5135	Dimensions Dimensões Dimensiones (in) CW	BW	RE	PSIRR/L	Cutting conditions Condições de corte Condiciones de corte 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
1130185	SANCAR-3L 5	SANCAR-3L 5	○	○	○	○	○	0.118	0.098	0.010	5°	0.004	0.002	0.006
1130390	SANCAR-4L 5	SANCAR-4L 5	○	○	○	○	○	0.157	0.130	0.010	5°	0.005	0.003	0.008
1130389	SANCAR-5L 5	SANCAL-5L 5	○	○	○	○	○	0.197	0.169	0.010	5°	0.006	0.003	0.010
1130288	SANCAR-3R 5	SANCAR-3R 5	○	○	○	○	○	0.118	0.098	0.010	5°	0.004	0.002	0.006
1130188	SANCAR-4R 5	SANCAR-4R 5	○	○	○	○	○	0.157	0.130	0.010	5°	0.005	0.003	0.008
1130388	SANCAR-5R 5	SANCAR-5R 5	○	○	○	○	○	0.197	0.169	0.010	5°	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

BLADES CODE KEY Chave de codificação para laminas | Llave de codificación de lamas

BL	ST	3	-	26
1	2	3		4

1 - Product Line

BL - Blade

2 - Blade Type

ST - Standard Blade



S - SANCAR Blade



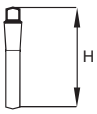
3 - Cutting Width

2mm (0.079 in) | 3mm (0.118 in) | 4mm (0.157 in) | 5mm (0.197 in) | 6mm (0.236 in)



4 - Maximum Depth of Cut

19 - 19mm (0.748 in) | 26 - 26mm (1.024 in) | 32 - 32mm (1.260 in)

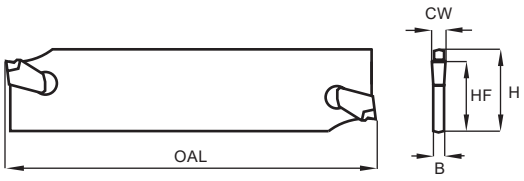


BLADES Lâminas | Lamas

BLST (GTN)

METRIC LINE





GTN...



Hand Type
N, R, L

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inserts	Toolholder		Wrench	Stock
		H	CW	HF	B	OAL		CPTS	DPTS		
183008000	BLST 2-19	0.748	0.079	0.630	0.063	3.346	GTN-2...	CPTS 19...	DPTS 19...	LE05	⚙
183008100	BLST 2-26	1.024	0.079	0.843	0.063	4.331	GTN-2...	CPTS 26...	DPTS 26...	LE05	⚙
213008200	BLST 3-26	1.024	0.118	0.843	0.094	4.331	GTN-3...	CPTS 26...	DPTS 26...	LE05	⚙
213008300	BLST 4-26	1.024	0.157	0.843	0.126	4.331	GTN-4...	CPTS 26...	DPTS 26...	LE05	⚙
213008400	BLST 5-26	1.024	0.197	0.843	0.157	4.331	GTN-5...	CPTS 26...	DPTS 26...	LE05	⚙
213008500	BLST 6-26	1.024	0.236	0.843	0.205	4.331	GTN-6...	CPTS 26...	DPTS 26...	LE05	⚙
183008600	BLST 2-32	1.260	0.079	0.984	0.063	5.906	GTN-2...	CPTS 32...	DPTS 32...	LE05	⚙
213008700	BLST 3-32	1.260	0.118	0.984	0.094	5.906	GTN-3...	CPTS 32...	DPTS 32...	LE05	⚙
213008800	BLST 4-32	1.260	0.157	0.984	0.126	5.906	GTN-4...	CPTS 32...	DPTS 32...	LE05	⚙
213008900	BLST 5-32	1.260	0.197	0.984	0.157	5.906	GTN-5...	CPTS 32...	DPTS 32...	LE05	⚙
213009000	BLST 6-32	1.260	0.236	0.984	0.205	5.906	GTN-6...	CPTS 32...	DPTS 32...	LE05	⚙

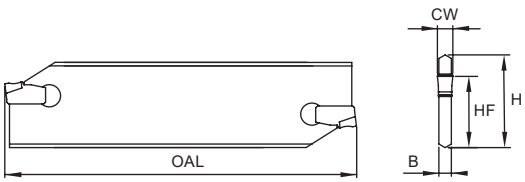
⚙ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

Note: Check the procedures for inserts extration on page D-749.

BLS (SANCAR)

METRIC LINE





SANCAR...



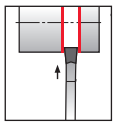
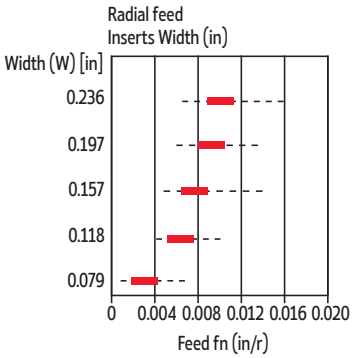
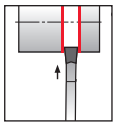
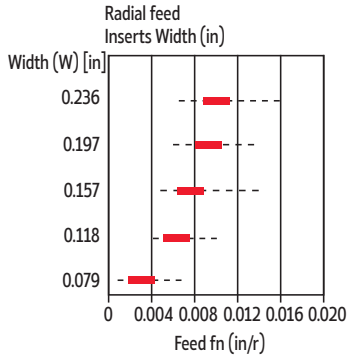
Hand Type
N, R, L

Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Inserts	Toolholder		Wrench	Stock
		H	CW	HF	B	OAL		CPTS	DPTS		
213004600	BLS 3-32	1.260	0.118	0.984	0.094	5.906	SANCAR 3...	CPTS 32...	DPTS 32...	LE05	⚙
213004700	BLS 4-32	1.260	0.157	0.984	0.126	5.906	SANCAR 4...	CPTS 32...	DPTS 32...	LE05	⚙
213005500	BLS 5-32	1.260	0.197	0.984	0.157	5.906	SANCAR 5...	CPTS 32...	DPTS 32...	LE05	⚙

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

Note: Check the procedures for inserts extration on page D-749.

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-719.

PROCEDURE FOR INSERT EXTRACTION

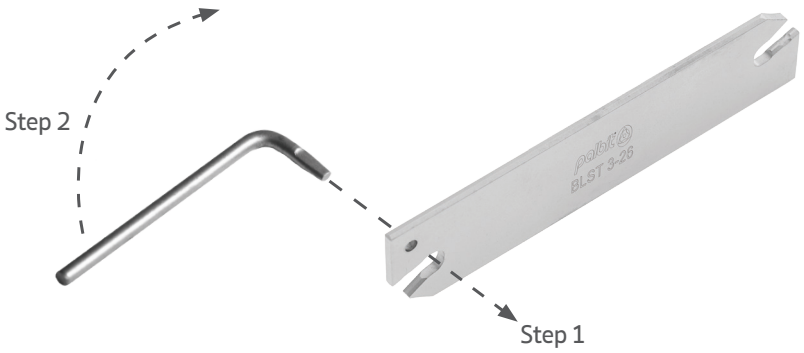
Procedimentos para remoção de pastilha | Procedimientos para retirar plaquitas

1. Always use the right key to remove the insert.
   Use sempre a chave adequada para rettirar as pastilhas.
   Utilice siempre la llave adecuada para retirar la plaquita.

2. Position the LE05 key according to **Step 1** and make sure it fits perfectly.
   Posicione a chave LE05 de acordo com o **Passo 1** e certifique que está bem encaixada.
   Coloque la llave LE05 de acuerdo con el **Paso 1** y asegúrese de que esté correctamente montada.

3. Hold the blade with one hand. With the other hand, rotate the LE05 key as illustrated in **Step 2**.
   Segure a lâmina com uma mão. Com a outra rode a chave LE05 como ilustrado no **Passo 2**.
   Sostenga la lama con una mano. Con la otra gire la llave LE05 como se ilustra en **Paso 2**.

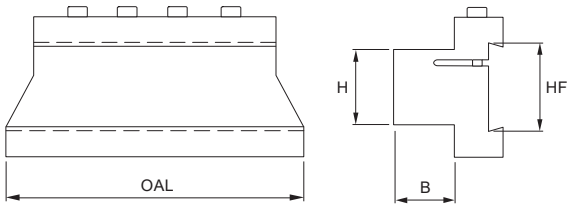
4. Always replace damaged inserts with new ones.
   Substitua sempre as pastilhas danificadas por pastilhas novas.
   Siempre reemplace las plaquitas dañadas por plaquitas nuevas.



TOOLHOLDERS Suportes | Herramientas

CPTS



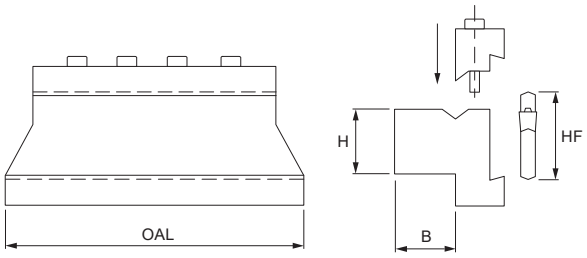


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				WT (lbs)	Screw	Wrench	Stock
		HF	OAL	H	B				
290087000	CPTS 1019	0.750	2.990	0.625	0.625	0.660	D0503000	SS40	○
290007600	CPTS 1026	1.020	3.430	0.625	0.625	0.990	D0603600	SS50	○
290086900	CPTS 1226	1.020	3.430	0.750	0.750	1.100	D0603600	SS50	○
290007700	CPTS 1232	1.250	3.940	0.750	0.750	1.540	D0603600	SS50	○
290007800	CPTS 1632	1.250	4.330	1.000	1.000	2.090	D0603600	SS50	○
290087100	CPTS 2032	1.250	4.750	1.250	1.250	3.080	D0603600	SS50	○
213033300	CPTS 2432	1.250	4.750	1.500	1.640	3.080	D0603600	SS50	○

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)				WT (lbs)	Screw	Wrench	Stock
		HF	OAL	H	B				
213032900	DPTS 1019	0.750	2.990	0.625	0.625	0.550	D0503000	SS40	○
213032200	DPTS 1026	1.020	3.430	0.625	0.625	1.210	D0603600	SS50	○
213032300	DPTS 1226	1.020	3.430	0.750	0.750	1.540	D0603600	SS50	○
213033000	DPTS 1232	1.250	3.940	0.750	0.750	1.650	D0603600	SS50	○
213032400	DPTS 1632	1.250	4.330	1.000	1.000	2.200	D0603600	SS50	○
213033100	DPTS 2032	1.250	4.750	1.250	1.250	3.190	D0603600	SS50	○
213033200	DPTS 2432	1.250	4.750	1.500	1.640	3.190	D0603600	SS50	○

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

TRIGON INSERTS CODE KEY

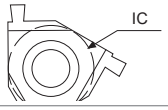
Chave de codificação para pastilhas | Llave de codificación para plaquitas

For Trigon 60º Inserts

16	-	ER	-	W	-	1.00
1		2		3		4

1 - Inscribed Circle

16 - 9,525mm (0.375 in)



2 - Insert Type

ER - External Right | IR - Internal Right

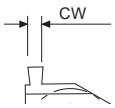
3 - Cutting Edge Type

W - Rectangular 

R - Rounded 

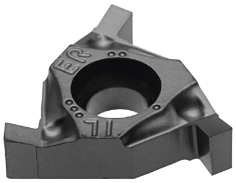
4 - Cutting Edge Length

0,50 - 0,5mm (0.020 in) | 2,25 - 2,25mm (0.890 in)

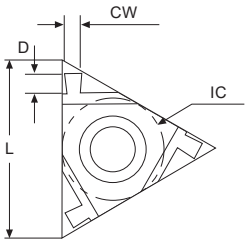


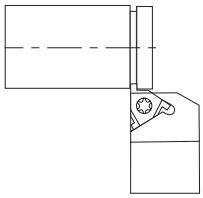
TRIGON INSERTS Pastilhas | Plaquitas

FLAT GROOVING



External



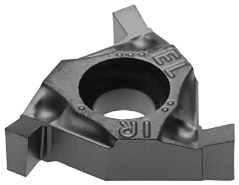


Inserts ER = IL

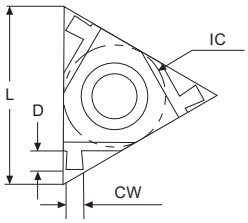
Order code Código	Reference Referência Referencia	Anvil	L (mm)	Dimensions | Dimensões | Dimensiones (in)				Stock - Grade Code (2)	
				IC	L	CW	D	(68) PH6920	(D0) PH8920
1883721	11 ER W 0.50	-	11	0.250	0.433	0.020	0.055	○	○
1883722	11 ER W 0.60	-	11	0.250	0.433	0.024	0.055	○	○
1883723	11 ER W 0.70	-	11	0.250	0.433	0.028	0.055	○	○
1883724	11 ER W 0.80	-	11	0.250	0.433	0.031	0.055	○	○
1883725	11 ER W 1.00	-	11	0.250	0.433	0.039	0.051	○	○
1883726	16 ER W 0.50	EA 16	16	0.375	0.630	0.020	0.055	○	○
1881125	16 ER W 1.00	EA 16	16	0.375	0.630	0.039	0.055	◈	○
1883707	16 ER W 1.20	EA 16	16	0.375	0.630	0.047	0.063	◈	○
1883720	16 ER W 1.40	EA 16	16	0.375	0.630	0.055	0.071	◈	○
1881129	16 ER W 1.70	EA 16	16	0.375	0.630	0.067	0.079	◈	◈
1883711	16 ER W 1.95	EA 16	16	0.375	0.630	0.077	0.079	◈	◈
1883714	16 ER W 2.25	EA 16	16	0.375	0.630	0.089	0.089	◈	◈

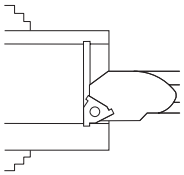
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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



Internal





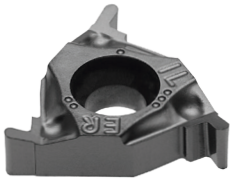
Inserts IR = EL

Order code Código	Reference Referência Referencia	Anvil	L (mm)	Dimensions | Dimensões | Dimensiones (in)				Stock - Grade Code (2)	
				IC	L	CW	D	(68) PH6920	(D0) PH8920
1881142	11 IR W 0.50	-	11	0.010	0.017	0.001	0.002	◈	○
1883727	11 IR W 0.60	-	11	0.010	0.017	0.001	0.002	○	○
1883728	11 IR W 0.70	-	11	0.010	0.017	0.001	0.002	○	○
1883729	11 IR W 0.80	-	11	0.010	0.017	0.001	0.002	○	○
1881144	11 IR W 1.00	-	11	0.010	0.017	0.002	0.002	◈	○
1883730	16 IR W 0.50	EA 16	16	0.015	0.025	0.001	0.002	○	○
1881134	16 IR W 1.00	EA 16	16	0.015	0.025	0.002	0.002	◈	○
1883731	16 IR W 1.20	EA 16	16	0.015	0.025	0.002	0.002	◈	○
1883712	16 IR W 1.40	EA 16	16	0.015	0.025	0.002	0.003	◈	○
1881138	16 IR W 1.70	EA 16	16	0.015	0.025	0.003	0.003	◈	○
1883710	16 IR W 1.95	EA 16	16	0.015	0.025	0.003	0.003	◈	○
1883713	16 IR W 2.25	EA 16	16	0.015	0.025	0.004	0.004	◈	○

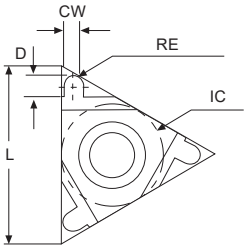
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

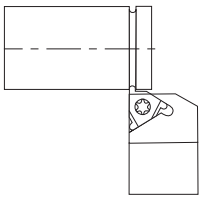
Insert order code = (1) Geometry Code + (2) Grade Code

FULL RADIUS GROOVING



External





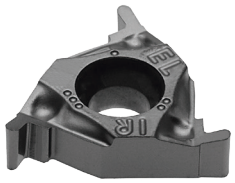
Inserts ER = IL

Order code Código	Reference Referência Referencia	Anvil	L (mm)	Dimensions | Dimensões | Dimensiones (in)					Stock - Grade Code (2)	
				IC	L	CW	RE	D	(68) PH6920	(D0) PH8920
1881149	16 ER R 0.50	EA 16	16	0.375	0.630	0.039	0.020	0.055	◈	○
1883732	16 ER R 0.60	EA 16	16	0.375	0.630	0.047	0.024	0.063	○	○
1883733	16 ER R 0.90	EA 16	16	0.375	0.630	0.071	0.035	0.079	○	○
1881151	16 ER R 1.00	EA 16	16	0.375	0.630	0.079	0.039	0.079	○	○
1883734	16 ER R 1.10	EA 16	16	0.375	0.630	0.087	0.043	0.085	○	○
1883735	16 ER R 1.20	EA 16	16	0.375	0.630	0.094	0.047	0.085	○	○

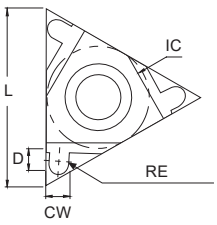
◈ Stock item | Produto de stock | Itens de stock

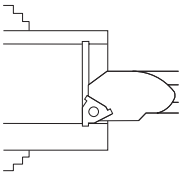
○ Available under request | Disponível sobre consulta
Disponible bajo consulta

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



Internal





Inserts IR = EL

Order code Código	Reference Referência Referencia	Anvil	L (mm)	Dimensions | Dimensões | Dimensiones (in)					Stock - Grade Code (2)	
				IC	L	CW	RE	D	(68) PH6920	(D0) PH8920
1881145	16 IR R 0.50	EA 16	16	0.375	0.630	0.039	0.020	0.055	○	○
1883736	16 IR R 0.60	EA 16	16	0.375	0.630	0.047	0.024	0.063	○	○
1883737	16 IR R 0.90	EA 16	16	0.375	0.630	0.071	0.035	0.079	○	○
1881147	16 IR R 1.00	EA 16	16	0.375	0.630	0.079	0.039	0.079	○	○
1883738	16 IR R 1.10	EA 16	16	0.375	0.630	0.087	0.043	0.085	○	○
1883739	16 IR R 1.20	EA 16	16	0.375	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

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

SAL

SWISS AUTOMATIC LATHES



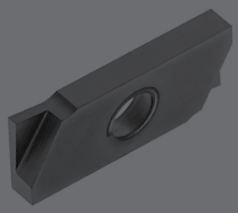
The SAL is a set of tools specifically tailored for grooving, parting off, turning, and threading applications on Swiss lathe machines. It optimizes performance and enhances productivity in precision manufacturing processes.

O SAL é um conjunto de ferramentas especialmente projetado para aplicações de canais, corte, torneamento e roscagem em máquinas de torno. Otimiza o desempenho e aumenta a produtividade nos processos de fabricação de precisão.

El SAL es un conjunto de herramientas diseñadas específicamente para aplicaciones de ranurado, corte, torneado y roscado en máquinas de torno. Optimiza el rendimiento y mejora la productividad en procesos de fabricación de precisión.

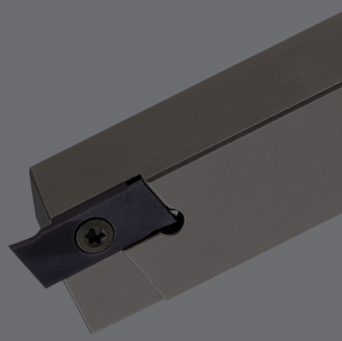
INSERTS > page 694

- > Square and Round Grooving
  Ranhura quadrada e redonda | Ranurado cuadrado y redondo
- > Parting Off
  Sangramento | Tronzado
- > Threading
  Roscagem | Roscado
- > Turning
  Torneamento | Torneado



EXTERNAL TOOLHOLDERS > page 698

- > Inserts SAL...L and SAL...R
  Pastilhas SAL...L e SAL...R | Plaquitas SAL...L y SAL...R
- > Right and Left
  Esquerdo e Direito | Izquierdo y derecho



SAL - SWISS AUTOMATIC LATHES Maquinação de precisão | Herramientas para tornos automáticos

INSERTS CODE KEY Chave de codificação para pastilhas | Llave de codificación de plaquitas

Grooving Inserts

SAL	25	G	050	R	-	GS
1	2	5	6	8		11

Parting Off Inserts

SAL	11	P	100	R	N	-	P07
1	3	5	6	8	9		11

Threading Inserts

SAL	100	H	010	R	60	-	PT
1	4	5	7	8	10		11

Turning Inserts

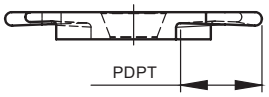
SAL	60	T	300	R	-	TP
1	2	5	6	8		11

1 - Product line

SAL - Swiss Automatic Lathes Line

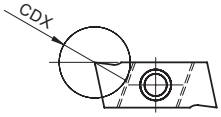
2 - Maximum depth of cut (Turning and Grooving inserts)

25 - 2,5mm | 60 - 6,0mm



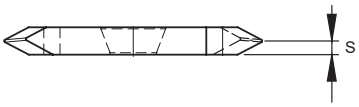
3 - Maximum Cutting Diameter (Parting Off Inserts)

11 - 11,0mm | 13 - 13,0mm

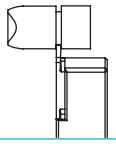
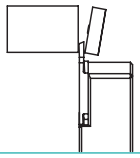
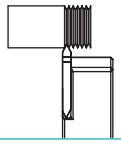
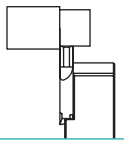


4 - Center distance (Threading Inserts)

050 - 0,5mm | 100 - 1,00mm

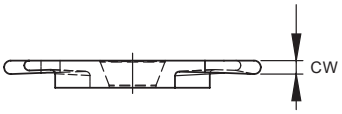


5 - Operations type

G - Grooving	P - Parting off	H - Threading	T - Turning
			

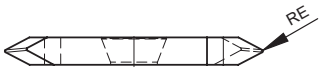
6 - Cut thickness (Grooving, Parting Off and Turning Inserts)

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)

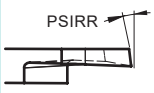
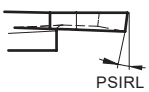
005 - 0,05mm | 010 - 0,10mm
012 - 0,12mm



8- Insert / toolholder side

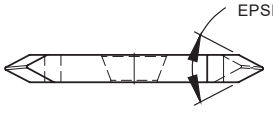
L - Left hand	R - Right hand
	

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)

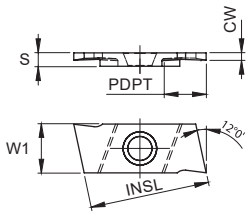
Turning	TP - Turning steel
Grooving	GS - Square Grooving GR - Round Grooving
Parting Off	P00 - Front angle 0° P07 - Front angle 7°
Threading	PT - Partial Profile

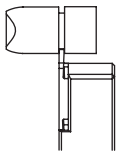
GS SERIES Inserts | Pastilhas | Plaquitas



Right hand style show

For square grooving
Para grooving quadrado
Para ranurado quadrado





Grooving

			P		M		K		S	
	(2) Grade code		PVD							
			G1	G4	G4	P8	G4	P8	G4	P8
(1) Geometry code	ANSI Reference	ISO Reference	PH7910	PH7920	PH7920	PH7135	PH7920	PH7135	PH7920	PH7135
1130441	SAL25G050R-GS	SAL25G050R-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130475	SAL25G070R-GS	SAL25G070R-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130477	SAL25G080R-GS	SAL25G080R-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130479	SAL25G090R-GS	SAL25G090R-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130488	SAL60G110R-GS	SAL60G110R-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130490	SAL60G130R-GS	SAL60G130R-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130442	SAL60G160R-GS	SAL60G160R-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130495	SAL60G185R-GS	SAL60G185R-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130473	SAL25G050L-GS	SAL25G050L-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130474	SAL25G070L-GS	SAL25G070L-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130476	SAL25G080L-GS	SAL25G080L-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130478	SAL25G090L-GS	SAL25G090L-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130487	SAL60G110L-GS	SAL60G110L-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130489	SAL60G130L-GS	SAL60G130L-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130493	SAL60G160L-GS	SAL60G160L-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130494	SAL60G185L-GS	SAL60G185L-GS	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○

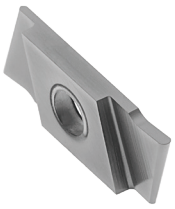
Dimensions Dimensões Dimensiones (in)					Cutting conditions Condições de corte Condiciones de corte		
CW	INSL	S	W1	PDPT	fn (in/r)	Min.	Max.
0.020	0.669	0.079	0.276	0.098	0.002	0.001	0.002
0.028	0.669	0.079	0.276	0.098	0.002	0.001	0.003
0.031	0.669	0.079	0.276	0.098	0.002	0.001	0.004
0.035	0.669	0.079	0.276	0.098	0.002	0.001	0.004
0.043	0.669	0.079	0.276	0.236	0.002	0.001	0.004
0.051	0.669	0.079	0.276	0.236	0.003	0.001	0.005
0.063	0.669	0.079	0.276	0.236	0.003	0.001	0.005
0.073	0.669	0.079	0.276	0.236	0.003	0.001	0.006
0.020	0.669	0.079	0.276	0.098	0.002	0.001	0.002
0.028	0.669	0.079	0.276	0.098	0.002	0.001	0.003
0.031	0.669	0.079	0.276	0.098	0.002	0.001	0.004
0.035	0.669	0.079	0.276	0.098	0.002	0.001	0.004
0.043	0.669	0.079	0.276	0.236	0.002	0.001	0.004
0.051	0.669	0.079	0.276	0.236	0.003	0.001	0.005
0.063	0.669	0.079	0.276	0.236	0.003	0.001	0.005
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 with delivery time 4 weeks
Disponível sobre consulta com prazo de entrega de 4 semanas
Disponible bajo consulta, con fecha de entrega en 4 semanas

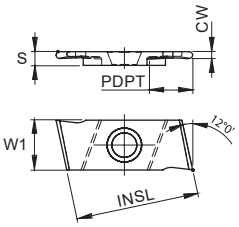
Order code = (1) Geometry code + (2) Grade code

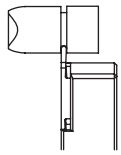
GR SERIES Inserts | Pastilhas | Plaquitas



Right hand style show

For round grooving
Para grooving redondo
Para ranurado redondo





Grooving

			P		M		K		S	
	(2) Grade code		PVD							
			G1	G4	G4	P8	G4	P8	G4	P8
(1) Geometry code	ISO Reference	ANSI Reference	PH7910	PH7920	PH7920	PH7135	PH7920	PH7135	PH7920	PH7135
1130443	SAL60G100R-GR	SAL60G100R-GR	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130492	SAL60G150R-GR	SAL60G150R-GR	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130497	SAL60G200R-GR	SAL60G200R-GR	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130486	SAL60G100L-GR	SAL60G100L-GR	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130491	SAL60G150L-GR	SAL60G150L-GR	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○
1130496	SAL60G200L-GR	SAL60G200L-GR	○	Ⓢ	Ⓢ	○	Ⓢ	○	Ⓢ	○

Dimensions Dimensões Dimensiones (in)					Cutting conditions Condições de corte Condiciones de corte		
CW	INSL	S	W1	PDPT	fn (in/r)	Min.	Max.
0.039	0.669	0.079	0.276	0.236	0.002	0.001	0.004
0.059	0.669	0.079	0.276	0.236	0.003	0.001	0.005
0.079	0.669	0.079	0.276	0.236	0.003	0.001	0.006
0.039	0.669	0.079	0.276	0.236	0.002	0.001	0.004
0.059	0.669	0.079	0.276	0.236	0.003	0.001	0.005
0.079	0.669	0.079	0.276	0.236	0.003	0.001	0.006

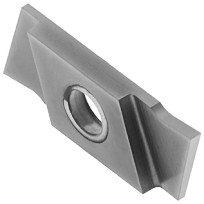
Ⓢ Stock item | Produto de stock | Itens de stock

○ Available under request with delivery time 4 weeks
Disponível sobre consulta com prazo de entrega de 4 semanas
Disponible bajo consulta, con fecha de entrega en 4 semanas

Order code = (1) Geometry code + (2) Grade code

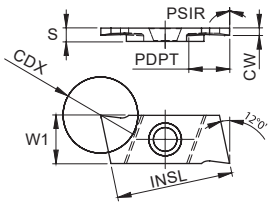
SAL - SWISS AUTOMATIC LATHES Maquinação de precisão | Herramientas para tornos automáticos

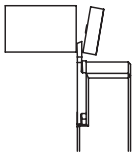
P(P00) SERIES Inserts | Pastilhas | Plaquitas



Right hand style show

Without front angle
Sem ângulo frontal
Sín angulo frontal





Parting off

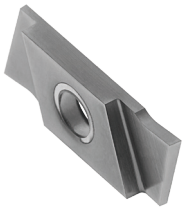
(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P PVD G1 PH7910	P PVD G4 PH7920	M PVD G4 PH7920	M PVD P8 PH7135	K PVD G4 PH7920	K PVD P8 PH7135	S G4 PH7920	S P8 PH7135	Dimensions Dimensões Dimensiones (in) CW	INSL	S	W1	PDPT	PSIRR/L	CDX	Cutting conditions Condições de corte Condiciones de corte 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	0.004
1130462	SAL11P150RN-P00	SAL11P150RN-P00	○	◈	◈	○	◈	○	◈	○	0.059	0.669	0.079	0.276	0.236	0	0.433	0.003	0.005
1130468	SAL13P200RN-P00	SAL13P200RN-P00	○	◈	◈	○	◈	○	◈	○	0.079	0.669	0.079	0.276	0.236	0	0.512	0.003	0.006
1130456	SAL11P100LN-P00	SAL11P100LN-P00	○	◈	◈	○	◈	○	◈	○	0.039	0.669	0.079	0.276	0.236	0	0.433	0.002	0.004
1130459	SAL11P150LN-P00	SAL11P150LN-P00	○	◈	◈	○	◈	○	◈	○	0.059	0.669	0.079	0.276	0.236	0	0.433	0.003	0.005
1130465	SAL13P200LN-P00	SAL13P200LN-P00	○	◈	◈	○	◈	○	◈	○	0.079	0.669	0.079	0.276	0.236	0	0.512	0.003	0.006

◈ Stock item | Produto de stock | Itens de stock

○ Available under request with delivery time 4 weeks
Disponível sobre consulta com prazo de entrega de 4 semanas
Disponible bajo consulta, con fecha de entrega en 4 semanas

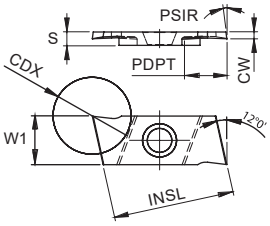
Order code = (1) Geometry code + (2) Grade code

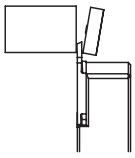
P(P07) SERIES Inserts | Pastilhas | Plaquitas



Right hand style show

Front angle 7°
Ângulo frontal de 7°
Angulo frontal de 7°





Parting off

(1) Geometry code	(2) Grade code ISO Reference	ANSI Reference	P PVD G1 PH7910	P PVD G4 PH7920	M PVD G4 PH7920	M PVD P8 PH7135	K PVD G4 PH7920	K PVD P8 PH7135	S G4 PH7920	S P8 PH7135	Dimensions Dimensões Dimensiones (in) CW	INSL	S	W1	PDPT	PSIRR/L	CDX	Cutting conditions Condições de corte Condiciones de corte fn (in/r) Min.	Max.
1130445	SAL11P100RR-P07	SAL11P100RR-P07	○	◈	◈	○	◈	○	◈	○	0,039	0,669	0,079	0,276	0,236	7°	0,433	0,002	0,003
1130446	SAL11P100RL-P07	SAL11P100RL-P07	○	◈	◈	○	◈	○	◈	○	0,039	0,669	0,079	0,276	0,236	7°	0,433	0,002	0,003
1130463	SAL11P150RR-P07	SAL11P150RR-P07	○	◈	◈	○	◈	○	◈	○	0,059	0,669	0,079	0,276	0,236	7°	0,433	0,002	0,004
1130461	SAL11P150RL-P07	SAL11P150RL-P07	○	◈	◈	○	◈	○	◈	○	0,059	0,669	0,079	0,276	0,236	7°	0,433	0,002	0,004
1130469	SAL13P200RR-P07	SAL13P200RR-P07	○	◈	◈	○	◈	○	◈	○	0,079	0,669	0,079	0,276	0,236	7°	0,512	0,002	0,005
1130467	SAL13P200RL-P07	SAL13P200RL-P07	○	◈	◈	○	◈	○	◈	○	0,079	0,669	0,079	0,276	0,236	7°	0,512	0,002	0,005
1130457	SAL11P100LR-P07	SAL11P100LR-P07	○	◈	◈	○	◈	○	◈	○	0,039	0,669	0,079	0,276	0,236	7°	0,433	0,002	0,003
1130455	SAL11P100LL-P07	SAL11P100LL-P07	○	◈	◈	○	◈	○	◈	○	0,039	0,669	0,079	0,276	0,236	7°	0,433	0,002	0,003
1130460	SAL11P150LR-P07	SAL11P150LR-P07	○	◈	◈	○	◈	○	◈	○	0,059	0,669	0,079	0,276	0,236	7°	0,433	0,002	0,004
1130458	SAL11P150LL-P07	SAL11P150LL-P07	○	◈	◈	○	◈	○	◈	○	0,059	0,669	0,079	0,276	0,236	7°	0,433	0,002	0,004
1130466	SAL13P200LR-P07	SAL13P200LR-P07	○	◈	◈	○	◈	○	◈	○	0,079	0,669	0,079	0,276	0,236	7°	0,512	0,002	0,005
1130464	SAL13P200LL-P07	SAL13P200LL-P07	○	◈	◈	○	◈	○	◈	○	0,079	0,669	0,079	0,276	0,236	7°	0,512	0,002	0,005

◈ Stock item | Produto de stock | Itens de stock

○ Available under request with delivery time 4 weeks
Disponível sobre consulta com prazo de entrega de 4 semanas
Disponible bajo consulta, con fecha de entrega en 4 semanas

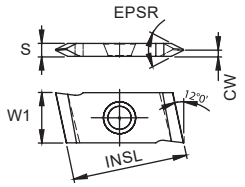
Order code = (1) Geometry code + (2) Grade code

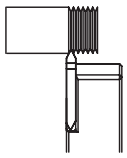
PT SERIES Inserts | Pastilhas | Plaquitas



Right hand style show

For partial profile threading
Para perfil parcial de roscagem
Para perfil parcial de roscado





Threading

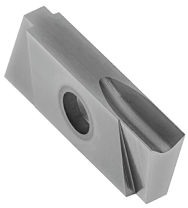
(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P PVD G1 PH7910	P PVD G4 PH7920	M PVD G4 PH7920	M PVD P8 PH7135	K PVD G4 PH7920	K PVD P8 PH7135	S PVD G4 PH7920	S PVD P8 PH7135	Dimensions Dimensões Dimensiones (in) CW	INSL	S	W1	PDPT	EPSR	Cutting conditions Condições de corte Condiciones de corte fn (in/r)	Min.	Max.
1130472	SAL100H012R55-PT	SAL100H012R55-PT	○	◈	◈	○	◈	○	◈	○	0.043	0.669	0.079	0.276	0.005	55°	0.031	0.008	0.079
1130447	SAL100H012R60-PT	SAL100H012R60-PT	○	◈	◈	○	◈	○	◈	○	0.043	0.669	0.079	0.276	0.005	60°	0.031	0.008	0.079
1130470	SAL100H012L55-PT	SAL100H012L55-PT	○	◈	◈	○	◈	○	◈	○	0.043	0.669	0.079	0.276	0.005	55°	0.031	0.008	0.079
1130471	SAL100H012L60-PT	SAL100H012L60-PT	○	◈	◈	○	◈	○	◈	○	0.043	0.669	0.079	0.276	0.005	60°	0.031	0.008	0.079

◈ Stock item | Produto de stock | Itens de stock

○ Available under request with delivery time 4 weeks
Disponível sobre consulta com prazo de entrega de 4 semanas
Disponible bajo consulta, con fecha de entrega en 4 semanas

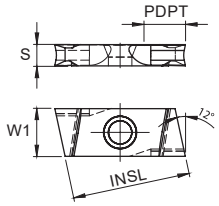
Order code = (1) Geometry code + (2) Grade code

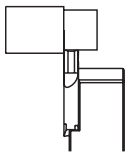
TP SERIES Inserts | Pastilhas | Plaquitas



Right hand style show

For turning
Para torneamento
Para torneado





Turning

(1) Geometry code	(2) Grade code ANSI Reference	ISO Reference	P PVD G1 PH7910	P PVD G4 PH7920	M PVD G4 PH7920	M PVD P8 PH7135	K PVD G4 PH7920	K PVD P8 PH7135	S PVD G4 PH7920	S PVD P8 PH7135	Dimensions Dimensões Dimensiones (in) INSL	S	W1	PDPT	Cutting conditions Condições de corte Condiciones de corte 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

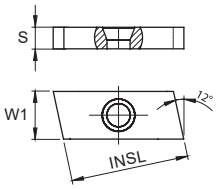
○ Available under request with delivery time 4 weeks
Disponível sobre consulta com prazo de entrega de 4 semanas
Disponible bajo consulta, con fecha de entrega en 4 semanas

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 ISO Reference	ANSI Reference	Uncoated 10 PH0910	Uncoated 12 PH0920	Uncoated 14 PH0135	Dimensions Dimensões Dimensiones (in) INSL	S	W1
1130440	BLANK SALR 17x7x2	BLANK SALR 17x7x2	◈	◈	◈	0.689	0.079	0.295
1130504	BLANK SALR 17x7x3.17	BLANK SALR 17x7x3.17	◈	◈	◈	0.000	0.125	0.295
1130453	BLANK SALL 17x7x2	BLANK SALL 17x7x2	◈	◈	◈	0.689	0.079	0.295
1130505	BLANK SALL 17x7x3.17	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

SAL - SWISS AUTOMATIC LATHES Maquinação de precisão | Herramientas para tornos automáticos

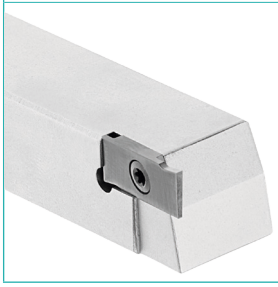
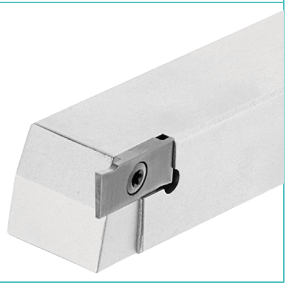
TOOLHOLDERS CODE KEY Chave de codificação para suportes | Llave de codificación de herramienta

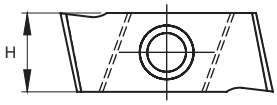
SAL	H	E	R	-	07	05
1	2	3	4		5	6

1 - Product line
SAL - Swiss Automatic Lathes Line

2 - Tool type
H - Holder

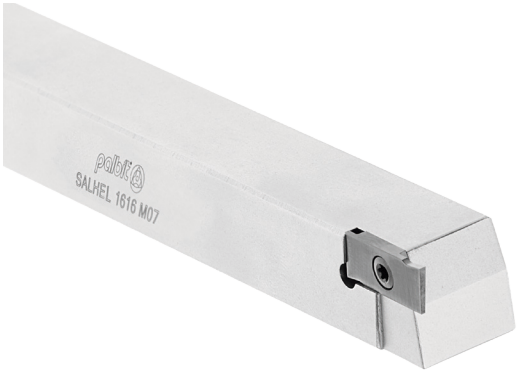
3 - Internal or External
E - External

4 - Insert / toolholder side	
L - Left hand	R - Right hand
	

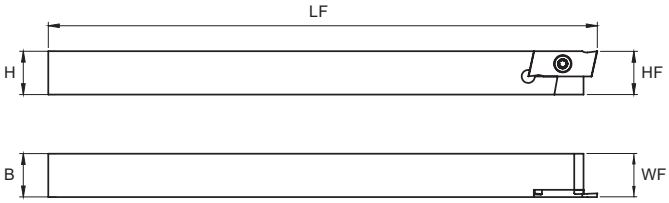
5 - Insert cutting edge lenght (mm)
07 - 7,0 mm (0.276in)


9 - Shank height (in)
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´´


EXTERNAL TOOLHOLDERS Suportes exteriores | herramientas de tronzado exterior



Left hand style show



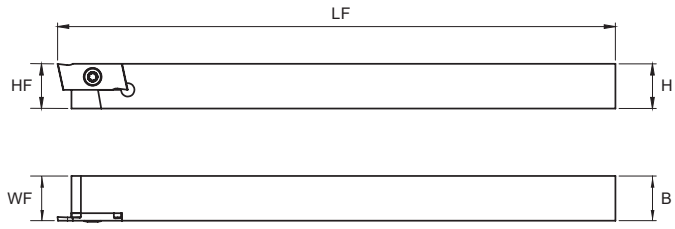
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					* Insert	Screw	Wrench	Stock
		B	H	HF	LF	WF				
213024700	SALHEL 05-07	0.312	0.312	0.312	6.00	0.312	SAL...L	P0300900	XT 08	◉
213024800	SALHEL 06-07	0.375	0.375	0.375	6.00	0.375	SAL...L	P0300900	XT 08	◉
213024900	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



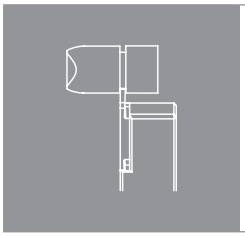
Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					* Insert	Screw	Wrench	Stock
		B	H	HF	LF	WF				
213024300	SALHER 05-07	0.312	0.312	0.312	6.00	0.312	SAL...R	P0300900	XT 08	◉
213024400	SALHER 06-07	0.375	0.375	0.375	6.00	0.375	SAL...R	P0300900	XT 08	◉
213024500	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

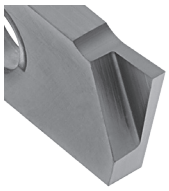
SAL - SWISS AUTOMATIC LATHES Maquinação de precisão | Herramientas para tornos automáticos

GROOVING Canais | Ranurado



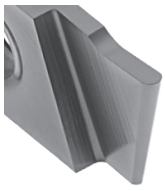
- High precision
- Close tolerances
- Wide variety of insert widths

GS

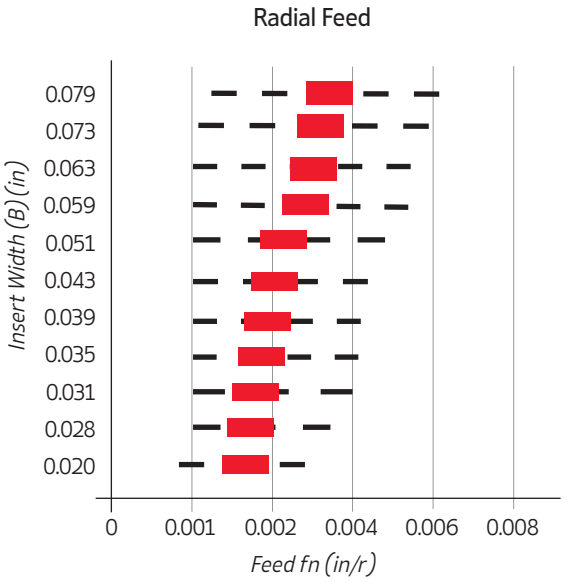


Square grooving

GR



Round grooving



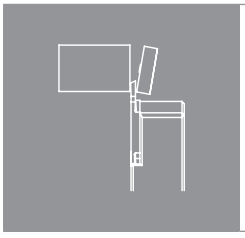
Recomended cutting conditions

P	M	K	S
197-656	197-591	197-492	66-164

Recomended grade PH7920, (Vc) SFM.

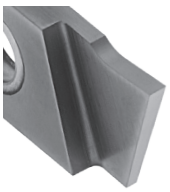
Grade PH7910 and PH7135
Available under request (4 weeks delivery time)

PARTING OFF Corte | Tronzado



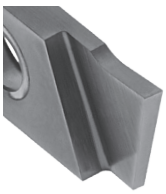
- When parting off with a sub-spindle, it is more productive to use a straight cutting edge. This is a more stable parting method and will generate the best surface finish.
- When parting off without a sub-spindle, we recommend you use an insert with a maximum 7° front angle to minimize the risk of burr and pips on the component.
- When parting off with 7° front angled inserts, we recommend reducing the feed rate by approximately 30%.

P00

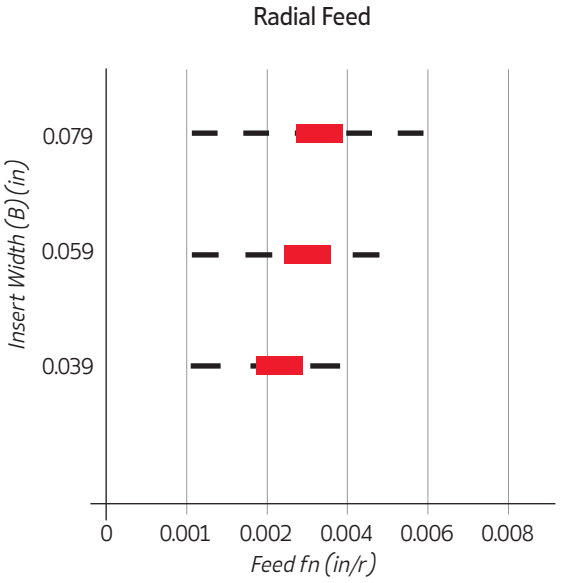


0º Relief angle

P07



7º Relief angle



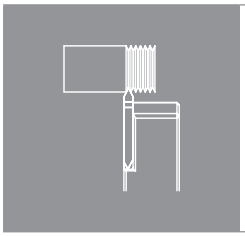
Recomended cutting conditions

P	M	K	S
197-656	197-591	197-492	66-164

Recomended grade PH7920, (Vc) SFM.

Grade PH7910 and PH7135
Available under request (4 weeks delivery time)

THREADING Roscagem | Roscado



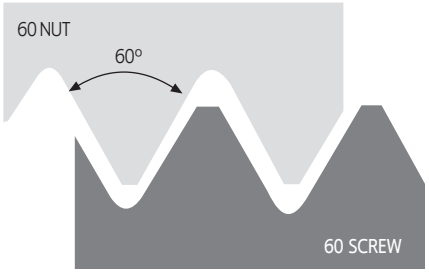
Two types of threading:
- Partial profile 55º
- Partial profile 60º

Pitch from 12 - 94 TPI / 0.010 - 0.078 in

PT



Partial profile

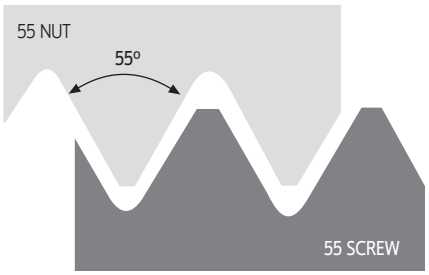


Recomended cutting conditions

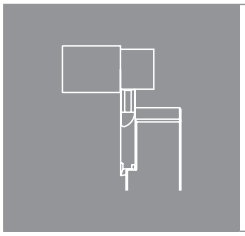
P	M	K	S
197-656	197-591	197-492	66-164

Recomended grade PH7920, (Vc) SFM.

Grade PH7910 and PH7135
Available under request (4 weeks delivery time)

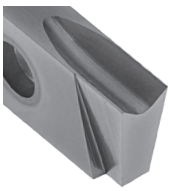


TURNING Torneamento | Torneado



- Insert for turning
- Maximum deep of cut is 0.098 in
- Excesssively low cutting speeds will result in inadequate tool life.

TP



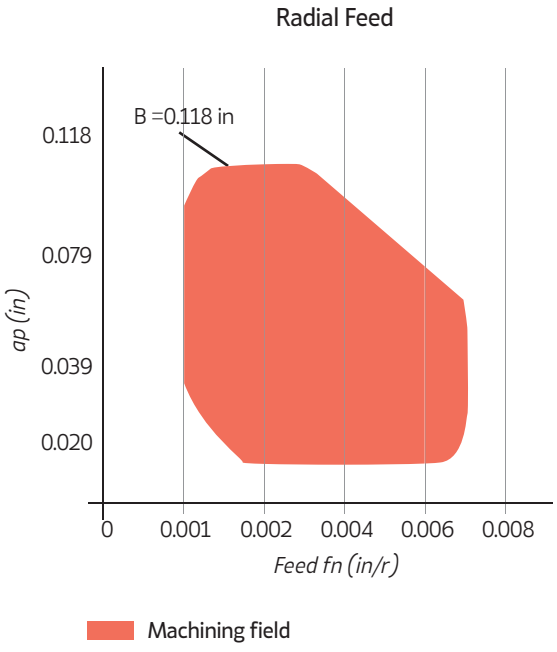
Turning steel

Recomended cutting conditions

P	M	K	S
197-656	197-591	197-492	66-164

Recomended grade PH7920, (Vc) SFM.

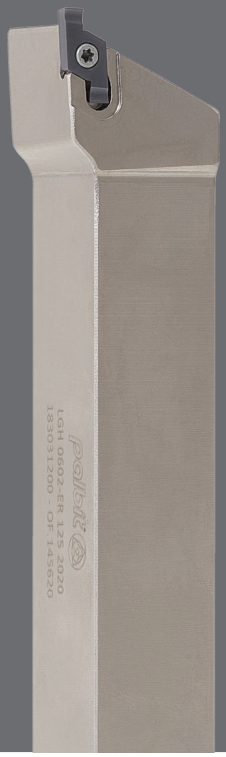
Grade PH7910 and PH7135
Available under request (4 weeks delivery time)



LIGHT GROOVING

METRIC LINE





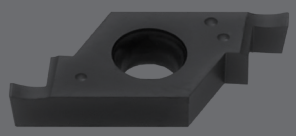
Light grooving is specifically tailored for the manufacturing of grooves, whether internal or external, for coupling circlips.

O Light Grooving é especificamente adaptado para a fabricação de canais, internos ou externos, para acoplamento de anéis de retenção.

El Light Grooving está específicamente diseñado para la fabricación de ranuras, ya sean internas o externas, para acoplamiento de circlips.

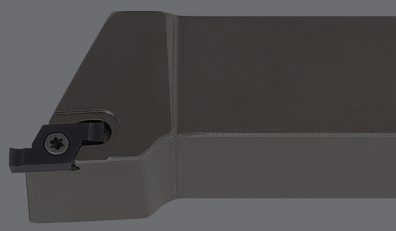
INSERTS > page 704

- For circlip width from 0.039 in to 0.118 in
  Para anéis de retenção com largura desde 0.039 in até 0.118 in | Para anillos de retención con anchos de 0.039 in a 0.118 in
- 2 cutting edges
  2 arestas de corte | 2 filos de corte
- Size 06
  Tamanho 06 | Tamaño 06



TOOLHOLDERS > page 706

- External and Internal
  Externo e Interno | Externo e interno
- Insert LG-R/L
  Pastilha LG-R/L | Plaquita LG-R/L



LIGHT GROOVING INSERTS Pastilhas | Plaquitas

LG	06	02	R	110
1	2	3	4	5

1 - Product Line

LG - Light Grooving

2 - Insert size

06 - IC = 6,35mm (0.250 in)

3 - Cutting edges

02 - 2 cutting edges

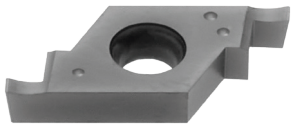
4 - Work side

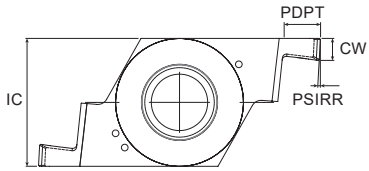
R - Right
L - Left

5 - Edge width

110 = 1,1mm (0.043 in)

LG-R

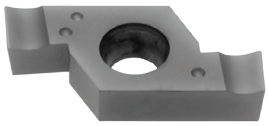


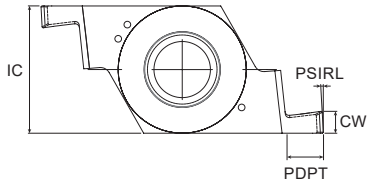


Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				For circlip widht	Stock
		IC	PSIRR	CW	PDPT		PH7920
1130597G4	LG 0602R110	0.250	0.118	0.043	0.031	0.039	⚙
1130598G4	LG 0602R130	0.250	0.118	0.051	0.055	0.047	⚙
1130599G4	LG 0602R160	0.250	0.118	0.063	0.067	0.059	⚙
1130600G4	LG 0602R185	0.250	0.118	0.073	0.079	0.069	⚙
1130601G4	LG 0602R215	0.250	0.118	0.085	0.094	0.079	⚙
1130602G4	LG 0602R265	0.250	0.118	0.104	0.106	0.098	⚙
1130603G4	LG 0602R300	0.250	0.118	0.118	0.118	-	⚙
1130604G4	LG 0602R315	0.250	0.118	0.124	0.118	0.118	⚙

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

LG-L





Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				For circlip widht	Stock
		IC	PSIRL	CW	PDPT		PH7920
1130589G4	LG 0602L110	0.250	0.118	0.043	0.031	0.039	⚙
1130590G4	LG 0602L130	0.250	0.118	0.051	0.055	0.047	⚙
1130591G4	LG 0602L160	0.250	0.118	0.063	0.067	0.059	⚙
1130592G4	LG 0602L185	0.250	0.118	0.073	0.079	0.069	⚙
1130593G4	LG 0602L215	0.250	0.118	0.085	0.094	0.079	⚙
1130594G4	LG 0602L265	0.250	0.118	0.104	0.106	0.098	⚙
1130595G4	LG 0602L300	0.250	0.118	0.118	0.118	-	⚙
1130596G4	LG 0602L315	0.250	0.118	0.124	0.118	0.118	⚙

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

LIGHT GROOVING TOOLHOLDERS Suportes | Herramientas

LG	H	06	02	I	R	150	16
1	2	3	4	5	6	7	8

1 - Product Line

LG - Light Grooving

2 - Product type

H - Holder

3 - Insert size

06 - IC=6,35mm (0.250 in)

4 - Cutting edges

02 - 2 Cutting edges

5 - Internal / External

I - Internal
E - External

6 - Work side

R - Right
L - Left

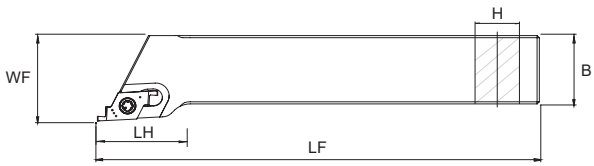
7 - Tool length

150 - 150mm (5.906 in)

8 - Shank dimenson

Internal: 16 - Ø16mm (0.630 in)
External: 2020 - 20mm x 20mm (0.787 in x 0.787 in)

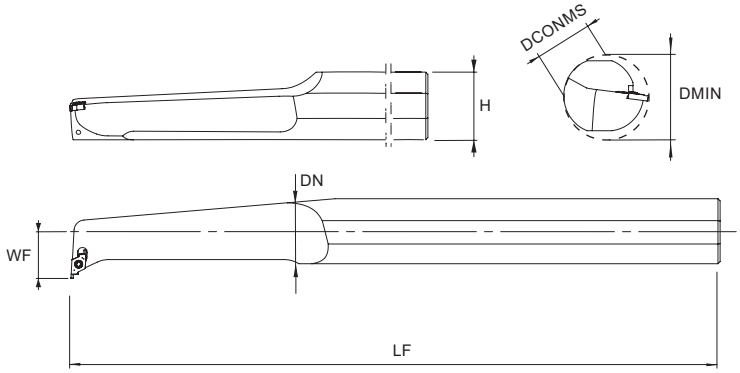
LGH-ER/L



Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)					Insert	Screw	Key	Stock
		H	B	LF	LH	WF				
Right Toolholder										
183031100	LGH 0602-ER 100 1616	0.630	0.630	3.937	0.827	0.787	LG 0602R	P0250702	XT08	◈
183031200	LGH 0602-ER 125 2020	0.787	0.787	4.921	0.984	0.984	LG 0602R	P0250702	XT08	◈
183031300	LGH 0602-ER 150 2525	0.984	0.984	5.906	1.260	1.260	LG 0602R	P0250702	XT08	◈
Left Toolholder										
183030300	LGH 0602-EL 100 1616	0.630	0.630	3.937	0.827	0.787	LG 0602L	P0250702	XT08	◈
183030400	LGH 0602-EL 125 2020	0.787	0.787	4.921	0.984	0.984	LG 0602L	P0250702	XT08	◈
183030500	LGH 0602-EL 150 2525	0.984	0.984	5.906	1.260	1.260	LG 0602L	P0250702	XT08	◈

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

LGH-IR/L



Order code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)						Insert	Screw	Key	Stock
		DCONMS	DMIN	H	DN	LF	WF				
Right Toolholder											
183031400	LGH 0602-IR 150 12	0.472	0.630	0.433	0.453	5.906	0.354	LG 0602L	P0250503	XT08	◈
183031500	LGH 0602-IR 150 16	0.630	0.787	0.591	0.591	5.906	0.433	LG 0602L	P0250503	XT08	◈
183031600	LGH 0602-IR 170 20	0.787	0.984	0.709	0.748	6.693	0.512	LG 0602L	P0250503	XT08	◈
183031700	LGH 0602-IR 200 25	0.984	1.260	0.906	0.945	7.874	0.669	LG 0602L	P0250503	XT08	◈
183031800	LGH 0602-IR 300 32	1.260	1.575	1.181	1.220	11.811	0.866	LG 0602L	P0250503	XT08	◈
Left Toolholder											
183030600	LGH 0602-IL 150 12	0.472	0.630	0.433	0.453	5.906	0.354	LG 0602R	P0250503	XT08	◈
183030700	LGH 0602-IL 150 16	0.630	0.787	0.591	0.591	5.906	0.433	LG 0602R	P0250503	XT08	◈
183030800	LGH 0602-IL 170 20	0.787	0.984	0.709	0.748	6.693	0.512	LG 0602R	P0250503	XT08	◈
183030900	LGH 0602-IL 200 25	0.984	1.260	0.906	0.945	7.874	0.669	LG 0602R	P0250503	XT08	◈
183031000	LGH 0602-IL 300 32	1.260	1.575	1.181	1.220	11.811	0.866	LG 0602R	P0250503	XT08	◈

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

FORMING GROOVING

METRIC LINE

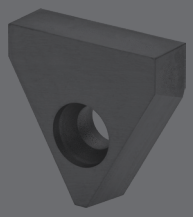


Carbide blanks for customization, tailored to the profile designed by the custome.

Blanks em metal duro para personalização, adaptados ao perfil desenhado pelo cliente.

Blanks de carburo para personalización, adaptados al perfil diseñado por el cliente.

BLANKS > page 926



- From sizes 0.512 in to 1.024 in
  De tamanhos de 0.512 in a 1.024 in | De tamaños de 0.512 in a 1.024 in
- 2 geometrys
  2 geometrias | 2 geometrías
- Available in grades PH0930
  Disponível nos graus PH0930 | Disponible en las calidades PH0930

TOOLHOLDERS > page 928



- 4 types
  4 tipos | 4 tipos

FORMING GROOVING - BLANKS Code Key | Chave de codificação | Llave de codificación

FG	I	13
1	2	3

1 - Product Line

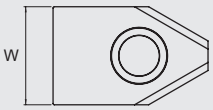
FG - Forming Grooving

2 - Product type

I - Insert

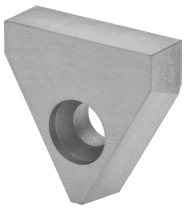
3 - Edge width (W)

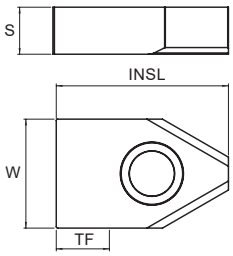
13 - 13mm (0.512 in)
16 - 16mm (0.630 in)
20 - 20mm (0.787 in)
32 - 32mm (1.260 in)





FGI



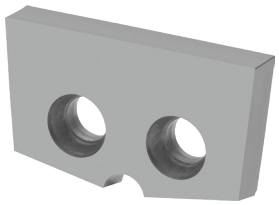


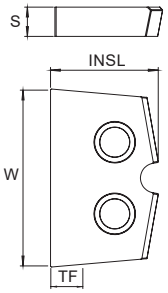
(1) Geometry code	(2) Grade code ISO Reference	UNC 18 PH0930	Dimensions | Dimensões | Dimensiones (in) W	S	INSL	TF
1130550	BLANK FGI 13	◈	0.512	0.211	0.815	0.236
1130551	BLANK FGI 16	◈	0.630	0.211	0.984	0.394
1130552	BLANK FGI 20	◈	0.787	0.250	0.815	0.276
1130615	BLANK FGI 20 L	◈	0.787	0.250	0.984	0.433

◈ 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

FGI





(1) Geometry code	(2) Grade code ISO Reference	UNC 18 PH0930	Dimensions | Dimensões | Dimensiones (in) W	S	INSL	TF
1130553	BLANK FGI 32	◈	1.260	0.197	0.780	0.276

◈ 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

FORMING GROOVING - TOOLHOLDERS Blanks de Sangramento | Blanks de Tronzado

FG	H	13	-	A	125	12	.	12	-	5º
1	2	3		4	5	6		7		8

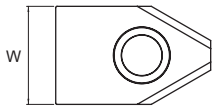
1 - Product Line

FG - Forming Grooving

2 - Cutting Width

H - Holder

3 - Edge Width (Forming)



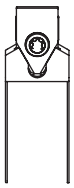
13 - 13 mm (0.512 in)
16 - 16 mm (0.630 in)
20 - 20 mm (0.787 in)
32 - 32 mm (1.260 in) (2 holes)

4 - Toolholder Type (Forming)

Type A



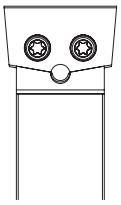
Type B



Type C



Type C

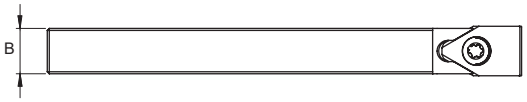


5 - Toolholder total lenght



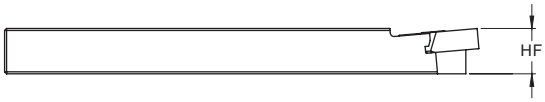
125 - 125 mm (4.921 in)
150 - 150 mm (5.906 in)

6 - Toolholder depth



10 - 10 mm (0.394 in)
12 - 12 mm (0.472 in)
14 - 14 mm (0.551 in)
16 - 16 mm (0.630 in)
20 - 20 mm (0.787 in)

7 - Insert height



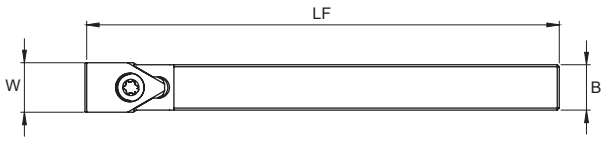
10 - 10 mm (0.394 in)
12 - 12 mm (0.472 in)
14 - 14 mm (0.551 in)
16 - 16 mm (0.630 in)
20 - 20 mm (0.787 in)

8 - Insert relief angle

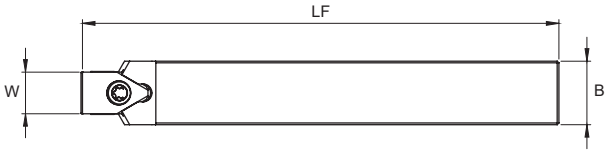


0º
5º

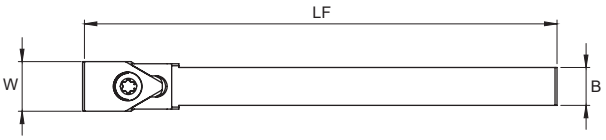
Type A



Type B



Type C



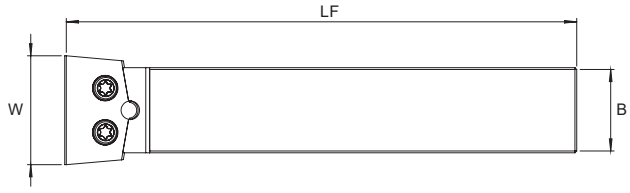
Type A|B|C



Order code		ISO Reference	Dimensions | Dimensões | Dimensiones (in)					Insert	Toolholder Type	Stock	
*a 0º	*a 5º		H	HF	B	LF	W			0º	5º
113056500	113055400	FGH 13-A 125 12.12 - 0º/5º	0.472	0.472	0.472	4.921	0.512	FGI 13	A	●	●
113056600	113055500	FGH 13-B 125 14.14 - 0º/5º	0.551	0.551	0.551	4.921	0.512	FGI 13	B	●	●
113058000	113058100	FGH 13-B 125 16.16-0°/5º	0.630	0.630	0.630	4.921	0.512	FGI 13	B	○	●
113056700	113055600	FGH 13-C 125 10.10 - 0º/5º	0.394	0.394	0.394	4.921	0.512	FGI 13	C	○	●
113056800	113055700	FGH 16-A 125 16.16 - 0º/5º	0.630	0.630	0.630	4.921	0.630	FGI 16	A	●	●
113056900	113055800	FGH 16-B 150 20.20 - 0º/5º	0.787	0.787	0.787	5.906	0.630	FGI 16	B	●	●
113057000	113055900	FGH 16-C 125 14.14 - 0º/5º	0.551	0.551	0.551	4.921	0.630	FGI 16	C	●	●
113057100	113056000	FGH 20-A 150 20.20 - 0º/5º	0.787	0.787	0.787	5.906	0.787	FGI 20	A	○	●
113057200	113056100	FGH 20-C 125 16.16 - 0º/5º	0.630	0.630	0.630	4.921	0.787	FGI 20	C	○	●
113061600	113061700	FGH 20L-A 150 20.20-0º/5º	0.787	0.787	0.787	5.906	0.787	FGI 20 L	A	●	●
113061800	113061900	FGH 20L-C 125 16.16-0º/5º	0.630	0.630	0.630	4.921	0.787	FGI 20 L	C	●	●

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

Type C





Order code		ISO Reference	Dimensions | Dimensões | Dimensiones (in)					Insert	Toolholder Type	Stock	
*a 0º	*a 5º		H	HF	B	LF	W			0º	5º
113057300	113056200	FGH 32-C 150 25.25 - 0º/5º	0.984	0.984	0.984	5.906	1.260	FGI 32	C	○	●

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



SPARE PARTS

SCREWS & KEYS





Screws

Order code Código	Reference Referência Referencia	Sock
290074100	D0503000	●
290020700	D0603600	●
290062900	D0602200	●
290087400	D0602600	●
290087500	D0603100	●
290017700	P0250702	●
290033100	P0250503	●
290044800	P0260700	●
290044600	P5401390	●
290044900	P5401391	●

Keys

Order Code Código	Reference Referência Referencia	Stock
290011700	XT08	●
290013100	XT10	●

● 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	●

Order code Código	Reference Referência Referencia	Sock
290074400	LE05	●

Order code Código	Reference Referência Referencia	Sock
290079600	LE25-30	●

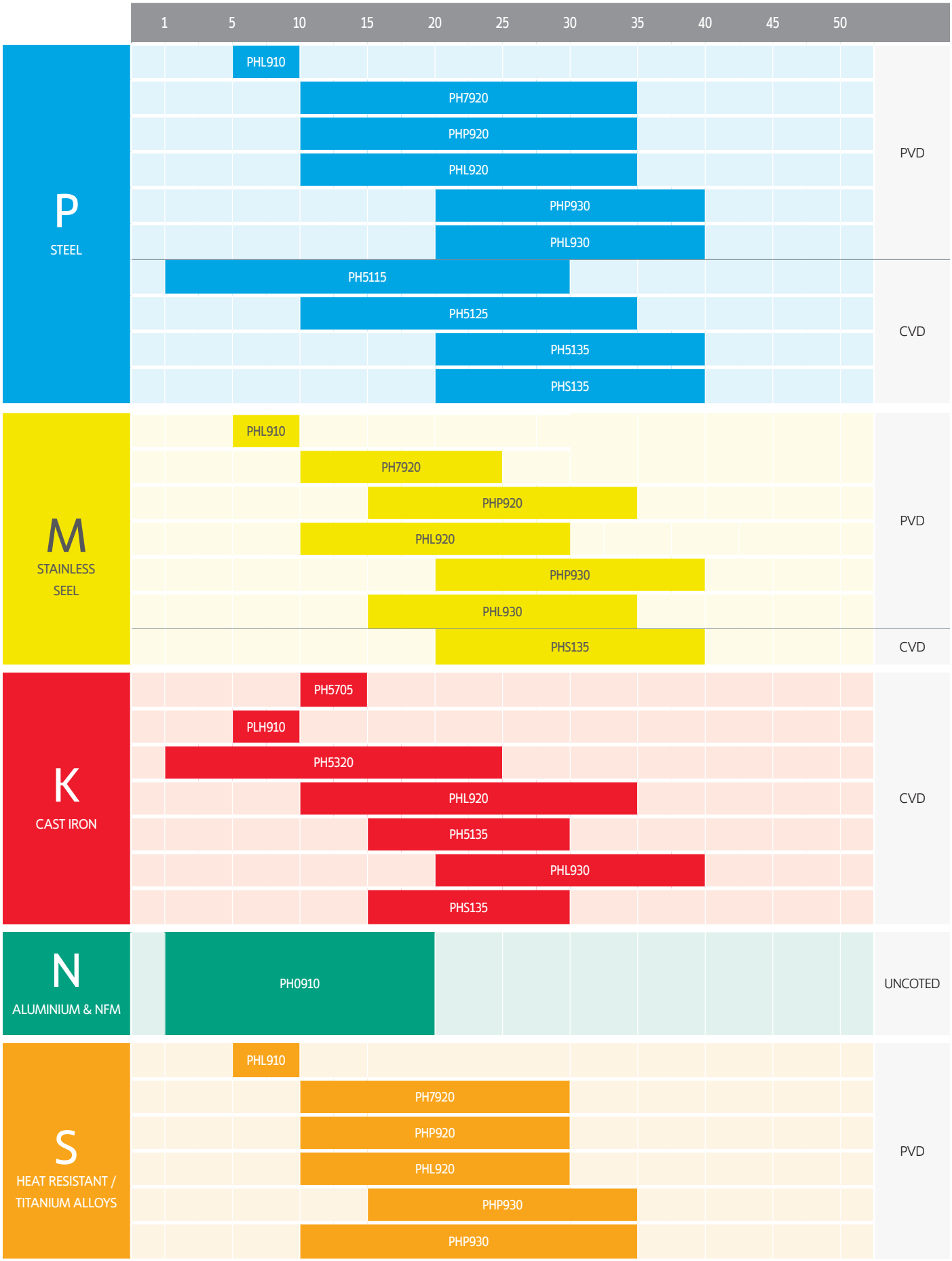
● Stock item | Produto de stock | Itens de stock

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



TECHNICAL DATA

GROOVING & PARTING OFF GRADES Graus para Sangramento | Calidades para Tronzado



GROOVING & PARTING OFF GRADES DESCRIPTION

Graus de Sangramento | Calidades para Tronzado

PVD GRADES

PHL910
P05-P10
K05-K10
M05-M10
S05-S10

A hard carbide substrate coated with in yellow to be visually distinguishable. under good conditions or lightly interrupted cuts.

PH7920
P10-P35
M10-M25
S10-S30

A hard carbide substrate coated with PVD coating. Recommended for general purpose on steel, stainless steel and HRSA.

PHP920
P10-P35
M10-M25
S10-S30

A hard carbide insert coated with revolutionary PVD coating with great adhesion and smoothness. Recommended for machining under good conditions or lightly interrupted cuts at medium to high cutting speeds.

PHL920
P10-P35
K10-K35
M10-M30
S10-S30

A hard carbide insert coated in yellow to be visually distinguishable. Recommended for machining under good conditions or lightly interrupted cuts at medium to high cutting speeds.

PHP930
P20-P40
M20-M40
S15-S35

A tough carbide insert coated with revolutionary PVD coating with great adhesion and smoothness. Recommended for machining under lightly to highly interrupted cuts at low to medium cutting speeds.

PHL930
P20-P40
K20-K40
M15-M35
S15-S35

A tough carbide insert coated in yellow to be visually distinguishable. Recommended for machining under lightly to highly interrupted cuts at low to medium cutting speeds.

CVD GRADES

PH5

A thick CVD coating with a smooth surface. Works great at medium temperatures.

WEAR RESISTANCE ⟷ TOUGHNESS

PH5705
K05-K15

PH5320
K01-K25

PH5115
P10-P25

PH5125
P20-P35

PH5135
P20-P40
K15-K30

PHS

PHS135
P20-P40
M15-M35
K15-K30

A though substrate combined with a thin CVD coating with excellent thermal resistance and hardness at high temperature.
Excellent solution for difficult operations at low velocities.

UNCOATED CARBIDE GRADE

PH0910
N01-N20

Uncoated carbide with polished surface.
1st choice for machining aluminum alloys.

palbit

RECOMMENDED GRADES AND CUTTING SPEEDS (SFM)

Graus recomendados e velocidades de cortesfmin) | Calidades recomendadas y velocidades de corte (sfm)

ISO	Material	Grade fn (in/r) / HB (brinell)	CVD Coating				PVD Coating		
			← Wear Resistence						Toughness →
			PH5115	PH5125	PH5135	PHS135	PH7920	PHP920	PHP930
			0.002-0.020	0.002-0.020	0.002-0.020	0.002-0.020	0.002-0.020	0.002-0.020	0.002-0.020
P	Unalloyed steel	125-170	296-591	263-558	230-525	230-525	197-525	197-525	164-492
	Low-alloy steel	180-350	230-525	197-492	197-460	197-492	197-460	197-492	164-460
	High-alloy steel	200-325	164-492	132-460	132-427	132-460	164-427	164-460	132-427

ISO	Material	Grade fn (in/r) / HB (brinell)	CVD Coating	PVD Coating		
			← Wear Resistence			Toughness →
			PHS135	PH7920	PHP920	PHP930
			0.002-0.020	0.002-0.020	0.002-0.020	0.002-0.020
M	SS - Ferritic / Martensitic	200-330	230-492	197-460	197-460	164-427
	SS - Austenitic / Duplex	180-330	197-427	197-394	197-427	164-361
	SS - Ferritic / Duplex	230-260	132-394	132-361	132-394	132-361

ISO	Material	Grade fn (in/r) / HB (brinell)	CVD Coating			
			← Wear Resistence			Toughness →
			PH5705	PH5320	PH5115	PHS135
			0.002-0.020	0.002-0.020	0.002-0.020	0.002-0.020
K	Marble cast iron	130-230	328-722	296-689	296-656	263-558
	Grey cast iron	180-220	328-656	296-624	263-591	230-492
	Nodular cast iron	160-380	263-558	263-525	230-492	164-460

ISO	Material	Grade fn (in/r) / HB (brinell)	Uncoated
			PH0910
			0.002-0.014
N	Aluminium alloys	60-130	632-5904

ISO	Material	Grade fn (in/r) / HB (brinell)	PVD Coating		
			← Wear Resistence		Toughness →
			PH7920	PHP920	PHP930
			0.002-0.012	0.002-0.012	0.002-0.012
S	Heat resistant super alloys (Iron base)	200-280	115-296	-	-
	Heat resistant super alloys (Nickel base)	250-320	73-197	-	-
	Heat resistant super alloys (Cobalt base)	200-320	99-296	99-296	66-263

CUTTING TOOLS FOR

THREADING



E

E - THREADING

E - 938 | Thread Milling
E - 938 | Thread Milling Inserts



E - 948 | Thread Milling Toolholders
E - 953 | Technical Data
E - 954 | Thread Turning
E - 958 | Inserts Overview
E - 960 | Partial Profile Inserts
E - 964 | Full Profile Inserts
E - 1004 | Tangential Profile Inserts
E - 1020 | Technical Data

THREAD MILLING

INSERTS

METRIC LINE

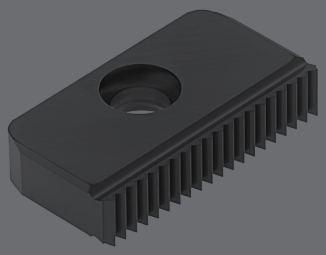


Thread milling inserts offer versatility by producing both internal and external threads without the need for tool changes. Featuring various thread profile types, inserts enable the production of diverse thread types and pitches simply by replacing them with another insert. This flexibility streamlines the machining process, enhancing productivity and precision in thread milling operations.

As pastilhas para fresagem de roscas oferecem versatilidade ao produzir roscas internas e externas sem a necessidade de trocar de ferramenta. Com diversos tipos de perfil de rosca, as pastilhas permitem a produção de diferentes passos de rosca, substituindo-as por outra pastilha. Essa flexibilidade otimiza o processo de maquinação, aumentando a produtividade e a precisão nas operações de roscagem.

Las plaquitas de fresado de roscas ofrecen versatilidad al producir roscas internas y externas sin necesidad de cambio de herramienta. Con diferentes tipos de perfil de rosca, las plaquitas permiten realizar diferentes pasos de rosca, sustituyéndolos por otro inserto. Esta flexibilidad optimiza el proceso de mecanizado, aumentando la productividad y la precisión en las operaciones de roscado.

INSERTS > page 724



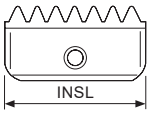
- Internal and external threads
  Roscas internas e externas | Hilos internos y externos
- Full profile: ISO, UN, WHIT, BSPT, NPT, NPTF, ABUT, ACME and others
  Perfil completo: ISO, ONU, WHIT, BSPT, NPT, NPTF, ABUT, ACME e outros | Perfil completo: ISO, ONU, WHIT, BSPT, NPT, NPTF, ABUT, ACME e outros
- Multiple sizes and thread pitches
  Multiplos tamanhos e passos de rosca | Múltiples tamaños y pasos de rosca

THREAD MILLING INSERTS CODE KEY

Codificação ISO para pastilhas de fresagem de roscar | Codificación ISO para plaquitas de fresado de roscar

30	E	20	UN	PH7920
1	2	3	4	5

1 - Insert Size



12 (0.472 in)
14 (0.551 in)
21 (0.827 in)
30 (1.181 in)
40 (1.575 in)

2 - Insert Hand Type

E	External
I	Internal
I/E	Internal + External

3 - Pitch

Example: 20 = 20.00

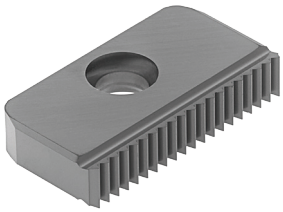
4 - Profile Type

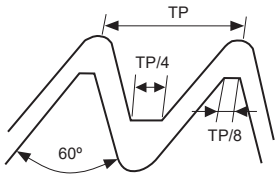
Symbol	Profile Type	Symbol	Profile Type	Symbol	Profile Type
ISO	ISO METRIC	**NPT**	NPT	**ACME**	AMERICAN ACME
UN	AMERICAN UN	**NPTF**	NPTF	**PG**	PG
W	WITHWORTH	**NPS**	NPS	**UNJ**	UNJ
BSPT	BSPT	**NPSF**	NPSF	**ABUT**	AMERICAN BUTTRESS

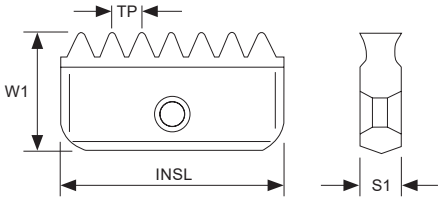
5 - Grades

PH7920

palbit







INSL	S1	W1
12	0.114	0.256
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

External

P (Pitch)	Dimensions | Dimensões | Dimensiones								Stock grade code (2)
	14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
0.75 EXT	2123972	14 E 0.75 ISO							
0.80 EXT	2124202	14 E 0.80 ISO							
1.00 EXT	2123973	14 E 1.00 ISO	2123987	21 E 1.00 ISO					
1.25 EXT	2123974	14 E 1.25 ISO							
1.50 EXT	2123975	14 E 1.50 ISO	2123988	21 E 1.50 ISO	2123999	30 E 1.50 ISO	2124012	40 E 1.50 ISO	
1.75 EXT	2123976	14 E 1.75 ISO							
2.00 EXT	2123977	14 E 2.00 ISO	2123989	21 E 2.00 ISO	2124000	30 E 2.00 ISO	2124013	40 E 2.00 ISO	
2.50 EXT	2123978	14 E 2.50 ISO	2123990	21 E 2.50 ISO					
3.00 EXT			2123991	21 E 3.00 ISO	2124001	30 E 3.00 ISO	2124014	40 E 3.00 ISO	
3.50 EXT					2124002	30 E 3.50 ISO			
4.00 EXT					2124003	30 E 4.00 ISO	2124015	40 E 4.00 ISO	
5.00 EXT							2124016	40 E 5.00 ISO	
6.00 EXT							2124017	40 E 6.00 ISO	

Stock item | Produto de stock | Itens de stock

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

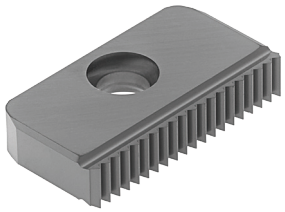
Internal

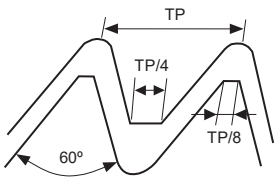
P (Pitch)	Dimensions | Dimensões | Dimensiones (in)										Stock grade code (2)
	12		14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
0.50 INT	2123967	12 I 0.50 ISO	2123979	14 I 0.50 ISO							
0.75 INT	2123968	12 I 0.75 ISO	2123980	14 I 0.75 ISO							
1.00 INT	2123969	12 I 1.00 ISO	2123981	14 I 1.00 ISO	2123992	21 I 1.00 ISO					
1.25 INT	2123970	12 I 1.25 ISO	2123982	14 I 1.25 ISO							
1.50 INT	2123971	12 I 1.50 ISO	2123983	14 I 1.50 ISO	2123993	21 I 1.50 ISO	2124004	30 I 1.50 ISO	2124018	40 I 1.50 ISO	
1.75 INT			2123984	14 I 1.75 ISO	2123994	21 I 1.75 ISO					
2.00 INT			2123985	14 I 2.00 ISO	2123995	21 I 2.00 ISO	2124005	30 I 2.00 ISO	2124019	40 I 2.00 ISO	
2.50 INT			2123986	14 I 2.50 ISO	2123996	21 I 2.50 ISO					
3.00 INT					2123997	21 I 3.00 ISO	2124006	30 I 3.00 ISO	2124020	40 I 3.00 ISO	
3.50 INT					2123998	21 I 3.50 ISO	2124007	30 I 3.50 ISO	2124021	40 I 3.50 ISO	
4.00 INT							2124008	30 I 4.00 ISO	2124022	40 I 4.00 ISO	
4.50 INT							2124009	30 I 4.50 ISO	2124023	40 I 4.50 ISO	
5.00 INT							2124010	30 I 5.00 ISO	2124024	40 I 5.00 ISO	
5.50 INT									2124025	40 I 5.50 ISO	
6.00 INT									2124026	40 I 6.00 ISO	

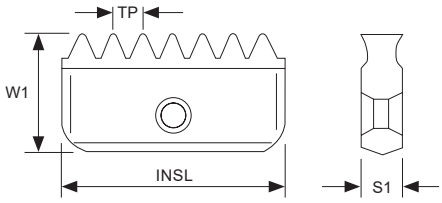
Stock item | Produto de stock | Itens de stock

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

UN UNC, UNF, UNEF, UNS Two cutting edges | Duas arestas de corte | Dos filos de corte







INSL	S1	W1
12	0.114	0.256
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

External

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)								Stock grade code (2)
	14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
32.00 EXT	2124033	14 E 32 UN							◈
28.00 EXT	2124034	14 E 28 UN							◈
24.00 EXT	2124035	14 E 24 UN	2124055	21 E 24 UN					◈
20.00 EXT	2124036	14 E 20 UN	2124056	21 E 20 UN	2124072	30 E 20 UN			◈
18.00 EXT	2124037	14 E 18 UN	2124057	21 E 18 UN	2124073	30 E 18 UN			◈
16.00 EXT	2124038	14 E 16 UN	2124058	21 E 16 UN	2124074	30 E 16 UN	2124089	40 E 16 UN	◈
14.00 EXT	2124039	14 E 14 UN	2124059	21 E 14 UN	2124075	30 E 14 UN	2124090	40 E 14 UN	◈
13.00 EXT	2124203	14 E 13 UN							◈
12.00 EXT	2124040	14 E 12 UN	2124060	21 E 12 UN	2124076	30 E 12 UN	2124091	40 E 12 UN	◈
11.00 EXT	2124041	14 E 11 UN							◇
10.00 EXT			2124062	21 E 10 UN	2124077	30 E 10 UN	2124092	40 E 10 UN	◈
8.00 EXT					2124078	30 E 8.0 UN	2124093	40 E 8.0 UN	◈
6.00 EXT					2124079	30 E 6.0 UN	2124094	40 E 6.0 UN	◈

◈ Stock item | Produto de stock | Itens de stock

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

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

Internal

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)										Stock grade code (2)
	12		14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
32.00 INT	2124027	12 I 32 UN	2124043	14 I 32 UN							◈
28.00 INT	2124028	12 I 28 UN	2124044	14 I 28 UN							◈
27.00 INT			2124045	14 I 27 UN							◈
24.00 INT	2124029	12 I 24 UN	2124046	14 I 24 UN	2124063	21 I 24 UN					◈
20.00 INT	2124030	12 I 20 UN	2124047	14 I 20 UN	2124064	21 I 20 UN	2124080	30 I 20 UN			◈
18.00 INT	2124031	12 I 18 UN	2124048	14 I 18 UN	2124065	21 I 18 UN	2124081	30 I 18 UN			◈
16.00 INT	2124032	12 I 16 UN	2124049	14 I 16 UN	2124066	21 I 16 UN	2124082	30 I 16 UN	2124095	40 I 16 UN	◈
14.00 INT			2124050	14 I 14 UN	2124067	21 I 14 UN	2124083	30 I 14 UN	2124096	40 I 14 UN	◈
12.00 INT			2124051	14 I 12 UN	2124068	21 I 12 UN	2124084	30 I 12 UN	2124097	40 I 12 UN	◈
10.00 INT			2124053	14 I 10 UN	2124069	21 I 10 UN	2124085	30 I 10 UN	2124098	40 I 10 UN	◈
9.00 INT			2124054	14 I 9.0 UN							◇
8.00 INT					2124070	21 I 8.0 UN	2124086	30 I 8.0 UN	2124099	40 I 8.0 UN	◈
7.00 INT					2124071	21 I 7.0 UN					◇
6.00 INT							2124087	30 I 6.0 UN	2124100	40 I 6.0 UN	◈
5.00 INT							2124088	30 I 5.0 UN			◈
4.50 INT									2124101	40 I 4.5 UN	◈
4.00 EXT									2124102	40 I 4.0 UN	◈

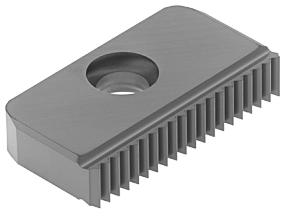
◈ Stock item | Produto de stock | Itens de stock

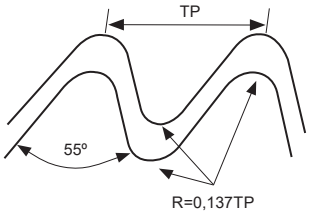
◇ Stock available until sold out | Stock disponível até acabar o stock
Stock disponible hasta acabar el stock

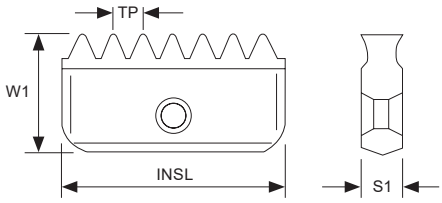
Insert order code = (1) Geometry Code + (2) Grade Code

WHIT BSW, BSF, BSP Two cutting edges | Duas arestas de corte | Dos filos de corte

METRIC LINE







INSL	S1	W1
12	0.114	0.256
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

Same insert for external and internal thread | Mesma pastilha para roscagem externa e interna | Misma plaquita para roscado externo e interno

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)										Stock grade code (2)
	12		14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
24.00			2124104	14 I/E 24 W							⚙
20.00			2124105	14 I/E 20 W	2124110	21 I/E 20 W					⚙
19.00	2124103	12 I/E 19 W*	2124106	14 I/E 19 W	2124111	21 I/E 19 W					⚙
16.00			2124107	14 I/E 16 W	2124112	21 I/E 16 W	2124115	30 I/E 16 W			⚙
14.00			2124108	14 I/E 14 W	2124113	21 I/E 14 W	2124116	30 I/E 14 W			⚙
11.00			2124109	14 I/E 11 W	2124114	21 I/E 11 W	2124117	30 I/E 11 W	2124118	40 I/E 11 W	⚙
8.00									2124119	40 I/E 8 W	⚙

*One cutting edge | Uma aresta de corte | Un filo de corte

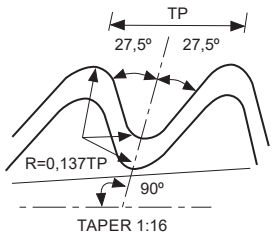
⚙ Stock item | Produto de stock | Itens de stock

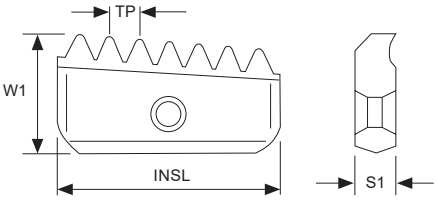
Insert order code = (1) Geometry Code + (2) Grade Code

BSPT One cutting edge | Uma aresta de corte | Un filo de corte

METRIC LINE







INSL	S1	W1
12	0.114	0.256
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

Conical pipe thread milling inserts are one sided and may be used for both external and internal threading | As pastilhas de roscagem para tubos cónicos têm uma face e podem ser usadas para roscagem externa e interna | Las plaquitas de roscado para tubos cónicos tienen una cara y pueden ser usadas para roscado externo e interno.

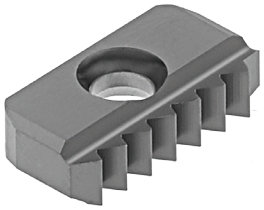
P (Pitch)	Dimensions | Dimensões | Dimensiones (in)										Stock grade code (2)
	12		14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
19.00	2124120	12 I/E 19 BSPT	2124121	14 I/E 19 BSPT							⚙
14.00			2124122	14 I/E 14 BSPT	2124123	21 I/E 14 BSPT					⚙
11.00					2124124	21 I/E 11 BSPT	2124125	30 I/E 11 BSPT	2124126	40 I/E 11 BSPT	⚙

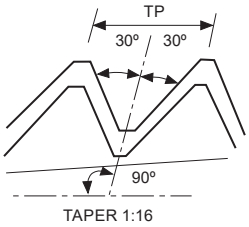
⚙ Stock item | Produto de stock | Itens de stock

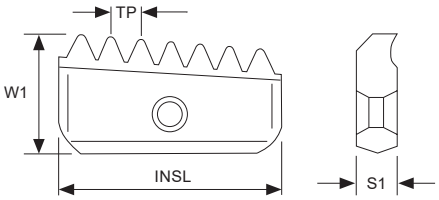
Insert order code = (1) Geometry Code + (2) Grade Code

NPT One cutting edge | Uma aresta de corte | Un filo de corte

METRIC LINE







INSL	S1	W1
12	0.114	0.256
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

Conical pipe thread milling inserts are one sided and may be used for both external and internal threading | As pastilhas de roscagem para tubos cónicos têm uma face e podem ser usadas para roscagem externa e interna | Las plaquitas de roscado para tubos cónicos tienen una cara y pueden ser usadas para roscado externo e interno.

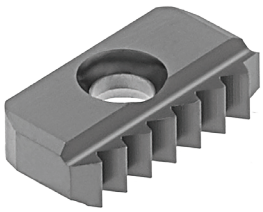
P (Pitch)	Dimensions | Dimensões | Dimensiones (in)										Stock grade code (2)
	12		14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
18.00	2124127	12 I/E 18 NPT	2124128	14 I/E 18 NPT							⛃
14.00			2124129	14 I/E 14 NPT	2124130	21 I/E 14 NPT					⛃
11.50					2124131	21 I/E 11.5 NPT	2124132	30 I/E 11.5 NPT	2124134	40 I/E 11.5 NPT	⛃
8.00							2124133	30 I/E 8 NPT	2124135	40 I/E 8 NPT	⛃

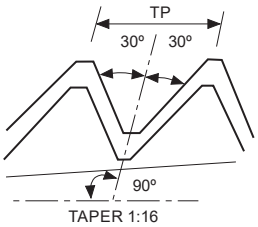
⛃ Stock item | Produto de stock | Itens de stock

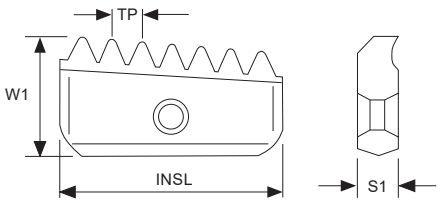
Insert order code = (1) Geometry Code + (2) Grade Code

NPTF One cutting edge | Uma aresta de corte | Un filo de corte

METRIC LINE







INSL	S1	W1
12	0.114	0.256
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

Conical pipe thread milling inserts are one sided and may be used for both external and internal threading | As pastilhas de roscagem para tubos cónicos têm uma face e podem ser usadas para roscagem externa e interna | Las plaquitas de roscado para tubos cónicos tienen una cara y pueden ser usadas para roscado externo e interno.

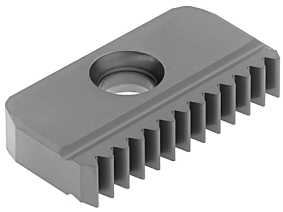
P (Pitch)	Dimensions | Dimensões | Dimensiones (in)										Stock grade code (2)
	12		14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
18.00	2124136	12 I/E 18 NPTF	2124137	14 I/E 18 NPTF							⛃
14.00			2124138	14 I/E 14 NPTF	2124139	21 I/E 14 NPTF					⛃
11.50					2124140	21 I/E 11.5 NPTF	2124141	30 I/E 11.5 NPTF	2124143	40 I/E 11.5 NPTF	⛃
8.00							2124142	30 I/E 8 NPTF	2124144	40 I/E 8 NPTF	⛃

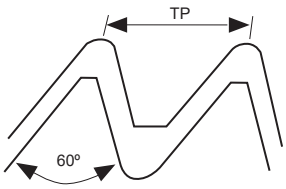
⛃ Stock item | Produto de stock | Itens de stock

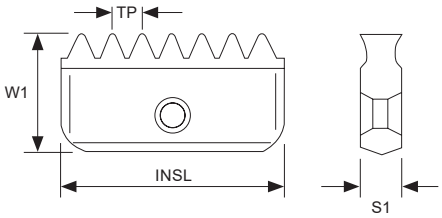
Insert order code = (1) Geometry Code + (2) Grade Code

NPS Two cutting edges | Duas arestas de corte | Dos filos de corte

METRIC LINE







INSL	S1	W1
12	0.114	0.256
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

Same insert for external and internal thread | Mesma pastilha para roscagem externa e interna | Misma plaquita para roscado externo e interno

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)										Stock grade code (2)
	12		14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
18.00	2124145	12 I/E 18 NPS*	2124147	14 I/E 18 NPS							⚠
14.00			2124148	14 I/E 14 NPS	2124149	21 I/E 14 NPS					⚠
11.50					2124150	21 I/E 11.5 NPS	2124151	30 I/E 11.5 NPS	2124153	40 I/E 11.5 NPS	⚠
8.00							2124152	30 I/E 8 NPS	2124154	40 I/E 8 NPS	⚠

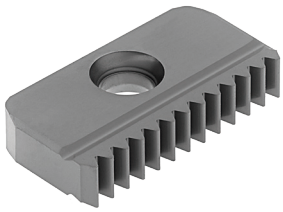
⚠ Stock available until sold out. This item will be discontinued. | Stock disponivel até acabar o stock. Este artigo será descontinuado. Stock disponible hasta acabar el stock. Este item será descontinuado.

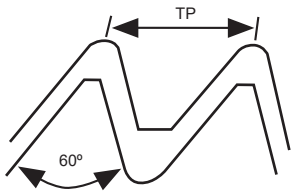
Insert order code = (1) Geometry Code + (2) Grade Code

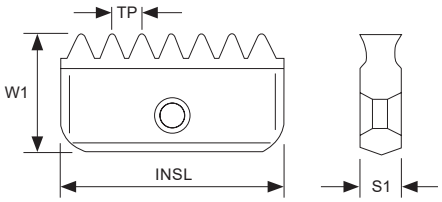
*One cutting edge | Uma aresta de corte | Un filo de corte

NPSF Two cutting edges | Duas arestas de corte | Dos filos de corte

METRIC LINE







INSL	S1	W1
12	0.114	0.256
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

Same insert for external and internal thread | Mesma pastilha para roscagem externa e interna | Misma plaquita para roscado externo e interno

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)										Stock grade code (2)
	12		14		21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
18.00	2124155	12 I/E 18 NPSF*	2124156	14 I/E 18 NPSF							⚠
14.00			2124157	14 I/E 14 NPSF	2124158	21 I/E 14 NPSF					⚠
11.50					2124159	21 I/E 11.5 NPSF	2124160	30 I/E 11.5 NPSF	2124162	40 I/E 11.5 NPSF	⚠
8.00							2124161	30 I/E 8 NPSF	2124163	40 I/E 8 NPSF	⚠

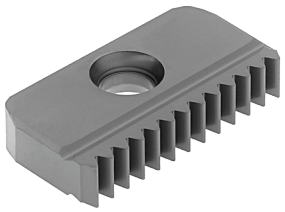
⚠ Stock available until sold out. This item will be discontinued. | Stock disponivel até acabar o stock. Este artigo será descontinuado. Stock disponible hasta acabar el stock. Este item será descontinuado.

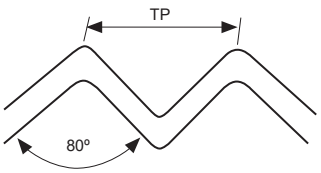
Insert order code = (1) Geometry Code + (2) Grade Code

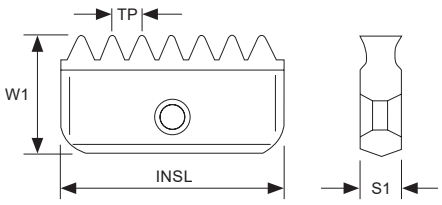
*One cutting edge | Uma aresta de corte | Un filo de corte

PG DIN 40430 Two cutting edges | Duas arestas de corte | Dos filos de corte

METRIC LINE







INSL	S1	W1
14	0.122	0.311
21	0.185	0.496
30	0.217	0.657

Same insert for external and internal thread | Mesma pastilha para roscagem externa e interna | Misma plaquita para roscado externo e interno

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)						Stock grade code (2)
	14		21		30		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
18.00	2124164	14 I/E 18 PG	2124165	21 I/E 18 PG			⛭
16.00			2124166	21 I/E 16 PG	2124167	30 I/E 16 PG	⛭

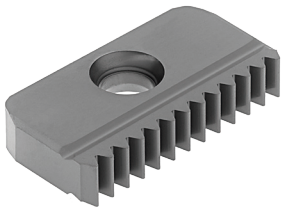
*One cutting edge | Uma aresta de corte | Un filo de corte

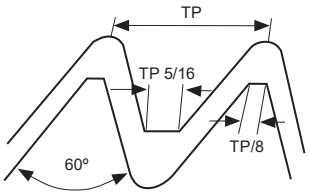
⛭ Stock item | Produto de stock | Itens de stock

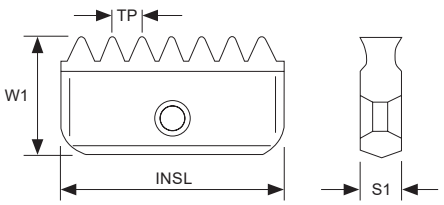
Insert order code = (1) Geometry Code + (2) Grade Code

UNJ Two cutting edges | Duas arestas de corte | Dos filos de corte

METRIC LINE







INSL	S1	W1
14	0.122	0.311
21	0.185	0.496

Same insert for external and internal thread | Mesma pastilha para roscagem externa e interna | Misma plaquita para roscado externo e interno

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)				Stock grade code (2)
	14		21		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
24.00	2124168	14 E 24 UNJ	2124174	21 E 24 UNJ	⛭
20.00	2124169	14 E 20 UNJ	2124175	21 E 20 UNJ	⛭
18.00	2124170	14 E 18 UNJ			⛭
16.00	2124171	14 E 16 UNJ			⛭
14.00	2124172	14 E 14 UNJ			⛭
12.00	2124173	14 E 12 UNJ	2124179	21 E 12 UNJ	⛭

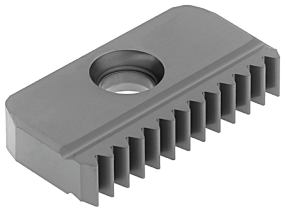
⛭ Stock item | Produto de stock | Itens de stock

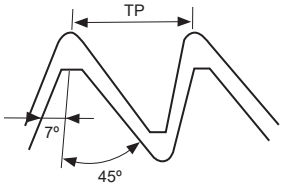
Insert order code = (1) Geometry Code + (2) Grade Code

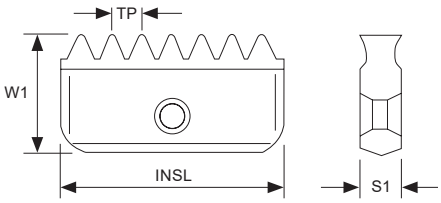
Note: For internal UNJ threads it is common to use UN inserts as partial profile tool | Para roscagem interna UNJ é comum utilizar pastilhas UN como ferramenta de perfil parcial | Para roscado interno UNJ é usual utilizar plaquitas UN como herramienta de perfilado parcial

AMERICAN BUTTRESS Two cutting edges | Duas arestas de corte | Dos filos de corte

METRIC LINE







INSL	S1	W1
21	0.185	0.496
30	0.217	0.657

Same insert for external and internal thread | Mesma pastilha para roscagem externa e interna | Misma plaquita para roscado externo e interno

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)				Stock grade code (2)
	21		30		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
16.00	2124180	21 I/E 16 ABUT	2124184	30 I/E 16 ABUT	⛆
12.00	2124181	21 I/E 12 ABUT	2124185	30 I/E 12 ABUT	⛆
10.00	2124182	21 I/E 10 ABUT	2124186	30 I/E 10 ABUT	⛆
8.00	2124183	21 I/E 8 ABUT	2124187	30 I/E 8 ABUT	⛆
6.00			2124188	30 I/E 6 ABUT	⛆
4.00			2124189	30 I/E 4 ABUT	⛆

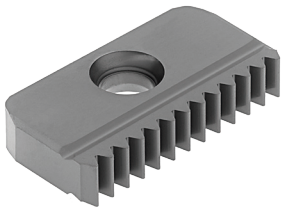
⛆ Stock item | Produto de stock | Itens de stock

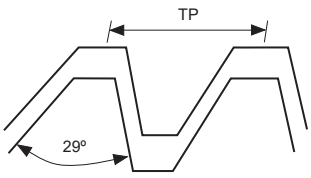
Insert order code = (1) Geometry Code + (2) Grade Code

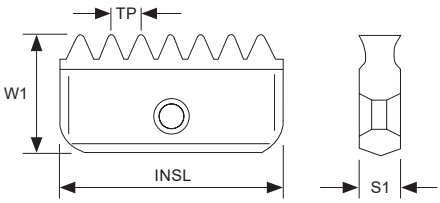
Note: ABUT thread milling inserts are one-sided and it can be used only on Multi-insert toolholders | As pastilhas de roscagem ABUT são de uma face e só podem ser utilizadas nos suportes de múltiplas pastilhas | Las plaquitas de roscado ABUT son de una cara y sólo se pueden utilizar en las herramientas de múltiples plaquitas

ACME Two cutting edges | Duas arestas de corte | Dos filos de corte

METRIC LINE







INSL	S1	W1
21	0.185	0.496
30	0.217	0.657
40	0.248	0.823

Same insert for external and internal thread | Mesma pastilha para roscagem externa e interna | Misma plaquita para roscado externo e interno

P (Pitch)	Dimensions | Dimensões | Dimensiones (in)						Stock grade code (2)
	21		30		40		
	Geometry code (1)	Ref.	Geometry code (1)	Ref.	Geometry code (1)	Ref.	(G4) PH7920
12.00	2124191	21 I 12 ACME					⛆
10.00							⛆
8.00							⛆
6.00			2124197	30 I 6.0 ACME			⛆
4.00							⛆
3.50							⛆
3.00							⛆

⛆ Stock item | Produto de stock | Itens de stock

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

THREAD MILLING

TOOLHOLDERS

METRIC LINE



Thread milling offers a variable range of toolholders suitable for internal, external, medium, and large threads. It is particularly effective for threading large diameter or blind holes. With reduced cutting force requirements and the ability to use a single tool across various hole sizes, thread milling ensures versatility, process security, efficiency, and precise threading.

A fresagem de roscas oferece uma ampla gama de suportes adequados para roscas internas, externas, de tamanho médio e grande. É particularmente eficaz para furos de grande diâmetro ou cegos. Com requisitos reduzidos de força de corte e a capacidade de usar uma única ferramenta em diferentes tamanhos de furo, garante versatilidade, segurança do processo, eficiência e precisão na roscagem.

El fresado de roscas ofrece una amplia gama de soportes adecuados para roscas internas, externas, medianas y grandes. Es particularmente eficaz para agujeros ciegos o de gran diámetro. Con requisitos de fuerza de corte reducidos y la capacidad de utilizar una sola herramienta en diferentes tamaños de orificios, garantiza versatilidad, seguridad del proceso, eficiencia y precisión en el roscado.

SINGLE INSERT TOOLHOLDERS

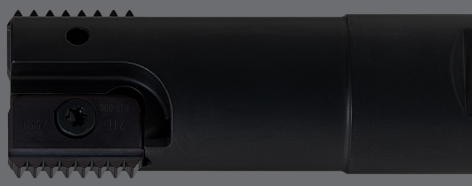
> page 735



- From DC 0.374 in to 1.890 in
  De DC 0.374 in a 1.890 in | Desde DC 0.374 in hasta 1.890 in
- Short and long version on weldon shank
  Versão curta e longa com haste weldon | Versión corta y larga con mango weldon
- Long carbide on cylindrical shank
  Haste cilíndrica longa em metal duro | Mango cilíndrico largo en metal duro

DOUBLE INSERT TOOLHOLDERS

> page 736



- From DC 0.787 in to 1.969 in
  De DC 0.787 in a 1.969 in | Desde DC 0.787 in hasta 1.969 in
- Short version on weldon shank
  Versão curta com haste weldon | Versión corta con mango weldon

THREAD MILLING TOOLHOLDERS CODE KEY

Codificação ISO para suportes de fresagem de roscar | Codificación ISO para herramientas de fresado de roscar

W	S	S	N	029	110	A30	-	1
1	2	3	4	5	6	7		8

1 - Mounting type	
A	Arbor
E	Cylindrical
W	Weldon

2 - Toolholder material	
S	Steel
C	Carbide

3 - Clamping	
S	Screw

4 - Operation type	
N	Internal + External
E	External

5 - Cutting diameter (DC - mm)
Example: 029 = 29 mm (1.142 in)

6 - Toolholder lenght (LF - mm)
Example: 110 = 110 mm (4.331 in)

7 - Insert Pocket Size	
A12	12 mm (0.472 in)
A14	14 mm (0.551 in)
A21	21 mm (0.827 in)
A30	30 mm (1.181 in)
A40	40 mm (1.575 in)

8 - Number of inserts				
1	**2**	**3**	**4**	**5**

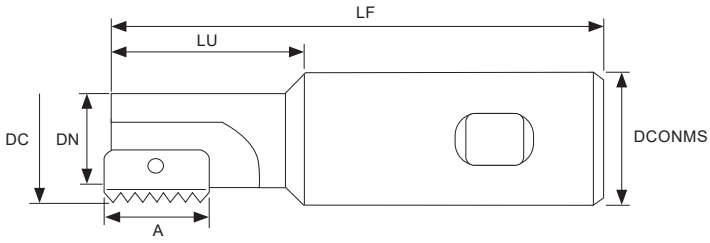
palbit

SINGLE INSERT TOOLHOLDERS Suportes de uma única pastilha | Herramientas de una única plaquita

METRIC LINE

WSSN-1





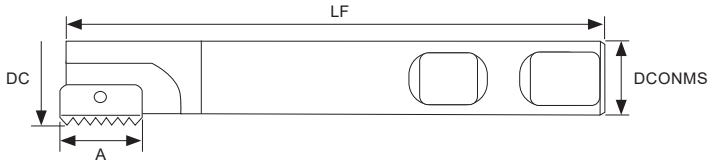
Order Code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)						Number of inserts	Stock
		A	DC	DCONMS	DN	LF	LU		
182004400	WSSN 009 085 A12-1	0.472	0.374	0.787	0.295	3.346	0.551	1	⚙
182008000	WSSN 010 085 A12-1	0.472	0.390	0.787	0.299	3.346	0.630	1	⚙
182004500	WSSN 012 075 A14-1	0.551	0.472	0.787	0.350	2.953	0.787	1	⚙
182008100	WSSN 014 085 A14-1	0.551	0.571	0.787	0.441	3.346	0.984	1	⚙
182008200	WSSN 017 085 A14-1	0.551	0.669	0.787	0.528	3.346	1.181	1	⚙
182003500	WSSN 018 085 A21-1*	0.827	0.709	0.787	0.567	3.346	1.181	1	⚙
182003600	WSSN 021 094 A21-1	0.827	0.827	0.787	0.650	3.701	1.575	1	⚙
182008300	WSSN 029 110 A30-1	1.181	1.142	0.984	0.882	4.331	1.969	1	⚙
182019600	WSSN 048 153 A40-1	1.575	1.890	1.575	1.378	6.024	3.071	1	○

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

***Can not be used with the following inserts:** | Não pode ser usado com as seguintes pastilhas: | No se puede utilizar con las seguientes plaquitas:
21 I 3.5 ISO; 21 I 8.0 UN; 21 I 7.0 UN; 21 I/E 11 BSPT; 21 I/E 11.5 NPT; 21 I/E 11.5 NPTF

WSSN-1 Long shank





Order Code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				Number of inserts	Stock
		A	DC	DCONMS	LF		
182008600	WSSN 025 125 A21-1	0.827	0.984	0.787	4.921	1	⚙
182008700	WSSN 031 150 A30-1	1.181	1.220	0.984	5.906	1	⚙
182019500	WSSN 038 150 A30-1	1.181	1.496	1.260	5.906	1	⚙
182019700	WSSN 048 210 A40-1	1.575	1.890	1.575	8.268	1	○

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

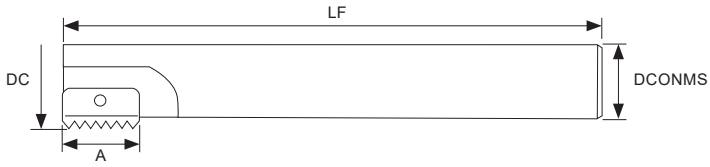
Note: For holders with long overhang reduce the cutting speed by 20-40%, depending on workpiece, material, pitch and overhang | Para suportes com comprimento elevado reduza a velocidade de corte em 20-40%, dependendo da peça a maquinar, do material, do pitch e comprimento | Para herramientas con longitud elevada reduzca la velocidad de corte en 20-40%, dependiendo de la pieza a mecanizar, del material, del pitch y la longitud.

SINGLE INSERT TOOLHOLDERS Suportes de uma única pastilha | Herramientas de una única plaquita

METRIC LINE

ECSN-1 Long carbide shank





Order Code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)				Number of inserts	Stock
		A	DC	DCONMS	LF		
182007400	ECSN 010 125 A12-1*	0.472	0.390	0.315	4.921	1	⊛
182007600	ECSN 013 155 A14-1	0.551	0.520	0.394	6.102	1	⊛
182007700	ECSN 015 175 A14-1	0.551	0.598	0.472	6.890	1	⊛
182007800	ECSN 021 130 A21-1	0.827	0.827	0.630	5.118	1	⊛
182007900	ECSN 021 200 A21-1	0.827	0.827	0.630	7.874	1	⊛

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

*** Without coolant bore** | Sem furo de refrigeração | Sin agujero de refrigeración

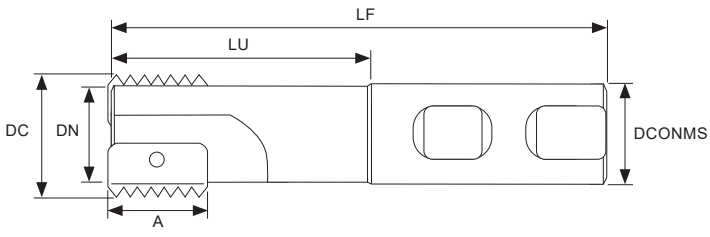
Note: For holders with long overhang reduce the cutting speed by 20-40%, depending on workpiece, material, pitch and overhang | Para suportes com comprimento elevado reduza a velocidade de corte em 20-40%, dependendo da peça a maquinar, do material, do pitch e comprimento | Para herramientas con longitud elevada reduzca la velocidad de corte en 20-40%, dependiendo de la pieza a mecanizar, del material, del pitch y la longitud.

DOUBLE INSERT TOOLHOLDERS Suportes de duas pastilhas | Herramientas de dos plaquitas

WSSN-2

METRIC LINE





Order Code Código	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)						Number of inserts	Stock
		A	DC	DCONMS	DN	LF	LU		
182004300	WSSN 020 093 A14-2	0.551	0.787	0.787	0.630	3.661	1.614	2	⊛
182008400	WSSN 030 108 A21-2	0.827	1.181	0.984	0.945	4.252	2.047	2	⊛
182008500	WSSN 040 130 A30-2	1.181	1.575	1.260	1.181	5.118	2.756	2	⊛
182019800	WSSN 050 153 A40-2	1.575	1.969	1.575	1.496	6.024	3.071	2	◯

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

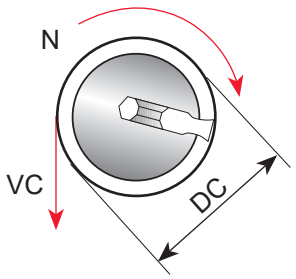
THREAD MILLING TOOLHOLDERS TECHNICAL DATA

Dados técnicos de suportes de fresagem de roscar | Datos técnicos de herramientas de fresado de roscar

Conversion of selected cutting speed to rotational speed is calculated using the following formulas:

Spindle Speed (rev/min)

$$n = \frac{vc \cdot 12}{\pi \cdot DC} \quad (RPM)$$



Cutting Speed (SFM)

$$vc = \frac{n \cdot \pi \cdot DC}{12} \quad (sfm)$$

Nomenclature

DC	- Cutter diameter	(inch)
n	- Spindle Speed	(rev/min)
VC	- Cutting Speed	(SFM)

Example for the following values:
vc = 394 sfm
DC = 1.220 in

$$n = \frac{vc \times 12}{\pi \times D} = \frac{394 \times 12}{3.14 \times 1.220} = 1234 \text{ RPM}$$

SPEED AND FEED SELECTION Selecção da velocidade e do avanço | Selección de la velocidad e de avance

TiAlN – Sub-Micron Grade with Titanium Aluminium Nitride multi-layer coating (ISO K10-K20). This is a general purpose grade, which can be used with all materials, it should be run at medium to high cutting speeds.

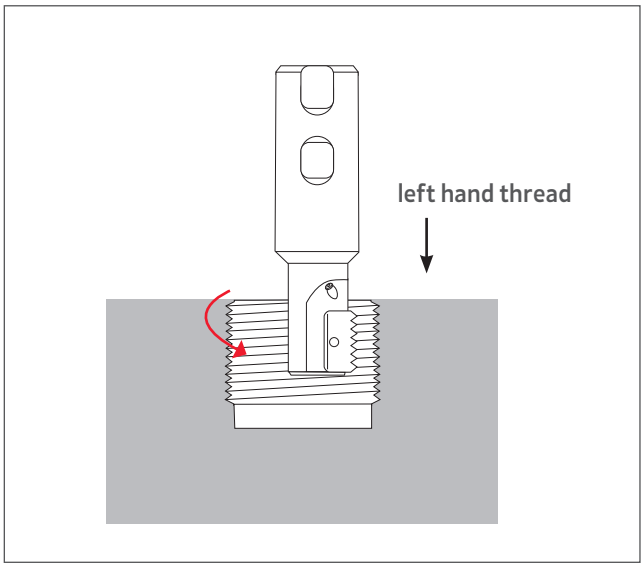
Recommended feed per tooth: 0.002–0.006 in/t

ISO	Material	Cutting Speed VC (SFM) TiAlN
P	Low and Medium Carbon Steels	377–919
	High Carbon Steels	427–656
	Treated Steels	345–591
M	Stainless Steels, Cast Stainless Steels	427–623
	Cast Steels	492–623
K	Cast Iron	263–558
N	Non-Ferrous and Aluminium	591–1116
	Synthetics, Duroplastics, Thermoplastics	377–1509
S	Nickel Alloys, Titanium Alloys	82–295

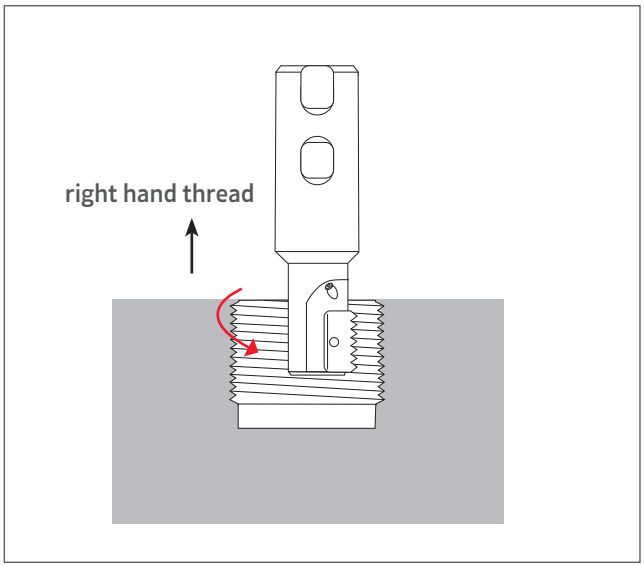
THREAD MILLING TOOLHOLDERS TECHNICAL DATA

INTERNAL THREAD Roscagem interna | Roscado interno

Left hand thread | Rosca esquerda | Rosca izquierda

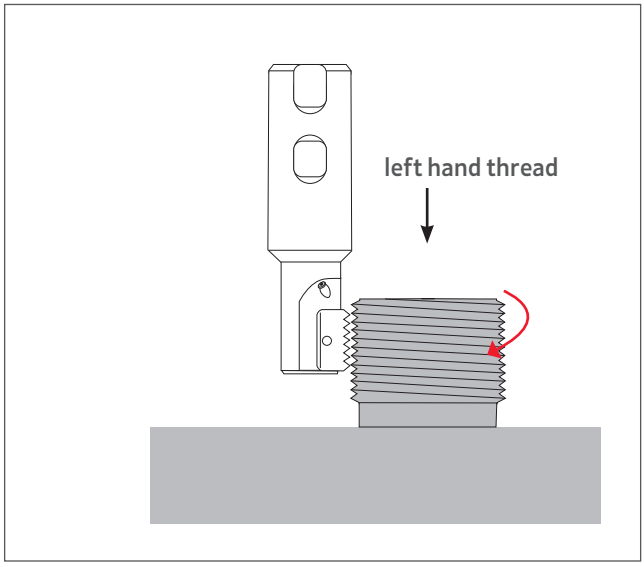


Right hand thread | Rosca direita | Rosca derecha

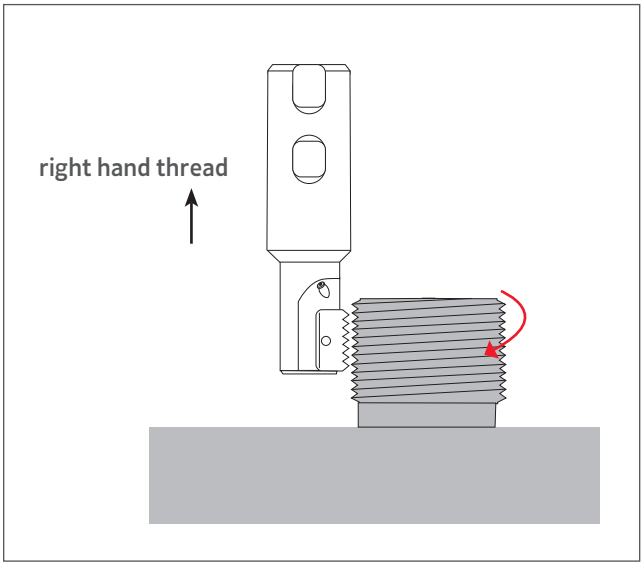


EXTERNAL THREAD Roscagem externa | Roscado externo

Left hand thread | Rosca esquerda | Rosca izquierda

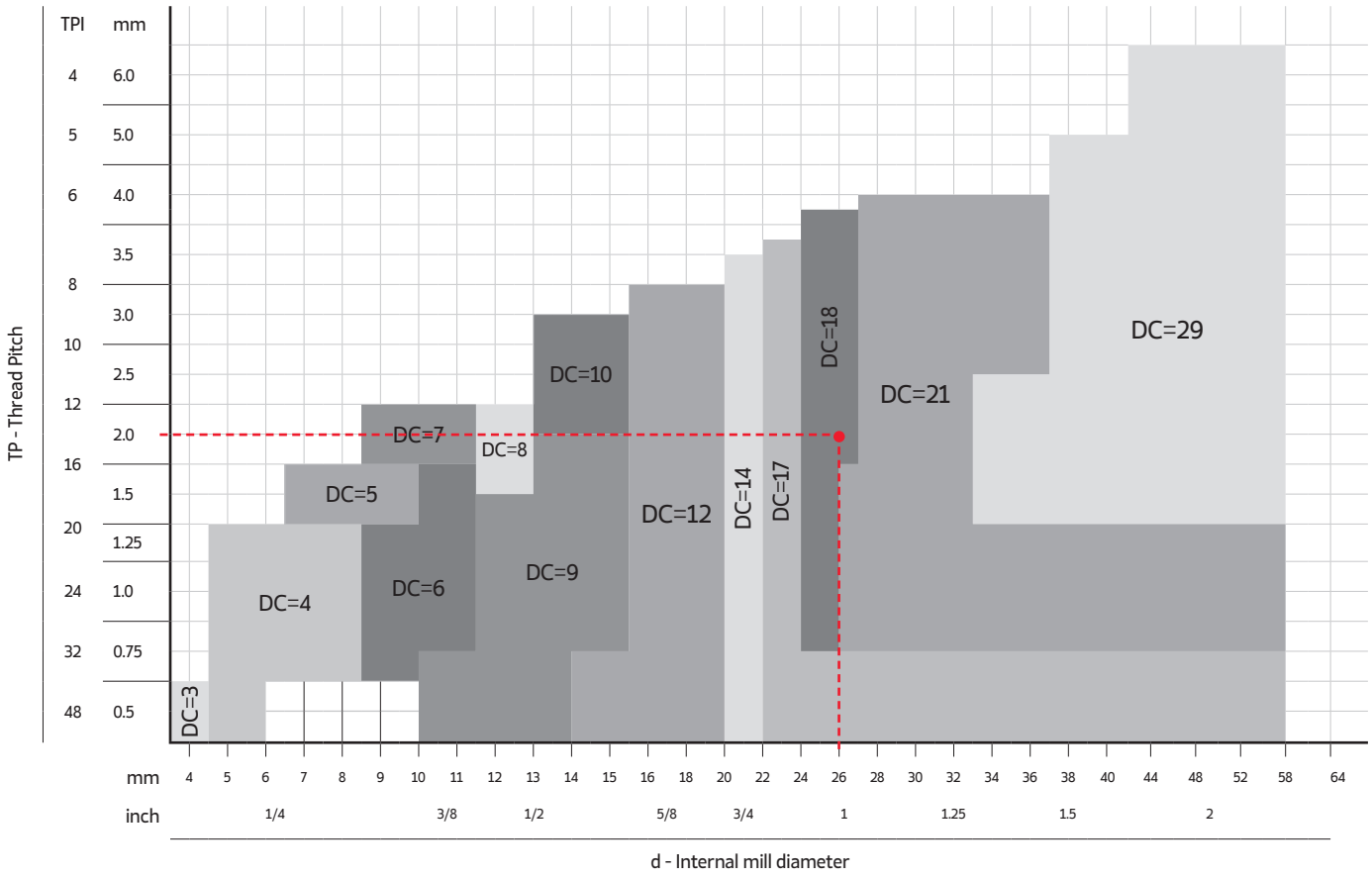


Right hand thread | Rosca direita | Rosca derecha



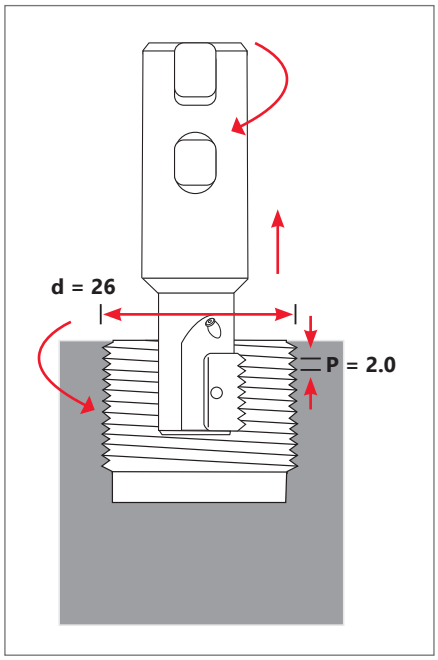
TOOL SELECTION Selecção de ferramenta | Selección de herramienta

The chart bellow provide a accurate visual selection tool for internal threading.
(Suitable for the thread forms: ISO, UN, WHIT, NPT, NPTF, BSPT and PG)



Any tool with a small diameter can produce larger diameter threads.

Right hand Thread
Rosca direita | Rosca derecha



Example:

Internal thread: M26 x 2.0
Find a milling tool to produce **d = 26 internal**
right hand ISO thread with a tread pitch **P = 2.0mm.**

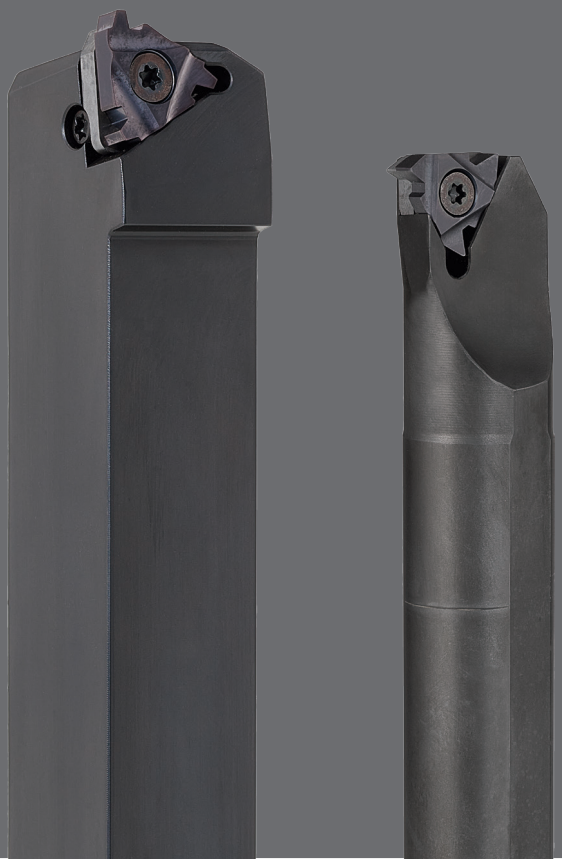
Internal mill diameter **d = 26 mm**
+
Thread pitch **P = 2.0 mm**

As you can see above, the two red lines intersect at a selected tool
with a cutting diameter of **Dc = 18 mm**

Chosen toolholder - order code: 212395200 | Reference: WSSN 018 085 A21-1
Chosen insert - order code: 2123995G4 | Reference: 21 I 2.0 ISO PH7920

THREAD TURNING

INSERTS

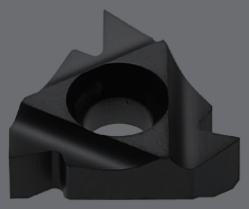


Thread turning inserts are indispensable tools in machining, capable of producing various thread types such as metric, imperial, acme, and buttress. They ensure precise threading, vital for diverse industry needs.

As pastilhas para torneamento de roscas são ferramentas indispensáveis na maquinação, capazes de produzir diversos tipos de roscas, tais como métrica, imperial, acme e buttress. Estas garantem um processo de roscagem preciso, vital para as diversas necessidades da indústria.

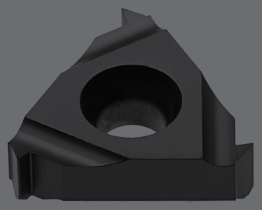
Los insertos de torneado de roscas son herramientas indispensables en el mecanizado, capaces de producir varios tipos de roscas, como métricas, imperiales, acme y buttress. Garantizan un roscado preciso, vital para diversas necesidades de industria.

PARTIAL PROFILE > page 746



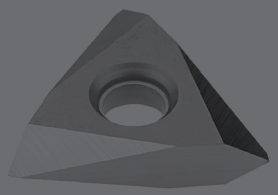
- 55º and 60º
  55º e 60º | 55º y 60º
- From sizes 06 to 27
  De tamanhos 06 até 27 | De tamaños 06 a 27

FULL PROFILE > page 750



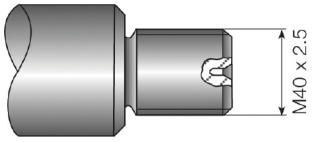
- ISO, UN, WHIT, BSPT, NPT, NPTF, ABUT, ACME, API and others
  ISO, UN, WHIT, BSPT, NPT, NPTF, ABUT, ACME, API e outros | ISO, UN, WHIT, BSPT, NPT, NPTF, ABUT, ACME, API y otros
- From sizes 06 to 27
  De tamanhos 06 até 27 | De tamaños 06 a 27

TANGENTIAL PROFILE > page 790



- Inserts TNMC and TPMC
  Pastilhas TNMC e TPMC | Plaquitas TNMC y TPMC
- Sizes 16 and 22
  Tamanhos 16 e 22 | Tamaños 16 y 22

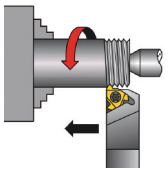
THREAD TURNING - STEP BY STEP EXAMPLE (mm)



Application:

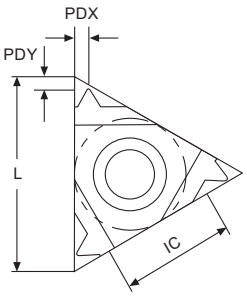
Thread: External Right Hand
ISO MetricM40x2,5
Material: 4140 (25HRc)

1 - Choose the Thread Working Method



Feed direction towards the chuck was choosen.
Therefore, an external right hand insert and an external right hand holder will be used.

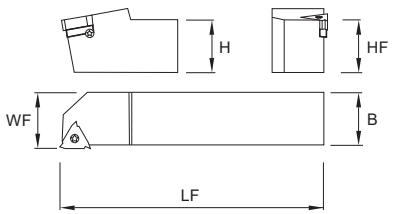
2 - Choose the Insert Size



Chosen insert: **16ER 2.50ISO**

Insert Size		Pitch	Reference	Anvil	Toolholder
IC	L mm	mm		RH	
9.525	16	2.50	16ER 2.50ISO	EA16	STCNL 2525 M16

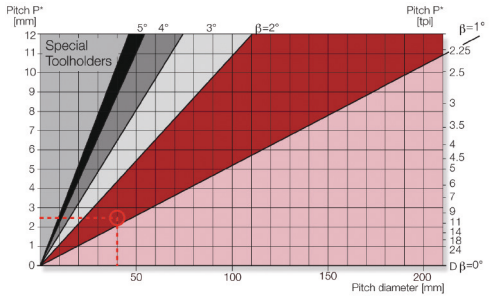
3 - Choose the Toolholder



Chosen toolholder: **SXANR 2525 M16**

Insert Size	Reference	Dimensions mm		
IC		H=HF=B	WF	LF
9.525	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 **1,5°**

THREAD TURNING - STEP BY STEP EXAMPLE (mm)

Roscagem - Exemplo passo-a-passo (mm) | Roscado - Ejemplo paso a paso (mm)

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					
9,525	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: **140 m/min**

	Material:		Hardness Brinell HB	PH6920
P	Low alloy steel (alloying elements ≤ 5%)	Non hardened	180	**85-145**
		Hardened	275	75-140
		Hardened	350	70-135

7 - Determine the Number of Passes

Number of passes; 10

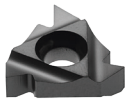
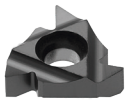
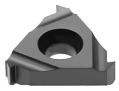
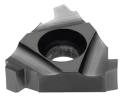
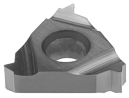
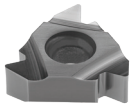
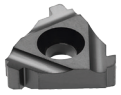
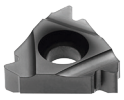
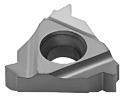
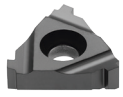
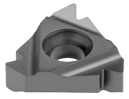
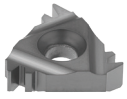
ISO External

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

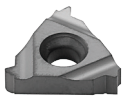
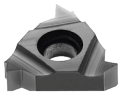
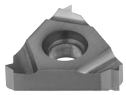
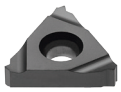
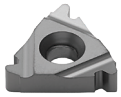
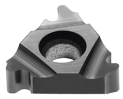
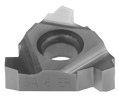
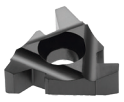
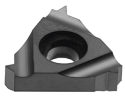
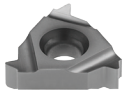
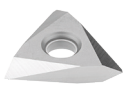
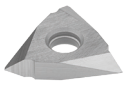
	Thread Type	ISO M40x2,5 External Right Hand
1	Feed Direction:	Towards the chuck
2	Insert and Grade:	16ER 2.5 ISO PH6920
3	Toolholder:	SXANR 2525 M16
4	Helix Angle:	1,5°
5	Anvil:	EA16
6	Cutting Speed:	140 m/min
7	Number of Passes;	14

THREAD TURNING INSERTS OVERVIEW

	Insert Image	Description	Page
Partial Profile		PARTIAL PROFILE 60°	747
		PARTIAL PROFILE 55°	748
Full Profile		AMERICAN BUTTRESS | ANSI B1.9-1973	783
		AMERICAN ACME | ANSI/ASME: 1.5-1988	774
		AMERICAN UN (UNC, UNF, UNEF) | ANSI B1.1-1982	755
		API | API SPEC 7:2001 (0.040 | 0.038R | 0.050)	785
		API | BUTTRESS CASING | API SPEC 5B:2008 | OIL THREADS	786
		API ROUND CASING & TUBING | API SPEC 5B:2008	787
		BSPT | B.S.21: 1985	765
		EXTREME LINE CASING | API SPEC 5B:2008 - OIL THREADS	788
		ISO METRIC ISO 965-1: 1999-11 | DIN 13: 2005-08	751
		METRIC BUTTRESS SAGENGEWINDE (DIN 513:1985) SAW THREAD	784

THREAD TURNING INSERTS OVERVIEW

Vista geral de pastilhas | Vista general de plaquitas

	Insert Image	Description	Page
Full Profile		MJ | ISO 5855-1:1989	782
		NPT | ANSI/ASME B 1.20.1-1983	766
		NPTF | ANSI B 1.20.3-1976	768
		PG | DIN 40430; 1971	789
		ROUND (DIN 20400) | DIN 20400:1990	771
		ROUND (DIN 405) | DIN 405:1997	770
		STUB ACME | ANSI/ASME: 1.8-1988	776
		TRAPEZ | DIN 103:1977 | ISO 2901:1993	772
		UNJ | MIL-S-8879A	778
		WITHWORTH FOR BSW, BSF, BSP, B.S.84: 1956, DIN 259, ISO 228-1:1994	760
Tangential Profile		TNMC	791
		TPMC	791

PARTIAL PROFILE INSERTS CODE KEY

Chave do codificação de pastilhas | Llave de codificación de plaquitas

Partial Profile Example

16	ER	A	55	PH6920
1	2	3	4	5

1 - Insert Size						
L	**06**	**08**	**11**	**16**	**22**	**27**
IC (in)	0.157	0.197	0.250	0.375	0.500	0.625

2 - Insert Hand Type	
ER	External Right Holder
EL	External Left Holder
IR	Internal Right Holder
IL	Internal Left Holder

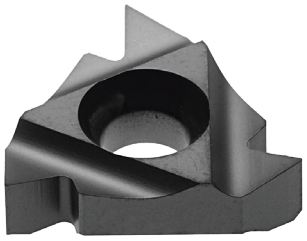
3 - Profile Type		
symbol	**mm**	**TPI**
A	0,5 - 1,5	48 - 16
G	1,75 - 3,0	14 - 8
AG	0,5 - 3,0	48 - 8
N	3,5 - 5,0	7 - 5
Q	5,5 - 6,0	4.5 - 4

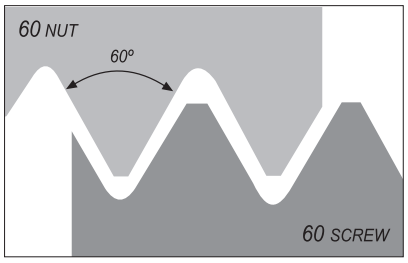
4 - Profile Angle	
55	55º
60	60º

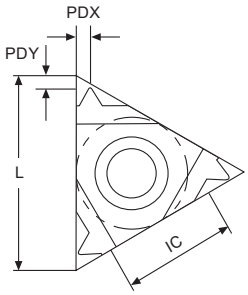
5 - Grades
PH6920

palbit

PARTIAL PROFILE 60°







External

Geometry code [1]	Reference Referência Referencia	Pitch		L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		MM	TPI		IC	PDY	PDX	(68) PH6920
1880592	11 ER A60	0,5-1,5	48-16	11	0.250	0.031	0.035	◎
1880429	16 ER A60	0,5-1,5	48-16	16	0.375	0.031	0.035	◎
1880431	16 ER G60	1,75-3,0	14-8	16	0.375	0.047	0.067	◎
1880388	16 ER AG60	0,5-3,0	48-8	16	0.375	0.047	0.067	◎
1880046	22 ER N60	3,5-5,0	7-5	22	0.500	0.067	0.098	◎
1882486	27 ER Q60	5,5-6,0	4.5-4	27	0.625	0.083	0.122	◎
1881851	11 EL A60	0,5-1,5	48-16	11	0.250	0.031	0.035	◎
1880771	16 EL A60	0,5-1,5	48-16	16	0.375	0.031	0.035	◎
1880773	16 EL G60	1,75-3,0	14-8	16	0.375	0.047	0.067	◎
1880524	16 EL AG60	0,5-3,0	48-8	16	0.375	0.047	0.067	◎
1880853	22 EL N60	3,5-5,0	7-5	22	0.500	0.067	0.098	◎
1882155	27 EL Q60	5,5-6,0	4.5-4	27	0.625	0.083	0.122	○

◎ 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

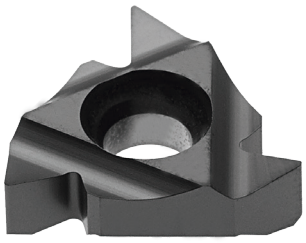
Internal

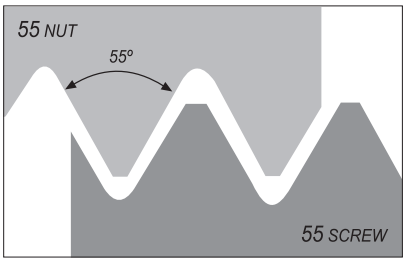
Geometry code [1]	Reference Referência Referencia	Pitch		L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		MM	TPI		IC	PDY	PDX	(68) PH6920
1881730	06 IR A60	0,5-1,25	48-20	06	0.157	0.024	0.024	○
1881773	08 IR A60	0,5-1,5	48-16	08	0.197	0.024	0.028	○
1880595	11 IR A60	0,5-1,5	48-16	11	0.250	0.031	0.035	◎
1880045	16 IR A60	0,5-1,5	48-16	16	0.375	0.031	0.035	◎
1880435	16 IR G60	1,75-3,0	14-8	16	0.375	0.047	0.067	◎
1880437	16 IR AG60	0,5-3,0	48-8	16	0.375	0.047	0.067	◎
1880769	22 IR N60	3,5-5,0	7-5	22	0.500	0.067	0.098	◎
1882487	27 IR Q60	5,5-6,0	4.5-4	27	0.625	0.083	0.122	○
1881716	06 IL A60	0,5-1,25	48-20	06	0.157	0.024	0.024	○
1882199	08 IL A60	0,5-1,5	48-16	08	0.197	0.024	0.028	◎
1880855	11 IL A60	0,5-1,5	48-16	11	0.250	0.031	0.035	◎
1880772	16 IL A60	0,5-1,5	48-16	16	0.375	0.031	0.035	◎
1880774	16 IL G60	1,75-3,0	14-8	16	0.375	0.047	0.067	◎
1880775	16 IL AG60	0,5-3,0	48-8	16	0.375	0.047	0.067	◎
1880854	22 IL N60	3,5-5,0	7-5	22	0.500	0.067	0.098	◎
1882179	27 IL Q60	5,5-6,0	4.5-4	27	0.625	0.083	0.122	○

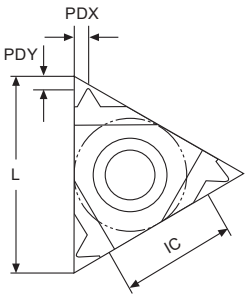
◎ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

PARTIAL PROFILE 55°







External

Geometry code (1)	Reference Referência Referencia	Pitch		L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		MM	TPI		IC	PDY	PDX	(68) PH6920
1880598	11 ER A55	0,5-1,5	48-16	11	0.250	0.031	0.035	◉
1880430	16 ER A55	0,5-1,5	48-16	16	0.375	0.031	0.035	◉
1880432	16 ER G55	1,75-3,0	14-8	16	0.375	0.047	0.067	◉
1880433	16 ER AG55	0,5-3,0	48-8	16	0.375	0.047	0.067	◉
1880770	22 ER N55	3,5-5,0	7-5	22	0.500	0.067	0.098	◉
1882167	27 ER Q55	5,5-6,0	4.5-4	27	0.625	0.079	0.114	○
1881850	11 EL A55	0,5-1,5	48-16	11	0.250	0.031	0.035	○
1880776	16 EL A55	0,5-1,5	48-16	16	0.375	0.031	0.035	○
1880778	16 EL G55	1,75-3,0	14-8	16	0.375	0.047	0.067	○
1880780	16 EL AG55	0,5-3,0	48-8	16	0.375	0.047	0.067	○
1880858	22 EL N55	3,5-5,0	7-5	22	0.500	0.067	0.098	○
1882154	27 EL Q55	5,5-6,0	4.5-4	27	0.625	0.079	0.114	○

◉ 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

PARTIAL PROFILE 55°

Internal

Geometry code (1)	Reference Referência Referencia	Pitch		L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		MM	TPI		IC	PDY	PDX	(68) PH6920
1881729	06 IR A55	0,5-1,25	48-20	06	0.157	0.020	0.024	○
1881772	08 IR A55	0,5-1,5	48-16	08	0.197	0.024	0.028	○
1880006	11 IR A55	0,5-1,5	48-16	11	0.250	0.031	0.035	◈
1880434	16 IR A55	0,5-1,5	48-16	16	0.375	0.031	0.035	◈
1880436	16 IR G55	1,75-3,0	14-8	16	0.375	0.047	0.067	◈
1880438	16 IR AG55	0,5-3,0	48-8	16	0.375	0.047	0.067	◈
1880047	22 IR N55	3,5-5,0	7-5	22	0.500	0.067	0.098	◈
1882189	27 IR Q55	5,5-6,0	4,5-4	27	0.625	0.079	0.114	○
1881715	06 IL A55	0,5-1,25	48-20	06	0.157	0.020	0.024	○
1881751	08 IL A55	0,5-1,5	48-16	08	0.197	0.024	0.028	○
1880856	11 IL A55	0,5-1,5	48-16	11	0.250	0.031	0.035	○
1880777	16 IL A55	0,5-1,5	48-16	16	0.375	0.031	0.035	○
1880779	16 IL G55	1,75-3,0	14-8	16	0.375	0.047	0.067	○
1880781	16 IL AG55	0,5-3,0	48-8	16	0.375	0.047	0.067	◈
1880857	22 IL N55	3,5-5,0	7-5	22	0.500	0.067	0.098	○
1882178	27 IL Q55	5,5-6,0	4,5-4	27	0.625	0.079	0.114	○

◈ 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

FULL PROFILE INSERTS CODE KEY Chave do codificação de pastilhas | Llave de codificación de plaquitas

Full Profile Example

16	ER	1.50	ISO	PH6920
1	2	3	4	7

1 - Insert Size						
L	**06**	**08**	**11**	**16**	**22**	**27**
IC (in)	0.157	0.197	0.250	0.375	0.500	0.625

2 - Insert Hand Type	
ER	External Right Holder
EL	External Left Holder
IR	Internal Right Holder
IL	Internal Left Holder

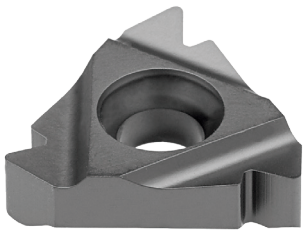
3 - Pitch	
mm	TPI
0,35 - 7,0	72 - 3

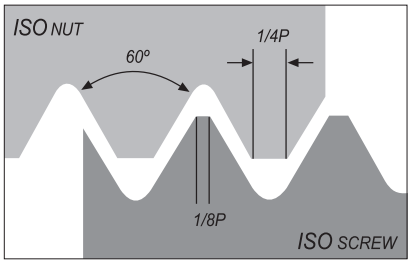
4 - Profile Type							
symbol	**profile type**	**symbol**	**profile type**	**symbol**	**profile type**	**symbol**	**profile type**
ISO	ISO METRIC	**NPTF**	NPTF	**STACME**	STUB ACME	**API**	API
UN	AMERICAN UN	**RD**	ROUND (DIN 405)	**UNJ**	UNJ	**BUT**	API BUTTRESS CASING
W	WITHWORTH	**RD20400**	ROUND (DIN 20400)	**MJ**	MJ	**API RD**	API ROUND CAS. & TUBING
BSPT	BSPT	**TR**	TRAPEZ	**ABUT**	AMERICAN BUTTRESS	**EL**	EXTREME LINE CASING
NPT	NPT	**ACME**	AMERICAN ACME	**SAGE**	METRIC BUT. SAGENGWINDE	**PG**	PG

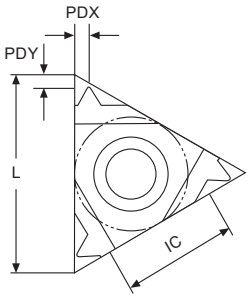
5 - Grades
PH6920

palbit

ISO METRIC ISO 965-1: 1999-11 | DIN 13: 2005-08







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		MM		IC	PDY	PDX	(68) PH6920
1881852	11 ER 0.35 ISO	0,35	11	0.250	0.031	0.016	○
1881853	11 ER 0.40 ISO	0,40	11	0.250	0.028	0.016	○
1881854	11 ER 0.45 ISO	0,45	11	0.250	0.028	0.016	○
1881855	11 ER 0.50 ISO	0,50	11	0.250	0.024	0.024	○
1881856	11 ER 0.60 ISO	0,60	11	0.250	0.024	0.024	○
1881857	11 ER 0.70 ISO	0,70	11	0.250	0.024	0.024	○
1881858	11 ER 0.75 ISO	0,75	11	0.250	0.024	0.024	ⓢ
1881859	11 ER 0.80 ISO	0,80	11	0.250	0.024	0.024	○
1880602	11 ER 1.00 ISO	1,00	11	0.250	0.028	0.028	ⓢ
1881861	11 ER 1.25 ISO	1,25	11	0.250	0.031	0.035	ⓢ
1880603	11 ER 1.50 ISO	1,50	11	0.250	0.031	0.039	ⓢ
1881864	11 ER 1.75 ISO	1,75	11	0.250	0.031	0.043	○
1881881	11 ER 2.00 ISO	2,00	11	0.250	0.031	0.043	○
1882030	16 ER 0.35 ISO	0,35	16	0.375	0.031	0.016	○
1882031	16 ER 0.40 ISO	0,40	16	0.375	0.028	0.016	○
1882032	16 ER 0.45 ISO	0,45	16	0.375	0.028	0.016	○
1880819	16 ER 0.50 ISO	0,50	16	0.375	0.024	0.024	○
1882033	16 ER 0.60 ISO	0,60	16	0.375	0.024	0.024	○
1882034	16 ER 0.70 ISO	0,70	16	0.375	0.024	0.024	○
1880447	16 ER 0.75 ISO	0,75	16	0.375	0.024	0.024	ⓢ
1880804	16 ER 0.80 ISO	0,80	16	0.375	0.024	0.024	ⓢ
1880479	16 ER 1.00 ISO	1,00	16	0.375	0.028	0.028	ⓢ
1880007	16 ER 1.25 ISO	1,25	16	0.375	0.031	0.035	ⓢ
1880262	16 ER 1.50 ISO	1,50	16	0.375	0.031	0.039	ⓢ
1880732	16 ER 1.75 ISO	1,75	16	0.375	0.035	0.047	ⓢ
1880018	16 ER 2.00 ISO	2,00	16	0.375	0.039	0.051	ⓢ
1880020	16 ER 2.50 ISO	2,50	16	0.375	0.043	0.059	ⓢ
1880022	16 ER 3.00 ISO	3,00	16	0.375	0.047	0.063	ⓢ
1883740	16 ER 3.50 ISO	3,50	16	0.375	0.047	0.067	○
1880823	22 ER 3.50 ISO	3,50	22	0.500	0.063	0.091	ⓢ
1880811	22 ER 4.00 ISO	4,00	22	0.500	0.063	0.091	ⓢ
1880824	22 ER 4.50 ISO	4,50	22	0.500	0.067	0.094	ⓢ
1880649	22 ER 5.00 ISO	5,00	22	0.500	0.067	0.098	ⓢ
1883741	22 ER 5.50 ISO	5,50	22	0.500	0.067	0.102	○
1883742	22 ER 6.00 ISO	6,00	22	0.500	0.075	0.106	○
1882163	27 ER 5.50 ISO	5,50	27	0.625	0.063	0.091	○
1882164	27 ER 6.00 ISO	6,00	27	0.625	0.071	0.098	○

ⓢ 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 METRIC ISO 965-1: 1999-11 | DIN 13: 2005-08

External

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		MM		IC	PDY	PDX	(68) PH6920
1881794	11 EL 0.35 ISO	0,35	11	0.250	0.031	0.016	○
1881795	11 EL 0.40 ISO	0,40	11	0.250	0.028	0.016	○
1881796	11 EL 0.45 ISO	0,45	11	0.250	0.028	0.016	○
1881797	11 EL 0.50 ISO	0,50	11	0.250	0.024	0.024	○
1881798	11 EL 0.60 ISO	0,60	11	0.250	0.024	0.024	○
1881799	11 EL 0.70 ISO	0,70	11	0.250	0.024	0.024	○
1881800	11 EL 0.75 ISO	0,75	11	0.250	0.024	0.024	○
1881801	11 EL 0.80 ISO	0,80	11	0.250	0.024	0.024	○
1881802	11 EL 1.00 ISO	1,00	11	0.250	0.028	0.028	○
1881803	11 EL 1.25 ISO	1,25	11	0.250	0.031	0.035	○
1881804	11 EL 1.50 ISO	1,50	11	0.250	0.031	0.039	○
1881806	11 EL 1.75 ISO	1,75	11	0.250	0.031	0.043	○
1880654	11 EL 2.00 ISO	2,00	11	0.250	0.031	0.043	○
1881977	16 EL 0.35 ISO	0,35	16	0.375	0.031	0.016	○
1881978	16 EL 0.40 ISO	0,40	16	0.375	0.028	0.016	○
1881979	16 EL 0.45 ISO	0,45	16	0.375	0.028	0.016	◈
1881980	16 EL 0.50 ISO	0,50	16	0.375	0.024	0.024	○
1881981	16 EL 0.60 ISO	0,60	16	0.375	0.024	0.024	○
1881982	16 EL 0.70 ISO	0,70	16	0.375	0.024	0.024	○
1881983	16 EL 0.75 ISO	0,75	16	0.375	0.024	0.024	◈
1881984	16 EL 0.80 ISO	0,80	16	0.375	0.024	0.024	○
1880782	16 EL 1.00 ISO	1,00	16	0.375	0.028	0.028	◈
1880651	16 EL 1.25 ISO	1,25	16	0.375	0.031	0.035	◈
1880652	16 EL 1.50 ISO	1,50	16	0.375	0.031	0.039	○
1880653	16 EL 1.75 ISO	1,75	16	0.375	0.035	0.047	◈
1882519	16 EL 2.00 ISO	2,00	16	0.375	0.039	0.051	◈
1880788	16 EL 2.50 ISO	2,50	16	0.375	0.043	0.059	◈
1880488	16 EL 3.00 ISO	3,00	16	0.375	0.047	0.063	○
1883743	16 EL 3.50 ISO	3,50	16	0.375	0.047	0.067	○
1880844	22 EL 3.50 ISO	3,50	22	0.500	0.063	0.091	○
1880845	22 EL 4.00 ISO	4,00	22	0.500	0.063	0.091	○
1880846	22 EL 4.50 ISO	4,50	22	0.500	0.067	0.094	○
1880847	22 EL 5.00 ISO	5,00	22	0.500	0.067	0.098	○
1883744	22 EL 5.50 ISO	5,50	22	0.500	0.067	0.102	○
1883745	22 EL 6.00 ISO	6,00	22	0.500	0.075	0.106	○
1882150	27 EL 5.50 ISO	5,50	27	0.625	0.063	0.091	○
1882151	27 EL 6.00 ISO	6,00	27	0.625	0.071	0.098	○

◈ 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

Internal

Geometry code [1]	Reference Referência Referencia	Pitch		Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		MM	L	IC	PDY	PDX	(68) PH6920
1881717	06 IR 0.50 ISO	0,50	06	0.157	0.035	0.020	○
1881718	06 IR 0.75 ISO	0,75	06	0.157	0.031	0.020	○
1881719	06 IR 1.00 ISO	1,00	06	0.157	0.028	0.024	○
1881720	06 IR 1.25 ISO	1,25	06	0.157	0.024	0.024	○
1881752	08 IR 0.35 ISO	0,35	08	0.197	0.028	0.016	○
1881753	08 IR 0.50 ISO	0,50	08	0.197	0.024	0.020	○
1881754	08 IR 0.75 ISO	0,75	08	0.197	0.024	0.020	○
1881755	08 IR 1.00 ISO	1,00	08	0.197	0.024	0.024	○
1881756	08 IR 1.25 ISO	1,25	08	0.197	0.024	0.028	◎
1881757	08 IR 1.50 ISO	1,50	08	0.197	0.024	0.028	○
1881758	08 IR 1.75 ISO	1,75	08	0.197	0.024	0.031	○
1881937	11 IR 0.35 ISO	0,35	11	0.250	0.031	0.012	○
1881938	11 IR 0.40 ISO	0,40	11	0.250	0.031	0.016	○
1881939	11 IR 0.45 ISO	0,45	11	0.250	0.031	0.016	○
1880825	11 IR 0.50 ISO	0,50	11	0.250	0.024	0.024	◎
1881940	11 IR 0.60 ISO	0,60	11	0.250	0.024	0.024	○
1881941	11 IR 0.70 ISO	0,70	11	0.250	0.024	0.024	○
1880762	11 IR 0.75 ISO	0,75	11	0.250	0.024	0.024	◎
1881942	11 IR 0.80 ISO	0,80	11	0.250	0.024	0.024	○
1880604	11 IR 1.00 ISO	1,00	11	0.250	0.031	0.028	◎
1880827	11 IR 1.25 ISO	1,25	11	0.250	0.031	0.031	◎
1880605	11 IR 1.50 ISO	1,50	11	0.250	0.031	0.039	◎
1880828	11 IR 1.75 ISO	1,75	11	0.250	0.031	0.043	◎
1880829	11 IR 2.00 ISO	2,00	11	0.250	0.031	0.035	◎
1883746	11 IR 2.50 ISO	2,50	11	0.250	0.031	0.047	○
1882108	16 IR 0.35 ISO	0,35	16	0.375	0.031	0.012	○
1882109	16 IR 0.40 ISO	0,40	16	0.375	0.031	0.016	○
1882110	16 IR 0.45 ISO	0,45	16	0.375	0.031	0.016	○
1880830	16 IR 0.50 ISO	0,50	16	0.375	0.024	0.024	◎
1882112	16 IR 0.60 ISO	0,60	16	0.375	0.024	0.024	○
1882113	16 IR 0.70 ISO	0,70	16	0.375	0.024	0.024	○
1880831	16 IR 0.75 ISO	0,75	16	0.375	0.024	0.024	◎
1880832	16 IR 0.80 ISO	0,80	16	0.375	0.024	0.024	◎
1880025	16 IR 1.00 ISO	1,00	16	0.375	0.024	0.028	◎
1880026	16 IR 1.25 ISO	1,25	16	0.375	0.031	0.035	◎
1880619	16 IR 1.50 ISO	1,50	16	0.375	0.031	0.039	◎
1880733	16 IR 1.75 ISO	1,75	16	0.375	0.035	0.047	◎
1880039	16 IR 2.00 ISO	2,00	16	0.375	0.039	0.051	◎
1880041	16 IR 2.50 ISO	2,50	16	0.375	0.043	0.059	◎
1880042	16 IR 3.00 ISO	3,00	16	0.375	0.043	0.059	◎
1883747	16 IR 3.50 ISO	3,50	16	0.375	0.047	0.067	◎
1880834	22 IR 3.50 ISO	3,50	22	0.500	0.063	0.091	◎
1880818	22 IR 4.00 ISO	4,00	22	0.500	0.063	0.091	◎
1880835	22 IR 4.50 ISO	4,50	22	0.500	0.063	0.094	○
1880650	22 IR 5.00 ISO	5,00	22	0.500	0.063	0.091	◎
1883748	22 IR 5.50 ISO	5,50	22	0.500	0.063	0.091	○
1883749	22 IR 6.00 ISO	6,00	22	0.500	0.063	0.094	○
1882185	27 IR 5.50 ISO	5,50	27	0.625	0.063	0.091	◎
1882186	27 IR 6.00 ISO	6,00	27	0.625	0.071	0.098	○

◎ 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 METRIC ISO 965-1: 1999-11 | DIN 13: 2005-08

Internal

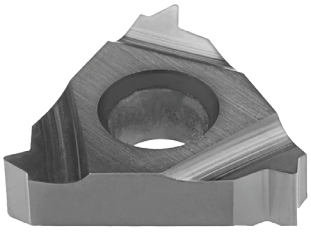
Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		MM		IC	PDY	PDX	(68) PH6920
1881703	06 IL 0.50 ISO	0,50	06	0.157	0.035	0.020	○
1881704	06 IL 0.75 ISO	0,75	06	0.157	0.031	0.020	○
1881705	06 IL 1.00 ISO	1,00	06	0.157	0.028	0.024	○
1881706	06 IL 1.25 ISO	1,25	06	0.157	0.024	0.024	○
1881732	08 IL 0.50 ISO	0,50	08	0.197	0.024	0.020	◎
1881733	08 IL 0.75 ISO	0,75	08	0.197	0.024	0.020	○
1881734	08 IL 1.00 ISO	1,00	08	0.197	0.024	0.024	○
1881735	08 IL 1.25 ISO	1,25	08	0.197	0.024	0.028	○
1881736	08 IL 1.50 ISO	1,50	08	0.197	0.024	0.028	○
1881737	08 IL 1.75 ISO	1,75	08	0.197	0.024	0.031	○
1881911	11 IL 0.35 ISO	0,35	11	0.250	0.031	0.012	○
1881912	11 IL 0.40 ISO	0,40	11	0.250	0.031	0.016	○
1881913	11 IL 0.45 ISO	0,45	11	0.250	0.031	0.016	○
1880837	11 IL 0.50 ISO	0,50	11	0.250	0.024	0.024	○
1881914	11 IL 0.60 ISO	0,60	11	0.250	0.024	0.024	○
1881915	11 IL 0.70 ISO	0,70	11	0.250	0.024	0.024	○
1880838	11 IL 0.75 ISO	0,75	11	0.250	0.024	0.024	○
1881916	11 IL 0.80 ISO	0,80	11	0.250	0.024	0.024	○
1880839	11 IL 1.00 ISO	1,00	11	0.250	0.031	0.028	○
1880840	11 IL 1.25 ISO	1,25	11	0.250	0.031	0.031	◎
1880841	11 IL 1.50 ISO	1,50	11	0.250	0.031	0.039	◎
1880842	11 IL 1.75 ISO	1,75	11	0.250	0.031	0.043	◎
1880843	11 IL 2.00 ISO	2,00	11	0.250	0.031	0.035	◎
1883750	11 IL 2.50 ISO	2,50	11	0.250	0.031	0.047	○
1882058	16 IL 0.35 ISO	0,35	16	0.375	0.031	0.012	○
1882059	16 IL 0.40 ISO	0,40	16	0.375	0.031	0.016	○
1882060	16 IL 0.45 ISO	0,45	16	0.375	0.031	0.016	○
1882061	16 IL 0.50 ISO	0,50	16	0.375	0.024	0.024	○
1882062	16 IL 0.60 ISO	0,60	16	0.375	0.024	0.024	○
1882063	16 IL 0.70 ISO	0,70	16	0.375	0.024	0.024	○
1882064	16 IL 0.75 ISO	0,75	16	0.375	0.024	0.024	○
1882065	16 IL 0.80 ISO	0,80	16	0.375	0.024	0.024	○
1880783	16 IL 1.00 ISO	1,00	16	0.375	0.024	0.028	◎
1880784	16 IL 1.25 ISO	1,25	16	0.375	0.031	0.035	◎
1880785	16 IL 1.50 ISO	1,50	16	0.375	0.031	0.039	◎
1880786	16 IL 1.75 ISO	1,75	16	0.375	0.035	0.047	◎
1880787	16 IL 2.00 ISO	2,00	16	0.375	0.039	0.051	◎
1880789	16 IL 2.50 ISO	2,50	16	0.375	0.043	0.059	◎
1880790	16 IL 3.00 ISO	3,00	16	0.375	0.043	0.059	◎
1883751	16 IL 3.50 ISO	3,50	16	0.375	0.047	0.067	○
1880848	22 IL 3.50 ISO	3,50	22	0.500	0.063	0.091	○
1880849	22 IL 4.00 ISO	4,00	22	0.500	0.063	0.091	○
1880850	22 IL 4.50 ISO	4,50	22	0.500	0.063	0.094	○
1880851	22 IL 5.00 ISO	5,00	22	0.500	0.063	0.091	○
1883752	22 IL 5.50 ISO	5,50	22	0.500	0.063	0.091	○
1883753	22 IL 6.00 ISO	6,00	22	0.500	0.063	0.094	○
1882174	27 IL 5.50 ISO	5,50	27	0.625	0.063	0.091	○
1882175	27 IL 6.00 ISO	6,00	27	0.625	0.071	0.098	○

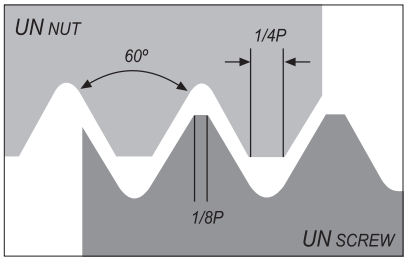
◎ Stock item | Produto de stock | Itens de stock

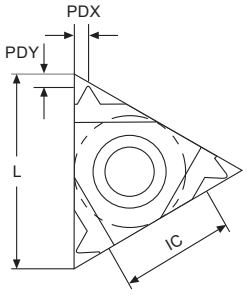
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

AMERICAN UN (UNC, UNF, UNEF) | ANSI B1.1-1982







External

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1881907	11 ER 72 UN	72	11	0.250	0.031	0.016	○
1881906	11 ER 64 UN	64	11	0.250	0.031	0.016	○
1881903	11 ER 56 UN	56	11	0.250	0.028	0.016	○
1881901	11 ER 48 UN	48	11	0.250	0.024	0.024	○
1881900	11 ER 44 UN	44	11	0.250	0.024	0.024	○
1881898	11 ER 40 UN	40	11	0.250	0.024	0.024	○
1881896	11 ER 36 UN	36	11	0.250	0.024	0.024	○
1881894	11 ER 32 UN	32	11	0.250	0.024	0.024	○
1881892	11 ER 28 UN	28	11	0.250	0.024	0.028	○
1881890	11 ER 27 UN	27	11	0.250	0.028	0.031	○
1881885	11 ER 24 UN	24	11	0.250	0.028	0.031	○
1881882	11 ER 20 UN	20	11	0.250	0.031	0.035	○
1881877	11 ER 18 UN	18	11	0.250	0.031	0.039	○
1881873	11 ER 16 UN	16	11	0.250	0.035	0.043	○
1881869	11 ER 14 UN	14	11	0.250	0.035	0.043	○
1882055	16 ER 72 UN	72	16	0.375	0.031	0.012	○
1882054	16 ER 64 UN	64	16	0.375	0.031	0.016	○
1882051	16 ER 56 UN	56	16	0.375	0.028	0.016	○
1882049	16 ER 48 UN	48	16	0.375	0.024	0.024	○
1882048	16 ER 44 UN	44	16	0.375	0.024	0.024	○
1882046	16 ER 40 UN	40	16	0.375	0.024	0.024	○
1882044	16 ER 36 UN	36	16	0.375	0.024	0.024	○
1880870	16 ER 32 UN	32	16	0.375	0.024	0.024	○
1880869	16 ER 28 UN	28	16	0.375	0.024	0.028	◎
1882041	16 ER 27 UN	27	16	0.375	0.028	0.031	○
1880868	16 ER 24 UN	24	16	0.375	0.028	0.031	◎
1880021	16 ER 20 UN	20	16	0.375	0.031	0.035	○
1880867	16 ER 18 UN	18	16	0.375	0.031	0.039	○
1880616	16 ER 16 UN	16	16	0.375	0.035	0.043	◎
1880014	16 ER 14 UN	14	16	0.375	0.039	0.047	◎
1880866	16 ER 13 UN	13	16	0.375	0.039	0.051	◎
1880865	16 ER 12 UN	12	16	0.375	0.043	0.055	○
1883754	16 ER 11.5 UN	11.5	16	0.375	0.043	0.059	○
1880864	16 ER 11 UN	11	16	0.375	0.043	0.059	○
1880863	16 ER 10 UN	10	16	0.375	0.043	0.059	◎
1880862	16 ER 9 UN	9	16	0.375	0.047	0.067	◎

◎ 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

AMERICAN UN (UNC, UNF, UNEF) | ANSI B1.1-1982

External

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1880024	16 ER 8 UN	8	16	0.375	0.047	0.063	○
1880861	22 ER 7 UN	7	22	0.500	0.063	0.091	◈
1880860	22 ER 6 UN	6	22	0.500	0.063	0.091	◈
1880859	22 ER 5 UN	5	22	0.500	0.067	0.098	○
1882157	27 ER 4.5 UN	4.5	27	0.625	0.075	0.106	○
1882161	27 ER 4 UN	4	27	0.625	0.083	0.118	○
1881848	11 EL 72 UN	72	11	0.250	0.031	0.016	○
1881847	11 EL 64 UN	64	11	0.250	0.031	0.016	○
1882200	11 EL 56 UN	56	11	0.250	0.028	0.016	○
1881843	11 EL 48 UN	48	11	0.250	0.024	0.024	○
1881842	11 EL 44 UN	44	11	0.250	0.024	0.024	○
1881840	11 EL 40 UN	40	11	0.250	0.024	0.024	○
1881838	11 EL 36 UN	36	11	0.250	0.024	0.024	○
1881836	11 EL 32 UN	32	11	0.250	0.024	0.024	○
1881834	11 EL 28 UN	28	11	0.250	0.024	0.028	○
1881832	11 EL 27 UN	27	11	0.250	0.028	0.031	○
1881827	11 EL 24 UN	24	11	0.250	0.028	0.031	○
1881824	11 EL 20 UN	20	11	0.250	0.031	0.035	○
1881819	11 EL 18 UN	18	11	0.250	0.031	0.039	○
1881815	11 EL 16 UN	16	11	0.250	0.035	0.043	○
1881811	11 EL 14 UN	14	11	0.250	0.035	0.043	○
1882022	16 EL 72 UN	72	16	0.375	0.031	0.012	○
1882020	16 EL 64 UN	64	16	0.375	0.031	0.016	○
1882017	16 EL 56 UN	56	16	0.375	0.028	0.016	○
1882015	16 EL 48 UN	48	16	0.375	0.024	0.024	○
1882014	16 EL 44 UN	44	16	0.375	0.024	0.024	○
1882012	16 EL 40 UN	40	16	0.375	0.024	0.024	○
1882010	16 EL 36 UN	36	16	0.375	0.024	0.024	○
1880886	16 EL 32 UN	32	16	0.375	0.024	0.024	○
1880885	16 EL 28 UN	28	16	0.375	0.024	0.028	◈
1882007	16 EL 27 UN	27	16	0.375	0.028	0.031	○
1880884	16 EL 24 UN	24	16	0.375	0.028	0.031	◈
1880883	16 EL 20 UN	20	16	0.375	0.031	0.035	○
1880882	16 EL 18 UN	18	16	0.375	0.031	0.039	◈
1880881	16 EL 16 UN	16	16	0.375	0.035	0.043	○
1880880	16 EL 14 UN	14	16	0.375	0.039	0.047	○
1880879	16 EL 13 UN	13	16	0.375	0.039	0.051	○
1880878	16 EL 12 UN	12	16	0.375	0.043	0.055	○
1883755	16 EL 11.5 UN	11.5	16	0.375	0.043	0.059	○
1880877	16 EL 11 UN	11	16	0.375	0.043	0.059	○
1880876	16 EL 10 UN	10	16	0.375	0.043	0.059	○
1880875	16 EL 9 UN	9	16	0.375	0.047	0.067	○
1880874	16 EL 8 UN	8	16	0.375	0.047	0.063	○
1880873	22 EL 7U N	7	22	0.500	0.063	0.091	○
1880872	22 EL 6 UN	6	22	0.500	0.063	0.091	○
1880871	22 EL 5 UN	5	22	0.500	0.067	0.098	○
1882144	27 EL 4.5 UN	4.5	27	0.625	0.075	0.106	○
1882148	27 EL 4 UN	4	27	0.625	0.083	0.118	○

◈ 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

palbit

Internal

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1881726	06 IR 32 UN	32	06	0.157	0.031	0.020	○
1881725	06 IR 28 UN	28	06	0.157	0.031	0.024	○
1881722	06 IR 24 UN	24	06	0.157	0.028	0.024	○
1883756	06 IR 20 UN	20	06	0.157	0.024	0.024	○
1881721	06 IR 18 UN	18	06	0.157	0.024	0.028	○
1881769	08 IR 32 UN	32	08	0.197	0.024	0.020	○
1881768	08 IR 28 UN	28	08	0.197	0.024	0.024	○
1881765	08 IR 24 UN	24	08	0.197	0.024	0.024	○
1881764	08 IR 20 UN	20	08	0.197	0.024	0.028	◈
1881762	08 IR 18 UN	18	08	0.197	0.024	0.028	○
1881760	08 IR 16 UN	16	08	0.197	0.024	0.028	○
1881759	08 IR 14 UN	14	08	0.197	0.024	0.031	○
1881956	11 IR 72 UN	72	11	0.250	0.031	0.012	○
1881955	11 IR 64 UN	64	11	0.250	0.031	0.016	○
1881954	11 IR 56 UN	56	11	0.250	0.028	0.016	○
1881953	11 IR 48 UN	48	11	0.250	0.024	0.024	○
1881952	11 IR 44 UN	44	11	0.250	0.024	0.024	○
1881951	11 IR 40 UN	40	11	0.250	0.024	0.024	○
1881950	11 IR 36 UN	36	11	0.250	0.024	0.024	○
1880910	11 IR 32 UN	32	11	0.250	0.024	0.024	○
1880909	11 IR 28 UN	28	11	0.250	0.024	0.028	○
1881948	11 IR 27 UN	27	11	0.250	0.028	0.031	○
1880908	11 IR 24 UN	24	11	0.250	0.028	0.031	○
1880907	11 IR 20 UN	20	11	0.250	0.031	0.035	○
1880906	11 IR 18 UN	18	11	0.250	0.031	0.039	○
1880905	11 IR 16 UN	16	11	0.250	0.035	0.043	◈
1880904	11 IR 14 UN	14	11	0.250	0.035	0.043	◈
1880903	11 IR 13 UN	13	11	0.250	0.031	0.039	○
1880902	11 IR 12 UN	12	11	0.250	0.035	0.043	◈
1880901	11 IR 11 UN	11	11	0.250	0.031	0.043	○
1882126	16 IR 72 UN	72	16	0.375	0.031	0.012	○
1882124	16 IR 64 UN	64	16	0.375	0.031	0.016	○
1882123	16 IR 56 UN	56	16	0.375	0.028	0.016	○
1882122	16 IR 48 UN	48	16	0.375	0.024	0.024	○
1882121	16 IR 44 UN	44	16	0.375	0.024	0.024	○
1882120	16 IR 40 UN	40	16	0.375	0.024	0.024	○
1882118	16 IR 36 UN	36	16	0.375	0.024	0.024	○
1880900	16 IR 32 UN	32	16	0.375	0.024	0.024	○
1880899	16 IR 28 UN	28	16	0.375	0.024	0.028	○
1882117	16 IR 27 UN	27	16	0.375	0.028	0.031	○
1880898	16 IR 24 UN	24	16	0.375	0.028	0.031	○
1880618	16 IR 20 UN	20	16	0.375	0.031	0.035	◈
1880897	16 IR 18 UN	18	16	0.375	0.031	0.039	◈
1880037	16 IR 16 UN	16	16	0.375	0.035	0.043	○
1880034	16 IR 14 UN	14	16	0.375	0.039	0.047	○
1882116	16 IR 13 UN	13	16	0.375	0.039	0.051	◈

◈ 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

AMERICAN UN (UNC, UNF, UNEF) | ANSI B1.1-1982

Internal

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1880894	16 IR 12 UN	12	16	0.375	0.043	0.055	◈
1883757	16 IR 11.5 UN	11.5	16	0.375	0.043	0.059	○
1880893	16 IR 11 UN	11	16	0.375	0.043	0.059	○
1880892	16 IR 10 UN	10	16	0.375	0.043	0.059	○
1880891	16 IR 9 UN	9	16	0.375	0.047	0.067	○
1880044	16 IR 8 UN	8	16	0.375	0.047	0.063	○
1880889	22 IR 7 UN	7	22	0.500	0.063	0.091	○
1880888	22 IR 6 UN	6	22	0.500	0.063	0.091	○
1880887	22 IR 5 UN	5	22	0.500	0.063	0.091	○
1882181	27 IR 4.5 UN	4.5	27	0.625	0.067	0.094	○
1882184	27 IR 4 UN	4	27	0.625	0.071	0.106	○
1881712	06 IL 32 UN	32	06	0.157	0.031	0.020	○
1881711	06 IL 28 UN	28	06	0.157	0.031	0.024	○
1881708	06 IL 24 UN	24	06	0.157	0.028	0.024	○
1883758	06 IL 20 UN	20	06	0.157	0.024	0.024	○
1881707	06 IL 18 UN	18	06	0.157	0.024	0.028	○
1881748	08 IL 32 UN	32	08	0.197	0.024	0.020	○
1881747	08 IL 28 UN	28	08	0.197	0.024	0.024	○
1881744	08 IL 24 UN	24	08	0.197	0.024	0.024	○
1881743	08 IL 20 UN	20	08	0.197	0.024	0.028	○
1881741	08 IL 18 UN	18	08	0.197	0.024	0.028	○
1881739	08 IL 16 UN	16	08	0.197	0.024	0.028	○
1881738	08 IL 14 UN	14	08	0.197	0.024	0.031	○
1881936	11 IL 72 UN	72	11	0.250	0.031	0.012	○
1881935	11 IL 64 UN	64	11	0.250	0.031	0.016	○
1881934	11 IL 56 UN	56	11	0.250	0.028	0.016	○
1881933	11 IL 48 UN	48	11	0.250	0.024	0.024	○
1881932	11 IL 44 UN	44	11	0.250	0.024	0.024	○
1881931	11 IL 40 UN	40	11	0.250	0.024	0.024	○
1881930	11 IL 36 UN	36	11	0.250	0.024	0.024	○
1880935	11 IL 32 UN	32	11	0.250	0.024	0.024	○
1880934	11 IL 28 UN	28	11	0.250	0.024	0.028	○
1881928	11 IL 27 UN	27	11	0.250	0.028	0.031	○
1880933	11 IL 24 UN	24	11	0.250	0.028	0.031	○
1880932	11 IL 20 UN	20	11	0.250	0.031	0.035	○
1880931	11 IL 18 UN	18	11	0.250	0.031	0.039	○
1880930	11 IL 16 UN	16	11	0.250	0.035	0.043	○
1880929	11 IL 14 UN	14	11	0.250	0.035	0.043	○
1880928	11 IL 13 UN	13	11	0.250	0.031	0.039	○
1880927	11 IL 12 UN	12	11	0.250	0.035	0.043	○
1880926	11 IL 11 UN	11	11	0.250	0.031	0.043	○
1882101	16 IL 72 UN	72	16	0.375	0.031	0.012	○
1882098	16 IL 64 UN	64	16	0.375	0.031	0.016	○
1882097	16 IL 56 UN	56	16	0.375	0.028	0.016	○
1882096	16 IL 48 UN	48	16	0.375	0.024	0.024	○
1882095	16 IL 44 UN	44	16	0.375	0.024	0.024	○

◈ 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

palbit

Internal

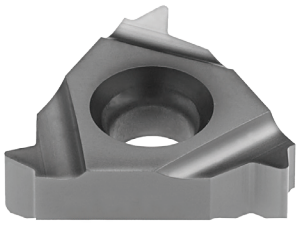
Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1882094	16 IL 40 UN	40	16	0.375	0.024	0.024	○
1882092	16 IL 36 UN	36	16	0.375	0.024	0.024	○
1880925	16 IL 32 UN	32	16	0.375	0.024	0.024	○
1880924	16 IL 28 UN	28	16	0.375	0.024	0.028	○
1882089	16 IL 27 UN	27	16	0.375	0.028	0.031	○
1880923	16 IL 24 UN	24	16	0.375	0.028	0.031	○
1880922	16 IL 20 UN	20	16	0.375	0.031	0.035	○
1880921	16 IL 18 UN	18	16	0.375	0.031	0.039	○
1880920	16 IL 16 UN	16	16	0.375	0.035	0.043	○
1880919	16 IL 14 UN	14	16	0.375	0.039	0.047	○
1882074	16 IL 13 UN	13	16	0.375	0.039	0.051	○
1880918	16 IL 12 UN	12	16	0.375	0.043	0.055	○
1883759	16 IL 11.5 UN	11.5	16	0.375	0.043	0.059	○
1880917	16 IL 11 UN	11	16	0.375	0.043	0.059	○
1880916	16 IL 10 UN	10	16	0.375	0.043	0.059	○
1880915	16 IL 9 UN	9	16	0.375	0.047	0.067	○
1880914	16 IL 8 UN	8	16	0.375	0.047	0.063	○
1880913	22 IL 7 UN	7	22	0.500	0.063	0.091	○
1880912	22 IL 6 UN	6	22	0.500	0.063	0.091	○
1880911	22 IL 5 UN	5	22	0.500	0.063	0.091	○
1882170	27 IL 4.5 UN	4.5	27	0.625	0.067	0.094	○
1882173	27 IL 4 UN	4	27	0.625	0.071	0.106	○

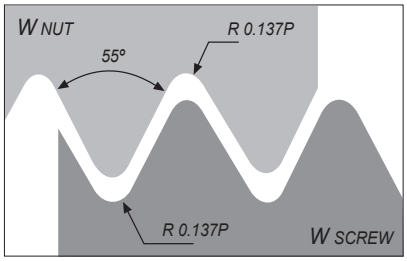
Stock item | Produto de stock | Itens de stock

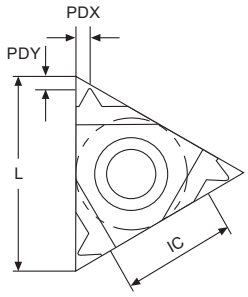
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

WITHWORTH FOR BSW, BSF, BSP, B.S.84: 1956, DIN 259, ISO 228-1:1994







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1881908	11 ER 72 W	72	11	0.250	0.028	0.016	○
1881905	11 ER 60 W	60	11	0.250	0.028	0.016	○
1881904	11 ER 56 W	56	11	0.250	0.028	0.016	○
1881902	11 ER 48 W	48	11	0.250	0.024	0.024	○
1881899	11 ER 40 W	40	11	0.250	0.024	0.024	○
1881897	11 ER 36 W	36	11	0.250	0.024	0.024	○
1881895	11 ER 32 W	32	11	0.250	0.024	0.024	○
1881893	11ER 28 W	28	11	0.250	0.024	0.028	○
1881887	11 ER 26 W	26	11	0.250	0.028	0.028	○
1881886	11 ER 24 W	24	11	0.250	0.028	0.031	○
1881884	11 ER 22 W	22	11	0.250	0.031	0.035	○
1881883	11 ER 20 W	20	11	0.250	0.031	0.035	○
1881880	11 ER 19 W	19	11	0.250	0.031	0.039	○
1881878	11 ER 18 W	18	11	0.250	0.031	0.039	○
1881874	11 ER 16 W	16	11	0.250	0.035	0.043	○
1881870	11 ER 14 W	14	11	0.250	0.035	0.043	○
1882056	16 ER 72 W	72	16	0.375	0.028	0.016	○
1882053	16 ER 60 W	60	16	0.375	0.028	0.016	○
1882052	16 ER 56 W	56	16	0.375	0.028	0.016	○
1882050	16 ER 48 W	48	16	0.375	0.024	0.024	○
1882047	16 ER 40 W	40	16	0.375	0.024	0.024	○
1882045	16 ER 36 W	36	16	0.375	0.024	0.024	○
1882043	16 ER 32 W	32	16	0.375	0.024	0.024	○
1880940	16 ER 28 W	28	16	0.375	0.024	0.028	○
1882040	16 ER 26 W	26	16	0.375	0.028	0.028	○
1880939	16 ER 24 W	24	16	0.375	0.028	0.031	○
1882039	16 ER 22 W	22	16	0.375	0.031	0.035	○
1880938	16 ER 20 W	20	16	0.375	0.031	0.035	◈
1880017	16 ER 19 W	19	16	0.375	0.031	0.039	◈
1880937	16 ER 18 W	18	16	0.375	0.031	0.039	○
1880609	16 ER 16 W	16	16	0.375	0.035	0.043	◈
1880015	16 ER 14 W	14	16	0.375	0.039	0.047	◈
1880611	16 ER 12 W	12	16	0.375	0.043	0.055	◈
1880613	16 ER 11 W	11	16	0.375	0.043	0.059	◈
1880614	16 ER 10 W	10	16	0.375	0.043	0.059	◈
1880936	16 ER 9 W	9	16	0.375	0.047	0.067	○

◈ 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

palbit

External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1880646	16 ER 8 W	8	16	0.375	0.047	0.059	◉
1880941	22 ER 7 W	7	22	0.500	0.063	0.091	◉
1880942	22 ER 6 W	6	22	0.500	0.063	0.091	◉
1880943	22 ER 5 W	5	22	0.500	0.067	0.094	○
1882518	27 ER 4.5 W	4.5	27	0.625	0.071	0.102	◉
1882162	27 ER 4 W	4	27	0.625	0.079	0.114	○
1881849	11 EL 72 W	72	11	0.250	0.028	0.016	○
1881846	11 EL 60 W	60	11	0.250	0.028	0.016	○
1881845	11 EL 56 W	56	11	0.250	0.028	0.016	○
1881844	11 EL 48 W	48	11	0.250	0.024	0.024	○
1881841	11 EL 40 W	40	11	0.250	0.024	0.024	○
1881839	11 EL 36 W	36	11	0.250	0.024	0.024	○
1881837	11 EL 32 W	32	11	0.250	0.024	0.024	○
1881835	11 EL 28 W	28	11	0.250	0.024	0.028	○
1881829	11 EL 26 W	26	11	0.250	0.028	0.028	○
1881828	11 EL 24 W	24	11	0.250	0.028	0.031	○
1881826	11 EL 22 W	22	11	0.250	0.031	0.035	○
1881825	11 EL 20 W	20	11	0.250	0.031	0.035	○
1881822	11 EL 19 W	19	11	0.250	0.031	0.039	○
1881820	11 EL 18 W	18	11	0.250	0.031	0.039	○
1881816	11 EL 16 W	16	11	0.250	0.035	0.043	○
1881812	11 EL 14 W	14	11	0.250	0.035	0.043	○
1882023	16 EL 72 W	72	16	0.375	0.028	0.016	○
1882019	16 EL 60 W	60	16	0.375	0.028	0.016	○
1882018	16 EL 56 W	56	16	0.375	0.028	0.016	○
1882016	16 EL 48 W	48	16	0.375	0.024	0.024	○
1882013	16 EL 40 W	40	16	0.375	0.024	0.024	○
1882011	16 EL 36 W	36	16	0.375	0.024	0.024	○
1882009	16 EL 32 W	32	16	0.375	0.024	0.024	○
1880955	16 EL 28 W	28	16	0.375	0.024	0.028	○
1882004	16 EL 26 W	26	16	0.375	0.024	0.028	○
1880954	16 EL 24 W	24	16	0.375	0.028	0.031	○
1882003	16 EL 22 W	22	16	0.375	0.031	0.035	○
1880953	16 EL 20 W	20	16	0.375	0.031	0.035	○
1880952	16 EL 19 W	19	16	0.375	0.031	0.039	○
1880951	16 EL 18 W	18	16	0.375	0.031	0.039	○
1880950	16 EL 16 W	16	16	0.375	0.035	0.043	○
1880949	16 EL 14 W	14	16	0.375	0.039	0.047	◉
1880948	16 EL 12 W	12	16	0.375	0.043	0.055	○
1880947	16 EL 11 W	11	16	0.375	0.043	0.059	○
1880946	16 EL 10 W	10	16	0.375	0.043	0.059	○
1880945	16 EL 9 W	9	16	0.375	0.047	0.067	○
1880944	16 EL 8 W	8	16	0.375	0.047	0.059	○
1880956	22 EL 7 W	7	22	0.500	0.063	0.091	○
1880957	22 EL 6 W	6	22	0.500	0.063	0.091	○
1880958	22 EL 5 W	5	22	0.500	0.067	0.094	○
1882145	27 EL 4.5 W	4.5	27	0.625	0.071	0.102	○
1882149	27 EL 4 W	4	27	0.625	0.079	0.114	○

◉ 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

WITHWORTH FOR BSW, BSF, BSP, B.S.84: 1956, DIN 259, ISO 228-1:1994

Internal

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1882203	06 IR 26 W	26	06	0.157	0.028	0.024	○
1882207	06 IR 22 W	22	06	0.157	0.024	0.024	○
1883760	06 IR 20 W	20	06	0.157	0.024	0.028	○
1882211	06 IR 18 W	18	06	0.157	0.024	0.028	○
1882213	08 IR 28 W	28	08	0.197	0.024	0.024	○
1882217	08 IR 24 W	24	08	0.197	0.024	0.024	○
1882219	08 IR 20 W	20	08	0.197	0.024	0.028	○
1882221	08 IR 19 W	19	08	0.197	0.024	0.028	○
1882223	08 IR 18 W	18	08	0.197	0.024	0.028	○
1882225	08 IR 16 W	16	08	0.197	0.024	0.028	○
1882227	11 IR 72 W	72	11	0.250	0.028	0.016	○
1882229	11 IR 60 W	60	11	0.250	0.028	0.016	○
1882231	11 IR 56 W	56	11	0.250	0.028	0.016	○
1882233	11 IR 48 W	48	11	0.250	0.024	0.024	○
1882235	11 IR 40 W	40	11	0.250	0.024	0.024	○
1883761	11 IR 36 W	36	11	0.250	0.024	0.024	○
1882237	11 IR 32 W	32	11	0.250	0.024	0.024	○
1880972	11 IR 28 W	28	11	0.250	0.024	0.028	○
1882239	11 IR 26 W	26	11	0.250	0.028	0.028	○
1880971	11 IR 24 W	24	11	0.250	0.028	0.031	○
1883762	11 IR 22 W	22	11	0.250	0.031	0.035	○
1880970	11 IR 20 W	20	11	0.250	0.031	0.035	○
1880005	11 IR 19 W	19	11	0.250	0.031	0.039	○
1880968	11 IR 18 W	18	11	0.250	0.031	0.039	◈
1880967	11 IR 16 W	16	11	0.250	0.035	0.043	○
1880004	11 IR 14 W	14	11	0.250	0.035	0.043	◈
1883763	11 IR 12 W	12	11	0.250	0.039	0.043	○
1883764	11 IR 11 W	11	11	0.250	0.035	0.047	○
1882241	16 IR 72 W	72	16	0.375	0.028	0.016	○
1882498	16 IR 60 W	60	16	0.375	0.028	0.016	○
1882244	16 IR 56 W	56	16	0.375	0.028	0.016	○
1882246	16 IR 48 W	48	16	0.375	0.024	0.024	○
1882248	16 IR 40 W	40	16	0.375	0.024	0.024	○
1882250	16 IR 36 W	36	16	0.375	0.024	0.024	○
1882252	16 IR 32 W	32	16	0.375	0.024	0.024	○
1880965	16 IR 28 W	28	16	0.375	0.024	0.028	◈
1882254	16 IR 26 W	26	16	0.375	0.024	0.028	○
1880964	16 IR 24 W	24	16	0.375	0.028	0.031	○
1882256	16 IR 22 W	22	16	0.375	0.031	0.035	○
1880963	16 IR 20 W	20	16	0.375	0.031	0.035	◈
1880608	16 IR 19 W	19	16	0.375	0.031	0.039	◈
1880962	16 IR 18 W	18	16	0.375	0.031	0.039	◈
1880610	16 IR 16 W	16	16	0.375	0.035	0.043	◈
1880035	16 IR 14 W	14	16	0.375	0.039	0.047	◈
1880612	16 IR 12 W	12	16	0.375	0.043	0.055	◈
1880031	16 IR 11 W	11	16	0.375	0.043	0.059	◈

◈ 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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Internal

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1880615	16 IR 10 W	10	16	0.375	0.043	0.059	○
1882258	16 IR 9 W	9	16	0.375	0.047	0.067	○
1880672	16 IR 8 W	8	16	0.375	0.047	0.059	◎
1880959	22 IR 7 W	7	22	0.500	0.063	0.091	○
1880960	22 IR 6 W	6	22	0.500	0.063	0.091	◎
1880961	22 IR 5 W	5	22	0.500	0.067	0.094	○
1882259	27 IR 4.5 W	4.5	27	0.625	0.071	0.102	○
1882261	27 IR 4 W	4	27	0.625	0.079	0.114	○
1882204	06 IL 26 W	26	06	0.157	0.028	0.024	○
1882208	06 IL 22 W	22	06	0.157	0.024	0.024	○
1883765	06 IL 20 W	20	06	0.157	0.024	0.028	○
1882212	06 IL 18 W	18	06	0.157	0.024	0.028	○
1882214	08 IL 28 W	28	08	0.197	0.028	0.028	○
1882218	08 IL 24 W	24	08	0.197	0.028	0.028	○
1882220	08 IL 20 W	20	08	0.197	0.028	0.028	○
1882222	08 IL 19 W	19	08	0.197	0.028	0.028	○
1882224	08 IL 18 W	18	08	0.197	0.028	0.028	○
1882226	08 IL 16 W	16	08	0.197	0.028	0.028	○
1882228	11 IL 72 W	72	11	0.250	0.028	0.016	○
1882230	11 IL 60 W	60	11	0.250	0.028	0.016	○
1882232	11 IL 56 W	56	11	0.250	0.028	0.016	○
1882234	11 IL 48 W	48	11	0.250	0.024	0.024	○
1882236	11 IL 40 W	40	11	0.250	0.024	0.024	○
1883766	11 IL 36 W	36	11	0.250	0.024	0.024	○
1882238	11 IL 32 W	32	11	0.250	0.024	0.024	○
1880994	11 IL 28 W	28	11	0.250	0.024	0.028	○
1882240	11 IL 26 W	26	11	0.250	0.028	0.028	○
1880993	11 IL 24 W	24	11	0.250	0.028	0.031	○
1883767	11 IL 22 W	22	11	0.250	0.031	0.035	○
1880992	11 IL 20 W	20	11	0.250	0.031	0.035	○
1880991	11 IL 19 W	19	11	0.250	0.031	0.039	○
1880990	11 IL 18 W	18	11	0.250	0.031	0.039	○
1880989	11 IL 16 W	16	11	0.250	0.035	0.043	○
1880988	11 IL 14 W	14	11	0.250	0.035	0.043	○
1883768	11 IL 12 W	12	11	0.250	0.039	0.043	○
1883769	11 IL 11 W	11	11	0.250	0.035	0.047	○
1882242	16 IL 72 W	72	16	0.375	0.028	0.016	○
1882243	16 IL 60 W	60	16	0.375	0.028	0.016	○
1882245	16 IL 56 W	56	16	0.375	0.028	0.016	○
1882247	16 IL 48 W	48	16	0.375	0.024	0.024	○

◎ 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

WITHWORTH FOR BSW, BSF, BSP, B.S.84: 1956, DIN 259, ISO 228-1:1994

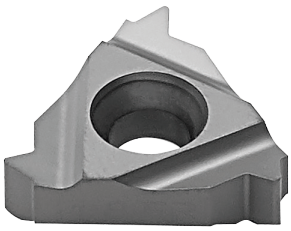
Internal

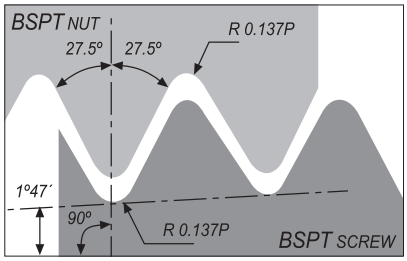
Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1882249	16 IL 40 W	40	16	0.375	0.024	0.024	○
1882251	16 IL 36 W	36	16	0.375	0.024	0.024	○
1882253	16 IL 32 W	32	16	0.375	0.024	0.024	○
1880987	16 IL 28 W	28	16	0.375	0.024	0.028	○
1882255	16 IL 26 W	26	16	0.375	0.024	0.028	○
1880986	16 IL 24 W	24	16	0.375	0.028	0.031	○
1882257	16 IL 22 W	22	16	0.375	0.031	0.035	○
1880985	16 IL 20 W	20	16	0.375	0.031	0.035	○
1880984	16 IL 19 W	19	16	0.375	0.031	0.039	○
1880983	16 IL 18 W	18	16	0.375	0.031	0.039	○
1880982	16 IL 16 W	16	16	0.375	0.035	0.043	○
1880981	16 IL 14 W	14	16	0.375	0.039	0.047	○
1880980	16 IL 12 W	12	16	0.375	0.043	0.055	○
1880979	16 IL 11 W	11	16	0.375	0.043	0.059	◈
1880978	16 IL 10 W	10	16	0.375	0.043	0.059	○
1880977	16 IL 9 W	9	16	0.375	0.047	0.067	○
1880976	16 IL 8 W	8	16	0.375	0.047	0.059	○
1880975	22 IL 7 W	7	22	0.500	0.063	0.091	○
1880974	22 IL 6 W	6	22	0.500	0.063	0.091	○
1880973	22 IL 5 W	5	22	0.500	0.067	0.094	○
1882260	27 IL 4.5 W	4.5	27	0.625	0.071	0.102	○
1882262	27 IL 4 W	4	27	0.625	0.079	0.114	○

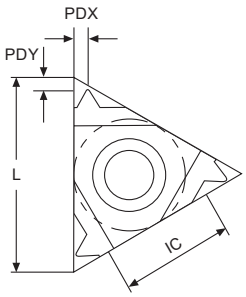
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

BSPT | B.S.21: 1985







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1880998	16 ER 28 BSPT	28	16	0.375	0.024	0.024	○
1880997	16 ER 19 BSPT	19	16	0.375	0.031	0.035	○
1880996	16 ER 14 BSPT	14	16	0.375	0.039	0.047	○
1880995	16 ER 11 BSPT	11	16	0.375	0.043	0.059	◈
1882008	16 EL 28 BSPT	28	16	0.375	0.024	0.024	○
1882001	16 EL 19 BSPT	19	16	0.375	0.031	0.035	○
1881993	16 EL 14 BSPT	14	16	0.375	0.039	0.047	○
1881989	16 EL 11 BSPT	11	16	0.375	0.043	0.059	○

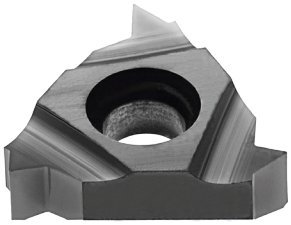
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta **Insert order code** = (1) Geometry Code + (2) Grade Code

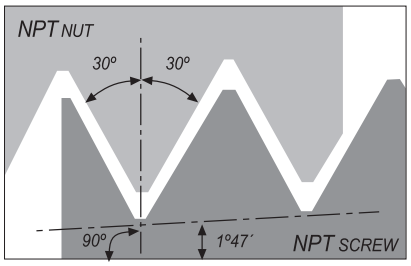
Internal

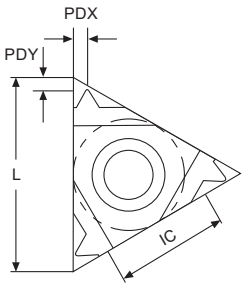
Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1881724	06 IR 28 BSPT	28	06	0.157	0.028	0.024	○
1881767	08 IR 28 BSPT	28	08	0.197	0.024	0.024	○
1881763	08 IR 19 BSPT	19	08	0.197	0.024	0.024	○
1881949	11 IR 28 BSPT	28	11	0.250	0.024	0.024	○
1881004	11 IR 19 BSPT	19	11	0.250	0.031	0.035	○
1881003	11 IR 14 BSPT	14	11	0.250	0.035	0.039	○
1883770	11 IR 11 BSPT	11	11	0.250	0.035	0.047	○
1881002	16 IR 28 BSPT	28	16	0.375	0.024	0.024	○
1881001	16 IR 19 BSPT	19	16	0.375	0.031	0.035	○
1881000	16 IR 14 BSPT	14	16	0.375	0.039	0.047	○
1880999	16 IR 11 BSPT	11	16	0.375	0.043	0.059	○
1881710	06 IL 28 BSPT	28	06	0.157	0.028	0.024	○
1881746	08 IL 28 BSPT	28	08	0.197	0.024	0.024	○
1881742	08 IL 19 BSPT	19	08	0.197	0.024	0.024	○
1881929	11 IL 28 BSPT	28	11	0.250	0.024	0.024	○
1881925	11 IL 19 BSPT	19	11	0.250	0.031	0.035	○
1881918	11 IL 14 BSPT	14	11	0.250	0.035	0.039	○
1883771	11 IL 11 BSPT	11	11	0.250	0.035	0.047	○
1882090	16 IL 28 BSPT	28	16	0.375	0.024	0.024	○
1882084	16 IL 19 BSPT	19	16	0.375	0.031	0.035	○
1882076	16 IL 14 BSPT	14	16	0.375	0.039	0.047	○
1882071	16 IL 11 BSPT	11	16	0.375	0.043	0.059	○

◈ 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

NPT | ANSI/ASME B 1.20.1-1983







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1881888	11 ER 27 NPT	27	11	0.250	0.028	0.031	○
1881875	11 ER 18 NPT	18	11	0.250	0.031	0.039	○
1881867	11 ER 14 NPT	14	11	0.250	0.031	0.039	○
1881017	16 ER 27 NPT	27	16	0.375	0.028	0.031	ⓢ
1881016	16 ER 18 NPT	18	16	0.375	0.031	0.039	ⓢ
1880013	16 ER 14 NPT	14	16	0.375	0.035	0.047	ⓢ
1880009	16 ER 11.5 NPT	11.5	16	0.375	0.043	0.059	ⓢ
1880023	16 ER 8 NPT	8	16	0.375	0.051	0.071	○
1881830	11 EL 27 NPT	27	11	0.250	0.028	0.031	○
1881817	11 EL 18 NPT	18	11	0.250	0.031	0.039	○
1881809	11 EL 14 NPT	14	11	0.250	0.031	0.039	○
1882005	16 EL 27 NPT	27	16	0.375	0.028	0.031	○
1881999	16 EL 18 NPT	18	16	0.375	0.031	0.039	○
1881994	16 EL 14 NPT	14	16	0.375	0.035	0.047	○
1881987	16 EL 11.5 NPT	11.5	16	0.375	0.043	0.059	○
1882025	16 EL 8 NPT	8	16	0.375	0.051	0.071	○

ⓢ 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

Internal

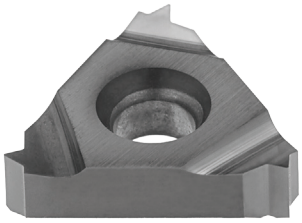
Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1881723	06 IR 27 NPT	27	06	0.157	0.024	0.024	○
1881766	08 IR 27 NPT	27	08	0.197	0.024	0.024	○
1881761	08 IR 18 NPT	18	08	0.197	0.024	0.028	○
1881946	11 IR 27 NPT	27	11	0.250	0.028	0.031	○
1881020	11 IR 18 NPT	18	11	0.250	0.031	0.039	◈
1880003	11 IR 14 NPT	14	11	0.250	0.031	0.039	◈
1881019	16 IR 27 NPT	27	16	0.375	0.028	0.031	○
1881018	16 IR 18 NPT	18	16	0.375	0.031	0.039	◈
1880033	16 IR 14 NPT	14	16	0.375	0.035	0.047	◈
1880029	16 IR 11.5 NPT	11.5	16	0.375	0.043	0.059	○
1880043	16 IR 8 NPT	8	16	0.375	0.051	0.071	○
1881709	06 IL 27 NPT	27	06	0.157	0.024	0.024	○
1881745	08 IL 27 NPT	27	08	0.197	0.024	0.024	○
1881740	08 IL 18 NPT	18	08	0.197	0.024	0.024	○
1881926	11 IL 27 NPT	27	11	0.250	0.028	0.031	○
1881923	11 IL 18 NPT	18	11	0.250	0.031	0.039	○
1881919	11 IL 14 NPT	14	11	0.250	0.031	0.039	○
1882087	16 IL 27 NPT	27	16	0.375	0.028	0.031	○
1882082	16 IL 18 NPT	18	16	0.375	0.031	0.039	○
1882077	16 IL 14 NPT	14	16	0.375	0.035	0.047	○
1882069	16 IL 11.5 NPT	11.5	16	0.375	0.043	0.059	○
1882103	16 IL 8 NPT	8	16	0.375	0.051	0.071	○

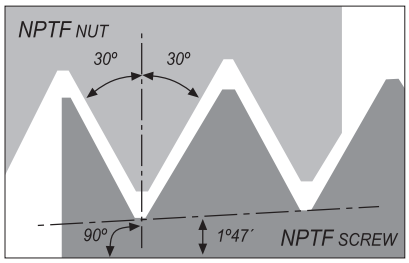
◈ Stock item | Produto de stock | Itens de stock

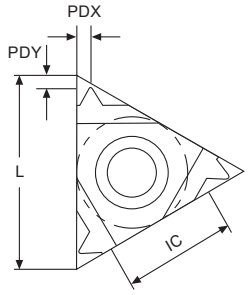
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

NPTF | ANSI B 1.20.3-1976







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1881889	11 ER 27 NPTF	27	11	0.250	0.028	0.028	○
1881876	11 ER 18 NPTF	18	11	0.250	0.031	0.039	○
1881868	11 ER 14 NPTF	14	11	0.250	0.031	0.039	○
1881030	16 ER 27 NPTF	27	16	0.375	0.028	0.028	⚙
1881029	16 ER 18 NPTF	18	16	0.375	0.031	0.039	⚙
1881028	16 ER 14 NPTF	14	16	0.375	0.035	0.047	○
1881027	16 ER 11.5 NPTF	11.5	16	0.375	0.043	0.059	○
1882057	16 ER 8 NPTF	8	16	0.375	0.051	0.071	○
1881831	11 EL 27 NPTF	27	11	0.250	0.028	0.028	○
1881818	11 EL 18 NPTF	18	11	0.250	0.031	0.039	○
1881810	11 EL 14 NPTF	14	11	0.250	0.031	0.039	○
1882006	16 EL 27 NPTF	27	16	0.375	0.028	0.031	○
1882000	16 EL 18 NPTF	18	16	0.375	0.031	0.039	○
1881995	16 EL 14 NPTF	14	16	0.375	0.035	0.047	○
1881988	16 EL 11.5 NPTF	11.5	16	0.375	0.043	0.059	○
1882026	16 EL 8 NPTF	8	16	0.375	0.051	0.071	○

⚙ 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

Internal

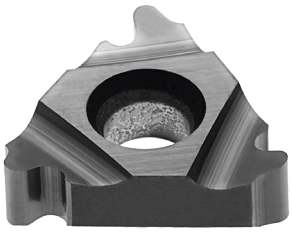
Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1883772	06 IR 27 NPTF	27	06	0.157	0.028	0.024	○
1883773	08 IR 18 NPTF	18	08	0.197	0.024	0.024	○
1883774	08 IR 14 NPTF	14	08	0.197	0.024	0.024	○
1881947	11 IR 27 NPTF	27	11	0.250	0.028	0.028	○
1881026	11 IR 18 NPTF	18	11	0.250	0.031	0.039	○
1881025	11 IR 14 NPTF	14	11	0.250	0.031	0.039	○
1881024	16 IR 27 NPTF	27	16	0.375	0.028	0.028	○
1881023	16 IR 18 NPTF	18	16	0.375	0.031	0.039	○
1881022	16 IR 14 NPTF	14	16	0.375	0.035	0.047	○
1881021	16 IR 11.5 NPTF	11.5	16	0.375	0.043	0.059	○
1882127	16 IR 8 NPTF	8	16	0.375	0.051	0.071	○
1883775	06 IL 27 NPTF	27	06	0.157	0.028	0.024	○
1883776	08 IL 18 NPTF	18	08	0.197	0.024	0.024	○
1883777	08 IL 14 NPTF	14	08	0.197	0.024	0.024	○
1881927	11 IL 27 NPTF	27	11	0.250	0.028	0.028	○
1881924	11 IL 18 NPTF	18	11	0.250	0.031	0.039	○
1881920	11 IL 14 NPTF	14	11	0.250	0.031	0.039	○
1882088	16 IL 27 NPTF	27	16	0.375	0.028	0.028	○
1882083	16 IL 18 NPTF	18	16	0.375	0.031	0.039	○
1882078	16 IL 14 NPTF	14	16	0.375	0.035	0.047	○
1882070	16 IL 11.5 NPTF	11.5	16	0.375	0.043	0.059	○
1882104	16 IL 8 NPTF	8	16	0.375	0.051	0.071	○

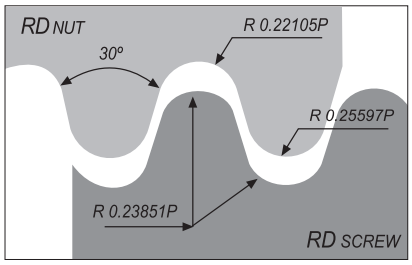
Stock item | Produto de stock | Itens de stock

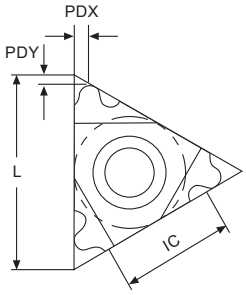
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

ROUND (DIN 405) | DIN 405:1997







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1881031	16 ER 10 RD	10	16	0.375	0.043	0.047	○
1881032	16 ER 8 RD	8	16	0.375	0.055	0.055	○
1881033	16 ER 6 RD	6	16	0.375	0.055	0.059	○
1881034	22 ER 6 RD	6	22	0.500	0.059	0.067	○
1881035	22 ER 4 RD	4	22	0.500	0.087	0.091	⊛
1882332	27 ER 4 RD	4	27	0.625	0.087	0.091	○
1882333	16 EL 10 RD	10	16	0.375	0.043	0.047	○
1882334	16 EL 8 RD	8	16	0.375	0.055	0.055	○
1882335	16 EL 6 RD	6	16	0.375	0.055	0.059	○
1882336	22 EL 6 RD	6	22	0.500	0.059	0.067	○
1882337	22 EL 4 RD	4	22	0.500	0.087	0.091	○
1882338	27 EL 4 RD	4	27	0.625	0.087	0.091	○

⊛ 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

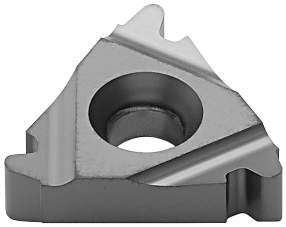
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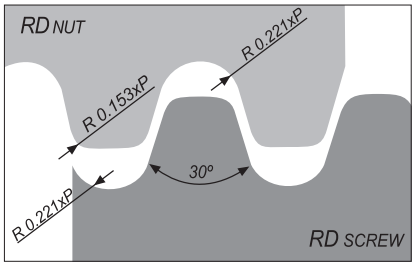
Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1881039	16 IR 10 RD	10	16	0.375	0.043	0.047	⊛
1881040	16 IR 8 RD	8	16	0.375	0.055	0.055	⊛
1881041	16 IR 6 RD	6	16	0.375	0.055	0.059	○
1881042	22 IR 6 RD	6	22	0.500	0.059	0.067	○
1881043	22 IR 4 RD	4	22	0.500	0.087	0.091	○
1882339	27 IR 4 RD	4	27	0.625	0.087	0.091	○
1882340	16 IL 10 RD	10	16	0.375	0.043	0.047	○
1882341	16 IL 8 RD	8	16	0.375	0.055	0.055	○
1882342	16 IL 6 RD	6	16	0.375	0.055	0.059	○
1882343	22 IL 6 RD	6	22	0.500	0.059	0.067	○
1882344	22 IL 4 RD	4	22	0.500	0.087	0.091	○
1882345	27 IL 4 RD	4	27	0.625	0.087	0.091	○

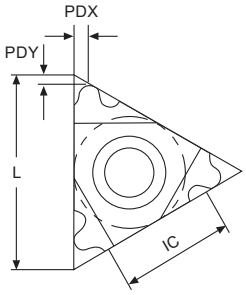
⊛ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

ROUND (DIN 20400) | DIN 20400:1990







External

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		in		IC	PDY	PDX	(68) PH6920
1882347	22 ER 4.0 RD20400	0.157	22	0.500	0.055	0.055	◈
1882348	22 ER 5.0 RD20400	0.197	22	0.500	0.067	0.071	○
1882349	22 ER 6.0 RD20400	0.236	22	0.500	0.067	0.079	○
1882351	22 EL 4.0 RD20400	0.157	22	0.500	0.055	0.055	○
1882352	22 EL 5.0 RD20400	0.197	22	0.500	0.067	0.071	○
1882353	22 EL 6.0 RD20400	0.236	22	0.500	0.067	0.079	○

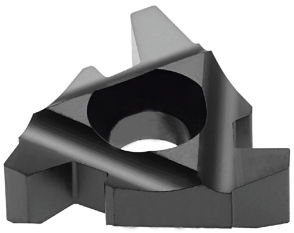
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta **Insert order code** = (1) Geometry Code + (2) Grade Code

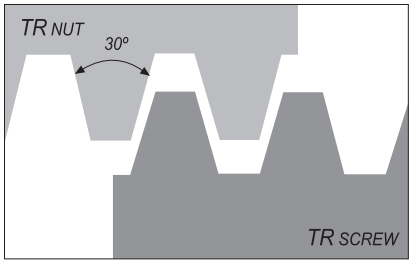
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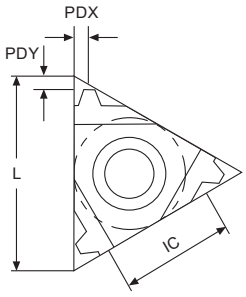
Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		in		IC	PDY	PDX	(68) PH6920
1882355	22 IR 4.0 RD20400	0.157	22	0.500	0.055	0.055	○
1882356	22 IR 5.0 RD20400	0.197	22	0.500	0.067	0.071	○
1882357	22 IR 6.0 RD20400	0.236	22	0.500	0.067	0.079	○
1882359	22 IL 4.0 RD20400	0.157	22	0.500	0.055	0.055	○
1882360	22 IL 5.0 RD20400	0.197	22	0.500	0.067	0.071	○
1882361	22 IL 6.0 RD20400	0.236	22	0.500	0.067	0.079	○

◈ 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

TRAPEZ | DIN 103:1977 | ISO 2901:1993







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		in		IC	PDY	PDX	(68) PH6920
1881044	16 ER 1.5 TR	0.059	16	0.375	0.039	0.043	○
1881045	16 ER 2.0 TR	0.079	16	0.375	0.039	0.051	◈
1881046	16 ER 3.0 TR	0.118	16	0.375	0.051	0.059	◈
1883778	16 ER 4.0 TR	0.157	16	0.375	0.051	0.059	○
1881047	22 ER 4.0 TR	0.157	22	0.500	0.071	0.075	◈
1881049	22 ER 5.0 TR	0.197	22	0.500	0.079	0.094	◈
1883779	22 ER 6.0 TR	0.236	22	0.500	0.079	0.094	○
1882165	27 ER 6.0 TR	0.236	27	0.625	0.091	0.106	○
1882166	27 ER 7.0 TR	0.276	27	0.625	0.087	0.102	○
1881050	16 EL 1.5 TR	0.059	16	0.375	0.039	0.043	○
1881051	16 EL 2.0 TR	0.079	16	0.375	0.043	0.051	○
1881052	16 EL 3.0 TR	0.118	16	0.375	0.051	0.059	○
1883780	16 EL 4.0 TR	0.157	16	0.375	0.051	0.059	○
1881053	22 EL 4.0 TR	0.157	22	0.500	0.071	0.075	○
1882130	22 EL 5.0 TR	0.197	22	0.500	0.079	0.094	○
1883781	22 EL 6.0 TR	0.236	22	0.500	0.079	0.094	○
1882152	27 EL 6.0 TR	0.236	27	0.625	0.091	0.106	○
1882153	27 EL 7.0 TR	0.276	27	0.625	0.087	0.102	○

◈ 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

Internal

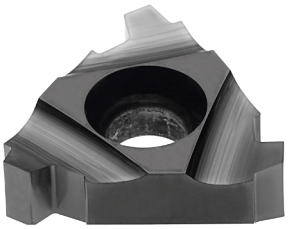
Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		in		IC	PDY	PDX	(68) PH6920
1883782	08 IR 1.5 TR	0.059	08	0.197	0.024	0.024	○
1881055	16 IR 1.5 TR	0.059	16	0.375	0.039	0.043	○
1881056	16 IR 2.0 TR	0.079	16	0.375	0.039	0.051	◈
1881057	16 IR 3.0 TR	0.118	16	0.375	0.051	0.059	◈
1882119	16 IR 4.0 TR	0.157	16	0.375	0.051	0.059	◈
1881058	22 IR 4.0 TR	0.157	22	0.500	0.071	0.075	○
1881059	22 IR 5.0 TR	0.197	22	0.500	0.079	0.094	◈
1881060	22 IR 6.0 TR	0.236	22	0.500	0.079	0.094	◈
1882187	27 IR 6.0 TR	0.236	27	0.625	0.091	0.106	◈
1882188	27 IR 7.0 TR	0.276	27	0.625	0.087	0.102	○
1883783	08 IL 1.5 TR	0.059	08	0.197	0.024	0.024	○
1881062	16 IL 2.0 TR	0.079	16	0.375	0.039	0.051	○
1881063	16 IL 3.0 TR	0.118	16	0.375	0.051	0.059	○
1882093	16 IL 4.0 TR	0.157	16	0.375	0.051	0.059	○
1881064	22 IL 4.0 TR	0.157	22	0.500	0.071	0.075	○
1881065	22 IL 5.0 TR	0.197	22	0.500	0.079	0.094	○
1881066	22 IL 6.0 TR	0.236	22	0.500	0.079	0.094	○
1882176	27 IL 6.0 TR	0.236	27	0.625	0.091	0.106	○
1882177	27 IL 7.0 TR	0.276	27	0.625	0.087	0.102	○

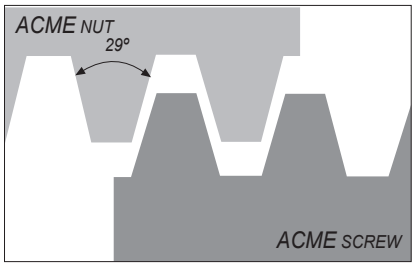
◈ Stock item | Produto de stock | Itens de stock

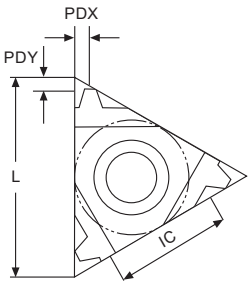
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

AMERICAN ACME | ANSI/ASME: 1.5-1988







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1881871	11 ER 16 ACME	16	11	0.250	0.035	0.039	○
1881078	16 ER 16 ACME	16	16	0.375	0.035	0.039	◈
1881077	16 ER 14 ACME	14	16	0.375	0.039	0.047	◈
1881076	16 ER 12 ACME	12	16	0.375	0.043	0.047	◈
1881075	16 ER 10 ACME	10	16	0.375	0.051	0.051	◈
1881079	16 ER 8 ACME	8	16	0.375	0.059	0.059	◈
1883784	16 ER 6 ACME	6	16	0.375	0.067	0.071	○
1881080	22 ER 6 ACME	6	22	0.500	0.071	0.083	◈
1881081	22 ER 5 ACME	5	22	0.500	0.079	0.091	○
1883826	22 ER 4 ACME	4	22	0.500	0.083	0.087	○
1882159	27 ER 4 ACME	4	27	0.625	0.091	0.106	○
1881813	11 EL 16 ACME	16	11	0.250	0.035	0.039	○
1881997	16 EL 16 ACME	16	16	0.375	0.035	0.039	○
1881992	16 EL 14 ACME	14	16	0.375	0.039	0.047	○
1881990	16 EL 12 ACME	12	16	0.375	0.043	0.047	○
1881985	16 EL 10 ACME	10	16	0.375	0.051	0.051	○
1882024	16 EL 8 ACME	8	16	0.375	0.059	0.059	○
1883827	16 EL 6 ACME	6	16	0.375	0.067	0.071	○
1882133	22 EL 6 ACME	6	22	0.500	0.071	0.083	◈
1882131	22 EL 5 ACME	5	22	0.500	0.079	0.091	◈
1883785	22 EL 4 ACME	4	22	0.500	0.083	0.087	○
1882146	27 EL 4 ACME	4	27	0.625	0.091	0.106	○

◈ 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

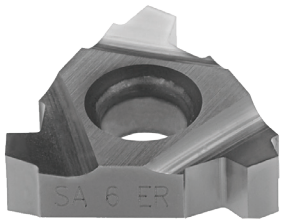
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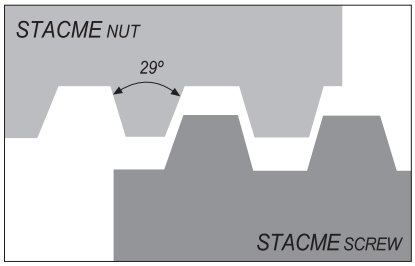
Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1883786	08 IR 16 ACME	16	08	0.197	0.024	0.024	○
1881944	11 IR 16 ACME	16	11	0.250	0.035	0.039	○
1881107	16 IR 16 ACME	16	0.9	0.375	0.039	0.043	◈
1881106	16 IR 14 ACME	14	1.0	0.375	0.047	0.047	◈
1881105	16 IR 12 ACME	12	1.1	0.375	0.047	0.047	○
1881104	16 IR 10 ACME	10	1.3	0.375	0.051	0.055	○
1881103	16 IR 8 ACME	8	1.5	0.375	0.059	0.059	○
1881885	16 IR 6 ACME	6	1.7	0.375	0.071	0.059	○
1881083	22 IR 6 ACME	6	22	0.500	0.071	0.083	◈
1881082	22 IR 5 ACME	5	22	0.500	0.079	0.091	○
1881102	22 IR 4 ACME	4	22	0.500	0.083	0.087	◈
1882182	27 IR 4 ACME	4	27	0.625	0.091	0.106	○
1883787	08 IL 16 ACME	16	08	0.197	0.024	0.024	○
1881921	11 IL 16 ACME	16	11	0.250	0.035	0.039	○
1882080	16 IL 16 ACME	16	0.9	0.375	0.039	0.043	○
1882075	16 IL 14 ACME	14	1.0	0.375	0.047	0.047	○
1882072	16 IL 12 ACME	12	1.1	0.375	0.047	0.047	○
1882067	16 IL 10 ACME	10	1.3	0.375	0.051	0.055	○
1882102	16 IL 8 ACME	8	1.5	0.375	0.059	0.059	○
1882099	16 IL 6 ACME	6	1.7	0.375	0.071	0.059	○
1882140	22 IL 6 ACME	6	22	0.500	0.071	0.083	○
1882138	22 IL 5 ACME	5	22	0.500	0.079	0.091	○
1882136	22 IL 4 ACME	4	22	0.500	0.083	0.087	○
1882171	27 IL 4 ACME	4	27	0.625	0.091	0.106	○

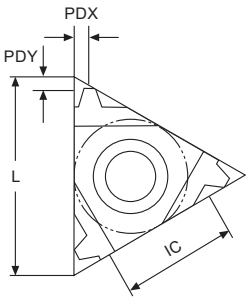
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

STUB ACME | ANSI/ASME: 1.8-1988







External

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1881872	11 ER 16 STACME	16	11	0.250	0.039	0.039	○
1881116	16 ER 16 STACME	16	16	0.375	0.039	0.039	○
1881117	16 ER 14 STACME	14	16	0.375	0.043	0.043	○
1881118	16 ER 12 STACME	12	16	0.375	0.047	0.047	⍟
1881119	16 ER 10 STACME	10	16	0.375	0.051	0.051	○
1881120	16 ER 8 STACME	8	16	0.375	0.059	0.059	⍟
1881121	16 ER 6 STACME	6	16	0.375	0.071	0.071	⍟
1882135	22 ER 6 STACME	6	22	0.500	0.071	0.083	⍟
1881122	22 ER 5 STACME	5	22	0.500	0.079	0.091	○
1881123	22 ER 4 STACME	4	22	0.500	0.091	0.094	⍟
1882160	27 ER 4 STACME	4	27	0.625	0.091	0.094	⍟
1882156	27 ER 3 STACME	3	27	0.625	0.110	0.114	○
1881814	11 EL 16 STACME	16	11	0.250	0.039	0.039	○
1881998	16 EL 16 STACME	16	16	0.375	0.039	0.039	○
1881996	16 EL 14 STACME	14	16	0.375	0.043	0.043	○
1881991	16 EL 12 STACME	12	16	0.375	0.047	0.047	○
1881986	16 EL 10 STACME	10	16	0.375	0.051	0.051	○
1882027	16 EL 8 STACME	8	16	0.375	0.059	0.059	○
1882021	16 EL 6 STACME	6	16	0.375	0.071	0.071	○
1882134	22 EL 6 STACME	6	22	0.500	0.071	0.083	○
1882132	22 EL 5 STACME	5	22	0.500	0.079	0.091	○
1881889	22 EL 4 STACME	4	22	0.500	0.091	0.094	○
1882147	27 EL 4 STACME	4	27	0.625	0.091	0.094	○
1882143	27 EL 3 STACME	3	27	0.625	0.110	0.114	○

⍟ 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

Internal

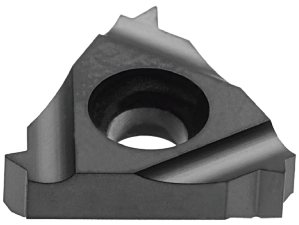
Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		IC	PDY	PDX	(68) PH6920
1883788	08 IR 16 STACME	16	08	0.197	0.024	0.024	○
1881108	16 IR 16 STACME	16	16	0.375	0.039	0.039	○
1881109	16 IR 14 STACME	14	16	0.375	0.043	0.043	○
1881110	16 IR 12 STACME	12	16	0.375	0.047	0.047	○
1881111	16 IR 10 STACME	10	16	0.375	0.051	0.051	○
1881112	16 IR 8 STACME	8	16	0.375	0.059	0.059	◈
1881113	16 IR 6 STACME	6	16	0.375	0.071	0.071	○
1882142	22 IR 6 STACME	6	22	0.500	0.071	0.083	○
1881114	22 IR 5 STACME	5	22	0.500	0.079	0.091	○
1881115	22 IR 4 STACME	4	22	0.500	0.091	0.094	○
1882183	27 IR 4 STACME	4	27	0.625	0.091	0.094	◈
1882180	27 IR 3 STACME	3	27	0.625	0.110	0.114	○
1883789	08 IL 16 STACME	16	08	0.197	0.024	0.024	○
1882081	16 IL 16 STACME	16	16	0.375	0.039	0.039	○
1882079	16 IL 14 STACME	14	16	0.375	0.043	0.043	○
1882073	16 IL 12 STACME	12	16	0.375	0.047	0.047	○
1882068	16 IL 10 STACME	10	16	0.375	0.051	0.051	○
1882105	16 IL 8 STACME	8	16	0.375	0.059	0.059	○
1882100	16 IL 6 STACME	6	16	0.375	0.071	0.071	○
1882141	22 IL 6 STACME	6	22	0.500	0.071	0.083	○
1882139	22 IL 5 STACME	5	22	0.500	0.079	0.091	○
1882137	22 IL 4 STACME	4	22	0.500	0.091	0.094	○
1882172	27 IL 4 STACME	4	27	0.625	0.091	0.094	○
1882169	27 IL 3 STACME	3	27	0.625	0.110	0.114	○

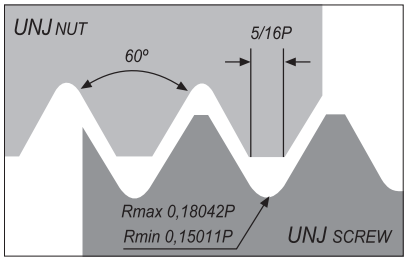
◈ Stock item | Produto de stock | Itens de stock

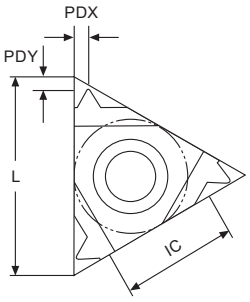
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

UNJ | MIL-S-8879A







External

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1883790	11 ER 48 UNJ	48	11	0.250	0.024	0.024	○
1883791	11 ER 44 UNJ	44	11	0.250	0.024	0.024	○
1883792	11 ER 40 UNJ	40	11	0.250	0.024	0.024	○
1883793	11 ER 36 UNJ	36	11	0.250	0.024	0.024	○
1882318	11 ER 32 UNJ	32	11	0.250	0.024	0.024	○
1882319	11 ER 28 UNJ	28	11	0.250	0.024	0.024	○
1882320	11 ER 24 UNJ	24	11	0.250	0.028	0.031	○
1882321	11 ER 20 UNJ	20	11	0.250	0.031	0.035	○
1882322	11 ER 18 UNJ	18	11	0.250	0.031	0.039	○
1882323	11 ER 16 UNJ	16	11	0.250	0.031	0.039	○
1882324	11 ER 14 UNJ	14	11	0.250	0.035	0.039	○
1883794	16 ER 48 UNJ	48	16	0.375	0.024	0.024	○
1883795	16 ER 44 UNJ	44	16	0.375	0.024	0.024	○
1883796	16 ER 40 UNJ	40	16	0.375	0.024	0.024	○
1883797	16 ER 36 UNJ	36	16	0.375	0.024	0.024	○
1881165	16 ER 32 UNJ	32	16	0.375	0.024	0.024	○
1881164	16 ER 28 UNJ	28	16	0.375	0.024	0.024	○
1881163	16 ER 24 UNJ	24	16	0.375	0.028	0.031	○
1881162	16 ER 20 UNJ	20	16	0.375	0.031	0.035	○
1881161	16 ER 18 UNJ	18	16	0.375	0.031	0.039	○
1881160	16 ER 16 UNJ	16	16	0.375	0.031	0.039	○
1881159	16 ER 14 UNJ	14	16	0.375	0.039	0.047	○
1881158	16 ER 13 UNJ	13	16	0.375	0.039	0.051	○
1881157	16 ER 12 UNJ	12	16	0.375	0.043	0.055	○
1881156	16 ER 11 UNJ	11	16	0.375	0.043	0.059	○
1881155	16 ER 10 UNJ	10	16	0.375	0.043	0.059	○
1881154	16 ER 9 UNJ	9	16	0.375	0.047	0.063	○
1881153	16 ER 8 UNJ	8	16	0.375	0.047	0.063	○
1883798	11 EL 48 UNJ	48	11	0.250	0.024	0.024	○
1883799	11 EL 44 UNJ	44	11	0.250	0.024	0.024	○
1883800	11 EL 40 UNJ	40	11	0.250	0.024	0.024	○
1883801	11 EL 36 UNJ	36	11	0.250	0.024	0.024	○
1882325	11 EL 32 UNJ	32	11	0.250	0.024	0.024	○
1882326	11 EL 28 UNJ	28	11	0.250	0.024	0.024	○
1882327	11 EL 24 UNJ	24	11	0.250	0.028	0.031	○
1882328	11 EL 20 UNJ	20	11	0.250	0.031	0.035	○

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

palbit

External

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1882329	11 EL 18 UNJ	18	11	0.250	0.031	0.039	○
1882330	11 EL 16 UNJ	16	11	0.250	0.031	0.039	○
1882331	11 EL 14 UNJ	14	11	0.250	0.035	0.039	○
1883802	16 ER 48 UNJ	48	16	0.375	0.024	0.024	○
1883803	16 ER 44 UNJ	44	16	0.375	0.024	0.024	○
1883804	16 ER 40 UNJ	40	16	0.375	0.024	0.024	○
1883805	16 ER 36 UNJ	36	16	0.375	0.024	0.024	○
1881179	16 EL 32 UNJ	32	16	0.375	0.024	0.024	○
1881178	16 EL 28 UNJ	28	16	0.375	0.024	0.024	○
1881177	16 EL 24 UNJ	24	16	0.375	0.028	0.031	○
1881176	16 EL 20 UNJ	20	16	0.375	0.031	0.035	○
1881175	16 EL 18 UNJ	18	16	0.375	0.031	0.039	○
1881174	16 EL 16 UNJ	16	16	0.375	0.031	0.039	○
1881173	16 EL 14 UNJ	14	16	0.375	0.039	0.047	○
1881172	16 EL 13 UNJ	13	16	0.375	0.039	0.051	○
1881170	16 EL 12 UNJ	12	16	0.375	0.043	0.055	○
1881169	16 EL 11 UNJ	11	16	0.375	0.043	0.059	○
1881168	16 EL 10 UNJ	10	16	0.375	0.043	0.059	○
1881167	16 EL 9 UNJ	9	16	0.375	0.047	0.063	○
1881166	16 EL 8 UNJ	8	16	0.375	0.047	0.063	○

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

UNJ | MIL-S-8879A

Internal

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1883806	11 IR 48 UNJ	48	11	0.250	0.024	0.024	○
1883807	11 IR 44 UNJ	44	11	0.250	0.024	0.024	○
1883808	11 IR 40 UNJ	40	11	0.250	0.024	0.024	○
1883809	11 IR 36 UNJ	36	11	0.250	0.024	0.024	○
1881198	11 IR 32 UNJ	32	11	0.250	0.024	0.024	○
1881197	11 IR 28 UNJ	28	11	0.250	0.024	0.024	○
1881196	11 IR 24 UNJ	24	11	0.250	0.028	0.031	○
1881195	11 IR 20 UNJ	20	11	0.250	0.031	0.035	○
1881194	11 IR 18 UNJ	18	11	0.250	0.031	0.039	○
1881193	11 IR 16 UNJ	16	11	0.250	0.031	0.039	○
1881192	11 IR 14 UNJ	14	11	0.250	0.035	0.039	○
1883810	16 IR 48 UNJ	48	16	0.375	0.024	0.024	○
1883811	16 IR 44 UNJ	44	16	0.375	0.024	0.024	○
1883812	16 IR 40 UNJ	40	16	0.375	0.024	0.024	○
1883813	16 IR 36 UNJ	36	16	0.375	0.024	0.024	○
1881191	16 IR 32 UNJ	32	16	0.375	0.024	0.024	○
1881190	16 IR 28 UNJ	28	16	0.375	0.024	0.024	○
1881189	16 IR 24 UNJ	24	16	0.375	0.028	0.031	○
1881188	16 IR 20 UNJ	20	16	0.375	0.031	0.035	○
1881187	16 IR 18 UNJ	18	16	0.375	0.031	0.039	○
1881186	16 IR 16 UNJ	16	16	0.375	0.031	0.039	○
1881185	16 IR 14 UNJ	14	16	0.375	0.039	0.047	○
1883814	16 IR 13 UNJ	13	16	0.375	0.039	0.051	○
1881184	16 IR 12 UNJ	12	16	0.375	0.043	0.055	◎
1881183	16 IR 11 UNJ	11	16	0.375	0.043	0.059	○
1881182	16 IR 10 UNJ	10	16	0.375	0.043	0.059	◎
1881181	16 IR 9 UNJ	9	16	0.375	0.047	0.063	○
1881180	16 IR 8 UNJ	8	16	0.375	0.047	0.063	○
1883815	11 IL 48 UNJ	48	11	0.250	0.024	0.024	○
1883816	11 IL 44 UNJ	44	11	0.250	0.024	0.024	○
1883817	11 IL 40 UNJ	40	11	0.250	0.024	0.024	○
1883818	11 IL 36 UNJ	36	11	0.250	0.024	0.024	○
1881217	11 IL 32 UNJ	32	11	0.250	0.024	0.024	○
1881216	11 IL 28 UNJ	28	11	0.250	0.024	0.024	○
1881215	11 IL 24 UNJ	24	11	0.250	0.028	0.031	○
1881214	11 IL 20 UNJ	20	11	0.250	0.031	0.035	○
1881213	11 IL 18 UNJ	18	11	0.250	0.031	0.039	○
1881188	11 IL 16 UNJ	16	11	0.250	0.031	0.039	○
1881211	11 IL 14 UNJ	14	11	0.250	0.035	0.039	○
1883819	16 IL 48 UNJ	48	16	0.375	0.024	0.024	◎
1883820	16 IL 44 UNJ	44	16	0.375	0.024	0.024	◎
1883821	16 IL 40 UNJ	40	16	0.375	0.024	0.024	○
1883822	16 IL 36 UNJ	36	16	0.375	0.024	0.024	○
1881210	16 IL 32 UNJ	32	16	0.375	0.024	0.024	◎
1881209	16 IL 28 UNJ	28	16	0.375	0.024	0.024	○
1881208	16 IL 24 UNJ	24	16	0.375	0.028	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

palbit

Internal

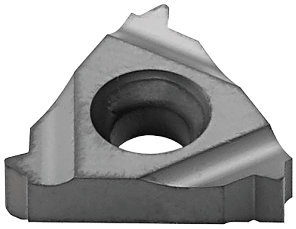
Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1881207	16 IL 20 UNJ	20	16	0.375	0.031	0.035	○
1881206	16 IL 18 UNJ	18	16	0.375	0.031	0.039	○
1881205	16 IL 16 UNJ	16	16	0.375	0.031	0.039	○
1881204	16 IL 14 UNJ	14	16	0.375	0.039	0.047	○
1883823	16 IR 13 UNJ	13	16	0.375	0.039	0.051	○
1881203	16 IL 12 UNJ	12	16	0.375	0.043	0.055	○
1881202	16 IL 11 UNJ	11	16	0.375	0.043	0.059	○
1881201	16 IL 10 UNJ	10	16	0.375	0.043	0.059	○
1881200	16 IL 9 UNJ	9	16	0.375	0.047	0.063	○
1881199	16 IL 8 UNJ	8	16	0.375	0.047	0.063	○

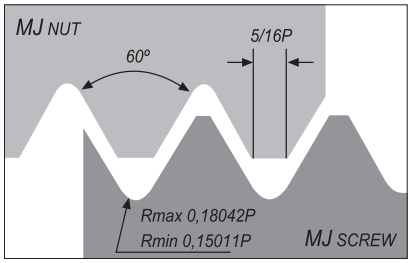
Stock item | Produto de stock | Itens de stock

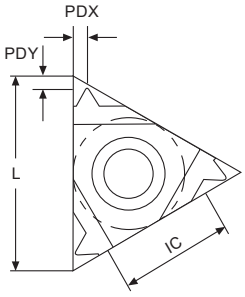
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

MJ | ISO 5855-1:1989







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		in		IC	PDY	PDX	(68) PH6920
1881067	16 ER 1.0 MJ	0.039	16	0.375	0.028	0.031	○
1881068	16 ER 1.25 MJ	0.049	16	0.375	0.031	0.035	○
1881069	16 ER 1.5 MJ	0.059	16	0.375	0.031	0.039	○
1881070	16 ER 2.0 MJ	0.079	16	0.375	0.039	0.051	◈

◈ 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

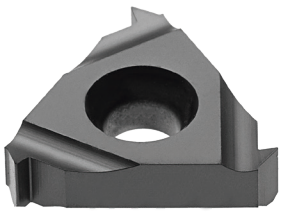
Internal

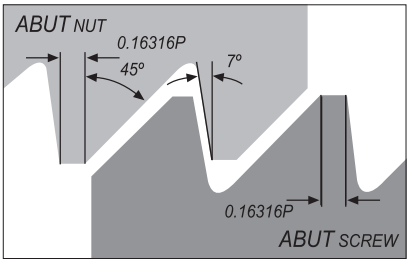
Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		in		IC	PDY	PDX	(68) PH6920
1882370	11 IR 1.0 MJ	0.039	11	0.250	0.028	0.031	○
1882371	11 IR 1.25 MJ	0.049	11	0.250	0.031	0.035	○
1882372	11 IR 1.5 MJ	0.059	11	0.250	0.031	0.039	○
1883824	11 IR 2.0 MJ	0.079	11	0.250	0.035	0.039	○
1881071	16 IR 1.0 MJ	0.039	16	0.375	0.028	0.031	○
1881072	16 IR 1.25 MJ	0.049	16	0.375	0.031	0.035	○
1881073	16 IR 1.5 MJ	0.059	16	0.375	0.031	0.039	○
1881074	16 IR 2.0 MJ	0.079	16	0.375	0.039	0.051	○

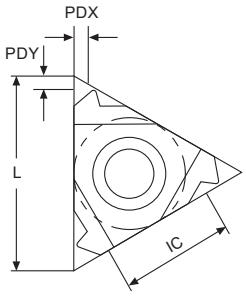
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

AMERICAN BUTTRESS | ANSI B1.9-1973







External

Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1882298	11 ER 20 ABUT	20	11	0.250	0.039	0.051	○
1882299	11 ER 16 ABUT	16	11	0.250	0.039	0.059	○
1881007	16 ER 20 ABUT	20	16	0.375	0.039	0.051	○
1880754	16 ER 16 ABUT	16	16	0.375	0.039	0.059	○
1881006	16 ER 12 ABUT	12	16	0.375	0.055	0.079	○
1881005	16 ER 10 ABUT	10	16	0.375	0.059	0.091	○
1881008	22 ER 8 ABUT	8	22	0.500	0.083	0.130	○
1881009	22 ER 6 ABUT	6	22	0.500	0.083	0.134	○
1882300	11 EL 20 ABUT	20	11	0.250	0.039	0.055	○
1882301	11 EL 16 ABUT	16	11	0.250	0.043	0.063	○
1882302	16 EL 20 ABUT	20	16	0.375	0.039	0.051	○
1882303	16 EL 16 ABUT	16	16	0.375	0.039	0.059	○
1882304	16 EL 12 ABUT	12	16	0.375	0.055	0.079	○
1882305	16 EL 10 ABUT	10	16	0.375	0.059	0.091	○
1882306	22 EL 8 ABUT	8	22	0.500	0.083	0.130	○
1882307	22 EL 6 ABUT	6	22	0.500	0.083	0.134	○

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

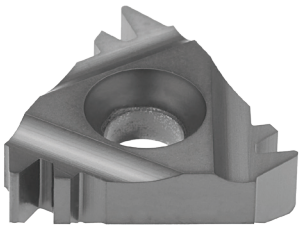
Internal

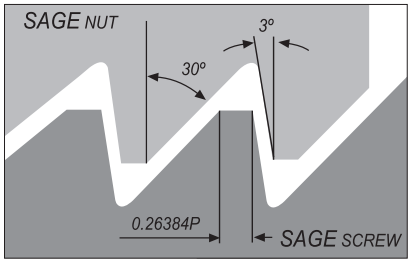
Geometry code [1]	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI		IC	PDY	PDX	(68) PH6920
1882308	11 IR 20 ABUT	20	11	0.250	0.039	0.055	○
1882309	11 IR 16 ABUT	16	11	0.250	0.043	0.063	○
1881015	16 IR 20 ABUT	20	16	0.375	0.039	0.051	○
1881014	16 IR 16 ABUT	16	16	0.375	0.039	0.059	◎
1881013	16 IR 12 ABUT	12	16	0.375	0.055	0.079	○
1881012	16 IR 10 ABUT	10	16	0.375	0.059	0.091	◎
1881011	22 IR 8 ABUT	8	22	0.500	0.083	0.130	○
1881010	22 IR 6 ABUT	6	22	0.500	0.083	0.134	○
1882310	11 IL 20 ABUT	20	11	0.250	0.039	0.055	○
1882311	11 IL 16 ABUT	16	11	0.250	0.043	0.063	○
1882312	16 IL 20 ABUT	20	16	0.375	0.039	0.051	○
1882313	16 IL 16 ABUT	16	16	0.375	0.039	0.059	○
1882314	16 IL 12 ABUT	12	16	0.375	0.055	0.079	○
1882315	16 IL 10 ABUT	10	16	0.375	0.059	0.091	○
1882316	22 IL 8 ABUT	8	22	0.500	0.083	0.130	○
1882317	22 IL 6 ABUT	6	22	0.500	0.083	0.134	○

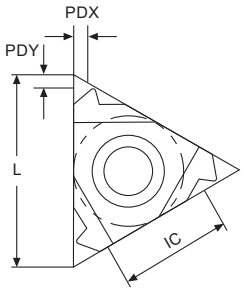
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

METRIC BUTTRESS SAGENGEWINDE (DIN 513:1985) SAW THREAD







External

Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		in		IC	PDY	PDX	(68) PH6920
1882384	16 ER 2.0 SAGE	0.079	16	0.375	0.043	0.063	○
1882385	22 ER 3.0 SAGE	0.118	22	0.500	0.059	0.094	○
1882386	22 ER 4.0 SAGE	0.157	22	0.500	0.075	0.122	◈
1882387	16 EL 2.0 SAGE	0.079	16	0.375	0.043	0.063	○
1882388	22 EL 3.0 SAGE	0.118	22	0.500	0.059	0.094	○
1882389	22 EL 4.0 SAGE	0.157	22	0.500	0.075	0.122	○

◈ 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

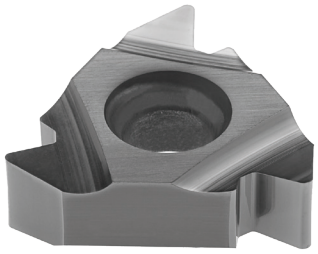
Internal

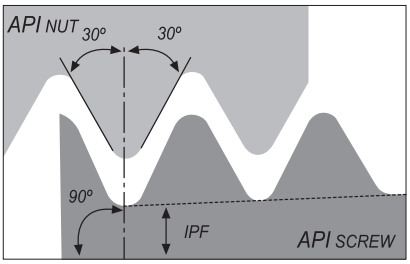
Geometry code (1)	Reference Referência Referencia	Pitch	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		in		IC	PDY	PDX	(68) PH6920
1882390	16 IR 2.0 SAGE	0.079	16	0.375	0.047	0.067	○
1882391	22 IR 3.0 SAGE	0.118	22	0.500	0.075	0.114	○
1882392	22 IR 4.0 SAGE	0.157	22	0.500	0.091	0.138	○
1882393	16 IL 2.0 SAGE	0.079	16	0.375	0.047	0.067	○
1882394	22 IL 3.0 SAGE	0.118	22	0.500	0.075	0.114	○
1882395	22 IL 4.0 SAGE	0.157	22	0.500	0.091	0.138	○

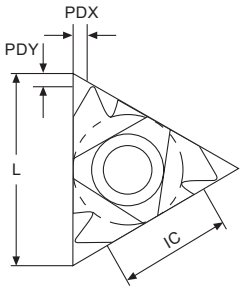
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

API | API SPEC 7:2001 (0.040 | 0.038R | 0.050)







External

Geometry code (1)	Reference Referência Referencia	Pitch	Thread	Taper	Size	L	Dimensions | Dimensões Dimensiones (in)			Stock - Grade Code (2)
		TPI		IPF			IC	PDY	PDX	(68) PH6920
1881326	22 ER 5.00 API 403	5	V-0.040	3	2 3/8" - 4 1/2" REG	22	0.500	0.071	0.098	◈
1881322	22 ER 4.00 API 382	4	V-0.038R	2	NC23-NC50	22	0.500	0.079	0.102	○
1881323	22 ER 4.00 API 383	4	V-0.038R	3	NC56-NC77	22	0.500	0.079	0.102	◈
1881324	22 ER 4.00 API 502	4	V-0.050	2	6 5/8" REG	22	0.500	0.075	0.110	○
1882396	27 ER 5.00 API 403	5	V-0.040	3	2 3/8" - 4 1/2" REG	27	0.625	0.075	0.106	○
1882397	27 ER 4.00 API 382	4	V-0.038R	2	NC23-NC50	27	0.625	0.083	0.110	○
1882398	27 ER 4.00 API 383	4	V-0.038R	3	NC56-NC77	27	0.625	0.083	0.110	○
1882399	27 ER 4.00 API 502	4	V-0.050	2	6 5/8" REG	27	0.625	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	0.625	0.079	0.118	○

◈ 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

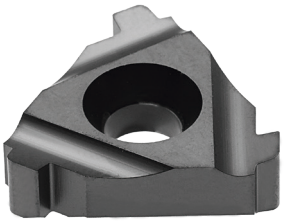
Internal

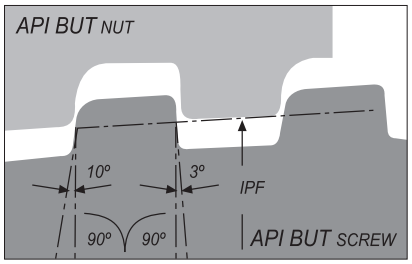
Geometry code (1)	Reference Referência Referencia	Pitch	Thread	Taper	Size	L	Dimensions | Dimensões Dimensiones (in)			Stock - Grade Code (2)
		TPI		IPF			IC	PDY	PDX	(68) PH6920
1881335	22 IR 5.00 API 403	5	V-0.040	3	2 3/8" - 4 1/2" REG	22	0.500	0.071	0.098	◈
1881331	22 IR 4.00 API 382	4	V-0.038R	2	NC23-NC50	22	0.500	0.079	0.102	○
1881333	22 IR 4.00 API 502	4	V-0.050	2	6 5/8" REG	22	0.500	0.075	0.110	○
1882401	27 IR 5.00 API 403	5	V-0.040	3	2 3/8" - 4 1/2" REG	27	0.625	0.075	0.106	○
1882402	27 IR 4.00 API 382	4	V-0.038R	2	NC23-NC50	27	0.625	0.083	0.110	○
1882403	27 IR 4.00 API 383	4	V-0.038R	3	NC56-NC77	27	0.625	0.083	0.110	○
1882404	27 IR 4.00 API 502	4	V-0.050	2	6 5/8" REG	27	0.625	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	0.625	0.079	0.118	○

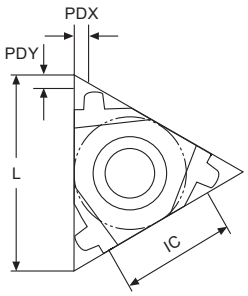
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

API | BUTTRESS CASING | API SPEC 5B:2008 | OIL THREADS







External

Geometry code [1]	Reference Referência Referencia	Pitch	Taper	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI	IPF			IC	PDY	PDX	(68) PH6920
1881327	22 ER 5 BUT 0.75	5	0.75	4 1/2" - 13 3/8"	22	0.500	0.087	0.094	◈
1881328	22 ER 5 BUT 1.00	5	1.00	16" - 20"	22	0.500	0.091	0.094	◈

◈ 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

Internal

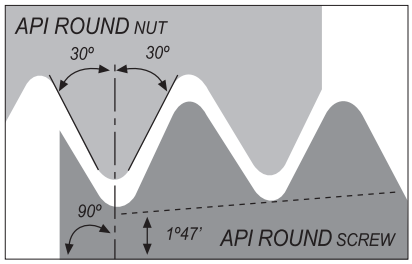
Geometry code [1]	Reference Referência Referencia	Pitch	Taper	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code [2]
		TPI	IPF			IC	PDY	PDX	(68) PH6920
1881336	22 IR 5 BUT 0.75	5	0.75	4 1/2" - 13 3/8"	22	0.500	0.087	0.094	◈
1881337	22 IR 5 BUT 1.00	5	1.00	16" - 20"	22	0.500	0.091	0.094	◈

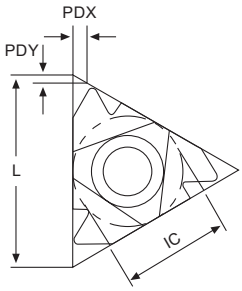
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

API ROUND CASING & TUBING | API SPEC 5B:2008







External

Geometry code (1)	Reference Referência Referencia	Pitch	Taper	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI	IPF		IC	PDY	PDX	(68) PH6920
1881318	16 ER 10 API RD	10	0.75	16	0.375	0.059	0.055	◈
1881320	16 ER 8 API RD	8	0.75	16	0.375	0.051	0.063	◈

◈ 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

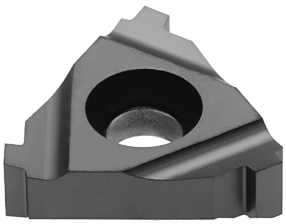
Internal

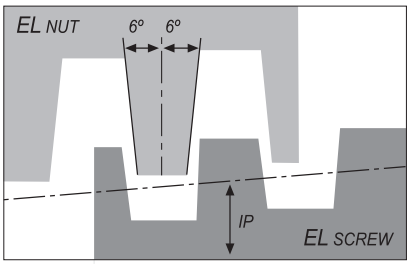
Geometry code (1)	Reference Referência Referencia	Pitch	Taper	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI	IPF		IC	PDY	PDX	(68) PH6920
1881319	16 IR 10 API RD	10	0.75	16	0.375	0.059	0.055	◈
1881321	16 IR 8 API RD	8	0.75	16	0.375	0.051	0.063	○

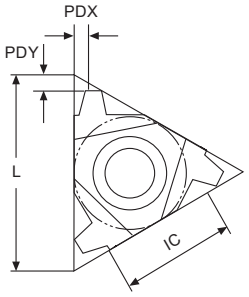
◈ Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

EXTREME LINE CASING | API SPEC 5B:2008 - OIL THREADS







External

Geometry code (1)	Reference Referência Referencia	Pitch	Taper	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI	IPF			IC	PDY	PDX	(68) PH6920
1881329	22 ER 6 EL 1.5	6	1.5	5" - 7 5/8"	22	0.500	0.075	0.075	○
1881330	22 ER 5 EL 1.25	5	1.25	8 5/8" - 10 3/4"	22	0.500	0.094	0.091	○

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

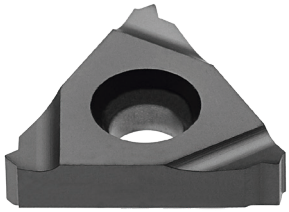
Internal

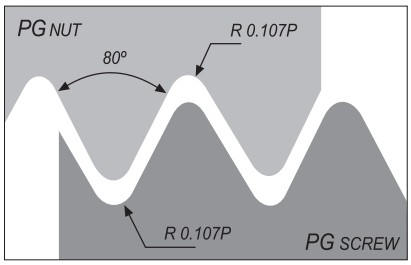
Geometry code (1)	Reference Referência Referencia	Pitch	Taper	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI	IPF			IC	PDY	PDX	(68) PH6920
1881339	22 IR 6 EL 1.5	6	1.5	5" - 7 5/8"	22	0.500	0.075	0.075	○
1881338	22 IR 5 EL 1.25	5	1.25	8 5/8" - 10 3/4"	22	0.500	0.094	0.091	○

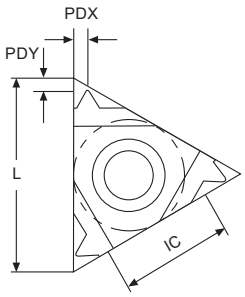
Stock item | Produto de stock | Itens de stock ○ Available under request | Disponível sobre consulta | Disponible bajo consulta

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

PG | DIN 40430; 1971







External

Geometry code (1)	Reference Referência Referencia	Pitch	Size	L	Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI			IC	PDY	PDX	(68) PH6920
1882290	16 ER 20 PG	20	PG7	16	0.375	0.028	0.031	○
1882291	16 ER 18 PG	18	PG9, PG11, PG13.5, PG16	16	0.375	0.031	0.035	⛭
1882292	16 ER 16 PG	16	PG21, PG29, PG36, PG42, PG48	16	0.375	0.031	0.039	○

⛭ 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

Internal

Geometry code (1)	Reference Referência Referencia	Pitch	Size		Dimensions | Dimensões | Dimensiones (in)			Stock - Grade Code (2)
		TPI		L	IC	PDY	PDX	(68) PH6920
1883825	08 IR 20 PG	20	PG7	8	0.197	0.024	0.028	○
1882294	11 IR 18 PG	18	PG9, PG11, PG13.5, PG16	11	0.250	0.031	0.035	⛭
1882296	16 IR 18 PG	18	PG9, PG11, PG13.5, PG16	16	0.375	0.031	0.035	○
1882297	16 IR 16 PG	16	PG21, PG29, PG36, PG42, PG48	16	0.375	0.031	0.039	⛭

⛭ 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

TANGENTIAL PROFILE INSERTS CODE KEY

Chave do codificação de pastilhas | Llave de codificación de plaquitas

Tangential Profile Example

TNMC	16	03	55	PH6920
1	2	3	4	5

1 - Insert Type
TNMC
TPMC

2 - Insert Size (LF - in)	
16	0.650
22	0.866

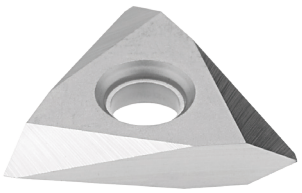
3 - Insert Size (S - in)	
03	0.125
04	0.187

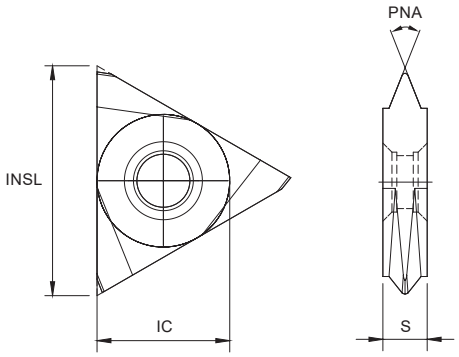
4 - Profile Angle	
55	55º
60	60º

5 - Grades
PH6920

palbit

TNMC (TANGENTIAL INSERTS)



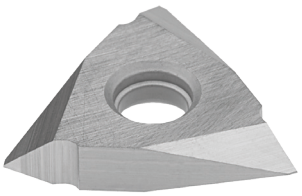


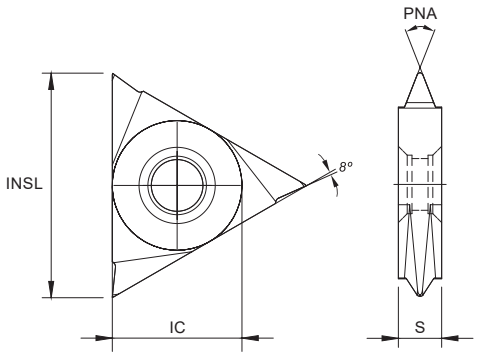
Geometry code [1]	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)			PNA	Stock - Grade Code [2]
		IC	INSL	S		(68) PH6920
1110401	TNMC 1603 55	0.375	0.650	0.125	55	○
1110402	TNMC 1603 60	0.375	0.650	0.125	60	○
1110530	TNMC 2204 55	0.500	0.866	0.187	55	○
1110404	TNMC 2204 60	0.500	0.866	0.187	60	○

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

TPMC (TANGENTIAL INSERTS)





Geometry code [1]	Reference Referência Referencia	Dimensions | Dimensões | Dimensiones (in)			PNA	Geometry code [1]
		IC	INSL	S		(68) PH6920
1110481	TPMC 1603 55	0.375	0.650	0.125	55	○
1110480	TPMC 1603 60	0.375	0.650	0.125	60	○
1110541	TPMC 2204 55	0.500	0.866	0.187	55	○
1110542	TPMC 2204 60	0.500	0.866	0.187	60	○

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



TECHNICAL DATA

THREADING TECHNICAL DATA Dados técnicos de roscagem | Datos técnicos de roscado

THREADING GRADES Graus de roscagem | Calidades para roscado



GRADES DESCRIPTION Descrição de graus | Descripción de calidades

PH7920

PH6920

P10-P35
M10-M25
K10-K30
N05-N15
S10-S30

Multi purpose PVD coated grade with good balance between wear resistance and toughness.

RECOMMENDED GRADES AND CUTTING SPEEDS (SFM)

Graus recomendados e velocidades de corte (sfm) | Calidades recomendadas y velocidades de corte (sfm)

ISO	Material	Hardness HB	Coated
			PH7(6)920
P	Unalloyed steel	130	394-656
	Low-alloyed steel	200	361-591
	High-alloy steel	240	328-558
	Steel castings	270	230-394
	Heat Treated steel	400	164-296
M	300 Stainless steel: (303,304,316)	200	230-460
	400 Stainless steel: (420,440)	240	263-394
	17-4 PH, 15-5 PH, 13-8MO PH	400	164-361
K	Grey cast iron	190	230-492
	Nodular cast iron	180	328-460
	Malleable cast iron	240	296-492
N	Wrought aluminium: (2024, 6061, 7075...)	80	328-1312
	Cast aluminium:	90	492-1312
	Copper & Copper: Brass, Bronze, Copper Silicon	100	263-591
	Non metalic: Rubber, Polypropylene, Thermoplastics (PVC), Thermoplastics, Plastics (Fiberglass), Polyamides		656-1640
S	Titanium:		
	Pure titanium: 99,0Ti		328-492
	Alpha alloys: Ti5A12.5Sn		132-197
	Beta alloys: Ti 13V11Cr3A1		99-164
	Alpha - beta alloys: Ti 6A14V		99-164
	Cobalt base alloys: Stellite		66-132
	Nikel base alloys: Inconel, Hastelloy, Waspalloy, Kovar		66-132
	High temperature alloys: Iron based: Incoloy		99-197
H	Hardened steel	56 HRc	-
	Hardened cast iron	50 HRc	-

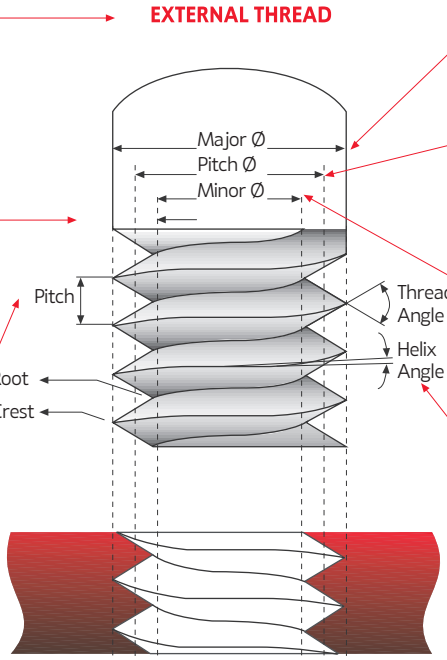
THREAD TURNING TECHNICAL DATA

THREAD TERMINOLOGY Terminologia da roscagem | Terminología del roscado

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 the reciprocal of the pitch



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.

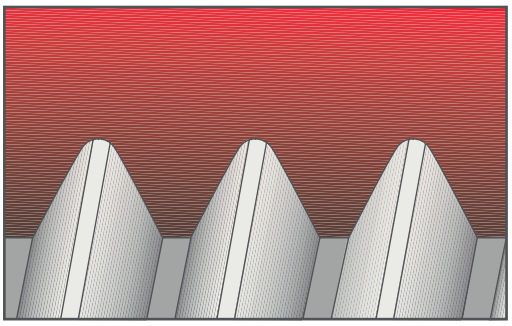
Straight Thread
A thread formed on a cylinder.

Taper Thread
A thread formed on a cone.

Nominal Diameter
The diameter from which the diameter limits are derived by the application of deviation allowances and tolerances.

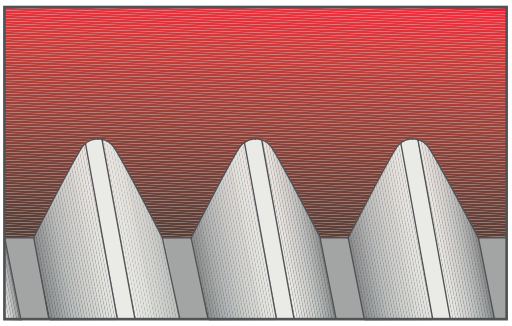
Internal Thread
A thread on the internal surface of a cylinder or cone.

LEFT-HAND THREAD



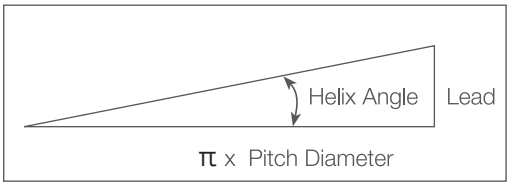
A thread which, when viewed axially, winds in a counter-clockwise and receding direction. All left-hand threads are designated LH.

RIGHT-HAND THREAD



A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right hand unless otherwise specified.

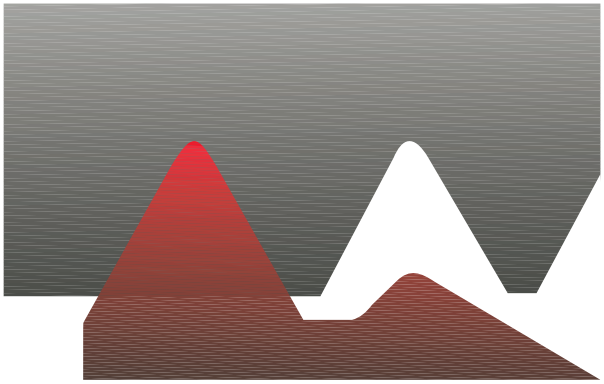
THE HELIX ANGLE



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.

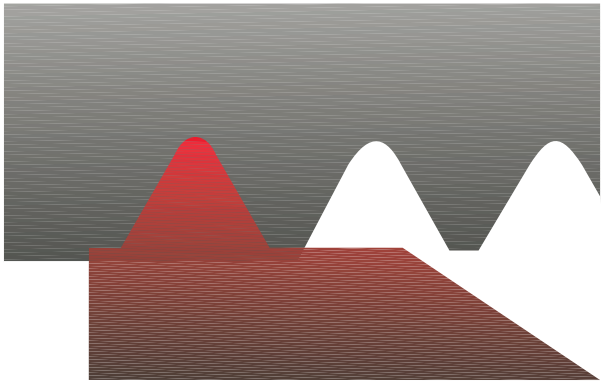
INSERT PROFILE STYLES Estilos de perfis das pastilhas | Estilos de perfiles de las plaquitas

PARTIAL PROFILE



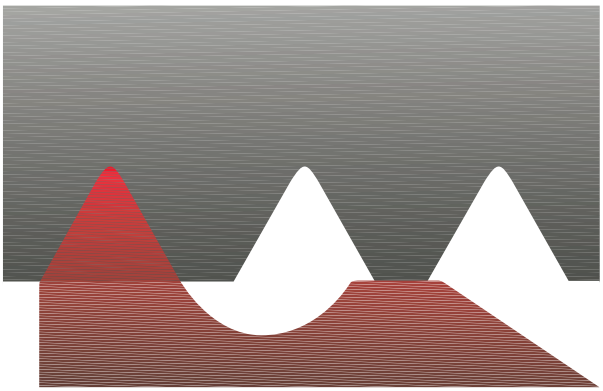
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle.

FULL PROFILE



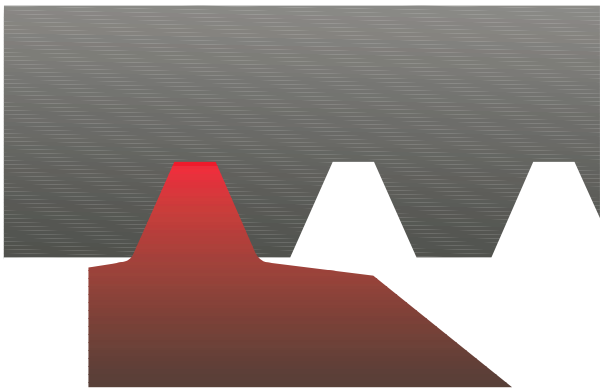
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required.

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 the second tooth.

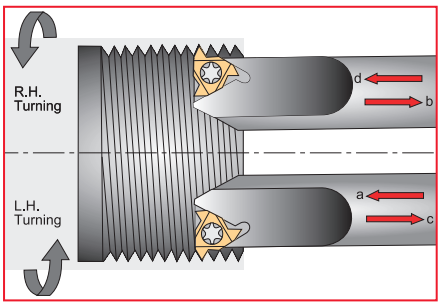
SEMI FULL

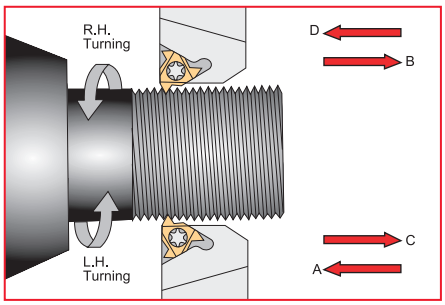


The Semi profile insert will form a complete thread including crest radius, but without topping the outer diameter.
Mainly used for trapezoidal profiles.

THREAD TURNING TECHNICAL DATA

THREAD WORK METHODS Métodos de trabalho de roscagem | Métodos de trabajo de roscado

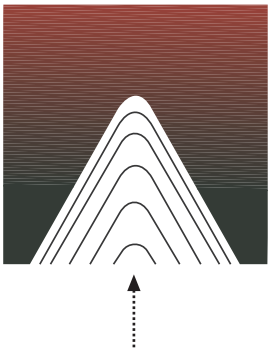




Thread	Inserts & Toolholders	Rotation	Feed Direction	Helix Method	Method
Right Hand external	EX RH	Anticlockwise	Towards chuck	Regular	A
	EX LH	Clockwise	From chuck	Reversed	B
Right Hand Internal	IN RH	Anticlockwise	Towards chuck	Regular	a
	IN LH	Clockwise	From chuck	Reversed	b
Left Hand External	EX 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

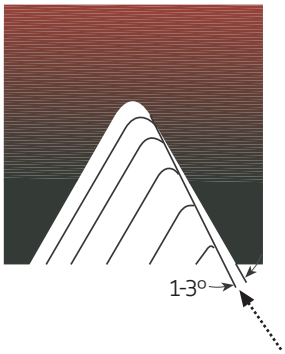
THREAD INFEED METHODS Métodos de roscagem infeed | Métodos de roscado infeed

RADIAL INFEED



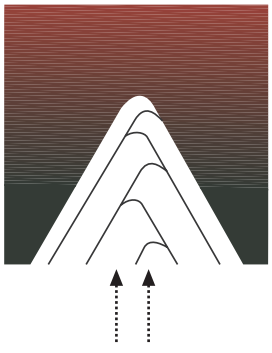
Radial infeed is the simplest and quickest method.
The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation.
Radial infeed is recommended in 3 cases:
• when the pitch is smaller than 1,5 mm, or 16 tpi.
• for short chipping materials
• for work with hardened material

FLANK INFEED (modified)



Flank infeed is recommended in the following cases:
• when the pitch is larger than 1,5 mm, or 16 tpi. With radial infeed, the cutting edge length would be too large, resulting in chatter.
• for TRAPEZ and ACME profiles. Radial infeed would result in three simultaneous cutting edges, making chip flow very difficult.

ALTERNATE FLANK INFEED

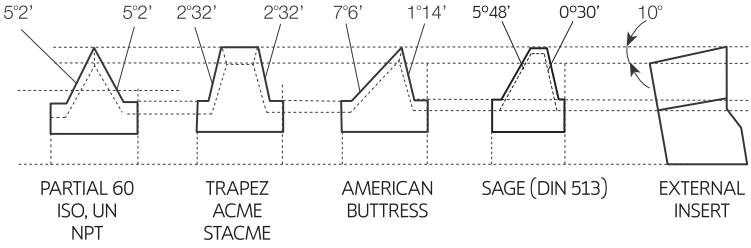


Use of the alternate flank method is recommended especially in large pitches and for long chipping materials.
This method divides the load equally on both flanks, resulting in equal wear along the cutting edges. Alternate flank infeed requires more complicated programming, and is not available on all lathes.

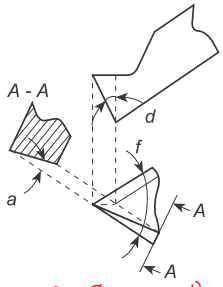
CALCULATE THE HELIX ANGLE AND CHOOSE THE RIGHT ANVIL

Calcular o ângulo de hélice e escolher o colchão adequado | Calcular el ángulo de hélice y elegir el colchón adecuado

FLANK CLEARANCE ANGLE (a)



Palbit toolholders are designed to tilt the insert when seated in the toolholder (10º for external, 15º for internal tooling). To avoid the flank face from rubbing on the workpiece, it is critical that the insert helix angle is correct - especially when threading profiles with small enclosed flank angles. This correction is provided by Palbit anvils.

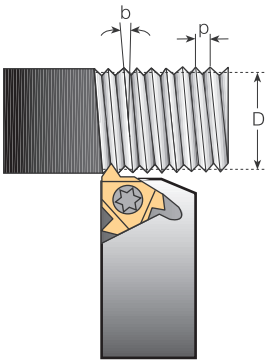


$a = \arctan(\tan Ø / 2 \times \tan d)$

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:

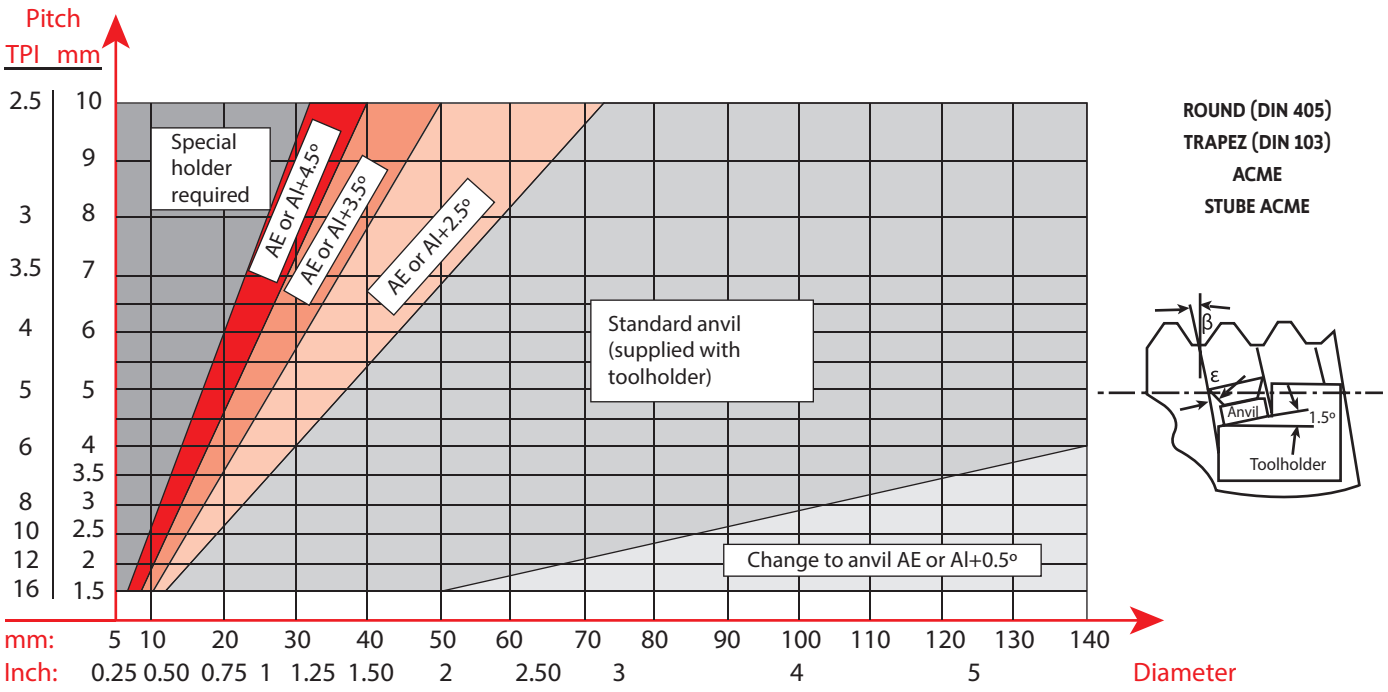
$$b = \arctan \frac{P \times N}{\pi \times D}$$

b - Helix angle (°)
P - Pitch (1/TPI)
N - No. of starts
D - Pitch diameter (mm)
Lead = P x N
TPI = Threads per inches

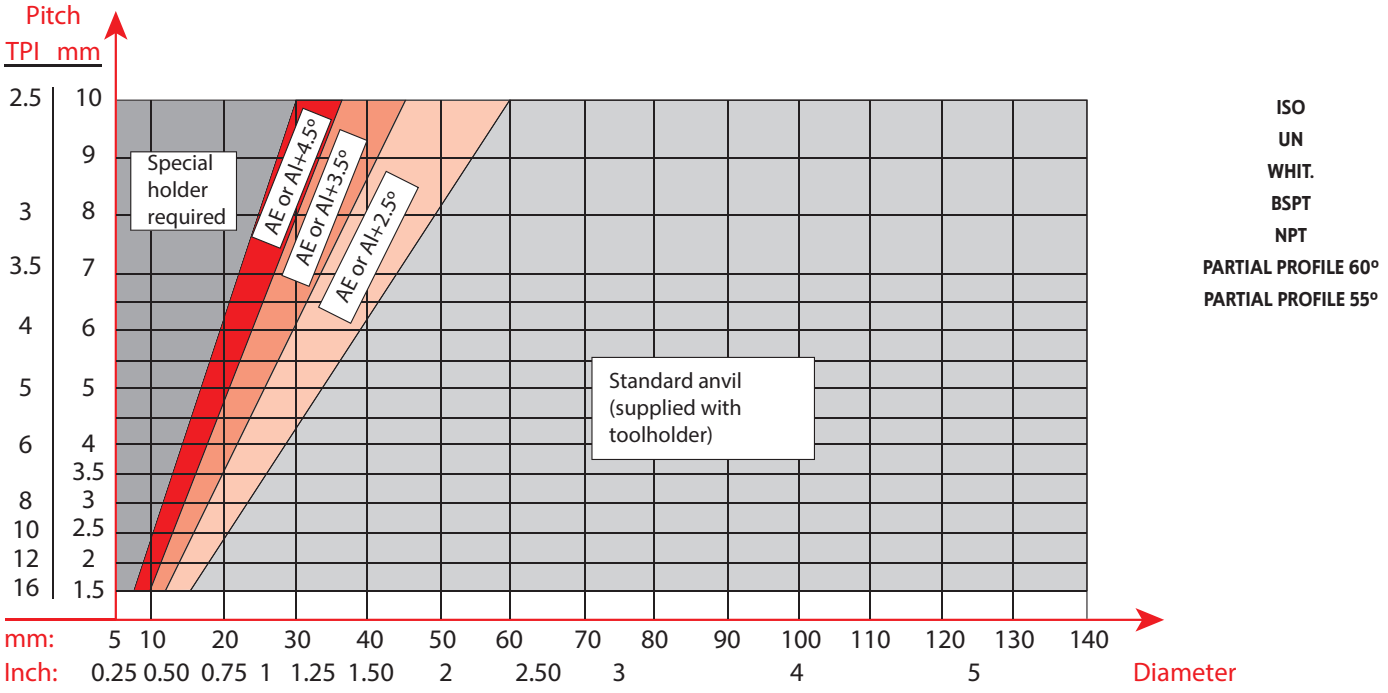
The helix angle can also be found using the diagram below

THREAD TURNING TECHNICAL DATA

The chart below represents the relation between diameter, pitch and anvil choice. When change of anvil is required, use EA anvils for ER and IL toolholders and IA anvils for IR and EL toolholders.



The majority of applications do not require an anvil change as it can be seen in the chart below. When change is required, use EA anvils for ER and IL toolholders and IA anvils for IR and EL toolholders.

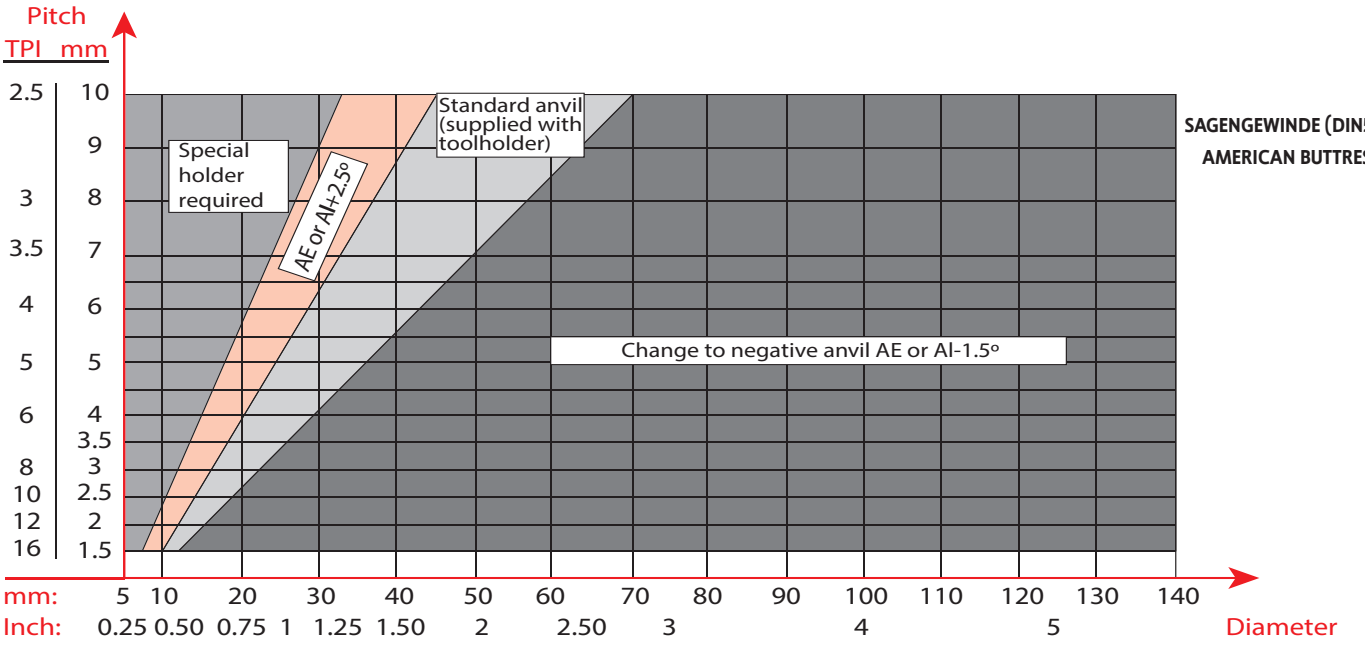


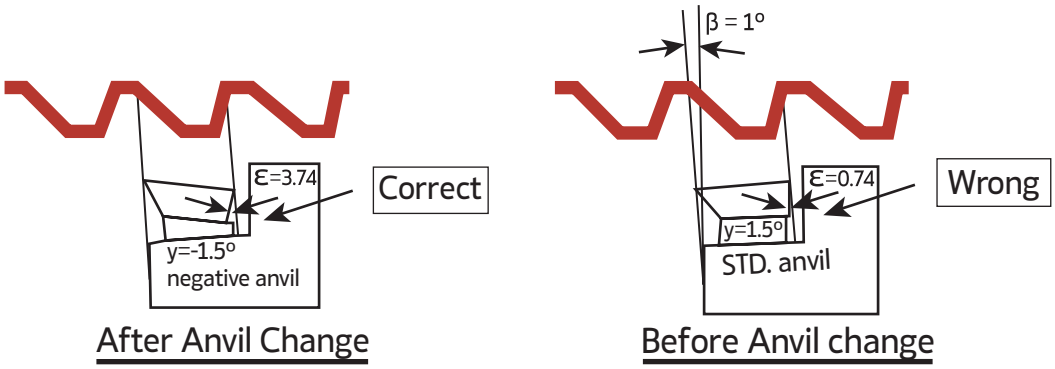
Note: ER=External Right | IR=Internal Right | EL=External Left | IL=Internal Left

THREAD TURNING TECHNICAL DATA

Dados técnicos de roscagem | Datos técnicos de roscado

The chart below shows that most applications require an anvil change. In most cases a negative anvil is required. Use EA anvils for ER and IL toolholders and IA anvils for IR and EL toolholders.



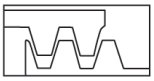
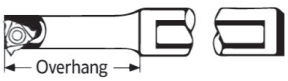
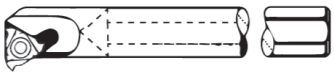


Change from a standard anvil to a negative angle anvil will eliminate the side rubbing.

Note: ER=External Right | IR=Internal Right | EL=External Left | IL=Internal Left

THREAD TURNING TECHNICAL DATA

CUTTING CONDITIONS DEPENDS ON Condições de corte dependem de | Las condiciones de corte dependen de

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	

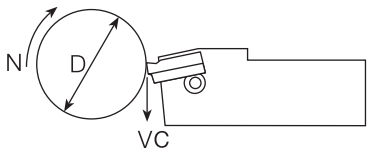
NUMBER OF CUTTING PASSES Número de passos de corte | Número de pasos de corte

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
	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

CALCULATE THE N (RPM) Calcular o N (rpm) | Calcular el N (rpm)

$$N = \frac{1000 \times VC}{\pi \times D}$$

$$VC = \frac{N \times \pi \times D}{1000}$$



N - Revolution Per Minute [RPM]
VC - Cutting Speed [m/min]
D - Workpiece Diameter [mm]

ANVILS Colchões | Colchones

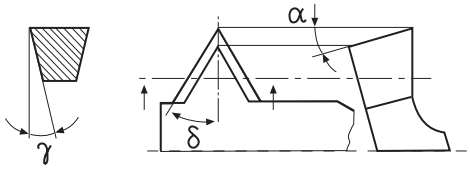
Insert Size		Holder Type	Resultant Helix Angle							
IC	L (mm)		4.5	3.5	2.5	1.5 standard	0.5	0	-0.5	-1.5
3,8"	16	ER/IL	EA16 +4.5	EA16 +3.5	EA16 +2.5	EA16	EA16 +0.5	EA16 0.0	EA16 -0.5	EA16 -1.5
		EL/IR	IA16 +4.5	IA16 +3.5	IA16 +2.5	IA16	IA16 +0.5	IA16 0.0	IA16 -0.5	IA16 -1.5
1/2"	22	ER/IL	EA22 +4.5	EA22 +3.5	EA22 +2.5	EA22	EA22 +0.5	EA22 0.0	EA22 -0.5	EA22 -1.5
		EL/IR	IA22 +4.5	IA22 +3.5	IA22 +2.5	IA22	IA22 +0.5	IA22 0.0	IA22 -0.5	IA22 -1.5
5/8"	27	ER/IL	EA27 +4.5	EA27 +3.5	EA27 +2.5	EA27	EA27 +0.5	EA27 0.0	EA27 -0.5	EA27 -1.5
		EL/IR	IA27 +4.5	IA27 +3.5	IA27 +2.5	IA27	IA27 +0.5	IA27 0.0	IA27 -0.5	IA27 -1.5

FLANK CLEARANCE ANGLE - γ

$\gamma = tg\ -1[tg\alpha \times tg\delta]$

α = **10° for external**

α = **15° for internal**



THREAD TURNING TECHNICAL DATA RECOMMENDED N° OF PASSES

ISO METRIC EXTERNAL THREAD

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	0.45	0.43	0.42	0.39	0.34	0.34	0.27	0.26	0.24	0.23	0.23	0.20	0.19	0.17	0.11	0.10
2	0.37	0.36	0.37	0.33	0.30	0.31	0.23	0.22	0.23	0.21	0.21	0.18	0.16	0.15	0.09	0.08
3	0.33	0.31	0.31	0.29	0.25	0.24	0.20	0.20	0.19	0.16	0.18	0.14	0.13	0.11	0.08	0.06
4	0.28	0.27	0.28	0.25	0.21	0.20	0.18	0.17	0.17	0.14	0.16	0.12	0.10	0.06	0.06	
5	0.26	0.25	0.25	0.23	0.19	0.19	0.17	0.16	0.15	0.12	0.11	0.10	0.06			
6	0.24	0.23	0.23	0.20	0.18	0.17	0.16	0.14	0.12	0.10	0.06	0.06				
7	0.23	0.22	0.21	0.19	0.16	0.16	0.15	0.13	0.10	0.08						
8	0.22	0.20	0.20	0.18	0.15	0.15	0.13	0.12	0.06	0.06						
9	0.20	0.19	0.19	0.16	0.15	0.14	0.12	0.10								
10	0.19	0.18	0.18	0.15	0.14	0.12	0.11	0.06								
11	0.18	0.17	0.16	0.14	0.13	0.10	0.09									
12	0.17	0.16	0.14	0.12	0.12	0.06	0.06									
13	0.16	0.15	0.10	0.10	0.10											
14	0.14	0.12	0.06	0.06	0.06											
15	0.13	0.10														
16	0.10	0.06														
17	0.06															
18																
Total	3.71	3.40	3.10	2.79	2.48	2.18	1.87	1.56	1.26	1.10	0.95	0.80	0.64	0.49	0.34	0.24

ISO METRIC INTERNAL THREAD

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	0.44	0.43	0.42	0.36	0.32	0.32	0.25	0.25	0.23	0.22	0.22	0.19	0.18	0.16	0.10	0.09
2	0.36	0.34	0.37	0.32	0.27	0.29	0.22	0.21	0.21	0.20	0.20	0.16	0.15	0.14	0.09	0.08
3	0.32	0.29	0.28	0.28	0.22	0.23	0.19	0.19	0.18	0.15	0.17	0.13	0.12	0.10	0.07	0.06
4	0.27	0.24	0.26	0.25	0.20	0.19	0.17	0.16	0.16	0.13	0.15	0.11	0.10	0.06	0.06	
5	0.25	0.23	0.24	0.22	0.19	0.18	0.16	0.15	0.14	0.11	0.10	0.10	0.06			
6	0.23	0.22	0.21	0.19	0.18	0.16	0.16	0.13	0.11	0.09	0.06	0.06				
7	0.22	0.21	0.20	0.18	0.16	0.15	0.14	0.12	0.09	0.08						
8	0.21	0.20	0.19	0.17	0.15	0.14	0.12	0.11	0.06	0.06						
9	0.19	0.18	0.18	0.15	0.14	0.13	0.11	0.09								
10	0.17	0.16	0.16	0.14	0.14	0.11	0.10	0.06								
11	0.16	0.16	0.14	0.12	0.12	0.09	0.08									
12	0.15	0.15	0.12	0.10	0.10	0.06	0.06									
13	0.14	0.14	0.09	0.09	0.09											
14	0.13	0.11	0.06	0.06	0.06											
15	0.11	0.09														
16	0.09	0.06														
17	0.06															
18																
Total	3.50	3.21	2.92	2.63	2.34	2.05	1.76	1.47	1.18	1.04	0.90	0.75	0.61	0.46	0.32	0.23

UN EXTERNAL THREAD

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	0.44	0.43	0.42	0.37	0.33	0.29	0.29	0.26	0.25	0.25	0.24	0.23	0.22	0.21	0.20	0.20	0.18	0.18	0.13
2	0.38	0.35	0.37	0.32	0.28	0.22	0.24	0.22	0.22	0.23	0.22	0.20	0.20	0.19	0.16	0.17	0.15	0.16	0.09
3	0.33	0.30	0.32	0.27	0.23	0.20	0.23	0.20	0.19	0.20	0.18	0.18	0.18	0.17	0.15	0.14	0.11	0.12	0.07
4	0.29	0.28	0.27	0.25	0.22	0.18	0.22	0.17	0.17	0.18	0.16	0.14	0.14	0.16	0.13	0.11	0.09	0.06	0.06
5	0.27	0.26	0.26	0.24	0.21	0.17	0.18	0.16	0.16	0.16	0.14	0.12	0.11	0.11	0.11	0.06	0.06		
6	0.26	0.23	0.24	0.18	0.19	0.16	0.16	0.15	0.15	0.14	0.13	0.11	0.09	0.06	0.06				
7	0.24	0.22	0.22	0.17	0.18	0.16	0.15	0.14	0.13	0.11	0.10	0.10	0.06						
8	0.23	0.21	0.20	0.16	0.15	0.15	0.12	0.12	0.12	0.06	0.06	0.06							
9	0.21	0.20	0.19	0.15	0.14	0.14	0.11	0.11	0.06										
10	0.20	0.19	0.18	0.13	0.14	0.14	0.06	0.06											
11	0.19	0.18	0.17	0.12	0.12	0.11													
12	0.18	0.17	0.14	0.10	0.06	0.06													
13	0.18	0.15	0.11	0.11															
14	0.17	0.14	0.06	0.06															
15	0.16	0.12																	
16	0.13	0.06																	
17	0.06																		
Total	3.92	3.49	3.15	2.63	2.25	1.98	1.76	1.59	1.45	1.33	1.23	1.14	1.00	0.90	0.81	0.68	0.59	0.52	0.35

UN INTERNAL THREAD

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	0.43	0.43	0.42	0.34	0.31	0.29	0.29	0.25	0.24	0.24	0.23	0.22	0.21	0.20	0.19	0.19	0.17	0.17	0.12
2	0.34	0.35	0.37	0.28	0.27	0.22	0.23	0.21	0.20	0.21	0.21	0.20	0.19	0.18	0.16	0.16	0.14	0.15	0.09
3	0.32	0.29	0.28	0.26	0.22	0.19	0.20	0.19	0.18	0.19	0.17	0.17	0.17	0.16	0.14	0.13	0.10	0.11	0.07
4	0.28	0.24	0.26	0.22	0.20	0.17	0.20	0.16	0.16	0.17	0.15	0.13	0.13	0.15	0.11	0.10	0.08	0.06	0.06
5	0.26	0.23	0.24	0.21	0.19	0.16	0.16	0.15	0.15	0.15	0.13	0.11	0.10	0.09	0.10	0.06	0.06		
6	0.25	0.22	0.21	0.18	0.18	0.16	0.15	0.13	0.14	0.13	0.12	0.10	0.09	0.06	0.06				
7	0.23	0.21	0.20	0.17	0.16	0.14	0.14	0.12	0.12	0.10	0.09	0.09	0.06						
8	0.21	0.20	0.19	0.16	0.15	0.14	0.13	0.12	0.10	0.06	0.06	0.06							
9	0.20	0.19	0.18	0.15	0.14	0.13	0.11	0.11	0.06										
10	0.19	0.18	0.16	0.13	0.14	0.12	0.06	0.06											
11	0.18	0.17	0.16	0.12	0.10	0.08													
12	0.17	0.16	0.13	0.10	0.06	0.06													
13	0.16	0.14	0.10	0.09															
14	0.16	0.12	0.06	0.06															
15	0.14	0.10																	
16	0.12	0.06																	
17	0.06																		
Total	3.70	3.29	2.96	2.47	2.12	1.86	1.67	1.50	1.35	1.25	1.16	1.08	0.95	0.84	0.76	0.64	0.55	0.49	0.34

THREAD TURNING TECHNICAL DATA RECOMMENDED N° OF PASSES

W. EXTERNAL THREAD

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	0.45	0.44	0.43	0.38	0.34	0.30	0.28	0.27	0.26	0.26	0.24	0.22	0.24	0.22	0.21	0.20	0.18	0.19	0.16
2	0.40	0.36	0.38	0.33	0.29	0.24	0.25	0.23	0.23	0.23	0.21	0.18	0.21	0.19	0.19	0.18	0.15	0.16	0.14
3	0.35	0.31	0.33	0.28	0.24	0.21	0.22	0.21	0.20	0.21	0.17	0.15	0.16	0.17	0.15	0.16	0.12	0.13	0.06
4	0.31	0.29	0.28	0.27	0.23	0.19	0.21	0.18	0.18	0.19	0.15	0.13	0.15	0.14	0.13	0.11	0.10	0.06	
5	0.28	0.27	0.27	0.25	0.22	0.18	0.20	0.17	0.17	0.17	0.14	0.12	0.11	0.11	0.10	0.06	0.06		
6	0.27	0.24	0.25	0.19	0.20	0.17	0.17	0.16	0.16	0.15	0.12	0.10	0.06	0.06	0.06				
7	0.25	0.23	0.23	0.18	0.19	0.17	0.17	0.14	0.13	0.12	0.10	0.09							
8	0.24	0.22	0.21	0.17	0.16	0.16	0.15	0.13	0.12	0.06	0.06	0.06							
9	0.22	0.21	0.20	0.16	0.15	0.14	0.13	0.11	0.06										
10	0.21	0.20	0.19	0.14	0.15	0.13	0.06	0.06											
11	0.20	0.19	0.18	0.12	0.12	0.11													
12	0.19	0.18	0.15	0.10	0.06	0.06													
13	0.18	0.16	0.12	0.11															
14	0.18	0.15	0.06	0.06															
15	0.17	0.13																	
16	0.13	0.06																	
17	0.06																		
Total	4.09	3.64	3.28	2.74	2.35	2.06	1.84	1.66	1.51	1.39	1.19	1.05	0.93	0.89	0.84	0.71	0.61	0.54	0.36

W. INTERNAL THREAD

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	0.45	0.44	0.43	0.38	0.34	0.30	0.28	0.27	0.26	0.26	0.24	0.22	0.24	0.22	0.21	0.20	0.18	0.19	0.16
2	0.40	0.36	0.38	0.33	0.29	0.24	0.25	0.23	0.23	0.23	0.21	0.18	0.21	0.19	0.19	0.18	0.15	0.16	0.14
3	0.35	0.31	0.33	0.28	0.24	0.21	0.22	0.21	0.20	0.21	0.17	0.15	0.16	0.17	0.15	0.16	0.12	0.13	0.06
4	0.31	0.29	0.28	0.27	0.23	0.19	0.21	0.18	0.18	0.19	0.15	0.13	0.15	0.14	0.13	0.11	0.10	0.06	
5	0.28	0.27	0.27	0.25	0.22	0.18	0.20	0.17	0.17	0.17	0.14	0.12	0.11	0.11	0.10	0.06	0.06		
6	0.27	0.24	0.25	0.19	0.20	0.17	0.17	0.16	0.16	0.15	0.12	0.10	0.06	0.06	0.06				
7	0.25	0.23	0.23	0.18	0.19	0.17	0.17	0.14	0.13	0.12	0.10	0.09							
8	0.24	0.22	0.21	0.17	0.16	0.16	0.15	0.13	0.12	0.06	0.06	0.06							
9	0.22	0.21	0.20	0.16	0.15	0.14	0.13	0.11	0.06										
10	0.21	0.20	0.19	0.14	0.15	0.13	0.06	0.06											
11	0.20	0.19	0.18	0.12	0.12	0.11													
12	0.19	0.18	0.15	0.10	0.06	0.06													
13	0.18	0.16	0.12	0.11															
14	0.18	0.15	0.06	0.06															
15	0.17	0.13																	
16	0.13	0.06																	
17	0.06																		
Total	4.09	3.64	3.28	2.74	2.35	2.06	1.84	1.66	1.51	1.39	1.19	1.05	0.93	0.89	0.84	0.71	0.61	0.54	0.36

THREAD TURNING TECHNICAL DATA - RECOMMENDED N° OF PASSES

Dados técnicos de roscagem - n° de passos recomendados | Datos técnicos de roscado - n° de pasos recomendados

NPT EXTERNAL & INTERNAL

No. of Passes	Pitch TPI				
	4	11.5	14	18	27
1	0.32	0.23	0.22	0.18	0.14
2	0.25	0.19	0.18	0.15	0.11
3	0.21	0.17	0.15	0.13	0.11
4	0.17	0.16	0.14	0.13	0.10
5	0.16	0.15	0.13	0.12	0.09
6	0.16	0.13	0.12	0.11	0.08
7	0.15	0.12	0.10	0.09	0.06
8	0.15	0.10	0.10	0.08	
9	0.14	0.10	0.09	0.06	
10	0.13	0.10	0.08		
11	0.13	0.09	0.06		
12	0.12	0.08			
13	0.12	0.06			
14	0.10				
15	0.08				
16	0.06				
Total	2.45	1.68	1.37	1.05	0.69

NPTF EXTERNAL & INTERNAL

No. of Passes	Pitch TPI				
	8	11.5	14	18	27
1	0.31	0.22	0.21	0.17	0.14
2	0.24	0.17	0.17	0.14	0.10
3	0.20	0.16	0.14	0.13	0.09
4	0.16	0.16	0.14	0.12	0.09
5	0.16	0.14	0.14	0.11	0.08
6	0.15	0.13	0.12	0.10	0.08
7	0.15	0.12	0.10	0.09	0.06
8	0.14	0.11	0.10	0.08	
9	0.14	0.10	0.09	0.06	
10	0.13	0.10	0.08		
11	0.13	0.09	0.06		
12	0.12	0.08			
13	0.12	0.06			
14	0.10				
15	0.08				
16	0.06				
Total	2.39	1.64	1.35	1.00	0.64

TR EXTERNAL & INTERNAL

No. of Passes	Pitch (mm)						
	7.0	6.0	5.0	4.0	3.0	2.0	1.5
1	0.38	0.36	0.34	0.32	0.31	0.30	0.24
2	0.34	0.32	0.30	0.28	0.26	0.26	0.22
3	0.28	0.28	0.25	0.23	0.23	0.22	0.17
4	0.26	0.25	0.23	0.20	0.19	0.18	0.14
5	0.25	0.24	0.22	0.19	0.19	0.16	0.12
6	0.23	0.23	0.21	0.18	0.18	0.12	0.06
7	0.22	0.22	0.19	0.17	0.15	0.06	
8	0.21	0.20	0.18	0.16	0.12		
9	0.20	0.19	0.17	0.15	0.11		
10	0.19	0.17	0.16	0.14	0.06		
11	0.19	0.16	0.14	0.12			
12	0.18	0.15	0.13	0.10			
13	0.18	0.13	0.12	0.06			
14	0.16	0.13	0.10				
15	0.16	0.12	0.06				
16	0.15	0.12					
17	0.15	0.11					
18	0.14	0.11					
19	0.12	0.06					
20	0.06						
Total	4.05	3.55	2.80	2.30	1.80	1.30	0.95

THREAD TURNING TECHNICAL DATA RECOMMENDED N° OF PASSES

ACME EXTERNAL & INTERNAL

No. of Passes	Pitch TPI							
	4	5	6	8	10	12	14	16
1	0.36	0.34	0.31	0.27	0.26	0.26	0.25	0.24
2	0.32	0.30	0.29	0.23	0.23	0.22	0.21	0.22
3	0.28	0.25	0.25	0.19	0.20	0.18	0.18	0.18
4	0.25	0.23	0.21	0.18	0.19	0.16	0.15	0.15
5	0.24	0.22	0.18	0.17	0.16	0.14	0.13	0.12
6	0.23	0.21	0.17	0.16	0.14	0.12	0.10	0.06
7	0.22	0.19	0.16	0.15	0.12	0.10	0.06	
8	0.20	0.19	0.15	0.14	0.11	0.06		
9	0.19	0.18	0.15	0.12	0.10			
10	0.17	0.17	0.14	0.12	0.06			
11	0.15	0.15	0.13	0.10				
12	0.14	0.13	0.12	0.06				
13	0.13	0.12	0.10					
14	0.12	0.10	0.06					
15	0.11	0.06						
16	0.11							
17	0.10							
18	0.10							
19	0.06							
Total	3.48	2.84	2.42	1.89	1.57	1.24	1.08	0.97

STUB ACME EXTERNAL & INTERNAL

No. of Passes	Pitch TPI							
	4	5	6	8	10	12	14	16
1	0.31	0.30	0.27	0.23	0.23	0.22	0.21	0.18
2	0.26	0.26	0.23	0.19	0.17	0.17	0.18	0.16
3	0.21	0.21	0.20	0.16	0.14	0.14	0.15	0.13
4	0.19	0.18	0.16	0.15	0.13	0.12	0.12	0.12
5	0.17	0.16	0.15	0.13	0.12	0.10	0.06	0.06
6	0.17	0.15	0.14	0.12	0.11	0.06		
7	0.16	0.15	0.13	0.11	0.10			
8	0.15	0.13	0.12	0.10	0.06			
9	0.15	0.12	0.10	0.06				
10	0.14	0.10	0.06					
11	0.13	0.06						
12	0.11							
13	0.06							
Total	2.21	1.82	1.56	1.25	1.06	0.81	0.72	0.65

UNJ EXTERNAL THREAD

No. of Passes	Pitch TPI												
	8	9	10	11	12	13	14	16	18	20	24	28	32
1	0.29	0.29	0.26	0.25	0.25	0.24	0.23	0.22	0.21	0.20	0.20	0.18	0.18
2	0.22	0.24	0.22	0.22	0.23	0.22	0.20	0.20	0.19	0.16	0.17	0.14	0.15
3	0.20	0.22	0.19	0.19	0.19	0.18	0.17	0.17	0.16	0.14	0.13	0.10	0.11
4	0.18	0.20	0.17	0.16	0.17	0.15	0.14	0.13	0.15	0.12	0.10	0.09	0.06
5	0.16	0.17	0.15	0.15	0.15	0.13	0.11	0.10	0.10	0.10	0.06	0.06	
6	0.16	0.16	0.14	0.14	0.13	0.12	0.10	0.09	0.06	0.06			
7	0.15	0.14	0.13	0.12	0.10	0.09	0.09	0.06					
8	0.14	0.12	0.11	0.11	0.06	0.06	0.06						
9	0.13	0.10	0.10	0.06									
10	0.12	0.06	0.06										
11	0.10												
12	0.06												
Total	1.91	1.70	1.53	1.40	1.28	1.19	1.10	0.97	0.87	0.78	0.66	0.57	0.50

UNJ INTERNAL THREAD

No. of Passes	Pitch TPI												
	8	9	10	11	12	13	14	16	18	20	24	28	32
1	0.29	0.29	0.26	0.25	0.25	0.24	0.23	0.22	0.21	0.20	0.20	0.18	0.18
2	0.22	0.24	0.22	0.22	0.23	0.22	0.20	0.20	0.19	0.16	0.17	0.14	0.15
3	0.20	0.22	0.19	0.19	0.19	0.18	0.17	0.17	0.16	0.14	0.13	0.10	0.11
4	0.18	0.20	0.17	0.16	0.17	0.15	0.14	0.13	0.15	0.12	0.10	0.09	0.06
5	0.16	0.17	0.15	0.15	0.15	0.13	0.11	0.10	0.10	0.10	0.06	0.06	
6	0.16	0.16	0.14	0.14	0.13	0.12	0.10	0.09	0.06	0.06			
7	0.15	0.14	0.13	0.12	0.10	0.09	0.09	0.06					
8	0.14	0.12	0.11	0.11	0.06	0.06	0.06						
9	0.13	0.10	0.10	0.06									
10	0.12	0.06	0.06										
11	0.10												
12	0.06												
Total	1.91	1.70	1.53	1.40	1.28	1.19	1.10	0.97	0.87	0.78	0.66	0.57	0.50

THREAD TURNING TECHNICAL DATA RECOMMENDED N° OF PASSES

MJ INTERNAL THREAD

No. of Passes	Pitch (mm)					
	1.0	1.25	1.5	2.0	2.5	3.0
1	0.16	0.17	0.22	0.23	0.24	0.24
2	0.13	0.14	0.19	0.21	0.21	0.20
3	0.11	0.12	0.14	0.18	0.18	0.18
4	0.09	0.10	0.11	0.16	0.16	0.17
5	0.06	0.09	0.09	0.14	0.14	0.16
6		0.06	0.06	0.10	0.13	0.15
7				0.06	0.12	0.13
8					0.10	0.12
9					0.06	0.10
10						0.09
11						0.06
12						
Total	0.55	0.68	0.81	1.08	1.34	1.60

MJ EXTERNAL THREAD

No. of Passes	Pitch (mm)					
	1.0	1.25	1.5	2.0	2.5	3.0
1	0.18	0.18	0.22	0.23	0.25	0.26
2	0.15	0.16	0.20	0.22	0.21	0.22
3	0.13	0.14	0.18	0.18	0.19	0.19
4	0.10	0.12	0.15	0.16	0.16	0.17
5	0.06	0.10	0.11	0.14	0.15	0.16
6		0.06	0.06	0.12	0.14	0.15
7				0.10	0.13	0.14
8				0.06	0.12	0.13
9					0.10	0.12
10					0.06	0.11
11						0.09
12						0.06
Total	0.62	0.76	0.92	1.21	1.51	1.80

RD (DIN 20400) EXTERNAL & INTERNAL THREAD

No. of Passes	Pitch (mm)			
	6.0	5.0	4.0	3.0
1	0.35	0.32	0.25	0.24
2	0.33	0.28	0.24	0.23
3	0.32	0.27	0.23	0.21
4	0.31	0.26	0.22	0.20
5	0.30	0.25	0.21	0.19
6	0.29	0.24	0.20	0.18
7	0.26	0.22	0.19	0.14
8	0.23	0.20	0.18	0.11
9	0.22	0.19	0.16	0.10
10	0.19	0.16	0.14	0.09
11	0.17	0.15	0.12	0.06
12	0.15	0.13	0.10	
13	0.12	0.12	0.06	
14	0.10	0.06		
15	0.06			
Total	3.40	2.85	2.30	1.75

RD (DIN 405) EXTERNAL & INTERNAL THREAD

No. of Passes	Pitch TPI			
	4	6	8	10
1	0.35	0.25	0.24	0.23
2	0.32	0.24	0.22	0.21
3	0.31	0.22	0.20	0.19
4	0.30	0.21	0.19	0.18
5	0.29	0.20	0.18	0.16
6	0.28	0.19	0.16	0.14
7	0.25	0.18	0.14	0.11
8	0.22	0.16	0.11	0.09
9	0.21	0.15	0.10	0.06
10	0.18	0.13	0.09	
11	0.16	0.12	0.06	
12	0.13	0.11		
13	0.12	0.06		
14	0.10			
15	0.06			
Total	3.28	2.22	1.69	1.37

PG INTERNAL & EXTERNAL

No. of Passes	Pitch TPI		
	20	18	16
1	0.17	0.18	0.19
2	0.15	0.14	0.16
3	0.14	0.12	0.13
4	0.10	0.10	0.11
5	0.06	0.09	0.10
6		0.06	0.09
7			0.06
Total	0.62	0.69	0.78

AMERICAN BUTTRESS EXTERNAL & INTERNAL

No. of Passes	Pitch TPI					
	6	8	10	12	16	20
1	0.28	0.25	0.22	0.21	0.20	0.18
2	0.24	0.22	0.20	0.19	0.18	0.16
3	0.21	0.19	0.19	0.18	0.17	0.14
4	0.20	0.19	0.17	0.16	0.14	0.13
5	0.20	0.17	0.16	0.15	0.13	0.12
6	0.19	0.16	0.15	0.14	0.12	0.10
7	0.19	0.16	0.13	0.13	0.10	0.06
8	0.18	0.15	0.12	0.12	0.06	
9	0.17	0.14	0.12	0.11		
10	0.16	0.13	0.11	0.06		
11	0.15	0.12	0.10			
12	0.14	0.11	0.06			
13	0.14	0.10				
14	0.13	0.06				
15	0.12					
16	0.10					
17	0.06					
Total	2.86	2.15	1.73	1.45	1.10	0.89

THREAD TURNING TECHNICAL DATA RECOMMENDED N° OF PASSES

SAGENGEWINDE (DIN 513) EXTERNAL

No. of Passes	Pitch (mm)		
	4.0	3.0	2.0
1	0.32	0.30	0.29
2	0.30	0.28	0.26
3	0.27	0.26	0.24
4	0.25	0.24	0.19
5	0.23	0.22	0.18
6	0.21	0.21	0.17
7	0.20	0.20	0.15
8	0.19	0.18	0.14
9	0.18	0.17	0.11
10	0.17	0.15	0.06
11	0.16	0.14	
12	0.15	0.13	
13	0.15	0.11	
14	0.15	0.06	
15	0.14		
16	0.14		
17	0.13		
18	0.12		
19	0.06		
Total	3.52	2.65	1.79

SAGENGEWINDE (DIN 513) INTERNAL

No. of Passes	Pitch (mm)		
	4.0	3.0	2.0
1	0.32	0.31	0.29
2	0.30	0.29	0.27
3	0.27	0.27	0.25
4	0.24	0.24	0.21
5	0.23	0.23	0.18
6	0.21	0.22	0.16
7	0.20	0.20	0.12
8	0.19	0.19	0.06
9	0.18	0.16	
10	0.17	0.13	
11	0.16	0.06	
12	0.15		
13	0.14		
14	0.13		
15	0.10		
16	0.06		
Total	3.05	2.30	1.54

API EXTERNAL & INTERNAL

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	0.45	0.45	0.44	0.44	0.41	0.24	0.24
2	0.38	0.38	0.39	0.39	0.36	0.22	0.22
3	0.33	0.33	0.34	0.34	0.32	0.18	0.18
4	0.30	0.30	0.31	0.31	0.28	0.14	0.14
5	0.28	0.28	0.28	0.28	0.26	0.12	0.12
6	0.24	0.24	0.26	0.26	0.24	0.12	0.12
7	0.22	0.22	0.24	0.24	0.22	0.12	0.12
8	0.20	0.20	0.23	0.23	0.20	0.10	0.10
9	0.18	0.18	0.21	0.21	0.18	0.10	0.10
10	0.14	0.14	0.19	0.19	0.14	0.10	0.10
11	0.13	0.13	0.18	0.18	0.13	0.10	0.10
12	0.12	0.12	0.16	0.16	0.12	0.06	0.06
13	0.11	0.10	0.14	0.14	0.11		
14	0.06	0.06	0.13	0.13	0.06		
15			0.12	0.12			
16			0.10	0.11			
17			0.06	0.06			
Total	3.14	3.13	3.79	3.78	3.03	1.60	1.60

API EXTERNAL & INTERNAL

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	0.23	0.25	0.25	0.25	0.25	0.25	0.25	0.25
2	0.20	0.20	0.22	0.23	0.22	0.22	0.20	0.20
3	0.16	0.17	0.20	0.21	0.20	0.20	0.17	0.17
4	0.15	0.15	0.18	0.19	0.18	0.18	0.15	0.15
5	0.13	0.14	0.15	0.16	0.16	0.16	0.14	0.14
6	0.12	0.13	0.14	0.15	0.15	0.15	0.13	0.13
7	0.11	0.12	0.13	0.14	0.14	0.14	0.12	0.12
8	0.10	0.12	0.12	0.13	0.13	0.13	0.12	0.12
9	0.06	0.10	0.11	0.12	0.12	0.12	0.10	0.10
10		0.06	0.10	0.11	0.11	0.11	0.06	0.06
11			0.10	0.11	0.11	0.11		
12			0.06	0.10	0.06	0.06		
13				0.06				
Total	1.26	1.44	1.76	1.96	1.83	1.83	1.44	1.44

THREAD TURNING TECHNICAL DATA

TAPER PIPE THREAD: NPT / ANSI/ASME B 1.20.1-1983 - INTERNAL THREAD

AMERICAN NATIONAL STANDARD TAPER PIPE THREADS

Thread Size	Dimensions | Dimensões | Dimensiones			Recommended Tools	
	Pitch TPI	Pitch (mm)	Profile Depth	Insert	Toolholder
NPT 1/16	27	0.941	0.69	06IR 27NPT	S12H SXFNR 06
NPT 1/8	27	0.941	0.69	08IR 27NPT	S16K SXFNR 08
NPT 1/4	18	1,411	1.05	08IR 18NPT	S16K SXFNR 08
NPT 3/8	18	1,411	1.05	11IR 18NPT	S10K SXFNR 11
NPT 1/2	14	1,814	1.37	16IR 14NPT	S13M SXFNR 16
NPT 3/4	14	1,814	1.37	16IR 14NPT	S16P SXFNR 16
NPT 1	11.5	2,209	1.68	16IR 11.5NPT	S20P SXFNR 16
NPT 1 1/4	11.5	2,209	1.68	16IR 11.5NPT	S25R SXFNR 16
NPT 1 1/2	11.5	2,209	1.68	16IR 11.5NPT	S32S SXFNR 16
NPT 2	11.5	2,209	1.68	16IR 11.5NPT	S32S SXFNR 16
NPT 2 1/2	8	3,175	2.45	16IR 8NPT	S40T SXFNR 16
NPT 3	8	3,175	2.45	16IR 8NPT	S40T SXFNR 16
NPT 3 1/2	8	3,175	2.45	16IR 8NPT	S40T SXFNR 16
NPT 4	8	3,175	2.45	16IR 8NPT	S40T SXFNR 16
NPT 5	8	3,175	2.45	16IR 8NPT	S40T SXFNR 16

TAPER PIPE THREAD: NPTF / ANSI B 1.20.3-1976 - INTERNAL THREAD

AMERICAN NATIONAL STANDARD DRYSEAL PIPE THREADS

Thread Size	Dimensions | Dimensões | Dimensiones			Recommended Tools	
	Pitch TPI	Pitch (mm)	Profile Depth	Insert	Toolholder
NPTF 1/16	27	0.941	0.64	06IR 27NPTF	S12H SXFNR 06
NPTF 1/8	27	0.941	0.64	08IR 27NPTF	S16K SXFNR 08
NPTF 1/4	18	1,411	1.00	08IR 18NPTF	S16K SXFNR 08
NPTF 3/8	18	1,411	1.00	11IR 18NPTF	S10K SXFNR 11
NPTF 1/2	14	1,814	1.35	16IR 14NPTF	S13M SXFNR 16
NPTF 3/4	14	1,814	1.35	16IR 14NPTF	S16P SXFNR 16
NPTF 1	11.5	2,209	1.64	16IR 11.5NPTF	S20P SXFNR 16
NPTF 1 1/4	11.5	2,209	1.64	16IR 11.5NPTF	S25R SXFNR 16
NPTF 1 1/2	11.5	2,209	1.64	16IR 11.5NPTF	S32S SXFNR 16
NPTF 2	11.5	2,209	1.64	16IR 11.5NPTF	S32S SXFNR 16
NPTF 2 1/2	8	3,175	2.39	16IR 08NPTF	S40T SXFNR 16
NPTF 3	8	3,175	2.39	16IR 08NPTF	S40T SXFNR 16

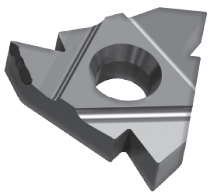
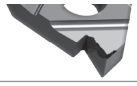
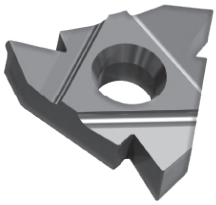
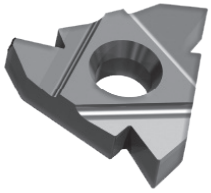
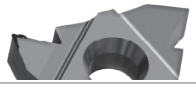
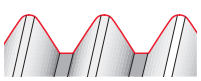
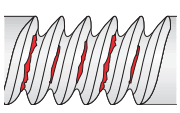
PARALLEL PIPE THREAD / BSP (G) - INTERNAL THREAD

Thread Size	Dimensions | Dimensões | Dimensiones				Recommended Tools	
	Pitch TPI	Pitch (mm)	Profile Depth	Bore Diameter	Insert	Toolholder
G1/16	28	0.907	0.581	6,561	06IR 28W	S12H SXFNR 06
G1/8	28	0.907	0.581	8,556	08IR 28W	S16K SXFNR 08
G1/4	19	1,337	0.856	11,445	08IR 19W	S16K SXFNR 08
G3/8	19	1,337	0.856	14,950	11IR 19W	S10K SXFNR 11
G1/2	14	1,814	1,162	18,631	16IR 14W	S13M SXFNR 16
G5/8	14	1,814	1,162	20,587	16IR 14W	S16P SXFNR 16
G3/4	14	1,814	1,162	24,117	16IR 14W	S16P SXFNR 16
G7/8	11	1,814	1,162	27,877	16IR 14W	S20P SXFNR 16
G1	11	2,309	1,479	30,291	16IR 11W	S20P SXFNR 16
G1 1/8	11	2,309	1,479	34,939	16IR 11W	S25R SXFNR 16
G1 1/4	11	2,309	1,479	38,952	16IR 11W	S25R SXFNR 16
G1 1/2	11	2,309	1,479	44,845	16IR 11W	S32S SXFNR 16
G1 3/4	11	2,309	1,479	50,788	16IR 11W	S32S SXFNR 16
G2	11	2,309	1,479	56,656	16IR 11W	S32S SXFNR 16

TAPER PIPE THREAD / B SPT (RC) - INTERNAL THREAD

Thread Size	Dimensions | Dimensões | Dimensiones				Recommended Tools	
	Pitch TPI	Pitch (mm)	Profile Depth	Bore Diameter	Insert	Toolholder
Rc 1/16	28	0.907	0.581	6,561	06IR 28BSPT	S12H SXFNR 06
Rc 1/8	28	0.907	0.581	8,556	08IR 28BSPT	S16K SXFNR 08
Rc 1/4	19	1,337	0.856	11,445	08IR 19BSPT	S16K SXFNR 08
Rc 3/8	19	1,337	0.856	14,950	11IR 19BSPT	S10K SXFNR 11
Rc 1/2	14	1,814	1,162	18,631	16IR 14BSPT	S13M SXFNR 16
Rc 5/8	14	1,814	1,162	20,587	16IR 14BSPT	S16P SXFNR 16
Rc 3/4	14	1,814	1,162	24,117	16IR 14BSPT	S16P SXFNR 16
Rc 7/8	14	1,814	1,162	27,877	16IR 14BSPT	S20P SXFNR 16
Rc 1	11	2,309	1,479	30,291	16IR 11BSPT	S20P SXFNR 16
Rc 1 1/8	11	2,309	1,479	34,939	16IR 11BSPT	S25R SXFNR 16
Rc 1 1/4	11	2,309	1,479	38,952	16IR 11BSPT	S25R SXFNR 16
Rc 1 1/2	11	2,309	1,479	44,845	16IR 11BSPT	S32S SXFNR 16
Rc 1 3/4	11	2,309	1,479	50,788	16IR 11BSPT	S32S SXFNR 16
Rc 2	11	2,309	1,479	56,656	16IR 11BSPT	S32S SXFNR 16

TROUBLESHOOTING

Problem | Problema	Possible Cause | Causa Possível | Causa Possible	Solution | Solução | Solucíon
Increased flank wear Desgaste da aresta Desgaste del flanco 	• Cutting speed too high • Velocidade de corte alta • Alta velocidad de corte	• Reduce cutting speed / Use coated insert • Reduza a velocidade de corte / Use uma pastilha revestida • Reducir la velocidad de corte / Utilice un inserto recubierto
	• Depth of cut too low/ too many passes • Profundidade de corte demasiado baixa / demasiados passos • Profundidad de corte demasiado baja / demasiados pasos	• Increase the depth of cut per pass • Aumente a profundidade de corte por passo • Aumento de la profundidad de corte por paso
	• Unsuitable carbide grade • Grau desajustado • Grado desajustado	• Use a coated carbide grade • Use um grau revestido • Utilice un grado recubierto
	• Insufficient cooling • Refrigeração insuficiente • Insuficiente refrigeración	• 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	• Choose the correct anvil • Escolha o ângulo correcto • Elija el ángulo correcto
	• Wrong infeed method • Método de avanço incorrecto • Método incorrecto de avance	• 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	• 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
	• Insufficient cooling • Refrigeração insuficiente • Insuficiente refrigeración	• Increase coolant flow rate • Aumente o fluxo de refrigeração • Aumentar el flujo de refrigeración
	• Cutting speed too high • Velocidade de corte alta • Alta velocidad de corte	• Reduce cutting speed • Reduza a velocidade de corte • Reducir la velocidad de corte
	• Unsuitable carbide grade • Grau não aconselhável • Grado no es aconsejable	• Use a tougher carbide • Use um grau mais macio • Usar un grado más suave
	• Nose radius too small • Raio demasiado pequeno • Radio demasiado pequeño	• 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	• 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
	• Extreme plastic deformation • Deformação plástica extrema • Deformacíon plastica extrema	• Use a tougher carbide • Use um grau mais macio • Usar un grado más suave
	• Insufficient cooling • Refrigeração insuficiente • Insuficiente refrigeración	• 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
	• Unsuitable carbide grade • Grau não aconselhável • Grado no es aconsejable	• Use a tougher carbide • Use um grau mais macio • Usar un grado más suave
	• Instability • Instabilidade • Inestabilidad	• 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	• Change the cutting speed • Altere a velocidade de corte • Cambiar la velocidad de corte
	• Unsuitable carbide grade • Grau não aconselhável • Grado no es aconsejable	• 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	• Change tool height • Altere o posicionamento em altura da ferramenta • Cambiar la posición en la altura de la herramienta
	• Insert is not machining the thread crest • A ferramenta não está posicionada correctamente • La herramienta no está colocada correctamente a cresta de la rosca	• Measure the workpiece diameter • Medir o diâmetro correcto da peça de trabalho • Medir el diámetro de la pieza de trabajo
	• Worn insert • Pastilha gasta • Inserto pasado	• 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	• Increase cutting speed • Aumente a velocidade de corte • Aumentar la velocidad de corte
	• Wrong anvil • Colchão errado • Colchón cambiado	• Choose correct anvil • Escolha um colchão mais apropriado • Elija un colchón más apropiado
	• Flank infeed method is not appropriate • Posição de avanço inapropriada • Posición de avance inadecuada	• 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

ALUMINIUM AND NON-FERROUS

ISO	PSM	Material Example	Description	R_m(N/mm²)	kcX (N/mm²)	m_c
N	10	AW7075 AlSi12 CuZn37	Aluminium alloys: Low Si Aluminium alloys: High Si Copper alloys			

HEAT RESISTANT 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.

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

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							

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

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							

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

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

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

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

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

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		

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

Material da peça - seleção de materiais Palbit, PSM | Material de la pieza - selección materiales Palbit, PSM

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
		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
			A439TypeD-5				Austenite
			A436TypeD-3A				Austenite
			A436TypeD-3				Austenite
			A436TypeD-5B				Austenite
			A439TypeD-2M				Austenite
			NicrosilalSpheronic				Austenite
			A439TypeD-4				Austenite
			A436 Type3				Austenite
			Nicrosilal				Austenite
			A436TypeD-4				Austenite

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
	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			
10	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					
	4355	AA2011					
		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						
	4244						
	4245						
	4251						
		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					

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
10	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		
	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					

WORKPIECE MATERIALS - PALBIT SELECTION MATERIALS, PSM

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
10	CuZn40Mn1	2.0572	CW723R	CuZn40Mn1			
	CuZn40Mn1Pb	2.0580	CW720R	CuZn40Mn1Pb			
	CuZn40Pb2	2.0402	CW612N	CuZn40Pb2	CuZn39Pb2		
	CuZn44Pb2	2.0410	CW622N	CuZn44Pb2			
	CuZn5	2.0220	CW500L	CuZn5		CZ136	
						CZ120	
						CZ104	
						CZ125	
11		1.4876	X2NiCrAlTi3220				
		2.4810	NiMo30				
		2.4810	NiMo30				
		2.4602					
		2.4819	NiMo16Cr15W				
		2.4610	NiMo16Cr16Ti				
		2.4619					
		2.4665	NiCr21Fe18Mo9				

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
	5168	C37800					
	5272	C68700					
C2100		C21000					
				AMPCO15			
				AMPCO18			
				AMPCO18.136			
				AMPCO18.22			
				AMPCO18.23			
				AMPCO21			
				AMPCO22			
				AMPCO25			
				AMPCO26			
				AMPCO45			
				AMPCO483			
				AMPCO642			
				AMPCO673			
				AMPCO674			
				AMPCO8			
				AMPCO863			
		S66286		AMPCOM4	precip.hardened		
		S35000		AM350		cast	
		S35000		AM350	heattreated		
		S35500		AM355			
		S45500		Custom455			
				Discalloy			
		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			
		N10002		HastelloyC		plate	
		N10002		HastelloyC		cast	
				HastelloyC-22			
		N10276		HastelloyC-276			
		N06455		HastelloyC-4			
		N06007		HastelloyG			
		N06985		HastelloyG-3			
		N10003		HastelloyN		bar,forge,ring	
		N10003		HastelloyN		cast	
		N06635		HastelloyS		allforms	
		N10004		HastelloyW			
		N06002		HastelloyX		allforms	

ISO	DIN	W.-Nr	EN	EN-Nr	AFNOR	BS	UNI
11		2.4816	NiCr15Fe				
		2.4851					
		2.4856	NiCr22Mo9Nb				
		2.4856	NiCr22Mo9Nb				
		2.4856	NiCr22Mo9Nb				
			NiFe38Cr16Nb				
		2.4668	NiCr19Fe19Nb5Mo3				
		2.4668	NiCr19Fe19Nb5Mo3				
		2.4668	NiCr19Fe19Nb5Mo3				
		2.4669					
		2.4669					
		2.4061	Ni99.6				
		2.4634					
		2.4636					
		2.4650					
		2.4631	NiCr20TiAl				
		2.4632					
		2.4662					
		ppm					
			NiCr19Co18Mo4Ti3Al3				
		2.4654	NiCr20Co13Mo4Ti3Al				
		2.4654	NiCr20Co13Mo4Ti3Al				
		3.7024					
		3.7024					
	TiV10Fe2Al3						
		3.7124	TiCu2				
			TiAl5Sn2.5				
			TiAl5Sn2.5				
			TiAl5Sn2.5				
		3.7164	TiAl6V4				
		3.7164	TiAl6V4				
			TiAl6V4				
		3.7164	TiAl6V4				
		3.7164	TiAl6V4				

JIS	SS	UNS	AISI/ASTM	Misc. Brand	Condition	Form	Structure
				IN100			
		N06600		Inconel600		allforms	
		N06601		Inconel601		allforms	
		N06625		Inconel625		bar,forge,ring	
		N06625		Inconel625		tube	
		N06625		Inconel625		cast	
		N09706		Inconel706			
				Inconel708		bar,forge,ring	
		N07713		Inconel713			
				Inconel713LC			
		N07718		Inconel718		bar,forge,ring	
		N07718		Inconel718		tube	
		N07718		Inconel718		cast	
				Inconel901			
		N07750		InconelX-750	sol.treated		
		N07750		InconelX-750	precip.hardened		
				Mar-M-200			
				Mar-M-247		allforms	
				Mod.IN100			
				Mod.IN792			
		N02205		Nickel201			
				Nimonic101			
				Nimonic105			
				Nimonic115			
		N07263		Nimonic263			
		N07080		Nimonic80A			
				Nimonic81			
				Nimonic86			
		N07090		Nimonic90			
		N09901		Nimonic901			
				Nimonic91			
				René95			
		N03260		TDNickel			
		N07500		Udimet500			
				Udimet520			
				Udimet700			
				Udimet720			
		N07001		Waspalloy		bar,forge	
		N07001		Waspalloy		cast	
				Ti(pure)		pure-tube	Ti(?)
			AMS4900,-01,-21	Ti(pure)(grd1-4)		pure-plate,bar,forge	Ti(?)
			AMS4986	Ti10V-2Fe-3Al			Ti(?)
		R58210	ASTMGrade21	Ti15Mo-3Nb-3Al-0.2Si			Ti(?)
		R58650	AMS4995	Ti17			Ti(a+b)
				Ti2Cu			Ti(?)
		R56320	AMS4943	Ti3Al-2.5V	annealed	tube	Ti(?+?)
		R56320	AMS4943	Ti3Al-2.5V		bar,forge	Ti(?+?)
		R54520	AMS4910	Ti5Al-2.5Sn	ELI		Ti(?)
		R54521	AMS4909	Ti5Al-2.5Sn			Ti(?)
		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(?+?)
		R56400	AMS4920	Ti6Al-4V	annealed		Ti(?+?)
		R56400	AMS4920,Grd5	Ti6Al-4V	annealed		Ti(?+?)
		R56401	AMS4981	Ti6Al-4V	ELI	ELI	Ti(?+?)
		R56400	AMS4920	Ti6Al-4V		extrusion	Ti(?+?)
		R56400	AMS4920	Ti6Al-4V	precip.hardened		Ti(?+?)

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