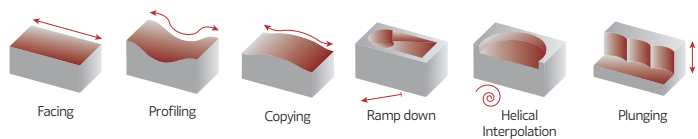


TetraFeed

Double-sided high feed milling solution



palbit®
TOOLING SOLUTIONS EXPERTS

TETRAFEED
16320

NEW

PHP

NEW
GRADE

PHH

NEW
GRADE

PHS

NEW
GRADE



INSERT SIZE
06 XNKU
06T3



NEW

SINCE **1916**

NEW PHP | PHH = MILLING GRADES

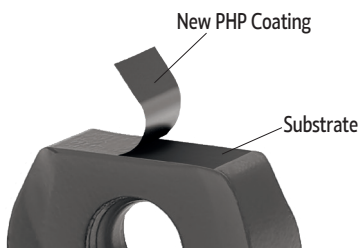
NEW

Novos graus de fresagem | Nuevos grados de fresado

The new grades PHP and PHH are the result achieved by a new PVD coating technology. This method allows the formation of sputter smooth coatings, with superior adhesion, higher oxidation resistance and improved wear resistance, comparatively to standard PVD coating.

Test results shows that with the same material and cutting conditions this new grades can improve tool life up to 30%.

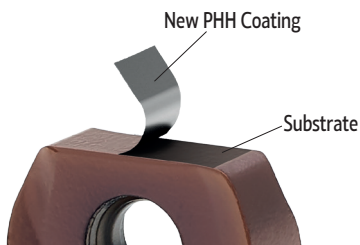
PHP GRADE = PVD grade



This new PHP coating technology coating provides hardness stabilization which improves wear and welding resistance.

For high-performance applications in unalloyed, alloyed and high-speed steels and suitable for cast iron machining.

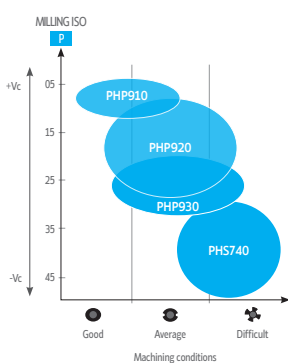
PHH GRADE = PVD grade



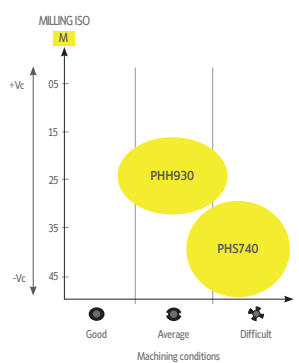
This new PHH coating technology has a very high thermal stability and provides long tool life.

For applications in machining of hardened steels, stainless steels and titanium alloys.

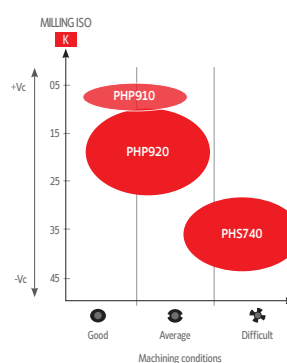
P - STEEL



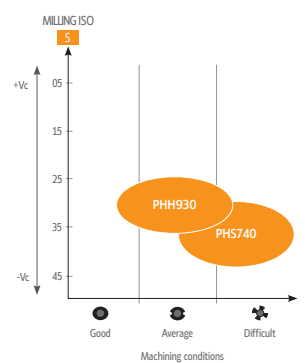
M - STAINLESS STEEL

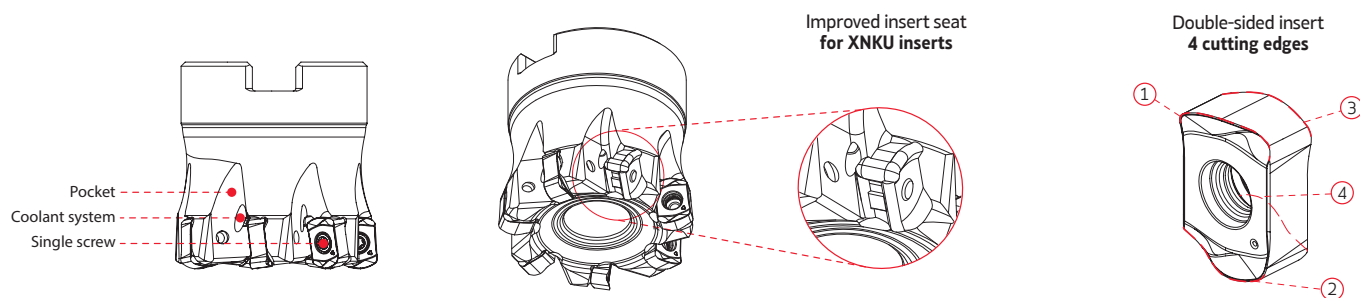


K - CAST IRON



S - HEAT RESISTANT / TITANIUM ALLOYS





MILLING CUTTER

Design

- Optimized design for better chip evacuation;

Pocket

- Strong pocket design for better cutter body durability;
- Improved insert seat;

INSERT

Insert Width

- Large cross section;

Cutting edge

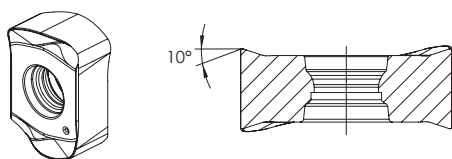
- Improved cutting edge;
- Improved wear resistance;

Double-sided insert

- Double-sided insert with 4 cutting edges;

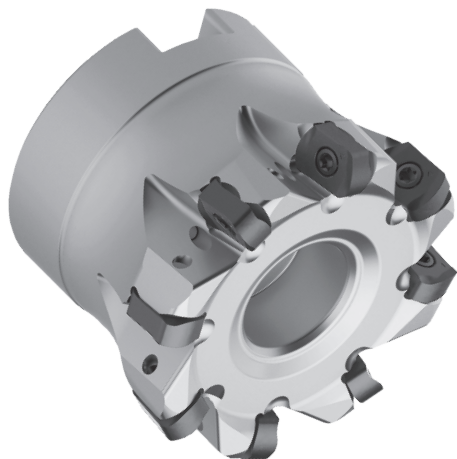
XNKU 06T3

XNKU-MP

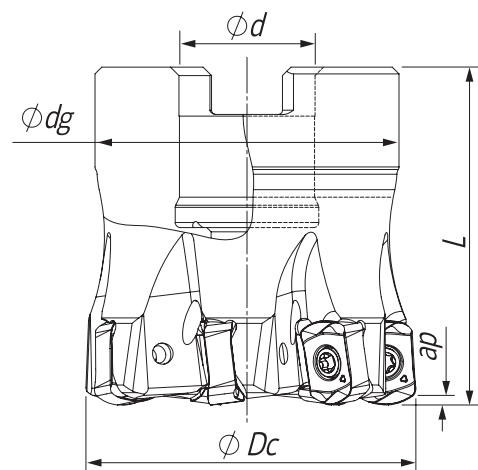


GEOMETRY FEATURES || Características geométricas | Características geométricas

Geometry	Features Características Características
Geometry MP General machining	Geometry with a reinforced cutting edge for general applications on different materials.



Arbor Mounting
 $K_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=1,8$



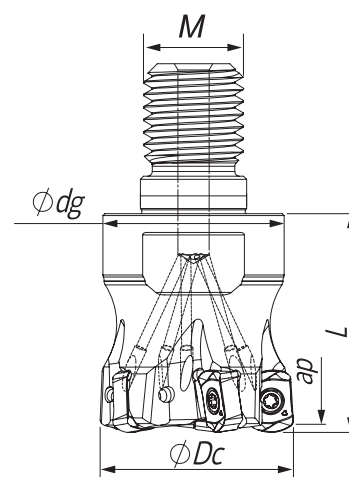
Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Specifications		Insert	Stock
			ϕDc	$\phi d/M$	ϕdg	L		Ap max (mm)	Arbor Type		
181152300	040A16320-07-07-016040	7	40	16	36	40	0,20	1,00	A	XNKU 06...	
181157500	050A16320-06-07-022040	6	50	22	42	40	0,25	1,00	A	XNKU 06...	
181152400	050A16320-08-07-022040	8	50	22	42	40	0,29	1,00	A	XNKU 06...	
181152500	052A16320-08-07-022040	8	52	22	40	40	0,39	1,00	A	XNKU 06...	
181152600	063A16320-09-07-022040	9	63	22	48	40	0,50	1,00	A	XNKU 06...	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



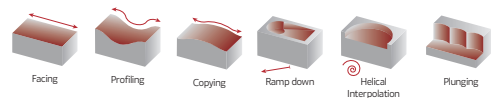
Threaded Coupling
 $K_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=1,8$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Specifications		Insert	Stock
			ϕDc	$\phi d/M$	ϕdg	L		Ap max (mm)	Arbor Type		
181151300	016R16320-02-07-M08025	2	16	M08	13	25	0,02	1,00	XNKU 06...		
181151400	020R16320-03-07-M10028	3	20	M10	18	28	0,05	1,00	XNKU 06...		
181151500	025R16320-04-07-M12030	4	25	M12	18	30	0,07	1,00	XNKU 06...		
181148000	032R16320-05-07-M16035	5	32	M16	29	35	0,16	1,00	XNKU 06...		
181151600	035R16320-06-07-M16035	6	35	M16	29	35	0,17	1,00	XNKU 06...		
181151700	040R16320-05-07-M16045	5	40	M16	29	45	0,24	1,00	XNKU 06...		
181151800	042R16320-07-07-M16035	7	42	M16	29	35	0,24	1,00	XNKU 06...		

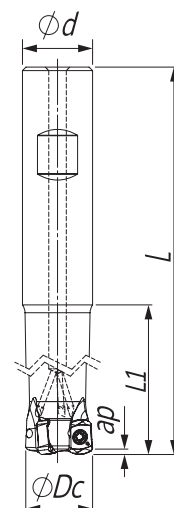
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Weldon Shank

$K_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=1,8$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Specifications	Insert	Stock
			ϕD_c	$\phi d/M$	L	L1		Ap max (mm)		
181161000	016W16320-02-07-016150	2	16	16	150	50	0,19	1,00	XNKU 06...	
181151900	020W16320-03-07-020160	3	20	20	160	90	0,29	1,00	XNKU 06...	
181152000	025W16320-04-07-025180	4	25	25	180	100	0,40	1,00	XNKU 06...	
181152100	032W16320-05-07-032200	5	32	32	200	120	1,10	1,00	XNKU 06...	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

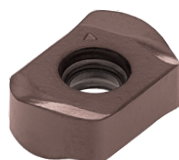
XNKU 06T3... || Inserts | Pastilhas | Plaquetas



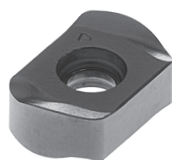
XNKU-MP
(PHP grade)



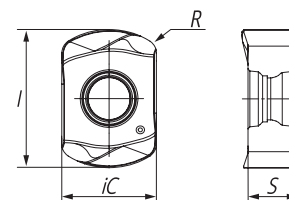
XNKU-MP
(PHH grade)



XNKU-MP
(PHS grade)



XNKU-MP



		P				M		K		S		Dimensions Dimensões Dimensiones (mm)					
		CVD		PVD		CVD	PVD	CVD	PVD	CVD	PVD						
		T9	X5	T1	P4	T9	X9	T9	X5	T1	T9						X9
⁽¹⁾ Geometry code	ISO Reference	PHS740	PHP910	PHP920	PHP930	PHS740	PHH930	PHS740	PHP910	PHP920	PHS740	PHH930	iC	S	I	R	F
1112802	XNKU 06T310-MP												6,85	3,60	10,00	1,00	-

First choice | Primeira opção | 1ª opción

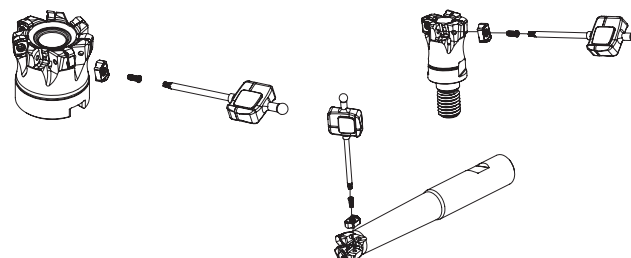
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

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

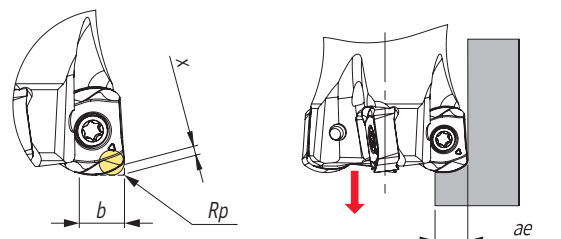
SPARE PARTS Complementos | Repuestos

Cutter ϕD_c	Order separately			
	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
A16320 - 40-63	P0250704	XT08	DT0812	1,20
R16320 - 20-42	P0250704	XT08	DT0812	1,20
W16320 - 20-32	P0250704	XT08	DT0812	1,20



PROGRAMMING DATA || Dados para programação | Datos para la programación

Insert	Programming Data			
	Rp	X	b	ae
XNKU 06T310-MP	1,8	0,4	3,6	3,4



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

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

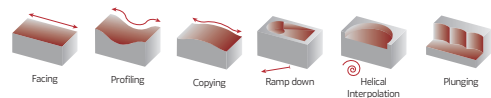
ISO	PSM	Material	HB (Brinell)	Vc (m/min)					Feed fz (mm/t)
				← Wear Resistance			Toughness →		
				PHP910	PHP920	PHP930	PHH930	PHS740	
P	1	Unalloyed Steel	125-220	190-260	180-250	160-230	-	160-230	0,50-1,50
	2	Low-Alloyed Steel	220-280	180-220	170-210	150-190	-	150-190	0,50-1,50
	3	High-Alloyed Steel	280-380	170-210	160-200	140-180	-	140-180	0,50-1,50
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	130-170	120-180	0,50-1,40
	5	SS - Austenitic	200-330	-	-	-	100-160	100-150	0,50-1,40
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	80-140	70-130	0,50-1,40
K	7	Malleable Cast Iron	130-230	190-330	180-320	-	-	160-300	0,50-1,50
	8	Grey Cast Iron	180-245	180-290	170-280	-	-	150-260	0,50-1,50
	9	Nodular Cast iron	160-250	110-240	100-240	-	-	80-220	0,50-1,50
S	11	Heat Resistant Super Alloys	200-320	-	-	-	30-75	30-70	0,50-1,30

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

(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

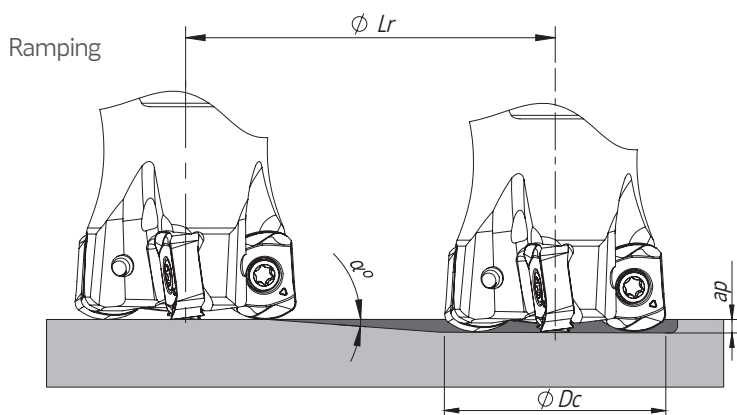
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

(Note 3) When using $\varnothing D_c=16\text{mm}$ apply 70% or less feed (fz) from the table.



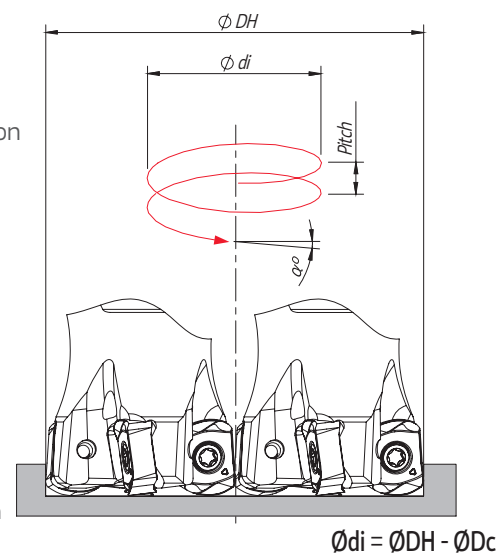
RAMPING AND HELICAL INTERPOLATION

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



Helical Interpolation

Blind hole
Flat bottom



$$\phi di = \phi DH - \phi Dc$$

ϕDc	Ramping			Helical Interpolation		
	Max Ramp a°	Max a_p	Min Lr	ϕDH_{min}	ϕDH_{max}	Max Pitch/Rev.
16	0,5	1	114,6	24,8	-	0,2
				-	30,0	0,3
20	0,5	1	114,6	32,8	-	0,3
				-	38,0	0,4
25	0,8	1	71,6	42,8	-	0,7
				-	48,0	1,0
32	0,8	1	71,6	56,8	-	1,0
				-	62,0	1,3
35	0,5	1	114,6	62,8	-	0,7
				-	68,0	0,9
40	0,4	1	143,2	72,8	-	0,7
				-	78,0	0,8
42	0,4	1	143,2	76,8	-	0,7
				-	82,0	0,8
50	0,3	1	191,0	92,8	-	0,7
				-	98,0	0,7
52	0,3	1	191,0	96,8	-	0,7
				-	102,0	0,8
63	0,25	1	229,2	118,8	-	0,7
				-	124,0	0,8

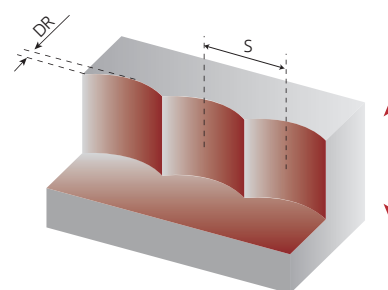
Note: During helical interpolation do not exceed max Pitch.

(*) Down cutting is recommended, tool pass rotation should be counter-clockwise.

(*) In case of ramping and helical interpolation, apply 70% or less feed (f_z) from recommended cutting conditions table.

PLUNGING | Mergulho | Plunge

L≤3Dc	L>3Dc	S max.
f _z (mm/t)		
0,08-0,15	0,05 - 0,10	S _{max} = √DC·Dr-Dr ²

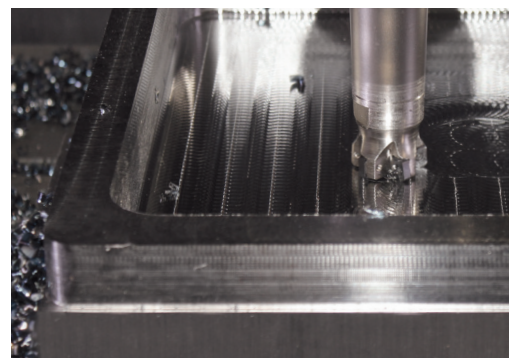
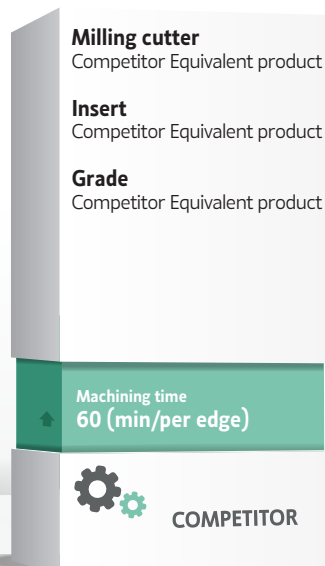


S max and DR corresponding cutting diameter Dc (mm)										
DR (mm)	Dc (mm) XNKU 06...									
	16	20	25	32	35	40	42	50	52	63
1	3,9	4,4	4,9	5,6	5,8	6,2	6,4	7,0	7,1	7,9
2	5,3	6,0	6,8	7,7	8,1	8,7	8,9	9,8	10,0	11,0
3	6,2	7,1	8,1	9,3	9,8	10,5	10,8	11,9	12,1	13,4

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



PHP TEST REPORT

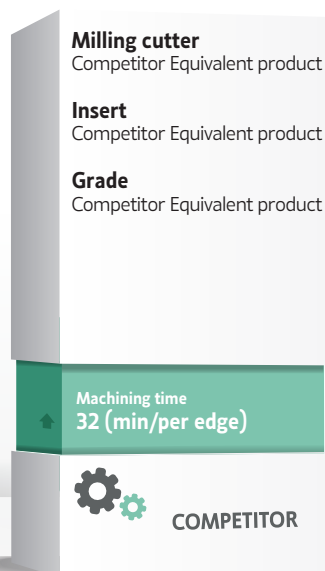


Workpiece material: 40CrMnNiMo7 (1.2738) - (32-36 HRC)

Cutting speed: Vc (m/min)	200
Feed per tooth: fz (mm/t)	0,65
Depth of cut: ap (mm)	1,0
Width of cut: ae (mm)	24
Method of machining	Ramping and Helical Interpolation
Coolant	Dry



PHH TEST REPORT



Workpiece material: stainless steel, AISI 316

Cutting speed: Vc (m/min)	120
Feed per tooth: fz (mm/t)	1,0
Depth of cut: ap (mm)	0,5
Width of cut: ae (mm)	24
Method of machining	Ramping and Helical Interpolation
Coolant	Dry