Tooling solutions
For turbine blades milling

palbit
TOOLING SOLUTIONS EXPERTS
SINCE1916

NEW
TURBINE BLADES

PDF

SINCE 1916

TURBINE BLADES - DIFFICULT MATERIALS

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

NEW

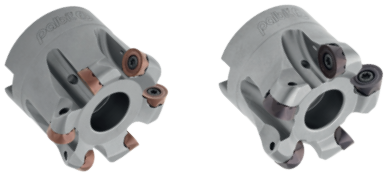
Turbine blades can be found everywhere. From the skies where they fly high above our heads, to the land where they power our houses, schools and factories.
Being such a crucial component of the modern society way of life, a lot of investment is made in its research.

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 produtos | Palas de turbina - Gama de productos

NEW

PDF

RAD-INTEG

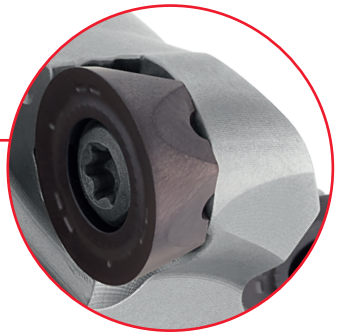
Ø8 - Ø16

PDF

TurboMill 34190|34290 ‖ ToroMill 33890

Ø42 - Ø125

New indexation system



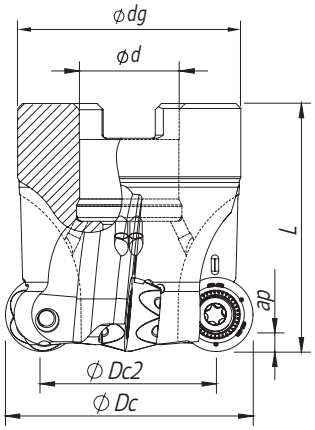
- Extensive tool life
- Extreme wear resistance

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

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

TURBOMILL 34190

NEW



Arbor Mounting

$\gamma_p = 5°$

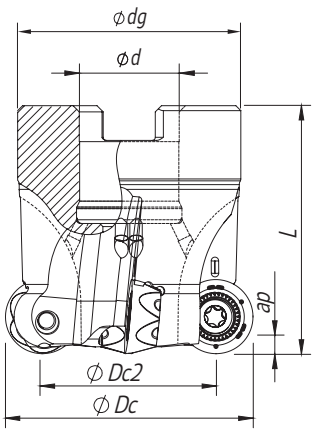
Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (mm)					Kg	Specifications		Insert	Stock
			ØDc	ØDc2	Ød	Ødg	L		Arbor Type	Ap max (mm)		
181160100	042A34190-06-05-016040	6	42	32	16	36	40	0,16	A	5	RPHT 10T3M0E-LS(4)	◈
181160200	050A34190-06-05-022039	6	50	40	22	42	40	0,26	A	5	RPHT 10T3M0E-LS(4)	◈
181160700	052 A34190-07-05-022040	7	52	42	22	42	40	0,30	A	5	RPHT 10T3M0E-LS(4)	◈

◈ 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)

TURBOMILL 34290

NEW



Arbor Mounting

$\gamma_p = 5°$

Order code Código	Reference Referência Referencia		Dimensions | Dimensões | Dimensiones (mm)					Kg	Specifications		Insert	Stock
			ØDc	ØDc2	Ød	Ødg	L		Arbor Type	Ap max (mm)		
181159600	040A34290-04-05-016040	4	40	28	16	36	40	0,15	A	6	RPHT 1204 M0E-LS(4)	◈
181159500	052A34290-05-05-022040	5	52	40	22	42	40	0,25	A	6	RPHT 1204 M0E-LS(4)	◈
181160400	063A34290-06-05-022040	6	63	51	22	48	40	0,36	A	6	RPHT 1204 M0E-LS(4)	◈
181160500	066A34290-06-05-027050	6	66	54	27	48	50	0,40	A	6	RPHT 1204 M0E-LS(4)	◈
181160600	080A34290-07-05-027050	7	80	68	27	60	50	0,68	A	6	RPHT 1204 M0E-LS(4)	◈

◈ Stock item | Produto de stock | Itens de stock

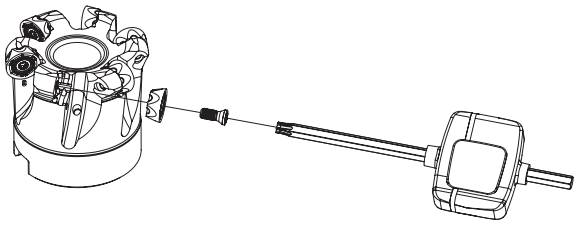
◯ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Complementos | Repuestos

Order separately

Cutter ØDc	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
34190	P0300800	XT09	DT0914	1,40
34290	P0350800	XT15	DT1530	3,00

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.



RPHT-LS | Inserts | Pastilhas | Plaquitas

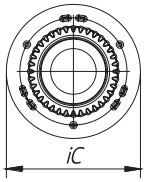
RPHT-LS4

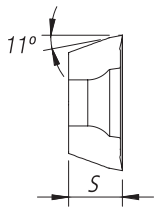
RPHT-LS

PHH NEW GRADE

PHP NEW GRADE

RPHT-LS | LS4





		P			M			S		Dimensions Dimensões Dimensiones (mm)	
		CVD	PVD		PVD			PVD			
	(2) Grade code	T9	Z1	Z2	Y2	Z2	Z3	Y2	Z3		
(1) Geometry code	ISO Reference	PHS740	PHP808	PHP530	PHH808	PHP530	PHH530	PHH808	PHH530	iC	S
1112772	RPHT 10T3M0E-LS	◈	◈	◈	◈	◈	◈	◈	◈	10,00	3,97
1113021	RPHT 10T3 M0E-LS4			◈		◈	◈		◈	12,00	4,76
1112766	RPHT 1204 M0E-LS	◈	◈	◈	◈	◈	◈	◈	◈	10,00	3,97
1113020	RPHT 1204 M0E-LS4			◈		◈	◈		◈	12,00	4,76

◈ 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

TURBOMILL 34190 | 34290 ‖ TOROMILL 33590 | 33690 | 33790 | 33890 | 33990

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

ISO	PSM	Material	HB (Brinell)	Grades						
				← Wear Resistance						Toughness →
				PHP920	PHH930	PHP530	PHH530	PHP808	PHH808	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		✓		✓		✓	
S	11	Heat Resistant Super Alloys	200-320		✓		✓		✓	

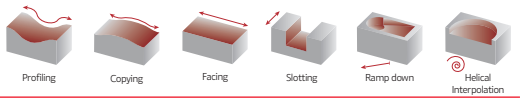
Good Conditions Average Conditions Difficult Conditions

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

ISO	PSM	Material	HB (Brinell)	Vc (m/min)						
						← Wear Resistance				Toughness →
				PHP920	PHH930	PHP530	PHH530	PHP808	PHH808	PHS740
P	1	Unalloyed Steel	125-220	180-250	-	180-340	-	180-340	-	180-350
	2	Low-Alloyed Steel	220-280	160-230	-	180-340	-	180-340	-	180-340
	3	High-Alloyed Steel	280-380	140-220	-	180-330	-	180-330	-	180-340
M	4	SS - Ferritic / Martensitic	200-330	-	140-210	150-270	170-280	-	160-270	-
	5	SS - Austenitic	200-330	-	120-170	-	160-280	-	160-270	-
	6	SS - Austenitic-ferritic (Duplex)	230-260	-	100-150	-	150-260	-	150-250	-
S	11	Heat Resistant Super Alloys	200-320	-	30-110	-	30-150	-	30-140	-

ISO	PSM	Material	HB (Brinell)	Feed fz (mm/t)				
				RDHT 08..	RPHT 10...	RPHT 12...	RPHT 16...	RPHT 20...
P	1	Unalloyed Steel	125-220	0,05-0,35	0,05-0,40	0,05-0,45	0,08-0,55	0,10-0,55
	2	Low-Alloyed Steel	220-280	0,05-0,35	0,05-0,40	0,05-0,45	0,08-0,55	0,10-0,55
	3	High-Alloyed Steel	280-380	0,05-0,30	0,05-0,35	0,05-0,40	0,08-0,50	0,10-0,55
M	4	SS - Ferritic / Martensitic	200-330	0,05-0,25	0,05-0,30	0,05-0,35	0,08-0,45	0,10-0,50
	5	SS - Austenitic	200-330	0,05-0,25	0,05-0,30	0,05-0,35	0,08-0,45	0,10-0,50
	6	SS - Austenitic-ferritic (Duplex)	230-260	0,05-0,25	0,05-0,30	0,05-0,35	0,08-0,45	0,10-0,45
S	11	Heat Resistant Super Alloys	200-320	0,05-0,20	0,05-0,25	0,05-0,30	0,08-0,35	0,10-0,40

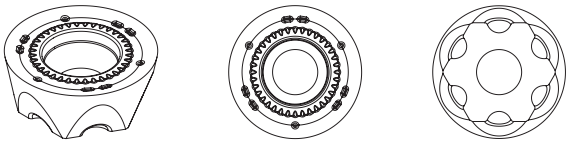
(Note 1) Cutting conditions $a_e/Dc=70\%$.



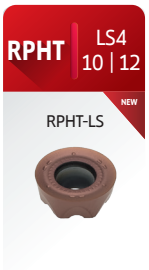
INSERT INFORMATION | Informação de pastilha | Información del inserto

RPHT-LS

RPHT-LS



P M S



6 cutting edges insert

- Insert with 6 cutting edges for a higher productivity.

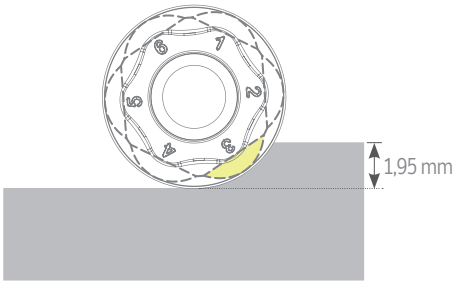
Insert Geometry

- Improved geometry for low cutting force;
- Positive insert with a brand new edge positioning system.

The maximum depth of cut using 6 cutting edges (LS)

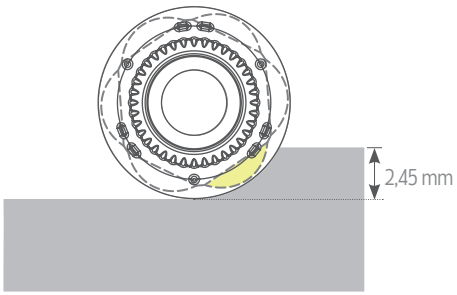
TOROMILL 33590

RDHT 0802...



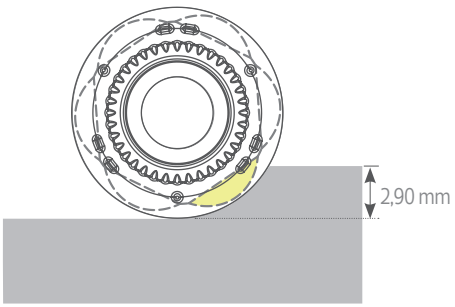
TURBOMILL 34190

RPHT 10T3M0E-LS



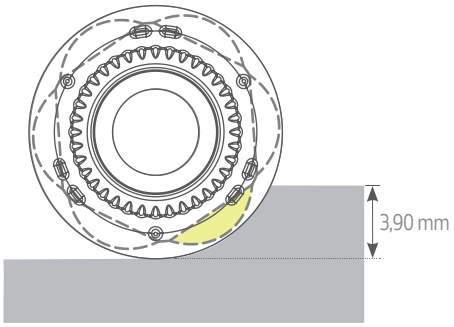
TURBOMILL 34290

RPHT 1204 M0E-LS



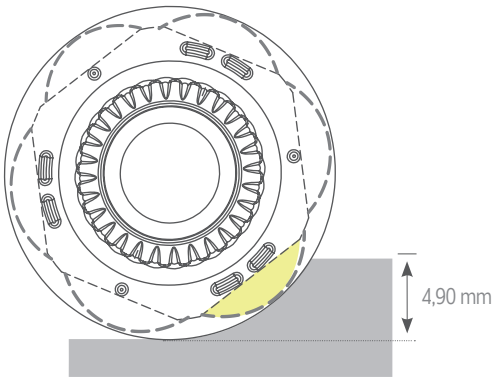
TOROMILL 33890

RPHT 1605 M0E-LS



TOROMILL 33990

RPHT 2006...



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TURBINE BLADES

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