






ÍNDICE ICONOS / SOMMAIRE DES ICONES / ICON INDEX

SERIE / SÉRIE / SERIE

	Extra Larga / Extra longue / Extra-long
	Larga / Longue / Longue
	Corta / Courte / Short
	Extra corta / Extra courte / Extra-short

AFILADO / AFFÛTAGE / SHARPENED

	Convencional / Normal / Conventional
	Corrección de labios / Correction de lèvres / Lip correction
	Split Point
	Puntos soldadura / Points de soudure / Welding points
	Placa de carburo / Plaquette carbure / Carbide sheet

ESPIRAL / SPIRALE / SPIRAL

	Espiral a 8° / Spirale à 8° / 8° Spiral
	Espiral a 15° / Spirale à 15° / 15° Spiral
	Espiral a 18° / Spirale à 18° / 18° Spiral
	Espiral a 25° / Spirale à 25° / 25° Spiral
	Espiral a 30° / Spirale à 30° / 30° Spiral
	Espiral a 35° / Spirale à 35° / 35° Spiral
	Espiral a 40° / Spirale à 40° / 40° Spiral
	Espiral a 45° / Spirale à 40° / 40° Spiral
	Espiral S / Spirale S / S Spiral
	Giro a izquierdas / Rotation à gauche / Anti-clockwise rotation


ASIENTO / VIS / SHOULDERED

	90°
	80°

CENTRADO / CENTRAGE / CENTRED

	20°
	60°
	60° / 120°
	Radial / Radial / Radial






ÁNGULO DE LA PUNTA / ANGLE DE LA POINTE / TIP ANGLE

	Punta a 90° / Pointe à 90° / 90° Tip
	Punta a 118° / Pointe à 118° / 118° Tip
	Punta a 135° / Pointe à 135° / 135° Tip

MANGO / QUEUE / SHANK

	Reducido / Réduite / Small
	Reforzado / Renforcée / Reinforced
	Delgado / Fine / Thin

ENTRADA / ENTRÉE / ENTRY

Form. D 	3,5-5h
Form. E 	1,5-2h
Form. A 	6-8h
Form. B "Gun" 	3,5-5h Entrada corregida / Entrée corrigée / Corrected entry
Form. C 	2-3h







TOLERANCIA / TOLÉRANCE / TOLERANCE

Tol. 2A 	Tolerancia 2A / Tolérance 2A / 2A Tolerance
Tol. 2B 	Tolerancia 2B / Tolérance 2B / 2B Tolerance
Tol. 6H 	Tolerancia 6H / Tolérance 6H / 6H Tolerance
Tol. 6HX 	Tolerancia 6HX / Tolérance 6HX / 6HX Tolerance
Tol. 6H+0,1 	Tolerancia 6H+0,1 / Tolérance 6H+0,1 / 6H+0,1 Tolerance
Tol. 6G 	Tolerancia 6G / Tolérance 6G / 6G Tolerance



TIPO DE AGUJERO / TYPE DE TROU / TYPE OF HOLE

	Pasante "gun" / Débouchant "gun" / "Gun" bushing
	Pasante / Débouchant / Bushing
	Ciego / Borgne / Blind
	Roscado por laminación / Filetage par laminage / Threaded by lamination




OTROS / AUTRES / OTHERS

	Taladro manual / Perçage manuel / Manual drill
	Asiento Allen / Vis Allen / Allen setting
	Conicidad 2% / Conicité 2% / 2 % Taper
	Micrograno K30 / Micrograin k30 / K30 Micrograin
	Acero ASP / Acier ASP / ASP Steel
	Mango Hexagonal / Queue Hexagonal / Hexagonale shank






TIPOS DE PUNTA / TYPES DE POINTE / TYPES OF TIPS

	Radial / Radiale / Radial
	Normal / Normale / Normal




LABIOS / LÈVRES / LIPS

	Debaste / Dégrossissage / Grinding
	Debaste fino / Dégrossissage fin / Fine grinding
	Acabado / Finition / Finishing

CORTES / DENTS / CUTS

1z 	1 corte / 1 dent / 1 cut
2z 	2 cortes / 2 dents / 2 cuts
3z 	3 cortes / 3 dents / 3 cuts
4z 	4 cortes / 4 dents / 4 cuts
z ≥ 4 	Varios cortes / Plusieurs dents / Various cuts

DENTADO / DENTURE / TEETH

	Dentado aluminio / Denture aluminium / Aluminium teeth
	Dentado cruzado / Denture croisée / Crossed teeth
	Dentado diamond / Denture diamond / Diamond teeth

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Taladrado Perçage Drilling

Pag. 07-92

- › Brocas Metal Duro / Brocas mango cilíndrico / Brocas mango cónico / Brocas bidiametrales y de centrar / Accesorios y Portabrocas
- › Forets Carbure / Forets à queue cylindrique / Forets à queue conique / Forets bietaqués et à centrer / Accessoires et Mandrins
- › Hard Metal drill-bits / Straight shank drill-bits / Taper straight shank drill-bits / Two-diameter and centre drill-bits / Accessories and drill Chucks



Roscado Taraudage Threading

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- › Machos de máquina / Machos de mano / Cojinetes / Insertos roscados / Calibres / Accesorios
- › Tarauds machine / Tarauds à main / Filières / Filets rapportés / Calibres / Accessoires
- › Machine taps / Hand taps / Dies / Wire thread inserts / Gauges / Accessories



Escariado Alésage Reaming

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- › Escariadores de mano / Escariadores de máquina / Escariadores extensibles
- › Alésoirs à main / Alésoirs machine / Alésoirs extensibles
- › Hand reamers / Machine reamers / Extendable reamers



Avellanado Chanfreinage Counterboring

Pag. 295-324

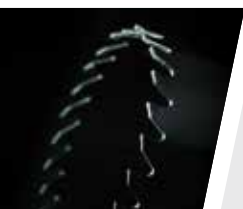
- › Brocas avellanadoras y escalonadas / Avellanadores
- › Fraises coniques et étagées / Fraises à trou et à chanfreiner
- › Counterbore and step drill-bits / Countersink cutters



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- › Fresas Metal Duro / Fresas frontales HSSE / Fresas con agujero HSSE / Fresas especiales HSSE / Fresas frontales HSSE-PM / Fresas rotativas HM / Fresas huecas
- › Fraises Carbure / Fraises HSSE / Fraises à trou HSSE / Fraises HSSE spéciales / Fraises HSSE-PM / Fraises rotatives HM / Fraises à trou
- › Hard Metal mills / HSSE mills / HSSE mills with hole / HSSE special mills / HSSE-PM mills / HM Rotary mills / Hole saws



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- › Sierras de cinta / Sierras circulares / Sierras de máquina
- › Scies à ruban / Scies circulaires / Scies pour machine
- › Saws Band saw blades / Circular saws / Machine saw blades



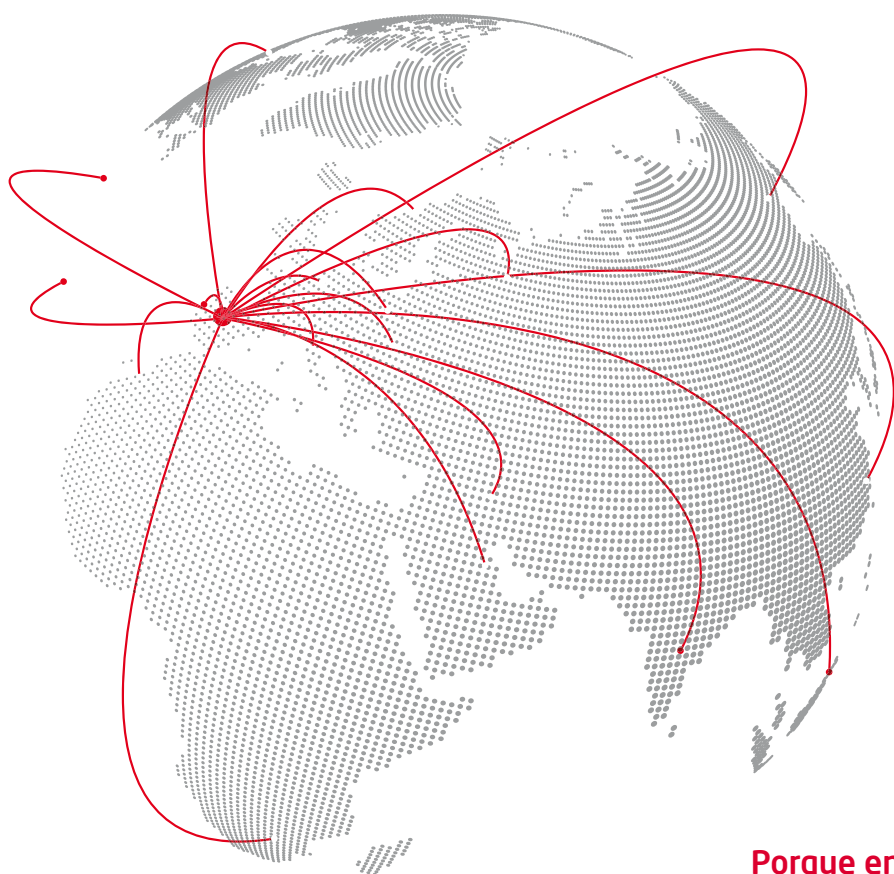
Totem / Display

Pag. 430-440

- › Totem / Display
- › Totem / Display
- › Totem / Display

Porque somos expertos en herramienta de corte desde hace más de 70 años

Y hoy somos una industria 4.0 con presencia en los sectores más innovadores de la producción gracias a inversiones millonarias, robotización, crecimiento continuado en gama y mercados internacionales.



Porque en menos de 24 horas estamos allí

Hepyc es una empresa orientada al cliente. Con entregas en cualquier parte del mundo en cuestión de horas y un departamento de asistencia exclusivamente orientado a solventar dudas, dar apoyo técnico, formación... a nuestros clientes.



- › **Líderes nacionales en herramienta de roscado. Presentes en más de 30 países.**
- › **Hepyc, leaders nationaux en outils de filetage. Présents dans plus de 30 pays.**
- › **Hepyc, national leaders in threading tools. With a presence in over 30 countries.**

Parce que nous sommes experts en outils de coupe depuis plus de 70 ans

Nous sommes aujourd'hui une industrie 4.0 présente sur les secteurs les plus innovants de la production grâce à des investissements qui se chiffrent en millions, la robotisation, l'expansion continue de la gamme et les marchés internationaux.

Because we have been experts in cutting tools for over 70 years

And right now we are a 4.0 industry with a presence in the most innovative sectors of production thanks to heavy investment, robotization, ongoing product range growth and international markets.

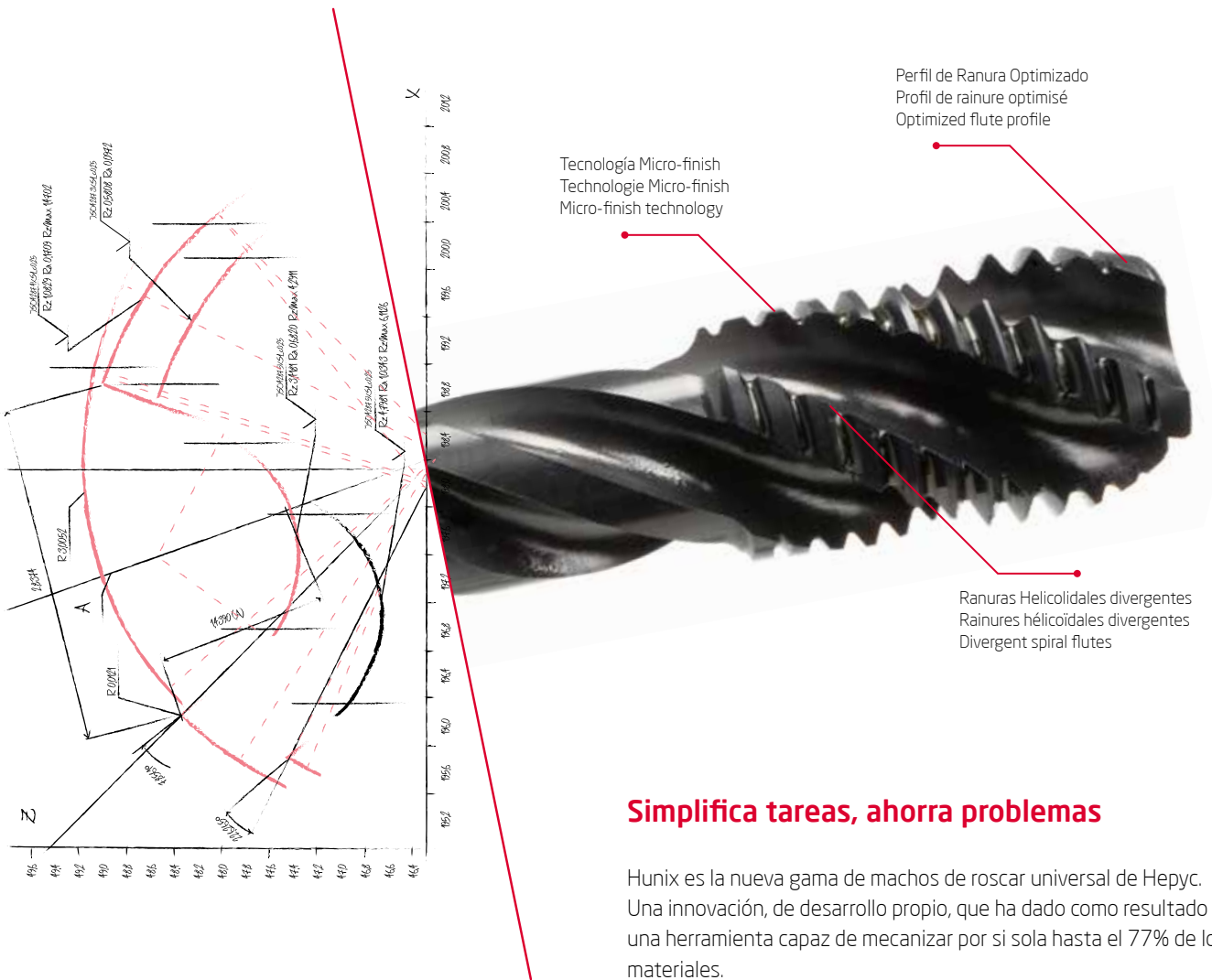


Parce que nous sommes chez vous en moins de 24 heures

Chez Hepyc, le service du client est notre maître mot. Nous livrons partout dans le monde en quelques heures et nous mettons à votre disposition notre service d'assistance exclusivement conçu pour répondre aux questions de nos clients et leur apporter un support technique et la formation nécessaire.

Because we arrive in less than 24 hours

Hepyc is a company geared towards its customers. With deliveries in any part of the world within a matter of hours, and a support department exclusively geared towards dealing with our customers' queries, and providing them with technical support, training, etc.



Simplifica tareas, ahorra problemas

Hunix es la nueva gama de machos de roscar universal de Hperc. Una innovación, de desarrollo propio, que ha dado como resultado una herramienta capaz de mecanizar por sí sola hasta el 77% de los materiales.

¿Imaginas lo que supone para un distribuidor reducir sus referencias aumentando la calidad? ¿Y la optimización del proceso de mecanizado de una industria? Disminución de tiempos, reducción de incidencias, simplificación de stock... ¡menos problemas! ¡más eficiencia! Además, gracias a nuestro exclusivo diseño y fabricación, conseguimos hasta 2 veces más de vida útil y mejora en el mecanizado.

HUNIX / VAP



VAP / Básico para una mejor Lubricación
La base d'une meilleure lubrification
Basic for better lubrication

)] **HUNIX-TAP** puede mecanizar
P + M + K + N = 77% de los materiales

)] **HUNIX-TAP** peut usiner
P + M + K + N = 77% des matériaux

)] The **HUNIX-TAP** machines
P + M + K + N = 77% of materials

Materiales no féreos
Matériaux non ferreux
Non-ferrous materials

N

Acero inoxidable
Acier inoxydable
Stainless steel

M

Aceros
Aciers
Steels

P

S

Súper aleaciones
Super alliages
Super-alloys

K

Fundición
Fonte
Cast iron

INNOVATION]

Simplifie les tâches, évite les problèmes

Hunix est la nouvelle gamme filetages universels de Hepyc. Une innovation, développée en interne qui a donné naissance à un outil capable d'usiner seul jusqu'à 77% des matériaux. Pouvez-vous imaginer ce que cela signifie pour un distributeur de réduire ses références en augmentant la qualité ? Et qu'en est-il de l'optimisation du processus d'usinage dans une industrie ? Réduction des temps, réduction des incidents, simplification du stock... moins de problèmes ! plus d'efficacité ! De plus, grâce à notre conception et à notre fabrication exclusives, nous obtenons jusqu'à 2 fois plus de durée de vie utile et d'amélioration de l'usinage.

Simplify tasks, save on problems

Hunix is the new Hepyc range of universal tap screws. A proprietary innovation that has resulted in a tool capable of machining up to 77% of materials by itself. Can you imagine what it means for a distributor to reduce his references while increasing quality? And the optimization of the machining process of an industry? Decrease in production times, reduction of incidents, stock simplification... less problems! More efficiency! Moreover, thanks to our exclusive design and manufacturing, we achieve over a useful life over 2 times longer and machining improvements.

HUNIX / **TIN+**



TIN+ / **Tratamiento Bicapa**
Traitement à deux couches
Two-layer coating



Taladrado >
Perçage
Drilling

Перус

Brocas Metal Duro / Forets Carbure / Hard Metal Drill-bits													
1175	HM-MD	DIN 6537 S	TIALN		3XD	<table border="1"> <tr><td>P</td><td>M</td></tr> <tr><td>K</td><td>S</td></tr> </table>	P	M	K	S	24		
P	M												
K	S												
1176	HM-MD	DIN 6537 S	TIALN		3XD	<table border="1"> <tr><td>P</td><td>M</td><td>K</td></tr> <tr><td>S</td><td>H</td><td></td></tr> </table>	P	M	K	S	H		25
P	M	K											
S	H												
1177	HM-MD	DIN 6537 L	TIALN		5XD	<table border="1"> <tr><td>P</td><td>M</td><td>K</td></tr> <tr><td>S</td><td>H</td><td></td></tr> </table>	P	M	K	S	H		26
P	M	K											
S	H												
1178	HM-MD	DIN 6537 EL	TIALN		8XD	<table border="1"> <tr><td>P</td><td>M</td><td>K</td></tr> <tr><td>S</td><td>H</td><td></td></tr> </table>	P	M	K	S	H		27
P	M	K											
S	H												
NEW 1184	HM-MD		TIALN		12XD	<table border="1"> <tr><td>P</td><td>M</td></tr> <tr><td>K</td><td>S</td></tr> </table>	P	M	K	S	27		
P	M												
K	S												
1182	HM-MD		TIN		1XD	<table border="1"> <tr><td>H</td></tr> </table>	H	28					
H													
1120	HM-MD	DIN 6539			2XD	<table border="1"> <tr><td>P</td><td>M</td><td>K</td></tr> <tr><td>N</td><td>S</td><td></td></tr> </table>	P	M	K	N	S		29
P	M	K											
N	S												
1109	HM-MD	DIN 338N			4XD	<table border="1"> <tr><td>P</td><td>M</td><td>K</td></tr> <tr><td>N</td><td>S</td><td></td></tr> </table>	P	M	K	N	S		30
P	M	K											
N	S												

Brocas con mango cilíndrico cortas / Forets à queue cylindrique courtes / Short straight shank drill-bits (DIN 338)											
1101	HSS	DIN338N				<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		31
P	K										
N											
1101/1	HSS	DIN338N				<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		33
P	K										
N											
1104	HSS	DIN338N				<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		33
P	K										
N											
1104/9	HSS	ANSI				<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		34
P	K										
N											
1501	HSS					<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		34
P	K										
N											
1158	HSS	DIN338NSP				<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		35
P	K										
N											
1158/9	HSS	DIN338NSP				<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		36
P	K										
N											
1108	HSS	DIN338NSP	TIN			<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		37
P	K										
N											
1103	HSS	DIN338H				<table border="1"> <tr><td>N</td></tr> </table>	N	38			
N											
1105	HSSCO	DIN 338N				<table border="1"> <tr><td>P</td><td>K</td></tr> <tr><td>N</td><td></td></tr> </table>	P	K	N		39
P	K										
N											

Brocas con mango cilíndrico cortas / Forets à queue cylindrique courtes / Short straight shank drill-bits (DIN 338)									
1105/9	HSSCO	DIN 338N				P, K N	40		
1161	HSSCO	DIN338N	TIALN			P, K N	41		
1107	HSSCO	DIN338N				P, K N	41		
1107/9	HSSCO	ANSI				P, K N	42		
NEW 1187	HSSCO	DIN338W				P, M N, S	43		
1106	HSSCO	DIN338W				M, N S	44		
1162	HSSCO	DIN338W	TIALN			M, N S	45		
1159	HSSCO	DIN338S				P, N	46		
1160	HSSCO	DIN338S	TIALN			P, N	47		
1110	WIDIA	DIN338N				P, K N	48		
Brocas con mango cilíndrico largos / Forets à queue cylindrique longues / Long straight shank drill-bits (DIN 340)									
1112	HSS	DIN 340 N				P, K N	49		
1113	HSSCO	DIN 340 N				P, K N	50		
1114	HSSCO	DIN 340 S				P, N	51		
1164	HSSCO	DIN 340 S	TIALN			P, N	52		
Brocas con mango cilíndrico extra largos / Forets à queue cylindrique extra longues / Extra-long straight shank drill-bits (DIN 1869)									
1115	HSS	DIN 1869 N				P, K N	53		
1165	HSSCO	DIN 1869 S				P, N	54		

Brocas con mango cilíndrico extra cortas / Forets à queue cylindrique extra-courtes / Extra-short straight shank drill-bits (DIN 1897)

1116	HSS	DIN 1897 N			P K N	55
1117	HSS	DIN 1897 N			P K N	56
1118	HSSCO	DIN 1897 N			P K N	56
1166	HSSCO	DIN 1897 S			P N	57
1167	HSSCO	DIN 1897 S			P N	58

Brocas con mango cónico / Forets à queue conique / Taper straight shank drill-bits

1121	HSS	DIN 345 N			P K N	59
1121/9	HSS	DIN 345 N			P K N	61
1123	WIDIA	DIN 345 N			P K	62
1122	HSSCO	DIN 345 N			P K N	63
1181	HSSCO				P S H	64
1125	HSS	DIN 341 N			P K N	65
1126	HSS	DIN 1870 N			P K N	66
1139	HSS	DIN 343			P K N	67

Brocas bidiametrales / Forets biétagés / Two-diameter drill-bits

1127	HSS	DIN 8376			P K N	68
1128	HSS	DIN 8374			P K N	68
1129	HSS	DIN 8377			P K N	69
1130	HSS	DIN 8375			P K N	69

Brocas bidiametrales / Forets biétagés / Two-diameter drill-bits





1152	HSS	DIN 8378				P K N	70
1153	HSS	DIN 8379				P K N	70
NEW 1191	HSSCO					P M K N S	71
NEW 1192	HSSCO					P M K N S	71

Brocas de centrar / Forets à centrer / Centre drill-bits














1132	HSS	DIN 333 A			 	P K N	72
NEW 1188	HSS	DIN 333 A	TIN		 	P K N	72
NEW 1193	HM-MD	DIN 333 A			 	P M K N S H	73
1133	HSS	DIN 333 A			 	P K N	73
1135	HSS	DIN 333 R			 	P K N	74
1137	HSS	DIN 333 B			 	P K N	74
1138	HSSCO				 	P M K N S	75
1155	HSSCO				 	P M K N S	75
NEW 1189	HSSCO		TIN		 	P M K N S	76
NEW 1190	HSSCO		TIN		 	P M K N S	76
1179	HM-MD				 	P M K N S	77
1180	HM-MD				 	P M K N S	77
NEW 1185	HM-MD		TIALN		 	P M K N S	78
NEW 1186	HM-MD		TIALN		 	P M K N S	78

1119	HSSCO	DIN 1897N				P	79
NEW 1194	HSSCO	DIN 1897N	TIALN			P	79

Brocas fresa / Forets fraiseur / Mill drills

5114	HSS					P N	80
5115	HSS		TIN			P N	80

Accesorios / Accessoires / Accessories

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6123	Porta / Mandrins / Chuck						85
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FICHE TECHNIQUE FORETS SPECIAUX / TECHNICAL ENQUIRY FOR SPECIAL DRILL BITS

Fecha / Date:

Empresa / Entreprise / Company: Contacto / Contact:

Dirección / Adresse / Adress: Población / Ville / Town:

Tel / Fax: E-mail:

TRABAJO A REALIZAR / TRAVAIL DEMANDE / REQUESTED WORK

Material / Matière / Material Norma / Norme / Norm:

Dureza / Durété / Hardness HB HRc Resistencia / Résistance / Resistance N/mm²

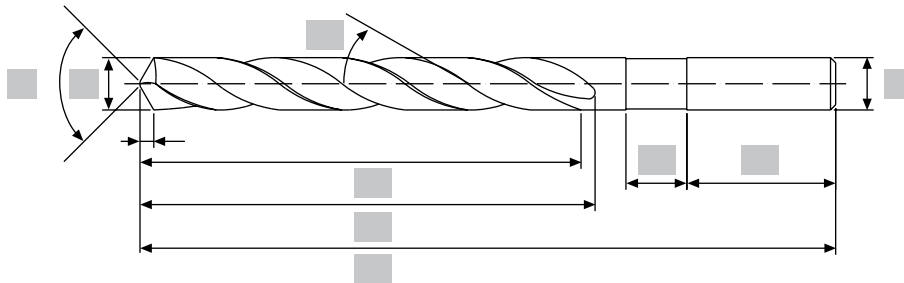
Tipo viruta: Corta Larga Polvo
 Type copeau Courte Longue Poussière
 Shaving Short Long Powder

Máquina / Machine Refrigerante / Réfrigérant / Coolant

Posición / Position Horizontal Vertical V. Corte V. avance
 V. Coupe Avance
 Cutting Speed Feed

HERRAMIENTA / OUTIL / TOOL

Descripción / Description Cantidad / Quantité / Quantity



Mango: Cilíndrico Weldon Cónico Rebajado
 Queue: Cylindrique Weldon Conique Réduite
 Shank: Straight Weldon Taper Reduced

Afilado: Convencional Corrección de labios Split Point Puntos soldadura Placa carburo
 Affûtage: Normal Correction de lèvres Affûtage en croix Points de soudure plaquelette carbure
 Sharpened: Convencional Lip correction Split Point Welding points Carbide sheet

Material / Matière / Material: HSS HSSE HM HSS-HM

Superficie / Surface: Brillante Negra Recubrimiento
 Brillant Noire Revêtement
 Brilliant Black Coating

COMENTARIOS / COMMENTAIRES/ COMMENTS:

.....

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$

Ref. / Réf. / Ref.	1175	1176	1177	1178	1184	1182	1120	1109
Prof. / Prof./Depth	3xd	3xd	5xd	8xd	12xd	1Xd	2xd	4xd
Punta/Poin/Point	140°	140°	140°	140°	140°	120°	118°	118°
Refrig./Réfrig./Cooling	No	Si	Si	Si	Si	No	No	No
Mat.	HM	HM	HM	HM	HM	HM	HM	HM
Rec./Rev./Coat.	TIALN	TIALN	TIALN	TIALN	TIALN	TIN		
DIN	6537	6537	6537	6537	-	-	6539	338
Gama/Gamme/Range	3-20	3-20	3-20	3-16	3-16	M3-M12	2-13	2-10,20
Pag.	24	25	26	27	27	28	29	30

Mat.	Avance/Feed (mm/rpm)						Vc (m/min)								
	Ø2	Ø5	Ø10	Ø15	Ø20	Ø2	Ø5	Ø10	Ø15	Ø20	Ø2	Ø5	Ø10	Ø15	Ø20
P.1	<600	0,10-0,14	0,20-0,28	0,30-0,45	0,38-0,55	0,48-0,68	80-110	90-120	90-120	90-120	90-120	70-90		40-70	40-70
P.2	<800	0,08-0,12	0,16-0,24	0,25-0,38	0,32-0,48	0,40-0,60	40-80	50-90	50-90	50-90	40-80		30-60	30-60	
P.3	<1000	0,06-0,10	0,12-0,20	0,20-0,32	0,25-0,40	0,30-0,50	35-75	40-85	40-85	40-85	35-55		25-50	25-50	
P.4	<1200	0,04-0,08	0,08-0,16	0,12-0,26	0,15-0,32	0,18-0,40	30-50	35-55	35-55	35-55	30-50		20-40	20-40	
P.5	<1400	0,03-0,06	0,06-0,12	0,08-0,20	0,10-0,25	0,12-0,30	25-40	30-45	30-45	30-45	25-40		15-25	15-25	
M.1	<950	0,04-0,08	0,08-0,16	0,12-0,26	0,15-0,32	0,18-0,40	35-75	40-85	40-85	40-85	35-55		20-25	20-25	
M.2		0,04-0,08	0,08-0,16	0,12-0,26	0,15-0,32	0,18-0,40	35-75	40-85	40-85	40-85	35-55		20-25	20-25	
M.3	<1200	0,03-0,06	0,06-0,12	0,08-0,20	0,10-0,25	0,12-0,30		35-55	35-55	35-55					
M.4		0,03-0,06	0,06-0,12	0,08-0,20	0,10-0,25	0,12-0,30		30-45	30-45	30-45					
K.1	<500	0,08-0,12	0,16-0,24	0,25-0,38	0,32-0,48	0,40-0,60	100-130	120-150	120-150	120-150	90-120		50-70	50-70	
K.2		0,08-0,12	0,16-0,24	0,25-0,38	0,32-0,48	0,40-0,60	60-80	70-90	70-90	70-90	60-80				
K.3	<800	0,06-0,10	0,12-0,20	0,20-0,32	0,25-0,40	0,30-0,50	80-110	90-120	90-120	90-120	70-90		40-50	40-50	
K.4.1		0,06-0,10	0,12-0,20	0,20-0,32	0,25-0,40	0,30-0,50	70-90	80-110	80-110	80-110	60-80				
K.4.2	<1400	0,03-0,06	0,06-0,12	0,08-0,20	0,10-0,25	0,12-0,30	40-60	50-70	50-70	50-70	30-50				
N.1.1	Al	0,08-0,12	0,16-0,24	0,25-0,38	0,32-0,48	0,40-0,60							100-140	100-140	
N.1.2		0,08-0,12	0,16-0,24	0,25-0,38	0,32-0,48	0,40-0,60							70-100	70-100	
N.1.3		0,08-0,12	0,16-0,24	0,25-0,38	0,32-0,48	0,40-0,60							60-80	60-80	
N.2.1	Cu	0,06-0,10	0,12-0,20	0,20-0,32	0,25-0,40	0,30-0,50							40-70	40-70	
N.2.2		0,06-0,10	0,12-0,20	0,20-0,32	0,25-0,40	0,30-0,50							40-70	40-70	
N.2.3		0,06-0,10	0,12-0,20	0,20-0,32	0,25-0,40	0,30-0,50							30-60	30-60	
N.2.4		0,04-0,08	0,08-0,16	0,12-0,26	0,15-0,32	0,18-0,40							25-50	25-50	
N.3.1	Mg/Zn	0,06-0,10	0,12-0,20	0,20-0,32	0,25-0,40	0,30-0,50							30-60	30-60	
N.4.1	Plastic	0,06-0,10	0,12-0,20	0,20-0,32	0,25-0,40	0,30-0,50							40-70	40-70	
N.4.2															
N.4.3															
S.1.1	Ni	0,03-0,05	0,05-0,08	0,08-0,12	0,12-0,16	0,16-0,20	20-25	25-30	25-30	25-30	20-25		10-15	10-15	
S.1.2		0,03-0,05	0,05-0,08	0,08-0,12	0,12-0,16	0,16-0,20		20-25	20-25	20-25	15-20				
S.2.1	Ti	0,04-0,08	0,08-0,16	0,12-0,26	0,15-0,32	0,18-0,40	35-75	40-85	40-85	40-85			15-25	15-25	
S.2.2		0,03-0,05	0,05-0,08	0,08-0,12	0,12-0,16	0,16-0,20	25-35	30-40	30-40	30-40			10-15	10-15	
S.2.3		0,03-0,05	0,05-0,08	0,08-0,12	0,12-0,16	0,16-0,20	20-25	25-30	25-30	25-30					
H.1	50 HRC	0,03-0,06	0,06-0,12	0,08-0,20	0,10-0,25	0,12-0,30	25-35	30-40	30-40	30-40			25-30		
H.2	55 HRC	0,01-0,04	0,04-0,08	0,06-0,10	0,08-0,12	0,10-0,18	15-25	20-35	20-35	20-35			15-25		
H.3	60 HRC	0,01-0,04	0,04-0,08	0,06-0,10	0,08-0,12	0,10-0,18		15-25	15-25	15-25			10-15		

● Optima / Optimun ○ Alternativo / Alternative

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

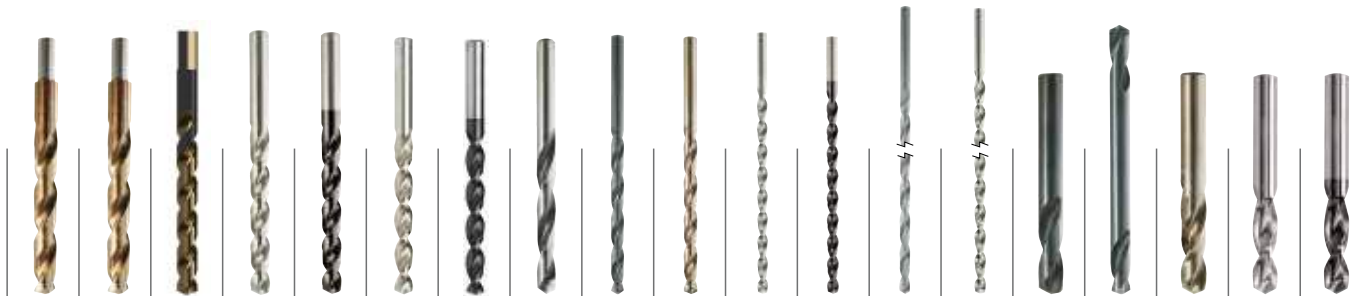


$$\text{r.p.m.} = \frac{V_c \times 1.000}{\pi \times \phi}$$

Ref./ Réf. / Ref.	1101	1101/1	1104	1104/9	1501	1158	1158/9	1108	1103	1105	1105/9	1161
DIN	338	338	338	ANSI	338	338	338	338	338	338	338	338
Punta/Poin/Point	118°	118°	118°	118°	118°	118°	118°	118°	118°	135°	135°	135°
Ejec./Exéc./Exec.	N	N	N	N	N	NSP	NSP	NSP	N	NSP	NSP	NSP
Hel./Hél./Spiral	30°	30°-LH	30°	30°	30°	30°	30°	30°	18°	30°	30°	30°
Mat.	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSSCO	HSSCO	HSSCO
Rec./Rev./Coat.								TIN				TIALN
Prof./ Prof./Depth	5xD	5xD	3xD	3xD	5xD	5xD	5xD	5xD	5xD	5xD	5xD	5xD
Gama/Gamme/Range	0,20-20	2-12	10-30	17/32-1"1/8	3-10	1-20	1/16-1/2	1-13	1-13	0,50-20	1/16-1/2	2-13
Pag.	31	33	33	34	34	35	36	37	38	39	40	41

Mat.	Avance/Feed (mm/rpm)						Vc (m/min)														
	Ø2	Ø5	Ø10	Ø15	Ø20																
P.1	<600	0,04-0,06	0,08-0,12	0,20-0,30	0,30-0,40	0,35-0,46	• 25-35	• 25-35	• 25-35	• 25-35	• 25-35	• 25-35	• 25-35	• 35-45	○ 25-35	○ 25-35	○ 35-50				
P.2	<800	0,02-0,06	0,08-0,12	0,12-0,30	0,18-0,40	0,22-0,46	• 15-30	• 15-30	• 15-30	• 15-30	• 15-30	• 15-30	• 15-30	• 20-40		○ 15-30	○ 15-30	• 25-45			
P.3	<1000	0,02-0,03	0,05-0,07	0,12-0,18	0,18-0,24	0,22-0,28								• 15-30		○ 12-20	○ 12-20	• 18-30			
P.4	<1200	0,01-0,04	0,04-0,09	0,09-0,18	0,12-0,28	0,14-0,33										• 6-16	• 6-16	• 10-25			
P.5	<1400	0,01-0,04	0,04-0,09	0,09-0,18	0,12-0,28	0,14-0,33															
M.1	<950	0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33										○ 10-14	○ 10-14	○ 15-20			
M.2		0,01-0,03	0,05-0,07	0,14-0,18	0,20-0,24	0,22-0,28										○ 8-12	○ 8-12	○ 12-18			
M.3	<1200																				
M.4																					
K.1	<500	0,04-0,06	0,08-0,12	0,20-0,30	0,30-0,40	0,35-0,46	• 25-30	• 25-30	• 25-30	• 25-30	• 25-30	• 25-30	• 25-30	• 35-40		• 25-30	• 25-30	• 38-45			
K.2																					
K.3	<800	0,04-0,06	0,08-0,12	0,20-0,30	0,30-0,40	0,35-0,46															
K.4.1		0,04-0,06	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33	• 12-16	• 12-16	• 12-16	• 12-16	• 12-16	• 12-16	• 12-16	• 15-20		• 12-16	• 12-16	• 18-25			
K.4.2		<1400	0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33														
N.1.1	Al	0,03-0,05	0,08-0,12	0,18-0,24	0,25-0,32	0,30-0,37								○ 75-90							
N.1.2		0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33	○ 50-60	○ 50-60	○ 50-60	○ 50-60	○ 50-60	○ 50-60	○ 50-60	○ 65-75		○ 50-60	○ 50-60	○ 70-80			
N.1.3		0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33															
N.2.1	Cu	0,03-0,05	0,08-0,10	0,18-0,24	0,25-0,32	0,30-0,37										• 40-60					
N.2.2		0,03-0,05	0,08-0,10	0,18-0,24	0,25-0,32	0,30-0,37										○ 25-60					
N.2.3		0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33	• 30-60	• 30-60	• 30-60	• 30-60	• 30-60	• 30-60	• 30-60	• 40-70		• 30-60	• 30-60	• 45-80			
N.2.4																					
N.3.1	Mg/Zn	0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33															
N.4.1	Plastic	0,03-0,04	0,06-0,07	0,12-0,13	0,16-0,17	0,25-0,26	○ 20-25	○ 20-25	○ 20-25	○ 30-35		○ 20-25	○ 20-25	○ 20-25		○ 20-25	○ 20-25	○ 30-35			
N.4.2		0,03-0,04	0,06-0,07	0,12-0,13	0,16-0,17	0,25-0,26															
N.4.3																					
S.1.1	Ni	0,01-0,03	0,03-0,05	0,06-0,10	0,10-0,14	0,16-0,20															
S.1.2		0,01-0,03	0,03-0,05	0,06-0,10	0,10-0,14	0,16-0,20															
S.2.1	Ti	0,01-0,03	0,04-0,06	0,08-0,10	0,10-0,14	0,16-0,20															
S.2.2		0,01-0,03	0,03-0,05	0,06-0,10	0,10-0,14	0,16-0,20															
S.2.3		0,01-0,03	0,03-0,05	0,06-0,10	0,10-0,14	0,16-0,20															
H.1	50 HRC	0,02-0,03	0,05-0,07	0,09-0,13	0,14-0,18	0,18-0,22															
H.2	55 HRC																				
H.3	60 HRC																				

● Optima / Optimun ○ Alternativo / Alternative



1107	1107/9	1187	1106	1162	1159	1160	1110	1112	1113	1114	1164	1115	1165	1116	1117	1118	1166	1167
338	ANSI	338	338	338	338	338	338	340	340	340	340	1869	1869	1897		1897	1897	1897
135°	135°	135°	135°	135°	135°	135°	118°	118°	135°	135°	135°	118°	135°	118°	118°	135°	135°	135°
NSP	NSP	W	W	W	TS	TS	N	N	NSP	TS	TS	N	TS	N	N	NSP	TS	TS
30°	30°	35°	35°	35°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°
HSSCO	HSSCO	HSSCO	HSSCO	HSSCO	HSSCO	HSSCO	HSS WIDIA	HSS	HSSCO	HSSCO	HSSCO	HSS	HSSCO	HSS	HSS	HSSCO	HSSCO	HSSCO
				TIALN		TIALN						TIALN						TIALN
5xD	3xD	5xD	5xD	5xD	5xD	5xD	5xD	10xD	10xD	10xD	10xD	15-30xD	15-30xD	3xD	3xD	3xD	3xD	3xD
10-20	17/32-13/16	1-13	1-13	1-13	2-13	2-13	1,50-20	1-20	2-13	2-13	2-13	2-13	2-12	1-20	2-8	2-13	2-16	2-16
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	56	57	58

Vc (m/min)

○ 25-35	○ 25-35	● 35-40						● 25-35	○ 25-35			● 25-35		● 25-35	● 25-35	○ 25-35		
● 15-30	● 15-30	● 30-35			● 15-30	● 25-45	● 25-45	● 15-30	● 15-30	● 15-30	● 25-45	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 25-45
● 12-20	● 12-20				● 12-20	● 18-30	● 18-30		● 12-20	● 12-20	● 18-30		● 12-20			● 12-20	● 12-20	● 18-30
● 6-16	● 6-16				● 6-16	● 10-25	● 10-25		● 6-16	● 6-16	● 10-25					● 6-16	● 6-16	● 10-25
							○ 6-9											
○ 10-14	○ 10-14	● 10-14	● 10-14	○ 15-20	○ 10-14	○ 15-20			○ 10-14	○ 10-14	○ 15-20		○ 10-14			○ 10-14	○ 10-14	○ 15-20
○ 8-12	○ 8-12	● 8-12	● 8-12	● 12-18	○ 8-12	○ 12-18			○ 8-12	○ 8-12	○ 12-18		○ 8-12			○ 8-12	○ 8-12	○ 12-18
● 25-30	● 25-30							● 25-30	● 25-30			● 25-30		● 25-30	● 25-30	● 25-30	● 25-30	
							● 30-40											
● 12-16	● 12-16							● 12-16	● 12-16			● 12-16		● 12-16	● 12-16	● 12-16	● 12-16	
							○ 15-20											
		○ 60-80	○ 60-80	○ 85-100	○ 60-80	○ 85-100				○ 60-80	○ 85-100		○ 60-80				○ 60-80	○ 85-100
○ 50-60	○ 50-60	○ 50-60	○ 50-60	○ 75-90	○ 50-60	○ 75-90		○ 50-60	○ 50-60	○ 50-60	○ 75-90	○ 50-60	○ 50-60	○ 50-60	○ 50-60	○ 50-60	○ 50-60	○ 75-90
		● 30-40	● 30-40	● 45-60	● 30-40	● 45-60				● 30-40	● 45-60		● 30-40			● 30-40	● 45-60	
● 30-60	● 30-60	○ 50-70	○ 50-70					● 30-60	● 30-60			● 30-60		● 30-60	● 30-60	● 30-60	● 30-60	
		○ 50-70	○ 50-70	○ 75-95	● 50-70	● 70-90				● 50-70	● 70-90		● 50-70				● 50-70	● 70-90
○ 20-25	○ 20-25						○ 30-35	○ 20-25	○ 20-25			○ 20-25		○ 20-25	○ 20-25	○ 20-25	○ 20-25	
		● 8-10	● 8-10	● 12-15														

● Optima / Optimun ○ Alternativo / Alternative

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$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$

Ref./ Réf. / Ref.	1121	1121/9	1122	1123	1181	1125	1126	1139
DIN	345	345	345	345	1181	341	1870	343
Punta/Poin/Point	118°	118°	135°	118°	128°	118°	118°	120°
Ejec./Exéc./Exec.	N	N	NSP	N	N	N	N	N
Hel./Hél./Spiral	30°	30°	30°	30°	15°	30°	30°	30°
Mat.	HSS	HSS	HSSCO	HSS WIDIA	HSSCO	HSS	HSS	HSS
Rec./Rev./Coat.								
Prof./ Prof./Depth	5xD	5xD	5xD	5xD	3xD	8xD	10-15xD	5xD
Gama/Gamme/Range	5-80	1/2-2"	10-40	10-30	10-50	5-40	8-50	10-40
Pag.	59	61	62	63	64	65	66	67

Mat.	Avance/Feed (mm/rpm)						Vc (m/min)					
	$\phi 2$	$\phi 5$	$\phi 10$	$\phi 15$	$\phi 20$							
P.1	<600	0,04-0,06	0,08-0,12	0,20-0,30	0,30-0,40	0,35-0,46	• 25-35	• 25-35	• 25-35	• 25-45	• 25-35	• 25-35
P.2	<800	0,02-0,06	0,08-0,12	0,12-0,30	0,18-0,40	0,22-0,46	• 15-30	• 15-30	• 15-30	• 25-45	• 15-30	• 15-30
P.3	<1000	0,02-0,03	0,05-0,07	0,12-0,18	0,18-0,24	0,22-0,28			○ 12-20	○ 18-30		
P.4	<1200	0,01-0,04	0,04-0,09	0,09-0,18	0,12-0,28	0,14-0,33			○ 6-16	○ 10-25	○ 8-10	
P.5	<1400	0,01-0,04	0,04-0,09	0,09-0,18	0,12-0,28	0,14-0,33			○ 6-9	○ 6-8		
M.1	<950	0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33			○ 8-12			○ 8-12
M.2		0,01-0,03	0,05-0,07	0,14-0,18	0,20-0,24	0,22-0,28			○ 10-14			○ 10-14
M.3	<1200											
M.4												
K.1	<500	0,04-0,06	0,08-0,12	0,20-0,30	0,30-0,40	0,35-0,46	• 25-30	• 25-30	• 25-30		• 25-30	• 25-30
K.2												
K.3	<800	0,04-0,06	0,08-0,12	0,20-0,30	0,30-0,40	0,35-0,46			○ 30-40			
K.4.1		0,04-0,06	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33	• 12-16	• 12-16	• 12-16		• 12-16	• 12-16
K.4.2	<1400	0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33			○ 15-20			
N.1.1	Al	0,03-0,05	0,08-0,12	0,18-0,24	0,25-0,32	0,30-0,37						
N.1.2		0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33	○ 50-60	○ 50-60	○ 50-60		○ 50-60	○ 50-60
N.1.3		0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33						
N.2.1	Cu	0,03-0,05	0,08-0,10	0,18-0,24	0,25-0,32	0,30-0,37						
N.2.2		0,03-0,05	0,08-0,10	0,18-0,24	0,25-0,32	0,30-0,37						
N.2.3		0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33	• 30-60	• 30-60	• 30-60		• 30-60	• 30-60
N.2.4												
N.3.1	Mg/Zn	0,02-0,04	0,05-0,09	0,18-0,21	0,20-0,28	0,25-0,33						
N.4.1	Plastic	0,03-0,04	0,06-0,07	0,12-0,13	0,16-0,17	0,25-0,26	○ 20-25	○ 20-25	○ 20-25	○ 30-35	○ 20-25	○ 20-25
N.4.2		0,03-0,04	0,06-0,07	0,12-0,13	0,16-0,17	0,25-0,26			○ 15-20			
N.4.3												
S.1.1	Ni	0,01-0,03	0,03-0,05	0,06-0,10	0,10-0,14	0,16-0,20				○ 5-7		
S.1.2		0,01-0,03	0,03-0,05	0,06-0,10	0,10-0,14	0,16-0,20				○ 4-6		
S.2.1	Ti	0,01-0,03	0,04-0,06	0,08-0,10	0,10-0,14	0,16-0,20						
S.2.2		0,01-0,03	0,03-0,05	0,06-0,10	0,10-0,14	0,16-0,20						
S.2.3		0,01-0,03	0,03-0,05	0,06-0,10	0,10-0,14	0,16-0,20						
H.1	50 HRC	0,02-0,03	0,05-0,07	0,09-0,13	0,14-0,18	0,18-0,22				○ 4-6		
H.2	55 HRC											
H.3	60 HRC											

● Optima / Optimun ○ Alternativo / Alternative



A series of horizontal dotted lines spanning the width of the page, providing a template for writing or drawing.

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

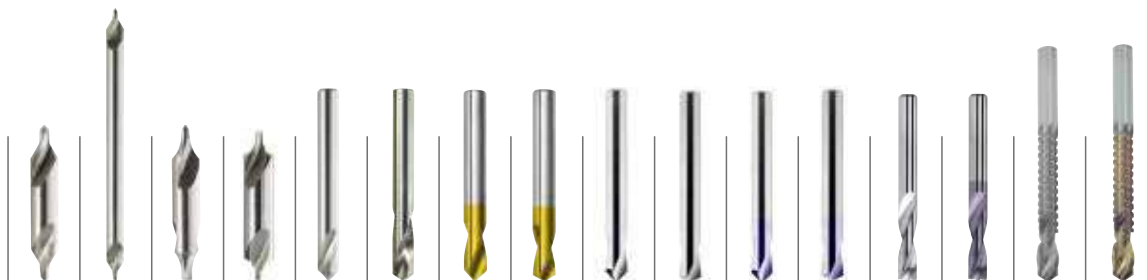


$$r.p.m. = \frac{V_c \times 1.000}{\pi \times \phi}$$

Ref./ Réf. / Ref.	1127	1128	1129	1130	1152	1153	1191	1192	1132	1188
DIN	8376	8374	8377	8375	8378	8379			333	333
Punta/Poin/Point	180°	90°	180°	90°	90°	90°	90°	90°	60°	60°
Ejec./Exéc./Exec.									A	A
Hel./Hél./Spiral										
Mat.	HSS	HSS	HSS	HSS	HSS	HSS	HSSCo	HSSCo	HSS	HSS
Rec./Rev./Coat.										TIN
Prof./ Prof./Depth										
Gama/Gamme/Range	M3-M10	M3-M10	M8-M20	M5-M10	M3-M12	M8-M20	M3-M12	M4-M10	1-12,5	1-12
Pag.	68	68	69	69	70	70	71	71	72	72

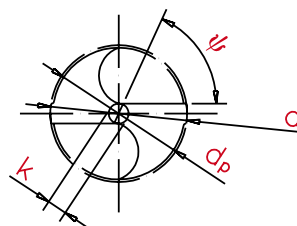
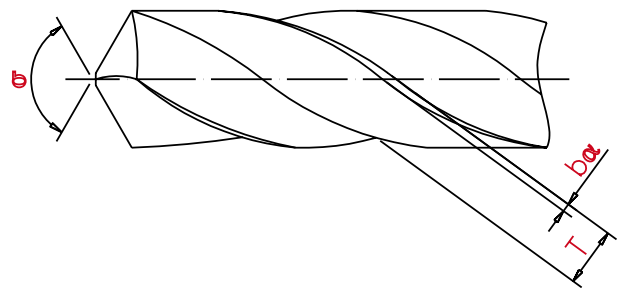
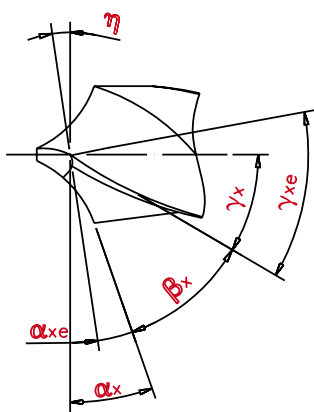
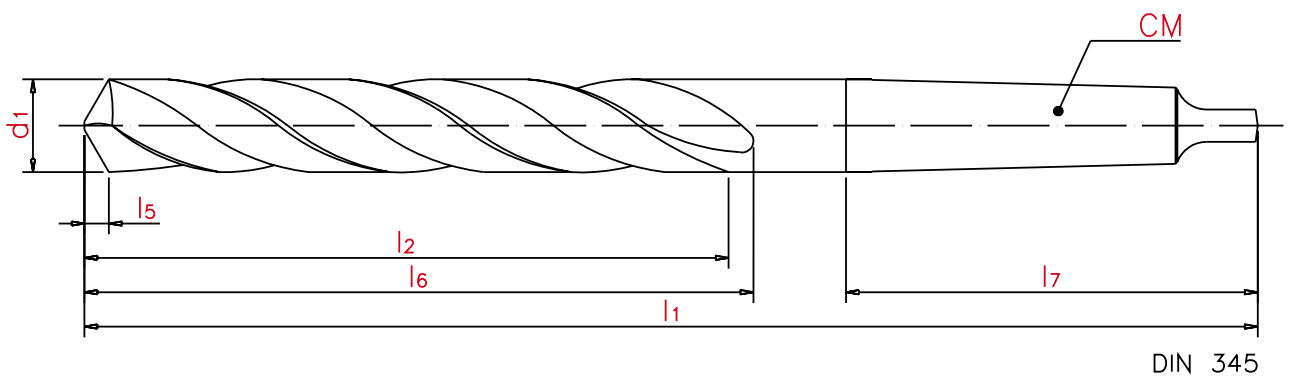
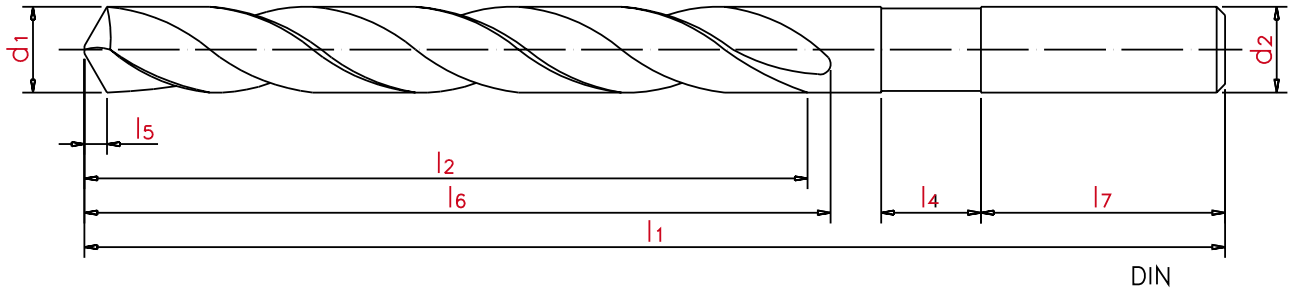
Avance/Feed (mm/rpm) HSS/HSSCo - HM=x2							Vc (m/min)																			
Mat.	Ø2	Ø5	Ø10	Ø15	Ø20																					
P.1	<600	0.04-0.06	0.08-0.12	0.20-0.30	0.30-0.40	0.35-0.46	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
P.2	<800	0.02-0.06	0.08-0.12	0.12-0.30	0.18-0.40	0.22-0.46	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
P.3	<1000	0.02-0.03	0.05-0.07	0.12-0.18	0.18-0.24	0.22-0.28	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
P.4	<1200	0.01-0.04	0.04-0.09	0.09-0.18	0.12-0.28	0.14-0.33									○	○										
P.5	<1400	0.01-0.04	0.04-0.09	0.09-0.18	0.12-0.28	0.14-0.33																				
M.1	<950	0.02-0.04	0.05-0.09	0.18-0.21	0.20-0.28	0.25-0.33									●	●										
M.2		0.01-0.03	0.05-0.07	0.14-0.18	0.20-0.24	0.22-0.28									●	●										
M.3	<1200	0.03-0.04	0.04-0.06	0.08-0.10	0.12-0.14	0.16-0.18																				
M.4		0.02-0.03	0.03-0.05	0.06-0.08	0.10-0.12	0.14-0.16																				
K.1	<500	0.04-0.06	0.08-0.12	0.20-0.30	0.30-0.40	0.35-0.46	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
K.2							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
K.3	<800	0.04-0.06	0.08-0.12	0.20-0.30	0.30-0.40	0.35-0.46	●	●	●	●	●	●	●	●	○	○	●	●	●	●	●	●	●	●	●	
K.4.1		0.04-0.06	0.05-0.09	0.18-0.21	0.20-0.28	0.25-0.33	●	●	●	●	●	●	●	●	○	○	●	●	●	●	●	●	●	●	●	
K.4.2	<1400	0.02-0.04	0.05-0.09	0.18-0.21	0.20-0.28	0.25-0.33	○	○	○	○	○	○	○	○												
N.1.1	Al	0.03-0.05	0.08-0.12	0.18-0.24	0.25-0.32	0.30-0.37									●	●										
N.1.2		0.02-0.04	0.05-0.09	0.18-0.21	0.20-0.28	0.25-0.33									●	●										
N.1.3		0.02-0.04	0.05-0.09	0.18-0.21	0.20-0.28	0.25-0.33	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
N.2.1	Cu	0.03-0.05	0.08-0.10	0.18-0.24	0.25-0.32	0.30-0.37									●	●										
N.2.2		0.03-0.05	0.08-0.10	0.18-0.24	0.25-0.32	0.30-0.37	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
N.2.3		0.02-0.04	0.05-0.09	0.18-0.21	0.20-0.28	0.25-0.33	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
N.2.4																										
N.3.1	Mg/Zn	0.02-0.04	0.05-0.09	0.18-0.21	0.20-0.28	0.25-0.33									●	●										
N.4.1	Plastic	0.03-0.04	0.06-0.07	0.12-0.13	0.16-0.17	0.25-0.26	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
N.4.2		0.03-0.04	0.06-0.07	0.12-0.13	0.16-0.17	0.25-0.26									●	●										
N.4.3																										
S.1.1	Ni	0.01-0.03	0.03-0.05	0.06-0.10	0.10-0.14	0.16-0.20									○	○										
S.1.2		0.01-0.03	0.03-0.05	0.06-0.10	0.10-0.14	0.16-0.20									○	○										
S.2.1	Ti	0.01-0.03	0.04-0.06	0.08-0.10	0.10-0.14	0.16-0.20									●	●										
S.2.2		0.01-0.03	0.03-0.05	0.06-0.10	0.10-0.14	0.16-0.20									○	○										
S.2.3		0.01-0.03	0.03-0.05	0.06-0.10	0.10-0.14	0.16-0.20									○	○										
H.1	50 HRC	0.02-0.03	0.05-0.07	0.09-0.13	0.14-0.18	0.18-0.22																				
H.2	55 HRC																									
H.3	60 HRC																									

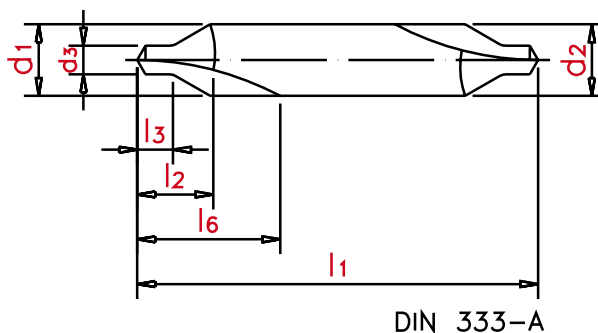
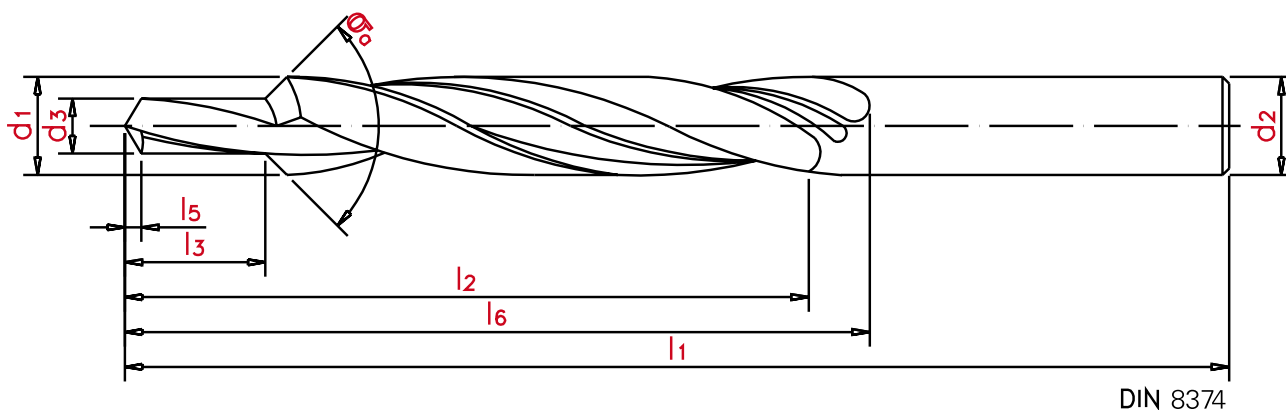
● Optima / Optimun ○ Alternativo / Alternative



1193	1133	1135	1137	1138	1155	1189	1190	1179	1180	1185	1186	1119	1194	5114	5115
333	333	333	333	CNC	CNC	CNC	CNC	CNC	CNC	CNC	CNC	1897	1897		
60°	60°	Radial	60°	90°	120°	90°	120°	90°	120°	90°	120°	118°	118°	118°	118°
A	A	R	B												
												30°	30°		
HM	HSS	HSS	HSS	HSSCo	HSSCo	HSSCo	HSSCo	HM	HM	HM	HM	HSSCo	HSSCo	HSS	HSS
						TiN	TiN			TiAlN	TiAlN		TiAlN		TiN
1-6,30	1-5	1-12,5	1-6,30	3-20	3-20	3-20	3-20	6-12	6-12	6-12	6-12	6-10	6-10	6-8	6-8
73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80
Vc (m/min)															
0 55-60	• 20-30	• 20-30	• 20-30	• 20-30	• 20-30	• 35-40	• 35-40	• 60-80	• 60-80	• 80-100	• 80-100	0 25-30	0 35-40	• 20-25	• 25-35
0 45-60	• 20-25	• 20-25	• 20-25	• 20-25	• 20-25	• 30-35	• 30-35	• 55-70	• 55-70	• 70-90	• 70-90	0 20-25	0 30-35	• 10-15	• 15-20
• 40-55	• 8-12	• 8-12	• 8-12	• 8-12	• 8-12	• 12-16	• 12-16	• 40-55	• 40-55	• 55-75	• 55-75	• 12-18	• 16-20		
• 25-30				• 6-10	• 6-10	• 10-14	• 10-14	• 35-45	• 35-45	• 50-60	• 50-60	• 6-10	• 8-14		
• 20-25															
• 40-55				• 8-12	• 8-12	• 12-16	• 12-16	• 20-30	• 20-30	• 25-35	• 25-35				
• 40-55				• 6-10	• 6-10	• 10-14	• 10-14	• 15-20	• 15-20	• 20-25	• 20-25				
• 25-30															
• 25-30															
• 40-55	• 20-25	• 20-25	• 20-25	• 20-25	• 20-25	• 30-35	• 30-35	• 60-80	• 60-80	• 80-100	• 80-100				
• 40-55	• 20-25	• 20-25	• 20-25	• 20-25	• 20-25	• 30-35	• 30-35	• 60-80	• 60-80	• 80-100	• 80-100				
• 35-45	• 15-20	• 15-20	• 15-20	• 15-20	• 15-20	• 20-25	• 20-25	• 40-60	• 40-60	• 55-80	• 55-80				
• 35-45	• 15-20	• 15-20	• 15-20	• 15-20	• 15-20	• 20-25	• 20-25	• 40-60	• 40-60	• 55-80	• 55-80				
• 20-25															
• 110-130								• 120-160	• 120-160	• 160-200	• 160-200				
• 100-110								• 100-130	• 100-130	• 140-180	• 140-180				
• 80-100	• 15-20	• 15-20	• 15-20	• 15-20	• 15-20	• 20-25	• 20-25	• 70-90	• 70-90	• 100-120	• 100-120			• 15-20	• 20-25
0 40-55								0 60-80	0 60-80	0 80-100	0 80-100				
• 55-65	• 25-30	• 25-30	• 25-30	• 25-30	• 25-30	• 35-40	• 35-40	• 100-120	• 100-120	• 140-160	• 140-160				
• 45-55								• 80-100	• 80-100	• 110-140	• 110-140				
0 25-30															
• 100-110															
• 150-200	0 10-15	0 10-15	0 10-15	• 25-30	• 25-30	• 35-40	• 35-40	0 50-70	0 50-70	0 50-70	0 50-70			• 25-30	• 35-40
• 70-100															
• 20-30								0 10-20	0 10-20	0 15-20	0 15-20				
								0 8-12	0 8-12	0 12-16	0 12-16				
• 25-30				• 10-12	• 10-12	• 12-16	• 12-16	• 20-30	• 20-30	• 25-35	• 25-35				
0 25-25															
0 15-20															
• 15-20															
• 10-15															
0 4-6															

● Optima / Optimun ○ Alternativo / Alternative





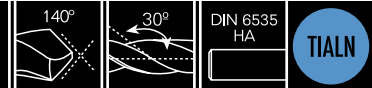
l1	Longitud total / Longueur totale / Total length
l2	Longitud de corte / Longueur de coupe / Length of cut
l3	Longitud de corte del diámetro menor / Longueur de coupe du plus petit diamètre / Length of cut of the smaller diameter
l7	Longitud del mango-del cono / Longueur de la queue du cône / Length of cone shank
l5	Longitud de punta / Longueur de pointe / Length of tip
l6	Longitud de ranura / Longueur de rainure / Length of groove
l4	Diámetro de broca / Diamètre de foret / Drill-bit diameter
d1	Longitud de sangrado / Longueur d'indentation / Bled length
d3	Diámetro inicial / Diamètre initial / Initial diameter
d2	Diámetro de mango / Diamètre de queue / Shank diameter
CM	Tamaño del cono morse / Taille du cône morse / Morse taper size
dp	Diámetro posterior / Diamètre postérieur / Rear diameter
bα	Ancho de fase / Largeur de phase / Phase width
T	Ancho de alma / Largeur d'âme / Core width
k	Espesor del núcleo / Épaisseur du noyau / Thickness of nucleus
σ	Ángulo de la punta / Angle de la pointe / Tip angle
$\sigma\alpha$	Ángulo de avellanado / Angle de chanfreinage / Countersink angle
ψ	Ángulo de corte transversal / Angle de coupe transversale / Transversal cut angle
γ_{xe}	Ángulo de corte lateral efectivo / Angle de coupe latérale effectif / Effective lateral cut angle
γ_x	Ángulo de corte lateral / Angle de coupe latérale / Lateral cut angle
α_{xe}	Ángulo de incidencia lateral efectivo / Angle d'incidence latérale effectif / Effective lateral angle of incidence
α_x	Ángulo de incidencia lateral / Angle d'incidence latérale / Lateral angle of incidence
β_x	Ángulo ortogonal de la herramienta / Angle orthogonal de l'outil / Orthogonal angle of the tool
η	Ángulo del sentido efectivo del corte / Angle du sens effectif de la coupe / Effective direction of cut angle



1175

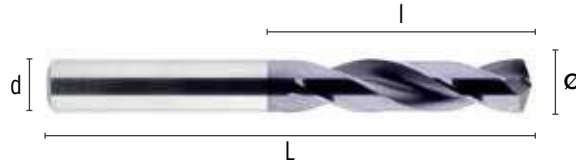
HM-MD DIN 6537 S

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●					○	●	○	○	
40-110	35-75	30-50	25-40	35-75		60-100	70-110	40-60					20-25	20-75	25-35	15-25	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	☐	Ø mm	d mm	€	L mm	l mm	☐
3,00	6,00	34,00	62,00	20,00	1	8,20	10,00	61,44	89,00	47,00	1
3,10	6,00	34,00	62,00	20,00	1	8,30	10,00	61,44	89,00	47,00	1
3,20	6,00	34,00	62,00	20,00	1	8,40	10,00	61,44	89,00	47,00	1
3,30	6,00	34,00	62,00	20,00	1	8,50	10,00	61,44	89,00	47,00	1
3,40	6,00	34,00	62,00	20,00	1	8,60	10,00	61,44	89,00	47,00	1
3,50	6,00	34,00	62,00	20,00	1	8,70	10,00	61,44	89,00	47,00	1
3,60	6,00	34,00	62,00	20,00	1	8,80	10,00	61,44	89,00	47,00	1
3,70	6,00	34,00	62,00	20,00	1	8,90	10,00	61,44	89,00	47,00	1
3,80	6,00	34,00	66,00	24,00	1	9,00	10,00	61,44	89,00	47,00	1
3,90	6,00	34,00	66,00	24,00	1	9,10	10,00	61,44	89,00	47,00	1
4,00	6,00	34,00	66,00	24,00	1	9,20	10,00	61,44	89,00	47,00	1
4,10	6,00	34,00	66,00	24,00	1	9,30	10,00	61,44	89,00	47,00	1
4,20	6,00	34,00	66,00	24,00	1	9,40	10,00	61,44	89,00	47,00	1
4,30	6,00	34,00	66,00	24,00	1	9,50	10,00	61,44	89,00	47,00	1
4,40	6,00	34,00	66,00	24,00	1	9,60	10,00	61,44	89,00	47,00	1
4,50	6,00	34,00	66,00	24,00	1	9,70	10,00	61,44	89,00	47,00	1
4,60	6,00	34,00	66,00	24,00	1	9,80	10,00	61,44	89,00	47,00	1
4,70	6,00	34,00	66,00	24,00	1	9,90	10,00	61,44	89,00	47,00	1
4,80	6,00	34,00	66,00	28,00	1	10,00	10,00	61,44	89,00	47,00	1
4,90	6,00	34,00	66,00	28,00	1	10,10	12,00	92,69	102,00	55,00	1
5,00	6,00	34,00	66,00	28,00	1	10,20	12,00	92,69	102,00	55,00	1
5,10	6,00	34,00	66,00	28,00	1	10,30	12,00	92,69	102,00	55,00	1
5,20	6,00	34,00	66,00	28,00	1	10,40	12,00	92,69	102,00	55,00	1
5,30	6,00	34,00	66,00	28,00	1	10,50	12,00	92,69	102,00	55,00	1
5,40	6,00	34,00	66,00	28,00	1	10,60	12,00	92,69	102,00	55,00	1
5,50	6,00	34,00	66,00	28,00	1	10,70	12,00	92,69	102,00	55,00	1
5,60	6,00	34,00	66,00	28,00	1	10,80	12,00	92,69	102,00	55,00	1
5,70	6,00	34,00	66,00	28,00	1	10,90	12,00	92,69	102,00	55,00	1
5,80	6,00	34,00	66,00	28,00	1	11,00	12,00	92,69	102,00	55,00	1
5,90	6,00	34,00	66,00	28,00	1	11,50	12,00	92,69	102,00	55,00	1
6,00	6,00	34,00	66,00	28,00	1	11,80	12,00	92,69	102,00	55,00	1
6,10	8,00	46,13	79,00	34,00	1	12,00	12,00	92,69	102,00	55,00	1
6,20	8,00	46,13	79,00	34,00	1	12,50	14,00	122,81	107,00	60,00	1
6,30	8,00	46,13	79,00	34,00	1	12,80	14,00	122,81	107,00	60,00	1
6,40	8,00	46,13	79,00	34,00	1	13,00	14,00	122,81	107,00	60,00	1
6,50	8,00	46,13	79,00	34,00	1	13,50	14,00	122,81	107,00	60,00	1
6,60	8,00	46,13	79,00	34,00	1	13,80	14,00	122,81	107,00	60,00	1
6,70	8,00	46,13	79,00	34,00	1	14,00	14,00	122,81	107,00	60,00	1
6,80	8,00	46,13	79,00	34,00	1	14,50	16,00	155,19	115,00	65,00	1
6,90	8,00	46,13	79,00	34,00	1	14,80	16,00	155,19	115,00	65,00	1
7,00	8,00	46,13	79,00	34,00	1	15,00	16,00	155,19	115,00	65,00	1
7,10	8,00	46,13	79,00	41,00	1	15,80	16,00	155,19	115,00	65,00	1
7,20	8,00	46,13	79,00	41,00	1	16,00	16,00	155,19	115,00	65,00	1
7,30	8,00	46,13	79,00	41,00	1	16,50	18,00	212,63	123,00	73,00	1
7,40	8,00	46,13	79,00	41,00	1	17,00	18,00	212,63	123,00	73,00	1
7,50	8,00	46,13	79,00	41,00	1	17,50	18,00	212,63	123,00	73,00	1
7,60	8,00	46,13	79,00	41,00	1	18,00	18,00	212,63	123,00	73,00	1
7,70	8,00	46,13	79,00	41,00	1	18,50	20,00	270,06	131,00	79,00	1
7,80	8,00	46,13	79,00	41,00	1	19,00	20,00	270,06	131,00	79,00	1
7,90	8,00	46,13	79,00	41,00	1	19,50	20,00	270,06	131,00	79,00	1
8,00	8,00	46,13	79,00	41,00	1	20,00	20,00	270,06	131,00	79,00	1
8,10	10,00	61,44	89,00	47,00	1						

1176

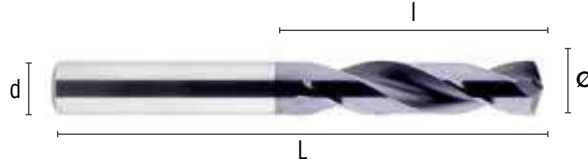
HM-MD DIN 6537 S

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	○	●	●	●					●	●	●	●	○
50-120	40-85	35-55	30-45	40-85	30-55	70-150	80-120	50-70					25-30	25-40	30-40	20-35	15-25

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm		Ø mm	d mm	€	L mm	l mm	
3,00	6,00	54,25	62,00	20,00	1	8,00	8,00	70,50	79,00	41,00	1
3,10	6,00	54,25	62,00	20,00	1	8,10	10,00	88,44	89,00	47,00	1
3,20	6,00	54,25	62,00	20,00	1	8,20	10,00	88,44	89,00	47,00	1
3,30	6,00	54,25	62,00	20,00	1	8,30	10,00	88,44	89,00	47,00	1
3,40	6,00	54,25	62,00	20,00	1	8,40	10,00	88,44	89,00	47,00	1
3,50	6,00	54,25	62,00	20,00	1	8,50	10,00	88,44	89,00	47,00	1
3,60	6,00	54,25	62,00	20,00	1	8,60	10,00	88,44	89,00	47,00	1
3,70	6,00	54,25	62,00	20,00	1	8,70	10,00	88,44	89,00	47,00	1
3,80	6,00	54,25	66,00	24,00	1	8,80	10,00	88,44	89,00	47,00	1
3,90	6,00	54,25	66,00	24,00	1	8,90	10,00	88,44	89,00	47,00	1
4,00	6,00	58,63	66,00	24,00	1	9,00	10,00	88,44	89,00	47,00	1
4,10	6,00	58,63	66,00	24,00	1	9,10	10,00	88,44	89,00	47,00	1
4,20	6,00	58,63	66,00	24,00	1	9,20	10,00	88,44	89,00	47,00	1
4,30	6,00	58,63	66,00	24,00	1	9,30	10,00	88,44	89,00	47,00	1
4,40	6,00	58,63	66,00	24,00	1	9,40	10,00	88,44	89,00	47,00	1
4,50	6,00	58,63	66,00	24,00	1	9,50	10,00	88,44	89,00	47,00	1
4,60	6,00	58,63	66,00	24,00	1	9,60	10,00	88,44	89,00	47,00	1
4,70	6,00	58,63	66,00	24,00	1	9,70	10,00	88,44	89,00	47,00	1
4,80	6,00	58,63	66,00	28,00	1	9,80	10,00	88,44	89,00	47,00	1
4,90	6,00	58,63	66,00	28,00	1	9,90	10,00	88,44	89,00	47,00	1
5,00	6,00	58,63	66,00	28,00	1	10,00	10,00	88,44	89,00	47,00	1
5,10	6,00	58,63	66,00	28,00	1	10,10	12,00	125,00	102,00	55,00	1
5,20	6,00	58,63	66,00	28,00	1	10,20	12,00	125,00	102,00	55,00	1
5,30	6,00	58,63	66,00	28,00	1	10,30	12,00	125,00	102,00	55,00	1
5,40	6,00	58,63	66,00	28,00	1	10,40	12,00	125,00	102,00	55,00	1
5,50	6,00	58,63	66,00	28,00	1	10,50	12,00	125,00	102,00	55,00	1
5,60	6,00	58,63	66,00	28,00	1	10,60	12,00	125,00	102,00	55,00	1
5,70	6,00	58,63	66,00	28,00	1	10,70	12,00	125,00	102,00	55,00	1
5,80	6,00	58,63	66,00	28,00	1	10,80	12,00	125,00	102,00	55,00	1
5,90	6,00	58,63	66,00	28,00	1	10,90	12,00	125,00	102,00	55,00	1
6,00	6,00	58,63	66,00	28,00	1	11,00	12,00	125,00	102,00	55,00	1
6,10	8,00	70,50	79,00	34,00	1	11,50	12,00	125,00	102,00	55,00	1
6,20	8,00	70,50	79,00	34,00	1	11,80	12,00	125,00	102,00	55,00	1
6,30	8,00	70,50	79,00	34,00	1	12,00	12,00	125,00	102,00	55,00	1
6,40	8,00	70,50	79,00	34,00	1	12,50	14,00	158,56	107,00	60,00	1
6,50	8,00	70,50	79,00	34,00	1	12,80	14,00	158,56	107,00	60,00	1
6,60	8,00	70,50	79,00	34,00	1	13,00	14,00	158,56	107,00	60,00	1
6,70	8,00	70,50	79,00	34,00	1	13,50	14,00	158,56	107,00	60,00	1
6,80	8,00	70,50	79,00	34,00	1	14,00	14,00	158,56	107,00	60,00	1
6,90	8,00	70,50	79,00	34,00	1	14,50	16,00	197,19	115,00	65,00	1
7,00	8,00	70,50	79,00	34,00	1	15,00	16,00	197,19	115,00	65,00	1
7,10	8,00	70,50	79,00	41,00	1	16,00	16,00	197,19	115,00	65,00	1
7,20	8,00	70,50	79,00	41,00	1	16,50	18,00	314,56	123,00	73,00	1
7,30	8,00	70,50	79,00	41,00	1	17,00	18,00	314,56	123,00	73,00	1
7,40	8,00	70,50	79,00	41,00	1	17,50	18,00	314,56	123,00	73,00	1
7,50	8,00	70,50	79,00	41,00	1	18,00	18,00	314,56	123,00	73,00	1
7,60	8,00	70,50	79,00	41,00	1	18,50	20,00	341,56	131,00	79,00	1
7,70	8,00	70,50	79,00	41,00	1	19,00	20,00	341,56	131,00	79,00	1
7,80	8,00	70,50	79,00	41,00	1	19,50	20,00	341,56	131,00	79,00	1
7,90	8,00	70,50	79,00	41,00	1	20,00	20,00	341,56	131,00	79,00	1



BROCAS METAL DURO FORETS CARBURE / HARD METAL DRILL-BITS

1177

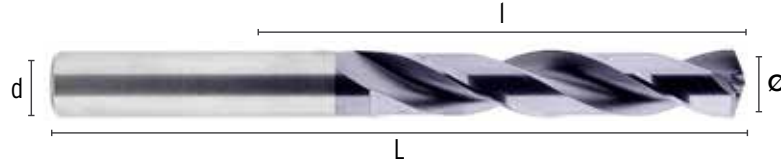
HM-MD DIN 6537 L

5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	○	●	●	●					●	●	●	●	○
50-120	40-85	35-55	30-45	40-85	30-55	70-150	80-120	50-70					25-30	25-40	30-40	20-35	15-25

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	📦	Ø mm	d mm	€	L mm	l mm	📦
3,00	6,00	62,44	66,00	28,00	1	8,20	10,00	93,06	103,00	61,00	1
3,10	6,00	62,44	66,00	28,00	1	8,30	10,00	93,06	103,00	61,00	1
3,20	6,00	62,44	66,00	28,00	1	8,40	10,00	93,06	103,00	61,00	1
3,30	6,00	62,44	66,00	28,00	1	8,50	10,00	93,06	103,00	61,00	1
3,40	6,00	62,44	66,00	28,00	1	8,60	10,00	93,06	103,00	61,00	1
3,50	6,00	62,44	66,00	28,00	1	8,70	10,00	93,06	103,00	61,00	1
3,60	6,00	62,44	66,00	28,00	1	8,80	10,00	93,06	103,00	61,00	1
3,70	6,00	62,44	66,00	28,00	1	8,90	10,00	93,06	103,00	61,00	1
3,80	6,00	62,44	74,00	36,00	1	9,00	10,00	93,06	103,00	61,00	1
3,90	6,00	62,44	74,00	36,00	1	9,10	10,00	93,06	103,00	61,00	1
4,00	6,00	66,38	74,00	36,00	1	9,20	10,00	93,06	103,00	61,00	1
4,10	6,00	66,38	74,00	36,00	1	9,30	10,00	93,06	103,00	61,00	1
4,20	6,00	66,38	74,00	36,00	1	9,40	10,00	93,06	103,00	61,00	1
4,30	6,00	66,38	74,00	36,00	1	9,50	10,00	93,06	103,00	61,00	1
4,40	6,00	66,38	74,00	36,00	1	9,60	10,00	93,06	103,00	61,00	1
4,50	6,00	66,38	74,00	36,00	1	9,70	10,00	93,06	103,00	61,00	1
4,60	6,00	66,38	74,00	36,00	1	9,80	10,00	93,06	103,00	61,00	1
4,70	6,00	66,38	74,00	36,00	1	9,90	10,00	93,06	103,00	61,00	1
4,80	6,00	66,38	82,00	44,00	1	10,00	10,00	93,06	103,00	61,00	1
4,90	6,00	66,38	82,00	44,00	1	10,10	12,00	131,81	118,00	71,00	1
5,00	6,00	66,38	82,00	44,00	1	10,20	12,00	131,81	118,00	71,00	1
5,10	6,00	66,38	82,00	44,00	1	10,30	12,00	131,81	118,00	71,00	1
5,20	6,00	66,38	82,00	44,00	1	10,40	12,00	131,81	118,00	71,00	1
5,30	6,00	66,38	82,00	44,00	1	10,50	12,00	131,81	118,00	71,00	1
5,40	6,00	66,38	82,00	44,00	1	10,60	12,00	131,81	118,00	71,00	1
5,50	6,00	66,38	82,00	44,00	1	10,70	12,00	131,81	118,00	71,00	1
5,60	6,00	66,38	82,00	44,00	1	10,80	12,00	131,81	118,00	71,00	1
5,70	6,00	66,38	82,00	44,00	1	10,90	12,00	131,81	118,00	71,00	1
5,80	6,00	66,38	82,00	44,00	1	11,00	12,00	131,81	118,00	71,00	1
5,90	6,00	66,38	82,00	44,00	1	11,50	12,00	131,81	118,00	71,00	1
6,00	6,00	66,38	82,00	44,00	1	11,80	12,00	131,81	118,00	71,00	1
6,10	8,00	74,19	91,00	53,00	1	12,00	12,00	131,81	118,00	71,00	1
6,20	8,00	74,19	91,00	53,00	1	12,50	14,00	176,13	124,00	77,00	1
6,30	8,00	74,19	91,00	53,00	1	12,80	14,00	176,13	124,00	77,00	1
6,40	8,00	74,19	91,00	53,00	1	13,00	14,00	176,13	124,00	77,00	1
6,50	8,00	74,19	91,00	53,00	1	13,50	14,00	176,13	124,00	77,00	1
6,60	8,00	74,19	91,00	53,00	1	13,80	14,00	176,13	124,00	77,00	1
6,70	8,00	74,19	91,00	53,00	1	14,00	14,00	176,13	124,00	77,00	1
6,80	8,00	74,19	91,00	53,00	1	14,50	16,00	219,06	133,00	83,00	1
6,90	8,00	74,19	91,00	53,00	1	14,80	16,00	219,06	133,00	83,00	1
7,00	8,00	74,19	91,00	53,00	1	15,00	16,00	219,06	133,00	83,00	1
7,10	8,00	74,19	91,00	53,00	1	15,80	16,00	219,06	133,00	83,00	1
7,20	8,00	74,19	91,00	53,00	1	16,00	16,00	219,06	133,00	83,00	1
7,30	8,00	74,19	91,00	53,00	1	16,50	18,00	349,31	143,00	93,00	1
7,40	8,00	74,19	91,00	53,00	1	17,00	18,00	349,31	143,00	93,00	1
7,50	8,00	74,19	91,00	53,00	1	17,50	18,00	349,31	143,00	93,00	1
7,60	8,00	74,19	91,00	53,00	1	18,00	18,00	349,31	143,00	93,00	1
7,70	8,00	74,19	91,00	53,00	1	18,50	20,00	379,88	153,00	101,00	1
7,80	8,00	74,19	91,00	53,00	1	19,00	20,00	379,88	153,00	101,00	1
7,90	8,00	74,19	91,00	53,00	1	19,50	20,00	379,88	153,00	101,00	1
8,00	8,00	74,19	91,00	53,00	1	20,00	20,00	379,88	153,00	101,00	1
8,10	10,00	93,06	103,00	61,00	1						

1178

HM-MD DIN 6537 EL

8XD

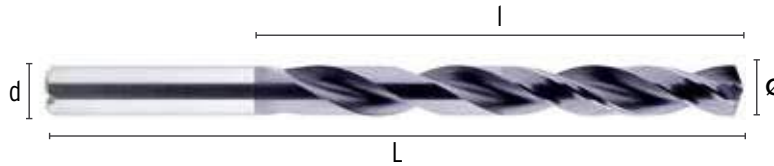


DIN 6535 HA

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	○	●	●	●					●	●			
50-120	40-85	35-55	30-45	40-85	30-55	70-150	80-120	50-70					25-30	25-40	30-40	20-35	15-25

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	
3,00	6	148,38	70	30	1
3,30	6	148,38	70	30	1
3,50	6	148,38	70	30	1
3,70	6	148,38	70	30	1
4,00	6	148,38	75	37	1
4,20	6	148,38	75	37	1
4,50	6	148,38	75	37	1
4,70	6	148,38	75	37	1
5,00	6	148,38	90	50	1
5,50	6	148,38	90	50	1
6,00	6	148,38	90	50	1
6,50	8	172,44	106	66	1
6,80	8	172,44	106	66	1
7,00	8	172,44	106	66	1

∅ mm	d mm	€	L mm	l mm	
7,50	8	172,44	106	66	1
8,00	8	172,44	106	66	1
8,50	10	207,75	131	87	1
9,00	10	207,75	131	87	1
9,50	10	207,75	131	87	1
10,00	10	207,75	131	87	1
10,20	12	283,75	155	106	1
10,50	12	283,75	155	106	1
11,00	12	283,75	155	106	1
12,00	12	283,75	155	106	1
13,00	14	403,94	182	133	1
14,00	14	403,94	182	133	1
15,00	16	503,50	204	152	1
16,00	16	503,50	204	152	1

1184

HM-MD

12XD



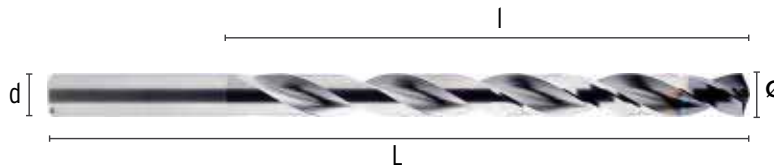
DIN 6535 HA

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	○	●	●	●					●				
40-90	35-55	30-50	25-40	35-55		60-120	60-90	30-50					15-25				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



∅ mm	d mm	€	L mm	l mm	
3,00	6	199,31	90	50	1
3,30	6	199,31	90	50	1
3,50	6	199,31	90	50	1
3,70	6	199,31	90	50	1
4,00	6	199,31	102	64	1
4,20	6	199,31	102	64	1
4,50	6	199,31	102	64	1
4,70	6	199,31	102	64	1
5,00	6	199,31	116	78	1
5,50	6	199,31	116	78	1
6,00	6	199,31	116	78	1
6,50	8	245,69	146	108	1
6,80	8	245,69	146	108	1
7,00	8	245,69	146	108	1

∅ mm	d mm	€	L mm	l mm	
7,50	8	245,69	146	108	1
8,00	8	245,69	146	108	1
8,50	10	309,75	162	120	1
9,00	10	309,75	162	120	1
9,50	10	309,75	162	120	1
10,00	10	309,75	162	120	1
10,20	12	411,00	204	156	1
10,50	12	411,00	204	156	1
11,00	12	411,00	204	156	1
12,00	12	411,00	204	156	1
13,00	14	509,19	230	182	1
14,00	14	509,19	230	182	1
15,00	16	720,56	260	208	1
16,00	16	720,56	260	208	1

1182

HM-MD

1XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
															●	●	●
															25-30	15-25	10-15

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Sacar Machos rotos / Enlever Taraud cassés / Remove Broken Taps

∅ mm	M	€	L mm	l mm	d mm
2,5	M3	82,38	38	10	3
3,3	M4	113,31	46	14	4
4,2	M5	127,53	50	19	5
5	M6	141,62	50	23	6

∅ mm	M	€	L mm	l mm	d mm
6,8	M8	155,84	60	23	8
8,5	M10	198,28	80	25	10
10,2	M12	295,36	80	35	12

1120

HM-MD DIN 6539 N

2XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-70	● 25-50	● 20-40	● 15-25	● 20-25		● 50-70	● 40-50		● 60-140	● 25-70	● 30-60	● 40-70	○ 10-15	○ 10-25			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	📦	Ø mm	€	L mm	l mm	📦
2,00	6,88	38	12	1	6,40	27,45	70	31	1
2,10	7,50	38	12	1	6,50	27,45	70	31	1
2,20	7,50	40	13	1	6,60	33,22	70	31	1
2,30	7,50	40	13	1	6,70	33,22	70	31	1
2,40	7,50	43	14	1	6,80	33,22	74	34	1
2,50	7,50	43	14	1	6,90	33,22	74	34	1
2,60	7,50	43	14	1	7,00	32,08	74	34	1
2,70	10,07	46	16	1	7,10	39,04	74	34	1
2,80	10,26	46	16	1	7,20	39,04	74	34	1
2,90	10,26	46	16	1	7,30	39,04	74	34	1
3,00	10,07	46	16	1	7,40	39,04	74	34	1
3,10	10,26	49	18	1	7,50	39,04	74	34	1
3,20	10,26	49	18	1	7,60	47,83	79	37	1
3,30	10,26	49	18	1	7,70	47,83	79	37	1
3,40	11,46	52	20	1	7,80	47,83	79	37	1
3,50	11,46	52	20	1	7,90	47,83	79	37	1
3,60	12,65	52	20	1	8,00	43,48	79	37	1
3,70	12,65	52	20	1	8,10	54,98	79	37	1
3,80	13,18	52	20	1	8,20	54,98	79	37	1
3,90	13,18	55	22	1	8,30	54,98	79	37	1
4,00	13,18	55	22	1	8,40	54,98	79	37	1
4,10	14,36	55	22	1	8,50	54,98	79	37	1
4,20	14,36	55	22	1	8,60	58,37	84	40	1
4,30	15,08	58	24	1	8,70	58,37	84	40	1
4,40	15,08	58	24	1	8,80	58,37	84	40	1
4,50	15,08	58	24	1	8,90	58,37	84	40	1
4,60	15,08	58	24	1	9,00	56,23	84	40	1
4,70	16,03	58	24	1	9,10	56,23	84	40	1
4,80	16,03	62	26	1	9,20	57,90	84	40	1
4,90	16,03	62	26	1	9,30	57,90	84	40	1
5,00	16,03	62	26	1	9,40	57,90	84	40	1
5,10	21,28	62	26	1	9,50	61,90	84	40	1
5,20	21,28	62	26	1	9,60	61,90	89	43	1
5,30	23,25	62	26	1	9,70	61,90	89	43	1
5,40	23,25	66	28	1	9,80	61,90	89	43	1
5,50	21,28	66	28	1	9,90	61,90	89	43	1
5,60	24,58	66	28	1	10,00	78,08	89	43	1
5,70	24,58	66	28	1	10,20	79,61	89	43	1
5,80	22,33	66	28	1	10,50	94,07	89	43	1
5,90	24,58	66	28	1	11,00	100,65	95	47	1
6,00	22,33	66	28	1	11,50	107,25	95	47	1
6,10	27,45	70	31	1	12,00	107,25	102	51	1
6,20	27,45	70	31	1	13,00	160,70	102	51	1
6,30	27,45	70	31	1					

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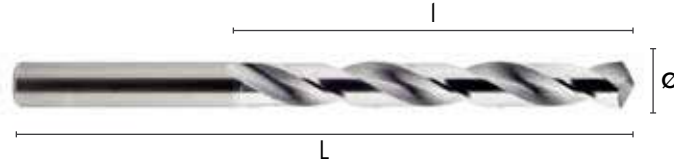
HM-MD DIN 338 N

4XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●		●	●		●	●	●	●	○	○			
30-70	25-50	20-40	15-25	20-25		50-70	40-50		60-140	25-70	30-60	40-70	10-15	10-25			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon	Ø mm	€	L mm	l mm	Icon
2,00	9,26	49	24	1	4,60	27,11	80	47	1
2,10	10,93	49	24	1	4,70	27,11	80	47	1
2,20	11,50	53	27	1	4,80	27,11	86	52	1
2,30	11,50	53	27	1	4,90	27,11	86	52	1
2,40	11,50	57	30	1	5,00	27,11	86	52	1
2,50	11,50	57	30	1	5,10	33,26	86	52	1
2,60	13,65	57	30	1	5,20	33,26	86	52	1
2,70	14,03	61	33	1	5,30	33,26	86	52	1
2,80	14,03	61	33	1	5,40	33,26	93	57	1
2,90	14,03	61	33	1	5,50	33,26	93	57	1
3,00	14,03	61	33	1	5,60	35,75	93	57	1
3,10	14,32	65	36	1	5,70	35,75	93	57	1
3,20	14,89	65	36	1	5,80	35,75	93	57	1
3,30	14,98	65	36	1	5,90	35,75	93	57	1
3,40	16,71	70	39	1	6,00	35,75	93	57	1
3,50	16,13	70	39	1	6,10	45,00	101	63	1
3,60	17,33	70	39	1	6,20	45,00	101	63	1
3,70	17,33	70	39	1	6,30	45,00	101	63	1
3,80	17,51	75	43	1	6,40	45,00	101	63	1
3,90	18,19	75	43	1	6,50	45,00	101	63	1
4,00	18,38	75	43	1	6,80	55,99	109	69	1
4,10	23,10	75	43	1	7,00	55,99	109	69	1
4,20	23,10	75	43	1	8,00	77,23	117	75	1
4,30	23,10	80	47	1	8,50	88,63	117	75	1
4,40	23,10	80	47	1	10,00	143,27	113	87	1
4,50	23,05	80	47	1	10,20	143,27	113	87	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1101

HSS DIN 338 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	
0,20	2,54	19	2,50	10
0,25	2,54	19	3	10
0,30	2,54	19	3	10
0,35	2,54	19	3	10
0,40	2,54	20	5	10
0,45	2,54	22	6	10
0,50	1,88	22	6	10
0,55	1,91	24	7	10
0,60	1,91	24	7	10
0,65	1,91	26	8	10
0,70	1,91	28	9	10
0,75	1,80	28	9	10
0,80	1,80	30	10	10
0,85	1,80	30	10	10
0,90	1,80	32	11	10
0,95	1,80	32	11	10
1,00	1,08	34	12	10
1,05	1,35	34	12	10
1,10	1,23	36	14	10
1,15	1,23	36	14	10
1,20	1,23	38	16	10
1,25	1,00	38	16	10
1,30	1,12	38	16	10
1,35	1,23	40	18	10
1,40	1,12	40	18	10
1,45	1,17	40	18	10
1,50	0,91	40	18	10
1,55	1,17	43	20	10
1,60	1,08	43	20	10
1,65	1,17	43	20	10
1,70	1,08	43	20	10
1,75	1,00	46	22	10
1,80	1,08	46	22	10
1,85	1,08	46	22	10
1,90	1,08	46	22	10
1,95	1,17	49	24	10
2,00	0,89	49	24	10
2,05	1,17	49	24	10
2,10	1,08	49	24	10
2,15	1,17	53	27	10
2,20	1,08	53	27	10
2,25	0,98	53	27	10
2,30	1,08	53	27	10
2,35	1,08	53	27	10
2,40	1,08	57	30	10
2,45	1,17	57	30	10
2,50	0,89	57	30	10
2,55	1,23	57	30	10
2,60	1,12	57	30	10
2,65	1,12	57	30	10

Ø mm	€	L mm	l mm	
2,70	1,12	61	33	10
2,75	1,00	61	33	10
2,80	1,12	61	33	10
2,85	1,23	61	33	10
2,90	1,12	61	33	10
2,95	1,23	61	33	10
3,00	0,78	61	33	10
3,05	1,30	65	36	10
3,10	1,11	65	36	10
3,15	1,30	65	36	10
3,20	1,11	65	36	10
3,25	0,98	65	36	10
3,30	1,18	65	36	10
3,35	1,30	70	39	10
3,40	1,18	70	39	10
3,45	1,30	70	39	10
3,50	0,98	70	39	10
3,55	1,45	70	39	10
3,60	1,30	70	39	10
3,65	1,45	70	39	10
3,70	1,30	70	39	10
3,75	1,19	70	39	10
3,80	1,30	75	43	10
3,90	1,30	75	43	10
3,95	1,44	75	43	10
4,00	1,01	75	43	10
4,05	1,55	75	43	10
4,10	1,41	75	43	10
4,15	1,55	75	43	10
4,20	1,41	75	43	10
4,25	1,30	75	43	10
4,30	1,54	80	47	10
4,40	1,54	80	47	10
4,50	1,30	80	47	10
4,55	1,91	80	47	10
4,60	1,74	80	47	10
4,65	1,91	80	47	10
4,70	1,74	80	47	10
4,75	1,60	80	47	10
4,80	1,74	86	52	10
4,90	1,74	86	52	10
5,00	1,28	86	52	10
5,10	1,93	86	52	10
5,20	2,13	86	52	10
5,25	1,63	86	52	10
5,30	1,93	86	52	10
5,40	1,93	93	57	10
5,50	1,63	93	57	10
5,60	2,23	93	57	10
5,70	2,23	93	57	10



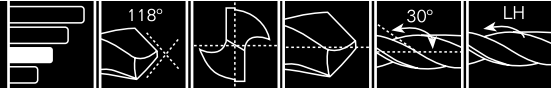
BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.11010 / suite Réf.11010 / Ref.11010 cont'd)

Ø mm	€	L mm	l mm		Ø mm	€	L mm	l mm	
5,75	2,03	93	57	10	10,10	6,92	133	87	5
5,80	2,23	93	57	10	10,20	6,92	133	87	5
5,85	2,44	93	57	10	10,25	6,37	133	87	5
5,90	2,23	93	57	10	10,30	6,92	133	87	5
6,00	1,72	93	57	10	10,40	6,92	133	87	5
6,10	2,61	101	63	10	10,50	5,79	133	87	5
6,20	2,61	101	63	10	10,60	7,73	133	87	5
6,25	2,40	101	63	10	10,70	7,73	142	94	5
6,30	2,61	101	63	10	10,75	7,09	142	94	5
6,35	2,88	101	63	10	10,80	7,73	142	94	5
6,40	2,61	101	63	10	10,90	7,73	142	94	5
6,50	2,21	101	63	10	11,00	6,43	142	94	5
6,60	3,02	101	63	10	11,10	8,59	142	94	5
6,70	3,02	101	63	10	11,20	8,59	142	94	5
6,75	2,77	109	69	10	11,25	7,89	142	94	5
6,80	3,02	109	69	10	11,30	8,59	142	94	5
6,90	3,02	109	69	10	11,40	8,59	142	94	5
6,95	3,34	109	69	10	11,50	7,13	142	94	5
7,00	2,54	109	69	10	11,60	9,04	142	94	5
7,10	3,43	109	69	10	11,70	9,04	142	94	5
7,20	3,43	109	69	10	11,75	8,30	142	94	5
7,25	3,16	109	69	10	11,80	9,04	142	94	5
7,30	3,43	109	69	10	11,90	9,04	151	101	5
7,35	3,76	109	69	10	12,00	7,56	151	101	5
7,40	3,43	109	69	10	12,10	10,19	151	101	5
7,50	2,86	109	69	10	12,20	10,19	151	101	5
7,60	3,75	117	75	10	12,25	9,32	151	101	5
7,65	4,13	117	75	10	12,30	10,19	151	101	5
7,70	3,75	117	75	10	12,40	10,19	151	101	5
7,75	3,44	117	75	10	12,50	8,46	151	101	5
7,80	3,75	117	75	10	12,60	11,12	151	101	5
7,90	3,75	117	75	10	12,70	11,12	151	101	5
7,95	4,13	117	75	10	12,75	10,19	151	101	5
8,00	2,99	117	75	10	12,80	11,12	151	101	5
8,10	4,47	117	75	10	12,90	11,12	151	101	5
8,15	4,92	117	75	10	13,00	9,30	151	101	5
8,20	4,47	117	75	10	13,25	12,97	160	108	4
8,25	4,12	117	75	10	13,50	11,80	160	108	4
8,30	4,47	117	75	10	13,75	14,04	160	108	4
8,40	4,47	117	75	10	14,00	12,76	160	108	4
8,45	4,92	117	75	10	14,25	16,00	169	114	4
8,50	3,75	117	75	10	14,50	14,55	169	114	4
8,60	4,89	125	81	10	14,75	18,30	169	114	4
8,65	5,38	125	81	10	15,00	16,63	169	114	4
8,70	4,89	125	81	10	15,25	22,06	178	120	1
8,75	4,47	125	81	10	15,50	20,07	178	120	1
8,80	4,89	125	81	10	15,75	22,06	178	120	1
8,90	5,38	125	81	10	16,00	20,07	178	120	1
8,95	5,38	125	81	10	16,25	28,53	184	125	1
9,00	4,11	125	81	10	16,50	25,91	184	125	1
9,05	5,82	125	81	10	16,75	28,53	184	125	1
9,10	5,49	125	81	10	17,00	25,91	184	125	1
9,20	5,49	125	81	10	17,25	31,74	191	130	1
9,25	5,49	125	81	10	17,50	28,86	191	130	1
9,30	5,49	125	81	10	17,75	31,74	191	130	1
9,35	6,07	125	81	10	18,00	28,86	191	130	1
9,40	5,49	125	81	10	18,25	35,42	198	135	1
9,45	6,07	125	81	10	18,50	32,20	198	135	1
9,50	4,61	125	81	10	18,75	35,42	198	135	1
9,60	6,15	133	87	10	19,00	32,20	198	135	1
9,70	6,15	133	87	10	19,25	42,46	205	140	1
9,75	5,63	133	87	10	19,50	38,61	205	140	1
9,80	6,15	133	87	10	19,75	42,45	205	140	1
9,90	6,15	133	87	10	20,00	38,61	205	140	1
10,00	4,69	133	87	5					

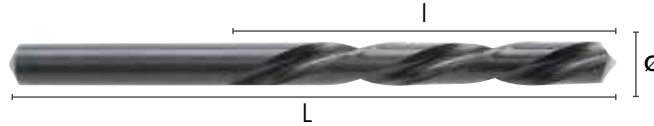
BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1101/1 HSS DIN 338 N Izquierda / A gauche / Left hand



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

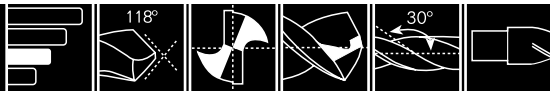
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	
2,00	4,31	49	24	10
2,25	4,76	53	27	10
2,50	4,31	57	30	10
2,75	4,92	61	33	10
3,00	3,84	61	33	10
3,25	4,80	65	36	10
3,50	4,80	70	39	10
3,75	5,92	70	39	10
4,00	4,95	75	43	10
4,50	6,30	80	47	10
5,00	6,26	86	52	10
5,25	7,97	86	52	10
5,50	7,97	93	57	10

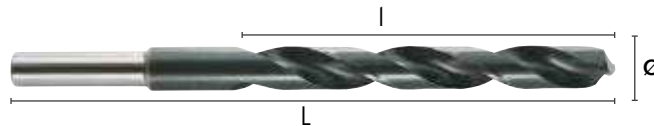
Ø mm	€	L mm	l mm	
6,00	8,45	93	57	10
6,50	10,73	101	63	10
7,00	12,41	109	69	10
7,50	14,12	109	69	10
8,00	14,65	117	75	10
8,50	18,45	117	75	10
9,00	20,06	125	81	10
9,50	22,51	125	81	10
10,00	23,01	133	87	5
10,50	28,91	133	87	5
11,00	32,16	142	94	5
11,50	35,65	142	94	5
12,00	37,08	151	101	5

1104 HSS DIN 338 N MR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
10,00	8	7,99	133	87	1
10,50	8	9,18	133	87	1
11,00	8	9,18	142	94	1
11,50	8	10,26	142	94	1
12,00	8	10,26	151	101	1
12,50	8	11,32	151	101	1
13,00	10	12,48	151	101	1
13,25	10	15,91	160	108	1
13,50	10	15,91	160	108	1
13,75	10	17,29	160	108	1
14,00	10	15,91	160	108	1
14,25	10	19,94	169	114	1
14,40	10	19,65	169	114	1
14,50	10	19,58	169	114	1
14,75	10	28,07	169	114	1
15,00	10	19,58	169	114	1
15,25	10	25,95	178	120	1
15,50	10	23,18	178	120	1

Ø mm	d mm	€	L mm	l mm	
15,75	10	25,49	178	120	1
16,00	12	23,18	178	120	1
16,25	12	33,00	184	125	1
16,40	12	29,88	184	125	1
16,50	12	29,06	184	125	1
16,75	12	32,00	184	125	1
17,00	12	29,06	184	125	1
17,25	12	35,60	191	130	1
17,50	12	32,15	191	130	1
17,75	12	35,35	191	130	1
18,00	12	32,15	191	130	1
18,25	12	39,44	198	135	1
18,50	12	36,10	198	135	1
18,60	12	39,14	198	135	1
18,75	12	39,68	198	135	1
19,00	12	36,10	198	135	1
19,25	12	47,59	205	140	1
19,50	12	42,58	205	140	1



BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

Ø mm	d mm	€	L mm	l mm	
19,75	12	46,80	205	149	1
20,00	13	42,58	205	140	1
20,50	13	49,56	212	145	1
20,60	13	40,80	212	145	1
21,00	13	49,56	212	145	1
21,50	13	53,99	219	150	1
22,00	13	53,99	219	150	1
22,50	13	57,09	226	155	1
22,60	13	51,64	226	155	1
23,00	13	57,09	226	155	1
23,50	13	63,56	226	155	1
24,00	13	63,56	233	160	1

Ø mm	d mm	€	L mm	l mm	
24,50	13	64,45	233	160	1
25,00	13	64,45	233	160	1
25,50	13	83,69	240	165	1
26,00	13	83,69	240	165	1
26,50	13	90,35	240	165	1
27,00	13	90,35	247	170	1
27,50	13	91,71	247	170	1
28,00	13	91,71	247	170	1
28,50	13	113,99	254	175	1
29,00	13	113,99	254	175	1
29,50	13	118,94	254	175	1
30,00	13	118,94	254	175	1

1104/9 HSS ANSI



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●						●	●		○	●							
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
17/32"	1/2"	15,91	152	76	1
9/16"	1/2"	15,91	152	76	1
19/32"	1/2"	19,58	152	76	1
5/8"	1/2"	23,18	152	76	1
21/32"	1/2"	29,06	152	76	1
11/16"	1/2"	32,15	152	76	1
23/32"	1/2"	32,15	152	76	1
3/4"	1/2"	36,10	152	76	1
25/32"	1/2"	42,58	152	76	1

Ø mm	d mm	€	L mm	l mm	
13/16"	1/2"	40,80	152	76	1
27/32"	1/2"	49,56	152	76	1
7/8"	1/2"	54,00	152	76	1
29/32"	1/2"	57,09	152	76	1
15/16"	1/2"	63,56	152	76	1
31/32"	1/2"	64,45	152	76	1
1"	1/2"	64,45	152	76	1
1-1/16"	1/2"	90,35	152	76	1
1-1/8"	1/2"	113,99	152	76	1

1501 HSS Hex.



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●						●	●		○	●							
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	L mm	l mm	€	
3,00	61	33	3,51	1
4,00	75	43	3,86	1
5,00	86	52	4,03	1
6,00	93	57	4,34	1

Ø mm	L mm	l mm	€	
7,00	109	69	4,47	1
8,00	117	75	4,72	1
9,00	125	81	4,78	1
10,00	133	87	6,02	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1158 HSS DIN 338 NSP



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative





Ø mm	€	L mm	l mm	Icon	Ø mm	€	L mm	l mm	Icon
1,00	1,18	34	12	10	5,30	2,58	86	52	10
1,10	1,47	36	14	10	5,40	2,58	93	57	10
1,20	1,47	38	16	10	5,50	1,79	93	57	10
1,30	1,30	38	16	10	5,60	2,71	93	57	10
1,40	1,30	40	18	10	5,70	2,71	93	57	10
1,50	1,02	40	18	10	5,75	2,25	93	57	10
1,60	1,25	43	20	10	5,80	2,58	93	57	10
1,70	1,25	43	20	10	5,90	2,58	93	57	10
1,80	1,11	46	22	10	6,00	1,91	93	57	10
1,90	1,11	46	22	10	6,10	2,96	101	63	10
2,00	0,97	49	24	10	6,20	2,96	101	63	10
2,10	1,08	49	24	10	6,25	2,67	101	63	10
2,20	1,08	53	27	10	6,30	3,13	101	63	10
2,25	1,08	53	27	10	6,40	3,18	101	63	10
2,30	1,29	53	27	10	6,50	2,42	101	63	10
2,40	1,29	57	30	10	6,60	3,91	101	63	10
2,50	0,97	57	30	10	6,70	3,91	101	63	10
2,60	1,30	57	30	10	6,75	3,06	109	69	10
2,70	1,30	61	33	10	6,80	2,95	109	69	10
2,75	1,11	61	33	10	6,90	4,32	109	69	10
2,80	1,30	61	33	10	7,00	2,80	109	69	10
2,90	1,30	61	33	10	7,10	4,59	109	69	10
3,00	0,88	61	33	10	7,20	4,59	109	69	10
3,10	1,11	65	36	10	7,25	3,50	109	69	10
3,20	1,11	65	36	10	7,30	4,59	109	69	10
3,25	1,08	65	36	10	7,40	4,59	109	69	10
3,30	1,11	65	36	10	7,50	3,18	109	69	10
3,40	1,42	70	39	10	7,60	5,39	117	75	10
3,50	1,08	70	39	10	7,70	5,39	117	75	10
3,60	1,48	70	39	10	7,75	3,82	117	75	10
3,70	1,48	70	39	10	7,80	5,46	117	75	10
3,75	1,32	70	39	10	7,90	5,46	117	75	10
3,80	1,56	75	43	10	8,00	3,29	117	75	10
3,90	1,56	75	43	10	8,10	5,54	117	75	10
4,00	1,11	75	43	10	8,20	5,54	117	75	10
4,10	1,37	75	43	10	8,25	4,55	117	75	10
4,20	1,37	75	43	10	8,30	5,81	117	75	10
4,25	1,41	75	43	10	8,40	5,81	117	75	10
4,30	1,84	80	47	10	8,50	4,16	117	75	10
4,40	1,84	80	47	10	8,60	7,30	125	81	10
4,50	1,41	80	47	10	8,70	7,30	125	81	10
4,60	1,88	80	47	10	8,75	4,95	125	81	10
4,70	1,88	80	47	10	8,80	7,34	125	81	10
4,75	1,76	80	47	10	8,90	7,34	125	81	10
4,80	2,04	86	52	10	9,00	4,54	125	81	10
4,90	2,01	86	52	10	9,10	7,36	125	81	10
5,00	1,41	86	52	10	9,20	7,36	125	81	10
5,10	2,05	86	52	10	9,25	6,08	125	81	10
5,20	2,05	86	52	10	9,30	6,86	125	81	10
5,25	1,79	86	52	10	9,40	6,86	125	81	10



BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.1158 / suite Réf.1158 / Ref.1158 cont'd)

∅ mm	€	L mm	l mm	
9,50	5,08	125	81	10
9,60	8,78	133	87	10
9,70	8,78	133	87	10
9,75	6,22	133	87	10
9,80	8,65	133	87	10
9,90	8,65	133	87	10
10,00	5,17	133	87	5
10,50	6,39	133	87	5
11,00	7,11	142	94	5
11,50	7,89	142	94	5
12,00	8,35	151	101	5
12,50	9,36	151	101	5
13,00	10,24	151	101	5
13,50	12,96	151	101	4

∅ mm	€	L mm	l mm	
14,00	14,04	169	108	4
14,50	16,00	169	114	4
15,00	18,28	169	114	4
15,50	22,05	178	120	1
16,00	22,05	178	120	1
16,50	28,48	184	125	1
17,00	28,48	184	125	1
17,50	31,73	191	130	1
18,00	31,73	191	130	1
18,50	35,41	198	125	1
19,00	35,41	198	125	1
19,50	42,43	205	140	1
20,00	42,43	205	140	1


1158/9 HSS DIN 338 NSP




P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 15-35						● 25-30	● 12-16		○ 50-60	● 30-60		○ 20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	€	L mm	l mm	
1/16"	1,02	43	20	10
5/64"	0,97	49	24	10
3/32"	0,97	57	30	10
7/64"	1,11	61	33	10
1/8"	0,88	65	36	10
9/64"	1,08	70	39	10
5/32"	1,11	75	43	10
11/64"	1,41	80	47	10
3/16"	1,41	86	52	10
13/64"	1,41	86	52	10
7/32"	1,79	93	57	10
15/64"	1,91	93	57	10
1/4"	2,42	101	63	10
17/64"	2,80	109	69	10
9/32"	2,80	109	69	10

∅ mm	€	L mm	l mm	
19/64"	3,18	117	75	10
5/16"	3,29	117	75	10
21/64"	4,16	117	75	10
11/32"	4,54	125	81	10
23/64"	4,54	125	81	10
3/8"	5,08	133	87	10
25/64"	5,17	133	87	10
13/32"	6,39	133	87	5
27/64"	6,71	142	94	5
7/16"	7,11	142	94	5
29/64"	7,89	142	94	5
15/32"	8,35	151	101	5
31/64"	9,36	151	101	5
1/2"	10,24	151	101	5

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1108 HSS DIN 338 NSP



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 20-45	● 15-30					● 35-40	● 15-20		○ 65-90	● 40-70	○ 65-90	○ 25-35					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative





Ø mm	€	L mm	l mm	📦	Ø mm	€	L mm	l mm	📦
1,00	2,40	34	12	10	5,30	3,43	86	52	10
1,10	2,14	36	14	10	5,40	3,43	93	57	10
1,20	2,14	38	16	10	5,50	3,43	93	57	10
1,30	2,14	38	16	10	5,60	3,79	93	57	10
1,40	2,14	40	18	10	5,70	3,79	93	57	10
1,50	1,86	40	18	10	5,75	3,79	93	57	10
1,60	2,14	43	20	10	5,80	3,79	93	57	10
1,70	2,14	43	20	10	5,90	3,79	93	57	10
1,80	2,14	46	22	10	6,00	3,79	93	57	10
1,90	2,14	46	22	10	6,10	4,66	101	63	10
2,00	1,86	49	24	10	6,20	4,66	101	63	10
2,10	2,14	49	24	10	6,25	4,66	101	63	10
2,20	2,14	53	27	10	6,30	4,66	101	63	10
2,25	2,14	53	27	10	6,40	4,66	101	63	10
2,30	2,14	53	27	10	6,50	4,66	101	63	10
2,40	2,14	57	30	10	6,60	5,39	101	63	10
2,50	1,86	57	30	10	6,70	5,39	101	63	10
2,60	2,14	57	30	10	6,75	5,41	109	69	10
2,70	2,14	61	33	10	6,80	6,23	109	69	10
2,75	1,86	61	33	10	6,90	6,23	109	69	10
2,80	2,14	61	33	10	7,00	6,23	109	69	10
2,90	2,14	61	33	10	7,10	6,23	109	69	10
3,00	2,03	61	33	10	7,20	6,23	109	69	10
3,10	2,39	65	36	10	7,25	6,75	109	69	10
3,20	2,39	65	36	10	7,30	6,75	109	69	10
3,25	2,07	65	36	10	7,40	6,75	109	69	10
3,30	2,39	65	36	10	7,50	6,75	109	69	10
3,40	2,39	70	39	10	7,60	7,05	117	75	10
3,50	2,25	70	39	10	7,70	7,05	117	75	10
3,60	2,64	70	39	10	7,75	7,05	117	75	10
3,70	2,64	70	39	10	7,80	7,11	117	75	10
3,75	2,33	70	39	10	7,90	7,11	117	75	10
3,80	2,64	75	43	10	8,00	7,11	117	75	10
3,90	2,64	75	43	10	8,10	8,22	117	75	10
4,00	2,54	75	43	10	8,20	8,22	117	75	10
4,10	3,18	75	43	10	8,25	8,22	117	75	10
4,20	3,18	75	43	10	8,30	8,22	117	75	10
4,25	2,77	75	43	10	8,40	8,22	117	75	10
4,30	2,77	80	47	10	8,50	8,22	117	75	10
4,40	2,77	80	47	10	8,60	8,96	125	81	10
4,50	2,77	80	47	10	8,70	8,96	125	81	10
4,60	2,77	80	47	10	8,75	8,97	125	81	10
4,70	2,77	80	47	10	8,80	8,96	125	81	10
4,75	2,99	80	47	10	8,90	8,96	125	81	10
4,80	2,99	86	52	10	9,00	8,97	125	81	10
4,90	3,00	86	52	10	9,10	10,12	125	81	10
5,00	2,86	86	52	10	9,20	10,12	125	81	10
5,10	3,43	86	52	10	9,25	10,11	125	81	10
5,20	3,43	86	52	10	9,30	10,12	125	81	10
5,25	3,43	86	52	10	9,40	10,12	125	81	10

(continúa Ref.1108 / suite Réf.1108 / Ref.1108 cont'd)

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.1108 / suite Réf.1108 / Ref.1108 cont'd)

∅ mm	€	L mm	l mm	
9,50	10,11	125	81	10
9,60	11,26	133	87	10
9,75	11,26	133	87	10
9,80	11,26	133	87	10
9,90	11,26	133	87	10
10,00	11,26	133	87	5

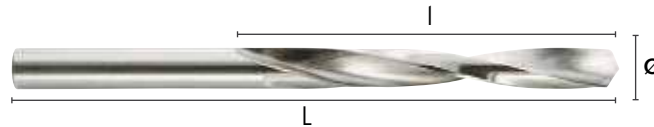
∅ mm	€	L mm	l mm	
10,50	13,01	133	87	5
11,00	14,55	142	94	5
11,50	16,15	142	94	5
12,00	18,55	151	101	5
12,50	19,60	151	101	5
13,00	21,40	151	101	5


1103 HSS DIN 338 H




P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
										25-60							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	€	L mm	l mm	
1,00	3,83	34	12	1
1,25	4,32	38	16	1
1,50	3,75	40	18	1
1,75	4,21	46	22	1
2,00	3,43	49	24	1
2,25	4,02	53	27	1
2,50	3,50	57	30	1
2,75	4,70	61	33	1
3,00	3,83	61	33	1
3,25	4,70	65	36	1
3,50	4,13	70	39	1
3,75	6,09	70	39	1
4,00	4,43	75	43	1
4,25	6,63	75	43	1
4,50	5,46	80	47	1
4,75	7,48	80	47	1
5,00	5,94	86	52	1
5,25	8,95	86	52	1
5,50	7,19	93	57	1
5,75	10,94	93	57	1
6,00	7,79	93	57	1
6,25	10,94	101	63	1

∅ mm	€	L mm	l mm	
6,50	8,68	101	63	1
6,75	13,18	109	69	1
7,00	9,17	109	69	1
7,25	17,40	109	69	1
7,50	10,78	109	69	1
7,75	20,13	117	75	1
8,00	11,49	117	75	1
8,25	21,50	117	75	1
8,50	13,31	117	75	1
8,75	22,51	125	81	1
9,00	13,98	125	81	1
9,25	29,01	125	81	1
9,50	16,36	125	81	1
9,75	32,10	133	87	1
10,00	17,09	133	87	1
10,50	20,48	133	87	1
11,00	22,87	142	94	1
11,50	27,65	142	94	1
12,00	29,81	151	101	1
12,50	33,79	151	101	1
13,00	36,17	151	101	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1105 HSSCO DIN 338 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 15-35	● 12-20	● 6-16		○ 8-14		● 25-30	● 12-16		○ 50-60	● 30-60		○ 20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	📦	Ø mm	€	L mm	l mm	📦
0,50	2,80	22	6	10	4,80	2,67	86	52	10
0,60	2,27	24	7	10	4,90	2,69	86	52	10
0,70	2,21	28	9	10	5,00	2,22	86	52	10
0,75	2,21	28	9	10	5,10	2,72	86	52	10
0,80	2,00	30	10	10	5,20	2,73	86	52	10
0,90	2,00	32	11	10	5,25	2,78	86	52	10
1,00	1,75	34	12	10	5,30	2,78	86	52	10
1,10	1,52	36	14	10	5,40	3,21	93	57	10
1,20	1,69	38	16	10	5,50	3,51	93	57	10
1,25	2,00	38	16	10	5,60	3,51	93	57	10
1,30	1,60	38	16	10	5,70	3,51	93	57	10
1,40	1,51	40	18	10	5,75	3,51	93	57	10
1,50	1,60	40	18	10	5,80	3,51	93	57	10
1,60	1,67	43	20	10	5,90	3,51	93	57	10
1,70	1,54	43	20	10	6,00	3,00	93	57	10
1,75	2,25	46	22	10	6,10	3,90	101	63	10
1,80	1,54	46	22	10	6,20	3,93	101	63	10
1,90	1,59	46	22	10	6,25	3,93	101	63	10
2,00	1,64	49	24	10	6,30	3,93	101	63	10
2,10	1,79	49	24	10	6,40	4,23	101	63	10
2,20	1,79	53	27	10	6,50	3,90	101	63	10
2,25	2,59	53	27	10	6,60	4,23	101	63	10
2,30	1,79	53	27	10	6,70	4,23	101	63	10
2,40	1,80	57	30	10	6,75	4,55	109	69	10
2,50	1,75	57	30	10	6,80	4,55	109	69	10
2,60	1,88	57	30	10	6,90	4,55	109	69	10
2,70	1,88	61	33	10	7,00	4,11	109	69	10
2,75	1,93	61	33	10	7,10	5,55	109	69	10
2,80	1,90	61	33	10	7,20	5,55	109	69	10
2,90	1,93	61	33	10	7,25	5,55	109	69	10
3,00	1,46	61	33	10	7,30	5,55	109	69	10
3,10	1,93	65	36	10	7,40	5,55	109	69	10
3,20	1,93	65	36	10	7,50	4,37	109	69	10
3,25	1,95	65	36	10	7,60	6,73	117	75	10
3,30	2,04	65	36	10	7,70	6,73	117	75	10
3,40	2,07	70	39	10	7,75	6,73	117	75	10
3,50	1,93	70	39	10	7,80	6,73	117	75	10
3,60	2,12	70	39	10	7,90	6,73	117	75	10
3,70	2,14	70	39	10	8,00	5,46	117	75	10
3,75	2,32	70	39	10	8,10	6,73	117	75	10
3,80	2,16	75	43	10	8,20	6,73	117	75	10
3,90	2,22	75	43	10	8,25	6,45	117	75	10
4,00	1,90	75	43	10	8,30	6,73	117	75	10
4,10	2,25	75	43	10	8,40	6,73	117	75	10
4,20	2,27	75	43	10	8,50	5,36	117	75	10
4,25	2,22	75	43	10	8,60	7,89	125	81	10
4,30	2,42	80	47	10	8,70	7,89	125	81	10
4,40	2,48	80	47	10	8,75	8,20	125	81	10
4,50	2,32	80	47	10	8,80	8,20	125	81	10
4,60	2,54	80	47	10	8,90	8,20	125	81	10
4,70	2,59	80	47	10	9,00	6,78	125	81	10
4,75	2,58	80	47	10	9,10	8,78	125	81	10

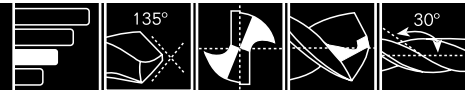
BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.1105 / suite Réf.1105 / Ref.1105 cont'd)

Ø mm	€	L mm	l mm		Ø mm	€	L mm	l mm	
9,20	8,78	125	81	10	11,75	20,58	142	94	5
9,25	9,05	125	81	10	11,80	20,58	142	94	5
9,30	9,67	125	81	10	11,90	20,58	151	101	5
9,40	9,67	125	81	10	12,00	15,77	151	101	5
9,50	8,56	125	81	10	12,10	24,57	151	101	5
9,60	10,83	133	87	10	12,20	24,57	151	101	5
9,70	11,09	133	87	10	12,25	24,57	151	101	5
9,75	10,68	133	87	10	12,30	24,57	151	101	5
9,80	11,10	133	87	10	12,40	24,57	151	101	5
9,90	11,10	133	87	10	12,50	21,63	151	101	5
10,00	8,56	133	87	5	12,60	25,65	151	101	5
10,10	14,04	133	87	5	12,70	25,65	151	101	5
10,20	14,04	133	87	5	12,75	25,65	151	101	5
10,25	14,04	133	87	5	12,80	25,65	151	101	5
10,30	14,04	133	87	5	12,90	25,65	151	101	5
10,40	14,04	133	87	5	13,00	21,92	151	101	5
10,50	11,41	133	87	5	13,50	24,17	160	108	4
10,60	16,33	133	87	5	14,00	23,89	160	108	4
10,70	16,33	142	94	5	14,50	33,85	169	114	4
10,75	16,33	142	94	5	15,00	34,41	169	114	4
10,80	16,33	142	94	5	15,50	39,76	178	120	1
10,90	16,33	142	94	5	16,00	41,25	178	120	1
11,00	12,56	142	94	5	16,50	47,19	184	125	1
11,10	19,14	142	94	5	17,00	47,19	184	125	1
11,20	19,14	142	94	5	17,50	52,23	191	130	1
11,25	19,14	142	94	5	18,00	56,93	191	130	1
11,30	19,14	142	94	5	18,50	62,84	198	125	1
11,40	19,14	142	94	5	19,00	62,84	198	125	1
11,50	16,10	142	94	5	19,50	69,69	205	140	1
11,60	20,58	142	94	5	20,00	80,52	205	140	1
11,70	20,58	142	94	5					

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HSSCO DIN 338 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	●	●		○		●	●		○	●		○					
15-35	12-20	6-16		8-14		25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm		Ø mm	€	L mm	l mm	
1/16"	1,59	43	20	10	19/64"	4,37	117	75	10
5/64"	1,64	49	24	10	5/16"	5,46	117	75	10
3/32"	1,75	57	30	10	21/64"	5,36	117	75	10
7/64"	1,93	61	33	10	11/32"	8,20	125	81	10
1/8"	1,46	65	36	10	23/64"	6,78	125	81	10
9/64"	1,93	70	39	10	3/8"	8,56	133	87	10
5/32"	1,90	75	43	10	25/64"	8,56	133	87	10
11/64"	2,32	80	47	10	13/32"	11,41	133	87	5
3/16"	2,32	86	52	10	27/64"	16,33	142	94	5
13/64"	2,22	86	52	10	7/16"	12,56	142	94	5
7/32"	3,51	93	57	10	29/64"	16,10	142	94	5
15/64"	3,00	93	57	10	15/32"	15,77	151	101	5
1/4"	3,90	101	63	10	31/64"	21,63	151	101	5
17/64"	4,55	109	69	10	1/2"	21,92	151	101	5
9/32"	4,11	109	69	10					

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

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HSSCO DIN 338 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 25-50	● 18-30	● 10-25		○ 12-20		● 38-45	● 18-25		○ 70-80	● 45-80		○ 30-35					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon
2,00	3,48	49	24	1
2,50	3,48	57	30	1
3,00	3,44	61	33	1
3,10	4,33	65	36	1
3,25	4,33	65	36	1
3,30	4,33	65	36	1
3,40	4,51	70	39	1
3,50	4,32	70	39	1
4,00	4,46	75	43	1
4,10	4,69	75	43	1
4,20	4,69	75	43	1
4,25	4,69	75	43	1
4,30	4,73	80	47	1
4,50	4,75	80	47	1
5,00	4,83	86	52	1
5,10	5,19	86	52	1
5,25	5,24	86	52	1

Ø mm	€	L mm	l mm	Icon
5,50	5,47	93	57	1
6,00	5,68	93	57	1
6,50	10,45	101	63	1
7,00	11,07	109	69	1
7,50	11,34	109	69	1
8,00	12,09	117	75	1
8,50	13,47	117	75	1
9,00	14,94	125	81	1
9,50	15,19	125	81	1
10,00	15,94	133	87	1
10,50	27,46	133	87	1
11,00	28,61	142	94	1
11,50	30,37	142	94	1
12,00	31,39	151	101	1
12,50	38,81	151	101	1
13,00	39,45	151	101	1

1107

HSSCO DIN 338 MR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 15-35	● 12-20	● 6-16		○ 8-14		● 25-30	● 12-16		○ 50-60	● 30-60		○ 20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Icon
10,00	8	10,17	133	87	1
10,50	8	13,61	133	87	1
11,00	8	14,67	142	94	1
11,50	8	18,01	142	94	1
12,00	8	19,09	151	101	1
12,50	8	23,17	151	101	1
13,00	10	23,49	151	101	1
13,50	10	25,59	160	108	1
14,00	10	25,33	160	108	1
14,50	10	34,69	169	114	1
15,00	10	35,18	169	114	1

Ø mm	d mm	€	L mm	l mm	Icon
15,50	10	40,19	178	120	1
16,00	12	41,62	178	120	1
16,50	12	47,18	184	125	1
17,00	12	47,18	184	125	1
17,50	12	51,91	191	130	1
18,00	12	56,31	191	130	1
18,50	12	61,90	191	130	1
19,00	12	61,90	191	130	1
19,50	12	68,31	191	130	1
20,00	12	78,47	191	130	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

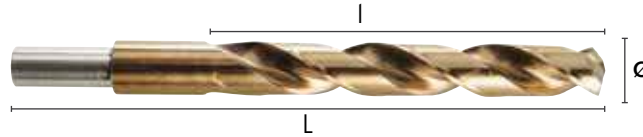
1107/9

HSSCO ANSI



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		○		●	●		○	●		○					
15-35	12-20	6-16		8-14		25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
17/32"	1/2"	25,59	152	76	1
9/16"	1/2"	25,33	152	76	1
19/32"	1/2"	35,18	152	76	1
5/8"	1/2"	41,62	152	76	1
21/32"	1/2"	47,18	152	76	1

Ø mm	d mm	€	L mm	l mm	
11/16"	1/2"	51,91	152	76	1
23/32"	1/2"	56,41	152	76	1
3/4"	1/2"	61,90	152	76	1
25/32"	1/2"	68,31	152	76	1
13/16"	1/2"	78,47	152	76	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1187

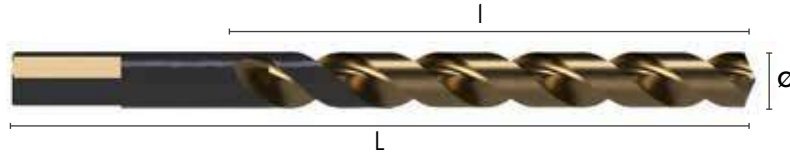
HSSCO DIN 338W



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●				●					○	○	○			●			
30-40				8-14					30-80	50-70	50-70			8-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



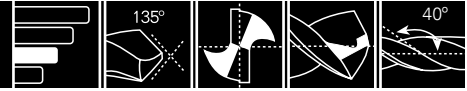
Ø mm	€	L mm	l mm	
1,00	2,89	34	12	10
1,25	3,45	38	16	10
1,50	2,75	40	18	10
1,75	3,45	46	22	10
2,00	2,75	49	24	10
2,25	3,05	53	27	10
2,50	2,51	57	30	10
2,75	3,05	61	33	10
3,00	2,45	61	33	10
3,20	3,01	65	36	10
3,25	3,01	65	36	10
3,30	3,01	65	36	10
3,50	2,96	70	39	10
3,75	3,57	70	39	10
4,00	3,22	75	43	10
4,20	3,57	75	43	10
4,25	3,57	75	43	10
4,50	3,57	80	47	10
4,75	3,99	80	47	10
5,00	3,83	86	52	10
5,20	4,75	86	52	10
5,25	4,48	86	52	10

Ø mm	€	L mm	l mm	
5,50	4,85	93	57	10
5,75	5,42	93	57	10
6,00	5,16	93	57	10
6,25	5,93	101	63	10
6,50	6,04	101	63	10
6,75	7,07	109	69	10
6,80	7,05	109	69	10
7,00	6,58	109	69	10
7,50	7,00	109	69	10
8,00	8,19	117	75	10
8,50	8,55	117	75	10
8,75	13,13	125	81	10
9,00	10,89	125	81	10
9,50	11,26	125	81	10
10,00	12,43	133	87	5
10,20	16,76	133	87	5
10,50	16,76	133	87	5
11,00	18,51	142	94	5
11,50	21,29	142	94	5
12,00	22,83	151	101	5
12,50	25,41	151	101	5
13,00	25,79	151	101	5

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1106

HSSCO DIN 338 W



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
				●					○	○	○			●			
				8-14					30-80	50-70	50-70			8-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon
1,00	2,95	34	12	10
1,25	3,49	38	16	10
1,50	2,81	40	18	10
2,00	2,81	49	24	10
2,25	3,40	53	27	10
2,50	2,80	57	30	10
2,75	4,35	61	33	10
3,00	3,11	61	33	10
3,10	3,38	65	36	10
3,20	3,38	65	36	10
3,25	3,44	65	36	10
3,30	4,31	65	36	10
3,50	3,38	70	39	10
3,75	3,99	70	39	10
4,00	3,83	75	43	10
4,10	4,78	75	43	10
4,20	4,78	75	43	10
4,25	4,44	75	43	10
4,50	4,44	80	47	10
4,75	4,41	80	47	10
5,00	4,67	86	52	10
5,10	5,94	86	52	10
5,20	5,31	86	52	10

Ø mm	€	L mm	l mm	Icon
5,25	5,81	86	52	10
5,50	5,68	93	57	10
5,75	6,43	93	57	10
6,00	6,31	93	57	10
6,25	6,63	101	63	10
6,50	7,51	101	63	10
6,75	7,91	109	69	10
7,00	8,73	109	69	10
7,25	10,08	109	69	10
7,50	9,94	109	69	10
8,00	10,78	117	75	10
8,25	11,64	117	75	10
8,50	12,99	117	75	10
9,00	14,09	125	81	10
9,50	15,95	125	81	10
10,00	17,54	133	87	5
10,25	24,44	133	87	5
10,50	20,76	133	87	5
11,00	22,14	142	94	5
11,50	25,97	142	94	5
12,00	25,97	151	101	5
12,50	32,57	151	101	5
13,00	32,57	151	101	5

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

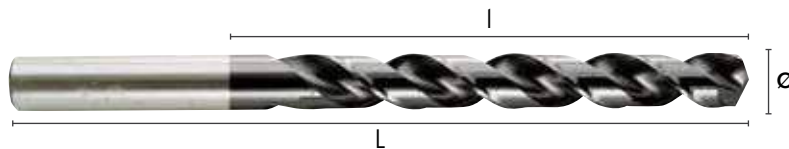
1162

HSSCO DIN 338 W



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
				● 12-20					○ 45-100		○ 75-95			● 12-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	
1,00	5,61	34	12	1
1,25	6,65	38	16	1
1,50	5,34	40	18	1
2,00	5,34	49	24	1
2,25	6,47	53	27	1
2,50	5,32	57	30	1
2,75	8,28	61	33	1
3,00	5,93	61	33	1
3,10	6,44	65	36	1
3,20	6,44	65	36	1
3,25	6,55	65	36	1
3,30	8,17	65	36	1
3,50	6,45	70	39	1
3,75	7,61	70	39	1
4,00	7,30	75	43	1
4,10	9,07	75	43	1
4,20	9,07	75	43	1
4,25	8,47	75	43	1
4,50	8,47	80	47	1
4,75	8,39	80	47	1
5,00	8,89	86	52	1
5,10	11,31	86	52	1
5,20	10,11	86	52	1

Ø mm	€	L mm	l mm	
5,25	11,07	86	52	1
5,50	10,83	93	57	1
5,75	12,24	93	57	1
6,00	12,02	93	57	1
6,25	12,60	101	63	1
6,50	14,32	101	63	1
6,75	15,04	109	69	1
7,00	16,61	109	69	1
7,25	19,19	109	69	1
7,50	18,94	109	69	1
8,00	20,55	117	75	1
8,25	22,18	117	75	1
8,50	24,75	117	75	1
9,00	26,84	125	81	1
9,50	30,38	125	81	1
10,00	33,38	133	87	1
10,25	46,54	133	87	1
10,50	39,53	133	87	1
11,00	42,18	142	94	1
11,50	49,46	142	94	1
12,00	49,46	151	101	1
12,50	62,01	151	101	1
13,00	62,01	151	101	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

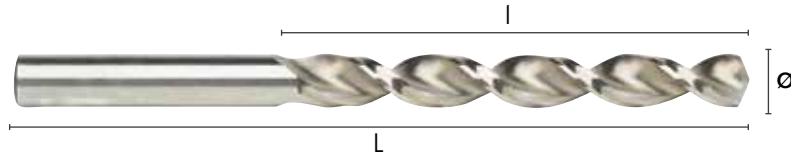
1159

HSSCO DIN 338 S



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 15-30	● 12-20	● 6-16		○ 8-14					● 30-80		● 50-70						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	📦	Ø mm	€	L mm	l mm	📦
2,00	3,76	49	24	10	6,00	8,15	93	57	10
2,10	3,61	49	24	10	6,10	9,05	101	63	10
2,20	3,61	53	27	10	6,20	9,05	101	63	10
2,30	3,61	53	27	10	6,30	9,10	101	63	10
2,40	3,61	57	30	10	6,40	9,10	101	63	10
2,50	3,76	57	30	10	6,50	9,10	101	63	10
2,60	3,89	57	30	10	6,60	10,42	101	63	10
2,70	3,89	61	33	10	6,70	10,42	101	63	10
2,80	4,11	61	33	10	6,80	10,42	109	69	10
2,90	4,11	61	33	10	6,90	10,42	109	69	10
3,00	4,11	61	33	10	7,00	10,42	109	69	10
3,10	4,19	65	36	10	7,10	12,63	109	69	10
3,20	4,19	65	36	10	7,20	12,63	109	69	10
3,30	4,19	65	36	10	7,30	12,63	109	69	10
3,40	4,19	70	39	10	7,40	12,63	109	69	10
3,50	4,68	70	39	10	7,50	11,29	109	69	10
3,60	4,58	70	39	10	7,60	17,24	117	75	10
3,70	4,58	70	39	10	7,70	17,24	117	75	10
3,80	5,29	75	43	10	7,80	17,24	117	75	10
3,90	5,29	75	43	10	7,90	17,24	117	75	10
4,00	5,12	75	43	10	8,00	13,31	117	75	10
4,10	5,29	75	43	10	8,10	17,24	117	75	10
4,20	5,29	75	43	10	8,20	15,09	117	75	10
4,30	5,41	80	47	10	8,30	16,21	117	75	10
4,40	5,41	80	47	10	8,40	16,21	117	75	10
4,50	5,46	80	47	10	8,50	14,66	117	75	10
4,60	5,83	80	47	10	8,60	18,59	125	81	10
4,70	5,83	80	47	10	8,70	18,59	125	81	10
4,80	6,01	86	52	10	8,80	18,59	125	81	10
4,90	6,01	86	52	10	8,90	18,59	125	81	10
5,00	5,78	86	52	10	9,00	17,24	125	81	10
5,10	6,53	86	52	10	9,50	18,57	125	81	10
5,20	6,83	86	52	10	9,80	23,30	133	87	10
5,30	6,83	86	52	10	10,00	21,18	133	87	5
5,40	6,83	93	57	10	10,50	26,06	133	87	5
5,50	7,74	93	57	10	11,00	32,26	142	94	5
5,60	8,17	93	57	10	11,50	39,13	142	94	5
5,70	9,10	93	57	10	12,00	40,37	151	101	5
5,80	8,17	93	57	10	12,50	44,05	151	101	5
5,90	8,17	93	57	10	13,00	44,05	151	101	5

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

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HSSCO DIN 338 S



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		○					●		●						
25-45	18-30	10-25		12-20					45-100		70-90						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm		Ø mm	€	L mm	l mm	
2,00	5,27	49	24	1	6,00	11,41	93	57	1
2,10	5,07	49	24	1	6,10	12,66	101	63	1
2,20	5,07	53	27	1	6,20	12,66	101	63	1
2,30	5,07	53	27	1	6,30	12,73	101	63	1
2,40	5,07	57	30	1	6,40	12,73	101	63	1
2,50	5,27	57	30	1	6,50	12,73	101	63	1
2,60	5,43	57	30	1	6,60	14,59	101	63	1
2,70	5,43	61	33	1	6,70	14,59	101	63	1
2,80	5,75	61	33	1	6,80	14,59	109	69	1
2,90	5,75	61	33	1	6,90	14,59	109	69	1
3,00	5,75	61	33	1	7,00	14,30	109	69	1
3,10	5,88	65	36	1	7,10	17,68	109	69	1
3,20	5,88	65	36	1	7,20	17,68	109	69	1
3,30	5,88	65	36	1	7,30	17,68	109	69	1
3,40	5,88	70	39	1	7,40	17,68	109	69	1
3,50	6,54	70	39	1	7,50	15,80	109	69	1
3,60	6,42	70	39	1	7,60	24,15	117	75	1
3,70	6,42	70	39	1	7,70	24,15	117	75	1
3,80	7,41	75	43	1	7,80	24,15	117	75	1
3,90	7,41	75	43	1	7,90	24,15	117	75	1
4,00	7,16	75	43	1	8,00	18,64	117	75	1
4,10	7,41	75	43	1	8,10	24,15	117	75	1
4,20	7,41	75	43	1	8,20	21,12	117	75	1
4,30	7,57	80	47	1	8,30	24,15	117	75	1
4,40	7,66	80	47	1	8,40	24,15	117	75	1
4,50	7,66	80	47	1	8,50	20,51	117	75	1
4,60	8,16	80	47	1	8,60	26,04	125	81	1
4,70	8,16	80	47	1	8,70	26,04	125	81	1
4,80	8,42	86	52	1	8,80	26,04	125	81	1
4,90	8,42	86	52	1	8,90	26,04	125	81	1
5,00	8,08	86	52	1	9,00	24,15	125	81	1
5,10	9,14	86	52	1	9,50	26,00	125	81	1
5,20	9,58	86	52	1	9,80	32,63	133	87	1
5,30	9,58	86	52	1	10,00	29,64	133	87	1
5,40	9,58	93	57	1	10,50	36,49	133	87	1
5,50	10,84	93	57	1	11,00	45,15	142	94	1
5,60	11,46	93	57	1	11,50	54,79	142	94	1
5,70	12,73	93	57	1	12,00	56,50	151	101	1
5,80	11,46	93	57	1	12,50	58,55	151	101	1
5,90	11,46	93	57	1	13,00	61,68	151	101	1

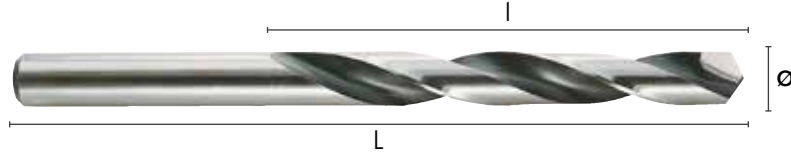
BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1110 HSS DIN 338 N - WIDIA



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○				●	●				○					
25-45	18-30	10-25	6-9				30-40	15-20				30-35					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



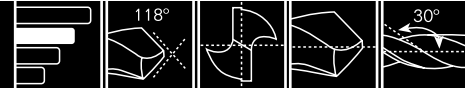
∅ mm	€	L mm	l mm	
1,50	27,05	40	18	1
2,00	20,55	49	24	1
2,50	20,55	57	30	1
3,00	20,55	61	33	1
3,50	20,55	70	39	1
4,00	20,55	75	43	1
4,50	21,01	80	47	1
5,00	21,01	86	52	1
5,50	22,22	93	57	1
6,00	23,30	93	57	1
6,50	27,65	101	63	1
7,00	27,65	109	69	1
7,50	28,75	109	69	1
8,00	28,75	117	75	1
8,50	31,46	117	75	1

∅ mm	€	L mm	l mm	
9,00	31,46	125	81	1
9,50	34,39	125	81	1
10,00	34,39	133	87	1
10,50	44,32	133	87	1
11,00	44,32	142	97	1
12,00	51,00	151	101	1
13,00	60,93	151	101	1
14,00	71,00	160	108	1
15,00	80,86	169	114	1
16,00	93,10	178	120	1
17,00	101,93	184	125	1
18,00	109,75	191	130	1
19,00	136,30	198	135	1
20,00	155,16	205	140	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

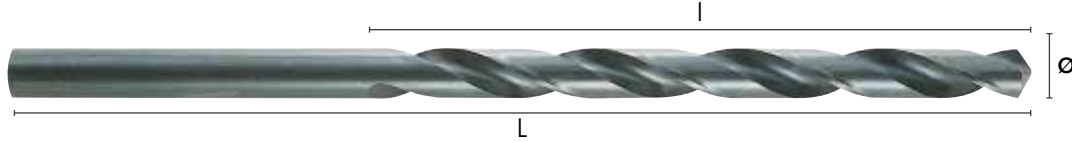
1112

HSS DIN 340 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	📦	Ø mm	€	L mm	l mm	📦
1,00	3,23	56	33	10	5,25	5,48	132	87	10
1,10	3,91	60	37	10	5,30	6,03	132	87	10
1,20	3,91	65	41	10	5,40	6,03	139	91	10
1,25	3,55	65	41	10	5,50	4,95	139	91	10
1,30	3,91	65	41	10	5,60	6,03	139	91	10
1,40	3,91	70	45	10	5,70	6,03	139	91	10
1,50	3,23	70	45	10	5,75	5,48	139	91	10
1,60	3,32	76	50	10	5,80	6,03	139	91	10
1,70	3,03	76	50	10	5,90	6,03	139	91	10
1,75	3,03	80	53	10	6,00	4,85	139	91	10
1,80	3,32	80	53	10	6,10	7,65	148	97	10
1,90	3,32	80	53	10	6,20	7,65	148	97	10
2,00	2,77	85	56	10	6,25	6,95	148	97	10
2,10	3,32	85	56	10	6,30	7,65	148	97	10
2,20	3,32	85	56	10	6,40	8,34	148	97	10
2,25	3,03	90	59	10	6,50	6,33	148	97	10
2,30	3,32	90	59	10	6,60	7,65	148	97	10
2,40	3,32	95	62	10	6,70	7,65	148	97	10
2,50	2,77	95	62	10	6,75	6,95	156	102	10
2,60	3,32	100	66	10	6,80	8,84	156	102	10
2,70	3,32	100	66	10	6,90	8,84	156	102	10
2,75	3,03	100	66	10	7,00	6,33	156	102	10
2,80	3,32	100	66	10	7,10	9,35	156	102	10
2,90	3,32	100	66	10	7,20	9,35	156	102	10
3,00	2,51	100	66	10	7,25	8,52	156	102	10
3,10	3,96	106	69	10	7,30	9,35	156	102	10
3,20	3,96	106	69	10	7,40	9,35	156	102	10
3,25	3,60	106	69	10	7,50	7,73	156	102	10
3,30	3,96	106	69	10	7,60	9,35	165	109	10
3,40	3,96	112	73	10	7,70	9,35	165	109	10
3,50	3,27	112	73	10	7,75	8,52	165	109	10
3,60	3,96	112	73	10	7,80	9,35	165	109	10
3,70	3,96	112	73	10	7,90	9,35	165	109	10
3,75	3,60	112	73	10	8,00	7,73	165	109	10
3,80	3,96	119	78	10	8,10	11,53	165	109	10
3,90	3,96	119	78	10	8,20	11,53	165	109	10
4,00	3,06	119	78	10	8,25	10,48	165	109	10
4,10	5,06	119	78	10	8,30	11,53	165	109	10
4,20	5,06	119	78	10	8,40	11,53	165	109	10
4,25	4,61	119	78	10	8,50	9,51	165	109	10
4,30	5,06	126	82	10	8,75	10,48	175	115	10
4,40	5,06	126	82	10	8,80	11,53	175	115	10
4,50	4,26	126	82	10	8,90	12,02	175	115	10
4,60	5,06	126	82	10	9,00	9,51	175	115	10
4,70	5,06	126	82	10	9,25	12,18	175	115	10
4,75	4,61	126	82	10	9,30	13,43	175	115	10
4,80	5,06	132	87	10	9,40	13,43	175	115	10
4,90	5,06	132	87	10	9,50	11,11	175	115	10
5,00	3,94	132	87	10	9,70	13,43	184	121	10
5,10	6,03	132	87	10	9,75	12,18	184	121	10
5,20	6,03	132	87	10	9,90	13,43	184	121	10

(continúa Ref.1112 / suite Réf.1112 / Ref.1112 cont'd)

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.1112 / suite Réf.1112 / Ref.1112 cont'd)

Ø mm	€	L mm	l mm	
10,00	11,11	184	121	5
10,25	16,66	184	121	5
10,30	23,71	184	121	5
10,40	18,34	184	121	5
10,50	15,17	184	121	5
10,75	16,66	195	128	5
11,00	15,17	195	128	5
11,10	21,74	195	128	5
11,20	21,74	195	128	5
11,25	19,77	195	128	5
11,50	17,98	195	128	5
11,75	19,77	195	128	5
12,00	17,98	205	134	5
12,25	23,78	205	134	5
12,50	21,61	205	134	5
12,75	23,78	205	134	5
13,00	21,61	205	134	5

Ø mm	€	L mm	l mm	
13,25	29,70	214	140	1
13,50	27,00	214	140	1
13,75	29,70	214	140	1
14,00	27,00	214	140	1
14,50	30,08	220	144	1
15,00	30,08	220	144	1
15,50	32,87	227	149	1
16,00	32,87	227	149	1
16,50	45,11	235	154	1
17,00	45,11	235	154	1
17,50	49,77	241	158	1
18,00	49,77	241	158	1
18,50	56,68	247	162	1
19,00	56,68	247	162	1
19,50	61,26	254	166	1
20,00	61,26	254	166	1

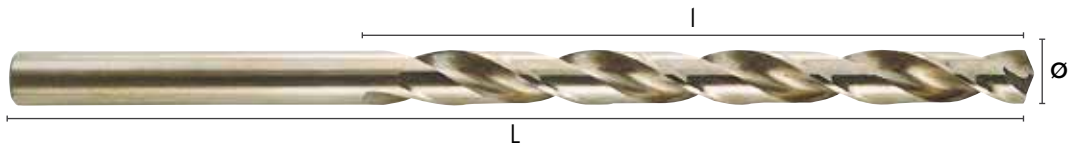
1113

HSSCO DIN 340 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 15-35	● 12-20	● 6-16		○ 8-14		● 25-30	● 12-16		○ 50-60	● 30-60		○ 20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



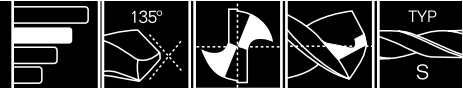
Ø mm	€	L mm	l mm	
2,00	6,58	85	56	10
2,50	6,58	95	62	10
3,00	6,58	100	66	10
3,25	11,47	106	69	10
3,50	7,81	112	73	10
3,75	7,81	112	73	10
4,00	7,81	119	78	10
4,25	9,07	119	78	10
4,50	10,01	126	82	10
4,75	12,43	126	82	10
5,00	10,01	132	87	10
5,25	21,81	132	87	10
5,50	10,96	139	91	10
5,75	14,82	139	91	10
6,00	10,96	139	91	10

Ø mm	€	L mm	l mm	
6,50	13,91	148	97	10
7,00	15,12	156	102	10
7,50	18,51	156	102	10
8,00	17,00	165	109	10
8,50	21,01	165	109	10
9,00	21,01	175	115	10
9,50	24,45	175	115	10
10,00	32,95	184	121	5
10,50	41,48	184	121	5
11,00	43,05	195	128	5
11,50	55,83	195	128	5
12,00	46,25	205	134	5
12,50	59,01	205	134	5
13,00	59,01	204	134	5

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1114

HSSCO DIN 340 S



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 15-30	● 12-20	● 6-16		○ 8-14					● 30-80		● 50-70						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	
2,00	9,10	85	56	1
2,10	8,45	85	56	1
2,30	8,78	90	59	1
2,50	9,10	95	62	1
2,70	9,26	100	66	1
3,00	9,44	100	66	1
3,10	10,84	106	69	1
3,20	10,84	106	69	1
3,30	10,84	106	69	1
3,50	10,50	112	73	1
3,60	11,45	112	73	1
3,70	11,72	112	73	1
4,00	10,42	119	78	1
4,10	13,47	119	78	1
4,20	13,47	119	78	1
4,30	15,14	126	82	1
4,50	12,06	126	82	1
4,70	14,98	126	82	1
4,80	15,67	132	87	1
5,00	12,97	132	87	1
5,10	16,29	132	87	1
5,20	16,26	132	87	1
5,50	15,03	139	91	1

Ø mm	€	L mm	l mm	
5,60	19,28	139	91	1
5,80	19,75	139	91	1
6,00	15,99	139	91	1
6,20	24,44	148	97	1
6,50	19,83	148	97	1
6,80	31,10	156	102	1
7,00	24,49	156	102	1
7,20	30,66	156	102	1
7,50	28,16	156	102	1
8,00	28,16	165	109	1
8,20	33,33	165	109	1
8,50	32,79	165	109	1
8,80	35,55	175	115	1
9,00	34,18	175	115	1
9,50	44,75	175	115	1
9,80	61,32	184	121	1
10,00	45,73	184	121	1
10,50	71,12	184	121	1
11,00	53,54	195	128	1
11,50	99,39	195	128	1
12,00	73,85	195	128	1
13,00	92,01	195	128	1

P Aceros
Aciers
Steels

M Aceros Inox
Aciers Inox
Stainless Steels

K Fundicion
Fonte
Cast Iron

N Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S Titanio y Superalesiones
Titanium et Supeallages
Titanium and Superalloys

H Materiales Duros
Materiels Durs
Hard materials

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

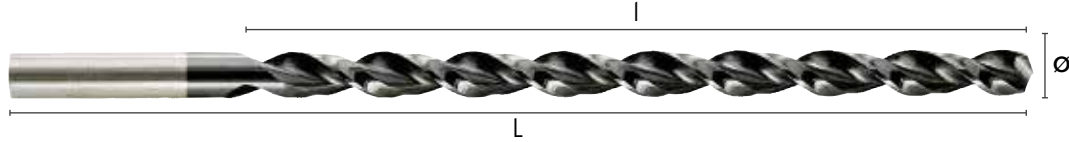
1164

HSSCO DIN 340 S



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		○					●		●						
25-45	18-30	10-25		12-20					45-100		70-90						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



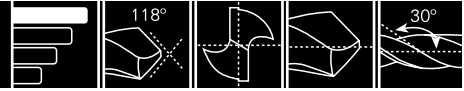
Ø mm	€	L mm	l mm	Icon
2,00	11,74	85	56	1
2,10	10,89	85	56	1
2,30	11,31	90	59	1
2,50	11,74	95	62	1
2,70	11,93	100	66	1
3,00	12,14	100	66	1
3,10	13,96	106	69	1
3,20	13,96	106	69	1
3,30	13,96	106	69	1
3,50	13,53	112	73	1
3,60	14,74	112	73	1
3,70	15,09	112	73	1
4,00	13,41	119	78	1
4,10	17,37	119	78	1
4,20	17,37	119	78	1
4,30	19,50	126	82	1
4,50	15,54	126	82	1
4,70	19,30	126	82	1
4,80	20,19	132	87	1
5,00	16,69	132	87	1
5,10	20,97	132	87	1
5,20	20,94	132	87	1
5,50	19,35	139	91	1

Ø mm	€	L mm	l mm	Icon
5,60	24,86	139	91	1
5,80	25,43	139	91	1
6,00	20,60	139	91	1
6,20	31,48	148	97	1
6,50	25,54	148	97	1
6,80	40,07	156	102	1
7,00	31,53	156	102	1
7,20	39,49	156	102	1
7,50	36,27	156	102	1
8,00	36,27	165	109	1
8,20	42,93	165	109	1
8,50	42,22	165	109	1
8,80	45,80	175	115	1
9,00	44,01	175	115	1
9,50	57,65	175	115	1
9,80	78,98	184	121	1
10,00	58,90	184	121	1
10,50	91,60	184	121	1
11,00	68,96	195	128	1
11,50	128,03	195	128	1
12,00	95,12	195	128	1
13,00	118,51	195	128	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

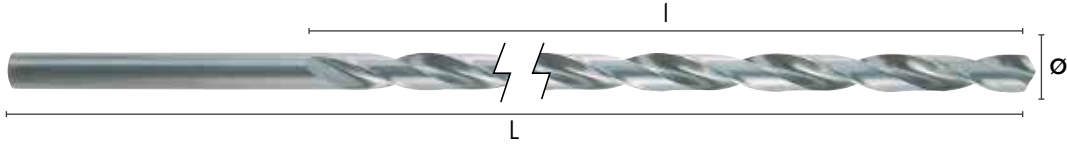
1115

HSS DIN 1869 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	📦	Ø mm	€	L mm	l mm	📦
2,00	12,02	125	85	1	8,00	44,13	305	210	1
2,50	12,56	140	95	1	8,00	57,47	390	265	1
3,00	12,98	150	100	1	8,50	43,37	240	165	1
3,00	13,88	190	130	1	8,50	59,10	305	210	1
3,50	14,65	165	115	1	8,50	81,28	390	265	1
3,50	16,88	210	145	1	9,00	41,36	250	175	1
3,50	24,17	265	180	1	9,00	54,61	320	220	1
4,00	14,65	175	120	1	9,00	80,17	410	280	1
4,00	17,29	220	150	1	9,50	48,69	250	175	1
4,00	24,63	280	190	1	9,50	66,93	320	220	1
4,50	16,23	185	125	1	9,50	90,16	410	280	1
4,50	20,29	235	160	1	10,00	48,06	265	185	1
4,50	29,02	295	200	1	10,00	62,86	340	235	1
5,00	17,17	195	135	1	10,00	87,35	430	295	1
5,00	21,80	245	170	1	10,50	91,59	265	145	1
5,00	26,82	315	210	1	10,50	99,26	340	250	1
5,50	20,34	205	140	1	10,50	105,57	430	295	1
5,50	29,02	260	180	1	11,00	60,85	280	195	1
5,50	33,53	330	235	1	11,00	89,12	365	250	1
6,00	20,34	205	140	1	11,00	104,34	455	310	1
6,00	29,02	260	180	1	11,50	85,29	280	195	1
6,00	33,53	330	225	1	11,50	114,50	365	250	1
6,50	24,17	215	150	1	11,50	118,30	455	310	1
6,50	31,23	275	190	1	12,00	80,35	295	205	1
6,50	38,92	350	235	1	12,00	100,55	375	260	1
7,00	25,62	225	155	1	12,00	122,83	480	315	1
7,00	35,67	290	210	1	12,50	99,26	295	205	1
7,00	48,20	370	250	1	12,50	111,15	375	260	1
7,50	28,85	225	155	1	12,50	134,93	480	315	1
7,50	38,42	290	200	1	13,00	99,26	295	205	1
7,50	56,00	370	250	1	13,00	114,52	375	260	1
8,00	31,88	240	165	1	13,00	136,21	480	315	1



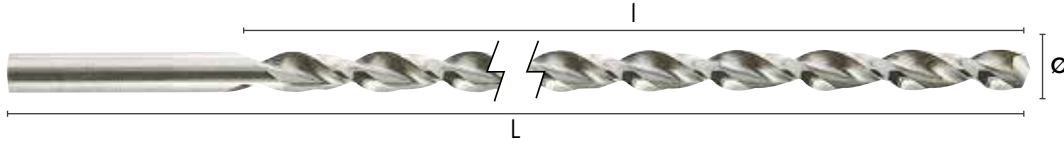
BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1165 HSSCO DIN 1869 S



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●			○					●		●						
15-30	12-20			8-14					30-80		50-70						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon
2,00	18,07	125	85	1
2,50	19,71	140	95	1
3,00	19,71	150	100	1
3,00	23,01	190	130	1
3,00	36,15	240	160	1
3,50	21,36	165	115	1
3,50	24,64	210	145	1
3,50	32,87	265	180	1
4,00	23,01	175	120	1
4,00	27,94	220	150	1
4,00	32,87	180	190	1
4,50	24,64	185	125	1
4,50	31,23	235	160	1
4,50	36,15	295	200	1
5,00	26,29	195	135	1
5,00	32,87	245	170	1
5,00	39,44	315	210	1
5,50	29,58	205	140	1
5,50	37,78	260	180	1
5,50	44,37	330	225	1
6,00	27,94	205	140	1
6,00	34,51	260	180	1
6,00	42,74	330	225	1
6,50	31,23	215	150	1
6,50	39,44	275	190	1
6,50	52,57	350	235	1
7,00	36,15	225	155	1
7,00	42,74	290	200	1
7,00	57,52	370	250	1
7,50	39,44	225	155	1

Ø mm	€	L mm	l mm	Icon
7,50	47,65	290	200	1
7,50	62,44	370	250	1
8,00	44,37	240	165	1
8,00	52,57	305	210	1
8,00	75,60	390	265	1
8,50	46,01	240	165	1
8,50	55,86	305	210	1
8,50	78,88	390	265	1
9,00	54,22	250	175	1
9,00	65,73	320	220	1
9,00	92,03	410	280	1
9,50	55,86	250	175	1
9,50	65,73	320	220	1
9,50	96,96	410	280	1
10,00	62,44	265	185	1
10,00	87,09	340	235	1
10,00	106,80	430	295	1
10,50	65,73	265	185	1
10,50	92,03	340	235	1
10,50	110,10	430	295	1
11,00	72,29	280	195	1
11,00	100,23	365	250	1
11,00	123,24	455	310	1
11,50	82,16	280	195	1
11,50	113,38	365	250	1
11,50	138,03	455	310	1
12,00	90,37	275	205	1
12,00	123,24	375	260	1
12,00	152,82	480	330	1

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1116

HSS DIN 1897 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	📦	Ø mm	€	L mm	l mm	📦
1,00	1,23	26	6	10	5,10	2,38	62	26	10
1,10	2,72	28	7	10	5,20	2,38	62	26	10
1,20	3,14	30	8	10	5,25	1,95	62	26	10
1,25	1,11	30	8	10	5,30	2,39	62	26	10
1,30	3,61	30	8	10	5,40	2,39	66	28	10
1,40	4,14	32	9	10	5,50	1,95	66	28	10
1,50	1,08	32	9	10	5,60	2,58	66	28	10
1,60	2,46	34	10	10	5,70	3,87	66	28	10
1,70	2,85	34	10	10	5,75	2,24	66	28	10
1,75	1,08	36	11	10	5,80	2,58	66	28	10
1,80	2,85	36	11	10	5,90	2,72	66	28	10
1,90	2,85	36	11	10	6,00	2,24	66	28	10
2,00	1,08	38	12	10	6,10	3,22	70	31	10
2,10	1,32	38	12	10	6,20	3,22	70	31	10
2,20	1,32	40	13	10	6,25	2,67	70	31	10
2,25	1,08	40	13	10	6,30	3,22	70	31	10
2,30	1,32	40	13	10	6,40	3,22	70	31	10
2,40	1,32	43	14	10	6,50	2,67	70	31	10
2,50	1,08	43	14	10	6,60	3,74	70	31	10
2,60	1,79	43	14	10	6,70	3,74	70	31	10
2,70	1,23	46	16	10	6,75	3,08	74	34	10
2,75	1,12	46	16	10	6,80	3,74	74	34	10
2,80	1,35	46	16	10	6,90	3,74	74	34	10
2,90	1,35	46	16	10	7,00	3,08	74	34	10
3,00	1,12	46	16	10	7,25	3,49	74	34	10
3,10	1,46	49	18	10	7,50	3,49	74	34	10
3,20	1,46	49	18	10	7,75	3,83	79	37	10
3,25	1,22	49	18	10	8,00	3,83	79	37	10
3,30	1,39	49	18	10	8,25	4,58	79	37	10
3,40	1,46	52	20	10	8,50	4,58	79	37	10
3,50	1,22	52	20	10	8,75	5,06	84	40	10
3,60	1,62	52	20	10	9,00	5,00	84	40	10
3,70	1,62	52	20	10	9,25	5,32	84	40	10
3,75	1,31	52	20	10	9,50	5,59	84	40	10
3,80	1,62	55	22	10	9,75	6,25	89	43	10
3,90	1,62	55	22	10	10,00	6,25	89	43	5
4,00	1,31	55	22	10	10,50	7,02	89	43	5
4,10	1,90	55	22	10	11,00	7,84	95	47	5
4,20	1,90	55	22	10	11,50	8,72	95	47	5
4,25	1,59	55	22	10	12,00	9,19	102	51	5
4,30	1,90	58	24	10	13,00	11,31	102	51	5
4,40	1,90	58	24	10	14,00	15,57	107	54	4
4,50	1,59	58	24	10	15,00	20,28	111	56	4
4,60	2,16	58	24	10	16,00	24,44	115	58	1
4,70	2,16	58	24	10	17,00	28,73	119	60	1
4,75	1,77	58	24	10	18,00	32,00	123	62	1
4,80	2,16	62	26	10	19,00	35,67	127	64	1
4,90	2,16	62	26	10	20,00	42,77	131	66	1
5,00	1,77	62	26	10					



BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1117 HSS DIN 1897 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		○		●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon
2,00	2,35	38	9	10
2,25	2,35	40	9	10
2,50	2,35	43	10	10
2,75	2,35	46	10	10
3,00	2,04	46	10	10
3,25	2,04	49	10	10
3,30	2,04	49	10	10
3,50	2,27	52	13	10
3,75	2,60	52	13	10
4,00	2,34	55	13	10
4,10	2,52	55	13	10
4,20	2,52	55	13	10

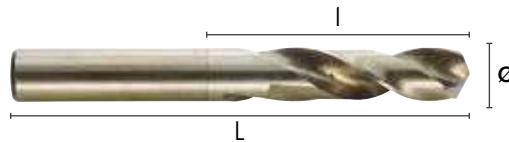
Ø mm	€	L mm	l mm	Icon
4,25	2,52	55	13	10
4,50	2,60	58	13	10
4,75	4,21	58	13	10
4,80	2,87	58	13	10
5,00	2,98	62	13	10
5,25	4,21	62	13	10
5,50	3,59	66	16	10
5,75	4,97	66	16	10
6,00	4,02	66	16	10
7,00	5,31	74	19	10
8,00	6,51	79	19	10

1118 HSSCO DIN 1897 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		○		●	●		○	●		○					
15-35	12-20	6-16		8-14		25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon
2,00	1,42	38	12	10
2,20	2,48	40	13	10
2,25	1,94	40	13	10
2,50	2,03	43	14	10
2,70	3,42	46	16	10
2,75	2,14	46	16	10
3,00	2,14	46	16	10
3,20	2,71	49	18	10
3,25	2,10	49	18	10
3,30	2,80	49	18	10
3,50	2,27	52	20	10
3,75	2,38	52	20	10
4,00	2,50	55	22	10
4,10	4,56	55	22	10
4,20	3,45	55	22	10
4,25	2,71	55	22	10
4,50	2,88	58	24	10
4,75	2,98	58	24	10
4,90	3,61	62	26	10
5,00	3,22	62	26	10
5,10	4,03	62	26	10

Ø mm	€	L mm	l mm	Icon
5,20	3,92	62	26	10
5,25	3,07	62	26	10
5,50	3,36	66	28	10
5,75	3,48	66	28	10
6,00	3,62	66	28	10
6,50	4,14	70	31	10
6,75	7,07	74	34	10
7,00	4,64	74	34	10
7,50	5,89	74	34	10
8,00	6,54	79	37	10
8,25	8,33	79	37	10
8,50	7,07	79	37	10
9,00	7,84	84	40	10
9,50	8,46	84	40	10
10,00	9,39	89	43	5
10,50	14,12	89	43	5
11,00	13,04	95	47	5
11,50	14,63	95	47	5
12,00	17,96	102	51	5
12,50	18,84	102	51	5
13,00	24,62	102	51	5

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

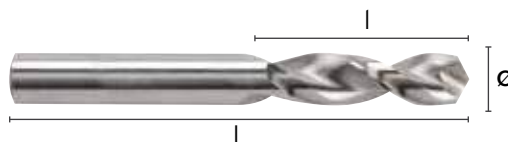
1166

HSSCO DIN 1897 S



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●							●		●						
15-30	12-20	6-16							30-80		50-70						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon	Ø mm	€	L mm	l mm	Icon
2,00	4,15	38	12	10	5,70	7,87	66	28	10
2,50	3,74	43	14	10	5,80	7,56	66	28	10
2,80	3,76	46	16	10	5,90	7,56	66	28	10
3,00	3,60	46	16	10	6,00	7,46	66	28	10
3,10	4,00	49	18	10	6,10	9,59	66	28	10
3,20	4,00	49	18	10	6,20	9,56	70	31	10
3,30	4,00	49	18	10	6,50	8,92	70	31	10
3,40	4,00	52	20	10	6,80	12,43	70	31	10
3,50	4,00	52	20	10	7,00	10,22	74	34	10
3,60	4,87	52	20	10	7,20	12,96	74	34	10
3,70	4,87	52	20	10	7,50	13,19	74	34	10
3,80	5,07	55	22	10	7,80	13,19	74	34	10
3,90	4,87	55	22	10	8,00	12,85	79	37	10
4,00	4,43	55	22	10	8,20	11,35	79	37	10
4,10	5,27	55	22	10	8,50	15,24	79	37	10
4,20	5,27	55	22	10	8,80	22,30	79	37	10
4,30	6,07	58	24	10	9,00	16,62	84	40	10
4,40	6,07	58	24	10	9,20	18,73	84	40	10
4,50	5,27	58	24	10	9,50	18,73	84	40	10
4,60	6,31	58	24	10	9,80	20,81	84	40	10
4,70	6,33	58	24	10	10,00	20,81	89	43	10
4,80	6,33	62	26	10	10,50	22,63	89	43	5
4,90	6,31	62	26	10	11,00	25,94	89	43	5
5,00	5,87	62	26	10	11,50	28,81	95	47	5
5,10	7,18	62	26	10	12,00	30,36	95	47	5
5,20	7,18	62	26	10	13,00	37,40	102	51	5
5,30	7,18	62	26	10	14,00	48,20	102	51	5
5,40	7,17	66	28	10	15,00	53,37	107	54	4
5,50	6,55	66	28	10	16,00	61,97	111	56	4
5,60	7,56	66	28	10					

BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

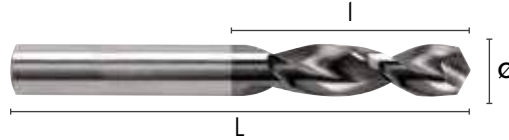
1167

HSSCO DIN 1897 S



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		○					●		●						
25-45	18-30	10-25		12-20					45-100		70-90						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



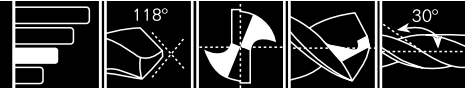
Ø mm	€	L mm	l mm	
2,00	5,82	38	12	1
2,50	5,26	43	14	1
2,80	5,26	46	16	1
3,00	5,04	46	16	1
3,10	5,60	49	18	1
3,20	5,60	49	18	1
3,30	5,60	49	18	1
3,40	5,60	52	20	1
3,50	5,60	52	20	1
3,60	6,83	52	20	1
3,70	6,83	52	20	1
3,80	7,10	55	22	1
3,90	6,83	55	22	1
4,00	6,22	55	22	1
4,10	7,36	55	22	1
4,20	7,36	55	22	1
4,30	8,50	58	24	1
4,40	8,50	58	24	1
4,50	7,36	58	24	1
4,60	8,86	58	24	1
4,70	8,87	58	24	1
4,80	8,87	62	26	1
4,90	8,86	62	26	1
5,00	8,24	62	26	1
5,10	10,03	62	26	1
5,20	10,03	62	26	1
5,30	10,03	62	26	1
5,40	10,03	66	28	1
5,50	9,17	66	28	1
5,60	10,59	66	28	1

Ø mm	€	L mm	l mm	
5,70	11,01	66	28	1
5,80	10,59	66	28	1
5,90	10,59	66	28	1
6,00	10,44	66	28	1
6,10	13,41	70	31	1
6,20	13,40	70	31	1
6,50	12,46	70	31	1
6,80	17,40	74	34	1
7,00	14,32	74	34	1
7,20	18,16	74	34	1
7,50	18,47	74	34	1
7,80	18,48	79	37	1
8,00	17,99	79	37	1
8,20	15,90	79	37	1
8,50	21,33	79	37	1
8,80	31,21	84	40	1
9,00	23,27	84	40	1
9,20	26,22	84	40	1
9,50	26,22	84	40	1
9,80	29,13	89	43	1
10,00	29,13	89	43	1
10,50	31,68	89	43	1
11,00	36,32	95	47	1
11,50	40,33	95	47	1
12,00	42,53	102	51	1
13,00	52,36	102	51	1
14,00	67,47	107	54	1
15,00	74,70	111	56	1
16,00	86,77	115	58	1

BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1121

HSS DIN 345 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



▶	△	Ø mm	€	L mm	l mm	📦	▶	△	Ø mm	€	L mm	l mm	📦
	1	5,00	18,12	133	52	1		2	17,75	57,14	228	130	1
	1	5,25	20,87	133	52	1		2	18,00	38,20	228	130	1
	1	5,50	18,12	138	57	1		2	18,25	62,87	233	135	1
	1	5,75	20,87	138	57	1		2	18,50	42,05	233	135	1
	1	6,00	18,12	138	57	1		2	18,75	62,87	233	135	1
	1	6,25	23,77	144	63	1		2	19,00	42,05	233	135	1
	1	6,50	20,64	144	63	1		2	19,25	68,45	238	140	1
	1	6,75	23,77	150	69	1		2	19,50	45,76	238	140	1
	1	7,00	20,64	150	69	1		2	19,75	68,45	238	140	1
	1	7,25	25,52	150	69	1		2	20,00	45,76	238	140	1
	1	7,50	22,20	150	69	1		2	20,25	70,94	243	145	1
	1	7,75	25,52	156	75	1		2	20,50	49,46	243	145	1
	1	8,00	22,20	156	75	1		2	20,75	70,94	243	145	1
	1	8,25	29,95	156	75	1		2	21,00	49,46	243	145	1
	1	8,50	20,03	156	75	1		2	21,25	78,24	248	150	1
	1	8,75	29,95	162	81	1		2	21,50	54,60	248	150	1
	1	9,00	20,03	162	81	1		2	21,75	78,24	248	150	1
	1	9,25	30,94	162	81	1		2	22,00	54,60	248	150	1
	1	9,50	19,78	162	81	1		2	22,25	86,64	248	150	1
	1	9,75	30,94	168	87	1		2	22,50	59,73	253	155	1
	1	10,00	19,78	168	87	1		2	22,75	85,64	253	155	1
	1	10,25	31,58	168	87	1		2	23,00	59,73	253	155	1
	1	10,50	21,12	168	87	1		3	23,25	94,45	276	155	1
	1	10,75	31,58	175	94	1		3	23,50	65,92	276	155	1
	1	11,00	21,12	175	94	1		3	23,75	94,45	281	160	1
	1	11,25	33,26	175	94	1		3	24,00	65,92	281	160	1
	1	11,50	22,26	175	94	1		3	24,25	103,03	281	160	1
	1	11,75	33,26	175	94	1		3	24,50	71,86	281	160	1
	1	12,00	22,26	182	101	1		3	24,75	103,03	281	160	1
	1	12,25	37,05	182	101	1		3	25,00	71,86	281	160	1
	1	12,50	24,77	182	101	1		3	25,25	112,09	286	165	1
	1	12,75	37,05	182	101	1		3	25,50	78,20	286	165	1
	1	13,00	24,77	182	101	1		3	25,75	112,09	286	165	1
	1	13,25	40,73	189	108	1		3	26,00	78,20	286	165	1
	1	13,50	27,24	189	108	1		3	26,25	121,39	286	165	1
	1	13,75	40,73	189	108	1		3	26,50	84,68	286	165	1
	1	14,00	27,24	189	108	1		3	26,75	121,39	291	170	1
	2	14,25	44,07	212	114	1		3	27,00	86,94	291	170	1
	2	14,50	29,49	212	114	1		3	27,25	129,92	291	170	1
	2	14,75	44,07	212	114	1		3	27,50	90,67	291	170	1
	2	15,00	29,49	212	114	1		3	27,75	129,92	291	170	1
	2	15,25	45,66	218	120	1		3	28,00	90,67	291	170	1
	2	15,50	30,51	218	120	1		3	28,25	139,35	296	175	1
	2	15,75	45,66	218	120	1		3	28,50	97,21	296	175	1
	2	16,00	30,51	218	120	1		3	28,75	139,35	296	175	1
	2	16,25	51,61	223	125	1		3	29,00	97,21	296	175	1
	2	16,50	34,52	223	125	1		3	29,25	153,22	296	175	1
	2	16,75	51,61	223	125	1		3	29,50	106,73	296	175	1
	2	17,00	34,52	223	125	1		3	29,75	153,22	296	175	1
	2	17,25	57,14	228	130	1		3	30,00	106,89	296	175	1
	2	17,50	38,20	228	130	1		3	30,25	170,49	301	180	1

(continúa Ref.1121 / suite Réf.1121 / Ref.1121 cont'd)



BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

(continúa Ref.1121 / suite Réf.1121 / Ref.1121 cont'd)

		∅ mm	€	L mm	l mm	
3		30,50	148,26	301	180	1
3		30,75	170,49	301	180	1
3		31,00	118,97	301	180	1
3		31,25	180,57	301	180	1
3		31,50	148,34	301	180	1
3		31,75	180,57	306	185	1
4		32,00	125,97	334	185	1
4		32,50	179,30	334	185	1
4		33,00	143,86	334	185	1
4		33,50	194,96	334	185	1
4		34,00	156,47	339	190	1
4		34,50	213,08	339	190	1
4		35,00	171,00	339	190	1
4		35,50	228,65	339	190	1
4		36,00	183,41	344	195	1
4		36,50	241,02	344	195	1
4		37,00	193,37	344	195	1
4		37,50	253,52	344	195	1
4		38,00	203,44	349	200	1
4		38,50	270,33	349	200	1
4		39,00	216,93	349	200	1
4		39,50	285,48	349	200	1
4		40,00	229,06	349	200	1
4		40,50	300,14	354	205	1
4		41,00	240,83	354	205	1
4		41,50	318,53	354	205	1
4		42,00	255,55	354	205	1
4		42,50	334,05	354	205	1
4		43,00	268,04	359	210	1
4		43,50	349,77	359	210	1
4		44,00	280,61	359	210	1
4		44,50	365,17	359	210	1
4		45,00	291,43	359	210	1
4		45,50	380,61	364	215	1
4		46,00	305,36	364	215	1
4		46,50	396,10	364	215	1
4		47,00	317,84	364	215	1
4		47,50	409,42	364	215	1
4		48,00	328,50	369	220	1
4		48,50	425,13	369	220	1
4		49,00	341,11	369	220	1
4		49,50	440,61	369	220	1

		∅ mm	€	L mm	l mm	
4		50,00	344,06	369	220	1
5		51,00	447,16	412	225	1
5		52,00	474,66	412	225	1
5		53,00	514,19	412	225	1
5		54,00	528,16	417	230	1
5		55,00	529,34	417	230	1
5		56,00	623,74	417	230	1
5		57,00	665,87	422	235	1
5		58,00	665,87	422	235	1
5		59,00	681,05	422	235	1
5		60,00	655,19	422	235	1
5		61,00	729,87	427	240	1
5		62,00	746,89	427	240	1
5		63,00	802,44	427	240	1
5		64,00	836,14	432	245	1
5		65,00	799,89	432	245	1
5		66,00	911,49	432	245	1
5		67,00	938,47	432	245	1
5		68,00	967,40	437	250	1
5		69,00	992,52	437	250	1
5		70,00	1.023,37	437	250	1
5		71,00	970,28	437	250	1
5		72,00	1.120,29	442	255	1
5		73,00	1.143,46	442	255	1
5		74,00	1.173,40	442	255	1
5		75,00	1.207,72	442	255	1
5		76,00	1.137,63	447	260	1
6		77,00	1.339,58	514	260	1
6		78,00	1.437,56	514	260	1
6		79,00	1.465,62	514	260	1
6		80,00	1.495,14	514	260	1

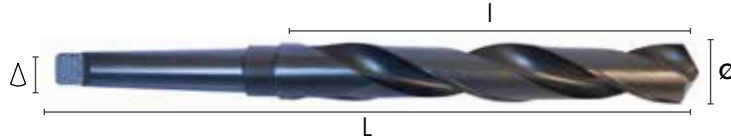
BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1121/9 HSS DIN 345 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	
1/2"	24,77	182	101	1
33/64"	24,77	182	101	1
17/32"	27,24	189	108	1
35/64"	27,24	189	108	1
9/16"	29,49	212	114	1
37/64"	44,07	212	114	1
19/32"	29,49	218	120	1
39/64"	30,51	218	120	1
5/8"	30,51	218	120	1
41/64"	51,61	223	125	1
21/32"	34,52	223	125	1
43/64"	34,52	223	125	1
11/16"	38,20	228	130	1
45/64"	38,20	228	130	1
23/32"	62,87	233	135	1
47/64"	42,05	233	135	1
3/4"	42,05	238	140	1
49/64"	45,76	238	140	1
25/32"	68,45	238	140	1
51/64"	45,76	243	145	1
13/16"	49,46	243	145	1
53/64"	49,46	243	145	1
27/32"	54,60	248	150	1
55/64"	78,24	248	150	1
7/8"	54,60	248	150	1
57/64"	59,73	253	155	1

Ø mm	€	L mm	l mm	
29/32"	59,73	253	155	1
59/64"	65,92	276	155	1
15/16"	129,92	281	160	1
61/64"	65,92	281	160	1
31/32"	54,60	281	160	1
63/64"	71,86	286	160	1
1"	79,40	290	170	1
1-1/16"	86,94	291	170	1
1-1/8"	97,21	296	175	1
1-5/32"	97,21	296	175	1
1-3/16"	106,89	301	180	1
1-7/32"	118,97	301	180	1
1-1/4"	180,57	306	185	1
1-9/32"	179,30	334	185	1
1-5/16"	143,86	334	185	1
1-11/32"	156,47	339	190	1
1-3/8"	171,00	339	190	1
1-13/32"	183,41	344	195	1
1-7/16"	241,02	344	195	1
1-1/2"	203,44	349	200	1
1-9/16"	229,06	349	200	1
1-5/8"	240,83	354	205	1
1-11/16"	268,04	359	210	1
1-3/4"	280,61	359	210	1
2"	344,06	374	225	1

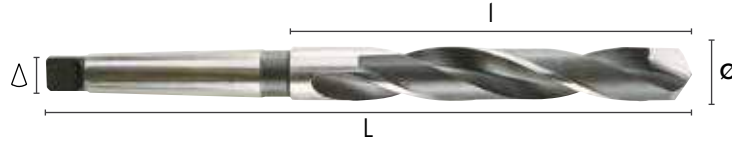
BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1123 HSS DIN 345 N - WIDIA



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○				●	●				○					
25-45	18-30	10-25	6-9				30-40	15-20				30-35					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	Ø mm	€	L mm	l mm	📦
1	10,00	80,28	168	87	1
1	11,00	86,84	175	94	1
1	12,00	91,11	182	101	1
1	13,00	103,55	182	101	1
1	14,00	112,57	189	108	1
1	14,50	127,18	212	114	1
2	15,00	127,18	212	114	1
2	15,50	135,85	218	120	1
2	16,00	135,85	218	120	1
2	16,50	144,10	223	125	1
2	17,00	144,10	223	125	1
2	17,50	155,51	228	130	1
2	18,00	155,51	228	130	1
2	18,50	182,03	233	135	1
2	19,00	182,03	233	135	1

△	Ø mm	€	L mm	l mm	📦
2	19,50	204,58	238	140	1
2	20,00	204,04	238	140	1
2	20,50	207,56	243	145	1
2	21,00	207,56	243	145	1
2	21,50	226,58	248	150	1
2	22,00	226,58	248	150	1
2	22,50	246,35	253	155	1
2	23,00	246,35	253	155	1
3	24,00	270,73	281	160	1
3	25,00	277,19	281	160	1
3	26,00	311,61	286	165	1
3	27,00	332,27	291	170	1
3	28,00	367,95	291	170	1
3	29,00	391,69	296	175	1
3	30,00	416,76	296	175	1

BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1122

HSSCO DIN 345 N



P			M		K			N				S		H			
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		○		●	●		○	●		●					
15-35	12-20	6-16		8-14		25-30	12-16		50-60	30-60		15-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



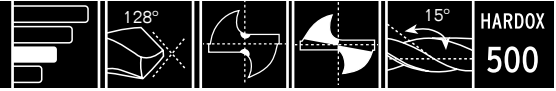
▶	△	Ø mm	€	L mm	l mm	📦
1		10,00	66,73	168	87	1
1		10,50	69,54	168	87	1
1		11,00	66,68	175	94	1
1		11,50	69,54	175	94	1
1		12,00	71,32	182	101	1
1		12,50	75,47	182	101	1
1		13,00	73,24	182	101	1
1		13,50	95,72	189	108	1
1		14,00	93,89	189	108	1
2		14,50	104,20	212	114	1
2		15,00	95,72	212	114	1
2		15,50	106,05	218	120	1
2		16,00	102,33	218	120	1
2		16,50	106,98	223	125	1
2		17,00	106,05	223	125	1
2		17,50	112,68	228	130	1
2		18,00	110,79	228	130	1
2		18,50	121,09	233	135	1
2		19,00	118,30	233	135	1
2		19,50	136,16	238	140	1
2		20,00	132,36	238	140	1
2		20,50	152,09	243	145	1
2		21,00	153,95	243	145	1
2		21,50	173,73	248	150	1
2		22,00	156,68	248	150	1
2		22,50	193,39	253	155	1

▶	△	Ø mm	€	L mm	l mm	📦
2		23,00	182,22	253	155	1
3		23,50	193,39	276	155	1
3		24,00	195,26	281	160	1
3		24,50	208,45	281	160	1
3		25,00	206,25	281	160	1
3		25,50	255,45	286	165	1
3		26,00	242,07	286	165	1
3		26,50	268,50	286	165	1
3		27,00	268,50	291	170	1
3		27,50	321,07	291	170	1
3		28,00	297,05	291	170	1
3		28,50	328,61	296	175	1
3		29,00	303,66	296	175	1
3		29,50	336,14	296	175	1
3		30,00	310,10	296	175	1
3		31,00	310,09	301	180	1
4		32,00	355,34	334	185	1
4		33,00	405,85	334	185	1
4		34,00	482,25	339	190	1
4		35,00	482,25	339	190	1
4		36,00	517,45	344	195	1
4		37,00	534,81	344	195	1
4		38,00	595,70	349	200	1
4		39,00	611,84	349	200	1
4		40,00	646,16	349	200	1

BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1181

HSSCO (8%)



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
		● 8-10	● 6-8										● 4-7		● 4-6		

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	Ø mm	€	L mm	l mm	📦
2	10	55,94	190	90	1
2	11	55,94	190	90	1
2	12	61,27	190	90	1
2	13	61,27	190	90	1
2	14	65,23	190	90	1
2	15	66,51	190	90	1
2	16	79,13	190	90	1
2	17	84,36	190	90	1
2	18	85,63	190	90	1
3	19	97,29	225	105	1
3	20	103,44	225	105	1
3	21	112,64	225	105	1
3	22	129,50	225	105	1

△	Ø mm	€	L mm	l mm	📦
3	24	139,50	225	105	1
3	25	165,31	225	105	1
3	26	195,89	225	105	1
4	27	210,66	265	120	1
4	28	218,75	265	120	1
4	30	243,32	265	120	1
4	32	283,19	265	120	1
4	35	353,83	265	120	1
4	36	372,14	265	120	1
4	40	467,84	265	120	1
4	45	636,27	265	120	1
5	50	747,47	340	150	1

BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1125 HSS DIN 341 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



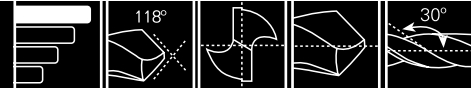
▶	△	Ø mm	€	L mm	l mm	📦
1	*	5,00	25,25	155	74	1
1	*	5,50	34,14	161	80	1
1	*	6,00	26,94	161	80	1
1	*	6,50	28,40	167	86	1
1	*	7,00	30,02	174	93	1
1	*	7,50	31,33	174	93	1
1		8,00	31,62	181	100	1
1		8,50	31,62	181	100	1
1		9,00	34,62	188	107	1
1		9,50	38,61	188	107	1
1		10,00	37,49	197	116	1
1		10,50	37,71	197	116	1
1		11,00	36,83	206	125	1
1		11,50	36,83	206	125	1
1		12,00	39,21	215	134	1
1		12,50	40,73	215	134	1
1		13,00	40,73	215	134	1
1		13,50	42,59	223	142	1
1		14,00	46,25	223	142	1
1		14,50	58,20	245	147	1
2		15,00	58,20	245	147	1
2		15,50	59,52	251	153	1
2		16,00	60,49	251	153	1
2		16,50	63,92	257	159	1
2		17,00	64,26	257	159	1
2		17,50	62,72	263	165	1
2		18,00	69,70	263	165	1
2		18,50	71,61	269	171	1
2		19,00	73,88	269	171	1
2		19,50	77,56	275	177	1
2		20,00	78,51	275	177	1

▶	△	Ø mm	€	L mm	l mm	📦
2		20,50	90,00	282	184	1
2		21,00	87,24	282	184	1
2		21,50	106,20	289	191	1
2		22,00	101,36	289	191	1
2		22,50	110,47	296	198	1
2		23,00	105,29	296	198	1
3		23,50	131,00	319	198	1
3		24,00	129,02	327	206	1
3		24,50	137,01	327	206	1
3		25,00	131,31	327	206	1
3		25,50	155,70	335	214	1
3		26,00	146,94	335	214	1
3		26,50	160,60	335	214	1
3		27,00	156,36	343	222	1
3		27,50	189,18	343	222	1
3		28,00	171,77	343	222	1
3		28,50	224,72	351	230	1
3		29,00	183,47	351	230	1
3		29,50	224,72	351	230	1
3		30,00	206,76	351	230	1
3		31,00	237,05	360	239	1
4		32,00	245,77	397	248	1
4		33,00	274,94	397	248	1
4		34,00	320,09	406	257	1
4		35,00	316,93	406	257	1
4		36,00	367,11	416	267	1
4		37,00	381,42	416	267	1
4		38,00	408,53	426	277	1
4		39,00	414,89	426	277	1
4		40,00	448,72	426	277	1

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

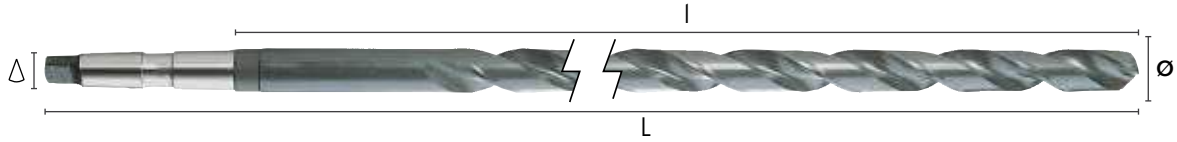
BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1126 HSS DIN 1870 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						●	●		○	●		○					
15-35						25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	Ø mm	€	L mm	l mm	📦	△	Ø mm	€	L mm	l mm	📦
1	8,00	79,35	265	165	1	2	20,00	240,65	385	260	1
1	8,00	98,91	330	210	1	2	20,00	292,51	490	325	1
1	8,50	87,10	265	165	1	2	20,50	272,56	385	260	1
1	8,50	101,08	330	210	1	2	20,50	327,30	490	325	1
1	9,00	89,68	275	175	1	2	21,00	272,56	385	260	1
1	9,00	114,03	345	220	1	2	21,00	327,30	490	325	1
1	9,50	96,00	275	175	1	2	21,50	290,65	405	270	1
1	9,50	115,22	345	220	1	2	21,50	351,28	515	345	1
1	10,00	98,63	285	185	1	2	22,00	290,65	405	270	1
1	10,00	121,61	360	235	1	2	22,00	351,28	515	345	1
1	10,50	104,73	285	185	1	2	22,50	331,25	405	270	1
1	10,50	125,36	360	235	1	2	22,50	396,51	515	345	1
1	11,00	109,32	300	195	1	2	23,00	331,25	405	270	1
1	11,00	149,49	375	250	1	2	23,00	396,51	515	345	1
1	11,50	119,71	300	195	1	3	23,50	363,95	425	270	1
1	11,50	149,49	375	250	1	3	23,50	441,29	535	345	1
1	12,00	122,50	310	205	1	3	24,00	363,95	440	290	1
1	12,00	152,65	395	260	1	3	24,00	441,29	555	365	1
1	12,50	130,38	310	205	1	3	24,50	377,18	440	290	1
1	12,50	170,39	395	260	1	3	24,50	465,09	555	365	1
1	13,00	130,38	310	205	1	3	25,00	377,18	440	290	1
1	13,00	170,39	395	260	1	3	25,00	465,09	555	365	1
1	13,50	142,76	325	220	1	3	25,50	389,85	440	290	1
1	13,50	174,98	410	275	1	3	25,50	513,75	555	365	1
1	14,00	142,76	325	220	1	3	26,00	389,85	440	290	1
1	14,00	174,98	410	275	1	3	26,00	513,75	555	365	1
2	14,50	156,37	340	220	1	3	26,50	399,22	440	290	1
2	14,50	190,58	425	275	1	3	26,50	530,09	555	365	1
2	15,00	156,37	340	220	1	3	27,00	399,22	460	305	1
2	15,00	190,58	425	275	1	3	27,00	530,09	580	385	1
2	15,50	175,30	355	230	1	3	27,50	425,90	460	305	1
2	15,50	210,22	445	295	1	3	27,50	573,46	580	385	1
2	16,00	175,30	355	230	1	3	28,00	425,90	460	305	1
2	16,00	210,22	445	295	1	3	28,00	573,46	580	385	1
2	16,50	188,91	355	230	1	3	28,50	441,29	460	305	1
2	16,50	227,14	445	295	1	3	28,50	632,74	580	385	1
2	17,00	188,91	355	230	1	3	29,00	441,29	460	305	1
2	17,00	227,14	445	295	1	3	29,00	632,74	580	385	1
2	17,50	207,86	370	245	1	3	29,50	456,89	460	305	1
2	17,50	250,12	465	310	1	3	29,50	637,95	580	385	1
2	18,00	207,86	370	245	1	3	30,00	456,89	460	305	1
2	18,00	250,12	465	310	1	3	30,00	637,95	580	385	1
2	18,50	225,34	370	245	1	3	31,00	512,15	480	320	1
2	18,50	270,28	465	310	1	3	31,00	680,17	610	410	1
2	19,00	225,34	370	245	1	4	32,00	535,50	505	320	1
2	19,00	270,28	465	310	1	4	32,00	713,62	635	410	1
2	19,50	240,65	385	260	1	4	33,00	583,51	505	320	1
2	19,50	292,51	490	325	1	4	33,00	790,04	635	410	1

(continúa Ref.1126 / suite Réf.1126 / Ref.1126 cont'd)

BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

(continúa Ref.1126 / suite Réf.1126 / Ref.1126 cont'd)

▶	△	∅ mm	€	L mm	l mm	📦
4		34,00	632,71	530	340	1
4		34,00	820,45	665	430	1
4		35,00	651,67	530	340	1
4		35,00	890,82	665	430	1
4		36,00	703,07	530	340	1
4		36,00	935,43	665	430	1
4		37,00	720,81	530	340	1
4		37,00	1.039,38	665	430	1
4		38,00	786,32	555	360	1
4		38,00	1.100,63	695	460	1
4		39,00	819,51	555	360	1
4		39,00	1.153,14	695	460	1

▶	△	∅ mm	€	L mm	l mm	📦
4		40,00	863,91	555	360	1
4		40,00	1.099,93	695	460	1
4		41,00	1.250,21	695	460	1
4		42,00	1.334,84	695	460	1
4		43,00	1.362,03	735	490	1
4		44,00	1.409,90	735	490	1
4		45,00	1.475,57	735	490	1
4		46,00	1.541,53	735	490	1
4		47,00	1.617,20	735	490	1
4		48,00	1.711,25	765	510	1
4		49,00	1.776,41	765	510	1
4		50,00	1.822,81	765	510	1

1139

HSS DIN 343



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●				○		●	●		○	●							
15-35				8-14		25-30	12-16		50-60	30-60		20-25					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



▶	△	∅ mm	d mm	€	L mm	l mm	📦
1		10,00	7,00	71,77	168	87	1
1		11,00	7,70	74,33	175	94	1
1		12,00	8,40	76,92	182	101	1
1		13,00	9,10	80,39	182	101	1
1		14,00	9,80	85,07	189	108	1
2		15,00	10,50	91,49	212	114	1
2		16,00	11,20	97,40	218	120	1
2		17,00	11,90	106,51	223	125	1
2		18,00	12,60	115,42	228	130	1
2		19,00	13,30	137,83	233	135	1
2		20,00	14,00	139,24	238	140	1
2		21,00	15,00	149,48	243	145	1
2		22,00	15,50	163,57	248	150	1

▶	△	∅ mm	d mm	€	L mm	l mm	📦
2		23,00	16,00	175,25	253	155	1
3		24,00	17,00	188,60	281	160	1
3		25,00	17,50	201,94	281	160	1
3		26,00	18,00	222,97	286	165	1
3		27,00	19,00	240,28	291	170	1
3		28,00	19,50	260,48	291	170	1
3		30,00	21,00	302,16	296	175	1
4		32,00	22,00	340,64	334	185	1
4		34,00	24,00	377,69	339	190	1
4		35,00	25,00	409,69	339	190	1
4		36,00	25,50	417,29	344	195	1
4		38,00	26,50	476,51	349	200	1
4		40,00	28,00	524,20	349	210	1

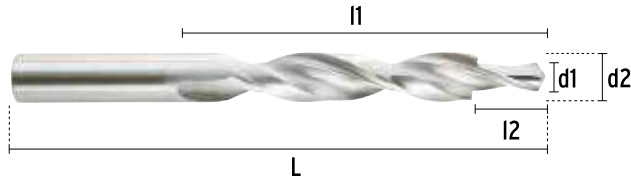
BROCAS BIDIAMETRALES Y DE CENTRAR FORETS BIÉTAGÉS ET À CENTRER / TWO-DIAMETER AND CENTRE DRILL-BITS

1127 HSS DIN 8376



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	●	○	●	●		○					
15-25	8-10					30-35	25-30	14-18	20-25	30-35		15-20					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
M-3	3,40	6,00	62,69	93	57	9	1
M-4	4,50	8,00	65,73	117	75	11	1
M-5	5,50	10,00	78,14	133	87	13	1

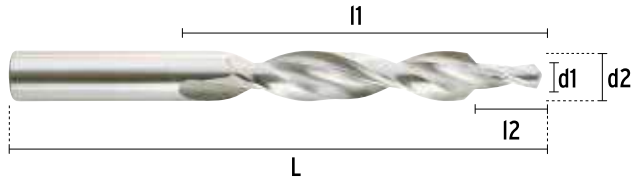
M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
M-6	6,60	11,00	88,29	142	94	15	1
M-8	9,00	15,00	108,48	169	114	19	1
M-10	11,00	18,00	215,60	191	130	23	1

1128 HSS DIN 8374



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	●	○	●	●		○					
15-25	8-10					30-35	25-30	14-18	20-25	30-35		15-20					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
M-3	3,20	6,00	73,15	93	57	9	1
M-4	4,30	8,00	76,70	117	75	11	1
M-5	5,30	10,00	91,18	133	87	13	1

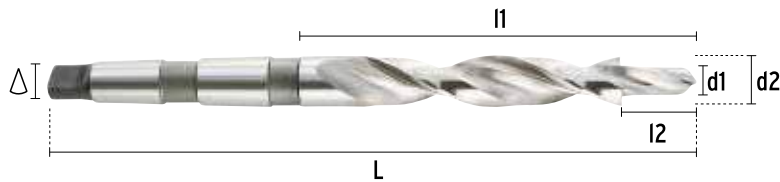
M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
M-6	6,40	11,50	104,13	142	94	15	1
M-8	8,40	15,00	142,45	169	114	19	1
M-10	10,50	19,00	219,99	198	130	23	1

1129 HSS DIN 8377



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	●	○	●	●		○					
15-25	8-10					30-35	25-30	14-18	20-25	30-35		15-20					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	📦
2	M-8	9,00	15,00	162,26	212	114	19	1
2	M-10	11,00	18,00	182,89	228	130	23	1
2	M-12	14,00	20,00	204,60	238	140	27	1
3	M-14	16,00	24,00	290,15	281	160	31	1

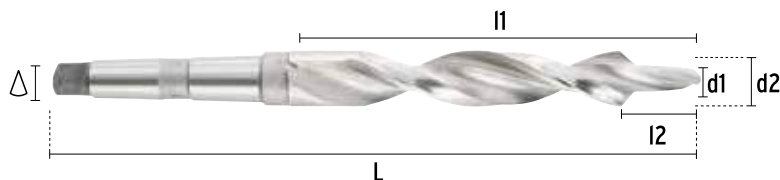
△	M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	📦
3	M-16	18,00	26,00	413,71	286	165	35	1
3	M-18	20,00	30,00	462,63	296	175	39	1
4	M-20	22,00	33,00	521,76	334	185	43	1

1130 HSS DIN 8375



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	●	○	●	●		○					
15-25	8-10					30-35	25-30	14-18	20-25	30-35		15-20					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	📦
1	M-5	5,50	11,00	156,93	175	94	13	1
1	M-6	6,60	13,00	160,13	182	101	15	1

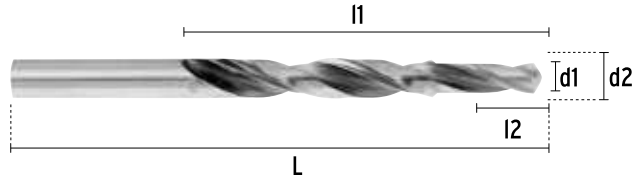
△	M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	📦
2	M-8	9,00	17,20	190,82	228	130	19	1
2	M-10	11,00	21,50	225,92	248	150	23	1

1152 HSS DIN 8378



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	●	○	●	●		○					
15-25	8-10					30-35	25-30	14-18	20-25	30-35		15-20					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
M-3	2,50	3,40	56,19	70	39	8,80	1
M-4	3,30	4,50	60,44	80	47	11,40	1
M-5	4,20	5,50	65,10	93	57	13,60	1
M-6	5,00	6,60	74,06	101	63	16,50	1

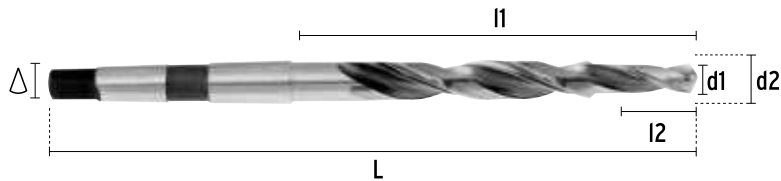
M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
M-8	6,80	9,00	88,23	125	81	21,00	1
M-10	8,50	11,00	102,93	142	94	25,50	1
M-12	10,20	13,50	128,16	160	108	30,00	1

1153 HSS DIN 8379



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	●	○	●	●		○					
15-25	8-10					30-35	25-30	14-18	20-25	30-35		15-20					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



	M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
1	M-8	6,80	9,00	143,82	162	81	21,00	1
1	M-10	8,50	11,00	156,71	175	94	25,50	1
1	M-12	10,20	13,50	185,12	189	108	30,00	1
2	M-14	12,00	15,50	197,53	218	120	34,50	1

	M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
2	M-16	14,00	17,50	213,18	228	130	38,50	1
2	M-18	15,50	20,00	238,40	238	140	43,50	1
2	M-20	17,50	22,00	288,29	248	150	47,50	1

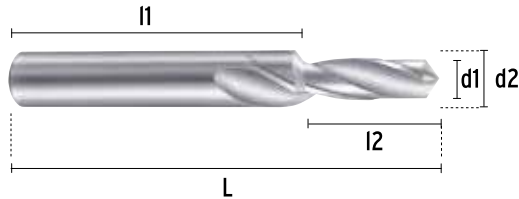
1191 HSSCO



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●		●	○		●	●	●	●	○	●			
20-30	12-18	4-8		4-10		20-25	10-15		15-80	25-60	60-90	12-70	2-6	2-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
M-3	2,50	3,40	37,45	52	20	8	1
M-4	3,30	4,50	39,62	58	24	11	1
M-5	4,20	5,50	41,37	66	28	13	1
M-6	5,00	6,60	45,28	70	31	16	1

M	d1 mm	d2 mm	€	L mm	l1 mm	l2 mm	
M-8	6,80	9,00	60,95	84	40	20	1
M-10	8,50	11,00	81,85	95	47	24	1
M-12	10,20	14,00	111,47	107	54	29	1

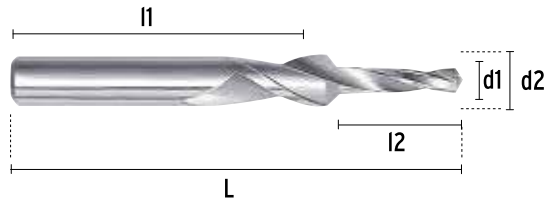
1192 HSSCO



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●		●	○		●	●	●	●	○	●			
20-30	12-18	4-8		4-10		20-25	10-15		15-80	25-60	60-90	12-70	2-6	2-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



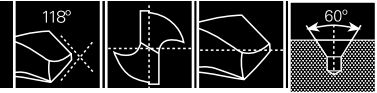
M	d1 mm	d2 mm	€	L mm	l2 mm	
M-4	4,30	8,60	99,27	110	30	1
M-4	5,30	10,40	104,50	110	30	1
M-6	6,40	12,40	111,47	110	30	1

M	d1 mm	d2 mm	€	L mm	l2 mm	
M-8	8,40	16,40	148,03	110	30	1
M-10	10,50	20,40	179,38	110	30	1



BROCAS BIDIAMETRALES Y DE CENTRAR FORETS BIÉTAGÉS ET À CENTRER / TWO-DIAMETER AND CENTRE DRILL-BITS

1132 HSS DIN 333 A



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	○		●	●		○					
20-30	8-12					20-25	15-20		15-20	25-30		10-15					

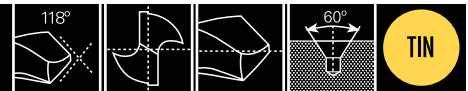
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



d1 mm	d2 mm	€	L mm	l mm	
1,00	3,15	6,07	31,50	1,60	1
1,25	3,15	6,07	33,50	1,90	1
1,25	4,00	6,70	35,50	1,90	1
1,60	4,00	6,07	37,50	2,40	1
1,60	5,00	7,14	40,00	2,40	1
2,00	5,00	6,54	42,00	2,90	1
2,00	6,30	7,59	45,00	2,90	1
2,50	6,30	7,26	47,00	3,60	1
2,50	8,00	8,49	50,00	3,60	1
3,15	8,00	8,00	52,00	4,40	1

d1 mm	d2 mm	€	L mm	l mm	
3,15	10,00	9,40	56,00	4,40	1
4,00	10,00	10,91	59,00	5,60	1
4,00	12,50	12,88	63,00	5,60	1
5,00	12,50	18,28	66,00	6,90	1
5,00	16,00	31,12	71,00	6,90	1
6,30	16,00	26,11	74,00	8,60	1
6,30	20,00	40,17	80,00	8,60	1
10,00	25,00	78,73	100,00	31,50	1
12,50	31,50	187,87	125,00	33,50	1

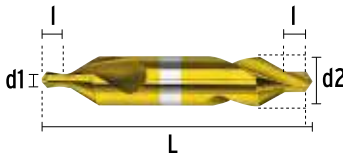
1188 HSS DIN 333 A



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	○		●	●		○					
30-40	12-16					30-35	20-30		20-30	35-40		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

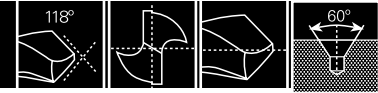
NEW



d1 mm	d2 mm	€	L mm	l mm	
1,00	3,15	11,57	31,50	1,60	1
1,25	3,15	11,57	33,50	1,90	1
1,60	4,00	12,10	37,50	2,40	1
2,00	5,00	13,25	42,00	2,90	1
2,50	6,30	14,42	47,00	3,60	1
3,15	8,00	15,10	52,00	4,40	1

d1 mm	d2 mm	€	L mm	l mm	
4,00	10,00	21,00	59,00	5,60	1
5,00	12,50	26,88	66,00	6,90	1
6,30	16,00	28,73	74,00	8,60	1
10,00	25,00	86,76	100,00	31,50	1
12,00	31,50	206,66	125,00	33,50	1

1193 **HM-MD DIN 333 A**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
○	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○
45-65	40-55	25-30	20-25	40-55	25-30	40-55	35-45	20-25	80-130	25-65	100-110	70-200	20-30	15-30	15-20	10-15	4-6

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



d1 mm	d2 mm	€	L mm	l mm	
1,00	3,15	56,38	31,50	1,60	1
1,25	3,15	56,38	33,50	1,90	1
1,60	4,00	58,00	37,50	2,40	1
2,00	5,00	72,49	42,00	2,90	1
2,50	6,30	86,19	47,00	3,60	1

d1 mm	d2 mm	€	L mm	l mm	
3,15	8,00	104,71	52,00	4,40	1
4,00	10,00	139,35	59,00	5,60	1
5,00	12,50	235,21	66,00	6,90	1
6,30	16,00	372,14	74,00	8,60	1

1133 **HSS DIN 333 A**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	○		●	●		○					
20-30	8-12					20-25	15-20		15-20	25-30		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



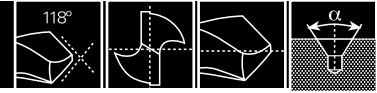
d1 mm	d2 mm	€	L mm	l mm	
1,00	4,00	18,92	60,00	1,30	1
1,50	5,00	19,26	60,00	2,00	1
2,00	6,00	20,08	80,00	2,50	1
2,50	8,00	24,39	80,00	3,10	1
3,00	8,00	24,39	80,00	3,90	1
1,00	4,00	47,22	120,00	1,30	1
1,50	5,00	44,88	120,00	2,00	1

d1 mm	d2 mm	€	L mm	l mm	
2,00	6,00	44,88	120,00	2,50	1
2,50	8,00	51,96	120,00	3,10	1
3,00	8,00	51,96	120,00	3,90	1
3,00	10,00	59,01	120,00	3,90	1
4,00	10,00	59,01	120,00	5,00	1
4,00	12,00	70,42	120,00	5,00	1
5,00	14,00	84,58	120,00	6,30	1



BROCAS BIDIAMETRALES Y DE CENTRAR FORETS BIÉTAGÉS ET À CENTRER / TWO-DIAMETER AND CENTRE DRILL-BITS

1135 HSS DIN 333 R



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	○		●	●		○					
20-30	8-12					20-25	15-20		15-20	25-30		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



d1 mm	d2 mm	€	L mm	l mm	
1,00	3,15	6,67	31,50	3,00	1
1,25	3,15	6,67	33,50	3,35	1
1,25	4,00	6,67	35,50	3,75	1
1,60	4,00	6,67	35,50	4,25	1
1,60	5,00	7,22	40,00	4,75	1
2,00	5,00	7,22	40,00	5,30	1
2,00	6,30	8,02	45,00	6,00	1
2,50	6,30	8,00	45,00	6,70	1
2,50	8,00	8,83	50,00	7,50	1
3,15	8,00	8,83	50,00	8,50	1

d1 mm	d2 mm	€	L mm	l mm	
3,15	10,00	11,50	56,00	9,50	1
4,00	10,00	11,50	56,00	10,60	1
4,00	12,50	19,20	63,00	11,80	1
5,00	12,50	19,23	63,00	13,20	1
5,00	16,00	27,32	71,00	15,00	1
6,30	16,00	27,51	71,00	17,00	1
6,30	20,00	49,01	80,00	19,00	1
8,00	20,00	51,53	80,00	21,20	1
10,00	25,00	82,81	100,00	31,50	1
12,50	31,50	197,58	125,00	33,50	1

1137 HSS DIN 333 B



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●					●	●		●	●		○					
20-30	8-12					20-25	15-20		15-20	25-30		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

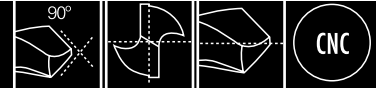


d1 mm	d2 mm	€	L mm	l mm	
1,00	4,00	11,01	35,50	1,60	1
1,25	5,00	11,01	40,00	1,90	1
1,60	6,30	11,01	45,00	2,40	1
2,00	8,00	11,01	50,00	2,90	1
2,50	10,00	12,64	56,00	3,60	1

d1 mm	d2 mm	€	L mm	l mm	
3,15	11,20	14,49	60,00	4,40	1
4,00	14,00	22,27	67,00	5,60	1
5,00	18,00	31,05	75,00	6,90	1
6,30	20,00	45,32	80,00	8,60	1

BROCAS BIDIAMETRALES Y DE CENTRAR FORETS BIÉTAGÉS ET À CENTRER / TWO-DIAMETER AND CENTRE DRILL-BITS

1138 HSSCO



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		●		●	●		●	●		●		●			
20-30	8-12	6-10		6-12		20-25	15-20		15-20	25-30		25-30		10-12			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	📦
3,00	22,31	50,00	10,00	1
4,00	22,31	52,00	12,00	1
5,00	25,15	60,00	15,00	1
6,00	25,15	66,00	20,00	1
8,00	28,42	79,00	25,00	1

Ø mm	€	L mm	l mm	📦
10,00	28,42	89,00	25,00	1
12,00	39,30	102,00	30,00	1
16,00	54,20	115,00	35,00	1
20,00	106,64	131,00	40,00	1

1155 HSSCO



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		●		●	●		●	●		●		●			
20-30	8-12	6-10		6-12		20-25	15-20		15-20	25-30		25-30		10-12			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



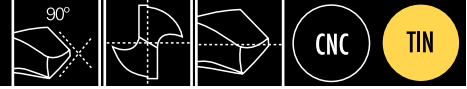
Ø mm	€	L mm	l mm	📦
3,00	22,31	46	12	1
4,00	22,31	55	12	1
5,00	25,15	62	14	1
6,00	25,15	66	16	1
8,00	28,42	79	21	1

Ø mm	€	L mm	l mm	📦
10,00	28,42	89	25	1
12,00	39,30	102	30	1
16,00	54,20	115	38	1
20,00	106,64	131	45	1



1189

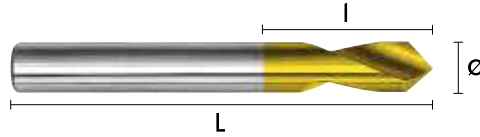
HSSCO



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•	•	•		•		•	•		•	•		•		•			
20-30	12-16	10-14		6-12		30-35	20-25		20-25	35-40		35-40		12-16			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



Ø mm	€	L mm	l mm	
3,00	29,00	50	10	1
4,00	29,00	52	12	1
5,00	32,70	60	15	1
6,00	32,70	66	20	1
8,00	36,95	79	25	1

Ø mm	€	L mm	l mm	
10,00	36,95	89	25	1
12,00	51,09	102	30	1
16,00	70,46	115	35	1
20,00	138,63	131	40	1

1190

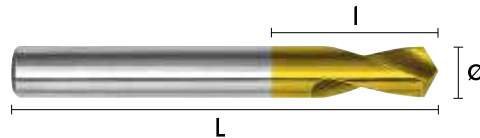
HSSCO



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•	•	•		•		•	•		•	•		•		•			
20-30	12-16	10-14		6-12		30-35	20-25		20-25	35-40		35-40		12-16			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



Ø mm	€	L mm	l mm	
3,00	29,00	46	12	1
4,00	29,00	55	12	1
5,00	32,70	62	14	1
6,00	32,70	66	16	1
8,00	36,95	79	21	1

Ø mm	€	L mm	l mm	
10,00	36,95	89	25	1
12,00	51,09	102	30	1
16,00	70,46	115	38	1
20,00	138,63	131	45	1

BROCAS BIDIAMETRALES Y DE CENTRAR FORETS BIÉTAGÉS ET À CENTRER / TWO-DIAMETER AND CENTRE DRILL-BITS

1179

HM-MD

1XD



DIN 6535
HA

CNC

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		●		●	●		●	●		○	○	●			
55-80	40-55	35-45		15-30		60-80	40-60		70-160	60-120		50-70	8-20	20-30			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	
6,00	6	24,63	65	15	1
8,00	8	42,42	80	20	1

∅ mm	d mm	€	L mm	l mm	
10,00	10	61,17	90	25	1
12,00	12	85,83	100	30	1

1180

HM-MD

1XD



DIN 6535
HA

CNC

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		●		●	●		●	●		○	○	●			
55-80	40-55	35-45		15-30		60-80	40-60		70-160	60-120		50-70	8-20	20-30			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	
6,00	6	24,63	65	15	1
8,00	8	42,42	80	20	1

∅ mm	d mm	€	L mm	l mm	
10,00	10	61,17	90	25	1
12,00	12	85,83	100	30	1

1185

HM-MD

1XD



DIN 6535 HA

CNC

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		●		●	●		●	●		○	○	●			
70-100	55-75	50-60		20-35		80-100	55-80		100-200	80-160		50-70	12-20	25-35			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



Ø mm	d mm	€	L mm	l mm	Icon
6,00	6	32,02	65	15	1
8,00	8	55,15	80	20	1

Ø mm	d mm	€	L mm	l mm	Icon
10,00	10	79,52	90	25	1
12,00	12	111,58	100	30	1

1186

HM-MD

1XD



DIN 6535 HA

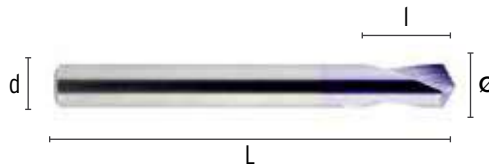
CNC

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		●		●	●		●	●		○	○	●			
70-100	55-75	50-60		20-35		80-100	55-80		100-200	80-160		50-70	12-20	25-35			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



Ø mm	d mm	€	L mm	l mm	Icon
6,00	6	32,02	65	15	1
8,00	8	55,15	80	20	1

Ø mm	d mm	€	L mm	l mm	Icon
10,00	10	79,52	90	25	1
12,00	12	111,58	100	30	1

BROCAS BIDIAMETRALES Y DE CENTRAR FORETS BIÉTAGÉS ET À CENTRER / TWO-DIAMETER AND CENTRE DRILL-BITS

1119

HSSCO DIN 1897 N Soldadura / Soudure / Welding

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon
6,00	12,85	66	28	1
7,00	14,16	74	34	1

Ø mm	€	L mm	l mm	Icon
8,00	15,52	79	37	1
10,00	17,56	89	43	1

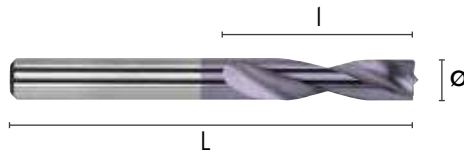
1194

HSSCO DIN 1897N Soldadura / Soudure / Welding

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



Ø mm	€	L mm	l mm	Icon
6,00	22,49	66	28	1
7,00	24,79	74	34	1

Ø mm	€	L mm	l mm	Icon
8,00	27,16	79	37	1
10,00	30,72	89	43	1



5114 HSS



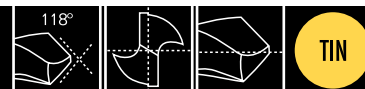
P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●									●	●		●					
10-25									15-20	25-30		25-30					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	Z	
6,00	16,70	90	5	1
8,00	22,84	90	7	1

5115 HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●									●	●		●					
15-35									20-25	35-40		35-40					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	Z	
6,00	30,32	90	5	1
8,00	39,65	90	7	1

6110 Espiga / Queue à tenon / Bit shank



»	△	DIN 228	€	L mm	gr	📦
	1	B-12	9,89	89	65	1
	1	B-16	9,89	99	80	1
	1	B-18	9,89	107	110	1
	>2	B-12	11,98	106	140	1
	2	B-16	11,98	112	160	1
	2	B-18	11,98	119	185	1

»	△	DIN 228	€	L mm	gr	📦
	>3	B-16	14,62	134	305	1
	3	B-18	14,62	140	330	1
	>4	B-16	20,94	156	120	1
	4	B-18	22,58	165	640	1
	>5	B-16	89,16	221	1.570	1
	5	B-18	89,16	221	1.590	1

6111 Casquillo DIN 2185 / Douille de réduction / Drill sleeve



»	△	€	L mm	gr	📦
	2 x 1	24,11	92	90	1
	3 x 1	29,77	99	200	1
	3 x 2	29,77	112	180	1
	4 x 1	41,64	124	510	1
	4 x 2	39,14	124	420	1
	4 x 3	39,14	140	370	1
	5 x 1	69,06	180	1.550	1

»	△	€	L mm	gr	📦
	5 x 2	65,45	156	1.200	1
	5 x 3	65,45	156	1.150	1
	5 x 4	76,39	171	1.023	1
	6 x 3	127,12	230	3.800	1
	6 x 4	144,23	230	3.390	1
	6 x 5	144,23	230	2.700	1

6114 Contrapunto / Contrepointe / Fixed centre



»	△	HSS €	HM €	📦
	1	14,94	-	1
	2	19,90	-	1
	3	30,91	74,68	1

»	△	HSS €	HM €	📦
	4	48,31	91,06	1
	5	68,23	178,02	1
	6	263,10	-	1



6112 Alargadera / Adaptateur / Extension piece



Ext.	Int.	€	L mm	Box
1	1	30,39	145	1
1	2	47,06	160	1
2	1	30,39	160	1
2	2	44,17	175	1
2	3	63,97	196	1
3	1	44,17	175	1
3	2	45,61	194	1
3	3	66,89	215	1
3	4	107,89	240	1
4	1	63,97	200	1

Ext.	Int.	€	L mm	Box
4	2	62,52	215	1
4	3	65,43	240	1
4	4	107,89	265	1
4	5	181,08	300	1
5	1	123,33	232	1
5	2	114,67	247	1
5	3	121,09	268	1
5	4	136,88	300	1
5	5	226,46	335	1

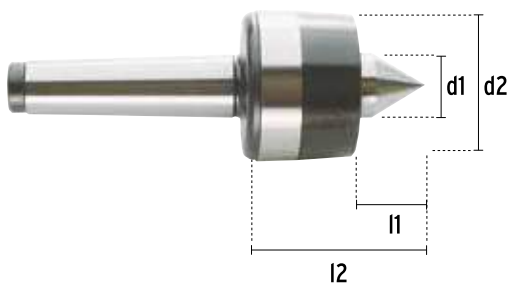
6113 Expulsor / Éjecteur / Ejector



Ext.	€	gr	Box
1 - 2	12,88	50	1
2 - 3	15,24	80	1
3 - 4	20,10	160	1

Ext.	€	gr	Box
4 - 5	27,31	350	1
5 - 6	44,39	690	1

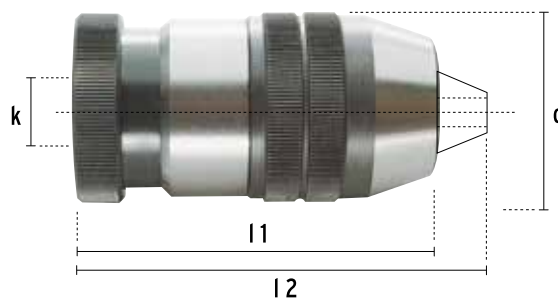
6115 Punto giratorio / Pointe tournante / Revolving lathe centre



Ext.	d1 mm	d2 mm	l1 mm	l2 mm	Kg	€	Box
1	12	32	18	42	180	143,25	1
2	16	40	23	46	400	159,79	1
3	24	45	27	53	600	214,81	1
4	24	59	36	65	1200	254,58	1
5	38	79	41	77	1500	367,94	1

6101 HP1

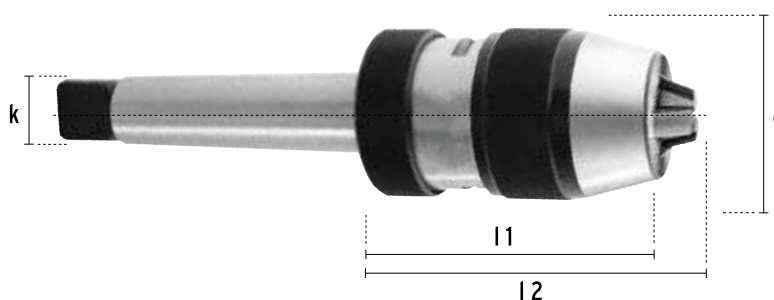
- > **Componentes totalmente templados y rectificados.**
Composants entièrement trempés et rectifiés.
Fully tempered and rectified components.
- > **Uso en taladros de precisión estacionarios, fresadoras.**
Pour perçages de précision stationnaires, fraiseuses.
For use with stationary precision drills, milling machines.
- > **Excentricidad máxima 0,04 mm.**
Excentricité maximum de 0,04 mm.
Maximum eccentricity 0.04 mm.



Ø mm	d mm	k △	Int.	€	l1 mm	l2 mm		Husillo Arbre Spindle €	Juego de garras Jeux de griffes Set of claws €
0,00 - 10,00	41	B16	1/2" - 20H	171,74	81	89	1	29,38	39,85
1,00 - 13,00	46	B16	1/2" - 20H	188,56	88	89	1	31,55	42,76
3,00 - 16,00	55	B16, B18	-	213,00	95	107	1	31,55	44,19

6120 HP1-CM

- > **Portabrocas automático alta precisión con espiga integrada (Cono Morse)**
Mandrin automatique de haute précision avec queue à tenon intégrée (Cone Morse)
High precision automatic drill chuck with bit shank (Taper Shank)

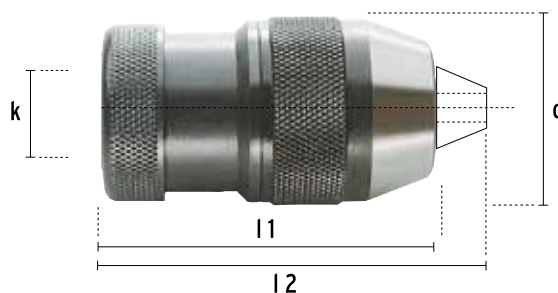


Ø mm	d mm	k △	€	l1 mm	l2 mm		Husillo Arbre Spindle €	Juego de garras Jeux de griffes Set of claws €
0,00 - 10,00	43	CM2	372,20	73	82	1	29,38	39,85
1,00 - 13,00	48	CM2, CM3, CM4	404,10	80	92	1	31,55	42,76
3,00 - 16,00	54	CM2, CM3, CM4	482,75	85	96	1	31,55	44,19



6102 > **HP2**

- > **Componentes parcialmente templados y rectificados.**
Composants partiellement trempés et rectifiés.
Partially tempered and rectified components.
- > **Uso industrial para taladros fijos y portátiles.**
Usage industriel pour perceuses fixes et portables.
For industrial use with fixed and portable drills.
- > **Excentricidad máxima 0,20 mm.**
Excentricité maximum de 0,20 mm.
Maximum eccentricity 0.20 mm.



Ø mm	d mm		k Int.	€	l1 mm	l2 mm		Husillo Arbre Spindle €	Juego de garras Jeu de griffes Set of claws €
0,00 - 10,00	39	B12	1/2" - 20H 3/8" - 24H	94,06	73	80	1	19,85	39,66
2,00 - 13,00	46	B16	1/2" - 20H 3/8" - 24H	118,22	87	95	1	22,90	42,86
3,00 - 16,00	51	B16,B18	5/8" - 16H 1/2" - 20H	157,04	102	115	1	22,90	42,86
5,00 - 20,00	56	B18	-	207,03	95	110	1	28,04	50,41

6103 > **HP3**

- > **Uso industrial para taladros fijos y portátiles.**
Usage industriel pour perceuses fixes et portables.
For industrial use with fixed and portable drills.
- > **Excentricidad no garantizada.**
Excentricité non garantie.
Maximum not guaranteed.




Ø mm	d mm		k Int.	€	l1 mm	l2 mm	
1,00 - 10,00	35	B12*	1/2" - 20H, 3/8" - 24H*	63,27	65	72	1
1,50 - 13,00	40	B16	1/2" - 20H	72,60	83	91	1
3,00 - 16,00	53	B16,B18	1/2" - 20H, 5/8" - 24H*	95,89	96	109	1

* (Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

6122 > **Afilador de Brocas / Affûteuses forets / Twist Drill Sharpener**

- > **Para Brocas HSS, HSSE, HSS+TIN, HM**
 Pour Forets HSS, HSSE, HSS+TIN, HM
 For Drill-bits HSS, HSSE, HS+TIN, HM
- > **Para ángulo normal afilado en cruz**
 Pour angle normal et affûtage en croix
 For normal angle and Splint point
- > **Ángulo de punta de 118°**
 Angle de la point e 118°
 Point angle of 118°



∅ mm	€	
3 a 13	159,34	1

6123 > **Porta / Mandrins / Chuck**

€	
9,65	1



6124 > **Muela / Meule / Wheel**

€	
20,48	1



1171 **Ø 1 a 10 X 0,5 mm**

Ø mm 1 a 10	X mm 0,50	 19	DIN 338
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>HSS
(1101)



>SPEED PLUS
(1158)



>HSS CO
(1105)



>HSS CO INOX
(1106)



>HSS TIN
(1108)



REF.	€
HSS	46,83
SPEED PLUS	51,35
HSS CO	77,16
HSS CO INOX	158,38
HSS TIN	95,71
VACIO/VIDE/EMPTY	12,40

1172 **Ø 1 a 13 X 0,5 mm**

Ø mm 1 a 13	X mm 0,50	 25	DIN 338
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>HSS
(1101)



>SPEED PLUS
(1158)



>HSS CO
(1105)



>HSS CO INOX
(1106)



>HSS TIN
(1108)



REF.	€
HSS	91,62
SPEED PLUS	100,80
HSS CO	176,68
HSS CO INOX	318,43
HSS TIN	199,10
VACIO/VIDE/EMPTY	16,54

1143 **Ø 1 a 10 X 0,25 mm**

Ø mm 1 a 10	X mm 0,25	 37	DIN 338
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>HSS
(1101)



>HSS CO
(1105)



REF.	€
HSS	128,75
HSS CO	190,05
VACIO/VIDE/EMPTY	41,91

1144 **Ø 6 a 10 X 0,10 mm**

Ø mm 6 a 10	X mm 0,10	 41	DIN 338
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>HSS
(1101)



>HSS CO
(1105)



REF.	€
HSS	241,98
HSS CO	346,46
VACIO/VIDE/EMPTY	72,53

1145 **Ø 1 a 13 X 0,25 mm**

Ø mm 1 a 13	X mm 0,25	 49	DIN 338
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>HSS
(1101)



>HSS CO
(1105)



REF.	€
HSS	224,07
HSS CO	415,61
VACIO/VIDE/EMPTY	43,52

1146 **Ø 1 a 6 X 0,10 mm**

Ø mm 1 a 6	X mm 0,10	 51	DIN 338
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>HSS
(1101)



>HSS CO
(1105)



REF.	€
HSS	98,36
HSS CO	139,66
VACIO/VIDE/EMPTY	29,01

1173

1/16" a 3/8" X 1/64"



21

DIN
338

>HSS
 (1158/9)



>HSS CO
 (1105/9)



REF.	€
SPEED PLUS	74,95
HSS CO	103,12

1174

1/16" a 1/2" X 1/64"



29

DIN
338

>SPEED PLUS
 (1158/9)



>HSS CO
 (1105/9)



REF.	€
SPEED PLUS	136,17
HSS CO	227,39

JUEGO DE BROCAS COFFRETS DE FORETS / DRILL SETS

1150 Ø 1 a 10 X 0,5 mm

Ø
mm
1 a 10

X
mm
0,50

DIN
338

>HSS
(1101)

>HSS NSP
(1158)

>HSS CO
(1105)

>HSS TIN
(1108)



REF.	€
HSS	542,13
HSS NSP	581,77
HSS CO	473,88
HSS TIN	604,95
VACIO/VIDE/EMPTY	72,53

Ø mm	HSS	HSS NSP	HSS CO	HSS TIN
1,00	20	20	10	10
1,50	10	10	5	5
2,00	20	20	10	10
2,50	10	10	5	5
3,00	20	20	10	10
3,50	10	10	5	5
4,00	20	20	10	10
4,50	10	10	5	5
5,00	20	20	10	10
5,50	10	10	5	5

Ø mm	HSS	HSS NSP	HSS CO	HSS TIN
6,00	20	20	10	10
6,50	10	10	5	5
7,00	10	10	5	5
7,50	10	10	5	5
8,00	10	10	5	5
8,50	10	10	5	5
9,00	10	10	5	5
9,50	10	10	5	5
10,00	10	10	5	5
TOTAL	250	250	125	125

1183 Ø 1 a 13 X 0,5 mm

Ø
mm
1 a 10

X
mm
0,50

DIN
338

>HSS
(1101)

>HSS NSP
(1158)

>HSS CO
(1105)

>HSS TIN
(1108)



REF.	€
HSS	838,02
HSS NSP	900,99
HSS CO	1.043,37
HSS TIN	1.193,83
VACIO/VIDE/EMPTY	145,07

Ø mm	HSS	HSS NSP	HSS CO	HSS TIN
1,00	20	20	10	10
1,50	10	10	5	5
2,00	20	20	10	10
2,50	10	10	5	5
3,00	20	20	10	10
3,50	10	10	5	5
4,00	20	20	10	10
4,50	10	10	5	5
5,00	20	20	10	10
5,50	10	10	5	5
6,00	20	20	10	10
6,50	10	10	5	5
7,00	10	10	5	5

Ø mm	HSS	HSS NSP	HSS CO	HSS TIN
7,50	10	10	5	5
8,00	10	10	5	5
8,50	10	10	5	5
9,00	10	10	5	5
9,50	10	10	5	5
10,00	10	10	5	5
10,50	5	5	5	5
11,00	5	5	5	5
11,50	5	5	5	5
12,00	5	5	5	5
12,50	5	5	5	5
13,00	5	5	5	5
TOTAL	280	280	155	155



8201 > Ø 1 a 13 mm

>HSS DIN 338 N
(1101)






>HSS DIN 338 NSP
(1158)

>HSSCO DIN 338 N
(1105)

>HSSCO DIN 338 W
(1106)

>HSSTIN DIN 338 N
(1108)



Ø mm	 HSS DIN 338 N					 HSS DIN 338 NSP					 HSSCO DIN 338 N					 HSSCO DIN 338 W					 HSSTIN DIN 338 N				
	HSS DIN 338 N	HSS DIN 338 NSP	HSSCO DIN 338 N	HSSCO DIN 338 W	HSSTIN DIN 338 N	HSS DIN 338 N	HSS DIN 338 NSP	HSSCO DIN 338 N	HSSCO DIN 338 W	HSSTIN DIN 338 N	HSS DIN 338 N	HSS DIN 338 NSP	HSSCO DIN 338 N	HSSCO DIN 338 W	HSSTIN DIN 338 N										
1,00	20	20	20	-	20	20	20	10	-	10	20	20	10	-	10										
1,50	20	20	10	-	10	20	20	10	-	10	20	20	10	-	10										
2,00	50	50	20	-	20	10	10	10	-	10	20	20	10	-	10										
2,25	20	20	20	-	10	20	20	20	-	10	20	20	10	-	10										
2,50	40	40	20	-	10	20	20	10	-	10	20	20	10	-	10										
3,00	50	50	20	-	20	20	20	10	-	10	20	20	10	-	10										
3,25	30	30	20	10	10	20	20	10	10	20	20	10	10	10	10										
3,50	40	40	20	10	20	20	20	10	10	20	20	10	10	10	10										
4,00	50	50	30	10	30	20	20	10	10	20	20	10	10	10	10										
4,25	30	30	20	10	10	20	20	10	10	20	20	10	10	10	10										
4,50	40	40	20	10	10	20	20	10	10	20	20	10	10	10	10										
5,00	50	50	30	10	30	20	20	10	10	20	20	10	10	10	10										
5,25	20	20	10	10	10	20	20	10	10	20	20	10	10	10	10										
5,50	30	30	20	10	20	20	20	10	10	20	20	10	10	10	10										
6,00	50	50	30	10	20	20	20	10	10	20	20	10	10	10	10										
TOTAL	735	735	430	200	360	735	735	430	200	360	735	735	430	200	360										
€	1.432,31	1.565,60	1.702,26	2.226,32	1.795,55	1.432,31	1.565,60	1.702,26	2.226,32	1.795,55	1.432,31	1.565,60	1.702,26	2.226,32	1.795,55										

8201/9 **1/16" a 1/2" x 1/64"**

>HSS DIN 338 NSP
(1158/9)



>HSSCO DIN 338 N
(1105/9)

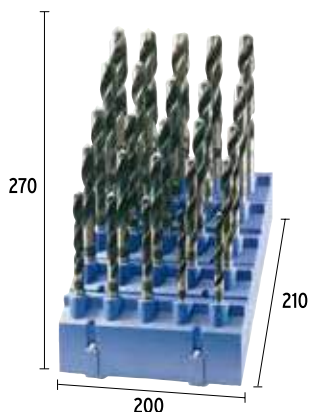


Ø mm	HSS DIN 338 NSP	HSSCO DIN 338 N
1/16"	20	20
5/64"	20	10
3/32"	50	20
7/64"	20	20
1/8"	40	20
9/64"	50	20
5/32"	30	20
11/64"	40	20
3/16"	50	30
13/64"	30	20
7/32"	40	20
15/64"	50	30
1/4"	20	10
17/64"	30	20
9/32"	50	30

Ø mm	HSS DIN 338 NSP	HSSCO DIN 338 N
19/64"	20	10
5/16"	20	10
21/64"	10	10
11/32"	40	20
23/64"	20	10
3/8"	20	10
25/64"	10	10
13/32"	20	10
27/64"	5	5
7/16"	5	5
29/64"	5	5
15/32"	10	5
31/64"	5	5
1/2"	5	5
TOTAL	735	430
€	1.855,61	1.991,75



8203 > Ø 14 a 30 mm (Ref. 1121)



Ø mm	Icon	Ø mm	Icon	Ø mm	Icon
14,00	1	18,50	1	23,00	1
14,50	1	19,00	1	24,00	1
15,00	1	19,50	1	25,00	1
15,50	1	20,00	1	26,00	1
16,00	1	20,50	1	27,00	1
16,50	1	21,00	1	28,00	1
17,00	1	21,50	1	30,00	1
17,50	1	22,00	1		
18,00	1	22,50	1		
				TOTAL	25
				€	1296,38

8207 > Ø 1 a 16 mm

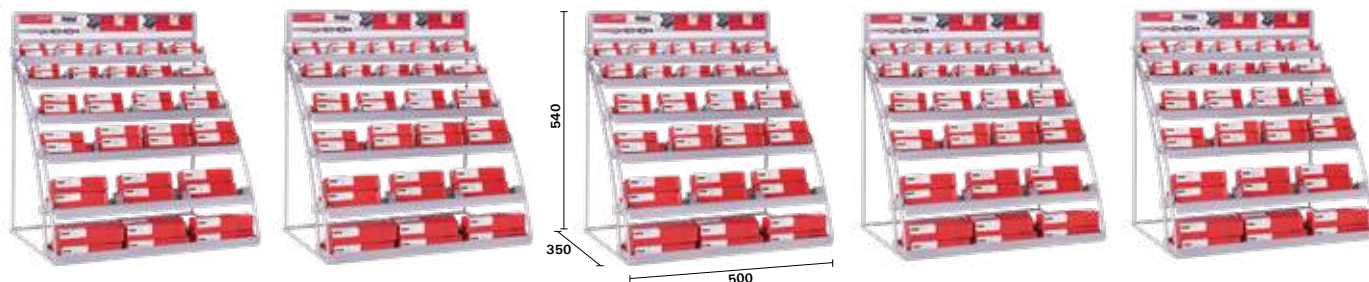
>HSS DIN 338 N
(1101)

>HSS DIN 338 NSP
(1158)

>HSSCO DIN 338 N
(1105)

>HSSCO DIN 338 W
(1187)

>HSSTIN DIN 338 N
(1108)



Ø mm	HSS DIN 338 N	HSS DIN 338 NSP	HSSCO DIN 338 N	HSSCO DIN 338 W	HSSTIN DIN 338 N
1,00	40	40	40	40	40
1,50	20	20	20	20	20
2,00	40	40	40	40	40
2,25	40	40	40	40	40
2,50	40	40	40	40	40
3,00	60	60	60	60	60
3,25	40	40	40	40	40
3,50	40	40	40	40	40
4,00	60	60	60	60	60
4,25	40	40	40	40	40
4,50	40	40	40	40	40
5,00	60	60	60	60	60
5,50	40	40	40	40	40
6,00	60	60	60	60	60

Ø mm	HSS DIN 338 N	HSS DIN 338 NSP	HSSCO DIN 338 N	HSSCO DIN 338 W	HSSTIN DIN 338 N
6,50	20	20	20	20	20
7,00	20	20	20	20	20
7,50	20	20	20	20	20
8,00	30	30	30	30	30
8,50	20	20	20	20	20
9,00	20	20	20	20	20
10,00	20	20	20	20	20
11,00	10	10	10	10	10
12,00	10	10	10	10	10
13,00	5	5	5	5	5
TOTAL	795	795	795	795	795
€	1.396,74	1.526,75	2.551,23	3.918,85	3.145,28



Roscado 
Taraudage
Threading

 **HERCULES**

Machos de máquina / Tarauds machine / Machine taps (M-MF)

Entrada recta (Agujeros Ciegos y pasantes) / Entrée droite (trous borgnes et débouchants) / Straight flute (through and blind holes)

2102	HSSE	DIN 371			M-MF DIN 13	Form. C		Tol. 6H	1,5XD	R	P	136	
2101	HSSE	DIN 376/374			M-MF DIN 13	Form. C		Tol. 6H	1,5XD	D	P	137	
2102/5	HSSE	DIN 371			M-MF DIN 13	Form. C		Tol. 6H	LH	1,5XD	R	139	
2101/5	HSSE	DIN 376/374			M-MF DIN 13	Form. C		Tol. 6H	LH	1,5XD	D	139	
2114	HSSE	DIN 371			M-MF DIN 13	Form. A		Tol. 6H	1,5XD	R	P	140	
2113	HSSE	DIN 376/374			M-MF DIN 13	Form. A		Tol. 6H	1,5XD	D	P	140	
2190	HSSE	DIN 371			M DIN 13	Form. E		Tol. 6H	R	1,5XD	MF	N	141
2191	HSSE	DIN 376			M DIN 13	Form. E		Tol. 6H	D	1,5XD	MF	N	141
2180	HSSE-PM	DIN 371	TiCN		M DIN 13	Form. C		Tol. 6HX	R	1,5XD	MF	K	142
2179	HSSE-PM	DIN 376	TiCN		M DIN 13	Form. C		Tol. 6HX	D	1,5XD	MF	K	142
NEW 2274	HM	DIN 371	TiCN		M DIN 13	Form. D		Tol. 6HX	R	1,5XD	MF	H	143
NEW 2275	HM	DIN 376	TiCN		M DIN 13	Form. D		Tol. 6HX	D	1,5XD	MF	H	143

Entrada Corregida (Agujeros pasantes) / Entrée corrigée (Trous débouchants) / Spiral point (through holes)

2104	HSSE	DIN 371			M-MF DIN 13	Form. B "Gun"		Tol. 6H	3XD	R	P N	144
2103	HSSE	DIN 376/374			M-MF DIN 13	Form. B "Gun"		Tol. 6H	3XD	D	P N	144
2104/5	HSS	DIN 371			M-MF DIN 13	Form. B "Gun"		Tol. 6H	3XD	R	P N	146
2103/5	HSS	DIN 376/374			M-MF DIN 13	Form. B "Gun"		Tol. 6H	3XD	D	P N	146
2111	HSSE	DIN 371-L			M DIN 13	Form. B "Gun"		Tol. 6H	3XD	R	P N	147
NEW 2272	HSS	DIN 376-L			M DIN 13	Form. B "Gun"		Tol. 6H	3XD	D	P N	147
2110	HSSE	DIN 371			M DIN 13	Form. B "Gun"		Tol. 6H +0.1	3XD	R	P N	148

	2109	HSSE	DIN 376			M DIN 13	Form. B "Gun"	Tol. 6H +0,1	3XD	D	P N	148
	2168	HSSE	DIN 371			M DIN 13	Form. B "Gun"	Tol. 6G	3XD	R	P N	149
	2169	HSSE	DIN 376			M DIN 13	Form. B "Gun"	Tol. 6G	3XD	D	P N	149
NEW	2250	HSSE	DIN 371	VAP		M DIN 13	Form. B "Gun"	Tol. 6H	3XD	R MF	P M N	150
NEW	2251	HSSE	DIN 376/374	VAP		M-MF DIN 13	Form. B "Gun"	Tol. 6H	3XD	D MF	P M N	150
NEW	2116	HSSE	DIN 371	TIN+		M DIN 13	Form. B "Gun"	Tol. 6H	3XD	R MF	P M K N	151
NEW	2115	HSSE	DIN 376	TIN+		M-MF DIN 13	Form. B "Gun"	Tol. 6H	3XD	D MF	P M K N	151
	2126	HSSE-PM	DIN 371	TICN+		M DIN 13	Form. B "Gun"	Tol. 6H	3XD	R MF	P K	152
	2125	HSSE-PM	DIN 376/374	TICN+		M-MF DIN 13	Form. B "Gun"	Tol. 6H	3XD	D MF	P K	152
	2176	HSSE-PM	DIN 371	TICN+		M DIN 13	Form. B "Gun"	Tol. 6HX	3XD	R MF	P K	153
	2175	HSSE-PM	DIN 376	TICN+		M DIN 13	Form. B "Gun"	Tol. 6HX	3XD	D MF	P K	153
	2122	HSSE	DIN 371	VAP		M DIN 13	Form. B "Gun"	Tol. 6H	3XD	R MF	P M	154
	2121	HSSE	DIN 376/374	VAP		M-MF DIN 13	Form. B "Gun"	Tol. 6H	3XD	D MF	P M	154
	2133	HSSE	DIN 371			M DIN 13	B-AZ	Tol. 6H	3XD	R	N	155
	2132	HSSE	DIN 376			M DIN 13	B-AZ	Tol. 6H	3XD	D	N	155
	2254	HSSE-PM	DIN 371 MULTI	HL		M DIN 13	Form. B "Gun"	Tol. 6HX	3XD	R MF	P M K N S	156
	2255	HSSE-PM	DIN 371 MULTI	HL		M DIN 13	Form. B "Gun"	Tol. 6HX	3XD	D MF	P M K N S	156
	2258	HSSE-PM	DIN 371 SYNCHRO	HL		M DIN 13	Form. B "Gun"	Tol. 6HX CNC	3XD	R MF	P M K N S	157
	2259	HSSE-PM	DIN 371 SYNCHRO	HL		M DIN 13	Form. B "Gun"	Tol. 6HX CNC	3XD	D MF	P M K N S	157

Forma Helicoidal (Agujeros ciegos) / Forme helicoidale (Trous borgnes) / Spiral fluted (Blind holes)

	2106	HSSE	DIN 371			M-MF DIN 13	Form. C		Tol. 6H		3XD		P	N	158	
	2105	HSSE	DIN 376/374			M-MF DIN 13	Form. C		Tol. 6H		3XD		P	N	158	
	2106/5	HSSE	DIN 371			M-MF DIN 13	Form. C		Tol. 6H		LH	3XD		P	N	160
	2105/5	HSSE	DIN 376/374			M-MF DIN 13	Form. C		Tol. 6H		LH	3XD		P	N	160
NEW	2112	HSSE	DIN 371-L			M DIN 13		Form. C	Tol. 6H			3XD		P	N	161
	2273	HSSE	DIN 376-L			M DIN 13		Form. C	Tol. 6H			3XD		P	N	161
	2166	HSSE	DIN 371			M DIN 13		Form. C	Tol. 6H +0.1			3XD		P	N	162
	2165	HSSE	DIN 376			M DIN 13		Form. C	Tol. 6H +0.1			3XD		P	N	162
	2170	HSSE	DIN 371			M DIN 13		Form. C	Tol. 6G			3XD		P	N	163
	2208	HSSE	DIN 376			M DIN 13		Form. C	Tol. 6G			3XD		P	N	163
	2108	HSSE	DIN 371			M DIN 13		Form. C	Tol. 6H			3XD		P	N	164
	2107	HSSE	DIN 376/374			M DIN 13		Form. C	Tol. 6H			3XD		P	N	164
NEW	2252	HSSE	DIN 371	VAP		M DIN 13	Form. C		Tol. 6H			3XD		MF	P M N	165
NEW	2253	HSSE	DIN 376/374	VAP		M-MF DIN 13	Form. C		Tol. 6H			3XD		MF	P M N	165
NEW	2118	HSSE	DIN 371	TiN+		M DIN 13	Form. C		Tol. 6H			3XD		MF	P M K N	166
NEW	2117	HSSE	DIN 376/374	TiN+		M-MF DIN 13	Form. C		Tol. 6H			3XD		MF	P M K N	166
	2124	HSSE-PM	DIN 371	TiCN+		M IN 13	Form. C		Tol. 6H			3XD		MF	P K	167
	2123	HSSE-PM	DIN 376/374	TiCN+		M-MF DIN 13	Form. C		Tol. 6H			3XD		MF	P K	167
	2178	HSSE-PM	DIN 371	TiCN+		M DIN 13	Form. C		Tol. 6HX			3XD		MF	P K	168
	2177	HSSE-PM	DIN 376	TiCN+		M DIN 13	Form. C		Tol. 6HX			3XD		MF	P K	168

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2120	HSSE	DIN 371	VAP		M DIN 13	Form. C	Tol. 6H	35°	3XD	R	MF	P M	169
2119	HSSE	DIN 376/374	VAP		M-MF DIN 13	Form. C	Tol. 6H	35°	3XD	D	MF	P M	169
2182	HSSE	DIN 371			M DIN 13	Form. C	Tol. 6H	45°	3XD	R		N	170
2181	HSSE	DIN 376			M DIN 13	Form. C	Tol. 6H	45°	3XD	D		N	170
2256	HSSE-PM	DIN 371 MULTI	HL		M DIN 13	Form. C	Tol. 6HX	45°	3XD	R	MF	P M K N S	171
2257	HSSE-PM	DIN 376 MULTI	HL		M DIN 13	Form. C	Tol. 6HX	45°	3XD	D	MF	P M K N S	171
2260	HSSE-PM	DIN 371 SYNCHRO	HL		M DIN 13	CNC Form. C	Tol. 6HX	45°	3XD	R	MF	P M K N S	172
2261	HSSE-PM	DIN 376 SYNCHRO	HL		M DIN 13	CNC Form. C	Tol. 6HX	45°	3XD	D	MF	P M K N S	172

Laminación / Tarauds à refouler / Forming taps

2188	HSSE-PM	DIN 371	TIN		M DIN 13	Form. C	Tol. 6HX	A>12%	1.5XD	R	MF	P M N	173
2187	HSSE-PM	DIN 376	TIN		M DIN 13	Form. C	Tol. 6HX	A>12%	1.5XD	D	MF	P M N	173
2214	HSSE-PM	DIN 371	TIN		M DIN 13	Form. C	Tol. 6HX	A>12%	3XD	R	MF	P M N	174
2213	HSSE-PM	DIN 376	TIN		M-MF DIN 13	Form. C	Tol. 6HX	A>12%	3XD	D	MF	P M N	174
2216	HSSE-PM	DIN 371	TIN		M DIN 13	Form. C	Tol. 6GX	A>12%	1.5XD	R	MF	P M N	175
2215	HSSE-PM	DIN 376	TIN		M DIN 13	Form. C	Tol. 6GX	A>12%	1.5XD	D	MF	P M N	175
2218	HSSE-PM	DIN 371	TIN		M DIN 13	Form. C	Tol. 6GX	A>12%	3XD	R	MF	P M N	176
2217	HSSE-PM	DIN 376	TIN		M DIN 13	Form. C	Tol. 6GX	A>12%	3XD	D	MF	P M N	176

Otros / Autres / Others









2199	HSSE	DIN 357			M DIN 13		16-18h	Tol. 6H		R		P	177
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2134	HSSE		MIT		M DIN 13	16-18h	Tol. 6H	D	P	177
2806	HSSE	DIN 13			M DIN 13		Tol. 6H		P N	178
1504	HSS	Hex			M DIN 13		Tol. 6H	1/4"	P	178
2248	HSS	ISO 529			M DIN 13	Form. B "Gun"	Tol. 6H	3XD	P N	179
2249	HSS	ISO 529			M DIN 13	Form. C	Tol. 6H	35° 3XD	P N	179
2266	HSSE	JIS			M DIN 13	Form. B "Gun"	Tol. 6H	3XD D	P N	180
2267	HSSE	JIS			M DIN 13	Form. C	Tol. 6H	35° 3XD D	P N	180
2268	HSSE	JIS	VAP		M DIN 13	Form. B "Gun"	Tol. 6H	3XD D MF	P N	181
2269	HSSE	JIS	VAP		M DIN 13	Form. C	Tol. 6H	35° 3XD D MF	P N	181
2270	HSSE	JIS	TIN		M DIN 13	Form. B "Gun"	Tol. 6H	3XD D MF	P N	182
2271	HSSE	JIS	TIN		M DIN 13	Form. C	Tol. 6H	35° 3XD D MF	P N	182























Machos de máquina / Tarauds machine / Machine taps (UNC-UNF-UN-UNS-UNEF)

	2148	HSSE	DIN 371			UNC ANEBRASIVE B1.1	Form. C	Tol. 2B	1.5XD	R	P	183
	2147	HSSE	DIN 376			UNC ANEBRASIVE B1.1	Form. C	Tol. 2B	1.5XD	D	P	183
	2147/5	HSSE	DIN 376			UNC ANEBRASIVE B1.1	Form. C	LH	1.5XD	D	P	184
	2150	HSSE	DIN 371			UNC ANEBRASIVE B1.1	Form. B "Gun"	Tol. 2B	3XD	R	P N	185
	2149	HSSE	DIN 376			UNC ANEBRASIVE B1.1	Form. B "Gun"	Tol. 2B	3XD	D	P N	185
NEW	2262	HSSE	DIN371	VAP		UNC ANEBRASIVE B1.1	Form. B "Gun"	Tol. 2B	3XD	R MF	P M N	186
NEW	2263	HSSE	DIN 376	VAP		UNC ANEBRASIVE B1.1	Form. B "Gun"	Tol. 2B	3XD	D MF	P M N	186
NEW	2234	HSSE	DIN 371	TIN+		UNC ANEBRASIVE B1.1	Form. B "Gun"	Tol. 2B	3XD	R MF	P M N K	187

NEW	2235	HSSE	DIN 376	TIN+		UNC ANBRASME B1.1 Form. B "Gun" Tol. 2B 3XD D MF	P M K N	187
	2152	HSSE	DIN 371			UNC ANBRASME B1.1 Form. C Tol. 2B 3XD 35° R	P N	188
	2151	HSSE	DIN 376			UNC ANBRASME B1.1 Form. C Tol. 2B 3XD 35° D	P N	188
NEW	2264	HSSE	DIN 371	VAP		UNC ANBRASME B1.1 Form. C Tol. 2B 3XD 35° R MF	P M N	189
NEW	2265	HSSE	DIN 371	VAP		UNC ANBRASME B1.1 Form. C Tol. 2B 3XD D MF	P M N	189
NEW	2236	HSSE	DIN 371	TIN+		UNC ANBRASME B1.1 Form. C Tol. 2B 3XD R MF	P M K N	190
NEW	2237	HSSE	DIN 376	TIN+		UNC ANBRASME B1.1 Form. C Tol. 2B 3XD D MF	P M K N	190
	2154	HSSE	DIN 371			UNF ANBRASME B1.1 Form. C Tol. 2B 1.5XD R	P	191
	2153	HSSE	DIN 374			UNF ANBRASME B1.1 Form. C Tol. 2B 1.5XD D	P	191
	2153/5	HSSE	DIN 374			UNF ANBRASME B1.1 Form. C Tol. 2B LH 1.5XD D	P	192
	2156	HSSE	DIN 371			UNF ANBRASME B1.1 Form. B "Gun" Tol. 2B 3XD R	P N	193
	2155	HSSE	DIN 374			UNF ANBRASME B1.1 Form. B "Gun" Tol. 2B 3XD D	P N	193
NEW	2276	HSSE	DIN 371	VAP		UNF ANBRASME B1.1 Form. B "Gun" Tol. 2B 3XD R MF	P M N	194
NEW	2277	HSSE	DIN 374	VAP		UNF ANBRASME B1.1 Form. B "Gun" Tol. 2B 3XD D MF	P M N	194
NEW	2280	HSSE	DIN 371	TIN+		UNF ANBRASME B1.1 Form. B "Gun" Tol. 2B 3XD R MF	P M K N	195
NEW	2281	HSSE	DIN 374	TIN+		UNF ANBRASME B1.1 Form. B "Gun" Tol. 2B 3XD D MF	P M K N	195
	2158	HSSE	DIN 371			UNF ANBRASME B1.1 Form. C Tol. 2B 35° 3XD R	P N	196
	2157	HSSE	DIN 374			UNF ANBRASME B1.1 Form. C Tol. 2B 35° 3XD D	P N	196
NEW	2278	HSSE	DIN 371	VAP		UNF ANBRASME B1.1 Form. C Tol. 2B 35° 3XD R MF	P M N	197
NEW	2279	HSSE	DIN 374	VAP		UNF ANBRASME B1.1 Form. C Tol. 2B 35° 3XD D MF	P M N	197

NEW	2282	HSSE	DIN 371	TIN+		UNF ANSI/ASME B1.1	Form. C		Tol. 2B		3XD	R	M F	P M K N	198
NEW	2283	HSSE	DIN 374	TIN+		UNF ANSI/ASME B1.1	Form. C		Tol. 2B		3XD	D	M F	P M K N	198
	2189	HSSE	DIN 374			UN ANSI/ASME B1.1	Form. C		Tol. 2B	1,5XD	D		P	199	
	2160	HSSE	DIN 374			UNEF ANSI/ASME B1.1	Form. C		Tol. 2B	1,5XD	D		P	199	

Machos de máquina / Tarauds machine / Machine taps (BSW-BSF)

	2136	HSSE	DIN 371			BSW BS 84	Form. C		1,5XD	R		P	200
	2135	HSSE	DIN 376			BSW BS 84	Form. C		1,5XD	D		P	200
	2136/5	HSSE	DIN 371			BSW BS 84	Form. C		LH	1,5XD	R	P	201
	2135/5	HSSE	DIN 376			BSW BS 84	Form. C		LH	1,5XD	D	P	201
	2138	HSSE	DIN 371			BSW BS 84	Form. B "Gun"		3XD	R		P N	202
	2137	HSSE	DIN 376			BSW BS 84	Form. B "Gun"		3XD	D		P N	202
	2140	HSSE	DIN 371			BSW BS 84	Form. C			3XD	R	P N	203
	2139	HSSE	DIN 376			BSW BS 84	Form. C			3XD	D	P N	203
	2141	HSSE	DIN 371			BSF BS 84	Form. C		1,5XD	R		P	204
	2142	HSSE	DIN 376			BSF BS 84	Form. C		1,5XD	D		P	204

Machos de máquina / Tarauds machine / Machine taps (G-Rc-NPT)

2144	HSSE	DIN 5156			G ISO 228, Form. C, 1,5XD, D	P	205
2144/5	HSSE	DIN 5156			G ISO 228, Form. C, LH, 1,5XD, D	P	205
2192	HSSE	DIN 5156			G ISO 228, Form. E, 1,5XD, D	N	206
2206	HSSE	DIN 5156			G ISO 228, Form. E, +0,1, 1,5XD, D	N	206
2145	HSSE	DIN 5156			G ISO 228, Form. B "Gun", 3XD, D	P, N	207
NEW 2284	HSSE	DIN 5156	VAP		G ISO 228, Form. B "Gun", 3XD, D, MF	P, M, N	207
NEW 2286	HSSE	DIN 5156	TIN+		G ISO 228, Form. B "Gun", 3XD, D, MF	P, M, K, N	208
2146	HSSE	DIN 5156			G ISO 228, Form. C, 35°, 3XD, D	P, N	208
NEW 2285	HSSE	DIN 5156	VAP		G ISO 228, Form. C, 35°, 3XD, D, MF	P, M, N	209
NEW 2287	HSSE	DIN 5156	TIN+		G ISO 228, Form. C, 35°, 3XD, D, MF	P, M, K, N	209
2159	HSSE	DIN 5156			Rc DIN 2999, Form. C, 1,5XD, D	P	210
2164	HSSE	DIN 374			NPT ANSI/ASME B1.20.1, Form. C, 1,5XD, D	P	210

Machos de máquina / Tarauds machine / Machine taps (TR-VG)

2212	HSSE				Tr DIN 103, Tol. 7H	P, N	211
2212/5	HSSE				Tr DIN 103, Tol. 7H, LH	P, N	211
2163	HSSE	DIN 40433			PG DIN 40433, Form. C, 1,5XD, D	P	212
2242	HSSE	DIN 371			VG BS 94, Form. C, 1,5XD, R	P	212






Machos de mano / Tarauds à main / Hands taps									
2301	HSS	DIN 352 / 2181			M-MF DIN 13		Tol. 6H	P N	213
2301/5	HSS	DIN 352			M-MF DIN 13		Tol. 6H	LH	215
2314	HSSE	DIN 352			M DIN 13		Tol. 6HX	P	216
2303	HSSE	DIN 352	VAP		M DIN 13		Tol. 6HX	P M	216
2324	HSSE-PM	DIN 352	TiCN		M DIN 13		Tol. 6HX	P	217
2302	HSS	DIN 352	TiN		M DIN 13		Tol. 6HX	P N	217
2304	HSS	DIN 352			BSW BS 84			P N	218
2304/5	HSS	DIN 352			BSW BS 84		LH 30°	P N	219
2305	HSS	DIN 2181			BSF BS 84			P N	219
2306	HSS	DIN 5157			G ISO 228			P N	220
2306/5	HSS	DIN 5157			G ISO 228		LH 30°	P N	220
2316	HSS	DIN 5157			G ISO 228			N	221
2317	HSS	DIN 5157			G ISO 228		+0,1	N	221






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2307	HSS	DIN 352			P N 222
2307/5	HSS	DIN 352			P N 223
2308	HSS	DIN 2181			P N 223
2308/5	HSS	DIN 2181			P N 224
2315	HSS	DIN 2181			P N 224
2309	HSS	DIN 5157			P N 225
2310	HSS	DIN 2181			P N 225
2312	HSS	DIN 40432			P N 226
2313	HSS	DIN 2181			P N 226

Machos Perfil Completo / Taraud Profil Complet / Non Serial Form Taps

2321	HSS	DIN 352			P N 227
2322	HSS	DIN 352			P N 228
2323	HSS	DIN 2181			P N 228

Cojinetes / Filières / Dies							
2501	HSS	DIN EN22568			M-MF DIN 13 Tol. 6g	P N	229
2501/5	HSS	DIN EN22568			M-MF DIN 13 Tol. 6g LH	P N	231
2514	HSSE	DIN EN22568	NIT		M DIN 13 Tol. 6g 2,25mm GUN	P	232
2512	HSSE	DIN EN22568	VAP		M DIN 13 Tol. 6g 2mm GUN	P M	232
2502	HSS	DIN EN22568			BSW BS 84	P N	233
2502/5	HSS	DIN EN22568			BSW BS 84 LH	P N	233
2503	HSS	DIN EN22568			BSF BS 84	P N	234
2504	HSS	DIN EN24231			G ISO 228	P N	234
2504/5	HSS	DIN EN24231			G ISO 228 LH	P N	235
2522	HSS	DIN EN24231			G ISO 228	N	236
2521	HSS	DIN EN24231			G ISO 228 -0,1 GUN	N	236
2505	HSS	DIN EN22568			UNC ANSI/ASME B1.1 Tol. 2A	P N	237
2505/5	HSS	DIN EN22568			UNC ANSI/ASME B1.1 Tol. 2A LH	P N	237
2506	HSS	DIN EN22568			UNF ANSI/ASME B1.1 Tol. 2A	P N	238
2506/5	HSS	DIN EN22568			UNF ANSI/ASME B1.1 Tol. 2A LH	P N	238
2507	HSS	DIN EN24230			R EN 2999	P N	239
2508	HSS	DIN EN22568			UNEF ANSI/ASME B1.1 Tol. 2A	P N	239
2520	HSS	DIN EN22568			UN ANSI/ASME B1.1 Tol. 2A	P N	240
2510	HSS	DIN 40434			PG EN 10000	P N	240
2509	HSS	DIN EN24230			NPT ANSI/ASME B1.20.1	P N	241

Machos máquina para insertos / Tarauds machine pour inserts / Machine taps for wire thread inserts										
2701	HSS	ISO 529			EG-M STI	Form. D	Tol. 4H	P	N	242
2702	HSS	ISO 529			EG-UNC STI	Form. D	Tol. 4H	P	N	243
2703	HSS	ISO 529			EG-UNF STI	Form. D	Tol. 4H	P	N	243
2704	HSS	ISO 529			EG-W STI	Form. D	Tol. 4H	P	N	244
2715	HSS	ISO 529			EG-G STI	Form. D		P	N	244









Insertos roscados / Filets rapportés / Wire thread inserts										
2705	HSS	DIN 8140			M DIN 8140		Tol. 6H			245
2706	HSS	DIN 8140			UNC ANSI/ASME B18.29.1		Tol. 2B			246
2707	HSS	DIN 8140			UNF ANSI/ASME B18.29.1		Tol. 2B			247
2708	HSS	DIN 8140			BSW BS 84					248
2716	HSS	DIN 8140			G ISO 229		Tol. 2B			248

Accesorios / Accessoires / Accessories										
2709	Insertador / Appareil de pose manuel / Insert Tool									249
2710	Rompe Arrastre / Rupteur / Tang break tool									250
Estuches / Kits / Sets										251

Calibres / Calibres / Gauges							
2901/1	ISO 1502		CTPNP	M-MF DIN 13	Tol. 6H	PASA NO PASA	256
2901/4	ISO 1502		CTP	M-MF DIN 13	Tol. 6H	PASA	257
2901/5	ISO 1502		CTNP	M-MF DIN 13	Tol. 6H	NO PASA	257
2901/2	ISO 1502		CAP	M-MF DIN 13	Tol. 6G	PASA	258
2901/3	ISO 1502		CANP	M-MF DIN 13	Tol. 6G	NO PASA	259
2902/1	ISO 228-2		CTPNP	G ISO 228	PASA NO PASA		260
2902/4	ISO 228-2		CTP	G ISO 228	PASA		260
2902/5	ISO 228-2		CTNP	G ISO 228	NO PASA		260
2902/2	ISO 228-2		CAP	G ISO 228	PASA		261
2902/3	ISO 228-2		CANP	G ISO 228	NO PASA		261
2903/1	BS 919		CTPNP	BSW BS 84	PASA NO PASA		262
2903/2	BS 919		CAP	BSW BS 84	PASA		262
2903/3	BS 919		CANP	BSW BS 84	NO PASA		262
2904/1	ANSI / ASME B1.2		CTPNP	UNC ANSI/ASME B1.2	PASA NO PASA		263
2904/2	ANSI / ASME B1.2		CAP	UNC ANSI/ASME B1.2	PASA		263
2904/3	ANSI / ASME B1.2		CANP	UNC ANSI/ASME B1.2	NO PASA		264
2905/1	ANSI / ASME B1.2		CTPNP	UNF ANSI/ASME B1.2	PASA NO PASA		264
2905/2	ANSI / ASME B1.2		CAP	UNF ANSI/ASME B1.2	PASA		264
2905/3	ANSI / ASME B1.2		CANP	UNF ANSI/ASME B1.2	NO PASA		265

2906/1	ANSI / ASME B1.20.1		CTPNP NPT PASA ANGRENE BLU NO PASA	265
2906/2	ANSI / ASME B1.20.1		CAPNP NPT PASA ANGRENE BLU NO PASA	265
2907/1	DIN 7162		CTL PASA NO PASA	266
2907/4	DIN 7162		CTLP H7 PASA	266
2907/5	DIN 7162		CTLNP H7 NO PASA	267
2907/2	DIN 2250-C		CAL	267

Accesorios / Accessoires / Accessories

2801	Giramachos / Tourne-à-gauche / Tap turners			268
2802	Volvedor / Porte-filières / Tap wrench			268
2803	Giramacho T / Tourne-à-gauche en T / Tap turner in T			268
2804	Giramacho T / Tourne-à-gauche en T / Tap turner in T			269
2805	Extractor / Extracteur			269
2808	Alargador / Adaptateur / Extension piece			269
2834	Extractor / Extracteur			270
2846	Aceite / Huile / Oil			270
Estuches / Coffrets / Sets				271

¿Por qué conformarse con menos?

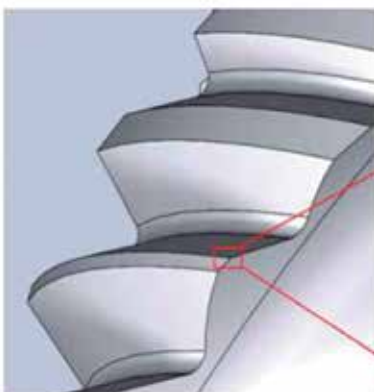
- La tecnología MICROFINISH consiste en que una vez el macho de roscar es rectificado, se limpia de rebabas y se redondean las aristas de corte.
- Se logra un mayor control y estabilidad del desgaste de la herramienta.
- Ello se traduce en un notable incremento de su rendimiento.
- Y en la mejora de los acabados de la rosca.

Pourquoi se satisfaire de peu?

- La technologie MICROFINISH agit après le surfaçage du taraud, qui est nettoyé des bavures et dont les arêtes de coupe sont arrondies.
- L'usure de l'outil est alors mieux contrôlée et plus stable.
- Cela se traduit par une augmentation significative de son rendement.
- Et une amélioration des finitions du filetage.

Why settle for less?

- With MICROFINISH technology once the thread of the tap is rectified, it is cleaned from burrs and the cutting edges are rounded.
- Greater control and stability of wear on the tool is achieved.
- This translates into a notable increase in performance.
- And improves the finishes of the thread.

**CON MICROFINISH**
AVEC MICROFINISH / WITH MICROFINISH**SIN MICROFINISH**
SANS MICROFINISH / WITHOUT MICROFINISH

CON MICROFINISH
AVEC MICROFINISH / WITH MICROFINISH



SIN MICROFINISH
SANS MICROFINISH / WITHOUT MICROFINISH



1. UNA ROSCA CON CALIDAD SUPERFICIAL SUPERIOR

Las roscas obtenidas tienen una calidad superficial superior, gracias a dos efectos:

- La geometría redondeada de forma constante a lo largo de todo el filo de corte del macho, permite un corte continuo y homogéneo de la rosca de la pieza.
- La menor rugosidad superficial de la rosca del macho reduce la fricción durante el roscado para obtener a su vez, una rosca con mejor calidad superficial.

2. MAYOR VIDA ÚTIL DE LA HERRAMIENTA

- Gracias a su nuevo acabado redondeado y a que el filo de corte se va desgastando de manera más controlada y constante, se evita el salto de partículas de cualquier forma y tamaño.
- Ello impide que se produzcan roturas prematuras con el uso.

1. UN FILET D'UNE QUALITÉ DE SURFACE SUPÉRIEURE

Les filets obtenus présentent une qualité de surface supérieure, grâce à deux effets :

- La géométrie arrondie de manière constante tout au long du fil de coupe du taraud apporte une coupe continue et homogène sur le filetage de la pièce.
- La plus faible rugosité de surface du taraud réduit la friction lors du taraudage, permettant ainsi d'obtenir un filet de meilleure qualité de surface.

2. UNE DURÉE DE VIE UTILE DE L'OUTIL PROLONGÉE

- Grâce à sa nouvelle finition arrondie et grâce à un fil de coupe qui s'use de manière mieux contrôlée et plus homogène, le décrochement de particules de toute forme et dimension est évité.
- Cela évite les ruptures prématurées à l'usage.

1. A THREAD WITH HIGHER SERVICE QUALITY

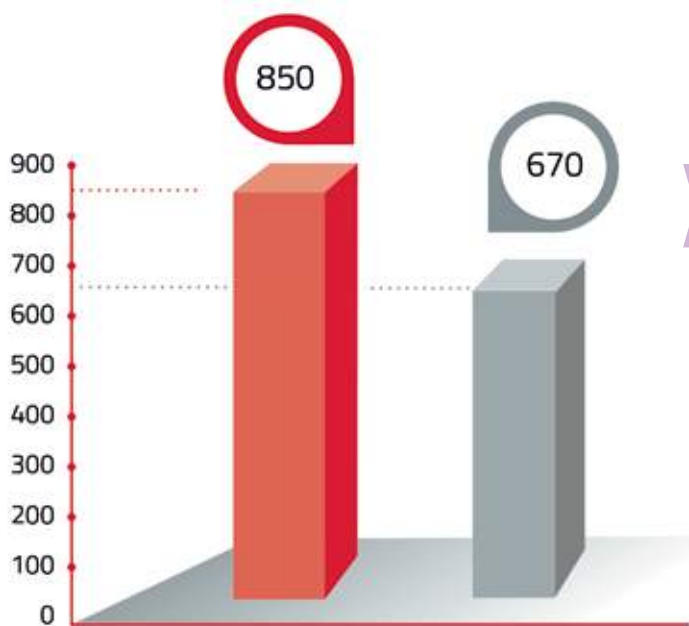
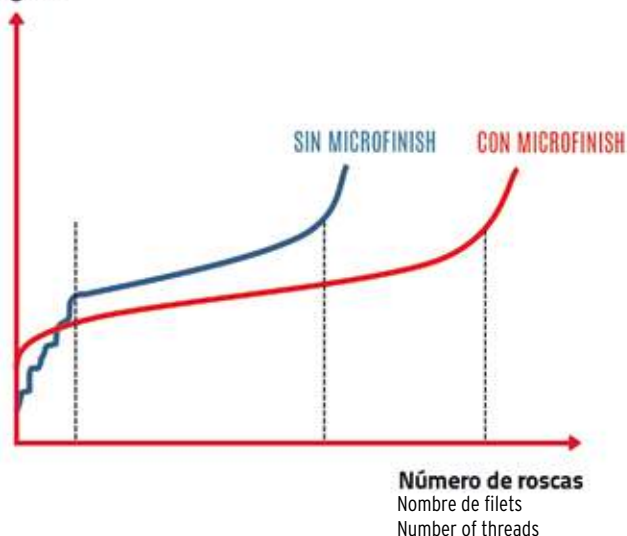
The threads obtained have a higher service quality, thanks to two effects:

- The constant rounded geometry over the entire cutting edge of the tap enables continuous and even cutting of the part's thread.
- The lower surface roughness of the thread on the tap reduces friction during threading, which obtains a thread with a higher surface quality.

2. LONGER SERVICE LIFE OF THE TOOL

- Thanks to its new rounded finish and that the cutting-edge is worn in a controlled and constant manner, the release of particles of any shape and size is avoided.
- This avoids premature breakage with use.

Desgaste Usure /Wear



Rosca/Filet/Thread: M6 6H
Material/Matériau/Material: F114 (C45)
Profundidad/Profondeur/Depth: 12mm
Velocidad/Vitesse/Speed: 10 m/min



Fecha / Date:

Empresa / Entreprise / Company: Contacto / Contact:

Dirección / Adresse / Address: Población / Ville / Town:

Tel / Fax: E-mail:

TRABAJO A REALIZAR / TRAVAIL DEMANDE / REQUESTED WORK

Material / Matière / Material Norma / Norme / Norm:

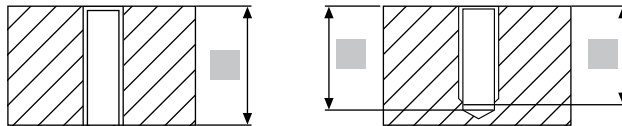
Dureza / Durété / Hardness HB HRC Resistencia / Résistance / Resistance N/mm²

Tipo viruta: Corta Larga Polvo
 Type copeau Courte Longue Poussière
 Shaving Short Long Powder

Máquina / Machine Refrigerante / Réfrigérant / Coolant

Posición / Position: Horizontal Vertical V. Corte V. avance
 V. Coupe Avance
 Cutting Speed Feed

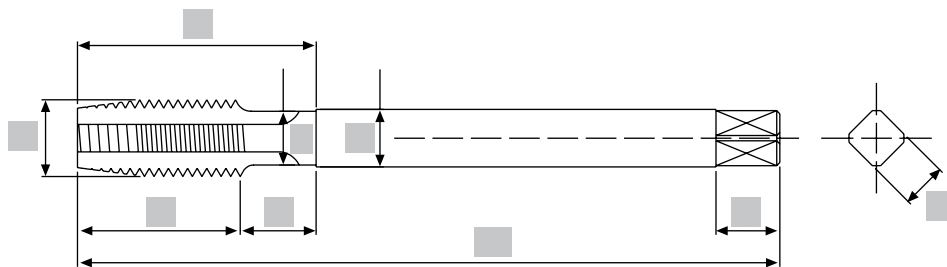
Agujero / Trou / Hole:



HERRAMIENTA / OUTIL / TOOL

Descripción / Description Tolerancia / Tolérance / Tolerance

Cantidad / Quantité / Quantity Número ranuras / Rainures / Grooves



Mango: Cilíndrico Weldon Cónico Rebajado
 Queue: Cylindrique Weldon Conique Réduite
 Shank: Straight Weldon Taper Reduced

Entrada: A B C D E Otra
 Entrée: A B C D E Autres
 Entry: A B C D E Others

Material / Matière / Material: HSS HSSE HM HSS-HM

Superficie / Surface: Brillante Recubrimiento
 Brillant Revêtement
 Brilliant Coating

COMENTARIOS / COMMENTAIRES/ COMMENTS:

Fecha / Date:

Empresa / Entreprise / Company: Contacto / Contact:

Dirección / Adresse / Address: Población / Ville / Town:

Tel / Fax: E-mail:

TRABAJO A REALIZAR / TRAVAIL DEMANDE / REQUESTED WORK

Material / Matière / Material Norma / Norme / Norm:

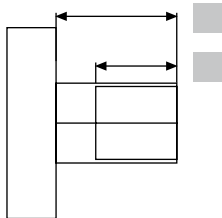
Dureza / Durété / Hardness HB HRC Resistencia / Résistance / Resistance N/mm²

Tipo viruta: Corta Larga Polvo
 Type copeau Courte Longue Poussière
 Shaving Short Long Powder

Máquina / Machine Refrigerante / Réfrigérant / Coolant

Posición / Position: Horizontal Vertical V. Corte V. avance
 V. Coupe Avance
 Cutting Speed Feed

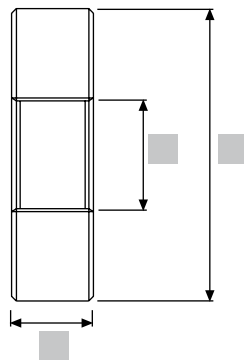
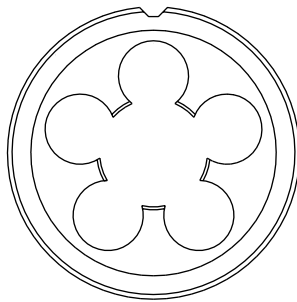
Eje / Axe / Axis:



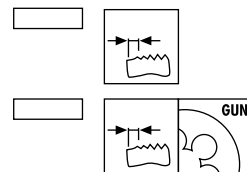
HERRAMIENTA / OUTIL / TOOL

Descripción / Description Tolerancia / Tolérance / Tolerance

Cantidad / Quantité / Quantity Número ranuras / Rainures / Grooves



Entrada / Entrée / Entry



Material / Matière / Material: HSS HSSE HM HSS-HM

Superficie / Surface: Brillante Recubrimiento
 Brillant Revêtement
 Brilliant Coating

COMENTARIOS / COMMENTAIRES/ COMMENTS:



TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$

Ref./ Réf. / Ref.	2102	2101	2102/5	2101/5	2114	2113	2190	2191	2180	2179	2274	2275	2148	2147	2147/5	2154	2153	2153/5	2189
Rosca/ Filetage/Thread	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	UNC	UNC	UNC	UNF	UNF	UNF	UN
DIN	371	376-374	371	376-374	371	376-374	371	376-374	371	376-374	371	376	371	376-374	376-374	374	374	374	374
Form.	C(2-3)	C(2-3)	C(2-3)	C(2-3)	A(6-8)	A(6-8)	E(1,5-2)	E(1,2-2)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)
Ejec./Exec./Exec.			LH	LH											LH			LH	
Tol.	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H
Mat.	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HM	HM	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE
Rec./Rev./Coat.									TICN+	TICN+	TICN	TICN							
Prof./ Depth	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD	1,5xD
Gama/Gamme/Range	1-10	3-63	3-10	5-30	2-10	3-52	3-10	6-16	3-10	8-20	3-10	12-16	N.4-5/16	1/4-1"1/2	1/4-1"	N.4-5/16	1/4-1"1/2	1/4-1"	1"1/8-2"
Pag.	136	137	139	139	140	140	141	141	142	142	143	143	183	183	184	191	191	192	199

Mat.		Vc (m/min)																					
P.1	<600	15-25	15-25	15-25	15-25	15-25	15-25									15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25
P.2	<800	10-20	10-20	10-20	10-20	10-20	10-20									10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
P.3	<1000	10-15	10-15	10-15	10-15	10-15	10-15									10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
P.4	<1200																						
P.5	<1400																						
M.1	<950																						
M.2																							
M.3	<1200																						
M.4																							
K.1	<500									15-30	15-30												
K.2																							
K.3	<800									10-20	10-20												
K.4.1		10-15	10-15	10-15	10-15	10-15	10-15									10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15
K.4.2	<1400																						
N.1.1																							
N.1.2	Al																						
N.1.3																							
N.2.1																							
N.2.2	Cu							25-35	25-35	35-50	35-50												
N.2.3		10-20	10-20	10-20	10-20	10-20	10-20									10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
N.2.4																							
N.3.1	Mg/Zn																						
N.4.1																							
N.4.2	Plastic																						
N.4.3																							
S.1.1	Ni																						
S.1.2																							
S.2.1																							
S.2.2	Ti																						
S.2.3																							
H.1	50 HRC											3-6	3-6										
H.2	55 HRC											2-5	2-5										
H.3	60 HRC											1-4	1-4										

● Optima / Optimun ○ Alternativo / Alternative

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$

Ref./ Réf. / Ref.	2104	2103	2104/5	2103/5	2111	2272	2110	2109	2168	2169	2250	2251	2116	2115	2126	2125	2176	2175	2122	2121	2133	2132	
Rosca/ Filetage/Thread	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF
DIN	371	374	371	374	371-EL	376-EL	371	374	371	374	371	374	371	374	371	374	371	374	371	374	371	374	376
Form.	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	AZ
Ejec./Exéc./Exec.			LH	LH																			
Tol.	6H	6H	6H	6H	6H	6H	6H+0.1	6H+0.1	6G	6G	6H	6H	6H	6H	6H	6H	6HX	6HX	6H	6H	6H	6H	6H
Mat.	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE-PM	HSSE-PM	HSSE-PM	HSSE-PM	HSSE	HSSE	HSSE	HSSE	HSSE
Rec./Rev./Coat.											VAP	VAP	TIN+	TIN+	TICN+	TICN+	TICN+	TICN+	VAP	VAP			
Prof./ Depth	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD
Gama/Gamme/Range	2-10	3-52	3-10	20-24	3-12	8-16	3-10	8-16	3-10	8-20	2-10	3-24	2-10	3-24	3-10	8-24	3-10	8-20	3-10	8-24	3-10	8-24	4-16
Pag.	144	144	146	146	147	147	148	148	149	149	150	150	151	151	152	152	153	153	154	154	155	155	155

Mat.		Vc (m/min)																					
P.1	<600	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25	15-25
P.2	<800	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	15-25	15-25					10-20	10-20	
P.3	<1000	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15						
P.4	<1200													8-12	8-12	6-10	6-10	6-10	6-10				
P.5	<1400															4-6	4-6	4-6	4-6				
M.1	<950	7-10	7-10	7-10	7-10	7-10	7-10	7-10	7-10	7-10	7-10	7-10	9-12	9-12							7-10	7-10	
M.2		5-8	5-8	5-8	5-8	5-8	5-8	5-8	5-8	5-8	5-8	5-8	6-10	6-10							5-8	5-8	
M.3													6-10	6-10									
M.4	<1200												6-10	6-10	6-12	6-12			4-6	4-6			
K.1	<500												10-15	10-15									
K.2													10-15	10-15									
K.3	<800												15-20	15-20									
K.4.1		10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-20	15-20									
K.4.2	<1400															10-20	10-20	10-20	10-20				
N.1.1													15-25	15-25								10-20	10-20
N.1.2	Al	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-25	15-25								10-15	10-15
N.1.3													15-25	15-25									
N.2.1													15-25	15-25								6-8	6-8
N.2.2	Cu															4-6	4-6	4-6	4-6				
N.2.3		10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	15-25	15-25									
N.2.4																							
N.3.1	Mg/Zn																					10-20	10-20
N.4.1		10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	12-18	12-18								10-15	10-15
N.4.2	Plastic															10-15	10-15	10-15	10-15				
N.4.3																							
S.1.1	Ni																						
S.1.2																							
S.2.1																					10-15	10-15	
S.2.2	Ti															6-8	6-8	6-8	6-8				
S.2.3																4-6	4-6	4-6	4-6				
H.1	50 HRC																						
H.2	55 HRC																						
H.3	60 HRC																						

● Optima / Optimun ○ Alternativo / Alternative

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

M-MF	M-MF	M-MF	M-MF	UNC	UNC	UNC	UNC	UNC	UNC	UNF	UNF	UNF	UNF	UNF	UNF	BSW	BSW	G	G	G	M-MF	M-MF	M-MF	M-MF	
371	374	371	374	371	376	371	376	371	376	371	374	371	374	371	374	371	376	5156	5156	5156	ISO 529	JIS B4430	JIS B4430	JIS B4430	
B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	B(3,5-5)	
6HX	6HX	6HX	6HX	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	Med	Med	Med	Med	Med	6H	6H	6H	6H
HSSE-PM	HSSE-PM	HSSE-PM	HSSE-PM	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSS	HSSE	HSSE	TIN
HL	HL	HL	HL	HL	HL	VAP	VAP	TIN+	TIN+	TIN+	TIN+	VAP	VAP	TIN+	TIN+	TIN+	VAP	TIN+	VAP	TIN+	VAP	TIN+	VAP	TIN	
3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD	3xD
3-10	12-16	3-10	12-16	N.4-3/8	1/4-1/4	N.4-3/8	7/16-1"	N.4-3/8	7/16-1"	N.4-3/8	1/4-1"	N.4-3/8	7/16-1"	N.4-3/8	7/16-1"	1/8-3/8	1/4-1"	1/8-1/2	1/8-1"	1/8-1"	3-30	3-20	3-20	3-20	
156	156	157	157	185	185	186	186	187	187	193	193	194	194	195	195	202	202	207	207	208	183	180	180	182	
Vc (m/min)																									
20-40	20-40	20-50	20-50	15-25	15-25	15-25	15-25	20-30	20-30	15-25	15-25	15-25	15-25	20-30	20-30	15-25	15-25	15-25	15-25	20-30	10-20	15-25	15-25	20-30	
20-40	20-40	20-50	20-50	10-20	10-20	10-20	10-20	15-25	15-25	10-20	10-20	10-20	10-20	15-25	15-25	10-20	10-20	10-20	10-20	15-25	5-15	10-20	10-20	15-25	
15-30	15-30	15-40	15-40	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15	10-15	10-15	12-18		10-15	10-15	12-18	
10-20	10-20	10-20	10-20					8-12	8-12					8-12	8-12					8-12					
5-10	5-10	5-10	5-10																						
5-15	5-15	5-15	5-15	7-10	7-10	7-10	7-10	9-12	9-12	7-10	7-10	7-10	7-10	9-12	9-12	7-10	7-10	7-10	7-10	9-12		7-10	7-10	9-12	
5-15	5-15	5-15	5-15	5-8	5-8	5-8	5-8	6-10	6-10	5-8	5-8	5-8	5-8	6-10	6-10	5-8	5-8	5-8	5-8	6-10		5-8	5-8	6-10	
5-10	5-10	5-10	5-10			5-8	5-8	6-10	6-10			5-8	5-8	6-10	6-10					5-8		6-10	6-10		
5-10	5-10	5-10	5-10																						
10-30	10-30	10-40	10-40					10-15	10-15					10-15	10-15					10-15					
10-30	10-30	10-40	10-40					10-15	10-15					10-15	10-15					10-15					
10-20	10-20	10-20	10-20					15-20	15-20					15-20	15-20					15-20					
10-30	10-30	10-40	10-40	10-15	10-15	10-15	10-15	15-20	15-20	10-15	10-15	10-15	10-15	15-20	15-20	10-15	10-15	10-15	10-15	15-20	5-15	10-15	10-15	15-20	
5-15	5-15	5-15	5-15																						
10-30	10-30	10-40	10-40					15-25	15-25					15-25	15-25					15-25					
10-30	10-30	10-40	10-40	10-15	10-15	10-15	10-15	15-25	15-25	10-15	10-15	10-15	10-15	15-25	15-25	10-15	10-15	10-15	10-15	15-25	10-15	10-15	10-15	15-20	
10-30	10-30	10-40	10-40					15-25	15-25					15-25	15-25					15-25					
10-30	10-30	10-40	10-40					15-25	15-25					15-25	15-25					15-25					
10-30	10-30	10-40	10-40	10-20	10-20	10-20	10-20	15-25	15-25	10-20	10-20	10-20	10-20	15-25	15-25	10-20	10-20	10-20	10-20	15-25	5-15	10-20	10-20	15-25	
10-30	10-30	10-40	10-40																						
5-15	5-15	5-15	5-15																						
10-30	10-30	10-40	10-40	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15	10-15	10-15	12-18	10-15	10-15	10-15	12-18	
10-30	10-30	10-40	10-40																						
2-8	2-8	2-8	2-8																						
10-15	10-15	10-15	10-15																						
2-8	2-8	2-8	2-8																						

● Optima / Optimun ○ Alternativo / Alternative



2256	2257	2260	2261	2152	2151	2264	2265	2236	2237	2158	2157	2278	2279	2282	2283	2140	2139	2146	2285	2287	2806	2249	2267	2269	2271	
M-MF	M-MF	M-MF	M-MF	UNC	UNC	UNC	UNC	UNC	UNC	UNF	UNF	UNF	UNF	UNF	UNF	BSW	BSW	G	G	G	M-MF	M-MF	M-MF	M-MF	M-MF	
371	374 376	371	374 376	371	376	371	376	371	376	371	374	371	374	371	374	371	376	5156	5156	5156	ISO 529	JIS B4430	JIS B4430	JIS B4430	JIS B4430	
C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	D(3,5-5)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	
R45°	R45°	R45°	R45°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R35°	R25°	R35°	R35°	R35°	R35°	
6HX	6HX	6HX	6HX	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	Med	Med	Med	Med	Med	6H	6H	6H	6H	6H
HSSE-PM	HSSE-PM	HSSE-PM	HSSE-PM	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSS	HSSE	HSSE	HSSE	
HL	HL	HL	HL			VAP	VAP	TIN+	TIN+			VAP	VAP	TIN+	TIN+				VAP	TIN+				VAP	TIN	
2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	2,5xD	1,5xD	2,5xD	2,5xD	2,5xD	
M3-M10	M12-M16	M3-M10	M12-M16	N.4-3/8	1/4-1 1/4	N.4-3/8	7/16-1"	N.4-3/8	7/16-1"	N.4-3/8	1/4-1"	N.4-3/8	7/16-1"	N.4-3/8	7/16-1"	1/8-3/8	3/16-1"	1/8-1 1/2	1/8-1"							
171	171	172	172	188	188	189	189	190	190	196	196	197	197	198	198	203	203	208	209	209	178	179	180	181	182	

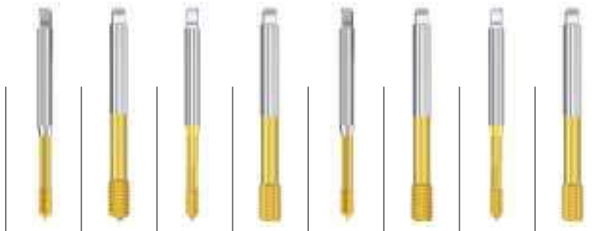
Vc (m/min)

20-40	20-40	20-50	20-50	15-25	15-25	15-25	15-25	20-30	20-30	15-25	15-25	15-25	15-25	20-30	20-30	15-25	15-25	15-25	15-25	20-30	15-25	10-20	15-25	15-25	20-30
20-40	20-40	20-50	20-50	10-20	10-20	10-20	10-20	15-25	15-25	10-20	10-20	10-20	10-20	15-25	15-25	10-20	10-20	10-20	10-20	15-25	10-20	5-15	10-20	10-20	15-25
15-30	15-30	15-40	15-40	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15	10-15	10-15	12-18			10-15	10-15	12-18
10-20	10-20	10-20	10-20					8-12	8-12					8-12	8-12					8-12					
5-10	5-10	5-10	5-10																						
5-15	5-15	5-15	5-15	7-10	7-10	7-10	7-10	9-12	9-12	7-10	7-10	7-10	7-10	9-12	9-12	7-10	7-10	7-10	7-10	9-12			7-10	7-10	9-12
5-15	5-15	5-15	5-15	5-8	5-8	5-8	5-8	6-10	6-10	5-8	5-8	5-8	5-8	6-10	6-10	5-8	5-8	5-8	5-8	6-10			5-8	5-8	6-10
5-10	5-10	5-10	5-10		5-8	5-8	6-10	6-10	6-10		5-8	5-8	6-10	6-10					5-8	6-10					
5-10	5-10	5-10	5-10																						
10-30	10-30	10-40	10-40																						
10-30	10-30	10-40	10-40																						
10-20	10-20	10-20	10-20					15-20	15-20					15-20	15-20					15-20					
10-30	10-30	10-40	10-40	10-15	10-15	10-15	10-15	15-20	15-20	10-15	10-15	10-15	10-15	15-20	15-20	10-15	10-15	10-15	10-15	15-20	10-15	5-15	10-15	10-15	15-20
5-15	5-15	5-15	5-15																						
10-30	10-30	10-40	10-40							10-15	10-15											10-15	10-15	10-15	10-15
10-30	10-30	10-40	10-40																						
10-30	10-30	10-40	10-40					15-25	15-25					15-25	15-25					15-25					
10-30	10-30	10-40	10-40																						
10-30	10-30	10-40	10-40	10-20	10-20	10-20	10-20	15-25	15-25	10-20	10-20	10-20	10-20	15-25	15-25	10-20	10-20	10-20	10-20	15-25	10-20	5-15	10-20	10-20	15-25
10-30	10-30	10-40	10-40																						
5-15	5-15	5-15	5-15																						
10-30	10-30	10-40	10-40	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15	10-15	10-15	12-18	12-18	10-15	10-15	10-15	10-15	12-18	10-15	10-15	10-15	10-15	12-18
10-30	10-30	10-40	10-40																						
2-8	2-8	2-8	2-8																						
10-15	10-15	10-15	10-15																						
2-8	2-8	2-8	2-8																						

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TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

$$\text{r.p.m.} = \frac{V_c \times 1.000}{\pi \times \phi}$$



Ref./ Réf. / Ref.	2188	2187	2214	2213	2216	2215	2218	2217
Rosca/ Filetage/Thread	M	M	M	M	M	M	M	M
DIN	371	374 376	371	374 376	371	374 376	371	374 376
Form.	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)	C(2-3)
Ejec./Exéc./Exec.	A>12%	A>12%	A>12%	A>12%	A>12%	A>12%	A>12%	A>12%
Tol.	6HX	6HX	6HX	6HX	6GX	6GX	6GX	6GX
Mat.	HSSE-PM	HSSE-PM	HSSE-PM	HSSE-PM	HSSE-PM	HSSE-PM	HSSE-PM	HSSE-PM
Rec./Rev./Coat.	TIN	TIN	TIN	TIN	TIN	TIN	TIN	TIN
Prof./ Depth	1,5xD	1,5xD	3xD	3xD	1,5xD	1,5xD	3xD	3xD
Gama/Gamme/Range	M3-M10	M12-M16	M3-M10	M8-M16	M3-M10	M12	M3-M10	M12
Pag.	173	173	174	174	175	175	176	176

Mat.		Vc (m/min)									
P.1	<600	•	•	•	•	•	•	•	•		
	P.2	<800	•	•	•	•	•	•	•		
		P.3	<1000	•	•	•	•	•	•	•	
			P.4	<1200							
				P.5	<1400						
M.1	<950	•	•	•	•	•	•	•	•		
		•	•	•	•	•	•	•	•		
	M.2	•	•	•	•	•	•	•	•		
		<1200									
K.1	<500										
	K.2	<800									
K.3	<800										
	K.4.1	<1400									
K.4.2											
N.1.1	Al	•	•	•	•	•	•	•	•		
		•	•	•	•	•	•	•	•		
N.2.1	Cu	•	•	•	•	•	•	•	•		
		•	•	•	•	•	•	•	•		
N.3.1	Mg/Zn	•	•	•	•	•	•	•	•		
N.4.1	Plastic										
S.1.1	Ni										
S.2.1	Ti	○	○	○	○	○	○	○	○		
S.2.2											
S.2.3											
H.1	50 HRC										
	55 HRC										
	60 HRC										

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A series of horizontal dotted lines for writing, spanning the width of the page.



TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$



Ref./ Réf. / Ref.	2301	2301/5	2302	2314	2303	2324	2304	2304/5	2305	2306	2306/5	2316	2317
Rosca/ Filetage/Thread	M-MF	M	M	M	M	M	BSW	BSW	BSF	G	G	G	G
DIN	352-2181	352	352	352	352	352	352	352	2181	5157	5157	5157	5157
Form.												E(1,5-2)	E(1,5-2)
Ejec./Exéc./Exec.		LH						LH			LH		
Tol.	6H	6H	6H	6HX	6HX	6HX	Med	Med	Med	Med	Med	Med	+0,1
Mat.	HSS	HSS	HSS	HSSE	HSSE	HSSE-PM	HSS	HSS	HSS	HSS	HSS	HSS	HSS
Rec./Rev./Coat.			TIN		VAP	TICN							
Prof./ Depth													
Gama/Gamme/Range	M1-M64	M3-M30	M3-M20	M3-M16	M3-M20	M4-M16	3/32-3"	1/8-1"	3/16-1"1/2	1/8-3"	1/8-1"	1/8-1"	1/8-1"
Pag.	213	215	217	216	216	217	218	219	219	220	220	221	221

Mat.		Vc (m/min)											
P.1	<600	●	●	●	○	○		●	●	●	●	●	
P.2	<800	●	●	●	●	●	○	●	●	●	●	●	
P.3	<1000			○	●	●	●						
P.4	<1200				○	○	●						
P.5	<1400						●						
M.1	<950				○	●							
M.2					○	●							
M.3							○						
M.4	<1200						○						
K.1	<500												
K.2													
K.3	<800												
K.4.1													
K.4.2	<1400						○						
N.1.1													
N.1.2	Al	○	○	○				○	○	○	○	○	
N.1.3		●	●	●				●	●	●	●	●	
N.2.1													
N.2.2	Cu											●	●
N.2.3		●	●	●	○	○	○	●	●	●	●	●	
N.2.4													
N.3.1	Mg/Zn												
N.4.1													
N.4.2	Plastic												
N.4.3													
S.1.1	Ni												
S.1.2													
S.2.1					●								
S.2.2	Ti												
S.2.3													
H.1	50 HRC												
H.2	55 HRC												
H.3	60 HRC												

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2307	2307/5	2308	2308/5	2315	2309	2310	2312	2313	2321	2322	2323	2701	2702	2703	2704
UNC	UNC	UNF	UNF	UN	Rc	UNEF	Pg	NPT	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF	M-MF
352	352	2181	2181	2181	5157	2181	40432	2181	352-2181	352-2181	352-2181	ISO 529	ISO 529	ISO 529	ISO 529
									No Prog	No Prog	No Prog	D(3-5)	D(3-5)	D(3-5)	D(3-5)
	LH		LH												
2B	2B	2B	2B	2B		2B			6H	6H	6H	4H	4H	4H	4H
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
N.4-2"	1/4-1"	N.4-1"1/2	1/4-1"	1"1/8-2"	1/8-1"	1/4-1"	7-48	1/16-2"	M2-M42	N.4-2"	N.4-1"1/2	M2-M24	N.2-1"	N.4-1"	
222	223	223	224	224	225	225	226	226	227	228	228	242	243	243	244

Vc (m/min)

•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

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TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$



Ref./ Réf. / Ref.	2501	2501/5	2514	2512	2502	2502/5	2503	2504	2504/5	2522	2521
Rosca/ Filetage/Thread	M-MF	M	M	M	BSW	BSW	BSF	G	G	G	G
DIN	22568	22568	22568	22568	22568	22568	22568	24231	24231	24231	24231
Form.											
Ejec./Exéc./Exec.		LH				LH			LH		
Tol.	6g	6g	6g	6g	Med	Med	Med	Med	Med	Med	-0,1
Mat.	HSS	HSS	HSSE	HSSE	HSS	HSS	HSS	HSS	HSS	HSS	HSS
Rec./Rev./Coat.			NIT	VAP							
Prof./ Depth											
Gama/Gamme/Range	M1-M64	M3-M30	M3-M16	M3-M20	3/32-2"	1/8-1"	3/16-1"	1/8-2"	1/8-1"	1/8-1"	1/8-1"
Pag.	229	231	232	232	233	233	234	234	235	236	236

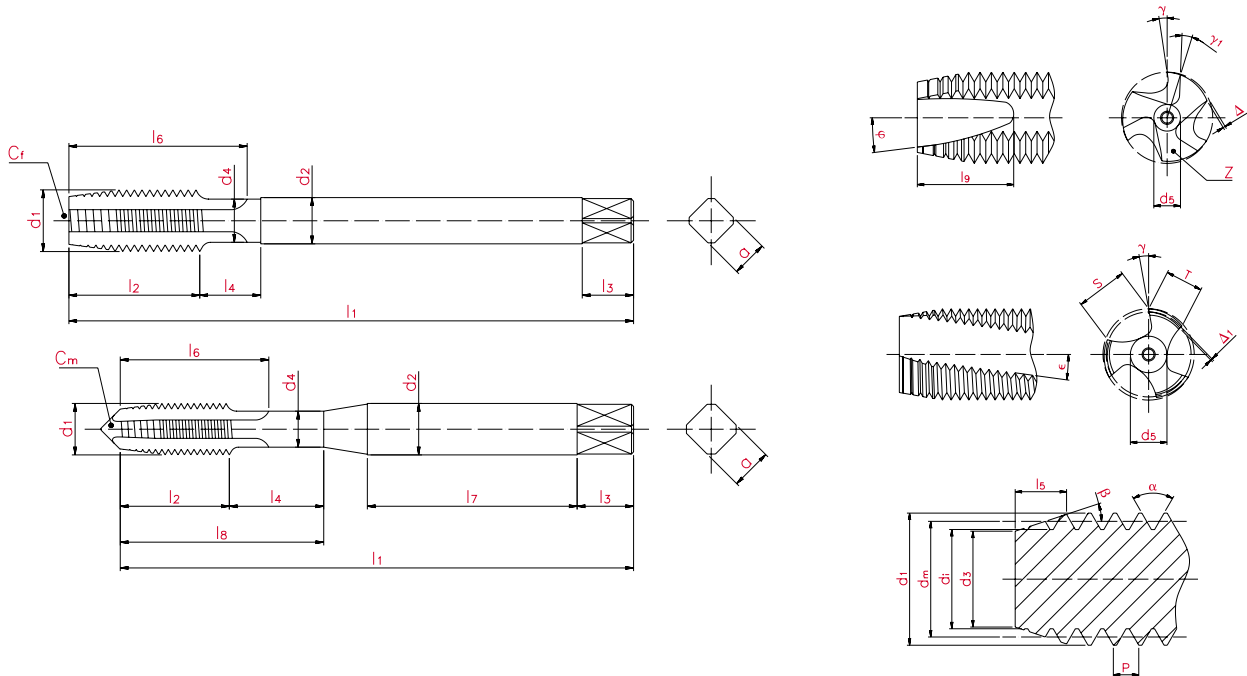
Mat.		Vc (m/min)										
P.1	<600	●	●	○	○	●	●	●	●	●		
P.2	<800	●	●	●	●	●	●	●	●	●		
P.3	<1000			●	●							
P.4	<1200			○	○							
P.5	<1400											
M.1	<950			○	●							
M.2				○	●							
M.3	<1200											
M.4												
K.1	<500											
K.2												
K.3	<800											
K.4.1												
K.4.2	<1400						○					
N.1.1												
N.1.2	Al	○	○			○	○	○	○	○		
N.1.3		●	●			●	●	●	●	●		
N.2.1												
N.2.2	Cu										●	●
N.2.3		●	●	○	○	●	●	●	●	●		
N.2.4												
N.3.1	Mg/Zn											
N.4.1												
N.4.2	Plastic											
N.4.3												
S.1.1	Ni											
S.1.2												
S.2.1												
S.2.2	Ti				●							
S.2.3												
H.1	50 HRC											
H.2	55 HRC											
H.3	60 HRC											

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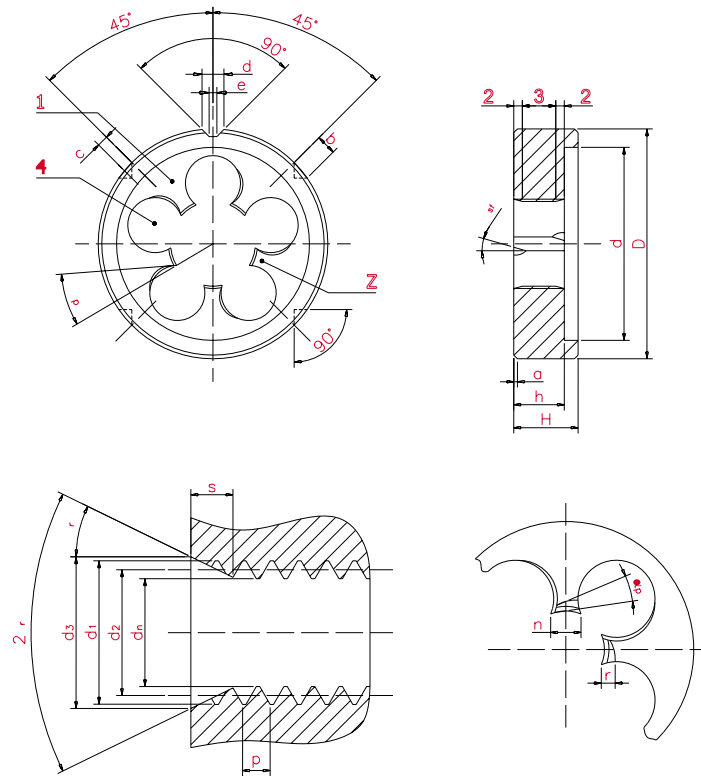
2505	2505/5	2506	2506/5	2520	2507	2508	2510	2509
UNC	UNC	UNF	UNF	UN	R	UNEF	Pg	NPT
22568	22568	22568	22568	22568	24231	22568	40434	24230
	LH		LH					
2A	2A	2A	2A	2A		2A		
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
N.4-2"	1/4-1"	N.4-1"1/2	1/4-1"	1"1/8-2"	1/8-1"	1/4-1"	7-48	1/16-2"
237	237	238	238	240	239	239	240	241
•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•
o	o	o	o	o	o	o	o	o
•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•

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A series of horizontal dotted lines providing a template for writing or drawing.



I1	Longitud total / Longueur totale / Total length
I2	Longitud de rosca / Longueur de filetage / Thread length
I7	Longitud de mango / Longueur de queue / Shank length
I3	Longitud de cuadro / Longueur du carré / Square length
I4	Longitud de sangrado / Longueur d'indentation / Neck length
I5	Longitud de entrada / Longueur d'entrée / Chamfer length
I6	Longitud de ranura / Longueur de rainure / Flute Length
I8	Longitud útil de corte / Longueur utile de coupe / Useful length of cut
I9	Longitud de la entrada en hélice / Longueur de l'entrée en hélice / Spiral point length
d1	Diámetro exterior / Diamètre extérieur / External diameter
d2	Diámetro de mango / Diamètre de queue / Shank diameter
d3	Diámetro de entrada / Diamètre d'entrée / Chamfer diameter
d4	Diámetro de sangrado / Diamètre d'indentation / Neck diameter
d5	Diámetro del alma / Diamètre de l'âme / Core diameter
dm	Diámetro medio / Diamètre moyen / Pitch diameter
di	Diámetro interno / Diamètre interne / Internal diameter
α	Cuadrado / Carré / Square
Cm	Punto macho / Pointe mâle / Male point
Cf	Punto hembra / Pointe femelle / Female point
P	Paso de la rosca / Pas de filetage / Pitch of thread
S	Ancho de la ranura / Largeur de la rainure / Flute width
T	Ancho del diente / Largeur de la dent / Width of land
Z	Número de ranuras / Nombre de rainures / Number of flutes
α	Ángulo de flancos / Angle de flancs / Angle of thread
β	Ángulo de la entrada / Angle de l'entrée / Chamfer angle
γ	Ángulo de corte / Angle de coupe / Rake angle
γ1	Ángulo de corte de la entrada corregida / Angle de coupe de l'entrée corrigée / Spiral point rake angle
φ	Ángulo de la entrada corregida / Angle de l'entrée corrigée / Spiral point angle
ε	Ángulo de la ranura / Angle de la rainure / Flute angle
Δ	Ángulo de destalonado de la entrada / Angle de détalonnage de l'entrée / Chamfer relief angle
Δ1	Ángulo de destalonado de flancos / Angle de détalonnage des flancs / Flank relief angle



1	Cuerpo del cojinete / Corps de la filière / Die body
2	Parte cortante - Entrada cónica / Partie coupante - Entrée conique / Cutting part - Conical entry
3	Hilos enteros / Fils entiers / Entire threads
4	Alojamiento para viruta / Logement pour copeau / Void for shavings
d1	Diámetro nominal de rosca / Diamètre nominal de filetage / Nominal diameter of thread
d2	Diámetro de flancos / Diamètre de flancs / Flank Diameter
dn	Diámetro de núcleo / Diamètre du noyau / Nucleus diameter
d3	Diámetro de la entrada cónica / Diamètre de l'entrée conique / Diameter of conical chamfer
P	Paso de la rosca / Pas de filetage / Thread pitch
D	Diámetro exterior del cojinete / Diamètre extérieur de la filière / Exterior diameter of die
d	Diámetro de la parte rebajada / Diamètre de la partie chanfreinée / Diameter of the reduced part
H	Diámetro de sangrado / Diamètre d'indentation / Bled diameter
h	Ancho del cojinete / Largeur de la filière / Die width
Z	Ancho útil del cojinete / Largeur utile de la filière / Useful width of the die
n	Número de dientes / Nombre de dents / Number of teeth
r	Ancho del diente / Largeur de la dent / Tooth width
s	Destalonado de la entrada cónica / Détalonnage de l'entrée conique / Conical chamfer relief
a	Longitud de la entrada cónica / Longueur de l'entrée conique / Conical chamfer length
b	Chaflán / Chanfrein / Bevel
c	Diámetro del agujero de fijación / Diamètre du trou de fixation / Mounting hole diameter
d	Desplazamiento del agujero de fijación / Déplacement du trou de fixation / Mounting hole displacement
e	Ancho de pranura / Largeur de pré-rainure / Pre-groove width
γ_p	Ángulo de la ranura / Angle de la rainure / Groove angle
χ_r	Ángulo de desprendimiento (de corte) / Angle de dégagement (de coupe) / Rake angle (of cut)
$2\chi_r$	Ángulo de la entrada cónica / Angle de l'entrée conique / Conical chamfer angle
α_p	Ángulo de destalonado de la entrada cónica / Angle de détalonnage de l'entrée conique / Conical chamfer relief angle
γ_{sf}	Ángulo de la entrada en hélice (rompevirutas) / Longueur de l'entrée en hélice (brise-copeaux) / Blade chamfer angle (chip cap)

> Roscas más usuales en pulgadas.
 Filetages les plus courants en pouces.
 Most common threads in inches.

Ø	W 55°	BSF 55°	GAS 55°	BSB BRASS 55°	UNC 60°	UNF 60°	UNEF NEF 60°	NPS NPT API 60°	UN 60°					UNS 60°						
N° 0	-	-	-	-	-	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N° 1	-	-	-	-	64	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N° 2	-	-	-	-	56	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N° 3	-	-	-	-	48	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N° 4	-	-	-	-	40	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N° 5	-	-	-	-	40	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N° 6	-	-	-	-	32	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N° 8	-	-	-	-	32	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N° 10	-	-	-	-	24	32	-	-	-	-	-	-	-	-	28	36	40	48	56	-
N° 12	-	-	-	-	24	28	32	-	-	-	-	-	-	-	36	40	48	56	-	-
1/16	60	-	-	-	-	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-
3/32	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/8	40	-	28	-	-	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-
5/32	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/16	24	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7/32	24	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4	20	26	19	26	20	28	32	18	-	-	-	-	-	-	24	27	26	40	48	56
9/32	20	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/16	18	22	-	26	18	24	32	-	20	28	-	-	-	-	27	36	40	48	-	-
3/8	16	20	19	26	16	24	32	18	20	28	-	-	-	-	18	27	36	40	-	-
7/16	14	18	-	26	14	20	28	-	16	32	-	-	-	-	18	24	27	-	-	-
1/2	12	16	14	26	13	20	28	14	16	32	-	-	-	-	12	14	18	24	27	-
9/16	12	16	-	26	12	18	24	-	16	20	28	32	-	-	14	27	-	-	-	-
5/8	11	14	14	26	11	18	24	14	12	16	20	28	32	-	14	27	-	-	-	-
11/16	11	14	-	-	-	-	24	-	12	16	20	28	32	-	-	-	-	-	-	-
3/4	10	12	14	26	10	16	20	14	12	28	32	-	-	-	14	18	24	27	-	-
13/16	10	12	-	-	-	-	20	-	12	16	28	32	-	-	-	-	-	-	-	-
7/8	9	11	14	26	9	14	20	-	12	16	28	32	-	-	10	18	24	27	-	-
15/16	-	-	-	-	-	-	20	-	16	28	32	-	-	-	-	-	-	-	-	-
1"	8	10	11	26	8	12	20	11,5	16	28	16	-	28	-	10	14	18	24	27	-
1" 1/16	-	-	-	-	-	-	18	-	8	16	20	28	-	-	-	-	-	-	-	-
1" 1/8	7	9	11	26	7	12	18	-	8	16	20	28	-	-	10	14	24	-	-	-
1" 3/16	-	-	-	-	-	-	18	-	8	16	20	28	-	-	-	-	-	-	-	-
1" 1/4	7	9	11	26	7	12	18	11,5	8	16	20	28	-	-	10	14	24	-	-	-
1" 5/16	-	-	-	-	-	-	18	-	8	16	20	28	-	-	-	-	-	-	-	-
1" 3/8	6	8	11	26	6	12	18	-	6	8	12	16	20	28	10	14	24	-	-	-
1" 7/16	-	-	-	-	-	-	18	-	8	16	20	28	-	-	-	-	-	-	-	-
1" 1/2	6	8	11	26	6	12	18	11,5	6	8	16	20	-	-	10	14	24	-	-	-
1" 9/16	-	-	-	-	-	-	18	-	6	8	12	16	20	-	-	-	-	-	-	-
1" 5/8	5	8	11	26	-	-	18	-	6	8	12	16	20	-	10	14	24	-	-	-
1" 11/16	-	-	-	-	-	-	18	-	6	8	12	16	20	-	-	-	-	-	-	-
1" 3/4	5	7	11	26	5	-	-	-	6	8	12	16	20	-	10	14	24	-	-	-
1" 13/16	-	-	-	-	-	-	-	-	6	8	12	16	20	-	-	-	-	-	-	-
1" 7/8	4,5	-	-	26	-	-	-	-	6	8	12	16	20	-	10	14	24	-	-	-
1" 15/16	-	-	-	-	-	-	-	-	6	8	12	16	20	-	-	-	-	-	-	-
2"	4,5	7	11	26	4,5	-	-	11,5	6	8	12	16	20	-	10	14	24	-	-	-



TABLAS DE ROSCAS Y PASOS GRILLES DES FILETAGES ET DES PAS / TABLE OF THREADS AND PITCHES

- **Equivalencias en mm de los diámetros de las siguientes roscas.**
Équivalences en mm des diamètres des filetages suivants.
Equivalents in mm of the diameters of the following threads.

BSW/BSF		UNC/UNF		BSP (GAS)		NSP/NPT		PG	
3/32 = 2,381mm	5/8 = 15,875 mm	G1/8 = 9,728 mm	G1"3/8 = 44,323 mm	1/8 = 10,287 mm	PG7 = 12,50 mm				
1/8 = 3,175 mm	3/4 = 19,050 mm	G1/4 = 13,157 mm	G1"1/2 = 47,803 mm	1/4 = 13,716 mm	PG9 = 15,20 mm				
5/32 = 3,969 mm	7/8 = 22,225 mm	G3/8 = 16,662 mm	G1"5/8 = 51,988 mm	3/8 = 17,145 mm	PG11 = 18,60 mm				
3/16 = 4,762 mm	1" = 25,400 mm	G1/2 = 20,955 mm	G1"3/4 = 53,746 mm	1/2 = 21,336 mm	PG13,5 = 20,40 mm				
7/32 = 5,556 mm	1"1/8 = 28,575 mm	G5/8 = 22,911 mm	G2" = 59,614 mm	3/4 = 26,670 mm	PG16 = 22,50 mm				
1/4 = 6,350 mm	1"1/4 = 31,750 mm	G3/4 = 26,441 mm	G2"1/4 = 65,710 mm	1" = 33,401 mm	PG21 = 28,30 mm				
9/32 = 7,144 mm	1"3/8 = 34,925 mm	G7/8 = 30,201 mm	G2"3/8 = 69,390 mm	1"1/4 = 42,164 mm	PG29 = 37,00 mm				
5/16 = 7,938 mm	1"1/2 = 38,100 mm	G1" = 33,249 mm	G2"1/2 = 75,184 mm	1"1/2 = 48,260 mm	PG36 = 47,00 mm				
3/8 = 9,525 mm	1"5/8 = 41,275 mm	G1"1/8 = 37,897 mm	G2"3/4 = 81,534 mm	2" = 60,325 mm	PG42 = 54,00 mm				
7/16 = 11,112 mm	1"3/4 = 44,450 mm	G1"1/4 = 41,910 mm	G3" = 87,844 mm	2"1/2 = 73,025 mm	PG48 = 59,30 mm				
1/2 = 12,700 mm	1"7/8 = 47,625 mm			3" = 88,900 mm					
9/16 = 14,288 mm	2" = 50,800 mm								

- **Equivalencia del paso en hilos por pulgada a mm.**
Équivalence du pas en fils par pouce en mm.
Equivalents of pitch in threads per inch to mm.

PASO h/1"	EQUIV. mm	PASO h/1"	EQUIV. mm	PASO h/1"	EQUIV. mm	PASO h/1"	EQUIV. mm	PASO h/1"	EQUIV. mm
PAS h/1"	ÉQUIV. mm	PAS h/1"	ÉQUIV. mm	PAS h/1"	ÉQUIV. mm	PAS h/1"	ÉQUIV. mm	PAS h/1"	ÉQUIV. mm
PITCH h/1"	EQUIV. mm	PITCH h/1"	EQUIV. mm	PITCH h/1"	EQUIV. mm	PITCH h/1"	EQUIV. mm	PITCH h/1"	EQUIV. mm
80	0,317	44	0,577	26	0,976	16	1,587	9	2,822
72	0,352	40	0,636	24	1,058	14	1,814	8	3,174
64	0,396	36	0,705	22	1,154	13	1,953	7	3,628
60	0,423	32	0,793	20	1,270	12	2,116	6	4,233
56	0,453	28	0,907	19	1,336	11,5	2,208	5	5,080
48	0,523	27	0,940	18	1,411	11	2,309	4,5	5,644

- **Equivalencia de las roscas PG a MF.**
Équivalence du pas PG à MF.
Equivalents of threads PG to MF.

PG	MF	PG	MF
7 x 20 h.	12 x 1,50	21 x 16 h.	32 x 1,50
9 x 18 h.	16 x 1,50	29 x 16 h.	40 x 1,50
11 x 18 h.	20 x 1,50	36 x 16 h.	50 x 1,50
13,5 x 18 h.	20 x 1,50	48 x 16 h.	63 x 1,50
16 x 18 h.	25 x 1,50		

DIÁMETROS PREVIOS AL ROSCADO


DIAMÈTRES PRÉALABLES AU FILETAGE / DIAMETERS BEFORE THREAD


M		MF		MF		MF	
dl x p (mm)	Øa	dl x p (mm)	Øa	dl x p (mm)	Øa	dl x p (mm)	Øa
M 1 x 0,25	0,75	M 1 x 0,2	0,80	M 18 x 2	16,00	M 42 x 1,5	40,50
M 1,1 x 0,25	0,85	M 1,1 x 0,2	0,90	M 19 x 1	18,00	M 42 x 2	40,00
M 1,2 x 0,25	0,95	M 1,2 x 0,2	1,00	M 19 x 1,25	17,75	M 42 x 3	39,00
M 1,4 x 0,3	1,10	M 1,4 x 0,2	1,20	M 19 x 1,5	17,50	M 44 x 1,5	42,50
M 1,6 x 0,35	1,25	M 1,6 x 0,2	1,40	M 20 x 1	19,00	M 45 x 1,5	43,50
M 1,7 x 0,35	1,30	M 1,7 x 0,2	1,50	M 20 x 1,25	18,75	M 45 x 2	43,00
M 1,8 x 0,35	1,45	M 1,8 x 0,2	1,60	M 20 x 1,5	18,50	M 45 x 3	42,00
M 2 x 0,4	1,60	M 2 x 0,25	1,75	M 20 x 2	18,00	M 45 x 4	41,00
M 2,2 x 0,45	1,75	M 2,2 x 0,25	1,95	M 21 x 1	20,00	M 48 x 1,5	46,50
M 2,3 x 0,4	1,90	M 2,3 x 0,25	2,05	M 21 x 1,25	19,75	M 48 x 2	46,00
M 2,5 x 0,45	2,05	M 2,5 x 0,35	2,15	M 21 x 1,5	19,50	M 48 x 3	45,00
M 2,6 x 0,45	2,10	M 2,6 x 0,35	2,25	M 22 x 1	21,00	M 48 x 4	44,00
M 3 x 0,5	2,50	M 3 x 0,35	2,65	M 22 x 1,25	20,75	M 50 x 1,5	48,50
M 3,5 x 0,6	2,90	M 3,5 x 0,35	3,15	M 22 x 1,5	20,50	M 50 x 2	48,00
M 4 x 0,7	3,30	M 4 x 0,35	3,65	M 22 x 2	20,00	M 50 x 3	47,00
M 4,5 x 0,75	3,70	M 4 x 0,5	3,50	M 23 x 1	22,00	M 52 x 1,5	50,50
M 5 x 0,8	4,20	M 4,5 x 0,5	4,00	M 23 x 1,5	21,50	M 52 x 2	50,00
M 6 x 1	5,00	M 5 x 0,5	4,50	M 24 x 1	23,00	M 52 x 3	49,00
M 7 x 1	6,00	M 5,5 x 0,5	5,00	M 24 x 1,25	22,75	M 52 x 4	48,00
M 8 x 1,25	6,80	M 6 x 0,5	5,50	M 24 x 1,5	22,50	M 56 x 1,5	54,50
M 9 x 1,25	7,80	M 6 x 0,75	5,20	M 24 x 2	22,00	M 56 x 2	54,00
M 10 x 1,5	8,50	M 7 x 0,5	6,50	M 25 x 1	24,00	M 56 x 3	53,00
M 11 x 1,5	9,50	M 7 x 0,75	6,20	M 25 x 1,25	23,75	M 56 x 4	52,00
M 12 x 1,75	10,20	M 8 x 0,5	7,50	M 25 x 1,5	23,50	M 60 x 1,5	58,50
M 14 x 2	12,00	M 8 x 0,75	7,20	M 25 x 2	23,00	M 60 x 2	58,00
M 16 x 2	14,00	M 8 x 1	7,00	M 26 x 1	25,00	M 60 x 3	57,00
M 18 x 2,5	15,50	M 9 x 0,75	8,20	M 26 x 1,5	24,50	M 60 x 4	56,00
M 20 x 2,5	17,50	M 9 x 1	8,00	M 26 x 2	24,00	M 63 x 1,5	61,50
M 22 x 2,5	19,50	M 10 x 0,5	9,50	M 27 x 1	26,00		
M 24 x 3	21,00	M 10 x 0,75	9,20	M 27 x 1,5	25,50		
M 27 x 3	24,00	M 10 x 1	9,00	M 27 x 2	25,00		
M 30 x 3,5	26,50	M 10 x 1,25	8,80	M 28 x 1	27,00		
M 33 x 3,5	29,50	M 11 x 0,75	10,20	M 28 x 1,5	26,50		
M 36 x 4	32,00	M 11 x 1	10,00	M 28 x 2	26,00		
M 39 x 4	35,00	M 11 x 1,25	9,75	M 30 x 1	29,00		
M 42 x 4,5	37,50	M 12 x 0,75	11,25	M 30 x 1,5	28,50		
M 45 x 4,5	40,50	M 12 x 1	11,00	M 30 x 2	28,00		
M 48 x 5	43,00	M 12 x 1,25	10,80	M 30 x 3	27,00		
M 52 x 5	47,00	M 12 x 1,5	10,50	M 32 x 1	31,00		
M 56 x 5,5	50,50	M 13 x 0,75	12,25	M 32 x 1,5	30,50		
M 60 x 5,5	54,50	M 13 x 1	12,00	M 32 x 2	30,00		
M 64 x 6	58,00	M 13 x 1,25	11,75	M 33 x 1	32,00		
M 68 x 6	62,00	M 13 x 1,5	11,50	M 33 x 1,5	31,50		
		M 14 x 0,75	13,25	M 33 x 2	31,00		
		M 14 x 1	13,00	M 33 x 3	30,00		
		M 14 x 1,25	12,80	M 34 x 1,5	32,50		
		M 14 x 1,5	12,50	M 34 x 2	32,00		
		M 15 x 1	14,00	M 35 x 1,5	33,50		
		M 15 x 1,25	13,75	M 36 x 1,5	34,50		
		M 15 x 1,5	13,50	M 36 x 2	34,00		
		M 16 x 1	15,00	M 36 x 3	33,00		
		M 16 x 1,25	14,75	M 38 x 1,5	36,50		
		M 16 x 1,5	14,50	M 38 x 2	36,00		
		M 17 x 1	16,00	M 39 x 1,5	37,50		
		M 17 x 1,25	15,75	M 39 x 2	37,00		
		M 17 x 1,5	15,50	M 39 x 3	36,00		
		M 18 x 1	17,00	M 40 x 1,5	38,50		
		M 18 x 1,25	16,75	M 40 x 2	38,00		
		M 18 x 1,5	16,50	M 40 x 3	37,00		


M		BSW	
dl x p (mm)	Øa	dl (") - p (tpi)	Øa
M 3 x 0,6	2,40	W 1/16 - 60	1,15
M 3,5 x 0,75	2,75	W 3/32 - 48	1,80
M 4 x 0,75	3,25	W 1/8 - 40	2,50
M 4 x 0,8	3,20	W 5/32 - 32	3,10
M 5 x 0,9	4,10	W 3/16 - 24	3,60
M 5 x 1	4,00	W 7/32 - 24	4,40
M 5,5 x 0,9	4,60	W 1/4 - 20	5,10
M 6 x 1,25	4,75	W 9/32 - 20	5,90
M 8 x 1,5	6,50	W 5/16 - 18	6,50
M 13 x 1,75	11,25	W 3/8 - 16	7,90
M 15 x 2	13,00	W 7/16 - 14	9,30
		W 1/2 - 12	10,50
		W 9/16 - 12	12,00
		W 5/8 - 11	13,50
		W 11/16 - 11	15,00
		W 3/4 - 10	16,50
		W 13/16 - 10	18,00
		W 7/8 - 9	19,25
		W 1" - 8	22,00
		W 1"1/8 - 7	24,75
		W 1"1/4 - 7	27,75
		W 1"3/8 - 6	30,50
		W 1"1/2 - 6	33,50
		W 1"5/8 - 5	35,50
		W 1"3/4 - 5	39,00
		W 1"7/8 - 4,5	41,50




DIÁMETROS PREVIOS AL ROSCADO DIAMÈTRES PRÉALABLES AU FILETAGE / DIAMETERS BEFORE THREAD


BSW			
d1 (") - p (tpi)			Øa
W 2" - 4,5			44,50
W 2" 1/4 - 4			50,00
W 2" 1/2 - 4			56,50
W 2" 3/4 - 3,5			62,00
W 3" - 3,5			68,50


UNC			
d1 (") - p (tpi)			Øa
UNC 1" 3/4 - 5			39,50
UNC 2" - 4,5			45,00
UNC 2" 1/4 - 4,5			51,50
UNC 2" 1/2 - 4			57,25
UNC 2" 3/4 - 4			63,50
UNC 3" - 4			70,00


UNEF			
d1 (") - p (tpi)			Øa
UNEF 1" 7/16 - 18			35,10
UNEF 1" 1/2 - 18			36,70
UNEF 1" 9/16 - 18			38,30
UNEF 1" 5/8 - 18			39,90


BSF			
d1 (") - p (tpi)			Øa
BSF 3/16 - 32			4,00
BSF 7/32 - 28			4,50
BSF 1/4 - 26			5,20
BSF 9/32 - 26			6,00
BSF 5/16 - 22			6,60
BSF 3/8 - 20			8,10
BSF 7/16 - 18			9,50
BSF 1/2 - 16			11,00
BSF 9/16 - 16			12,50
BSF 5/8 - 14			14,00
BSF 11/16 - 14			15,60
BSF 3/4 - 12			16,50
BSF 13/16 - 12			18,25
BSF 7/8 - 11			19,50
BSF 1" - 10			22,50
BSF 1" 1/8 - 9			25,50
BSF 1" 1/4 - 9			28,75
BSF 1" 3/8 - 8			31,50
BSF 1" 1/2 - 8			34,50
BSF 1" 5/8 - 8			37,50
BSF 1" 3/4 - 7			40,50
BSF 2" - 7			46,50


UNF			
d1 (") - p (tpi)			Øa
UNF N.0 - 80			1,30
UNF N.1 - 72			1,60
UNF N.2 - 64			1,90
UNF N.3 - 56			2,10
UNF N.4 - 48			2,40
UNF N.5 - 44			2,70
UNF N.6 - 40			3,00
UNF N.8 - 36			3,50
UNF N.10 - 32			4,10
UNF N.12 - 28			4,70
UNF 1/4 - 28			5,50
UNF 5/16 - 24			6,90
UNF 3/8 - 24			8,50
UNF 7/16 - 20			9,90
UNF 1/2 - 20			11,50
UNF 9/16 - 18			12,90
UNF 5/8 - 18			14,50
UNF 3/4 - 16			17,50
UNF 7/8 - 14			20,40
UNF 1" - 12			23,25
UNF 1" 1/8 - 12			26,50
UNF 1" 1/4 - 12			29,50
UNF 1" 3/8 - 12			32,75
UNF 1" 1/2 - 12			36,00

G (BSP)			
d1 (") - p (tpi)			Øa
G1/16 - 28			6,80
G1/8 - 28			8,80
G1/4 - 19			11,80
G3/8 - 19			15,25
G1/2 - 14			19,00
G5/8 - 14			21,00
G3/4 - 14			24,50
G7/8 - 14			28,25
G1" - 11			30,75
G1" 1/8 - 11			35,30
G1" 1/4 - 11			39,25
G1" 3/8 - 11			41,90
G1" 1/2 - 11			45,25
G1" 3/4 - 11			51,30
G2" - 11			57,00
G2" 1/4 - 11			63,10
G2" 1/2 - 11			72,60
G2" 3/4 - 11			79,10
G3" - 11			85,50
G3" 1/4 - 11			91,50
G3" 1/2 - 11			97,70
G3" 3/4 - 11			104,00
G4" - 11			110,50


UNC			
d1 (") - p (tpi)			Øa
UNC N.1 - 64			1,50
UNC N.2 - 56			1,80
UNC N.3 - 48			2,10
UNC N.4 - 40			2,30
UNC N.5 - 40			2,60
UNC N.6 - 32			2,85
UNC N.8 - 32			3,50
UNC N.10 - 24			3,90
UNC N.12 - 24			4,50
UNC 1/4 - 20			5,20
UNC 5/16 - 18			6,60
UNC 3/8 - 16			8,00
UNC 7/16 - 14			9,40
UNC 1/2 - 13			10,75
UNC 9/16 - 12			12,20
UNC 5/8 - 11			13,50
UNC 3/4 - 10			16,50
UNC 7/8 - 9			19,50
UNC 1" - 8			22,25
UNC 1" 1/8 - 7			25,00
UNC 1" 1/4 - 7			28,25
UNC 1" 3/8 - 6			30,75
UNC 1" 1/2 - 6			34,00


UNEF			
d1 (") - p (tpi)			Øa
UNEF N.12 - 32			4,70
UNEF 1/4 - 32			5,55
UNEF 5/16 - 32			7,15
UNEF 3/8 - 32			8,70
UNEF 7/16 - 28			10,20
UNEF 1/2 - 28			11,80
UNEF 9/16 - 24			13,20
UNEF 5/8 - 24			14,80
UNEF 11/16 - 24			16,40
UNEF 3/4 - 20			17,80
UNEF 13/16 - 20			19,40
UNEF 7/8 - 20			20,95
UNEF 15/16 - 20			22,50
UNEF 1" - 20			24,10
UNEF 1" 1/16 - 18			25,60
UNEF 1" 1/8 - 18			27,15
UNEF 1" 3/16 - 18			28,75
UNEF 1" 1/4 - 18			30,35
UNEF 1" 5/16 - 18			31,90
UNEF 1" 3/8 - 18			33,60


BA			
d1 (") - p (tpi)			Øa
BA 7 2,5 - 0,48			2,00
BA 8 2,2 - 0,43			1,80
BA 9 1,9 - 0,39			1,50
BA 10 1,7 - 0,35			1,30
BA 11 1,5 - 0,31			1,20
BA 12 1,3 - 0,28			1,00
BA 13 1,2 - 0,25			0,95
BA 14 1 - 0,23			0,75


PG			
d1 (") - p (tpi)			Øa
Pg 7 12,5 - 20			11,40
Pg 9 15,2 - 18			14,00
Pg 11 18,6 - 18			17,25
Pg 13,5 20,4 - 18			19,00
Pg 16 22,5 - 18			21,25
Pg 21 28,3 - 16			26,75
Pg 29 37,0 - 16			35,50
Pg 36 47,0 - 16			45,50
Pg 42 54,0 - 16			52,50
Pg 48 59,3 - 16			58,00


DIÁMETROS PREVIOS AL ROSCADO DIAMÈTRES PRÉALABLES AU FILETAGE / DIAMETERS BEFORE THREAD


BA			
dl (") - p (tpi)		Øa	
Rp1/16	- 28	6,60	
Rp1/8	- 28	8,60	
Rp1/4	- 19	11,50	
Rp3/8	- 19	15,00	
Rp1/2	- 14	18,50	
Rp3/4	- 14	24,00	
Rp1"	- 11	30,25	
Rp1"1/4	- 11	39,00	
Rp1"1/2	- 11	45,00	
Rp2"	- 11	56,50	
Rp2"1/2	- 11	72,25	
Rp3"	- 11	85,00	


NPSM			
dl (") - p (tpi)		Øa	
NPSM 1/8	- 27	9,10	
NPSM 1/4	- 18	12,00	
NPSM 3/8	- 18	15,50	
NPSM 1/2	- 14	19,00	
NPSM 3/4	- 14	24,50	
NPSM 1"	- 11,5	30,50	
NPSM 1"1/4	- 11,5	39,25	
NPSM 1"1/2	- 11,5	45,50	
NPSM 2"	- 11,5	57,50	
NPSM 2"1/2	- 8	69,00	
NPSM 3"	- 8	85,00	


M (Laminación Laminage/Lamination)			
dl - p (mm)		Øa ± 0,02	
M 3	x 0,5	2,76	
M 4	x 0,7	3,67	
M 5	x 0,8	4,62	
M 6	x 1	5,52	
M 8	x 1,25	7,40	
M 10	x 1,5	9,28	
M 12	x 1,75	11,16	
M 14	x 2	13,04	
M 16	x 2	15,03	

Rp			
dl (") - p (tpi)		Øa	
BA 0	6 - 1	5,10	
BA 1	5,3 - 0,9	4,50	
BA 2	4,7 - 0,81	4,00	
BA 3	4,1 - 0,73	3,40	
BA 4	3,6 - 0,66	3,00	
BA 5	3,2 - 0,59	2,60	
BA 6	2,8 - 0,53	2,30	

NPT					
dl (") - p (tpi)		L min	Øa	Øb	Øc
NPT 1/16	- 27	12,00	6,20	6,00	6,39
NPT 1/8	- 27	12,00	8,50	8,30	8,74
NPT 1/4	- 18	17,50	11,00	10,70	11,36
NPT 3/8	- 18	17,60	14,50	14,20	14,80
NPT 1/2	- 14	22,80	17,80	17,40	18,32
NPT 3/4	- 14	23,00	23,00	22,50	23,67
NPT 1"	- 11,5	27,40	29,00	28,50	29,69
NPT 1"1/4	- 11,5	28,00	37,50	37,00	38,45
NPT 1"1/2	- 11,5	28,40	44,00	43,50	44,52
NPT 2"	- 11,5	28,00	56,00	55,50	56,56
NPT 2"1/2	- 8	40,80	66,50	66,00	67,62
NPT 3"	- 8	43,00	82,50	82,00	83,53

NPTF					
dl (") - p (tpi)		L min	Øa	Øb	Øc
NPTF 1/16	- 27	12,00	6,20	6,00	6,41
NPTF 1/8	- 27	12,00	8,50	8,30	8,76
NPTF 1/4	- 18	17,50	11,00	10,70	11,40
NPTF 3/8	- 18	17,60	14,50	14,20	14,84
NPTF 1/2	- 14	22,80	17,80	17,40	18,33
NPTF 3/4	- 14	23,00	23,00	22,50	23,68
NPTF 1"	- 11,5	27,40	29,00	28,50	29,72
NPTF 1"1/4	- 11,5	28,00	37,50	37,00	38,48
NPTF 1"1/2	- 11,5	28,40	44,00	43,50	44,55
NPTF 2"	- 11,5	28,00	56,00	55,50	56,59
NPTF 2"1/2	- 8	40,80	66,50	66,00	67,67
NPTF 3"	- 8	43,00	82,50	82,00	83,58

RC					
dl (") - p (tpi)		L min	Øa	Øb	Øc
Rc 1/16	- 28	10,10	6,30	6,00	6,50
Rc 1/8	- 28	10,10	8,30	8,00	8,50
Rc 1/4	- 19	15,00	11,00	10,70	11,35
Rc 3/8	- 19	15,40	14,50	14,15	14,85
Rc 1/2	- 14	20,50	18,10	17,60	18,50
Rc 3/4	- 14	21,80	23,50	23,00	24,00
Rc 1"	- 11	26,00	29,60	29,00	30,20
Rc 1"1/4	- 11	28,30	38,10	37,50	38,80
Rc 1"1/2	- 11	28,30	44,00	43,35	44,70
Rc 2"	- 11	32,70	55,60	54,90	56,50

RC			
dl (") - p (tpi)		Øa	
UN 1"1/8	- 8	25,40	
UN 1"1/4	- 8	28,50	
UN 1"3/8	- 8	31,75	
UN 1"1/2	- 8	35,00	
UN 1"5/8	- 8	38,10	
UN 1"3/4	- 8	41,25	
UN 2"	- 8	47,63	
UN 2"1/4	- 8	54,00	
UN 2"1/2	- 8	60,35	
UN 2"3/4	- 8	66,70	
UN 3"	- 8	73,05	



EJES PREVIOS AL ROSCADO AXES PRÉALABLES AU FILETAGE / SHAFTS BEFORE THREAD

M		MF		MF		MF	
d1 x p (mm)	Øa	d1 x p (mm)	Øa	d1 x p (mm)	Øa	d1 x p (mm)	Øa
M 1 x 0,25	0,97	M 2 x 0,25	1,97	M 21 x 1	20,88	M 48 x 1,5	47,85
M 1,1 x 0,25	1,07	M 2,2 x 0,25	2,17	M 21 x 1,25	20,87	M 48 x 2	47,82
M 1,2 x 0,25	1,17	M 2,3 x 0,25	2,27	M 21 x 1,5	20,85	M 48 x 3	47,76
M 1,4 x 0,3	1,36	M 2,5 x 0,35	2,44	M 22 x 1	21,88	M 48 x 4	47,70
M 1,6 x 0,35	1,54	M 2,6 x 0,35	2,54	M 22 x 1,25	21,87	M 50 x 1,5	49,85
M 1,7 x 0,35	1,64	M 3 x 0,35	2,94	M 22 x 1,5	21,85	M 50 x 2	49,82
M 1,8 x 0,35	1,74	M 3,5 x 0,35	3,44	M 22 x 2	21,82	M 50 x 3	49,76
M 2 x 0,4	1,93	M 4 x 0,35	3,94	M 23 x 1	22,88	M 52 x 1,5	51,85
M 2,2 x 0,45	2,13	M 4 x 0,5	3,93	M 23 x 1,5	22,85	M 52 x 2	51,82
M 2,3 x 0,4	2,23	M 4,5 x 0,5	4,42	M 24 x 1	23,88	M 52 x 3	51,76
M 2,5 x 0,45	2,43	M 5 x 0,5	4,93	M 24 x 1,25	23,87	M 52 x 4	51,70
M 2,6 x 0,45	2,53	M 5,5 x 0,5	5,42	M 24 x 1,5	23,85	M 56 x 1,5	55,85
M 3 x 0,5	2,92	M 6 x 0,5	5,93	M 24 x 2	23,82	M 56 x 2	55,82
M 3,5 x 0,6	3,41	M 6 x 0,75	5,90	M 25 x 1	24,88	M 56 x 3	55,76
M 4 x 0,7	3,91	M 7 x 0,5	6,92	M 25 x 1,25	24,87	M 56 x 4	55,70
M 4,5 x 0,75	4,41	M 7 x 0,75	6,90	M 25 x 1,5	24,85	M 60 x 1,5	59,75
M 5 x 0,8	4,90	M 8 x 0,5	7,93	M 25 x 2	24,82	M 60 x 2	59,82
M 6 x 1	5,88	M 8 x 0,75	7,90	M 26 x 1	25,88	M 60 x 3	59,76
M 7 x 1	6,88	M 8 x 1	7,88	M 26 x 1,5	25,85	M 60 x 4	59,70
M 8 x 1,25	7,87	M 9 x 0,75	8,90	M 26 x 2	25,82	M 63 x 1,5	62,85
M 9 x 1,25	8,87	M 9 x 1	8,88	M 27 x 1	26,88		
M 10 x 1,5	9,85	M 10 x 0,5	9,93	M 27 x 1,5	26,85		
M 11 x 1,5	10,85	M 10 x 0,75	9,90	M 27 x 2	26,82		
M 12 x 1,75	11,83	M 10 x 1	9,88	M 28 x 1	27,88		
M 14 x 2	13,82	M 10 x 1,25	9,86	M 28 x 1,5	27,85		
M 16 x 2	15,82	M 11 x 0,75	10,90	M 28 x 2	27,82		
M 18 x 2,5	17,79	M 11 x 1	10,88	M 30 x 1	29,88		
M 20 x 2,5	19,79	M 11 x 1,25	10,87	M 30 x 1,5	29,85		
M 22 x 2,5	21,79	M 12 x 0,75	11,90	M 30 x 2	29,82		
M 24 x 3	23,77	M 12 x 1	11,88	M 30 x 3	29,76		
M 27 x 3	26,77	M 12 x 1,25	11,86	M 32 x 1	31,88		
M 30 x 3,5	29,73	M 12 x 1,5	11,85	M 32 x 1,5	31,85		
M 33 x 3,5	32,73	M 13 x 0,75	12,90	M 32 x 2	31,82		
M 36 x 4	35,70	M 13 x 1	12,88	M 33 x 1	32,88		
M 39 x 4	38,70	M 13 x 1,25	12,87	M 33 x 1,5	32,85		
M 42 x 4,5	41,69	M 13 x 1,5	12,85	M 33 x 2	32,82		
M 45 x 4,5	44,69	M 14 x 0,75	13,90	M 33 x 3	32,76		
M 48 x 5	47,66	M 14 x 1	13,88	M 34 x 1,5	33,85		
M 52 x 5	51,66	M 14 x 1,25	13,86	M 34 x 2	33,82		
M 56 x 5,5	55,65	M 14 x 1,5	13,85	M 35 x 1,5	34,85		
M 60 x 5,5	59,65	M 15 x 1	14,88	M 36 x 1,5	35,85		
M 64 x 6	63,62	M 15 x 1,25	14,87	M 36 x 2	35,82		
M 68 x 6	67,62	M 15 x 1,5	14,85	M 36 x 3	35,76		
		M 16 x 1	15,88	M 38 x 1,5	37,85		
		M 16 x 1,25	15,87	M 38 x 2	37,82		
		M 16 x 1,5	15,85	M 39 x 1,5	38,85		
		M 17 x 1,25	16,87	M 39 x 2	38,82		
		M 17 x 1,5	16,85	M 39 x 3	38,76		
		M 18 x 1	17,88	M 40 x 1,5	39,85		
		M 18 x 1,25	17,85	M 40 x 2	39,82		
		M 18 x 1,5	17,85	M 40 x 3	39,76		
		M 18 x 2	17,82	M 42 x 1,5	41,85		
		M 19 x 1	18,88	M 42 x 2	41,82		
		M 19 x 1,25	18,87	M 42 x 3	41,76		
		M 19 x 1,5	18,85	M 44 x 1,5	43,75		
		M 20 x 1	19,88	M 45 x 1,5	44,85		
		M 20 x 1,25	19,87	M 45 x 2	44,82		
		M 20 x 1,5	19,85	M 45 x 3	44,76		
		M 20 x 2	19,82	M 45 x 4	44,70		

M		BSW	
d1 x p (mm)	Øa	d1 ("") - p (tpi)	Øa
M 3 x 0,6	2,40	W 1/16 - 60	1,49
M 3,5 x 0,75	2,75	W 3/32 - 48	2,28
M 4 x 0,75	3,25	W 1/8 - 40	3,06
M 4 x 0,8	3,20	W 5/32 - 32	3,85
M 5 x 0,9	4,10	W 3/16 - 24	4,63
M 5 x 1	4,00	W 7/32 - 24	5,42
M 5,5 x 0,9	4,60	W 1/4 - 20	6,18
M 6 x 1,25	4,75	W 5/16 - 18	7,78
M 8 x 1,5	6,50	W 3/8 - 16	9,35
M 13 x 1,75	11,25	W 7/16 - 14	10,90
M 15 x 2	13,00	W 1/2 - 12	12,47
		W 9/16 - 12	13,92
		W 5/8 - 11	15,66
		W 11/16 - 11	17,20
		W 3/4 - 10	18,80
		W 7/8 - 9	21,92
		W 1" - 8	25,11
		W 1"1/8 - 7	28,28
		W 1"1/4 - 7	31,45
		W 1"3/8 - 6	34,57
		W 1"1/2 - 6	37,76
		W 1"5/8 - 5	40,91
		W 1"3/4 - 5	44,05
		W 1"7/8 - 4,5	47,27
		W 2" - 4,5	50,38
		W 2"1/4 - 4	56,90
		W 2"1/2 - 4	63,20
		W 2"3/4 - 3,5	69,60
		W 3" - 3,5	76,20

EJES PREVIOS AL ROSCADO AXES PRÉALABLES AU FILETAGE / SHAFTS BEFORE THREAD



UNC	
dl (") - p (tpi)	Øa
UNC N.1- 64	1,79
UNC N.2- 56	2,12
UNC N.3- 48	2,44
UNC N.4- 40	2,76
UNC N.5- 40	3,09
UNC N.6- 32	3,41
UNC N.8- 32	4,07
UNC N.10- 24	4,71
UNC N.12- 24	5,37
UNC 1/4- 20	6,22
UNC 5/16- 18	7,8
UNC 3/8- 16	9,37
UNC 7/16- 14	10,95
UNC 1/2- 13	12,52
UNC 9/16- 12	14,10
UNC 5/8- 11	15,68
UNC 3/4- 10	18,84
UNC 7/8- 9	22,00
UNC 1" - 8	25,16
UNC 1" 1/8- 7	28,31
UNC 1" 1/4- 7	31,49
UNC 1" 3/8- 6	34,63
UNC 1" 1/2- 6	37,81
UNC 1" 3/4- 5	44,12
UNC 2" - 4,5	50,45
UNC 2" 1/4- 4,5	56,80
UNC 2" 1/2- 4	63,10
UNC 2" 3/4- 4	69,45
UNC 3" - 4	75,80

UNEF	
dl (") - p (tpi)	Øa
UNEF N.12- 32	5,39
UNEF 1/4- 32	6,25
UNEF 5/16- 32	7,84
UNEF 3/8- 32	9,42
UNEF 7/16- 28	11,00
UNEF 1/2- 28	12,59
UNEF 9/16- 24	14,18
UNEF 5/8- 24	15,75
UNEF 3/4- 20	18,91
UNEF 7/8- 20	22,09
UNEF 1" - 20	25,26
UNEF 1" 1/8- 18	28,40
UNEF 1" 1/4- 18	31,59
UNEF 1" 3/8- 18	34,76
UNEF 1" 1/2- 18	37,94

PG	
dl (") - p (tpi)	Øa
Pg 7 12,5- 20	12,40
Pg 9 15,2- 18	15,10
Pg 11 18,6- 18	18,50
Pg 13,5 20,4- 18	20,30
Pg 16 22,5- 18	22,40
Pg 21 28,3- 16	28,15
Pg 29 37,0- 16	36,85
Pg 36 47,0- 16	46,85
Pg 42 54,0- 16	53,85
Pg 48 59,3- 16	59,15

BSF	
dl (") - p (tpi)	Øa
BSF 3/16 - 32	4,67
BSF 7/32 - 28	5,47
BSF 1/4 - 26	6,25
BSF 5/16 - 22	7,82
BSF 3/8 - 20	9,39
BSF 7/16 - 18	10,97
BSF 1/2 - 16	12,54
BSF 9/16 - 16	14,12
BSF 5/8 - 14	15,71
BSF 11/16 - 14	17,30
BSF 3/4 - 12	18,85
BSF 7/8 - 11	22,02
BSF 1" - 10	25,17
BSF 1" 1/8 - 9	24,40
BSF 1" 1/4 - 9	31,60
BSF 1" 3/8 - 8	34,70
BSF 1" 1/2 - 8	37,90
BSF 1" 5/8 - 8	41,10
BSF 1" 3/4 - 7	44,20
BSF 2" - 7	50,60

NPSM	
dl (") - p (tpi)	Øa
NPSM 1/8- 27	4,99
NPSM 1/4- 18	13,24
NPSM 3/8- 18	16,70
NPSM 1/2- 14	20,77
NPSM 3/4- 14	26,13
NPSM 1" - 11,5	32,68
NPSM 1" 1/4- 11,5	41,45
NPSM 1" 1/2- 11,5	47,52
NPSM 2" - 11,5	59,56

G (BSP)	
dl (") - p (tpi)	Øa
G 1/16- 28	7,61
G 1/8- 28	9,62
G 1/4- 19	13,03
G 3/8- 19	16,53
G 1/2- 14	20,81
G 5/8- 14	22,77
G 3/4- 14	26,30
G 7/8- 14	30,06
G 1" - 11	33,07
G 1" 1/8- 11	37,71
G 1" 1/4- 11	41,73
G 1" 3/8- 11	44,14
G 1" 1/2- 11	47,62
G 1" 3/4- 11	53,56
G 2" - 11	59,43
G 2" 1/4- 11	65,49
G 2" 1/2- 11	74,94
G 2" 3/4- 11	81,27
G 3" - 11	87,57
G 3" 1/4- 11	93,68
G 3" 1/2- 11	100,01
G 3" 3/4- 11	106,35
G 4" - 11	112,68

NPT		
dl (") - p (tpi)	L min	Øa
NPT 1/16- 27	8,40	7,58
NPT 1/8- 27	8,50	9,93
NPT 1/4- 18	12,70	13,18
NPT 3/8- 18	12,90	16,60
NPT 1/2- 14	16,80	20,63
NPT 3/4- 14	17,10	25,95
NPT 1" - 11,5	21,30	32,51
NPT 1" 1/4- 11,5	21,90	41,23
NPT 1" 1/2- 11,5	22,30	47,30
NPT 2" - 11,5	23,10	59,31

UNF	
dl (") - p (tpi)	Øa
UNF N.0- 80	1,47
UNF N.1- 72	1,79
UNF N.2- 64	2,12
UNF N.3- 56	2,44
UNF N.4- 48	2,77
UNF N.5- 44	3,10
UNF N.6- 40	3,42
UNF N.8- 36	4,08
UNF N.10- 32	4,73
UNF N.12- 28	5,38
UNF 1/4- 28	6,24
UNF 5/16- 24	7,82
UNF 3/8- 24	9,41
UNF 7/16- 20	10,98
UNF 1/2- 20	12,56
UNF 9/16- 18	14,14
UNF 5/8- 18	15,73
UNF 3/4- 16	18,89
UNF 7/8- 14	22,05
UNF 1" - 12	25,21
UNF 1" 1/8- 12	28,38
UNF 1" 1/4- 12	31,56
UNF 1" 3/8- 12	34,73
UNF 1" 1/2- 12	37,91

BA	
dl (") - p (tpi)	Øa
BA 0 6-1	5,93
BA 1 5,3- 0,9	5,23
BA 2 4,7- 0,81	4,64
BA 3 4,1- 0,73	4,04
BA 4 3,6- 0,66	3,55
BA 5 3,2- 0,59	3,15
BA 6 2,8- 0,53	2,76
BA 7 2,5- 0,48	2,46
BA 8 2,2- 0,43	2,16

NPTF		
dl (") - p (tpi)	L min	Øa
NPTF 1/16- 27	8,40	7,58
NPTF 1/8- 27	8,50	9,93
NPTF 1/4- 18	12,70	13,18
NPTF 3/8- 18	12,90	16,60
NPTF 1/2- 14	16,80	20,63
NPTF 3/4- 14	17,10	25,95
NPTF 1" - 11,5	21,30	32,51
NPTF 1" 1/4- 11,5	21,90	41,23
NPTF 1" 1/2- 11,5	22,30	47,30
NPTF 2" - 11,5	23,10	59,31

R		
dl (") - p (tpi)	L min	Øa
R 1/8- 28	8,20	9,48
R 1/4- 19	12,10	12,78
R 3/8- 19	12,50	16,26
R 1/2- 14	16,40	20,44
R 3/4- 14	17,70	25,85
R 1" - 11	20,90	32,60
R 1" 1/4- 11	23,20	41,12
R 1" 1/2- 11	23,20	47,01
R 2" - 11	27,50	58,62



2102

HSSE DIN 371

M-MF
DIN 13

Form.
C



Tol.
6H

1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M1,0	0,25	51,15	40	6	2,10	2,5
M1,1	0,25	51,15	40	6	2,10	2,5
M1,2	0,25	36,59	40	6	2,10	2,5
M1,4	0,30	36,59	40	7	2,10	2,5
M1,6	0,35	35,94	40	8	2,10	2,5
M1,7	0,35	32,84	40	8	2,10	2,5
M1,8	0,35	33,75	40	8	2,10	2,5
M2,0	0,40	15,70	45	10	2,10	2,8
M2,2	0,45	16,23	45	10	2,10	2,8
M2,3	0,40	16,23	45	10	2,10	2,8
M2,5	0,45	15,70	50	9	2,10	2,8
M2,6	0,45	15,70	50	9	2,10	2,8
M3,0	0,35	23,85	56	11	2,70	3,5
M3,0	0,50	10,78	56	11	2,70	3,5
*M3,0	0,60	18,07	56	11	2,70	3,5

Ø	P	€	L mm	l mm	∠ mm	d mm
M3,5	0,60	14,25	56	12	3,00	4,0
*M3,5	0,75	20,60	56	11	3,00	4,0
M4,0	0,50	22,51	63	13	3,40	4,5
M4,0	0,70	11,03	63	13	3,40	4,5
M4,5	0,75	19,65	70	14	4,90	6,0
M5,0	0,50	23,14	70	14	4,90	6,0
*M5,0	0,75	23,63	70	16	4,90	6,0
M5,0	0,80	11,06	70	16	4,90	6,0
M6,0	0,75	19,85	80	14	4,90	6,0
M6,0	1,00	12,56	80	19	4,90	6,0
M7,0	1,00	15,19	80	18	5,50	7,0
M8,0	0,75	23,20	80	18	6,20	8,0
M8,0	1,25	14,12	90	22	6,20	8,0
M9,0	1,25	22,94	90	22	7,00	9,0
M10,0	1,50	15,83	100	24	8,00	10,0

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

2101

HSSE DIN 376/374

M-MF
DIN 13

Form.
C



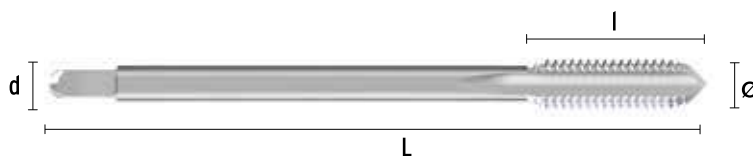
Tol.
6H

1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	10,58	56	11	2,00	2,2
*M3,5	0,60	14,25	56	13	2,10	2,8
M4,0	0,70	11,03	63	13	2,10	2,8
M5,0	0,80	11,06	70	16	2,70	3,5
*M6,0	0,50	27,77	80	18	3,40	4,5
*M6,0	0,75	18,27	80	14	3,40	4,5
M6,0	1,00	12,56	80	19	3,40	4,5
*M7,0	0,50	31,61	80	19	4,30	5,5
*M7,0	0,75	24,38	80	14	4,30	5,5
*M7,0	1,00	15,19	80	19	4,30	5,5
*M8,0	0,50	30,44	80	19	4,90	6,0
*M8,0	0,75	22,24	80	19	4,90	6,0
M8,0	1,00	18,01	90	20	4,90	6,0
M8,0	1,25	14,12	90	22	4,90	6,0
*M9,0	0,75	32,99	90	22	5,50	7,0
M9,0	1,00	27,47	90	20	5,50	7,0
*M9,0	1,25	22,94	90	20	5,50	7,0
*M10,0	0,50	87,43	90	18	5,50	7,0
M10,0	0,75	35,57	90	18	5,50	7,0
M10,0	1,00	20,00	90	20	5,50	7,0
M10,0	1,25	22,88	100	20	5,50	7,0
M10,0	1,50	15,83	100	24	5,50	7,0
M11,0	1,00	35,13	90	20	6,20	8,0
*M11,0	1,25	35,13	90	22	6,20	8,0
M11,0	1,50	28,88	100	24	6,20	8,0
*M12,0	0,75	54,88	100	22	7,00	9,0
M12,0	1,00	27,32	100	20	7,00	9,0
M12,0	1,25	27,63	100	20	7,00	9,0
M12,0	1,50	24,71	100	22	7,00	9,0
M12,0	1,75	20,39	110	29	7,00	9,0
*M13,0	0,75	93,91	100	22	9,00	11,0
*M13,0	1,00	50,74	100	22	9,00	11,0
*M13,0	1,25	50,74	100	22	9,00	11,0
*M13,0	1,50	50,74	100	22	9,00	11,0
*M13,0	1,75	50,74	110	27	9,00	11,0
*M14,0	0,75	93,91	100	22	9,00	11,0
M14,0	1,00	43,92	100	20	9,00	11,0
M14,0	1,25	36,11	100	20	9,00	11,0
M14,0	1,50	28,48	100	20	9,00	11,0
M14,0	2,00	28,25	110	30	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M15,0	1,00	56,56	100	20	9,00	12,0
*M15,0	1,25	61,78	100	22	9,00	12,0
*M15,0	1,50	50,22	100	22	9,00	12,0
*M15,0	2,00	61,45	110	30	9,00	12,0
M16,0	1,00	53,30	100	20	9,00	12,0
*M16,0	1,25	58,14	100	22	9,00	12,0
M16,0	1,50	32,52	100	22	9,00	12,0
M16,0	2,00	33,21	110	30	9,00	12,0
*M17,0	1,00	106,02	100	20	9,00	12,0
*M17,0	1,25	106,02	100	22	9,00	12,0
*M17,0	1,50	106,02	100	22	9,00	12,0
M18,0	1,00	59,68	110	24	11,00	14,0
*M18,0	1,25	75,44	110	25	11,00	14,0
M18,0	1,50	46,61	110	25	11,00	14,0
M18,0	2,00	67,04	125	34	11,00	14,0
M18,0	2,50	47,87	125	34	11,00	14,0
*M19,0	1,00	139,29	110	25	11,00	14,0
*M19,0	1,25	139,21	110	25	11,00	14,0
*M19,0	1,50	139,28	110	25	11,00	14,0
M20,0	1,00	78,79	125	24	12,00	16,0
M20,0	1,25	139,29	125	25	12,00	16,0
M20,0	1,50	52,78	125	25	12,00	16,0
M20,0	2,00	69,16	140	27	12,00	16,0
M20,0	2,50	50,87	140	34	12,00	16,0
*M21,0	1,00	202,22	125	25	12,00	16,0
*M21,0	1,25	202,22	125	25	12,00	16,0
*M21,0	1,50	148,45	125	25	12,00	16,0
M22,0	1,00	88,34	125	24	14,50	18,0
*M22,0	1,25	139,29	125	25	14,50	18,0
M22,0	1,50	63,53	125	24	14,50	18,0
M22,0	2,00	88,34	140	27	14,50	18,0
M22,0	2,50	64,49	140	34	14,50	18,0
*M23,0	1,00	202,13	125	25	14,50	18,0
*M23,0	1,50	96,31	125	25	14,50	18,0
M24,0	1,00	202,22	140	27	14,50	18,0
*M24,0	1,25	78,12	140	28	14,50	18,0
M24,0	1,50	98,76	140	27	14,50	18,0
M24,0	2,00	77,24	140	27	14,50	18,0
M24,0	3,00	261,59	160	38	14,50	18,0
M25,0	1,00	121,57	140	28	14,50	18,0

(continúa Ref.2101 / suite Réf.2101 / Ref.2101 cont'd)

MACHOS DE MÁQUINA TARAUDS MACHINE / MACHINE TAPS

Ø	P	€	L mm	l mm	∠ mm	d mm
M25,0	1,50	261,59	140	27	14,50	18,0
*M25,0	2,00	261,59	140	28	14,50	18,0
*M26,0	1,00	27,32	140	28	14,50	18,0
*M26,0	1,0	105,36	140	27	14,50	18,0
*M26,0	2,00	261,59	140	28	14,50	18,0
*M27,0	1,00	132,32	140	27	16,00	20,0
M27,0	1,50	115,06	140	27	16,00	20,0
M27,0	2,00	137,70	140	27	16,00	20,0
M27,0	3,00	96,40	160	38	16,00	20,0
*M28,0	1,00	261,59	140	28	16,00	20,0
M28,0	1,50	115,06	140	27	16,00	20,0
M28,0	2,00	261,59	140	27	16,00	20,0
*M30,0	1,00	147,18	150	27	18,00	22,0
M30,0	1,50	119,93	150	27	18,00	22,0
M30,0	2,00	148,45	150	27	18,00	22,0
*M30,0	3,00	163,23	180	45	18,00	22,0
M30,0	3,50	123,54	180	40	18,00	22,0
*M32,0	1,00	321,09	150	28	18,00	22,0
M32,0	1,50	151,71	150	27	18,00	22,0
*M32,0	2,00	321,23	150	27	18,00	22,0
*M33,0	1,00	321,23	160	30	20,00	25,0
M33,0	1,50	166,26	160	30	20,00	25,0
M33,0	2,00	280,18	160	30	20,00	25,0
*M33,0	3,00	308,06	180	50	20,00	25,0
M33,0	3,50	148,45	180	45	20,00	25,0
*M34,0	1,50	195,37	170	30	22,00	28,0
*M34,0	2,00	352,58	170	30	22,00	28,0
M35,0	1,50	194,85	170	30	22,00	28,0
M36,0	1,50	190,03	170	30	22,00	28,0
M36,0	2,00	256,67	170	30	22,00	28,0

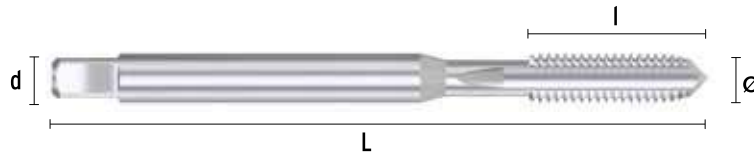
Ø	P	€	L mm	l mm	∠ mm	d mm
M36,0	3,00	294,45	200	50	22,00	28,0
M36,0	4,00	189,74	200	50	22,00	28,0
M38,0	1,50	202,59	170	30	22,00	28,0
*M38,0	2,00	415,25	170	30	22,00	28,0
M39,0	1,50	307,02	170	30	24,00	32,0
M39,0	2,00	307,02	170	30	24,00	32,0
M39,0	3,00	415,72	200	50	24,00	32,0
M39,0	4,00	242,25	200	55	24,00	32,0
M40,0	1,50	265,01	170	30	24,00	32,0
M40,0	2,00	307,84	170	30	24,00	32,0
*M40,0	3,00	307,84	200	60	24,00	32,0
M42,0	1,50	268,99	170	30	24,00	32,0
M42,0	2,00	352,14	170	30	24,00	32,0
M42,0	3,00	352,14	200	50	24,00	32,0
M42,0	4,50	311,41	200	60	24,00	32,0
M45,0	1,50	333,03	180	30	29,00	36,0
M45,0	2,00	422,80	180	30	29,00	36,0
M45,0	3,00	422,80	200	50	29,00	36,0
M45,0	4,50	340,28	220	60	29,00	36,0
M48,0	1,50	340,28	190	30	29,00	36,0
M48,0	2,00	512,42	190	30	29,00	36,0
M48,0	3,00	512,39	225	50	29,00	36,0
M48,0	5,00	418,40	250	65	29,00	36,0
M50,0	1,50	397,93	190	30	29,00	36,0
M52,0	1,50	402,83	190	32	32,00	40,0
M52,0	2,00	615,47	190	32	32,00	40,0
*M52,0	3,00	631,93	225	50	32,00	40,0
M52,0	5,00	428,52	250	65	32,00	40,0
*M63,0	1,50	923,24	275	40	32,00	40,0

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

2102/5 **HSSE DIN 371** **M** **DIN 13** **Form. C** **Tol. 6H** **LH** **1,5XD** **R**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



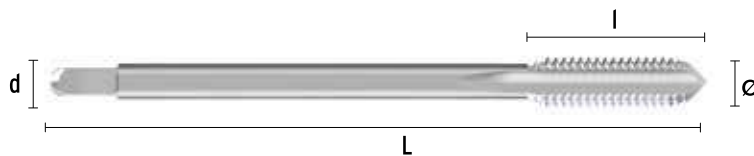
Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	21,57	56	10	2,70	3,5
M4,0	0,70	22,02	63	12	3,40	4,5
M5,0	0,80	22,12	70	14	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	25,10	80	18	4,90	6,0
M8,0	1,25	28,26	90	20	6,20	8,0
M10,0	1,50	31,65	100	20	8,00	10,0

2101/5 **HSSE DIN 376/374** **M-MF** **DIN 13** **Form. C** **Tol. 6H** **LH** **1,5XD** **D**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
*M5,0	0,80	22,12	70	14	2,70	3,5
*M6,0	1,00	25,10	80	18	3,40	4,5
*M7,0	1,00	30,39	80	18	4,30	5,5
*M8,0	1,00	36,02	90	20	4,90	6,0
*M8,0	1,25	28,26	90	20	4,90	6,0
*M9,0	1,25	45,90	90	20	5,50	7,0
*M10,0	1,00	39,96	90	20	5,50	7,0
*M10,0	1,25	31,65	90	20	5,50	7,0
*M10,0	1,50	31,65	100	20	5,50	7,0
*M12,0	1,25	55,23	100	20	7,00	9,0
*M12,0	1,50	49,40	100	20	7,00	9,0
M12,0	1,75	40,80	110	24	7,00	9,0
*M14,0	1,50	56,95	100	20	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M14,0	2,00	56,49	110	25	9,00	11,0
*M16,0	1,50	65,02	100	20	9,00	12,0
M16,0	2,00	66,40	110	32	9,00	12,0
*M18,0	1,50	93,22	110	24	11,00	14,0
M18,0	2,50	100,36	125	32	11,00	14,0
*M20,0	1,50	105,56	125	24	12,00	16,0
M20,0	2,50	106,59	140	32	12,00	16,0
*M22,0	1,50	127,07	125	24	14,50	18,0
M22,0	2,50	129,01	140	32	14,50	18,0
*M24,0	1,50	156,26	140	27	14,50	18,0
M24,0	3,00	154,49	160	38	14,50	18,0
*M27,0	3,00	192,78	160	38	16,00	20,0
*M30,0	3,50	247,05	180	40	18,00	22,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2114

HSSE DIN 371

M-MF
DIN 13

Form.
A



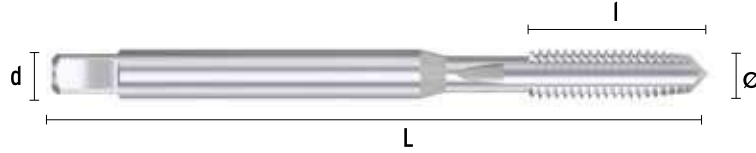
Tol.
6H

1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
*M2,0	0,40	16,65	45	8	2,10	2,8
*M2,2	0,45	18,03	45	9	2,10	2,8
*M2,3	0,40	17,17	45	9	2,10	2,8
*M2,5	0,45	16,65	50	9	2,10	2,8
*M2,6	0,45	16,65	50	9	2,10	2,8
M3,0	0,50	11,87	56	11	2,70	3,5
*M3,5	0,60	15,12	56	12	3,00	4,0
M4,0	0,70	12,11	63	13	3,40	4,5

Ø	P	€	L mm	I mm	∠ mm	d mm
M4,5	0,75	20,82	70	14	4,90	6,0
M5,0	0,80	12,17	70	16	4,90	6,0
M6,0	1,00	13,81	80	19	4,90	6,0
M7,0	1,00	15,79	80	16	5,50	7,0
M8,0	1,25	15,53	90	19	6,20	8,0
*M9,0	1,25	24,33	90	19	7,00	9,0
M10,0	1,50	17,39	100	22	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2113

HSSE DIN 376/374

M-MF
DIN 13

Form.
A



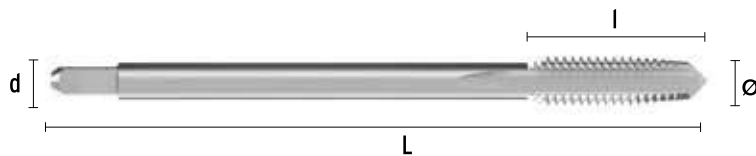
Tol.
6H

1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
*M3,0	0,50	11,87	56	11	2,00	2,2
*M3,5	0,60	15,12	56	13	2,10	2,8
M4,0	0,70	12,11	63	13	2,10	2,8
M5,0	0,80	12,17	70	16	2,70	3,5
M6,0	1,00	13,81	80	19	3,40	4,5
*M7,0	1,00	15,79	80	19	4,30	5,5
M8,0	1,25	15,53	90	22	4,90	6,0
*M9,0	1,25	24,33	90	22	5,50	7,0
M10,0	1,50	17,39	100	24	5,50	7,0
*M11,0	1,50	30,64	100	24	6,20	8,0
M12,0	1,75	22,45	110	29	7,00	9,0
*M13,0	1,75	53,77	110	29	9,00	11,0
M14,0	2,00	29,36	110	30	9,00	11,0
*M15,0	2,00	65,11	110	30	9,00	12,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M16,0	2,00	34,49	110	32	9,00	12,0
M18,0	2,50	53,17	125	34	11,00	14,0
M20,0	2,50	56,48	140	34	12,00	16,0
M22,0	2,50	68,33	140	34	14,50	18,0
M24,0	3,00	81,85	160	38	14,50	18,0
*M27,0	3,00	102,13	160	38	16,00	20,0
*M30,0	3,50	130,89	180	45	18,00	22,0
*M33,0	3,50	157,29	180	50	20,00	25,0
*M36,0	4,00	201,05	200	56	22,00	28,0
*M39,0	4,00	256,66	200	60	24,00	32,0
*M42,0	4,50	329,96	200	60	24,00	32,0
*M45,0	4,50	360,53	220	65	29,00	36,0
*M48,0	5,00	443,32	250	70	29,00	36,0
*M52,0	5,00	454,01	250	70	32,00	40,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock



Aceros
Aciers
Steels



Aceros Inox
Aciers Inox
Stainless Steels



Fundicion
Fonte
Cast Iron



Metales no ferrosos
Métal non Ferreux
Non Ferrous metals



Titanio y Superaloaciones
Titanium et Superalloages
Titanium and Superalloys



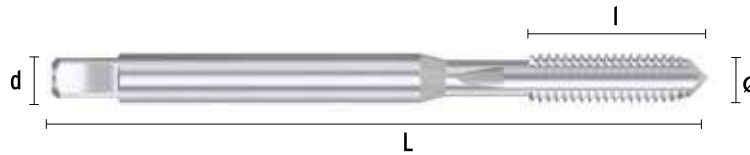
Materiales Duros
Materiels Durs
Hard materials

2190 **HSSE DIN 371** **M** **Form. E** **Tol. 6H** **1,5XD** **R**
DIN 13

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	12,05	56	11	2,70	3,5
M4,0	0,70	12,31	63	13	3,40	4,5
M5,0	0,80	12,35	70	16	4,90	6,0

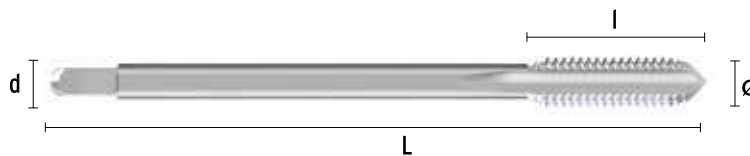
Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	14,05	80	19	4,90	6,0
M8,0	1,25	18,02	90	22	6,20	8,0
M10,0	1,50	23,25	100	24	8,00	10,0

2191 **HSSE DIN 376** **M** **Form. E** **Tol. 6H** **1,5XD** **D**
DIN 13

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH



Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	14,05	80	19	3,40	4,5
M8,0	1,25	18,02	90	22	4,90	6,0
M10,0	1,50	23,25	100	24	5,50	7,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	30,96	110	29	7,00	9,0
M14,0	2,00	36,41	110	30	9,00	11,0
M16,0	2,00	43,68	110	32	9,00	12,0

2180

HSSE-PM DIN 371

M
DIN 13

Form.
C



Toi.
6HX

1,5XD



TICN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
						● 15-30	● 10-20			○ 35-50							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH
THEORETICAL TECHNOLOGY



∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	21,65	56	10	2,70	3,5
M4,0	0,70	22,10	63	12	3,40	4,5
M5,0	0,80	22,10	70	14	4,90	6,0

∅	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	23,43	80	18	4,90	6,0
M8,0	1,25	27,92	90	20	6,20	8,0
M10,0	1,50	33,78	100	20	8,00	10,0

2179

HSSE-PM DIN 376

M
DIN 13

Form.
C



Toi.
6HX

1,5XD



TICN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
						● 15-30	● 10-20			○ 35-50							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH
THEORETICAL TECHNOLOGY



∅	P	€	L mm	l mm	∠ mm	d mm
M8,0	1,25	27,92	90	20	4,90	6,0
M10,0	1,50	33,78	100	20	5,50	7,0
M12,0	1,75	42,54	110	24	7,00	9,0
M14,0	2,00	54,22	110	25	9,00	11,0

∅	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	62,53	110	32	9,00	12,0
M18,0	2,50	104,96	125	32	11,00	14,0
M20,0	2,50	118,60	140	32	12,00	16,0

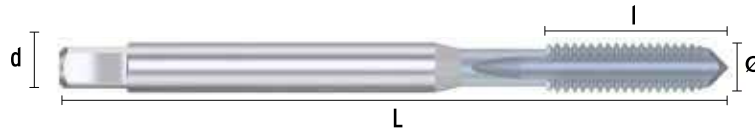
2274 **HM DIN 371** **M** **DIN 13** **Form. D** **ToI. 6HX** **1,5XD** **R** **TICN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
															3-6	2-5	1-4

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	90,08	56	10	2,70	3,5
M4,0	0,70	92,96	63	12	3,40	4,5
M5,0	0,80	95,74	70	14	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	106,98	80	18	4,90	6,0
M8,0	1,25	129,50	90	20	6,20	8,0
M10,0	1,50	224,70	100	20	8,00	10,0

2275 **HM DIN 376** **M** **DIN 13** **Form. D** **ToI. 6HX** **1,5XD** **D** **TICN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
															3-6	2-5	1-4

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	382,19	110	24	7,00	9,0
M14,0	2,00	382,19	110	25	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	464,75	110	32	9,00	12,0

2104

HSSE DIN 371

M-MF
DIN 13

Form.
B
"Gun"



Tol.
6H

3XD

R

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M2,0	0,40	17,16	45	10	2,10	2,8
M2,2	0,45	17,16	45	10	2,10	2,8
M2,3	0,45	17,16	45	10	2,10	2,8
M2,5	0,45	17,07	50	9	2,10	2,8
M2,6	0,45	17,07	50	9	2,10	2,8
M3,0	0,35	17,07	56	10	2,70	3,5
M3,0	0,50	12,16	56	11	2,70	3,5
*M3,0	0,60	20,18	56	10	2,70	3,5
M3,5	0,35	20,18	56	10	3,00	4,0
M3,5	0,60	15,57	56	12	3,00	4,0
M4,0	0,50	24,77	63	12	3,00	4,0
M4,0	0,70	12,43	63	13	3,40	4,5

Ø	P	€	L mm	l mm	∠ mm	d mm
*M4,0	0,75	17,76	63	13	3,40	4,5
M4,5	0,75	21,80	70	14	4,90	6,0
M5,0	0,50	25,46	70	14	4,90	6,0
M5,0	0,80	12,45	70	16	4,90	6,0
M6,0	0,75	23,65	80	14	4,90	6,0
M6,0	1,00	13,66	80	19	4,90	6,0
M7,0	1,00	17,87	80	18	5,50	7,0
M8,0	0,75	25,80	80	18	6,20	8,0
M8,0	1,25	15,07	90	22	6,20	8,0
M9,0	1,25	23,39	90	18	7,00	9,0
M10,0	1,50	18,49	100	24	8,00	10,0

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

2103

HSSE DIN 376/374

M-MF
DIN 13

Form.
B
"Gun"



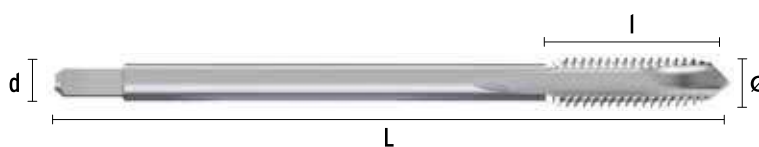
Tol.
6H

3XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	12,16	56	11	2,70	3,5
*M3,5	0,60	15,58	56	13	3,00	4,0
M4,0	0,70	12,43	63	13	2,10	2,8
*M4,5	0,75	21,80	70	16	2,70	3,5
M5,0	0,80	12,45	70	16	2,70	3,5
*M6,0	0,75	20,70	80	18	3,40	4,5
M6,0	1,00	13,66	80	19	3,40	4,5
*M7,0	0,75	27,02	80	18	4,30	5,5
* M7,0	1,00	17,87	80	18	4,30	5,5
*M8,0	0,75	25,56	90	20	4,30	5,5
M8,0	1,00	19,80	90	20	4,90	6,0
M8,0	1,25	15,07	90	22	4,90	6,0
M9,0	1,00	30,21	90	20	5,50	7,0
*M9,0	1,25	23,39	90	20	5,50	7,0
M10,0	0,75	36,31	90	18	5,50	7,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M10,0	1,00	22,06	90	20	5,50	7,0
M10,0	1,25	26,28	100	20	5,50	7,0
M10,0	1,50	18,49	100	24	5,50	7,0
M11,0	1,00	38,67	90	20	6,20	8,0
*M11,0	1,25	38,67	100	22	6,20	8,0
M11,0	1,50	31,76	100	22	6,20	8,0
M12,0	1,00	30,06	100	20	7,00	9,0
M12,0	1,25	30,39	100	20	7,00	9,0
M12,0	1,50	27,14	100	20	7,00	9,0
M12,0	1,75	23,60	110	29	7,00	9,0
*M13,0	1,00	55,81	100	22	9,00	11,0
*M13,0	1,25	55,77	100	22	9,00	11,0
*M13,0	1,50	55,77	100	22	9,00	11,0
* M13,0	1,75	55,81	110	27	9,00	11,0
M14,0	1,00	48,31	100	20	9,00	11,0

MACHOS DE MÁQUINA TARAUDS MACHINE / MACHINE TAPS

Ø	P	€	L mm	I mm	∠ mm	d mm
M14,0	1,25	39,42	100	20	9,00	11,0
M14,0	1,50	31,35	100	20	9,00	11,0
M14,0	2,00	31,08	110	30	9,00	11,0
M15,0	1,00	62,08	100	20	9,00	12,0
*M15,0	1,25	67,98	100	22	9,00	12,0
*M15,0	1,50	55,22	100	22	9,00	12,0
*M15,0	2,00	67,60	110	30	9,00	12,0
M16,0	1,00	58,61	100	20	9,00	12,0
*M16,0	1,25	64,97	100	22	9,00	12,0
M16,0	1,50	39,07	100	22	9,00	12,0
M16,0	2,00	38,18	110	30	9,00	12,0
M18,0	1,00	65,61	110	24	11,00	14,0
M18,0	1,50	51,27	110	24	11,00	14,0
M18,0	2,00	73,77	125	27	11,00	14,0
M18,0	2,50	51,88	125	34	11,00	14,0
M20,0	1,00	86,69	125	24	12,00	16,0
M20,0	1,50	58,03	125	25	12,00	16,0
M20,0	2,00	76,06	140	27	12,00	16,0
M20,0	2,50	55,97	140	34	12,00	16,0
M22,0	1,00	97,17	125	25	14,50	18,0
M22,0	1,50	69,87	125	25	14,50	18,0
M22,0	2,00	97,17	140	27	14,50	18,0
M22,0	2,50	70,94	140	34	14,50	18,0
M24,0	1,00	121,05	140	28	14,50	18,0
M24,0	1,50	85,89	140	27	14,50	18,0
M24,0	2,00	108,63	140	27	14,50	18,0
M24,0	3,00	84,48	160	38	14,50	18,0
M25,0	1,50	133,47	140	27	14,50	18,0
*M25,0	2,00	287,75	140	28	14,50	18,0
M26,0	1,50	110,47	140	27	14,50	18,0
*M26,0	2,00	287,75	140	28	14,50	18,0
M27,0	1,50	126,27	140	27	16,00	20,0
M27,0	2,00	150,57	140	27	16,00	20,0
M27,0	3,00	105,68	160	38	16,00	20,0
M28,0	1,50	126,27	140	27	16,00	20,0
M28,0	2,00	287,75	140	27	16,00	20,0
*M30,0	1,00	179,62	150	28	18,00	22,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M30,0	1,50	131,95	150	27	18,00	22,0
M30,0	2,00	163,29	150	27	18,00	22,0
M30,0	3,50	135,80	180	40	18,00	22,0
M32,0	1,50	166,80	150	27	18,00	22,0
*M32,0	2,00	353,37	150	28	18,00	22,0
M33,0	1,50	180,51	160	30	20,00	25,0
M33,0	2,00	308,15	160	30	20,00	25,0
M33,0	3,50	170,82	180	45	20,00	25,0
*M34,0	1,50	209,03	170	30	22,00	28,0
M35,0	1,50	220,87	170	30	22,00	28,0
M36,0	1,50	209,03	170	30	22,00	28,0
M36,0	2,00	282,33	170	30	22,00	28,0
M36,0	3,00	323,89	200	50	22,00	28,0
M36,0	4,00	208,70	200	50	22,00	28,0
M38,0	1,50	228,23	170	30	22,00	28,0
M38,0	2,00	456,80	170	30	22,00	28,0
M39,0	1,50	407,43	170	30	24,00	32,0
M39,0	2,00	412,14	170	30	24,00	32,0
M39,0	3,00	549,48	170	30	24,00	32,0
M39,0	4,00	266,49	200	55	24,00	32,0
M40,0	1,50	291,55	170	30	24,00	32,0
M40,0	2,00	310,50	170	30	24,00	32,0
*M40,0	3,00	360,09	200	60	24,00	32,0
M42,0	1,50	296,37	170	30	24,00	32,0
M42,0	2,00	442,34	170	30	24,00	32,0
M42,0	3,00	442,34	170	30	24,00	32,0
M42,0	4,50	342,60	200	60	24,00	32,0
M45,0	1,50	362,90	180	30	29,00	36,0
M45,0	2,00	442,34	180	30	29,00	36,0
M45,0	3,00	411,75	200	50	29,00	36,0
M45,0	4,50	374,26	220	60	29,00	36,0
M48,0	1,50	490,50	190	30	29,00	36,0
M48,0	2,00	494,45	190	30	29,00	36,0
M48,0	3,00	470,93	225	50	29,00	36,0
M48,0	5,00	460,22	250	65	29,00	36,0
M50,0	1,50	442,31	190	30	29,00	36,0
M52,0	5,00	471,12	250	65	32,00	40,0



*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2104/5

HSS DIN 371

M-MF
DIN 13

Form.
B
"Gun"



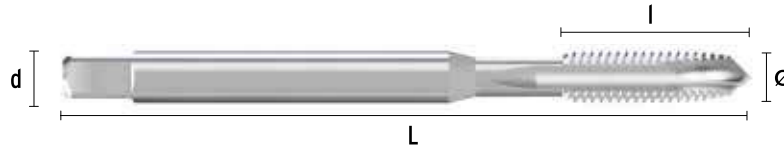
Tol.
6H

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
M3,0	0,50	23,50	56	11	2,70	3,5
M4,0	0,70	23,76	63	13	3,40	4,5
M5,0	0,80	25,05	70	16	4,90	6,0

Ø	P	€	L mm	l mm	∅ mm	d mm
M6,0	1,00	25,05	80	19	4,90	6,0
M8,0	1,25	29,26	90	22	6,20	8,0
M10,0	1,50	37,48	100	24	8,00	10,0

2103/5

HSS DIN 376/374

M-MF
DIN 13

Form.
B
"Gun"



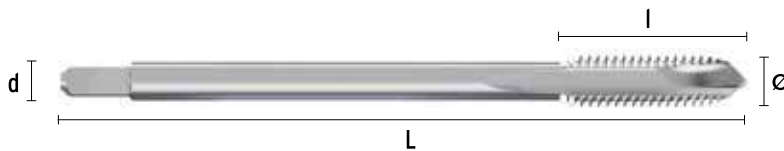
Tol.
6H

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

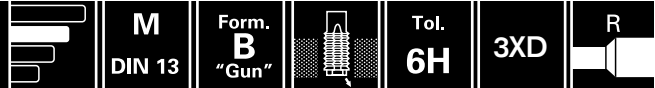


Ø	P	€	L mm	l mm	∅ mm	d mm
M12,0	1,75	52,95	110	29	7,00	9,0
M16,0	2,00	77,48	110	30	9,00	12,0

Ø	P	€	L mm	l mm	∅ mm	d mm
M20,0	2,50	112,73	140	34	12,00	16,0
M24,0	3,00	148,80	160	38	14,50	18,0

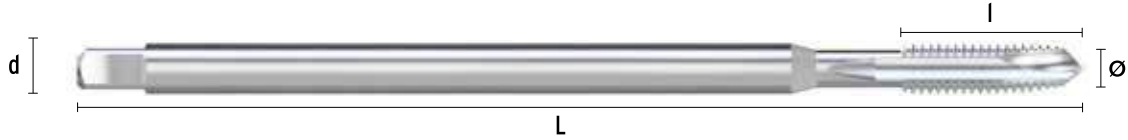
2111

HSSE DIN 371



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○			○		○	●		○					
10-25	10-15			5-10			10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



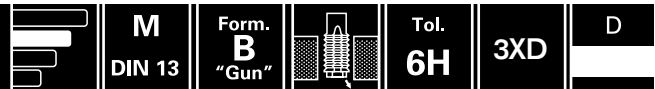
Ø	P	€	L mm	l mm	∅ mm	d mm
M3,0	0,50	27,97	100	10	2,70	3,5
M4,0	0,70	27,97	125	12	3,40	4,5
M5,0	0,80	31,59	140	14	4,90	6,0
M6,0	1,00	31,59	160	18	4,90	6,0

Ø	P	€	L mm	l mm	∅ mm	d mm
*M8,0	1,25	41,71	150	22	6,20	8,0
*M10,0	1,50	50,62	150	24	8,00	10,0
*M12,0	1,75	56,89	150	29	9,00	12,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2272

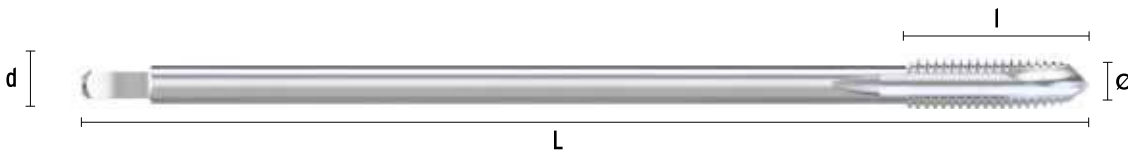
HSS DIN 376



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○			○		○	●		○					
10-25	10-15			5-10			10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



Ø	P	€	L mm	l mm	∅ mm	d mm
M8,0	1,25	49,73	180	20	4,90	6,0
M10,0	1,50	61,03	200	20	5,50	7,0

Ø	P	€	L mm	l mm	∅ mm	d mm
M12,0	1,75	78,35	220	24	7,00	9,0
M16,0	2,00	114,73	220	32	9,00	12,0

2110

HSSE DIN 371

M
DIN 13

Form.
B
"Gun"



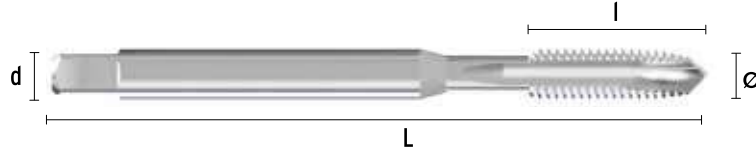
Tol.
6H
+0,1

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	19,33	56	11	2,70	3,5
M4,0	0,70	19,74	63	13	3,40	4,5
M5,0	0,80	19,79	70	14	4,90	6,0

∅	P	€	L mm	I mm	∠ mm	d mm
M6,0	1,00	22,49	80	16	4,90	6,0
M8,0	1,25	25,32	90	18	6,20	8,0
M10,0	1,50	31,88	100	22	8,00	10,0

2109

HSSE DIN 376

M
DIN 13

Form.
B
"Gun"



Tol.
6H
+0,1

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	I mm	∠ mm	d mm
M8,0	1,25	25,32	90	20	4,90	6,0
M10,0	1,50	31,88	100	22	5,50	7,0
M12,0	1,75	40,71	110	27	7,00	9,0

∅	P	€	L mm	I mm	∠ mm	d mm
M14,0	2,00	51,10	110	30	9,00	11,0
M16,0	2,00	61,83	110	30	9,00	12,0

2168

HSSE DIN 371

M
DIN 13

Form. **B**
"Gun"



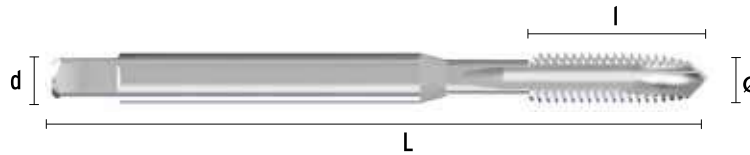
Tol. **6G**

3XD

R

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	19,11	56	10	2,70	3,5
M4,0	0,70	19,11	63	12	3,40	4,5
M5,0	0,80	19,11	70	14	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	19,27	80	18	4,90	6,0
M8,0	1,25	23,12	90	20	6,20	8,0
M10,0	1,50	27,17	100	20	8,00	10,0

2169

HSSE DIN 376

M
DIN 13

Form. **B**
"Gun"



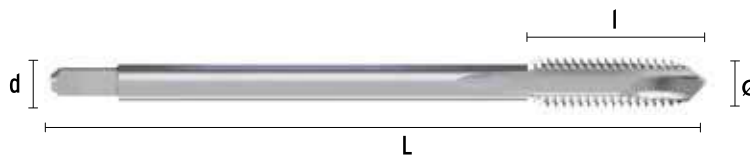
Tol. **6G**

3XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M8,0	1,25	23,12	90	20	4,90	6,0
M10,0	1,50	27,17	100	20	5,50	7,0
M12,0	1,75	33,96	110	24	7,00	9,0
M14,0	2,00	42,59	110	25	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	51,52	110	32	9,00	12,0
M18,0	2,50	70,77	125	32	11,00	14,0
M20,0	2,50	73,98	140	32	12,00	16,0

2250

HSSE DIN 371

M
DIN13

Form.
B
"Gun"



Tol.
6H

3XD



VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			● 5-10	○ 5-8		○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
M2,0	0,40	25,70	45	10	2,10	2,8
M2,5	0,45	25,70	50	9	2,10	2,8
M3,0	0,50	13,41	56	11	2,70	3,5
M3,5	0,60	17,74	56	12	3,00	4,0
M4,0	0,70	13,60	63	13	3,40	4,5

Ø	P	€	L mm	I mm	∠ mm	d mm
M5,0	0,80	14,33	70	16	4,90	6,0
M6,0	1,00	14,33	80	19	4,90	6,0
M8,0	1,25	16,72	90	22	6,20	8,0
M10,0	1,50	21,39	100	24	8,00	10,0

2251

HSSE DIN 376/374

M-MF
DIN13

Form.
B
"Gun"



Tol.
6H

3XD



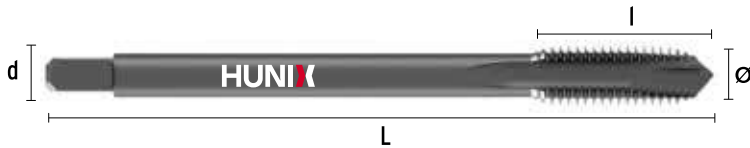
VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			● 5-10	○ 5-8		○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	16,13	56	11	2,70	3,5
M4,0	0,70	17,21	63	13	2,10	2,8
M5,0	0,80	18,19	70	16	2,70	3,5
M6,0	1,00	18,19	80	19	3,40	4,5
M8,0	1,00	27,48	90	20	4,90	6,0
M8,0	1,25	21,17	90	22	4,90	6,0
M10,0	1,00	30,99	90	20	5,50	7,0
M10,0	1,25	36,20	100	20	5,50	7,0
M10,0	1,50	23,55	100	24	5,50	7,0
M12,0	1,00	40,08	100	20	7,00	9,0
M12,0	1,25	43,39	100	20	7,00	9,0
M12,0	1,50	40,08	100	20	7,00	9,0
M12,0	1,75	30,34	110	29	7,00	9,0
M14,0	1,00	54,71	100	20	9,00	11,0
M14,0	1,25	50,18	100	20	9,00	11,0
M14,0	1,50	54,71	100	20	9,00	11,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M14,0	2,00	45,54	110	30	9,00	11,0
M16,0	1,00	63,43	100	20	9,00	12,0
M16,0	1,50	56,17	100	22	9,00	12,0
M16,0	2,00	48,78	110	30	9,00	12,0
M18,0	1,00	87,16	110	24	11,00	14,0
M18,0	1,50	66,99	110	24	11,00	14,0
M18,0	2,50	66,99	125	34	11,00	14,0
M20,0	1,00	85,18	125	24	12,00	16,0
M20,0	1,50	78,06	125	25	12,00	16,0
M20,0	2,50	70,95	140	34	12,00	16,0
M22,0	1,00	121,30	125	25	14,50	18,0
M22,0	1,50	101,14	125	25	14,50	18,0
M22,0	2,50	101,14	140	34	14,50	18,0
M24,0	1,50	103,04	140	27	14,50	18,0
M24,0	2,00	112,41	140	27	14,50	18,0
M24,0	3,00	93,67	160	38	14,50	18,0

P

Aceros
Aciers
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundicion
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S

Titanio y Superaloaciones
Titanium et Superalloys
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

2116

HSSE DIN 371

M
DIN 13

Form. **B**
"Gun"



Tol. **6H**

3XD



TIN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●		●	●		○					
15-30	12-18	8-12		6-12	6-10	10-15	15-20		15-25	15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH

NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
M2,0	0,40	26,63	45	10	2,10	2,8
M2,5	0,45	26,63	50	9	2,10	2,8
M3,0	0,50	18,67	56	11	2,70	3,5
M3,5	0,60	21,98	56	12	3,00	4,0
M4,0	0,70	18,83	63	13	3,40	4,5

Ø	P	€	L mm	I mm	∠ mm	d mm
M5,0	0,80	20,59	70	16	4,90	6,0
M6,0	1,00	21,34	80	19	4,90	6,0
M8,0	1,25	25,55	90	22	6,20	8,0
M10,0	1,50	33,60	100	24	8,00	10,0

2115

HSSE DIN 376/374

M-MF
DIN13

Form. **B**
"Gun"



Tol. **6H**

3XD



TIN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●		●	●		○					
15-30	12-18	8-12		6-12	6-10	10-15	15-20		15-25	15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH

NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	20,60	56	11	2,70	3,5
M4,0	0,70	22,19	63	13	2,10	2,8
M5,0	0,80	24,06	70	16	2,70	3,5
M6,0	1,00	24,86	80	19	3,40	4,5
M8,0	1,00	38,24	90	20	4,90	6,0
M8,0	1,25	29,71	90	22	4,90	6,0
M10,0	1,00	45,07	90	20	5,50	7,0
M10,0	1,25	49,23	100	20	5,50	7,0
M10,0	1,50	37,60	100	24	5,50	7,0
M12,0	1,00	56,06	100	20	7,00	9,0
M12,0	1,25	62,09	100	20	7,00	9,0
M12,0	1,50	53,77	100	20	7,00	9,0
M12,0	1,75	46,62	110	29	7,00	9,0
M14,0	1,00	73,93	100	20	9,00	11,0
M14,0	1,25	68,91	100	20	9,00	11,0
M14,0	1,50	71,26	100	20	9,00	11,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M14,0	2,00	61,50	110	30	9,00	11,0
M16,0	1,00	85,72	100	20	9,00	12,0
M16,0	1,50	74,57	100	22	9,00	12,0
M16,0	2,00	66,62	110	30	9,00	12,0
M18,0	1,00	106,10	110	24	11,00	14,0
M18,0	1,50	94,68	110	24	11,00	14,0
M18,0	2,50	90,46	125	34	11,00	14,0
M20,0	1,00	100,66	125	24	12,00	16,0
M20,0	1,50	106,62	125	25	12,00	16,0
M20,0	2,50	99,05	140	34	12,00	16,0
M22,0	1,00	136,61	125	25	14,50	18,0
M22,0	1,50	133,40	125	25	14,50	18,0
M22,0	2,50	133,45	140	34	14,50	18,0
M24,0	1,50	145,19	140	27	14,50	18,0
M24,0	2,00	159,32	140	27	14,50	18,0
M24,0	3,00	136,55	160	38	14,50	18,0

P

Aceros
Aciers
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundición
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S

Titanio y Superalloys
Titanium et Superalloys
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

2126

HSSE-PM DIN 371

M
DIN 13

Form. B
"Gun"



Tol. 6H

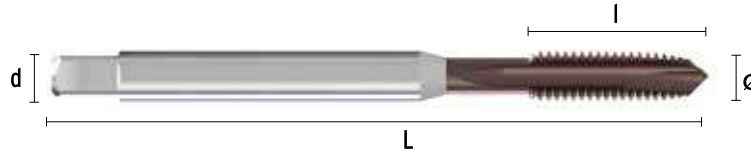
3XD



TICN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○	●	●	●	●	●	○	○	○	○	○	○			
10-15	6-10	4-6		6-12		10-20			4-6			10-15		4-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M3,0	0,50	21,31	56	10	2,70	3,5
M4,0	0,70	21,62	63	12	3,40	4,5
M5,0	0,80	23,36	70	14	4,90	6,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M6,0	1,00	24,09	80	18	4,90	6,0
M8,0	1,25	28,91	90	20	6,20	8,0
M10,0	1,50	37,91	100	20	8,00	10,0

2125

HSSE-PM DIN 376/374

M-MF
DIN13

Form. B
"Gun"



Tol. 6H

3XD



TICN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○	●	●	●	●	●	○	○	○	○	○	○			
10-15	6-10	4-6		6-12		10-20			4-6			10-15		4-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M8,0	1,00	44,89	90	20	4,90	6,0
M8,0	1,25	33,18	90	20	4,90	6,0
M10,0	1,00	47,21	90	20	5,50	7,0
M10,0	1,25	63,30	100	20	5,50	7,0
M10,0	1,50	41,74	100	20	5,50	7,0
M12,0	1,00	60,98	100	20	7,00	9,0
M12,0	1,25	65,14	100	20	7,00	9,0
M12,0	1,50	60,98	110	20	7,00	9,0
M12,0	1,75	52,73	110	24	7,00	9,0
M14,0	1,25	76,73	100	20	9,00	11,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M14,0	1,50	81,10	100	20	9,00	11,0
M14,0	2,00	69,75	110	25	9,00	11,0
M16,0	1,50	84,65	100	20	9,00	12,0
M16,0	2,00	75,62	110	32	9,00	12,0
M18,0	1,50	102,84	110	24	11,00	14,0
M18,0	2,50	102,79	125	32	11,00	14,0
M20,0	1,50	123,42	125	24	12,00	16,0
M20,0	2,50	112,19	140	32	12,00	16,0
M22,0	2,50	151,86	140	32	14,50	18,0
M24,0	3,00	154,09	160	38	14,50	18,0

2176 **HSSE-PM DIN 371** **M** **Form. B "Gun"** **ToL. 6HX** **3XD** **R** **TICN+**
DIN 13

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
		○ 6-10	● 4-6		○ 4-6			● 10-20		○ 4-6		○ 10-15		○ 4-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	27,07	56	10	2,70	3,5
M4,0	0,70	27,50	63	12	3,40	4,5
M5,0	0,80	29,56	70	14	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	31,47	80	18	4,90	6,0
M8,0	1,25	36,71	90	20	6,20	8,0
M10,0	1,50	45,85	100	20	8,00	10,0

2175 **HSSE-PM DIN 376** **M** **Form. B "Gun"** **ToL. 6HX** **3XD** **D** **TICN+**
DIN 13

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
		○ 6-10	● 4-6		○ 4-6			● 10-20		○ 4-6		○ 10-15		○ 4-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M8,0	1,25	45,85	90	20	4,90	6,0
M10,0	1,50	59,93	100	20	5,50	7,0
M12,0	1,75	68,74	110	24	7,00	9,0
M14,0	2,00	95,69	110	25	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	101,10	110	32	9,00	12,0
M18,0	2,50	147,86	125	32	11,00	14,0
M20,0	2,50	145,98	140	32	12,00	16,0

MACHOS DE MÁQUINA TARAUDS MACHINE / MACHINE TAPS

2122 **HSSE DIN 371** **M** **Form. B "Gun"** **Tol. 6H** **3XD** **R** **VAP**
DIN 13

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●				●										○			
10-25				5-10										10-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M3,0	0,50	18,37	56	10	2,70	3,5
M4,0	0,70	18,37	63	12	3,40	4,5
M5,0	0,80	18,37	70	14	4,90	6,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M6,0	1,00	20,18	80	18	4,90	6,0
M8,0	1,25	22,97	90	20	6,20	8,0
M10,0	1,50	26,96	100	20	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

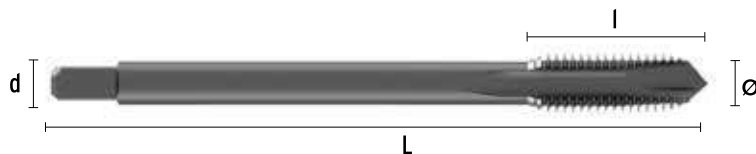
*Para mismo rendimiento / Pour le même rendement / For the same performance Ref. 2250

*Para mayor rendimiento / Pour plus rendement / For higher performance Ref. 2116

2121 **HSSE DIN 376/374** **M-MF** **Form. B "Gun"** **Tol. 6H** **3XD** **D** **VAP**
DIN 13

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●				●										○			
10-25				5-10										10-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M8,0	1,00	27,81	90	20	4,90	6,0
M8,0	1,25	22,97	90	20	4,90	6,0
M10,0	1,00	30,59	90	20	5,50	7,0
M10,0	1,25	34,89	100	20	5,50	7,0
M10,0	1,50	26,96	100	20	5,50	7,0
M12,0	1,00	41,73	100	20	7,00	9,0
M12,0	1,25	42,05	100	20	7,00	9,0
M12,0	1,50	42,39	110	20	7,00	9,0
M12,0	1,75	35,14	110	24	7,00	9,0
M14,0	1,25	56,76	100	20	9,00	11,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M14,0	1,50	45,04	100	20	9,00	11,0
M14,0	2,00	44,76	110	25	9,00	11,0
M16,0	1,50	53,59	100	20	9,00	12,0
M16,0	2,00	52,67	110	32	9,00	12,0
M18,0	1,50	73,83	110	24	11,00	14,0
M18,0	2,50	74,72	125	32	11,00	14,0
M20,0	1,50	111,09	125	24	12,00	16,0
M20,0	2,50	80,59	140	32	12,00	16,0
M22,0	2,50	87,03	140	32	14,50	18,0
M24,0	3,00	94,00	160	38	14,50	18,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

*Para mismo rendimiento / Pour le même rendement / For the same performance Ref. 2251

*Para mayor rendimiento / Pour plus rendement / For higher performance Ref. 2115

2133

HSSE DIN 371

M
DIN 13

B-AZ



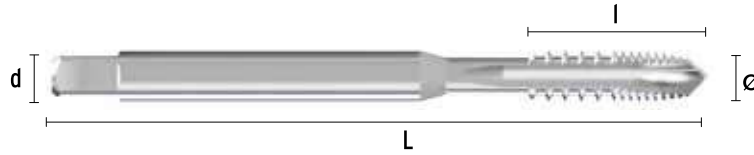
Tol.
6H

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									● 10-20	○ 6-8	○ 10-20	○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	19,99	56	11	2,70	3,5
M4,0	0,70	19,99	63	13	3,40	4,5
M5,0	0,80	19,99	70	16	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	21,05	80	19	4,90	6,0
M8,0	1,25	25,18	90	22	6,20	8,0
M10,0	1,50	29,66	100	24	8,00	10,0

2132

HSSE DIN 376

M
DIN 13

B-AZ



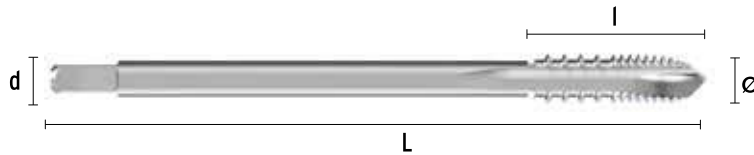
Tol.
6H

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									● 10-20	○ 6-8	○ 10-20	○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M4,0	0,70	19,99	63	13	2,10	2,8
M5,0	0,80	19,99	70	16	2,70	3,5
M6,0	1,00	21,05	80	19	3,40	4,5
M8,0	1,25	25,18	90	22	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M10,0	1,50	29,66	100	24	5,50	7,0
M12,0	1,75	37,43	110	29	7,00	9,0
M14,0	2,00	46,61	110	30	9,00	11,0
M16,0	2,00	61,80	110	32	9,00	12,0

2254

HSSE-PM DIN 371 MULTI

M
DIN 13

Form. **B**
"Gun"



Tol. **6HX**

3XD



HL

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
20-40	15-30	10-20	5-10	5-15	5-10	10-30	10-30	5-15	10-30	10-30	5-15	10-30	2-8	2-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M3,0	0,50	26,30	56	5	2,70	3,5
M4,0	0,70	29,18	63	7	3,40	4,5
M5,0	0,80	30,48	70	8	4,90	6,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M6,0	1,00	31,78	80	10	4,90	6,0
M8,0	1,25	38,40	90	13	6,20	8,0
M10,0	1,50	50,54	100	15	8,00	10,0

2255

HSSE-PM DIN 376 MULTI

M
DIN 13

Form. **B**
"Gun"



Tol. **6HX**

3XD



HL

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
20-40	15-30	10-20	5-10	5-15	5-10	10-30	10-30	5-15	10-30	10-30	5-15	10-30	2-8	2-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M12,0	1,75	75,22	110	18	7,00	9,0
M14,0	2,00	101,66	110	20	9,00	11,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M16,0	2,00	106,99	110	20	9,00	12,0

2258 **HSSE-PM DIN 371 SYNCHRO** **M** **Form. B "Gun"** **Tol. 6HX** **CNC** **3XD** **R** **HL**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
20-50	15-40	10-20	5-10	5-15	5-10	10-30	10-30	5-15	10-30	10-30	5-15	10-30	2-8	2-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	26,30	56	5	2,70	3,5
M4,0	0,70	29,18	63	7	3,40	4,5
M5,0	0,80	30,48	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	31,78	80	10	4,90	6,0
M8,0	1,25	38,40	90	13	6,20	8,0
M10,0	1,50	50,54	100	15	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2259 **HSSE-PM DIN 376 SYNCHRO** **M** **Form. B "Gun"** **Tol. 6HX** **CNC** **3XD** **D** **HL**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
20-50	15-40	10-20	5-10	5-15	5-10	10-30	10-30	5-15	10-30	10-30	5-15	10-30	2-8	2-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	75,22	110	18	7,00	9,0
M14,0	2,00	101,66	110	20	9,00	11,00

Ø	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	106,99	110	20	9,00	12,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2106

HSSE DIN 371

M-MF
DIN 13

Form.
C



Tol.
6H



3XD

R

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
M2,0	0,40	33,74	45	5	2,10	2,8
M2,2	0,45	33,74	45	10	2,10	2,8
M2,3	0,40	33,74	45	10	2,10	2,8
M2,5	0,45	33,74	50	5	2,10	2,8
M2,6	0,45	33,74	50	5	2,10	2,8
M3,0	0,35	33,74	56	5	2,70	3,5
M3,0	0,50	14,99	56	6	2,70	3,5
M3,5	0,35	33,74	56	5	3,00	4,0
M3,5	0,60	18,50	56	6	3,00	4,0
M4,0	0,50	24,78	63	7	3,40	4,5
M4,0	0,70	14,99	63	7	3,40	4,5

Ø	P	€	L mm	l mm	∅ mm	d mm
M4,5	0,75	25,54	70	7	4,90	6,0
M5,0	0,50	34,75	70	8	4,90	6,0
M5,0	0,80	14,49	70	8	4,90	6,0
M6,0	0,75	24,40	80	10	4,90	6,0
M6,0	1,00	15,89	80	10	4,90	6,0
M7,0	1,00	19,45	80	10	5,50	7,0
M8,0	0,75	28,21	80	10	6,20	8,0
M8,0	1,25	18,94	90	14	6,20	8,0
M9,0	1,25	32,89	90	13	7,00	9,0
M10,0	1,50	22,03	100	16	8,00	10,0

2105

HSSE DIN 376/374

M-MF
DIN13

Form.
C



Tol.
6H

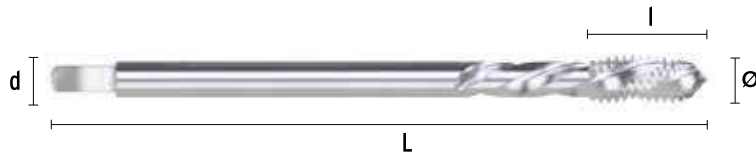


3XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
M3,0	0,50	14,99	56	5	2,00	2,2
M4,0	0,70	14,99	63	7	2,10	2,8
M5,0	0,80	14,49	70	8	2,70	3,5
M6,0	1,00	15,89	80	10	3,40	4,5
*M7,0	1,00	19,45	80	10	4,30	5,5
M8,0	1,00	23,44	90	10	4,90	6,0
M8,0	1,25	18,94	90	14	4,90	6,0
M9,0	1,00	30,20	90	10	5,50	7,0
*M9,0	1,25	28,77	90	13	5,50	7,0
M10,0	0,75	42,65	90	10	5,50	7,0
M10,0	1,00	27,67	90	10	5,50	7,0
M10,0	1,25	30,08	100	15	5,50	7,0
M10,0	1,50	22,03	100	16	5,50	7,0
M11,0	1,00	88,10	90	10	6,20	8,0
*M11,0	1,25	78,58	100	15	6,20	8,0

Ø	P	€	L mm	l mm	∅ mm	d mm
M11,0	1,50	64,19	100	15	6,20	8,0
M12,0	1,00	35,58	100	10	7,00	9,0
M12,0	1,25	34,03	100	15	7,00	9,0
M12,0	1,50	32,77	100	15	7,00	9,0
*M12,0	1,75	29,42	110	18	7,00	9,0
M14,0	1,00	57,46	100	10	9,00	11,0
M14,0	1,25	49,07	100	15	9,00	11,0
M14,0	1,50	36,95	100	15	9,00	11,0
*M14,0	2,00	37,77	110	20	9,00	11,0
M15,0	1,00	75,25	100	10	9,00	12,0
*M15,0	1,50	55,21	100	20	9,00	12,0
M16,0	1,00	120,33	100	10	9,00	12,0
*M16,0	1,25	99,87	100	20	9,00	12,0
M16,0	1,50	48,22	100	15	9,00	12,0
M16,0	2,00	45,61	110	20	9,00	12,0

MACHOS DE MÁQUINA

TARAUDS MACHINE / MACHINE TAPS

Ø	P	€	L mm	I mm	∠ mm	d mm
M18,0	1,00	95,80	110	13	11,00	14,0
M18,0	1,50	61,04	110	20	11,00	14,0
M18,0	2,00	115,03	125	20	11,00	14,0
M18,0	2,50	61,33	125	25	11,00	14,0
M20,0	1,00	93,65	125	13	12,00	16,0
M20,0	1,50	69,75	125	20	12,00	16,0
M20,0	2,00	109,30	140	20	12,00	16,0
M20,0	2,50	65,34	140	25	12,00	16,0
M22,0	1,00	92,25	125	13	14,50	18,0
M22,0	1,50	75,27	125	17	14,50	18,0
M22,0	2,00	103,50	140	20	14,50	18,0
M22,0	2,50	80,58	140	27	14,50	18,0
M24,0	1,00	123,70	140	13	14,50	18,0
M24,0	1,50	102,28	140	20	14,50	18,0
M24,0	2,00	123,70	140	20	14,50	18,0
M24,0	3,00	98,37	160	30	14,50	18,0
M25,0	1,50	164,90	140	20	14,50	18,0
M26,0	1,50	110,44	140	20	14,50	18,0
M27,0	1,50	126,22	140	20	16,00	20,0
M27,0	2,00	165,60	140	20	16,00	20,0
M27,0	3,00	120,49	160	30	16,00	20,0
M28,0	1,50	126,22	140	20	16,00	20,0
M28,0	2,00	206,90	140	20	16,00	20,0
M30,0	1,50	157,27	150	22	18,00	22,0
M30,0	2,00	332,26	150	22	18,00	22,0
M30,0	3,50	154,38	180	35	18,00	22,0
M32,0	1,50	194,08	150	22	18,00	22,0
M33,0	1,50	238,00	160	22	20,00	25,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M33,0	2,00	261,70	160	24	20,00	25,0
M33,0	3,50	185,49	180	35	20,00	25,0
M35,0	1,50	265,50	170	22	22,00	28,0
M36,0	1,50	323,55	170	22	22,00	28,0
M36,0	2,00	420,50	170	24	22,00	28,0
M36,0	3,00	328,00	200	30	22,00	28,0
M36,0	4,00	250,31	200	40	22,00	28,0
M38,0	1,50	388,10	170	24	22,00	28,0
M39,0	1,50	312,75	170	25	24,00	32,0
M39,0	2,00	312,75	170	25	24,00	32,0
M39,0	3,00	511,70	200	30	24,00	32,0
M39,0	4,00	528,75	200	40	24,00	32,0
M40,0	1,50	426,85	170	25	24,00	32,0
M40,0	2,00	346,50	170	25	24,00	32,0
M42,0	1,50	459,00	170	25	24,00	32,0
M42,0	2,00	387,00	170	25	24,00	32,0
M42,0	3,00	387,00	200	30	24,00	32,0
M42,0	4,50	386,20	200	45	24,00	32,0
M45,0	1,50	452,25	180	27	29,00	36,0
M45,0	2,00	452,25	180	27	29,00	36,0
M45,0	3,00	540,00	200	30	29,00	36,0
M45,0	4,50	708,75	220	45	29,00	36,0
M48,0	1,50	540,00	190	27	29,00	36,0
M48,0	2,00	540,00	190	27	29,00	36,0
M48,0	3,00	540,00	225	33	29,00	36,0
M48,0	5,00	776,25	250	50	29,00	36,0
M50,0	1,50	630,00	190	27	29,00	36,0
M52,0	5,00	922,50	250	50	32,00	40,0



*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2106/5 **HSS DIN 371** **M** **Form. C** **Tol. 6H** **35°** **LH** **3XD** **R**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	25,05	56	6	2,70	3,5
M4,0	0,70	25,36	63	7	3,40	4,5
M5,0	0,80	26,77	70	8	4,90	6,0

∅	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	26,77	80	10	4,90	6,0
M8,0	1,25	31,23	90	14	6,20	8,0
M10,0	1,50	39,95	100	16	8,00	10,0

2105/5 **HSS DIN 376/374** **M** **Form. C** **Tol. 6H** **35°** **LH** **3XD** **D**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



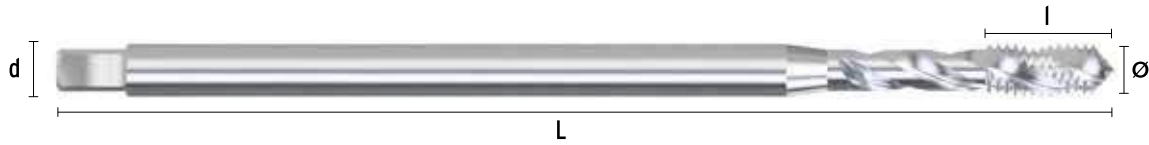
∅	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	58,82	110	18	7,00	9,0
M16,0	2,00	86,03	110	20	9,00	12,0

∅	P	€	L mm	l mm	∠ mm	d mm
M20,0	2,50	125,04	140	25	12,00	16,0
M24,0	1,50	165,18	140	20	14,50	18,0

2112 **HSSE DIN 371**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	33,04	100	5	2,70	3,5
M4,0	0,70	33,04	125	7	3,40	4,5
M5,0	0,80	38,10	140	8	4,90	6,0
M6,0	1,00	38,10	160	10	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
*M8,0	1,25	48,24	150	14	6,20	8,0
*M10,0	1,50	58,35	150	16	8,00	10,0
*M12,0	1,75	60,72	150	18	9,00	12,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2273 **HSSE DIN 376**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M8,0	1,25	54,80	180	20	4,90	6,0
M10,0	1,50	67,09	200	20	5,50	7,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	86,27	220	24	7,00	9,0
M16,0	2,00	126,22	220	32	9,00	12,0

2166

HSSE DIN 371

M
DIN 13

Form.
C



Tol.
6H
+0,1



3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	24,21	56	5	2,70	3,5
M4,0	0,70	24,21	63	7	3,40	4,5
M5,0	0,80	23,37	70	8	4,90	6,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M6,0	1,00	25,63	80	10	4,90	6,0
M8,0	1,25	30,59	90	13	4,90	6,0
M10,0	1,50	36,27	110	15	8,00	10,0

2165

HSSE DIN 376

M
DIN 13

Form.
C

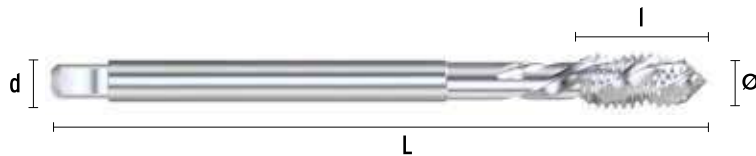


Tol.
6H
+0,1



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



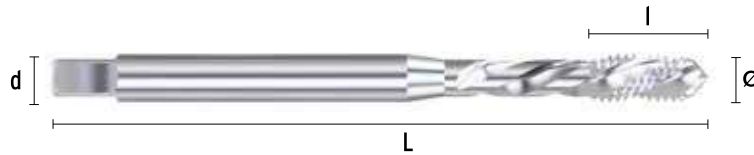
Ø	P	€	L mm	I mm	∠ mm	d mm
M8,0	1,25	30,59	90	15	4,90	6,0
M10,0	1,50	36,27	100	17	5,50	7,0
M12,0	1,75	40,71	110	18	7,00	9,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M14,0	2,00	58,28	110	20	9,00	11,0
M16,0	2,00	70,36	110	20	9,00	12,0

2170 HSSE DIN 371

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	21,05	56	5	2,70	3,5
M4,0	0,70	21,05	63	7	3,40	4,5
M5,0	0,80	20,30	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	22,27	80	10	4,90	6,0
M8,0	1,25	26,59	90	13	6,20	8,0
M10,0	1,50	31,51	110	15	8,00	10,0

2208 HSSE DIN 376

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M8,0	1,25	26,59	90	15	4,90	6,0
M10,0	1,50	31,51	100	17	5,50	7,0
M12,0	1,75	42,05	110	18	7,00	9,0
M14,0	2,00	48,57	110	20	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	58,65	110	20	9,00	12,0
M18,0	2,50	79,91	125	25	11,00	14,0
M20,0	2,50	84,06	140	25	12,00	16,0

2108 **HSSE DIN 371** **M** **Form. C** **Tol. 6H** **3XD** **R**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
*M2,0	0,40	18,96	45	8	2,10	2,8
M3,0	0,50	15,91	56	11	2,70	3,5
M4,0	0,70	15,27	63	13	3,40	4,5
M5,0	0,80	14,72	70	16	4,90	6,0

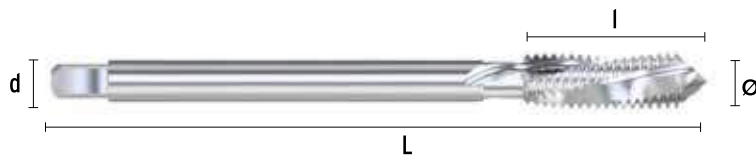
Ø	P	€	L mm	I mm	∅ mm	d mm
M6,0	1,00	16,14	80	19	4,90	6,0
M7,0	1,00	19,57	80	19	5,50	7,0
M8,0	1,25	19,28	90	22	6,20	8,0
M10,0	1,50	22,84	100	24	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2107 **HSSE DIN 376/374** **M** **Form. C** **Tol. 6H** **3XD** **D**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M4,0	0,70	15,13	63	13	2,10	2,8
M5,0	0,80	14,62	70	16	2,70	3,5
M6,0	1,00	16,14	80	19	3,40	4,5
M7,0	1,00	19,57	80	19	4,30	5,5
M8,0	1,25	19,28	90	22	4,90	6,0
M10,0	1,50	22,84	100	24	5,50	7,0
M12,0	1,75	30,50	110	29	7,00	9,0
M14,0	2,00	36,27	110	30	9,00	11,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M16,0	2,00	43,82	110	32	9,00	12,0
M18,0	2,50	58,95	125	34	11,00	14,0
M20,0	2,50	62,80	140	34	12,00	16,0
M22,0	2,50	77,45	140	34	14,50	18,0
M24,0	3,00	94,10	160	38	14,50	18,0
*M27,0	3,00	115,83	160	38	16,00	20,0
*M30,0	3,50	148,40	180	45	18,00	22,0
*M36,0	4,00	239,30	200	56	22,00	28,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2252 **HSSE DIN 371** M Form. Tol. 35° 3XD R VAP
DIN 13 C 6H

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			● 5-10	○ 5-8		○ 10-15			● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
M2,0	0,40	29,21	45	5	2,10	2,8
M2,5	0,45	29,21	50	5	2,10	2,8
M3,0	0,50	16,21	56	6	2,70	3,5
M3,5	0,60	19,44	56	6	3,00	4,0
M4,0	0,70	16,48	63	7	3,40	4,5

Ø	P	€	L mm	l mm	∠ mm	d mm
M5,0	0,80	17,41	70	8	4,90	6,0
M6,0	1,00	17,41	80	10	4,90	6,0
M8,0	1,25	20,24	90	14	6,20	8,0
M10,0	1,50	25,90	100	16	8,00	10,0

2253 **HSSE DIN 376/374** M-MF Form. Tol. 35° 3XD D VAP
DIN13 C 6H

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			● 5-10	○ 5-8		○ 10-15			● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	18,59	56	5	2,00	2,2
M4,0	0,70	18,99	63	7	2,10	2,8
M5,0	0,80	19,97	70	8	2,70	3,5
M6,0	1,00	19,97	80	10	3,40	4,5
M8,0	1,00	30,26	90	10	4,90	6,0
M8,0	1,25	23,27	90	14	4,90	6,0
M10,0	1,00	34,22	90	10	5,50	7,0
M10,0	1,25	39,88	100	15	5,50	7,0
M10,0	1,50	28,53	100	16	5,50	7,0
M12,0	1,00	44,04	100	10	7,00	9,0
M12,0	1,25	47,80	100	15	7,00	9,0
M12,0	1,50	44,04	100	15	7,00	9,0
M12,0	1,75	36,73	110	18	7,00	9,0
M14,0	1,00	60,13	100	10	9,00	11,0
M14,0	1,25	55,19	100	15	9,00	11,0
M14,0	1,50	60,13	100	15	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M14,0	2,00	50,18	110	20	9,00	11,0
M16,0	1,00	69,70	100	10	9,00	12,0
M16,0	1,50	61,70	100	15	9,00	12,0
M16,0	2,00	53,66	110	20	9,00	12,0
M18,0	1,00	95,80	110	13	11,00	14,0
M18,0	1,50	73,70	110	20	11,00	14,0
M18,0	2,50	73,70	125	25	11,00	14,0
M20,0	1,00	93,67	125	13	12,00	16,0
M20,0	1,50	85,83	125	20	12,00	16,0
M20,0	2,50	78,06	140	25	12,00	16,0
M22,0	1,00	157,00	125	13	14,50	18,0
M22,0	1,50	111,21	125	17	14,50	18,0
M22,0	2,50	111,21	140	27	14,50	18,0
M24,0	1,50	113,39	140	20	14,50	18,0
M24,0	2,00	123,68	140	20	14,50	18,0
M24,0	3,00	103,04	160	30	14,50	18,0

2118

HSSE DIN 371

M
DIN 13

Form.
C



Tol.
6H



3XD



TIN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○		●			●		○					
10-25	12-18	8-12		6-12	6-10		15-20			15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH

NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
M2,0	0,40	31,41	45	5	2,10	2,8
M2,5	0,45	31,41	50	5	2,10	2,8
M3,0	0,50	19,52	56	6	2,70	3,5
M3,5	0,60	24,80	56	6	3,00	4,0
M4,0	0,70	19,68	63	7	3,40	4,5

Ø	P	€	L mm	I mm	∠ mm	d mm
M5,0	0,80	21,44	70	8	4,90	6,0
M6,0	1,00	22,19	80	10	4,90	6,0
M8,0	1,25	26,67	90	14	6,20	8,0
M10,0	1,50	35,04	100	16	8,00	10,0

2117

HSSE DIN 376/374

M-MF
DIN 13

Form.
C



Tol.
6H



3XD



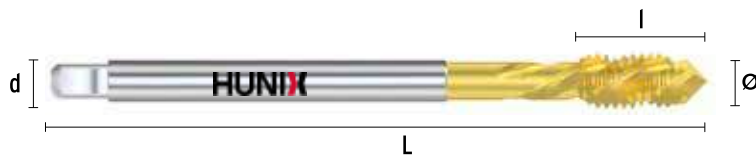
TIN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○		●			●		○					
10-25	12-18	8-12		6-12	6-10		15-20			15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH

NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	21,03	56	5	2,00	2,2
M4,0	0,70	24,11	63	7	2,10	2,8
M5,0	0,80	26,08	70	8	2,70	3,5
M6,0	1,00	26,88	80	10	3,40	4,5
M8,0	1,00	41,50	90	10	4,90	6,0
M8,0	1,25	32,11	90	14	4,90	6,0
M10,0	1,00	48,65	90	10	5,50	7,0
M10,0	1,25	53,23	100	15	5,50	7,0
M10,0	1,50	40,54	100	16	5,50	7,0
M12,0	1,00	60,49	100	10	7,00	9,0
M12,0	1,25	67,31	100	15	7,00	9,0
M12,0	1,50	57,98	100	15	7,00	9,0
M12,0	1,75	50,14	110	18	7,00	9,0
M14,0	1,00	80,17	100	10	9,00	11,0
M14,0	1,25	74,51	100	15	9,00	11,0
M14,0	1,50	77,07	100	15	9,00	11,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M14,0	2,00	66,30	110	20	9,00	11,0
M16,0	1,00	92,76	100	10	9,00	12,0
M16,0	1,50	80,49	100	15	9,00	12,0
M16,0	2,00	71,85	110	20	9,00	12,0
M18,0	1,00	110,61	110	13	11,00	14,0
M18,0	1,50	101,88	110	20	11,00	14,0
M18,0	2,50	97,61	125	25	11,00	14,0
M20,0	1,00	108,61	125	13	12,00	16,0
M20,0	1,50	114,95	125	20	12,00	16,0
M20,0	2,50	106,62	140	25	12,00	16,0
M22,0	1,00	148,01	125	13	14,50	18,0
M22,0	1,50	144,17	125	17	14,50	18,0
M22,0	2,50	144,12	140	27	14,50	18,0
M24,0	1,50	156,12	140	20	14,50	18,0
M24,0	2,00	181,30	140	20	14,50	18,0
M24,0	3,00	146,52	160	30	14,50	18,0

2124 **HSSE-PM DIN 371** **M** **DIN 13** **Form. C** **Tol. 6H** **35°** **3XD** **R** **TICN+**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○	●	●	○	○	●				○		○			
10-15		6-10	4-6	6-12				10-20				10-15		4-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	23,12	56	5	2,70	3,5
M4,0	0,70	23,48	63	7	3,40	4,5
M5,0	0,80	25,31	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	26,11	80	10	4,90	6,0
M8,0	1,25	33,61	90	13	6,20	8,0
M10,0	1,50	40,75	100	15	8,00	10,0

2123 **HSSE-PM DIN 376/374** **M-MF** **DIN 13** **Form. C** **Tol. 6H** **35°** **3XD** **D** **TICN+**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○	●	●	○	○	●				○		○			
10-15		6-10	4-6	6-12				10-20				10-15		4-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M8,0	1,00	44,37	90	10	4,90	6,0
M8,0	1,25	34,87	90	15	4,90	6,0
M10,0	1,00	51,09	90	10	5,50	7,0
M10,0	1,25	58,75	100	15	5,50	7,0
M10,0	1,50	44,84	100	17	5,50	7,0
M12,0	1,00	76,14	100	10	7,00	9,0
M12,0	1,25	68,03	100	15	7,00	9,0
M12,0	1,50	65,99	100	15	7,00	9,0
M12,0	1,75	56,89	110	18	7,00	9,0
M14,0	1,25	164,57	100	15	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M14,0	1,50	87,80	100	15	9,00	11,0
M14,0	2,00	75,48	110	20	9,00	11,0
M16,0	1,50	91,65	100	15	9,00	12,0
M16,0	2,00	81,71	110	20	9,00	12,0
M18,0	1,50	111,06	110	17	11,00	14,0
M18,0	2,50	111,79	125	25	11,00	14,0
M20,0	1,50	130,59	125	17	12,00	16,0
M20,0	2,50	120,98	140	25	12,00	16,0
M22,0	2,50	164,38	140	25	14,50	18,0
M24,0	3,00	178,41	160	30	14,50	18,0

2178

HSSE-PM DIN 371

M
DIN 13

Form.
C



Tol.
6HX



3XD



TICN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
		○ 6-10	● 4-6		○ 4-6			● 10-20				○ 10-15		○ 4-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	35,04	56	10	2,70	3,5
M4,0	0,70	25,85	63	12	3,40	4,5
M5,0	0,80	27,50	70	14	4,90	6,0

∅	P	€	L mm	I mm	∠ mm	d mm
M6,0	1,00	29,42	80	18	4,90	6,0
M8,0	1,25	33,61	90	20	6,20	8,0
M10,0	1,50	44,04	100	20	8,00	10,0

2177

HSSE-PM DIN 376

M
DIN 13

Form.
C



Tol.
6HX



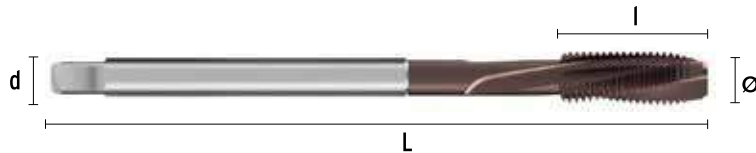
3XD



TICN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
		○ 6-10	● 4-6		○ 4-6			● 10-20				○ 10-15		○ 4-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	I mm	∠ mm	d mm
M8,0	1,25	50,10	90	20	4,90	6,0
M10,0	1,50	51,63	100	20	5,50	7,0
M12,0	1,75	61,38	110	24	7,00	9,0
M14,0	2,00	85,19	110	25	9,00	11,0

∅	P	€	L mm	I mm	∠ mm	d mm
M16,0	2,00	88,29	110	32	9,00	12,0
M18,0	2,50	146,76	125	32	11,00	14,0
M20,0	0,25	136,02	140	32	12,00	16,0

2120 HSSE DIN 371

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25				● 5-10										○ 10-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	20,18	56	5	2,70	3,5
M4,0	0,70	20,18	63	7	3,40	4,5
M5,0	0,80	20,18	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	21,55	80	10	4,90	6,0
M8,0	1,25	25,31	90	13	6,20	8,0
M10,0	1,50	30,88	100	15	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

*Para mismo rendimiento / Pour le même rendement / For the same performance Ref. 2252

*Para mayor rendimiento / Pour plus rendement / For higher performance Ref. 2118

2119 HSSE DIN 376/374

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25				● 5-10										○ 10-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M8,0	1,00	29,89	90	10	4,90	6,0
M8,0	1,25	25,31	90	15	4,90	6,0
M10,0	1,00	36,63	90	10	5,50	7,0
M10,0	1,25	39,09	100	15	5,50	7,0
M10,0	1,50	30,88	100	17	5,50	7,0
M12,0	1,00	48,03	100	10	7,00	9,0
M12,0	1,25	46,46	100	15	7,00	9,0
M12,0	1,50	48,14	110	15	7,00	9,0
M12,0	1,75	41,76	110	18	7,00	9,0
M14,0	1,25	67,43	100	15	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M14,0	1,50	51,08	100	15	9,00	11,0
M14,0	2,00	51,92	110	20	9,00	11,0
M16,0	1,50	65,40	100	15	9,00	12,0
M16,0	2,00	62,74	110	20	9,00	12,0
M18,0	1,50	83,75	110	17	11,00	14,0
M18,0	2,50	84,33	125	25	11,00	14,0
M20,0	1,50	94,35	125	17	12,00	16,0
M20,0	2,50	89,86	140	25	12,00	16,0
M22,0	2,50	95,75	140	25	14,50	18,0
M24,0	3,00	101,51	160	30	14,50	18,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

*Para mismo rendimiento / Pour le même rendement / For the same performance Ref. 2253

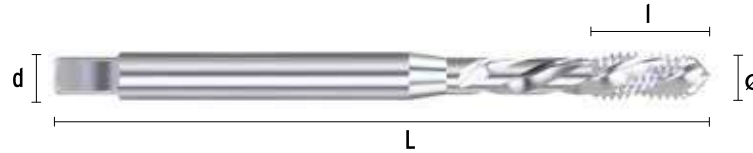
*Para mayor rendimiento / Pour plus rendement / For higher performance Ref. 2117

2182

HSSE DIN 371 **M** **Form. C** **Tol. 6H** **3XD** **R**
DIN 13

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									● 10-20	○ 6-8	○ 10-20	○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	18,09	56	6	2,70	3,5
M4,0	0,70	18,09	63	7	3,40	4,5
M5,0	0,80	18,46	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	20,02	80	10	4,90	6,0
M8,0	1,25	23,90	90	14	6,20	8,0
M10,0	1,50	28,24	100	16	8,00	10,0

2181

HSSE DIN 376 **M** **Form. C** **Tol. 6H** **3XD** **D**
DIN 13

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									● 10-20	○ 6-8	○ 10-20	○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	20,02	80	18	3,40	4,5
M8,0	1,25	23,90	90	20	4,90	6,0
M10,0	1,50	28,24	100	22	5,50	7,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	33,58	110	18	7,00	9,0
M14,0	2,00	49,08	110	20	9,00	11,0
M16,0	2,00	66,19	110	22	9,00	12,0

2256 **HSSE-PM DIN 371 MULTI** **M** **DIN 13** **Form. C** **Tol. 6HX** **3XD** **R** **HL**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
20-40	15-30	10-20	5-10	5-15	5-15	10-30	10-30	5-15	10-30	10-30	5-15	10-30	2-8	2-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	31,08	56	5	2,70	3,5
M4,0	0,70	32,71	63	7	3,40	4,5
M5,0	0,80	35,52	70	8	4,90	6,0

∅	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	36,82	80	10	4,90	6,0
M8,0	1,25	44,21	90	13	6,20	8,0
M10,0	1,50	58,18	100	15	8,00	10,0

2257 **HSSE-PM DIN 376 MULTI** **M** **DIN 13** **Form. C** **Tol. 6HX** **3XD** **D** **HL**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
20-40	15-30	10-20	5-10	5-15	5-15	10-30	10-30	5-15	10-30	10-30	5-15	10-30	2-8	2-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



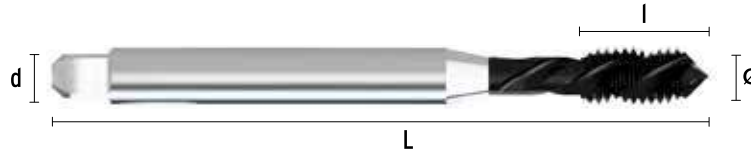
∅	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	86,95	110	18	7,00	9,0
M14,0	2,00	114,46	110	20	9,00	11,0

∅	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	124,1	110	20	9,00	12,0

2260 **HSSE-PM DIN 371 SYNCHRO** **M** **Form. C** **To. 6HX** **45°** **CNC** **3XD** **R** **HL**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
20-50	15-40	10-20	5-10	5-15	5-10	10-40	10-40	5-15	10-40	10-40	5-15	10-40	2-8	2-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M3,0	0,50	31,08	56	5	2,70	3,5
M4,0	0,70	32,71	63	7	3,40	4,5
M5,0	0,80	35,52	70	8	4,90	6,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M6,0	1,00	36,82	80	10	4,90	6,0
M8,0	1,25	44,21	90	13	6,20	8,0
M10,0	1,50	58,18	100	15	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2261 **HSSE-PM DIN 376 SYNCHRO** **M** **Form. C** **To. 6HX** **45°** **CNC** **3XD** **D** **HL**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
20-50	15-40	10-20	5-10	5-15	5-10	10-40	10-40	5-15	10-40	10-40	5-15	10-40	2-8	2-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M12,0	1,75	86,95	110	18	7,00	9,0
M14,0	2,00	114,46	110	20	9,00	11,0

Ø	P	€	L mm	I mm	∅ mm	d mm
M16,0	2,00	124,10	110	20	9,00	12,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2188 **HSSE-PM DIN 371** A>12% **M** DIN 13 Form. **C** Tol. **6HX** 1,5XD **R** **TIN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 15-45	● 15-25			● 10-25					● 15-40	● 15-30	● 20-40			○ 10-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	30,17	56	10	2,70	3,5
M4,0	0,70	30,17	63	7	3,40	4,5
M5,0	0,80	31,73	70	8	4,90	6,0

∅	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	33,82	80	10	4,90	6,0
M8,0	1,25	40,40	90	13	6,20	8,0
M10,0	1,50	49,26	100	15	8,00	10,0

2187 **HSSE-PM DIN 376** A>12% **M** DIN 13 Form. **C** Tol. **6HX** 1,5XD **D** **TIN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 15-45	● 15-25			● 10-25					● 15-40	● 15-30	● 20-40			○ 10-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



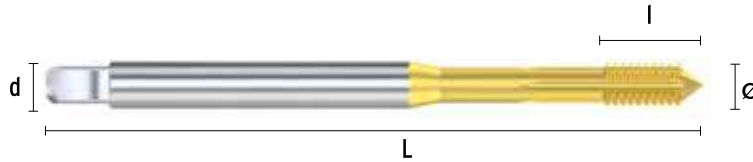
∅	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	63,70	110	18	7,00	9,0
M14,0	2,00	85,90	110	20	9,00	11,0

∅	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	103,09	110	20	9,00	12,0

2214 **HSSE-PM DIN 371** A>12% **M** **DIN 13** **Form. C** **Tol. 6HX** **3XD** **R** **TIN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 15-45	● 15-25			● 10-25					● 15-40	● 15-30	● 20-40		○ 10-20				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



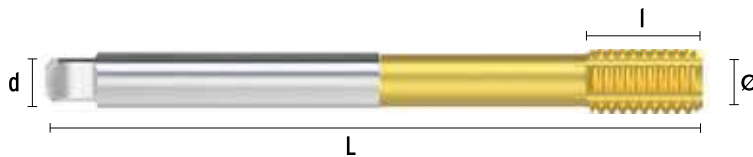
∅	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	30,17	56	10	2,70	3,5
M4,0	0,70	30,17	63	7	3,40	4,5
M5,0	0,80	31,73	70	8	4,90	6,0

∅	P	€	L mm	I mm	∠ mm	d mm
M6,0	1,00	33,82	80	10	4,90	6,0
M8,0	1,25	40,40	90	13	6,20	8,0
M10,0	1,50	49,26	100	15	8,00	10,0

2213 **HSSE-PM DIN 376/374** A>12% **M-MF** **DIN13** **Form. C** **Tol. 6HX** **3XD** **D** **TIN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 15-45	● 15-25			● 10-25					● 15-40	● 15-30	● 20-40		○ 10-20				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



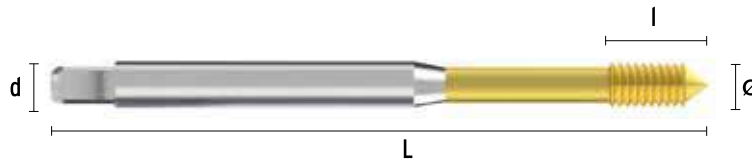
∅	P	€	L mm	I mm	∠ mm	d mm
M8,0	1,00	66,20	90	13	4,90	6,0
M8,0	1,25	57,10	90	13	4,90	6,0
M10,0	1,00	54,25	90	13	5,50	7,0
M10,0	1,25	84,60	100	15	5,50	7,0
M10,0	1,50	67,40	100	15	5,50	7,0
M12,0	1,00	83,75	100	10	7,00	9,0

∅	P	€	L mm	I mm	∠ mm	d mm
M12,0	1,25	87,55	100	15	7,00	9,0
M12,0	1,50	85,15	100	15	7,00	9,0
M12,0	1,75	65,15	110	18	7,00	9,0
M14,0	2,00	85,90	110	20	9,00	11,0
M16,0	1,50	133,00	100	15	9,00	12,0
M16,0	2,00	103,10	110	20	9,00	12,0

2216 **HSSE-PM DIN 371** $A>12\%$ **M** **DIN 13** **Form. C** **Tol. 6GX** **1,5XD** **R** **TIN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●			●					●	●	●			○			
15-45	15-25			10-25					15-40	15-30	20-40			10-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



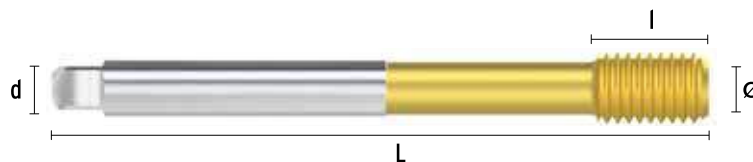
∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	25,90	56	10	2,70	3,5
M4,0	0,70	26,80	63	7	3,40	4,5
M5,0	0,80	27,50	70	8	4,90	6,0

∅	P	€	L mm	l mm	∠ mm	d mm
M6,0	1,00	28,60	80	10	4,90	6,0
M8,0	1,25	38,90	90	13	6,20	8,0
M10,0	1,50	48,80	100	15	8,00	10,0

2215 **HSSE-PM DIN 376** $A>12\%$ **M** **DIN 13** **Form. C** **Tol. 6GX** **1,5XD** **D** **TIN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●			●					●	●	●			○			
15-45	15-25			10-25					15-40	15-30	20-40			10-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

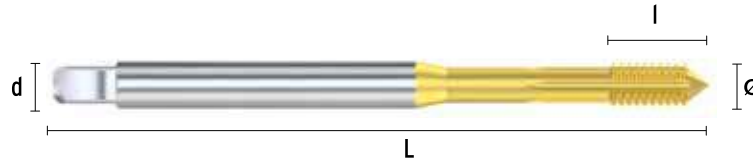


∅	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	73,60	110	18	7,00	9,0

2218 **HSSE-PM DIN 371** A>12% **M** **Form. C** **Tol. 6GX** **3XD** **R** **TIN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●			●					●	●	●			○			
15-45	15-25			10-25					15-40	15-30	20-40			10-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	25,45	56	10	2,70	3,5
M4,0	0,70	31,55	63	7	3,40	4,5
M5,0	0,80	33,40	70	8	4,90	6,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M6,0	1,00	26,75	80	10	4,90	6,0
M8,0	1,25	43,45	90	13	6,20	8,0
M10,0	1,50	52,35	100	15	8,00	10,0

2217 **HSSE-PM DIN 376** A>12% **M** **Form. C** **Tol. 6GX** **3XD** **D** **TIN**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●			●					●	●	●			○			
15-45	15-25			10-25					15-40	15-30	20-40			10-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
M12,0	1,75	52,35	110	18	7,00	9,0

2199

HSSE DIN 357

M
DIN 13



Tol.
6H



D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●							○			○							
10-25							10-15			10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	26,47	70	22		2,2
M4,0	0,70	26,47	90	25	2,10	2,8
M5,0	0,80	27,23	100	28	2,70	3,5
M6,0	1,00	25,24	110	32	3,40	4,5
M8,0	1,25	29,49	125	40	4,90	6,0
M10,0	1,50	45,37	140	45	5,50	7,0
M12,0	1,75	54,43	180	50	7,00	9,0

Ø	P	€	L mm	I mm	∠ mm	d mm
M14,0	2,00	60,47	200	56	9,00	11,0
M16,0	2,00	74,10	200	63	9,00	12,0
M18,0	2,50	90,72	220	63	11,00	14,0
M20,0	2,50	105,07	250	70	12,00	16,0
M22,0	2,50	134,55	280	80	14,50	18,0
M24,0	3,00	158,73	280	80	14,50	18,0

2134

HSSE

M
DIN 13

16-18
tpi



Tol.
6H



D

NIT

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●							○			○							
10-25							10-15			10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	d mm
M3,0	0,50	72,56	280	12	2,7
M4,0	0,70	71,54	280	17	2,1
M5,0	0,80	71,54	280	20	2,7
M6,0	1,00	71,54	280	25	3,4
M8,0	1,25	75,88	280	31	4,9
M10,0	1,50	87,96	280	37	5,5
M12,0	1,75	137,16	420	43	7,0

Ø	P	€	L mm	I mm	d mm
M14,0	2,00	132,48	420	50	9,0
M16,0	2,00	186,31	420	50	9,0
M18,0	2,50	230,09	530	62	14,2
M20,0	2,50	304,28	530	63	12,0
M22,0	2,50	351,47	530	62	18,0
M24,0	3,00	492,28	530	75	19,2

P

Aceros
Aciers
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundicion
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S

Titanio y Superalloys
Titanium et Superalloys
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

2806

HSSE DIN 13

M
DIN 13 **Tol.**
6H

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●							○		○	●		○		○			
10-25							10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	35,88	56	16	2,40	3,0
M4,0	0,70	35,88	63	18	3,00	4,0
M5,0	0,80	35,88	71	20	3,80	5,0
M6,0	1,00	39,65	80	22	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M8,0	1,25	44,79	95	26	6,20	8,0
M10,0	1,50	49,29	106	30	8,00	10,0
M12,0	1,75	58,17	115	32	9,00	12,0

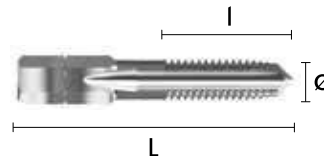
1504

HSS Hex.

M
DIN 13 **Tol.**
6H 

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●																	
15-45																	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm
M3,0	0,50	7,33	33	11	1/4"
M4,0	0,70	7,33	35	12	1/4"
M5,0	0,80	7,33	36	15	1/4"

Ø	P	€	L mm	l mm	∠ mm
M6,0	1,00	7,33	39	18	1/4"
M8,0	1,25	10,15	40	19	1/4"
M10,0	1,50	11,62	41	21	1/4"

2248

HSS ISO 529

M
DIN 13

Form.
B
"Gun"



Tol.
6H

3XD

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●							○		○	●		○					
5-20						5-15			10-15	5-15		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	5,95	48	11	2,50	3,2
M4,0	0,70	6,04	53	13	3,15	4,0
M5,0	0,80	7,66	58	16	4,00	5,0
M6,0	1,00	8,01	66	19	5,00	6,3
M8,0	1,25	8,27	72	22	6,30	8,0
M10,0	1,50	10,11	80	24	8,00	10,0
M12,0	1,75	15,31	89	29	7,10	10,2
M14,0	2,00	16,06	95	30	9,00	11,2

∅	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	18,77	102	32	10,00	12,5
M18,0	2,50	23,45	110	37	11,20	14,0
M20,0	2,50	26,21	112	37	11,20	14,0
M22,0	2,50	29,71	118	38	12,50	16,0
M24,0	3,00	37,54	130	45	14,00	18,0
M27,0	3,00	50,40	135	45	16,00	20,0
M30,0	3,50	93,54	138	48	16,00	20,0

2249

HSS ISO 529

M
DIN 13

Form.
C



Tol.
6H

3XD

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●							○		○	●		○					
5-20						5-15			10-15	5-15		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	7,44	48	11	2,50	3,2
M4,0	0,70	7,70	53	13	3,15	4,0
M5,0	0,80	9,54	58	16	4,00	5,0
M6,0	1,00	9,89	66	19	5,00	6,3
M8,0	1,25	10,54	72	22	6,30	8,0
M10,0	1,50	12,64	80	24	8,00	10,0
M12,0	1,75	19,12	89	29	7,10	10,2
M14,0	2,00	21,57	95	30	9,00	11,2

∅	P	€	L mm	l mm	∠ mm	d mm
M16,0	2,00	23,45	102	32	10,00	12,5
M18,0	2,50	29,44	112	37	11,20	14,0
M20,0	2,50	32,99	112	37	11,20	14,0
M22,0	2,50	37,06	118	38	12,50	16,0
M24,0	3,00	46,81	130	45	14,00	18,0
M27,0	3,00	62,91	135	45	16,00	20,0
M30,0	3,50	105,70	138	48	16,00	20,0

2266

HSSE JIS

M
DIN13

Form.
B
"Gun"



HH1
HH4

3XD

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
M3,0	0,50	12,16	46	11	3,20	4,0
M4,0	0,70	12,43	52	13	4,00	5,0
M5,0	0,80	12,45	60	16	4,50	5,5
M6,0	1,00	13,66	62	19	4,50	6,0
M8,0	1,25	15,07	70	22	5,00	6,2
M10,0	1,50	18,49	75	24	5,50	7,0

Ø	P	€	L mm	l mm	∅ mm	d mm
M12,0	1,75	23,60	82	29	6,50	8,5
M14,0	2,00	31,08	88	30	8,00	10,5
M16,0	2,00	38,18	95	32	10,00	12,5
M18,0	2,50	51,88	100	37	11,00	14,0
M20,0	2,50	55,97	105	37	12,00	15,0

2267

HSSE JIS

M
DIN13

Form.
C



HH1
HH4



3XD

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
M3,0	0,50	14,99	46	6	3,20	4,0
M4,0	0,70	14,99	52	9	4,00	5,0
M5,0	0,80	14,49	60	10	4,50	5,5
M6,0	1,00	15,89	62	12	4,50	6,0
M8,0	1,25	18,94	70	15	5,00	6,2
M10,0	1,50	22,03	75	18	5,50	7,0

Ø	P	€	L mm	l mm	∅ mm	d mm
M12,0	1,75	29,42	82	21	6,50	8,5
M14,0	2,00	37,77	88	24	8,00	10,5
M16,0	2,00	45,61	95	24	10,00	12,5
M18,0	2,50	61,33	100	30	11,00	14,0
M20,0	2,50	65,34	105	30	12,00	15,0

2268

HSSE JIS

M
DIN13

Form.
B
"Gun"



HH1
HH4

3XD

VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	13,61	46	11	3,20	4,0
M4,0	0,70	13,93	52	13	4,00	5,0
M5,0	0,80	13,94	60	16	4,50	5,5
M6,0	1,00	15,30	62	19	4,50	6,0
M8,0	1,25	16,87	70	22	5,00	6,2
M10,0	1,50	20,72	75	24	5,50	7,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	26,44	82	29	6,50	8,5
M14,0	2,00	34,81	88	30	8,00	10,5
M16,0	2,00	42,76	95	32	10,00	12,5
M18,0	2,50	58,11	100	37	11,00	14,0
M20,0	2,50	62,69	105	37	12,00	15,0

2269

HSSE JIS

M
DIN13

Form.
C



HH1
HH4



3XD

VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH



Ø	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	16,81	46	6	3,20	4,0
M4,0	0,70	16,81	52	9	4,00	5,0
M5,0	0,80	16,23	60	10	4,50	5,5
M6,0	1,00	17,79	62	12	4,50	6,0
M8,0	1,25	21,22	70	15	5,00	6,2
M10,0	1,50	24,69	75	18	5,50	7,0

Ø	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	32,95	82	21	6,50	8,5
M14,0	2,00	42,30	88	24	8,00	10,5
M16,0	2,00	51,08	95	24	10,00	12,5
M18,0	2,50	68,69	100	30	11,00	14,0
M20,0	2,50	73,19	105	30	12,00	15,0

P Aceros
Aciers
Steels

M Aceros Inox
Aciers Inox
Stainless Steels

K Fundicion
Fonte
Cast Iron

N Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S Titanio y Superalloys
Titanium et Superalloys
Titanium and Superalloys

H Materiales Duros
Materiels Durs
Hard materials

2270

HSSE JIS

M
DIN13

Form.
B
"Gun"



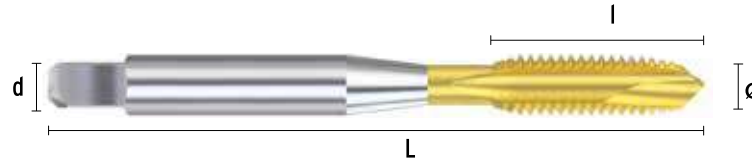
HH1
HH4

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 12-18			○ 5-10			○ 15-20		○ 15-20	● 15-25		○ 12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	17,02	46	11	3,20	4,0
M4,0	0,70	18,19	52	13	4,00	5,0
M5,0	0,80	18,20	60	16	4,50	5,5
M6,0	1,00	19,41	62	19	4,50	6,0
M8,0	1,25	22,47	70	22	5,00	6,2
M10,0	1,50	29,47	75	24	5,50	7,0

∅	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	35,69	82	29	6,50	8,5
M14,0	2,00	44,79	88	30	8,00	10,5
M16,0	2,00	53,26	95	32	10,00	12,5
M18,0	2,50	66,96	100	37	11,00	14,0
M20,0	2,50	71,04	105	37	12,00	15,0

2271

HSSE JIS

M
DIN13

Form.
C



HH1
HH4

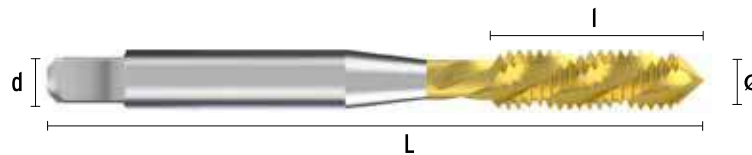


3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 12-18			○ 5-10			○ 15-20		○ 15-20	● 15-25		○ 12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
M3,0	0,50	20,11	46	6	3,20	4,0
M4,0	0,70	21,03	52	9	4,00	5,0
M5,0	0,80	20,53	60	10	4,50	5,5
M6,0	1,00	21,91	62	12	4,50	6,0
M8,0	1,25	26,70	70	15	5,00	6,2
M10,0	1,50	33,53	75	18	5,50	7,0

∅	P	€	L mm	l mm	∠ mm	d mm
M12,0	1,75	42,09	82	21	6,50	8,5
M14,0	2,00	52,14	88	24	8,00	10,5
M16,0	2,00	61,41	95	24	10,00	12,5
M18,0	2,50	77,13	100	30	11,00	14,0
M20,0	2,50	81,14	105	30	12,00	15,0

2148

HSSE DIN 371

UNC
ANSI/ASME
B1.1

Form.
C



Tol.
2B

1,5XD

R

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
Nº4	40,00	23,96	56	11	2,70	3,5
Nº5	40,00	23,96	56	11	2,70	3,5
Nº6	32,00	22,81	56	12	3,00	4,0
Nº8	32,00	22,81	63	13	3,40	4,5

Ø	P	€	L mm	I mm	∠ mm	d mm
Nº10	24,00	23,96	70	14	4,90	6,0
Nº12	24,00	25,14	80	16	4,90	6,0
1/4	20,00	21,27	80	16	5,50	7,0
5/16	18,00	22,62	90	20	6,20	8,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2147

HSSE DIN 376

UNC
ANSI/ASME
B1.1

Form.
C



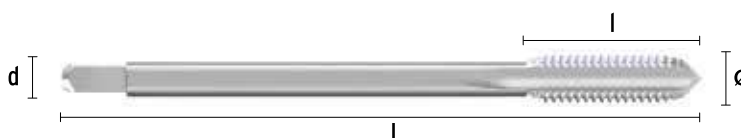
Tol.
2B

1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
1/4	20,00	21,27	80	18	3,40	4,5
5/16	18,00	24,07	90	20	4,90	6,0
3/8	16,00	27,46	100	22	5,50	7,0
7/16	14,00	37,75	100	22	6,20	8,0
1/2	13,00	41,42	110	27	7,00	9,0
9/16	12,00	56,41	110	30	9,00	11,0
5/8	11,00	54,79	110	30	9,00	12,0

Ø	P	€	L mm	I mm	∠ mm	d mm
3/4	10,00	72,41	125	35	11,00	14,0
7/8	9,00	95,39	140	36	14,50	18,0
1	8,00	125,28	160	38	16,00	20,0
1*1/8	7,00	158,18	180	45	18,00	22,0
1*1/4	7,00	193,95	180	45	18,00	22,0
1*1/2	6,00	327,03	200	55	24,00	32,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2147/5

HSSE DIN 376

UNC
ANSI/ASME
B1.1

Form.
C



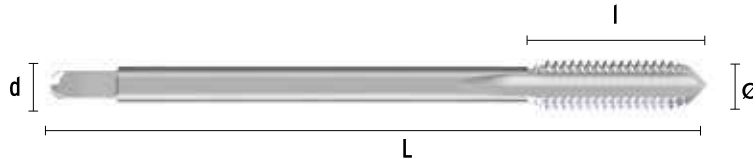
Tol.
2B

1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
1/4	20,00	42,53	80	18	3,40	4,5
5/16	18,00	48,13	90	20	4,90	6,0
3/8	16,00	54,94	100	22	5,50	7,0
7/16	14,00	75,51	100	22	6,20	8,0
1/2	13,00	82,83	110	27	7,00	9,0

Ø	P	€	L mm	l mm	∅ mm	d mm
9/16	12,00	112,82	110	30	9,00	11,0
5/8	11,00	109,58	110	30	9,00	12,0
3/4	10,00	144,82	125	35	11,00	14,0
7/8	9,00	190,81	140	36	14,50	18,0
1"	8,00	250,53	160	38	16,00	20,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2150

HSSE DIN 371

UNC
ANSI/ASME
B1.1

Form. B
"Gun"



Tol. 2B

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
Nº4	40,00	22,15	56	10	2,70	3,5
Nº5	40,00	20,64	56	10	2,70	3,5
Nº6	32,00	20,64	56	12	3,00	4,0
Nº8	32,00	20,64	63	12	3,40	4,5
Nº10	24,00	20,89	70	14	4,90	6,0

Ø	P	€	L mm	I mm	∠ mm	d mm
Nº12	24,00	22,10	80	18	4,90	6,0
1/4	20,00	22,10	80	18	5,50	7,0
5/16	18,00	23,87	90	20	6,20	8,0
3/8	16,00	28,21	100	20	8,00	10,0

2149

HSSE DIN 376

UNC
ANSI/ASME
B1.1

Form. B
"Gun"



Tol. 2B

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
*1/4	20,00	22,10	80	18	3,40	4,5
*5/16	18,00	23,87	90	20	4,90	6,0
*3/8	16,00	28,21	100	20	5,50	7,0
7/16	14,00	40,10	100	22	6,20	8,0
1/2	13,00	40,10	110	24	7,00	9,0
9/16	12,00	54,70	110	25	9,00	11,0

Ø	P	€	L mm	I mm	∠ mm	d mm
5/8	11,00	53,65	110	32	9,00	12,0
3/4	10,00	78,05	125	32	11,00	14,0
7/8	9,00	111,20	140	32	14,50	18,0
1"	8,00	103,05	160	38	16,00	20,0
1*1/8	7,00	171,55	180	40	18,00	22,0
1*1/4	7,00	176,40	180	40	18,00	22,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2262

HSSE DIN 371

UNC
ANSI/ASME
B1.1

Form.
B
"Gun"



Tol.
2B



3XD

VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			●	○		○		○	●		○					
10-25	10-15			5-10	5-8		10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH

NEW



Ø	P	€	L mm	l mm	∅ mm	d mm
Nº4	40,00	24,36	56	10	2,70	3,5
Nº5	40,00	22,71	56	10	2,70	3,5
Nº6	32,00	22,71	56	12	3,00	4,0
Nº8	32,00	22,71	63	12	3,40	4,5
Nº10	24,00	22,98	70	14	4,90	6,0

Ø	P	€	L mm	l mm	∅ mm	d mm
Nº12	24,00	24,31	80	18	4,90	6,0
1/4	20,00	24,31	80	18	5,50	7,0
5/16	18,00	26,26	90	20	6,20	8,0
3/8	16,00	31,03	100	20	8,00	10,0

2263

HSSE DIN 376

UNC
ANSI/ASME
B1.1

Form.
B
"Gun"



Tol.
2B



3XD

VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			●	○		○		○	●		○					
10-25	10-15			5-10	5-8		10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH

NEW



Ø	P	€	L mm	l mm	∅ mm	d mm
7/16	14,00	44,09	100	22	6,20	8,0
1/2	13,00	44,09	110	24	7,00	9,0
9/16	12,00	60,19	110	25	9,00	11,0
5/8	11,00	59,03	110	32	9,00	12,0

Ø	P	€	L mm	l mm	∅ mm	d mm
3/4	10,00	85,87	125	32	11,00	14,0
7/8	9,00	122,33	140	32	14,50	18,0
1"	8,00	113,34	160	38	16,00	20,0

2234 **HSSE DIN 371** **UNC** **Form. B "Gun"** **Tol. 2B** **R** **3XD** **TIN+**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●		●	●		○					
15-30	12-18	8-12		6-12	6-10	10-15	15-20		15-25	15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
N°4	40,00	33,28	56	10	2,70	3,5
N°5	40,00	30,02	56	10	2,70	3,5
N°6	32,00	30,02	56	12	3,00	4,0
N°8	32,00	30,02	63	12	3,40	4,5
N°10	24,00	32,26	70	14	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
N°12	24,00	33,73	80	18	4,90	6,0
1/4	20,00	33,73	80	18	5,50	7,0
5/16	18,00	37,83	90	20	6,20	8,0
3/8	16,00	46,47	100	20	8,00	10,0

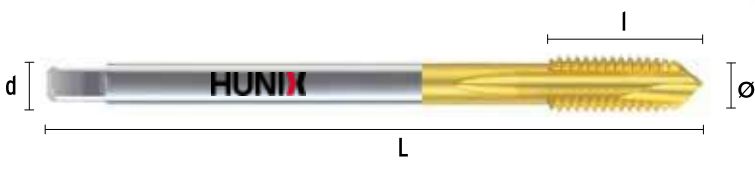
2235 **HSSE DIN 376** **UNC** **Form. B "Gun"** **Tol. 2B** **D** **3XD** **TIN+**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●		●	●		○					
15-30	12-18	8-12		6-12	6-10	10-15	15-20		15-25	15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
7/16	14,00	64,97	100	22	6,20	8,0
1/2	13,00	66,95	110	24	7,00	9,0
9/16	12,00	91,40	110	25	9,00	11,0
5/8	11,00	86,66	110	32	9,00	12,0

Ø	P	€	L mm	l mm	∠ mm	d mm
3/4	10,00	127,89	125	32	11,00	14,0
7/8	9,00	191,64	140	32	14,50	18,0
1"	8,00	176,85	160	38	16,00	20,0

2152

HSSE DIN 371

UNC
ANSI/ASME
B1.1

Form.
C



Tol.
2B



3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
Nº4	40,00	24,40	56	5	2,70	3,5
Nº5	40,00	22,65	56	7	2,70	3,5
Nº6	32,00	22,65	56	6	3,00	4,0
Nº8	32,00	22,65	63	7	3,40	4,5
Nº10	24,00	23,05	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
Nº12	24,00	24,35	80	10	4,90	6,0
1/4	20,00	24,35	80	13	5,50	7,0
5/16	18,00	26,30	90	13	6,20	8,0
3/8	16,00	31,05	100	15	8,00	10,0

2151

HSSE DIN 376

UNC
ANSI/ASME
B1.1

Form.
C



Tol.
2B



3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
*1/4	20,00	24,35	80	13	3,40	4,5
*5/16	18,00	26,30	90	13	4,90	6,0
*3/8	16,00	31,05	100	16	5,50	7,0
7/16	14,00	44,05	100	15	6,20	8,0
1/2	13,00	44,05	110	18	7,00	9,0
9/16	12,00	60,15	110	20	9,00	11,0

Ø	P	€	L mm	l mm	∠ mm	d mm
5/8	11,00	59,05	110	22	9,00	12,0
3/4	10,00	85,85	125	25	11,00	14,0
7/8	9,00	122,30	140	30	14,50	18,0
1"	8,00	113,40	160	30	16,00	20,0
1*1/8	7,00	188,71	180	40	18,00	22,0
1*1/4	7,00	194,04	180	40	18,00	22,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

P

Aceros
Aciers
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundicion
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S

Titanio y Superaloaciones
Titanium et Superalloages
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

2264 **HSSE DIN 371** **UNC** **Form. C** **Tol. 2B** **35°** **R** **3XD** **VAP**
ANSI/ASME B1.1

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			● 5-10	○ 5-8		○ 10-15			● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
Nº4	40,00	26,84	56	5	2,70	3,5
Nº5	40,00	24,94	56	7	2,70	3,5
Nº6	32,00	24,94	56	6	3,00	4,0
Nº8	32,00	24,94	63	7	3,40	4,5
Nº10	24,00	25,38	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
Nº12	24,00	26,76	80	10	4,90	6,0
1/4	20,00	26,76	80	13	5,50	7,0
5/16	18,00	28,94	90	13	6,20	8,0
3/8	16,00	34,14	100	15	8,00	10,0

2265 **HSSE DIN 376** **UNC** **Form. C** **Tol. 2B** **35°** **D** **3XD** **VAP**
ANSI/ASME

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			● 5-10	○ 5-8		○ 10-15			● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
7/16	14,00	48,45	100	15	6,20	8,0
1/2	13,00	48,45	110	18	7,00	9,0
9/16	12,00	66,14	110	20	9,00	11,0
5/8	11,00	64,98	110	22	9,00	12,0

Ø	P	€	L mm	l mm	∠ mm	d mm
3/4	10,00	94,41	125	25	11,00	14,0
7/8	9,00	134,54	140	30	14,50	18,0
1"	8,00	124,72	160	30	16,00	20,0

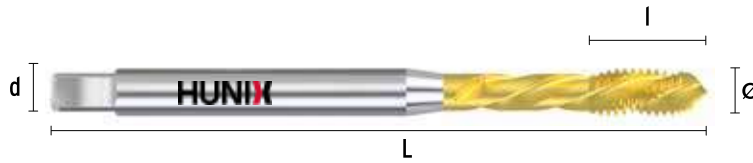
2236 **HSSE DIN 371** **UNC** Form. **C** Tol. **2B** **35°** **R** **3XD** **TIN+**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○		●			●		○					
10-25	12-18	8-12		6-12	6-10		15-20			15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
N°4	40,00	33,28	56	5	2,70	3,5
N°5	40,00	33,28	56	7	2,70	3,5
N°6	32,00	32,64	56	6	3,00	4,0
N°8	32,00	32,64	63	7	3,40	4,5
N°10	24,00	34,95	70	8	4,90	6,0

Ø	P	€	L mm	I mm	∠ mm	d mm
N°12	24,00	36,61	80	10	4,90	6,0
1/4	20,00	36,61	80	13	5,50	7,0
5/16	18,00	40,84	90	13	6,20	8,0
3/8	16,00	50,12	100	15	8,00	10,0

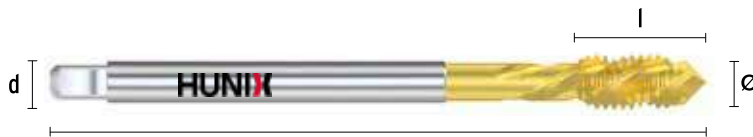
2237 **HSSE DIN 376** **UNC** Form. **C** Tol. **2B** **35°** **D** **3XD** **TIN+**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○		●			●		○					
10-25	12-18	8-12		6-12	6-10		15-20			15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
7/16	14,00	70,09	100	15	6,20	8,0
1/2	13,00	72,14	110	18	7,00	9,0
9/16	12,00	98,76	110	20	9,00	11,0
5/8	11,00	93,45	110	22	9,00	12,0

Ø	P	€	L mm	I mm	∠ mm	d mm
3/4	10,00	137,93	125	25	11,00	14,0
7/8	9,00	206,61	140	30	14,50	18,0
1"	8,00	190,04	160	30	16,00	20,0

2154

HSSE DIN 371

UNF
ANSI/ASME
B1.1

Form.
C



Tol.
2B

1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
N°4	48,00	26,25	56	11	2,70	3,5
N°5	44,00	26,25	56	11	2,70	3,5
N°6	40,00	25,16	56	12	3,00	4,0
N°8	36,00	25,16	63	13	3,40	4,5

Ø	P	€	L mm	l mm	∅ mm	d mm
N°10	32,00	25,16	70	14	4,90	6,0
N°12	28,00	26,25	80	16	4,90	6,0
1/4	28,00	20,20	80	16	5,50	7,0
5/16	24,00	23,22	90	20	6,20	8,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2153

HSSE DIN 374

UNF
ANSI/ASME
B1.1

Form.
C



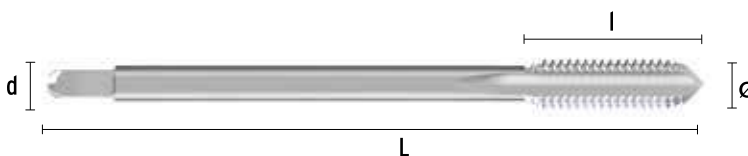
Tol.
2B

1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
1/4	28,00	20,20	80	18	3,40	4,5
5/16	24,00	23,22	90	20	4,90	6,0
3/8	24,00	26,80	100	20	5,50	7,0
7/16	20,00	34,34	100	22	6,20	8,0
1/2	20,00	36,55	100	22	7,00	9,0
9/16	18,00	44,88	100	22	9,00	11,0
5/8	18,00	50,54	100	22	9,00	12,0

Ø	P	€	L mm	l mm	∅ mm	d mm
3/4	16,00	64,66	110	25	11,00	14,0
7/8	14,00	81,34	125	25	14,50	18,0
1"	12,00	106,62	140	28	16,00	20,0
1*1/8	12,00	160,13	150	28	18,00	22,0
1*1/4	12,00	202,38	150	28	18,00	22,0
1*1/2	12,00	339,61	170	30	22,00	28,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2153/5

HSSE DIN 374

UNF
ANSI/ASME
B1.1

Form.
C



LH

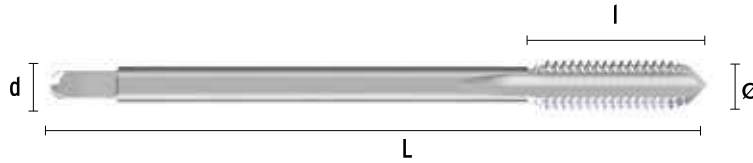
Tol.
2B

1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
1/4	28,00	40,37	80	18	3,40	4,5
5/16	24,00	46,42	90	20	4,90	6,0
3/8	24,00	53,59	100	20	5,50	7,0
7/16	20,00	68,65	100	22	6,20	8,0
1/2	20,00	73,08	100	22	7,00	9,0

Ø	P	€	L mm	l mm	∅ mm	d mm
9/16	18,00	89,74	100	22	9,00	11,0
5/8	18,00	101,07	100	22	9,00	12,0
3/4	16,00	129,32	110	25	11,00	14,0
7/8	14,00	162,69	125	25	14,50	18,0
1"	12,00	213,26	140	28	16,00	20,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2156

HSSE DIN 371

UNF
ANSI/ASME
B1.1

Form. B
"Gun"



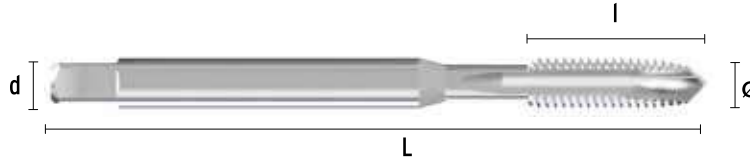
Tol. 2B

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
Nº4	48,00	23,35	56	11	2,70	3,5
Nº5	44,00	23,35	56	11	2,70	3,5
Nº6	40,00	23,52	56	12	3,00	4,0
Nº8	36,00	23,72	63	12	3,40	4,5
Nº10	32,00	24,13	70	14	4,90	6,0

Ø	P	€	L mm	l mm	∅ mm	d mm
Nº12	28,00	25,33	80	18	4,90	6,0
1/4	20,00	26,51	80	18	5,50	7,0
5/16	24,00	27,48	90	20	6,20	8,0
3/8	24,00	32,57	100	20	8,00	10,0

2155

HSSE DIN 376

UNF
ANSI/ASME
B1.1

Form. B
"Gun"



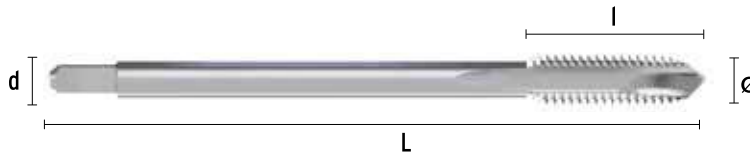
Tol. 2B

3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
*1/4	28,00	26,51	80	19	3,40	4,5
*5/16	24,00	27,48	90	22	4,90	6,0
*3/8	24,00	32,57	90	20	5,50	7,0
7/16	20,00	46,07	100	20	6,20	8,0
1/2	20,00	46,07	100	20	7,00	9,0

Ø	P	€	L mm	l mm	∅ mm	d mm
9/16	18,00	62,83	100	20	9,00	11,0
5/8	18,00	61,70	100	20	9,00	12,0
3/4	16,00	89,79	110	24	11,00	14,0
7/8	14,00	127,89	125	24	14,50	18,0
1"	12,00	118,60	140	27	14,50	18,0

*Hasta fin de existencias / Jusqu'à épuisement des stocks / Until end of stock

P

Aceros
Aciers
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundición
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S

Titanio y Superaloaciones
Titanium et Superalloages
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

2276 **HSSE DIN 371** UNF Form. B "Gun" Tol. 2B 3XD R VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	○			●	○		○		○	●		○					
10-25	10-15			5-10	5-8		10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
Nº4	48,00	25,69	56	11	2,70	3,5
Nº5	44,00	25,68	56	11	2,70	3,5
Nº6	40,00	25,88	56	12	3,00	4,0
Nº8	36,00	26,10	63	12	3,40	4,5
Nº10	32,00	26,54	70	14	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
Nº12	28,00	27,86	80	18	4,90	6,0
1/4	20,00	29,16	80	18	5,50	7,0
5/16	24,00	30,23	90	20	6,20	8,0
3/8	24,00	35,82	100	20	8,00	10,0

2277 **HSSE DIN 374** UNF Form. B "Gun" Tol. 2B 3XD D VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	○			●	○		○		○	●		○					
10-25	10-15			5-10	5-8		10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
7/16	20,00	50,68	100	20	6,20	8,0
1/2	20,00	50,68	100	20	7,00	9,0
9/16	18,00	69,11	100	20	9,00	11,0
5/8	18,00	67,87	100	20	9,00	12,0

Ø	P	€	L mm	l mm	∠ mm	d mm
3/4	16,00	98,77	110	24	11,00	14,0
7/8	14,00	140,68	125	24	14,50	18,0
1"	12,00	130,46	140	27	14,50	18,0

2280

HSSE DIN 371

UNF
ANSI/ASME
B1.1

Form. B
"Gun"



Tol. 2B

3XD



TIN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●		●	●		○					
15-30	12-18	8-12		6-12	6-10	10-15	15-20		15-25	15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH

NEW



Ø	P	€	L mm	I mm	∅ mm	d mm
N°4	48,00	37,93	56	11	2,70	3,5
N°5	44,00	34,22	56	11	2,70	3,5
N°6	40,00	34,22	56	12	3,00	4,0
N°8	36,00	34,22	63	12	3,40	4,5
N°10	32,00	36,48	70	14	4,90	6,0

Ø	P	€	L mm	I mm	∅ mm	d mm
N°12	28,00	38,15	80	18	4,90	6,0
1/4	20,00	38,15	80	18	5,50	7,0
5/16	24,00	43,20	90	20	6,20	8,0
3/8	24,00	53,77	100	20	8,00	10,0

2281

HSSE DIN 374

UNF
ANSI/ASME
B1.1

Form. B
"Gun"



Tol. 2B

3XD



TIN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●		●	●		○					
15-30	12-18	8-12		6-12	6-10	10-15	15-20		15-25	15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH

NEW



Ø	P	€	L mm	I mm	∅ mm	d mm
7/16	20,00	73,35	100	20	6,20	8,0
1/2	20,00	77,06	100	20	7,00	9,0
9/16	18,00	105,10	100	20	9,00	11,0
5/8	18,00	99,59	100	20	9,00	12,0

Ø	P	€	L mm	I mm	∅ mm	d mm
3/4	16,00	147,22	110	24	11,00	14,0
7/8	14,00	216,21	125	24	14,50	18,0
1"	12,00	203,03	140	27	14,50	18,0

2158

HSSE DIN 371

UNF
ANSI/ASME
B1.1

Form.
C



Tol.
2B

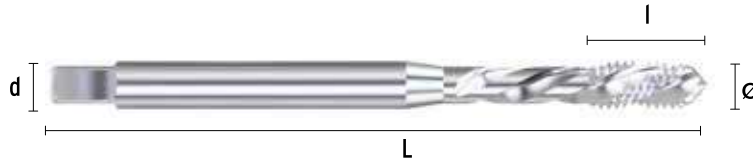


3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○			○		○	●		○					
10-25	10-15			5-10			10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
Nº4	48,00	25,70	56	5	2,70	3,5
Nº5	44,00	25,70	56	5	2,70	3,5
Nº6	40,00	26,03	56	6	3,00	4,0
Nº8	36,00	26,18	63	7	3,40	4,5
Nº10	32,00	26,51	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∅ mm	d mm
Nº12	28,00	27,88	80	10	4,90	6,0
1/4	28,00	29,21	80	10	5,50	7,0
5/16	24,00	30,26	90	13	6,20	8,0
3/8	24,00	35,87	100	15	8,00	10,0

2157

HSSE DIN 374

UNF
ANSI/ASME
B1.1

Form.
C



Tol.
2B



3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○			○		○	●		○					
10-25	10-15			5-10			10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
*1/4	28,00	29,21	80	13	3,40	4,5
*5/16	24,00	30,26	90	13	4,90	6,0
*3/8	24,00	35,87	100	16	5,50	7,0
7/16	20,00	50,71	100	15	6,20	8,0
1/2	20,00	50,71	100	15	7,00	9,0

Ø	P	€	L mm	l mm	∅ mm	d mm
9/16	18,00	69,29	100	15	9,00	11,0
5/8	18,00	67,92	100	15	9,00	12,0
3/4	16,00	98,76	110	17	11,00	14,0
7/8	14,00	140,74	125	17	14,50	18,0
1"	12,00	130,40	140	20	14,50	18,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2278

HSSE DIN 371

UNF
ANSI/ASME
B1.1

Form.
C



Tol.
2B



3XD



VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			●	○		○			●		○					
10-25	10-15			5-10	5-8		10-15			10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH
ULTRA-FINE TECHNOLOGY



Ø	P	€	L mm	l mm	∠ mm	d mm
Nº4	48,00	28,27	56	5	2,70	3,5
Nº5	44,00	28,27	56	5	2,70	3,5
Nº6	40,00	28,63	56	6	3,00	4,0
Nº8	36,00	28,80	63	7	3,40	4,5
Nº10	32,00	29,16	70	8	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
Nº12	28,00	30,67	80	10	4,90	6,0
1/4	28,00	32,13	80	10	5,50	7,0
5/16	24,00	33,29	90	13	6,20	8,0
3/8	24,00	39,46	100	15	8,00	10,0

2279

HSSE DIN 374

UNF
ANSI/ASME
B1.1

Form.
C



Tol.
2B



3XD



VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			●	○		○			●		○					
10-25	10-15			5-10	5-8		10-15			10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH
ULTRA-FINE TECHNOLOGY



Ø	P	€	L mm	l mm	∠ mm	d mm
7/16	20,00	55,78	100	20	6,20	8,0
1/2	20,00	55,78	100	20	7,00	9,0
9/16	18,00	76,22	100	20	9,00	11,0
5/8	18,00	74,71	100	20	9,00	12,0

Ø	P	€	L mm	l mm	∠ mm	d mm
3/4	16,00	108,63	110	24	11,00	14,0
7/8	14,00	154,82	125	24	14,50	18,0
1"	12,00	143,44	140	27	14,50	18,0

P Aceros
Aciers
Steels

M Aceros Inox
Aciers Inox
Stainless Steels

K Fundicion
Fonte
Cast Iron

N Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S Titanio y Superalloys
Titanium et Superalloys
Titanium and Superalloys

H Materiales Duros
Materiels Durs
Hard materials

2282 **HSSE DIN 371** UNF ANSI/ASME B1.1 Form. C Tol. 2B 35° 3XD R TIN+

P				M		K		N				S		H			
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	●	○		●	○		●			●		○					
10-25	12-18	8-12		6-12	6-10		15-20			15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	I mm	∅ mm	d mm
N°4	48,00	41,83	56	5	2,70	3,5
N°5	44,00	37,60	56	5	2,70	3,5
N°6	40,00	37,60	56	6	3,00	4,0
N°8	36,00	37,60	63	7	3,40	4,5
N°10	32,00	39,56	70	8	4,90	6,0

Ø	P	€	L mm	I mm	∅ mm	d mm
N°12	28,00	41,35	80	10	4,90	6,0
1/4	28,00	41,35	80	10	5,50	7,0
5/16	24,00	46,72	90	13	6,20	8,0
3/8	24,00	57,61	100	15	8,00	10,0

2283 **HSSE DIN 374** UNF ANSI/ASME B1.1 Form. C Tol. 2B 35° 3XD D TIN+

P				M		K		N				S		H			
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	●	○		●	○		●			●		○					
10-25	12-18	8-12		6-12	6-10		15-20			15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	I mm	∅ mm	d mm
7/16	20,00	79,18	100	15	6,20	8,0
1/2	20,00	82,95	100	15	7,00	9,0
9/16	18,00	113,61	100	15	9,00	11,0
5/8	18,00	106,44	100	15	9,00	12,0

Ø	P	€	L mm	I mm	∅ mm	d mm
3/4	16,00	158,61	110	17	11,00	14,0
7/8	14,00	233,37	125	17	14,50	18,0
1"	12,00	217,56	140	20	14,50	18,0

2189

HSSE DIN 374

UN
ANSI/ASME
B1.1

Form.
C



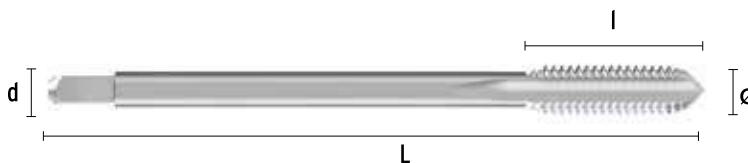
Tol.
2B

1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1"1/8	8,00	418,52	180	45	18,00	22,0
1"1/4	8,00	539,96	180	45	18,00	22,0
1"3/8	8,00	449,79	200	56	22,00	28,0
1"1/2	8,00	514,98	200	60	24,00	32,0

Ø	P	€	L mm	l mm	∠ mm	d mm
1"5/8	8,00	524,25	200	60	24,00	32,0
1"3/4	8,00	657,22	200	50	29,00	36,0
2"	8,00	1.068,29	225	50	32,00	40,0

2160

HSSE DIN 374

UNEF
ANSI/ASME
B1.1

Form.
C



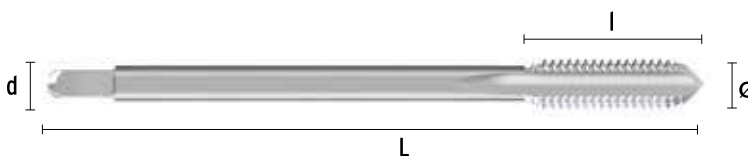
Tol.
2B

1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1/4	32,00	86,12	80	18	3,40	4,5
5/16	32,00	100,31	90	20	4,90	6,0
3/8	32,00	114,98	90	20	5,50	7,0
7/16	28,00	146,35	90	22	6,20	8,0
1/2	28,00	156,60	100	22	7,00	9,0

Ø	P	€	L mm	l mm	∠ mm	d mm
9/16	24,00	188,10	100	22	9,00	11,0
5/8	24,00	218,74	100	22	9,00	12,0
3/4	20,00	289,87	110	25	11,00	14,0
1"	20,00	474,97	140	28	14,50	18,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2136

HSSE DIN 371

BSW
BS 84

Form.
C

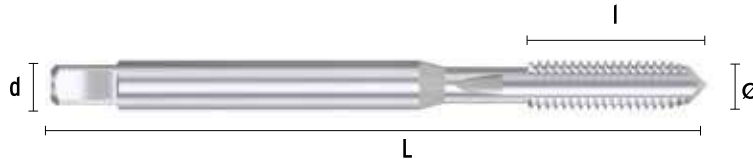


1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
3/32	48,00	20,24	50	10	2,10	2,8
1/8	40,00	16,91	56	11	2,70	3,5
5/32	32,00	16,91	63	13	3,40	4,5
3/16	24,00	16,91	70	16	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
7/32	24,00	25,70	80	16	4,90	6,0
1/4	20,00	18,43	80	18	5,50	7,0
5/16	18,00	22,62	90	20	6,20	8,0
3/8	16,00	24,99	100	22	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuïsement des stocks / Until end of stock

2135

HSSE DIN 376

BSW
BS 84

Form.
C

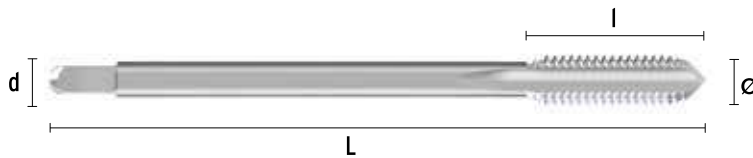


1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	40,00	16,91	56	11	2,10	2,8
5/32	32,00	16,91	63	13	2,10	2,8
3/16	24,00	16,91	70	16	2,70	3,5
7/32	24,00	25,70	80	18	3,40	4,5
1/4	20,00	18,43	80	18	3,40	4,5
5/16	18,00	22,62	90	20	4,90	6,0
3/8	16,00	24,99	100	20	5,50	7,0
7/16	14,00	32,97	100	22	6,20	8,0
1/2	12,00	31,62	110	22	7,00	9,0
9/16	12,00	45,35	110	30	9,00	11,0
5/8	11,00	42,89	110	28	9,00	12,0
3/4	10,00	57,40	125	32	11,00	14,0

Ø	P	€	L mm	l mm	∠ mm	d mm
7/8	9,00	77,74	140	36	14,50	18,0
1"	8,00	97,77	160	38	14,50	18,0
1*1/8	7,00	129,70	180	45	18,00	22,0
1*1/4	7,00	188,24	180	45	18,00	22,0
1*3/8	6,00	309,48	200	55	22,00	28,0
1*1/2	6,00	335,95	200	55	24,00	32,0
1*5/8	5,00	490,19	220	60	24,00	32,0
1*3/4	5,00	528,83	220	62	29,00	36,0
1*7/8	4,50	586,28	250	70	29,00	36,0
2"	4,50	756,85	250	70	32,00	40,0
2*1/4	4,00	824,86	280	78	35,00	45,0
2*1/2	4,00	952,83	315	90	39,00	50,0

*Hasta fin de existencias / Jusqu'à epuïsement des stocks / Until end of stock

2136/5

HSSE DIN 371

BSW
BS 84

Form.
C

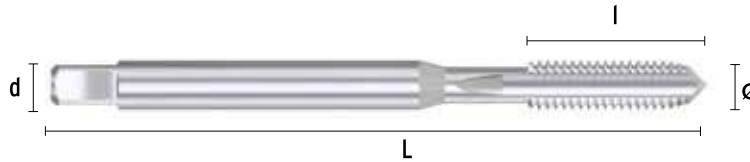


1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	I mm	∠ mm	d mm
1/8	40,00	33,83	56	11	2,70	3,5
5/32	32,00	33,83	63	13	3,40	4,5

∅	P	€	L mm	I mm	∠ mm	d mm
3/16	24,00	33,83	70	14	4,90	6,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2135/5

HSSE DIN 376

BSW
BS 84

Form.
C

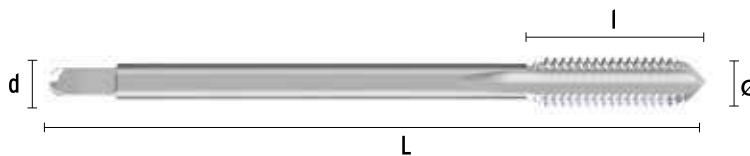


1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	I mm	∠ mm	d mm
1/4	20,00	36,86	80	18	3,40	4,5
5/16	18,00	45,24	90	20	4,90	6,0
3/8	16,00	49,98	100	22	5,50	7,0
7/16	14,00	65,93	100	22	6,20	8,0
1/2	12,00	63,22	110	27	7,00	9,0

∅	P	€	L mm	I mm	∠ mm	d mm
9/16	12,00	90,69	110	30	9,00	11,0
5/8	11,00	85,81	110	30	9,00	12,0
3/4	10,00	114,79	125	35	11,00	14,0
7/8	9,00	155,48	140	36	14,50	18,0
1"	8,00	195,53	160	38	14,50	18,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2138

HSSE DIN 371

BSW
BS 84

Form.
B
"Gun"

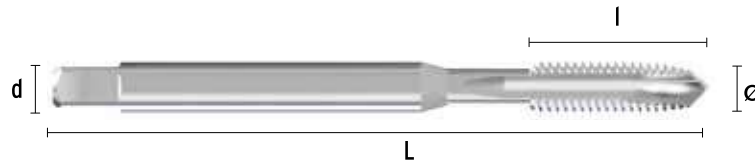


3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	○			○			○		○	●		○					
10-25	10-15			5-10			10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	40,00	18,68	56	11	2,70	3,5
*5/32	32,00	18,68	63	13	3,40	4,5
3/16	24,00	18,68	70	15	4,90	6,0

Ø	P	€	L mm	l mm	∠ mm	d mm
1/4	20,00	21,22	80	18	5,50	7,0
5/16	18,00	28,68	90	20	6,20	8,0
3/8	16,00	27,46	100	20	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2137

HSSE DIN 376

BSW
BS 84

Form.
B
"Gun"



3XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	○			○			○		○	●		○					
10-25	10-15			5-10			10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
*1/4	20,00	21,22	80	17	3,40	4,5
*5/16	18,00	24,84	90	20	4,90	6,0
*3/8	16,00	27,46	100	22	5,50	7,0
7/16	14,00	34,67	100	22	6,20	8,0
1/2	12,00	36,30	110	27	7,00	9,0

Ø	P	€	L mm	l mm	∠ mm	d mm
9/16	12,00	49,86	110	30	9,00	11,0
5/8	11,00	47,12	110	30	9,00	12,0
3/4	10,00	63,20	125	35	11,00	14,0
7/8	9,00	85,48	140	36	14,50	18,0
1"	8,00	107,48	160	38	14,50	18,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2140

HSSE DIN 371

BSW
BS 84

Form.
C



3XD

R

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
1/8	40,00	21,22	56	7	2,70	3,5
*5/32	32,00	21,22	63	7	3,40	4,5
3/16	24,00	21,22	70	10	4,90	6,0

Ø	P	€	L mm	I mm	∠ mm	d mm
1/4	20,00	28,75	80	13	5,50	7,0
5/16	18,00	35,26	90	14	6,20	8,0
3/8	16,00	37,22	100	20	8,00	10,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2139

HSSE DIN 376

BSW
BS 84

Form.
C

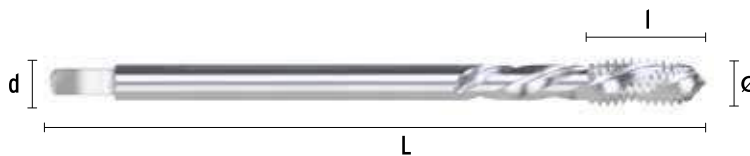


3XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10			○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
*3/16	24,00	21,22	70	14	2,70	3,5
*1/4	20,00	28,75	80	16	3,40	4,5
*5/16	18,00	33,71	90	18	4,90	6,0
3/8	16,00	37,22	100	20	5,50	7,0
7/16	14,00	42,27	100	15	6,20	8,0
1/2	12,00	40,52	110	18	7,00	9,0

Ø	P	€	L mm	I mm	∠ mm	d mm
9/16	12,00	58,08	110	22	9,00	11,0
5/8	11,00	54,95	110	22	9,00	12,0
3/4	10,00	73,57	125	25	11,00	14,0
7/8	9,00	99,58	140	30	14,50	18,0
1"	8,00	125,01	160	30	16,00	20,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

P

Aceros
Aciers
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundicion
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S

Titanio y Superalesaciones
Titanium et Superaillages
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

2141

HSSE DIN 371

BSF
BS 84

Form.
C

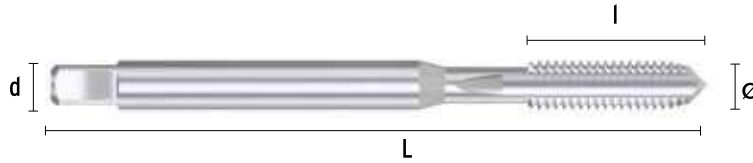


1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
3/16	32,00	72,58	70	14	4,90	6,0
1/4	26,00	30,90	80	18	3,40	4,5

Ø	P	€	L mm	l mm	∠ mm	d mm
5/16	22,00	36,71	90	20	4,90	6,0
3/8	20,00	38,56	100	22	5,50	7,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2142

HSSE DIN 374

BSF
BS 84

Form.
C

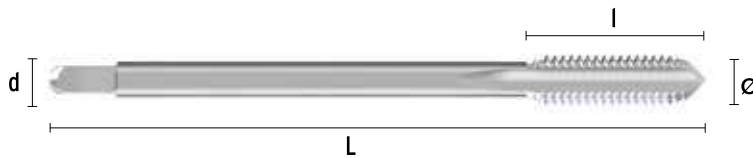


1,5XD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
7/16	18,00	52,04	100	20	6,20	8,0
1/2	16,00	58,87	110	22	7,00	9,0
9/16	16,00	62,31	110	23	9,00	11,0
5/8	14,00	83,04	110	28	9,00	12,0

Ø	P	€	L mm	l mm	∠ mm	d mm
3/4	12,00	98,29	125	32	11,00	14,0
7/8	11,00	136,66	140	34	14,50	18,0
1"	10,00	163,18	140	28	16,00	20,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2144

HSSE DIN 5156

G
ISO 228

Form.
C

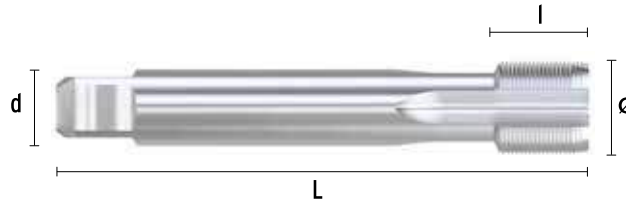


1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	28,00	28,57	90	20	5,50	7,0
1/4	19,00	40,73	100	22	9,00	11,0
3/8	19,00	48,74	100	22	9,00	12,0
1/2	14,00	61,59	125	25	12,00	16,0
5/8	14,00	76,77	125	25	14,50	18,0
3/4	14,00	96,43	140	28	16,00	20,0
7/8	14,00	129,63	150	30	18,00	22,0

Ø	P	€	L mm	l mm	∠ mm	d mm
1"	11,00	149,63	160	32	20,00	25,0
1"1/8	11,00	227,41	170	34	22,00	28,0
1"1/4	11,00	266,81	170	34	24,00	32,0
1"3/8	11,00	333,71	180	32	29,00	36,0
1"1/2	11,00	423,49	190	36	29,00	36,0
1"3/4	11,00	503,33	190	36	32,00	40,0
2"	11,00	641,39	220	40	35,00	45,0

2144/5

HSSE DIN 5156

G
ISO 228

Form.
C



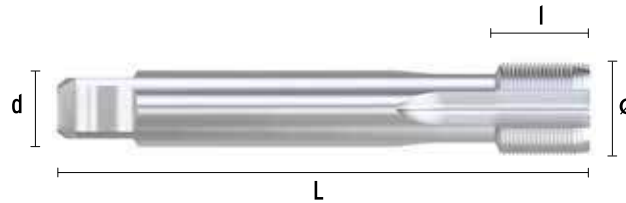
LH

1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	28,00	57,15	90	20	5,50	7,0
1/4	19,00	81,47	100	22	9,00	11,0
3/8	19,00	97,45	100	22	9,00	12,0
1/2	14,00	123,17	125	25	12,00	16,0

Ø	P	€	L mm	l mm	∠ mm	d mm
5/8	14,00	153,55	125	25	14,50	18,0
3/4	14,00	192,86	140	28	16,00	20,0
1"	11,00	299,26	160	32	20,00	25,0

P

Aceros
Aciers
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundicion
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S

Titanio y Superaloaciones
Titanium et Superalloages
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

2192

HSSE DIN 5156

G
ISO 228

Form.
E

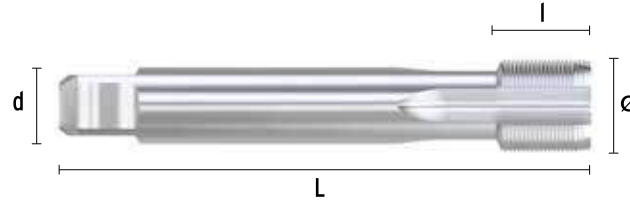


1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
										• 25-35							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
1/8	28,00	34,65	90	20	5,50	7,0
1/4	19,00	53,21	100	22	9,00	11,0
3/8	19,00	73,48	100	22	9,00	12,0
1/2	14,00	99,15	125	25	12,00	16,0

Ø	P	€	L mm	I mm	∅ mm	d mm
5/8	14,00	103,59	125	25	14,50	18,0
3/4	14,00	145,51	140	28	16,00	20,0
7/8	14,00	177,85	150	28	18,00	22,0
1"	11,00	221,96	160	30	20,00	25,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2206

HSSE DIN 5156

+0,1

G
ISO 228

Form.
E

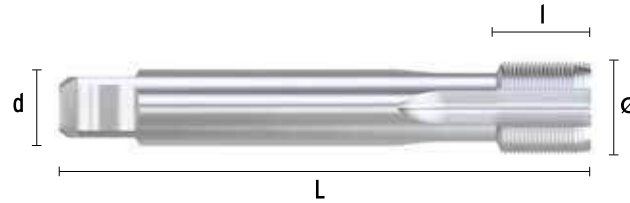


1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
										• 25-35							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
1/8	28,00	42,24	90	20	5,50	7,0
1/4	19,00	62,94	100	22	9,00	11,0
3/8	19,00	88,18	100	22	9,00	12,0
1/2	14,00	120,38	125	25	12,00	16,0

Ø	P	€	L mm	I mm	∅ mm	d mm
5/8	14,00	125,90	125	25	14,50	18,0
3/4	14,00	174,62	140	28	16,00	20,0
7/8	14,00	206,30	150	28	18,00	22,0
1"	11,00	257,46	160	30	20,00	25,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2145

HSSE DIN 5156

G ISO 228 **Form. B "Gun"** **3XD** **D**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10	○ 5-10		○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	28,00	33,02	90	20	5,50	7,0
1/4	19,00	59,27	100	22	9,00	11,0
3/8	19,00	58,47	100	22	9,00	12,0
1/2	14,00	78,06	125	25	12,00	16,0
5/8	14,00	121,30	125	25	14,50	18,0
3/4	14,00	137,99	140	28	16,00	20,0

Ø	P	€	L mm	l mm	∠ mm	d mm
7/8	14,00	176,34	150	30	18,00	22,0
1"	11,00	259,62	160	32	20,00	25,0
1"1/8	11,00	388,03	170	30	22,00	28,0
1"1/4	11,00	386,20	170	30	24,00	32,0
1"3/8	11,00	395,40	190	32	29,00	36,0
1"1/2	11,00	411,13	190	32	29,00	36,0

2284

HSSE DIN 5156

G ISO 228 **Form. B "Gun"** **3XD** **D** **VAP**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15			○ 5-10	○ 5-10		○ 10-15		○ 10-15	● 10-20		○ 10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



MICRO FINISH

Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	28,00	36,32	90	20	5,50	7,0
1/4	19,00	65,20	100	22	9,00	11,0
3/8	19,00	64,32	100	22	9,00	12,0
1/2	14,00	85,87	125	25	12,00	16,0

Ø	P	€	L mm	l mm	∠ mm	d mm
5/8	14,00	133,43	125	25	14,50	18,0
3/4	14,00	151,79	140	28	16,00	20,0
7/8	14,00	193,98	150	30	18,00	22,0
1"	11,00	285,58	160	32	20,00	25,0

2286

HSSE DIN 5156

G
ISO 228

Form.
B
"Gun"



3XD

D

TIN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	○	○		●	○	●	●		●	●		○					
15-30	12-18	8-12		6-12	6-10	10-15	15-20		15-25	15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



NEW



Ø	P	€	L mm	I mm	∠ mm	d mm
1/8	28,00	55,88	90	20	5,50	7,0
1/4	19,00	91,34	100	22	9,00	11,0
3/8	19,00	102,79	100	22	9,00	12,0
1/2	14,00	130,57	125	25	12,00	16,0

Ø	P	€	L mm	I mm	∠ mm	d mm
5/8	14,00	197,46	125	25	14,50	18,0
3/4	14,00	221,53	140	28	16,00	20,0
7/8	14,00	291,04	150	30	18,00	22,0
1"	11,00	397,16	160	32	20,00	25,0

2146

HSSE DIN 5156

G
ISO 228

Form.
C



3XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	○			○			○		○	○		○					
10-25	10-15			5-10			10-15		10-15	10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∠ mm	d mm
1/8	28,00	36,20	90	10	5,50	7,0
1/4	19,00	65,21	100	14	9,00	11,0
3/8	19,00	64,41	100	15	9,00	12,0
1/2	14,00	85,83	125	17	12,00	16,0
5/8	14,00	133,43	125	20	14,50	18,0
3/4	14,00	151,77	140	20	16,00	20,0

Ø	P	€	L mm	I mm	∠ mm	d mm
7/8	14,00	194,08	150	22	18,00	22,0
1"	11,00	285,52	160	24	20,00	25,0
1" 1/8	11,00	426,84	170	24	22,00	28,0
1" 1/4	11,00	424,82	170	25	24,00	32,0
1" 3/8	11,00	434,94	190	32	29,00	36,0
1" 1/2	11,00	452,24	190	32	29,00	36,0

2285

HSSE DIN 5156

G
ISO 228

Form.
C



3XD

D

VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	○			●	○		○			●		○					
10-25	10-15			5-10	5-8		10-15			10-20		10-15					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH
TECHNOLOGY

NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	28,00	39,82	90	10	5,50	7,0
1/4	19,00	71,73	100	14	9,00	11,0
3/8	19,00	70,85	100	15	9,00	12,0
1/2	14,00	94,41	125	17	12,00	16,0

Ø	P	€	L mm	l mm	∠ mm	d mm
5/8	14,00	146,77	125	20	14,50	18,0
3/4	14,00	166,94	140	20	16,00	20,0
7/8	14,00	213,49	150	22	18,00	22,0
1"	11,00	314,07	160	24	20,00	25,0

2287

HSSE DIN 5156

G
ISO 228

Form.
C



3XD

D

TIN+

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
●	○			●	○		○			●		○					
10-25	12-18	8-12		6-12	6-10		15-20			15-25		12-18					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

MICRO FINISH
TECHNOLOGY

NEW



Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	28,00	60,17	90	10	5,50	7,0
1/4	19,00	98,95	100	14	9,00	11,0
3/8	19,00	113,10	100	15	9,00	12,0
1/2	14,00	140,62	125	17	12,00	16,0

Ø	P	€	L mm	l mm	∠ mm	d mm
5/8	14,00	213,01	125	20	14,50	18,0
3/4	14,00	236,38	140	20	16,00	20,0
7/8	14,00	313,50	150	22	18,00	22,0
1"	11,00	430,25	160	24	20,00	25,0

P

Aceros
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundicion
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S

Titanio y Superaloaciones
Titanium et Superalloages
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

2159

HSSE DIN 5156

Rc
DIN 2999

Form.
C

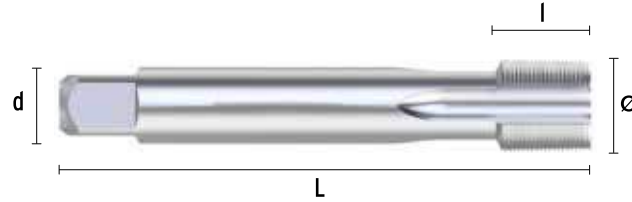


1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 7-15	○ 7-10						○ 7-10			○ 7-15							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1/8	28,00	48,14	90	18	5,50	7,0
1/4	19,00	69,70	100	22	9,00	11,0
3/8	19,00	96,12	100	22	9,00	12,0
1/2	14,00	133,97	125	25	12,00	16,0

Ø	P	€	L mm	l mm	∠ mm	d mm
3/4	14,00	207,66	140	28	16,00	20,0
*7/8	14,00	358,52	150	28	18,00	22,0
1"	11,00	298,53	160	33	20,00	25,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2164

HSSE DIN 374

NPT
ANSI/ASME
B1.20.1

Form.
C



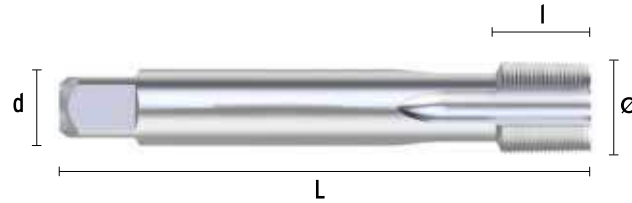
Tol.
6H

1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 7-15	○ 7-10						○ 7-10			○ 7-15							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
1/16	27,00	60,35	90	12	4,90	6,0
1/8	27,00	47,52	90	15	5,50	7,0
1/4	18,00	65,27	100	20	9,00	11,0
3/8	18,00	84,33	110	22	11,00	14,0
1/2	14,00	112,41	140	27	14,50	18,0

Ø	P	€	L mm	l mm	∠ mm	d mm
3/4	14,00	174,44	140	28	16,00	20,0
1"	11,50	373,60	160	35	20,00	25,0
*1"1/4	11,50	385,73	190	35	24,00	32,0
*1"1/2	11,50	651,21	200	35	29,00	36,0
*2"	11,50	896,65	220	35	35,00	45,0

*Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

2212

HSSE

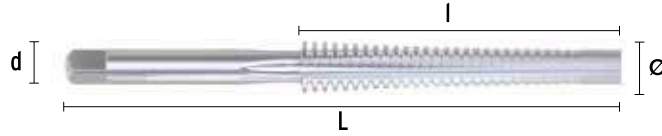
Tr
DIN 103



Tol.
7H

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 2-8	○ 1-5									● 2-6							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
10	2,00	374,46	110	63	5,50	7,0
10	3,00	374,46	125	75	5,50	7,0
12	3,00	438,03	165	111	6,20	8,0
14	3,00	449,06	140	85	8,00	10,0
14	4,00	484,93	170	112	8,00	10,0
16	4,00	484,93	180	116	9,00	11,0
18	4,00	519,75	190	120	9,00	12,0

∅	P	€	L mm	l mm	∠ mm	d mm
20	4,00	565,87	200	124	11,00	14,0
22	5,00	565,87	235	155	12,00	16,0
24	5,00	612,16	245	160	14,50	18,0
26	5,00	635,31	255	165	16,00	20,0
28	5,00	693,00	265	170	18,00	22,0
30	6,00	750,87	290	185	18,00	22,0
32	6,00	737,87	300	191	20,00	25,0

2212/5

HSSE

Tr
DIN 103

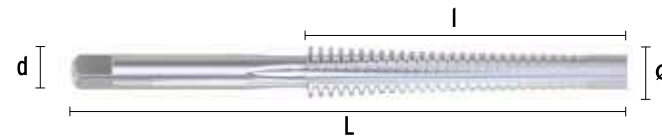


Tol.
7H



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 2-8	○ 1-5									● 2-6							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	L mm	l mm	∠ mm	d mm
10	2,00	468,03	110	63	5,50	7,0
10	3,00	468,03	125	75	5,50	7,0
12	3,00	547,52	165	111	6,20	8,0
14	3,00	561,32	140	85	8,00	10,0
14	4,00	606,20	170	112	8,00	10,0
16	4,00	606,20	180	116	9,00	11,0
18	4,00	649,64	190	120	9,00	12,0

∅	P	€	L mm	l mm	∠ mm	d mm
20	4,00	707,33	200	124	11,00	14,0
22	5,00	707,33	235	155	12,00	16,0
24	5,00	765,21	245	160	14,50	18,0
26	5,00	794,15	255	165	16,00	20,0
28	5,00	866,16	265	170	18,00	22,0
30	6,00	938,63	290	185	18,00	22,0
32	6,00	922,34	300	191	20,00	25,0

2163

HSSE DIN 40433

PG
DIN 40430

Form.
C



1,5XD

D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Pg	Ø	P	€	L mm	l mm	∠ mm	d mm	Pg	Ø	P	€	L mm	l mm	∠ mm	d mm
7,0	12,5	20,00	44,28	100	22	7,00	9,0	21,0	28,3	16,00	167,25	150	28	18,00	22,0
9,0	15,2	18,00	61,27	100	22	9,00	11,0	29,0	37,0	16,00	282,75	170	30	22,00	28,0
11,0	18,6	18,00	79,74	110	25	11,00	14,0	36,0	47,0	16,00	496,09	190	32	29,00	36,0
13,5	20,4	18,00	89,49	125	25	12,00	16,0	42,0	54,0	16,00	807,70	190	32	32,00	40,0
16,0	22,5	18,00	105,35	125	25	14,50	18,0	48,0	59,3	16,00	984,70	220	40	35,00	45,0

2242

HSSE DIN 371

Vg
DIN 7756

Form.
C



1,5XD

R

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
● 10-25	○ 10-15						○ 10-15			○ 10-20							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm	Ø	P	€	L mm	l mm	∠ mm	d mm
5,0	36,00	92,43	70	12	4,90	6,0	6,0	32,00	105,23	80	14	5,50	7,0
5,2	24,00	92,43	80	17	4,90	6,0	8,0	32,00	117,08	80	16	6,20	8,0

2301

HSS DIN 352/2181

M-MF
DIN 13

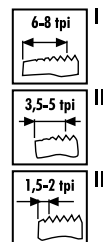
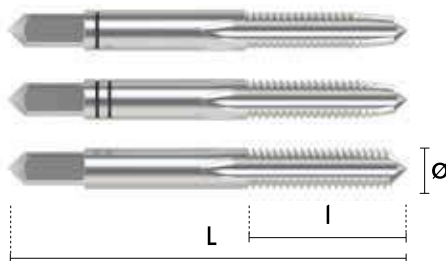


Tol.
6H

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3° }
 Taraud 3° } PVP = € / 3 } M (€ / 3)
 Tap 3° } MF (€ / 2)



Ø	P	Nº	€	L mm	I mm	∅ mm	d mm	Ø	P	Nº	€	L mm	I mm	∅ mm	d mm
M1,0	0,25	3	76,43	32	5,5	2,10	2,5	M12,0	0,75	2	66,84	70	22	7,00	9,0
M1,1	0,25	3	76,43	32	5,5	2,10	2,5	M12,0	1,00	2	41,25	70	22	7,00	9,0
M1,2	0,25	3	76,43	32	5,5	2,10	2,5	M12,0	1,25	2	41,42	70	22	7,00	9,0
M1,4	0,30	3	76,43	32	7	2,10	2,5	M12,0	1,50	2	35,24	70	22	7,00	9,0
M1,6	0,35	3	69,74	32	8	2,10	2,5	M12,0	1,75	3	37,61	75	28	7,00	9,0
M1,7	0,35	3	44,04	32	8	2,10	2,5	M13,0	0,75	2	116,98	70	20	9,00	11,0
M1,8	0,35	3	65,47	32	8	2,10	2,5	M13,0	1,00	2	67,63	70	22	9,00	11,0
M2,0	0,40	3	34,73	36	8	2,10	2,8	M13,0	1,25	2	67,63	70	22	9,00	11,0
M2,2	0,45	3	37,41	36	9	2,10	2,8	M13,0	1,50	2	67,63	70	22	9,00	11,0
M2,3	0,45	3	37,45	36	9	2,10	2,8	M13,0	1,75	3	85,19	75	30	9,00	11,0
M2,5	0,45	3	35,92	40	9	2,10	2,8	M14,0	0,75	2	117,09	70	22	9,00	11,0
M2,6	0,45	3	33,05	40	9	2,10	2,8	M14,0	1,00	2	61,72	70	22	9,00	11,0
M3,0	0,50	3	19,02	40	11	2,70	3,5	M14,0	1,25	2	50,63	70	22	9,00	11,0
M3,0	0,60	2	36,47	40	11	2,70	3,5	M14,0	1,50	2	39,33	70	22	9,00	11,0
M3,5	0,60	2	26,32	45	12	3,00	4,0	M14,0	2,00	3	49,49	80	30	9,00	11,0
M3,5	0,75	2	44,05	45	14	3,40	4,5	M15,0	1,00	2	91,23	70	22	9,00	12,0
M4,0	0,50	2	37,09	45	13	3,40	4,5	M15,0	1,25	2	96,01	70	22	9,00	12,0
M4,0	0,70	3	17,51	45	14	3,40	4,5	M15,0	1,50	2	93,40	70	22	9,00	12,0
M4,5	0,75	2	33,94	50	16	4,90	6,0	M15,0	2,00	3	97,60	80	32	9,00	12,0
M5,0	0,50	2	39,44	50	12	4,90	6,0	M16,0	1,00	2	86,37	70	22	9,00	12,0
M5,0	0,75	2	36,75	50	12	4,90	6,0	M16,0	1,25	2	90,92	70	22	9,00	12,0
M5,0	0,80	3	19,03	50	16	4,90	6,0	M16,0	1,50	2	49,04	70	22	9,00	12,0
M5,0	1,00	3	21,13	50	14	4,90	6,0	M16,0	2,00	3	69,68	80	32	9,00	12,0
M5,5	0,90	2	128,58	50	18	4,90	6,0	M17,0	1,00	2	139,18	70	22	9,00	12,0
M6,0	0,50	2	39,40	56	14	4,90	6,0	M17,0	1,25	2	139,18	70	22	9,00	12,0
M6,0	0,75	2	22,19	56	14	4,90	6,0	M17,0	1,50	2	139,18	70	22	9,00	12,0
M6,0	0,90	2	128,47	56	19	4,90	6,0	M18,0	1,00	2	96,00	80	22	11,00	14,0
M6,0	1,00	3	19,03	56	19	4,90	6,0	M18,0	1,25	2	137,19	80	22	11,00	14,0
M7,0	0,75	2	28,01	56	14	4,90	6,0	M18,0	1,50	2	65,02	80	22	11,00	14,0
M7,0	1,00	3	26,26	56	19	4,90	6,0	M18,0	2,00	2	103,45	80	22	11,00	14,0
M8,0	0,50	2	42,06	56	18	4,90	6,0	M18,0	2,50	3	93,14	95	34	11,00	14,0
M8,0	0,75	2	32,77	56	18	4,90	6,0	M19,0	1,00	2	202,02	80	22	11,00	14,0
M8,0	1,00	2	21,79	63	22	4,90	6,0	M19,0	1,25	2	201,84	80	22	11,00	14,0
M8,0	1,25	3	22,91	63	22	4,90	6,0	M19,0	1,50	2	202,02	80	22	11,00	14,0
M9,0	1,00	2	28,16	63	22	5,50	7,0	M20,0	1,00	2	127,85	80	22	12,00	16,0
M9,0	1,25	3	40,65	63	22	5,50	7,0	M20,0	1,25	2	202,02	80	22	12,00	16,0
M10,0	0,50	2	106,86	63	18	5,50	7,0	M20,0	1,50	2	81,13	80	22	12,00	16,0
M10,0	0,75	2	46,97	63	20	5,50	7,0	M20,0	2,00	2	107,22	80	22	12,00	16,0
M10,0	1,00	2	23,63	63	20	5,50	7,0	M20,0	2,50	3	104,67	95	34	12,00	16,0
M10,0	1,25	2	24,06	70	24	5,50	7,0	M21,0	1,00	2	261,07	80	22	12,00	16,0
M10,0	1,50	3	28,93	70	24	5,50	7,0	M21,0	1,25	2	261,07	80	22	12,00	16,0
M11,0	0,75	2	116,98	63	20	6,20	8,0	M21,0	1,50	2	206,44	80	22	12,00	16,0
M11,0	1,00	2	41,76	63	20	6,20	8,0	M22,0	1,00	2	142,62	80	22	14,50	18,0
M11,0	1,25	2	41,76	70	22	6,20	8,0	M22,0	1,25	2	202,02	80	22	14,50	18,0
M11,0	1,50	3	56,06	70	24	6,20	8,0	M22,0	1,50	2	88,70	80	22	14,50	18,0

MACHOS DE MANO TARAUDS À MAIN / HANDS TAPS

Ø	P	Nº	€	L mm	l mm	∠ mm	d mm	Ø	P	Nº	€	L mm	l mm	∠ mm	d mm
M22,0	2,00	2	142,63	80	22	14,50	18,0	M35,0	1,50	2	391,92	100	25	22,00	28,0
M22,0	2,50	3	128,32	100	34	14,50	18,0	M36,0	1,50	2	326,92	100	25	22,00	28,0
M23,0	1,00	2	260,82	80	22	14,50	18,0	M36,0	2,00	2	418,35	125	40	22,00	28,0
M23,0	1,50	2	260,82	80	22	14,50	18,0	M36,0	3,00	2	570,71	125	40	22,00	28,0
M24,0	1,00	2	159,46	90	22	14,50	18,0	M36,0	4,00	3	431,83	150	56	22,00	28,0
M24,0	1,25	2	261,07	90	22	14,50	18,0	M38,0	1,50	2	367,74	100	25	22,00	28,0
M24,0	1,50	2	113,23	90	22	14,50	18,0	M38,0	2,00	2	660,32	125	40	22,00	28,0
M24,0	2,00	2	159,46	90	22	14,50	18,0	M39,0	1,50	2	493,21	110	25	24,00	32,0
M24,0	3,00	3	161,64	110	38	14,50	18,0	M39,0	2,00	2	493,21	125	40	24,00	32,0
M25,0	1,00	2	228,43	90	22	14,50	18,0	M39,0	3,00	2	479,93	125	40	24,00	32,0
M25,0	1,25	2	371,92	90	22	14,50	18,0	M39,0	4,00	3	479,84	150	60	24,00	32,0
M25,0	1,50	2	197,51	90	22	14,50	18,0	M40,0	1,50	2	431,90	110	25	24,00	32,0
M25,0	2,00	2	382,56	90	22	14,50	18,0	M40,0	2,00	2	501,67	125	40	24,00	32,0
M26,0	1,00	2	372,29	90	22	14,50	18,0	M40,0	3,00	2	497,01	125	40	24,00	32,0
M26,0	1,50	2	180,40	90	22	14,50	18,0	M42,0	1,50	2	477,73	110	25	24,00	32,0
M26,0	2,00	2	372,29	90	22	14,50	18,0	M42,0	2,00	2	573,95	125	40	24,00	32,0
M27,0	1,00	2	224,18	90	22	16,00	20,0	M42,0	3,00	2	573,95	125	40	24,00	32,0
M27,0	1,50	2	199,89	90	22	16,00	20,0	M42,0	4,50	3	601,22	150	60	24,00	32,0
M27,0	2,00	2	221,04	90	22	16,00	20,0	M45,0	1,50	2	537,82	110	25	29,00	36,0
M27,0	3,00	3	208,17	110	38	16,00	20,0	M45,0	2,00	2	683,31	125	40	29,00	36,0
M28,0	1,00	2	372,27	90	22	16,00	20,0	M45,0	3,00	2	683,31	125	40	29,00	36,0
M28,0	1,50	2	200,42	90	22	16,00	20,0	M45,0	4,50	3	697,37	160	65	29,00	36,0
M28,0	2,00	2	372,27	90	22	16,00	20,0	M48,0	1,50	2	606,06	140	40	29,00	36,0
M30,0	1,00	2	230,99	90	22	18,00	22,0	M48,0	2,00	2	899,02	140	40	29,00	36,0
M30,0	1,50	2	207,90	90	22	18,00	22,0	M48,0	3,00	2	827,25	140	40	29,00	36,0
M30,0	2,00	2	239,68	90	22	18,00	22,0	M48,0	5,00	3	837,54	180	70	29,00	36,0
M30,0	3,50	3	264,30	125	45	18,00	22,0	M50,0	1,50	2	662,78	140	40	29,00	36,0
M32,0	1,00	2	483,69	90	22	18,00	22,0	M52,0	1,50	2	703,10	140	40	32,00	40,0
M32,0	1,50	2	255,98	90	22	18,00	22,0	M52,0	2,00	2	1.011,52	140	40	32,00	40,0
M32,0	2,00	2	484,12	90	22	18,00	22,0	M52,0	3,00	2	939,13	140	40	32,00	40,0
M33,0	1,00	2	484,12	100	25	20,00	25,0	M52,0	5,00	3	1.092,95	180	70	32,00	40,0
M33,0	1,50	2	282,03	100	25	20,00	25,0	M56,0	5,50	3	1.578,62	200	70	35,00	45,0
M33,0	2,00	2	335,32	100	25	20,00	25,0	M60,0	5,50	3	1.978,29	200	75	35,00	45,0
M33,0	3,50	3	335,32	125	50	20,00	25,0	M63,0	1,50	2	1.572,41	160	40	39,00	50,0
M34,0	1,50	2	305,18	100	25	22,00	28,0	M64,0	6,00	3	2.470,47	220	80	39,00	50,0

2301/5

HSS DIN 352 Izquierda / A gauche / Left hand

M-MF
DIN 13



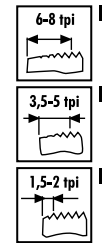
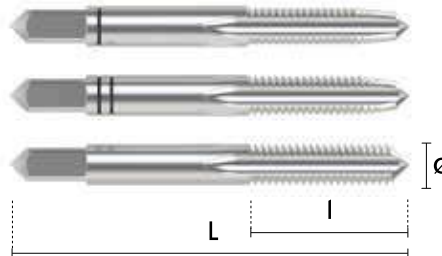
Tol.
6H



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3° } PVP = €/3
Tap 3°



Ø	P	Nº	€	L mm	I mm	∅ mm	d mm	Ø	P	Nº	€	L mm	I mm	∅ mm	d mm
M3,0	0,50	3	38,02	40	11	2,70	3,5	M14,0	1,25	2	101,26	70	22	9,00	11,0
M4,0	0,70	3	35,02	45	13	3,40	4,5	M14,0	1,50	2	78,68	70	22	9,00	11,0
M5,0	0,80	3	38,06	50	16	4,90	6,0	M14,0	2,00	3	98,96	80	30	9,00	11,0
M6,0	1,00	3	38,06	56	19	4,90	6,0	M16,0	1,50	2	98,07	70	22	9,00	12,0
M7,0	1,00	3	52,53	56	19	4,90	6,0	M16,0	2,00	3	139,35	80	32	9,00	12,0
M8,0	1,00	2	43,58	63	22	4,90	6,0	M18,0	2,50	3	186,29	95	34	11,00	14,0
M8,0	1,25	3	45,83	63	22	4,90	6,0	M20,0	1,50	2	162,28	80	22	12,00	16,0
M9,0	1,25	3	81,30	63	22	5,50	7,0	M20,0	2,50	3	209,33	95	34	12,00	16,0
M10,0	1,00	2	47,24	63	20	5,50	7,0	M22,0	1,50	2	177,41	80	22	14,50	18,0
M10,0	1,25	2	48,12	70	24	5,50	7,0	M22,0	2,50	3	256,65	100	34	14,50	18,0
M10,0	1,50	3	57,87	70	24	5,50	7,0	M24,0	1,50	2	226,43	90	22	14,50	18,0
M12,0	1,25	2	82,87	70	22	7,00	9,0	M24,0	3,00	3	323,28	110	38	14,50	18,0
M12,0	1,50	2	70,48	70	22	7,00	9,0	M27,0	3,00	3	416,35	110	38	16,00	20,0
M12,0	1,75	3	75,22	75	29	7,00	9,0	M30,0	3,50	3	528,58	125	45	18,00	22,0

2314

HSSE DIN 352

M
DIN 13

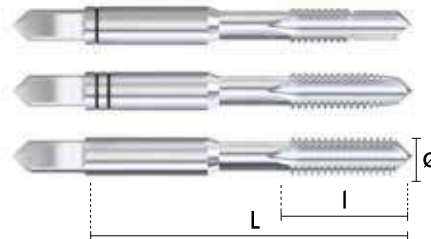


Tol.
6HX

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		○													

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3°
Tap 3° } PVP = €/3



Ø	P	Nº	€	L mm	l mm	∅ mm	d mm	Ø	P	Nº	€	L mm	l mm	∅ mm	d mm
M3,0	0,50	3	27,87	40	11	2,70	3,5	M10,0	1,50	3	43,23	70	24	5,50	7,0
M4,0	0,70	3	27,81	45	13	3,40	4,5	M12,0	1,75	3	61,44	75	29	7,00	9,0
M5,0	0,80	3	29,13	50	16	4,90	6,0	M14,0	2,00	3	81,35	80	30	9,00	11,0
M6,0	1,00	3	29,23	56	19	4,90	6,0	M16,0	2,00	3	89,73	80	32	9,00	12,0
M8,0	1,25	3	33,57	63	22	4,90	6,0								

2303

HSSE DIN 352

M
DIN 13



Tol.
6HX

VAP

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●										●			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3°
Tap 3° } PVP = €/3



Ø	P	Nº	€	L mm	l mm	∅ mm	d mm	Ø	P	Nº	€	L mm	l mm	∅ mm	d mm
M3,0	0,50	3	28,42	40	11	2,70	3,5	M12,0	1,75	3	63,21	75	29	7,00	9,0
M4,0	0,70	3	28,42	45	13	3,40	4,5	M14,0	2,00	3	70,02	80	30	9,00	11,0
M5,0	0,80	3	29,57	50	16	4,90	6,0	M16,0	2,00	3	95,92	80	32	9,00	12,0
M6,0	1,00	3	29,57	56	19	4,90	6,0	M18,0	2,50	3	131,05	95	40	11,00	14,0
M8,0	1,25	3	34,32	63	22	4,90	6,0	M20,0	2,50	3	145,48	95	40	12,00	16,0
M10,0	1,50	3	44,17	70	24	5,50	7,0								

2324

HSSE-PM DIN 352

M
DIN 13



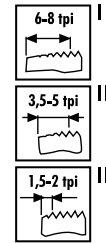
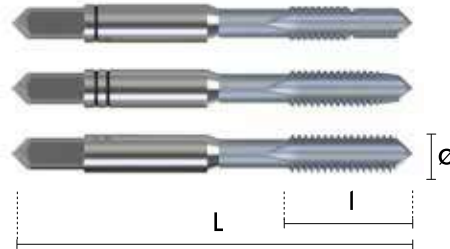
Tol.
6HX

TiCN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
○	●	●	●		○			○		○							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3° }
Taraud 3° } PVP = €/3
Tap 3° }



Ø	P	Nº	€	L mm	I mm	∠ mm	d mm	Ø	P	Nº	€	L mm	I mm	∠ mm	d mm
M4,0	0,70	3	101,19	45	13	2,70	3,5	M10,0	1,50	3	142,75	70	24	5,50	7,0
M5,0	0,80	3	102,45	50	16	4,90	6,0	M12,0	1,75	3	173,52	75	29	7,00	9,0
M6,0	1,00	3	102,45	56	19	4,90	6,0	M14,0	2,00	3	255,12	80	30	9,00	11,0
M8,0	1,25	3	115,48	63	22	4,90	6,0	M16,0	2,00	3	255,12	80	32	9,00	12,0

2302

HSS DIN 352

M
DIN 13



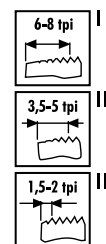
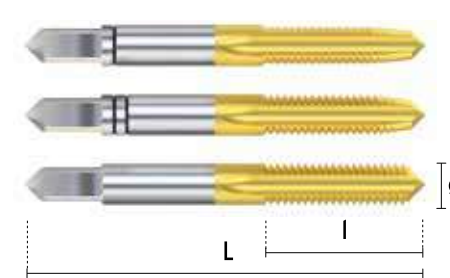
Tol.
6H

TiN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○								●	●							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3° }
Taraud 3° } PVP = €/3
Tap 3° }



Ø	P	Nº	€	L mm	I mm	∠ mm	d mm	Ø	P	Nº	€	L mm	I mm	∠ mm	d mm
M3,0	0,50	3	42,54	40	11	2,70	3,5	M10,0	1,50	3	63,74	70	24	5,50	7,0
M4,0	0,70	3	43,61	45	13	3,40	4,5	M12,0	1,75	3	97,98	75	28	7,00	9,0
M5,0	0,80	3	44,58	50	16	4,90	6,0	M14,0	2,00	3	116,62	80	30	9,00	11,0
M6,0	1,00	3	44,67	56	19	4,90	6,0	M16,0	2,00	3	145,61	80	32	9,00	12,0
M8,0	1,25	3	53,68	63	22	4,90	6,0	M20,0	2,50	3	157,90	95	34	12,00	16,0

2304 HSS DIN 352

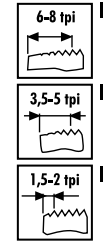
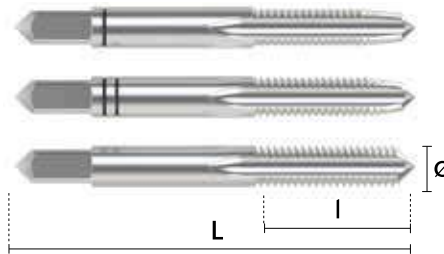
BSW
BS 84



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

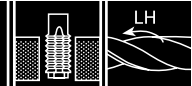
**Macho 3°
Taraud 3° } PVP = €/3
Tap 3°**



Ø	P	Nº	€	L mm	I mm	∅ mm	d mm	Ø	P	Nº	€	L mm	I mm	∅ mm	d mm
3/32	48,00	3	35,33	36	10	2,10	2,8	1"	8,00	3	210,99	110	50	14,50	18,0
1/8	40,00	3	24,37	40	12	2,70	3,5	1"1/8	7,00	3	314,39	132	56	18,00	22,0
5/32	32,00	3	24,61	45	14	3,40	4,5	1"1/4	7,00	3	380,31	132	56	18,00	22,0
3/16	24,00	3	24,37	50	18	4,90	6,0	1"3/8	6,00	3	472,98	150	63	22,00	28,0
7/32	24,00	3	43,35	50	18	4,90	6,0	1"1/2	6,00	3	569,42	150	63	24,00	32,0
1/4	20,00	3	27,46	50	19	4,90	6,0	1"5/8	5,00	3	854,22	160	70	24,00	32,0
5/16	18,00	3	33,51	56	22	4,90	6,0	1"3/4	5,00	3	1.051,33	160	70	29,00	36,0
3/8	16,00	3	36,83	70	24	5,50	7,0	1"7/8	4,50	3	1.357,89	190	80	29,00	36,0
7/16	14,00	3	48,97	70	24	6,20	8,0	2"	4,50	3	1.425,52	190	80	32,00	40,0
1/2	12,00	3	53,05	75	29	7,00	9,0	2"1/4	4,00	3	1.884,36	220	80	35,00	45,0
9/16	12,00	3	72,16	80	30	9,00	11,0	2"1/2	4,00	3	2.292,34	220	80	39,00	50,0
5/8	11,00	3	82,94	80	32	9,00	12,0	2"3/4	3,50	3	3.273,19	240	80	39,00	50,0
3/4	10,00	3	118,09	95	40	11,00	14,0	3"	3,50	3	3.786,72	240	80	39,00	50,0
7/8	9,00	3	172,77	100	40	14,50	18,0								

2304/5 HSS DIN 352 Izquierda / A gauche / Left hand

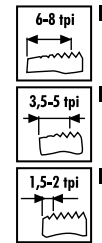
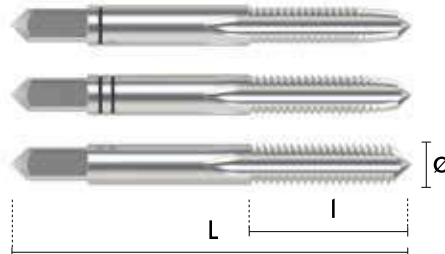
BSW
BS 84



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3°
Tap 3° } PVP = € / 3



Ø	P	Nº	€	L mm	I mm	∅ mm	d mm	Ø	P	Nº	€	L mm	I mm	∅ mm	d mm
1/8	40,00	3	48,75	40	12	2,70	3,5	1/2	12,00	3	106,08	75	29	7,00	9,0
5/32	32,00	3	49,23	45	14	3,40	4,5	9/16	12,00	3	144,32	80	30	9,00	11,0
3/16	24,00	3	48,75	50	18	4,90	6,0	5/8	11,00	3	165,90	80	32	9,00	12,0
1/4	20,00	3	54,89	50	19	4,90	6,0	3/4	10,00	3	236,18	95	40	11,00	14,0
5/16	18,00	3	67,01	56	22	4,90	6,0	7/8	9,00	3	345,51	100	40	14,50	18,0
3/8	16,00	3	73,65	70	24	5,50	7,0	1"	8,00	3	421,98	110	50	14,50	18,0
7/16	14,00	3	97,94	70	24	6,20	8,0								

2305 HSS DIN 2181

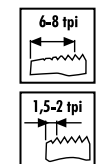
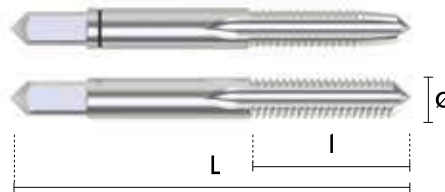
BSF
BS 84



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3°
Tap 3° } PVP = € / 2



Ø	P	Nº	€	L mm	I mm	∅ mm	d mm	Ø	P	Nº	€	L mm	I mm	∅ mm	d mm
3/16	32,00	2	93,37	50	14	4,90	6,0	5/8	14,00	2	110,33	80	28	9,00	12,0
1/4	26,00	2	38,48	50	18	4,90	6,0	3/4	12,00	2	169,06	95	32	11,00	14,0
5/16	22,00	2	44,90	56	22	4,90	6,0	7/8	11,00	2	201,76	100	36	14,50	18,0
3/8	20,00	2	51,94	63	22	5,50	7,0	1"	10,00	2	283,21	110	40	14,50	18,0
7/16	18,00	2	62,33	63	22	6,20	8,0	1", 1/8	9,00	2	584,39	110	22	18,00	22,0
1/2	16,00	2	70,47	75	24	7,00	9,0	1", 1/4	9,00	2	667,23	110	22	18,00	22,0
9/16	16,00	2	84,51	80	28	9,00	11,0	1", 1/2	9,00	2	1.016,85	125	40	24,00	32,0

2306

HSS DIN 5157

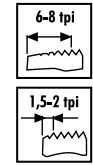
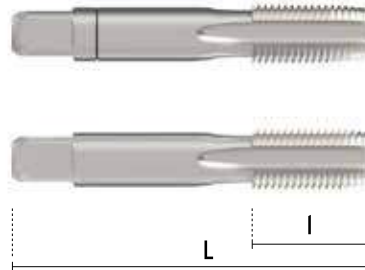
G
ISO 228



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

**Macho 3°
Taraud 3°
Tap 3°** } PVP = € / 2

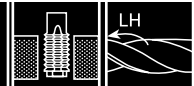


Ø	P	Nº	€	L mm	I mm	∠ mm	d mm	Ø	P	Nº	€	L mm	I mm	∠ mm	d mm
1/8	28,00	2	31,16	63	20	5,50	7,0	1 1/4	11,00	2	311,00	125	40	24,00	32,0
1/4	19,00	2	43,89	70	22	9,00	11,0	1 3/8	11,00	2	422,47	140	40	29,00	36,0
3/8	19,00	2	55,27	70	22	9,00	12,0	1 1/2	11,00	2	470,09	140	40	29,00	36,0
1/2	16,00	2	77,30	75	24	7,00	9,0	1 3/4	11,00	2	781,52	140	40	32,00	40,0
5/8	14,00	2	102,10	80	22	14,50	18,0	2"	11,00	2	866,36	160	40	35,00	45,0
3/4	14,00	2	120,70	90	22	16,00	20,0	2 1/4	11,00	2	1.473,99	160	40	39,00	50,0
7/8	14,00	2	166,03	90	22	18,00	22,0	2 1/2	11,00	2	2.215,59	160	40	39,00	50,0
1"	11,00	2	192,14	100	25	20,00	25,0	2 3/4	11,00	2	2.686,41	160	40	39,00	50,0
1 1/8	11,00	2	285,44	125	40	22,00	28,0	3"	11,00	2	2.795,80	160	40	39,00	50,0

2306/5

HSS DIN 5157 Izquierda / A gauche / Left hand

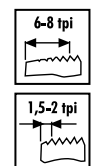
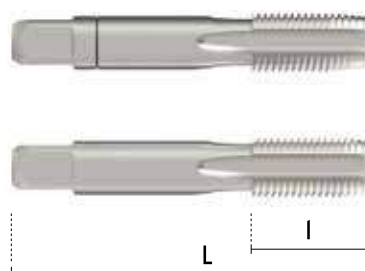
G
ISO 228



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

**Macho 3°
Taraud 3°
Tap 3°** } PVP = € / 2



Ø	P	Nº	€	L mm	I mm	∠ mm	d mm	Ø	P	Nº	€	L mm	I mm	∠ mm	d mm
1/8	28,00	2	62,34	63	20	5,50	7,0	5/8	14,00	2	204,19	80	22	14,50	18,0
1/4	19,00	2	87,77	70	22	9,00	11,0	3/4	14,00	2	241,40	90	22	16,00	20,0
3/8	19,00	2	110,52	70	22	9,00	12,0	1"	11,00	2	384,31	100	25	20,00	25,0
1/2	14,00	2	154,59	80	22	12,00	16,0								

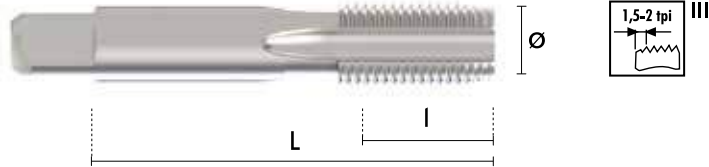
2316 **HSSE DIN 5157**

G
ISO 228



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	Nº	€	L mm	l mm	∠ mm	d mm	Ø	P	Nº	€	L mm	l mm	∠ mm	d mm
1/8	28,00	1	18,43	63	20	5,50	7,0	5/8	14,00	1	70,19	80	22	14,50	18,0
1/4	19,00	1	30,01	70	22	9,00	11,0	3/4	14,00	1	82,10	90	22	16,00	20,0
3/8	19,00	1	32,82	70	22	9,00	11,0	7/8	14,00	1	118,68	90	22	18,00	22,0
1/2	14,00	1	52,51	80	22	12,00	16,0	1"	11,00	1	136,05	100	25	20,00	25,0

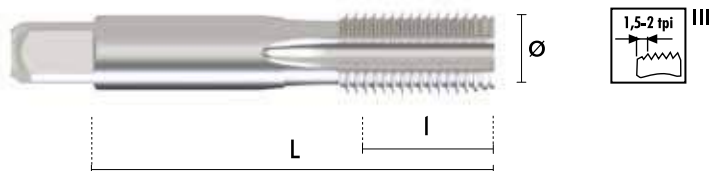
2317 **HSSE DIN 5157**

G
ISO 228 **+0,1**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	Nº	€	L mm	l mm	∠ mm	d mm	Ø	P	Nº	€	L mm	l mm	∠ mm	d mm
1/8	28,00	1	20,24	63	20	5,50	7,0	5/8	14,00	1	77,20	80	22	14,50	18,0
1/4	19,00	1	33,03	70	22	9,00	11,0	3/4	14,00	1	90,28	90	22	16,00	20,0
3/8	19,00	1	36,24	70	22	9,00	11,0	7/8	14,00	1	130,55	90	22	18,00	22,0
1/2	14,00	1	60,01	80	22	12,00	16,0	1"	11,00	1	149,65	100	25	20,00	25,0

2307

HSS DIN 352

UNC
ANSI/ASME
B1.1

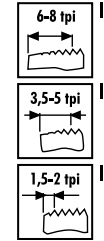
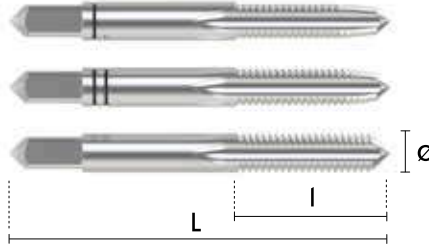


Tol.
2B

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3° } PVP = € / 3
Tap 3°



Ø	P	Nº	€	L mm	l mm	∅ mm	d mm	Ø	P	Nº	€	L mm	l mm	∅ mm	d mm
Nº4	40,00	3	48,11	40	12	2,70	3,5	9/16	12,00	3	85,04	80	30	9,00	11,0
Nº5	40,00	3	46,00	40	12	2,70	3,5	5/8	11,00	3	117,31	80	32	9,00	12,0
Nº6	32,00	3	46,00	45	14	3,00	4,0	3/4	10,00	3	159,71	95	40	11,00	14,0
Nº18	32,00	3	46,00	45	14	3,40	4,5	7/8	9,00	3	196,71	100	40	14,50	18,0
Nº10	24,00	3	46,00	50	16	4,90	6,0	1"	8,00	3	265,66	110	50	14,50	18,0
Nº12	24,00	3	46,00	50	18	4,90	6,0	1"1/8	7,00	3	405,54	132	56	18,00	22,0
1/4	20,00	3	37,23	50	19	4,90	6,0	1"1/4	7,00	3	510,47	132	56	18,00	22,0
5/16	18,00	3	42,53	56	22	4,90	6,0	1"3/8	6,00	3	647,57	150	63	22,00	28,0
3/8	16,00	3	48,08	70	24	5,50	7,0	1"1/2	6,00	3	795,10	150	63	24,00	32,0
7/16	14,00	3	62,58	70	24	6,20	8,0	1"3/4	5,00	3	990,53	160	70	29,00	36,0
1/2	13,00	3	72,03	75	29	7,00	9,0	2"	4,50	3	1.138,71	190	80	32,00	40,0

2307/5

HSS DIN 352 Izquierda / A gauche / Left hand

UNC
ANSI/ASME
B1.1



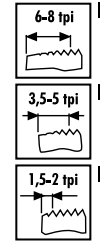
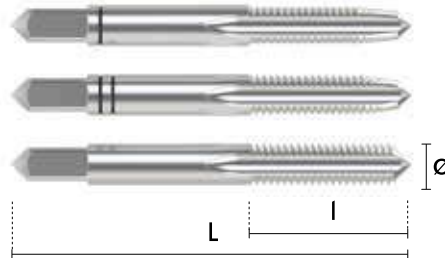
Tol.
2B



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3° } PVP = €/3
Tap 3°



Ø	P	Nº	€	L mm	I mm	mm	d mm	Ø	P	Nº	€	L mm	I mm	mm	d mm
1/4	20,00	3	74,46	50	19	4,90	6,0	9/16	12,00	3	170,08	80	30	9,00	11,0
5/16	18,00	3	85,04	56	22	4,90	6,0	5/8	11,00	3	234,59	80	32	9,00	12,0
3/8	16,00	3	96,16	70	24	5,50	7,0	3/4	10,00	3	319,42	95	40	11,00	14,0
7/16	14,00	3	125,19	70	24	6,20	8,0	7/8	9,00	3	393,39	100	40	14,50	18,0
1/2	13,00	3	144,06	75	29	7,00	9,0	1"	8,00	3	531,32	110	50	14,50	18,0

2308

HSS DIN 2181

UNF
ANSI/ASME
B1.1

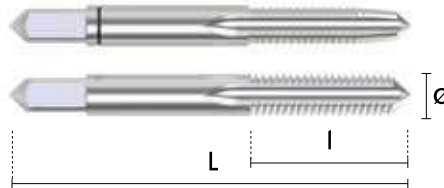


Tol.
2B

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3° } PVP = €/2
Tap 3°



Ø	P	Nº	€	L mm	I mm	mm	d mm	Ø	P	Nº	€	L mm	I mm	mm	d mm
Nº4	48,00	2	36,54	36	11	2,70	3,5	1/2	20,00	2	42,28	75	24	7,00	9,0
Nº5	44,00	2	36,54	36	11	2,70	3,5	9/16	18,00	2	55,07	80	28	9,00	11,0
Nº6	40,00	2	34,91	40	12	3,40	4,5	5/8	18,00	2	71,13	80	28	9,00	12,0
Nº8	36,00	2	34,91	40	12	3,40	4,5	3/4	16,00	2	95,56	95	32	11,00	14,0
Nº10	32,00	2	34,91	45	14	4,90	6,0	7/8	14,00	2	122,80	100	36	14,50	18,0
Nº12	28,00	2	36,54	50	14	4,90	6,0	1"	12,00	2	162,81	110	40	14,50	18,0
1/4	28,00	2	25,17	50	18	4,90	6,0	1*1/8	12,00	2	253,53	110	50	18,00	22,0
5/16	24,00	2	26,93	56	22	4,90	6,0	1*1/4	12,00	2	319,80	132	56	18,00	22,0
3/8	24,00	2	31,14	63	22	5,50	7,0	1*3/8	12,00	2	406,14	132	56	22,00	28,0
7/16	20,00	2	41,35	63	22	6,20	8,0	1*1/2	12,00	2	497,29	150	63	24,00	32,0

2308/5

HSS DIN 2181 Izquierda / A gauche / Left hand

UNF
ANSI/ASME
B1.1



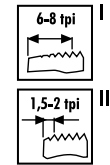
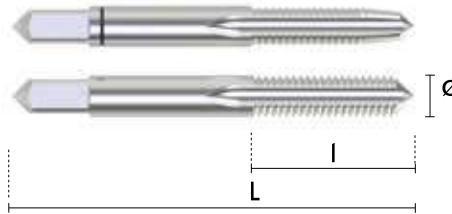
Tol.
2B



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3° } PVP = € / 2
Tap 3°



Ø	P	Nº	€	L mm	I mm	∠ mm	d mm	Ø	P	Nº	€	L mm	I mm	∠ mm	d mm
1/4	28,00	2	50,32	50	18	4,90	6,0	9/16	18,00	2	110,12	80	28	9,00	11,0
5/16	24,00	2	53,88	56	22	4,90	6,0	5/8	18,00	2	142,22	80	28	9,00	12,0
3/8	24,00	2	62,28	63	22	5,50	7,0	3/4	16,00	2	191,13	95	32	11,00	14,0
7/16	20,00	2	82,68	63	22	6,20	8,0	7/8	14,00	2	245,62	100	36	14,50	18,0
1/2	20,00	2	84,54	75	24	7,00	9,0	1"	12,00	2	325,62	110	40	14,50	18,0

2315

HSS DIN 2184

UN
ANSI/ASME
B1.1

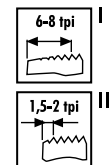
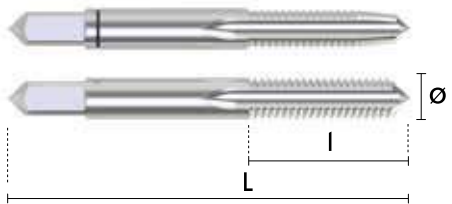


Tol.
2B

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3° } PVP = € / 2
Tap 3°



Ø	P	Nº	€	L mm	I mm	∠ mm	d mm	Ø	P	Nº	€	L mm	I mm	∠ mm	d mm
1"1/8	8,00	2	224,55	125	40	18,00	22,0	1"5/8	8,00	2	504,70	125	40	24,00	32,0
1"1/4	8,00	2	289,70	125	40	18,00	22,0	1"3/4	8,00	2	614,82	125	40	29,00	36,0
1"3/8	8,00	2	328,61	125	40	22,00	28,0	2"	8,00	2	658,76	140	40	32,00	40,0
1"1/2	8,00	2	431,47	125	40	24,00	32,0								

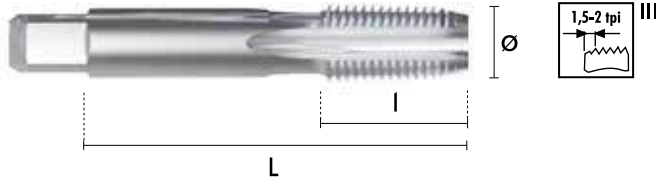
2309 HSS DIN 5157

Rc
DIN 2999



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	Nº	€	L mm	l mm	mm	d mm	Ø	P	Nº	€	L mm	l mm	mm	d mm
1/8	28,00	1	32,84	59	15	6,30	8,0	5/8	14,00	1	164,76	80	36	14,50	18,0
1/4	19,00	1	46,32	67	19	8,00	10,0	3/4	14,00	1	152,80	85	28	16,00	20,0
3/8	19,00	1	64,32	75	21	10,00	12,5	7/8	14,00	1	274,60	100	36	18,00	22,0
1/2	14,00	1	90,03	87	26	12,50	16,0	1"	11,00	1	232,61	109	33	20,00	25,0

2310 HSS DIN 2181

UNEF
ANSI/ASME
B1.1

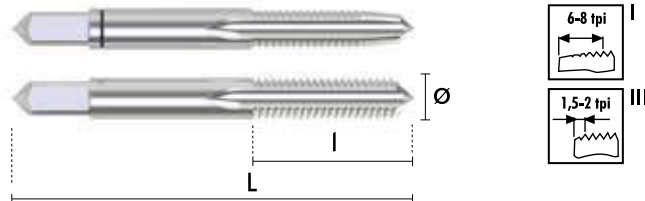


Tol.
2B

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

**Macho 3°
Taraud 3°
Tap 3°** } PVP = € / 2



Ø	P	Nº	€	L mm	l mm	mm	d mm	Ø	P	Nº	€	L mm	l mm	mm	d mm
1/4	32,00	2	103,48	56	14	4,90	6,0	9/16	24,00	2	222,58	70	22	9,00	11,0
5/16	32,00	2	115,62	56	18	4,90	6,0	5/8	24,00	2	309,80	70	22	9,00	12,0
3/8	32,00	2	132,29	63	20	5,50	7,0	3/4	20,00	2	458,78	80	22	11,00	14,0
7/16	28,00	2	168,39	63	20	6,20	8,0	1"	20,00	2	656,43	90	22	14,50	18,0
1/2	28,00	2	190,27	70	22	7,00	9,0								

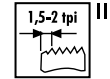
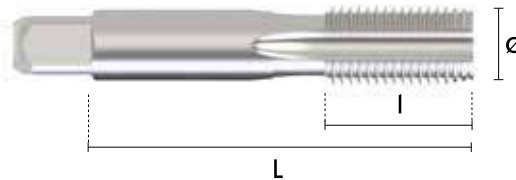
2312 HSS DIN 40432

PG
DIN 40430



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PG	Ø	P	Nº	€	L mm	I mm	mm	d mm	PG	Ø	P	Nº	€	L mm	I mm	mm	d mm
7,0	12,5	20,00	1	34,55	70	22	7,00	9,0	21,0	28,3	16,00	1	118,11	90	22	18,00	22,0
9,0	15,2	18,00	1	43,92	70	22	9,00	12,0	29,0	37,0	16,00	1	234,49	100	25	22,00	28,0
11,0	18,6	18,00	1	60,98	80	22	11,00	14,0	36,0	47,0	16,00	1	391,70	140	40	29,00	36,0
13,5	20,4	18,00	1	66,89	80	22	12,00	16,0	42,0	54,0	16,00	1	465,18	140	40	32,00	40,0
16,0	22,5	18,00	1	80,30	80	22	14,50	18,0	48,0	59,3	16,00	1	586,65	160	40	35,00	45,0

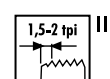
2313 HSS

NPT
ANSI/ASME
B1.20.1



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	Nº	€	L mm	I mm	mm	d mm	Ø	P	Nº	€	L mm	I mm	mm	d mm
1/16	27,00	1	28,50	65	19	5,50	7,0	3/4	14,00	1	117,93	100	33	16,00	20,0
1/8	27,00	1	28,50	65	19	5,50	7,0	1"	11,50	1	131,31	110	38	20,00	25,0
1/4	18,00	1	39,97	70	25	9,00	11,0	1*1/4	11,50	1	215,30	125	41	24,00	32,0
3/8	18,00	1	55,15	75	26	9,00	12,0	1*1/2	11,50	1	327,16	140	42	29,00	36,0
1/2	14,00	1	77,13	80	31	12,00	16,0	2"	11,50	1	510,73	160	44	29,00	36,0

MACHOS DE MANO PERFIL COMPLETO TARAUDS À MAIN PROFIL COMPLET / HANDS TAPS NON SERIAL FORM

2321

HSS DIN 352

M-MF
DIN 13

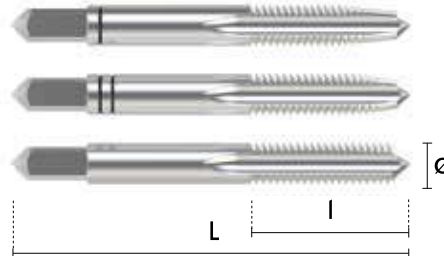


Tol.
6H

P			M		K			N				S		H			
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraud 3° } PVP = €/3
Tap 3°



Ø	P	Nº	€	L mm	l mm	∠ mm	d mm	Ø	P	Nº	€	L mm	l mm	∠ mm	d mm
M2,0	0,40	3	34,73	36	8	2,10	2,8	M16,0	1,00	2	86,37	70	22	9,00	12,0
M2,5	0,45	3	35,92	40	9	2,10	2,8	M16,0	1,25	2	90,92	70	22	9,00	12,0
M3,0	0,50	3	19,02	40	11	2,70	3,5	M16,0	1,50	2	49,04	70	22	9,00	12,0
M4,0	0,70	3	17,51	45	13	3,40	4,5	M16,0	2,00	3	69,68	80	32	9,00	12,0
M5,0	0,80	3	19,03	50	16	4,90	6,0	M18,0	1,50	2	65,02	80	22	11,00	14,0
M6,0	1,00	3	19,03	56	19	4,90	6,0	M18,0	2,00	2	103,45	80	22	11,00	14,0
M7,0	1,00	3	26,26	56	19	4,90	6,0	M18,0	2,50	3	93,14	95	34	11,00	14,0
M8,0	1,00	2	21,79	63	22	4,90	6,0	M20,0	1,50	2	81,13	80	22	12,00	16,0
M8,0	1,25	3	22,91	63	22	4,90	6,0	M20,0	2,00	2	107,22	80	22	12,00	16,0
M9,0	1,00	2	28,16	63	22	5,50	7,0	M20,0	2,50	3	104,67	95	34	12,00	16,0
M9,0	1,25	3	40,65	63	22	5,50	7,0	M22,0	1,50	2	88,70	80	22	14,50	18,0
M10,0	1,00	2	23,63	63	20	5,50	7,0	M22,0	2,00	2	142,63	80	22	14,50	18,0
M10,0	1,25	2	24,06	70	24	5,50	7,0	M22,0	2,50	3	128,32	100	34	14,50	18,0
M10,0	1,50	3	28,93	70	24	5,50	7,0	M24,0	1,50	2	113,23	90	22	14,50	18,0
M11,0	1,00	2	41,76	63	20	6,20	8,0	M24,0	2,00	3	159,46	90	22	14,50	18,0
M11,0	1,25	2	41,76	70	24	6,20	8,0	M24,0	3,00	2	161,64	110	38	14,50	18,0
M11,0	1,50	3	56,06	70	24	6,20	8,0	M26,0	1,50	2	180,40	90	22	14,50	18,0
M12,0	1,00	2	41,25	70	22	7,00	9,0	M26,0	2,00	2	372,29	90	22	14,50	18,0
M12,0	1,25	2	41,42	70	22	7,00	9,0	M27,0	3,00	3	208,17	110	38	16,00	20,0
M12,0	1,50	2	35,24	70	22	7,00	9,0	M28,0	1,50	2	200,42	90	22	16,00	20,0
M12,0	1,75	3	37,61	75	28	7,00	9,0	M30,0	3,50	3	264,30	125	45	18,00	22,0
M14,0	1,00	2	61,72	70	22	9,00	11,0	M33,0	3,50	3	335,32	125	50	20,00	25,0
M14,0	1,25	2	50,63	70	22	9,00	11,0	M36,0	4,00	3	431,83	150	56	22,00	28,0
M14,0	1,50	2	39,33	70	22	9,00	11,0	M39,0	4,00	3	479,84	150	60	24,00	32,0
M14,0	2,00	3	49,49	80	30	9,00	11,0	M42,0	4,50	3	601,22	150	60	24,00	32,0

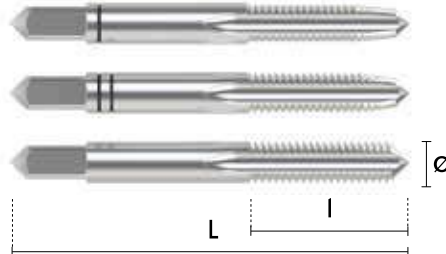
MACHOS DE MANO PERFIL COMPLETO TARAUDS À MAIN PROFIL COMPLET / HANDS TAPS NON SERIAL FORM

2322 HSS DIN 352 UNC ANSI/ASME B1.1 Tol. 2B

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraut 3°
Tap 3° } PVP = € / 3



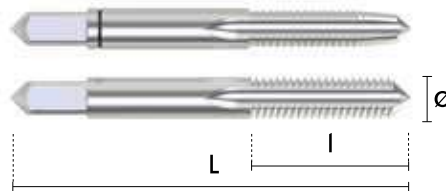
Ø	P	Nº	€	L mm	I mm	∅ mm	d mm	Ø	P	Nº	€	L mm	I mm	∅ mm	d mm
Nº4	40,00	3	48,11	40	12	2,70	3,5	9/16	12,00	3	85,04	80	30	9,00	11,0
Nº5	40,00	3	46,00	40	12	2,70	3,5	5/8	11,00	3	117,31	80	32	9,00	12,0
Nº6	32,00	3	46,00	45	14	3,00	4,0	3/4	10,00	3	159,71	95	40	11,00	14,0
Nº18	32,00	3	46,00	45	14	3,40	4,5	7/8	9,00	3	196,71	100	40	14,50	18,0
Nº10	24,00	3	46,00	50	16	4,90	6,0	1"	8,00	3	265,66	110	50	14,50	18,0
Nº12	24,00	3	46,00	50	18	4,90	6,0	1 1/8	7,00	3	405,54	132	56	18,00	22,0
1/4	20,00	3	37,23	50	19	4,90	6,0	1 1/4	7,00	3	510,47	132	56	18,00	22,0
5/16	18,00	3	42,53	56	22	4,90	6,0	1 3/8	6,00	3	647,57	150	63	22,00	28,0
3/8	16,00	3	48,08	70	24	5,50	7,0	1 1/2	6,00	3	795,10	150	63	24,00	32,0
7/16	14,00	3	62,58	70	24	6,20	8,0	1 3/4	5,00	3	990,53	160	70	29,00	36,0
1/2	13,00	3	72,03	75	29	7,00	9,0	2"	4,50	3	1.138,71	190	80	32,00	40,0

2323 HSS DIN 352 Perfil completo / Profil complet / Non serial form UNF ANSI/ASME B1.1 Tol. 2B

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Macho 3°
Taraut 3°
Tap 3° } PVP = € / 2



Ø	P	Nº	€	L mm	I mm	∅ mm	d mm	Ø	P	Nº	€	L mm	I mm	∅ mm	d mm
Nº4	48,00	2	36,54	36	11	2,70	3,5	1/2	20,00	2	42,28	75	24	7,00	9,0
Nº5	44,00	2	36,54	36	11	2,70	3,5	9/16	18,00	2	55,07	80	28	9,00	11,0
Nº6	40,00	2	34,91	40	12	3,40	4,5	5/8	18,00	2	71,13	80	28	9,00	12,0
Nº8	36,00	2	34,91	40	12	3,40	4,5	3/4	16,00	2	95,56	95	32	11,00	14,0
Nº10	32,00	2	34,91	45	14	4,90	6,0	7/8	14,00	2	122,80	100	36	14,50	18,0
Nº12	28,00	2	36,54	50	14	4,90	6,0	1"	12,00	2	162,81	110	40	14,50	18,0
1/4	28,00	2	25,17	50	18	4,90	6,0	1 1/8	12,00	2	253,53	110	50	18,00	22,0
5/16	24,00	2	26,93	56	22	4,90	6,0	1 1/4	12,00	2	319,80	132	56	18,00	22,0
3/8	24,00	2	31,14	63	22	5,50	7,0	1 3/8	12,00	2	406,14	132	56	22,00	28,0
7/16	20,00	2	41,35	63	22	6,20	8,0	1 1/2	12,00	2	497,29	150	63	24,00	32,0

2501

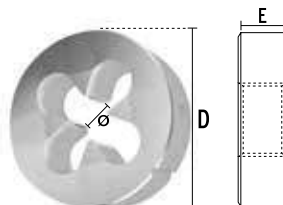
HSS DIN EN 22568

M-MF
DIN 13

Tol.
6g

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%




Ø	P	€	D mm	E mm	
** M1,0	0,25	50,91	16	5	1
** M1,1	0,25	84,06	16	5	1
** M1,2	0,25	78,87	16	5	1
** M1,4	0,30	72,26	16	5	1
M1,6	0,35	68,28	16	5	1
M1,7	0,35	68,28	16	5	1
M1,8	0,35	68,28	16	5	1
M2,0	0,40	28,90	16	5	1
M2,2	0,45	67,64	16	5	1
M2,3	0,40	28,90	16	5	1
M2,5	0,05	28,90	16	5	1
M2,6	0,45	28,90	16	5	1
M3,0	0,50	24,85	20	5	1
M3,0	0,60	32,27	25	5	1
M3,5	0,60	25,65	20	5	1
M3,5	0,75	83,25	20	5	1
M4,0	0,50	30,69	20	5	1
M4,0	0,70	24,85	20	5	1
M4,5	0,75	33,51	20	7	1
M5,0	0,05	33,85	20	5	1
M5,0	0,75	35,94	25	7	1
M5,0	0,80	24,85	20	7	1
M5,5	0,90	83,25	20	7	1
M6,0	0,50	32,94	20	7	1
M6,0	0,75	30,42	20	7	1
M6,0	1,00	24,85	20	7	1
M7,0	0,75	32,09	25	9	1
M7,0	1,00	27,09	25	9	1
M8,0	0,50	39,55	25	9	1
M8,0	0,75	32,09	25	9	1
M8,0	1,00	32,09	25	9	1
M8,0	1,25	25,96	25	9	1
M9,0	1,00	35,77	25	9	1
M9,0	1,25	38,21	25	9	1
M10,0	0,50	67,46	30	11	1
M10,0	0,75	49,97	30	11	1
M10,0	1,00	34,02	30	11	1
M10,0	1,25	42,61	30	11	1
M10,0	1,50	37,05	30	11	1
M11,0	0,75	92,38	30	11	1
M11,0	1,00	49,70	30	11	1
M11,0	1,25	53,26	30	11	1
M11,0	1,50	49,68	30	11	1
M12,0	0,75	57,74	38	10	1
M12,0	1,00	49,68	38	10	1
M12,0	1,25	49,68	38	10	1


Ø	P	€	D mm	E mm	
M12,0	1,50	44,37	38	10	1
M12,0	1,75	40,73	38	14	1
M13,0	0,75	92,38	38	10	1
M13,0	1,00	58,40	38	10	1
M13,0	1,50	60,91	38	10	1
M13,0	1,75	60,91	38	14	1
M14,0	0,75	90,75	38	10	1
M14,0	1,00	54,51	38	10	1
M14,0	1,25	54,16	38	10	1
M14,0	1,50	46,39	38	10	1
M14,0	2,00	40,73	38	14	1
M15,0	1,00	66,20	38	10	1
M15,0	1,50	66,20	38	10	1
M15,0	2,00	81,63	38	14	1
M16,0	1,00	68,91	45	14	1
M16,0	1,25	62,65	45	14	1
M16,0	1,50	51,64	45	14	1
M16,0	2,00	54,72	45	18	1
M17,0	1,00	98,52	45	14	1
M17,0	1,25	98,52	45	14	1
M17,0	1,50	98,52	45	14	1
M18,0	1,00	72,05	45	14	1
M18,0	1,25	81,90	45	14	1
M18,0	1,50	63,72	45	14	1
M18,0	2,00	72,05	45	14	1
M18,0	2,50	54,72	45	18	1
M19,0	1,00	159,69	45	14	1
M19,0	1,25	159,69	45	14	1
M19,0	1,50	162,55	45	14	1
M20,0	1,00	71,75	45	14	1
M20,0	1,25	159,69	45	14	1
M20,0	1,50	65,76	45	14	1
M20,0	2,00	72,27	45	14	1
M20,0	2,50	54,72	45	18	1
M21,0	1,00	185,23	45	16	1
M21,0	1,25	185,23	45	14	1
M21,0	1,50	152,67	45	14	1
M22,0	1,00	97,98	55	16	1
M22,0	1,25	159,69	55	16	1
M22,0	1,50	84,29	55	16	1
M22,0	2,00	93,78	55	16	1
M22,0	2,50	80,50	55	22	1
M23,0	1,50	185,23	55	16	1
M24,0	1,00	93,78	55	16	1
M24,0	1,25	159,69	55	16	1

**Tol. 6h

(continúa Ref.2501 / suite Réf.2501 / Ref.2501 cont'd)

(continúa Ref.2501 / suite Réf.2501 / Ref.2501 cont'd)

Ø	P	€	D mm	E mm	
M24,0	3,00	80,50	55	22	1
M25,0	1,00	145,03	55	16	1
M25,0	1,50	122,45	55	16	1
M26,0	1,00	210,38	55	16	1
M26,0	1,50	115,91	55	16	1
M26,0	2,00	210,38	55	16	1
M27,0	1,00	129,47	65	18	1
M27,0	1,50	127,47	65	18	1
M27,0	2,00	138,63	65	18	1
M27,0	3,00	115,91	65	25	1
M28,0	1,00	210,38	65	18	1
M28,0	1,50	127,47	65	18	1
M28,0	2,00	210,38	65	18	1
M30,0	1,00	142,35	65	18	1
M30,0	1,50	127,44	65	18	1
M30,0	2,00	142,35	65	18	1
M30,0	3,50	119,58	65	25	1
M32,0	1,00	214,13	65	18	1
M32,0	1,50	134,68	65	18	1
M32,0	2,00	210,38	65	18	1
M33,0	1,50	127,47	65	18	1
M33,0	2,00	138,81	65	18	1
M33,0	3,50	119,58	65	25	1
M34,0	1,50	132,98	65	18	1
M34,0	2,00	298,33	65	18	1
M35,0	1,50	137,95	65	18	1
M35,0	2,00	298,33	65	18	1
M36,0	1,50	130,57	65	18	1
M36,0	2,00	138,81	65	18	1
M36,0	3,00	151,07	65	25	1
M36,0	4,00	123,98	65	25	1

Ø	P	€	D mm	E mm	
M38,0	1,50	197,49	75	20	1
M38,0	2,00	378,05	75	20	1
M39,0	1,50	198,45	75	20	1
M39,0	2,00	209,55	75	20	1
M39,0	3,00	238,13	75	30	1
M39,0	4,00	186,10	75	30	1
M40,0	1,50	206,04	75	20	1
M40,0	2,00	209,55	75	20	1
M40,0	3,00	228,55	75	30	1
M42,0	1,50	270,85	75	20	1
M42,0	2,00	302,77	75	20	1
M42,0	3,00	315,88	75	30	1
M42,0	4,50	186,10	75	30	1
M45,0	1,50	270,85	90	22	1
M45,0	2,00	302,77	90	22	1
M45,0	3,00	315,88	90	36	1
M45,0	4,50	284,62	90	36	1
M48,0	1,50	272,56	90	22	1
M48,0	2,00	278,63	90	22	1
M48,0	3,00	302,77	90	36	1
M48,0	5,00	284,96	90	36	1
M50,0	1,50	270,85	90	22	1
M52,0	1,50	270,85	90	22	1
M52,0	2,00	314,78	90	22	1
M52,0	3,00	343,53	90	36	1
M52,0	5,00	284,96	90	36	1
M56,0	5,50	508,74	105	36	1
M60,0	5,50	508,74	105	36	1
M63,0	1,50	960,19	105	22	1
M64,0	6,00	608,31	120	36	1

2501/5

HSS DIN EN 22568

Izquierda / A gauche / Left hand

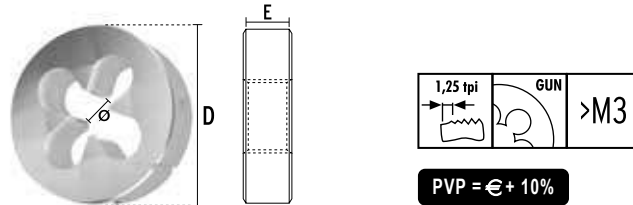
**M-MF
DIN 13**

**Tol.
6g**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	D mm	E mm	
M3,0	0,50	49,70	20	5	1
M4,0	0,70	49,70	20	5	1
M5,0	0,80	49,70	20	7	1
M6,0	1,00	49,70	25	7	1
M7,0	1,00	54,18	25	9	1
M8,0	1,00	64,14	25	9	1
M8,0	1,25	51,91	25	9	1
M10,0	1,00	68,06	30	11	1
M10,0	1,25	85,23	30	11	1
M10,0	1,50	74,11	30	11	1
M12,0	1,25	99,36	38	10	1
M12,0	1,50	74,11	38	10	1
M12,0	1,75	81,45	38	14	1
M14,0	1,50	92,81	38	10	1

Ø	P	€	D mm	E mm	
M14,0	2,00	81,44	38	14	1
M16,0	1,50	103,29	45	14	1
M16,0	2,00	109,44	45	18	1
M18,0	1,50	127,44	45	14	1
M18,0	2,50	109,44	45	18	1
M20,0	1,50	131,51	45	14	1
M20,0	2,50	109,44	45	18	1
M22,0	1,50	168,60	55	16	1
M22,0	2,50	161,00	55	22	1
M24,0	1,50	168,60	55	16	1
M24,0	3,00	161,00	55	22	1
M27,0	3,00	231,80	65	25	1
M30,0	3,50	239,16	65	25	1

2514

HSSE DIN EN 22568

**M
DIN 13**

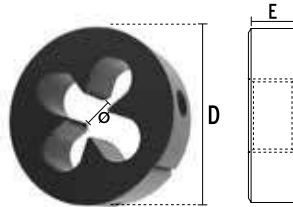
**ToL.
6g**

NIT



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		○													

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	D mm	E mm	
M3,0	0,50	39,83	20	5	1
M4,0	0,70	39,83	20	5	1
M5,0	0,80	39,83	20	7	1
M6,0	1,00	39,83	20	7	1
M8,0	1,25	41,61	25	9	1

∅	P	€	D mm	E mm	
M10,0	1,50	59,36	30	11	1
M12,0	1,75	65,26	38	14	1
M14,0	2,00	67,87	38	14	1
M16,0	2,00	91,14	45	18	1

2512

HSSE DIN EN 22568

**M
DIN 13**

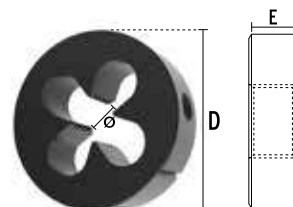
**ToL.
6g**

VAP



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●									○				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅	P	€	D mm	E mm	
M3,0	0,50	33,82	20	5	1
M4,0	0,70	33,82	20	5	1
M5,0	0,80	33,82	20	7	1
M6,0	1,00	33,82	20	7	1
M8,0	1,25	35,33	25	9	1
M10,0	1,50	50,45	30	11	1

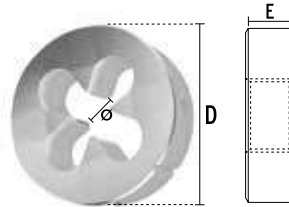
∅	P	€	D mm	E mm	
M12,0	1,75	55,46	38	14	1
M14,0	2,00	56,57	38	14	1
M16,0	2,00	75,95	45	18	1
M18,0	2,50	75,95	45	18	1
M20,0	2,50	75,95	45	18	1

2502 HSS DIN EN 22568

BSW
BS 84

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	
3/32	48,00	34,23			1
1/8	40,00	27,75	20	5	1
5/32	32,00	27,75	20	7	1
3/16	24,00	27,75	20	7	1
7/32	24,00	27,75	20	7	1
1/4	20,00	27,75	20	7	1
5/16	18,00	28,94	25	9	1
3/8	16,00	41,92	30	11	1
7/16	14,00	41,92	30	11	1
1/2	12,00	41,92	38	14	1
9/16	12,00	50,22	38	14	1
5/8	11,00	60,99	45	18	1

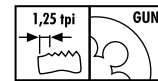
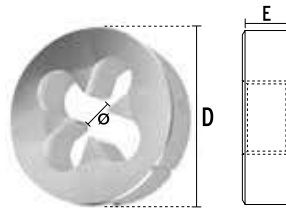
Ø	P	€	D mm	E mm	
3/4	10,00	60,98	45	18	1
7/8	9,00	89,69	55	22	1
1"	8,00	89,69	55	22	1
1*1/8	7,00	141,20	65	25	1
1*1/4	7,00	141,20	65	25	1
1*3/8	6,00	143,81	65	25	1
1*1/2	6,00	218,58	75	30	1
1*5/8	5,00	290,54	75	30	1
1*3/4	5,00	365,63	90	36	1
1*7/8	4,50	400,05	90	36	1
2"	4,50	380,84	90	36	1

2502/5 HSS DIN EN 22568 Izquierda / A gauche / Left hand

BSW
BS 84

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ti	Ni	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	
1/8	40,00	55,50	20	5	1
5/32	32,00	55,50	20	5	1
3/16	24,00	55,50	20	7	1
1/4	20,00	55,50	20	7	1
5/16	18,00	57,89	25	9	1
3/8	16,00	83,84	30	11	1

Ø	P	€	D mm	E mm	
7/16	14,00	83,84	38	11	1
1/2	12,00	83,84	38	14	1
9/16	12,00	100,44	38	14	1
5/8	11,00	122,00	45	18	1
7/8	9,00	179,40	55	22	1
1"	8,00	179,40	55	22	1

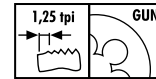
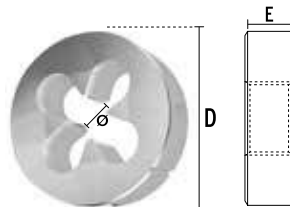
2503

HSS DIN EN 22568

**BSF
BS 84**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	
3/16	32,00	125,59	20	7	1
1/4	26,00	43,73	20	7	1
5/16	22,00	43,60	25	9	1
3/8	20,00	76,46	30	11	1
7/16	18,00	76,46	30	11	1
1/2	16,00	76,46	38	10	1

Ø	P	€	D mm	E mm	
9/16	16,00	85,26	38	10	1
5/8	14,00	107,73	45	14	1
3/4	12,00	107,73	45	14	1
7/8	11,00	159,29	55	22	1
1"	10,00	159,29	55	22	1

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

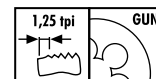
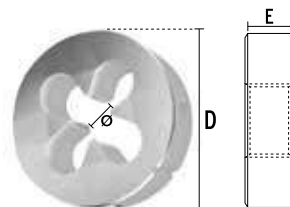
2504

HSS DIN EN 24231

**G
ISO 228**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	
1/8	28,00	44,66	30	11	1
1/4	19,00	44,66	38	10	1
3/8	19,00	57,74	45	14	1
1/2	14,00	57,74	45	14	1
5/8	14,00	80,06	55	16	1
3/4	14,00	119,67	55	16	1
7/8	14,00	125,27	65	18	1

Ø	P	€	D mm	E mm	
1"	11,00	125,27	65	18	1
1*1/8	11,00	178,56	75	20	1
1*1/4	11,00	175,74	75	20	1
1*3/8	11,00	277,02	90	22	1
1*1/2	11,00	269,21	90	22	1
1*3/4	11,00	277,02	105	22	1
2"	11,00	333,40	105	22	1

2504/5

HSS DIN EN 24231

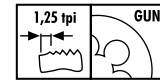
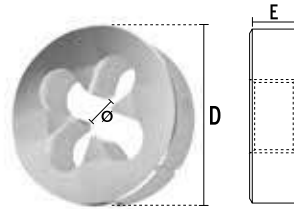
Izquierda / A gauche / Left hand

G
ISO 228



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	
1/8	28,00	89,29	30	11	1
1/4	19,00	89,29	38	10	1
3/8	19,00	115,47	45	14	1
1/2	14,00	115,47	45	14	1

Ø	P	€	D mm	E mm	
5/8	14,00	160,15	55	16	1
3/4	14,00	239,36	55	16	1
7/8	14,00	250,55	65	18	1
1"	11,00	250,55	65	18	1

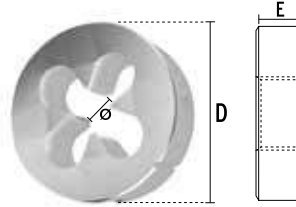
2522

HSS DIN EN 24231



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
										•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	D mm	E mm	
1/8	28,00	53,09	30	11	1
1/4	19,00	53,09	38	10	1
3/8	19,00	68,70	45	14	1
1/2	14,00	68,70	45	14	1

Ø	P	€	D mm	E mm	
5/8	14,00	108,49	55	16	1
3/4	14,00	142,28	55	16	1
7/8	14,00	148,95	65	18	1
1"	11,00	148,95	65	18	1

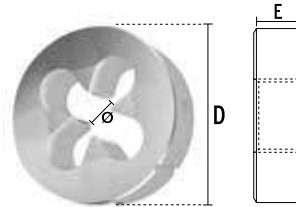
2521

HSS DIN EN 24231



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
										•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	D mm	E mm	
1/8	28,00	58,39	30	11	1
1/4	19,00	58,39	38	10	1
3/8	19,00	75,56	45	14	1
1/2	14,00	75,56	45	14	1

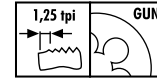
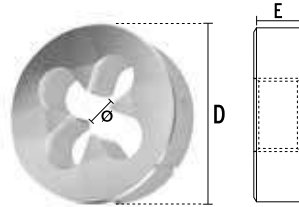
Ø	P	€	D mm	E mm	
5/8	14,00	150,74	55	16	1
3/4	14,00	156,51	55	16	1
7/8	14,00	190,27	65	18	1
1"	11,00	190,27	65	18	1

2505 HSS DIN EN 22568

UNC
ANSI/ASME
B1.1
ToL. 2A

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = €+ 10%

Ø	P	€	D mm	E mm	📦
N°4	40,00	35,67	20	5	1
N°5	40,00	35,67	20	5	1
N°6	32,00	35,67	20	5	1
N°8	32,00	35,67	20	7	1
N°10	24,00	35,67	20	7	1
N°12	24,00	35,67	20	7	1
1/4	20,00	32,83	20	7	1
5/16	18,00	32,09	25	9	1
3/8	16,00	47,25	30	11	1
7/16	14,00	47,25	30	11	1
1/2	13,00	48,63	38	14	1

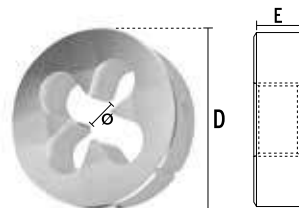
Ø	P	€	D mm	E mm	📦
9/16	12,00	50,88	38	14	1
5/8	11,00	66,77	45	18	1
3/4	10,00	66,77	45	18	1
7/8	9,00	87,34	55	22	1
1"	8,00	87,34	55	22	1
1 1/8"	7,00	129,72	65	25	1
1 1/4"	7,00	129,72	65	25	1
1 3/8"	6,00	129,72	65	25	1
1 1/2"	6,00	202,27	75	30	1
1 3/4"	5,00	433,43	90	36	1
2"	4,50	439,28	90	36	1

2505/5 HSS DIN EN 22568 Izquierda / A gauche / Left hand

UNC
ANSI/ASME
B1.1
ToL. 2A
LH

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = €+ 10%

Ø	P	€	D mm	E mm	📦
1/4	20,00	65,67	20	7	1
5/16	18,00	64,14	25	9	1
3/8	16,00	94,51	30	11	1
7/16	14,00	94,51	30	11	1
1/2	13,00	97,24	38	14	1

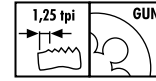
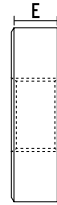
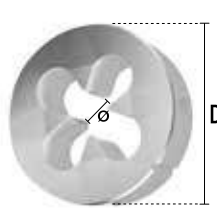
Ø	P	€	D mm	E mm	📦
9/16	12,00	101,79	38	14	1
5/8	11,00	133,54	45	18	1
3/4	10,00	133,54	45	18	1
7/8	9,00	174,71	55	22	1
1"	7,00	174,71	55	22	1

2506 HSS DIN EN 22568

UNF
ANSI/ASME
B1.1
Tol. 2A

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = €+ 10%

Ø	P	€	D mm	E mm	
Nº4	48,00	35,98	16	5	1
Nº5	44,00	35,98	20	5	1
Nº6	40,00	35,98	20	5	1
Nº8	36,00	35,98	20	7	1
Nº10	32,00	35,98	20	7	1
Nº12	28,00	35,28	20	7	1
1/4	28,00	28,50	20	7	1
5/16	24,00	33,88	25	9	1
3/8	24,00	47,55	30	11	1
7/16	20,00	43,72	30	11	1

Ø	P	€	D mm	E mm	
1/2	20,00	49,92	38	10	1
9/16	18,00	53,76	38	10	1
5/8	18,00	68,71	45	14	1
3/4	16,00	68,71	45	14	1
7/8	14,00	92,28	55	16	1
1"	12,00	92,28	55	16	1
1*1/8	12,00	142,12	65	18	1
1*1/4	12,00	142,12	65	18	1
1*3/8	12,00	212,56	65	18	1
1*1/2	12,00	212,56	75	20	1

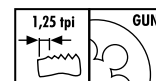
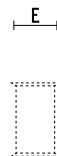
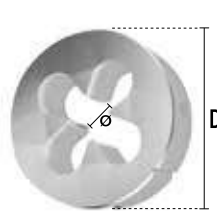
2506/5 HSS DIN EN 22568 Izquierda / A gauche / Left hand

UNF
ANSI/ASME
B1.1
Tol. 2A



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = €+ 10%

Ø	P	€	D mm	E mm	
1/4	28,00	57,02	20	7	1
5/16	24,00	67,77	25	9	1
3/8	24,00	95,09	30	11	1
7/16	20,00	87,44	30	11	1
1/2	20,00	99,83	38	10	1

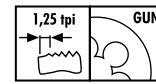
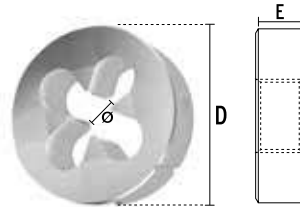
Ø	P	€	D mm	E mm	
9/16	18,00	107,52	38	10	1
5/8	18,00	137,41	45	14	1
3/4	16,00	137,41	45	14	1
7/8	14,00	184,55	55	16	1
1"	12,00	184,55	55	16	1

2507 HSS DIN EN 24230

R
DIN 2999

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	Icon
1/8	28,00	105,08	30	11	1
1/4	19,00	105,08	38	14	1
3/8	19,00	136,87	45	18	1

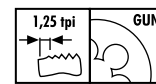
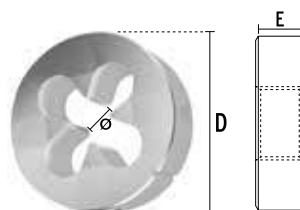
Ø	P	€	D mm	E mm	Icon
1/2	14,00	136,87	55	22	1
3/4	14,00	258,42	55	22	1
1"	11,00	275,34	65	25	1

2508 HSS DIN EN 22568

UNEF
ANSI/ASME
B1.1
Tol. 2A

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	Icon
1/4	32,00	107,42	20	7	1
5/16	32,00	107,42	25	9	1
3/8	32,00	166,78	30	11	1
7/16	28,00	166,78	30	11	1
1/2	28,00	166,78	38	10	1

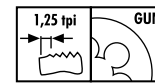
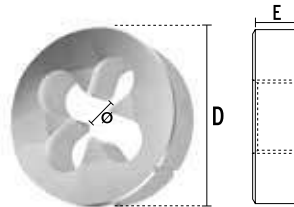
Ø	P	€	D mm	E mm	Icon
9/16	24,00	166,78	38	12	1
5/8	24,00	267,32	45	14	1
3/4	20,00	267,32	45	14	1
1"	20,00	326,72	55	16	1

2520 HSS DIN EN 22568

UN
ANSI/ASME
B1.1
Tol. 2A

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	
1"1/8	8,00	355,45	65	25	1
1"1/4	8,00	355,45	65	25	1
1"3/8	8,00	381,31	65	25	1
1"1/2	8,00	403,57	75	30	1

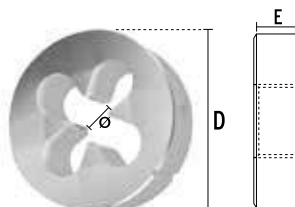
Ø	P	€	D mm	E mm	
1"5/8	8,00	508,97	75	30	1
1"3/4	8,00	619,10	90	36	1
2"	8,00	619,10	90	36	1

2510 HSS DIN 40434

PG
DIN 40430

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Pg	Ø	P	€	D mm	E mm	
7,0	12,5	20,00	63,80	38	10	1
9,0	15,2	18,00	63,80	45	14	1
11,0	18,6	18,00	79,91	45	14	1
13,5	20,4	18,00	79,91	45	14	1
16,0	22,5	18,00	103,03	55	16	1

Pg	Ø	P	€	D mm	E mm	
21,0	28,3	16,00	146,44	65	18	1
29,0	37,0	16,00	146,44	65	18	1
36,0	47,0	16,00	375,32	90	22	1
42,0	54,0	16,00	375,32	105	22	1
48,0	59,3	16,00	497,75	105	22	1

2509

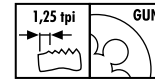
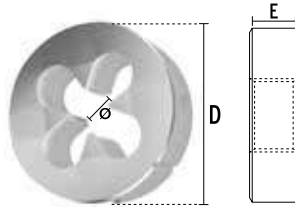
HSS DIN EN 24230

NPT

ANSI/ASME
B1.20.1

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



PVP = € + 10%

Ø	P	€	D mm	E mm	
1/16	27,00	81,22	25	9	1
1/8	27,00	67,01	30	11	1
1/4	14,00	67,01	38	14	1
3/8	18,00	87,51	45	18	1
1/2	14,00	87,51	45	18	1

Ø	P	€	D mm	E mm	
3/4	14,00	160,04	55	22	1
1"	11,50	192,43	65	25	1
1"1/4	11,50	239,12	75	25	1
1"1/2	11,50	333,57	90	25	1
2"	11,50	464,43	105	25	1

INSERTOS ROSCADOS FILETS RAPPORTES / WIRE THREAD INSERTS

2701

HSS ISO 529

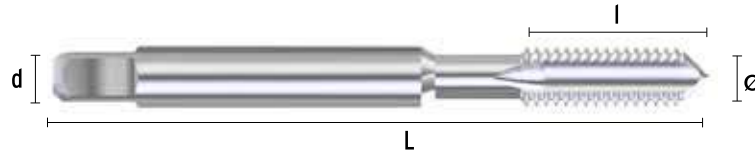
Tol.
4H

EG-M
(ST)

Form.
D

P			M		K			N				S		H		
<800	<1.000	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•								•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	I mm	∅ mm	d mm
M2,0	0,40	13,13	44,5	9,5	2,24	2,80
M2,2	0,45	13,13	44,5	9,5	2,24	2,80
M2,5	0,45	13,13	48	11	2,50	3,15
M3,0	0,50	8,52	53	13	3,15	4,00
M3,5	0,60	8,52	53	13	3,55	4,50
M4,0	0,70	10,34	58	16	4,00	5,00
M5,0	0,80	10,68	66	19	5,00	6,30
M6,0	1,00	10,68	72	22	6,30	8,00
M7,0	1,00	17,19	72	22	7,10	9,00
M8,0	1,00	17,19	80	24	8,00	10,00
M8,0	1,25	14,76	80	24	8,00	10,00
M9,0	1,25	21,36	85	25	6,30	8,00
M10,0	1,00	20,84	85	25	6,30	8,00
M10,0	1,25	20,84	85	25	6,30	8,00
M10,0	1,50	19,19	89	29	7,10	9,00
M11,0	1,50	24,49	89	29	7,10	9,00
M12,0	1,00	29,79	95	30	9,00	11,20
M12,0	1,25	29,79	95	30	9,00	11,20
M12,0	1,50	29,79	95	30	9,00	11,20
M12,0	1,75	21,11	95	30	9,00	11,20

Ø	P	€	L mm	I mm	∅ mm	d mm
M14,0	1,25	34,90	102	32	10,00	12,50
M14,0	1,50	34,90	102	32	10,00	12,50
M14,0	1,75	34,90	102	32	10,00	12,50
M14,0	2,00	29,25	102	32	10,00	12,50
M15,0	1,50	36,70	102	32	10,00	12,50
M15,0	2,00	36,70	112	37	11,20	14,00
M16,0	1,50	36,70	104	29	11,20	14,00
M16,0	2,00	36,70	112	37	11,20	14,00
M18,0	1,50	36,70	104	29	11,20	14,00
M18,0	2,00	45,89	104	29	11,20	14,00
M18,0	2,50	45,89	118	38	12,50	16,00
M20,0	1,50	50,90	113	33	12,50	16,00
M20,0	2,00	50,90	113	33	12,50	16,00
M20,0	2,50	50,90	118	38	12,50	16,00
M22,0	1,50	57,51	120	35	14,00	18,00
M22,0	2,00	57,51	120	35	14,00	18,00
M22,0	2,50	57,51	130	45	14,00	18,00
M24,0	1,50	72,48	120	35	14,00	18,00
M24,0	2,00	72,48	127	37	16,00	20,00
M24,0	3,00	72,48	138	48	16,00	20,00

2702

HSS ISO 529

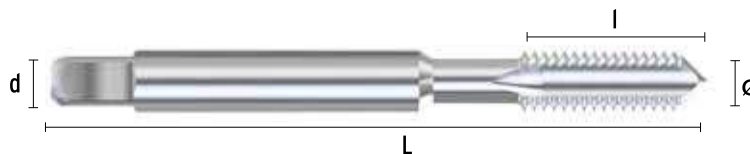
Tol. 3B

EG-UNC (STI)

Form. D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
N°2	56,00	21,54	48	9,5	2,50	3,15
N°4	40,00	21,54	53	13	3,15	4,00
N°6	32,00	21,54	58	16	4,00	5,00
N°8	32,00	21,54	62	17	4,50	5,60
N°10	24,00	14,41	66	19	5,00	6,30
N°12	24,00	14,41	66	19	5,60	7,10
1/4	20,00	14,41	72	22	6,30	8,00
5/16	18,00	15,20	80	24	8,00	10,00
3/8	16,00	16,41	85	25	6,30	8,00

Ø	P	€	L mm	l mm	∠ mm	d mm
7/16	14,00	23,18	95	30	9,00	11,20
1/2	13,00	24,93	102	32	10,00	12,50
9/16	12,00	38,72	112	37	11,20	14,00
5/8	11,00	46,46	112	37	11,20	14,00
11/16	11,00	61,81	112	37	11,20	14,00
3/4	10,00	61,81	118	38	12,50	16,00
7/8	9,00	71,54	130	45	14,00	18,00
1"	8,00	71,54	138	48	16,00	20,00



2703

HSS ISO 529

Tol. 3BH

EG-UNF (STI)

Form. D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∠ mm	d mm
N°4	48,00	21,54	53	13	3,15	4,00
N°6	40,00	21,54	53	13	3,55	4,50
N°8	36,00	21,54	62	17	4,50	5,60
N°10	32,00	14,41	66	19	5,00	6,30
1/4	28,00	14,41	69	19	6,30	8,00
5/16	24,00	15,20	76	20	8,00	10,00
3/8	24,00	16,41	82	22	6,30	8,00
7/16	20,00	23,18	84	24	7,10	9,00

Ø	P	€	L mm	l mm	∠ mm	d mm
1/2	20,00	24,93	90	25	9,00	11,20
9/16	18,00	38,72	104	29	10,00	12,50
5/8	18,00	46,46	104	29	11,20	14,00
3/4	16,00	61,81	104	29	11,20	14,00
7/8	14,00	71,54	120	35	14,00	18,00
1"	14,00	71,54	127	37	16,00	20,00
1"	12,00	71,54	127	37	16,00	20,00

2704

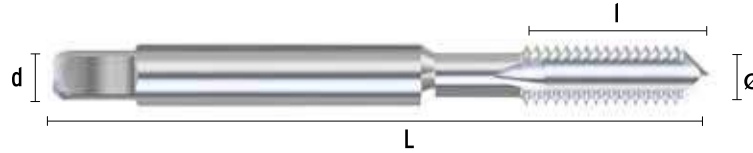
HSS ISO 529

EG-W
(STI)

Form.
D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	P	€	L mm	l mm	∅ mm	d mm
1/8	40,00	14,41	53	13	3,15	4,00
3/16	24,00	14,41	66	19	5,00	6,30
1/4	20,00	14,41	72	22	6,30	8,00
5/16	18,00	15,20	80	24	8,00	10,00
3/8	16,00	16,41	85	25	6,30	8,00
7/16	14,00	23,18	95	30	9,00	11,20
1/2	12,00	24,93	102	32	10,00	12,50

Ø	P	€	L mm	l mm	∅ mm	d mm
9/16	12,00	38,72	102	32	10,00	12,50
5/8	11,00	46,46	112	37	11,20	14,00
11/16	11,00	61,81	112	37	11,20	14,00
3/4	10,00	61,81	118	38	12,50	16,00
7/8	9,00	71,54	130	45	14,00	18,00
1"	8,00	71,54	138	48	16,00	20,00

2715

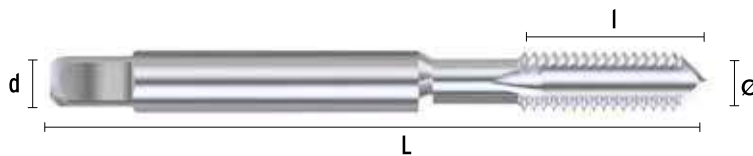
HSS ISO 529

EG-G
(STI)

Form.
D

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•									•	•							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



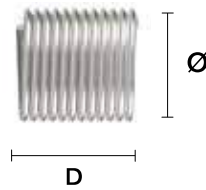
Ø	P	€	L mm	l mm	∅ mm	d mm
1/8	28,00	16,75	59	15	6,30	8,00
1/4	19,00	19,01	67	19	9,00	11,20


Ø	P	€	L mm	l mm	∅ mm	d mm
3/8	19,00	25,02	75	21	11,20	14,00
1/2	14,00	40,53	87	26	12,50	16,00

2705 > **DIN 8140**

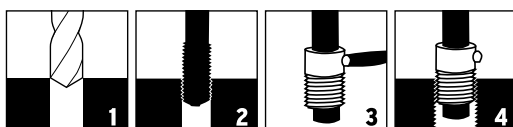
M
DIN 8140

Tol.
6H



Ø	P	Dmm.					
		1,0 Ø €	1,5 Ø €	2,0 Ø €	2,5 Ø* €	3,0 Ø* €	
M2,0	0,40	0,38	0,40	0,41	0,43	0,48	10
M2,2	0,45	0,36	0,38	0,40	0,41	0,36	10
M2,5	0,45	0,30	0,34	0,36	0,38	0,41	10
M3,0	0,50	0,27	0,28	0,30	0,38	0,41	10
M3,5	0,60	0,36	0,38	0,40	0,41	0,45	10
M4,0	0,70	0,27	0,28	0,30	0,36	0,40	10
M5,0	0,80	0,27	0,28	0,30	0,36	0,40	10
M6,0	1,00	0,27	0,28	0,30	0,36	0,40	10
M7,0	1,00	0,30	0,34	0,36	0,43	0,48	10
M8,0	1,00	0,34	0,38	0,45	0,63	0,74	5
M8,0	1,25	0,30	0,38	0,43	0,54	0,65	5
M9,0	1,25	0,47	0,54	0,66	0,83	0,96	5
M10,0	1,00	0,36	0,43	0,57	0,80	0,96	5
M10,0	1,25	0,36	0,43	0,57	0,80	0,96	5
M10,0	1,50	0,36	0,43	0,57	0,70	0,85	10
M11,0	1,50	0,48	0,76	1,02	1,39	1,72	10
M12,0	1,00	0,43	0,68	0,91	1,39	1,72	10
M12,0	1,25	0,43	0,68	0,91	1,39	1,72	10
M12,0	1,50	0,43	0,68	0,91	1,39	1,72	10
M12,0	1,75	0,43	0,68	0,91	1,23	1,53	10
M14,0	1,00	1,06	1,34	1,72	2,13	2,45	10
M14,0	1,25	1,06	1,34	1,72	2,13	2,45	10
M14,0	1,50	1,06	1,34	1,72	2,13	2,45	10
M14,0	2,00	0,75	0,95	1,21	2,13	2,45	5
M16,0	1,50	1,42	1,76	2,18	2,64	3,10	5
M16,0	2,00	1,00	1,24	1,53	2,64	3,13	5
M18,0	1,50	1,93	2,52	3,07	3,64	4,18	5
M18,0	2,00	1,93	2,52	3,09	3,64	4,16	5
M18,0	2,50	1,54	2,04	2,46	3,64	4,16	5
M20,0	1,50	2,33	3,05	3,70	4,78	5,49	5
M20,0	2,00	2,33	3,05	3,70	4,78	5,49	5
M20,0	2,50	1,87	2,44	2,96	4,78	5,49	5
M22,0	1,50	3,22	4,03	4,99	6,47	7,53	5
M22,0	2,00	3,22	4,03	4,99	6,47	7,53	5
M22,0	2,50	2,58	3,22	3,99	6,47	7,53	5
M24,0	1,50	4,03	5,28	6,42			5
M24,0	2,00	4,03	5,28	6,42			5
M24,0	3,00	4,03	5,28	6,42			5

* **Bajo pedido**
Sur commande
To-order



MODO DE EMPLEO / MODE D'EMPLOI / HOW TO USE

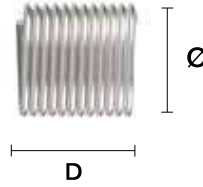
- 1- Taladrado previo / Perçage préalable / Previous drilling
- 2- Roscado previo / Taraudage préalable / Previous threading
- 3- Instalación del inserto en la herramienta / Pose de l'insert dans l'outil / Placement of the insert in the tool
- 4- Introducción del inserto en la rosca / Introduction de l'insert dans le filet / Introduction of the insert in the coil

2706

DIN 8140

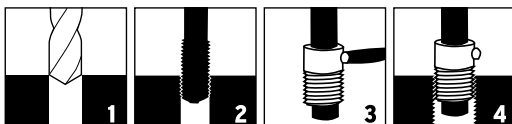
UNC
ANSI/ASME
B18.29.1

Tol.
2B



Ø	P	Dmm.					
		1,0 Ø €	1,5 Ø €	2,0 Ø €	2,5 Ø* €	3,0 Ø* €	
Nº 2	56,00	0,63	0,54	0,76	0,83	0,90	10
Nº 4	40,00	0,48	0,43	0,54	0,65	0,70	10
Nº 5	40,00	0,53	0,48	0,61	0,70	0,79	10
Nº 6	32,00	0,48	0,43	0,54	0,65	0,70	10
Nº 8	32,00	0,48	0,43	0,54	0,66	0,76	10
Nº 10	24,00	0,48	0,53	0,54	0,66	0,76	10
Nº 12	24,00	0,54	0,57	0,66	0,65	0,70	10
1/4	20,00	0,48	0,43	0,54	0,68	0,68	10
5/16	18,00	0,54	0,53	0,65	1,06	1,13	10
3/8	16,00	0,63	0,63	1,00	1,37	1,64	5
7/16	14,00	0,71	0,71	1,17	1,64	1,95	5
1/2	13,00	0,79	0,97	1,60	2,36	2,93	5
9/16	12,00	1,48	1,66	2,78	3,42	3,97	5
5/8	11,00	2,02	2,15	3,53	4,23	5,03	5
3/4	10,00	2,72	3,10	4,97	5,85	6,73	10
7/8	9,00	4,33	4,13	6,68	7,91	9,21	10
1"	8,00	5,43	5,37	8,61	11,26	12,94	10

* **Bajo pedido**
Sur commande
To-order



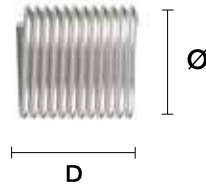
MODO DE EMPLEO / MODE D'EMPLOI / HOW TO USE


- 1- Taladrado previo / Perçage préalable / Previous drilling
- 2- Roscado previo / Taraudage préalable / Previous threading
- 3- Instalación del inserto en la herramienta / Pose de l'insert dans l'outil / Placement of the insert in the tool
- 4- Introducción del inserto en la rosca / Introduction de l'insert dans le filet / Introduction of the insert in the coil

2707 **DIN 8140**

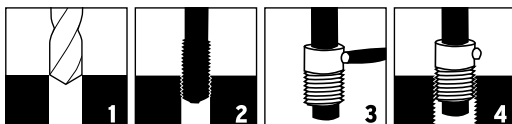
UNF
ANSI/ASME
B18.29.1

ToI.
2B



Ø	P	Dmm.					
		1,0 Ø €	1,5 Ø €	2,0 Ø €	2,5 Ø* €	3,0 Ø* €	
4	48,00	0,48	0,43	0,54	0,65	0,70	10
6	40,00	0,48	0,43	0,54	0,65	0,70	10
8	36,00	0,54	0,43	0,61	0,66	0,76	10
10	32,00	0,48	0,43	0,54	0,68	0,76	10
1/4	28,00	0,48	0,43	0,54	0,66	0,76	10
5/16	24,00	0,54	0,54	0,79	1,06	1,25	10
3/8	24,00	0,63	0,63	1,00	1,37	1,64	10
7/16	20,00	0,71	0,71	1,17	1,62	1,95	10
1/2	20,00	0,76	0,97	1,60	2,36	2,93	10
9/16	18,00	1,56	1,66	2,78	3,42	3,97	5
5/8	18,00	2,10	2,15	3,53	4,23	5,03	5
3/4	16,00	2,85	3,10	4,97	5,85	6,73	5
7/8	14,00	4,33	4,13	6,68	7,91	9,21	5
1"	12,00	5,43	5,37	8,61	11,26	12,94	5
1"1/8	12,00	9,08	9,03	13,69			10
1"1/4	12,00	10,04	15,59				10
1"3/8	12,00	11,91	11,21				10
1"1/2	12,00	12,56	13,57				

* **Bajo pedido**
Sur commande
To-order



MODO DE EMPLEO / MODE D'EMPLOI / HOW TO USE

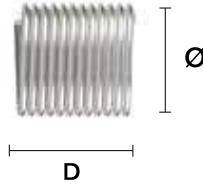
- 1- Taladrado previo / Perçage préalable / Previous drilling
- 2- Roscado previo / Taraudage préalable / Previous threading
- 3- Instalación del inserto en la herramienta / Pose de l'insert dans l'outil / Placement of the insert in the tool
- 4- Introducción del inserto en la rosca / Introduction de l'insert dans le filet / Introduction of the insert in the coil



2708 > **DIN 8140**

BSW
BS 84

Tol.
2B



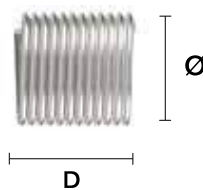
Ø	P	Dmm.					📦
		1,0 Ø €	1,5 Ø €	2,0 Ø €	2,5 Ø* €	3,0 Ø* €	
1/8	48,00	0,61	0,48	0,66	0,70	0,79	10
3/16	24,00	0,54	0,43	0,61	0,70	0,79	10
1/4	20,00	0,54	0,43	0,61	0,74	0,85	10
5/16	18,00	0,61	0,54	0,86	1,17	1,37	10
3/8	16,00	0,68	0,63	1,10	1,48	1,80	10
7/16	14,00	0,79	0,71	1,29	1,80	2,15	10
1/2	12,00	0,76	1,17	1,60	2,58	3,21	10
9/16	12,00	1,72	1,85	2,78	3,75	4,35	10
5/8	11,00	2,30	2,15	3,53	4,65	5,49	10
3/4	10,00	3,15	3,10	4,18	5,41	7,39	5
7/8	9,00	3,93	3,30	6,08	7,88	9,19	5
1"	8,00	4,94	4,31	7,84	10,23	11,76	5

* **Bajo pedido**
Sur commande
To-order

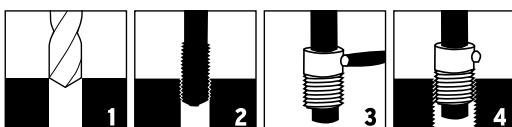
2716 > **DIN 8140**

G
ISO 229

Tol.
2B



Ø	P	Dmm.			📦
		1,0 Ø €	1,5 Ø €	2,0 Ø €	
1/8	28,00	0,57	0,82	0,90	10
1/4	19,00	0,77	1,11	1,25	10
3/8	19,00	0,69	1,26	1,43	10
1/2	14,00	1,19	1,82	1,91	10




MODO DE EMPLEO / MODE D'EMPLOI / HOW TO USE

- 1- Taladrado previo / Perçage préalable / Previous drilling
- 2- Roscado previo / Taraudage préalable / Previous threading
- 3- Instalación del inserto en la herramienta / Pose de l'insert dans l'outil / Placement of the insert in the tool
- 4- Introducción del inserto en la rosca / Introduction de l'insert dans le filet / Introduction of the insert in the coil

2709 > **Insertador / Appareil de pose manuel / Insert Tool**




n°	Ø x P mm	UNC/UNF/BSW/BSF/BSP		€
2	M 2,00 x 0,40 M 2,20 x 0,45	UNC Nº 2	1	24,75
3	M 2,50 x 0,45		1	24,75
4	M 3,00 x 0,50	UNC Nº 5, UNC/UNF Nº 4, BSW 18	1	18,68
5	M 3,50 x 0,60	UNC/UNF Nº 6	1	18,68
6	M 4,00 x 0,70	UNC, UNF Nº 8	1	18,68
7		BSW 3/16, UNC Nº 10	1	18,68
8	M 5,00 x 0,80	UNF Nº 10, UNC Nº 12, BSF 3/16	1	18,68
9	M 6,00 x 1,00	UNC, UNF 1/4, BSW, BSF 1/4	1	18,68
10	M 7,00 x 1,00		1	18,68
11	M 8,00 x 1,00 M 8,00 x 1,25	UNF, BSF 5/16 UNC, BSW 5/16	1	18,68
12	M 9,00 x 1,00 M 9,00 x 1,25		1	18,68
13	M 10,00 x 1,00 M 10,00 x 1,25 M 10,00 x 1,50	UNF, BSF 3/8 UNC, BSW 3/8 G 1/18	1	18,68
14	M 11,00 x 1,25 M 11,00 x 1,50	UNC, UNF 7/16, BSW, BSF 7/16	1	19,92
15	M 12,00 x 1,00 M 12,00 x 1,25 M 12,00 x 1,50 M 12,00 x 1,75	UNC, UNF 1/2, BSW, BSF 1/2	1	22,35
16	M 14,00 x 1,50 M 14,00 x 2,00	UNC, UNF 9/16, BSW, BSF 9/16 G 1/4, G 3/8	1	24,87
17	M 14,00 x 1,00 M 14,00 x 1,25		1	24,87
18	M 16,00 x 1,50 M 16,00 x 2,00	UNC, UNF 5/8, BSW, BSF 5/8	1	24,87
20	M 18,00 x 1,50 M 18,00 x 2,00 M 18,00 x 2,50	UNC 3/4, BSW, BSF 3/4	1	31,04
21	M 20,00 x 1,50 M 20,00 x 2,00 M 20,00 x 2,50	UNF 3/4	1	31,04
22	M 22,00 x 1,50 M 22,00 x 2,00 M 22,00 x 2,50	UNC, UNF 7/8, BSW, BSF 7/8 G 1/2	1	31,04
23	M 24,00 x 1,50 M 24,00 x 2,00 M 24,00 x 3,00	UNC, UNF 1", BSW, BSF 1"	1	49,76



2710 Rompe Arrastre / Rupteur / Tang break tool






nº	Ø x P mm	UNC/UNF/BSW/BSF/BSP		€
2	M 2,00 x 0,40 M 2,20 x 0,45	UNC Nº 2	1	5,91
3	M 2,50 x 0,45		1	5,91
4	M 3,00 x 0,50	UNC, UNF Nº 4	1	5,91
5	M 3,50 x 0,60	UNC, UNF Nº 6	1	5,91
6	M 4,00 x 0,70	UNC Nº 10, UNC/UNF Nº 8, BSF 3/16	1	5,91
8	M 5,00 x 0,80		1	7,42
9	M 6,00 x 1,00	UNC/UNF 1/4, BSW/BSF 1/4	1	7,42
	M 7,00 x 1,00			9,68
11	M 8,00 x 1,00 M 8,00 x 1,25	UNC/UNF 5/16, BSW/BSF 5/16	1	
12	M 9,00 x 1,00 M 9,00 x 1,25	BSF 3/8	1	9,68
	M 10,00 x 1,00	UNF 3/8	1	9,68
13	M 10,00 x 1,25 M 10,00 x 1,50	UNC, BSW 3/8 G 1/8		
14	M 11,00 x 1,25 M 11,00 x 1,50	UNC/UNF 7/16, BSW/BSF 7/16	1	9,68
	M 12,00 x 1,00	UNC/UNF 1/2, BSW/BSF 1/2	1	9,68
15	M 12,00 x 1,25 M 12,00 x 1,50 M 12,00 x 1,75	G 1/4		

2711 Kits / Kits

EG-M
(STI)






Ø	P				1,5D	€
M2,0	0,40	2,10	No. 2	No. 2	10	60,82
M2,5	0,45	2,60	No. 3	No. 3	10	60,26
M3,0	0,50	3,20	No. 4	No. 4	10	49,35
M3,5	0,60	3,70	No. 5	No. 5	10	50,14
M4,0	0,70	4,20	No. 6	No. 6	10	51,29
M5,0	0,80	5,20	No. 8	No. 8	10	54,20
M6,0	1,00	6,30	No. 9	No. 9	10	54,24
M7,0	1,00	7,30	No. 10	No. 11	10	64,16
M8,0	1,00	8,30	No. 11	No. 11	10	63,09
M8,0	1,25	8,30	No. 11	No. 11	10	65,52
M9,0	1,25	9,30	No. 12		10	62,69
M10,0	1,00	10,40	No. 13		10	62,31
M10,0	1,25	10,30	No. 13		10	62,31
M10,0	1,50	10,30	No. 13		10	60,66
M11,0	1,50	11,40	No. 14		5	68,25
M12,0	1,00	12,40	No. 15		5	77,05
M12,0	1,25	12,40	No. 15		5	77,05
M12,0	1,50	12,30	No. 15		5	68,37
M12,0	1,75	12,30	No. 15		5	78,68
M14,0	1,00		No. 16		5	67,60
M14,0	1,25		No. 16		5	78,68
M14,0	1,50		No. 17		5	78,68
M14,0	2,00		No. 17		5	67,60
M16,0	1,50		No. 18		5	82,51
M16,0	2,00		No. 18		5	82,51
M18,0	1,50		No. 20		5	101,79
M18,0	2,00		No. 20		5	101,79
M18,0	2,50		No. 20		5	101,79
M20,0	1,50		No. 21		5	109,33
M20,0	2,00		No. 21		5	109,33
M20,0	2,50		No. 21		5	109,33
M22,0	1,50		No. 22		5	120,92
M22,0	2,00		No. 22		5	120,92
M22,0	2,50		No. 22		5	120,92
M24,0	1,50		No. 23		5	160,74
M24,0	2,00		No. 23		5	160,74
M24,0	3,00		No. 23		5	160,74



2712 Kits / Kits

EG-UNC
(STI)







	Ø	P				1,5D	€
Nº2		56,00	2,10	No. 2	No. 2	10	70,79
Nº4		40,00	2,60	No. 3	No. 3	10	63,58
Nº6		32,00	3,20	No. 4	No. 4	10	63,74
Nº8		32,00	3,70	No. 5	No. 5	10	63,96
Nº10		24,00	4,20	No. 6	No. 6	10	58,37
Nº12		24,00	5,20	No. 8	No. 8	10	60,36
1/4		20,00	6,30	No. 9	No. 9	10	59,72
5/16		18,00	7,30	No. 10	No. 11	10	65,08
3/8		16,00	8,30	No. 11	No. 11	10	59,12
7/16		14,00	8,30	No. 11	No. 11	10	67,17
1/2		13,00	9,30	No. 12		10	72,84
9/16		12,00	10,40	No. 13		10	84,05
5/8		11,00	10,30	No. 13		10	94,22
3/4		10,00	10,30	No. 13		10	120,55
7/8		9,00	11,40	No. 14		5	135,36
1"		8,00	12,40	No. 15		5	160,30

2713

Kits / Kits

**EG-UNF
 (STI)**







	Ø	P				1,5D 	€
Nº4		48,00	2,10	No. 2	No. 2	10	65,71
Nº6		40,00	2,60	No. 3	No. 3	10	66,17
Nº8		36,00	3,20	No. 4	No. 4	10	66,39
Nº10		32,00	3,70	No. 5	No. 5	10	61,15
1/4		28,00	4,20	No. 6	No. 6	10	62,15
5/16		24,00	5,20	No. 8	No. 8	10	67,70
3/8		24,00	6,30	No. 9	No. 9	10	61,55
7/16		20,00	7,30	No. 10	No. 11	10	77,57
1/2		20,00	8,30	No. 11	No. 11	10	84,99
9/16		18,00	8,30	No. 11	No. 11	10	96,21
5/8		18,00	9,30	No. 12		10	106,37
3/4		16,00	10,40	No. 13		10	157,01
7/8		14,00	10,30	No. 13		10	171,81
1"		12,00	10,30	No. 13		10	196,77



2714 Kits / Kits

EG-W
(STI)







Ø	P				1,5D	
						€
1/8	40,00	2,10	No. 2	No. 2	10	59,54
3/16	24,00	2,60	No. 3	No. 3	10	62,15
1/4	20,00	3,20	No. 4	No. 4	10	62,15
5/16	18,00	3,70	No. 5	No. 5	10	67,70
3/8	16,00	4,20	No. 6	No. 6	10	61,55
7/16	14,00	5,20	No. 8	No. 8	10	77,57
1/2	12,00	6,30	No. 9	No. 9	10	85,97
9/16	12,00	7,30	No. 10	No. 11	10	97,19
5/8	11,00	8,30	No. 11	No. 11	10	106,37
3/4	10,00	8,30	No. 11	No. 11	10	157,01
7/8	9,00	9,30	No. 12		10	167,71
1"	8,00	10,40	No. 13		10	191,40

2717 Kits / Kits

EG-G
(STI)







Ø	P				1,5D	
						€
1/8	28,00	2,10	No. 2	No. 2	10	98,41
1/4	19,00	2,60	No. 3	No. 3	10	103,91
3/8	19,00	3,20	No. 4	No. 4	10	119,42
1/2	14,00	3,70	No. 5	No. 5	10	156,99

7167

Multi-kits / Multi-kits

EG-M
(ST)



Ø	P				1,5D 
M5,0	0,80	2,10	No. 2	No. 2	10
M6,0	1,00	2,60	No. 3	No. 3	10
M8,0	1,25	3,20	No. 4	No. 4	10
M10,0	1,50	3,70	No. 5	No. 5	10
M12,0	1,75	4,20	No. 6	No. 6	10

€ 383,21



2901/1

DIN ISO 1502

PASA
NO
PASA

CTPNP

M-MF
DIN 13

Tol.
6H



Ø	P	€		Ø	P	€		Ø	P	€	
M1,0	0,25	305,45	1	M12,0	0,75	171,82	1	M27,0	1,50	237,27	1
M1,1	0,25	305,45	1	M12,0	1,00	163,64	1	M27,0	2,00	237,27	1
M1,2	0,25	291,82	1	M12,0	1,25	171,82	1	M27,0	3,00	196,36	1
M1,4	0,30	291,82	1	M12,0	1,50	174,55	1	M30,0	1,00	291,82	1
M1,6	0,35	245,45	1	M12,0	1,75	117,27	1	M30,0	1,50	261,82	1
M1,8	0,35	215,45	1	M14,0	1,00	171,82	1	M30,0	2,00	261,82	1
M2,0	0,40	139,09	1	M14,0	1,25	185,45	1	M30,0	3,00	300,00	1
M2,2	0,45	199,29	1	M14,0	1,50	160,91	1	M30,0	3,50	215,45	1
M2,5	0,45	122,73	1	M14,0	2,00	125,45	1	M32,0	1,00	291,82	1
M3,0	0,50	114,55	1	M16,0	1,00	185,45	1	M32,0	1,50	267,27	1
M4,0	0,50	226,36	1	M16,0	1,50	166,36	1	M32,0	2,00	267,27	1
M4,0	0,70	109,09	1	M16,0	2,00	133,64	1	M33,0	1,00	294,55	1
M4,5	0,75	120,58	1	M18,0	1,00	188,18	1	M33,0	1,50	272,73	1
M5,0	0,50	220,91	1	M18,0	1,50	174,55	1	M33,0	2,00	272,73	1
M5,0	0,80	106,36	1	M18,0	2,50	144,55	1	M33,0	3,00	308,18	1
M6,0	0,50	220,91	1	M20,0	1,00	201,82	1	M33,0	3,50	237,27	1
M6,0	0,75	150,00	1	M20,0	1,50	185,45	1	M36,0	1,00	316,36	1
M6,0	1,00	100,91	1	M20,0	2,00	185,45	1	M36,0	1,50	291,82	1
M7,0	1,00	100,91	1	M20,0	2,50	155,45	1	M36,0	2,00	291,82	1
M8,0	0,50	220,91	1	M22,0	1,00	223,64	1	M36,0	3,00	291,82	1
M8,0	0,75	160,91	1	M22,0	1,50	207,27	1	M36,0	4,00	256,36	1
M8,0	1,00	144,55	1	M22,0	2,50	160,91	1	M39,0	1,50	316,36	1
M8,0	1,25	106,36	1	M24,0	1,00	240,00	1	M39,0	2,00	316,36	1
M9,0	1,25	109,09	1	M24,0	1,50	218,18	1	M39,0	3,00	370,91	1
M10,0	0,50	237,27	1	M24,0	2,00	218,18	1	M39,0	4,00	278,18	1
M10,0	0,75	163,64	1	M24,0	3,00	180,00	1	M40,0	1,50	335,45	1
M10,0	1,00	150,00	1	M25,0	1,00	245,45	1	M40,0	2,00	335,45	1
M10,0	1,25	177,27	1	M25,0	1,50	223,64	1	M40,0	3,00	376,36	1
M10,0	1,50	111,82	1	M25,0	2,00	223,64	1				
M12,0	0,50	253,64	1	M27,0	1,00	259,09	1				

2901/4

DIN ISO 1502

PASA

CTP

M-MF
DIN 13

Tol.
6H



∅	P	€	
M42,0	1,50	196,36	1
M42,0	2,00	196,36	1
M42,0	3,00	226,36	1
M42,0	4,50	188,18	1
M45,0	1,50	204,55	1
M45,0	2,00	207,27	1
M45,0	3,00	237,27	1

∅	P	€	
M45,0	4,50	201,82	1
M48,0	1,50	212,73	1
M48,0	2,00	218,18	1
M48,0	3,00	248,18	1
M48,0	5,00	218,18	1
M50,0	1,50	223,64	1
M50,0	2,00	226,36	1

∅	P	€	
M50,0	3,00	259,09	1
M52,0	1,50	229,09	1
M52,0	2,00	237,27	1
M52,0	3,00	272,73	1
M52,0	5,00	229,09	1

2901/5

DIN ISO 1502

NO
PASA

CTNP

M-MF
DIN 13

Tol.
6H



∅	P	€	
M42,0	1,50	196,36	1
M42,0	2,00	196,36	1
M42,0	3,00	226,36	1
M42,0	4,50	188,18	1
M45,0	1,50	204,55	1
M45,0	2,00	207,27	1
M45,0	3,00	237,27	1

∅	P	€	
M45,0	4,50	201,82	1
M48,0	1,50	212,73	1
M48,0	2,00	218,18	1
M48,0	3,00	248,18	1
M48,0	5,00	218,18	1
M50,0	1,50	223,64	1
M50,0	2,00	226,36	1

∅	P	€	
M50,0	3,00	259,09	1
M52,0	1,50	229,09	1
M52,0	2,00	237,27	1
M52,0	3,00	272,73	1
M52,0	5,00	229,09	1

2901/2

DIN ISO 1502

PASA

CAP

M-MF
DIN 13

Tol.
6g



Ø	P	€		Ø	P	€		Ø	P	€	
M2,0	0,40	155,45	1	M16,0	1,50	174,55	1	M33,0	3,00	319,09	1
M2,2	0,45	182,73	1	M16,0	2,00	169,09	1	M33,0	3,50	324,55	1
M2,5	0,45	120,00	1	M18,0	1,00	201,82	1	M36,0	1,00	354,55	1
M3,0	0,50	117,27	1	M18,0	1,50	188,18	1	M36,0	1,50	313,64	1
M4,0	0,50	242,73	1	M18,0	2,50	193,64	1	M36,0	2,00	330,00	1
M4,0	0,70	109,09	1	M20,0	1,00	215,45	1	M36,0	3,00	368,18	1
M4,5	0,75	109,09	1	M20,0	1,50	201,82	1	M36,0	4,00	349,09	1
M5,0	0,50	242,73	1	M20,0	2,00	215,45	1	M39,0	1,50	346,36	1
M5,0	0,80	109,09	1	M20,0	2,50	215,45	1	M39,0	2,00	360,00	1
M6,0	0,50	242,73	1	M22,0	1,00	264,55	1	M39,0	3,00	373,64	1
M6,0	0,75	150,00	1	M22,0	1,50	215,45	1	M39,0	4,00	379,09	1
M6,0	1,00	109,09	1	M22,0	2,50	231,82	1	M40,0	1,50	346,36	1
M7,0	1,00	139,09	1	M24,0	1,00	250,91	1	M40,0	2,00	368,18	1
M8,0	0,50	234,55	1	M24,0	1,50	234,55	1	M40,0	3,00	384,55	1
M8,0	0,75	169,09	1	M24,0	2,00	242,73	1	M42,0	1,50	360,00	1
M8,0	1,00	130,91	1	M24,0	3,00	245,45	1	M42,0	2,00	300,00	1
M8,0	1,25	109,09	1	M25,0	1,00	294,55	1	M42,0	3,00	395,45	1
M9,0	1,25	150,00	1	M25,0	1,50	240,00	1	M42,0	4,50	411,82	1
M10,0	0,50	270,00	1	M25,0	2,00	242,73	1	M45,0	1,50	379,09	1
M10,0	0,75	188,18	1	M27,0	1,00	316,36	1	M45,0	2,00	308,18	1
M10,0	1,00	144,55	1	M27,0	1,50	250,91	1	M45,0	3,00	400,91	1
M10,0	1,25	177,27	1	M27,0	2,00	264,55	1	M45,0	4,50	436,36	1
M10,0	1,50	122,73	1	M27,0	3,00	272,73	1	M48,0	1,50	400,91	1
M12,0	0,50	308,18	1	M30,0	1,00	300,00	1	M48,0	2,00	313,64	1
M12,0	0,75	223,64	1	M30,0	1,50	270,00	1	M48,0	3,00	414,55	1
M12,0	1,00	163,64	1	M30,0	2,00	270,00	1	M48,0	5,00	460,91	1
M12,0	1,25	199,09	1	M30,0	3,00	302,73	1	M50,0	1,50	414,55	1
M12,0	1,50	155,45	1	M30,0	3,50	300,00	1	M50,0	2,00	327,27	1
M12,0	1,75	141,82	1	M32,0	1,00	321,82	1	M50,0	3,00	425,45	1
M14,0	1,00	174,55	1	M32,0	1,50	289,09	1	M52,0	1,50	436,36	1
M14,0	1,25	250,91	1	M32,0	2,00	289,09	1	M52,0	2,00	335,45	1
M14,0	1,50	160,91	1	M33,0	1,00	330,00	1	M52,0	3,00	463,64	1
M14,0	2,00	155,45	1	M33,0	1,50	294,55	1	M52,0	5,00	496,36	1
M16,0	1,00	188,18	1	M33,0	2,00	300,00	1				

2901/3

DIN ISO 1502

**NO
PASA**

CANP

**M-MF
DIN 13**

**Tol.
6g**



Ø	P	€	☐	Ø	P	€	☐	Ø	P	€	☐
M2,0	0,40	155,45	1	M16,0	1,50	174,55	1	M33,0	3,00	319,09	1
M2,2	0,45	182,73	1	M16,0	2,00	169,09	1	M33,0	3,50	324,55	1
M2,5	0,45	120,00	1	M18,0	1,00	201,82	1	M36,0	1,00	354,55	1
M3,0	0,50	117,27	1	M18,0	1,50	188,18	1	M36,0	1,50	313,64	1
M4,0	0,50	242,73	1	M18,0	2,50	193,64	1	M36,0	2,00	330,00	1
M4,0	0,70	109,09	1	M20,0	1,00	215,45	1	M36,0	3,00	349,09	1
M4,5	0,75	109,09	1	M20,0	1,50	201,82	1	M36,0	4,00	349,09	1
M5,0	0,50	242,73	1	M20,0	2,00	215,45	1	M39,0	1,50	346,36	1
M5,0	0,80	109,09	1	M20,0	2,50	215,45	1	M39,0	2,00	360,00	1
M6,0	0,50	242,73	1	M22,0	1,00	264,55	1	M39,0	3,00	373,64	1
M6,0	0,75	150,00	1	M22,0	1,50	215,45	1	M39,0	4,00	379,09	1
M6,0	1,00	109,09	1	M22,0	2,50	231,82	1	M40,0	1,50	346,36	1
M7,0	1,00	139,09	1	M24,0	1,00	250,91	1	M40,0	2,00	368,18	1
M8,0	0,50	234,55	1	M24,0	1,50	234,55	1	M40,0	3,00	384,55	1
M8,0	0,75	169,09	1	M24,0	2,00	242,73	1	M42,0	1,50	360,00	1
M8,0	1,00	130,91	1	M24,0	3,00	245,45	1	M42,0	2,00	300,00	1
M8,0	1,25	109,09	1	M25,0	1,00	294,55	1	M42,0	3,00	395,45	1
M9,0	1,25	150,00	1	M25,0	1,50	240,00	1	M42,0	4,50	411,82	1
M10,0	0,50	270,00	1	M25,0	2,00	242,73	1	M45,0	1,50	379,09	1
M10,0	0,75	188,18	1	M27,0	1,00	316,36	1	M45,0	2,00	308,18	1
M10,0	1,00	144,55	1	M27,0	1,50	250,91	1	M45,0	3,00	400,91	1
M10,0	1,25	177,27	1	M27,0	2,00	264,55	1	M45,0	4,50	436,36	1
M10,0	1,50	122,73	1	M27,0	3,00	272,73	1	M48,0	1,50	400,91	1
M12,0	0,50	308,18	1	M30,0	1,00	300,00	1	M48,0	2,00	313,64	1
M12,0	0,75	223,64	1	M30,0	1,50	270,00	1	M48,0	3,00	414,55	1
M12,0	1,00	163,64	1	M30,0	2,00	270,00	1	M48,0	5,00	460,91	1
M12,0	1,25	199,09	1	M30,0	3,00	302,73	1	M50,0	1,50	414,55	1
M12,0	1,50	155,45	1	M30,0	3,50	300,00	1	M50,0	2,00	327,27	1
M12,0	1,75	141,82	1	M32,0	1,00	321,82	1	M50,0	3,00	425,45	1
M14,0	1,00	174,55	1	M32,0	1,50	289,09	1	M52,0	1,50	436,36	1
M14,0	1,25	250,91	1	M32,0	2,00	289,09	1	M52,0	2,00	335,45	1
M14,0	1,50	160,91	1	M33,0	1,00	330,00	1	M52,0	3,00	463,64	1
M14,0	2,00	155,45	1	M33,0	1,50	294,55	1	M52,0	5,00	496,36	1
M16,0	1,00	188,18	1	M33,0	2,00	300,00	1				

2902/1

ISO 228-2

PASA
NO
PASA

CTPNP

G
ISO 228



Ø	P	€	
1/8	28,00	160,91	1
1/4	19,00	171,82	1
3/8	19,00	199,09	1

Ø	P	€	
1/2	14,00	226,36	1
5/8	14,00	240,00	1
3/4	14,00	261,82	1

Ø	P	€	
7/8	14,00	291,82	1
1"	11,00	308,18	1
1"1/8	7,00	349,09	1

2902/4

ISO 228-2

PASA

CTP

G
ISO 228



Ø	P	€	
1"1/4	11,00	215,45	1
1"1/2	11,00	250,91	1

Ø	P	€	
1"3/4	11,00	283,64	1
2"	11,00	310,91	1

Ø	P	€	
2"1/4	11,00	338,18	1
2"1/2	11,00	390,00	1

2902/5

ISO 228-2

NO
PASA

CTNP

G
ISO 228



Ø	P	€	
1"1/4	11,00	215,45	1
1"1/2	11,00	250,91	1

Ø	P	€	
1"3/4	11,00	283,64	1
2"	11,00	310,91	1

Ø	P	€	
2"1/4	11,00	338,18	1
2"1/2	11,00	390,00	1

2902/2

DIN ISO 228-2

PASA

CAP

Tol.
A

G
ISO 228



∅	P	€	
1/8	28,00	177,27	1
1/4	19,00	207,27	1
3/8	19,00	248,18	1
1/2	14,00	240,00	1
5/8	14,00	259,09	1

∅	P	€	
3/4	14,00	275,45	1
7/8	14,00	310,91	1
1"	11,00	340,91	1
1*1/8	11,00	387,27	1
1*1/4	11,00	422,73	1

∅	P	€	
1*1/2	11,00	474,55	1
1*3/4	11,00	523,64	1
2"	11,00	578,18	1
2*1/4	11,00	624,55	1
2*1/2	11,00	709,09	1

2902/3

DIN ISO 228-2

NO
PASA

CANP

Tol.
A

G
ISO 228



∅	P	€	
1/8	28,00	177,27	1
1/4	19,00	207,27	1
3/8	19,00	248,18	1
1/2	14,00	240,00	1
5/8	14,00	259,09	1

∅	P	€	
3/4	14,00	275,45	1
7/8	14,00	310,91	1
1"	11,00	340,91	1
1*1/8	11,00	387,27	1
1*1/4	11,00	422,73	1

∅	P	€	
1*1/2	11,00	474,55	1
1*3/4	11,00	523,64	1
2"	11,00	578,18	1
2*1/4	11,00	624,55	1
2*1/2	11,00	709,09	1

2903/1 > **BS 919**

PASA
NO
PASA

CTPNP

BSW
BS 84



∅	P	€		∅	P	€		∅	P	€	
1/8	40,00	240,00	1	1/2	12,00	240,00	1	7/8	9,00	346,36	1
1/4	20,00	210,00	1	5/8	11,00	270,00	1	1	8,00	398,18	1
3/8	16,00	220,91	1	3/4	10,00	310,91	1				

2903/2 > **BS 919**

PASA

CAP

BSW
BS 84



∅	P	€		∅	P	€		∅	P	€	
1/8	40,00	199,09	1	1/2	12,00	212,73	1	7/8	9,00	330,00	1
1/4	20,00	169,09	1	5/8	11,00	248,18	1	1	8,00	368,18	1
3/8	16,00	190,91	1	3/4	10,00	289,09	1				

2903/3 > **BS 919**

NO
PASA

CANP

BSW
BS 84



∅	P	€		∅	P	€		∅	P	€	
1/8	40,00	199,09	1	1/2	12,00	212,73	1	7/8	9,00	330,00	1
1/4	20,00	169,09	1	5/8	11,00	248,18	1	1	8,00	368,18	1
3/8	16,00	190,91	1	3/4	10,00	289,09	1				

2904/1

ANSI / ASME B1.2

PASA
NO
PASA

CTPNP

UNC
ANSI/ASME
B1.1

Tol.
2B



Ø	P	€		Ø	P	€		Ø	P	€	
Nº4	40,00	245,45	1	5/16	18,00	147,27	1	7/8	9,00	234,55	1
Nº5	40,00	259,09	1	3/8	16,00	147,27	1	1	8,00	261,82	1
Nº6	32,00	155,45	1	7/16	14,00	155,45	1	1,1/8	7,00	289,09	1
Nº8	32,00	150,00	1	1/2	13,00	166,36	1	1,1/4	7,00	313,64	1
Nº10	24,00	147,27	1	9/16	12,00	171,82	1	1*3/8	6,00	338,18	1
Nº12	24,00	141,82	1	5/8	11,00	185,45	1	1*1/2	6,00	373,64	1
1/4	20,00	141,82	1	3/4	10,00	207,27	1				

2904/2

ANSI / ASME B1.2

PASA

CAP

UNC
ANSI/ASME
B1.1

Tol.
2A



Ø	P	€		Ø	P	€		Ø	P	€	
Nº4	40,00	226,36	1	5/16	18,00	155,45	1	7/8	9,00	316,36	1
Nº5	40,00	169,09	1	3/8	16,00	166,36	1	1	8,00	354,55	1
Nº6	32,00	166,36	1	7/16	14,00	177,27	1	1,1/8	7,00	392,73	1
Nº8	32,00	155,45	1	1/2	13,00	199,09	1	1,1/4	7,00	450,00	1
Nº10	24,00	150,00	1	9/16	12,00	220,91	1	1*3/8	6,00	496,36	1
Nº12	24,00	144,55	1	5/8	11,00	240,00	1	1*1/2	6,00	529,09	1
1/4	20,00	144,55	1	3/4	10,00	272,73	1				

2904/3

ANSI / ASME B1.2

NO
PASA

CANP

UNC
ANSI/ASME
B1.1

Tol.
2A



Ø	P	€		Ø	P	€		Ø	P	€	
Nº4	40,00	226,36	1	5/16	18,00	155,45	1	7/8	9,00	316,36	1
Nº5	40,00	169,09	1	3/8	16,00	166,36	1	1	8,00	354,55	1
Nº6	32,00	166,36	1	7/16	14,00	177,27	1	1,1/8	7,00	392,73	1
Nº8	32,00	155,45	1	1/2	13,00	199,09	1	1,1/4	7,00	450,00	1
Nº10	24,00	150,00	1	9/16	12,00	220,91	1	1*3/8	7,00	496,36	1
Nº12	24,00	144,55	1	5/8	11,00	240,00	1	1*1/2	7,00	529,09	1
1/4	20,00	144,55	1	3/4	10,00	272,73	1				

2905/1

ANSI / ASME B1.2

PASA
NO
PASA

CTPNP

UNF
ANSI/ASME
B1.1

ToL.
2B



Ø	P	€		Ø	P	€		Ø	P	€	
N°4	48,00	245,45	1	3/8	24,00	147,27	1	7/8	14,00	215,45	1
N°5	44,00	160,91	1	5/16	24,00	147,27	1	1"	12,00	240,00	1
N°6	40,00	155,45	1	1/2	20,00	166,36	1	1"1/8	12,00	261,82	1
N°8	36,00	150,00	1	7/16	20,00	155,45	1	1"1/4	12,00	275,45	1
N°10	32,00	147,27	1	5/8	18,00	177,27	1	1"3/8	8,00	300,00	1
N°12	28,00	165,79	1	9/16	18,00	171,82	1	1"1/2	12,00	330,00	1
1/4	28,00	141,82	1	3/4	16,00	196,36	1				

2905/2

ANSI / ASME B1.2

PASA

CAP

UNF
ANSI/ASME
B1.1

ToL.
2A



Ø	P	€		Ø	P	€		Ø	P	€	
N°4	48,00	223,64	1	3/8	24,00	166,36	1	7/8	14,00	316,36	1
N°5	44,00	169,09	1	5/16	24,00	155,45	1	1"	12,00	354,55	1
N°6	40,00	166,36	1	1/2	20,00	199,09	1	1"1/8	12,00	414,55	1
N°8	36,00	155,45	1	7/16	20,00	177,27	1	1"1/4	12,00	450,00	1
N°10	32,00	150,00	1	5/8	18,00	240,00	1	1"3/8	8,00	496,36	1
N°12	28,00	150,00	1	9/16	18,00	220,91	1	1"1/2	12,00	529,09	1
1/4	28,00	144,55	1	3/4	16,00	272,73	1				

2905/3

ANSI / ASME B1.2

NO
PASA

CANP

UNF
ANSI/ASME
B1.1

Tol.
2A



∅	P	€		∅	P	€		∅	P	€	
N°4	48,00	223,64	1	3/8	24,00	166,36	1	7/8	14,00	316,36	1
N°5	44,00	169,09	1	5/16	24,00	155,45	1	1"	12,00	354,55	1
N°6	40,00	166,36	1	1/2	20,00	199,09	1	1*1/8	12,00	414,55	1
N°8	36,00	155,45	1	7/16	20,00	177,27	1	1*1/4	12,00	450,00	1
N°10	32,00	150,00	1	5/8	18,00	240,00	1	1*3/8	8,00	496,36	1
N°12	28,00	150,00	1	9/16	18,00	220,91	1	1*1/2	12,00	529,09	1
1/4	28,00	144,55	1	3/4	16,00	272,73	1				

2906/1

ANSI / ASME B1.20.1

PASA
NO
PASA

CTPNP

NPT
ANSI/ASME
B1.1



∅	P	€		∅	P	€	
1/16	27,00	313,64	1	3/4	14,00	471,82	1
1/8	27,00	343,64	1	1	11,50	542,73	1
1/4	18,00	362,73	1	1*1/4	11,50	646,36	1
3/8	18,00	390,00	1	1*1/2	11,50	722,73	1
1/2	14,00	422,73	1	2"	11,50	938,57	1

2906/2

ANSI / ASME B1.20.1

PASA
NO
PASA

CAPNP

NPT
ANSI/ASME
B1.1



∅	P	€		∅	P	€	
1/16	27,00	544,17	1	3/4	14,00	673,64	1
1/8	27,00	572,73	1	1	11,50	758,18	1
1/4	18,00	600,00	1	1*1/4	11,50	886,36	1
3/8	18,00	570,00	1	1*1/2	11,50	979,09	1
1/2	14,00	616,36	1	2"	11,50	1.189,09	1

2907/1

DIN 7162

PASA
NO
PASA

H7

CTLPNP



∅	€	
1	73,64	1
2	81,82	1
3	81,82	1
4	73,64	1
5	73,64	1
6	73,64	1
7	68,18	1
8	68,18	1
9	68,18	1
10	68,18	1
11	79,09	1
12	79,09	1
13	79,09	1
14	79,09	1
15	84,55	1
16	84,55	1
17	84,55	1
18	84,55	1

∅	€	
19	95,45	1
20	95,45	1
21	95,45	1
22	95,45	1
23	100,91	1
24	100,91	1
25	100,91	1
26	100,91	1
27	100,91	1
28	111,82	1
30	111,82	1
32	111,82	1
33	125,45	1
34	125,45	1
35	125,45	1
36	125,45	1
37	125,45	1
38	125,45	1

∅	€	
40	133,64	1
42	133,64	1
44	150,00	1
45	150,00	1
46	150,00	1
47	150,00	1
48	150,00	1
50	185,45	1
52	185,45	1
55	185,45	1
58	226,36	1
60	226,36	1
62	226,36	1
65	242,73	1
68	242,73	1
70	242,73	1

2907/4

DIN 7162

PASA

H7

CTLP



∅	€	
72	160,91	1
75	160,91	1
78	177,27	1
80	177,27	1

2907/5

DIN 7162

NO
PASA

H7

CTLNP



∅	€	
72	160,91	1
75	160,91	1
78	177,27	1
80	177,27	1

2907/2

DIN 2250-C

CAL



∅	€	
4	250,91	1
5	250,91	1
6	201,82	1
7	201,82	1
8	201,82	1
9	201,82	1
10	201,82	1
11	207,27	1
12	207,27	1
13	207,27	1
14	207,27	1
15	226,36	1
16	226,36	1
17	226,36	1
18	226,36	1
19	234,55	1
20	234,55	1
21	234,55	1
22	234,55	1

∅	€	
23	248,18	1
24	248,18	1
25	248,18	1
26	248,18	1
27	248,18	1
28	261,82	1
30	261,82	1
32	261,82	1
33	283,64	1
34	283,64	1
35	283,64	1
36	283,64	1
37	283,64	1
38	283,64	1
40	308,18	1
42	308,18	1
44	321,82	1
45	321,82	1
46	321,82	1

∅	€	
47	321,82	1
48	321,82	1
50	340,91	1
52	340,91	1
55	340,91	1
58	360,00	1
60	360,00	1
62	360,00	1
65	379,09	1
68	379,09	1
70	379,09	1
72	403,64	1
75	403,64	1
78	441,82	1
80	441,82	1
82	441,82	1
85	488,18	1
90	488,18	1

2801 > Giramachos / Tourne-à-gauche / Tap turners



∅	Nº	€	mm	
M1 - M12	1	17,78	2,00 - 6,30	1
M4 - M12	2	23,76	3,00 - 9,00	1
M5 - M20	3	33,81	4,90 - 12,00	1
M10 - M27	4	53,94	5,50 - 16,00	1

∅	Nº	€	mm	
M13 - M32	5	113,38	7,00 - 20,00	1
M18 - M42	6	113,38	11,00 - 24,00	1
M25 - M52	7	196,58	16,00 - 32,00	1
M45 - M60	8	284,10	25,00 - 36,00	1

2802 > Volvedor / Porte-filières / Tap wrench



∅ Ext.	H mm	€	
16,00	5,00	9,86	1
20,00	5,00	10,08	1
20,00	7,00	10,10	1
20,60	6,35	10,08	1
25,00	9,00	11,99	1
25,40	9,50	11,99	1
30,00	11,00	13,51	1
38,00	14,00	17,81	1
38,10	12,70	17,81	1
45,00	14,00	22,13	1
45,00	18,00	22,13	1

∅ Ext.	H mm	€	
50,80	15,90	28,97	1
55,00	16,00	28,97	1
55,00	22,00	28,97	1
65,00	18,00	44,50	1
65,00	25,00	44,50	1
75,00	20,00	71,18	1
75,00	30,00	71,17	1
90,00	22,00	90,15	1
90,00	36,00	90,16	1
105,00	22,00	96,26	1
105,00	36,00	96,27	1

2803 > Giramacho T / Tourne-à-gauche en T / Tap turner in T



M DIN	M ISO	€	L mm	gr	mm	
M3 - 10	M3 - 6	20,58	85	180	2,60 - 5,50	1
M5 - 12	M6 - 12	26,85	110	300	4,60 - 8,00	1
M13 - 20	M14 - 20	104,10	117	400	9,00 - 12,50	1

2804 Giramacho T / Tourne-à-gauche en T / Tap turner in T



M DIN	M ISO	€	L mm	gr	mm	
M3-10	M3-6	32,95	250	250	2,60 - 5,50	1
M5-12	M6-12	39,27	300	440	4,60 - 8,00	1

2805 Extractor / Extracteur



M	Z	€	
M3	3	33,30	1
M4	3	33,30	1
M5	3	33,30	1
M6	3	34,14	1
M8	4,3	35,98	1

M	Z	€	
M10	4,3	37,33	1
M12	4,3	40,20	1
M14	4,3	55,37	1
M16	4,3	60,38	1

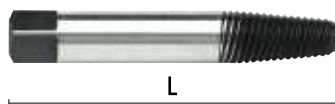
2808 Alargador / Adaptateur / Extension piece



mm	€	L mm	
2,10	6,45	60	1
2,40	6,45	60	1
2,70	6,45	80	1
3,00	6,45	90	1
3,40	10,10	95	1
3,80	10,58	95	1
4,30	11,28	110	1
4,90	11,77	110	1
5,50	12,33	115	1
6,20	15,90	120	1
7,00	16,57	125	1

mm	€	L mm	
8,00	18,78	130	1
9,00	22,21	130	1
10,00	26,83	130	1
11,00	31,09	150	1
12,00	33,51	155	1
13,00	46,29	155	1
14,50	53,16	175	1
16,00	56,22	180	1
18,00	64,09	200	1
20,00	85,42	220	1

2834 Extractor / Extracteur



M	∅ mm	€	L mm	mm	
M3 - 6	1,80 - 7,00	2,23	50	2,70	1
M6 - 8	3,20 - 10,00	2,23	57	3,80	1
M8 - 11	4,50 - 13,00	2,64	64	4,90	1
M11 - 14	6,50 - 16,00	3,26	71	7,00	1
M14 - 18	8,50 - 21,00	4,22	79	9,00	1
M18 - 24	12,00	6,79	85	12,00	1
M24 - 33	15,30	10,43	92	14,50	1
M33 - 45	20,00	15,25	100	18,00	1

JUEGOS / JEUX / SETS			
M	Pcs.	€	
M3 - 18	5	16,76	1
M3 - 24	6	23,66	1
M3 - 45	8	49,57	1

2846 Aceite de corte uso general / Huile de coupe usage général / Cutting oil for general uses



Envase / Emballage / Packaging	Litr.	€	
Aerosol / Pulvérisateur / Spray	400 ml	19,04	1
Granel / Vrac / Bulk	1 l.	25,76	1
Granel / Vrac / Bulk	5 l.	93,48	1

2821 Macho N°3 / Taraud / Tap

M
DIN 13

HSS



HSSCO



HSSCO INOX



	Machos Tarauds / Taps	Brocas Forets / Drill-bits	Giramachos n° Tourne-à-gauche n° Tap turner n°	€
HSS	M3-4-5-6-8-10-12	2,50-3,30-4,20-5,00-6,80-8,50-10,20	1,50	90,24
HSSCO	M3-4-5-6-8-10-12	2,50-3,30-4,20-5,00-6,80-8,50-10,20	1,50	154,36
HSSCO INOX	M3-4-5-6-8-10-12	2,50-3,30-4,20-5,00-6,80-8,50-10,20	1,50	156,15

2822/2840 Juegos de machos / Jeux de taraud / Tap set

M
DIN 13

>2822



>2840



Ref.	Machos Tarauds / Taps	Brocas Forets / Drill-bits	€
2822	M3-4-5-6-8-10-12	-	137,20
2840	M3-4-5-6-8-10-12	2,50-3,30-4,20-5,00-6,80-8,50-10,20	200,28



2824 M3-12

Form.
B
"Gun"

M
3-4-5-6-8-10-12


7

>HSS E

>HSSE-PM

>HSSE VAP

>HSSE TIN



REF.	€
HSS E	134,80
HSSE-PM	209,93
HSSE VAP	124,12
HSSE TIN	185,20

2825 M3-12



M
3-4-5-6-8-10-12


7

>HSS E

>HSSE-PM

>HSSE VAP

>HSSE TIN



REF.	€
HSS E	139,50
HSSE-PM	229,27
HSSE VAP	150,38
HSSE TIN	194,68

2850 M3-12

Form
B

M
3-4-5-6-8-10-12

\emptyset
2,5-3-3,4-2-5-6,
8-8,5-10,2


14

>HSSE + HSSCO

>HSSEVAP + HSSCO



REF.	€
HSSE+HSSCO	166,99
HSSEVAP(INOX)+HSSCO	202,38

2851 M3-12



M
3-4-5-6-8-10-12

\emptyset
2,5-3-3,4-2-5-6,
8-8,5-10,2


14

>HSSE + HSSCO

>HSSEVAP + HSSCO



REF.	€
HSSE+HSSCO	171,70
HSSEVAP(INOX)+HSSCO	221,33

2809/2810

M3-12

M
DIN 13

>2809



>2810



Ref.	Machos y cojinetes Tarauds et filières Taps and bearing	Brocas Forets/Drill-bits	Volvedores Porte-filières Tap wrench	Giramachos nº Tourne-à-gauche nº Tap turner nº	Carraca nº Cliquet nº Ratchet nº	€
2809	M3-4-5-6-8-10-12	2,50-3,30-4,20-5,00-6,80-8,50-10,20	20x5-20x7-25x9-30x11-38x40	1-2	-	338,85
2810	M3-4-5-6-8-10-12	-	25x9	1-1/2	1	231,54

2811/2812

M3-20 / M5-20

M
DIN 13

>2811/2812



Ref.	Machos y cojinetes Tarauds et filières Taps and bearing	Brocas Forets/Drill-bits	Volvedores Porte-filières Tap wrench	Giramachos nº Tourne-à-gauche nº Tap turner nº	Carraca nº Cliquet nº Ratchet nº	€
2811	M3-4-5-6-8-10-12-14-16-18-20	20x5-20x7-25x9-30x11-38x14-45x18	20x5-20x7-25x9-30x11-38x14-45x18	1 - 3	1 - 2	677,67
2812	M5-6-8-10-12-14-16-18-20	20x7-25x9-30x11-38x14-45x18	20x7-25x9-30x11-38x14-45x18	1 - 3	1 - 2	643,80

2813/2814

M3-24 / M5-30

M
DIN 13

>2813/2814



Ref.	Machos y cojinetes Tarauds et filières Taps and bearing	Volvedores Porte-filières Tap wrench	Giramachos nº Tourne-à-gauche nº Tap turner nº	€
2813	M3-4-5-6-8-10-12-14-16-18-20-22-24	20x5-20x7-25x9-30x11-38x14-45x18-55x22	1 - 4	1058,85
2814	M5-6-8-10-12-14-16-18-20-22-24-27-30	20x7-25x9-30x11-38x14-45x18-55x22-65x25	3 - 5	1796,93

2841/2842

MF3-12 / MF6-20

MF
DIN 13

>2841



>2842



Ref.	Machos y cojinetes Tarauds et filières Taps and bearing	Volvedores Porte-filières Tap wrench	Giramachos nº Tourne-à-gauche nº Tap turner nº	Carraca nº Cliquet nº Ratchet nº	€
2841	M3x0,35-4x0,50-5x0,50-6x0,75-8x0,75 8x1,00-10x1,00-12x1,50	20x5-25x9-30x11-38x10	1 - 2	1	695,32
2842	M6x0,75-8x0,75-8x1,00-10x1,00-12x1,00-12x1,50 14x1,25-14x1,50-16x1,50-18x1,50-20x1,50	20x7-25x9-30x11-38x10-45x14	1 - 3	1	1166,52

2815/2816/2817

W1/8-1/2, W1/4-1/2, W1/4-1"

BSW
BS 84

>2815



>2816



>2817



Ref.	Machos y cojinetes Tarauds et filières Taps and bearing	Volvedores Porte-filières Tap wrench	Giramachos nº Tourne-à-gauche nº Tap turner nº	Carraca nº Cliquet nº Ratchet nº	€
2815	W1/8-3/16-1/4-5/16-3/8-7/16-1/2	20x5-20x7-25x9-30x11-38x14	1 - 2	1	555,68
2816	W1/4-5/16-3/8-7/16-1/2	20x7-25x9-30x11-38x14	1 - 2	1	470,98
2817	W1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1"	20x7-25x9-30x11-38x14-45x18-55x22	1 - 4	-	1298,87

2843/2818

UNC1/4", UNF1/4-1"

UNC
ANSI/ASME
B1.1

UNF
ANSI/ASME
B1.1

>2843/2818



Ref.	Machos y cojinetes Tarauds et filières Taps and bearing	Volvedores Porte-filières Tap wrench	Giramachos nº Tourne-à-gauche nº Tap turner nº	€
2843	UNC1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1"	20x7-25x9-30x11-38x14-45x18-55x22	1 - 4	1870,87
2818	UNF1/4-5/16-3/8-7/16-1/2-5/8-3/4-7/8-1"	20x7-25x9-30x11-38x10-45x14-55x16	1 - 4	1185,90

2819/2820

BSP1/8-1", BSP1/4-1"1/2

G
ISO 228

>2819



>2820



Ref.	Machos y cojinetes Tarauds et filières Taps and bearing	Volvedores Porte-filières Tap wrench	Giramachos nº Tourne-à-gauche nº Tap turner nº	€
2819	BSP1/8-1/4-3/8-1/2-3 4-1"	30x11-38x10-45x14-65x18-55x18	1 - 3 - 5	914,84
2820	BSP1/4-3/8-1/2-3/4-1"-1"1/4-1"1/2	38x10-45x14-65x18-75x20-90x22	2 - 4 - 7	2134,65










Escariado >
Alésage
Reaming




Escariadores de mano / Alésoids à main / Hand reamers

4101	HSS	DIN 206		Form. B 8° Tol. H7 ISO 236	P K N	283
4102	HSS	DIN 9		Form. B 8° 2% ISO 3465	P K N	284
4119	HSS			Form. B 8° C. 1:16 (NPT-BSPT)	P K N	284

Escariadores de máquina / Alésoids machine / Machine reamers

4118	HM-MD	DIN 212		Form. B-D 8° Tol. H7 ISO 521	P M K N S H	285
4104	HSSCO	DIN 212		Form. B 8° Tol. H7 ISO 521	P M K N S	286
4105	HSSCO	DIN 212		Form. E 45° Tol. H7 ISO 521	P N	287
4103	HSSCO	DIN 2179		Form. E 45° 2% ISO 3466	P K N	288
4106	HSSCO	DIN 208		Form. B 8° Tol. H7 ISO 521	P M K N S	288
4107	HSSCO	DIN 208		Form. C 45° Tol. H7 ISO 521	P N	289
4108	HSS	DIN 311		25° ISO 2238	P K N	289

Escariadores de máquina entrada cónica / Alésoids machine pour goupilles coniques / Machine reamers for taper holes

4115	HSSCO	DIN 212		45° 5%	P K N	290
4116	HSSCO	DIN 212		45° 8%	P K N	290
4117	HSSCO	DIN 212		45° 10%	P K N	291

Escariadores huecos / Alésoids creux finisseurs à machine / Hole machine reamers

4109	HSS	DIN 219		Form. B 8° Tol. H7 ISO 2402	P M K N S	291
4114	HSS					292

Escariadores extensibles / Alésoids extenseibles / Extendable reamers

4110	HSS			Form. A REFORZ. RENFORC. RENFORC.	P K N	292
4111	HSS			Form. A	P K N	293

FORMULARIO ESCARIADORES / AVELLANADORES ESPECIALES
FICHE TECHNIQUE ALESOIRS ET FRAISES A TROU SPECIAUX
TECHNICAL ENQUIRY FOR SPECIAL REAMERS AND COUNTERSINK CUTTERS

Fecha / Date:

Empresa / Entreprise / Company: Contacto / Contact:

Dirección / Adresse / Address: Población / Ville / Town:

Tel / Fax: E-mail:

TRABAJO A REALIZAR / TRAVAIL DEMANDE / REQUESTED WORK

Material / Matière / Material Norma / Norme / Norm:

Dureza / Durété / Hardness HB HRc Resistencia / Résistance / Resistance N/mm²

Tipo viruta: Corta Larga Polvo
 Type copeau Courte Longue Poussière
 Shaving Short Long Powder

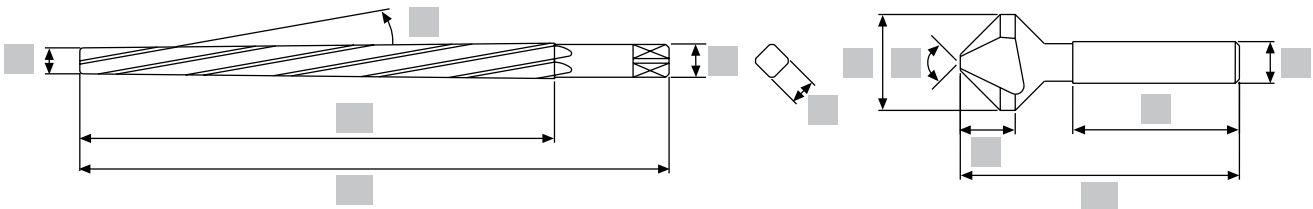
Máquina / Machine Refrigerante / Réfrigérant / Coolant

Posición / Position Horizontal Vertical V. Corte V. avance
 V. Coupe Avance
 Cutting Speed Feed

HERRAMIENTA / OUTIL / TOOL

Descripción / Description Tolerancia / Tolérance / Tolerance

Cantidad / Quantité / Quantity Número ranuras / Rainures / Grooves



Mango: Cilíndrico Weldon Cónico Rebajado
 Queue: Cylindrique Weldon Conique Réduite
 Shank: Straight Weldon Taper Reduced

Material / Matière / Material: HSS HSSE HM HSS-HM

Superficie / Surface: Brillante Negra Recubrimiento
 Brillant Noire Revêtement
 Brilliant Black Coating

COMENTARIOS / COMMENTAIRES/ COMMENTS:



TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



$$r.p.m. = \frac{V_c \times 1.000}{\pi \times \phi}$$

Ref./ Réf. / Ref.	4118	4104
Form.	B	B
Hel./Hél./Spiral	8°	8°
Mat.	HM	HSSCO
Rec./Rev./Coating		
DIN	212	212
Tol.	H7	H7
Gama/Gamme/Range	2-12	1-20
Pag.	285	286

Mat.	Avance/Feed (mm/rpm)																		Vc (m/min)		
	Ø2	Ø5	Ø10	Ø15	Ø20	Ø25	Ø30	Ø35	Ø40	Ø2	Ø5	Ø10	Ø15	Ø20	Ø25	Ø30	Ø35	Ø40	●	○	
P.1	<600	0.05	0.1	0.2	0.26	0.33	0.4	0.45	0.5	0.55	0.08	0.16	0.3	0.4	0.5	0.6	0.7	0.75	0.8	●	●
P.2	<800	0.05	0.1	0.2	0.26	0.33	0.4	0.45	0.5	0.55	0.08	0.16	0.3	0.4	0.5	0.6	0.7	0.75	0.8	●	●
P.3	<1000	0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	0.63	0.12	0.25	0.3	0.4	0.5	0.53	0.56	0.6	●	●
P.4	<1200	0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	0.05	0.1	0.2	0.26	0.33	0.4	0.45	0.5	0.55	○	○
P.5	<1400										0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	●	○
M.1	<950	0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	●	●
M.2		0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	●	●
M.3	<1200	0.02	0.05	0.1	0.12	0.16	0.2	0.23	0.25	0.27	0.02	0.05	0.1	0.12	0.16	0.2	0.23	0.25	0.27	●	○
M.4		0.02	0.05	0.1	0.12	0.16	0.2	0.23	0.25	0.27	0.02	0.05	0.1	0.12	0.16	0.2	0.23	0.25	0.27	●	○
K.1	<500	0.05	0.1	0.2	0.26	0.33	0.4	0.45	0.5	0.55	0.08	0.16	0.3	0.4	0.5	0.6	0.7	0.75	0.8	●	●
K.2																					
K.3	<800	0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	●	○
K.4.1		0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	0.63	0.12	0.25	0.3	0.4	0.5	0.53	0.56	0.6	●	●
K.4.2	<1400										0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	●	○
N.1.1	Al	0.08	0.16	0.3	0.4	0.5	0.6	0.7	0.75	0.8	0.1	0.2	0.4	0.5	0.65	0.8	0.9	0.95	1	●	●
N.1.2		0.63	0.12	0.25	0.3	0.4	0.5	0.53	0.56	0.6	0.1	0.2	0.4	0.5	0.65	0.8	0.9	0.95	1	●	●
N.1.3		0.63	0.12	0.25	0.3	0.4	0.5	0.53	0.56	0.6	0.1	0.2	0.4	0.5	0.65	0.8	0.9	0.95	1	●	●
N.2.1	Cu	0.63	0.12	0.25	0.3	0.4	0.5	0.53	0.56	0.6	0.08	0.16	0.3	0.4	0.5	0.6	0.7	0.75	0.8	●	●
N.2.2		0.63	0.12	0.25	0.3	0.4	0.5	0.53	0.56	0.6	0.1	0.2	0.4	0.5	0.65	0.8	0.9	0.95	1	●	●
N.2.3		0.63	0.12	0.25	0.3	0.4	0.5	0.53	0.56	0.6	0.08	0.16	0.3	0.4	0.5	0.6	0.7	0.75	0.8	●	●
N.2.4																					
N.3.1	Mg/Zn	0.63	0.12	0.25	0.3	0.4	0.5	0.53	0.56	0.6	0.1	0.2	0.4	0.5	0.65	0.8	0.9	0.95	1	●	○
N.4.1	Plastic	0.1	0.2	0.4	0.5	0.65	0.8	0.9	0.95	1	0.1	0.2	0.4	0.5	0.65	0.8	0.9	0.95	1	●	●
N.4.2		0.08	0.16	0.3	0.4	0.5	0.6	0.7	0.75	0.8	0.1	0.2	0.4	0.5	0.65	0.8	0.9	0.95	1	●	●
N.4.3																					
S.1.1	Ni	0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	0.05	0.1	0.2	0.26	0.33	0.4	0.45	0.5	0.55	●	○
S.1.2		0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	●	○
S.2.1	Ti	0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	0.05	0.1	0.2	0.26	0.33	0.4	0.45	0.5	0.55	●	●
S.2.2		0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	0.05	0.1	0.2	0.26	0.33	0.4	0.45	0.5	0.55	●	○
S.2.3		0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	0.04	0.08	0.16	0.2	0.25	0.32	0.36	0.4	0.43	●	○
H.1	50 HRC										0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	●	
H.2	55 HRC										0.03	0.06	0.12	0.16	0.2	0.25	0.28	0.32	0.35	●	
H.3	60 HRC										0.02	0.05	0.1	0.12	0.16	0.2	0.23	0.25	0.27	○	

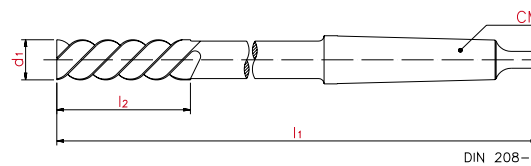
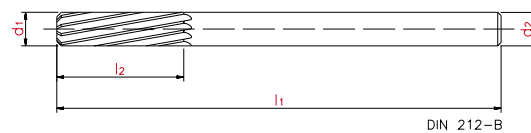
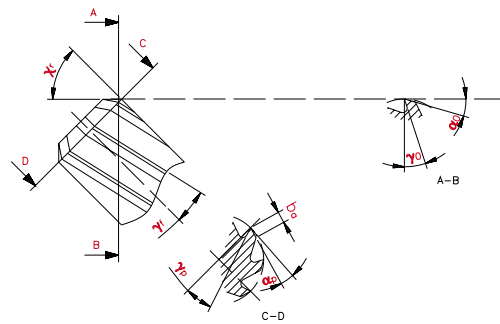
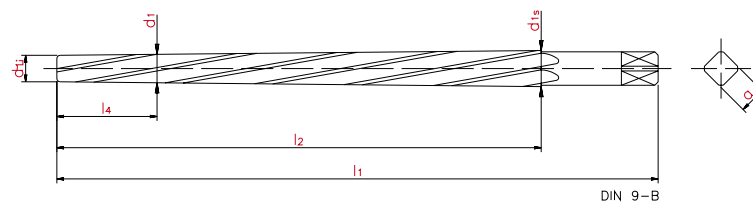
● Optima / Optimun ○ Alternativo / Alternative



4105	4103	4106	4107	4108	4115	4116	4117	4109
E	E	B	C					B
45°	45°	8°	45°	25°	45°	46°	47°	8°
HSSCO	HSSCO	HSSCO	HSSCO	HSSCO	HSSCO	HSSCO	HSSCO	HSS
212	2179	208	208	311	212	212	212	219
H7		H7	H7					H7
3-16	3-10	4-40	5-29	10-37	3-7	3-6	2-6	32-80
287	288	288	289	289	290	290	291	291
• 12-16	• 8-12	• 10-14	• 12-16	• 8-12	• 8-12	• 8-12	• 8-12	• 10-14
• 10-14	• 6-12	• 8-12	• 10-14	• 6-12	• 6-12	• 6-12	• 6-12	• 8-12
	○ 4-6	• 6-8		○ 4-6	○ 4-6	○ 4-6	○ 4-6	○ 6-8
		○ 4-6						
	○ 4-6	• 6-8		○ 4-6	○ 4-6	○ 4-6	○ 4-6	• 6-8
	○ 4-6	• 6-8		○ 4-6	○ 4-6	○ 4-6	○ 4-6	• 6-8
		○ 4-6						
		○ 4-6						
	• 10-14	• 12-16		• 10-14	• 10-14	• 10-14	• 10-14	• 10-14
		○ 6-8						○ 6-8
	• 6-8	• 10-12		• 6-8	• 6-8	• 6-8	• 6-8	• 10-12
• 20-25	• 16-22	• 20-25	• 20-25	• 16-22	• 16-22	• 16-22	• 16-22	• 20-25
• 16-22	• 14-20	• 16-22	• 16-22	• 14-20	• 14-20	• 14-20	• 14-20	• 16-22
• 14-20	• 8-12	• 14-20	• 14-20	• 8-12	• 8-12	• 8-12	• 8-12	• 14-20
	• 10-16	• 12-20		• 10-16	• 10-16	• 10-16	• 10-16	• 12-20
	• 16-22	• 20-25		• 16-22	• 16-22	• 16-22	• 16-22	• 20-25
• 14-20	• 12-18	• 16-22	• 14-20	• 12-18	• 12-18	• 12-18	• 12-18	• 16-22
		○ 12-16						○ 12-16
• 12-16	• 16-22	• 10-14	• 12-16	• 16-22	• 16-22	• 16-22	• 16-22	• 10-14
• 10-14	• 14-20	• 8-10	• 10-14	• 14-20	• 14-20	• 14-20	• 14-20	• 8-10
		○ 1-3						○ 1-3
		○ 1-3						
	○ 4-6	• 6-8		○ 4-6	○ 4-6	○ 4-6	○ 4-6	• 6-8
		○ 2-6						○ 2-6
		○ 2-6						

● Optima / Optimun ○ Alternativo / Alternative





l1	Longitud total / Longueur totale / Total length
l2	Longitud de corte / Longueur de coupe / Length of cut
l4	Longitud hasta el diámetro nominal / Longueur jusqu'au diamètre nominal / Length to the nominal diameter
a	Cuadrado / Carré / Square
ba	Ancho de fase / Largeur de phase / Phase width
d1	Diámetro nominal / Diamètre nominal / Nominal diameter
d1i	Diámetro inferior / Diamètre inférieur / Inferior diameter
d1s	Diámetro superior / Diamètre supérieur / Superior diameter
d2	Diámetro de mango / Diamètre de queue / Shank diameter
di	Diámetro interior / Diamètre intérieur / Interior diameter
CM	Tamaño del cono morse / Taille du cône morse / Morse taper size
α0	Ángulo de destalonado / Angle de détalonnage / Relief angle
απ	Ángulo de destalonado del corte seco / Angle de détalonnage de la coupe sèche / Dry cut relief angle
γ0	Ángulo corte ortogonal / Angle coupe orthogonale / Orthogonal cut angle
γφ	Ángulo de corte lateral / Angle de coupe latérale / Lateral cut angle
γπ	Ángulo corte posterior / Angle coupe postérieure / Rear cut angle
χρ	Ángulo de posición / Angle de position / Angle of position

4101 **HSS DIN ≈ 206**

Form.
B



Tol.
H7

ISO
236

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•						•	•		•	•		•					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon	Ø mm	€	L mm	l mm	Icon
1,50	76,18	41	20	1	12,50	44,99	152	76	1
2,00	21,43	50	25	1	13,00	44,99	152	76	1
2,25	23,56	54	27	1	13,50	126,35	163	81	1
2,50	21,43	58	29	1	14,00	48,05	163	81	1
2,75	23,56	62	31	1	14,50	126,35	163	81	1
3,00	21,43	62	31	1	15,00	52,50	163	81	1
3,25	61,11	66	33	1	15,50	126,35	175	87	1
3,50	21,43	71	35	1	16,00	57,11	175	87	1
3,75	61,11	71	35	1	16,50	126,35	175	87	1
4,00	21,43	76	38	1	17,00	68,76	175	87	1
4,25	61,11	76	38	1	17,50	126,35	188	93	1
4,50	22,40	81	41	1	18,00	82,44	188	93	1
4,75	61,11	81	41	1	18,50	126,35	188	93	1
5,00	22,40	87	44	1	19,00	82,44	188	93	1
5,25	61,11	87	44	1	19,50	181,97	201	100	1
5,50	22,40	93	47	1	20,00	89,18	201	100	1
5,75	61,11	93	47	1	20,50	178,46	201	100	1
6,00	22,40	93	47	1	21,00	112,00	201	100	1
6,25	61,11	100	50	1	21,50	162,95	215	107	1
6,50	22,40	100	50	1	22,00	116,05	215	107	1
6,75	61,11	107	54	1	22,50	188,43	215	107	1
7,00	22,40	107	54	1	23,00	121,21	215	107	1
7,25	61,82	107	54	1	23,50	207,79	215	107	1
7,50	23,63	107	54	1	24,00	133,85	231	115	1
7,75	61,82	115	58	1	24,50	220,52	231	115	1
8,00	23,63	115	58	1	25,00	142,05	231	115	1
8,25	61,82	115	58	1	25,50	345,60	231	115	1
8,50	24,83	115	58	1	26,00	155,22	231	115	1
8,75	61,82	124	62	1	26,50	290,29	231	115	1
9,00	24,83	124	62	1	27,00	169,22	247	124	1
9,25	61,82	124	62	1	27,50	297,25	247	124	1
9,50	25,87	124	62	1	28,00	175,19	247	124	1
9,75	118,48	133	66	1	28,50	312,57	247	124	1
10,00	25,87	133	66	1	29,00	248,40	247	124	1
10,25	118,48	133	66	1	29,50	347,03	247	124	1
10,50	32,79	133	66	1	30,00	222,96	247	124	1
10,75	118,48	142	71	1	32,00	258,32	265	133	1
11,00	32,79	142	71	1	34,00	270,90	284	142	1
11,25	118,48	142	71	1	36,00	305,54	284	142	1
11,50	118,48	142	71	1	38,00	354,25	305	152	1
11,75	126,35	142	71	1	40,00	354,25	305	152	1
12,00	35,24	152	76	1					

4102 HSS DIN 9

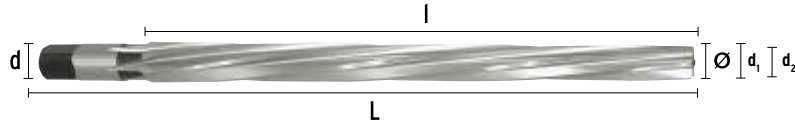
Form.
B



ISO
3465

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•						•	•		•	•		•					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø Nom.	d ₁ mm	d ₂ mm	d mm	∠ mm	€	L mm	I mm	📦	Ø Nom.	d ₁ mm	d ₂ mm	d mm	∠ mm	€	L mm	I mm	📦
*1,50	2,14	1,40	3,15	2,40	50,07	57	37	1	6,00	8,00	5,90	8,00	6,20	28,35	135	105	1
2,00	2,86	1,90	3,15	2,40	38,55	68	48	1	*6,50	8,50	6,40	8,00	6,20	39,38	135	105	1
2,50	3,36	2,40	3,15	2,40	38,55	68	48	1	7,00	9,00	6,90	8,00	6,20	32,71	135	105	1
3,00	4,06	2,90	4,00	3,00	38,55	80	58	1	8,00	10,80	7,90	10,00	8,00	44,02	180	145	1
*3,50	4,56	3,40	4,50	3,00	42,32	87	63	1	10,00	13,40	9,90	12,50	10,00	54,62	215	175	1
4,00	5,26	3,90	5,00	3,80	23,32	93	68	1	12,00	16,00	11,80	14,00	11,00	73,46	255	210	1
*4,50	5,76	4,40	6,00	3,80	30,27	93	68	1	14,00	18,30	13,80	16,00	12,00	103,04	270	225	1
5,00	6,36	4,90	6,30	4,90	23,98	100	73	1	16,00	20,40	15,80	18,00	14,50	114,16	280	230	1
*5,50	7,18	5,40	6,30	4,90	37,99	118	89	1	20,00	24,80	19,80	22,40	18,00	157,15	310	250	1

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

4119 HSS

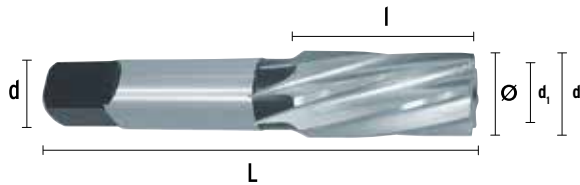
Form.
B



C. 1:16
(NPT/BSPT)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•						•	•		•	•		•					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø Nom.	d ₁ mm	d ₂ mm	d mm	∠ mm	€	L mm	I mm	📦	Ø Nom.	d ₁ mm	d ₂ mm	d mm	∠ mm	€	L mm	I mm	📦
1/16	5,91	6,98	6	4,90	142,30	70	17	1	1/2	16,91	19,10	16	12,00	173,20	95	35	1
1/8	8,92	9,08	7	5,50	144,15	70	17	1	3/4	22,29	24,42	20	16,00	226,10	105	35	1
1/4	10,28	11,97	11	9,00	151,45	80	27	1	1"	27,97	30,66	25	20,00	287,95	130	43	1
3/8	13,70	15,39	12	9,00	157,65	85	27	1									

4118

HM-MD DIN 212

Form.
B-D

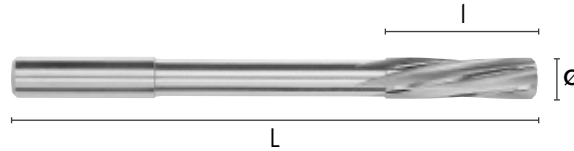


Tol.
H7

ISO
521

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○
12-18	10-14	6-10	4-6	8-12	6-10	25-30	8-18	6-10	20-35	20-35	20-25	12-20	4-6	6-12	3-4	3-4	3-4

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	€	L mm	l mm	Icon	Ø mm	€	L mm	l mm	Icon
1,00	111,64	38	7	1	4,00	77,91	75	19	1
1,10	116,09	40	10	1	4,10	118,32	75	19	1
1,20	116,09	40	10	1	4,20	118,32	75	19	1
1,30	116,09	40	10	1	4,30	133,95	80	21	1
1,40	116,09	40	10	1	4,40	133,95	80	21	1
1,50	116,09	40	10	1	4,50	89,59	80	21	1
1,60	111,64	43	11	1	4,60	133,95	80	21	1
1,70	111,64	43	11	1	4,70	133,95	80	21	1
1,80	109,36	49	12	1	4,80	129,50	86	23	1
1,90	109,36	49	12	1	4,90	129,50	86	23	1
2,00	67,23	49	12	1	5,00	82,50	86	23	1
2,10	109,36	49	12	1	5,10	129,50	86	23	1
2,20	109,36	49	12	1	5,20	129,50	86	23	1
2,30	109,36	49	12	1	5,30	129,50	86	23	1
2,40	107,18	57	18	1	5,40	145,09	93	26	1
2,50	77,27	57	18	1	5,50	100,27	93	26	1
2,60	107,18	57	18	1	5,60	145,09	93	26	1
2,70	107,18	57	18	1	5,70	145,09	93	26	1
2,80	107,18	57	18	1	5,80	145,09	93	26	1
2,90	107,18	57	18	1	5,90	140,64	101	28	1
3,00	73,32	57	18	1	6,00	99,27	101	28	1
3,10	107,18	57	18	1	6,50	121,77	101	28	1
3,20	107,18	57	18	1	7,00	128,36	109	31	1
3,30	107,18	57	18	1	8,00	146,68	117	33	1
3,40	107,18	57	18	1	8,50	168,68	117	33	1
3,50	82,18	57	18	1	9,00	168,05	125	36	1
3,60	107,18	57	18	1	10,00	186,41	133	38	11
3,70	107,18	57	18	1	11,00	278,05	133	38	1
3,80	118,32	75	19	1	12,00	293,36	151	44	1
3,90	118,32	75	19	1					

4104

HSSCO DIN 212

Form.
B
Ø ≤ 3,70

Form.
D
Ø > 3,70



Tol.
H7

ISO
521

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●		●	●	○	●	○	●			
8-14	6-8	4-6		6-8	4-6	12-16	6-12		14-25	12-25	12-16	8-14	1-3	2-8			


Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm		Ø mm	d mm	€	L mm	l mm	
1,00	1,00	38,63	34	7	1	6,20	6,30	30,23	101	28	1
1,20	1,20	38,63	34	7	1	6,30	6,30	30,23	101	28	1
1,40	1,40	34,63	40	8	1	6,40	6,30	30,23	101	28	1
1,50	1,50	34,63	40	8	1	6,50	6,30	23,31	101	28	1
1,60	1,60	34,63	43	9	1	6,60	6,30	30,23	101	28	1
1,80	1,80	34,63	46	10	1	6,70	6,30	30,23	101	28	1
1,90	1,90	34,63	46	10	1	6,80	7,10	30,23	109	31	1
2,00	2,00	34,63	49	11	1	6,90	7,10	30,23	109	31	1
2,10	2,10	34,63	49	11	1	7,00	7,10	23,31	109	31	1
2,20	2,20	34,63	53	12	1	7,10	7,10	30,23	109	31	1
2,30	2,30	34,63	53	12	1	7,20	7,10	30,23	109	31	1
2,40	2,40	30,58	57	14	1	7,30	7,10	30,23	109	31	1
2,50	2,50	30,58	57	14	1	7,40	7,10	30,23	109	31	1
2,60	2,60	30,58	57	14	1	7,50	7,10	25,28	109	31	1
2,70	2,70	28,29	61	15	1	7,60	8,00	33,40	117	33	1
2,80	2,80	28,29	61	15	1	7,70	8,00	33,40	117	33	1
2,90	2,90	28,29	61	15	1	7,80	8,00	33,40	117	33	1
3,00	3,00	21,25	61	15	1	7,90	8,00	33,40	117	33	1
3,10	3,10	27,52	65	16	1	8,00	8,00	25,77	117	33	1
3,20	3,20	27,52	65	16	1	8,10	8,00	38,40	117	33	1
3,30	3,30	27,52	65	16	1	8,20	8,00	38,40	117	33	1
3,40	3,40	27,52	70	18	1	8,30	8,00	38,40	117	33	1
3,50	3,50	21,25	70	18	1	8,40	8,00	38,40	117	33	1
3,60	3,60	27,52	70	18	1	8,50	8,00	28,21	117	33	1
3,70	3,70	27,52	70	18	1	8,60	9,00	38,40	125	36	1
3,80	4,00	27,52	75	19	1	8,70	9,00	38,40	125	36	1
3,90	4,00	27,52	75	19	1	8,80	9,00	38,40	125	19	1
4,00	4,00	21,25	75	19	1	8,90	9,00	38,40	125	36	1
4,10	4,00	27,52	75	19	1	9,00	9,00	31,02	125	36	1
4,20	4,00	27,52	75	19	1	9,10	9,00	38,40	125	36	1
4,30	4,50	27,52	80	21	1	9,20	9,00	38,40	125	36	1
4,40	4,40	27,52	80	21	1	9,30	9,00	38,40	125	36	1
4,50	4,50	21,25	80	21	1	9,40	9,00	38,40	125	36	1
4,60	4,50	27,52	80	21	1	9,50	9,00	31,51	125	36	1
4,70	4,50	27,52	80	21	1	9,60	10,00	42,22	133	38	1
4,80	5,00	27,52	86	23	1	9,70	10,00	42,22	133	38	1
4,90	5,00	27,52	86	23	1	9,80	10,00	42,22	133	38	1
5,00	5,00	21,25	86	23	1	9,90	10,00	42,22	133	38	1
5,10	5,00	27,52	86	23	1	10,00	10,00	31,51	133	38	1
5,20	5,00	27,52	86	23	1	11,00	10,00	37,23	142	41	1
5,30	5,00	27,52	86	23	1	12,00	10,00	36,39	151	44	1
5,40	5,60	27,52	93	26	1	13,00	10,00	62,56	151	44	1
5,50	5,60	21,25	93	26	1	14,00	12,50	59,82	160	47	1
5,60	5,60	27,52	93	26	1	15,00	12,50	65,32	162	50	1
5,70	5,60	27,52	93	26	1	16,00	12,50	69,92	170	52	1
5,80	5,60	27,52	93	26	1	17,00	14,00	80,63	175	54	1
5,90	5,60	27,52	93	26	1	18,00	14,00	84,07	182	56	1
6,00	5,60	23,31	93	26	1	19,00	16,00	89,32	189	58	1
6,10	6,30	30,23	101	28	1	20,00	16,00	89,95	195	60	1


4104/1


HSSCO DIN 212

Form. B Ø ≤ 3,70	Form. D Ø > 3,70		ISO 521
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P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●		●	●	○	●	○	●			
8-14	6-8	4-6		6-8	4-6	12-16	6-12		14-25	12-25	12-16	8-14	1-3	2-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

Ø mm	€	L mm	l mm	
0,95 - 1,31	40,73	34	5-7	1
1,32 - 1,54	36,52	40	8	1
1,55 - 1,70	36,52	43	9	1
1,71 - 1,90	36,52	46	10	1
1,91 - 2,12	36,52	49	11	1
2,13 - 2,36	36,52	53	12	1
2,37 - 2,66	32,25	57	14	1
2,67 - 3,05	29,86	61	15	1
3,06 - 3,35	29,86	65	16	1
3,36 - 3,75	33,53	70	18	1
3,76 - 4,25	33,53	75	19	1
4,26 - 4,75	32,68	80	21	1
4,76 - 5,30	32,68	86	23	1
5,31 - 5,95	33,08	93	26	1
5,96 - 6,00	33,89	93	26	1
6,01 - 6,70	33,89	101	28	1
6,71 - 7,29	37,34	109	31	1

Ø mm	€	L mm	l mm	
7,30 - 7,55	41,97	109	32	1
7,56 - 8,50	41,97	117	33	1
8,51 - 9,25	47,40	125	36	1
9,26 - 9,50	54,10	125	36	1
9,51 - 10,64	52,04	133	38	1
10,65 - 11,25	61,10	142	41	1
11,26 - 11,80	62,74	142	41	1
11,81 - 12,02	62,74	151	44	1
12,03 - 13,02	86,27	151	44	1
13,03 - 13,20	86,27	151	44	1
13,21 - 14,00	104,87	160	47	1
14,01 - 14,02	104,87	162	50	1
14,03 - 15,00	127,90	162	50	1
15,01 - 15,02	127,90	170	52	1
15,03 - 16,00	136,92	170	52	1
16,01 - 16,02	136,92	175	54	1

4105


HSSCO DIN 212


Form. E		ToL. H7	ISO 521
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P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●									●	●		●					
10-16									14-25	14-20		10-16					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



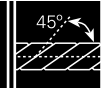
Ø mm	d mm	€	L mm	l mm	
3,00	3,00	29,15	61	15	1
3,50	3,50	29,15	70	18	1
4,00	4,00	29,15	75	19	1
4,50	4,50	29,69	80	21	1
5,00	5,00	29,69	86	23	1
5,50	5,60	29,69	93	26	1
6,00	5,60	29,69	93	26	1
6,50	6,30	34,51	101	28	1
7,00	7,10	30,20	109	31	1
7,50	7,10	35,16	109	31	1
8,00	8,00	30,77	117	33	1

Ø mm	d mm	€	L mm	l mm	
8,50	8,00	39,08	117	33	1
9,00	9,00	34,20	125	36	1
9,50	9,00	39,08	125	36	1
10,00	10,00	34,20	133	38	1
11,00	10,00	52,68	142	41	1
12,00	10,00	50,72	151	44	1
13,00	10,00	59,63	151	44	1
14,00	12,50	64,17	160	47	1
15,00	12,50	86,24	162	50	1
16,00	12,50	107,30	170	52	1

4103

HSSCO DIN 2179

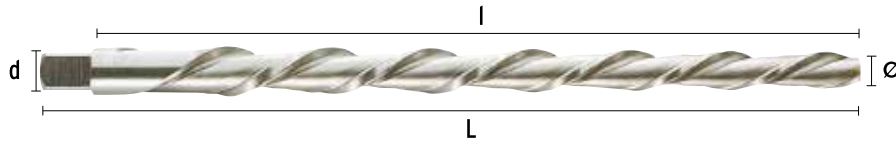
Form.
E



ISO
3466

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 6-12	○ 4-6			○ 4-6		● 10-14	● 6-8		● 8-22	● 10-22		● 14-22		○ 4-6			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

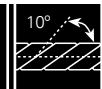


Ø Nom.	D mm	d mm	€	L mm	l mm	Icon	Ø Nom.	D mm	d mm	€	L mm	l mm	Icon
3,00	4,06	2,90	27,56	100	58	1	6,00	8,00	5,90	49,57	160	105	1
4,00	5,26	3,90	44,80	112	68	1	8,00	10,80	7,90	79,59	207	145	1
5,00	6,36	4,90	42,70	122	73	1	10,00	13,40	9,90	157,93	245	175	1

4106

HSSCO DIN 208

Form.
B



Tol.
H7

ISO
521

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 8-14	● 6-8	○ 4-6		● 6-8	○ 4-6	● 12-16	● 6-12		● 14-25	● 12-25	● 12-16	● 8-14	○ 1-3	○ 2-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Icon	Ø mm	€	L mm	l mm	Icon	Icon	Ø mm	€	L mm	l mm	Icon
1	4,00	53,54	129	19	1	2	16,00	63,77	210	52	1
1	5,00	38,80	133	23	1	2	16,50	84,36	214	54	1
1	5,50	47,68	138	26	1	2	17,00	71,28	214	54	1
1	6,00	39,36	138	26	1	2	18,00	75,75	219	56	1
1	6,50	48,62	144	28	1	2	19,00	79,29	223	58	1
1	7,00	40,04	150	31	1	2	20,00	82,32	228	60	1
1	7,50	33,02	150	31	1	2	21,00	102,13	232	62	1
1	8,00	40,99	156	33	1	2	22,00	108,65	237	64	1
1	8,50	52,73	156	33	1	2	23,00	113,49	241	66	1
1	9,00	43,84	162	36	1	3	24,00	137,55	268	68	1
1	9,50	53,23	162	36	1	3	25,00	140,29	268	68	1
1	10,00	41,59	168	38	1	3	26,00	146,92	273	70	1
1	10,50	53,94	168	38	1	3	27,00	169,05	277	71	1
1	11,00	42,14	175	41	1	3	28,00	169,05	277	71	1
1	11,50	56,84	175	41	1	3	29,00	184,18	281	73	1
1	12,00	42,14	182	44	1	3	30,00	184,18	281	73	1
1	12,50	66,64	182	44	1	3	31,00	235,25	285	75	1
1	13,00	55,29	182	44	1	4	32,00	220,44	317	77	1
1	13,50	68,62	189	47	1	4	34,00	231,57	321	78	1
1	14,00	56,85	189	47	1	4	35,00	266,73	321	78	1
2	14,50	72,25	204	50	1	4	36,00	342,71	325	79	1
2	15,00	58,57	204	50	1	4	38,00	364,91	329	81	1
2	15,50	75,92	210	52	1	4	40,00	372,32	329	81	1

4107

HSSCO DIN 208

Form. **C**



Tol. **H7**

ISO **521**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●				●		●	●	●	●	●	●	●					
10-16									14-25	14-20		10-16					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



▽	▽	Ø mm	€	L mm	l mm	📦
1	1	5,00	65,70	133	23	1
1	1	6,00	65,70	138	26	1
1	1	7,00	65,70	150	31	1
1	1	8,00	65,70	156	33	1
1	1	9,00	63,29	162	36	1
1	1	10,00	63,29	168	38	1
1	1	11,00	66,08	175	41	1
1	1	12,00	66,08	182	44	1
1	1	13,00	98,30	182	44	1
1	1	14,00	101,36	189	47	1
2	2	15,00	110,97	204	50	1
2	2	16,00	116,35	210	52	1

▽	▽	Ø mm	€	L mm	l mm	📦
2	2	17,00	125,92	214	54	1
2	2	18,00	133,77	219	56	1
2	2	19,00	141,91	223	58	1
2	2	20,00	149,19	228	60	1
2	2	21,00	161,23	232	62	1
2	2	22,00	172,07	237	64	1
2	2	23,00	184,53	241	66	1
3	3	24,00	194,64	268	68	1
3	3	25,00	206,62	268	68	1
3	3	26,00	218,05	273	70	1
3	3	28,00	241,06	277	71	1
3	3	29,00	253,66	281	73	1

4108

HSS DIN 311



ISO **2238**

▽ 1:10

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	○	●	●	●	●	●		○			
6-12	4-6			4-6		10-14	6-8		8-22	10-22		14-22		4-6			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



▽	▽	Ø mm	€	L mm	l mm	📦
1	1	10,00	62,22	171	95	1
1	1	11,00	63,92	176	100	1
2	2	12,00	66,20	199	105	1
2	2	13,00	72,09	199	105	1
2	2	14,00	79,41	209	115	1
2	2	15,00	83,42	219	125	1
2	2	16,00	87,58	229	135	1
3	3	17,00	113,12	251	135	1
3	3	18,00	117,04	261	145	1
3	3	19,00	120,38	261	145	1
3	3	20,00	122,56	271	155	1
3	3	21,00	134,87	271	155	1
3	3	22,00	140,75	281	165	1
3	3	23,00	150,92	281	165	1

▽	▽	Ø mm	€	L mm	l mm	📦
3	3	24,00	161,46	296	180	1
3	3	25,00	172,11	296	180	1
3	3	26,00	187,94	296	180	1
3	3	27,00	201,75	311	195	1
3	3	28,00	220,40	311	195	1
3	3	29,00	236,54	311	195	1
3	3	30,00	236,99	311	195	1
3	3	31,00	240,95	326	210	1
4	4	32,00	262,29	354	210	1
4	4	33,00	350,10	364	220	1
4	4	34,00	370,01	364	220	1
4	4	35,00	389,03	364	220	1
4	4	36,00	452,10	364	220	1
4	4	37,00	472,00	364	220	1

P

Aceros
Aciers
Steels

M

Aceros Inox
Aciers Inox
Stainless Steels

K

Fundición
Fonte
Cast Iron

N

Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

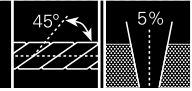
S

Titanio y Superalloys
Titanium et Superalloys
Titanium and Superalloys

H

Materiales Duros
Materiels Durs
Hard materials

4115 HSSCO 5%



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 6-12	○ 4-6			○ 4-6		● 10-14	● 6-8		● 8-22	● 10-22		● 14-22		○ 4-6			

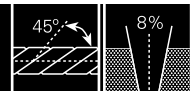
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø Nom.	€	D mm	d mm	L mm	I mm	
3,00	103,66	3	6	110	60	1
4,00	139,59	4	8	130	80	1
5,00	171,36	5	10	155	100	1

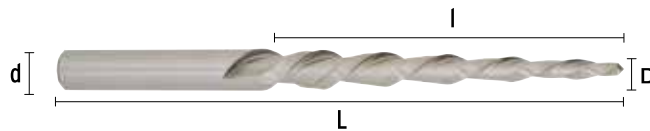
Ø Nom.	€	D mm	d mm	L mm	I mm	
6,00	211,09	6	12	180	120	1
7,00	271,77	7	14	200	140	1

4116 HSSCO 8%



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 6-12	○ 4-6			○ 4-6		● 10-14	● 6-8		● 8-22	● 10-22		● 14-22		○ 4-6			

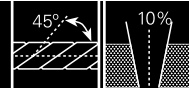
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø Nom.	€	D mm	d mm	L mm	I mm	
3,00	85,91	3	8	110	62	1
4,00	105,63	4	10	130	75	1

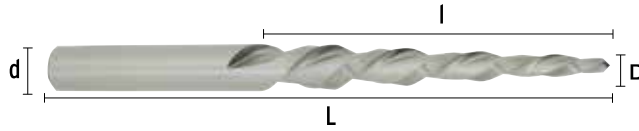
Ø Nom.	€	D mm	d mm	L mm	I mm	
5,00	139,22	5	12	150	90	1
6,00	159,60	6	14	160	100	1

4117 HSSCO 10%



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 6-12	○ 4-6			○ 4-6		● 10-14	● 6-8		● 8-22	● 10-22		● 14-22		○ 4-6			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø Nom.	€	D mm	d mm	L mm	l mm	📦
2,00	81,48	2	6	90	40	1
3,00	101,20	3	8	100	50	1
4,00	127,08	4	10	115	60	1

Ø Nom.	€	D mm	d mm	L mm	l mm	📦
5,00	128,17	5	12	130	70	1
6,00	224,65	6	14	140	80	1

4109 HSS DIN 219

Form. **B**



Tol. **H7**

ISO **2402**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 8-14	○ 6-8			● 6-8		● 12-16	● 6-12		● 14-25	● 16-25	○ 12-16	● 8-14	○ 1-3	● 2-8			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Ø int.	€	L mm	l mm	📦
32,00	16,00	101,33	50	36	1
34,00	16,00	112,35	50	36	1
36,00	19,00	128,63	56	40	1
38,00	19,00	137,03	56	40	1
42,00	19,00	155,93	56	40	1
45,00	22,00	183,23	63	45	1
47,00	22,00	194,25	63	45	1
48,00	22,00	205,80	63	45	1
52,00	27,00	249,90	71	50	1

Ø mm	Ø int.	€	L mm	l mm	📦
55,00	27,00	277,20	71	50	1
58,00	27,00	292,43	71	50	1
62,00	32,00	356,48	80	56	1
65,00	32,00	392,70	80	56	1
70,00	32,00	430,50	80	56	1
72,00	40,00	495,60	90	63	1
75,00	40,00	539,70	90	63	1
80,00	40,00	587,48	90	63	1

4114 Mandrino / Mandrin / Mandrel



∆	∅ mm	D mm	€	L mm	📦
3	31,00 - 35,00	16	226,10	260	1
4	36,00 - 42,00	19	261,44	298	1
4	43,00 - 50,00	22	332,08	310	1

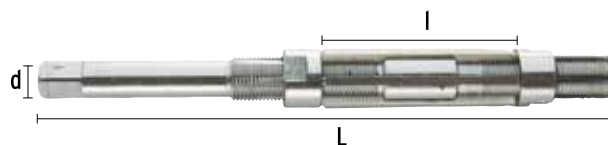
∆	∅ mm	D mm	€	L mm	📦
5	51,00 - 60,00	27	491,06	325	1
5	61,00 - 71,00	32	589,98	376	1
5	72,00 - 85,00	40	748,99	396	1

4110 Extensible / Extendible

Form. **A** REFORZ. / REINFORC. / REINFORC.

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•						•	•		•	•		•					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	📦	€ JUCHILLAS / LAMES/SET OF BLADES
8,00-9,00	4,50	118,14	100	35	1	74,53
9,00-10,00	5,50	118,14	120	39	1	74,53
10,00-11,00	5,90	118,14	125	40	1	74,53
11,00-12,00	6,50	118,14	130	43	1	74,53
12,00-13,50	7,50	118,14	135	46	1	74,53
13,50-15,50	8,00	118,14	140	51	1	74,53
15,50-18,00	9,50	125,71	165	61	1	78,04
18,00-21,00	12,00	130,13	185	66	1	82,26

∅ mm	d mm	€	L mm	l mm	📦	€ JUCHILLAS / LAMES/SET OF BLADES
21,00-24,00	13,50	151,40	195	70	1	94,69
24,00-27,50	15,00	164,85	215	83	1	99,70
27,50-31,50	18,50	180,27	240	88	1	109,64
31,50-37,00	21,00	234,99	265	91	1	134,88
37,00-45,00	25,00	350,37	310	110	1	208,76
45,00-55,00	32,00	504,09	380	128	1	321,05
55,00-67,00	42,00	916,60	440	150	1	486,48
67,00-80,00	45,00	1.389,81	490	170	1	739,20

4111

Extensible guía / Extensible guide / Extendible guide

Form.

A


P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
•						•	•		•	•		•					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	J.CUCHILLAS J.LAMES/SET OF BLADES	∅ mm	d mm	€	L mm	l mm	J.CUCHILLAS J.LAMES/SET OF BLADES		
8,00-9,00	4,50	151,83	175	35	1	74,53	21,00-24,00	13,50	168,60	320	70	1	94,69
9,00-10,00	5,50	151,83	185	35	1	74,53	24,00-27,50	15,00	179,25	350	83	1	99,70
10,00-11,00	5,90	151,83	195	40	1	74,53	27,50-31,50	18,50	229,45	385	88	1	109,64
11,00-12,00	6,50	151,83	200	41	1	74,53	31,50-37,00	21,00	342,42	424	91	1	134,88
12,00-13,50	7,50	151,83	220	44	1	74,53	37,00-45,00	25,00	498,57	490	110	1	208,76
13,50-15,50	8,00	151,83	243	53	1	74,53	45,00-55,00	32,00	714,58	600	128	1	321,05
15,50-18,00	9,50	160,94	274	61	1	78,04	55,00-67,00	42,00	1.140,10	740	150	1	486,48
18,00-21,00	12,00	160,94	300	66	1	82,26	67,00-80,00	45,00	1.568,49	830	170	1	739,20

A series of horizontal dotted lines spanning the width of the page, intended for writing or technical drawing.



Avellanado
Chanfreinage
Counterboring

Brocas avellanadoras / Fraises coniques / Counterbore drill-bits























5101	HSS						303
5102	HSSCO						303
5103	HSS		TIALN				304

Brocas escalonadas / Fraises étagées / Step drill-bits

5157	HSS						305
5158	HSS		TIALN				305
5105	HSS						306
5106	HSS		TIALN				306
5160	HSS	MULTI					307
5109	HSS						307
5112	HSS						308

Avellanadores / Fraises à trou et à chanfreiner / Countersink cutters

5159	HM-MD		TIALN				309
5116	HSS	DIN 335 C					309
5117	HSSCO	DIN 335 C					310
5118	HSS	DIN 335 C	TIALN				310
5119	HSSCO	DIN 335 C	TIALN				311
1505	HSS	DIN 335 C					311
5120	HSS	DIN 335 C					312

5121	HSS	DIN 335 C			3z	P, K, N	312
5122	HSS	DIN 335 C			3z	P, K, N	313
5123	HSS	DIN 334 C			3z	P, K, N	313
5124	HSS	DIN 335 C			3z	P, K, N	314
5161	HSS				3z	P, K, N	314
5125	HSS	DIN 335 C			1z	P, K, N	315
5126	HSS	DIN 334 A			$z \geq 4$	P, K, N	315
5127	HSS	DIN 335 A			$z \geq 4$	P, K, N	316
5129	HSS	DIN 335 D			3z	P, K, N	316
5130	HSS	DIN 334 D			3z	P, K, N	317
5132	HSS	DIN 334 D			3z	P, K, N	317

Avellanadores con agujero / Fraises à trou et à chanfreiner / Countersink cutters

5133	HSS					P, K, N	318
5134	HSSCO					P, M, K, N	318
5135	HSS					P, K, N	319

Avellanadores Allen / Fraises à trou et à chanfreiner / Countersink cutters

5136	HSS	DIN 373			ALLEN ISO 4206	P, K, N	320
5137	HSS	DIN 375			ALLEN	P, K, N	320
Estuches / Coffrets / Sets							321

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



$$r.p.m. = \frac{V_c \times 1.000}{\pi \times \phi}$$

Ref./ Réf. / Ref.	5159	5116	5117	5118	5119
Z	3	3	3	3	3
Punta/Poin/Point	90°	90°	90°	90°	90°
Mat.	HM	HSS	HSSCo	HSS	HSSCo
Rec./Rev./Coat.				TIALN	TIALN
DIN	335	335	335	335	335
Form.	C	C	C	C	C
Gama/Gamme/Range	6,30-31	4,30-40	6-40	4,30-40	6,30-30
Pag.	309	309	310	310	311

Mat.		Avance/Feed (mm/rpm) HSS/HSSCo - HM=x1,5									Vc (m/min)				
		Ø2	Ø5	Ø10	Ø15	Ø20	Ø25	Ø30	Ø35	Ø40					
P.1	<600	0,05	0,08	0,12	0,14	0,16	0,20	0,20	0,25	0,25	● 40-80	● 25-30	● 25-30	● 30-35	● 30-35
P.2	<800	0,04	0,07	0,10	0,12	0,14	0,18	0,20	0,22	0,22	● 35-60	● 20-25	● 20-25	● 25-30	● 25-30
P.3	<1000	0,03	0,04	0,05	0,06	0,08	0,10	0,10	0,12	0,12	● 30-40	○ 12-18	○ 12-18	○ 15-20	○ 15-20
P.4	<1200	0,03	0,04	0,05	0,06	0,08	0,10	0,10	0,12	0,12	● 15-25		○ 4-8		○ 6-10
P.5	<1400	0,01	0,03	0,03	0,06	0,08	0,10	0,12	0,14	0,16	● 10-15				
M.1	<950	0,04	0,05	0,06	0,07	0,08	0,09	0,10	0,11	0,12	● 20-30	○ 4-10	● 4-10	○ 6-12	● 6-12
M.2		0,04	0,05	0,06	0,07	0,08	0,09	0,10	0,11	0,12	● 20-30	○ 4-10	● 4-10	○ 6-12	● 6-12
M.3	<1200	0,01	0,03	0,03	0,06	0,08	0,10	0,12	0,14	0,16	● 15-25				○ 4-6
M.4		0,01	0,03	0,03	0,06	0,08	0,10	0,12	0,14	0,16	● 15-25				○ 4-6
K.1	<500	0,08	0,10	0,12	0,16	0,20	0,25	0,25	0,30	0,30	● 40-70	● 15-24	● 15-24	● 20-30	● 20-30
K.2															
K.3	<800	0,06	0,07	0,08	0,12	0,16	0,20	0,20	0,25	0,25	● 25-35	○ 9-13	○ 9-13	○ 12-16	● 12-16
K.4.1		0,06	0,07	0,08	0,12	0,16	0,20	0,20	0,25	0,25	● 25-35	○ 9-13	○ 9-13	○ 12-16	● 12-16
K.4.2	<1400	0,02	0,04	0,04	0,08	0,12	0,16	0,18	0,20	0,22	● 20-30				○ 6-10
N.1.1	Al	0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,35	0,40	● 60-120	● 50-80	● 50-80	● 65-100	● 65-100
N.1.2		0,08	0,10	0,12	0,16	0,20	0,25	0,25	0,30	0,30	● 50-90	● 30-50	● 30-50	● 40-65	● 40-65
N.1.3		0,08	0,10	0,12	0,16	0,20	0,25	0,25	0,30	0,30	● 40-80	● 15-30	● 15-30	● 20-40	● 20-40
N.2.1	Cu	0,06	0,07	0,08	0,12	0,16	0,20	0,20	0,25	0,25	● 40-80	● 25-35	● 25-35	● 30-45	● 30-45
N.2.2		0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,35	0,40	● 60-100	● 40-60	● 40-60	● 50-75	● 50-75
N.2.3		0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,35	0,40	● 50-90	● 30-50	● 30-50	● 40-65	● 40-65
N.2.4															
N.3.1	Mg/Zn	0,10	0,13	0,16	0,20	0,25	0,30	0,30	0,35	0,35	● 80-140	● 60-90	● 60-90	● 75-115	● 75-115
N.4.1	Plastic	0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,35	0,40	● 60-100	● 35-70	● 35-70	● 45-90	● 45-90
N.4.2		0,04	0,06	0,08	0,10	0,12	0,16	0,20	0,20	0,25	● 30-60	● 12-24	● 12-24	● 15-30	● 15-30
N.4.3															
S.1.1	Ni	0,04	0,07	0,1	0,12	0,14	0,18	0,2	0,22	0,22	● 15-25		○ 4-6		● 6-8
S.1.2		0,03	0,04	0,05	0,06	0,08	0,1	0,1	0,12	0,12	● 10-15		○ 2-5		● 3-6
S.2.1	Ti	0,04	0,07	0,1	0,12	0,14	0,18	0,2	0,22	0,22	● 20-30	○ 4-10	○ 6-10	○ 8-12	○ 8-12
S.2.2		0,04	0,07	0,1	0,12	0,14	0,18	0,2	0,22	0,22	● 15-25		○ 4-6		● 6-8
S.2.3		0,03	0,04	0,05	0,06	0,08	0,1	0,1	0,12	0,12	● 10-15		○ 2-5		● 3-6
H.1	50 HRC	0,01	0,03	0,03	0,06	0,08	0,10	0,12	0,14	0,16	● 6-10				
H.2	55 HRC	0,01	0,03	0,03	0,06	0,08	0,10	0,12	0,14	0,16	● 6-10				
H.3	60 HRC	0,01	0,03	0,03	0,06	0,08	0,10	0,12	0,14	0,16	○ 4-8				

● Optima / Optimun ○ Alternativo / Alternative

5121	5122	5123	5124	5161	5125	5126	5127	5129	5130	5132	5133	5134	5135	5136	5137
3	3	3	3	3	1	>4	>4	3	3	3					
90°	120°	60°	75°	30°	90°	60°	90°	90°	60°	120°	90°	90°	75°	ALLEN	ALLEN
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSSCo	HSS	HSS	HSS
335	335	334	335		335	334	335	335	334	334	335				
C	C	C	C		C	A	A	D	D	D					
10,40-31	6,30-25	6,30-25	6,30-25	6,30-31	10-31	12,50-25	8-25	20,50-80	40-63	40-63	2,5 - 25-30	2,5 - 15-20	2,5 - 10-15	M3-M12	M10-M24
311	313	313	314	314	315	315	316	316	317	317	318	318	319	320	320
Vc (m/min)															
● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30	● 25-30
● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25	● 20-25
○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18	○ 12-18
												○ 12-18	○ 12-18		
												○ 4-8			
○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10
○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10
● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24	● 15-24
○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13	○ 9-13
● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13	● 9-13
● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80	● 50-80
● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50
● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30	● 15-30
● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35	● 25-35
● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60	● 40-60
● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50	● 30-50
● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90	● 60-90
● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70	● 35-70
● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24	● 12-24
												○ 4-6			
												○ 2-5			
○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 4-10	○ 6-10	○ 4-10	○ 4-10	○ 4-10
												○ 4-6			
												○ 2-5			

● Optima / Optimun ○ Alternativo / Alternative



TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE





$$r.p.m. = \frac{V_c \times 1.000}{\pi \times \phi}$$



Ref / Réf. / Ref.	5101	5102	5103	5157	5158
Z	2	2	2	2	2
Punta/Poin/Point	118°	118°	118°	118°	118°
Mat.	HSS	HSSCo	HSS	HSS	HSS
Rec./Rev./Coat.			TiAIN		TiAIN
DIN					
Form.				35°	35°
Gama/Gamme/Range	3-14 - 6-25,40	3-14 - 26-40	3-14 - 46-60	4-12 - 6-37	4-12 - 6-30
Pag.	303	303	304	305	305

Mat.	Avance/Feed (mm/rpm) HSS/HSSCo - HM=x1,5											Vc (m/min)				
	Ø2	Ø5	Ø10	Ø15	Ø20	Ø25	Ø30	Ø35	Ø40	Ø40	Ø40	●	●	●	●	●
P.1	<600	0,05	0,08	0,12	0,14	0,16	0,20	0,20	0,25	0,25	0,40	● 25-30	● 25-30	● 30-35	● 25-30	● 30-35
P.2	<800	0,04	0,07	0,10	0,12	0,14	0,18	0,20	0,22	0,22	0,30	● 20-25	● 20-25	● 25-30	● 20-25	● 25-30
P.3	<1000	0,03	0,04	0,05	0,06	0,08	0,10	0,10	0,12	0,12	0,22	○ 12-18	● 12-18	○ 15-20	○ 12-18	○ 15-20
P.4	<1200	0,03	0,04	0,05	0,06	0,08	0,10	0,10	0,12	0,12	0,22		○ 4-8			
P.5											0,16					
M.1	<950	0,04	0,05	0,06	0,07	0,08	0,09	0,10	0,11	0,12	0,16	○ 4-10	● 4-10	○ 6-12	○ 4-10	○ 6-12
M.2		0,04	0,05	0,06	0,07	0,08	0,09	0,10	0,11	0,12	0,16	○ 4-10	● 4-10	○ 6-12	○ 4-10	○ 6-12
M.3	<1200										0,16					
M.4												0,16				
K.1	<500	0,08	0,10	0,12	0,16	0,20	0,25	0,25	0,30	0,30	0,35	● 15-24	● 15-24	● 20-30	● 15-24	● 20-30
K.2																
K.3	<800	0,06	0,07	0,08	0,12	0,16	0,20	0,20	0,25	0,25	0,30	○ 9-13	○ 9-13	○ 12-16	○ 9-13	○ 12-16
K.4.1		0,06	0,07	0,08	0,12	0,16	0,20	0,20	0,25	0,25	0,30	● 9-13	● 9-13	● 12-16	● 9-13	● 12-16
K.4.2	<1400										0,22					
N.1.1	Al	0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,35	0,40	0,40	● 40-60	● 40-60	● 50-70	● 40-60	● 50-70
N.1.2		0,08	0,10	0,12	0,16	0,20	0,25	0,25	0,30	0,30	0,40	● 25-40	● 25-40	● 30-50	● 25-40	● 30-50
N.1.3		0,08	0,10	0,12	0,16	0,20	0,25	0,25	0,30	0,30	0,35	● 15-30	● 15-30	● 20-40	● 15-30	● 20-40
N.2.1	Cu	0,06	0,07	0,08	0,12	0,16	0,20	0,20	0,25	0,25	0,30	● 25-35	● 25-35	● 30-40	● 25-35	● 30-40
N.2.2		0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,35	0,40	0,40	● 35-45	● 35-45	● 40-60	● 35-45	● 40-60
N.2.3		0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,35	0,40	0,30	● 25-35	● 25-35	● 30-50	● 25-35	● 30-50
N.2.4																
N.3.1	Mg/Zn	0,10	0,13	0,16	0,20	0,25	0,30	0,30	0,35	0,35	0,40	● 40-60	● 40-60	● 60-80	● 40-60	● 60-80
N.4.1	Plastic	0,10	0,12	0,14	0,18	0,20	0,24	0,30	0,35	0,40	0,40	● 30-50	● 30-50	● 35-50	● 30-50	● 35-50
N.4.2		0,04	0,06	0,08	0,10	0,12	0,16	0,20	0,20	0,25	0,35	● 12-24	● 12-24	● 15-30	● 12-24	● 15-30
N.4.3																
S.1.1	Ni	0,04	0,07	0,1	0,12	0,14	0,18	0,2	0,22	0,22	0,22					
S.1.2		0,03	0,04	0,05	0,06	0,08	0,1	0,1	0,12	0,12	0,16					
S.2.1	Ti	0,04	0,07	0,1	0,12	0,14	0,18	0,2	0,22	0,22	0,22	○ 4-10	● 6-10	○ 8-12	○ 4-10	○ 8-12
S.2.2		0,04	0,07	0,1	0,12	0,14	0,18	0,2	0,22	0,22	0,22					
S.2.3		0,03	0,04	0,05	0,06	0,08	0,1	0,1	0,12	0,12	0,16					
H.1	50 HRC										0,16					
H.2	55 HRC										0,16					
H.3	60 HRC										0,16					

● Optima / Optimun ○ Alternativo / Alternative

			
5105	5106	5160	5109
2	2	2	4
118°	118°	118°	118°
HSS	HSS	HSS	HSS
	TiAlN		
4-12 - 50-60	4-12 - 30-40	M8-M40	9-36 - 25-58
306	306	307	307
Vc (m/min)			
● 20-25	● 30-35	● 25-30	● 25-30
● 20-25	● 25-30	● 20-25	● 20-25
○ 12-18	○ 15-20	○ 12-18	○ 12-18
○ 4-10	○ 6-12	○ 4-10	○ 4-10
○ 4-10	○ 6-12	○ 4-10	○ 4-10
● 15-24	● 20-30	● 15-24	● 15-24
○ 9-13	○ 12-16	○ 9-13	○ 9-13
● 9-13	● 12-16	● 9-13	● 9-13
● 40-60	● 50-70	● 40-60	● 40-60
● 25-40	● 30-50	● 25-40	● 25-40
● 15-30	● 20-40	● 15-30	● 15-30
● 25-35	● 30-40	● 25-35	● 25-35
● 35-45	● 40-60	● 35-45	● 35-45
● 25-35	● 30-50	● 25-35	● 25-35
● 40-60	● 60-80	● 40-60	● 40-60
● 30-50	● 35-50	● 30-50	● 30-50
● 12-24	● 15-30	● 12-24	● 12-24
○ 4-10	○ 8-12	○ 4-10	○ 4-10

● Optima / Optimun ○ Alternativo / Alternative



P Aceros Inox
Aciers
Steels



M Aceros Inox
Aciers Inox
Stainless Steels



K Fundicion
Fonte
Cast Iron



N Metales no ferrosos
Métal non Ferraux
Non Ferrous metals



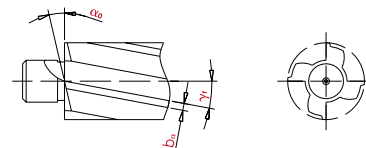
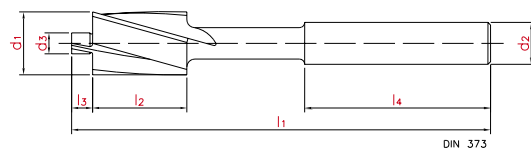
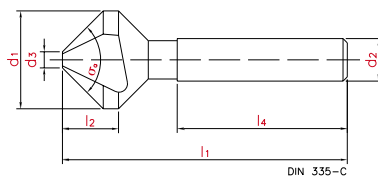
S Titanio y Superalaciones
Titanium et Supealleges
Titanium and Superalloys



H Materiales Duros
Materiels Durs
Hard materials

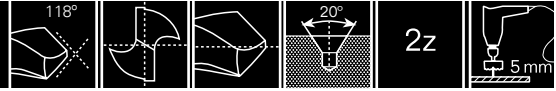


MANGO QUEUE SHANK	RANURA RAINURE GROOVE	FORMA FORME FORM	DIN 334	DIN 335	DIN 347	PLANOS PLANES FLAT
			60°	90°	120°	
CILÍNDRICO CYLINDRIQUE CYLINDRICAL	>4	A				DIN 373
	3	C				
CÓNICO CONIQUE TAPERED	>4	B				DIN 375
	3	D				



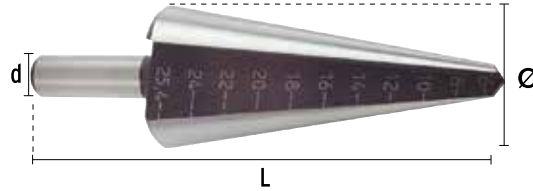
I1	Longitud total / Longueur totale / Total length
I2	Longitud diámetro mayor / Longueur du plus grand diamètre / Greater diameter length
I3	Longitud diámetro menor / Longueur du plus petit diamètre / Lesser diameter length
I4	Longitud mango / Longueur queue / Shank length
ba	Ancho de fase / Largeur de phase / Phase width
d2	Diámetro de mango / Diamètre de queue / Shank diameter
d1	Diámetro mayor / Plus grand diamètre / Greater diameter
d3	Diámetro menor / Plus petit diamètre / Lesser diameter
d6	Diámetro interno / Diamètre interne / Interior diameter
σa	Ángulo de avellanado / Angle de chanfreinage / Countersink angle
α0	Ángulo de destalonado / Angle de détalonnage / Relief angle
γ0	Ángulo corte ortogonal / Angle coupe orthogonale / Orthogonal cut angle
γf	Ángulo de corte lateral / Angle de coupe latérale / Lateral cut angle
γp	Ángulo corte posterior / Angle coupe postérieure / Rear cut angle
χr	Ángulo de posición / Angle de position / Angle of position

5101 HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-60	25-45	40-60	12-50		4-10			

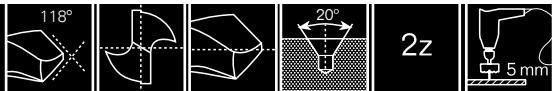
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	Icon
3,00 - 14,00	6	20,04	62	1
6,00 - 20,00	8	27,97	70	1
16,00 - 30,00	10	56,92	78	1
26,00 - 40,00	12	120,49	86	1
36,00 - 50,00	12	185,61	90	1

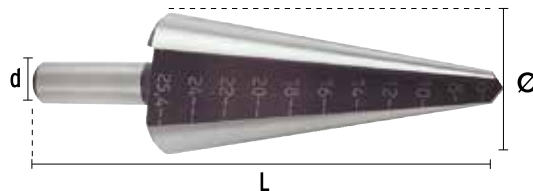
∅ mm	d mm	€	L mm	Icon
46,00 - 60,00	13	361,12	94	1
6,00 - 30,00	10	69,95	106	1
6,00 - 22,50	8	50,53	80	1
6,00 - 25,40	8	56,39	84	1

5102 HSSCO



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●		●	●		●	●	●	●		●			
20-30	12-18	4-8		4-10		15-24	9-13		15-60	25-45	40-60	12-50		6-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

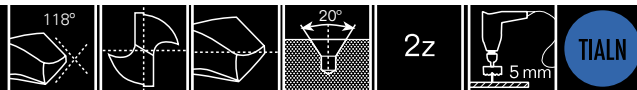


∅ mm	d mm	€	L mm	Icon
3,00 - 14,00	6	28,18	62	1
6,00 - 20,00	8	36,72	70	1

∅ mm	d mm	€	L mm	Icon
16,00 - 30,00	10	70,37	78	1
26,00 - 40,00	12	144,62	86	1

5103

HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
25-35	15-20			6-12		20-30	12-16		20-70	30-60	60-80	15-50		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	Icon
3,00 - 14,00	6	55,00	62	1
6,00 - 20,00	8	65,29	70	1
6,00 - 30,00	10	119,91	106	1
16,00 - 30,00	10	104,93	78	1

Ø mm	d mm	€	L mm	Icon
26,00 - 40,00	12	185,82	86	1
36,00 - 50,00	12	264,69	90	1
46,00 - 60,00	13	455,93	94	1

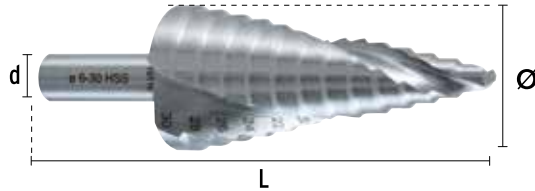
5157

HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-60	25-45	40-60	12-50		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	Grad. mm	€	L mm	Icon
4,00 - 12,00	6	1	59,79	70	1
4,00 - 20,00	8	2	87,75	77	1

Ø mm	d mm	Grad. mm	€	L mm	Icon
6,00 - 30,00	10	2	122,31	98	1
6,00 - 37,00	10	PG	190,81	100	1

5158

HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
25-35	15-20			6-12		20-30	12-16		20-70	30-60	60-80	15-50		8-12			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

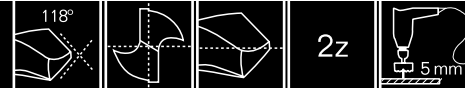


Ø mm	d mm	Grad. mm	€	L mm	Icon
4,00 - 12,00	6	1	89,69	70	1
4,00 - 20,00	8	2	131,61	77	1

Ø mm	d mm	Grad. mm	€	L mm	Icon
6,00 - 30,00	10	2	183,47	98	1

BROCAS ESCALONADAS FRAISES ÉTAGÉES / STEP DRILL-BITS

5105 HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-60	25-45	40-60	12-50		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	Grad. mm	€	L mm	Icon
4,00 - 12,00	6	1	41,01	69	1
4,00 - 12,00	6	2	42,84	69	1
4,00 - 20,00	8	2	55,34	75	1
6,00 - 30,00	10	2	84,05	95	1
12,00 - 20,00	9	1	75,60	75	1

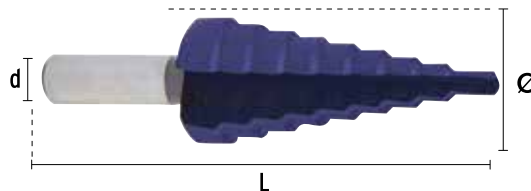
Ø mm	d mm	Grad. mm	€	L mm	Icon
20,00 - 30,00	12	1	105,24	93	1
30,00 - 40,00	12	1	190,55	93	1
40,00 - 50,00	12	1	276,29	97	1
50,00 - 60,00	13	1	402,02	97	1

5106 HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
25-35	15-20			6-12		20-30	12-16		20-70	30-60	60-80	15-50		8-12			

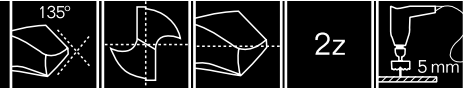
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	Grad. mm	€	L mm	Icon
4,00 - 12,00	6	1	96,53	69	1
4,00 - 12,00	6	2	99,95	69	1
4,00 - 20,00	8	2	126,97	75	1
6,00 - 30,00	10	2	182,35	95	1

Ø mm	d mm	Grad. mm	€	L mm	Icon
12,00 - 20,00	9	1	114,78	75	1
20,00 - 30,00	12	1	170,91	93	1
30,00 - 40,00	12	1	309,57	93	1

5160 HSS MULTI



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-60	25-45	40-60	12-50		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



M	Ciego Borgne Bling	Pasante Debouchant Bushing	d mm	€	L mm	
M8	-	Ø 8,5	12	176,4	97	1
M10	Ø 8,5	Ø 10,5	12		97	
M12	Ø 10,5	Ø 12,5	12		97	
M16	Ø 14,5	Ø 16,5	12		97	
M20	Ø 18,5	Ø 20,5	12		97	
M25	Ø 23,5	Ø 25,5	12		97	
M32	Ø 30,5	Ø 32,5	12		97	
M40	Ø 38,5	Ø 40,5	12		97	

5109 HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-60	25-45	40-60	12-50		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative




Ø mm	d mm	€	L mm	
9,00 - 36,00	10	220,40	88	1
25,00 - 58,00	10	540,76	91	1

* (Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

5112 > **Broca piloto / Foret pilote / Pilot drill-bit**



Ø mm	d mm	€	L mm	
7,00	4	36,30	40	1

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

5159

HM-MD DIN335C



3z

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 35-80	● 30-40	● 15-25	● 10-15	○ 20-30	● 15-25	● 40-70	● 25-35	● 20-30	● 40-120	● 40-100	● 80-140	● 30-100	● 10-25	● 10-30	● 6-10	● 6-10	○ 4-8

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	Icon
6,30	6	76,65	50	1
8,30	6	84,61	50	1
10,40	8	88,35	50	1
12,40	8	95,10	50	1

Ø mm	d mm	€	L mm	Icon
16,50	10	105,84	60	1
20,50	10	116,51	60	1
25,00	10	159,37	67	1
31,00	12	215,17	71	1

5116

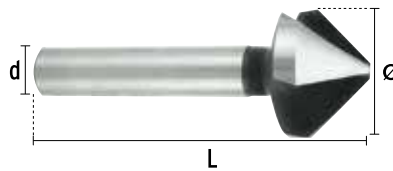
HSS DIN 335 C



3z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 20-30	○ 12-18			○ 4-10		● 15-24	● 9-13		● 15-80	● 25-60	● 60-90	● 12-70		○ 4-10			

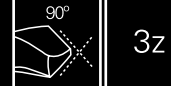
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	Icon
4,30	4	16,84	40	1
5,00	4	16,84	40	1
5,30	4	16,84	40	1
5,80	5	16,84	45	1
6,00	5	15,04	45	1
6,30	5	14,81	45	1
7,00	6	16,84	50	1
7,30	6	16,84	50	1
8,00	6	16,84	50	1
8,30	6	14,37	50	1
9,40	6	19,64	50	1
10,00	6	17,02	50	1
10,40	6	16,71	50	1
11,50	8	19,74	56	1

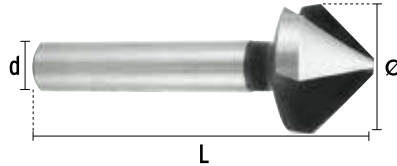
Ø mm	d mm	€	L mm	Icon
12,40	8	16,80	56	1
13,40	8	21,34	56	1
15,00	10	27,09	60	1
16,50	10	23,09	60	1
19,00	10	39,89	63	1
20,50	10	33,97	63	1
23,00	10	49,08	67	1
25,00	10	42,86	67	1
26,00	10	58,23	67	1
28,00	12	71,65	71	1
30,00	12	53,30	71	1
31,00	12	98,19	71	1
40,00	13	113,65	80	1

5117 HSSCO DIN 335 C



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●		●	●		●	●	●	●	○	●			
20-30	12-18	4-8		4-10		15-24	9-13		15-80	25-60	60-90	12-70	2-6	2-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	
6,00	5	15,69	45	1
6,30	5	15,69	45	1
8,00	6	21,68	50	1
8,30	6	21,69	50	1
9,40	6	25,34	50	1
10,00	6	25,34	50	1
10,40	6	25,34	50	1
11,50	8	27,92	56	1
12,40	8	27,92	56	1

Ø mm	d mm	€	L mm	
15,00	10	38,20	60	1
16,50	10	38,21	60	1
19,00	10	56,26	63	1
20,50	10	56,26	63	1
25,00	10	71,07	57	1
30,00	12	107,37	71	1
31,00	12	114,45	71	1
40,00	13	140,10	80	1

5118 HSS DIN 335 C



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●	○	○			
25-35	15-20			6-12		20-30	12-16		20-100	30-75	75-115	15-90		8-12			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

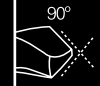


Ø mm	d mm	€	L mm	
4,30	4	33,35	40	1
5,00	4	33,35	40	1
5,30	4	33,35	40	1
5,80	5	29,31	45	1
6,00	5	28,65	45	1
6,30	5	28,65	45	1
7,00	6	38,24	50	1
7,30	6	38,24	50	1
8,00	6	38,24	50	1
8,30	6	38,24	50	1
9,40	6	43,19	50	1
10,00	6	43,19	50	1
10,40	6	43,19	50	1
11,50	8	45,73	56	1

Ø mm	d mm	€	L mm	
12,40	8	45,73	56	1
13,40	8	47,24	56	1
15,00	10	63,48	60	1
16,50	10	65,21	60	1
19,00	10	79,55	63	1
20,50	10	81,24	63	1
23,00	10	92,56	67	1
25,00	10	93,85	67	1
26,00	12	101,78	71	1
28,00	12	119,29	71	1
30,00	12	123,77	71	1
31,00	12	128,29	71	1
40,00	13	195,83	80	1

5119

HSSCO DIN 335 C



3z

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●	○	●	●	●	●	●	●			
25-35	15-20	6-10		6-12	4-6	20-30	12-16	6-10	20-100	30-75	75-115	15-90	3-8	3-12			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	Icon
6,30	5	32,21	45	1
8,30	6	43,19	50	1
10,40	6	49,17	50	1
12,40	8	53,92	56	1

Ø mm	d mm	€	L mm	Icon
16,50	10	76,46	60	1
20,50	10	97,71	63	1
25,00	10	114,68	67	1
30,00	12	155,04	71	1

1505

HSS DIN 335 C Hex.



1/4"

3z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●	●	○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

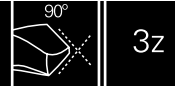
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	L mm	€	Icon
6,30	31	9,80	1
8,30	32	11,33	1
10,40	34	13,47	1

Ø mm	L mm	€	Icon
12,40	36	15,88	1
16,50	40	23,46	1
20,50	43	28,40	1

5120 HSS DIN 335 C



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

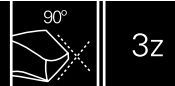


Ø mm	L mm	€	Icon
12,00	120	19,47	1
12,40	130	25,08	1
15,00	150	33,87	1
16,00	150	25,98	1

Ø mm	L mm	€	Icon
16,50	150	34,71	1
19,00	150	47,57	1
20,50	150	47,57	1
25,00	150	57,65	1

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

5121 HSS DIN 335 C EL



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	Icon
10,40	6	64,00	112	1
12,40	8	78,03	120	1
16,50	10	94,03	120	1

Ø mm	d mm	€	L mm	Icon
20,50	10	126,05	124	1
25,00	10	152,04	128	1
31,00	12	178,08	133	1

5122 HSS DIN 335 C



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

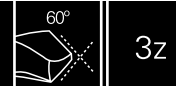
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	
6,30	5	16,74	45	1
8,30	6	23,07	50	1
10,40	6	26,93	50	1
12,40	8	32,25	56	1

Ø mm	d mm	€	L mm	
16,50	10	40,81	60	1
20,50	10	60,21	63	1
25,00	10	75,92	71	1

5123 HSS DIN 334 C



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	
6,30	5	20,41	45	1
8,00	6	22,45	50	1
10,00	6	24,49	53	1
12,50	8	27,13	56	1

Ø mm	d mm	€	L mm	
16,00	10	34,71	63	1
20,00	10	48,97	67	1
25,00	10	68,36	71	1

5124 HSS DIN 335 C



3z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	
6,30	5	15,71	45	1
8,30	6	21,42	50	1
10,40	6	25,32	50	1
12,40	8	27,96	56	1

Ø mm	d mm	€	L mm	
16,50	10	35,08	60	1
20,50	10	51,63	63	1
25,00	10	65,08	67	1

5161 HSS



3z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

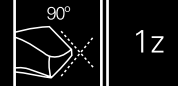
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	
6,30	5	36,75	50	1
12,40	8	51,45	65	1
16,50	10	62,48	73	1

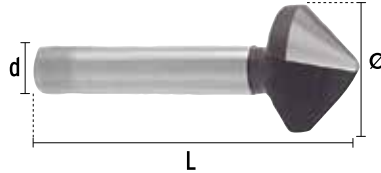
Ø mm	d mm	€	L mm	
20,50	10	84,53	83	1
25,00	10	113,93	90	1
31,00	12	161,70	98	1

5125 HSS DIN 335 C



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

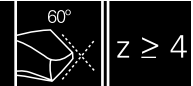
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	Icon
10,00	8	13,20	46	1
12,00	8	14,61	46	1
16,00	8	20,00	47	1
20,00	8	30,61	47	1

∅ mm	d mm	€	L mm	Icon
25,00	10	42,04	50	1
30,00	12	71,43	71	1
31,00	12	75,62	71	1

5126 HSS DIN 334 A



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	Icon
12,50	8	24,73	50	1
16,00	10	41,51	60	1

∅ mm	d mm	€	L mm	Icon
20,00	10	53,54	60	1
25,00	10	74,92	65	1

5127 HSS DIN 335 A



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

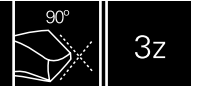
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	📦
8,00	8	13,51	48	1
12,50	8	19,78	48	1
16,00	10	33,26	56	1

∅ mm	d mm	€	L mm	📦
20,00	10	42,83	60	1
25,00	10	59,98	65	1

5129 HSS DIN 335 D



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	∅ mm	€	L mm	📦
2	20,50*	102,05	100	1
2	23,00*	106,04	106	1
2	25,00	106,04	106	1
2	26,00	106,04	106	1
2	28,00	108,03	112	1
2	30,00	114,04	112	1
2	31,00	118,04	112	1

△	∅ mm	€	L mm	📦
2	34,00	124,04	118	1
2	37,00	136,04	118	1
3	40,00	170,06	140	1
3	50,00	214,06	150	1
4	63,00	346,11	180	1
4	80,00	592,21	190	1

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

5130 HSS DIN 334 D



3z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



▲	Ø mm	€	L mm	📦
3	40,00	218,25	150	1
3	50,00	311,82	160	1
4	63,00	491,07	190	1

5132 HSS DIN 334 D



3z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



▲	Ø mm	€	L mm	📦
3	40,00	187,07	134	1
3	50,00	241,66	142	1
4	63,00	394,55	178	1

5133 HSS DIN 335 D



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	Icon
2,00 - 5,00	6	17,15	45	1
5,00 - 10,00	8	21,42	48	1
10,00 - 15,00	10	38,38	65	1

∅ mm	d mm	€	L mm	Icon
15,00 - 20,00	12	68,55	85	1
20,00 - 25,00	15	115,70	95	1
25,00 - 30,00	15	177,72	100	1

5134 HSSCO



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●		●	●		●	●	●	●	○	○			
20-30	12-18	4-8		4-10		15-24	9-13		15-80	25-60	60-90	12-70	2-6	2-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	Icon
2,00 - 5,00	6	20,41	45	1
5,00 - 10,00	8	25,53	48	1

∅ mm	d mm	€	L mm	Icon
10,00 - 15,00	10	45,54	65	1
15,00 - 20,00	12	81,63	85	1

5135

HSS



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	
2,00 - 5,00	6	20,41	45	1
5,00 - 10,00	8	25,53	48	1
10,00 - 15,00	10	45,71	65	1

5136

HSS DIN 373

ALLEN

ISO 4206

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



M	Ø mm	P mm	€	L mm	Icon
M3	6,00	3,20	23,88	71	1
M4	8,00	4,30	24,98	71	1
M5	10,00	5,30	24,11	80	1
M6	11,00	6,40	25,47	80	1

M	Ø mm	P mm	€	L mm	Icon
M8	15,00	8,40	33,29	100	1
M10	18,00	10,50	43,42	100	1
M12	20,00	13,00	54,02	100	1

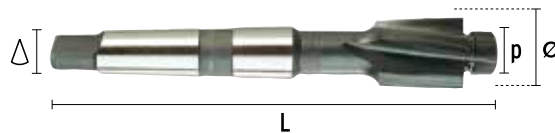
5137

HSS DIN 375

ALLEN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	○			○		●	●		●	●	●	●		○			
20-30	12-18			4-10		15-24	9-13		15-80	25-60	60-90	12-70		4-10			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Δ	M	Ø mm	P mm	€	L mm	Icon
2	M10	18,00	10,50	60,28	140	1
2	M12	20,00	13,00	73,22	140	1
2	M14	24,00	15,00	95,99	150	1
3	M16	26,00	17,00	115,76	180	1

Δ	M	Ø mm	P mm	€	L mm	Icon
3	M18	30,00	19,00	124,82	1	1
3	M20	33,00	21,00	159,18	1	1
3	M22	36,00	23,00	178,95	1	1
3	M24	40,00	25,00	197,28	1	1

JUEGOS DE AVELLANADORES
JEUX DE FRAISES À TROU ET À CHANFREINER / COUNTERSINK CUTTER SETS

5142 > Ø 6 a 19 mm

Ø
 mm
 6 - 8 - 10 - 11,5 - 15 - 19



>HSS

>HSS CO

>HSS TIALN



REF.	€
HSS	142,99
HSS CO	189,82
HSS TIALN	285,61

5143 > Ø 6,3 a 20,5 mm

Ø
 mm
 6,3 - 8,3 - 10,4 - 12,4 - 16,5 - 20,5



>HSS

>HSS CO

>HSS TIALN



REF.	€
HSS	132,52
HSS CO	192,32
HSS TIALN	304,95



JUEGOS DE AVELLANADORES
JEUX DE FRAISES À TROU ET À CHANFREINER / COUNTERSINK CUTTER SETS

5151


Ø 2-5 a 10-20 mm

∅
mm
2-5/5-10/10-15/15-20



>HSS



REF.	€	
HSS	173,85	4

5155


M3 - M10

∅
mm
M3/M4/M5/M6/M8/M10



>HSS



REF.	€	
HSS	236,05	6

5138 > Ø 3 a 14 / 6 a 20 / 16 a 30 mm

∅
mm
3-14,6-20,16-30


3

>HSS

>HSS CO

>HSS TIALN



REF.	€
HSS	118,30
HSS CO	148,63
HSS TIALN	253,55

5139 > Ø 4 a 12 / 12 a 20 / 20 a 30 mm

∅
mm
4-12,12-20,20-30

X
mm
1


3

>HSS

>HSS TIALN



REF.	€
HSS	246,97
HSS TIALN	396,24



JUEGO DE BROCAS
COFFRETS DE FORETS / DRILL SETS

5140 > Ø 4 a 12 / 4 a 20 / 6 a 30 mm

Ø
mm
4-12,4-20,6-30

X
mm
2



>HSS

>HSS TIALN

>HSS (35°)

>HSS TIALN (35°)



REF.

€

HSS	205,73
HSS TIALN	423,32
HSS (35°)	283,90
HSS TIALN (35°)	418,81

5141 > Ø 4 a 20 / 6 a 30 mm

Ø
mm
4-20,6-30

X
mm
2



>HSS

>HSS TIALN



REF.

€

HSS	160,85
HSS TIALN	323,37



Fresado 
Fraisage
Milling

 **hercules**

Fresas Metal duro / Fraises carbure / Hard metal mills							
	3141	HM-MD				N	349
	3189	HM-MD				N	349
NEW	3190	HM-MD				N	350
	3167	HM-MD	DIN 6527S	TIALN		P M K S	350
	3168	HM-MD	DIN 6527L	TIALN		P M K S	351
	3169	HM-MD	DIN 6527S	TIALN		P M K N H	352
	3170	HM-MD	DIN 6527L	TIALN		P M K N H	352
NEW	3191	HM-MD	DIN 6527EL	AlGN		P K S H	353
	3171	HM-MD	DIN 6527S	TIALN		P M K S	353
	3172	HM-MD	DIN 6527L	TIALN		P M K S	354
	3173	HM-MD	DIN 6527S	TIALN		P M K S H	354
	3174	HM-MD	DIN 6527L	TIALN		P M K S	355
	3175	HM-MD	DIN 6527S	TIALN		P M K S	356
	3176	HM-MD	DIN 6527L	TIALN		P M K S	356
	3177	HM-MD	DIN 6527L	TIALN		P M K S H	357
NEW	3192	HM-MD	DIN 6527 L	AlGN		P M K S H	358
NEW	3193	HM-MD	DIN 6527 EL	AlGN		P H	358
	3178	HM-MD	DIN 6527L	AlGN		P M K S H	359
	3179	HM-MD	DIN 6527L	TIALN		P M K S H	360

						Pág.							
3180	HM-MD	DIN 6527EL	TIALN			<table border="1"> <tr><td>P</td><td>M</td><td>K</td></tr> <tr><td>S</td><td>H</td><td></td></tr> </table>	P	M	K	S	H		360
P	M	K											
S	H												
3181	HM-MD	DIN 6527L	TIALN			<table border="1"> <tr><td>P</td><td>M</td><td></td></tr> <tr><td>K</td><td>S</td><td></td></tr> </table>	P	M		K	S		361
P	M												
K	S												
3183	HM-MD		TIALN			<table border="1"> <tr><td>P</td><td>M</td><td>K</td></tr> <tr><td>S</td><td>H</td><td></td></tr> </table>	P	M	K	S	H		361
P	M	K											
S	H												
3184	HM-MD		TIALN			<table border="1"> <tr><td>P</td><td>M</td><td></td></tr> <tr><td>K</td><td>S</td><td></td></tr> </table>	P	M		K	S		362
P	M												
K	S												
3185	HM-MD		TIALN			<table border="1"> <tr><td>P</td><td>M</td><td></td></tr> <tr><td>K</td><td>S</td><td></td></tr> </table>	P	M		K	S		362
P	M												
K	S												
NEW 3194	HM-MD	DIN 6527 L	AKr			<table border="1"> <tr><td>M</td><td>S</td><td></td></tr> </table>	M	S		363			
M	S												
NEW 3195	HM-MD	DIN 6527 EL	AKr			<table border="1"> <tr><td>M</td><td>S</td><td></td></tr> </table>	M	S		363			
M	S												
3101	HM-MD					<table border="1"> <tr><td>P</td><td>M</td><td></td></tr> <tr><td>K</td><td>S</td><td></td></tr> </table>	P	M		K	S		364
P	M												
K	S												
3105	HM-MD					<table border="1"> <tr><td>P</td><td>M</td><td></td></tr> <tr><td>K</td><td>S</td><td></td></tr> </table>	P	M		K	S		364
P	M												
K	S												
3107	HM-MD					<table border="1"> <tr><td>P</td><td>M</td><td></td></tr> <tr><td>K</td><td>S</td><td></td></tr> </table>	P	M		K	S		365
P	M												
K	S												



Fresas HSSE mango cilíndrico cortas / Fraises HSSE queue cylindrique courtes / HSSE Straight short shank mills

3120	HSSE				1z	N	366
3121	HSSE				1z	N	366
3122	HSSE				1z	N	367
3186	HSSE				40° 2z	P N	367
3110	HSSE	DIN 327 N			30° 2z	P	368
3110/1	HSSE	DIN 327 N	TIALN		30° 2z	P K	369
3112	HSSE	DIN 327 N			30° 2z	P	370
3112/1	HSSE	DIN 327 N	TIALN		30° 2z	P K S	370
3187	HSSE	DIN 327 N			30° 3z	P	371
3187/1	HSSE	DIN 327 N	TIALN		30° 3z	P K	371
3114	HSSE	DIN 844 W			45° 3z	P N	372
3114/1	HSSE	DIN 844 W	TIALN		45° 3z	P N	372
3115	HSSE	DIN 844 N			30° z≥4	P	373
3115/1	HSSE	DIN 844 N	TIALN		30° z≥4	P K S	373
3117	HSSE	DIN 844 NR			30° z≥4	P	374
3117/1	HSSE	DIN 844 NR	TIALN		30° z≥4	P K	374
3119	HSSE	DIN 844 NRF			30° z≥4	P K	375
3119/1	HSSE	DIN 844 NRF	TIALN		30° z≥4	P K	375

3162	HSSE-PM	DIN 844 N	TIALN			P M K S	376
3157	HSSE-PM	DIN 844 NR	TIALN			P M K	376
3159	HSSE-PM	DIN 844 NRF	TIALN			P M K S	377

Fresas HSSE mango cilíndrico largas / Fraises HSSE queue cylindrique longues / HSSE Straight long shank mills

3111	HSSE	DIN 844				P	378
3111/1	HSSE	DIN 844				P K	378
3113	HSSE	DIN 844				P	379
3113/1	HSSE	DIN 844	TIALN			P K S	379
3188	HSSE	DIN 327 N				P	380
3188/1	HSSE	DIN 327 N	TIALN			P K	380
3182	HSSE	DIN 844 W				P N	381
3182/1	HSSE	DIN 844 W	TIALN			P N	381
3116	HSSE	DIN 844 N				P	382
3116/1	HSSE	DIN 844 N	TIALN			P K S	382
3118	HSSE	DIN 844 NR				P	383
3118/1	HSSE	DIN 844 NR	TIALN			P K	383
3163	HSSE-PM	DIN 844 N	TIALN			P M K S	384
3158	HSSE-PM	DIN 844 vNR	TIALN			P M K	384
3160	HSSE-PM	DIN 844 NRF	TIALN			P M K S	385

Fresas mango cónico / Fraises queue conique / Tapered shank mills










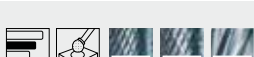

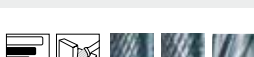
3144	HSSE	DIN 326 N				P N	386
3144/1	HSSE	DIN 326 N	TIALN			P K N	386
3145	HSSE	DIN 845 N				P N	387
3145/1	HSSE	DIN 845 N	TIALN			P K N S	387
3146	HSSE	DIN 845 NR				P N	388
3146/1	HSSE	DIN 845 NR	TIALN			P K N	388
3147	HSSE	DIN 845 N				P N	389
3147/1	HSSE	DIN 845 N	TIALN			P K N S	389
3148	HSSE	DIN 845 NR				P N	390
3148/1	HSSE	DIN 845 NR	TIALN			P K N	390

Fresas con agujero / Fraises à trou / Mills with holes


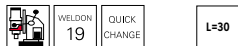



















3149	HSSE	DIN 1880 N				P M K N S	391
3150	HSSE	DIN 1880 NR				P M K N S	391
3165	HSSE	DIN 1880 NRF				P M K N S	392
3151	HSSE	DIN 885 D				P K N	392
3161	HSSE	DIN 885 A				P M K N S	393
3166	HSSE	DIN 1834 A				P K N	393

Fresas HSSE especiales / Fraises HSSE spéciales / HSSE Special mills						
3152	HSSE	DIN 850 D		Tol D (h11) d (h8) L (h8)	P N	394
3153	HSSE	DIN 851 N		Tol ISO D (h11) d (h8) L (h11)	3337	P N 394
3154	HSSE	DIN 851 B		Tol ISO D (h11) L (h11)	1641	P N 395
3155	HSSE	DIN 1833 A		Tol ISO D (h11) d (h8)	3859	P N 395
3156	HSSE	DIN 1833 B		Tol ISO D (h11) d (h8)	3859	P N 396
3164	HSSE	DIN 6518 N		Tol B (h11) d2 (h8)		P N 396

Fresas rotativas metal duro / Fraises rotatives métal dur / Hard metal rotary mills						
3201	HM-MD	Cilíndrica Cylindrique Straight			DIAM CRUZ ALU	P M K N S H 397
3202	HM-MD	Cilíndrica con corte Cylindrique taillée Straight with cut			DIAM CRUZ ALU	P M K N S H 397
3203	HM-MD	Cilíndrica radio Cylindrique à rayon Straight radius			DIAM CRUZ ALU	P M K N S H 398
3204	HM-MD	Esférica Sphérique Spherical			DIAM CRUZ ALU	P M K N S H 398
3205	HM-MD	Oval Ovale			DIAM CRUZ ALU	P M K N S H 399
3206	HM-MD	Árbol con radio Arbre à rayon Arc with radius			DIAM CRUZ ALU	P M K N S H 399
3207	HM-MD	Árbol Arbre Arc			DIAM CRUZ ALU	P M K N S H 400
3208	HM-MD	Llama Flamme Flame			DIAM CRUZ ALU	P M K N S H 400
3209	HM-MD	Cónica Conique Tapered			DIAM CRUZ ALU	P M K N S H 401
3210	HM-MD	Cónica 90° Conique 90° Tapered 90°			DIAM CRUZ ALU	P M K N S H 401
3211	HM-MD	Cónica radio Conique à rayon Tapered radius			DIAM CRUZ ALU	P M K N S H 402
3212	HM-MD	Cono invertido Cône inversé Inverted taper			DIAM CRUZ ALU	P M K N S H 402

3214	HM-MD	Cilíndrica L Cylindrique L Straight L			<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td>H</td></tr></table>	P	M	K	N	S	H	403
P	M	K										
N	S	H										
3215	HM-MD	Cilíndrica con corte L Cylindrique taillée L Straight with L cut			<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td>H</td></tr></table>	P	M	K	N	S	H	403
P	M	K										
N	S	H										
3216	HM-MD	Cilíndrica radio L Cylindrique à rayon L Straight L radius			<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td>H</td></tr></table>	P	M	K	N	S	H	404
P	M	K										
N	S	H										
3217	HM-MD	Árbol L Arbre L L Arc			<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td>H</td></tr></table>	P	M	K	N	S	H	404
P	M	K										
N	S	H										
3218	HM-MD	Esférica L Sphérique L L Spherical			<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td>H</td></tr></table>	P	M	K	N	S	H	405
P	M	K										
N	S	H										
3219	HM-MD	Árbol con radio L Arbre à rayon L L Radius arc			<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td>H</td></tr></table>	P	M	K	N	S	H	405
P	M	K										
N	S	H										

Fresas huecas máquinas electromagnéticas / Fraises à trou électromagnétiques / Electromagnetics core bits

7172	HSS				<table border="1"><tr><td>P</td><td>N</td></tr></table>	P	N	406				
P	N											
7172	HSS				<table border="1"><tr><td>P</td><td>N</td></tr></table>	P	N	407				
P	N											
7137	HSSE				<table border="1"><tr><td>P</td><td>K</td></tr><tr><td>N</td><td></td></tr></table>	P	K	N		408		
P	K											
N												
7137	HSSE				<table border="1"><tr><td>P</td><td>K</td></tr><tr><td>N</td><td></td></tr></table>	P	K	N		409		
P	K											
N												
7137	HSSE				<table border="1"><tr><td>P</td><td>K</td></tr><tr><td>N</td><td></td></tr></table>	P	K	N		410		
P	K											
N												
7138	HSSE				<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td></td></tr></table>	P	M	K	N	S		410
P	M	K										
N	S											
7138	HSSE				<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td></td></tr></table>	P	M	K	N	S		411
P	M	K										
N	S											
7139	TCT				<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td>H</td></tr></table>	P	M	K	N	S	H	412
P	M	K										
N	S	H										
7139	TCT				<table border="1"><tr><td>P</td><td>M</td><td>K</td></tr><tr><td>N</td><td>S</td><td>H</td></tr></table>	P	M	K	N	S	H	412
P	M	K										
N	S	H										
7140		CONO MORSE CONE MORSE MORSE TAPER				413						
7141		PUNZON POINÇON PUNCHER				413						
7158		ADAPTADOR FEIN FEIN FEIN				413						
Estuches / Coffrets / Sets						414						

Fecha / Date:

Empresa / Entreprise / Company: Contacto / Contact:

Dirección / Adresse / Address: Población / Ville / Town:

Tel / Fax: E-mail:

TRABAJO A REALIZAR / TRAVAIL DEMANDE / REQUESTED WORK

Material / Matière / Material Norma / Norme / Norm:

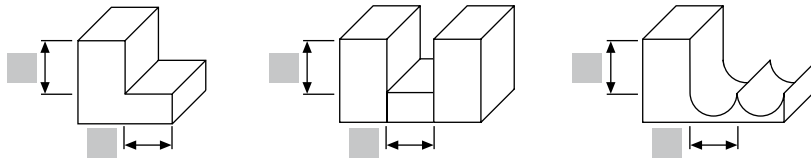
Dureza / Durété / Hardness HB HRC Resistencia / Résistance / Resistance N/mm²

Tipo viruta: Corta Larga Polvo
 Type copeau Courte Longue Poussière
 Shaving Short Long Powder

Máquina / Machine Refrigerante / Réfrigérant / Coolant

Posición / Position: Horizontal Vertical V. Corte V. avance
 V. Coupe Avance
 Cutting Speed Feed

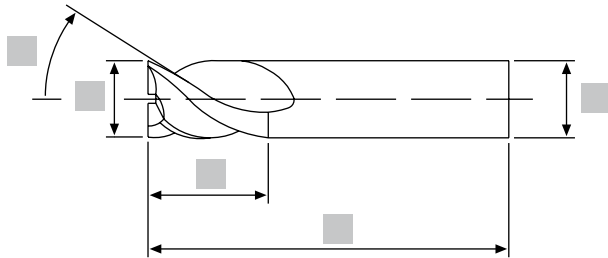
Forma / Forme / Form:



HERRAMIENTA / OUTIL / TOOL

Descripción / Description

Cantidad / Quantité / Quantity Número ranuras / Rainures / Grooves



Corte al centro / Coupe au centre / Cut to the center
 Sin corte al centro / Sans coupe au centre / Without cut to the center

Mango: Cilíndrico Weldon Cónico Rebajado
 Queue: Cylindrique Weldon Conique Réduite
 Shank: Straight Weldon Taper Reduced

Tipos de punta: Recta Chafilán Radial Labios: Desbaste Desbaste fino Acabado
 Types de pointe: Droite Chanfrein Radiale Lèvres: Dégrossissage Dégrossissage fin Finition
 Types of tips: Straight Chamfered Radial Lips: Grinding Fine grinding Finishing

Material / Matière / Material: HSS HSSE HM HSS-HM

Superficie / Surface: Brillante Recubrimiento
 Brillant Revêtement
 Brilliant Coating

COMENTARIOS / COMMENTAIRES/ COMMENTS:



TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$



Ref./ Réf. / Ref.	3141	3189	3190	3167	3168	3169	3170	3191	3171	3172	3173	3174	3175	
Z	1Z	2Z	3Z	2Z	2Z	2Z	2Z	2Z	3Z	3Z	3Z	3Z	4Z	
Ejec./Exéc./Exec.	N	W	W	N	N	N	N	N	N	N	W	W	N	
Hel./Hel./Spiral	30°	45°	45°	30°	30°	30°	30°	30°	30°	30°	45°	45°	30°	
Mat.	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	
Rec./Rev./Coat.				TIALN	TIALN	TIALN	TIALN	AICRN	TIALN	TIALN	TIALN	TIALN	TIALN	
DIN				6527S	6527L	6527S	6527L	6527EL	6527S	6527L	6527S	6527L	6527S	
Arista/Arête/Edge	45°					R	R	R						
Gama/Gamme/Range	3-10	3-20	3-20	3-20	3-20	3-20	3-20	2-20	3-20	3-20	3-20	3-20	3-20	
Pag.	349	349	350	351	351	352	352	353	354	354	355	355	356	
Mat.	Vc (m/min)													
P.1	<600				140-250	120-220	140-250	140-250	180-240	140-250	120-220	140-250	120-220	140-250
	<800				110-220	100-200	110-220	110-220	160-220	110-220	100-200	110-220	100-200	110-220
P.2	<1000				90-200	80-180	90-200	90-200	140-210	90-200	80-180	90-200	80-180	90-200
	<1200				75-180	70-150	75-180	75-180	150-200	75-180	70-150	75-180	70-150	75-180
P.3	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
	<950				80-140	70-110	70-110	70-110		80-140	70-110	80-140	70-110	80-140
M.1	<1200				60-120	60-100	60-100	60-100		60-120	60-100	60-120	60-100	60-120
	<1400				60-120	60-100	60-100	60-100		60-120	60-100	60-120	60-100	60-120
M.2	<500				120-180	100-160	120-180	120-180	120-180	120-180	100-160	120-180	100-160	120-180
	<800				100-140	80-120	100-140	100-140	90-130	100-140	80-120	100-140	80-120	100-140
K.1	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
K.2	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
K.3	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
K.4.1	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
K.4.2	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
	<1400				60-120	60-90	60-120	60-120	100-140	60-120	60-90	60-120	60-90	60-120
N.1.1	Al	150-300	150-300	150-300			150-450	150-450			150-300	110-240		
	Al	150-300	150-300	150-300			150-450	150-450			150-300	110-240		
N.1.2	Cu	120-350	120-350	120-350			120-350	120-350			120-350	110-250		
	Cu	120-350	120-350	120-350			120-350	120-350			120-350	110-250		
N.1.3	Mg/Zn	120-350	120-350	120-350			150-450	150-450			120-350	90-250		
	Mg/Zn	120-350	120-350	120-350			150-450	150-450			120-350	90-250		
N.2.1	Plastic	150-300	150-300	150-300			150-450	150-450			150-300	110-240		
	Plastic	150-300	150-300	150-300			150-450	150-450			150-300	110-240		
N.2.2	Ni				60-90	50-80			50-80	60-90	60-90	60-90	60-90	60-90
	Ni				40-75	40-60			40-60	40-75	40-75	40-75	40-75	40-75
N.2.3	Ti				80-140	70-110			80-140	70-110	80-140	70-110	80-140	
	Ti				75-100	70-90			70-90	75-100	75-100	75-100	75-100	75-100
N.2.4	Ti				60-90	60-80			60-80	60-90	60-90	60-90	60-90	60-90
	Ti				60-90	60-80			60-80	60-90	60-90	60-90	60-90	60-90
H.1	50 HRC						40-80	40-80	90-150			40-80		
	55 HRC						30-50	30-50	70-130			30-50		
H.2	60 HRC								60-110					
	60 HRC								60-110					

● Optima / Optimun ○ Alternativo / Alternative



3176	3177	3192	3193	3178	3179	3180	3181	3183	3184	3185	3194	3195	3101	3105	3107
4Z	4Z	4Z	5Z	4Z	6,8Z	6,8Z	3,4,5,6Z	4Z	4Z	4Z	4Z	5Z	ZZ	3Z	4Z
N	N-V	N-V	N-V	N-V	W	W	WR	60°	90°	r	N-V	N-V	N	N	N
30°	35°-38°	35°-38°	37°-38°	35°-38°	45°	45°	45°	0°	0°	0°	40°-42°	40°-42°	30°	30°	30°
HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM
TIALN	TIALN	AICRN	AICRN	AICRN	TIALN	TIALN	TIALN	TIALN	TIALN	TIALN	ALCR	ALCR			
6527L	6527L	6527L	6527EL	6527L	6527S	6527EL	6527L				6527L	6527EL			
	45°	45°	45°	r	45°	45°	45°	30°	45°	r	45°	45°			
3-20	3-20	3-20	6-25	6-16	6-20	6-20	4-20	1,20-2,40	1,20-2,40	0,50-5	3-20	6-25	3-20	3-20	3-20
356	357	358	358	359	360	360	361	361	362	362	363	363	364	364	365

Vc (m/min)

120-220	120-220	180-240	220-380	180-240	120-220	120-220	120-220	120-220	120-220	120-220			85-155	85-155	85-155
100-200	100-200	170-220	210-350	170-220	100-200	100-200	100-200	100-200	100-200	100-200			70-130	70-130	70-130
80-180	80-180	160-210	200-320	160-210	80-180	80-180	80-180	80-180	80-180	80-180			60-110	60-110	60-110
70-150	70-150	150-200	200-300	150-200	70-150	70-150	70-150	70-150	70-150	70-150			50-105	50-105	50-105
60-90	60-90	100-140	180-250	100-140	60-90	60-90	60-90	60-90	60-90	60-90			45-65	45-65	45-65
70-110	70-110	80-140		80-140	70-110	70-110	70-110	70-110	70-110	70-110	90-150	150-230	50-80	50-80	50-80
70-110	70-110	80-140		80-140	70-110	70-110	70-110	70-110	70-110	70-110	90-150	150-230	50-80	50-80	50-80
60-100	60-100	60-120		60-120	60-100	60-100	60-100	60-100	60-100	60-100	70-130	130-200	45-70	45-70	45-70
60-100	60-100	60-120		60-120	60-100	60-100	60-100	60-100	60-100	60-100	70-130	130-200	45-70	45-70	45-70
100-160	100-160	120-180		120-180	100-160	100-160	100-160	100-160	100-160	100-160			70-115	70-115	70-115
100-160	100-160	120-180		120-180	100-160	100-160	100-160	100-160	100-160	100-160			70-115	70-115	70-115
80-120	80-120	90-130		90-130	80-120	80-120	80-120	80-120	80-120	80-120			60-85	60-85	60-85
80-120	80-120	90-130		90-130	80-120	80-120	80-120	80-120	80-120	80-120			60-85	60-85	60-85
60-90	60-90	100-140		100-140	60-90	60-90	60-90	60-90	60-90	60-90					
100-200	100-200	170-220	200-250	170-220	100-200	100-200	100-200	100-200	100-200	100-200			70-130	70-130	70-130
60-90		50-80		50-80	50-80	50-80	50-80	50-80	50-80	50-80	60-80	50-100	40-60	40-60	40-60
40-75	40-60	40-60		40-60	40-60	40-60	40-60	40-60	40-60	40-60	50-70	40-80	30-45	30-45	30-45
70-110		80-140		80-140	70-110	70-110	70-110	70-110	70-110	70-110	90-150	150-230	50-80	50-80	50-80
75-100		70-90		70-90	70-90	70-90	70-90	70-90	70-90	70-90	80-100	80-170	50-80	50-80	50-80
60-90	60-80	60-80		60-80	60-80	60-80	60-80	60-80	60-80	60-80	60-80	60-120	45-60	45-60	45-60
	40-80	90-150	70-130	90-150	60-100	60-100		40-80							
	30-50	70-130	50-120	70-130	50-80	50-80		30-50							
		60-110	40-80	60-110											

● Optima / Optimun ○ Alternativo / Alternative



TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

$r.p.m.= \frac{Vc \times 1.000}{\pi \times \phi}$

Ref./ Réf. / Ref.	3120	3121	3122	3186	3110	3110/1	3112	3112/1	3187	3187/1	3114	3114/1	3115	3115/1	3117	3117/1	3119	3119/1	
Z	1Z	1Z	1Z	2Z	2Z	2Z	2Z	2Z	3Z	3Z	3Z	3Z	Z>4	Z>4	Z>4	Z>4	Z>4	Z>4	
Ejec./Exéc./Exec.	W	W	W	W	N	N	N	N	N	N	W	W	N	N	NR	NR	NRF	NRF	
Hel./Hel./Spiral				40°	30°	30°	30°	30°	30°	30°	45°	45°	30°	30°	30°	30°	30°	30°	
Mat.	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	
Rec./Rev./Coat.						TIALN		TIALN		TIALN		TIALN		TIALN		TIALN		TIALN	
DIN					327	327	327	327	327	327	844	844	844	844	844	844	844	844	
Gama/Gamme/Range	3-10	4-8	5	2-20	2,40	2,40	3-25	3-25	2-32	2-32	2-30	6-20	2-32	3-32	6-40	6-32	6-30	6-30	
Pag.	366	366	367	367	368	369	370	370	371	371	372	372	373	373	374	374	375	375	
Mat.	Vc (m/min)																		
P.1	<600				● 45-50	● 45-50	○ 70-80	● 45-50	○ 70-80	● 45-50	○ 70-80	● 45-50	○ 70-80	● 45-50	○ 70-80	● 45-50	○ 70-80	● 45-50	○ 70-80
P.2	<800				○ 30-36	● 30-36	● 48-65	● 30-36	● 48-65	● 30-36	● 48-65	● 30-36	○ 48-65	● 30-36	● 48-65	● 35-45	● 55-65	● 30-36	● 48-65
P.3	<1000					○ 25-30	● 40-45	○ 25-30	● 40-45	○ 25-30	● 40-45		○ 25-30	● 40-45	○ 25-30	● 45-55	○ 25-30	● 40-45	
P.4	<1200						○ 30-35		○ 30-35					○ 30-35		○ 35-40			
P.5	<1400																		
M.1	<950				○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35			○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35	
M.2					○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35			○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35	
M.3																			
M.4	<1200																		
K.1	<500				○ 34-38	● 55-60	○ 34-38	● 55-60	○ 34-38	● 55-60			○ 34-38	● 55-60	○ 34-38	● 55-60	○ 34-38	● 55-60	
K.2																			
K.3	<800					○ 30-35		○ 30-35		○ 30-35				○ 30-35			○ 20-25	○ 30-40	
K.4.1					○ 20-24	○ 30-40	○ 20-24	○ 30-40	○ 20-24	○ 30-40			○ 20-24	○ 30-40			○ 34-38	○ 55-60	
K.4.2	<1400					○ 30-35		○ 30-35		○ 30-35				○ 30-35					
N.1.1		● 160-200	● 160-200	● 160-200	● 160-200						● 100-150	● 130-200							
N.1.2	Al	● 160-200	● 160-200	● 160-200	● 160-200						● 100-150	● 130-200							
N.1.3		○ 60-100	○ 60-100	○ 60-100	○ 60-100						○ 60-100	○ 100-160							
N.2.1					○ 70-90	○ 90-120	○ 70-90	○ 90-120	○ 70-90	○ 90-120			○ 70-90	○ 90-120	○ 70-90	○ 90-120	○ 70-90	○ 90-120	
N.2.2	Cu				○ 70-90	○ 90-120	○ 70-90	○ 90-120	○ 70-90	○ 90-120			○ 70-90	○ 90-120	○ 70-90	○ 90-120	○ 70-90	○ 90-120	
N.2.3					○ 45-50	○ 70-80	○ 45-50	○ 70-80	○ 45-50	○ 70-80			○ 45-50	○ 70-80	○ 45-50	○ 60-75	○ 45-50	○ 60-75	
N.2.4																			
N.3.1	Mg/Zn	● 60-100	● 60-100	● 60-100	● 60-100						● 60-100	● 80-120							
N.4.1		● 50-80	● 50-80	● 50-80	● 50-80						● 50-80	● 65-100							
N.4.2	Plastic																		
N.4.3																			
S.1.1	Ni						○ 2-4	● 4-6					○ 15-20	● 25-35			○ 15-20	○ 25-35	
S.1.2																			
S.2.1									○ 15-20	○ 25-35			○ 15-20	● 25-35					
S.2.2	Ti									○ 30-35				○ 30-35					
S.2.3																			
H.1	50 HRC																		
H.2	55 HRC																		
H.3	60 HRC																		

● Optima / Optimun ○ Alternativo / Alternative



3162	3157	3159	3111	3111/1	3113	3113/1	3188	3188/1	3182	3182/1	3116	3116/1	3118	3118/1	3163	3158	3160
Z>4	Z>4	Z>4	ZZ	ZZ	ZZ	ZZ	3Z	3Z	3Z	3Z	Z>4	Z>4	Z>4	Z>4	Z>4	Z>4	Z>4
N	NR	NRF	N	N	N	N	N	N	W	W	N	N	NR	NR	N	NR	NRF
30°	30°	30°	30°	30°	30°	30°	30°	30°	40°	40°	30°	30°	30°	30°	30°	30°	30°
HSSE-PM	HSSE-PM	HSSE-PM	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE-PM	HSSE-PM	HSSE-PM
TIALN	TIALN	TIALN		TIALN		TIALN		TIALN		TIALN		TIALN		TIALN	TIALN	TIALN	TIALN
844	844	844	844-L	844-L	327-L	327-L	327-L	327-L	844-L	844-L	844-L	844-L	844-L	844-L	844-L	844-L	844-L
6-20	6-32	6-20	4-25	4-25	4-25	4-25	3-25	3-25	6-20	6-20	3-25	6-25	6-32	6-32	6-20	6-32	6-20
376	376	377	378	378	379	379	380	380	381	381	382	382	383	383	384	384	385

Vc (m/min)																	
80-85	85-90	80-85	45-50	70-80	45-50	70-80	45-50	70-80	45-50	70-80	45-50	70-80	45-50	70-80	80-85	85-90	80-85
55-65	60-70	55-65	30-36	48-65	30-36	48-65	30-36	48-65	30-36	48-65	35-45	48-65	35-45	55-65	55-65	60-70	55-65
50-60	50-60	40-50	25-30	40-45	25-30	40-45	25-30	40-45			25-30	40-45	25-30	45-55	50-60	50-60	40-50
35-40	45-50	35-40		30-35		30-35		30-35				30-35		35-40	35-40	45-50	35-40
35-40	35-40	30-35	15-20	25-35	15-20	25-35	15-20	25-35			15-20	25-35	15-20	25-35	35-40	35-40	30-35
35-40	35-40	30-35	15-20	25-35	15-20	25-35	15-20	25-35			15-20	25-35	15-20	25-35	35-40	35-40	30-35
28-35	28-35	25-30													28-35	28-35	25-30
28-35	28-35	25-30													28-35	28-35	25-30
55-60	60-65	55-60	34-38	55-60	34-38	55-60	34-38	55-60			34-38	55-60	34-38	55-60	55-60	60-65	55-60
30-35				30-35		30-35		30-35				30-35			30-35		30-35
30-40			20-24	30-40	20-24	30-40	20-24	30-40			20-24	30-40			30-40		30-40
30-35				30-35		30-35		30-35				30-35			30-35		30-35
130-200									100-150	130-200					130-200		130-200
130-200									100-150	130-200					130-200		130-200
90-130									60-100	100-160					90-130		90-130
90-120	120-140	120-140	60-80	80-110	70-90	90-120	55-75	90-120			70-90	90-120	70-90	90-120	90-120	120-140	120-140
90-120	120-140	120-140	60-80	80-110	70-90	90-120	55-75	90-120			70-90	90-120	70-90	90-120	90-120	120-140	120-140
80-85	85-90	80-85	45-50	70-80	45-50	70-80	45-50	70-80			45-50	70-80	45-50	60-75	80-85	85-90	80-85
90-130									60-100	80-120					90-130		90-130
75-190									50-150	65-100					75-190		75-190
35-40		35-40			2-4	4-6					15-20	25-35			35-40		35-40
15-20		15-20													15-20		15-20
35-40		35-40					15-20	25-35			15-20	25-35			35-40		35-40
30-35		30-35						30-35				30-35			30-35		30-35

● Optima / Optimun ○ Alternativo / Alternative

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$



Ref./ Réf. / Ref.	3144	3144/1	3145	3145/1	3146	3146/1	3147	3147/1	3148	3148/1	
Z	2Z	2Z	Z>4	Z>4	Z>4	Z>4	Z>4	Z>4	Z>4	Z>4	
Ejec./Exéc./Exec.	N	N	N	N	NR	NR	N	N	NR	NR	
Hel./Hel./Spiral	30°	30°	30°	30°	30°	30°	30°	30°	30°	30°	
Mat.	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	
Rec./Rev./Coat.		TIALN		TIALN		TIALN		TIALN		TIALN	
DIN	326	326	845	845	845	845	845-L	845-L	845-L	845-L	
Gama/Gamme/Range	12-40	12-40	12-50	12-50	12-50	12-50	12-50	12-50	16-50	20-50	
Pag.	386	386	387	387	388	388	389	389	390	390	
Mat.	Vc (m/min)										
P.1	<600	● 45-50	● 70-80	● 45-50	● 70-80	● 50-55	● 70-80	● 45-50	● 70-80	● 50-55	● 70-80
	<800	● 30-36	● 48-65	● 30-36	● 48-65	● 35-45	● 55-65	● 30-36	● 48-65	● 35-45	● 55-65
P.2	<1000	○ 25-30	○ 40-45	○ 25-30	○ 40-45	○ 25-30	○ 45-55	○ 25-30	○ 40-45	○ 25-30	○ 45-55
	<1200		○ 30-35		○ 30-35		○ 35-40		○ 30-35		○ 35-40
P.3	<1400										
M.1	<950	○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35
		○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35	○ 15-20	○ 25-35
M.2	<1200										
M.3											
M.4											
K.1	<500	○ 34-38	● 55-60	○ 34-38	● 55-60	○ 38-42	● 55-60	○ 34-38	● 55-60	○ 38-42	● 55-60
K.2	<800		○ 30-35		○ 30-35				○ 30-35		
K.3											
K.4.1	<1400	○ 20-24	● 30-40	○ 20-24	● 30-40	○ 20-24	● 30-35	○ 20-24	● 30-40	○ 20-24	● 30-35
K.4.2			○ 30-35		○ 30-35				○ 30-35		
N.1.1	Al	○ 100-150	○ 130-200	○ 100-150	○ 130-200			○ 100-150	○ 130-200		
		○ 100-150	○ 130-200	○ 100-150	○ 130-200			○ 100-150	○ 130-200		
N.1.2		○ 60-100	○ 90-130	○ 60-100	○ 90-130			○ 60-100	○ 90-130		
N.1.3											
N.2.1	Cu	● 55-75	● 90-120	● 55-75	● 90-120	● 55-75	● 90-120	● 55-75	● 90-120	● 55-75	● 90-120
		● 55-75	● 90-120	● 55-75	● 90-120	● 55-75	● 90-120	● 55-75	● 90-120	● 55-75	● 90-120
N.2.2		● 75-95	● 120-140	● 75-95	● 120-140	● 75-95	● 120-140	● 75-95	● 120-140	● 75-95	● 120-140
N.2.3											
N.2.4											
N.3.1	Mg/Zn	○ 60-100	○ 90-130	○ 60-100	○ 90-130			○ 60-100	○ 90-130		
		○ 50-150	○ 75-190	○ 50-150	○ 75-190			○ 50-150	○ 75-190		
N.4.1	Plastic										
N.4.2											
N.4.3											
S.1.1	Ni			○ 15-20	● 25-35			○ 15-20	● 25-35		
S.1.2											
S.2.1	Ti			○ 15-20	○ 25-35			○ 15-20	○ 25-35		
S.2.2											
S.2.3											
H.1	50 HRC										
	55 HRC										
H.2											
H.3	60 HRC										

● Optima / Optimun ○ Alternativo / Alternative

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \phi}$$

Ref./ Réf. / Ref.	3149	3150	3165	3151	3161	3166
Z	6-10	6-10	8-10	18-24	18-24	16-40
Ejec./Exéc./Exec.	N	NR	NRF	H	H	H
Hel./Hel./Spiral	30°	30°	30°	0°	10°	10°
Mat.	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE
Rec./Rev./Coat.						
DIN	1880	1880	1880	885-B	885-A	1834-A
Gama/Gamme/Range	40-80	40-80	40-80	63-125	63-125	50-125
Pag.	391	391	392	392	393	393
Mat.	Vc (m/min)					
P.1	<600	35-40	40-50	35-40	35-40	35-40
P.2	<800	30-35	35-45	30-35	30-35	30-35
P.3	<1000	15-25	25-35	15-25	15-25	15-25
P.4	<1200			15-20	15-20	15-20
P.5	<1400					
M.1	<950	10-15	15-20	10-15	10-15	
M.2		10-15	15-20	10-15	10-15	
M.3	<1200					
M.4						
K.1	<500			30-35	30-35	30-35
K.2				30-35	30-35	30-35
K.3	<800	20-24	25-30	15-25	15-25	15-25
K.4.1		20-24	25-30	15-25	15-25	15-25
K.4.2	<1400					
N.1.1						60-100
N.1.2	Al					160-260
N.1.3						60-100
N.2.1						
N.2.2	Cu			60-100	60-100	60-100
N.2.3		30-35	30-35	30-35	30-35	30-35
N.2.4						
N.3.1	Mg/Zn			50-90	50-90	50-90
N.4.1						
N.4.2	Plastic					
N.4.3						
S.1.1	Ni			10-15		
S.1.2				5-10		
S.2.1		10-15	15-20	10-15	10-15	
S.2.2	Ti					
S.2.3						
H.1	50 HRC					
H.2	55 HRC					
H.3	60 HRC					

3152	3153	3154	3155	3156	3164
6-12	4-10	8-10	8-12	10-12	4
	N	N			
10°	10°	10°	0°	0°	0°
HSSE	HSSE	HSSE	HSSE	HSSE	HSSE
850	851	851	1833-A	1833-B	6518
4,5-45,50	11-40	18-72	16-32	16-32	8-56
394	394	395	395	396	396
Vc (m/min)					
35-40	35-40	35-40	35-40	35-40	40-50
30-35	30-35	30-35	30-35	30-35	35-45
15-25	15-25	15-25	15-25	15-25	25-35

● Optima / Optimun ○ Alternativo / Alternative



P Aceros Aciers Steels



M Aceros Inox Aciers Inox Stainless Steels



K Fundicion Fonte Cast Iron



N Metales no ferrosos Métal non Ferraux Non Ferrous metals



S Titanio y Superalesaciones Titanium et Supeallages Titanium and Superalloys



H Materiales Duros Matériels Durs Hard materials

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE





r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

Ref./ Réf. / Ref.				
Z				
Ejec./Exéc./Exec.		CRUZ	DIAM	ALU
Hel./Hel./Spiral				
Mat.		HM	HM	HM
Rec./Rev./Coat.				
DIN				
Gama/Gamme/Range				
Pag.				
Mat.		Vc (m/min)		
P.1	<600	● 400-800	○ 400-800	
P.2	<800	● 400-800	○ 400-800	
P.3	<1000	● 400-800	○ 400-800	
P.4	<1200	○ 300-700	● 300-700	
P.5	<1400		● 300-700	
M.1	<950	● 600-1000	○ 600-1000	
M.2		● 600-1000	○ 600-1000	
M.3	<1200	○ 400-800	● 400-800	
M.4		○ 400-800	● 400-800	
K.1	<500	● 500-800	○ 500-800	
K.2		● 500-800	○ 500-800	
K.3	<800	● 400-800	○ 400-800	
K.4.1		● 400-800	○ 400-800	
K.4.2	<1400		● 300-700	
N.1.1				● 400-1000
N.1.2	Al			● 400-1000
N.1.3				● 300-700
N.2.1		○ 400-800		● 300-700
N.2.2	Cu	○ 400-800	○ 400-800	● 300-700
N.2.3		● 400-800		
N.2.4			○ 300-700	
N.3.1	Mg/Zn	● 400-800		○ 400-1000
N.4.1				● 400-1000
N.4.2	Plastic			● 400-1000
N.4.3			○ 300-700	
S.1.1		○ 400-800	● 400-800	
S.1.2	Ni		○ 300-700	
S.2.1		● 600-1000	● 600-1000	
S.2.2	Ti		● 400-800	
S.2.3			○ 300-700	
H.1	50 HRC		● 200-600	
H.2	55 HRC		● 200-600	
H.3	60 HRC			● 20-25

7172	7137	7138	7139
HSS	HSSE	HSSE	HSS - WIDIA
		TIALN	
12-60	12-60	12-50	18-50
406	408	410	412
Vc (m/min)			
● 20-25	● 35-45	○ 45-55	○ 55-65
● 15-20	● 25-35	● 40-50	● 40-50
	● 20-25	● 30-40	● 30-40
	○ 15-20	○ 20-25	○ 20-25
		○ 15-20	○ 15-20
	○ 15-20	○ 20-25	○ 20-30
	○ 15-20	○ 20-25	○ 20-30
		○ 15-20	○ 15-20
○ 20-30	● 30-35	● 45-55	● 50-60
○ 20-30	● 30-35	● 45-55	● 50-60
○ 15-20	○ 25-30	○ 40-50	○ 45-55
○ 15-20	○ 25-30	○ 40-50	○ 45-55
		○ 15-20	○ 15-20
● 40-50	● 50-60	● 60-70	● 70-90
○ 40-50	○ 50-60	○ 60-70	○ 70-90
○ 40-50	○ 50-60	○ 60-70	○ 70-90
○ 40-50	○ 50-60	○ 60-70	○ 70-90
○ 15-20	● 25-35	○ 40-50	○ 40-50
	○ 15-20	○ 20-25	○ 20-25
○ 20-25	● 30-35	● 45-55	● 50-60
○ 40-50	○ 50-60	○ 60-70	○ 70-90
○ 40-50	○ 50-60	○ 60-70	○ 70-90
		○ 10-15	● 15-20
			○ 15-20
		○ 20-25	● 20-30
		○ 15-20	○ 20-25
			○ 15-20
			○ 15-20

● Optima / Optimun ○ Alternativo / Alternative

Avance / Feed
$vf \text{ (mm/min)} = \text{rpm} \times Z \times fz \times K$
$\text{rpm} = (Vc \times 1000) / (D \times P)$
Z = número de dientes / nombre de dents / teeth number
fz = avance por diente / avance per dent / feed per tooth

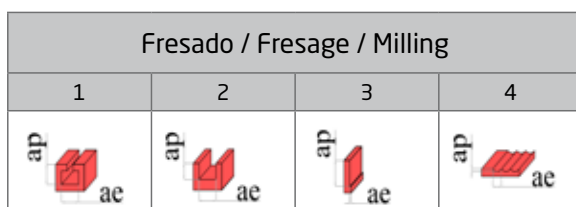
Fresado / Fresage / Milling			
1	2	3	4
			

K = Coef. x material (rest = 1)															
P.4	P.5	M.3	M.4	K.4.2	N.1.1	N.1.2	N.1.3	N.4.1	N.4.2	N.4.3	S.1.2	S.2.3	H.1	H.2	H.3
0,7	0,7	0,7	0,7	0,7	1,3	1,3	1,3	1,3	1,3	1,3	0,7	0,7	0,7	0,7	0,7



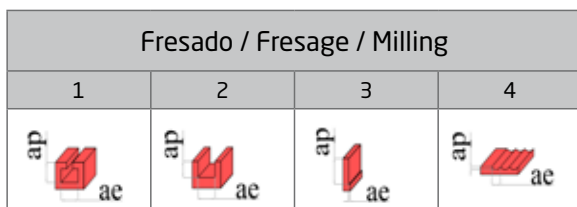
FRESAS METAL DURO / FRAISES CARBURE / HARD METAL MILLS

AVANCE / FEED (Fz = mm / Z)																
Ref.	Fres./ Mill	Ap	Ae	D (mm)												
				1	2	3	4	5	6	8	10	12	14	16	18	20
3189	2	1xD	1xD	-	-	0,010	0,013	0,017	0,020	0,027	0,033	0,040	0,047	0,053	0,060	0,067
3190	2	1xD	1xD	-	-	0,010	0,013	0,017	0,020	0,027	0,033	0,040	0,047	0,053	0,060	0,067
3167	2	0,5xD	1xD	-	-	0,010	0,013	0,017	0,020	0,027	0,033	0,040	0,047	0,053	0,060	0,067
3168	2	0,75xD	1xD	-	-	0,010	0,013	0,017	0,020	0,027	0,033	0,040	0,047	0,053	0,060	0,067
3169	4	0,025xD	0,05xD	-	-	0,050	0,067	0,083	0,100	0,133	0,167	0,200	0,233	0,267	0,300	0,333
3170	4	0,025xD	0,05xD	-	-	0,045	0,060	0,075	0,090	0,120	0,150	0,180	0,210	0,240	0,270	0,300
3191	4	0,1xD	0,05xD	-	-	0,030	0,040	0,050	0,060	0,080	0,100	0,120	0,140	0,160	0,180	0,200
3171	2	0,25xD	1xD	-	-	0,010	0,013	0,017	0,020	0,027	0,033	0,040	0,047	0,053	0,062	0,067
3171	3	0,75xD	0,2xD	-	-	0,020	0,025	0,033	0,040	0,050	0,065	0,080	0,090	0,100	0,110	0,130
3172	2	0,5xD	1xD	-	-	0,010	0,013	0,017	0,020	0,027	0,033	0,040	0,047	0,053	0,062	0,067
3172	3	1,5xD	0,2xD	-	-	0,015	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100
3173	2	0,25xD	1xD	-	-	0,015	0,020	0,025	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100
3173	3	0,75xD	0,2xD	-	-	0,030	0,040	0,050	0,060	0,080	0,100	0,120	0,135	0,160	0,180	0,200
3174	2	0,5xD	1xD	-	-	0,010	0,013	0,017	0,020	0,027	0,033	0,040	0,047	0,053	0,060	0,067
3174	3	1,5xD	0,2xD	-	-	0,025	0,035	0,040	0,050	0,065	0,080	0,100	0,115	0,130	0,150	0,170
3175	3	1xD	0,2xD	-	-	0,020	0,025	0,033	0,040	0,050	0,065	0,080	0,090	0,100	0,110	0,130
3176	3	1,75xD	0,2xD	-	-	0,012	0,017	0,022	0,025	0,035	0,040	0,050	0,060	0,070	0,080	0,090
3177	3	1,5xD	0,3xD	-	-	0,018	0,025	0,031	0,039	0,050	0,060	0,075	0,085	0,100	0,115	0,120
3177	2	1xD	1xD	-	-	0,012	0,016	0,020	0,024	0,032	0,040	0,048	0,056	0,064	0,072	0,080
3192	3	1,5xD	0,3xD	-	-	0,020	0,025	0,033	0,040	0,050	0,060	0,070	0,085	0,100	0,110	0,120
3193	2	3xD	0,2xD	-	-	0,015	0,023	0,043	0,062	0,083	0,104	0,125	0,146	0,166	0,187	0,208
3178	3	1,5xD	0,3xD	-	-	0,010	0,015	0,015	0,020	0,020	0,025	0,025	0,030	0,030	0,035	0,035
3178	2	1xD	1xD	-	-	0,010	0,015	0,015	0,020	0,025	0,025	0,030	0,030	0,030	0,035	0,035
3179	3	1,75xD	0,05xD	-	-	0,020	0,025	0,030	0,035	0,045	0,055	0,070	0,080	0,090	0,100	0,115
3180	3	2,75xD	0,05xD	-	-	0,010	0,015	0,018	0,022	0,032	0,038	0,045	0,052	0,060	0,067	0,075
3181	3	1,5xD	0,4xD	-	-	0,015	0,018	0,022	0,027	0,035	0,040	0,050	0,060	0,070	0,080	0,090
3181	2	1xD	1xD	-	-	0,012	0,015	0,019	0,023	0,030	0,038	0,045	0,053	0,060	0,068	0,075
3183	3	30°	-	0,030	0,070	0,110	-	-	-	-	-	-	-	-	-	-
3184	3	45°	-	0,040	0,100	0,140	-	-	-	-	-	-	-	-	-	-
3185	3	r	-	-	-	0,030	0,040	0,050	0,070	0,120	0,150	-	-	-	-	-
3194	3	1,5xD	0,3xD	-	-	0,020	0,025	0,030	0,038	0,050	0,060	0,072	0,085	0,095	0,110	0,125
3194	2	1xD	1xD	-	-	0,020	0,025	0,030	0,035	0,050	0,060	0,070	0,085	0,095	0,105	0,120
3195	2	3xD	0,12xD	-	-	0,010	0,015	0,020	0,030	0,040	0,050	0,060	0,070	0,080	0,090	0,100
3101	2	0,75xD	1xD	-	-	0,007	0,009	0,012	0,014	0,019	0,023	0,028	0,033	0,037	0,042	0,047
3105	3	1,5xD	0,2xD	-	-	0,010	0,015	0,020	0,025	0,030	0,035	0,040	0,045	0,050	0,055	0,060
3105	2	0,5xD	1xD	-	-	0,007	0,009	0,012	0,014	0,019	0,023	0,028	0,032	0,037	0,042	0,047
3107	3	1,75xD	0,2xD	-	-	0,010	0,015	0,020	0,024	0,028	0,035	0,040	0,047	0,055	0,065	0,075



FRESAS HSSE MANGO CILÍNDRICO / FRAISES HSSE QUEUE CYLINDRIQUE / HSSE STRAIGHT SHANK MILLS

AVANCE / FEED (Fz = mm / Z)																	
Ref.	Fres./ Mill	Ap	Ae	D (mm)													
				3	4	5	6	8	10	12	14	16	18	20	25	32	
3120	1	-	-	0,015	0,020	0,025	0,030	0,050	0,050	0,055	0,055	0,060	0,060	0,065	0,065	0,070	
3121	1	-	-	0,015	0,020	0,025	0,030	0,050	0,050	0,055	0,055	0,060	0,060	0,065	0,065	0,070	
3122	1	-	-	0,015	0,020	0,025	0,030	0,050	0,050	0,055	0,055	0,060	0,060	0,065	0,065	0,070	
3186	2	0,5xD	1xD	0,009	0,013	0,016	0,022	0,029	0,036	0,044	0,051	0,058	0,065	0,073	0,091	0,116	
3110	2	0,5xD	1xD	0,009	0,013	0,016	0,022	0,029	0,036	0,044	0,051	0,058	0,065	0,073	0,091	0,116	
3110/1	2	0,5xD	1xD	0,012	0,017	0,021	0,029	0,038	0,047	0,057	0,066	0,075	0,085	0,095	0,118	0,151	
3112	4	0,05xD	0,05xD	0,020	0,022	0,025	0,029	0,036	0,044	0,058	0,062	0,065	0,073	0,080	0,100	0,130	
3112/1	4	0,05xD	0,05xD	0,026	0,029	0,033	0,038	0,047	0,057	0,075	0,081	0,085	0,095	0,104	0,130	0,169	
3114	2	1xD	0,1xD	0,006	0,008	0,011	0,015	0,021	0,028	0,034	0,040	0,044	0,051	0,057	0,071	0,091	
3114/1	2	1xD	0,1xD	0,008	0,010	0,014	0,020	0,027	0,036	0,044	0,052	0,057	0,066	0,074	0,092	0,118	
3187	2	0,5xD	1xD	0,009	0,013	0,016	0,022	0,029	0,036	0,044	0,051	0,058	0,065	0,073	0,091	0,116	
3187/1	2	0,5xD	1xD	0,012	0,017	0,021	0,029	0,038	0,047	0,057	0,066	0,075	0,085	0,095	0,118	0,151	
3115	3	1xD	0,1xD	0,011	0,015	0,018	0,020	0,025	0,035	0,040	0,060	0,070	0,080	0,090	0,100	0,120	
3115/1	3	1xD	0,1xD	0,014	0,020	0,023	0,026	0,033	0,046	0,052	0,078	0,091	0,104	0,117	0,130	0,156	
3162	3	1xD	0,1xD	0,016	0,021	0,026	0,029	0,036	0,050	0,057	0,086	0,100	0,114	0,129	0,143	0,172	
3157	3	1,5xD	0,5xD	0,018	0,025	0,030	0,033	0,041	0,058	0,066	0,099	0,115	0,132	0,148	0,164	0,197	
3159	3	1,5xD	0,5xD	0,018	0,025	0,030	0,033	0,041	0,058	0,066	0,099	0,115	0,132	0,148	0,164	0,197	
3117	3	1,5xD	0,5xD	0,012	0,015	0,018	0,020	0,025	0,035	0,040	0,060	0,070	0,080	0,090	0,100	0,120	
3117/1	3	1,5xD	0,5xD	0,016	0,020	0,023	0,026	0,033	0,046	0,052	0,078	0,091	0,104	0,117	0,130	0,156	
3119	3	1,5xD	0,5xD	0,012	0,015	0,018	0,020	0,025	0,035	0,040	0,060	0,070	0,080	0,090	0,100	0,120	
3119/1	3	1,5xD	0,5xD	0,016	0,020	0,023	0,026	0,033	0,046	0,052	0,078	0,091	0,104	0,117	0,130	0,156	
3111	2	1,2xD	1xD	0,009	0,013	0,016	0,022	0,029	0,036	0,044	0,051	0,058	0,065	0,073	0,091	0,116	
3111/1	2	1,2xD	1xD	0,012	0,017	0,021	0,029	0,038	0,047	0,057	0,066	0,075	0,085	0,095	0,118	0,151	
3113	4	0,05xD	0,05xD	0,020	0,022	0,025	0,029	0,036	0,044	0,058	0,062	0,065	0,073	0,080	0,100	0,130	
3113/1	4	0,05xD	0,05xD	0,026	0,029	0,033	0,038	0,047	0,057	0,075	0,081	0,085	0,095	0,104	0,130	0,169	
3188	2	0,5xD	1xD	0,009	0,013	0,016	0,022	0,029	0,036	0,044	0,051	0,058	0,065	0,073	0,091	0,116	
3188/1	2	0,5xD	1xD	0,012	0,017	0,021	0,029	0,038	0,047	0,057	0,066	0,075	0,085	0,095	0,118	0,151	
3182	3	2,5xD	0,3xD	0,006	0,008	0,011	0,015	0,021	0,028	0,034	0,040	0,044	0,051	0,057	0,071	0,091	
3182/1	3	2,5xD	0,3xD	0,008	0,010	0,014	0,020	0,027	0,036	0,044	0,052	0,057	0,066	0,074	0,092	0,118	
3116	3	2,5xD	0,3xD	0,011	0,015	0,018	0,020	0,025	0,035	0,040	0,060	0,070	0,080	0,090	0,100	0,120	
3116/1	3	2,5xD	0,3xD	0,014	0,020	0,023	0,026	0,033	0,046	0,052	0,078	0,091	0,104	0,117	0,130	0,156	
3118	3	2,5xD	0,5xD	0,011	0,015	0,018	0,020	0,025	0,035	0,040	0,060	0,070	0,080	0,090	0,100	0,120	
3118/1	3	2,5xD	0,5xD	0,014	0,020	0,023	0,026	0,033	0,046	0,052	0,078	0,091	0,104	0,117	0,130	0,156	
3163	3	2,5xD	0,3xD	0,016	0,021	0,026	0,029	0,036	0,050	0,057	0,086	0,100	0,114	0,129	0,143	0,172	
3158	3	2,5xD	0,5xD	0,018	0,025	0,030	0,033	0,041	0,058	0,066	0,099	0,115	0,132	0,148	0,164	0,197	
3160	3	2,5xD	0,5xD	0,018	0,025	0,030	0,033	0,041	0,058	0,066	0,099	0,115	0,132	0,148	0,164	0,197	



FRESAS MANGO CÓNICO / FRAISES QUEUE CONIQUE / TAPERED SHANK MILLS


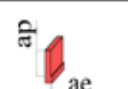

AVANCE / FEED (Fz = mm / Z)									
Ref.	Fres./Mill	Ap	Ae	D (mm)					
				12	16	20	25	32	40
3144	2	0,5xD	1xD	0,050	0,060	0,075	0,090	0,100	0,110
3144/1	2	0,5xD	1xD	0,065	0,078	0,098	0,117	0,130	0,143
3145	3	1xD	0,1xD	0,035	0,045	0,060	0,070	0,080	0,090
3145/1	3	1xD	0,1xD	0,046	0,059	0,078	0,091	0,104	0,117
3146	3	1,5xD	0,5xD	0,040	0,070	0,090	0,110	0,120	0,130
3146/1	3	1,5xD	0,5xD	0,052	0,091	0,117	0,143	0,156	0,169
3147	3	1xD	0,1xD	0,035	0,045	0,060	0,070	0,080	0,090
3147/1	3	1xD	0,1xD	0,046	0,059	0,078	0,091	0,104	0,117
3148	3	1,5xD	0,5xD	0,040	0,070	0,090	0,110	0,120	0,130
3148/1	3	1,5xD	0,5xD	0,052	0,091	0,117	0,143	0,156	0,169

FRESAS CON AGUJERO / FRAISES À TROU / MILLS WITH HOLES

AVANCE / FEED (Fz = mm / Z)									
Ref.	Fres./Mill	Ap	Ae	D (mm)					
				40	50	80	100	160	200
3149	3	0,05xD	0,75xD	0,080	0,085	0,110	0,110		
3150	3	0,05xD	0,75xD	0,080	0,085	0,110	0,110		
3165	3	0,05xD	0,75xD	0,080	0,085	0,110	0,110		
3151	2	0,1xD	1xe		0,050	0,070	0,080	0,090	0,090
3161	2	0,1xD	1xe		0,050	0,070	0,080	0,090	0,090
3166	2	0,1xD	1xe		0,050	0,070	0,080	0,090	0,090

FRESAS HSSE ESPECIALES / FRAISES HSSE SPECIALES / HSSE SPECIAL MILLS

AVANCE / FEED (Fz = mm / Z)										
Ref.	Fres./Mill	Ap	Ae	D (mm)						
				8	12	16	20	25	32	45
3152	1	-	-	0,040	0,055	0,070	0,075	0,090	0,090	0,100
3153	1	-	-	0,040	0,055	0,070	0,075	0,080	0,080	0,100
3154	1	0,1xD	1xl	0,040	0,055	0,070	0,075	0,080	0,080	0,100
3155	2	-	-	0,040	0,055	0,070	0,075	0,080	0,080	0,100
3156	2	-	1xl	0,040	0,055	0,070	0,075	0,080	0,080	0,100
3164	3	-	-	0,040	0,060	0,065	0,070	0,075	0,080	0,100

Fresado / Fresage / Milling			
1	2	3	4
			

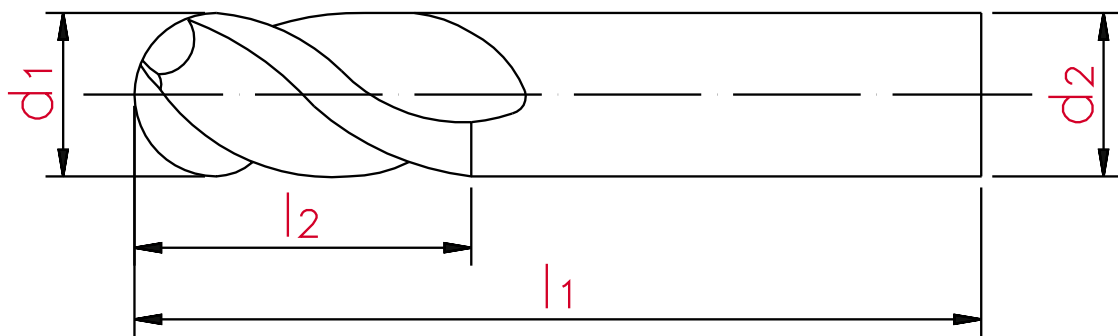
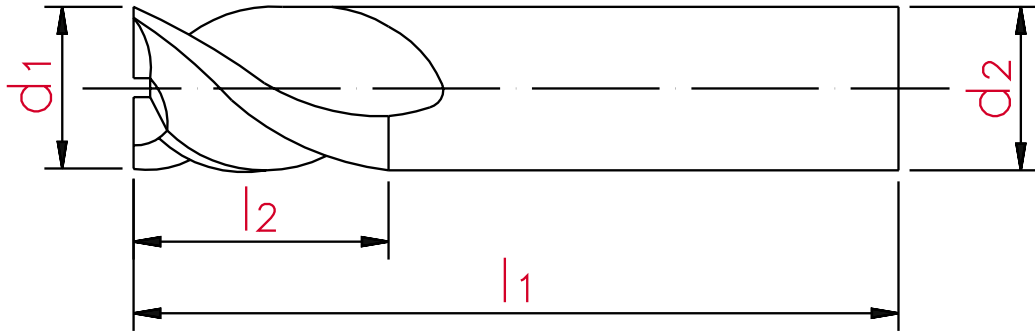
FRESAS ROTATIVAS / FRAISES ROTATIVES / ROTARY MILLS

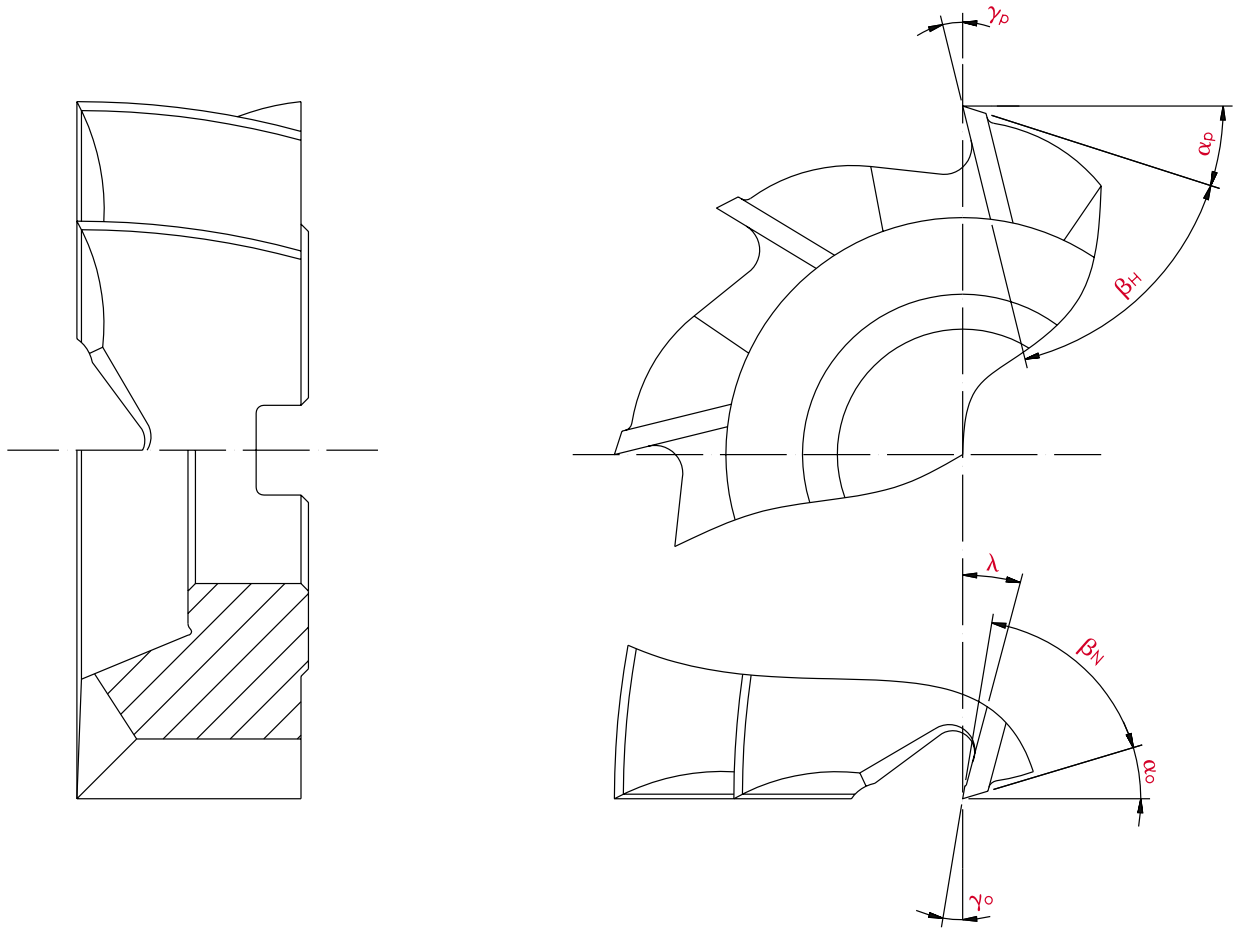
RPM		Vc (m/min)									
		100	200	300	400	500	600	700	800	900	1000
D (mm)	3	10.610	21.221	31.831	42.441	53.052	63.662	74.272	84.882	95.493	106.103
	4	7.958	15.915	23.873	31.831	39.789	47.746	55.704	63.662	71.620	79.577
	5	6.366	12.732	19.099	25.465	31.831	38.197	44.563	50.929	57.296	63.662
	6	5.305	10.610	15.915	21.221	26.526	31.831	37.136	42.441	47.746	53.052
	7	4.547	9.095	13.642	18.189	22.736	27.284	31.831	36.378	40.925	45.473
	8	3.979	7.958	11.937	15.915	19.894	23.873	27.852	31.831	35.810	39.789
	9	3.537	7.074	10.610	14.147	17.684	21.221	24.757	28.294	31.831	35.368
	10	3.183	6.366	9.549	12.732	15.915	19.099	22.282	25.465	28.648	31.831
	11	2.894	5.787	8.681	11.575	14.469	17.362	20.256	23.150	26.043	28.937
	12	2.653	5.305	7.958	10.610	13.263	15.915	18.568	21.221	23.873	26.526
	13	2.449	4.897	7.346	9.794	12.243	14.691	17.140	19.588	22.037	24.485
	14	2.274	4.547	6.821	9.095	11.368	13.642	15.915	18.189	20.463	22.736
	15	2.122	4.244	6.366	8.488	10.610	12.732	14.854	16.976	19.099	21.221
	16	1.989	3.979	5.968	7.958	9.947	11.937	13.926	15.915	17.905	19.894



FRESAS HUECAS / FRAISES À TROU / CORE BITS

RPM	Vc (m/min)										
	100	200	300	400	500	600	700	800	900	1000	
D (mm)	12	265	531	796	1.061	1.326	1.592	1.857	2.122	2.387	2.653
	13	245	490	735	979	1.224	1.469	1.714	1.959	2.204	2.449
	14	227	455	682	909	1.137	1.364	1.592	1.819	2.046	2.274
	15	212	424	637	849	1.061	1.273	1.485	1.698	1.910	2.122
	16	199	398	597	796	995	1.194	1.393	1.592	1.790	1.989
	17	187	374	562	749	936	1.123	1.311	1.498	1.685	1.872
	18	177	354	531	707	884	1.061	1.238	1.415	1.592	1.768
	19	168	335	503	670	838	1.005	1.173	1.340	1.508	1.675
	20	159	318	477	637	796	955	1.114	1.273	1.432	1.592
	21	152	303	455	606	758	909	1.061	1.213	1.364	1.516
	22	145	289	434	579	723	868	1.013	1.157	1.302	1.447
	23	138	277	415	554	692	830	969	1.107	1.246	1.384
	24	133	265	398	531	663	796	928	1.061	1.194	1.326
	25	127	255	382	509	637	764	891	1.019	1.146	1.273
	26	122	245	367	490	612	735	857	979	1.102	1.224
	27	118	236	354	472	589	707	825	943	1.061	1.179
	28	114	227	341	455	568	682	796	909	1.023	1.137
	29	110	220	329	439	549	659	768	878	988	1.098
	30	106	212	318	424	531	637	743	849	955	1.061
	31	103	205	308	411	513	616	719	821	924	1.027
	32	99	199	298	398	497	597	696	796	895	995
	33	96	193	289	386	482	579	675	772	868	965
	34	94	187	281	374	468	562	655	749	843	936
	35	91	182	273	364	455	546	637	728	819	909
	36	88	177	265	354	442	531	619	707	796	884
	37	86	172	258	344	430	516	602	688	774	860
	38	84	168	251	335	419	503	586	670	754	838
	39	82	163	245	326	408	490	571	653	735	816
	40	80	159	239	318	398	477	557	637	716	796
	41	78	155	233	311	388	466	543	621	699	776
42	76	152	227	303	379	455	531	606	682	758	
43	74	148	222	296	370	444	518	592	666	740	
44	72	145	217	289	362	434	506	579	651	723	
45	71	141	212	283	354	424	495	566	637	707	
46	69	138	208	277	346	415	484	554	623	692	
47	68	135	203	271	339	406	474	542	610	677	
48	66	133	199	265	332	398	464	531	597	663	
49	65	130	195	260	325	390	455	520	585	650	
50	64	127	191	255	318	382	446	509	573	637	
51	62	125	187	250	312	374	437	499	562	624	
52	61	122	184	245	306	367	428	490	551	612	
53	60	120	180	240	300	360	420	480	541	601	
54	59	118	177	236	295	354	413	472	531	589	
55	58	116	174	231	289	347	405	463	521	579	
56	57	114	171	227	284	341	398	455	512	568	
57	56	112	168	223	279	335	391	447	503	558	
58	55	110	165	220	274	329	384	439	494	549	
59	54	108	162	216	270	324	378	432	486	540	
60	53	106	159	212	265	318	371	424	477	531	





l1	Longitud total / Longueur totale / Total length
l2	Longitud de corte / Longueur de coupe / Length of cut
d1	Diámetro de fresa / Diamètre de fraise / Diameter of mill
d2	Longitud mango / Longueur queue / Shank length
λ	Ángulo de espiral / Angle de spirale / Spiral angle
απ	Ángulo de destalonado del corte principal / Angle de détalonnage de la coupe principale / Main cutting relief angle
α0	Ángulo de destalonado del corte secundario / Angle de détalonnage de la coupe secondaire / Secondary cutting relief angle
βH	Ángulo de cuña del corte principal / Angle de coin de la coupe principale / Main cutting wedge angle
βN	Ángulo de cuña del corte secundario / Angle de coin de la coupe secondaire / Secondary cutting wedge angle
γP	Ángulo de desprendimiento del corte principal / Angle de dégagement de la coupe principale / Main cutting rake angle
γ0	Ángulo de desprendimiento del corte secundario / Angle de dégagement de la coupe secondaire / Secondary cutting rake angle

3141 **HM-MD**



1z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									●	●	●	●					
									150-300	120-350	120-350	150-300					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
3,00	6	27,27	50	8	1
4,00	6	27,27	54	11	1
5,00	6	27,27	54	13	1

Ø mm	d mm	€	L mm	l mm	
6,00	6	27,27	54	13	1
8,00	8	38,48	58	19	1
10,00	10	54,69	66	22	1

3189 **HM-MD**



2z

DIN 6535 HA

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									●	●	●	●					
									150-300	120-350	120-350	150-300					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	z	
3,00	6	29,93	57	8	2	1
3,50	6	29,93	57	10	2	1
4,00	6	29,93	57	11	2	1
4,50	6	29,93	57	11	2	1
5,00	6	29,93	57	13	2	1
6,00	6	29,93	57	13	2	1
7,00	8	37,65	63	16	2	1
8,00	8	37,65	63	19	2	1

Ø mm	d mm	€	L mm	l mm	z	
9,00	10	55,11	72	19	2	1
10,00	10	55,11	72	22	2	1
12,00	12	79,63	83	26	2	1
14,00	14	119,53	83	26	2	1
16,00	16	147,14	92	32	2	1
18,00	18	193,26	92	32	2	1
20,00	20	233,42	104	38	2	1

FRESAS METAL DURO FRAISES CARBURE / HARD METAL MILLS

3190

HM-MD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									150-300	120-350	120-350	150-300					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	29,93	57	8	3	1
3,50	6	29,93	57	9	3	1
4,00	6	29,93	57	11	3	1
4,50	6	29,93	57	11	3	1
5,00	6	29,93	57	13	3	1
6,00	6	29,93	57	13	3	1
8,00	8	37,65	63	19	3	1

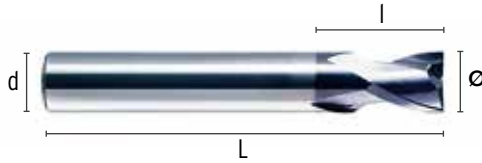
Ø mm	d mm	€	L mm	l mm	Z	
10,00	10	55,11	72	22	3	1
12,00	12	79,63	83	26	3	1
14,00	14	119,53	83	26	3	1
16,00	16	147,14	92	32	3	1
18,00	18	193,26	92	32	3	1
20,00	20	233,42	104	38	3	1

3167 HM-MD DIN 6527 S



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
110-250	90-200	75-180	60-120	80-140	60-120	120-180	100-140	60-120		110-220			40-90	60-140			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	24,51	50	4	2	1
3,50	6	24,51	50	4	2	1
4,00	6	25,05	54	5	2	1
4,50	6	25,05	54	5	2	1
5,00	6	25,05	54	6	2	1
6,00	6	25,05	54	7	2	1
7,00	8	33,12	58	8	2	1
8,00	8	33,12	58	9	2	1

Ø mm	d mm	€	L mm	l mm	Z	
9,00	10	45,51	66	10	2	1
10,00	10	45,51	66	11	2	1
12,00	12	65,46	73	12	2	1
14,00	14	93,66	75	14	2	1
16,00	16	110,25	82	16	2	1
18,00	18	152,46	84	18	2	1
20,00	20	171,84	92	20	2	1

3168 HM-MD DIN 6527 L



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-80	60-110			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	21,75	57	7	2	1
3,50	6	21,75	57	7	2	1
4,00	6	21,75	57	8	2	1
4,50	6	21,75	57	8	2	1
5,00	6	21,75	57	10	2	1
6,00	6	21,75	57	10	2	1
7,00	8	32,01	63	13	2	1
8,00	8	32,01	63	16	2	1

Ø mm	d mm	€	L mm	l mm	Z	
9,00	10	46,28	72	16	2	1
10,00	10	46,28	72	19	2	1
12,00	12	66,03	83	22	2	1
14,00	14	102,77	83	22	2	1
16,00	16	125,68	92	26	2	1
18,00	18	159,57	92	26	2	1
20,00	20	196,29	104	32	2	1

3169 **HM-MD DIN 6527 S**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	○	
110-250	90-200	75-180	60-120	70-110	60-100	120-180	100-140	60-120	150-450	60-350	150-450	150-450	40-80	60-110	40-80	30-50	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	Z	
3,00	6	32,55	50	4	2	1
4,00	6	33,12	54	5	2	1
5,00	6	33,12	54	6	2	1
6,00	6	33,12	54	7	2	1
8,00	8	44,67	58	9	2	1
10,00	10	60,90	66	11	2	1

∅ mm	d mm	€	L mm	l mm	Z	
12,00	12	85,26	73	12	2	1
14,00	14	113,25	75	14	2	1
16,00	16	137,76	82	16	2	1
18,00	18	168,57	84	18	2	1
20,00	20	207,75	92	20	2	1

3170 **HM-MD DIN 6527 L**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○	●	●	●	●	●	●	●	○	
110-250	90-200	75-180	60-120	70-110	60-100	120-180	100-140	60-120	150-450	60-350	150-450	150-450	40-80	60-110	40-80	30-50	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	Z	
3,00	6	21,75	57	7	2	1
4,00	6	21,75	57	8	2	1
5,00	6	21,75	57	10	2	1
6,00	6	21,75	57	10	2	1
8,00	8	32,01	63	16	2	1
10,00	10	46,28	72	19	2	1

∅ mm	d mm	€	L mm	l mm	Z	
12,00	12	66,03	83	22	2	1
14,00	14	102,77	83	22	2	1
16,00	16	137,74	92	26	2	1
18,00	18	178,75	92	26	2	1
20,00	20	250,43	104	32	2	1

FRESAS METAL DURO FRAISES CARBURE / HARD METAL MILLS

3191 HM-MD DIN 6527 EL



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●			●	●	○		○			●	●	●	●	○
160-240	140-210	150-200	100-140			120-180	90-130	100-140		100-200			40-80	60-90	90-150	70-130	60-110

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW

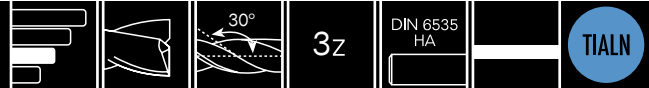


Ø mm	d mm	€	L mm	l mm	r	z	
2,00	6	43,77	62	3	1,0	2	1
3,00	6	43,77	62	4	1,5	2	1
4,00	6	43,77	62	5	2,0	2	1
5,00	6	50,55	80	6	2,5	2	1
6,00	6	50,55	80	7	3,0	2	1
8,00	8	72,00	90	9	4,0	2	1

Ø mm	d mm	€	L mm	l mm	r	z	
10,00	10	105,11	100	11	5,0	2	1
12,00	12	152,81	120	13	6,0	2	1
14,00	14	180,77	120	15	7,0	2	1
16,00	16	247,81	140	17	8,0	2	1
18,00	18	298,03	140	19	9,0	2	1
20,00	20	391,54	160	21	10,0	2	1



3171 **HM-MD DIN 6527 S**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
110-250	90-200	75-180	60-120	80-140	60-120	120-180	100-140	60-120		110-220			40-90	60-140			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	24,51	50	4	2	1
3,50	6	24,51	50	4	2	1
4,00	6	25,05	54	5	2	1
4,50	6	25,05	54	5	2	1
5,00	6	25,05	54	6	2	1
6,00	6	25,05	54	7	2	1
8,00	8	33,12	58	9	2	1

Ø mm	d mm	€	L mm	l mm	Z	
10,00	10	45,51	66	11	3	1
12,00	12	65,46	73	12	3	1
14,00	14	93,66	75	14	3	1
16,00	16	110,25	82	16	3	1
18,00	18	152,46	84	18	3	1
20,00	20	171,84	92	20	3	1

3172 **HM-MD DIN 6527 L**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-80	60-110			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	21,75	57	7	3	1
3,50	6	21,75	57	7	3	1
4,00	6	21,75	57	8	3	1
4,50	6	21,75	57	8	3	1
5,00	6	21,75	57	10	3	1
6,00	6	21,75	57	10	3	1
8,00	8	32,01	63	16	3	1

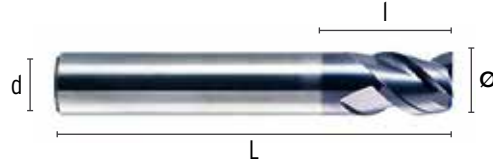
Ø mm	d mm	€	L mm	l mm	Z	
10,00	10	46,28	72	19	3	1
12,00	12	66,03	83	22	3	1
14,00	14	102,77	83	22	3	1
16,00	16	125,68	92	26	3	1
18,00	18	159,57	92	26	3	1
20,00	20	196,29	104	32	3	1

3173 **HM-MD DIN 6527 S**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○	○	○	○	○	○	●	●	○	○
110-250	90-200	75-180	60-120	80-140	60-120	120-180	100-140	60-120	150-300	110-350	120-350	150-300	40-90	60-140	40-80	30-50	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	25,05	50	4	2	1
3,50	6	25,05	50	4	2	1
4,00	6	25,56	54	5	2	1
4,50	6	25,56	54	5	2	1
5,00	6	25,56	54	6	2	1
6,00	6	25,56	54	7	2	1
8,00	8	33,24	58	9	2	1

Ø mm	d mm	€	L mm	l mm	Z	
10,00	10	45,72	66	11	3	1
12,00	12	65,46	73	12	3	1
14,00	14	93,66	75	14	3	1
16,00	16	110,25	82	16	3	1
18,00	18	152,46	84	18	3	1
20,00	20	171,72	92	20	3	1

3174 **HM-MD DIN 6527 L**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○	○	○	○	○	○	●	●	○	○
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90	110-240	100-250		110-240	40-80	60-110			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	28,71	57	7	3	1
3,50	6	28,71	57	7	3	1
4,00	6	28,71	57	8	3	1
4,50	6	28,71	57	8	3	1
5,00	6	28,71	57	10	3	1
6,00	6	28,71	57	10	3	1
8,00	8	36,60	63	16	3	1

Ø mm	d mm	€	L mm	l mm	Z	
10,00	10	50,40	72	19	3	1
12,00	12	74,91	83	22	3	1
14,00	14	103,80	83	22	3	1
16,00	16	126,21	92	26	3	1
18,00	18	165,75	92	26	3	1
20,00	20	196,35	104	32	3	1



3175 **HM-MD DIN 6527 S**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
110-250	90-200	75-180	60-120	80-140	60-120	120-180	100-140	60-120					40-90	60-140			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	24,51	50	5	4	1
3,50	6	24,51	50	6	4	1
4,00	6	25,05	54	8	4	1
4,50	6	25,05	54	8	4	1
5,00	6	25,05	54	9	4	1
6,00	6	25,05	54	10	4	1
8,00	8	33,12	58	12	4	1

Ø mm	d mm	€	L mm	l mm	Z	
10,00	10	45,51	66	14	4	1
12,00	12	65,46	73	16	4	1
14,00	14	93,66	75	18	4	1
16,00	16	110,25	82	22	4	1
18,00	18	152,46	84	24	4	1
20,00	20	171,84	92	26	4	1

3176 **HM-MD DIN 6527 L**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90					40-80	60-110			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
3,00	6	21,75	57	8	4	1
3,50	6	21,75	57	10	4	1
4,00	6	21,75	57	11	4	1
4,50	6	21,75	57	11	4	1
5,00	6	21,75	57	13	4	1
6,00	6	21,75	57	13	4	1
8,00	8	32,01	63	19	4	1

Ø mm	d mm	€	L mm	l mm	Z	
10,00	10	46,28	72	22	4	1
12,00	12	66,03	83	26	4	1
14,00	14	102,77	83	26	4	1
16,00	16	125,68	92	32	4	1
18,00	18	159,57	92	32	4	1
20,00	20	196,29	104	38	4	1

FRESAS METAL DURO FRAISES CARBURE / HARD METAL MILLS

3177 HM-MD DIN 6527 L



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●	●	○	
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-60	60-80	40-80	30-50	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	Z	
3,00	6	31,35	57	8	4	1
3,50	6	31,35	57	10	4	1
4,00	6	31,35	57	11	4	1
4,50	6	31,35	57	11	4	1
5,00	6	31,35	57	13	4	1
6,00	6	31,35	57	13	4	1
8,00	8	41,85	63	19	4	1

∅ mm	d mm	€	L mm	l mm	Z	
10,00	10	65,46	72	22	4	1
12,00	12	86,46	83	26	4	1
14,00	14	119,70	83	26	4	1
16,00	16	141,60	92	32	4	1
18,00	18	195,99	92	32	4	1
20,00	20	227,70	104	38	4	1

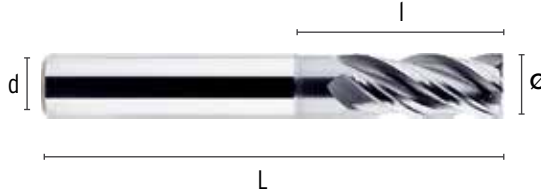


3192 **HM-MD DIN 6527 L**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●	●	●	○
170-240	160-210	150-200	100-140	80-140	60-120	120-180	90-130	100-140		170-220			40-80	60-140	90-150	70-130	60-110

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



∅ mm	d mm	€	L mm	l mm	z	
3,00	6	41,46	57	8	4	1
3,50	6	41,46	57	9	4	1
4,00	6	41,46	57	11	4	1
4,50	6	41,46	57	11	4	1
5,00	6	41,46	57	13	4	1
6,00	6	41,46	57	13	4	1
8,00	8	52,18	63	19	4	1

∅ mm	d mm	€	L mm	l mm	z	
10,00	10	81,43	72	22	4	1
12,00	12	101,58	83	26	4	1
14,00	14	140,60	83	26	4	1
16,00	16	166,32	92	32	4	1
18,00	18	218,09	92	32	4	1
20,00	20	253,38	104	38	4	1

3193 **HM-MD DIN 6527 EL**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●	●	●	○
210-380	200-320	200-300	180-250							200-250					70-130	50-120	40-80

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



∅ mm	d mm	€	L mm	l mm	z	
6,00	6	45,53	62	18	5	1
8,00	8	58,29	68	24	5	1
10,00	10	86,25	80	30	5	1
12,00	12	115,02	93	36	5	1
14,00	14	156,28	100	42	5	1

∅ mm	d mm	€	L mm	l mm	z	
16,00	16	214,16	108	48	5	1
18,00	18	273,46	115	54	5	1
20,00	20	331,69	126	60	5	1
25,00	25	585,34	150	75	5	1

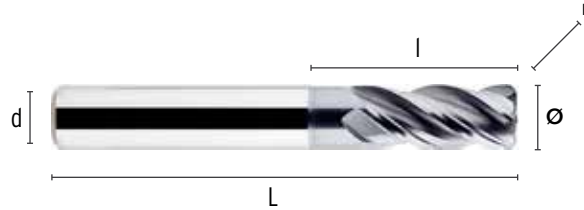
3178

HM-MD DIN 6527 L



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●	●	●	○
170-240	160-210	150-200	100-140	80-140	60-120	120-180	90-130	100-140		170-220			40-80	60-140	90-150	70-130	60-110

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	r	
6,00	6	45,00	57	13	0,5	1
6,00	6	45,00	57	13	1,0	1
8,00	8	58,11	63	19	0,5	1
8,00	8	58,11	63	19	1,0	1
10,00	10	87,51	72	22	0,5	1
10,00	10	87,51	72	22	1,0	1
10,00	10	87,51	72	22	2,0	1

∅ mm	d mm	€	L mm	l mm	r	
12,00	12	113,04	83	26	0,5	1
12,00	12	113,04	83	26	1,0	1
12,00	12	122,49	83	26	2,0	1
16,00	16	179,76	92	32	0,5	1
16,00	16	179,76	92	32	1,0	1
16,00	16	184,32	92	32	2,0	1



3179 **HM-MD DIN 6527 L**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●	●	○	
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-80	60-110	60-100	50-80	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
6,00	6	33,96	57	13	6	1
8,00	8	46,89	63	19	6	1
10,00	10	63,21	72	22	6	1
12,00	12	89,82	83	26	6	1

Ø mm	d mm	€	L mm	l mm	Z	
14,00	14	112,20	83	26	6	1
16,00	16	151,05	92	32	6	1
18,00	18	189,36	92	32	6	1
20,00	20	225,96	104	38	8	1

3180 **HM-MD DIN 6527 EL**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●	●	○	
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-90	60-110	60-100	50-80	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
6,00	6	36,96	62	18	6	1
8,00	8	50,40	68	24	6	1
10,00	10	70,71	80	30	6	1
12,00	12	101,49	93	36	6	1

Ø mm	d mm	€	L mm	l mm	Z	
14,00	14	140,55	100	45	6	1
16,00	16	189,21	108	48	6	1
18,00	18	255,00	115	55	6	1
20,00	20	326,07	126	60	8	1

3181 **HM-MD DIN 6527 L**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-90	60-110			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	Z	
4,00	6	34,86	57	11	3	1
5,00	6	34,86	57	13	4	1
6,00	6	34,86	57	13	4	1
8,00	8	49,56	63	19	4	1
10,00	10	67,41	72	22	4	1
12,00	12	94,35	83	26	4	1

Ø mm	d mm	€	L mm	l mm	Z	
14,00	14	126,90	83	26	4	1
16,00	16	163,80	92	32	4	1
16,00	16	163,80	92	32	5	1
18,00	18	200,13	92	32	5	1
20,00	20	224,55	104	38	5	1
20,00	20	224,55	104	38	6	1

3183 **HM-MD**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●	●	○	
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-90	60-110	40-80	30-50	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	Z	
1,20	6	28,93	57	4	1
1,60	8	40,15	63	4	1

Ø mm	d mm	€	L mm	Z	
2,00	10	59,85	72	4	1
2,40	12	86,45	83	4	1

FRESAS METAL DURO FRAISES CARBURE / HARD METAL MILLS

3184 HM-MD



4z

DIN 6535 HA

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-90	60-110			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	z	
1,20	6	28,93	57	4	1
1,60	8	40,15	63	4	1

∅ mm	d mm	€	L mm	z	
2,00	10	59,85	72	4	1
2,40	12	86,45	83	4	1

3185 HM-MD



4z

DIN 6535 HA

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	○		○			●	●			
100-220	80-180	70-150	60-90	70-110	60-100	100-160	80-120	60-90		100-200			40-90	60-110			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	r	d mm	€	L mm	z	
5,00	0,50	6	30,18	57	4	1
4,00	1,00	6	30,18	57	4	1
5,00	1,50	8	40,15	63	4	1
4,00	2,00	8	40,15	63	4	1
5,00	2,50	10	59,85	72	4	1

∅ mm	r	d mm	€	L mm	z	
4,00	3,00	10	59,85	72	4	1
5,00	3,50	12	86,45	83	4	1
4,00	4,00	12	86,45	83	4	1
4,00	5,00	14	115,79	83	4	1

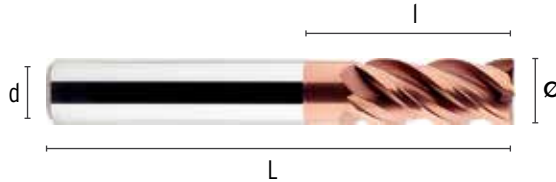
3194 **HM-MD DIN 6527 L**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
				● 90-150	● 70-130								● 50-80	● 60-150			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



∅ mm	d mm	€	L mm	l mm	Z	
3,00	6	44,72	57	8	4	1
3,50	6	44,72	57	10	4	1
4,00	6	44,72	57	11	4	1
4,50	6	44,72	57	11	4	1
5,00	6	44,72	57	13	4	1
6,00	6	44,72	57	13	4	1
8,00	8	56,73	63	19	4	1

∅ mm	d mm	€	L mm	l mm	Z	
10,00	10	87,26	72	22	4	1
12,00	12	107,49	83	26	4	1
14,00	14	144,54	83	26	4	1
16,00	16	193,66	92	32	4	1
18,00	18	239,67	92	32	4	1
20,00	20	289,82	104	38	4	1

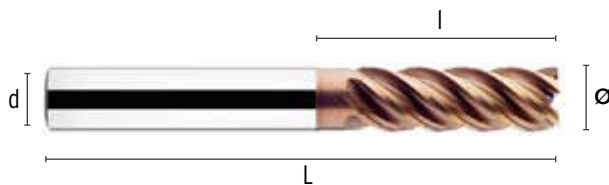
3195 **HM-MD DIN 6527 EL**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
				● 150-230	● 130-200								● 40-100	● 60-230			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW

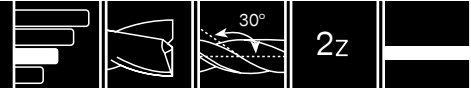


∅ mm	d mm	€	L mm	l mm	Z	
6,00	6	49,20	62	18	5	1
8,00	8	60,60	68	24	5	1
10,00	10	89,98	80	30	5	1
12,00	12	119,90	93	36	5	1
14,00	14	169,51	100	42	5	1

∅ mm	d mm	€	L mm	l mm	Z	
16,00	16	230,04	108	48	5	1
18,00	18	291,11	115	54	5	1
20,00	20	351,98	126	60	5	1
25,00	25	615,67	150	75	5	1

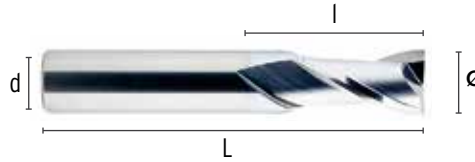
3101

HM-MD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○	●	●	●	●	●		○			●	●			
70-155	60-110	50-105	45-65	50-80	45-70	70-115	60-85			70-130			30-60	45-80			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

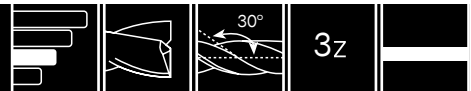


Ø mm	d mm	€	L mm	l mm	
3,00	3	17,84	40	12	1
4,00	4	20,14	40	12	1
5,00	5	20,98	50	14	1
6,00	6	25,88	50	16	1
8,00	8	37,21	60	20	1

Ø mm	d mm	€	L mm	l mm	
10,00	10	50,91	70	22	1
12,00	12	71,59	70	22	1
16,00	16	120,81	75	25	1
20,00	20	183,37	100	32	1

3105

HM-MD



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○	●	●	●	●	●		○			●	●			
70-155	60-110	50-105	45-65	50-80	45-70	70-115	60-85			70-130			30-60	45-80			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

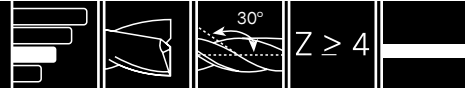


Ø mm	d mm	€	L mm	l mm	
3,00	3	17,84	40	12	1
4,00	4	20,14	40	14	1
5,00	5	20,98	50	16	1
6,00	6	25,88	50	19	1
8,00	8	37,21	60	20	1

Ø mm	d mm	€	L mm	l mm	
10,00	10	50,91	70	22	1
12,00	12	71,59	70	22	1
16,00	16	120,81	75	25	1
20,00	20	183,37	100	32	1

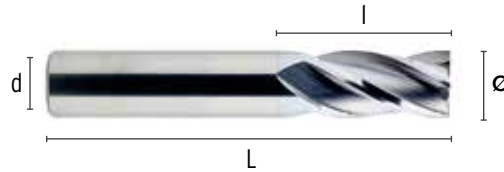
FRESAS METAL DURO FRAISES CARBURE / HARD METAL MILLS

3107 **HM-MD**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○	●	●	●	●			○			●	●			
70-155	60-110	50-105	45-65	50-80	45-70	70-115	60-85			70-130			30-60	45-80			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
3,00	3	17,84	40	12	1
4,00	4	20,14	40	12	1
5,00	5	20,98	50	14	1
6,00	6	25,88	50	16	1
8,00	8	37,21	60	20	1

Ø mm	d mm	€	L mm	l mm	
10,00	10	50,91	75	22	1
12,00	12	71,59	70	22	1
16,00	16	120,81	75	25	1
20,00	20	183,37	100	32	1



FRESAS MANGO CILÍNDRICO

FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3120

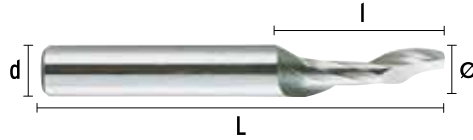
HSSE W



1z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									● 60-200		● 60-100	● 50-80					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
3,00	8	15,38	60	12	1
4,00*	6	15,38	60	12	1
4,00	8	15,38	60	12	1
5,00*	6	15,38	60	12	1
5,00	8	15,38	60	14	1

Ø mm	d mm	€	L mm	l mm	
6,00	6	15,38	60	14	1
6,00	8	15,38	60	14	1
7,00	8	18,68	60	14	1
8,00	8	18,68	80	14	1
10,00	8	23,61	80	14	1

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

3121

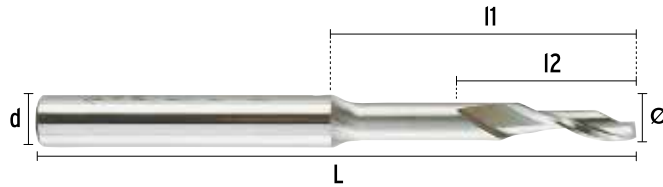
HSSE W



1z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
									● 60-200		● 60-100	● 50-80					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l1 mm	l2 mm	
4,00	8	21,78	80	45	16	1
5,00*	6	21,78	80	45	14	1
5,00	8	21,78	80	45	16	1

Ø mm	d mm	€	L mm	l1 mm	l2 mm	
6,00	8	21,78	90	45	16	1
8,00	8	24,15	100	70	30	1

*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3122

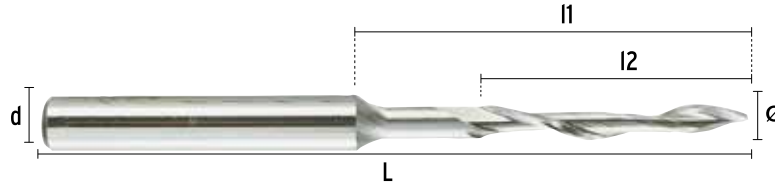
HSSE W



1z

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●									●		●	●					
									60-200		60-100	50-80					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l1 mm	l2 mm	
5,00	8	21,78	100	55	35	1

3186

HSSE W



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●									●		●	●					
30-50									60-150		60-100	50-80					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	l mm	
2	2	6	15,24	51	7	1
3	2	6	15,24	52	8	1
4	2	6	15,24	55	11	1
5	2	6	15,24	57	13	1
6	2	6	15,24	57	13	1
8	2	10	20,75	69	19	1

Ø mm	Z	d mm	€	L mm	l mm	
10	2	10	21,70	72	22	1
12	2	12	28,16	83	26	1
14	2	12	31,12	83	26	1
16	2	16	37,96	92	32	1
18	2	16	47,10	92	32	1
20	2	20	57,32	104	38	1

P Aceros Aciers Steels

M Aceros Inox Aciers Inox Stainless Steels

K Fundicion Fonte Cast Iron

N Metales no ferrosos Métal non Ferraux Non Ferrous metals

S Titanio y Superaloaciones Titanium et Supeallages Titanium and Superalloys

H Materiales Duros Materiels Durs Hard materials

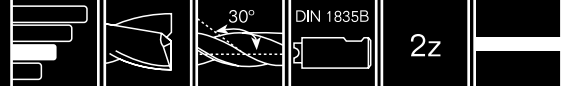


FRESAS MANGO CILÍNDRICO

FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

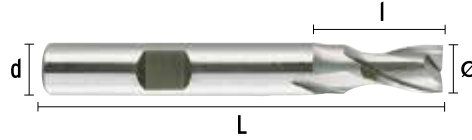
3110

HSSE DIN 327 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24			○ 45-90							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



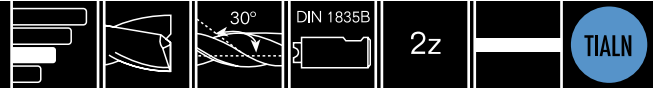
Ø mm	d mm	€	L mm	l mm	
2,00	6	13,84	48	4	1
2,50	6	13,84	49	5	1
3,00	6	13,84	49	5	1
3,50	6	15,06	50	6	1
4,00	6	13,84	51	7	1
4,50	6	16,54	51	7	1
5,00	6	13,84	52	8	1
5,50	6	17,56	52	8	1
6,00	6	13,84	52	8	1
6,50	10	22,95	60	10	1
7,00	10	22,26	60	10	1
7,50	10	22,06	60	10	1
8,00	10	19,83	61	11	1
8,50	10	24,76	61	11	1
9,00	10	22,79	61	11	1
9,50	10	24,16	61	11	1
10,00	10	19,62	63	13	1
11,00	12	26,76	70	13	1

Ø mm	d mm	€	L mm	l mm	
12,00	12	25,36	73	16	1
13,00	12	33,46	73	16	1
14,00	12	33,46	73	16	1
15,00	12	37,49	73	16	1
16,00	16	36,60	79	19	1
17,00	16	44,58	79	19	1
18,00	16	44,58	79	19	1
19,00	16	56,29	79	19	1
20,00	20	53,28	88	22	1
22,00	20	69,68	88	22	1
24,00	25	88,26	102	26	1
25,00	25	96,12	102	26	1
28,00	25	111,67	102	26	1
30,00	25	129,90	102	26	1
32,00	32	130,74	112	32	1
36,00	32	174,87	112	32	1
40,00	32	214,70	130	38	1

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

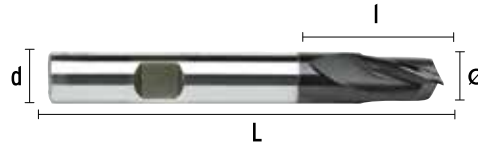
3110/1

HSSE DIN 327 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		○		●	●	○		○							
48-80	40-45	30-35		25-35		55-60	30-40	30-35		70-120							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	€	L mm	l mm	
2,00	6	19,37	48	4	1
2,50	6	19,37	49	5	1
3,00	6	19,37	49	5	1
3,50	6	21,08	50	6	1
4,00	6	19,37	51	7	1
4,50	6	23,15	51	7	1
5,00	6	19,37	52	8	1
5,50	6	24,58	52	8	1
6,00	6	19,37	52	8	1
6,50	10	32,13	60	10	1
7,00	10	31,16	60	10	1
7,50	10	30,88	60	10	1
8,00	10	27,77	61	11	1
8,50	10	34,66	61	11	1
9,00	10	31,90	61	11	1
9,50	10	33,82	61	11	1
10,00	10	27,47	63	13	1
11,00	12	37,47	70	13	1

∅ mm	d mm	€	L mm	l mm	
12,00	12	35,50	73	16	1
13,00	12	46,85	73	16	1
14,00	12	46,85	73	16	1
15,00	12	52,48	73	16	1
16,00	16	51,24	79	19	1
17,00	16	62,42	79	19	1
18,00	16	62,42	79	19	1
19,00	16	78,81	79	19	1
20,00	20	74,59	88	22	1
22,00	20	97,55	88	22	1
24,00	25	123,57	102	26	1
25,00	25	134,56	102	26	1
28,00	25	156,33	102	26	1
30,00	25	181,85	102	26	1
32,00	32	183,03	112	32	1
36,00	32	244,81	112	32	1
40,00	40	300,59	118	38	1

Bajo demanda / Sur commande / Upon request



FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3112 HSSE DIN 327 N

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24			○ 45-90			○ 2-4				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
3,00	6	27,32	49	5	1
4,00	6	27,32	51	7	1
5,00	6	27,32	52	8	1
6,00	6	27,32	52	8	1
7,00	10	32,94	60	10	1
8,00	10	29,33	61	11	1
9,00	10	33,72	61	11	1
10,00	10	29,12	63	13	1
12,00	12	37,53	73	16	1

Ø mm	d mm	€	L mm	l mm	
13,00	12	49,59	73	16	1
14,00	12	49,59	73	16	1
15,00	12	49,67	73	16	1
16,00	16	54,19	79	19	1
18,00	16	65,98	79	19	1
20,00	20	78,80	88	22	1
22,00	20	103,13	88	22	1
24,00	25	123,24	102	26	1
25,00	25	113,26	102	26	1

3112/1 HSSE DIN 327 N

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35		○ 70-120			○ 4-6				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
3,00	6	38,25	49	5	1
4,00	6	38,25	51	7	1
5,00	6	38,25	52	8	1
6,00	6	38,25	52	8	1
7,00	10	46,11	60	10	1
8,00	10	41,06	61	11	1
9,00	10	47,20	61	11	1
10,00	10	40,76	63	13	1
12,00	12	52,54	73	16	1

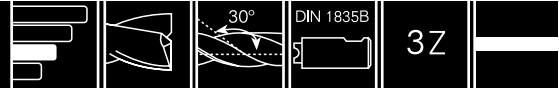
Ø mm	d mm	€	L mm	l mm	
13,00	12	69,43	73	16	1
14,00	12	69,43	73	16	1
15,00	12	69,53	73	16	1
16,00	16	75,87	79	19	1
18,00	16	92,37	79	19	1
20,00	20	110,32	88	22	1
22,00	20	144,38	88	22	1
24,00	25	172,53	102	26	1
25,00	25	158,57	102	26	1

Bajo demanda / Sur commande / upon request

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3187

HSSE DIN 327 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24			○ 45-90				○ 15-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

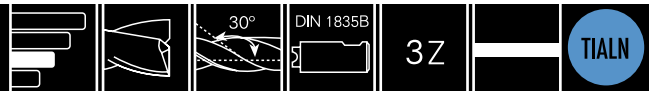


Ø mm	Z	d mm	€	L mm	l mm	
2,00	3	6	13,89	48	4	1
3,00	3	6	12,62	49	5	1
4,00	3	6	12,62	51	7	1
5,00	3	6	12,62	52	8	1
6,00	3	6	12,62	52	8	1
7,00	3	10	15,79	60	10	1
8,00	3	10	15,79	61	11	1
9,00	3	10	18,50	91	11	1
10,00	3	10	18,49	63	13	1
11,00	3	12	21,53	70	13	1
12,00	3	12	21,51	73	16	1

Ø mm	Z	d mm	€	L mm	l mm	
13,00	3	12	26,68	73	16	1
14,00	3	12	26,68	73	16	1
15,00	3	12	30,94	73	16	1
16,00	3	16	30,94	79	19	1
18,00	3	16	38,06	79	19	1
20,00	3	20	47,61	88	22	1
22,00	3	20	70,91	88	22	1
25,00	3	25	93,73	102	26	1
28,00	3	25	105,35	102	26	1
30,00	3	25	131,62	102	26	1
32,00	3	32	174,39	112	32	1

3187/1

HSSE DIN 327 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35		○ 70-120				○ 25-35			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	l mm	
2,00	3	6	19,45	48	4	1
3,00	3	6	17,67	49	5	1
4,00	3	6	17,67	51	7	1
5,00	3	6	17,67	52	8	1
6,00	3	6	17,67	52	8	1
7,00	3	10	22,11	60	10	1
8,00	3	10	22,11	61	11	1
9,00	3	10	25,90	91	11	1
10,00	3	10	25,89	63	13	1
11,00	3	12	30,14	70	13	1
12,00	3	12	30,12	73	16	1

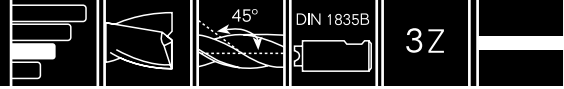
Ø mm	Z	d mm	€	L mm	l mm	
13,00	3	12	37,35	73	16	1
14,00	3	12	37,35	73	16	1
15,00	3	12	43,32	73	16	1
16,00	3	16	43,32	79	19	1
18,00	3	16	53,29	79	19	1
20,00	3	20	66,65	88	22	1
22,00	3	20	99,27	88	22	1
25,00	3	25	131,23	102	26	1
28,00	3	25	147,49	102	26	1
30,00	3	25	184,26	102	26	1
32,00	3	32	244,15	112	32	1



FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

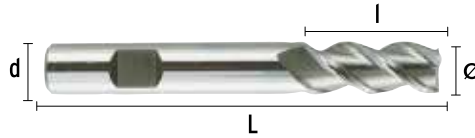
3114

HSSE DIN 844 W



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50									● 60-150		● 60-100	● 50-80					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



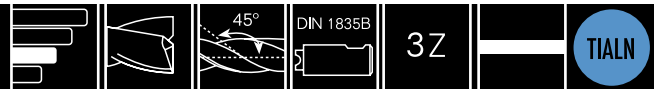
Ø mm	d mm	€	L mm	l mm	z	
2,00	6	16,26	51	7	3	1
3,00	6	16,26	52	8	3	1
4,00	6	16,26	55	11	3	1
5,00	6	16,26	57	13	3	1
6,00	6	20,23	57	13	3	1
7,00	10	22,40	69	16	3	1
8,00	10	24,66	69	19	3	1
9,00	10	27,17	69	19	3	1
10,00	10	25,43	72	22	3	1

Ø mm	d mm	€	L mm	l mm	z	
12,00	12	30,88	83	26	3	1
14,00	12	40,57	83	26	3	1
15,00	12	40,28	83	26	3	1
16,00	16	46,26	92	32	3	1
18,00	16	54,83	92	32	3	1
20,00	20	66,38	104	38	3	1
25,00*	25	109,60	121	45	4	1
30,00*	25	156,69	121	45	4	1

* Hasta fin de existencias / Jusqu'à epuïsement des stocks / Until end of stock

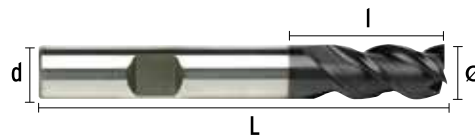
3114/1

HSSE DIN 844 W



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80									● 100-200		● 80-120	● 65-100					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	z	
6,00	6	28,33	57	13	3	1
7,00	10	31,36	66	16	3	1
8,00	10	34,53	69	19	3	1
9,00	10	38,04	69	19	3	1
10,00	10	35,60	72	22	3	1
12,00	12	43,23	83	26	3	1

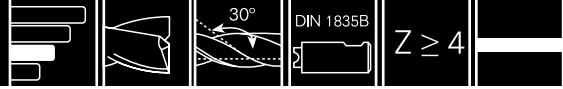
Ø mm	d mm	€	L mm	l mm	z	
14,00	12	56,80	83	26	3	1
15,00	12	56,39	83	26	3	1
16,00	16	64,77	92	32	3	1
18,00	16	76,76	92	32	3	1
20,00	20	92,93	104	38	3	1

Bajo demanda / Sur commade / upon request

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3115

HSSE DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24			○ 45-90			○ 15-20	● 15-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	I mm	
2,00	3	6	15,23	51	7	1
2,50	3	6	15,23	52	8	1
3,00	4	6	15,23	52	8	1
4,00	4	6	15,34	55	11	1
5,00	4	6	15,34	57	13	1
6,00	4	6	15,34	57	13	1
7,00	4	10	23,15	69	16	1
8,00	4	10	19,13	69	19	1
9,00	4	10	24,15	69	19	1
10,00	4	10	21,35	72	22	1
11,00	4	12	29,12	79	22	1
12,00	4	12	27,03	83	26	1

Ø mm	Z	d mm	€	L mm	I mm	
13,00	4	12	36,40	83	26	1
14,00	4	12	34,35	83	26	1
15,00	4	12	39,21	83	26	1
16,00	4	16	38,26	92	32	1
18,00	4	16	47,16	92	32	1
20,00	4	20	55,19	104	38	1
22,00	5	20	76,64	104	38	1
25,00	5	25	95,24	121	45	1
28,00	5	25	119,07	121	45	1
30,00	5	25	141,90	121	45	1
32,00	6	32	141,90	133	53	1

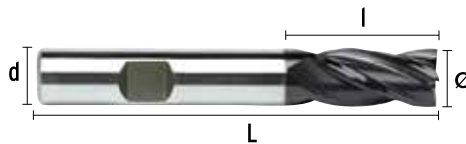
3115/1

HSSE DIN 327 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35	○ 90-200	○ 70-120			● 25-35	● 25-35			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



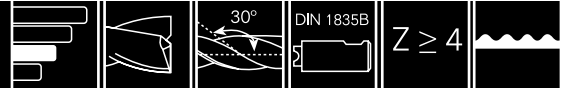
Ø mm	Z	d mm	€	L mm	I mm	
3,00	4	6	21,32	52	8	1
4,00	4	6	21,32	55	11	1
5,00	4	6	21,32	57	13	1
6,00	4	6	21,48	57	13	1
7,00	4	10	21,48	66	16	1
8,00	4	10	21,48	69	19	1
9,00	4	10	32,41	69	19	1
10,00	4	10	26,78	72	22	1
11,00	4	12	33,81	79	22	1
12,00	4	12	29,89	83	26	1
13,00	4	12	40,76	83	26	1

Ø mm	Z	d mm	€	L mm	I mm	
14,00	4	12	37,84	83	26	1
15,00	4	12	50,96	83	26	1
16,00	4	16	48,08	92	32	1
18,00	4	16	54,89	92	32	1
20,00	4	20	53,57	104	38	1
22,00	5	20	66,02	104	38	1
25,00	5	25	77,26	121	45	1
28,00	5	25	107,30	121	45	1
30,00	5	25	133,33	121	45	1
32,00	6	32	166,70	133	53	1

Bajo demanda / Sur commande / upon request

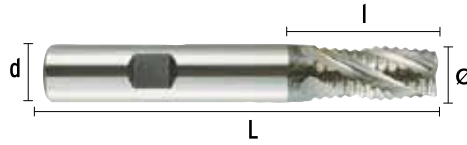
FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3117 HSSE DIN 844 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 35-50	○ 25-30			○ 15-20		○ 34-38				○ 45-90							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	I mm	
6,00	4	6	39,22	57	13	1
7,00	4	10	47,26	66	16	1
8,00	4	10	44,13	69	19	1
9,00	4	10	49,02	69	19	1
10,00	4	10	38,70	72	22	1
11,00	4	12	57,74	79	22	1
12,00	4	12	50,90	83	26	1
13,00	4	12	69,06	83	26	1
14,00	4	12	55,19	83	26	1
15,00	4	12	72,59	83	26	1
16,00	4	16	67,61	92	32	1
17,00	4	16	89,45	92	32	1

Ø mm	Z	d mm	€	L mm	I mm	
18,00	4	16	71,43	92	32	1
20,00	4	20	89,51	98	38	1
22,00	5	20	102,85	104	38	1
24,00	5	25	129,49	121	45	1
25,00	5	25	128,55	121	45	1
26,00	5	25	153,53	121	45	1
28,00	5	25	148,58	121	45	1
30,00	5	25	165,01	121	45	1
32,00	6	32	180,95	133	53	1
36,00*	6	32	214,25	133	53	1
40,00*	6	32	240,92	155	63	1

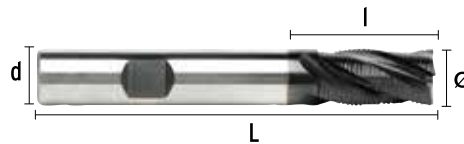
* Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

3117/1 HSSE DIN 844 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 55-80	● 45-55	○ 35-40		○ 25-35		● 55-60				○ 60-120							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	I mm	
6,00	4	6	54,90	57	13	1
7,00	4	10	66,16	66	16	1
8,00	4	10	61,78	69	19	1
9,00	4	10	68,63	69	19	1
10,00	4	10	54,18	72	22	1
11,00	4	12	80,84	79	22	1
12,00	4	12	71,27	83	26	1
13,00	4	12	96,68	83	26	1
14,00	4	12	77,26	83	26	1
15,00	4	12	101,62	83	26	1
16,00	4	16	94,65	92	32	1

Ø mm	Z	d mm	€	L mm	I mm	
17,00	4	16	125,23	92	32	1
18,00	4	16	100,00	92	32	1
20,00	4	20	125,32	98	38	1
22,00	5	20	143,99	104	38	1
24,00	5	25	181,28	121	45	1
25,00	5	25	179,97	121	45	1
26,00	5	25	214,94	121	45	1
28,00	5	25	208,01	121	45	1
30,00	5	25	231,01	121	45	1
32,00	6	32	253,33	133	53	1

Bajo demanda / Sur commade / upon request

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3119

HSSE DIN 844 NRF



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	● 20-38			○ 50-90			○ 15-20				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	l mm	📦
6,00	4	6	43,68	57	13	1
8,00	4	10	49,14	69	19	1
10,00	4	10	43,12	72	22	1
12,00	4	12	56,69	83	26	1
14,00	4	12	61,46	83	26	1

Ø mm	Z	d mm	€	L mm	l mm	📦
16,00	4	16	75,22	9	32	1
18,00	4	16	79,46	92	32	1
20,00	4	20	99,61	104	38	1
25,00	5	25	143,03	121	45	1
30,00	5	25	183,58	121	45	1

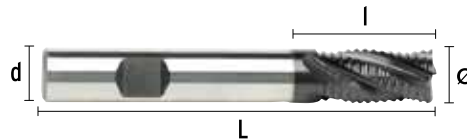
3119/1

HSSE DIN 844 NRF



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 40-45			○ 25-35		● 55-60	● 20-38			○ 60-120			○ 25-35				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	l mm	📦
6,00	4	6	61,15	57	13	1
8,00	4	10	68,80	69	19	1
10,00	4	10	60,37	72	22	1
12,00	4	12	79,37	83	26	1
14,00	4	12	86,04	83	26	1

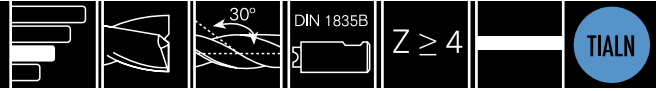
Ø mm	Z	d mm	€	L mm	l mm	📦
16,00	4	16	105,31	92	32	1
18,00	4	16	111,25	92	32	1
20,00	4	20	139,46	104	38	1
25,00	5	25	200,24	121	45	1
30,00	6	25	257,01	121	45	1

Bajo demanda / Sur commande / upon request



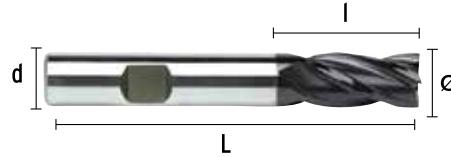
FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3162 HSSE-PM DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●	○	○	○	○	○	●	●			
55-85	50-60	35-40		35-40	28-35	55-60	30-40	30-35	90-200	80-120	90-130	75-190	15-40	30-40			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	l mm	€	Z	
6,00	6	57	13	42,23	4	1
8,00	10	69	19	52,73	4	1
10,00	10	72	22	62,46	4	1
12,00	12	83	26	74,69	4	1

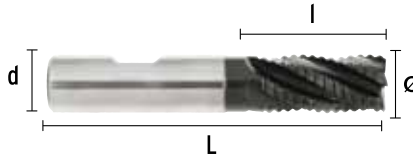
Ø mm	d mm	L mm	l mm	€	Z	
14,00	12	83	26	87,24	4	1
16,00	16	92	32	103,43	4	1
18,00	16	92	32	126,39	4	1
20,00	20	104	38	155,81	4	1

3157 HSSE-PM DIN 844 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●				○							
60-90	50-60	45-50		35-40	28-35	60-65				85-140							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	l mm	€	Z	
6,00	6	57	13	72,42	4	1
8,00	10	69	19	79,50	4	1
10,00	10	72	22	77,12	4	1
12,00	12	83	26	98,82	4	1
14,00	12	83	26	118,04	4	1
16,00	16	92	32	145,11	4	1
18,00	16	92	32	158,55	4	1

Ø mm	d mm	L mm	l mm	€	Z	
20,00	20	104	38	196,94	4	1
22,00	20	104	38	243,81	5	1
25,00	25	121	45	289,35	5	1
28,00	25	121	45	371,04	5	1
30,00	25	121	45	387,83	5	1
32,00	32	133	53	421,10	6	1

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3159

HSSE-PM DIN 844 NRF



P			M		K			N				S		H			
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●				○			●	●			
55-85	40-50	35-40		30-35	25-30	55-60				80-140			15-40	30-40			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

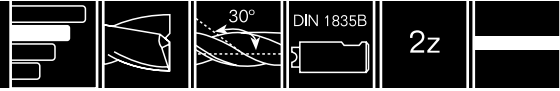


∅ mm	d mm	L mm	l mm	€	Z	
6,00	6	57	13	79,67	4	1
8,00	10	69	19	87,11	4	1
10,00	10	72	22	84,69	4	1
12,00	12	83	26	108,77	4	1

∅ mm	d mm	L mm	l mm	€	Z	
14,00	12	83	26	129,59	4	1
16,00	16	92	32	159,08	4	1
18,00	16	92	32	173,96	4	1
20,00	20	104	38	215,51	4	1

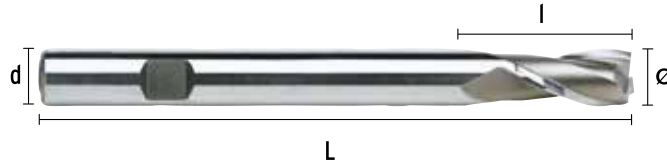
FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3111 HSSE DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24			○ 45-80							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



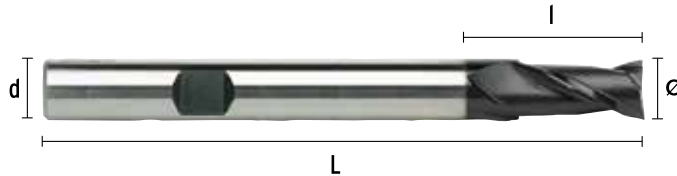
Ø mm	d mm	€	L mm	l mm	Box	Ø mm	d mm	€	L mm	l mm	Box
4,00	6	21,15	63	11	1	12,00	12	48,06	110	26	1
5,00	6	21,15	68	13	1	14,00	12	62,48	110	26	1
6,00	6	21,15	68	13	1	16,00	16	73,49	123	32	1
7,00	10	35,18	80	16	1	18,00	16	87,57	123	32	1
8,00	10	30,75	88	19	1	20,00	20	95,64	141	38	1
9,00	10	41,67	88	19	1	22,00	20	129,83	141	38	1
10,00	10	35,18	95	22	1	25,00	25	186,21	166	45	1

3111/1 HSSE DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35		○ 70-110							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



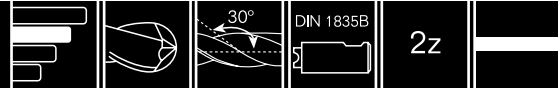
Ø mm	d mm	€	L mm	l mm	Box	Ø mm	d mm	€	L mm	l mm	Box
4,00	6	29,61	63	11	1	12,00	12	67,28	110	26	1
5,00	6	29,61	68	13	1	14,00	12	87,47	110	26	1
6,00	6	29,61	68	13	1	16,00	16	102,88	123	32	1
7,00	10	49,25	80	16	1	18,00	16	122,60	123	32	1
8,00	10	43,05	88	19	1	20,00	20	133,90	141	38	1
9,00	10	58,34	88	19	1	22,00	20	181,76	141	38	1
10,00	10	49,25	95	22	1	25,00	25	260,69	166	45	1

Bajo demanda / Sur commande / upon request

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3113

HSSE DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24			○ 45-90			○ 2-4				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	
4,00	6	30,83	63	11	1
5,00	6	32,63	68	13	1
6,00	6	29,46	68	13	1
8,00	10	36,13	88	19	1
10,00	12	39,64	95	22	1
12,00	12	50,85	110	26	1

Ø mm	d mm	€	L mm	l mm	
14,00	12	59,81	110	26	1
16,00	16	76,02	123	32	1
18,00	16	91,41	123	32	1
20,00	20	99,09	141	38	1
22,00	20	122,83	141	38	1
25,00	25	182,37	166	45	1

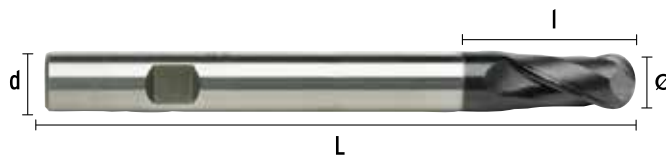
3113/1

HSSE DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35		○ 70-120			● 4-6				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



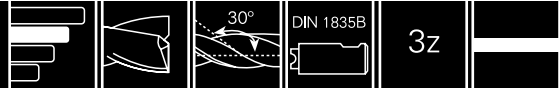
Ø mm	d mm	€	L mm	l mm	
4,00	6	43,16	63	11	1
5,00	6	45,69	68	13	1
6,00	6	41,25	68	13	1
8,00	10	50,58	88	19	1
10,00	10	55,49	95	22	1
12,00	12	71,19	110	26	1

Ø mm	d mm	€	L mm	l mm	
14,00	12	83,73	110	26	1
16,00	16	106,43	123	32	1
18,00	16	127,98	123	32	1
20,00	20	138,72	141	38	1
22,00	20	171,96	141	38	1
25,00	25	255,32	166	45	1

Bajo demanda / Sur commande / upon request

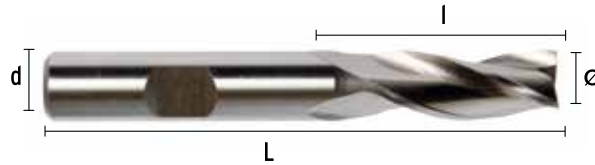
FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3188 HSSE DIN 327 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24			○ 55-75				○ 15-20			

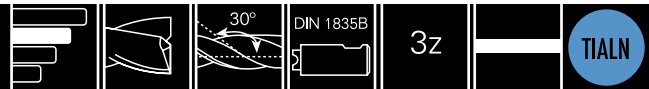
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	l mm	
3	3	6	16,33	52	8	1
4	3	6	16,33	55	11	1
5	3	6	16,33	57	13	1
6	3	6	16,33	57	13	1
7	3	10	20,48	66	16	1
8	3	10	20,48	69	19	1
9	3	10	22,10	69	22	1
10	3	10	24,11	72	22	1
11	3	12	25,80	79	22	1

Ø mm	Z	d mm	€	L mm	l mm	
12	3	12	27,94	83	26	1
13	3	12	30,22	83	26	1
14	3	12	34,80	83	26	1
15	3	12	38,08	83	26	1
16	3	16	40,30	92	32	1
18	3	16	49,64	92	32	1
20	3	20	61,94	104	38	1
22	3	20	72,17	104	38	1
25	3	25	80,12	121	45	1

3188/1 HSSE DIN 327 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35		○ 70-120				○ 25-35			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	l mm	
3	3	6	22,86	52	8	1
4	3	6	22,86	55	11	1
5	3	6	22,86	57	13	1
6	3	6	22,86	57	13	1
7	3	10	28,67	66	16	1
8	3	10	28,67	69	19	1
9	3	10	30,94	69	22	1
10	3	10	33,75	72	22	1
11	3	12	36,12	79	22	1

Ø mm	Z	d mm	€	L mm	l mm	
12	3	12	39,12	83	26	1
13	3	12	42,31	83	26	1
14	3	12	48,72	83	26	1
15	3	12	53,32	83	26	1
16	3	16	56,42	92	32	1
18	3	16	69,50	92	32	1
20	3	20	86,72	104	38	1
22	3	20	101,03	104	38	1
25	3	25	112,16	121	45	1

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

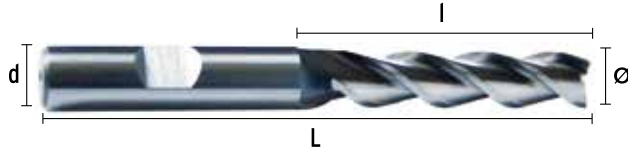
3182

HSSE DIN 844 W



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●									●		○						
30-50									60-150		60-100						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	€	L mm	l mm	z	
6,00	6	21,72	68	24	3	1
8,00	10	27,69	88	38	3	1
10,00	10	32,55	95	45	3	1
12,00	12	39,05	110	53	3	1

Ø mm	d mm	€	L mm	l mm	z	
14,00	12	45,56	110	53	3	1
16,00	16	54,31	123	63	3	1
18,00	16	61,77	123	63	3	1
20,00	20	77,04	141	75	3	1

3182/1

HSSE DIN 844 W



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●									●		○						
30-50									60-150		60-100						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

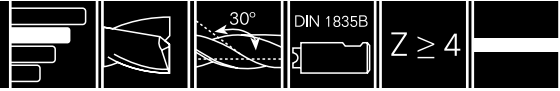


Ø mm	d mm	€	L mm	l mm	z	
6,00	6	30,41	68	24	3	1
8,00	10	38,76	88	38	3	1
10,00	10	45,57	95	45	3	1
12,00	12	54,67	110	53	3	1

Ø mm	d mm	€	L mm	l mm	z	
14,00	12	63,78	110	53	3	1
16,00	16	76,03	123	63	3	1
18,00	16	86,48	123	63	3	1
20,00	20	107,85	141	75	3	1

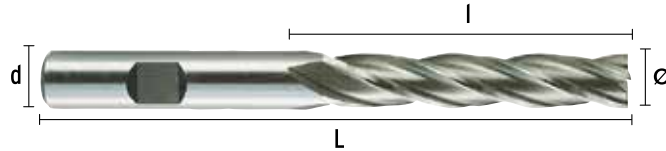
FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3116 HSSE DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24			● 55-75			○ 15-20	○ 15-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	Z	d mm	€	L mm	l mm	
3,00	4	6	18,22	56	12	1
4,00	4	6	18,22	63	19	1
5,00	4	6	18,22	68	24	1
6,00	4	6	18,22	68	24	1
7,00	4	10	27,63	80	30	1
8,00	4	10	25,38	88	38	1
9,00	4	10	28,57	88	38	1
10,00	4	10	25,15	95	45	1

∅ mm	Z	d mm	€	L mm	l mm	
12,00	4	12	31,88	110	53	1
14,00	4	12	41,70	110	53	1
16,00	4	16	45,61	123	63	1
18,00	4	16	55,70	123	63	1
20,00	4	20	65,23	141	75	1
22,00	5	20	90,46	141	75	1
25,00	5	25	119,99	166	90	1

3116/1 HSSE DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35		● 70-120			○ 25-35	○ 25-35			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	Z	d mm	€	L mm	l mm	
6,00	4	6	25,50	68	24	1
7,00	4	10	38,68	80	30	1
8,00	4	10	35,53	88	38	1
9,00	4	10	40,00	88	38	1
10,00	4	10	35,21	95	45	1
12,00	4	12	44,63	110	53	1

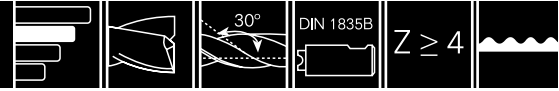
∅ mm	Z	d mm	€	L mm	l mm	
14,00	4	12	58,37	110	53	1
16,00	4	16	63,86	123	63	1
18,00	4	16	77,98	123	63	1
20,00	4	20	91,32	141	75	1
22,00	5	20	126,64	141	75	1
25,00	5	25	167,99	166	90	1

Bajo demanda / Sur commande / upon request

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3118

HSSE DIN 844 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 35-50	○ 25-30			○ 15-20		○ 34-38				○ 45-90							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

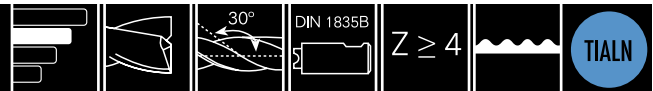


Ø mm	Z	d mm	€	L mm	l mm	
6,00	4	6	54,03	68	24	1
8,00	4	10	71,43	88	38	1
10,00	4	10	49,02	95	45	1
12,00	4	12	58,08	110	53	1
14,00	4	12	67,12	110	53	1
16,00	4	16	78,54	123	63	1
18,00	4	16	88,58	123	63	1

Ø mm	Z	d mm	€	L mm	l mm	
20,00	4	20	111,39	141	75	1
22,00	5	20	135,72	141	75	1
25,00	5	25	171,39	166	90	1
28,00	5	25	194,27	166	90	1
30,00	5	25	260,28	166	90	1
32,00	6	32	246,68	186	106	1

3118/1

HSSE DIN 844 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 55-80	● 45-55	○ 35-40		○ 25-35		● 55-60				○ 60-120							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	L mm	l mm	
6,00	4	6	75,65	68	24	1
8,00	4	10	100,00	88	38	1
10,00	4	10	68,63	95	45	1
12,00	4	12	81,31	110	53	1
14,00	4	12	93,96	110	53	1
16,00	4	16	109,96	123	63	1
18,00	4	16	124,01	123	63	1

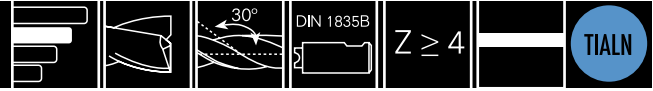
Ø mm	Z	d mm	€	L mm	l mm	
20,00	4	20	155,95	141	75	1
22,00	5	20	190,01	141	75	1
25,00	5	25	239,95	166	90	1
28,00	5	25	271,98	166	90	1
30,00	5	25	364,40	166	90	1
32,00	6	32	345,35	186	106	1

Bajo demanda / Sur commande / upon request



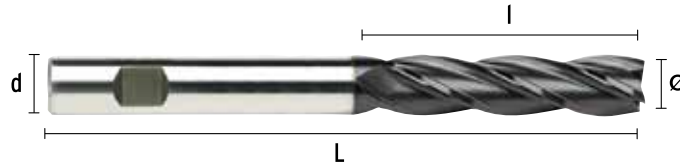
FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

3163 HSSE-PM DIN 844 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●	●	○	○	○	○	○	●	●			
55-85	50-60	35-40		35-40	28-35	55-60	30-40	30-35	90-200	80-120	90-130	75-190	15-40	30-40			

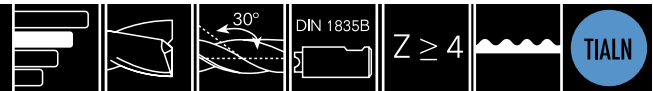
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	l mm	€	Z	
6,00	6	68	24	35,32	4	1
8,00	10	88	38	44,11	4	1
10,00	10	95	45	52,25	4	1
12,00	12	110	53	62,46	4	1

Ø mm	d mm	L mm	l mm	€	Z	
14,00	12	110	53	72,67	4	1
16,00	16	123	63	86,15	4	1
18,00	16	123	63	104,83	4	1
20,00	20	141	75	129,23	4	1

3158 HSSE-PM DIN 844 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●				○							
60-90	50-60	45-50		35-40	28-35	60-65				85-140							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



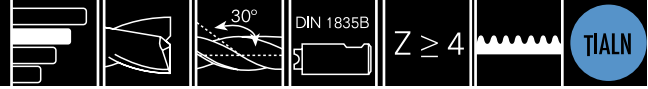
Ø mm	d mm	L mm	l mm	€	Z	
6,00	6	68	24	76,66	4	1
8,00	10	88	38	80,08	4	1
10,00	10	95	45	72,93	4	1
12,00	12	110	53	91,41	4	1
14,00	12	110	53	104,29	4	1

Ø mm	d mm	L mm	l mm	€	Z	
16,00	16	123	63	128,86	4	1
18,00	16	123	63	145,18	4	1
20,00	20	141	75	185,83	4	1
25,00	25	166	90	285,54	5	1
32,00	32	186	106	406,16	6	1

FRESAS MANGO CILÍNDRICO FRAISES QUEUE CYLINDRIQUE / STRAIGHT SHANK MILLS

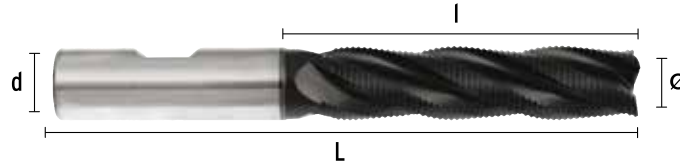
3160

HSSE-PM DIN 844 NRF



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	●				○			●	●			
55-85	40-50	35-40		30-35	25-30	55-60				80-140			15-40	30-40			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	l mm	€	Z	Icon
6,00	6	68	24	84,40	4	1
8,00	10	88	38	88,06	4	1
10,00	10	95	45	79,95	4	1
12,00	12	110	53	100,42	4	1

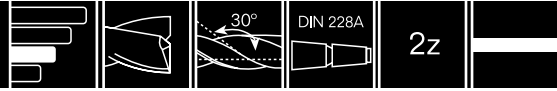
Ø mm	d mm	L mm	l mm	€	Z	Icon
14,00	12	110	53	114,69	4	1
16,00	16	123	63	141,49	4	1
18,00	16	123	63	159,42	4	1
20,00	20	141	75	204,40	4	1



FRESAS MANGO CÓNICO FRAISES QUEUE CONIQUE / TAPERED SHANK MILLS

3144

HSSE DIN 326 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24		○ 60-150	● 55-95	○ 60-100	○ 50-150					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

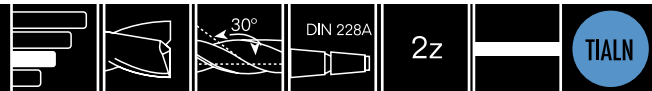


△	Ø mm	Z	€	L mm	l mm	📦
1	12,00	2	80,36	85	14	1
2	14,00	2	82,72	100	16	1
2	16,00	2	88,07	105	18	1
2	18,00	2	98,19	110	20	1
2	20,00	2	107,39	115	20	1
2	22,00	2	129,14	120	22	1
3	24,00	2	144,87	140	25	1

△	Ø mm	Z	€	L mm	l mm	📦
3	25,00	2	154,74	140	25	1
3	28,00	2	183,91	145	28	1
3	30,00	2	196,10	150	30	1
4	32,00	2	221,97	175	32	1
4	36,00	2	280,57	175	35	1
4	40,00	2	341,28	180	38	1

3144/1

HSSE DIN 326 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35	○ 90-200	○ 90-140	○ 90-130	○ 75-190					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	Ø mm	Z	€	L mm	l mm	📦
1	12,00	2	112,50	85	14	1
2	14,00	2	115,81	100	16	1
2	16,00	2	123,30	105	18	1
2	18,00	2	137,46	110	20	1
2	20,00	2	150,35	115	20	1
2	22,00	2	180,80	120	22	1
3	24,00	2	202,82	140	25	1

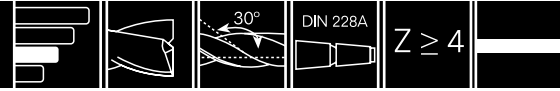
△	Ø mm	Z	€	L mm	l mm	📦
3	25,00	2	216,63	140	25	1
3	28,00	2	257,47	145	28	1
3	30,00	2	274,54	150	30	1
4	32,00	2	310,76	175	32	1
4	36,00	2	392,80	175	35	1
4	40,00	2	477,79	180	38	1

Bajo demanda / Sur commande / upon request

FRESAS MANGO CÓNICO FRAISES QUEUE CONIQUE / TAPERED SHANK MILLS

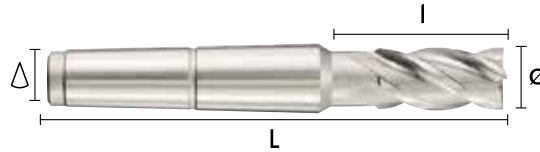
3145

HSSE DIN 845 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24		○ 60-150	● 55-95	○ 60-100	○ 50-150	○ 15-20	○ 15-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

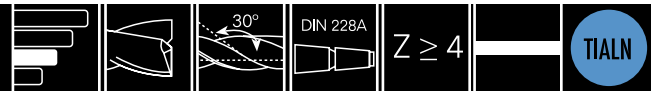


△	Ø mm	Z	€	L mm	I mm	📦
1	12,00	4	79,45	96	26	1
2	14,00	4	87,76	111	26	1
2	16,00	4	87,76	117	32	1
2	18,00	4	94,87	117	32	1
2	20,00	4	104,63	123	38	1
2	22,00	5	119,76	123	38	1
3	24,00	5	169,58	147	45	1
3	25,00	5	158,89	147	45	1

△	Ø mm	Z	€	L mm	I mm	📦
3	26,00	5	179,92	147	45	1
3	28,00	5	181,09	147	45	1
3	30,00	6	197,72	147	45	1
3	32,00	6	260,55	178	53	1
4	36,00	6	298,18	178	53	1
4	40,00	6	359,54	188	63	1
5	50,00	6	541,50	233	75	1

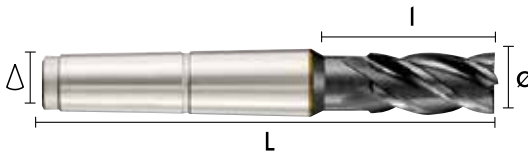
3145/1

HSSE DIN 845 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35	○ 90-200	● 90-140	○ 90-130	○ 75-190	● 25-35	○ 25-35			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	Ø mm	Z	€	L mm	I mm	📦
1	12,00	4	111,23	96	26	1
2	14,00	4	122,86	111	26	1
2	16,00	4	122,86	117	32	1
2	18,00	4	132,81	117	32	1
2	20,00	4	146,49	123	38	1
2	22,00	5	167,67	123	38	1
3	24,00	5	237,41	147	45	1
3	25,00	5	222,44	147	45	1

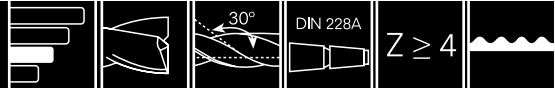
△	Ø mm	Z	€	L mm	I mm	📦
3	26,00	5	251,88	147	45	1
3	28,00	5	253,53	147	45	1
3	30,00	6	276,80	147	45	1
3	32,00	6	364,77	178	53	1
4	36,00	6	417,45	178	53	1
4	40,00	6	503,36	188	63	1
5	50,00	6	758,09	233	75	1

Bajo demanda / Sur commade / upon request



FRESAS MANGO CÓNICO FRAISES QUEUE CONIQUE / TAPERED SHANK MILLS

3146 HSSE DIN 845 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 35-55	○ 25-30			○ 15-20		○ 38-42	○ 20-24			● 55-95							

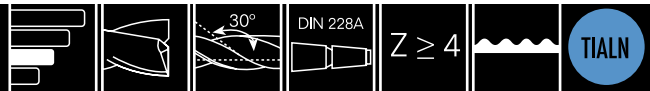
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	Ø mm	Z	€	L mm	I mm	📦
1	12,00	4	103,55	96	26	1
2	14,00	4	104,54	111	26	1
2	16,00	4	113,24	117	32	1
2	18,00	4	119,09	117	32	1
2	20,00	4	131,69	123	38	1
2	22,00	5	167,92	123	38	1
3	25,00	5	195,43	147	45	1

△	Ø mm	Z	€	L mm	I mm	📦
3	28,00	5	220,00	147	45	1
3	30,00	5	238,44	147	45	1
4	32,00	6	266,28	201	53	1
4	36,00	6	299,25	201	53	1
4	40,00	6	342,31	211	63	1
5	50,00	8	489,50	261	75	1

3146/1 HSSE DIN 845 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 55-80	● 45-55	○ 35-40		○ 25-35		● 55-60	● 30-35			● 90-140							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	Ø mm	Z	€	L mm	I mm	📦
1	12,00	4	144,97	96	26	1
2	14,00	4	146,35	111	26	1
2	16,00	4	158,54	117	32	1
2	18,00	4	166,73	117	32	1
2	20,00	4	184,37	123	38	1
2	22,00	5	235,08	123	38	1
3	25,00	5	273,60	147	45	1

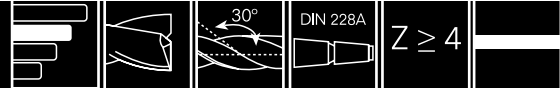
△	Ø mm	Z	€	L mm	I mm	📦
3	28,00	5	307,99	147	45	1
3	30,00	5	333,82	147	45	1
4	32,00	6	372,79	178	53	1
4	36,00	6	418,95	178	53	1
4	40,00	6	479,23	188	63	1
4	50,00	8	685,30	233	75	1

Bajo demanda / Sur commande / upon request

FRESAS MANGO CÓNICO FRAISES QUEUE CONIQUE / TAPERED SHANK MILLS

3147

HSSE DIN 845 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-50	○ 25-30			○ 15-20		○ 34-38	○ 20-24		○ 60-150	● 55-95	○ 60-100	○ 50-150	○ 15-20	○ 15-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

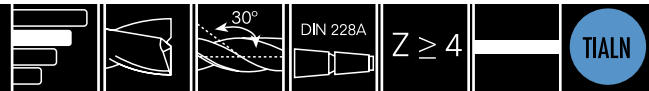


△	Ø mm	Z	€	L mm	l mm	📦
1	12,00	4	91,29	138	53	1
2	14,00	4	96,06	138	53	1
2	16,00	4	104,63	148	63	1
2	18,00	4	118,55	148	63	1
2	20,00	4	169,58	160	75	1
3	22,00	5	181,09	160	75	1
3	25,00	5	199,19	192	90	1

△	Ø mm	Z	€	L mm	l mm	📦
3	28,00	5	221,41	192	90	1
3	30,00	6	283,65	192	90	1
4	32,00	6	303,81	210	106	1
4	36,00	6	364,86	231	106	1
4	40,00	6	417,90	250	125	1
4	50,00	6	643,47	308	150	1

3147/1

HSSE DIN 845 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 48-80	● 40-45	○ 30-35		○ 25-35		● 55-60	● 30-40	○ 30-35	○ 90-200	○ 90-140	○ 90-130	○ 75-190	○ 25-35	○ 25-35			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



△	Ø mm	Z	€	L mm	l mm	📦
1	12,00	4	127,80	123	53	1
2	14,00	4	134,49	138	53	1
2	16,00	4	146,49	148	63	1
2	18,00	4	165,96	148	63	1
2	20,00	4	237,41	160	75	1
3	22,00	5	253,53	160	75	1
3	25,00	5	278,86	192	90	1

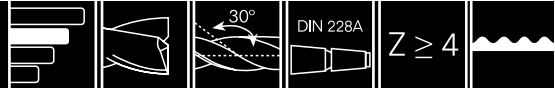
△	Ø mm	Z	€	L mm	l mm	📦
3	28,00	5	309,98	192	90	1
3	30,00	5	397,11	192	90	1
4	32,00	6	425,33	231	106	1
4	36,00	6	510,81	231	106	1
4	40,00	6	585,06	250	125	1
4	50,00	6	900,86	308	150	1

Bajo demanda / Sur commande / upon request

FRESAS MANGO CÓNICO FRAISES QUEUE CONIQUE / TAPERED SHANK MILLS

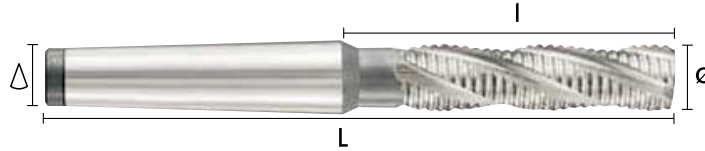
3148

HSSE DIN 845 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 35-55	○ 25-30			○ 15-20		○ 38-42	○ 20-24			● 55-95							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



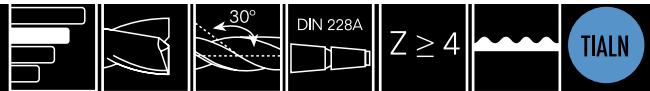
△	Ø mm	Z	€	L mm	I mm	📦
2	16,00*	4	151,74	148	63	1
2	18,00*	4	161,47	148	63	1
2	20,00	4	168,90	160	75	1
2	22,00	5	229,38	160	75	1
3	25,00	5	265,62	192	90	1
3	28,00	5	297,64	192	90	1

△	Ø mm	Z	€	L mm	I mm	📦
3	30,00	5	335,83	192	90	1
4	32,00	6	363,30	254	106	1
4	36,00	6	398,27	254	106	1
4	40,00	6	508,88	273	125	1
5	50,00	8	768,34	336	150	1

* Hasta fin de existencias / Jusqu'à epuisement des stocks / Until end of stock

3148/1

HSSE DIN 845 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 55-80	● 45-55	○ 35-40		○ 25-35		● 55-60	● 30-35			● 90-140							

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

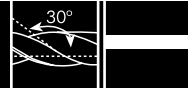


△	Ø mm	Z	€	L mm	I mm	📦
2	20,00	4	212,43	160	75	1
2	22,00	5	226,06	160	75	1
3	25,00	5	236,46	192	90	1
3	28,00	5	321,14	192	90	1
3	30,00	5	371,87	192	90	1

△	Ø mm	Z	€	L mm	I mm	📦
4	32,00	6	416,70	254	106	1
4	36,00	6	470,16	254	106	1
4	40,00	6	508,62	273	125	1
5	50,00	8	557,57	336	150	1

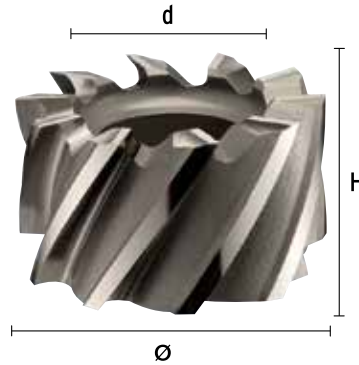
Bajo demanda / Sur commade / upon request

3149 HSSE DIN 1880 N



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●			●			●			●				●			
30-40	15-25			10-15			20-24			30-35				10-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	H mm	Icon
40,00	6	16	136,65	32	1
50,00	8	22	173,87	36	1

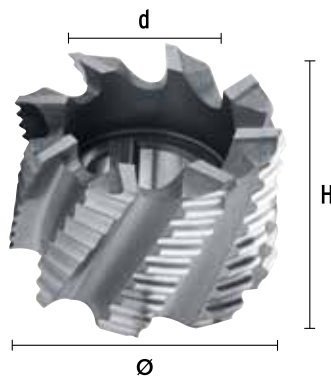
Ø mm	Z	d mm	€	H mm	Icon
63,00	8	27	236,28	40	1
80,00	10	27	346,69	45	1

3150 HSSE DIN 1880 NR



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●			●			●			●				●			
35-50	25-35			15-20			25-30			30-35				15-20			

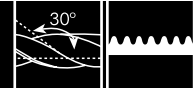
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	H mm	Icon
40,00	6	16	205,70	32	1
50,00	6	22	255,63	36	1

Ø mm	Z	d mm	€	H mm	Icon
63,00	8	27	324,31	40	1
80,00	8	27	450,95	45	1

3165 **HSSE DIN 1880 NRF**



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		●		○	●			●			●	●			
30-40	15-25	15-20		10-15		30-35	15-25			30-100			5-15	10-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	H mm	
40,00	8	16	250,40	32	1
50,00	8	22	311,17	36	1

Ø mm	Z	d mm	€	H mm	
63,00	10	27	402,43	40	1
80,00	10	27	604,60	45	1

3151 **HSSE DIN 885 B**

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●				●	●			●	●						
30-40	15-25	15-20				30-35	15-25			30-100	50-90						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	e mm	
63,00	18	22	154,53	4	1
63,00	18	22	145,90	5	1
63,00	18	22	138,39	6	1
63,00	18	22	147,61	8	1
63,00	18	22	155,67	10	1
80,00	20	27	137,75	4	1
80,00	20	27	174,12	5	1
80,00	20	27	177,65	6	1
80,00	20	27	182,21	8	1
80,00	20	27	199,52	10	1
80,00	20	27	219,11	12	1

Ø mm	Z	d mm	€	e mm	
100,00	24	32	212,19	6	1
100,00	24	32	232,94	8	1
100,00	24	32	257,17	10	1
100,00	24	32	284,85	12	1
100,00	24	32	329,83	14	1
125,00	24	32	332,13	6	1
125,00	24	32	342,50	8	1
125,00	24	32	359,80	10	1
125,00	24	32	418,60	12	1
125,00	24	32	443,99	14	1
125,00	24	32	387,72	16	1

3161 HSSE DIN 885 A

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●		●		●	●			●	●			●			
30-40	15-25	15-20		10-15		30-35	15-25			30-100	50-90			10-15			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	e mm	
63,00	18	22	118,22	4	1
63,00	18	22	121,83	5	1
63,00	18	22	126,98	6	1
63,00	18	22	136,67	8	1
63,00	18	22	152,58	10	1
80,00	20	27	147,00	4	1
80,00	20	27	153,23	5	1
80,00	20	27	161,72	6	1
80,00	20	27	171,64	8	1
80,00	18	27	175,97	10	1
80,00	18	27	198,19	12	1

Ø mm	Z	d mm	€	e mm	
100,00	20	32	191,91	6	1
100,00	20	32	213,16	8	1
100,00	20	32	247,12	10	1
100,00	20	32	266,46	12	1
100,00	20	32	297,27	14	1
125,00	24	32	226,64	6	1
125,00	24	32	269,86	8	1
125,00	24	32	295,77	10	1
125,00	24	32	352,77	12	1
125,00	24	32	397,51	14	1
125,00	24	32	412,09	16	1

3166 HSSE DIN 1834 A

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●				●	●		●	●	●						
30-40	15-25	15-20				30-35	15-25		60-260	30-100	50-90						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Z	d mm	€	e mm	
50,00	24	16	143,10	1,6	1
50,00	24	16	139,15	2	1
50,00	24	16	141,52	2,5	1
50,00	24	16	143,90	3	1
63,00	28	22	151,63	4	1
63,00	28	22	159,81	5	1
63,00	28	22	175,43	6	1
80,00	32	27	160,01	1,6	1
80,00	32	27	155,43	2	1
80,00	32	27	158,03	2,5	1
80,00	32	27	162,38	3	1
80,00	32	27	174,01	4	1
80,00	32	27	194,95	5	1
80,00	32	27	206,83	6	1
100,00	36	32	191,42	1,6	1
100,00	36	32	190,37	2	1

Ø mm	Z	d mm	€	e mm	
100,00	36	32	190,22	2,5	1
100,00	36	32	193,63	3	1
100,00	36	32	208,77	4	1
100,00	36	32	221,30	5	1
100,00	36	32	248,64	6	1
100,00	28	32	274,83	8	1
125,00	40	32	242,09	1,6	1
125,00	40	32	232,84	2	1
125,00	40	32	238,64	2,5	1
125,00	40	32	244,43	3	1
125,00	40	32	261,87	4	1
125,00	40	32	280,31	5	1
125,00	40	32	301,18	6	1
125,00	40	32	352,10	8	1
125,00	40	32	390,25	10	1



FRESAS ESPECIALES FRAISES SPÉCIALES / SPECIAL MILLS

3152 HSSE DIN 850 D

DIN 1835B



Tol
D (h11)
d (h8)
l (e8)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-04	● 15-25						○ 20-24		○ 60-150	● 55-95	○ 60-100						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	l mm	€	Z	
4,50	6	50	1,00	55,41	6	1
7,50	6	50	1,50	57,68	6	1
7,50	6	50	2,00	57,68	6	1
10,50	6	50	2,00	62,08	6	1
10,50	6	50	2,50	62,08	6	1
10,50	6	50	3,00	62,08	6	1
13,50	10	56	3,00	63,06	6	1
13,50	10	56	4,00	63,06	6	1
16,50	10	56	3,00	63,64	6	1
16,50	10	56	4,00	63,64	6	1
16,50	10	56	5,00	63,64	6	1
19,50	10	63	4,00	72,45	8	1
19,50	10	63	5,00	72,45	8	1

Ø mm	d mm	L mm	l mm	€	Z	
19,50	10	63	6,00	72,45	8	1
22,50	10	63	5,00	79,64	8	1
22,50	10	63	6,00	79,64	8	1
22,50	10	63	8,00	79,64	8	1
25,50	10	63	6,00	92,90	10	1
28,50	10	63	6,00	94,54	10	1
28,50	10	63	8,00	94,54	10	1
28,50	12	71	10,00	94,54	10	1
32,50	12	71	7,00	117,13	10	1
32,50	12	71	8,00	117,13	10	1
32,50	12	71	10,00	117,13	10	1
45,50	12	71	10,00	185,44	12	1

3153 HSSE DIN 851 N

DIN 1835B



ISO 3337

Tol
D (d11)
d (h8)
l (d11)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-04	● 15-25						○ 20-24		○ 60-150	● 55-95	○ 60-100						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	l mm	€	Z	
11,00	10	53,50	4	101,84	6	1
12,50	10	57	6	105,87	6	1
16,00	10	62	8	116,43	6	1
18,00	12	70	8	122,60	8	1

Ø mm	d mm	L mm	l mm	€	Z	
21,00	12	74	9	135,08	6	1
25,00	16	82	11	152,43	8	1
32,00	16	90	14	191,75	8	1
40,00	25	108	18	266,12	10	1

3154

HSSE DIN 851 N

DIN 228A



ISO
1641

ToI
D (d11)
I (d11)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●						○		○	●	○						
30-04	15-25						20-24		60-150	55-95	60-100						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∠	∅ mm	L mm	I mm	€	Z	📦
1	18,00	82	8	136,13	8	1
2	21,00	102	9	150,08	8	1
2	25,00	104	11	155,57	8	1
2	32,00	111	14	231,07	8	1

∠	∅ mm	L mm	I mm	€	Z	📦
3	40,00	138	18	304,52	8	1
4	50,00	173	22	369,80	8	1
4	60,00	188	28	534,29	10	1
5	72,00	229	35	695,97	10	1

3155

HSSE DIN 1833 A

DIN 1835B



ISO
3859

ToI
d (js16)
d (h8)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●						○		○	●	○						
30-04	15-25						20-24		60-150	55-95	60-100						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	Ang °	L mm	I mm	€	Z	📦
16,00	12	45	60	4,00	103,36	8	1
20,00	12	45	63	5,00	109,97	8	1
25,00	12	45	67	6,30	134,07	10	1
32,00	16	45	71	8,00	149,59	12	1

∅ mm	d mm	Ang °	L mm	I mm	€	Z	📦
16,00	12	60	60	6,30	103,36	8	1
20,00	12	60	63	8,00	109,97	8	1
25,00	12	60	67	10,00	134,07	10	1
32,00	16	60	71	12,50	149,59	12	1

P Aceros
Aciers
Steels

M Aceros Inox
Aciers Inox
Stainless Steels

K Fundicion
Fonte
Cast Iron

N Metales no ferrosos
Métal non Ferraux
Non Ferrous metals

S Titanio y Superaloaciones
Titanium et Supeallages
Titanium and Superalloys

H Materiales Duros
Materiels Durs
Hard materials



3156

HSSE DIN 1833 B

DIN 1835B

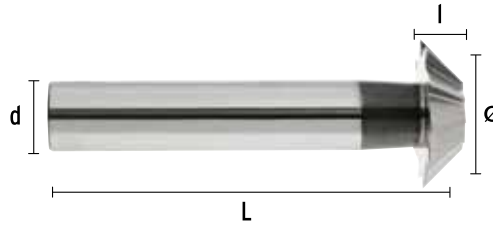


ISO
3859

Tol
D (js16)
d (h8)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-04	● 15-25						○ 20-24		○ 60-150	● 55-95	○ 60-100						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	Ang °	L mm	l mm	€	Z	
16,00	12	45	60	4,00	83,21	10	1
20,00	12	45	63	5,00	93,61	10	1
25,00	12	45	67	6,30	105,25	10	1
32,00	16	45	71	8,00	119,68	12	1

Ø mm	d mm	Ang °	L mm	l mm	€	Z	
16,00	12	60	60	6,30	83,21	10	1
20,00	12	60	63	8,00	93,61	10	1
25,00	12	60	67	10,00	105,25	10	1
32,00	16	60	71	12,50	119,68	12	1

3164

HSSE DIN 6518 N

DIN 1835B



Tol
R (H11)
dz (h6)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
● 30-04	● 15-25						○ 20-24										

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	Radio mm	d mm	L mm	€	Z	
8,00	1,00	10	60	70,17	4	1
9,20	1,60	10	60	76,61	4	1
10,00	2,00	10	60	76,61	4	1
11,00	2,50	10	60	76,61	4	1
12,00	3,00	12	60	79,65	4	1
14,00	4,00	12	60	86,19	4	1
16,00	5,00	12	60	92,40	4	1
20,00	6,00	16	67	97,40	4	1
22,00	7,00	16	71	119,61	4	1
24,00	8,00	16	71	119,61	4	1

Ø mm	Radio mm	d mm	L mm	€	Z	
26,00	9,00	25	85	143,99	4	1
28,00	10,00	25	85	143,99	4	1
32,00	11,00	25	90	159,00	4	1
34,00	12,00	25	90	159,00	4	1
42,00	13,00	25	100	222,64	6	1
44,00	14,00	25	100	222,64	6	1
46,00	15,00	25	100	254,61	6	1
48,00	16,00	25	100	254,61	6	1
52,00	18,00	32	112	287,25	6	1
56,00	20,00	32	112	319,05	6	1

3201 Cilíndrica / Cylindrique / Straight



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	● 400-800	● 300-700	● 300-700	○ 600-1000	○ 400-800	○ 500-800	○ 400-800	● 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	
3,00	3	12,36	13,59		38	13	1
4,00	4	20,60	22,66		50	13	1
6,00	6	24,18	26,60		50	19	1
8,00	6	30,36	33,40		65	19	1

Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	
10,00	6	33,94	37,34	37,53	65	19	1
12,00	6	48,63	53,49	52,84	70	25	1
16,00	6	61,19	67,31	76,58	70	25	1

3202 Cilíndrica con corte / Cylindrique taillée / Straight with cut



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	● 400-800	● 300-700	● 300-700	○ 600-1000	○ 400-800	○ 500-800	○ 400-800	● 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	
3,00	3	13,43	14,77		38	13	1
4,00	4	24,64	27,10		50	13	1
6,00	6	26,78	29,46		50	19	1
8,00	6	33,94	37,34		65	19	1

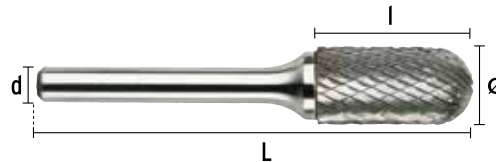
Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	
10,00	6	37,35	41,08	44,69	65	19	1
12,00	6	53,65	59,01	66,18	70	25	1
16,00	6	71,56	78,72	87,32	70	25	1

3203 Cilíndrica radio / Cylindrique à rayon / Straight radius



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	●	●	○		●	○	●	●			●	●		○	●			
DIAM	○	●	○	●	○	●	●	●	●		○		○	○	○	●	●	
ALU					●	○				●	○	○	●					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Icon
3,00	3	13,80	15,17		38	13	1
6,00	3	22,39	24,63		50	13	1
6,00	6	27,31	30,04		50	19	1
8,00	6	32,25	35,47		65	19	1

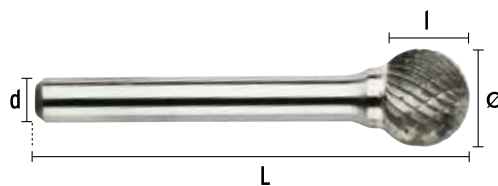
Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Icon
10,00	6	35,82	39,40	43,35	65	19	1
12,00	6	54,62	60,09	68,11	70	25	1
16,00	6	67,98	74,78	92,23	70	25	1

3204 Esférica / Sphérique / Spherical



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	●	●	○		●	○	●	●			●	●		○	●			
DIAM	○	●	○	●	○	●	●	●	●		○		○	○	○	●	●	
ALU					●	○				●	○	○	●					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Icon
3,00	3	14,07	15,48		38	2,50	1
6,00	3	21,19	23,31		44	5,00	1
6,00	6	25,00	27,50		50	5,00	1
8,00	6	27,76	30,54		51	6,40	1

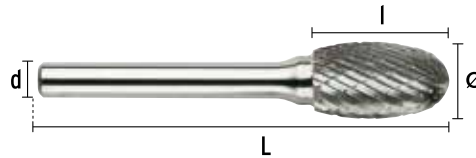
Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Icon
10,00	6	28,46	31,30	38,96	53	8,00	1
12,00	6	38,36	42,20	50,07	56	11,00	1
16,00	6	51,87	57,06	62,61	59	14,00	1
19,00	6	68,96	75,85		61	16,00	1

3205 **Oval / Ovale**



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	● 400-800	● 300-700	● 300-700	○ 600-1000	○ 400-800	○ 500-800	○ 400-800	● 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
3,00	3	15,22	16,75		38	6	1
6,00	3	21,95	29,40		47	10	1
8,00	6	30,36	33,40		58	13	1

Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
10,00	6	34,60	38,06		60	16	1
12,00	6	46,48	51,14		67	22	1
16,00	6	69,77	76,74		70	25	1

3206 **Árbol con radio / Arbre à rayon / Arc with radius**



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	● 400-800	● 300-700	● 300-700	○ 600-1000	○ 400-800	○ 500-800	○ 400-800	● 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
3,00	3	16,99	18,69		38	13	1
6,00	3	22,39	24,63		50	13	1
10,00	6	39,80	43,78	44,69	65	19	1

Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
12,00	6	52,83	58,11	64,22	70	25	1
16,00	6	69,24	76,16	89,48	70	25	1

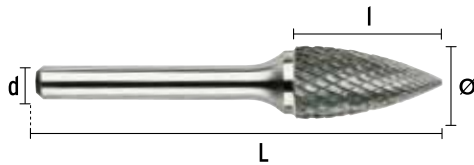


3207 **Árbol / Arbre / Arc**



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	●	●	○		●	○	●	●			●	○		○	●			
DIAM	○	●	●	●	○	●	●	●	●		○		○	●	●			
ALU										●	●	○	●					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Icon
3,00	3	16,04	17,64		38	13	1
6,00	3	23,21	25,53		50	13	1
6,00	6	28,57	31,43		50	16	1

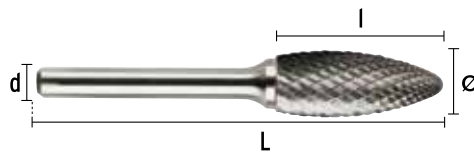
Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Icon
10,00	6	38,49	42,34		65	19	1
12,00	6	49,26	54,18		70	25	1
16,00	6	68,46	75,30		70	25	1

3208 **Llama / Flamme / Flame**



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	●	●	○		●	○	●	●			●	○		○	●			
DIAM	○	●	●	●	○	●	●	●	●		○		○	●	●			
ALU										●	●	○	●					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



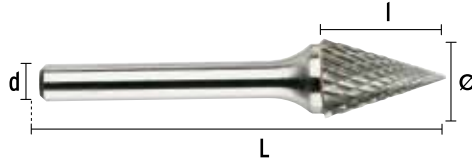
Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Icon
3,00	3	17,39	19,13		38	6	1
6,00	6	29,56	32,51		50	13	1

Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Icon
8,00	6	33,91	37,30		65	19	1
12,00	6	68,69	75,56		77	32	1

3209 Cónica / Conique / Tapered

	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	○ 400-800	● 300-700	● 300-700	○ 600-1000	○ 400-800	○ 500-800	○ 400-800	○ 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



∅ mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
3,00	3	15,57	17,13		38	11	1
6,00	6	25,22	27,74		50	19	1

∅ mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
10,00	6	33,91	37,30		61	16	1
12,00	6	47,81	52,59		67	25	1

3210 Cónica 90° / Conique 90° / Tapered 90°

	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	○ 400-800	● 300-700	● 300-700	○ 600-1000	○ 400-800	○ 500-800	○ 400-800	○ 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



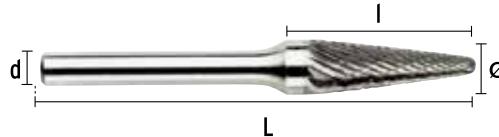
∅ mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
10,00	6	30,04	33,05		50	5	1
16,00	6	48,61	53,47		53	8	1

3211 Cónica radio / Conique à rayon / Tapered radius



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	●	●	○		●	○	●	●			●	●		○	●			
DIAM	○	●	●	●	○	●	●	●	●		○		○	●	●	●	●	
ALU										●	●	○	●					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
3,00	3	17,05	18,75		38	10	1
6,00	6	29,27	32,13		50	16	1
10,00	6	43,39	47,73	52,62	72	27	1

Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
12,00	6	51,37	56,51	62,17	73	28	1
16,00	6	81,65	89,81	124,96	78	33	1

3212 Cono invertido / Cône inversé / Inverted taper



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	●	●	○		●	○	●	●			●	●		○	●			
DIAM	○	●	●	●	○	●	●	●	●		○		○	●	●	●	●	
ALU										●	●	○	●					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



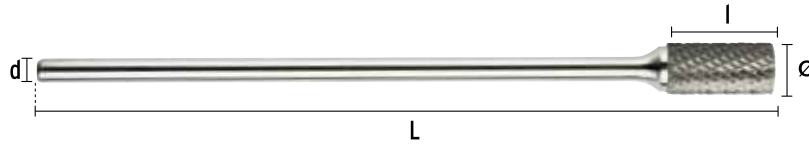
Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Icon
3,00	3	18,24	20,07		38	4	1
6,00	6	26,42	29,07		50	8	1

3214 Cilíndrica L / Cylindrique L / Straight L



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	● 400-800	● 300-700	● 300-700	○ 600-1000	● 400-800	● 500-800	● 400-800	● 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



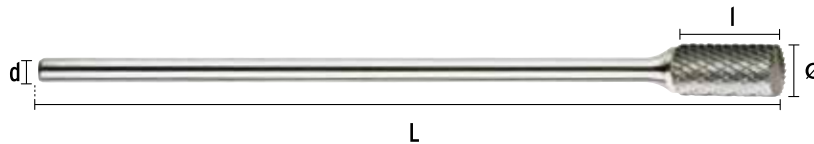
Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Box
10,00	6	43,39	47,73		169	19	1

3215 Cilíndrica con corte L / Cylindrique taillée L / Straight with L cut



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	● 400-800	● 300-700	● 300-700	○ 600-1000	● 400-800	● 500-800	● 400-800	● 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	CRUZ €	DIAM €	ALU €	L mm	l mm	Box
6,00	6	37,40	41,14		162	16	1

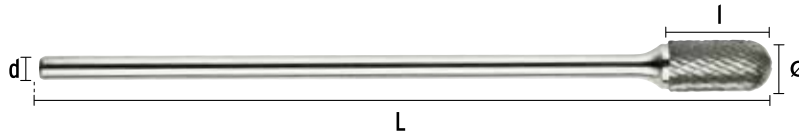


3216 Cilíndrica radio L / Cylindrique à rayon L / Straight L radius



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	●	●	○		●	○	●	●			●	○		○	●			
DIAM	○	●	●	●	○	○	●	●	●		○		○	●	●	●	●	
ALU									●	●	○	●						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



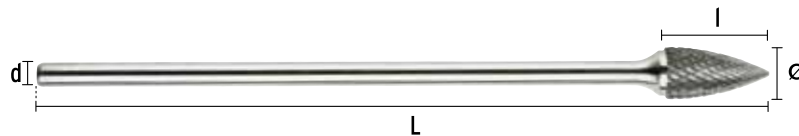
∅ mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Box
10,00	6	51,30	56,43		169	19	1
12,00	6	68,15	74,96		175	25	1

3217 Árbol L / Arbre L / L Arc



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	●	●	○		●	○	●	●			●	○		○	●			
DIAM	○	●	●	●	○	○	●	●	●		○		○	●	●	●	●	
ALU									●	●	○	●						

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



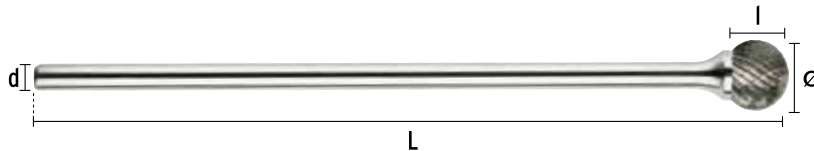
∅ mm	d mm	CRUZ €	DIAM €	ALU €	L mm	I mm	Box
12,00	6	67,73	74,50		175	25	1

3218 Esférica L / Sphérique L / L Spherical



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	● 400-800	● 300-700	● 300-700	○ 600-1000	● 400-800	● 500-800	● 400-800	● 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



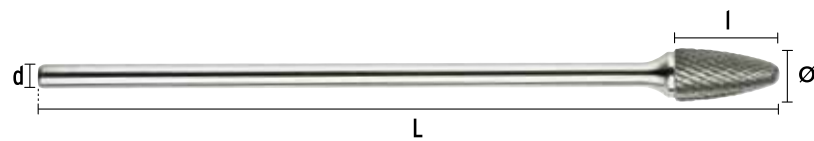
Ø	d	CRUZ	DIAM	ALU	L	l	
mm	mm	€	€	€	mm	mm	
12,00	6	53,48	58,82		161	11	1

3219 Árbol radio L / Arbre à rayon L / L Radius arc



	P				M		K			N				S		H		
	<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
CRUZ	● 400-800	● 400-800	○ 300-700		● 600-1000	○ 400-800	● 500-800	● 400-800			● 400-800	● 400-800		○ 400-800	● 600-1000			
DIAM	○ 400-800	● 400-800	● 300-700	● 300-700	○ 600-1000	● 400-800	● 500-800	● 400-800	● 300-700		○ 300-800		○ 300-700	● 300-800	● 300-1000	● 200-600	● 200-600	
ALU										● 300-1000	● 300-700	○ 400-1000	● 400-1000					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø	d	CRUZ	DIAM	ALU	L	l	
mm	mm	€	€	€	mm	mm	
12,00	6	74,49	74,13		175	25	1



FRESAS HUECAS MÁQUINAS ELECTROMAGNÉTICAS FRAISES A TROU ELECTROMAGNETIQUES / ELECTROMAGNETICS HOLE SAWS

7172 **HSS**

L=30



WELDON
19

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						○	○		●	○	○	○					
15-25						20-30	15-20		40-50	15-50	20-25	40-50					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	📦
12,00	19	30	33,08	1
13,00	19	30	33,08	1
14,00	19	30	33,93	1
15,00	19	30	35,31	1
16,00	19	30	36,55	1
17,00	19	30	37,94	1
18,00	19	30	42,66	1
19,00	19	30	43,51	1
20,00	19	30	45,29	1
21,00	19	30	48,50	1
22,00	19	30	50,60	1
23,00	19	30	52,37	1
24,00	19	30	54,34	1
25,00	19	30	56,18	1
26,00	19	30	57,75	1
27,00	19	30	62,28	1
28,00	19	30	62,35	1
29,00	19	30	64,64	1
30,00	19	30	66,29	1
31,00	19	30	72,32	1
32,00	19	30	81,38	1
33,00	19	30	82,49	1
34,00	19	30	96,14	1
35,00	19	30	105,99	1
36,00	19	30	108,61	1

Ø mm	d mm	L mm	€	📦
37,00	19	30	114,85	1
38,00	19	30	116,49	1
39,00	19	30	120,89	1
40,00	19	30	123,84	1
41,00	19	30	128,89	1
42,00	19	30	135,85	1
43,00	19	30	138,80	1
44,00	19	30	148,64	1
45,00	19	30	153,50	1
46,00	19	30	156,65	1
47,00	19	30	161,90	1
48,00	19	30	169,58	1
49,00	19	30	172,14	1
50,00	19	30	176,40	1
51,00	19	30	177,45	1
52,00	19	30	178,64	1
53,00	19	30	179,81	1
54,00	19	30	182,90	1
55,00	19	30	186,64	1
56,00	19	30	190,71	1
57,00	19	30	194,65	1
58,00	19	30	198,85	1
59,00	19	30	203,11	1
60,00	19	30	206,85	1

FRESAS HUECAS MÁQUINAS ELECTROMAGNÉTICAS FRAISES A TROU ELECTROMAGNETIQUES / ELECTROMAGNETICS HOLE SAWS

7172

HSS

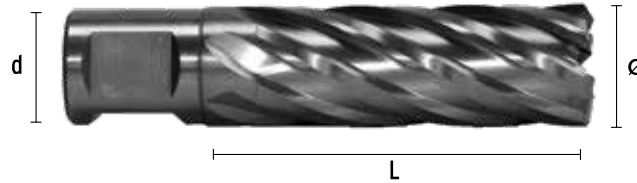
L=50



WELDON
19

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●						○	○		●	○	○	○					
15-25						20-30	15-20		40-50	15-50	20-25	40-50					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	📦
12,00	19	50	51,25	1
13,00	19	50	52,30	1
14,00	19	50	54,66	1
15,00	19	50	55,00	1
16,00	19	50	55,19	1
17,00	19	50	56,76	1
18,00	19	50	62,94	1
19,00	19	50	64,90	1
20,00	19	50	67,99	1
21,00	19	50	72,85	1
22,00	19	50	75,27	1
23,00	19	50	80,26	1
24,00	19	50	82,82	1
25,00	19	50	83,09	1
26,00	19	50	85,25	1
27,00	19	50	89,19	1
28,00	19	50	93,06	1
29,00	19	50	96,93	1
30,00	19	50	101,20	1
31,00	19	50	106,11	1
32,00	19	50	110,97	1
33,00	19	50	116,49	1
34,00	19	50	120,89	1
35,00	19	50	125,87	1
36,00	19	50	131,65	1

Ø mm	d mm	L mm	€	📦
37,00	19	50	133,75	1
38,00	19	50	138,80	1
39,00	19	50	148,64	1
40,00	19	50	159,54	1
41,00	19	50	161,24	1
42,00	19	50	170,10	1
43,00	19	50	175,29	1
44,00	19	50	180,08	1
45,00	19	50	207,77	1
46,00	19	50	223,00	1
47,00	19	50	237,96	1
48,00	19	50	245,64	1
49,00	19	50	248,06	1
50,00	19	50	249,31	1
51,00	19	50	249,84	1
52,00	19	50	251,09	1
53,00	19	50	252,53	1
54,00	19	50	257,25	1
55,00	19	50	260,80	1
56,00	19	50	262,37	1
57,00	19	50	268,54	1
58,00	19	50	269,91	1
59,00	19	50	274,45	1
60,00	19	50	277,07	1



FRESAS HUECAS MÁQUINAS ELECTROMAGNÉTICAS FRAISES A TROU ELECTROMAGNETIQUES / ELECTROMAGNETICS HOLE SAWS

7137 **HSSE**

L=30



WELDON
19

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		○		●	●		●	●	●	○					
25-45	20-25	15-20		15-20		30-35	25-30		50-60	25-60	30-35	50-60					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	📦
12,00	19	30	45,45	1
13,00	19	30	45,45	1
14,00	19	30	45,45	1
15,00	19	30	52,43	1
16,00	19	30	55,78	1
17,00	19	30	57,33	1
18,00	19	30	60,56	1
19,00	19	30	64,04	1
20,00	19	30	67,27	1
21,00	19	30	70,78	1
22,00	19	30	74,01	1
23,00	19	30	76,35	1
24,00	19	30	79,59	1
25,00	19	30	83,07	1
26,00	19	30	84,90	1
27,00	19	30	86,40	1
28,00	19	30	89,47	1
29,00	19	30	92,81	1
30,00	19	30	95,88	1
31,00	19	30	108,20	1
32,00	19	30	111,55	1
33,00	19	30	126,70	1
34,00	19	30	130,38	1
35,00	19	30	134,36	1
36,00	19	30	138,04	1

Ø mm	d mm	L mm	€	📦
37,00	19	30	142,04	1
38,00	19	30	145,72	1
39,00	19	30	149,71	1
40,00	19	30	153,39	1
41,00	19	30	157,38	1
42,00	19	30	161,06	1
43,00	19	30	165,05	1
44,00	19	30	168,72	1
45,00	19	30	172,71	1
46,00	19	30	176,40	1
47,00	19	30	180,38	1
48,00	19	30	184,07	1
49,00	19	30	188,06	1
50,00	19	30	191,74	1
55,00	19	30	211,06	1
60,00	19	30	230,08	1

FRESAS HUECAS MÁQUINAS ELECTROMAGNÉTICAS FRAISES A TROU ELECTROMAGNETIQUES / ELECTROMAGNETICS HOLE SAWS

7137

HSSE

L=50



WELDON
19

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		○		●	●		●	●	●	○					
25-45	20-25	15-20		15-20		30-35	25-30		50-60	25-60	30-35	50-60					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	☐
12,00	19	50	55,22	1
13,00	19	50	59,82	1
14,00	19	50	64,42	1
15,00	19	50	69,03	1
16,00	19	50	73,63	1
17,00	19	50	78,24	1
18,00	19	50	82,83	1
19,00	19	50	87,44	1
20,00	19	50	92,03	1
21,00	19	50	96,63	1
22,00	19	50	101,23	1
23,00	19	50	105,84	1
24,00	19	50	110,44	1
25,00	19	50	115,05	1
26,00	19	50	119,65	1
27,00	19	50	124,26	1
28,00	19	50	128,85	1
29,00	19	50	133,44	1
30,00	19	50	138,04	1
31,00	19	50	142,65	1
32,00	19	50	147,25	1
33,00	19	50	151,86	1
34,00	19	50	156,46	1
35,00	19	50	161,06	1
36,00	19	50	165,66	1

Ø mm	d mm	L mm	€	☐
37,00	19	50	170,26	1
38,00	19	50	174,86	1
39,00	19	50	179,47	1
40,00	19	50	184,07	1
41,00	19	50	188,67	1
42,00	19	50	193,27	1
43,00	19	50	197,87	1
44,00	19	50	202,47	1
45,00	19	50	207,07	1
46,00	19	50	211,67	1
47,00	19	50	216,28	1
48,00	19	50	220,88	1
49,00	19	50	225,49	1
50,00	19	50	230,08	1
51,00	19	50	234,69	1
52,00	19	50	239,28	1
53,00	19	50	243,88	1
54,00	19	50	248,48	1
55,00	19	50	253,09	1
56,00	19	50	257,69	1
57,00	19	50	262,30	1
58,00	19	50	266,89	1
59,00	19	50	271,50	1
60,00	19	50	276,10	1



FRESAS HUECAS MÁQUINAS ELECTROMAGNÉTICAS FRAISES A TROU ELECTROMAGNETIQUES / ELECTROMAGNETICS HOLE SAWS

7137 **HSSE**

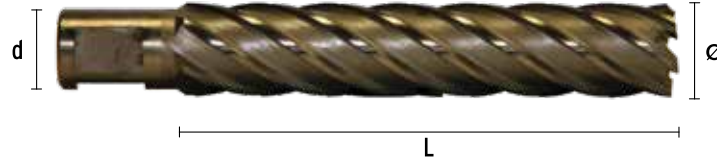
L=110



WELDON
19

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		○		●	●		●	●	●	○					
25-45	20-25	15-20		15-20		30-35	25-30		50-60	25-60	30-35	50-60					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	📦
20,00	19	110	146,09	1
22,00	19	110	152,34	1
24,00	19	110	160,84	1
25,00	19	110	166,94	1
26,00	19	110	181,76	1
28,00	19	110	196,33	1

Ø mm	d mm	L mm	€	📦
30,00	19	110	208,66	1
32,00	19	110	224,87	1
35,00	19	110	239,03	1
40,00	19	110	322,11	1
45,00	19	110	405,18	1
50,00	19	110	474,05	1

7138 **HSSE**

L=30



WELDON
19

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		○		●	●	○	●	●	●	○	○	●			
40-55	30-40	20-25	15-20	20-25	15-20	45-55	40-50	15-20	60-70	20-70	45-55	60-70	10-15	15-25			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	📦
12,00	19	30	83,39	1
13,00	19	30	83,39	1
14,00	19	30	83,39	1
15,00	19	30	86,87	1
16,00	19	30	86,87	1
17,00	19	30	93,61	1
18,00	19	30	97,08	1
19,00	19	30	99,04	1
20,00	19	30	102,95	1
21,00	19	30	110,32	1
22,00	19	30	115,10	1
23,00	19	30	119,24	1
24,00	19	30	123,57	1
25,00	19	30	128,35	1
26,00	19	30	133,14	1
27,00	19	30	137,71	1
28,00	19	30	142,04	1
29,00	19	30	146,60	1
30,00	19	30	150,74	1
31,00	19	30	164,63	1

Ø mm	d mm	L mm	€	📦
32,00	19	30	176,37	1
33,00	19	30	187,66	1
34,00	19	30	199,15	1
35,00	19	30	205,89	1
36,00	19	30	216,75	1
37,00	19	30	234,56	1
38,00	19	30	245,42	1
39,00	19	30	256,27	1
40,00	19	30	264,97	1

FRESAS HUECAS MÁQUINAS ELECTROMAGNÉTICAS FRAISES A TROU ELECTROMAGNETIQUES / ELECTROMAGNETICS HOLE SAWS

7138

HSSE

L=50



WELDON
19

TIALN

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	○	●	○	●	●	○	●	●	●	○	○	●			
40-55	30-40	20-25	15-20	20-25	15-20	45-55	40-50	15-20	60-70	20-70	45-55	60-70	10-15	15-25			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	Icon
12,00	19	50	111,41	1
13,00	19	50	111,41	1
14,00	19	50	111,41	1
15,00	19	50	120,98	1
16,00	19	50	129,44	1
17,00	19	50	134,23	1
18,00	19	50	144,21	1
19,00	19	50	147,90	1
20,00	19	50	155,51	1
21,00	19	50	167,01	1
22,00	19	50	172,44	1
23,00	19	50	178,31	1
24,00	19	50	183,96	1
25,00	19	50	189,83	1
26,00	19	50	195,24	1
27,00	19	50	204,15	1
28,00	19	50	213,05	1
29,00	19	50	223,70	1
30,00	19	50	232,39	1
31,00	19	50	243,24	1

Ø mm	d mm	L mm	€	Icon
32,00	19	50	247,59	1
33,00	19	50	258,45	1
34,00	19	50	267,15	1
35,00	19	50	278,01	1
36,00	19	50	286,68	1
37,00	19	50	299,72	1
38,00	19	50	308,41	1
39,00	19	50	317,10	1
40,00	19	50	334,47	1
45,00	19	50	397,47	1
50,00	19	50	503,86	1



FRESAS HUECAS MÁQUINAS ELECTROMAGNÉTICAS FRAISES A TROU ELECTROMAGNETIQUES / ELECTROMAGNETICS HOLE SAWS

7139

TCT

L=35



WELDON
19

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	○	●	●	●	○	●	○	○	●	●	●	○	
40-65	30-40	20-25	15-20	20-30	15-20	50-60	45-55	15-20	70-90	40-90	50-60	70-90	15-20	15-30	20-25	15-20	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	
18,00	19	35	168,28	1
19,00	19	35	168,28	1
20,00	19	35	168,28	1
21,00	19	35	168,28	1
22,00	19	35	171,28	1
23,00	19	35	171,28	1
24,00	19	35	172,75	1
25,00	19	35	172,75	1
26,00	19	35	174,55	1

Ø mm	d mm	L mm	€	
27,00	19	35	174,55	1
28,00	19	35	174,55	1
29,00	19	35	174,55	1
30,00	19	35	179,01	1
31,00	19	35	179,01	1
32,00	19	35	179,01	1
33,00	19	35	179,01	1
34,00	19	35	179,01	1
35,00	19	35	193,01	1

7139

TCT

L=50



WELDON
19

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	○	●	●	●	○	●	○	○	●	●	●	○	
40-65	30-40	20-25	15-20	20-30	15-20	50-60	45-55	15-20	70-90	40-90	50-60	70-90	15-20	15-30	20-25	15-20	

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ø mm	d mm	L mm	€	
18,00	19	50	180,51	1
19,00	19	50	180,51	1
20,00	19	50	180,51	1
21,00	19	50	180,51	1
22,00	19	50	183,77	1
23,00	19	50	183,77	1
24,00	19	50	185,26	1
25,00	19	50	185,26	1
26,00	19	50	186,76	1
27,00	19	50	186,76	1
28,00	19	50	186,76	1
29,00	19	50	186,76	1
30,00	19	50	191,52	1
31,00	19	50	191,52	1
32,00	19	50	191,52	1
33,00	19	50	191,52	1
34,00	19	50	191,52	1

Ø mm	d mm	L mm	€	
35,00	19	50	205,22	1
36,00	19	50	205,22	1
37,00	19	50	205,22	1
38,00	19	50	205,22	1
39,00	19	50	205,22	1
40,00	19	50	231,74	1
41,00	19	50	231,74	1
42,00	19	50	231,74	1
43,00	19	50	231,74	1
44,00	19	50	231,74	1
45,00	19	50	231,74	1
46,00	19	50	306,79	1
47,00	19	50	306,79	1
48,00	19	50	306,79	1
49,00	19	50	306,79	1
50,00	19	50	306,79	1

Accesorios / Accessoires / Accessories

7140 Cono Morse / Cône Morse / Morse taper



Δ	€	L mm
Nº 2	320,89	180
Nº 3	320,89	185

7141 Punzón / Poinçon / Puncher



Ref.	€	∅ mm	L mm	L Fresa L Fraise Cutting L
7137-7138- 7172	19,19	6,35	77	30
	19,19	6,35	87	35
	19,19	6,35	102	50
	24,22	8,00	160	110
7139	19,19	8,00	87	35
	19,19	8,00	102	50

7158 Adaptador para Taladros Fein / Adaptateur pour perceuses Fein / Adaptor for Fein drills



€	105,92
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3138 **Ø 4 a 12 mm**

Ø
mm
4-5-6
8-10-12

2z



REF	€
HSS E	128,54
HSS E TIALN	179,96

3139 **Ø 4 a 12 mm**

Ø
mm
6-8
10-12

3z



REF	€
HSS E	156,03
HSS E TIALN	218,44

3140 **Ø 4 a 12 mm**

Ø
mm
4-5-6
8-10-12

4z



REF	€
HSS E	135,75
HSS E TIALN	190,06

3220 **10 PCS**



Ref.	Ø mm	d mm	L mm	l mm
3201	10,00	6	65	19
3201	12,00	6	70	25
3203	10,00	6	65	19
3203	12,00	6	70	25
3204	10,00	6	53	9
3205	10,00	6	60	16
3206	12,00	6	70	25
3207	10,00	6	65	19
3207	12,00	6	70	25
3211	12,00	6	75	30
			€	429,57

3221 **5 PCS**



Ref.	Ø mm	d mm	L mm	l mm
3201	12,00	6	70	25
3203	12,00	6	70	25
3207	12,00	6	70	25
3211	12,00	6	75	30
3206	12,00	6	75	30
			€	258,26



7168 > 7 PCS

L = 25



Ref.	Ø mm	d mm	L mm	Pcs.
7137	12	19	25	1
7137	14	19	25	1
7137	16	19	25	1
7137	18	19	25	1
7137	20	19	25	1
7137	22	19	25	1
7141	6,35		77	1
			€	415,96

7169 > 7 PCS

L = 50











Ref.	Ø mm	d mm	L mm	Pcs.
7137	12	19	50	1
7137	14	19	50	1
7137	16	19	50	1
7137	18	19	50	1
7137	20	19	50	1
7137	22	19	50	1
7141	6,35		102	1
			€	536,79



Sierras >
Scies
Saws

Херус

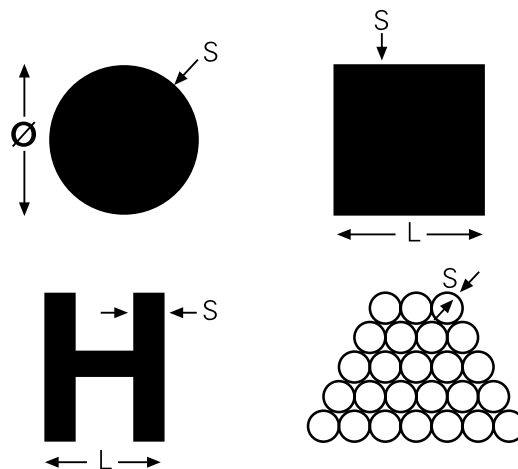
Hojas sierra cinta / Lames de scie à ruban / Band saw blades					
7202-7213	M42- CONSTANTE		68-69 HRC M42 (8% CO) CR CP	P M K N	424
7301-7314	M42- VARIABLE		68-69 HRC M42 (8% CO) VR VP	P M K N	425
7321-7324	M51- VARIABLE		68-69 HRC M51 (10% CO) VP 	P M K N	426
Sierras Circulares / Scies Circulaires / Circular Saw					
7801	HSS DIN1837 N		ISO 2296 Form. A Tot. Ø (q15) d (H7) Tot. I (q11) D1 (q18)	P K N	427
7802	HSS DIN1838 N		ISO 2296 Form. B Tot. Ø (q15) d (H7) Tot. I (q11) D1 (q18)	P K N	428
Hojas sierra de máquina / Lames de scie pour machine / Machine saw blades					
7401	HSS DC		M2 DC 	P M K	429

Dentado y amarre del material / Denture et fixation du matériel / Tothing and securing of material

> Selección del correcto dentado para el corte de tubos y perfiles.

Choix de la denture appropriée pour la coupe de tubes et de profilés.

Select correct tothing to cut tubes and beams.

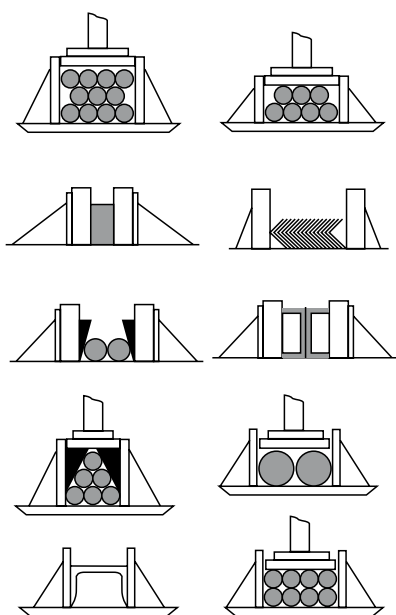


S mm	ØL mm																					
	20	40	60	80	100	120	150	200	300	400	500											
2				14					10/14													
3	14	14	14	10/14	10/14	10/14	10/14	10/14	10/14	10/14	8/12	8/12										
4																						
5																						
6	10/14	10/14	10/14	10/14	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6/10										
7																						
8		8/12	8/12	6/10	6/10	6/10	5/8	5/8	4/6	4/6	4/6	4/6										
10		6/10	6/10	6/10	5/8	5/8	5/8	4/6	4/6	4/6	4/6	4/6										
12																						
15																						
20			5/8	4/6	4/6	4/6	4/6	3/4	3/4	3/4	3/4	3/4										
30				4/6	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4										
50							2/3	2/3	2/3	2/3	2/3	2/3										

> Selección correcta de amarre de material.

Choix du type de fixation du matériel approprié.

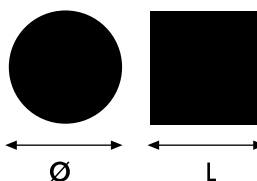
Correct selection to secure material.



> Para el corte de secciones macizas.

Pour la coupe de sections massives.

For cutting solid sections.



Ø L (mm)	tpi
< 20	10/14 ó 8/12
20 - 40	6/10 ó 6
40 - 70	6 ó 4/6
70 - 140	4 ó 3/4
140 - 200	3/4 ó 3
200 - 400	3 ó 2/3
> 400	1/2 ó 1,25



TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



							7202-7213				
Ref./ Réf. / Ref.							Constante/ Constant				
Diente/ Dent/ Teech							M42				
Mat.							M42				
Pag.							424	424	424	424	424
Z	10/14	8/12-6/10	5/8-4/6	4/6-3/4	3/4-2/3	3/4-2/3	10/14	8/12-6/10	5/8-4/6	4/6-3/4	3/4-2/3
Ø/L	0-13mm	13-25mm	25-75mm	75-150mm	>150mm	>150mm	0-13mm	13-25mm	25-75mm	75-150mm	>150mm
Mat.	Avance/Feed (cm2/min)						Vc (m/min)				
P.1	<600	55-75	60-80	70-90	77-100	77-100	100-120	95-115	90-110	80-100	70-90
P.2	<800	42-52	45-55	50-65	55-70	55-70	75-100	70-95	65-90	60-80	55-70
P.3	<1000	30-39	32-42	35-45	40-52	40-52	55-75	50-70	45-65	40-60	35-55
P.4	<1200	9-17	10-17	10-20	12-22	12-22	32-50	30-47	28-45	25-40	22-35
P.5	<1400	5-13	5-14	5-15	6-17	6-17					
M.1	<950	14-28	15-30	17-35	19-38	19-38	27-50	25-47	22-45	20-40	18-35
M.2		14-28	15-30	17-35	19-38	19-38	27-50	25-47	22-45	20-40	18-35
M.3	<1200	5-14	5-15	5-17	6-19	6-19					
M.4		5-14	5-15	5-17	6-19	6-19					
K.1	<500	26-33	28-36	30-40	35-45	35-45	60-85	57-82	55-80	50-70	45-60
K.2		26-33	28-36	30-40	35-45	35-45	60-85	57-82	55-80	50-70	45-60
K.3	<800	30-37	32-43	35-45	40-50	40-50	50-80	47-70	45-65	40-60	35-55
K.4.1		30-37	32-43	35-45	40-50	40-50	50-80	47-70	45-65	40-60	35-55
K.4.2	<1400	11-18	12-20	13-22	15-25	15-25					
N.1.1	Al	90-110	95-120	110-135	120-150	120-150	175-230	170-225	165-220	150-200	135-180
N.1.2		90-110	95-120	110-135	120-150	120-150	120-175	115-170	110-165	100-150	90-135
N.1.3		52-90	55-95	75-110	70-120	70-120	100-120	95-115	90-110	80-100	70-90
N.2.1	Cu	90-105	95-112	110-125	120-140	120-140	120-145	115-140	110-135	100-120	90-115
N.2.2		75-83	80-88	90-100	100-110	100-110	100-120	95-115	90-110	80-100	70-90
N.2.3		50-60	52-65	60-70	65-80	65-80	75-100	70-95	65-90	60-80	55-70
N.2.4		15-26	16-28	18-30	20-35	20-35	40-60	37-57	35-55	30-50	25-45
N.3.1	Mg/Zn	42-52	45-55	50-60	55-70	55-70	75-105	70-100	65-95	60-90	55-80
N.4.1	Plastic	90-110	95-120	110-135	120-150	120-150	120-175	115-170	110-165	100-150	90-135
N.4.2		52-90	55-95	75-110	70-120	70-120	100-120	95-115	90-110	80-100	70-90
N.4.3											
S.1.1	Ni	4-15	5-16	5-18	6-20	6-20					
S.1.2		4-7	5-8	5-9	6-10	6-10					
S.2.1	Ti	4-7	5-8	5-9	6-10	6-10					
S.2.2		4-7	5-8	5-9	6-10	6-10					
S.2.3		4-7	5-8	5-9	6-10	6-10					
H.1	50 HRC										
H.2	55 HRC										
H.3	60 HRC										

● Optima / Optimun ○ Alternativo / Alternative

TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

7301-7314					7321-7324				
Variable					Variable				
M42					M51				
425	425	425	425	425	426	426	426	426	426
10/14	8/12-6/10	5/8-4/6	4/6-3/4	3/4-2/3	10/14	8/12-6/10	5/8-4/6	4/6-3/4	3/4-2/3
0-13mm	13-25mm	25-75mm	75-150mm	150->mm	0-13mm	13-25mm	25-75mm	75-150mm	>150mm
Vc (m/min)									
● 100-120	● 95-115	● 90-110	● 80-100	● 70-90	○ 100-120	○ 95-115	○ 90-110	○ 80-100	○ 70-90
● 75-100	● 70-95	● 65-90	● 60-80	● 55-70	○ 75-100	○ 70-95	○ 65-90	○ 60-80	○ 55-70
● 55-75	● 50-70	● 45-65	● 40-60	● 35-55	● 55-75	● 50-70	● 45-65	● 40-60	● 35-55
○ 32-50	○ 30-47	○ 28-45	○ 25-40	○ 22-35	○ 32-50	○ 30-47	○ 28-45	○ 25-40	○ 22-35
					● 20-32	● 18-30	● 17-28	● 15-25	● 13-22
● 27-50	● 25-47	● 22-45	● 20-40	● 18-35	● 27-50	● 25-47	● 22-45	● 20-40	● 18-35
● 27-50	● 25-47	● 22-45	● 20-40	● 18-35	● 27-50	● 25-47	● 22-45	● 20-40	● 18-35
○ 18-30	○ 18-30	○ 17-28	○ 15-25	○ 13-22	○ 18-30	○ 18-30	○ 17-28	○ 15-25	○ 13-22
○ 18-30	○ 18-30	○ 17-28	○ 15-25	○ 13-22	○ 18-30	○ 18-30	○ 17-28	○ 15-25	○ 13-22
○ 60-85	○ 57-82	○ 55-80	○ 50-70	○ 45-60	○ 60-85	○ 57-82	○ 55-80	○ 50-70	○ 45-60
○ 60-85	○ 57-82	○ 55-80	○ 50-70	○ 45-60	○ 60-85	○ 57-82	○ 55-80	○ 50-70	○ 45-60
○ 50-80	○ 47-70	○ 45-65	○ 40-60	○ 35-55	○ 50-80	○ 47-70	○ 45-65	○ 40-60	○ 35-55
○ 50-80	○ 47-70	○ 45-65	○ 40-60	○ 35-55	○ 50-80	○ 47-70	○ 45-65	○ 40-60	○ 35-55
					○ 32-50	○ 30-47	○ 28-45	○ 25-40	○ 22-35
○ 175-230	○ 170-225	○ 165-220	○ 150-200	○ 135-180	○ 175-230	○ 170-225	○ 165-220	○ 150-200	○ 135-180
○ 120-175	○ 115-170	○ 110-165	○ 100-150	○ 90-135	○ 120-175	○ 115-170	○ 110-165	○ 100-150	○ 90-135
○ 100-120	○ 95-115	○ 90-110	○ 80-100	○ 70-90	○ 100-120	○ 95-115	○ 90-110	○ 80-100	○ 70-90
○ 120-145	○ 115-140	○ 110-135	○ 100-120	○ 90-115	○ 120-145	○ 115-140	○ 110-135	○ 100-120	○ 90-115
○ 100-120	○ 95-115	○ 90-110	○ 80-100	○ 70-90	○ 100-120	○ 95-115	○ 90-110	○ 80-100	○ 70-90
● 75-100	● 70-95	● 65-90	● 60-80	● 55-70	○ 75-100	○ 70-95	○ 65-90	○ 60-80	○ 55-70
● 40-60	● 37-57	● 35-55	● 30-50	● 25-45	○ 40-60	○ 37-57	○ 35-55	○ 30-50	○ 25-45
○ 75-105	○ 70-100	○ 65-95	○ 60-90	○ 55-80	○ 75-105	○ 70-100	○ 65-95	○ 60-90	○ 55-80
○ 120-175	○ 115-170	○ 110-165	○ 100-150	○ 90-135	○ 120-175	○ 115-170	○ 110-165	○ 100-150	○ 90-135
○ 100-120	○ 95-115	○ 90-110	○ 80-100	○ 70-90	○ 100-120	○ 95-115	○ 90-110	○ 80-100	○ 70-90
					● 25-30	● 25-30	● 22-28	● 20-25	● 18-22
					● 18-25	● 18-25	● 17-22	● 15-20	● 13-18
					● 25-47	● 25-47	● 22-45	● 20-40	● 18-35
					● 25-30	● 25-30	● 22-28	● 20-25	● 18-22
					● 18-25	● 18-25	● 17-22	● 15-20	● 13-18

● Optima / Optimun ○ Alternativo / Alternative



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TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



Ref./ Réf. / Ref.	7801	7802
Z	32-200	24-100
Ejec./Exéc./Exec.	N	N
Hel./Hel./Spiral		
Mat.	HSS	HSS
Rec./Rev./Coat.		
DIN	1837-A	1838-B
Gama/Gamme/Range	20-315	50-315
Pag.	427	428

Mat.		fz mm	Vc (m/min)	
P.1	<600	0,03-0,06	● 25-50	● 25-50
P.2	<800	0,03-0,04	● 15-30	● 15-30
P.3	<1000	0,02-0,03	● 10-20	● 10-20
P.4	<1200	0,01-0,03	○ 5-10	○ 5-10
P.5	<1400			
M.1	<950	0,01-0,03	○ 10-20	○ 10-20
M.2		0,01-0,03	○ 10-20	○ 10-20
M.3	<1200	0,01-0,03	○ 5-10	○ 5-10
M.4		0,01-0,03	○ 5-10	○ 5-10
K.1	<500	0,04-0,05	● 15-30	● 15-30
K.2		0,04-0,05	● 15-30	● 15-30
K.3	<800	0,03-0,04	○ 10-20	○ 10-20
K.4.1		0,03-0,04	○ 10-20	○ 10-20
K.4.2	<1400			
N.1.1	Al	0,04-0,09	● 1000-2000	● 1000-2000
N.1.2		0,03-0,06	● 500-1000	● 500-1000
N.1.3		0,03-0,04	● 120-200	● 120-200
N.2.1	Cu	0,04-0,06	● 100-400	● 100-400
N.2.2		0,04-0,06	● 100-400	● 100-400
N.2.3		0,04-0,06	● 40-120	● 40-120
N.2.4		0,01-0,03	○ 10-20	○ 10-20
N.3.1	Mg/Zn	0,04-0,06	○ 40-120	○ 40-120
N.4.1	Plastic	0,04-0,09	○ 500-1000	○ 500-1000
N.4.2		0,04-0,09	○ 500-1000	○ 500-1000
N.4.3				
S.1.1	Ni	0,03-0,04	○ 20-30	○ 20-30
S.1.2				
S.2.1	Ti	0,01-0,03	○ 10-20	○ 10-20
S.2.2		0,03-0,04	○ 10-20	○ 10-20
S.2.3				
H.1	50 HRC			
H.2	55 HRC			
H.3	60 HRC			

● Optima / Optimun ○ Alternativo / Alternative



Aceros
Aciers
Steels



Aceros Inox
Aciers Inox
Stainless Steels



Fundicion
Fonte
Cast Iron



Metales no ferrosos
Métal non Ferraux
Non Ferrous metals



Titanio y Superalaciones
Titanium et Supeallages
Titanium and Superalloys



Materiales Duros
Materiels Durs
Hard materials

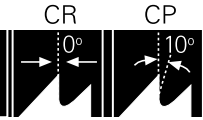


7202-7213

M42 Dentado constante
M42 Denture constant / M42 Constant tooth

68-69
HRC

M42
(8% CO)



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
○	○	○		○		○	○		●	●	●	●					
55-120	35-75	22-50		18-50		45-85	35-80		70-230	25-45	55-105	70-175					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ref.	A mm	e mm	t.p.i.								€ m	€ soldadura soudure welding		
			1,25	2	3	4	6	8	10	14			18	
*7202	6,00	0,90				CP	CP			CR	CR		17,68	10,05
*7204	10,00	0,90				CP	CP			CR	CR		17,68	10,05
7205	13,00	0,65						CP		CR	CR	CR	16,24	10,05
7206	13,00	0,90			CP	CP	CP			CR	CR		16,24	10,05
7207	20,00	0,90			CP	CP	CR	CR		CR	CR		18,57	10,05
7208	27,00	0,90		CP	CP	CP-CR	CR	CR		CR	CR		19,11	10,05
7209	34,00	1,10	CP	CP	CP	CR							26,55	13,22
7210	41,00	1,30	CP	CP	CP								33,21	16,70
7212	54,00	1,60	CP										48,65	28,12
7213	67,00	1,60	CP										82,87	51,86

* Se vende sólo en rollos de 30 m.
Vendu uniquement en rouleaux de 30 m.
Only sold in 30 m rolls.

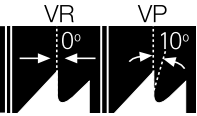
A x e mm	L	€	📦	A x e mm	L	€	📦	A x e mm	L	€	📦
13x0,65	1.138	28,53	3	27x0,90	2.550	57,41	1	34x1,10	4.870	103,09	1
	1.140	28,56	3		2.000	48,26	1		5.000	105,58	1
	1.300	31,15	3		2.060	49,40	1		3.180	97,68	1
	1.325	31,56	3		2.070	49,59	1		3.420	104,06	1
	1.330	31,65	3		2.080	49,78	1		3.505	106,31	1
	1.440	33,43	3		2.150	51,12	1		3.660	110,43	1
	1.470	33,92	3		2.352	54,98	1		3.720	112,02	1
	1.638	36,65	3		2.360	55,14	1		3.800	114,15	1
	1.640	36,68	3		2.370	55,32	1		4.100	122,12	1
	1.735	38,22	3		2.420	56,28	1		4.115	122,51	1
13x0,90	1.750	38,46	3	2.450	56,86	1	4.520	133,27	1		
	2.000	42,53	3	2.460	57,05	1	4.570	134,60	1		
	1.140	28,56	3	2.480	57,42	1	4.640	136,46	1		
	1.325	31,56	3	2.500	57,81	1	4.800	140,70	1		
	1.330	31,65	3	2.550	58,77	1	4.860	142,30	1		
	1.638	36,65	3	2.600	59,72	1	4.990	145,75	1		
	1.640	36,68	3	2.650	60,68	1	5.270	153,18	1		
	1.735	38,22	3	2.700	61,64	1	5.300	153,98	1		
	1.750	38,46	3	2.750	62,59	1	5.550	160,62	1		
	2.000	42,53	3	2.755	62,69	1	5.620	162,48	1		
20x0,90	2.000	47,20	1	2.765	62,87	1	5.800	167,27	1		
	2.060	48,31	1	2.825	64,02	1	6.000	172,58	1		
	2.070	48,50	1	2.835	64,21	1	41x1,30	4.100	152,84	1	
	2.080	48,69	1	2.845	64,40	1		4.520	166,79	1	
	2.090	48,87	1	2.850	64,50	1		4.570	168,45	1	
	2.100	49,06	1	2.895	65,35	1		5.300	192,69	1	
	2.110	49,25	1	2.945	66,31	1		5.500	199,33	1	
	2.115	49,34	1	2.950	66,41	1		5.550	200,99	1	
	2.120	49,42	1	2.960	66,60	1		5.800	209,30	1	
	2.140	49,80	1	3.010	67,56	1		6.000	215,93	1	
	2.265	52,12	1	3.100	69,27	1		6.200	222,58	1	
	2.360	53,89	1	3.180	70,80	1		6.300	225,90	1	
	2.362	53,93	1	3.420	75,39	1		6.600	235,86	1	
	2.370	54,08	1	3.505	77,01	1		6.700	239,18	1	
	2.375	54,17	1	3.660	79,97	1		6.900	245,83	1	
2.400	54,63	1	3.800	82,65	1	7.000		249,14	1		
2.465	55,84	1	4.100	88,38	1	6x0,90		30 M	530,52	1	
2.520	56,86	1	4.250	91,25	1	10x0,90	30 M	530,52	1		
2.530	57,05	1	4.570	97,36	1						

7301-7314

M42 Dentado variable
M42 Denture variable / M42 Variable tooth

68-69
HRC

M42
(8% CO)



P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		●	○	○	○		○	●	○	○					
55-120	35-75	22-50		18-50	13-30	45-85	35-80		70-230	25-45	55-105	70-175					

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ref.	A mm	e mm	t.p.i.										€ m	€ soldadura soudure welding		
			0,75/1,25	1,10/1,40	1,40/2	2/3	3/4	4/6	5/8	6/10	8/12	10/14				
7302*	6,00	0,90												VR	17,68	10,05
7304*	10,00	0,90												VR	17,68	10,05
7305	13,00	0,65												VR	16,24	10,05
7306	13,00	0,90												VR	16,24	10,05
7307	20,00	0,90							VP-VR	VR				VR	18,57	10,05
7308	27,00	0,90						VP	VP-VR	VP-VR	VP-VR			VR	19,11	10,05
7309	34,00	1,10						VP	VP-VR	VP-VR	VP-VR			VR	26,58	13,22
7310	41,00	1,30						VP	VP	VP-VR	VP-VR	VP-VR			33,21	16,70
7311	54,00	1,30						VP	VP	VP-VR	VP-VR				48,65	28,12
7312	54,00	1,60	VP	VP	VP	VP									48,65	28,12
7313	67,00	1,60	VP	VP	VP	VP									82,87	51,86
7314	80,00	1,60	VP												97,00	86,46

* Se vende sólo en rollos de 30 m.
Vendu uniquement en rouleaux de 30 m.
Only sold in 30 m rolls.

A x e mm	L	€	📦	A x e mm	L	€	📦	A x e mm	L	€	📦
13x0,65	1.138	28,53	3		2.550	57,41	1		4.870	103,09	1
	1.140	28,56	3	27x0,90	2.000	48,26	1		5.000	105,58	1
	1.300	31,15	3		2.060	49,40	1	34x1,10	3.180	97,71	1
	1.325	31,56	3		2.070	49,59	1		3.420	104,09	1
	1.330	31,65	3		2.080	49,78	1		3.505	106,34	1
	1.440	33,43	3		2.150	51,12	1		3.660	110,47	1
	1.470	33,92	3		2.352	54,98	1		3.720	112,06	1
	1.638	36,65	3		2.360	55,14	1		3.800	114,19	1
	1.640	36,68	3		2.370	55,32	1		4.100	122,16	1
	1.735	38,22	3		2.420	56,28	1		4.115	122,56	1
	1.750	38,46	3		2.450	56,86	1		4.520	133,32	1
	2.000	42,53	3		2.460	57,05	1		4.570	134,64	1
13x0,90	1.140	28,56	3		2.480	57,42	1		4.640	136,50	1
	1.325	31,56	3		2.500	57,81	1		4.800	140,75	1
	1.330	31,65	3		2.550	58,77	1		4.860	142,35	1
	1.638	36,65	3		2.600	59,72	1		4.990	145,80	1
	1.640	36,68	3		2.650	60,68	1		5.270	153,25	1
	1.735	38,22	3		2.700	61,64	1		5.300	154,05	1
	1.750	38,46	3		2.750	62,59	1		5.550	160,68	1
	2.000	42,53	3		2.755	62,69	1		5.620	162,54	1
20x0,90	2.000	47,20	1		2.765	62,87	1		5.800	167,33	1
	2.060	48,31	1		2.825	64,02	1		6.000	172,64	1
	2.070	48,50	1		2.835	64,21	1	41x1,30	4.100	152,84	1
	2.080	48,69	1		2.845	64,40	1		4.520	166,79	1
	2.090	48,87	1		2.850	64,50	1		4.570	168,45	1
	2.100	49,06	1		2.895	65,35	1		5.300	192,69	1
	2.110	49,25	1		2.945	66,31	1		5.500	199,33	1
	2.115	49,34	1		2.950	66,41	1		5.550	200,99	1
	2.120	49,42	1		2.960	66,60	1		5.800	209,30	1
	2.140	49,80	1		3.010	67,56	1		6.000	215,93	1
	2.265	52,12	1		3.100	69,27	1		6.200	222,58	1
	2.360	53,89	1		3.180	70,80	1		6.300	225,90	1
	2.362	53,93	1		3.420	75,39	1		6.600	235,86	1
	2.370	54,08	1		3.505	77,01	1		6.700	239,18	1
	2.375	54,17	1		3.660	79,97	1		6.900	245,83	1
	2.400	54,63	1		3.800	82,65	1		7.000	249,14	1
	2.465	55,84	1		4.100	88,38	1	6x0,90	30 M	530,52	1
	2.520	56,86	1		4.250	91,25	1	10x0,90	30 M	530,52	1
	2.530	57,05	1		4.570	97,36	1				



7321-7324

M51 Dentado variable
M42 Denture variable / M42 Variable tooth

VP

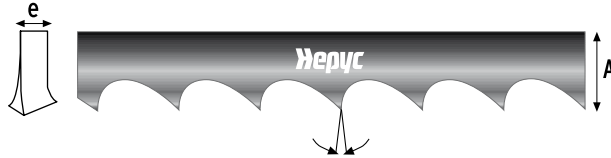


68-69
HRC

M51
(10% CO)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	●	●	●	●	●	●	●	○	●	○	○	●	●			
55-120	35-75	22-50	13-32	18-50	13-30	45-85	35-80	22-50	70-230	25-45	55-105	70-175	13-30	13-47			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



Ref.	A mm	e mm	t.p.i.					€ m	€ soldadura soudure welding
			0,75/1,25	1,5/2	2/3	3/4	4/6		
7321	27,00	0,90			VP	VP	VP	36,17	86,46
7322	34,00	1,10			VP	VP	VP	37,03	86,46
7323	41,00	1,30		VP	VP	VP	VP	45,24	86,46
7324	54,00	1,60	VP	VP	VP	VP	80,28	86,46	

A x e mm	L	€	📦
27x0,90	2.000	84,01	1
	2.060	86,18	1
	2.070	86,54	1
	2.080	86,91	1
	2.150	89,44	1
	2.352	96,75	1
	2.370	97,40	1
	2.360	97,03	1
	2.420	99,20	1
	2.450	100,29	1
	2.460	100,65	1
	2.480	101,38	1
	2.500	102,10	1
	2.550	103,91	1
	2.600	105,71	1
	2.650	107,52	1
	2.700	109,34	1
2.750	111,14	1	
2.755	111,32	1	
2.765	111,68	1	
2.825	113,85	1	
2.835	114,22	1	
2.845	114,58	1	
2.850	114,75	1	
2.895	116,38	1	
2.945	118,20	1	
2.950	118,38	1	
2.960	118,73	1	
3.010	120,55	1	
3.100	123,81	1	
3.180	126,69	1	
3.420	135,38	1	
3.505	138,45	1	
3.660	144,06	1	
3.800	149,12	1	
4.100	159,98	1	
4.250	165,40	1	

A x e mm	L	€	📦
	4.570	176,98	1
	4.870	187,82	1
	5.000	192,53	1
34x1,10	3.180	133,09	1
	3.420	141,98	1
	3.505	145,12	1
	3.660	150,86	1
	3.720	153,09	1
	3.800	156,05	1
	4.100	167,16	1
	4.115	167,72	1
	4.520	182,71	1
	4.570	184,57	1
	4.640	187,16	1
	4.800	193,08	1
	4.860	195,30	1
4.990	200,12	1	
5.270	210,49	1	
5.300	211,60	1	
5.550	220,86	1	
5.620	223,45	1	
5.800	230,12	1	
6.000	237,52	1	
41x1,30	4.100	204,91	1
	4.520	223,91	1
	4.570	226,17	1
	5.300	259,20	1
	5.500	268,25	1
	5.550	270,51	1
	5.800	281,82	1
	6.000	290,87	1
	6.200	299,92	1
	6.300	304,45	1
6.600	318,02	1	
6.700	322,55	1	
6.900	331,59	1	
7.000	336,12	1	

7801

HSS DIN 1837 N

ISO 2296	Form. A	Tol. Ø (j15) d (H7)	Tol. I (j11) D1 (j18)
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P				M			K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC	
●	●	○		○	○	●	○		●	●	○	●	○	○				
15-50	10-20	5-10		10-20	5-10	15-30	10-20		120-2000	10-400	40-120	500-1000	20-30	10-20				

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



D mm	e mm	d mm	z	€
20	0,20	5	80	16,76
	0,25		64	16,86
	0,30	64	15,87	
	0,40	64	15,54	
	0,50	48	15,54	
	0,60	48	14,65	
	0,80	48	15,09	
	1,00	40	15,98	
	1,20	40	16,42	
	1,60	40	17,03	
2,00	32	18,20		
25	0,20	8	80	17,31
	0,25		80	17,31
	0,30	80	16,42	
	0,40	64	15,26	
	0,50	64	15,54	
	0,60	64	15,71	
	0,80	48	15,71	
	1,00	48	15,87	
	1,20	48	16,42	
	1,60	40	16,86	
2,00	40	17,31		
2,50	40	19,26		
32	0,20	8	100	16,42
	0,25		100	14,82
	0,30	80	13,65	
	0,40	80	13,21	
	0,50	80	13,31	
	0,60	64	13,48	
	0,80	64	13,77	
	1,00	64	14,82	
	1,20	48	14,82	
	1,60	48	15,87	
2,00	48	17,64		
2,50	40	20,31		
3,00	40	22,08		
40	0,20	10	128	17,03
	0,25		100	16,15
	0,30	100	14,37	
	0,40	100	13,92	
	0,50	80	13,92	
	0,60	80	14,09	
	0,80	80	15,09	
	1,00	64	16,42	
	1,20	64	16,42	
	1,60	64	18,20	

D mm	e mm	d mm	z	€
	2,00		48	19,58
	2,50		48	22,69
	3,00		48	25,02
	3,00		48	25,02
50	0,25	13	128	19,58
	0,30		128	15,98
	0,40	100	15,26	
	0,50	100	15,87	
	0,60	100	15,87	
	0,80	80	21,98	
	1,00	80	21,98	
	1,20	80	21,98	
63	1,60	64	21,98	
	2,00		64	21,98
	2,50	64	24,47	
	3,00	48	27,13	
	4,00	48	32,46	
	5,00	48	36,90	
	0,30	16	128	21,47
	0,40		128	19,43
0,50	128	19,58		
0,60	100	19,58		
0,80	100	22,03		
1,00	100	23,86		
1,20	80	24,02		
1,60	80	25,19		
2,00	80	26,80		
2,50	64	31,29		
3,00	64	34,51		
4,00	64	41,61		
5,00	48	50,11		
6,00	48	55,87		
80	0,50	22	128	24,75
	0,60		128	25,47
	0,80	128	28,13	
	1,00	100	27,69	
	1,20	100	28,91	
	1,60	100	31,57	
	2,00	80	33,01	
	2,50	80	38,67	
3,00	80	44,01		
4,00	64	53,77		
5,00	64	65,03		
6,00	64	74,52		
100	0,60	22	160	32,46
	0,80		128	36,02
	1,00	128	34,85	

D mm	e mm	d mm	z	€
	1,20		128	34,85
	1,60		100	40,45
	2,00		100	43,11
	2,50		100	52,00
	3,00		80	58,54
	4,00		80	70,08
125	5,00	22	80	85,79
	6,00		64	98,54
	0,80		160	52,88
	1,00		160	56,04
	1,20		128	56,04
	1,60		128	57,04
160	2,00	32	128	60,31
	2,50		100	70,69
	3,00		100	80,46
	4,00		100	97,93
	5,00		80	117,53
	6,00		80	132,62
200	1,20	32	200	72,19
	1,60		160	82,56
	2,00		128	87,28
	2,50		128	103,26
	3,00		128	128,46
	4,00		100	165,80
250	5,00	40	100	206,69
	6,00		100	241,09
	1,60		160	123,46
	2,00		160	132,89
	2,50		160	155,76
	3,00		128	192,20
315	4,00	40	128	258,85
	5,00		128	320,83
	6,00		100	372,10
	2,00		200	172,89
	2,50		160	204,92
	3,00		160	254,13
	4,00		160	319,05
	5,00		128	399,96
	6,00		128	447,95
	2,50		200	325,10
	3,00		200	378,32
	4,00		160	474,92
	5,00		160	588,88
	6,00		160	681,16

7802

HSS DIN 1838 N

ISO
2296

Form.
B

Tol.
Ø (j15)
d (H7)

Tol.
I (j11)
D1 (j18)

P				M		K			N				S		H		
<800	<1.000	<1.200	<1.400	<950	<1.200	<500	<800	<1.400	Al	Cu	Mg/Zn	Plastic	Ni	Ti	50 HRC	55 HRC	60 HRC
●	●	○		○	○	●	○		●	●	○	●	○	○			
15-50	10-20	5-10		10-20	5-10	15-30	10-20		120-2000	10-400	40-120	500-1000	20-30	10-20			

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



D mm	e mm	d mm	z	€	D mm	e mm	d mm	z	€	
50	0,50	13	48	15,87	125	3,00	22	40	58,54	
	0,60		48	15,87		4,00		40	70,08	
	0,80		40	21,98		5,00		40	85,79	
	1,00		40	21,98		6,00		32	98,54	
	1,20		40	21,98		160		0,80	80	52,88
	1,60		32	21,98				1,00	80	56,04
	2,00		32	21,98				1,20	64	56,04
	2,50		32	24,47				1,60	64	57,04
	3,00		24	27,13				2,00	64	60,31
	4,00		24	32,46				2,50	64	70,69
5,00	24	36,90	3,00	48	80,46					
63	0,50	16	64	19,58	4,00		48	97,93		
	0,60		48	19,58	5,00		40	117,53		
	0,80		48	22,03	6,00		40	132,62		
	1,00		48	23,86	200	1,20	32	80	72,19	
	1,20		40	24,02		1,60	80	82,56		
	1,60		40	25,19		2,00	64	87,28		
	2,00		40	26,80		2,50	64	103,26		
	2,50		32	31,29		3,00	64	128,46		
	3,00		32	34,51		4,00	48	165,80		
	4,00		32	41,61		5,00	48	206,69		
5,00	24	50,11	6,00	48		241,09				
6,00	24	55,87	250	1,60		32	80	123,46		
80	0,60	22		64		25,47	2,00	80	132,89	
	0,80			64	28,13	2,50	80	155,76		
	1,00			48	27,69	3,00	64	192,20		
	1,20			48	28,91	4,00	64	258,85		
	1,60			48	31,57	5,00	64	320,83		
	2,00			40	33,01	6,00	48	372,10		
	2,50			40	38,67	315	2,00	32	100	172,89
	3,00			40	44,01		2,50	80	204,92	
	4,00			32	53,77		3,00	80	254,13	
	5,00		32	65,03	4,00		80	319,05		
6,00	32	74,52	5,00	80	399,96					
100	0,80	22	64	36,02	6,00		64	447,95		
	1,00		64	34,85	315		2,50	40	100	325,10
	1,20		64	34,85			3,00	100	378,32	
	1,60		48	40,45			4,00	80	474,92	
	2,00		48	43,11			5,00	80	588,88	
	2,50		48	52,00		6,00	80	681,16		

7401

HSS DC

M2



L mm	A mm	e mm	Pulgadas Pouces Inches	Ø Taladro Perceuse Drill	tpi					€
					4	6	8	10	14	
300	25	1,50	12	8,5				■	■	17,99
350	25	1,25	14	8,5				■		16,46
350	25	1,50	14	8,5					■	20,20
350	30	1,50	14	8,5				■	■	22,85
350	30	2,00	14	8,5		■		■		30,38
400	25	1,50	16	8,5				■	■	23,44
400	30	1,50	16	8,5		■	■	■	■	28,25
400	30	2,00	16	8,5		■	■	■	■	32,77
450	30	2,00	18	8,5	■	■	■	■		32,77
450	35	2,00	18	8,5		■	■	■		37,74
450	40	2,00	18	10,5	■	■		■		42,76
500	40	2,00	20	10,5	■	■	■	■		55,31
600	50	2,50	24	13		■				83,86



Heruc / CUTTING
TOOL
EXPERTS



**Nuevo Display
Modular
con placas
intercambiables**

**Nouveau Présentoir
Modulaire
avec étages réaménageables**

**New Modular Display
with exchangeable plates**

EXPOSITOR TOTEM PRÉSENTOIRS / DISPLAY STANDS

DISPLAY MODULAR

- Diseño atractivo
- Claridad expositiva
- Ahorro de espacio
- Expositor polivalente: para brocas, machos, fresas, etc
- Portafolletos

PRESENTOIR MODULAIRE

- Design attirant
- Mise en valeur des produits
- Encombrement réduit
- Présentoir polyvalent: pour forets, tarauds, fraises, etc...
- Porte-documents

MODULAR DISPLAY

- Attractive design
- Clear exposition
- Saving space
- Available for drill-bits, taps, end mills, etc.
- Brochure holders



Base + 2 pisos fijos
Posibilidad de añadir un 3º y un 4º módulo.

Base + 2 étages fixes
Possibilité d'ajouter un 3ème
et 4ème module.

Base + 2 fixed floors
Possibility of adding a 3th and 4th floor.

A elegir entre diferentes composiciones.

A choisir entre différentes compositions.
To chose among different compositions.

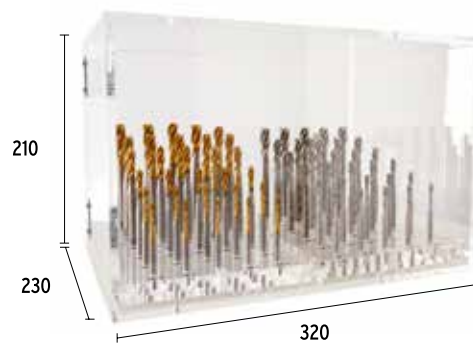


> Ref. 8214



€ Vacío 1009,53

> Ref. 8214/1



€ Urna vacía 105,93



€ Vacío 903,61



€ Vacío 797,67

BROCAS CILÍNDRICAS / FORETS CYLINDRIQUES / STRAIGHT DRILL-BITS

8214/2 HSS DIN 338 NSP



Ø mm	Icon	TOTAL pcs. 50	
4	10	€	144,80
5	10		
6	10		
8	10		
10	5		
12	5		

8214/3 HSS TIN DIN 338 NSP



Ø mm	Icon	TOTAL pcs. 50	
4	10	€	312,01
5	10		
6	10		
8	10		
10	5		
12	5		

8214/4 HSSCO DIN 338 N



Ø mm	Icon	TOTAL pcs. 50	
4	10	€	247,43
5	10		
6	10		
8	10		
10	5		
12	5		

8214/5 HSSCO TIALN DIN 338 N



Ø mm	Icon	TOTAL pcs. 50	
4	10	€	508,52
5	10		
6	10		
8	10		
10	5		
12	5		

8214/6 HSSCO DIN 338 IX



Ø mm	Icon	TOTAL pcs. 50	
4	10	€	473,49
5	10		
6	10		
8	10		
10	5		
12	5		

8214/7 HSSCO TIALN DIN 338 IX



Ø mm	Icon	TOTAL pcs. 50	
4	10	€	901,80
5	10		
6	10		
8	10		
10	5		
12	5		

8214/8 HSSCO DIN 338S



Ø mm	Icon	TOTAL pcs. 50	
4	10	€	631,35
5	10		
6	10		
8	10		
10	5		
12	5		

8214/9 HSSCO TIALN DIN 338S



Ø mm	Icon	TOTAL pcs. 50	
4	10	€	883,60
5	10		
6	10		
8	10		
10	5		
12	5		



8214/12 > **HSSCO DIN 1897 S**



Ø mm	
4	10
5	10
6	10
8	10
10	5
12	5

TOTAL pcs.	50
€	561,95

8214/13 > **HSSCO TIALN DIN 1897**





Ø mm	
4	10
5	10
6	10
8	10
10	5
12	5



TOTAL pcs.	50
€	787,20

BROCAS ESCALONADAS Y AVELLANADORAS
FRAISES ETAGEES ET CONIQUES / STEP AND COUNTERBORE DRILL-BITS



8214/20 HSS

Ø mm		
4-12*2	6	TOTAL pcs. 21 € 1.430,28
4-20	6	
6-30	5	
20-30	4	



8214/21 HSS TIALN

Ø mm		
4-12*2	6	TOTAL pcs. 21 € 2.956,89
4-20	6	
6-30	5	
20-30	4	



8214/22 HSS 35°

Ø mm		
4-12*2	12	TOTAL pcs. 28 € 2.467,08
4-20	6	
6-30	10	



8214/23 HSS 35° TIALN

Ø mm		
4-12*2	12	TOTAL pcs. 28 € 3.700,60
4-20	6	
6-30	10	

8214/24 HSS

Ø mm		
3-14	6	TOTAL pcs. 21 € 1.054,66
6-20	6	
16-30	5	
26-40	4	

8214/25 HSS TIALN


Ø mm		
3-14	6	TOTAL pcs. 21 € 1.989,65
6-20	6	
16-30	5	
26-40	4	



AVELLANADORES 90° / FRAISES A CHANFREINER 90° / COUNTERSINK CUTTERS 90°

8214/26 HSS DIN 335C




Ø mm	
8,30	6
10,40	6
12,40	6
16,50	6
20,50	5
25,00	5
30,00	4

TOTAL pcs. 38
 € 1.023,17

8214/27 HSS TIALN DIN 335C




Ø mm	
8,30	6
10,40	6
12,40	6
16,50	6
20,50	5
25,00	5
30,00	4

TOTAL pcs. 38
 € 2.524,69

8214/28 HSSCO DIN 335C




Ø mm	
8,30	6
10,40	6
12,40	6
16,50	6
20,50	5
25,00	5
30,00	4

TOTAL pcs. 38
 € 1.745,11

8214/29 HSSCO TIALN DIN 335C



Ø mm	
8,30	6
10,40	6
12,40	6
16,50	6
20,50	5
25,00	5
30,00	4

TOTAL pcs. 38
 € 3.018,56

MACHOS MÁQUINA / TARAUDS MACHINE / MACHINE TAPS

8214/30 HSSE DIN 371/376B



Ø mm			
M4	5		
M5	5		
M6	5		
M8	5		
M10	5	TOTAL pcs.	30
M12	5	€	478,54

8214/31 HSSE DIN 371/376 R35°



Ø mm			
M4	5		
M5	5		
M6	5		
M8	5		
M10	5	TOTAL pcs.	30
M12	5	€	578,81

8214/38 HSSE VAP DIN 371/376B



Ø mm			
M4	5		
M5	5		
M6	5		
M8	5		
M10	5	TOTAL pcs.	30
M12	5	€	553,55

8214/39 HSSE VAP DIN 371/376 R35°



Ø mm			
M4	5		
M5	5		
M6	5		
M8	5		
M10	5	TOTAL pcs.	30
M12	5	€	670,85

8214/32 HSSE TIN DIN 371/376B



Ø mm			
M4	5		
M5	5		
M6	5		
M8	5		
M10	5	TOTAL pcs.	30
M12	5	€	832,65

8214/33 HSSE TIN DIN 371/376 R35°



Ø mm			
M4	5		
M5	5		
M6	5		
M8	5		
M10	5	TOTAL pcs.	30
M12	5	€	875,80



8214/34 > **HSSEX TICN DIN 371/376B**



Ø mm	
M4	5
M5	5
M6	5
M8	5
M10	5
M12	5
TOTAL pcs. 30	
€ 943,10	

8214/35 > **HSSEX TICN DIN 371/376 R35°**



Ø mm	
M4	5
M5	5
M6	5
M8	5
M10	5
M12	5
TOTAL pcs. 30	
€ 1.030,75	

8214/36 > **HSSEX TICN DIN 371/376 B**



Ø mm	
M4	5
M5	5
M6	5
M8	5
M10	5
M12	5
TOTAL pcs. 30	
€ 1.199,15	

8214/37 > **HSSEX TICN DIN 371/376 R15° LH**



Ø mm	
M4	5
M5	5
M6	5
M8	5
M10	5
M12	5
TOTAL pcs. 30	
€ 1.109,00	

8214/49 > **HSSE TIN DIN 371/376 6HX R**



Ø mm	
M4	5
M5	5
M6	5
M8	5
M10	5
M12	5
TOTAL pcs. 30	
€ 1.252,65	

8214/53 > **HSSE TIN DIN 371/376 6GX R**



Ø mm	
M4	5
M5	5
M6	5
M8	5
M10	5
M12	5
TOTAL pcs. 30	
€ 1.199,25	

FRESAS FRONTALES / FRAISES FRONTALES / END MILLS

8214/54 HSSE DIN 327 N 2Z



Ø mm	
4	5
5	5
6	5
8	5
10	5
12	5

TOTAL pcs. 30
 € 531,67

8214/55 HSSE TIALN DIN 327 N 2Z



Ø mm	
4	5
5	5
6	5
8	5
10	5
12	5

TOTAL pcs. 30
 € 744,25

8214/56 HSSE DIN 327 N 2Z



Ø mm	
4	5
5	5
6	5
8	5
10	5
12	5

TOTAL pcs. 30
 € 889,67

8214/57 HSSE TIALN DIN 327 N 2Z



Ø mm	
4	5
5	5
6	5
8	5
10	5
12	5

TOTAL pcs. 30
 € 1,245,55

8214/58 HSSE DIN 844 W 3Z



Ø mm	
6	5
8	5
10	5
12	5

TOTAL pcs. 20
 € 668,69

8214/59 HSSE TIALN DIN 844 W 3Z



Ø mm	
6	5
8	5
10	5
12	5

TOTAL pcs. 20
 € 708,45

8214/60 HSSE DIN 844 N 4Z



Ø mm	
4	5
5	5
6	5
8	5
10	5
12	5

TOTAL pcs. 30
 € 567,63

8214/61 HSSE TIALN DIN 844 N 4Z



Ø mm	
4	5
5	5
6	5
8	5
10	5
12	5

TOTAL pcs. 30
 € 711,35



8214/62 > **HSSEX TIALN DIN 844 NR**



Ø mm	
6	5
8	5
10	5
12	5

TOTAL pcs. 20
€ 1.147,49

8214/63 > **HSSEX TIALN DIN 844 NRF**



Ø mm	
6	5
8	5
10	5
12	5

TOTAL pcs. 20
€ 1.260,79

FRESAS ROTATIVAS / FRAISES ROTATIVES / ROTARY MILLS

8214/69 > **FRESAS ROTATIVAS**



Ø mm	
12x6 (3201)	2
10x6 (3201)	2
8x6 (3201)	1
12x6 (3202)	2
10x6 (3202)	2
8x6 (3202)	1
12x6 (3203)	2
10x6 (3203)	2

Ø mm	
8x6 (3203)	1
12x6 (3204)	2
10x6 (3204)	2
8x6 (3204)	1
12x6 (3207)	3
10x6 (3207)	2
12x6 (3206)	5

TOTAL pcs. 30
€ 1.409,10

CORONAS METAL / SCIES TREPAN METAUX / METAL HOLE SAWS

8214/64 > **HSSE**

Ø mm	
14x25	1
16x25	1
18x25	1
20x25	1
22x25	1
24x25	1
14x50	1
16x50	1
18x50	1
20x50	1
22x50	1
24x50	1



TOTAL pcs. 12
€ 907,25

8214/65 > **HSS**

Ø mm	
14x25	1
16x25	1
18x25	1
20x25	1
22x25	1
24x25	1
14x50	1
16x50	1
18x50	1
20x50	1
22x50	1
24x50	1



TOTAL pcs. 12
€ 662,24

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1101	31	1166	57	2120	169	2181	170	2273	161
1103	38	1167	58	2121	154	2182	170	2274	143
1104	33	1171	86	2122	154	2187	173	2275	143
1105	39	1172	86	2123	167	2188	173	2276	194
1106	44	1173	88	2124	167	2189	199	2277	194
1107	41	1174	88	2125	152	2190	141	2278	197
1108	37	1175	24	2126	152	2191	141	2279	197
1109	30	1176	25	2132	155	2192	206	2280	195
1110	48	1177	26	2133	155	2199	177	2281	195
1112	49	1178	27	2134	177	2206	206	2282	198
1113	50	1179	77	2135	200	2208	163	2283	198
1114	51	1180	77	2136	200	2212	211	2284	207
1115	53	1181	64	2137	202	2213	174	2285	209
1116	55	1182	28	2138	202	2214	174	2286	208
1117	56	1183	89	2139	203	2215	175	2287	209
1118	56	1184	27	2140	203	2216	175	2301	213
1119	79	1185	78	2141	204	2217	176	2302	217
1120	29	1186	78	2142	204	2218	176	2303	216
1121	59	1187	43	2144	205	2234	187	2304	218
1122	63	1188	72	2145	207	2235	187	2305	219
1123	62	1189	76	2146	208	2236	190	2306	220
1125	65	1190	76	2147	183	2237	190	2307	222
1126	66	1191	71	2148	183	2242	212	2308	223
1127	68	1192	71	2149	185	2248	179	2309	225
1128	68	1193	73	2150	185	2249	179	2310	225
1129	69	1194	79	2151	188	2250	150	2312	226
1130	69	1501	34	2152	188	2251	150	2313	226
1132	72	1504	178	2153	191	2252	165	2314	216
1133	73	1505	311	2154	191	2253	165	2315	224
1135	74	2101	137	2155	193	2254	156	2316	221
1137	74	2102	136	2156	193	2255	156	2317	221
1138	75	2103	144	2157	196	2256	171	2321	227
1139	67	2104	144	2158	196	2257	171	2322	228
1143	86	2105	158	2159	210	2258	157	2323	228
1144	87	2106	158	2160	199	2259	157	2324	217
1145	87	2107	164	2163	212	2260	172	2501	229
1146	87	2108	164	2164	210	2261	172	2502	233
1150	89	2109	148	2165	162	2262	186	2503	234
1152	70	2110	148	2166	162	2263	186	2504	234
1153	70	2111	147	2168	149	2264	189	2505	237
1155	75	2112	161	2169	149	2265	189	2506	238
1158	35	2113	140	2170	163	2266	180	2507	239
1159	46	2114	140	2175	153	2267	180	2508	239
1160	47	2115	151	2176	153	2268	181	2509	241
1161	41	2116	151	2177	168	2269	181	2510	240
1162	45	2117	166	2178	168	2270	182	2512	232
1164	52	2118	166	2179	142	2271	182	2514	232
1165	54	2119	169	2180	142	2272	147	2520	240

2521	236	2850	272	3170	352	4103	288	5142	321
2522	236	2851	272	3171	353	4104	286	5143	321
2701	242	3101	364	3172	354	4105	287	5151	322
2702	243	3105	364	3173	354	4106	288	5155	322
2703	243	3107	365	3174	355	4107	289	5157	305
2704	244	3110	368	3175	356	4108	289	5158	305
2705	245	3111	378	3176	356	4109	291	5159	309
2706	246	3112	370	3177	357	4110	292	5160	307
2707	247	3113	379	3178	359	4111	293	5161	314
2708	248	3114	372	3179	360	4114	292	6101	83
2709	249	3115	373	3180	360	4115	290	6102	84
2710	250	3116	382	3181	361	4116	290	6103	84
2711	251	3117	374	3182	381	4117	291	6110	81
2712	252	3118	383	3183	361	4118	285	6111	81
2713	253	3119	375	3184	362	4119	284	6112	82
2714	254	3120	366	3185	362	5101	303	6113	82
2715	244	3121	366	3186	367	5102	303	6114	81
2716	248	3122	367	3187	371	5103	304	6115	83
2717	254	3138	414	3188	380	5105	306	6120	83
2801	268	3139	414	3189	349	5106	306	6122	85
2802	268	3140	414	3190	350	5109	307	6123	85
2803	268	3141	349	3191	353	5112	308	6124	85
2804	269	3144	386	3192	358	5114	80	7137	408
2805	269	3145	387	3193	358	5115	80	7138	410
2806	178	3146	388	3194	363	5116	309	7139	412
2808	269	3147	389	3195	363	5117	310	7140	413
2809	273	3148	390	3201	397	5118	310	7141	413
2810	273	3149	391	3202	397	5119	311	7158	413
2811	273	3150	391	3203	398	5120	312	7167	255
2812	273	3151	392	3204	398	5121	312	7168	416
2813	274	3152	394	3205	399	5122	313	7169	416
2814	274	3153	394	3206	399	5123	313	7172	406
2815	275	3154	395	3207	400	5124	314	7401	429
2816	275	3155	395	3208	400	5125	315	7801	427
2817	275	3156	396	3209	401	5126	315	7802	428
2818	275	3157	376	3210	401	5127	316	8201	90
2819	276	3158	384	3211	402	5129	316	8203	92
2820	276	3159	377	3212	402	5130	317	8207	92
2821	271	3160	385	3214	403	5132	317	8214	432
2822	271	3161	393	3215	403	5133	318	1101/1	33
2824	272	3162	376	3216	404	5134	318	1104/9	34
2825	272	3163	384	3217	404	5135	319	1105/9	40
2834	270	3164	396	3218	405	5136	320	1107/9	42
2840	271	3165	392	3219	405	5137	320	1121/9	61
2841	274	3166	393	3220	415	5138	323	1158/9	36
2842	274	3167	350	3221	415	5139	323	2101/5	139
2843	275	3168	351	4101	283	5140	324	2102/5	139
2846	270	3169	352	4102	284	5141	324	2103/5	146

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2106/5	160	3115/1	373	8214/53	438
2106/5	160	3116/1	382	8214/54	439
2135/5	201	3117/1	374	8214/55	439
2136/5	201	3118/1	383	8214/56	439
2144/5	205	3119/1	375	8214/57	439
2147/5	184	3144/1	386	8214/58	439
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2212/5	211	3146/1	388	8214/6	433
2301/5	215	3147/1	389	8214/60	439
2304/5	219	3148/1	390	8214/61	439
2306/5	220	3182/1	381	8214/62	440
2307/5	223	3187/1	371	8214/63	440
2308/5	224	3188/1	380	8214/64	440
2501/5	231	4104/1	287	8214/65	440
2502/5	233	7202- 7213	424	8214/69	440
2504/5	235	7301- 7314	425	8214/7	433
2505/5	237	7321- 7324	425	8214/8	433
2506/5	238			8214/9	433
2901/1	256	8201/9	91		
2901/2	258	8214/1	432		
2901/3	259	8214/12	434		
2901/4	257	8214/13	434		
2901/5	257	8214/2	433		
2902/1	260	8214/20	435		
2902/2	261	8214/21	435		
2902/3	261	8214/22	435		
2902/4	260	8214/23	435		
2902/5	260	8214/24	435		
2903/1	262	8214/25	435		
2903/2	262	8214/26	436		
2903/3	262	8214/27	436		
2904/1	263	8214/28	436		
2904/2	263	8214/29	436		
2904/3	264	8214/3	433		
2905/1	264	8214/30	437		
2905/2	264	8214/31	437		
2905/3	265	8214/32	437		
2906/1	265	8214/33	437		
2906/2	265	8214/34	438		
2907/1	266	8214/35	438		
2907/2	267	8214/36	438		
2907/4	266	8214/37	438		
2907/5	267	8214/38	437		
3110/1	369	8214/39	437		
3111/1	378	8214/4	433		
3112/1	370	8214/49	438		
3113/1	379				

FICHA DE CLIENTE

Representante:..... Código de cliente (rellenar por Hepyc):.....
CIF:..... Persona de contacto (nombre y apellido):.....
Dirección de facturación:..... C.P.:.....
Dirección de envío de mercancías (si es diferente):.....
Telf.:..... Fax:..... E-mail:.....
Forma de pago:..... Días pago:.....
CC:..... Dto a aplicar:.....

FORMULAIRE NOUVEAUX CLIENTS

Agent comercial:..... Nom de la société:.....
Raison sociale:..... SIREN/SIRET:.....
N° Intracommunautaire (TVA):.....
Personne à contacter:.....
Adresse de facturation:.....
Tél.:..... Fax:..... E-mail:.....
Mode de règlement:.....
IBAN:..... Remise:.....

CLIENT DATA SHEET

Representative:..... Client code (to be filled out by Hepyc):.....
Tax Identification Number:.....
Contact person (name and surname):.....
Invoice address:.....
Merchandise delivery address (if different)..... P.C.:.....
Tel.:..... Fax:..... E-mail:.....
Payment method:..... Payment days:.....
IBAN code:..... Discount to be applied:.....

1º Condiciones de pago:

Giro a 60 días f.f.: NETO.

2º Vencimientos:

En caso de fechas fijas de pago que rebasen los plazos estipulados giraremos a la fecha fijada pero inmediata anterior, según corresponda, siendo el plazo máximo en cualquier caso, de 60 días, fecha factura o envío.

3º Seguros:

Las mercancías viajarán por exclusiva cuenta y riesgo del comprador, siendo siempre a cargo del mismo la prima del seguro que se realice, en los casos que el cliente desee asegurarla.

4º Reclamaciones:

Se atenderán aquellas reclamaciones que se planteen dentro de los 8 días siguientes a la recepción del material, no aceptando ninguna devolución sin previo conocimiento de Manufacturas Hepyc, S.A.

5º Condicionalidad:

La aceptación de las mercancías, sin el rechazo inmediato por parte del comprador, supone la aprobación de estas condiciones generales de venta y su modificación sólo tendrá validez si consta por escrito la conformidad de Manufacturas Hepyc, S.A.

6º IVA:

Los precios están sujetos al impuesto sobre el valor añadido, siendo a cargo del cliente el recargo correspondiente.

7º Garantías:

Todas las herramientas están garantizadas contra cualquier defecto de fabricación y materiales, sin responsabilizarse Manufacturas Hepyc, S.A. de la utilización inadecuada de las mismas. En cualquier caso, nuestra responsabilidad estará limitada al valor de la herramienta suministrada. Nos reservamos el derecho de modificar, sin previo aviso, las dimensiones, calidades de acero y en general todas las características técnicas de las herramientas. No será sustituida ninguna herramienta sin un informe previo de Control de Calidad.

8º Portes:

Se suministrarán a portes pagados aquellos envíos a Península y Baleares cuyo valor neto en factura supere los 150 euros.

En aquellos casos de facturación mensual, quincenal, etc., Manufacturas Hepyc, S.A. cargará en factura los portes correspondientes a los envíos inferiores a 150 euros aunque la factura global (mensual, quincenal) supere dicha cantidad.

9º Importe mínimo por pedido:

Queda establecido como pedido mínimo la cantidad de 60 euros netos. Los clientes no habituales que cursen pedidos inferiores a 60 euros pagarán al contado o contra reembolso.

10º Envío de facturas:

Salvo indicación expresa por parte del cliente, se despacharán directamente.

11º Reserva de dominio:

Nuestras ventas se consideran siempre bajo la condición de "RESERVA DE DOMINIO", según el artículo 1506 del C.C. hasta que se haya hecho efectivo íntegramente el pago de todo lo adeudado.

12º Jurisdicción competente:

En caso de cualquier litigio por razón de incumplimiento por cualquiera de las partes, se someterán ambas al fuero de los JUZGADOS Y TRIBUNALES DE SAN SEBASTIÁN, con denuncia al que pudiera corresponderles.

CONDITIONS DE VENTE (France)

1° Tarif de prix:

Les prix figurants dans ce tarif sont des prix conseillés et s'entendent HORS TAXES, emballage compris.

2° Remise sur Tarif:

Remise à confirmer par notre agent.

3° Delai d'expédition:

Service normal: Commandes reçues avant 14 heures partiront de Hepyc le jour même et seront chez le client en 24-48 heures.

Service express: Sous 24 heures.

4° Port:

FRANCO pour les expédition dont la valeur nette facturée dépasse les 250 euros.

Les commandes inférieures à 250 euros seront majorés d'un forfait de 15 euros.

Manufacturas Hepyc, SA se réserve le droit d'utiliser le moyen de transport le plus économique.

Manufacturas Hepyc, SA facturera les ports concernant les envois d'outils peu courants qui, à la demande du client, devront être livrés en urgence à travers des agences de transport rapide.

5° Condition de paiement:

Le délai de paiement part de la date de facturation. Par LCR magnétique à 60 jours calendaires ou 45 jours fin de mois.

6° Assurances:

Le marchandises seront transportées aux risque et périls exclusifs de l'acheteur, celui-ci étant responsable de la prime d'assurance le cas échéant.

7° Réclamations:

Les réclamations seront acceptées dans un délai de 8 jours à partir de la réception du matériel; aucun retour ne sera accepté sans l'accord préalable de Manufacturas Hepyc, SA.

8° Conditionnalité:

L'acceptation de marchandises sans le rejet immédiat de la part de l'acheteur suppose l'approbation de ces conditions générales de vente et leur modification n'aura de validité que sur confirmation écrite de Manufacturas Hepyc, SA.

9° Garanties:

Tous les outils son garantis contre n'importe quel défaut de fabrication et de matériaux, Manufacturas Hepyc, SA. n'étant pas responsable de leur utilisation inadéquate. Dans tous les cas, notre responsabilité sera limité à la valeur de l'outil fourni. Nous nous réservons le droit de modifier, sans avertissement préalable, les dimensions, les qualités d'acier et en général toutes les caractéristiques techniques des outils. Aucun outil ne sera remplacé sans rapport préalable du contrôle de qualité.

10° Reserve de propriété:

La marchandise reste la pleine et entière propriété de la Société Manufacturas Hepyc, SA tant que le règlement intégral n'aura pas été effectué et ce en application de la loi du 12 mai 1980.

SALES CONDITIONS (Export)

1. Price List:

The prices that appear on this price list are recommended and **DO NOT INCLUDE TAXES** or packaging.

2. Discount: Discount to be confirmed by Manufacturas Hepyc.

3. Payment conditions:

Terms of payment set from invoice date.

Firts order must be paid in advanced. Rest of the orders to be agreed.

4. Insurance:

The merchandise will be transported exclusively at the purchaser's risk, the purchaser is responsible for the insurance premium if it is necessary.

5. Claims:

Claims will be accepted within the 8 days following the receipt of the merchandise; no returns will be accepted without the prior agreement of Manufacturas Hepyc, SA.

6. Conditions :

The acceptance of merchandise without the immediate rejection on the part of the purchaser supposes the acceptance of these general sales conditions and their modification will not be valid without the written consent of Manufacturas Hepyc, SA.

7. Guarantees:

All tools are guaranteed against any material or manufacturing defect, Manufacturas Hepyc, SA. is not responsible for their improper use. In all cases, our responsibility will be limited to the tool provided. We reserve the right to modify, without preliminary warning, the dimensions, steel qualities and all design feature of the tools in general. No tool will be replaced without the preliminary quality control report.

8. Reservation of title:

The merchandise remains the sole and exclusive property of the Manufacturas Hepyc, SA Corporation as long as the full payment is outstanding pursuant to the law of 12 May 1980.

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BUREAU VERITAS
Certification



Certification

Awarded to

MANUFACTURAS HEPYC SA

Bº ZIKUÑAGA,57 E IZQDA. POL IND IBARLUZE - 20120 - HERNANI -
GIPUZKOA - ESPAÑA

Bureau Veritas certification certifies that the Management System has been audited and
found to be in accordance with the requirements of standard:

STANDARD

ISO 9001:2015

Scope of certification:

**DESIGN, MANUFACTURING AND
DISTRIBUTION OF CUTTING TOOLS.**

Certificate Number: ES108200-1

Original approval date: 04-07-2001

Certification/Renovation Audit: 14-10-2019

Expiry date of previous cycle: 29-11-2019

Effective date: 30-11-2019

Certificate expiration date: 29-11-2022

Certification Manager:

This certificate is valid, subject to the general and specific terms and conditions of certification services

Certification Body: Bureau Veritas Iberia S.L.
C/ Valportillo Primera 22-24, Edificio Caoba, Pol. Ind. La granja,
28108 Alcobendas - Madrid, España



Can we **Help** you?

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