

Square shoulder milling new generation



palbit
TOOLING SOLUTIONS EXPERTS

LINEPRO
20090 | 20190 | 20290

PHP
NEW
GRADE

PHS
NEW
GRADE



INSERT SIZE
06 XP...
0602...



NEW

INSERT SIZE
10 XP...
1003...



NEW

INSERT SIZE
17 XPET
1706...



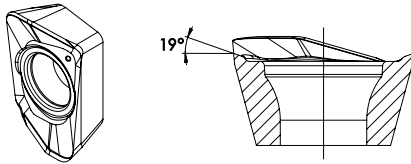
100
YEARS
SINCE 1916

LINEPRO 20090

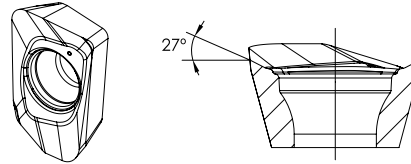
P M K N S

INSERT SIZE
06 XP...
0602...

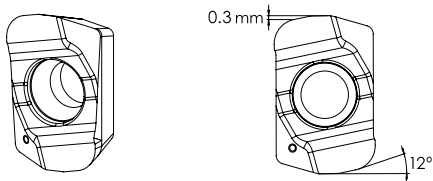
XPET-LP



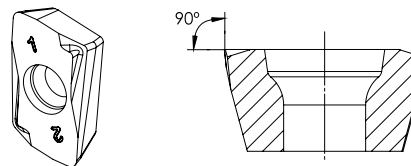
XPET-LN



XPET-HF



XPHW-MH



XPET-LP



XPET-HF



XPET-LN



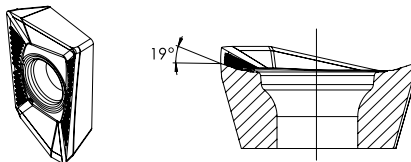
XPHW-MH



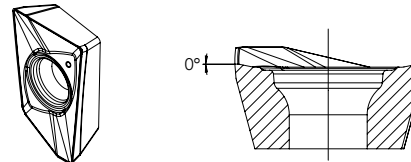
LINEPRO 20190

INSERT SIZE
10 XP...
1003...

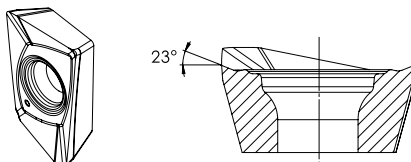
XPET-LP



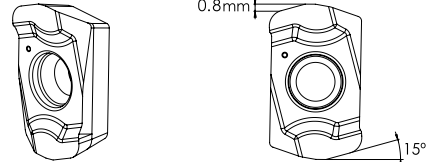
XPET-MP



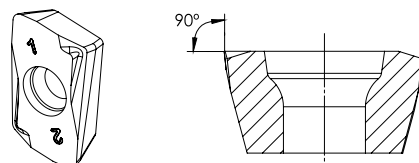
XPET-LN



XPET-HF



XPHW-MH



XPET-LP



XPET-MP



XPET-LN

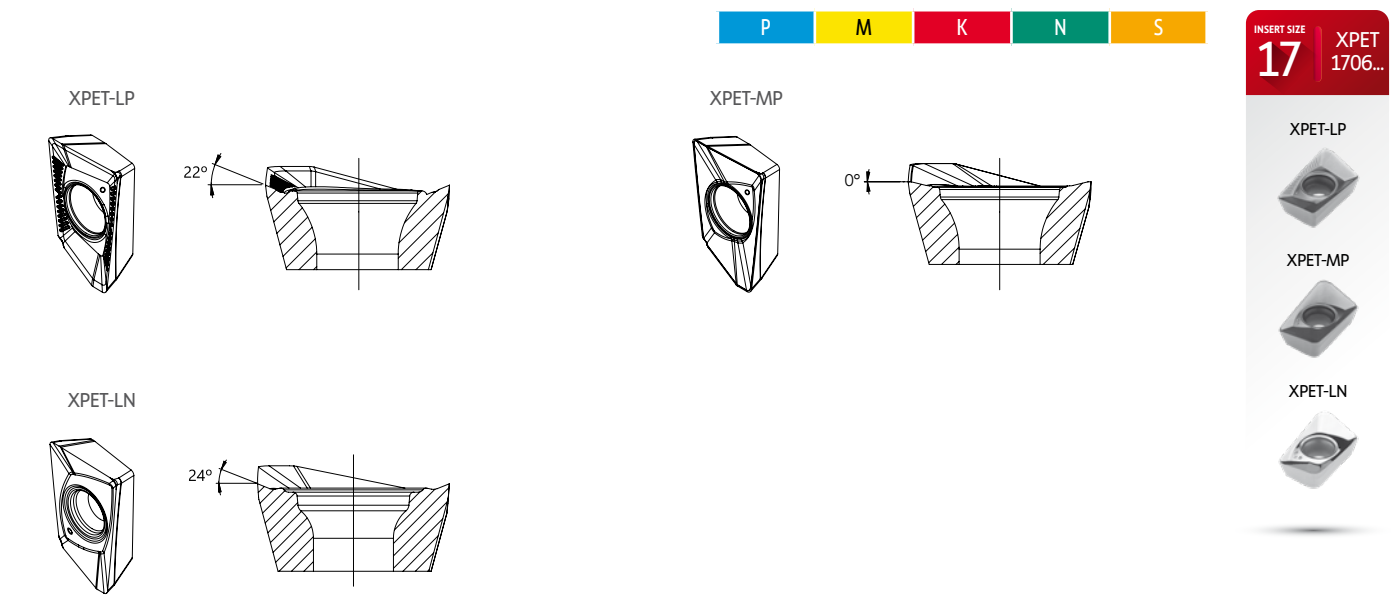


XPET-HF



XPHW-MH





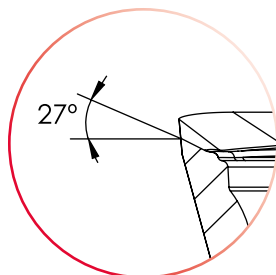
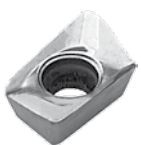
CHIP BREAKERS | Quebra-aparas | Rompevirutas

Chip Breaker	Features Características Características
Geometry HF Hifeed machining	New chipbreaker HF for Hifeed machining in all materials.
Geometry LP Light machining	Positive top rake angle to promote a good chip flow and reduce power consumption on low alloy steels.
Geometry MP Light machining	Chip-breaker with a reinforced chamfer for general applications on steel and cast iron.
Geometry LN Light machining	High positive chip-breaker, polished for applications of non ferrous materials (aluminum).
Geometry MH Light machining	First choice for Hard Materials in finishing operations.

INSERTS FEATURES

NEW

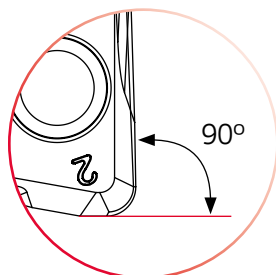
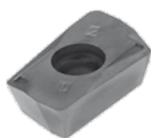
XPET-LN



XPET-LN SPECIFICATIONS

- Positive rake angle to promote a smooth cut;
- Polished surface to avoid built-up edge;
- First choice for non-ferrous materials.

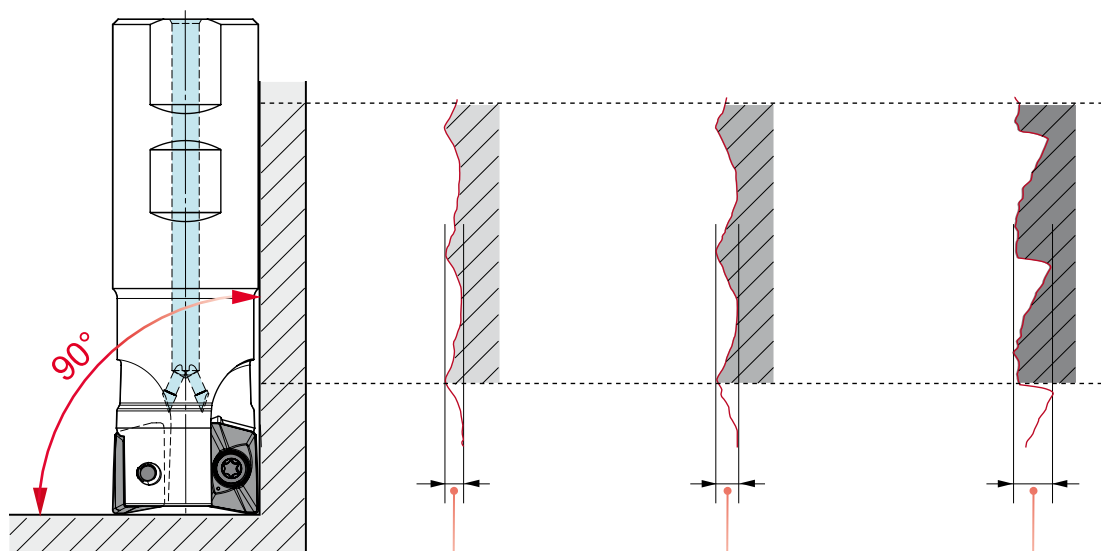
XPHW-MH



XPHW-MH SPECIFICATIONS

- Flat top insert for optimized finishing operations;
- Reinforced geometry to improve edge resistance;
- Perfect 90° cutting edge for excellent wall accuracy.

CUTTER FEATURES

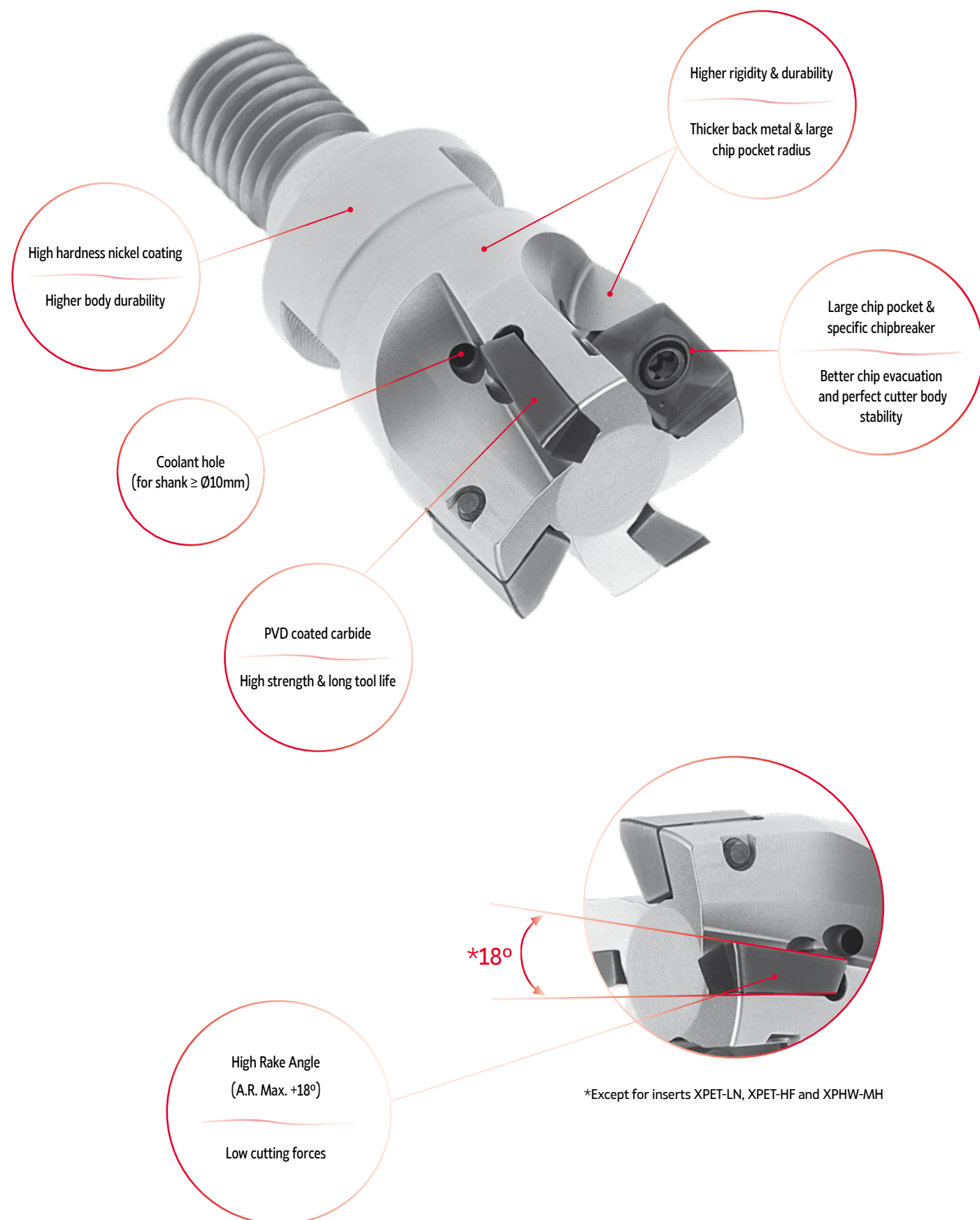


13 μm
LINEPRO
20090

15 μm
LINEPRO
20190

20 μm
LINEPRO
20290

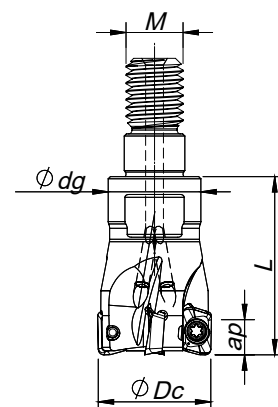
CUTTER FEATURES





Threaded Coupling

$K_r=90^\circ$ | $\gamma_p=+4^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Max ap (mm)			Insert Pastilha Inserto	Stock
			ØDc	Ød/M	Ødg	L		LP LN	HF	MH		
181120400	010R20090-02-04-M06020	2	10	M6	9,8	20	0,01	4,00	0,30	2,00	XP... 0602...	
181112800	011R20090-02-04-M06020	2	11	M6	9,8	20	0,01	4,00	0,30	2,00	XP... 0602...	
181120500	012R20090-03-04-M06020	3	12	M6	9,8	20	0,02	4,00	0,30	2,00	XP... 0602...	
181112900	013R20090-03-04-M06020	3	12	M6	9,8	20	0,02	4,00	0,30	2,00	XP... 0602...	
181087500	016R20090-04-04-M08025	4	16	M8	13,0	25	0,03	4,00	0,30	2,00	XP... 0602...	
181113000	017R20090-04-04-M08025	4	17	M8	13,0	25	0,04	4,00	0,30	2,00	XP... 0602...	
181087600	020R20090-05-04-M10030	5	20	M10	18,0	30	0,06	4,00	0,30	2,00	XP... 0602...	
181087700	025R20090-07-04-M12030	7	25	M12	21,0	30	0,09	4,00	0,30	2,00	XP... 0602...	
181087800	032R20090-08-04-M16035	8	32	M16	29,0	35	0,19	4,00	0,30	2,00	XP... 0602...	

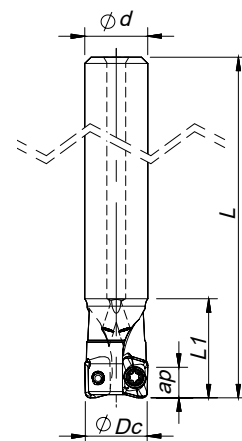
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Cylindrical Shank

$K_r=90^\circ$ | $\gamma_p=+4^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Max ap (mm)			Insert Pastilha Inserto	Stock
			ØDc	Ød/M	L	L1		LP LN	HF	MH		
181087100	010E20090-02-04-010055	2	10	10	55	16	0,03	4,00	0,30	2,00	XP... 0602...	
181108300	010E20090-02-04-010100	2	10	10	100	25	0,03	4,00	0,30	2,00	XP... 0602...	
181087200	012E20090-02-04-012080	2	12	12	80	17	0,06	4,00	0,30	2,00	XP... 0602...	
181109900	012E20090-03-04-012120	3	12	12	120	30	0,06	4,00	0,30	2,00	XP... 0602...	
181087300	016E20090-03-04-016090	3	16	16	90	20	0,12	4,00	0,30	2,00	XP... 0602...	
181087400	016E20090-04-04-016090	4	16	16	90	20	0,11	4,00	0,30	2,00	XP... 0602...	
181097100	017E20090-05-04-016090	5	17	16	90	35	0,11	4,00	0,30	2,00	XP... 0602...	
181097200	021E20090-05-04-020090	5	21	20	90	35	0,13	4,00	0,30	2,00	XP... 0602...	

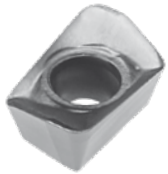
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



XP... 0602... || Inserts | Pastilhas | Plaquetas

XPET-LP



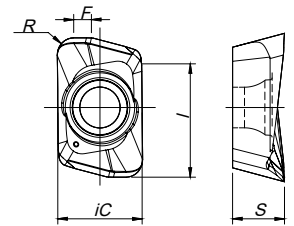
XPET-LN



NEW



XPET-LP | LN

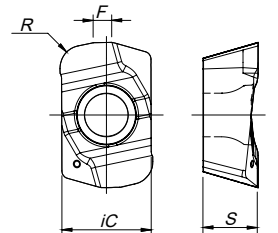


XPET-HF

(HiFeed geometry)

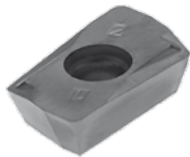


XPET-HF



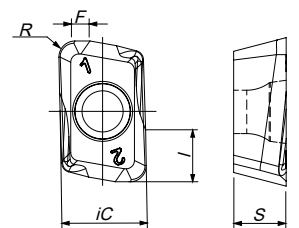
XPHW-MH

(finishing geometry)



NEW

XPHW-MH



		P								M			K				N		S		H		Dimensions Dimensões Dimensiones (mm)									
		CVD		PVD						CVD		PVD		PVD				UNC		PCD		PVD						PVD		PCBN		
		⁽²⁾ Grade code								T9	P7	G1	G4	T1	P3	P4	G6	R1	P3	P4	G4	T1						P3	P4	10	D6	P3
⁽¹⁾ Geometry code	ISO Reference	PHS740	PH7603	PH7910	PH7920	PHP920	PH7930	PHP930	PH7740	PHM740	PH7930	PHP930	PH7920	PHP920	PH7930	PHP930	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	I	R	F					
	1112002	XPET 060204 PDER-LP				⊗	⊗	⊗			⊗	⊗	⊗	⊗	⊗	⊗			⊗				3,90	2,40	5,30	0,40	0,80					
	1112003	XPET 060208 PDER-LP				⊗	⊗	⊗	⊗		⊗	⊗	⊗	⊗	⊗	⊗			⊗	⊗			3,90	2,40	5,30	0,80	0,70					
	1112004	XPET 060216 PDER-LP				⊗	⊗	⊗			⊗		⊗	⊗	⊗				⊗				3,90	2,40	5,30	1,60	0,60					
NEW	1112579	XPET 060202 PDFR-LN															⊗						3,90	2,40	5,10	0,20	0,95					
NEW	1112580	XPET 060204 PDFR-LN															⊗						3,90	2,40	5,10	0,40	0,80					
NEW	1112581	XPET 060208 PDFR-LN															○						3,90	2,40	5,40	0,80	0,90					
NEW	1112716	XPET 060212 PDFR-LN															○						3,90	2,40	5,40	1,20	0,60					
	1112049	XPET 060210 ZER-HF				⊗	⊗	⊗	⊗		⊗	⊗	⊗	⊗	⊗	⊗			⊗	⊗			3,90	2,40	-	1,00	0,80					
NEW	1112562	XPHW 060205 ZER-MH		○	○																○		3,90	2,40	2,40	0,50	1,00					
NEW	1112259	XPHW 060208 ZER-MH		⊗	⊗																⊗		3,90	2,40	2,40	0,80	0,70					
NEW	1112563	XPHW 060210 ZER-MH		○	○																○		3,90	2,40	2,40	1,00	0,50					

First choice | Primeira opção | 1ª opción

Stock item | Produto de stock | Itens de stock

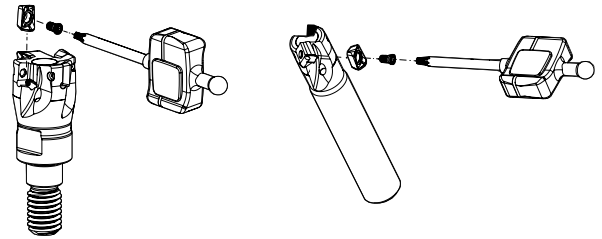
Available under request | Disponível sobre consulta
Disponible bajo consulta

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

LINEPRO 20090

SPARE PARTS | Complementos | Repuestos

Cutter ØDc	Insert Screw	Key (Torx)	Order separately	
			Key (Torx - Nm)	Torque Value
E20090 - 10	P0180300	XT06IP	DT0606IP	0,6
E20090 - 12-16	P0180400	XT06IP	DT0606IP	0,6
R20090 - 12-16	P0180400	XT06IP	DT0606IP	0,6



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

ISO	PSM	Material	HB (Brinell)	Vc (m/min)						
				← Wear Resistance			Toughness →			
				PH7603	PH0910	PH7910	PH7920	PHP920	PH7930	PHP930
P	1	Unalloyed Steel	125-220	220-280	-	200-260	180-240	180-240	160-220	160-220
	2	Low-Alloyed Steel	220-280	210-290	-	190-270	170-250	170-250	150-230	150-230
	3	High-Alloyed Steel	280-380	200-240	-	180-230	160-210	160-210	140-190	140-190
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	-	130-220	130-220
	5	SS - Austenitic	200-330	-	-	-	-	-	120-180	120-180
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	-	70-140	70-140
K	7	Malleable Cast Iron	130-230	-	-	-	160-350	160-350	160-350	160-350
	8	Grey Cast Iron	180-245	-	-	-	150-320	150-320	150-300	150-300
	9	Nodular Cast iron	160-250	-	-	-	130-280	130-280	120-260	120-260
N	10	Aluminium and Non Ferrous	30-130	-	350-1400	-	-	-	-	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	-	35-65	-
H	12	Hardened Steels	40-55 HRC	120-260	-	-	-	-	-	-

(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) PH5... and PHS... can be used wet or dry. PH7... use only air.

(Note 4) It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

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

Operation	a_e	Vc & fz	a_p (mm)
Slotting	100%	<20%	1,0-3,0
Shouldering	<50%	>8%	1,0-4,0
	≤25%	>12%	1,0-4,0

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

ISO	PSM	Material	HB (Brinell)	Grades						
				← Wear Resistance				Toughness →		
				PH7603	PH0910	PH7910	PH7920	PHP920	PH7930	PHP930
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

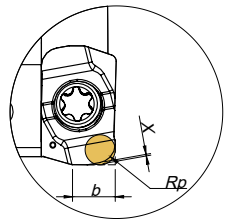
Feed fz (mm/t)			
XPET 06...LP	XPET 06...LN	XPET 06...HF	XPHW 06...MH
0,05-0,07	-	0,40-0,8	0,05-0,12
0,05-0,07	-	0,40-0,8	0,05-0,12
0,05-0,07	-	0,40-0,6	0,05-0,12
0,05-0,07	-	0,40-0,8	-
0,05-0,07	-	0,40-0,6	-
0,05-0,07	-	0,40-0,6	-
0,05-0,07	-	0,50-0,8	-
0,05-0,07	-	0,50-0,8	-
0,05-0,07	-	0,50-0,8	-
-	0,05-0,07	-	-
0,05-0,07	-	0,40-0,6	-
-	-	-	0,03-0,10

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

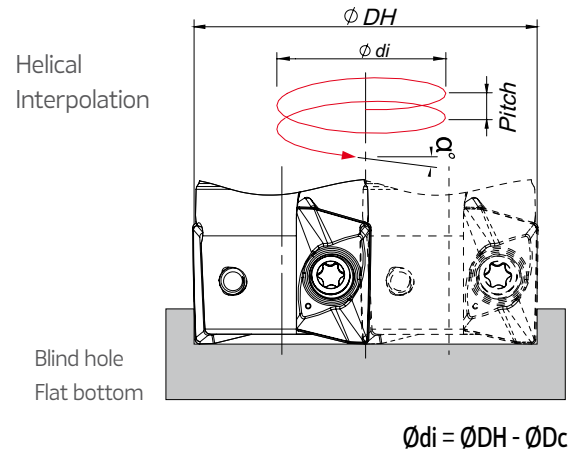
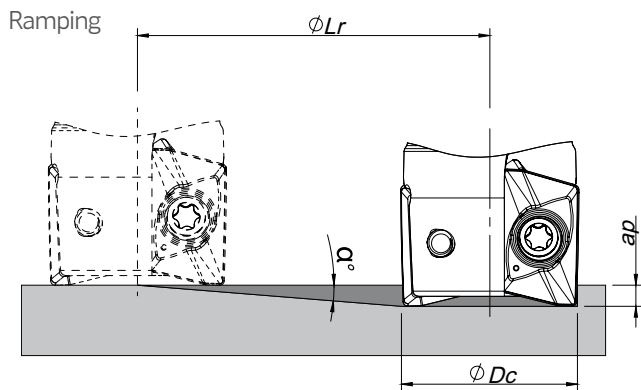
PROGRAMMING DATA | Dados para programação | Datos para la programación

Insert	Programming Data		
	Rp	X	b
XPET 06 HF	1,1	0,84	2,3



RAMPING AND HELICAL INTERPOLATION

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



ØDc	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	Max Ramp α°	Max ap	Min Lr	ØDHmin	ØDHmax	
10	5,5	4,0	41,5	17,2	-	2,2
				-	18,4	2,5
12	4,0	4,0	57,2	21,2	-	2,0
				-	22,4	2,3
16	2,5	4,0	91,6	29,2	-	1,8
				-	30,4	2,0
17	2,2	4,0	104,1	31,2	-	1,7
				-	32,4	1,9
20	1,9	4,0	120,6	37,2	-	1,8
				-	38,4	1,9
21	1,6	4,0	143,2	39,2	-	1,6
				-	40,4	1,7
25	1,3	4,0	171,0	47,2	-	1,6
				-	48,4	1,7
32	1,0	4,0	229,2	61,2	-	1,6
				-	62,4	1,7

(1) using LP insert with radius 0,8 mm

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: $\text{ØDHmin} = 2 \times (\text{ØDc} - (\text{R corner radius} + \text{F width of edge wiper}))$

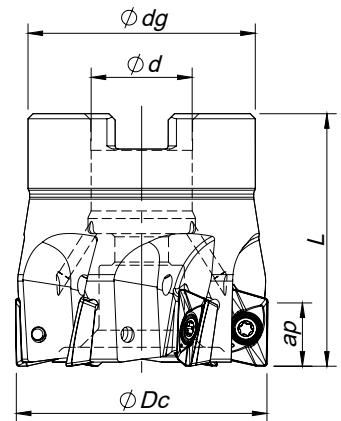
- Maximum Diameter: $\text{ØDHmax} = 2 \times (\text{ØDc} - \text{R corner radius})$

(On HF insert the corner radius should be corner radius programming)



Arbor Mounting

$K_r=90^\circ$ | $\gamma_p=+8^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Max ap (mm)			Arbor Style	Insert Pastilha Inserto	Stock
			ϕDc	$\phi d/M$	ϕdg	L		LP/MP	HF	MH			
181088600	040A20190-06-08-016040	6	40	16	36	40	0,22	10,0	0,80	3,00	A	XP... 1003...	
181088700	050A20190-07-08-022040	7	50	22	42	40	0,31	10,0	0,80	3,00	A	XP... 1003...	
181088800	063A20190-08-08-022040	8	63	22	52	40	0,43	10,0	0,80	3,00	A	XP... 1003...	

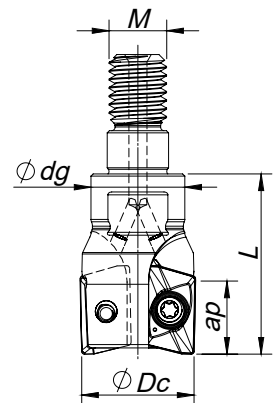
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Threaded Coupling

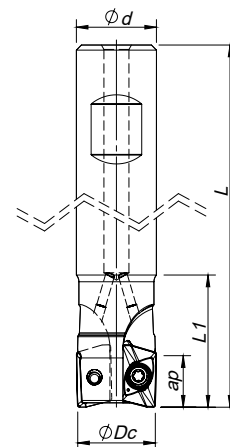
$K_r=90^\circ$ | $\gamma_p=+5^\circ \sim +6^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Max ap (mm)			Insert Pastilha Inserto	Stock
			ϕDc	$\phi d/M$	ϕdg	L		LP/MP	HF	MH		
181088200	016R20190-02-05-M08025	2	16	M8	14	25	0,03	10,0	0,80	3,00	XP... 1003...	
181088300	020R20190-03-05-M10030	3	20	M10	18	30	0,06	10,0	0,80	3,00	XP... 1003...	
181088400	025R20190-04-05-M12035	4	25	M12	21	35	0,12	10,0	0,80	3,00	XP... 1003...	
181088500	032R20190-05-06-M16035	5	32	M16	29	35	0,15	10,0	0,80	3,00	XP... 1003...	
181149100	040R20190-06-08-M16043	6	40	M16	29	43	0,25	10,0	0,80	3,00	XP... 1003...	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Weldon Shank

$K_r=90^\circ$ | $\gamma_p=+5^\circ \sim 8^\circ$

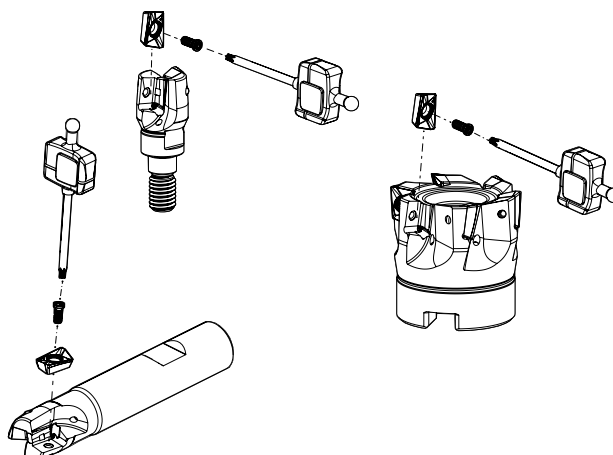
Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Max ap (mm)			Insert Pastilha Inserto	Stock
			ϕDc	$\phi d/M$	L	L1		LP/MP	HF	MH		
181087900	016W20190-02-05-016085	2	16	16	85	32	0,10	10,0	0,80	3,00	XP... 1003...	
181100600	016W20190-02-05-016150	2	16	16	150	70	0,13	10,0	0,80	3,00	XP... 1003...	
181108600	017W20190-02-05-016150	2	17	16	150	36	0,14	10,0	0,80	3,00	XP... 1003...	
181088000	020W20190-03-05-020090	3	20	20	90	28	0,21	10,0	0,80	3,00	XP... 1003...	
181100700	020W20190-03-05-020150	3	20	20	150	70	0,26	10,0	0,80	3,00	XP... 1003...	
181108700	022W20190-03-05-020150	3	22	20	150	70	0,30	10,0	0,80	3,00	XP... 1003...	
181088100	025W20190-04-05-025095	4	25	25	95	30	0,33	10,0	0,80	3,00	XP... 1003...	
181100800	025W20190-04-05-025150	4	25	25	150	80	0,36	10,0	0,80	3,00	XP... 1003...	
181108800	027W20190-04-05-025150	4	27	25	150	80	0,38	10,0	0,80	3,00	XP... 1003...	
181085400	032W20190-04-08-032110	4	32	32	110	50	0,55	10,0	0,80	3,00	XP... 1003...	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

SPARE PARTS | Complementos | Repuestos

Cutter ϕDc	Order separately			
	Insert Screw 	Key (Torx) 	Key (Torx - Nm) 	Torque Value
W20190 - 16-27	P0250503	XT08	DT0812	1,2
R20190 - 16-40	P0250503	XT08	DT0812	1,2
A20190 - 40-63	P0250704	XT08	DT0812	1,2

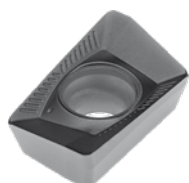


LINEPRO 20190

XP... 1003... | Inserts | Pastilhas | Plaquetas

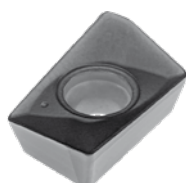
XPET-LP
(PHS grade)

NEW



XPET-MP
(PHS grade)

NEW



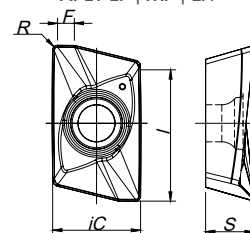
XPET-LN



PHP
NEW
GRADE

PHS
NEW
GRADE

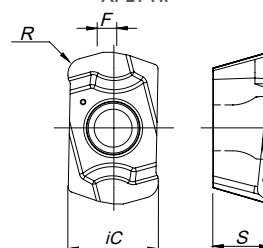
XPET-LP | MP | LN



XPET-HF
(HiFeed geometry)

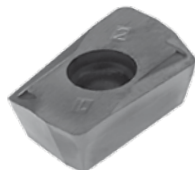


XPET-HF

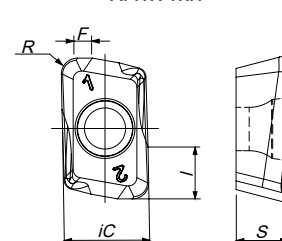


XPHW-MH
(finishing geometry)

NEW



XPHW-MH



			P								M		K						N		S		H		Dimensions Dimensões Dimensiones (mm)					
			CVD	PVD								PVD		CVD		PVD				UNC	PCD	PVD		PVD						PCBN
				T9	P7	G1	G4	T1	P3	P4	G6	P3	P4	L5	L9	G1	G4	T1	P3			10	D6							
(1)	Geometry code	ISO Reference	PH5740	PH7603	PH7910	PH7920	PH920	PH7930	PH930	PH7740	PH7930	PH930	PH5705	PH5740	PH7910	PH7920	PH920	PH7930	PH0910	PDP410	PH7930	PH930	PH7603	PBH910	iC	S	I	R	F	
NEW	1111980	XPET 100304 PDER-LP				⊗		⊗			⊗					⊗		⊗			⊗				6,95	3,96	10,50	0,40	1,30	
	1111981	XPET 100308 PDER-LP	⊗			⊗	⊗	⊗			⊗					⊗	⊗	⊗			⊗				6,95	3,96	10,50	0,80	1,40	
	1112022	XPET 100316 PDER-LP				⊗	⊗	⊗			⊗					⊗	⊗	⊗			⊗				6,95	3,96	10,50	1,60	0,80	
NEW	1111982	XPET 100304 PDSR-MP			⊗	⊗		⊗					⊗	⊗	⊗	⊗	⊗	⊗							6,95	3,96	10,50	0,40	1,10	
	1111983	XPET 100308 PDSR-MP	⊗		⊗	⊗	⊗	⊗	⊗				⊗	⊗	⊗	⊗	⊗	⊗							6,95	3,96	10,50	0,80	1,35	
	1111984	XPET 100304 PDFR-LN																	⊗						6,95	3,96	10,50	0,40	0,75	
NEW	1112906	XPET 100308 PDFR-LN																	⊗						6,95	3,96	10,50	0,80	1,05	
	1111985	XPET 100312 PDFR-LN																	⊗						6,95	3,96	10,50	1,20	0,75	
	1112376	XPET 100312 ZDR-HF			⊗	⊗	⊗	⊗	⊗		⊗				⊗	⊗	⊗	⊗			⊗	⊗			6,95	3,96	-	1,20	1,50	
NEW	1112500	XPHW 100308 ZER-MH		⊗	⊗																	⊗	○		6,95	3,60	3,00	0,80	1,30	
	1112736	XPHW 100310 ZER-MH		○	○																	○	○		6,95	3,60	3,00	1,00	0,35	
	1112735	XPHW 100320 ZER-MH		○	○																	○	○		6,95	3,60	3,00	1,20	1,10	

First choice | Primeira opção | 1ª opción

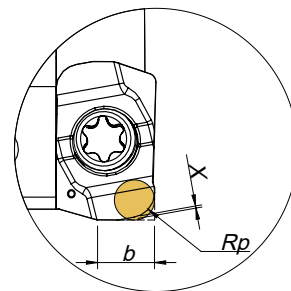
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta
Disponible bajo consulta

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

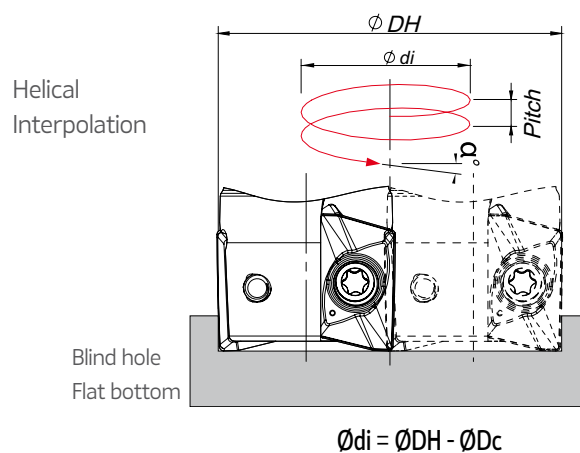
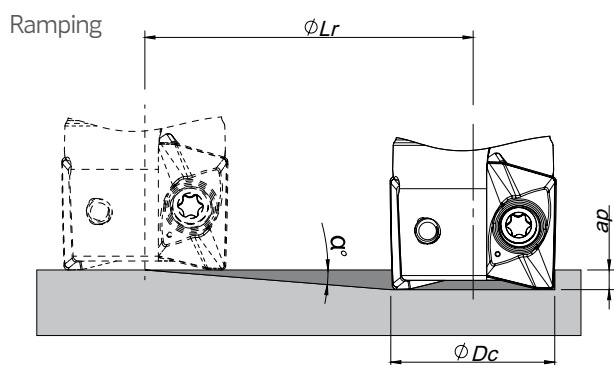
PROGRAMMING DATA | Dados para programação | Datos para la programación

Insert	Programming Data		
	Rp	X	b
XPET 10 HF	1,6	0,33	3,45



RAMPING AND HELICAL INTERPOLATION

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



ϕDc	Ramping			Helical Interpolation		
				Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
	Max Ramp α°	Max a_p	Min Lr	ϕDH_{min}	ϕDH_{max}	
16	7,5	10,0	76,0	27,6 -	- 30,4	4,8 6,0
17	7,0	10,0	81,4	29,6 -	- 32,4	4,9 5,9
20	5,0	10,0	114,3	35,6 -	- 38,4	4,3 5,1
22	4,5	10,0	127,1	39,6 -	- 42,4	4,3 5,0
25	3,5	10,0	163,5	45,6 -	- 48,4	4,0 4,5
27	3,0	10,0	190,8	49,6 -	- 52,4	3,7 4,2
32	2,5	10,0	229,0	59,6 -	- 62,4	3,8 4,2
40	1,7	10,0	336,9	75,6 -	- 78,4	3,3 3,6
50	1,3	10,0	440,7	95,6 -	- 98,4	3,2 3,4
63	1,0	10,0	572,9	121,6 -	- 124,4	3,2 3,4

(1) using LP insert with radius 0,8 mm

Note: During helical interpolation do not exceed maximum pitch

When using HF insert or other different insert radius to calculate the ϕDH_{min} and ϕDH_{max} use the equation below:

- Minimum Diameter: $\phi DH_{min} = 2 \times (\phi Dc - (R \text{ corner radius} + F \text{ width of edge wiper}))$

- Maximum Diameter: $\phi DH_{max} = 2 \times (\phi Dc - R \text{ corner radius})$

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

ISO	PSM	Material	HB (Brinell)	Grades									
				← Wear Resistance						Toughness →			
				PH7603	PH0910	PH7910	PH5705	PH7920	PHP920	PH7930	PHP930	PH5740	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			✓	✓	✓	✓			✓	
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

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

ISO	PSM	Material	HB (Brinell)	Vc (m/min)					
				← Wear Resistance					
				PH7603	PH0910	PH7910	PH5705	PH7920	PHP920
P	1	Unalloyed Steel	125-220	200-260	-	180-240	-	160-220	160-220
	2	Low-Alloyed Steel	220-280	190-270	-	170-250	-	150-230	150-230
	3	High-Alloyed Steel	280-380	180-230	-	160-210	-	140-190	140-190
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	-	-	170-380	160-390	160-350	160-350
	8	Grey Cast Iron	180-245	-	-	160-330	150-320	150-300	150-300
	9	Nodular Cast iron	160-250	-	-	130-280	120-280	120-260	120-260
N	10	Aluminium and Non Ferrous	30-130	-	350-1400	-	-	-	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	-	-
H	12	Hardened Steels	40-55 HRC	120-260	-	-	-	-	-

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

(Note 2): PH5... and PHS... can be used wet or dry. PH7... use only air.

(Note 3):

Operation	a_e	Vc & fz	a_p (mm)
Slotting	100%	<20%	2,0-4,0
Shouldering	<50%	>8%	3,0-6,0
	≤25%	>12%	7,0-9,0

(Note 4):

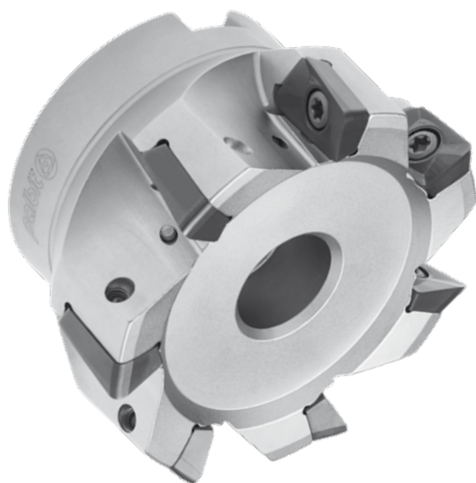
It's possible to occur vibrations in certain cases. Please reduce depth of cut and / or reduce cutting conditions in following cases:

- 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

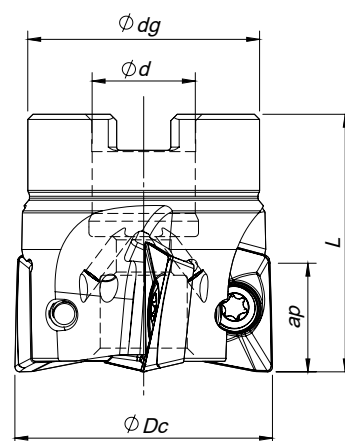
ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choice	Difficult Operations
P	1	Unalloyed Steel	125-220	XPET 10 ... LP/HF	XPET 10 ... MP
	2	Low-Alloyed Steel	220-280	XPET 10 ... LP/HF	XPET 10 ... MP
	3	High-Alloyed Steel	280-380	XPET 10 ... MP/HF	-
M	4	SS - Ferritic / Martensitic	200-330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

Vc (m/min)				Feed fz (mm/t)				
Toughness →								
PH7930	PHP930	PH5740	PHS740	XPET 10... LP	XPET 10... MP	XPET 10... LN	XPET 10... HF	XPHW 10... MH
140-200	140-200	-	120-150	0,08-0,20	0,10-0,25	-	0,40-0,80	0,10-0,25
130-180	130-180	-	110-170	0,08-0,20	0,10-0,20	-	0,40-0,80	0,10-0,25
100-170	100-170	-	100-130	0,08-0,15	0,10-0,20	-	0,40-0,60	0,10-0,25
130-220	-	-	-	0,08-0,20	0,10-0,20	-	0,40-0,70	-
120-180	-	-	-	0,08-0,20	0,10-0,20	-	0,40-0,70	-
70-140	-	-	-	0,08-0,15	0,10-0,20	-	0,40-0,60	-
140-260	-	120-240	-	0,08-0,20	0,10-0,25	-	0,50-0,80	-
130-220	-	110-200	-	0,08-0,20	0,10-0,25	-	0,50-0,80	-
100-180	-	90-170	-	0,08-0,20	0,10-0,20	-	0,50-0,60	-
-	-	-	-	-	-	0,07-0,25	-	-
35-65	35-65	-	-	0,05-0,07	-	-	0,40-0,60	-
-	-	-	-	-	-	-	-	0,08-0,15



Arbor Mounting

$K_r=90^\circ$ | $\gamma_p=+7^\circ \sim +8^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Specifications		Insert Pastilha Inserto	Stock
			ϕDc	$\phi d/M$	ϕdg	L		Arbor Type	Ap max (mm)		
181090900	040A20290-04-07-016040	4	40	16	32	40	0,18	A	17,0	XPET 1706...	⊗
181091000	050A20290-05-08-022040	5	50	22	42	40	0,29	A	17,0	XPET 1706...	⊗
181091100	063A20290-06-08-027040*	6	63	27	52	40	0,53	A	17,0	XPET 1706...	⊗
181091200	080A20290-07-08-027050	7	80	27	60	50	0,92	A	17,0	XPET 1706...	⊗
181091300	100A20290-08-08-032050	8	100	32	80	50	1,68	A	17,0	XPET 1706...	⊗
181091400	125A20290-09-08-040063	9	125	40	90	63	3,01	A	17,0	XPET 1706...	⊗

⊗ Stock item | Produto de stock | Itens de stock

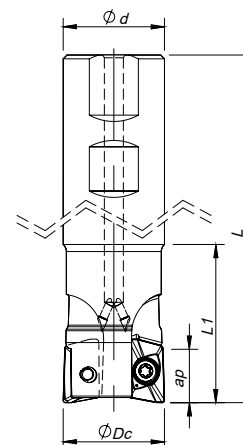
○ Available under request | Disponível sobre consulta | Disponible bajo consulta

* For shank assembly a DIN 6920 screw is needed.



Weldon Shank

$K_r=90^\circ$ | $\gamma_p=+6^\circ \sim +7^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)				Kg	Specifications	Insert Pastilha Inserto	Stock
			ØDc	Ød/M	L	L1		Ap max (mm)		
181090500	032W20290-02-06-032110	2	32	32	110	50	0,56	17,0	XPET 1706...	
181090600	032W20290-02-06-032200	2	32	32	200	60	1,10	17,0	XPET 1706...	
181090700	040W20290-03-07-032115	3	40	32	115	50	0,67	17,0	XPET 1706...	
181090800	040W20290-03-07-032200	3	40	32	200	60	1,19	17,0	XPET 1706...	

⊗ Stock item | Produto de stock | Itens de stock

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



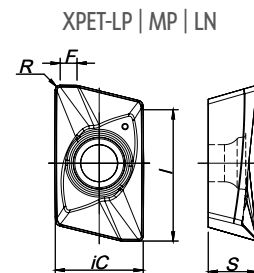
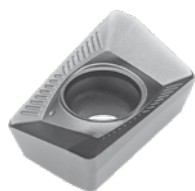
XPET 1706... | Inserts | Pastilhas | Plaquetas

XPET-LP

XPET-MP
(PHS grade)

NEW

XPET-LN



		P								M				K						N		S		H		Dimensions Dimensões Dimensiones (mm)					
		CVD	PVD								CVD	PVD			CVD			PVD			UNC	PCD	PVD	PVD	PCBN						
		⁽²⁾ Grade code	T9	P7	G4	T1	P3	P4	G6	R1	G4	P4	G6	L5	L9	G4	T1	G6	10	D6	P3	G6	P7	D4							
⁽¹⁾ Geometry code	ISO Reference	PHS740	PH7603	PH7920	PHP920	PH7930	PHP930	PH7740	PHM740	PH7920	PHP930	PH7740	PH5705	PH5740	PH7920	PHP920	PH7740	PH0910	PDP410	PH7930	PH7740	PH7603	PBH910	iC	S	I	R	F			
	1111986	XPET 170608 PDER-LP																							11,30	6,35	17,50	0,80	1,80		
	1111987	XPET 170616 PDER-LP																							11,30	6,35	17,50	1,60	1,20		
NEW	1111988	XPET 170608 PDSR-MP																						11,30	6,35	17,50	0,80	1,80			
	1111989	XPET 170616 PDSR-MP																						11,30	6,35	17,50	1,60	1,00			
	1111990	XPET 170608 PDFR-LN																						11,30	6,35	17,50	0,80	1,20			
	1111991	XPET 170620 PDFR-LN																						11,30	6,35	17,50	2,00	1,00			
	1111992	XPET 170632 PDFR-LN																							11,30	6,35	17,50	3,20	0,80		

⊗ First choice | Primeira opção | 1ª opção

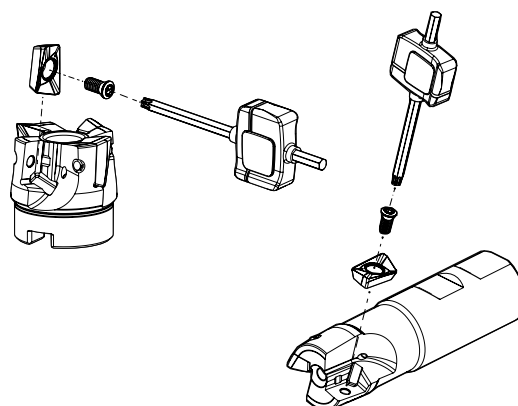
⊗ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta
Disponível bajo consulta

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

SPARE PARTS | Complementos | Repuestos

Cutter ØDc	Insert Screw	Key (Torx)	Order separately		Torque Value
			Key (Torx - Nm)		
W20290 - 32-40	P0451001	XT20	DT2050		5,0
A20290 - 40-80	P0451001	XT20	DT2050		5,0
A20290 - 100-125	P0451001	PT20	DT2050		5,0



LINEPRO 20290

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

ISO	PSM	Material	HB (Brinell)	Grades						
				← Wear Resistance				Toughness →		
				PH0910	PH5705	PH7920	PHP920	PH5740	PH5740	PH7740
										
P	1	Unalloyed Steel	125-220			✓	✓		✓	✓
	2	Low-Alloyed Steel	220-280			✓	✓		✓	✓
	3	High-Alloyed Steel	280-380			✓	✓		✓	✓
M	4	SS - Ferritic / Martensitic	200-330							✓
	5	SS - Austenitic	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-apanas | Guía para aplicación del rompevirutas

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

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

ISO	PSM	Material	HB (Brinell)	Vc (m/min)			
				← Wear Resistance			
				PH0910	PH5705	PH7920	PHP920
P	1	Unalloyed Steel	125-220	-	-	160-280	160-280
	2	Low-Alloyed Steel	220-280	-	-	150-230	150-230
	3	High-Alloyed Steel	280-380	-	-	140-190	140-190
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	-	160-380	160-350	160-350
	8	Grey Cast Iron	180-245	-	150-320	150-300	150-300
	9	Nodular Cast iron	160-250	-	120-280	120-260	120-260
N	10	Aluminium and Non Ferrous	30-130	350-1400	-	-	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-

(Note 1) Cutting conditions ae/DC=70%

(Note 2) Cutting conditions should be adjusted according to the machine and work rigidity.

(Note 3):

Operation	ae	Vc & fz	ap (mm)
Slotting	100%	<20%	2,0-6,0
Shouldering	<50%	>8%	7,0-13,0
	≤25%	>12%	13,0-16,0

(Note 4) It's possible to occur vibrations in certain cases.

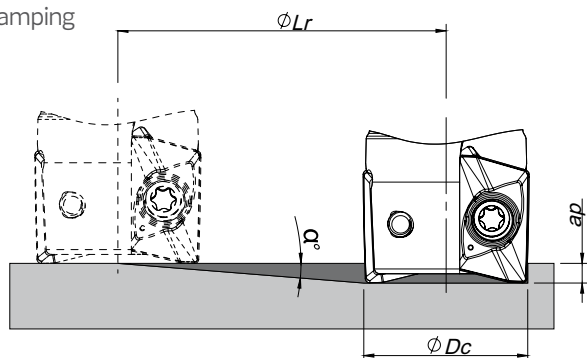
Please reduce depth of cut and / or reduce cutting conditions in following cases:

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

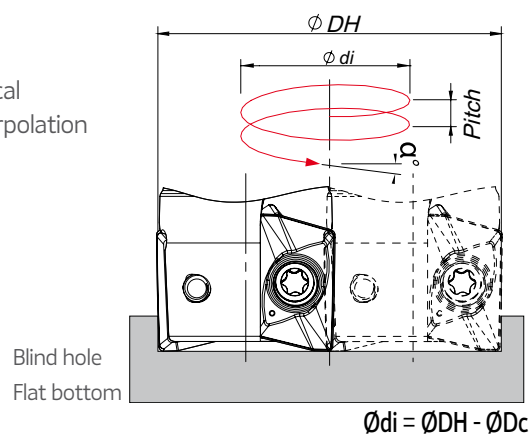
RAMPING AND HELICAL INTERPOLATION

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

Ramping



Helical Interpolation



ØDc	Ramping			Helical Interpolation		
	Max Ramp α°	Max ap	Min Lr	Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
				ØDHmin	ØDHmax	
32	3,8	17,0	255,9	58,8 -	- 62,4	5,6 6,3
40	2,7	17,0	360,5	74,8 -	- 78,4	5,2 5,7
50	2,0	17,0	486,8	94,8 -	- 98,4	4,9 5,3
63	1,5	17,0	649,2	120,8 -	- 124,4	4,8 5,0
80	1,0	17,0	973,9	154,8 -	- 158,4	4,1 4,3
100	0,8	17,0	1217,5	194,8 -	- 198,4	4,2 4,3
125	0,7	17,0	1498,4	244,8 -	- 248,4	4,3 4,4

(1) using LP insert with radius 0,8 mm

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:

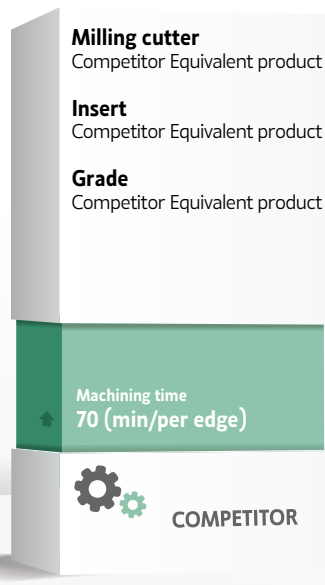
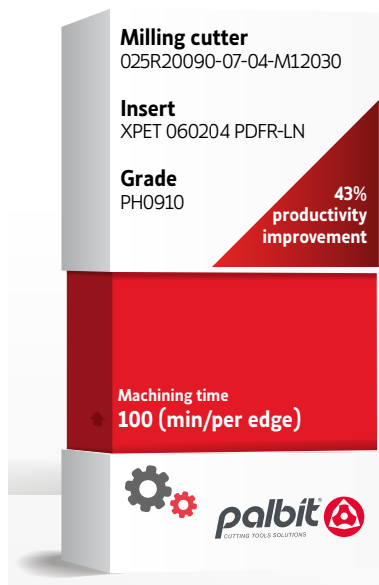
- Minimum Diameter: $\text{ØDHmin} = 2 \times (\text{ØDc} - (\text{R corner radius} + \text{F width of edge wiper}))$

- Maximum Diameter: $\text{ØDHmax} = 2 \times (\text{ØDc} - \text{R corner radius})$

Vc (m/min)			Feed fz (mm/t)		
		Toughness →			
PH5740	PHS740	PH7740	XPET 17... LP	XPET 17... MP	XPET 17... LN
-	140-220	140-220	0,10-0,35	0,10-0,35	-
-	130-180	130-180	0,10-0,35	0,10-0,35	-
-	100-170	100-170	0,10-0,30	0,10-0,30	-
-	-	130-220	0,10-0,30	0,10-0,30	-
-	-	120-180	0,10-0,30	0,10-0,30	-
-	-	70-140	0,10-0,25	0,10-0,25	-
150-300	-	140-260	0,10-0,35	0,10-0,35	-
140-250	-	130-220	0,10-0,35	0,10-0,35	-
120-220	-	100-180	0,10-0,30	0,10-0,30	-
-	-	-	-	-	0,10-0,35
-	-	30-65	0,10-0,20	-	-

LINEPRO 20090 | 20190 | 20290

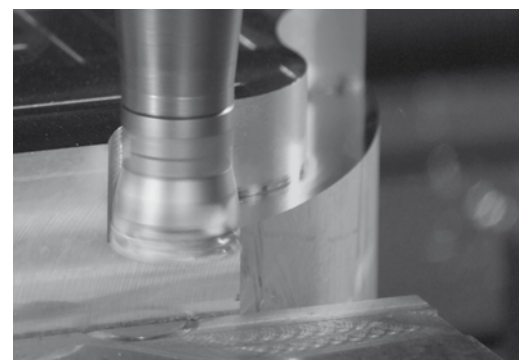
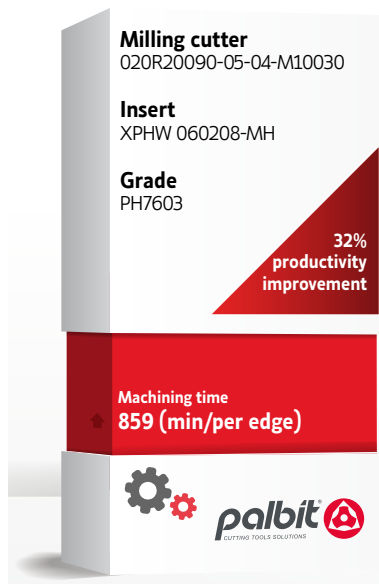
XPET 06...-LN TEST REPORT



Work material: AlSi10Mg

Cutting speed: Vc (m/min)	650
Feed per tooth: fz (mm/t)	0,08
Depth of cut: ap (mm)	1,00
Width of cut: ae (mm)	15
Method of machining	Shoulder milling
Coolant	Air

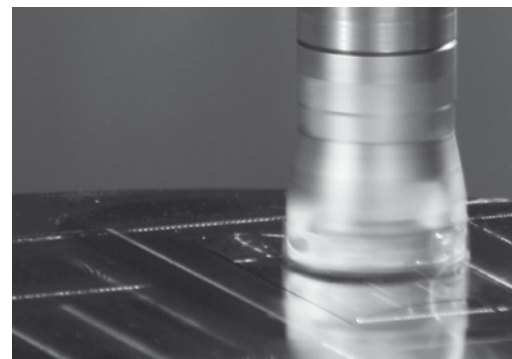
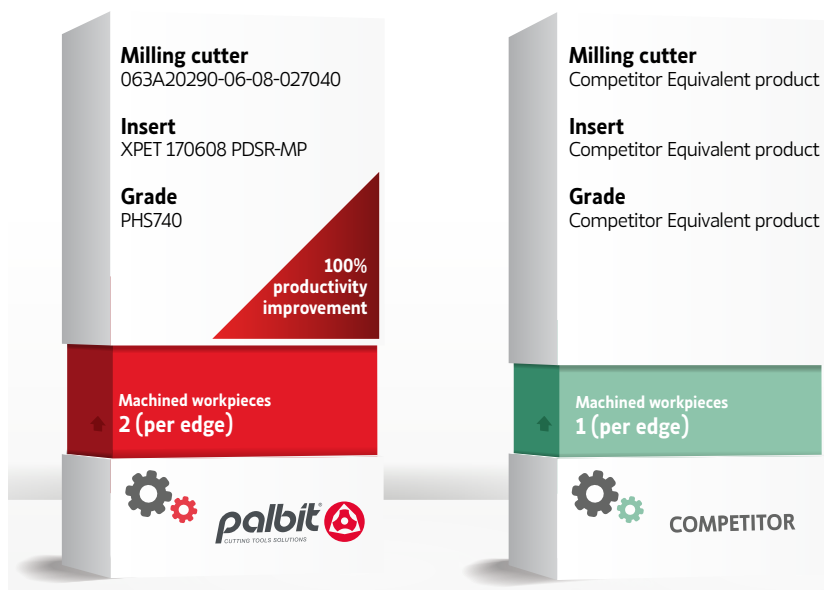
XPHW 06...-MH TEST REPORT



Work material: 40CrMnNiMo8 (1.2738) - (34-38 HRC)

Cutting speed: Vc (m/min)	300
Feed per tooth: fz (mm/t)	0,10
Depth of cut: ap (mm)	0,18
Width of cut: ae (mm)	0,20
Method of machining	Shoulder milling
Coolant	Air

XPET 17... - MP PHS740 TEST REPORT



Work material: 1.0037 Structural Steel
Unstable weld design and heavy interrupted cutting areas

Cutting speed: Vc (m/min)	400
Feed per tooth: fz (mm/t)	0,20
Depth of cut: ap (mm)	2-3
Width of cut: ae (mm)	60
Method of machining	Sholder milling
Coolant	Yes



LINEPRO
20090 | 20190 | 20290

HEADQUARTERS

PALBIT, S.A.

P.O.Box 4 - Palhal

3854-908 - Branca ALB - Portugal

T (+351) 234 540 300 | F (+351) 234 540 301

palbit@palbit.pt | www.palbit.pt

Branch office:

PALBIT México

Emerson 150. Int.803-804. Colonia Chapultepec

Morales Delagación Miguel Hidalgo

C.P. 11570 México DF

T (+52) 5555 454 543 | F (+52) 5552 509 190

info@palbit.com.mx | www.palbit.com.mx

Branch office:

PALBIT Brasil

Av. João XXIII. nº20. Sl 41 - Vila Gilda

Stº André. SP. CEP 09190-500 SP Brasil

T (+55) 1125 343 648 | F (+55) 1125 343 648

palbit@palbit.com.br | www.palbit.com.br

