

Tooling solutions For turbine blades milling



NEW
TURBINE BLADES



SINCE 1916

TURBINE BLADES = DIFFICULT MATERIALS

Pás de turbina - Materiais difíceis | Palas de turbina - Materiales difíciles

NEW

Turbine blades can be found everywhere. From the skies where they fly high above our heads, to the land where they power our houses, schools and factories.

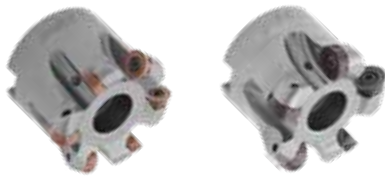
Being such a crucial component of the modern society way of life, a lot of investment is made in its research.

Most turbines (aircraft & gas turbines) operate in two sections:

- In the cold section, titanium is the most used material for aircraft and martensitic stainless steel for land-turbines.
- In the hot section both kinds of turbines rely on superalloys, such as Inconel, to withstand high temperatures and stresses.

In order to ensure outstanding performance the blades are shaped in a complex 3D geometry which also represents a challenge for machining.

Palbit embraces this challenge with the following range of products:



TURBOMILL 34190 | 34290



TOROMILL 33890

Rough milling of root, head and blade

- Optimized indexation seat
- Extreme insert working time
- Solutions for every blade material



RAD-INTEG

Finishing of blade ends

- Outstanding surface finish
- Extensive tool life

TURBINE BLADES - PRODUCTS RANGE

Pás de turbina - Gama de productos | Palas de turbina - Gama de productos

NEW



RAD-INTEG

Ø8 - Ø16

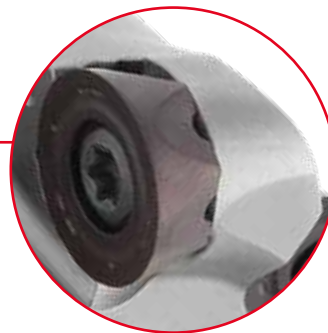


TurboMill 34190 | 34290 || ToroMill 33890

Ø42 - Ø125



New indexation system



- Extensive tool life
- Extreme wear resistance

RPHT-LS
Sizes 10 - 12 - 16
(PHP grade)



RPHT-LS
Sizes 10 - 12 - 16
(PHH grade)



TURBOMILL 34190

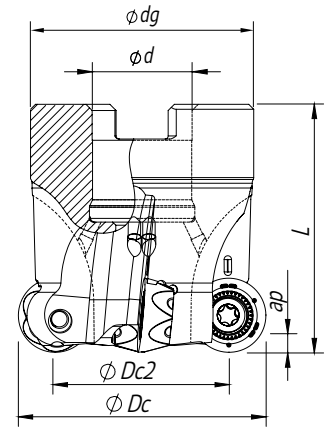
NEW

Proprietary milling line



Arbor Mounting

$$\gamma_p = 5^\circ$$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)					Kg	Specifications		Insert	Stock
			ϕDc	$\phi Dc2$	$\phi d/M$	ϕdg	L		Arbor Type	A_p max (mm)		
181160100	042A34190-06-05-016040	6	42	32	16	36	40	0,16	A	5	RPHT 10T3M0E-LS	
181160200	050A34190-06-05-022039	6	50	40	22	42	40	0,26	A	5	RPHT 10T3M0E-LS	
181160700	052 A34190-07-05-022040	7	52	42	22	42	40	0,30	A	5	RPHT 10T3M0E-LS	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

TURBOMILL 34290

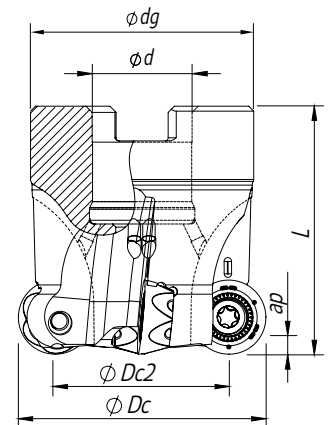
NEW

Proprietary milling line



Arbor Mounting

$$\gamma_p = 5^\circ$$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)					Kg	Specifications		Insert	Stock
			ϕDc	$\phi Dc2$	$\phi d/M$	ϕdg	L		Arbor Type	A_p max (mm)		
181159600	040A34290-04-05-016040	4	40	28	26	36	40	0,15	A	6	RPHT 1204 M0E-LS	
181159500	052A34290-05-05-022040	5	52	40	22	42	40	0,25	A	6	RPHT 1204 M0E-LS	
181160400	063A34290-06-05-022040	6	63	51	22	48	40	0,36	A	6	RPHT 1204 M0E-LS	
181160500	066A34290-06-05-027050	6	66	54	27	48	50	0,40	A	6	RPHT 1204 M0E-LS	
181160600	080A34290-07-05-027050	7	80	68	27	60	50	0,68	A	6	RPHT 1204 M0E-LS	

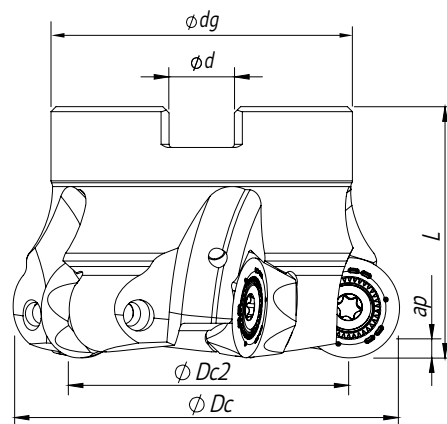
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Arbor Mounting

$$\gamma_p = 5^\circ$$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)					Kg	Specifications		Insert Pastilha Inserto	Stock
			ϕDc	$\phi Dc2$	$\phi d/M$	ϕdg	L		Arbor Type	Ap max (mm)		
181124500	050A33890-04-05-022040	4	50	34	22	42	40	0,21	A	8,0	RPHT 1605 M0E-LS	
181124600	052A33890-04-05-022040	4	52	36	22	42	40	0,25	A	8,0	RPHT 1605 M0E-LS	
181114900	063A33890-05-05-022040	5	63	47	22	48	40	0,37	A	8,0	RPHT 1605 M0E-LS	
181124700	066A33890-05-05-027050	5	66	54	27	48	50	0,46	A	8,0	RPHT 1605 M0E-LS	
181124800	080A33890-06-05-027052	6	80	64	27	60	52	0,85	A	8,0	RPHT 1605 M0E-LS	
181124900	100A33890-07-05-032052	7	100	84	32	80	52	1,57	A	8,0	RPHT 1605 M0E-LS	
181122200	125A33890-08-05-040052	8	125	109	40	90	52	2,12	A	8,0	RPHT 1605 M0E-LS	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

RPHT-LS | Inserts | Pastilhas | Plaquetas

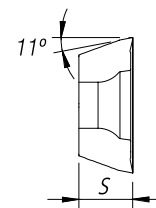
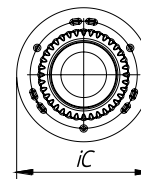
NEW

RPHT-LS
(PHP grade)

RPHT-LS
(PHH grade)



RPHT-LS



Geometry code	ISO Reference	P		M			K		N		S				H		Dimensions Dimensões Dimensiones (mm)						
		PVD	CVD	PVD	CVD		PVD	UNC	PVD	PVD				PVD									
		Z1	Z2	T9	Z2	Y2	Z3	T9	Z1	Z2	10	D6	Z1	Z2	Y2	Z3						X4	X6
1112772	RPHT 10T3M0E-LS																		10,00	3,97	-	-	-
1112766	RPHT 1204 M0E-LS																		12,00	4,76	-	-	-
1112951	RPHT 1605 M0E-LS																		16,00	5,56	-	-	-

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

Note: TURBOMILL 34190 and TURBOMILL 34290 cutters can only be mounted with inserts RPHT-LS. However, inserts RPHT 10T3M0E-LS and RPHT 1204 M0E-LS are suitable with TOROMILL 33690 and TOROMILL 33790 Milling program.

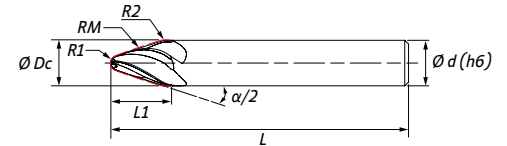
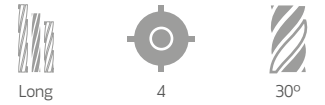
RAD-INTEG = Conical and Tangential Segment Endmills

NEW

HXC30GL = CONICAL



P M K S



All order codes are cylindrical shank.
Weldon shank available under request.

(1) Geometry code	(2) Grade code Reference Referência	⊕	P	M	K	S	Dimensions Dimensões Dimensiones (mm)							
			PVD	PVD	PVD	PVD	ØDc	Ød (h6)	L	L1	α/2	RM	R1	R2
			T1	Y3	T1	Y3	PHP920	PHH920	PHP920	PHH920				
1180046	HXC30GL 4 080 10 18RM030	4	⊕	⊕	⊕	⊕	8	8	75	10	18	300	1	1
1180047	HXC30GL 4 120 14 18RM045	4	⊕	⊕	⊕	⊕	12	12	83	14	18	450	2	2
1180048	HXC30GL 4 160 18 18RM120	4	⊕	⊕	⊕	⊕	16	16	95	18	18	1200	3	3
1180049	HXC30GL 4 160 12 28RM080	4	⊕	⊕	⊕	⊕	16	16	95	12	28	800	3	3
1180050	HXC30GL 4 160 16 18RM120	4	⊕	⊕	⊕	⊕	16	16	110	16	18	1200	4	4
1180051	HXC30GL 4 160 11 28RM080	4	⊕	⊕	⊕	⊕	16	16	110	11	28	800	4	4

⊕ First choice | Primeira opção | 1ª opción

⊗ Stock item | Produto de stock | Itens de stock

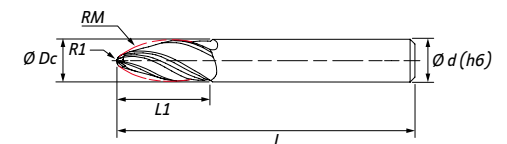
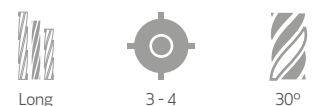
○ Available under request | Disponível sobre consulta
Disponível bajo consulta

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

HXT30GL = TANGENTIAL



P M K S



All order codes are cylindrical shank.
Weldon shank available under request.

(1) Geometry code	(2) Grade code Reference Referência	⊕	P	M	K	S	Dimensions Dimensões Dimensiones (mm)					
			PVD	PVD	PVD	PVD	ØDc	Ød (h6)	L	L1	RM	R1
			T1	Y3	T1	Y3	PHP920	PHH920	PHP920	PHH920		
1180045	HXT30GL 4 060 22 RM095	4	⊕	⊕	⊕	⊕	6	6	62	22	95	1
1180037	HXT30GL 4 080 24 RM095	4	⊕	⊕	⊕	⊕	8	8	70	24	95	1
1180038	HXT30GL 4 100 28 RM085	4	⊕	⊕	⊕	⊕	10	10	73	28	85	2
1180039	HXT30GL 4 120 28 RM090	4	⊕	⊕	⊕	⊕	12	12	83	28	90	2
1180040	HXT30GL 4 160 30 RM080	4	⊕	⊕	⊕	⊕	16	16	105	30	80	3

⊕ First choice | Primeira opção | 1ª opción

⊗ 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

TURBINE BLADES - TEST REPORTS

Pás de turbina - Relatórios de Teste | Palas de turbina - Informes de prueba

NEW

TEST REPORT | Relatório de teste | Informe de prueba

Cutter: 052A34290-05-05-022040

Insert: RPHT 1204 M0E-LS

Grade: PHH530

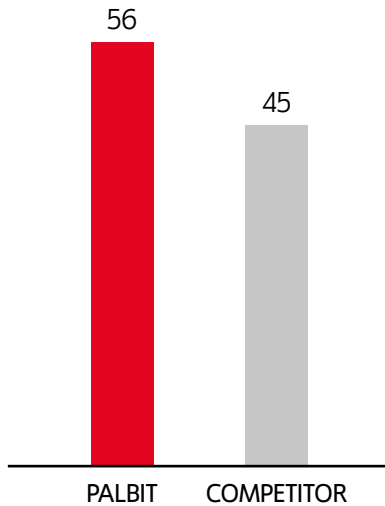


Palbit Insert



Competitor Insert

Workpiece material: AISI 316L - After 45 mins

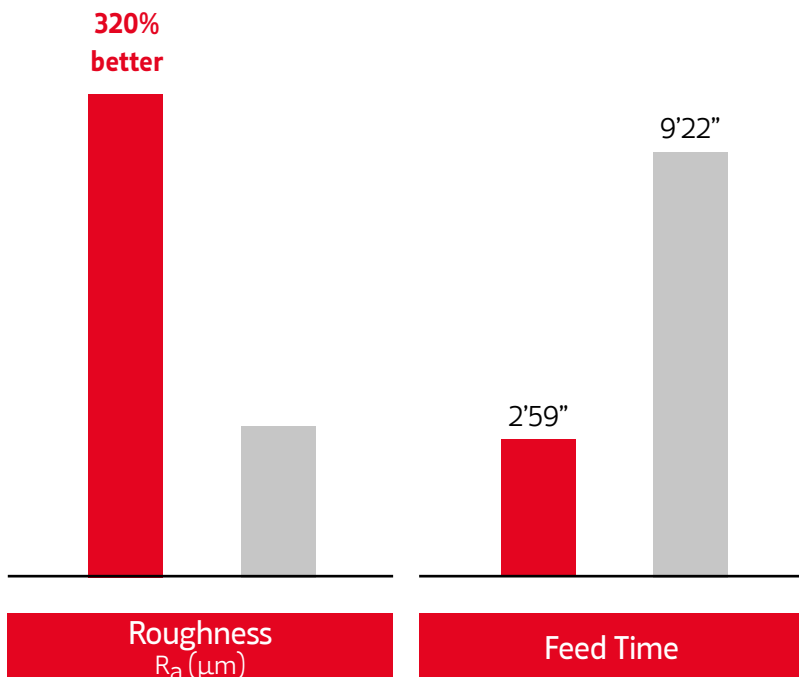


Tool life (min)

Cutting speed: V_c	200 m/min
Feed per tooth: f_z	0,2 mm/tooth
Depth of cut: a_p	2,0 mm
Stepover : a_e	60%
Operation	Face milling
Coolant	Air

RAD-INTEG - TEST REPORT

■ RAD-INTEG
■ Conventional Ball Endmill Ø12mm



	RAD-INTEG		Conventional Ball Endmill Ø12
	Ø12 HXC30GL 4 120 14 18RM045	Ø16 HXT30GL 4 160 30 RM080	
Cutting Speed: V_c	200 m/min	200 m/min	200 m/min
Feed per tooth: f_z	0,072 0,112 mm/t	0,08 mm/t	0,08 mm/t
Stepover: a_e	4,0 3,0 mm	1,2 mm	1,2 mm
Feed time: t_f	2'59"	9'22"	9'22"
Expected Roughness: R_a	1,1 3,6 μm	7,7 μm	7,7 μm



TURBINE BLADES

NEW

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



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