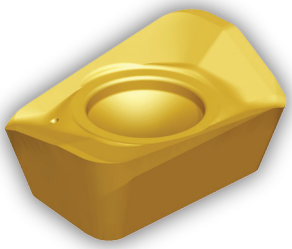


XPET

LINEPro

20090 | 20190 | 20290

New generation of square shoulder milling

Cutters

- Excellent solution for square shoulder milling.
- Offers longer tool life, better tolerances and better productivity parameters.
- Low power requirement & smooth cutting possible due to positive helical angle.
- Very flexible and suitable for most milling operations.

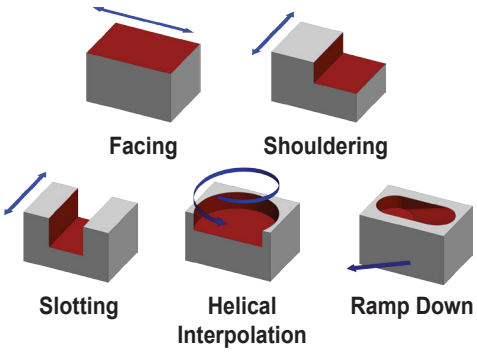
Inserts

- High positive cutting rake geometry.
- Positive top-form geometry inserts create lower cutting forces at higher feed rates.
- Insert designed for the most milling operations and for all range of materials.

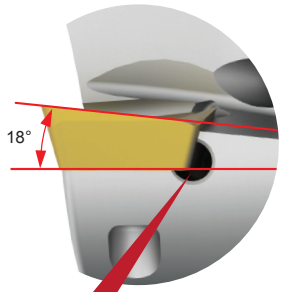
Specifications

- Geometry: 90º milling operations.
- Cutter diameters:
  - Cylindrical (E): Ø10 till Ø21.
  - Weldon Shank (W): Ø16 till Ø40.
  - Threaded Coupling (R): Ø16 till Ø32.
  - Arbor Mounting (A): Ø40 till Ø125.
- Workpiece material: Steel, stainless steel, cast iron, aluminum and HRSA.

Applications

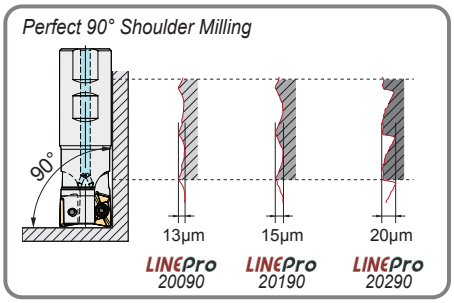


Main Features



High Rake Angle (A.R. Max. +18°)

Low cutting forces



Higher rigidity & durability

Thicker back metal & large chip pocket radius

High hardness nickel coating

Higher body durability

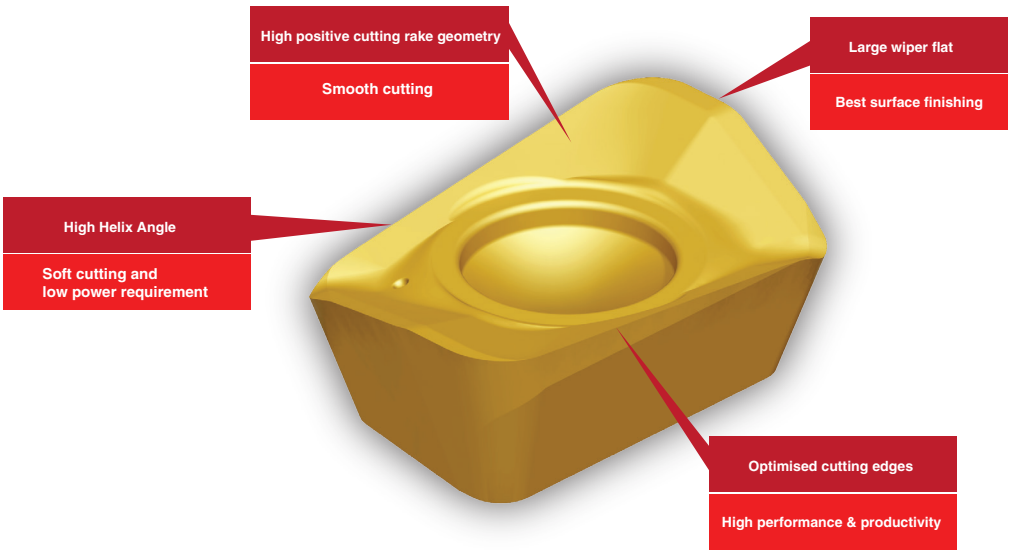
Coolant hole (for shank of ≥ ø10mm)

Large Chip Pocket & specific chipbreaker

Better chip evacuation and perfect cutter body stability

PVD coated carbide

High strength & long tool life



High positive cutting rake geometry

Smooth cutting

Large wiper flat

Best surface finishing

High Helix Angle

Soft cutting and low power requirement

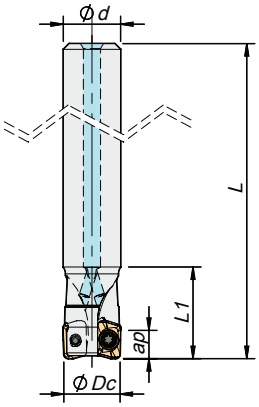
Optimised cutting edges

High performance & productivity

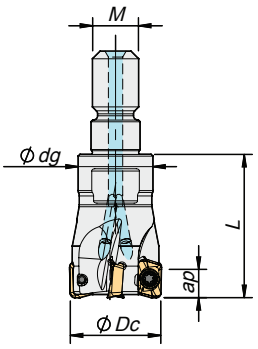
20090 Cutters

$K_r = 90°$ $\gamma_p = +3°\sim+8°$

Cylindrical Shank



Threaded Coupling

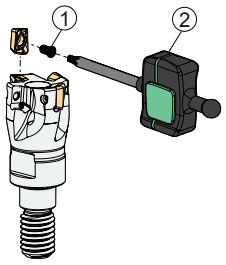


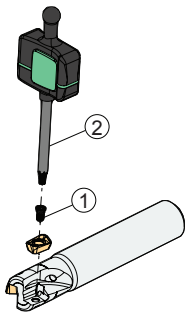
	Order Code	Reference		Dimensions (mm)					Kg	Max a_p (mm)		Stock
				Ø Dc	Ø d/M	Ø Dg	L	L1		LP	HF	
Cylindrical	181087100	010E20090-02-04-010055	2	10	10	-	55	16	0,03	4,0	0,3	●
	181108300	010E20090-02-04-010100	2	10	10	-	100	25	0,03			●
	181087200	012E20090-02-04-012080	2	12	12	-	80	17	0,06			●
	181109900	012E20090-03-04-012120	3	12	12	-	120	30	0,06			●
	181087300	016E20090-03-04-016090	3	16	16	-	90	20	0,12			●
	181087400	016E20090-04-04-016090	4	16	16	-	90	20	0,11			●
	181097100	017E20090-05-04-016090	5	17	16	-	90	35	0,11			●
	181097200	021E20090-05-04-020090	5	21	20	-	90	35	0,13			●
Threaded	181087500	016R20090-04-04-M08025	4	16	M8	13	25	-	0,03	4,0	0,3	●
	181087600	020R20090-05-04-M10030	5	20	M10	18	30	-	0,06			●
	181087700	025R20090-07-04-M12030	7	25	M12	21	30	-	0,09			●
	181087800	032R20090-08-04-M16035	8	32	M16	29	35	-	0,19			●

● Stock items / Itens de stock ○ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

Screws & Keys

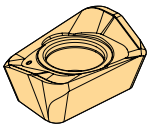
Item	1	2	
Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
E20090 – 10	P0180300	XT06IP	0,3
E20090 – 12 - 21	P0180400	XT06IP	0,3
R20090 – 16 - 32	P0180400	XT06IP	0,3



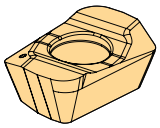


XPET 0602.. Inserts

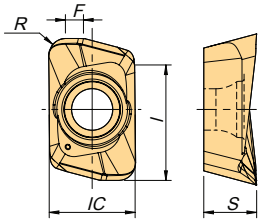
XPET - LP



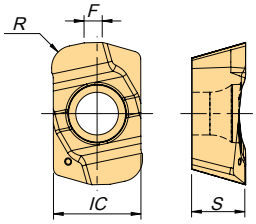
XPET - HF New



XPET - LP



XPET - HF



		P					M		K					S	
	(2) Grade Code	54	C2	66	G4	P3	C2	P3	54	C2	66	G4	P3	P3	Dimensions (mm)
(1) Geometry Code	Reference	PH6910	PHC920	PH6930	PH7920	PH7930	PHC920	PH7930	PH6910	PHC920	PH6930	PH7920	PH7930	PH7930	IC S I R F
1112002	XPET 060204 PDER-LP				◈	○		○				◈	○	○	3,9 2,4 5,3 0,4 0,8
1112003	XPET 060208 PDER-LP				◈	◈		◈				◈	◈	◈	3,9 2,4 5,3 0,8 0,6
1112004	XPET 060216 PDER-LP				◈	◈		◈				◈	◈	◈	3,9 2,4 5,3 1,6 0,5
1112049	XPET 060210 ZER-HF				◈	◈		◈				◈	◈	◈	3,9 2,4 - 1,0 0,8

◈ First choice / 1ª escolha / 1ª opción ◈ Stock items / Itens de stock ○ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

Order code = (1) Geometry Code + (2) Grade Code

Chip Breakers

Chip Breaker	Cutting Edge	Feature
Geometry **LP** General machining		Positive top rake angle to promote a good chip flow and reduce power consumption.
Geometry **HP** High feed applications		Improved geometry configuration for high feed applications and low cutting forces.

Rec. Cutting Conditions

ISO		HB (Brinell)	Vc (m/min)		fz (mm/t)	
			PH7920	PH7930	XPET 0602.. LP	XPET 060210 ZER-HF
P	Unalloyed Steel	125 - 220	160 - 280	140 - 220	0,05 - 0,07	0,4 - 0,8
P	Low-Alloyed Steel	220 - 280	150 - 230	130 - 180		0,4 - 0,8
P	High-Alloyed Steel	280 - 380	140 - 190	100 - 170		0,4 - 0,6
M	Ferritic / Martensitic	200 - 330	-	130 - 220	0,05 - 0,07	0,4 - 0,8
M	Austenitic / Duplex	200 - 330	-	120 - 180		0,4 - 0,6
M	Duplex	230 - 260	-	70 - 140		0,4 - 0,6
K	Malleable Cast Iron	130 - 230	160 - 350	140 - 260	0,05 - 0,07	0,5 - 0,8
K	Grey Cast Iron	180 - 245	150 - 300	130 - 220		0,5 - 0,8
K	Nodular Cast Iron	160 - 250	120 - 260	100 - 180		0,5 - 0,8
S	Heat Resistant Super Alloys	200 - 320	-	35 - 65	0,05 - 0,07	0,4 - 0,6

(1) Cutting conditions a_e / D_c = 70%

(2)

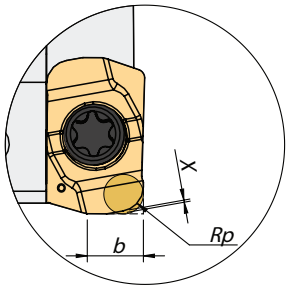
Operation	a_e	V_c & f_z	a_p (mm)
Slotting	100%	< 20%	1,0 - 3,0
Shouldering	< 50%	> 8%	1,0 - 4,0
	≤ 25%	> 12%	1,0 - 4,0

(3) It´s possible to occur vibrations in certain cases. Please reduce depth of cut and/or reduce cutting conditions in following cases:
- Using long shank;
- Using long overhang with arbor type;
- Application with poor clamping rigidity or using a low rigidity machine;

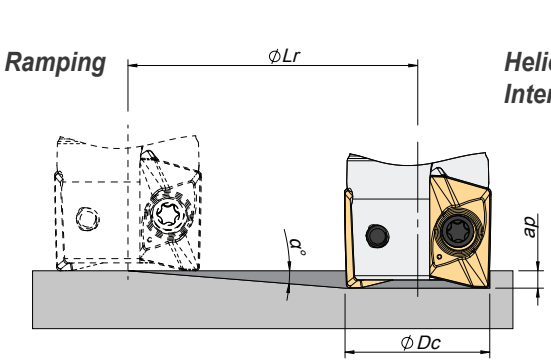
(4) The cutting speed and feed rate should be reduce 20% ~ 30% of the value show on the above table when overhang length of tools exceed 3xD

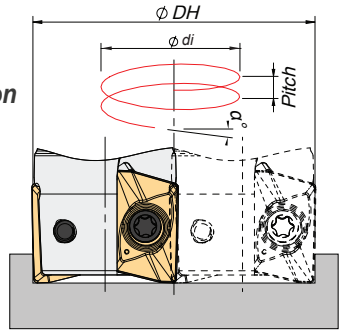
Programing Data

Insert	Programing Data		
	R_p	x	b
XPET 0602.. HF	1,1	0,84	2,3



Ramping and helical Interpolation



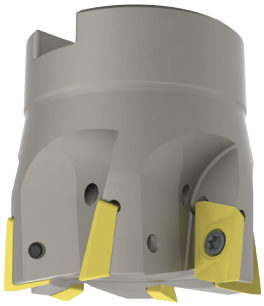


Ø di = Ø DH - Ø Dc
DH mín = 2 x (Dc - (r + F))
DH máx = 2 x (Dc - r)

Ø Dc	Ramping			Helical Interpolation diameter for flat botton face (1)		
	Max. Ramp α^o	Max. a_p	Min. Lr	Ø DH (min)	Ø DH (max)	Max. Pitch/Rev.
10	5,5	4,0	41,5	17,2	-	2,0
				-	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

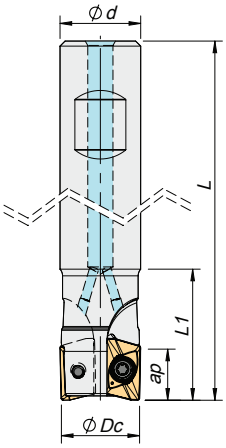
* During helical interpolation do not exceed maximum pitch.
* When using HF insert to calculate the DHmin and DHmáx, r used on the above equations must be Rp
(1) using LP insert with radius 0,8 mm

20190 Cutters

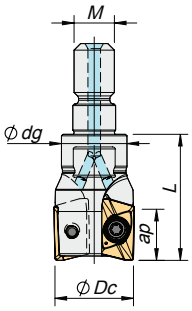


$\kappa_r = 90°$ $\gamma_p = +3°\sim+8°$

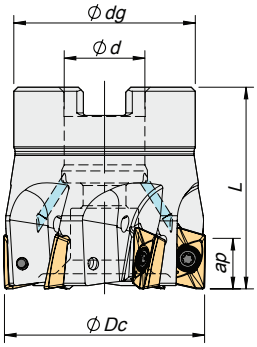
Weldon Shank



Threaded Coupling



Arbor Mounting

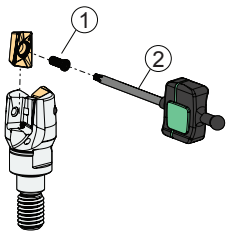


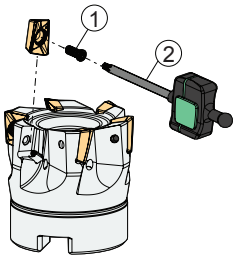
	Order Code	Reference		Dimensions (mm)					Kg	Specifications		Stock
				Ø Dc	Ø d/M	Ø Dg	L	L1		Style	Max. a_p (mm)	
Weldon	181087900	016W20190-02-05-016085	2	16	16	-	85	26	0,10	-		
	181100600	016W20190-02-05-016150	2	16	16	-	150	70	0,13	-		
	181108600	017W20190-02-05-016150	2	17	16	-	150	36	0,14	-		
	181088000	020W20190-03-05-020090	3	20	20	-	90	28	0,21	-		
	181100700	020W20190-03-05-020150	3	20	20	-	150	75	0,26	-	10,0	
	181108700	022W20190-03-05-020150	3	22	20	-	150	40	0,30	-		
	181088100	025W20190-04-05-016095	4	25	25	-	95	30	0,33	-		
	181100800	025W20190-04-05-025150	4	25	25	-	150	80	0,36	-		
	181108800	027W20190-04-05-025150	4	27	25	-	150	46	0,38	-		
Threaded	181088200	016R20190-02-05-M08025	2	16	M8	14	25	-	0,03	-		
	181088300	020R20190-03-05-M10030	3	20	M10	18	30	-	0,06	-	10,0	
	181088400	025R20190-04-05-M12035	4	25	M12	21	35	-	0,12	-		
	181088500	032R20190-05-06-M16035	5	32	M16	29	35	-	0,15	-		
Arbor	181088600	040A20190-06-07-016040	6	40	16	36	40	-	0,22	A		
	181088700	050A20190-07-08-022040	7	50	22	42	40	-	0,31	A	10,0	
	181088800	063A20190-08-08-022040	8	63	22	52	40	-	0,43	A		

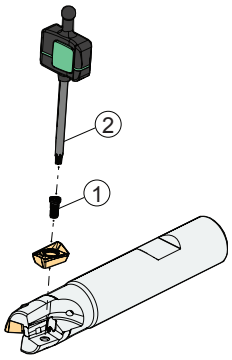
Stock items / Itens de stock ◯ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

Screws & Keys

Item	1	2	
Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
W20190 – 16 - 27	P0250704	XT08	1,2
R20190 – 16 - 32	P0250704	XT08	1,2
A20190 – 40 - 63	P0250704	XT08	1,2

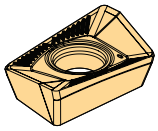




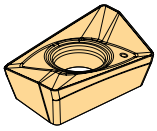


XPET 1003.. Inserts

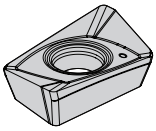
XPET - LP

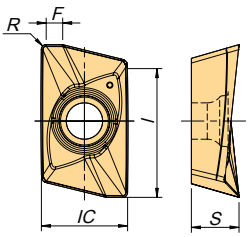


XPET - MP



XPET - LN





		P					M		K					N	S	
	(2) Grade Code	G1	G4	P3	54	I5	P3	I5	G1	G4	P3	L5	L9	10	P3	Dimensions (mm)
(1) Geometry Code	Reference	PH7910	PH7920	PH7930	PH6910	PH6740	PH7930	PH6740	PH7910	PH7920	PH7930	PH5705	PH5740	PH0910	PH7930	IC S I R F
1111980	XPET 100304 PDER-LP		◈	◈			◈			◈	◈				◈	6,95 3,96 10,5 0,4 1,2
1111981	XPET 100308 PDER-LP		◈	◈			◈			◈	◈				◈	6,95 3,96 10,5 0,8 1,4
1112022	XPET 100316 PDER-LP		◈	◈			◈			◈	◈				◈	6,95 3,96 10,5 1,6 0,5
1111982	XPET 100304 PDSR-MP		◈	◈			◈					◈	◈		◈	6,95 3,96 10,5 0,4 1,2
1111983	XPET 100308 PDSR-MP		◈	◈			◈					◈	◈		◈	6,95 3,96 10,5 0,8 1,4
1111984	XPET 100304 PDFR-LN													◈		6,95 3,96 10,5 0,4 1,2
1111985	XPET 100312 PDFR-LN													◈		6,95 3,96 10,5 1,2 0,9

◈ First choice / 1ª escolha / 1ª opción ◈ Stock items / Itens de stock ◯ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

Order code = (1) Geometry Code + (2) Grade Code

Rec. Cutting Conditions

ISO		HB (Brinell)	Vc (m/min)					fz (mm/t)		
			PH0910	PH5705	PH7920	PH7930	PH5740	XPET 10.. LP	XPET 10.. MP	XPET 10.. LN
P	Unalloyed Steel	125 - 220	-	-	160 - 280	140 - 220	-	0,08 - 0,20	0,10 - 0,25	-
	Low-Alloyed Steel	220 - 280	-	-	150 - 230	130 - 180	-	0,08 - 0,20	0,10 - 0,20	-
	High-Alloyed Steel	280 - 380	-	-	140 - 190	100 - 170	-	0,08 - 0,15	0,10 - 0,20	-
M	Ferritic / Martensitic	200 - 330	-	-	-	130 - 220	-	0,08 - 0,20	0,10 - 0,20	-
	Austenitic / Duplex	200 - 330	-	-	-	120 - 180	-	0,08 - 0,20	0,10 - 0,20	-
	Duplex	230 - 260	-	-	-	70 - 140	-	0,08 - 0,15	0,10 - 0,20	-
K	Malleable Cast Iron	130 - 230	-	160 - 380	160 - 350	140 - 260	150 - 300	0,08 - 0,20	0,10 - 0,25	-
	Grey Cast Iron	180 - 245	-	150 - 320	150 - 300	130 - 220	140 - 250	0,08 - 0,20	0,10 - 0,25	-
	Nodular Cast Iron	160 - 250	-	120 - 280	120 - 260	100 - 180	120 - 220	0,08 - 0,20	0,10 - 0,20	-
N	Alum. Alloys and Non-ferrous	30 - 130	350 - 1400	-	-	-	-	-	-	0,07 - 0,25
S	Heat Resistant Super Alloys	200 - 320	-	-	-	35 - 65	-	0,05 - 0,07	-	-

(1) Cutting conditions a_e / D_c = 70%

(2)

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

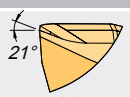
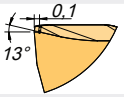
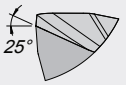
(3) It´s possible to occur vibrations in certain cases. Please reduce depth of cut and/or reduce cutting conditions in following cases:

- Using long shank;
- Using long overhang with arbor type;
- Application with poor clamping rigidity or using a low rigidity machine;

(4) The cutting speed and feed rate should be reduce 20% ~ 30% of the value show on the above table when overhang length of tools exceed 3xD

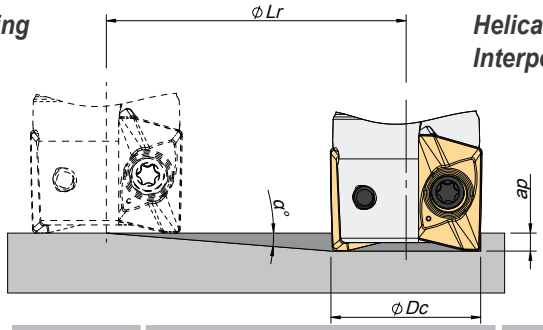
ISO		HB (Brinell)	Chip Breaker Application	
			1st Choice	Difficult Operations
P	Unalloyed Steel	125 - 220	XPET 10.. LP	XPET 10.. MP
	Low-Alloyed Steel	220 - 280	XPET 10.. LP	XPET 10.. MP
	High-Alloyed Steel	280 - 380	XPET 10.. MP	-
M	Ferritic / Martensitic	200 - 330	XPET 10.. LP	-
	Austenitic / Duplex	200 - 330	XPET 10.. LP	XPET 10.. MP
	Duplex	230 - 260	XPET 10.. MP	-
K	Malleable Cast Iron	130 - 230	XPET 10.. LP	XPET 10.. MP
	Grey Cast Iron	180 - 245	XPET 10.. MP	-
	Nodular Cast Iron	160 - 250	XPET 10.. MP	-
N	Allum. Alloys and Non-ferrous	30 - 130	XPET 10.. LN	-
S	Heat Resistant Super Alloys	200 - 320	XPET 10.. LP	-

Chip Breakers

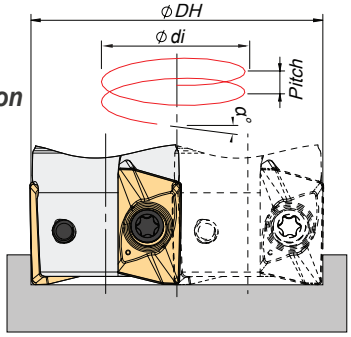
Chip Breaker	Cutting Edge	Feature
Geometry **LP** Light machining of steels		Positive top rake angle to promote a good chip flow and reduce power consumption on low alloy steels.
Geometry **MP** General machining of steels		Chip-breaker with a reinforced chanfer for general applications on steels.
Geometry **LN** Aluminum alloys and non-ferrous		High positive chip-breaker, polished for applications of non ferrous (aluminums, coopers and cooper alloys).

Ramping and helical Interpolation

Ramping



Helical Interpolation



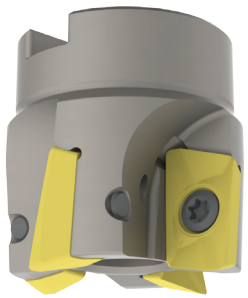
Ø di = Ø DH - Ø Dc
DH mín = 2 x (Dc - (r + F))
DH máx = 2 x (Dc - r)

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

* During helical interpolation do not exceed maximum pitch.

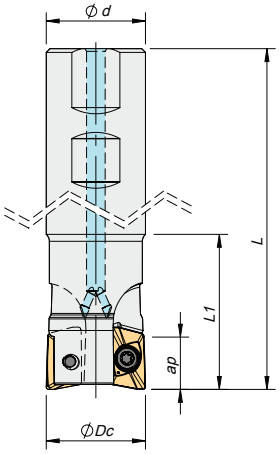
(1) using MP insert with radius 0,8 mm

20290 Cutters

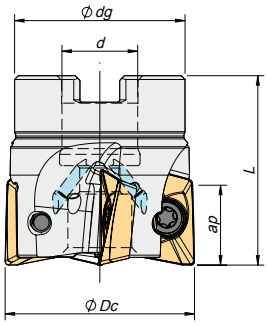


$\kappa_r = 90°$ $\gamma_p = +3°\sim+8°$

Weldon Shank



Arbor Mounting

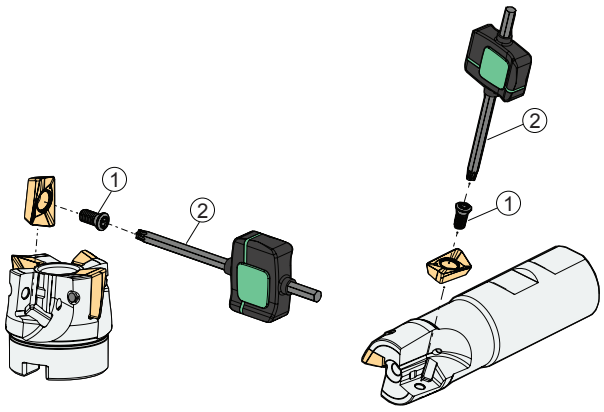


	Order Code	Reference		Dimensions (mm)					Kg	Specifications		Stock
				Ø Dc	Ø d	Ø Dg	L	L1		Style	Max. a_p (mm)	
Weldon	181090500	032W20290-02-06-032110	2	32	32	-	110	50	0,56	-	17,0	●
Weldon	181090600	032W20290-02-06-032200	2	32	32	-	200	60	1,10	-		●
Weldon	181090700	040W20290-03-07-032115	3	40	32	-	115	50	0,67	-		●
Weldon	181090800	040W20290-03-07-032200	3	40	32	-	200	60	1,19	-		●
Arbor	181090900	040A20290-04-07-016040	4	40	16	32	40	-	0,18	A	17,0	●
Arbor	181091000	050A20290-05-08-022040	5	50	22	42	40	-	0,29	A		●
Arbor	181091100	063A20290-06-08-027050	6	63	27	52	40	-	0,53	A		●
Arbor	181091200	080A20290-07-08-027050	7	80	27	60	50	-	0,92	A		●
Arbor	181091300	100A20290-08-08-032050	8	100	32	80	50	-	1,68	A		●
Arbor	181091400	125A20290-09-08-040063	9	125	40	90	63	-	3,01	A		●

● Stock items / Itens de stock ○ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

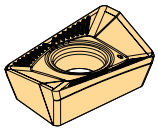
Screws & Keys

Item	1	2	
Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
W20290 – 32 - 40	P0451001	XT20	5,0
A20290 – 40 - 80	P0451001	XT20	5,0
A20290 – 100 - 125	P0451001	PT20	5,0

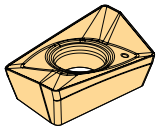


XPET 1706.. Inserts

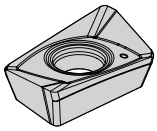
XPET - LP

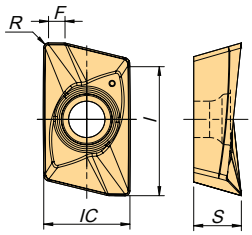


XPET - MP



XPET - LN





		P					M		K					N	S	
	(2) Grade Code	G1	G4	P3	54	G6	G4	G6	G1	G4	G6	L5	L9	10	G6	Dimensions (mm)
(1) Geometry Code	Reference	PH7910	PH7920	PH7930	PH6910	PH7740	PH7920	PH7740	PH7910	PH7920	PH7740	PH5705	PH5740	PH0910	PH7740	IC S I R F
1111986	XPET 170608 PDER-LP		◉			◉		◉		◉	◉				◉	11,3 6,35 17,5 0,8 1,8
1111987	XPET 170616 PDER-LP		◉			◉		◉		◉	◉				◉	11,3 6,35 17,5 1,6 1,2
1111988	XPET 170608 PDSR-MP		◉			◉		◉				◉	◉		◉	11,3 6,35 17,5 0,8 1,8
1111989	XPET 170616 PDSR-MP		◉			◉		◉				◉	◉		◉	11,3 6,35 17,5 1,6 1,0
1111990	XPET 170608 PDFR-LN													◉		11,3 6,35 17,5 0,8 1,2
1111991	XPET 170620 PDFR-LN													◉		11,3 6,35 17,5 2,0 1,0
1111992	XPET 170632 PDFR-LN													◉		11,3 6,35 17,5 3,2 0,8

◉ First choice / 1ª escolha / 1ª opción ◉ Stock items / Itens de stock ◯ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

Order code = (1) Geometry Code + (2) Grade Code

Rec. Cutting Conditions

ISO		HB (Brinell)	Vc (m/min)					fz (mm/t)		
			PH0910	PH5705	PH7920	PH7740	PH5740	XPET 17.. LP	XPET 17.. MP	XPET 17.. LN
P	Unalloyed Steel	125 - 220	-	-	160 - 280	140 - 220	-	0,10 - 0,30	0,10 - 0,35	-
	Low-Alloyed Steel	220 - 280	-	-	150 - 230	130 - 180	-	0,10 - 0,30	0,10 - 0,35	-
	High-Alloyed Steel	280 - 380	-	-	140 - 190	100 - 170	-	0,10 - 0,25	0,10 - 0,30	-
M	Ferritic / Martensitic	200 - 330	-	-	-	130 - 220	-	0,10 - 0,30	0,10 - 0,30	-
	Austenitic / Duplex	200 - 330	-	-	-	120 - 180	-	0,10 - 0,30	0,10 - 0,30	-
	Duplex	230 - 260	-	-	-	70 - 140	-	0,10 - 0,25	0,10 - 0,25	-
K	Malleable Cast Iron	130 - 230	-	160 - 380	160 - 350	140 - 260	150 - 300	0,10 - 0,35	0,10 - 0,35	-
	Grey Cast Iron	180 - 245	-	150 - 320	150 - 300	130 - 220	140 - 250	0,10 - 0,35	0,10 - 0,35	-
	Nodular Cast Iron	160 - 250	-	120 - 280	120 - 260	100 - 180	120 - 220	0,10 - 0,30	0,10 - 0,30	-
N	Allum. Alloys and Non-ferrous	30 - 130	350 - 1400	-	-	-	-	-	-	0,07 - 0,25
S	Heat Resistant Super Alloys	200 - 320	-	-	-	30 - 65	-	0,05 - 0,07	-	-

(1) Cutting conditions a_e / D_c = 70%

(2)

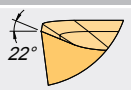
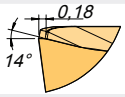
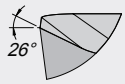
Operation	a_e	V_c & f_z	a_p (mm)
Slotting	100%	< 20%	2,0 - 6,0
Shouldering	< 50%	> 8%	7,0 - 13,0
	≤ 25%	> 12%	13,0 - 16,0

(3) It´s possible to occur vibrations in certain cases. Please reduce depth of cut and/or reduce cutting conditions in following cases:
- Using long shank;
- Using long overhang with arbor type;
- Application with poor clamping rigidity or using a low rigidity machine;

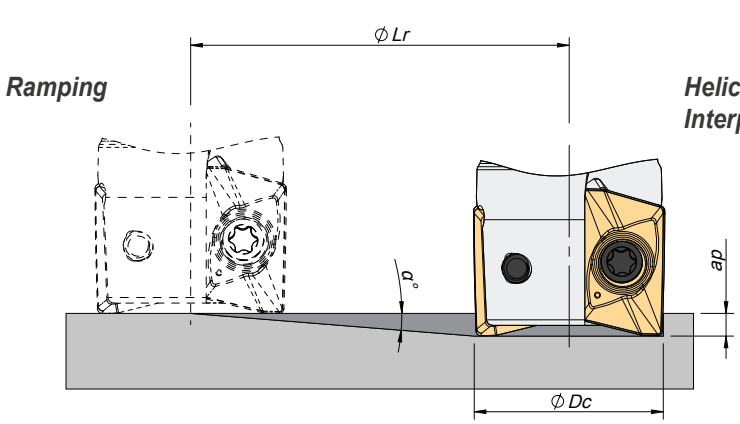
(4) The cutting speed and feed rate should be reduce 20% ~ 30% of the value show on the above table when overhang length of tools exceed 3xD

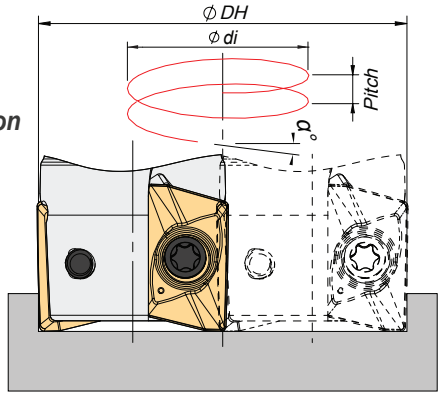
ISO		HB (Brinell)	Chip Breaker Application	
			1st Choice	Difficult Operations
P	Unalloyed Steel	125 - 220	XPET 17.. LP	XPET 17.. MP
	Low-Alloyed Steel	220 - 280	XPET 17.. LP	XPET 17.. MP
	High-Alloyed Steel	280 - 380	XPET 17.. MP	-
M	Ferritic / Martensitic	200 - 330	XPET 17.. LP	-
	Austenitic / Duplex	200 - 330	XPET 17.. LP	XPET 17.. MP
	Duplex	230 - 260	XPET 17.. MP	-
K	Malleable Cast Iron	130 - 230	XPET 17.. LP	XPET 17.. MP
	Grey Cast Iron	180 - 245	XPET 17.. MP	-
	Nodular Cast Iron	160 - 250	XPET 17.. MP	-
N	Allum. Alloys and Non-ferrous	30 - 130	XPET 17.. LN	-
S	Heat Resistant Super Alloys	200 - 320	XPET 17.. LP	-

Chip Breakers

Chip Breaker	Cutting Edge	Feature
Geometry **LP** Light machining of steels		Positive top rake angle to promote a good chip flow and reduce power consumption on low alloy steels.
Geometry **MP** General machining of steels		Chip-breaker with a reinforced chanfer for general applications on steels.
Geometry **LN** Aluminum alloys and non-ferrous		High positive chip-breaker, polished for applications of non ferrous (aluminums, coopers and cooper alloys).

Ramping and helical Interpolation





Ø Dc	Ramping			Helical Interpolation (diameter for flat botton face (1))		
	Max. Ramp α°	Max. a_p	Min. Lr	Ø DH (min)	Ø DH (max)	Max. Pitch/Rev.
32	3,8	17,0	255,9	58,8		5,6
					62,4	6,3
40	2,7	17,0	360,5	74,8	-	5,2
				-	78,4	5,7
50	2,0	17,0	486,8	94,8	-	4,9
				-	98,4	5,3
63	1,5	17,0	649,2	120,8	-	4,8
				-	124,4	5,0
80	1,0	17,0	973,9	154,8	-	4,1
				-	158,4	4,3
100	0,8	17,0	1217,5	194,8	-	4,2
					198,4	4,3
125	0,7	17,0	1498,4	244,8		4,3
					248,4	4,4

Ø di = Ø DH - Ø Dc
DH mín = 2 x (Dc - (r + F))
DH máx = 2 x (Dc - r)

* During helical interpolation do not exceed maximum pitch.
(1) using MP insert with radius 0,8 mm

Grades Selection Guide

ISO		HB (Brinell)	Grades (Wear Resistance ← → Toughness)					
			PH0910	PH5705	PH7920	PH7930	PH5740	PH7740
P	Unalloyed Steel	125 - 220			✓			✓
	Low-Alloyed Steel	220 - 280			✓			✓
	High-Alloyed Steel	280 - 380			✓			✓
M	Ferritic / Martensitic	200 - 330			✓	✓		✓
	Austenitic / Duplex	200 - 330			✓	✓		✓
	Duplex	230 - 260			✓	✓		✓
K	Malleable Cast Iron	130 - 230		✓			✓	
	Grey Cast Iron	180 - 245		✓			✓	
	Nodular Cast Iron	160 - 250		✓			✓	
N	Allum. Alloys and Non-ferrous	30 - 130	✓					
S	Heat Resistant Super Alloys	200 - 320				✓		✓

Grades

Grades	Information
PH0910	Uncoated carbide grade suitable for milling of aluminum alloys combined with positive geometries.
New PH7920	Advanced AlTiN-PVD coated carbide grade over a tough wear resistance submicro-susbtrate for general machining of steels and cast irons at high cutting speeds.
New PH7930	AlTiN-PVD coated carbide developed to provide better performance in general machining of stainless steel and high-temperature alloys. Resistant to breakage by offering improved wear resistance and increased strength.
PH5740	Substrate grade binary (WC & Co) with medium grain size combined with the medium temperature coating. Suitable for heavy roughing to roughing operations of cast irons with interrupted cut at medium to low cutting speeds.
New PH7740	Very tough, general-purpose AlNTin-PVD coated carbide grade for medium to heavy milling applications and on instable conditions. Recommended for high resistant super alloys, steels, stainless steels and cast irons. Can be used either in wet or dry conditions.

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