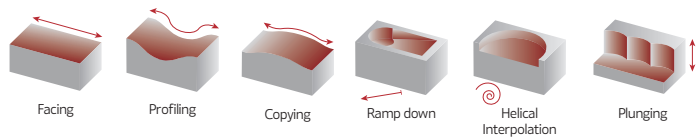


TetraFeed

Double-sided high feed milling solution



palbit[®]
TOOLING SOLUTIONS EXPERTS
SINCE 1916

TETRAFEED
XN20-06

NEW

PHP

NEW
GRADE

PHH

NEW
GRADE

PHS

NEW
GRADE



INSERT SIZE
06 XNKU
06T3



NEW

SINCE 1916

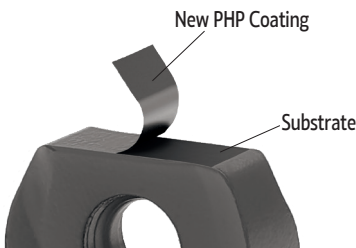
NEW PHP | PHH = MILLING GRADES



Novos graus de fresagem | Nuevos grados de fresado

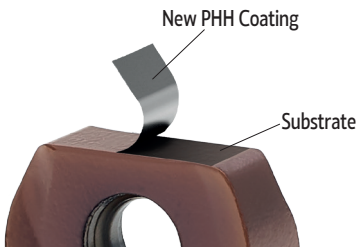
The new grades PHP and PHH are the result achieved by a new PVD coating technology. This method allows the formation of sputter smooth coatings, with superior adhesion, higher oxidation resistance and improved wear resistance, comparatively to standard PVD coating. Test results shows that with the same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



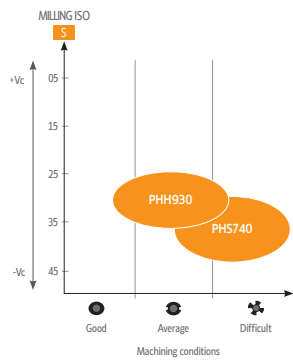
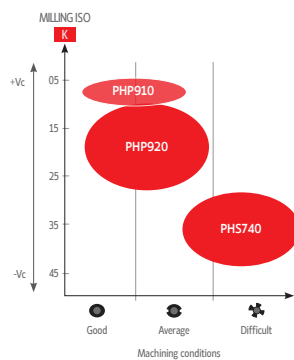
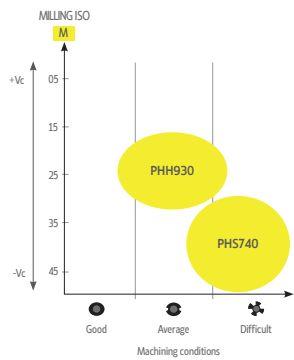
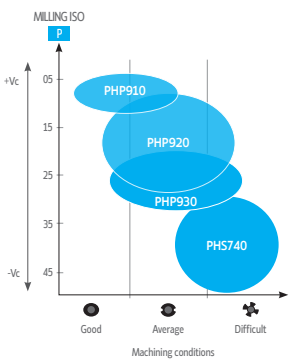
This new PHH coating technology has a very high thermal stability and provides long tool life. For applications in machining of hardened steels, stainless steels and titanium alloys.

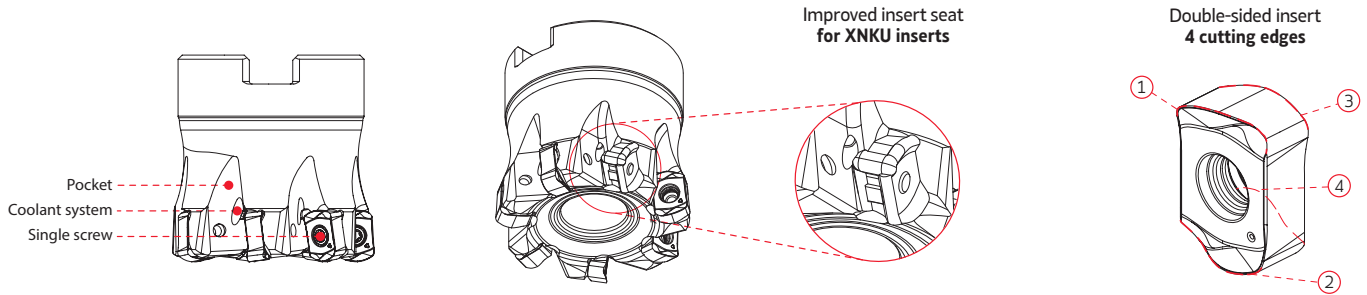
P - STEEL

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

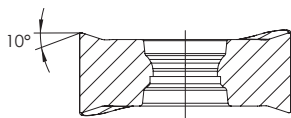
- Improved cutting edge;
- Improved wear resistance;

Double-sided insert

- Double-sided insert with 4 cutting edges;

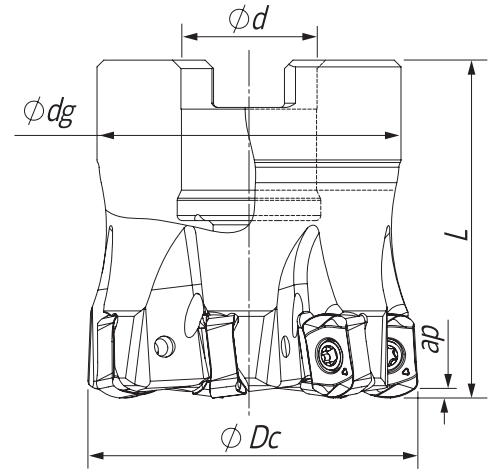
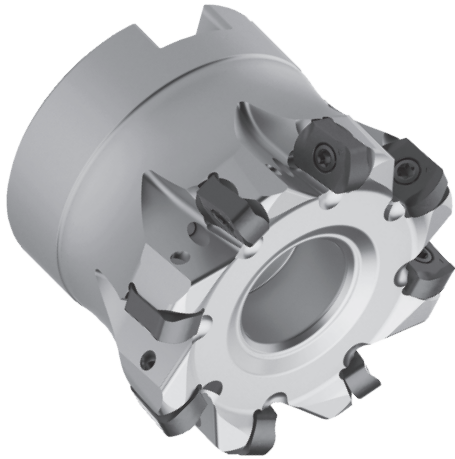
XNKU 06T3

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.

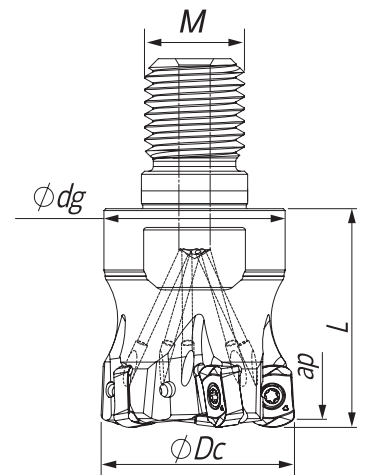


Arbor Mounting
 $\kappa_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=0.071$

Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (in)					Specifications		Insert	Stock
			ϕDc	$\phi d/M$	ϕdg	L		Ap max (in)	Arbor Type		
181169900	XN20 D1.50-A.500/1.50-07-06		1,500	0,500	1,450	1,500	0,434	0,035	A	XNKU 06...	
181170000	XN20 D2.00-A.750/1.50-08-06		2,000	0,750	1,772	1,500	0,725	0,035	A	XNKU 06...	
181170100	XN20 D2.50-A1.00/1.50-09-06		2,500	1,000	1,850	1,500	1,100	0,035	A	XNKU 06...	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

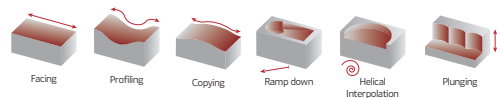


Threaded Coupling
 $\kappa_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=0.071$

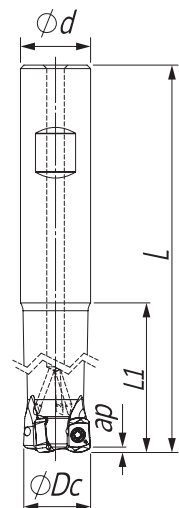
Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (in)					Specifications		Insert	Stock
			ϕDc	$\phi d/M$	ϕdg	L		Ap max (in)	Arbor Type		
181169400	XN20 D.625-R-08/.984-02-06		0,625	M8	0,579	0,984	0,050	0,035	XNKU 06...		
181169500	XN20 D.750-R-10/1.18-03-06		0,750	M10	0,728	1,181	0,090	0,035	XNKU 06...		
181169600	XN20 D1.00-R-12/1.18-04-06		1,000	M12	0,906	1,181	0,220	0,035	XNKU 06...		
181169700	XN20 D1.25-R-16/1.38-05-06		1,250	M16	1,181	1,378	0,341	0,035	XNKU 06...		
181169800	XN20 D1.50-R-20/1.58-06-06		1,500	M20	1,437	1,575	0,660	0,035	XNKU 06...		

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Weldon Shank
 $K_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=0.071$



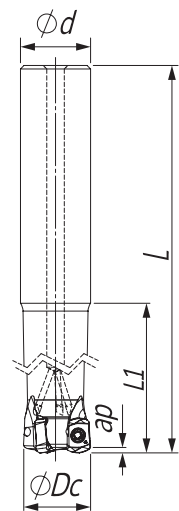
Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (in)				 lbs	Specifications	Insert	Stock
			ϕDc	$\phi d/M$	L	L1		Ap max (in)		
181170200	XN20 D.625-W.625/3.50-02-06	2	0,625	0,625	3,500	1,250	0.224	0,035	XNKU 06...	<input type="radio"/>
181170300	XN20 D.750-W.750/4.00-03-06	3	0,750	0,750	4,000	1,750	0.372	0,035	XNKU 06...	<input checked="" type="radio"/>
181170400	XN20 D1.00-W1.00/5.00-04-06	4	1,000	1,000	5,000	2,500	0,782	0,035	XNKU 06...	<input checked="" type="radio"/>
181170500	XN20 D1.25-W1.25/5.00-05-06	5	1,250	1,250	5,000	2,500	1,316	0,035	XNKU 06...	<input type="radio"/>

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Cylindrical Shank
 $K_r=20^\circ$ | $\gamma_p=-7^\circ$ | $R_p=0.071$



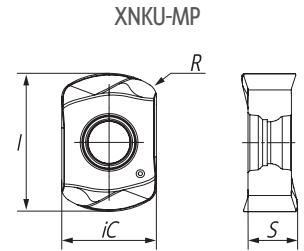
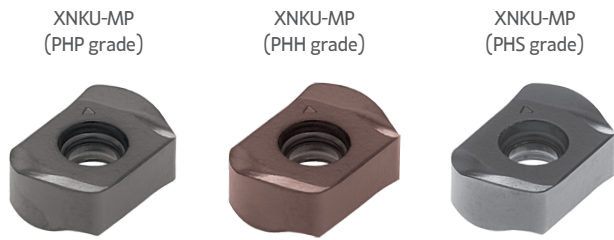
Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (in)				 lbs	Specifications	Insert	Stock
			ϕDc	$\phi d/M$	L	L1		Ap max (in)		
181170600	XN20 D.625-C.625/6.00-02-06	2	0,625	0,625	6,000	2,000	0.458	0,035	XNKU 06...	<input checked="" type="radio"/>
181170700	XN20 D.750-C.750/6.50-03-06	3	0,750	0,750	6,500	2,950	0.632	0,035	XNKU 06...	<input checked="" type="radio"/>
181170800	XN20 D1.00-C1.00/7.00-04-06	4	1,000	1,000	7,000	4,000	1,106	0,035	XNKU 06...	<input checked="" type="radio"/>
181170900	XN20 D1.25-C1.25/8.00-05-06	5	1,250	1,250	8,000	5,000	2,074	0,035	XNKU 06...	<input checked="" type="radio"/>
181171000	XN20 D1.50-C1.50/5.00-06-06	6	1,500	1,500	5,000	2,250	1,973	0,035	XNKU 06...	<input checked="" type="radio"/>

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



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

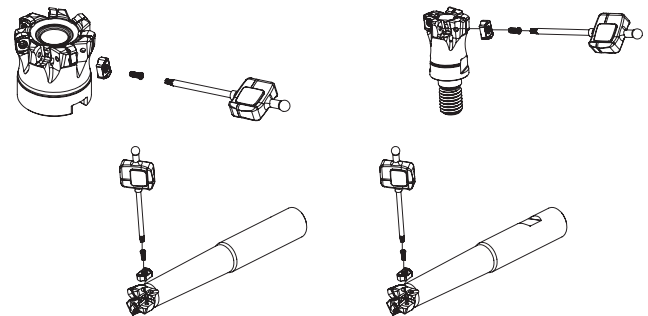


	(2) Grade code	P		M		K		S		Dimensions Dimensões Dimensiones (in)							
		CVD	PVD	CVD	PVD	CVD	PVD	CVD	PVD								
(1) Geometry code	ISO Reference	T9	X5	T1	P4	T9	X9	T9	X5	T1	T9	X9	iC	S	I	R	F
1112802	XNKU 06T310-MP	⊗	⊗	⊗	○	⊗	⊗	⊗	⊗	⊗	⊗	⊗	0.270	0.142	0.394	0.039	-

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

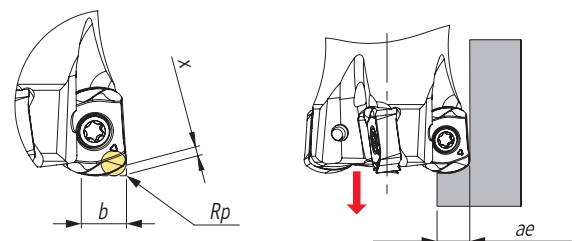
SPARE PARTS Complementos | Repuestos

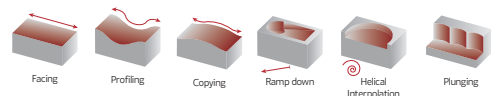
Cutter ØDc	Insert Screw	Key (Torx)	Order separately	
			Key (Torx - Nm)	Torque Value
XN-A-06 - 1.500-2.500	P0250704	XT08	DT0812	10.6
XN-R-06 - 0.625-1.500	P0250704	XT08	DT0812	10.6
XN-W-06 - 0.265-1.250	P0250704	XT08	DT0812	10.6
XN-C-06 - 0.625-1.500	P0250704	XT08	DT0812	10.6



PROGRAMMING DATA | Dados para programação | Datos para la programación

Insert	Programming Data			
	Rp	X	b	ae
XNKU 06T310-MP	0.071	0.016	0.142	0.134





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 (sfm)					Feed fz (in/t)
				← Wear Resistance			Toughness →		
				PHP910	PHP920	PHP930	PHH930	PHS740	
P	1	Unalloyed Steel	125-220	650-880	591-820	525-755	-	525-755	0.020-0.060
	2	Low-Alloyed Steel	220-280	610-745	558-689	492-624	-	492-624	0.020-0.060
	3	High-Alloyed Steel	280-380	575-700	525-656	460-591	-	460-591	0.020-0.060
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	427-558	394-591	0.020-0.056
	5	SS - Austenitic	200-330	-	-	-	328-525	328-492	0.020-0.056
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	263-460	230-427	0.020-0.056
K	7	Malleable Cast Iron	130-230	625-1100	591-1050	-	-	525-984	0.020-0.060
	8	Grey Cast Iron	180-245	600-1000	558-919	-	-	492-853	0.020-0.060
	9	Nodular Cast iron	160-250	400-850	328-788	-	-	263-722	0.020-0.060
S	11	Heat Resistant Super Alloys	200-320	-	-	-	99-246	99-230	0.020-0.052

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

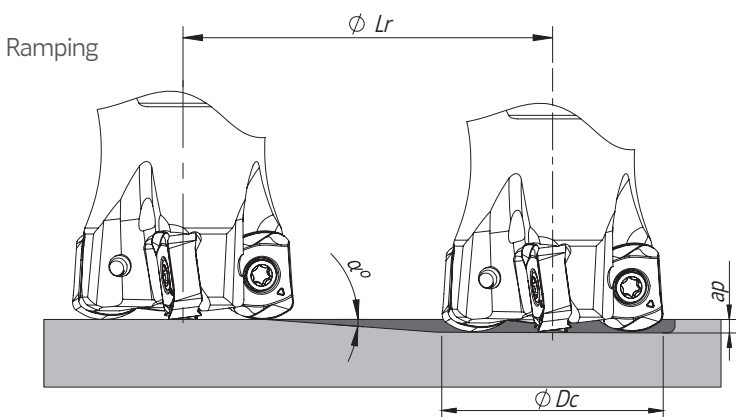
(Note 2) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

- 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.

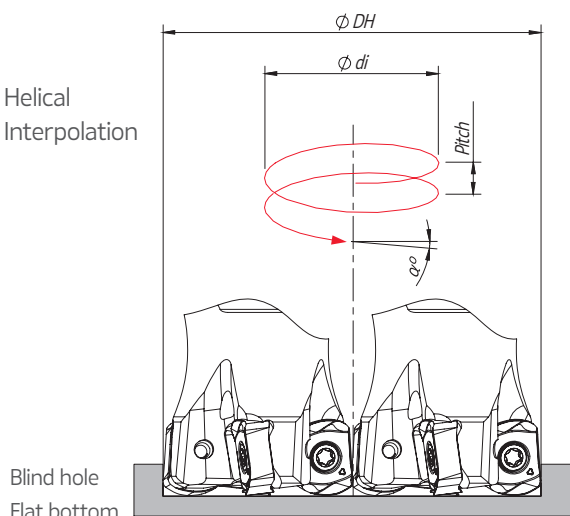
(Note 3) When using $\phi D_c=0.625$ in apply 70% or less feed (fz) from the table.

RAMPING AND HELICAL INTERPOLATION

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



Helical Interpolation



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

ϕDc	Ramping			Helical Interpolation		
	Max Ramp a°	Max ap	Min Lr	ϕDH_{min}	ϕDH_{max}	Max Pitch/Rev.
0.625	0.5	0.039	4.469	0.966	-	0.009
				-	1.171	0.014
0.750	0.5	0.039	4.469	1.216	-	0.012
				-	1.421	0.018
1.000	0.8	0.039	2.793	1.716	-	0.031
				-	1.921	0.040
1.250	0.8	0.039	2.793	2.216	-	0.042
				-	2.421	0.051
1.500	0.4	0.039	5.586	2.716	-	0.026
				-	2.921	0.031
2.000	0.3	0.039	7.448	3.716	-	0.028
				-	3.921	0.031
2.500	0.25	0.039	8.938	4.716	-	0.030
				-	4.921	0.030

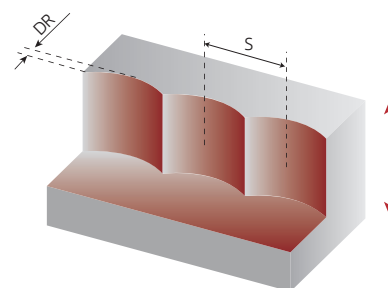
Note: During helical interpolation do not exceed max Pitch.

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

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

PLUNGING | Mergulho | Plunge

$L \leq 3Dc$	$L > 3Dc$	S_{max}
f_z (in/t)		
0.004-0.006	0.002-0.004	$S_{max} = \sqrt{DC \cdot Dr - Dr^2}$



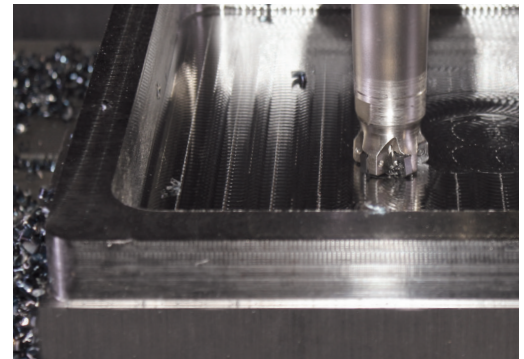
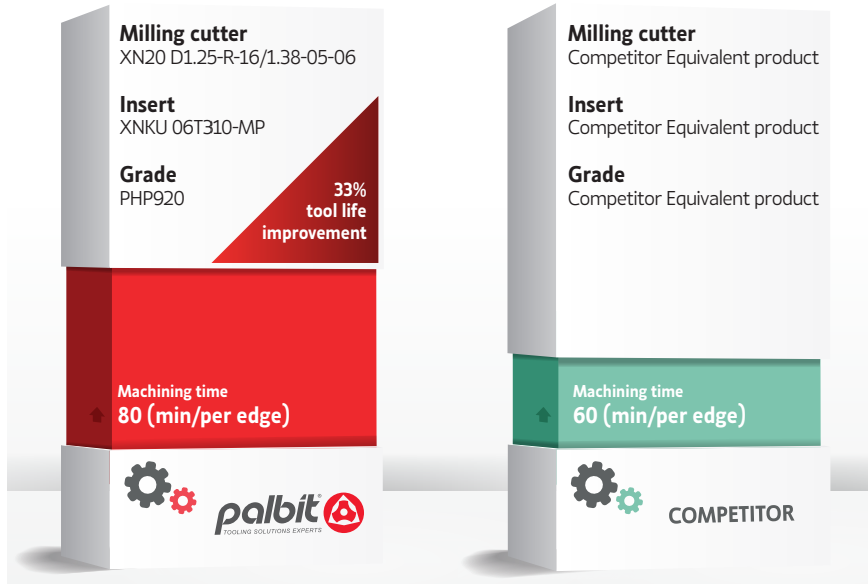
S max and DR corresponding cutting diameter Dc (in)							
DR (in)	Dc (in)						
	0.625	0.750	1.000	1.250	1.500	2.000	2.500
0.039	0.151	0.167	0.194	0.217	0.239	0.277	0.310
0.079	0.208	0.230	0.270	0.304	0.335	0.390	0.437
0.118	0.245	0.273	0.323	0.365	0.404	0.471	0.530

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

TETRAFEED XN20-06 = XNKU 06T3



PHP TEST REPORT

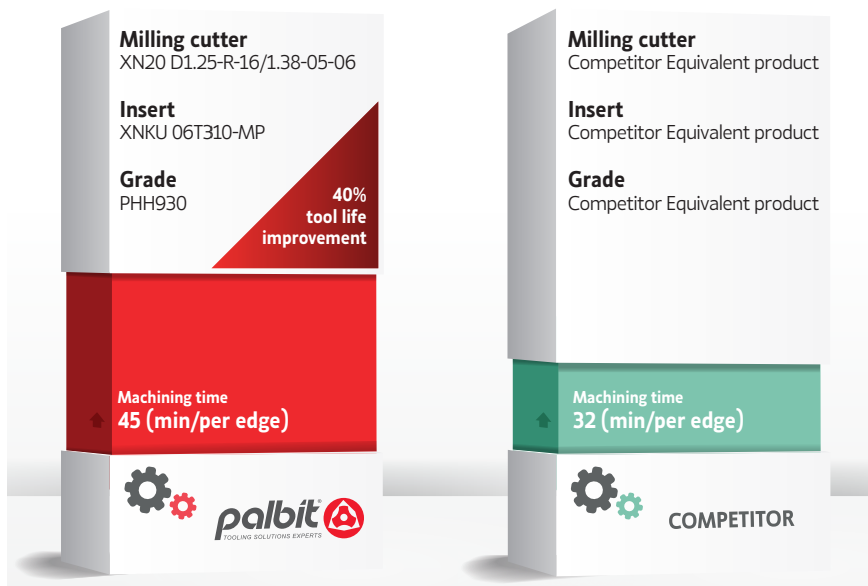


Workpiece material: 40CrMnNiMo7 (1.2738) - (32-36 HRC)

Cutting speed: Vc (sfm)	656
Feed per tooth: fz (in/t)	0.026
Depth of cut: ap (in)	0.039
Width of cut: ae (in)	0.945
Method of machining	Ramping and Helical Interpolation
Coolant	Dry



PHH TEST REPORT



Workpiece material: stainless steel, AISI 316

Cutting speed: Vc (sfm)	394
Feed per tooth: fz (in/t)	0.039
Depth of cut: ap (in)	0.020
Width of cut: ae (in)	0.945
Method of machining	Ramping and Helical Interpolation
Coolant	Dry



TETRAFEED
XN20-06

NEW

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