



SPECIALTY MILLING

1 HARDMILL 72090

- > Suitable for machining **N**
- > See page A - 276

2 CENTER & CHAMFER

- > Suitable for machining **P M K**
- > See page A - 280

3 ENGRAVING 64067

- > Suitable for machining **P M N S**
- > See page A - 284

4 SPOT FACE

- > Suitable for machining **P M K S**
- > See page A - 288

72090

HARDMILL



The HARDMILL 72090 is a specialized tool designed for specific applications in the automobile industry, such as gearbox housings. It features adjustment wedges for precise face milling on aluminum components.

A HARDMILL 72090 é uma ferramenta especializada projetada para aplicações específicas na indústria automóvel, como caixas de velocidades. Apresenta cunhas de ajuste de parafuso para fresagem frontal precisa em componentes de alumínio.

La HARDMILL 72090 es una herramienta especializada diseñada para aplicaciones específicas en la industria automotriz, como cajas de cambios. Presenta cuñas de ajuste de tornillo para fresado frontal preciso en componentes de aluminio.

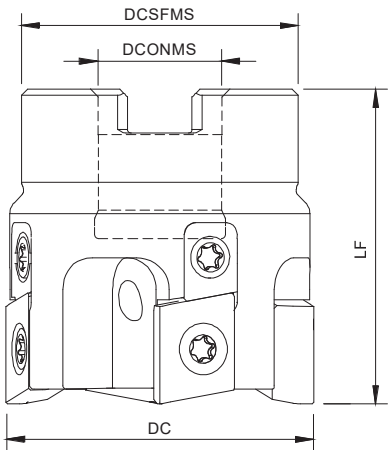
HARDMILL 72090 > page 278

- > **From DC 40mm to 160mm**
De DC 40mm a 160mm | Desde DC 40mm hasta 160mm
- > **Available in arbor mounting**
Disponível em montagem tipo árvore | Disponible en fijación con tornillo central
- > **Excellent solution for aluminium**
Excelente solução para alumínio | Excelente solución para aluminio
- > **PCD tipped insert**
Pastilha com ponta de PCD | Inserto con punta de PCD





Arbor Mounting
KAPR=90° | GAMP=0°



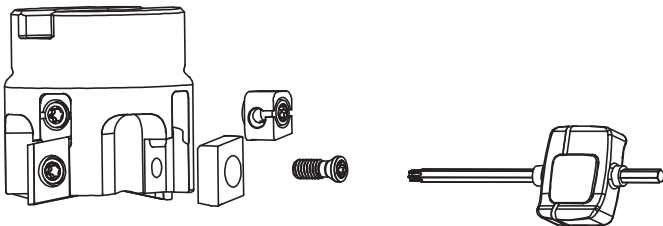
Order code Código	Reference Referência Referencia	CICT	Dimensions Dimensões Dimensiones (mm)				WT	Specifications		Insert Pastilha Inserto	Stock
			DC	DCONMS	DCSFMS	LF		Arbor Type	RPM max		
181129700	040A72090-04-016040	4	40	16	36	40	0,32	A	32 000	XNHW 1205...	⊗
181129800	050A72090-04-022040	4	50	22	46	40	0,38	A	32 000	XNHW 1205...	⊗
181129900	050A72090-05-022040	5	50	22	46	40	0,37	A	32 000	XNHW 1205...	○
181130000	063A72090-04-022040	4	63	22	49	40	0,65	A	29 000	XNHW 1205...	○
181130100	063A72090-07-022040	7	63	22	49	40	0,62	A	29 000	XNHW 1205...	⊗
181130200	080A72090-05-027050	5	80	27	60	50	1,25	A	26 000	XNHW 1205...	⊗
181130300	080A72090-09-027050	9	80	27	60	50	1,17	A	26 000	XNHW 1205...	⊗
181130400	100A72090-06-032050	6	100	32	70	50	1,93	A	24 000	XNHW 1205...	⊗
181130500	100A72090-12-032050	12	100	32	70	50	1,80	A	24 000	XNHW 1205...	○
181130600	125A72090-08-040063	8	125	40	72	63	2,88	A	22 000	XNHW 1205...	○
181130700	125A72090-14-040063	14	125	40	72	63	2,60	A	22 000	XNHW 1205...	○
181135500	160A72090-10-040063	10	160	40	72	63	3,30	A	18 000	XNHW 1205...	○
181135600	160A72090-16-040063	16	160	40	118	63	5,45	A	18 000	XNHW 1205...	○

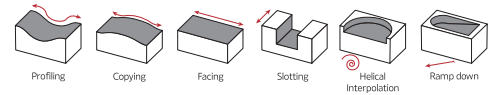
⊗ Stock item | Produto de stock | Itens de stock ○ Available under request (see page A-8) | Disponível sobre consulta (consulte a página A-8) | Disponible bajo consulta (mire pagina A-8)

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Order separately		Wedge
			Key (Torx - Nm)	Torque Value	
A72090 - 40-160	P0401100	XT15	DT1530	3,00	SETDEV AS 04 00

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-301.
Check the procedures for the clamping screws on the page A-301.





XNHW 1205... Inserts | Pastilhas | Plaquetas



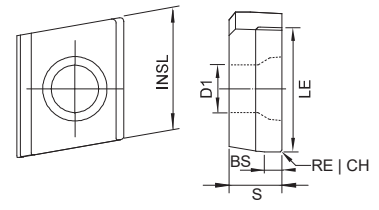
XNHW 1205 PZFR-020120



XNHW 120508 PZTR-000080



XNHW 120508 PZTR-015045



XNHW

(1) Geometry code	(2) Grade code	N		Dimensions Dimensões Dimensiones (mm)							
		PCD		INSL	S	LE	D1	RE	CHW	KCH	BS
		I3	D6								
	ISO Reference	PDP403	PDP410								
1112564	XNHW 120504 PZFR-015045	○	○	12,25	5,40	4,50	4,80	0,40	-	-	1,50
1112565	XNHW 120504 PZFR-000080	○	○	12,25	5,40	8,00	4,80	0,40	-	-	-
1112566	XNHW 120508 PZFR-015045	⊗	○	12,25	5,40	4,50	4,80	0,80	-	-	1,50
1112551	XNHW 120508 PZTR-015045	⊗	○	12,25	5,40	4,50	4,80	0,80	-	-	1,50
1112552	XNHW 120508 PZTR-000080	○	○	12,25	5,40	8,00	4,80	0,80	-	-	-
1112553	XNHW 1205 PZFR-020120	⊗	○	12,25	5,40	12,00	4,80	-	0,20	45°	2,00
1112567	XNHW 1205 PZFR-030045	○	○	12,25	5,40	4,50	4,80	-	0,20	45°	3,00
1112568	XNHW 1205 PZTR-030045	○	○	12,25	5,40	4,50	4,80	-	0,20	45°	3,00

⊗ 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

INSERTS CODIFICATION SYSTEM Sistema de codificação de pastilhas | Sistema de codificación de insertos

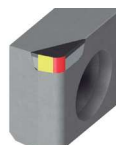
ISO CODE	Insert size	Insert thickness	Insert radius	Cutting edge position angle	Cutting edge relief angle	Cutting edge conditions	Cut direction	Wiper edge lenght	Máx. Ap
XNHW	12	05	04	P	Z	F	R	-	015 030



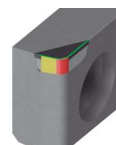
XNHW 120504 PZFR-0150045



XNHW 120504 PZFR-000080



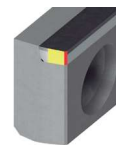
XNHW 120508 PZFR-015045



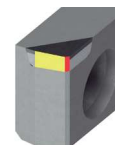
XNHW 120508 PZTR-015045



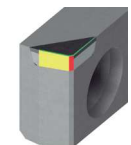
XNHW 120508 PZTR-000080



XNHW 1205 PZFR-020120



XNHW 1205 PZFR-030045



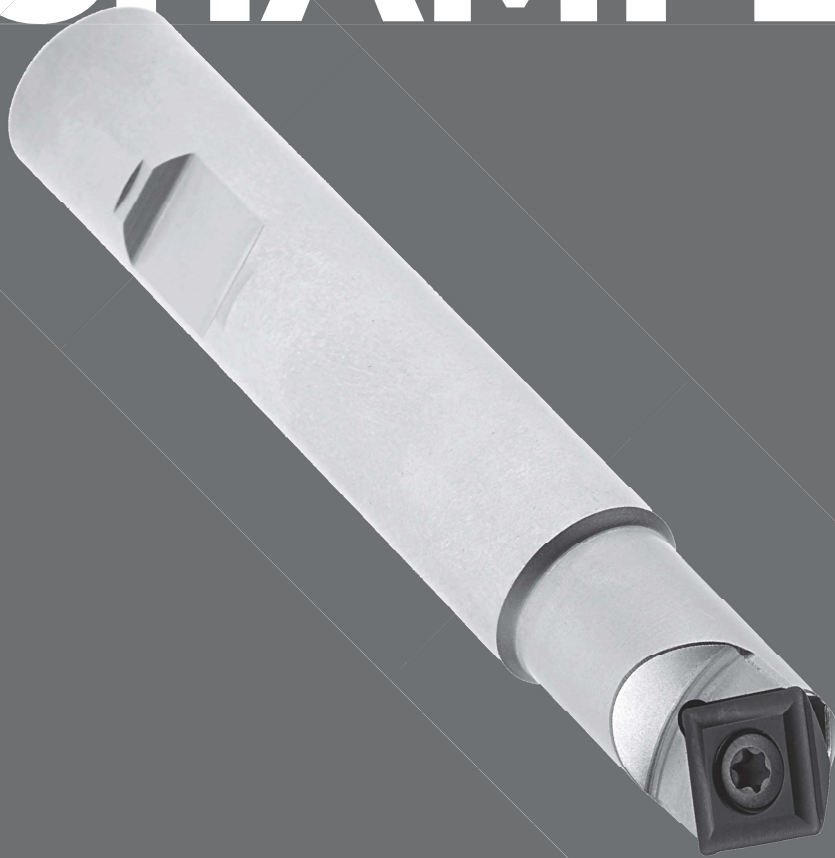
XNHW 1205 PZTR-030045

■ Cutting edge Type (radius, chamfer) ■ Wiper cutting edge ■ Edge Preparation (F, T)

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

ISO	Material		HB (Brinell)	Vc (m/min)	Feed fz (mm/t)
	Work piece material	Type of treatment / alloy		PDP403	XNHW 12...
N	Aluminium wrought alloys		80	300 - 4000	0,05 - 0,40
			90	300 - 1500	
	Aluminium cast alloys	< 12% Si	130	300 - 5000	
		< 12% Si	90	300 - 3000	
		> 12% Si	100	300 - 1000	
	Non-ferrous materials	brass, red bronze	100	100 - 700	
		bronze	-	100 - 1500	
		lead-free copper and electrolytic copper	-	300 - 3000	
	Non-metallic materials	thermosetting plastics	-	80 - 300	
		fibre-reinforced plastics	200-320	80 - 300	
		hard rubber		80 - 300	

CENTER & CHAMFER



The CENTER & CHAMFER line are versatile tool suitable for a variety of milling applications, including chamfering, spot drilling, engraving, and even grooving.

A CENTER & CHAMFER é uma ferramenta versátil adequada para uma variedade de aplicações de fresagem, incluindo chanfragem, furação de ponto, gravação e até mesmo ranhuras.

La línea CENTER & CHAMFER es una herramienta versátil adecuada para una variedad de aplicaciones de fresado, incluyendo chaflanado, taladrado puntual, grabado e incluso ranurado.

CENTER & CHAMFER > page 282

- > Chamfering

Chanfragem | Chaflanado

- > Spot Drilling

Furação de ponto | Taladrado puntual

- > Grooving

Ranhuras | Ranurado

- > Engraving

Gravação | Grabado



A CENTER & CHAMFER

MILLING

Face milling

High feed milling

Shoulder milling

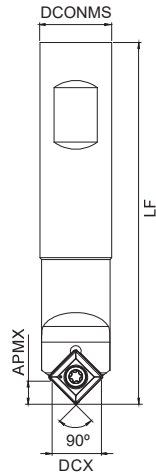
Profile milling

Specialty

Spare Parts

Technical Data

End Mills



Order code Código	Reference Referência Referencia	CICT	Dimensions Dimensões Dimensiones (mm)						WT	Insert Pastilha Inserto	Stock
			DCX	APMX	APMN	DCONMS	LF	KAPR			
181147400	CHT S16H N11-45	1	13	6,5	1,0	16	100	45°	0,146	SO..T 11T3..	Ⓢ
181147500	CHT S16M N11-45	1	13	6,5	1,0	16	150	45°	0,180	SO..T 11T3..	Ⓢ

Order code Código	Reference Referência Referencia	Nº Toolholder	Holder designation	Nº inserts	Insert Pastilha Inserto	Stock
1410286G4	PK SOMT 11T308 CHTS16H	1	CHT S16H N11-45	10	SOMT 11T308	Ⓢ
1410287G4	PK SOMT 11T308 CHTS16M	1	CHT S16M N11-45	10	SOMT 11T308	Ⓢ
1410318G4	PK SOGT 11T303 CHTS16H	1	CHT S16H N11-45	10	SOGT 11T303	Ⓢ
1410317G4	PK SOGT 11T303 CHTS16M	1	CHT S16M N11-45	10	SOGT 11T303	Ⓢ

Ⓢ 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)

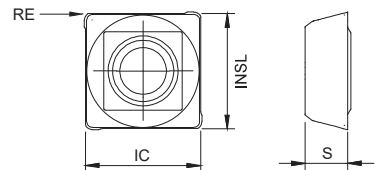
SO...T 11T3... Inserts | Pastilhas | Plaquitas



SOMT



SOGT



SOMT | SOGT

		P	M	K	Dimensions Dimensões Dimensiones (mm)			
		PVD	PVD	PVD				
		⁽²⁾ Grade code	G4	G4				
⁽¹⁾ Geometry code	ISO Reference	PH7920	PH7920	PH7920	IC	S	INSL	RE
1112425	SOMT 11T308				10,85	4,02	11,00	0,80
1112973	SOGT 11T303				10,85	4,00	11,00	(0,30)

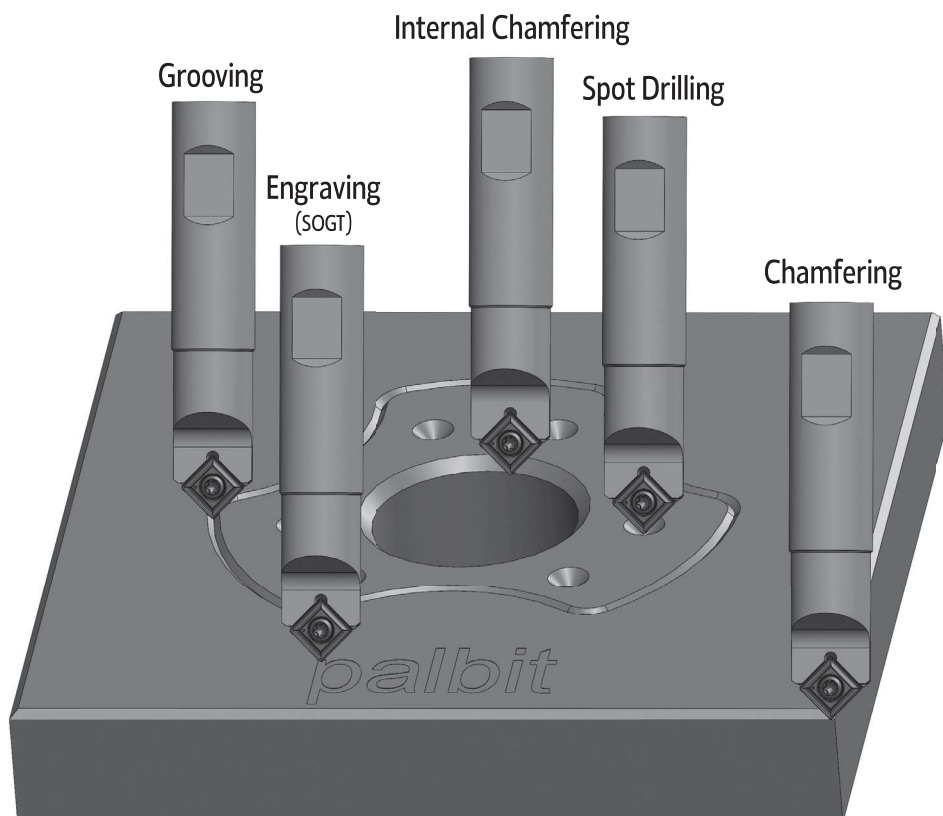
Ⓢ First choice | Primeira opção | 1ª opción

Ⓢ 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

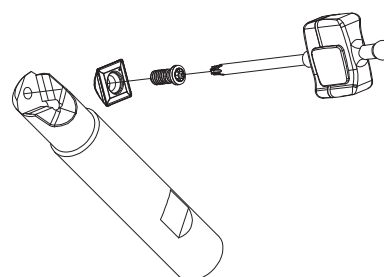
TOOL SELECTION Seleção de ferramenta | Selección de herramienta



SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				
CHT S16...	P0350800	XT15	DT1530	3,0

Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-301.
Check the procedures for the clamping screws on the page A-301.



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

ISO	PSM	Material	HB (Brinell)	Vc (m/min)	Feed fz (mm/t)	
				PH7920	SOMT 11T308	SOGT 11T303
P	1	Unalloyed Steel	125-220	120-150	0,04-0,08	0,05-0,10
	2	Low-Alloyed Steel	220-280	100-120	0,03-0,07	0,05-0,10
	3	High-Alloyed Steel	280-380	60-100	0,03-0,06	0,04-0,08
M	4	SS - Ferritic / Martensitic	200-330	100-150	0,04-0,07	0,03-0,06
	5	SS - Austenitic	200-330	80-120	0,03-0,06	0,03-0,06
	6	SS - Austenitic-ferritic (Duplex)	230-260	50-90	0,03-0,06	0,03-0,08
K	7	Malleable Cast Iron	130-230	90-150	0,05-0,10	0,05-0,10
	8	Grey Cast Iron	180-245	80-120	0,05-0,08	0,05-0,08
	9	Nodular Cast iron	160-250	70-110	0,04-0,08	0,04-0,08

NEW 64067

ENGRAVING



The ENGRAVING 64047 features an indexable carbide insert, ensuring excellent repeatability while drastically reducing presetting time, and eliminates the need for resharpener. The high positive rake angle facilitates faster cutting and enhanced durability compared to traditional engravers, revolutionizing the engraving process with unmatched efficiency and longevity.

A ENGRAVING 64047 apresenta uma pastilha de metal duro indexável, garantindo excelente repetibilidade enquanto reduz drasticamente o tempo de pré-ajuste e elimina a necessidade de afiação. O alto ângulo de inclinação positivo facilita o corte mais rápido e aumenta a durabilidade em comparação com as ferramentas de gravação tradicionais, revolucionando o processo de gravação com eficiência e longevidade incomparáveis.

La ENGRAVING 64047 presenta una pastilla de metal duro indexable, garantizando una excelente repetibilidad al tiempo que reduce drásticamente el tiempo de ajuste previo y elimina la necesidad de afilado. El alto ángulo de inclinación positiva facilita el corte más rápido y aumenta la durabilidad en comparación con las herramientas de grabado tradicionales, revolucionando el proceso de grabado con eficiencia y longevidad incomparables.

NEW ENGRAVING 64067 > page 286

- > **45° Engraving tool**

Ferramenta de gravação a 45° | Herramienta de grabado a 45°

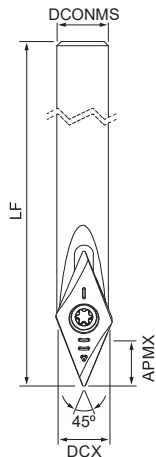
- > **Fine engraving with 0,2mm bottom width**

Gravação fina com largura de fundo de 0,2mm | Grabado fino con un ancho de fondo de 0,2mm

- > **Suitable for engraving on steel, stainless steel, superalloys and aluminium**

Adequado para gravação em aço, aço inoxidável, superligas e alumínio | Adecuado para grabado en acero, acero inoxidable, superaleaciones y aluminio





Type A: Steel Shank
Type B: Carbide Shank

Order code Código	Reference Referência Referencia	CICT	Type	Dimensions Dimensões Dimensiones (mm)							WT	Insert Pastilha Inserto	Stock
				DCN	DCX	APMN	APMX	DCONMS	LF	KAPR			
181168500	002E64067-01-10-U006040	1	A	0,45~0,65	2,10	0,05~0,20	2,00	6	40	67,5°	0,011	VPGT 0602...	⊗
181191300	002E64067-01-10-U006065	1	B	0,45~0,65	2,10	0,05~0,20	2,00	6	65	67,5°	0,024	VPGT 0602...	⊗
181168700	002E64067-01-10-U006100*	1	B	0,45~0,65	2,10	0,05~0,20	2,00	6	100	67,5°	0,050	VPGT 0602...	⊗

Order code Código	Reference Referência Referencia	Nº Toolholder	Holder designation	Nº inserts	Insert Pastilha Inserto	Stock
1410321Y3	PK VPGT 060202-45LM E64067-006040	1	002E64067-01-10-U006040	10	VPGT 060202-45LM	⊗
1410322Y3	PK VPGT 060202-45LM E64067-006065	1	002E64067-01-10-U006065	10	VPGT 060202-45LM	⊗
1410324Z5	PK VPGT 060202-45LN E64067-006040	1	002E64067-01-10-U006040	10	VPGT 060202-45LN	⊗
1410325Z5	PK VPGT 060202-45LN E64067-006065	1	002E64067-01-10-U006065	10	VPGT 060202-45LN	⊗
1410326Z5	PK VPGT 060202-45LN E64067-006100	1	002E64067-01-10-U006100*	10	VPGT 060202-45LN	⊗

⊗ Stock item | Produto de stock | Itens de stock

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

*Note: Recommended only for non-ferrous materials machining

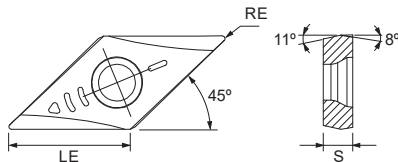
VPGT 0602... Inserts | Pastilhas | Plaquitas



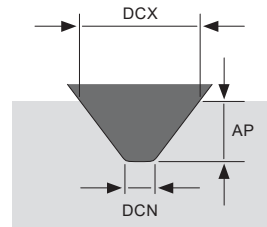
VPGT-45LM



VPGT-45LN



VPGT-45LM | 45LN



		P	M	N	S	Dimensions Dimensões Dimensiones (mm)						
		PVD	PVD	UNC	PVD							
		⁽²⁾ Grade code	Y3	Y3	Z5							
⁽¹⁾ Geometry code	ISO Reference	PHH920	PHH920	PH0610	PHH920	LE	S	RE	DCN	DCX	APMN	APMX
1113054	VPGT 060202-45LM	⊗	⊗		⊗	6,35	2,00	0,20	0,65	2,10	0,20	2,00
1113055	VPGT 060202-45LN			⊗	○	6,35	2,00	0,20	0,45	2,10	0,05	2,00

⊗ First choice | Primeira opção | 1ª opción

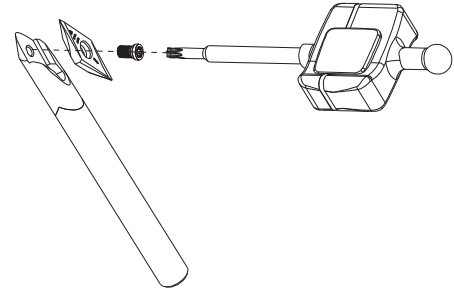
⊗ Stock item | Produto de stock | Itens de stock

○ Available under request (see page A-9) | Disponível sobre consulta (consulte a página A-9) | Disponible bajo consulta (mire pagina A-9)

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

SPARE PARTS Acessórios | Repuestos

Cutter DC	Order separately			
	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
002E64067	P0220401	XT06	DT0606	0,6



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

ISO	PSM	Material	n (RPM)	f (mm/rev)	
				VPGT 060602-45LM	VPGT 060602-45LN
P	1	Carbon Steel	5 000 - 40 000	0,008 - 0,05	-
	3	Alloy Steel	5 000 - 40 000	0,008 - 0,03	-
M	5	SS - Austenitic	5 000 - 40 000	0,008 - 0,05	-
N	10	Aluminium and Non Ferrous	5 000 - 40 000	-	0,008 - 0,05
S	11	Heat Resistant Super Alloys	5 000 - 30 000	0,005 - 0,03	-

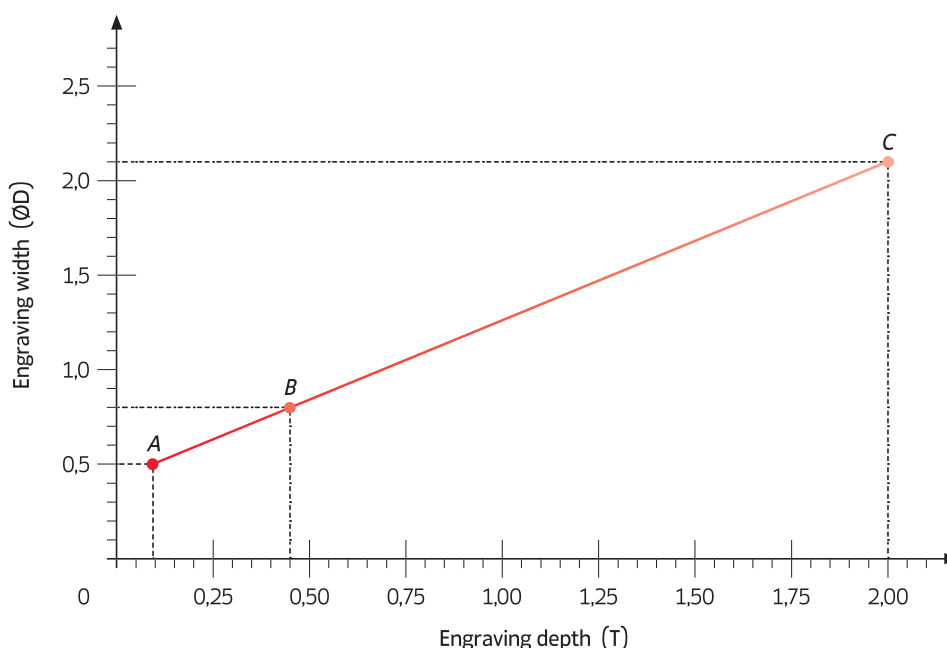
ap per step:

ISO	PSM	Material	AP (mm)							Tmax: 2mm
			1st	2nd	3rd	4th	5th	6th	Next steps	
P	1	Carbon Steel	0,70	0,70	0,30	0,20	0,10	-	-	0,10
	3	Alloy Steel	0,50	0,40	0,30	0,30	0,20	0,20	0,10	0,10
M	5	SS - Austenitic	0,50	0,40	0,20	0,30	0,20	0,20	0,10	0,05
N	10	Aluminium and Non Ferrous	1,00	0,80	0,20	-	-	-	-	0,10
S	11	Heat Resistant Super Alloys	0,50	0,40	0,20	0,30	0,20	0,20	0,10	0,05

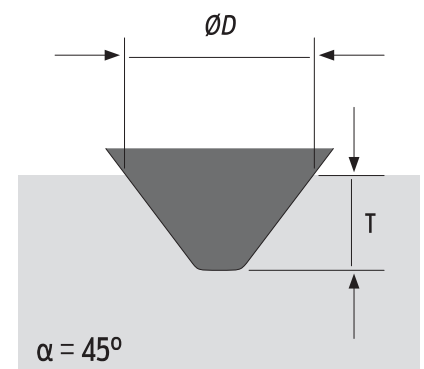
(Note 1) It is recommended to start engraving by steps according to the parameters on the table above.

(Note 2) Whenever possible, infeed should be done starting outside the workpiece being machined.

REFERENCE CHART Gráfico de referência | Tabla de referencia



- **Point A:**
Width= 0,5 mm x Depth = 0,08 mm
- **Point B:**
Width= 0,8 mm x Depth = 0,45 mm
- **Point C:**
Width= 2,1 mm x Depth = 2,00 mm



SPOT FACE



Spot face milling is a precision machining process crucial in crafting components for high-performance applications, particularly in the automotive and aerospace industries.

A fresagem de caixa é um processo de maquinação de precisão crucial no fabrico de componentes para aplicações de alto desempenho, especialmente nas indústrias automóvel e aeroespacial.

El fresado de caja es un proceso de mecanizado de precisión crucial en la fabricación de componentes para aplicaciones de alto rendimiento, especialmente en las industrias automotriz y aeroespacial.

SPOT FACE > page 290

- > From DC 10mm to 25mm

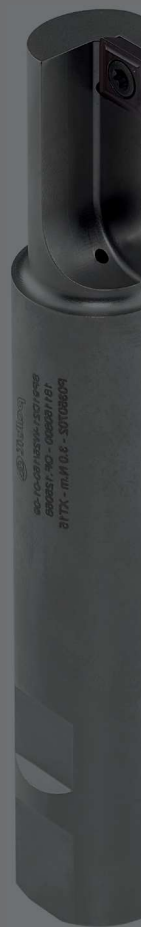
De DC 10mm a 25mm | Desde DC 10mm hasta 25mm

- > Counterbore hole

Furo de rebaixo | Orificio avellanado

- > Smooth cutting

Corte suave | Corte suave



A SPOT FACE

MILLING

Face milling

High feed milling

Shoulder milling

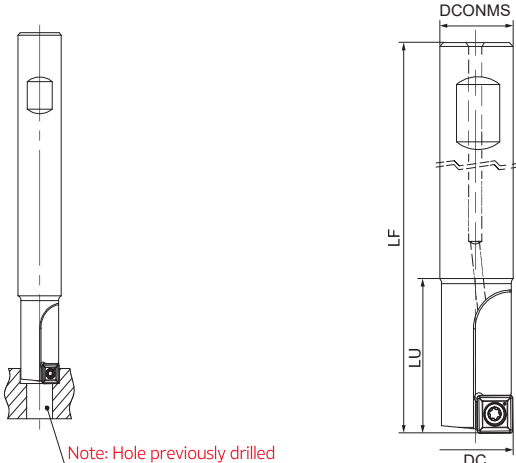
Profile milling

Specialty

Spare Parts

Technical Data

End Mills



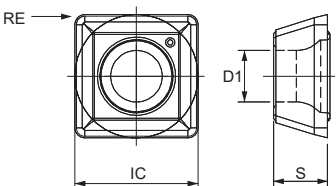
Order code Código	Reference Referência Referencia	CICT	Dimensions Dimensões Dimensiones (mm)				WT	Insert Pastilha Inserto	Stock
			DC	DCONMS	LF	LU			
181150100	SP91 D10-W10/100-01-05	1	10	10	100	30	0,048	SPKX 05T104	Ⓐ
181150200	SP91 D11-W12/100-01-05	1	11	12	100	30	0,070	SPKX 05T104	Ⓐ
181150300	SP91 D13-W16/100-01-06	1	13	16	100	30	0,116	SPKX 060204	Ⓐ
181150400	SP91 D14-W16/120-01-06	1	14	16	120	30	0,123	SPKX 060204	Ⓐ
181150500	SP91 D17-W20/120-01-07	1	17	20	120	35	0,224	SPKX 070308	Ⓐ
181150600	SP91 D18-W20/140-01-07	1	18	20	140	35	0,272	SPKX 070308	Ⓐ
181150700	SP91 D20-W20/140-01-09	1	20	20	140	40	0,303	SPKX 090308	Ⓐ
181150800	SP91 D21-W25/150-01-09	1	21	25	150	40	0,449	SPKX 090308	Ⓐ
181150900	SP91 D25-W25/150-01-11	1	25	25	150	40	0,473	SPKX 110408	Ⓐ

Ⓐ 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)

SPKX Inserts | Pastilhas | Plaquetas



(PHL grade)



SPKX

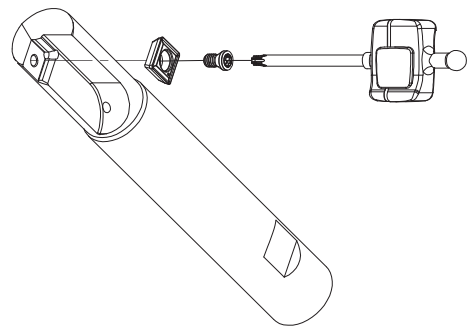
		P			M			K			S			Dimensions Dimensões Dimensiones (mm)			
		PVD			PVD			PVD			PVD						
		⁽²⁾ Grade code	68	66	3B	68	66	3B	68	66	3B	68	66				
⁽¹⁾ Geometry code	ISO Reference	PH6920	PH6930	PHL930	PH6920	PH6930	PHL930	PH6920	PH6930	PHL930	PH6920	PH6930	PHL930	IC	S	D1	RE
1111635	SPKX 05T104													5,00	1,98	2,20	0,40
1111282	SPKX 060204													6,00	2,38	2,55	0,40
1111636	SPKX 070308													7,94	3,18	2,85	0,80
1111637	SPKX 090308													9,80	3,18	4,10	0,80
1111282	SPKX 110408													11,50	4,80	4,40	0,80

Ⓐ 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
Ⓐ Stock available until sold out | Stock disponível até acabar o stock | Stock disponible hasta acabar el stock

SPARE PARTS Acessórios | Repuestos

Cutter DC	Insert Screw	Key (Torx)	Key (Torx - Nm)	Torque Value
				
10-11	P0200400	XT06	DT0606	0,6
13-14	P0220500	XT07	DT0709	0,9
17-18	P0250704	XT08	DT0812	1,2
20-21	P0350702	XT15	DT1530	3,0
25	P0400900	XT15	DT1530	3,0

Order separately



Note: The toolholder is supplied with the XT/PT key. To order the DT key please check the page A-301.
Check the procedures for the clamping screws on the page A-301.

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

ISO	PSM	Material	HB (Brinell)	Grades			
				← Wear Resistance		Toughness →	
				PH6920 	PH6930 	PHC930 	PHL930 
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	8	Grey Cast Iron	180-245	✓	✓	✓	✓
	9	Nodular Cast iron	160-250	✓	✓	✓	✓
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 →	
				PH6920	PH6930	PHC930	PHC930
P	1	Unalloyed Steel	125-220	180-250	160-240	160-240	160-240
	2	Low-Alloyed Steel	220-280	160-220	140-200	140-200	140-200
	3	High-Alloyed Steel	280-380	130-180	110-160	110-160	110-160
M	4	SS - Ferritic / Martensitic	200-330	170-230	140-210	140-210	140-210
	5	SS - Austenitic	200-330	160-200	130-200	130-200	130-200
	6	SS - Austenitic-ferritic (Duplex)	230-260	140-180	120-190	120-190	120-190
K	8	Grey Cast Iron	180-245	180-250	150-220	150-220	150-220
	9	Nodular Cast iron	160-250	130-200	110-180	110-180	110-180
S	11	Heat Resistant Super Alloys	200-320	40-120	30-100	30-100	30-100

ISO	PSM	Material	HB (Brinell)	Feed fz (mm/t)				
				SPKX 05...	SPKX 06...	SPKX 07...	SPKX 09...	SPKX 11...
P	1	Unalloyed Steel	125-220	0,05-0,08	0,06-0,10	0,06-0,12	0,07-0,13	0,08-0,15
	2	Low-Alloyed Steel	220-280	0,06-0,12	0,08-0,15	0,10-0,18	0,12-0,22	0,12-0,25
	3	High-Alloyed Steel	280-380	0,06-0,10	0,08-0,15	0,10-0,20	0,12-0,23	0,12-0,26
M	4	SS - Ferritic / Martensitic	200-330	0,05-0,10	0,06-0,12	0,08-0,15	0,09-0,16	0,10-0,20
	5	SS - Austenitic	200-330	0,04-0,08	0,05-0,10	0,06-0,12	0,07-0,13	0,08-0,18
	6	SS - Austenitic-ferritic (Duplex)	230-260	0,04-0,08	0,05-0,11	0,06-0,13	0,07-0,14	0,08-0,19
K	8	Grey Cast Iron	180-245	0,06-0,12	0,08-0,16	0,12-0,20	0,15-0,25	0,15-0,30
	9	Nodular Cast iron	160-250	0,06-0,10	0,08-0,15	0,10-0,18	0,12-0,20	0,15-0,25
S	11	Heat Resistant Super Alloys	200-320	0,04-0,08	0,05-0,10	0,06-0,12	0,07-0,13	0,08-0,18