

# LINEPRO 17090

A

MILLING

Overview

Face milling

Hi-feed milling

Shoulder milling

Profile milling

Hardmill

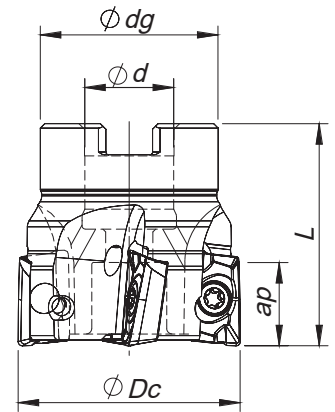
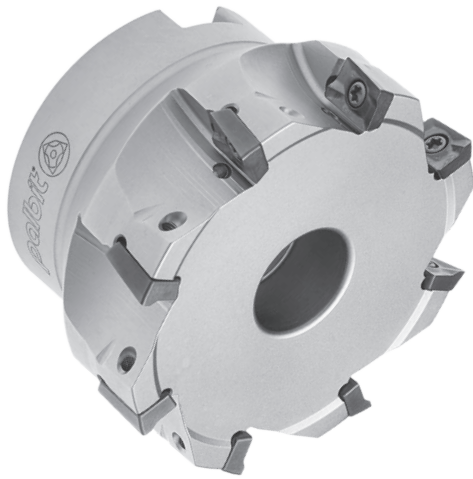
Center & Chamfer

Spot face

Spare Parts

Technical Data

End Mills



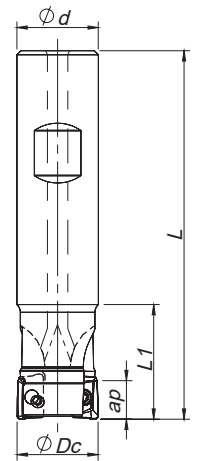
## Arbor Mounting

$K_r=90^\circ$  |  $\gamma_p=+9^\circ$

Order code Código	Reference Referência Referencia		Dimensions   Dimensões   Dimensiones (mm)				Kg	Specifications		Insert Pastilha Inserto	Stock
			$\phi Dc$	$\phi d$	$\phi dg$	L		Arbor Type	Ap max (mm)		
181010200	040A17090-06-09-022040		40	22	39	40	0,210	A	9,0	AP... 1003...	
181010300	050A17090-07-09-022040		50	22	40	40	0,320	A	9,0	AP... 1003...	
181014300	063A17090-08-09-022040		63	22	48	40	0,560	A	9,0	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)



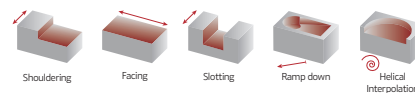
## Weldon Shank

$K_r=90^\circ$  |  $\gamma_p=+7^\circ \sim +9^\circ$

Order code Código	Reference Referência Referencia		Dimensions   Dimensões   Dimensiones (mm)				Kg	Specifications		Insert Pastilha Inserto	Stock
			$\phi Dc$	$\phi d$	L	L1		Ap max (mm)			
181041300	016W17090-02-07-016085		16	16	85	26	0,110	9,0	AP... 1003...		
181031700	016W17090-02-07-016150		16	16	150	26	0,210	9,0	AP... 1003...		
181041400	020W17090-03-09-020090		20	20	90	28	0,190	9,0	AP... 1003...		
181041600	020W17090-03-09-020150		20	20	150	28	0,320	9,0	AP... 1003...		
181041700	025W17090-04-09-020150		25	20	150	26	0,340	9,0	AP... 1003...		
181041500	025W17090-04-09-025095		25	25	95	30	0,310	9,0	AP... 1003...		

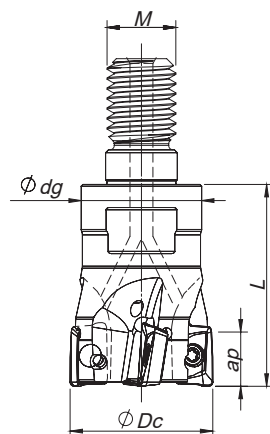
Stock item | Produto de stock | Itens de stock

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



### Threaded Coupling

$$K_r = 90^\circ \quad | \quad \gamma_p = +7^\circ \sim +9^\circ$$



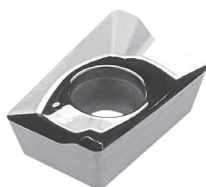
Order code Código	Reference Referência Referencia		Dimensions   Dimensões   Dimensiones (mm)				Kg	Specifications		Insert Pastilha Inserto	Stock
			ØDc	ØM	Ødg	L		Ap max (mm)			
181015100	016R17090-02-07-M08025	2	16	M8	13	25	0,030	9,0	AP... 1003...		
181015200	020R17090-03-09-M10030	3	20	M10	18	30	0,058	9,0	AP... 1003...		
181015300	025R17090-04-09-M12035	4	25	M12	21	35	0,110	9,0	AP... 1003...		

Stock item | Produto de stock | Itens de stock

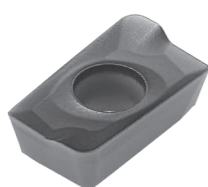
Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

## AP... 1003... || Inserts | Pastilhas | Plaquetas

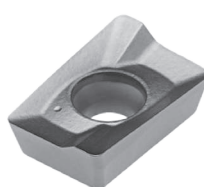
APET - LN



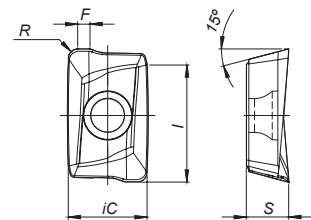
APKT - X



APKT - X1



APET-LN | APKT-X | APKT-X1



Geometry code	ISO Reference	P		M	K		N	Dimensions Dimensões Dimensiones (mm)				
		PVD		PVD	PVD		UNC	iC	S	I	R	F
		68	66	66	68	66	10					
<sup>(1)</sup>		PH6920	PH6930	PH6930	PH6920	PH6930	PH0910					
1112043	APET 100305 PDFR-LN							6,70	3,50	10,00	0,50	1,20
1112168	APKT 100305 PDER-X1							6,70	3,50	10,00	0,50	1,20
1112167	APKT 100305 PDSR-X1							6,70	3,50	10,00	0,50	1,20
1111071	APKT 100308 PDER-X							6,70	3,50	10,00	0,80	0,90
1111044	APKT 100308 PDSR-X							6,70	3,50	10,00	0,80	0,90
1111042	APKT 100308 PDTR-X							6,70	3,50	10,00	0,80	0,90
1111072	APKT 100312 PDER-X							6,70	3,50	10,00	1,20	-
1110987	APKT 100312 PDSR-X							6,70	3,50	10,00	1,20	-
1111045	APKT 100312 PDTR-X							6,70	3,50	10,00	1,20	-

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)

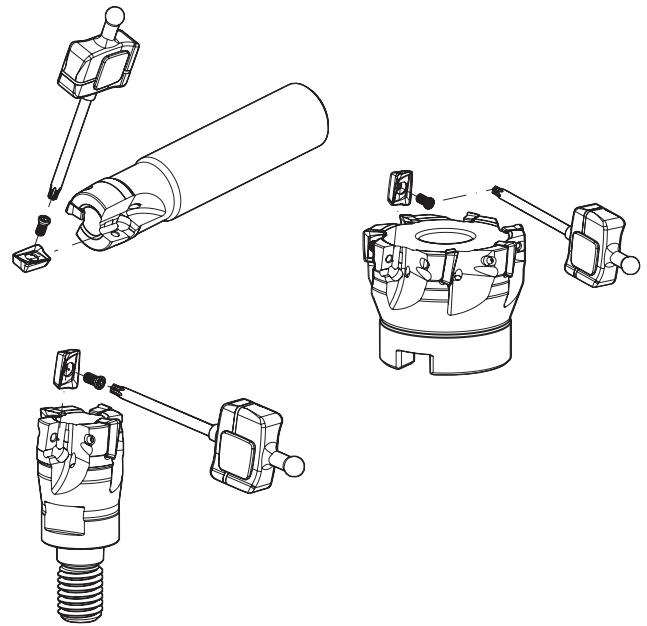
Insert order code = (1) Geometry Code + (2) Grade Code

# LINEPRO 17090

## SPARE PARTS | Acessórios | Repuestos

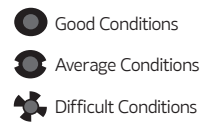
Cutter ØDc	Insert Screw	Key (Torx)	Order separately	
			Key (Torx - Nm)	Torque Value
W17090 - 16-25	P0250503	XT08	DT0812	1,2
R17090 - 16-25	P0250503	XT08	DT0812	1,2
A17090 - 40-63	P0250503	XT08	DT0812	1,2

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-241. Check the procedures for the clamping screws on the page A-241.



## GRADES SELECTION GUIDE | Guia para seleção 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	✓		



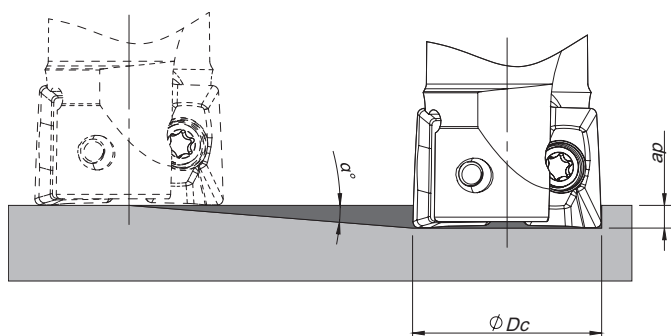
# CHIP-BREAKER SELECTION GUIDE | Guia para aplicações do quebra-apanas | Guía para aplicación del rompevirutas

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

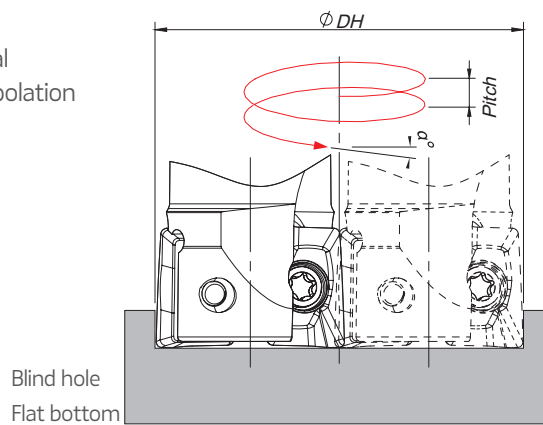
## RAMPING AND HELICAL INTERPOLATION

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

Ramping



Helical Interpolation



Blind hole  
Flat bottom

$$\text{Ødi} = \text{ØDH} - \text{ØDc}$$

ØDc	Ramping			Helical Interpolation		
	Max Ramp a°	Max ap	Min Lr	Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
				ØDHmin	ØDHmax	
16	1,3	9,0	396,6	29,2	-	0,9
				-	31,0	1,1
20	0,9	9,0	572,9	37,2	-	0,8
				-	39,0	0,9
25	0,6	9,0	859,4	47,2	-	0,7
				-	49,0	0,8
40	0,4	9,0	1289,1	77,2	-	0,8
				-	79,0	0,9
50	0,25	9,0	2062,6	97,2	-	0,6
				-	99,0	0,7
63	0,2	9,0	2578,3	123,2	-	0,7
				-	125,0	0,7

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

# LINEPRO 17090

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

ISO	PSM	Material	HB (Brinell)	Vc (m/min)		
				← Wear Resistance		Toughness →
				PH0910	PH6920	PH6930
P	1	Unalloyed Steel	125-220	-	180-240	160-220
	2	Low-Alloyed Steel	220-280	-	160-220	140-200
	3	High-Alloyed Steel	280-380	-	140-210	120-190
M	4	SS - Ferritic / Martensitic	200-330	-	140-220	140-200
	5	SS - Austenitic	200-330	-	130-180	120-160
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	120-160	100-140
K	7	Malleable Cast Iron	130-230	-	160-260	150-240
	8	Grey Cast Iron	180-245	-	140-240	140-230
	9	Nodular Cast iron	160-250	-	120-200	100-190
N	10	Aluminium and Non Ferrous	30-130	100-2000	-	-

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

(Note 2) Cutting conditions for slotting and shouldering operations:

Operation	$a_e$	Vc & fz	$a_p$ (mm)
Slotting	100%	<20%	3,0-4,0
	<50%	>8%	5,0-6,0
Shouldering	≤25%	>12%	7,0-8,0

(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  $a_p$  and Vc by 30% and keep the same fz per tooth.

Feed fz (mm/t)		
APKT 10... PDER-X/X1	APKT 10... PDS(T)R-X/X1	APET 10... PDFR-LN
0,07-0,15	0,10-0,25	-
0,07-0,10	0,10-0,20	-
0,07-0,10	0,10-0,20	-
0,07-0,10	-	-
0,07-0,10	-	-
0,07-0,10	-	-
0,07-0,15	0,10-0,25	-
0,07-0,15	0,10-0,25	-
-	0,10-0,20	-
-	-	0,07-0,20

A

MILLING

Overview

Face milling

Hifeed milling

Shoulder milling

Profile milling

Hardmill

Center & Chamfer

Spot face

Spare Parts

Technical Data

End Mills

# LINEPRO 18090

A

MILLING

Overview

Face milling

Hi-feed milling

Shoulder milling

Profile milling

Hardmill

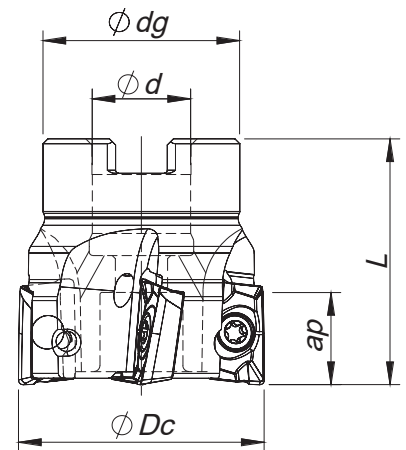
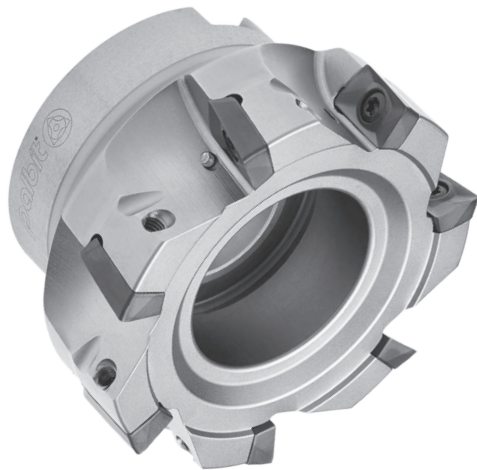
Center &amp; Chamfer

Spot face

Spare Parts

Technical Data

End Mills



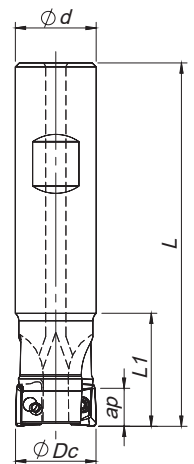
## Arbor Mounting

$K_r=90^\circ$  |  $\gamma_p=+8^\circ \sim +10^\circ$

Order code Código	Reference Referência Referencia		Dimensions   Dimensões   Dimensiones (mm)				Kg	Specifications		Insert Pastilha Inserto	Stock
			$\phi Dc$	$\phi d$	$\phi dg$	L		Arbor Type	Ap max (mm)		
181031200	040A18090-04-08-016040	4	40	16	32	40	0,180	A	14,5	AP.. 1604	
181030900	050A18090-05-08-022040	5	50	22	42	40	0,290	A	14,5	AP.. 1604	
181031300	063A18090-06-09-022040	6	63	22	52	40	0,530	A	14,5	AP.. 1604	
181031400	080A18090-07-10-027050	7	80	27	60	50	0,920	B	14,5	AP.. 1604	
181031500	100A18090-08-10-032050	8	100	32	80	50	1,680	B	14,5	AP.. 1604	
181031600	125A18090-09-10-040063	9	125	40	90	63	3,010	B	14,5	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 página A-8)



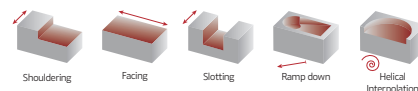
## Weldon Shank

$K_r=90^\circ$  |  $\gamma_p=+6^\circ \sim +8^\circ$

Order code Código	Reference Referência Referencia		Dimensions   Dimensões   Dimensiones (mm)				Kg	Specifications		Insert Pastilha Inserto	Stock
			$\phi Dc$	$\phi d$	L	L1		Ap max (mm)			
181041800	025W18090-02-06-025100	2	25	25	100	44	0,310	14,5	AP.. 1604		
181042100	025W18090-02-06-025200	2	25	25	200	60	0,670	14,5	AP.. 1604		
181041900	032W18090-03-07-032110	3	32	32	110	50	0,560	14,5	AP.. 1604		
181042200	032W18090-03-07-032200	3	32	32	200	60	1,100	14,5	AP.. 1604		
181042000	040W18090-04-08-032115	4	40	32	115	40	0,670	14,5	AP.. 1604		
181042300	040W18090-04-08-032200	4	40	32	200	40	1,190	14,5	AP.. 1604		

Stock item | Produto de stock | Itens de stock

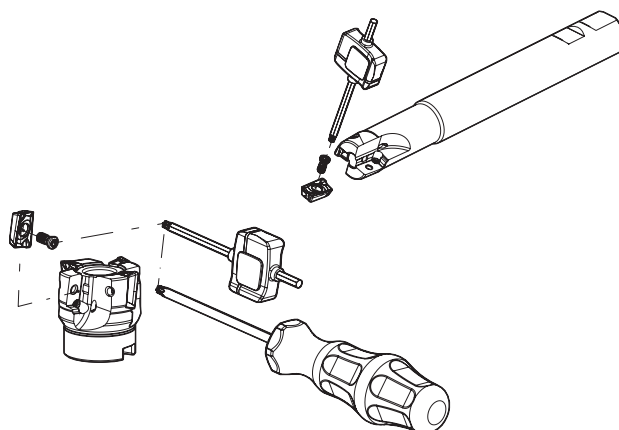
Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire página A-8)



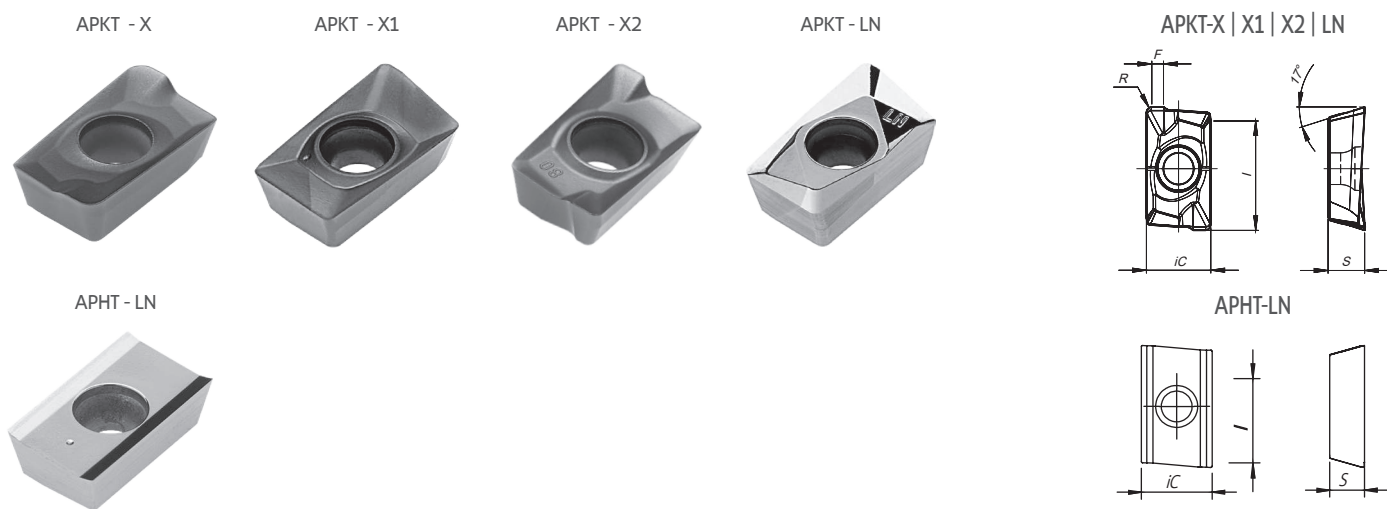
## SPARE PARTS || Acessórios | Repuestos

Cutter ØDc	Insert Screw	Key (Torx)	Order separately	
			Key (Torx - Nm)	Torque Value
W18090 - 25-40	P0400900	XT15	DT1530	3,0
A18090 - 40-80	P0400900	XT15	DT1530	3,0
A18090 - 100-125	P0400900	PT15	DT1530	3,0

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-241. Check the procedures for the clamping screws on the page A-241.



## AP... 1604... || Inserts | Pastilhas | Plaquetas



		P				M		K				N	Dimensions Dimensões Dimensiones (mm)				
		PVD				PVD		PVD				UNC					
		<sup>(2)</sup> Grade code		68	G4	66	P3	66	P3	68	G4	66					
<sup>(1)</sup> Geometry code	ISO Reference	PH6920	PH7920	PH6930	PH7930	PH6930	PH7930	PH6920	PH7920	PH6930	PH7930	PH0910	iC	S	I	R	F
1112159	APKT 160408 PDER-X1	⊗		⊗		⊗		⊗		⊗			9,45	5,35	16,00	0,80	1,80
1112464	APKT 160408 PDER-X2		⊗		⊗		⊗		⊗		⊗		9,45	5,35	16,00	0,80	1,80
1112158	APKT 160408 PDSR-X1	⊗		⊗				⊗		⊗			9,45	5,35	16,00	0,80	1,80
1112367	APKT 160408 PDSR-X2		⊗		⊗				⊗		⊗		9,45	5,35	16,00	0,80	1,80
1111923	APKT 160408 PDFR-LN											⊗	9,45	5,35	16,00	0,80	0,80
1111074	APKT 160416 PDER-X	⊗						⊗					9,45	5,35	16,00	1,60	1,20
1111050	APKT 160416 PDSR-X	⊗		⊗				⊗		⊗			9,45	5,35	16,00	1,60	1,20
1111075	APKT 160432 PDER-X	⊗						⊗					9,45	5,35	16,00	3,20	-
1111052	APKT 160432 PDSR-X	⊗						⊗					9,45	5,35	16,00	3,20	-
1111924	APHT 1604 PDFR-LN											⊗	9,45	5,35	16,00	-	-

⊗ 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 página A-9)




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

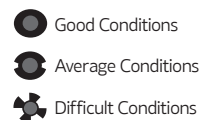
\*For inserts with radius above 2.0 mm, the cutter must be adjusted



# LINEPRO 18090

## 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	✓		



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

ISO	PSM	Material	HB (Brinell)	Vc (m/min)		
				← Wear Resistance		Toughness →
				PH0910	PH7(6)920	PH7(6)930
P	1	Unalloyed Steel	125-220	-	180-240	160-220
	2	Low-Alloyed Steel	220-280	-	160-220	140-200
	3	High-Alloyed Steel	280-380	-	140-210	120-190
M	4	SS - Ferritic / Martensitic	200-330	-	-	140-200
	5	SS - Austenitic	200-330	-	-	120-160
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	-	100-140
K	7	Malleable Cast Iron	130-230	-	160-260	150-240
	8	Grey Cast Iron	180-245	-	140-240	140-230
	9	Nodular Cast iron	160-250	-	120-200	100-190
N	10	Aluminium and Non Ferrous	30-130	100-2000	-	-

ISO	PSM	Material	HB (Brinell)	Feed fz (mm/t)		
				APKT 16... PDER-X/X2	APKT 16... PDS(T)R-X/X2	AP...T 16... PDFR-LN
				P	1	Unalloyed Steel
2	Low-Alloyed Steel	220-280	0,07-0,10		0,10-0,20	-
3	High-Alloyed Steel	280-380	0,07-0,10		0,10-0,20	-
M	4	SS - Ferritic / Martensitic	200-330	0,07-0,10	-	-
	5	SS - Austenitic	200-330	0,07-0,10	-	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	0,07-0,10	-	-
K	7	Malleable Cast Iron	130-230	0,07-0,15	0,10-0,25	-
	8	Grey Cast Iron	180-245	0,07-0,15	0,10-0,25	-
	9	Nodular Cast iron	160-250	-	0,10-0,20	-
N	10	Aluminium and Non Ferrous	30-130	-	-	0,07-0,20

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

(Note 2) Cutting conditions for slotting and shouldering operations:

Operation	$a_e$	Vc & fz	$a_p$ (mm)
Slotting	100%	<20%	5,0-6,0
Shouldering	<50%	>8%	6,0-9,0
	≤25%	>12%	10,0-12,5

(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:

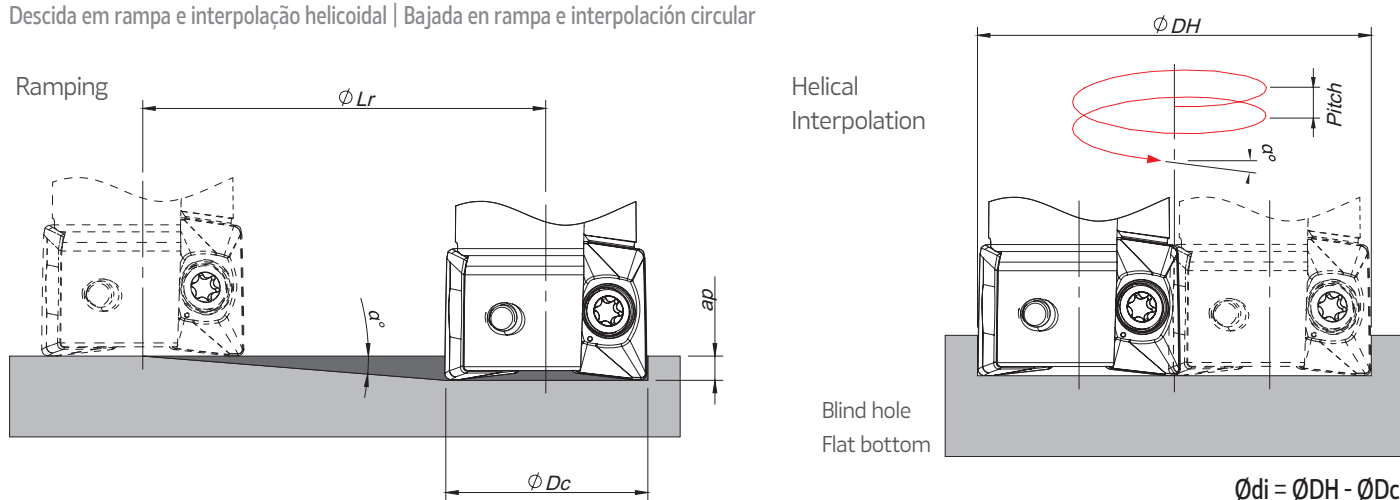
- When using long shank;
- When using long tool overhang with arbor type;
- When application has poor clamping rigidity or when using a low rigidity machine.

# 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	Difficult 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



$\phi_{Dc}$	Ramping			Helical Interpolation		
	Max Ramp $a^\circ$	Max $a_p$	Min $L_r$	Diameter for Blind Hole, Flat Bottom Face (1)		Max Pitch/Rev.
				$\phi_{DHmin}$	$\phi_{DHmax}$	
25	3	14,5	276,7	46,1 -	- 48,4	3,5 3,9
32	2	14,5	415,2	60,1 -	- 62,4	3,1 3,3
40	1,5	14,5	553,7	76,1 -	- 78,4	3,0 3,2
50	1,1	14,5	755,2	96,1 -	- 98,4	2,8 2,9
63	0,85	14,5	977,3	122,1 -	- 124,4	2,8 2,9
80	0,64	14,5	1298,1	156,1 -	- 158,4	2,7 2,7
100	0,5	14,5	1661,5	196,1 -	- 198,4	2,6 2,7
125	0,38	14,5	2186,3	246,1 -	- 248,4	2,5 2,6

(1) Using insert radius 0,8 mm

Note: During helical interpolation do not exceed maximum pitch

When using different insert radius to calculate the  $\phi_{DHmin}$  and  $\phi_{DHmax}$  use the equation below:

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

- Maximum Diameter:  $\phi_{DHmax} = 2 \times (\phi_{Dc} - R \text{ corner radius})$