

# HELIPRO

## 20290

Unlock the power of  
high Material Removal Rates



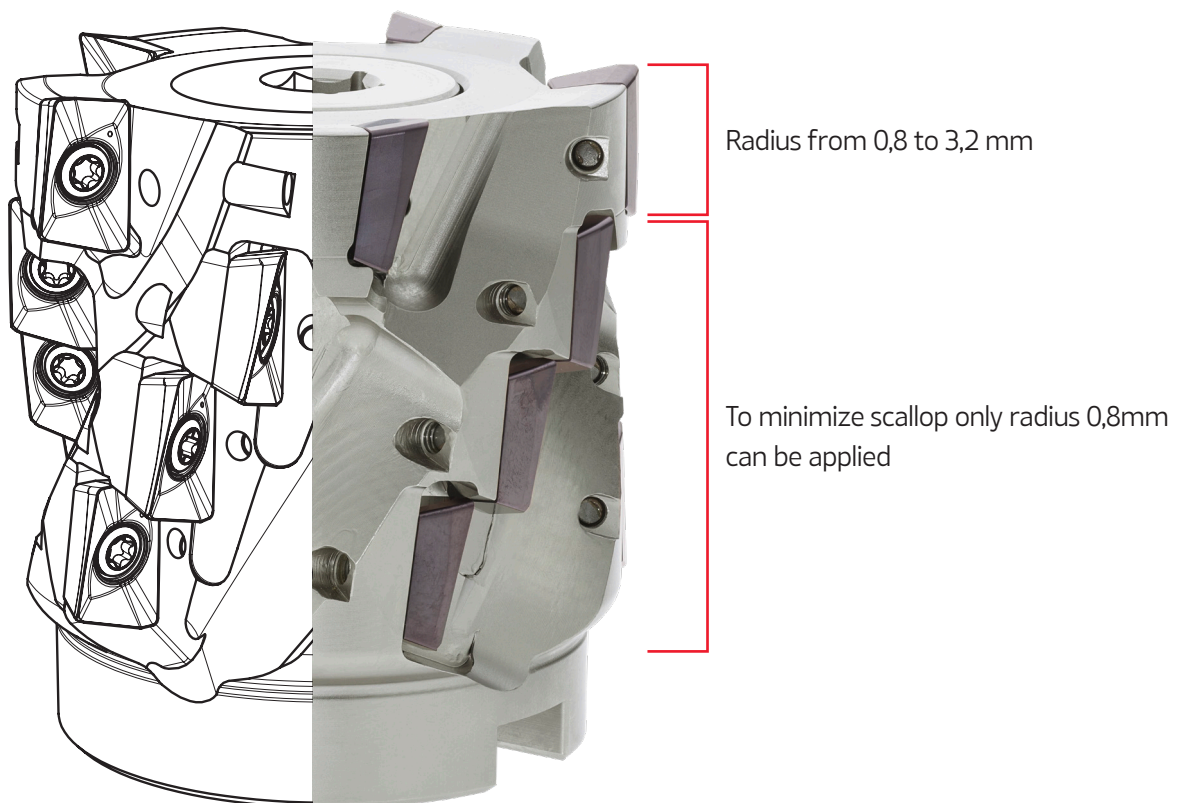
# HELIPRO 20290

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Palbit's latest innovation, the HeliPro 20290 brings the well-known XPET 1706 insert to a new level of productivity. With the disposal of this in a helical configuration we are able to achieve higher depths of cut, allowing us to speed up production with higher material removal rates (MRR). With the increasing competitiveness of the industry, customers are forced to reduce production costs and increase profitability. One of the best ways to achieve it is through the reduction of production cycle times and improving productivity of the milling operations.

This range of helical cutters has been specifically designed for shoulder and slot milling, providing an efficient and cost-effective solution for machining a variety of materials such as steel, stainless steel, cast iron, aluminum and super alloys. The lead line pockets are designed to accommodate various corner radius from 0,8mm to 3,2mm, meeting the needs of every customer. With such a wide range of options available, setting the HeliPro 20290 apart, users can tailor the tool to their specific application, ensuring optimal performance and precision. The helical design of the tool also offers a smoother cutting experience, which reduces the tool wear.

Palbit's attention to detail is evident in every aspect of the HeliPro 20290, from design to manufacturing to quality control. This results in a durable and reliable tool that professionals across many industries can depend on. If you are looking for a versatile and efficient solution for machining P, M, K, N and S classes materials with high performance results, the HeliPro 20290 is an excellent choice.

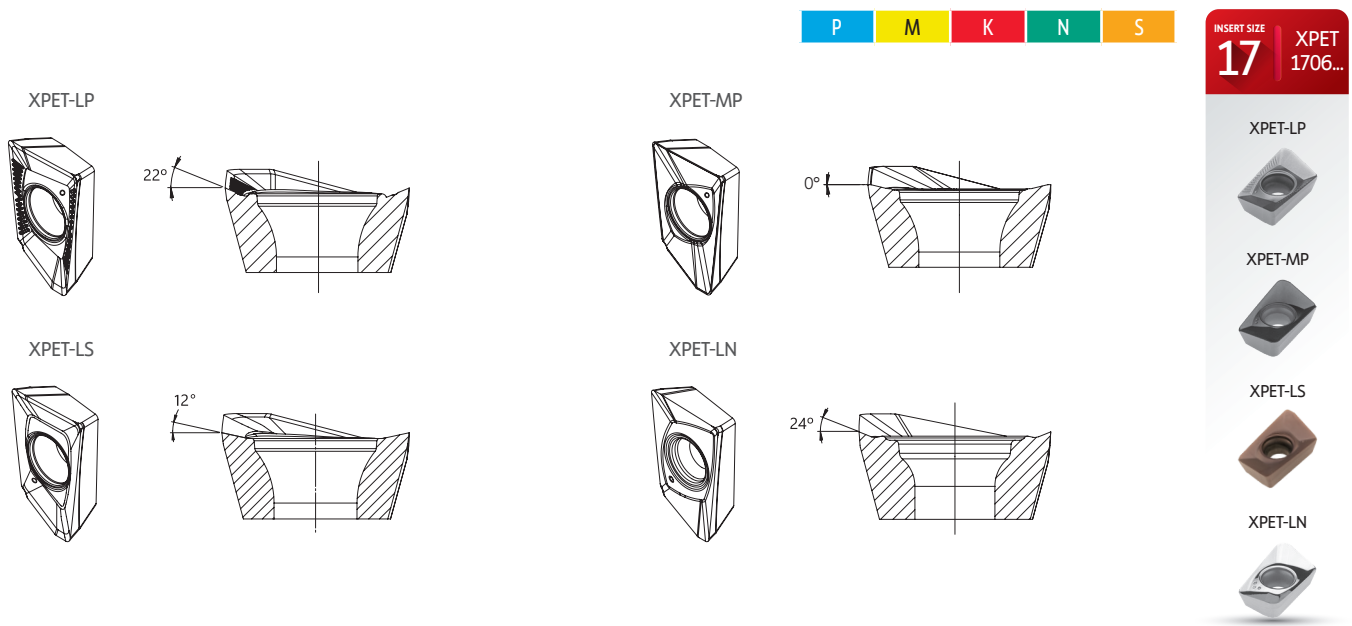


# HELIPRO 20290

## Advantages :

- **High metal removal capacity:** long edge cutters have a high metal removal capacity, making them ideal for deeper, larger, and heavier shoulder milling applications;
- **Superior stability:** the advanced design provides exceptional stability, which is critical in tough side milling applications;
- **Superior chip evacuation:** the large helix ensures a smooth, hassle-free chip flow even at higher metal removal rates;
- **Versatility:** the different chip-breakers and radius are suitable for a wide range of materials and applications, including high depth of cut shouldering and full slotting, making it a versatile tool that can compensate for the use of multiple tools;
- **Cost-effective:** due to the high material removal rate, it allows to reduce the production times, making it an excellent choice for professionals looking to reduce costs without sacrificing performance or quality.

## INSERTS XPET 1706 | Pastilhas XPET 1706.. | Plaquetas 1706..



## CHIP-BREAKERS | Quebra- aparas | Rompevirutas

Chip-Breaker	Features   Características   Características
Geometry <b>LP</b> Light machining	Positive top rake angle to promote a good chip flow and reduce power consumption on low alloy steels.
Geometry <b>MP</b> Light machining	Chip-breaker with a reinforced chamfer for general applications on steel and cast iron.
Geometry <b>LS</b> Light machining	Positive chip-breaker dedicated to stainless steel and HRSA.
Geometry <b>LN</b> Light machining	High positive chip-breaker, polished for applications of non ferrous materials (aluminum).



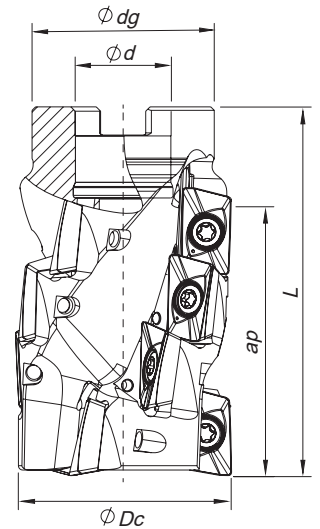
# HELIPRO 20290

Proprietary milling line



## Arbor Mounting

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



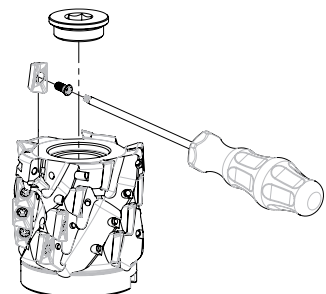
Order code Código	Reference Referência Referencia		Nº Stages	Nº Flutes	Dimensions   Dimensões   Dimensiones (mm)					Kg	Insert Pastilha Inserto	Stock
					ØDc	Ød	Ødg	L	Ap (max)			
181100100	050A20290-03-08-022085-063-12		4	3	50	22	42	85	63	0,465	XP... 1706...	
181133000	063A20290-04-08-027085-063-16		4	4	63	27	60	85	63	0,930	XP... 1706...	
181126500	080A20290-05-08-032085-063-20		4	5	80	32	70	85	63	1,723	XP... 1706...	
181126600	100A20290-06-08-040085-063-24		4	6	100	40	90	85	63	3,011	XP... 1706...	
181133100	125A20290-06-08-040105-079-30		5	6	125	40	90	105	79	4,800	XP... 1706...	

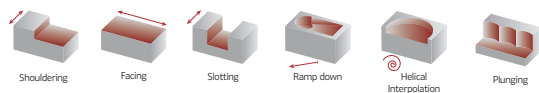
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

## SPARE PARTS | Complementos | Repuestos

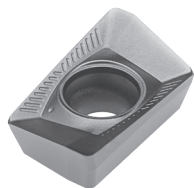
Cutter ØDc	Insert Screw 	Key (Torx) 	Order separately		Sealing Cap 
			Key (Torx - Nm) 	Torque Value 	
A20290 - 50	P0451001	PT20	DT2050	5,0	TRM2009S8
A20290 - 63	P0451001	PT20	DT2050	5,0	TRM2411S10
A20290 - 80	P0451001	PT20	DT2050	5,0	TRM3012S14
A20290 - 100	P0451001	PT20	DT2050	5,0	TRM3615S17
A20290 - 125	P0451001	PT20	DT2050	5,0	TRM3615S17





XPET 1706... | Inserts | Pastilhas | Plaquetas

XPET-LP



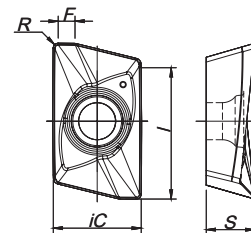
XPET-MP



PHH  
GRADE

PHP  
GRADE

XPET-LP | MP | LN | LS



XPET-LN



XPET-LS  
(PHH grade)



(1) Geometry code	(2) Grade code ISO Reference	P			M		K				N	S		Dimensions Dimensões Dimensiones (mm)				
		CVD		PVD	PVD		CVD		PVD		UNC	PVD						
		T9	T1	G6	X9	G6	L5	L9	T1	G6	10	X9	G6	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
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
1112223	XPET 170608 PDER-LS				⊗	⊗						⊗	⊗	11,30	6,35	17,50	0,80	1,94
1113373	XPET 170612 PDER-LS				○							○		11,30	6,35	17,50	1,20	1,56
1113361	XPET 170616 PDER-LS				○							○		11,30	6,35	17,50	1,60	1,19
1113362	XPET 170620 PDER-LS				○							○		11,30	6,35	17,50	2,00	2,10
1113363	XPET 170632 PDER-LS				○							○		11,30	6,35	17,50	3,20	0,96

⊗ 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

# HELIPRO 20290

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

ISO	PSM	Material	HB (Brinell)	Vc (m/min)				
				← Wear Resistance				
				PH0910	PH5705	PHP920	PHP930	PHH930
P	1	Unalloyed Steel	125-220	-	-	180-250	160-230	-
	2	Low-Alloyed Steel	220-280	-	-	160-230	140-210	-
	3	High-Alloyed Steel	280-380	-	-	140-220	120-200	-
M	4	SS - Ferritic / Martensitic	200-330	-	-	-	-	140-210
	5	SS - Austenitic	200-330	-	-	-	-	120-170
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	-	-	100-150
K	7	Malleable Cast Iron	130-230	-	160-290	160-270	-	-
	8	Grey Cast Iron	180-245	-	170-320	140-250	-	-
	9	Nodular Cast iron	160-250	-	140-200	120-210	-	-
N	10	Aluminium and Non Ferrous	30-130	100-2000	-	-	-	-
S	11	Heat Resistant Super Alloys	200-320	-	-	-	-	30-110

(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%	13,0-42,0
Shouldering	<50%	>8%	30,0-63,0
	≤25%	>12%	42,0-79,0

(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.

## 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

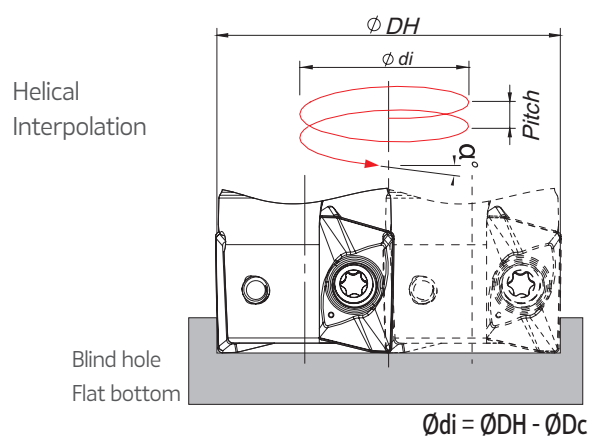
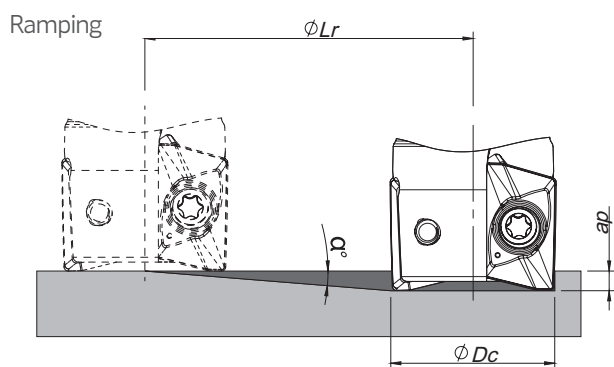
## CHIP-BREAKER SELECTION GUIDE | Guia para aplicações do quebra- aparas | Guía para aplicación del rompevirutas

ISO	PSM	Material	HB (Brinell)	Chip-Breaker Application	
				1st choice	Difficult Operations
P	1	Unalloyed Steel	125-220	XPET 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

Vc (m/min)			Feed fz (mm/t)			
			Toughness →			
PH5740	PHS740	PH7740	XPET 17... LP	XPET 17... MP	XPET 17... LN	XPET 17... LS
-	140-220	140-200	0,10-0,35	0,10-0,35	-	-
-	120-200	130-180	0,10-0,35	0,10-0,35	-	-
-	100-190	100-170	0,10-0,30	0,10-0,30	-	-
-	-	130-180	0,10-0,30	-	-	0,10-0,35
-	-	110-160	0,10-0,30	-	-	0,10-0,30
-	-	90-150	0,10-0,25	-	-	0,10-0,25
160-260	-	140-220	0,10-0,35	0,10-0,35	-	-
140-240	-	120-210	0,10-0,35	0,10-0,35	-	-
120-200	-	100-190	0,10-0,30	0,10-0,30	-	-
-	-	-	-	-	0,10-0,35	-
-	-	30-100	0,10-0,20	-	-	0,10-0,20

## RAMPING AND HELICAL INTERPOLATION

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



$\phi Dc$	Ramping			Helical Interpolation		
	Max Ramp $a^\circ$	Max $ap$	Min Lr	Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
				$\phi DH_{min}$	$\phi DH_{max}$	
50	2,0	8,5	243,4	94,8	-	4,9
				-	98,4	5,3
63	1,5	8,5	324,6	120,8	-	4,7
				-	124,4	5,0
80	1,0	8,5	487,0	154,8	-	4,1
				-	158,4	4,2
100	0,8	8,5	608,7	194,8	-	4,1
				-	198,4	4,3
125	0,7	8,5	695,7	244,8	-	4,5
				-	248,4	4,7

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



## HELIPRO 20290

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