

Machining of stainless steel & difficult-to-cut materials



TOROMILL

33590 | 33690 | 33790

33890 | 33990

PHM
GRADE



RDHT
08



RPHT
10 | 12 | 16 | 20



100
YEARS
SINCE 1916

A step on coating inovation!

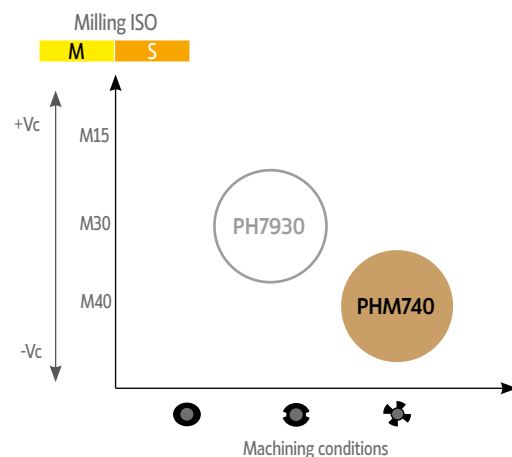


MT CVD coated carbide grade, named PHM.

Developed to provide a better performance in milling of stainless-steels and high temperature alloys.

Main features:

- Extraordinary heat resistance
- High toughness
- Excellent resistance to notching
- CVD high-performance coating with maximum hardness and extremely smooth surface



(TiBN)

Due to its high hardness, considerable mechanical strength and good wear resistance, it is well suited to be used as a protective coating for cutting tools

(Al₂O₃)

High-strength alumina coating. The top surface is smooth and does not stick to the chip.

Ti(C,N)

Fine grain TiCN (titanium carbide) coating with columnar structure which is hard and wear resistant against abrasive wear.

SUBSTRATE

Cemented-carbide substrate that combines high strength with reliable toughness.

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Line for machining stainless steel and difficult cutting materials

M S

Features

- High positive rake angle results in low cutting resistance;
- Optimal cutter design for stainless steel and difficult-to-cut material machining;
- Special grade (PHM740) with wear resistance and toughness characteristics.
- Optimized insert for machining with 6 cutting edges



RDHT



RPHT

TOROMILL 33590

RDHT 0802...

TOROMILL 33690

RPHT 10T3...

TOROMILL 33790

RPHT 1204...

TOROMILL 33890

RPHT 1605...

TOROMILL 33990

RPHT 2006...

RDHT | RPHT | Inserts | Pastilhas | Plaquetas

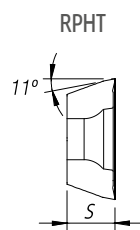
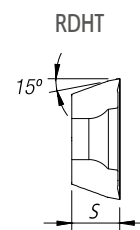
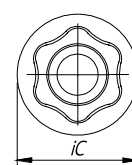
RDHT



RPHT
(PH7930 grade)



RPHT
(PHM grade)



		P				M				K						N		S				H	Dimensions Dimensões Dimensiones (mm)					
		CVD		PVD		CVD		PVD		CVD		PVD				UNC	PCD	CVD	PVD	PVD								
		T9	G1	G4	P3	T9	R1	G4	P3	G6	L5	L6	L9	54	68	66	10	D6	R1	P3	G6	M6						
⁽¹⁾ Geometry code	ISO Reference	PH5740	PH7910	PH7920	PH7930	PH5740	PHM740	PH7920	PH7930	PH7740	PH5705	PH5320	PH5740	PH7910	PH7920	PH7930	PH0910	PDP410	PHM740	PH7930	PH7740	PH6103	iC	S	I	F	B	R
1112152	RDHT 0802 M0E-LS			○			⊗		⊗	○									⊗	⊗	○		8,00	2,38	-	-	-	-
1112772	RPHT 10T3 M0E-LS	⊗				⊗	⊗												⊗				10,00	3,97	-	-	-	-
1112766	RPHT 1204 M0E-LS	⊗				⊗	⊗												⊗				12,00	4,76	-	-	-	-
1112253	RPHT 10T3 M0E-MS			○			⊗		⊗	○									⊗	⊗	○		10,00	3,97	-	-	-	-
1112186	RPHT 1204 M0E-MS			○			⊗		⊗	○									⊗	⊗	○		12,00	4,76	-	-	-	-
1112254	RPHT 1605 M0E-MS			○			⊗		⊗	○									⊗	⊗	○		16,00	5,56	-	-	-	-
1112153	RPHT 2006 M0E-MS			○			⊗		⊗	○									⊗	⊗	○		20,00	6,35	-	-	-	-

First choice | Primeira opção | 1ª opción

Stock item | Produto de stock | Itens de stock

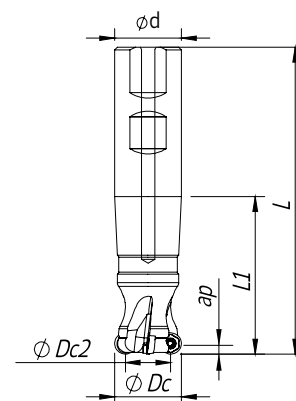
Available under request | Disponível sobre consulta
Disponível bajo consulta

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



Weldon Shank

$\gamma_p = +5^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)					Kg	Specifications	Insert Pastilha Inserto	Stock
			ØDc	ØDc2	Ød/M	L	L1		Ap max (mm)		
33590											
181122300	016W33590-02-04-016100	2	16	8	16	100	40	0,18	4,0	RD...0802 M0E	○
181122400	020W33590-03-05-020115	3	20	12	20	115	50	0,25	4,0	RD...0802 M0E	○
181112600	025W33590-04-05-025115	4	25	17	25	115	60	0,34	4,0	RD...0802 M0E	○
33690											
181123100	020W33690-02-05-016100	2	20	10	16	100	50	0,24	5,0	RP...10T3 M0E	○
181123200	025W33690-03-05-020115	3	25	15	20	115	60	0,37	5,0	RP...10T3 M0E	○
181123300	032W33690-04-05-025130	4	32	22	25	130	70	0,56	5,0	RP...10T3 M0E	○

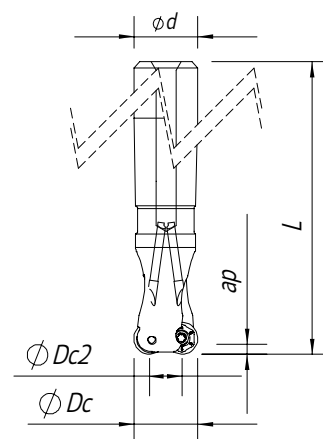
⊗ Stock item | Produto de stock | Itens de stock

○ Available under request | Disponível sobre consulta | Disponible bajo consulta



Cylindrical Shank

$\gamma_p = +5^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)					Kg	Specifications	Insert Pastilha Inserto	Stock
			ØDc	ØDc2	Ød/M	L	L1		Ap max (mm)		
33590											
181122500	016E33590-02-04-016160	2	16	8	16	160	59	0,23	4,0	RD...0802 M0E	
181122600	020E33590-03-05-020180	3	20	12	20	180	59	0,36	4,0	RD...0802 M0E	
181122700	025E33590-04-05-025200	4	25	17	25	200	59	0,65	4,0	RD...0802 M0E	
33690											
181123400	020E33690-02-05-020180	2	20	10	20	180	50	0,40	5,0	RP...10T3 M0E	
181123500	025E33690-03-05-025200	3	25	15	25	200	60	0,76	5,0	RP...10T3 M0E	
181123600	032E33690-04-05-032200	4	32	22	32	200	60	0,98	5,0	RP...10T3 M0E	

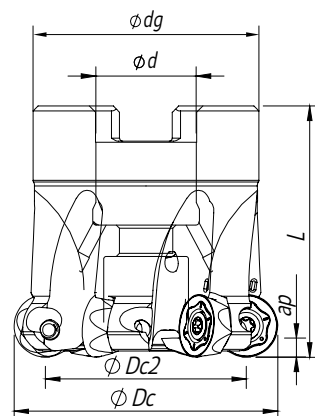
⊗ Stock item | Produto de stock | Itens de stock

○ 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
			ØDc	ØDc2	Ød/M	Ødg	L		Arbor Type	Ap max (mm)		
33690												
181123700	042A33690-06-05-016040	6	42	32	16	36	40	0,16	A	5,0	RP...10T3 MOE	
181123800	050A33690-06-05-022040	6	50	40	22	42	40	0,26	A	5,0	RP...10T3 MOE	
181123900	052A33690-07-05-022040	7	52	42	22	42	40	0,30	A	5,0	RP...10T3 MOE	
33790												
181098700	040A33790-04-05-016040	4	40	28	26	36	40	0,15	A	6,0	RP...1204 MOE	
181111500	050A33790-04-05-022040	4	50	38	22	42	40	0,20	A	6,0	RP...1204 MOE	
181124200	052A33790-05-05-022040	5	52	40	22	42	40	0,25	A	6,0	RP...1204 MOE	
181122100	063A33790-06-05-022040	6	63	51	22	48	40	0,36	A	6,0	RP...1204 MOE	
181124300	066A33790-06-05-027050	6	66	54	27	48	50	0,40	A	6,0	RP...1204 MOE	
181124400	080A33790-07-05-027050	7	80	68	27	60	50	0,68	A	6,0	RP...1204 MOE	

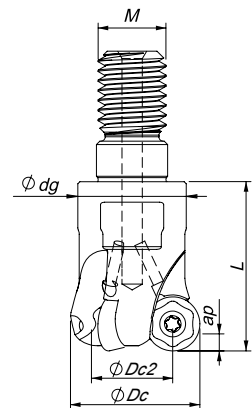
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Threaded Coupling

$\gamma_p = +5^\circ$



Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)					Kg	Specifications	Insert Pastilha Inserto	Stock
			ØDc	ØDc2	Ød/M	Ødg	L		Ap max (mm)		
33590											
181098600	016R33590-02-04-M08020	2	16	8	M8	13	20	0,03	4,0	RD...0802 MOE	
181122800	020R33590-03-05-M10025	3	20	12	M10	16	25	0,07	4,0	RD...0802 MOE	
181122900	025R33590-04-05-M12030	4	25	17	M12	21	30	0,14	4,0	RD...0802 MOE	
181123000	032R33590-05-05-M16043	5	32	24	M16	29	43	0,25	4,0	RD...0802 MOE	
33690											
181110600	020R33690-02-05-M10032	2	20	10	M10	16	32	0,10	5,0	RP...10T3 MOE	
181110700	025R33690-03-05-M12035	3	25	15	M12	21	35	0,19	5,0	RP...10T3 MOE	
181110800	032R33690-04-05-M16035	4	32	22	M16	29	35	0,31	5,0	RP...10T3 MOE	
181120700	035R33690-05-05-M16045	5	35	25	M16	29	45	0,40	5,0	RP...10T3 MOE	

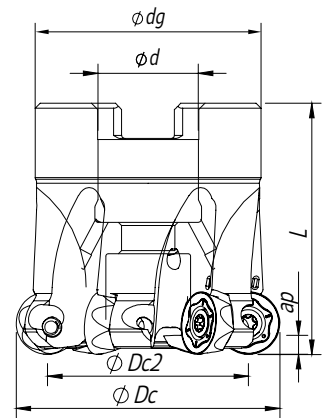
Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta



Arbor Mounting

$\gamma_p = 5^\circ$



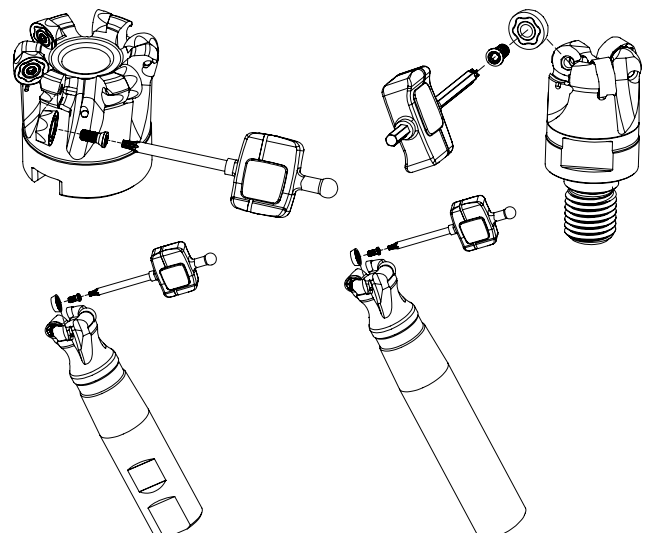
Order code Código	Reference Referência Referencia		Dimensions Dimensões Dimensiones (mm)					Kg	Specifications		Insert Pastilha Inserto	Stock
			ØDc	ØDc2	Ød/M	Ødg	L		Arbor Type	Ap max (mm)		
33890												
181124500	050A33890-04-05-022040	4	50	34	22	42	40	0,21	A	8,0	RP...1605 M0E	
181124600	052A33890-04-05-022040	4	52	36	22	42	40	0,25	A	8,0	RP...1605 M0E	
181114900	063A33890-05-05-022040	5	63	47	22	48	40	0,37	A	8,0	RP...1605 M0E	
181124700	066A33890-05-05-027050	5	66	54	27	48	50	0,46	A	8,0	RP...1605 M0E	
181124800	080A33890-06-05-027052	6	80	64	27	60	52	0,85	A	8,0	RP...1605 M0E	
181124900	100A33890-07-05-032052	7	100	84	32	80	52	1,57	A	8,0	RP...1605 M0E	
181122200	125A33890-08-05-040052	8	125	109	40	90	52	2,12	A	8,0	RP...1605 M0E	
33990												
181112200	080A33990-05-05-027050	5	80	60	27	60	50	0,73	A	10,0	RP...2006 M0E	
181099800	100A33990-06-05-032063	6	100	80	32	80	63	1,62	A	10,0	RP...2006 M0E	
181099900	125A33990-06-05-040063	6	125	105	40	90	63	2,53	A	10,0	RP...2006 M0E	

Stock item | Produto de stock | Itens de stock

Available under request | Disponível sobre consulta | Disponible bajo consulta

SPARE PARTS | Complementos | Repuestos

Cutter ϕDc	Order separately			
	Insert Screw 	Key (Torx) 	Key (Torx - Nm) 	Torque Value
33590	P0250503	XT08	DT0812	1,20
33690	P0300800	XT09	DT0914	1,40
33790	P0350800	XT15	DT1530	3,00
33890	P0451100	XT20	DT2050	5,00
33990	P0501302	PT20	DT2050	5,00



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

ISO	PSM	Material	HB (Brinell)	Grades	
				← Wear Resistance PH7930 	Toughness → PHM740 
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	✓	✓

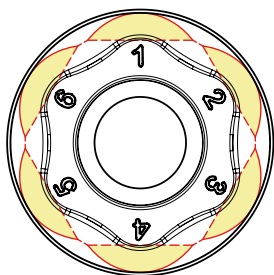
 Good Conditions
 Average Conditions
 Difficult Conditions

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

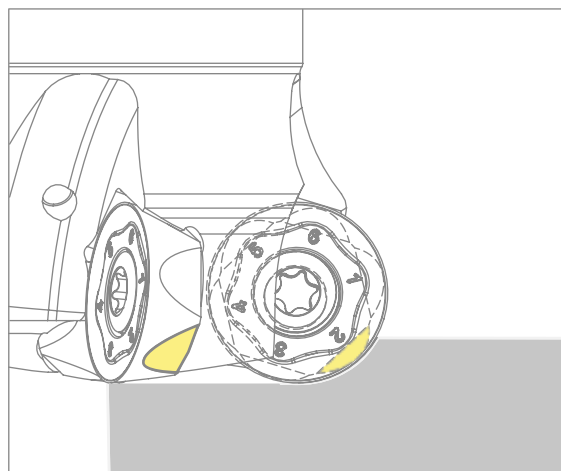
ISO	PSM	Material	HB (Brinell)	Vc (m/min)		RD... 08		RP... 10	
				← Wear Resistance PH7930	Toughness → PHM740	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)
M	4	SS - Ferritic / Martensitic	200-330	100-120	100-130	0,05-0,25	≤4,00	0,05-0,30	≤5,00
	5	SS - Austenitic	200-330	80-110	80-120	0,05-0,25		0,05-0,30	
	6	SS - Austenitic-ferritic (Duplex)	230-260	70-100	70-110	0,05-0,25		0,05-0,30	
S	11	Heat Resistant Super Alloys	200-320	20-80	20-90	0,05-0,20		0,05-0,25	

ISO	PSM	Material	HB (Brinell)	RP... 12		RP... 16		RP... 20	
				fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)
M	4	SS - Ferritic / Martensitic	200-330	0,05-0,35	≤6,00	0,08-0,45	≤8,00	0,08-0,55	≤10,00
	5	SS - Austenitic	200-330	0,05-0,35		0,08-0,45		0,08-0,55	
	6	SS - Austenitic-ferritic (Duplex)	230-260	0,05-0,35		0,08-0,45		0,08-0,55	
S	11	Heat Resistant Super Alloys	200-320	0,05-0,30		0,08-0,35		0,08-0,40	

The maximum depth of cut using 6 cutting edges

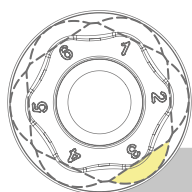


6 cutting edges



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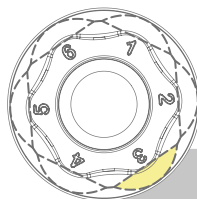
RDHT 0802...



2,00 mm

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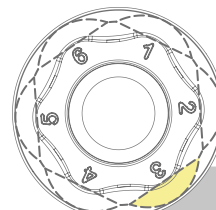
RPHT 10T3...



2,80 mm

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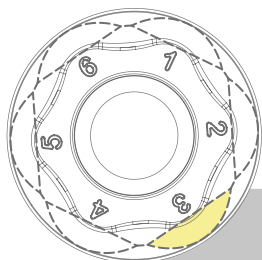
RPHT 1204...



3,00 mm

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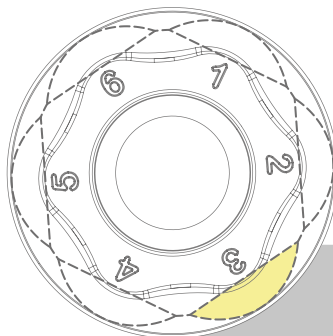
RPHT 1605...



4,50 mm

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RPHT 2006...



5,00 mm