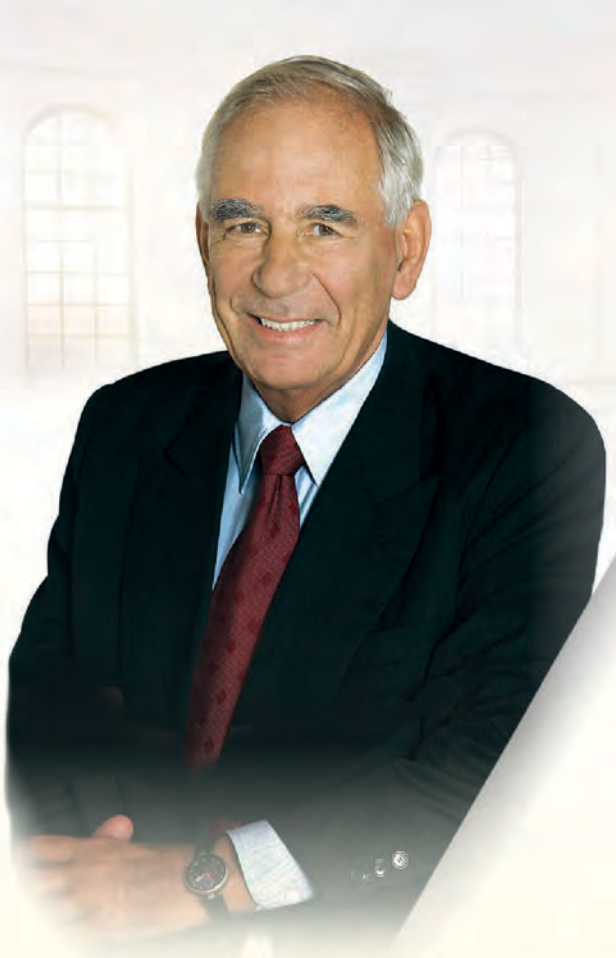
GÜHRING



RÔSCA POWER





Dr. Jörg Gühring

Diretor Executivo de Empresa

Oliver Gühring

Diretor Marketing e Vendas

7000

Funcionários
em todo mundo



3500

Funcionários
na Alemanha



Programa de formação interna

Transferência internacional de conhecimento através de intercâmbios globais para os funcionários



Dietmar Pfränger

Diretor de P&D, Logística, Engenharia e Produção

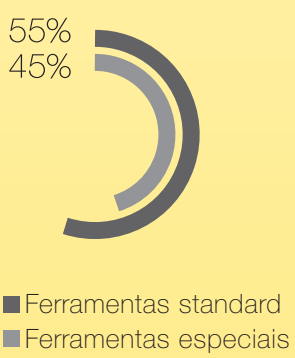
Bernd Schatz

Diretor Financeiro e Comercial

Divisão principal de negócios Ferramentas

50000
Artigos standard

2000
Tipos de ferramentas



Tudo em um fornecedor - abrangente e global

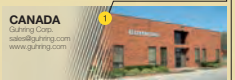
Com uma rede global de centros de produção, a Gühring desenvolve e produz ferramentas para todos os segmentos importantes de mercado. Usuários da indústria automotiva, aeroespacial, maquinas-ferrameta e mecânica geral contam com ferramentas inovadoras atendendo os mairoes requisitos de qualidade produzidas mundialmente.

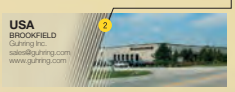
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CENTROS DE PRODEÇÃO

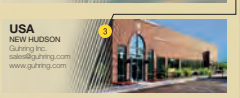
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SUBSIDIÁRIAS

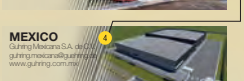
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CENTROS DE SERVIÇO

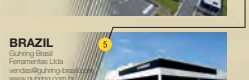


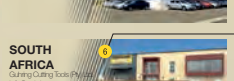






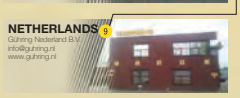








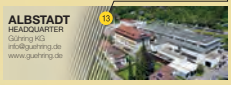


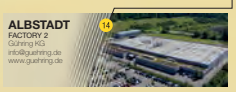








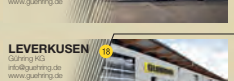


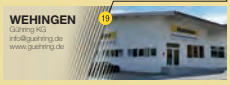


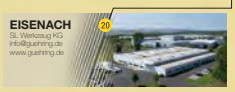




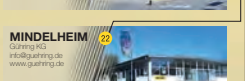
















Com tecnologias inovadoras realiza necessidades específicas do cliente a partir do desenho de processos para implantação de ferramentas de precisão - flexíveis e rápidas, em um nível mundial. Para issso temos especialistas internacionais, que acompanham o cliente local. Produção, serviços e contactos são, portanto, disponíveis em todo o mundo a partir de uma única fonte.

Produção própria de Metal Duro

Centros de revestimento próorios

Produção de máquinas própria

Padrão de qualidade em todo o mundo



CHEMNITZ 25
Dr. Gühring KG
info@guehring.de
www.guehring.de

KULMBACH 26
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service@german-carbide.com

MARKT-ERLBACH 27
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info@guehring.de
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www.guehring.de

TREUEN FACTORY 2 29
Dr. Gühring KG
info@guehring.de
www.guehring.de

TREUEN FACTORY 3 30
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Präzisionswerkzeuge
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www.guehring.de

ZORBAU 32
Hoffelder-Gühring GmbH
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SPAIN 33
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CZECH REPUBLIC 41
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DENMARK 42
Gühring Aps
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VIETNAM 43
Gühring Vietnam LLC
info@guhring.vn

THAILAND 44
Guehring (Thailand) Co., Ltd.
info.thailand@guehring.de
www.guehring.co.th

INDIA 45
Gühring India Pvt. Ltd.
info@guhring.in
www.guhring.in

CHINA 46
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TURKEY 47
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guhring@guhring.com.tr
www.guhring.com.tr

RUSSIA 48
Gühring - Russland
info@guhring.ru
www.guhring.ru

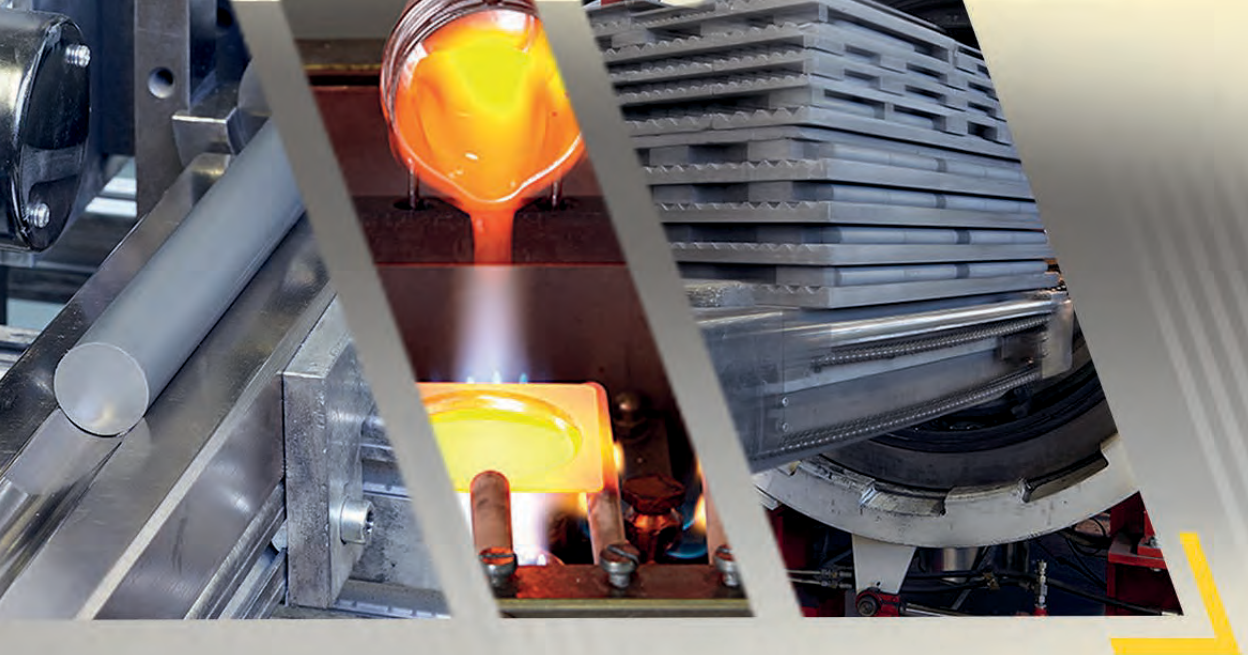
AUSTRALIA 49
Gühring Pty. Ltd.
guhring@guhring.com.au
www.guhring.com.au

INDONESIA 50
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TAIWAN 51
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www.guhring.co.jp

KOREA 53
Gühring Korea Co., Ltd.
info@guhring.co.kr
www.guhring.co.kr



MATERIAIS DA FERRAMENTA

Produção própria de Metal Duro

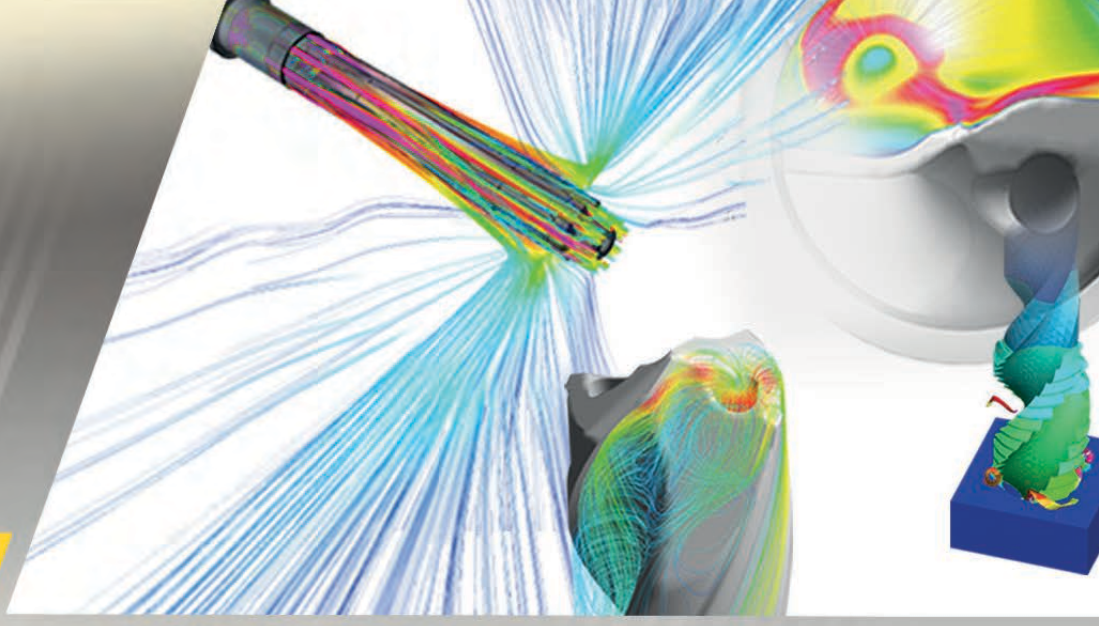
Combinação ótima de todos os parâmetros da ferramenta graças aos setores próprios de P&D



DIVISÃO DE MÁQUINAS E EQUIPAMENTOS

Produção própria de máquinas e equipamento





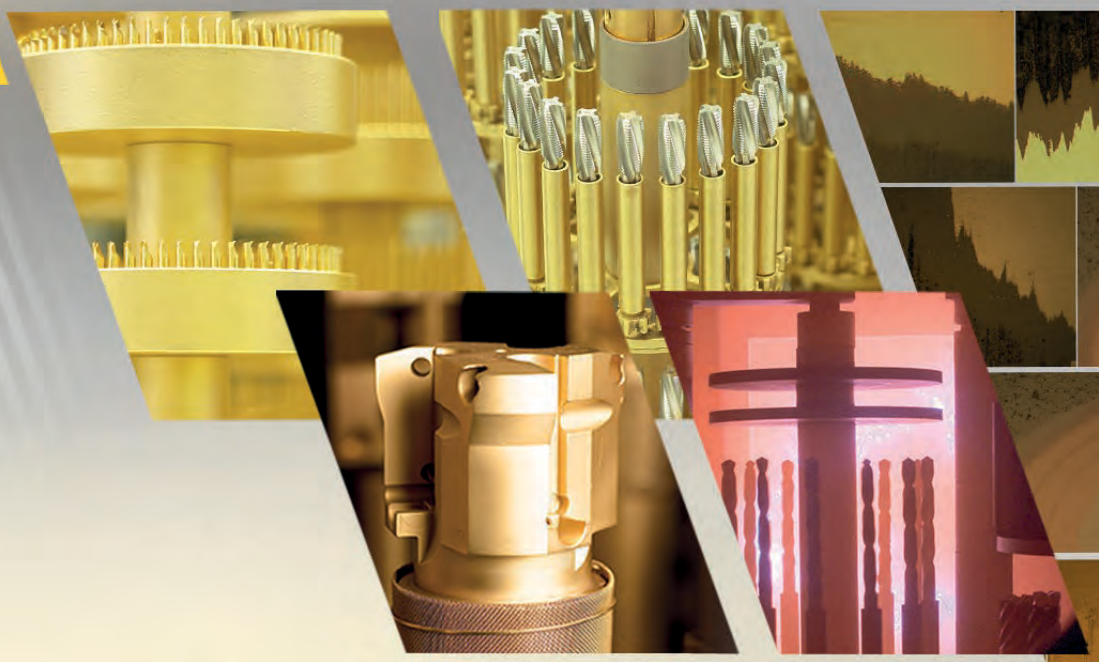
GEOMETRIAS

P&D para desenvolvimento de ferramentas



REVESTIMENTOS

Sistemas e desenvolvimento
de revestimetos próprios

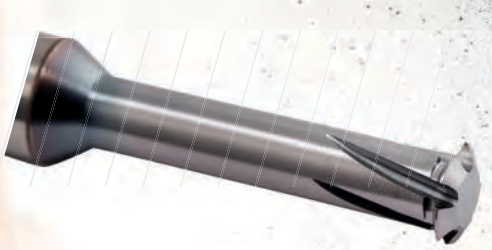


TUDO A PARTIR DE UMA FONTE

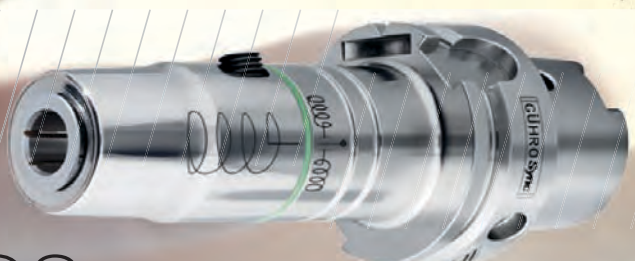
Maior variedade para sua produção com nossa linha de rosqueamento POWER



- Fresas para roscas



- Micro fresa de rosca





- GÜHROSync



❖ Machos

❖ Machos laminadores

❖ Micro laminador

SIRIUS®

NEW



USINA MAIS

ESPECIALMENTE PARA AÇOS INOXIDÁVEL, A SOLUÇÃO COM ALTA RESISTÊNCIA AO DESGATE

Mais informações sobre nosso revestimento Sirius pode ser encontrado com o código QR ou diretamente em www.guehring.de/download

Artigo Nr. 4218, vide página 38

Os novos Machos VA

NEW *Canal reforçado para alta confiabilidade do processo, combinado ao revestimento para maior vida útil*

Artigo Nr. 393, vide página 244

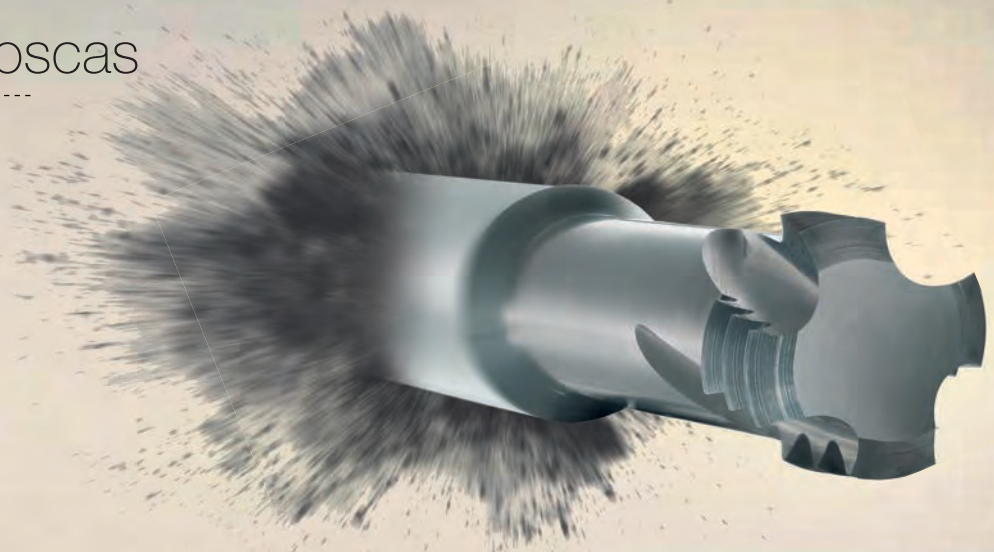


Fresas para roscas

NEW

Metal duro especial, geometria inovadora e revestimento ideal para a ferramenta perfeita

Artigo Nr. 4227, vide página 703



Usinagem de material endurecido> 45 HRC

Nova fresa de rosca com plano de fixação

NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW NEW



Agora com haste HB para fixação segura

Artigo Nr. 3556, vide página 209

Processos de produção econômicos e confiáveis com ferramentas de roscar de Guhring

NEW Micro-fresas de rosquear



Perfeição em detalhe para micro-roscas

Artigo Nr. 4226 M1.6, vide página 215
Artigo Nr. 4225 M1.8, vide página 217



Escala 1:1

LOCALIZAÇÃO

LAIZ

LOCALIZAÇÃO

TREUEN









GUHRING

LOCAIS DE PRODUÇÃO DE FERRAMENTAS PARA ROSQUEAMENTO

PICTOGRAMA
EM UM RELANCE

Código ISO

P	Aço de alta liga
M	Aço inoxidável
K	Ferro fundido cinzento/ esferoidal e ferro fundido maleável
N	Alumínio e outros materiais não ferrosos
S	Ligas especias, super, de titânio
H	Aços endurecidos e fundição dura

Nas páginas seguintes você vai encontrar preços e páginas do programa para cada recomendações da ferramenta em relação a grupos de aplicações e detalhes de max. resistência à tracção e dureza:

● Aplicação ótima
○ Aplicação limitada

Pictogramas

Material de corte

HSS | HSS-E | HSS-E-PM

Aço rápido

VHM

Metal duro Grão mais fino (HM-UF)

Profundidade de rosca

1,5xD | 2xD | 2,5xD | 3xD

Tolerance on Ø

2B | 2BX | 3B | 3BX | 4HX | 6H | 6HX | 6GX | 2a | 6g

ISO1/4H | ISO2/6H | ISO3/6G | ....

Tipo de rosca





Roscas passantes | Cego furos | Através furos e cego furos

Sentido de corte





à direita | à esquerda

Refrigeração interna




com RI | sem RI

Forma

A | B | C | C(K) | D | E

Denominação

V | M | F

machos para desbaste | p. semi-acabamento | para acabamento

Norma

DIN 352 | DIN 371 | DIN 376 | DIN 374 | DIN 371/376 | DIN 2189 | DIN 5156 | ....

conforme DIN

WN

conforme norma de empr.

Tipo

N | N R40 | H | H R15 | VA | Al | GG | Ti Ni | ....

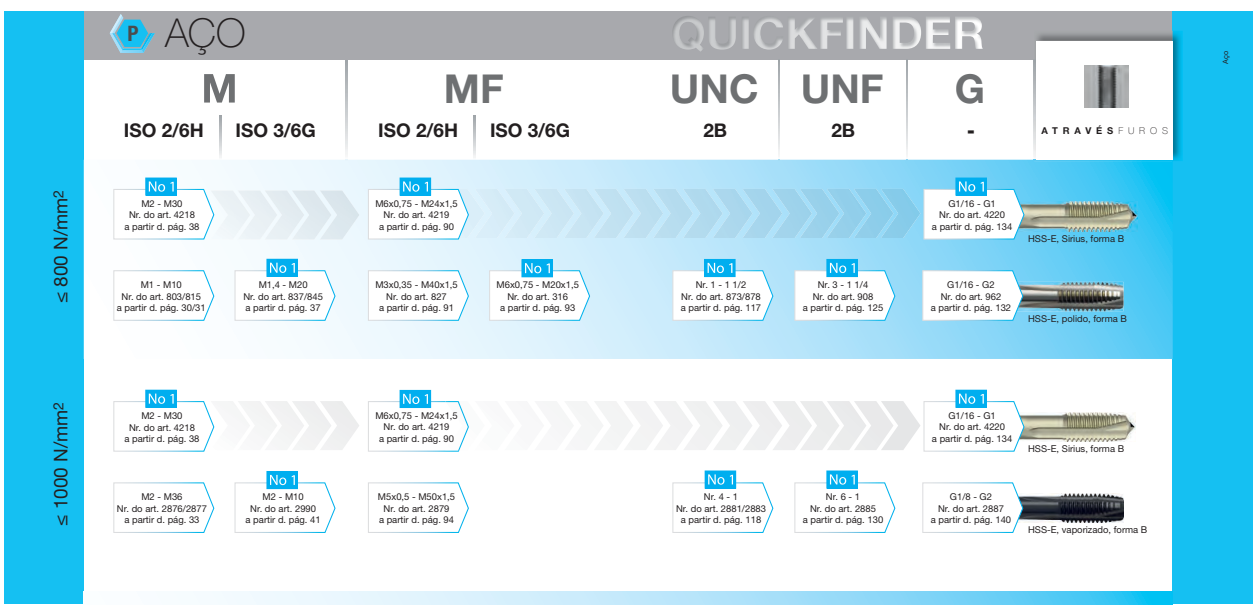
Revestimentos

- ○ polido
- ◌ parowane
- ● a vapor
- A TiAlN
- C TiCN
- Cb Carbo
- P AlCrN
- S TiN
- M MolyGlide
- S Sirius

SELEÇÃO DA FERRAMENTA FEITA FACILMENTE

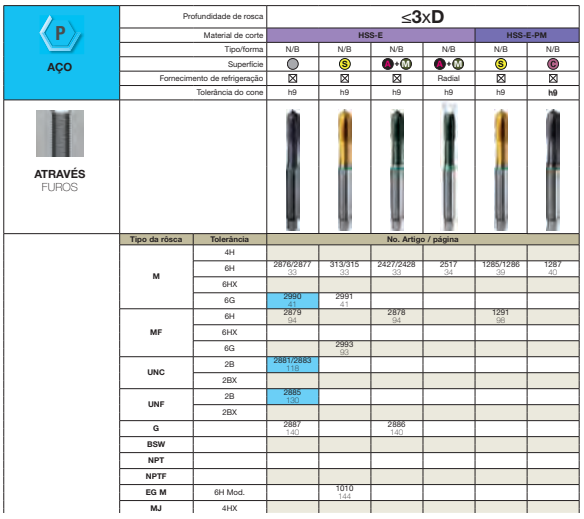
QUICKFINDER

De sua aplicação, rápido e facil para a ferramenta ideal!

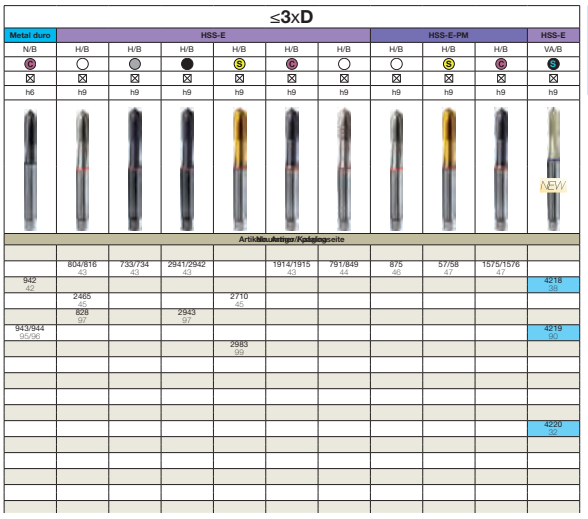


BÚSSOLA

O programa completo resumido - dados de corte recomendados incluídos!



AÇO	Profundidade de rosca	≤3xD					
	Material de corte	HSS-E				HSS-E-PM	
	Tipo/forma	N/B	N/B	N/B	N/B	N/B	N/B
	Superfície		S	M	M	S	C
	Fornecimento de refrigeração	⊠	⊠	⊠	Radial	⊠	⊠
	Tolerância do cone	h9	h9	h9	h9	h9	h9
ATRAVÉS FUROS							
Tipo da rôsca	Tolerância	No. Artigo / página					
M	4H						
	6H	2876/2877 33	313/315 33	2427/2428 33	2517 34	1285/1286 39	1287 40
	6HX						
	6G	2990 41	2991 41				
MF	6H	2879 94		2878 94		1291 98	
	6HX						
	6G		2993 93				
UNC	2B	2881/2883 118					
	2BX						
UNF	2B	2885 130					
	2BX						
G		2887 140		2886 140			
BSW							
NPT							
NPTF							
EG M	6H Mod.		1010 144				
MJ	4HX						



Metal duro	HSS-E							HSS-E-PM			HSS-E
N/B	H/B	H/B	H/B	H/B	H/B	H/B	H/B	H/B	H/B	H/B	VA/B
C				S	C				S	C	S
⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
h6	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9
											NEW
Artikkelnr./Artigo/Kodgingsseite											
	804/816 43	733/734 43	2941/2942 43		1914/1915 43	791/849 44		875 46	57/58 47	1575/1576 47	
942 42											4218 94
	2465 45			2710 45							
	828 97		2943 97								
943/944 95/96											4219 90
				2983 99							
											4220 92

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min					
P	aços estruturais e de fácil usinagem, aços sem ligas tratáveis termicamente	≤800 N/mm²	S235JR	1.0037	12	15	15	15	20	20
			C15	1.0401						
			11SMnPb30	1.0718						
	aços de fácil usinagem, aços endurecidos sem liga, aços de nitretação	800 - 1000 N/mm²	S355J2	1.0577	10	12	12	12	15	15
			C60	1.0601						
			31CrMo12	1.8515						
	aços ligados tratáveis termicamente, aços ferramenta, aços rápido	800 - 1200 N/mm²	42CrMo4	1.7225	6	8	8	8	10	10
			36CrNiMo4	1.6511						
			X36CrMo17	1.2316						
			HS 6-5-2	1.3343						

Velocidade de corte recomendada vc m/min										
40	-	-	-	-	-	-	-	-	-	25
30	6	6	6	6	6	6	8	10	10	20
25	10	10	10	12	12	10	12	15	15	15

SELECIONE E COMPRE

PÁGINA DO PRODUTO

Todos os dados em uma vista!

Machos para rosca métrica ISO

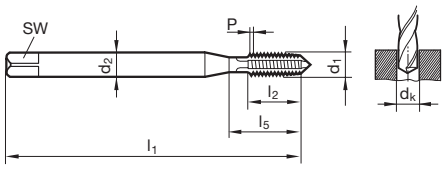
Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	☒

NEW

P	●
M	●
K	○
N	○
S	○
H	

Página de dados de corte 21

Aplicação recomendada:
- ● Aplicação ótima
- ○ Aplicação limitada





DIN 2184-1 DIN 371/DIN 376 Nr. do artigo **4218**

1 Nr. do artigo

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

2 Tamanho nominal

Por favor, sempre digite o número do artigo e do tamanho nominal na encomenda.
Por exemplo:. Macho para roscas métricas ISO de tamanho nominal M5 = 4218 5,000

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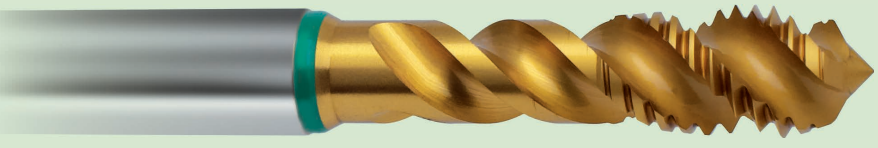
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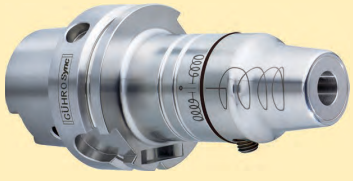












Aço

Quickfinder ..... a partir de página 10
Machos ..... a partir de página 18
Machos laminadores ..... a partir de página 26
Fresas de roscar ..... a partir de página 28

Aço inoxidável

Quickfinder ..... a partir de página 220
Machos ..... a partir de página 228
Machos laminadores ..... a partir de página 232
Fresas de roscar ..... a partir de página 234

Ferro fundido, fundição nodular e fundição maleável

Quickfinder ..... a partir de página 338
Machos ..... a partir de página 348
Machos laminadores ..... a partir de página 352
Fresas de roscar ..... a partir de página 354

Alumínio, metais não ferrosos e plásticos

Quickfinder ..... a partir de página 452
Machos ..... a partir de página 462
Machos laminadores ..... a partir de página 466
Fresas de roscar ..... a partir de página 468

Ligas especiais, super e ligas de titânio

Quickfinder ..... a partir de página 590
Machos ..... a partir de página 596
Machos laminadores ..... a partir de página 598
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Quickfinder ..... a partir de página 672
Machos ..... a partir de página 676
Fresas de roscar ..... a partir de página 678

Cossinetes ..... a partir de página 706
Machos manuais ..... a partir de página 721

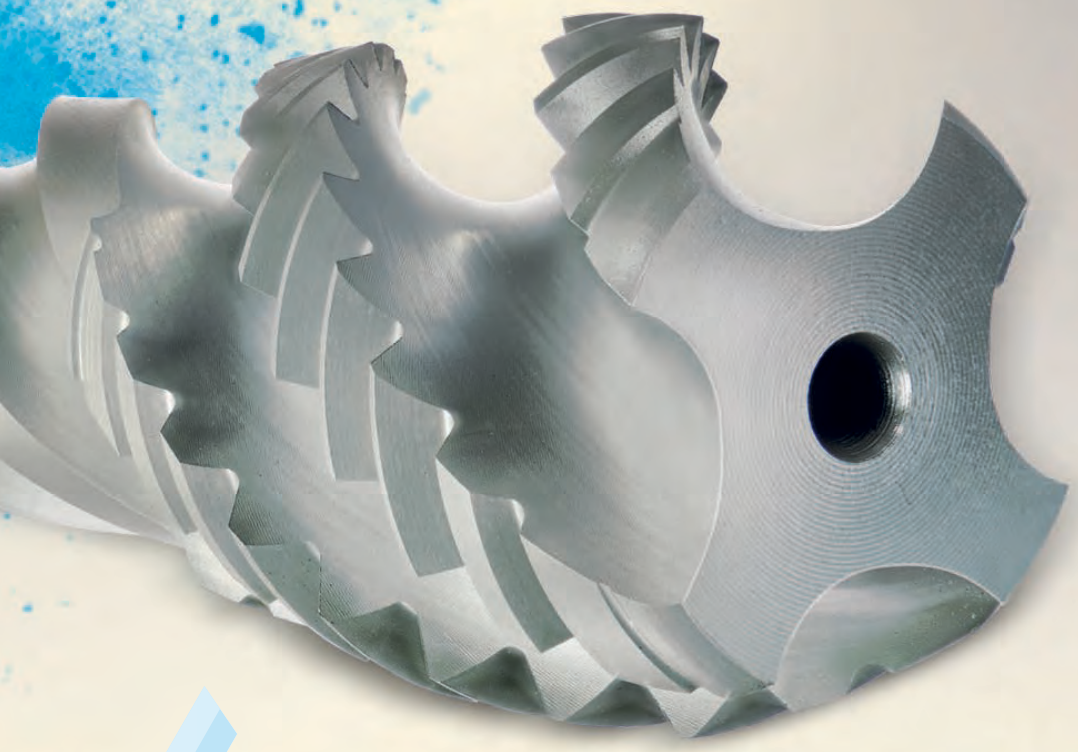
Mandris para rosqueamento ..... a partir de página 735

Informações técnicas ..... a partir de página 773

Sumário do conteúdo ..... a partir de página 824
Índice de artigos ..... a partir de página 854



Aço



P

Aços em geral com resistência à tração de 500 a 1200 N /mm^2, aços ferramenta, aços tratáveis termicamente, aço rápido

AÇO

M

ISO 2/6H

≤ 800 N/mm²

No 1
M2 - M30
Nr. do art. 4218
a partir d. pág. 38

M1 - M10
Nr. do art. 803/815
a partir d. pág. 30/31

≤ 1000 N/mm²

No 1
M2 - M30
Nr. do art. 4218
a partir d. pág. 38

M2 - M36
Nr. do art. 2876/2877
a partir d. pág. 33

≤ 1200 N/mm²

No 1
M2 - M30
Nr. do art. 4218
a partir d. pág. 38

M2 - M24
Nr. do art. 2941/2942
a partir d. pág. 43

ISO 3/6G

≤ 800 N/mm²

No 1
M1,4 - M20
Nr. do art. 837/845
a partir d. pág. 37

≤ 1000 N/mm²

No 1
M2 - M10
Nr. do art. 2990
a partir d. pág. 41

MF

ISO 2/6H

≤ 800 N/mm²

No 1
M6x0,75 - M24x1,5
Nr. do art. 4219
a partir d. pág. 90

M3x0,35 - M40x1,5
Nr. do art. 827
a partir d. pág. 91

≤ 1000 N/mm²

No 1
M6x0,75 - M24x1,5
Nr. do art. 4219
a partir d. pág. 90

M5x0,5 - M50x1,5
Nr. do art. 2879
a partir d. pág. 94

≤ 1200 N/mm²

No 1
M6x0,75 - M24x1,5
Nr. do art. 4219
a partir d. pág. 90

M3x0,35 - M24x1,5
Nr. do art. 2943
a partir d. pág. 97

ISO 3/6G

≤ 800 N/mm²

No 1
M6x0,75 - M20x1,5
Nr. do art. 316
a partir d. pág. 93

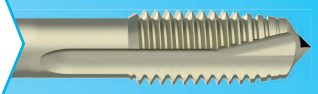
No 1 ideal tool

QUICKFINDER

UNC	UNF	G	ATRAVÉS FUROS
2B	2B	-	

Aço

No 1
G1/16 - G1
Nr. do art. 4220
a partir d. pág. 134

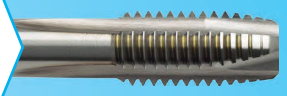


HSS-E, Sirius, forma B

No 1
Nr. 1 - 1 1/2
Nr. do art. 873/878
a partir d. pág. 117

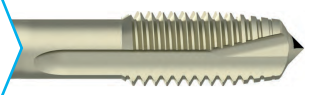
No 1
Nr. 3 - 1 1/4
Nr. do art. 908
a partir d. pág. 125

G1/16 - G2
Nr. do art. 962
a partir d. pág. 132



HSS-E, polido, forma B

No 1
G1/16 - G1
Nr. do art. 4220
a partir d. pág. 134



HSS-E, Sirius, forma B

No 1
Nr. 4 - 1
Nr. do art. 2881/2883
a partir d. pág. 118

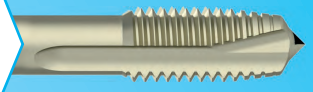
No 1
Nr. 6 - 1
Nr. do art. 2885
a partir d. pág. 130

G1/8 - G2
Nr. do art. 2887
a partir d. pág. 140



HSS-E, vaporizado, forma B

No 1
G1/16 - G1
Nr. do art. 4220
a partir d. pág. 134



HSS-E, Sirius, forma B



HSS-E, a vapor, forma B

P AÇO

M

ISO 2/6H

≤ 800 N/mm²

No 1
M2 - M30
Nr. do art. 393
a partir d. pág. 71

M2 - M30
Nr. do art. 810/822
a partir d. pág. 60

≤ 1000 N/mm²

No 1
M2 - M30
Nr. do art. 393
a partir d. pág. 71

M2 - M36
Nr. do art. 836/826
a partir d. pág. 66

≤ 1200 N/mm²

No 1
M2 - M30
Nr. do art. 393
a partir d. pág. 71

M2 - M30
Nr. do art. 2850/2851
a partir d. pág. 81

ISO 3/6G

≤ 800 N/mm²

No 1
M3 - M24
Nr. do art. 844/848
a partir d. pág. 61

≤ 1000 N/mm²

No 1
M2 - M20
Nr. do art. 2994
a partir d. pág. 73

≤ 1200 N/mm²

No 1
M2 - M10
Nr. do art. 2985
a partir d. pág. 84

MF

ISO 2/6H

≤ 800 N/mm²

No 1
M6x0,75 - M24x1,5
Nr. do art. 394
a partir d. pág. 115

M3x0,35 - M30x2
Nr. do art. 834
a partir d. pág. 105

≤ 1000 N/mm²

No 1
M6x0,75 - M24x1,5
Nr. do art. 394
a partir d. pág. 115

M5x0,5 - M30x2
Nr. do art. 2853
a partir d. pág. 107

≤ 1200 N/mm²

No 1
M6x0,75 - M24x1,5
Nr. do art. 394
a partir d. pág. 115

M6x0,75 - M24x1,5
Nr. do art. 2852
a partir d. pág. 114

ISO 3/6G

≤ 1000 N/mm²

No 1
M8x1 - M20x1,5
Nr. do art. 2999
a partir d. pág. 108

≤ 1200 N/mm²

No 1
M8x1 - M20x1,5
Nr. do art. 2988
a partir d. pág. 116

No 1 ideal tool

QUICKFINDER

UNC	UNF	G	
2B	2B	-	CEGO FUROS



No 1
G1/16 - G1
Nr. do art. 395
a partir d. pág. 139



HSS-E, TiAlN, forma C

No 1
Nr. 2 - 1
Nr. do art. 876/881
a partir d. pág. 122

No 1
Nr. 3 - 1
Nr. do art. 911
a partir d. pág. 128

G1/16 - G1 1/2
Nr. do art. 965
a partir d. pág. 136



HSS-E, polido, forma C

No 1
G1/16 - G1
Nr. do art. 395
a partir d. pág. 139



HSS-E, TiAlN, forma C

No 1
Nr.2 - 1
Nr. do art. 2855/2857
a partir d. pág. 123

No 1
Nr.10 - 7/8
Nr. do art. 2859
a partir d. pág. 129

G1/8 - G2
Nr. do art. 2861
a partir d. pág. 137



HSS-E, vaporizado, forma C

No 1
G1/16 - G1
Nr. do art. 395
a partir d. pág. 139



HSS-E, TiAlN, forma C



HSS-E, vaporizado, forma C

AÇO

M

6HX

sem canais de refrig.

No 1
M1 - M20
Nr. do art. 921/925
a partir d. pág. 149

com canais de refrig.

M3 - M39
Nr. do art. 919/923
a partir d. pág. 152

No 1
M3 - M39
Nr. do art. 2012/2013
a partir d. pág. 152

com refrigeração interna

No 1
M3 - M20
Nr. do art. 1270/1271
a partir d. pág. 159

No 1
M3 - M20
Nr. do art. 1725/1727
a partir d. pág. 159

No 1
M3 - M20
Nr. do art. 1972/1931
a partir d. pág. 163

6GX

sem canais de refrig.

No 1
M2 - M10
Nr. do art. 920
a partir d. pág. 150

com canais de refrig.

No 1
M3 - M20
Nr. do art. 918/922
a partir d. pág. 153

com refrigeração interna

No 1
M5 - M10
Nr. do art. 1713
a partir d. pág. 160

No 1
M3 - M20
Nr. do art. 1726/1728
a partir d. pág. 161

MF

6HX

sem canais de refrig.

No 1
M8x1 - M20x1,5
Nr. do art. 929
a partir d. pág. 165

com canais de refrig.

M6x0,75 - M24x1,5
Nr. do art. 1275/927
a partir d. pág. 169

No 1
M6x0,75 - M20x1,5
Nr. do art. 2008
a partir d. pág. 170

com refrigeração interna

No 1
M8x1 - M24x1,5
Nr. do art. 1272/1273
a partir d. pág. 178

No 1
M8x1 - M24x1,5
Nr. do art. 1729/1731
a partir d. pág. 178

No 1
M10x1 - M24x1,5
Nr. do art. 1581
a partir d. pág. 181

6GX

sem canais de refrig.

No 1
M8x1 - M18x1,5
Nr. do art. 928
a partir d. pág. 168

com canais de refrig.

No 1
M8x1 - M20x1,5
Nr. do art. 1277/926
a partir d. pág. 172

com refrigeração interna

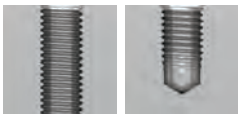
No 1
M8x1 - M24x1,5
Nr. do art. 1715/1716
a partir d. pág. 179

No 1
M8x1 - M24x1,5
Nr. do art. 1730/1732
a partir d. pág. 179

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2BX	2BX	-

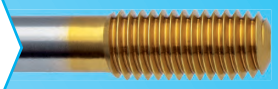


ATRAVÉS FUROS
CEGO FUROS

No 1
Nr. 4 - 7/8
Nr. do art. 2273/2274
a partir d. pág. 182

No 1
Nr. 4 - 1
Nr. do art. 1283/2275
a partir d. pág. 183

No 1
G1/16 - G1 1/4
Nr. do art. 966
a partir d. pág. 184



HSS-E, TiN, forma C

No 1
Nr. 4 - 7/8
Nr. do art. 1582/1583
a partir d. pág. 182

No 1
Nr. 4 - 1
Nr. do art. 1584/1585
a partir d. pág. 183

No 1
G1/16 - G1 1/4
Nr. do art. 1586
a partir d. pág. 184



HSS-E, TiN, forma C



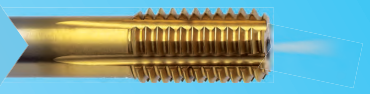
HSS-E, TiCN, forma C

FORMA C



HSS-E-PM, TiCN, forma C

FORMA E



HSS-E-PM, TiN, forma E

METAL DURO



Metal duro, TiCN, forma C

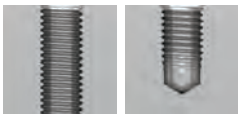
AÇO

	M UNIVERSAL	MF UNIVERSAL
1,5xD	No 1 M3 - M20 Nr. do art. 3525 a partir d. pág. 188	No 1 M4x0,5 - M16x1,5 Nr. do art. 3527 a partir d. pág. 191
2xD	No 1 M3 - M20 Nr. do art. 3526 a partir d. pág. 189	No 1 M4x0,5 - M16x1,5 Nr. do art. 3528 a partir d. pág. 192
2,5xD	No 1 M3 - M20 Nr. do art. 3759 a partir d. pág. 190	No 1 M4x0,5 - M16x1,5 Nr. do art. 3762 a partir d. pág. 193
3xD	No 1 M1,6 - M16 Nr. do art. 4226 a partir d. pág. 215	
universal	No 1 Ø8x0,5 - Ø20xP3,5 Nr. do art. 3541 a partir d. pág. 209	No 1 Ø8x0,5 - Ø20xP3,5 Nr. do art. 3541 a partir d. pág. 209

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
UNIVERSAL	UNIVERSAL	-



ATRAVÉS FUROS
CEGO FUROS



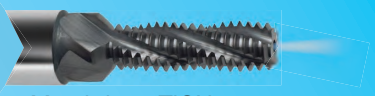
Metal duro, TiCN

No 1	No 1	No 1
1/4 - 1/2 Nr. do art. 3516 a partir d. pág. 195	1/4 - 1/2 Nr. do art. 3518 a partir d. pág. 198	1/8 - 3/8 Nr. do art. 3514 a partir d. pág. 202



Metal duro, TiCN

No 1	No 1	No 1
1/4 - 1/2 Nr. do art. 3517 a partir d. pág. 196	1/4 - 1/2 Nr. do art. 3519 a partir d. pág. 199	1/8 - 3/8 Nr. do art. 3515 a partir d. pág. 203



Metal duro, TiCN



Metal duro, TiCN

No 1	No 1	No 1
Ø10xUN24 - Ø20xUN7 Nr. do art. 3595 a partir d. pág. 211	Ø10xUN24 - Ø20xUN7 Nr. do art. 3595 a partir d. pág. 211	Ø10xG19 - Ø20xG11 Nr. do art. 3542 a partir d. pág. 212



Metal duro, TiCN

P

AÇO

ATRAVÉS
FUROS

Profundidade de rosca		≤1,5xD						
Material de corte		HSS-E						
Tipo/forma		N/C	N/C	N/C	N/D	NR28/D	N/-	
Superfície		◯	◯	◯	◯	◯	◯	
Fornecimento de refrigeração		☒	☒	☒	☒	☒	☒	
Tolerância do cone		h9	h9	h9	h9	h9	h9	
						 Brocas macho	 Machos para máquinas para porcas	
Tipo da rôsca	**Tolerância**	**No. Artigo / página**						
M	4H							
	6H	995 53		806/818 50/51	801/813 49	1839 87	851 85	
	6HX							
	6G			795 52				
MF	6H			830 100				
	6HX							
	6G			829 121				
UNC	2B			1977				
	2BX							
UNF	2B			1987 126				
	2BX							
G				963 133				
BSW								
NPT			973 146					
NPTF								
EG M	6H Mod.							
MJ	4HX							
MJF	4HX							
UNJC	3BX							
UNJF	3BX							
PG			979 147					
Lubrificante adequado		◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	

= No 1

◯ = Ar
● = Óleo integral
◯ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min					
P	aços estruturais e de fácil usinagem, aços sem ligas tratáveis termicamente	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**6**	**6**	**6**	**6**	**6**	**6**
	aços de fácil usinagem, aços endurecidos sem liga, aços de nitretação	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	-	4	-	-	-	-
	aços ligados tratáveis termicamente, aços ferramenta, aços rápido	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	-	-	-	-	-	-

≤1,5xD			≤3xD							
HSS-E										
N/B	N/B	N/B	NL15/D	N/B	N/B	N/B	N/B	N/B	N/B	N/B
◯	◯	◯	◯	◯	◯	◯	●	S	C	◯
☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9
 para usinagem de chapas	 para usinagem de chapas				 machos com haste passante					 rosca esquerda
No. Artigo / página										
						794 36				
839/847 54	838/846 54	802 55	808/820 89	991 35	998 86	803/815 30/31	945/948 30/31	912/915 30/31	1246/1249 30/31	789/790 32
796 56	869 56	797 56				837/845 37				
						827 91	2888 91	832 91		
						316 93				
						873/878 117	2889/2890 117			
						908 125	2891 125			
						962 132	2894 132			
							2892/2893 142			
				980 147						
◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△

Velocidade de corte recomendada vc m/min										
10	**10**	**10**	**10**	**10**	**6**	**10**	**10**	**12**	**12**	**10**
-	-	-	-	6	-	6	6	8	8	6
-	-	-	-	-	-	-	-	-	-	-

P

AÇO

ATRAVÉS
FUROS



Profundidade de rosca		≤3xD						
Material de corte		HSS-E				HSS-E-PM		
Tipo/forma		N/B	N/B	N/B	N/B	N/B	N/B	
Superfície		○	S	A+M	A+M	S	C	
Fornecimento de refrigeração		☒	☒	☒	Radial	☒	☒	
Tolerância do cone		h9	h9	h9	h9	h9	h9	
								
Tipo da rôsca	**Tolerância**	**No. Artigo / página**						
M	4H							
	6H	2876/2877 33	313/315 33	2427/2428 33	2517 34	1285/1286 39	1287 40	
	6HX							
	6G	2990 41	2991 41					
MF	6H	2879 94		2878 94		1291 98		
	6HX							
	6G		2993 93					
UNC	2B	2881/2883 118						
	2BX							
UNF	2B	2885 130						
	2BX							
G		2887 140		2886 140				
BSW								
NPT								
NPTF								
EG M	6H Mod.		1010 144					
MJ	4HX							
MJF	4HX							
UNJC	3BX							
UNJF	3BX							
PG								
Lubrificante adequado		○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
□ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min					
P	aços estruturais e de fácil usinagem, aços sem ligas tratáveis termicamente	≤800 N/mm²	S235JR	1.0037	**12**	**15**	**15**	**15**	**20**	**20**
			C15	1.0401						
			11SMnPb30	1.0718						
	aços de fácil usinagem, aços endurecidos sem liga, aços de nitretação	800 - 1000 N/mm²	S355J2	1.0577	**10**	**12**	**12**	**12**	**15**	**15**
			C60	1.0601						
			31CrMo12	1.8515						
	aços ligados tratáveis termicamente, aços ferramenta, aços rápido	800 - 1200 N/mm²	42CrMo4	1.7225	6	8	8	8	**10**	**10**
			36CrNiMo4	1.6511						
			X36CrMo17	1.2316						
			HS 6-5-2	1.3343						

≤3xD

Metal duro	HSS-E						HSS-E-PM			HSS-E
N/B	H/B	H/B	H/B	H/B	H/B	H/B	H/B	H/B	H/B	VA/B
C	○	●	●	S	C	○	○	S	C	S
☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
h6	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9
										 NEW
No. Artigo / página										
	804/816 43	733/734 43	2941/2942 43		1914/1915 43	791/849 44	875 46	57/58 47	1575/1576 47	
942 42										4218 38
	2465 45			2710 45						
	828 97		2943 97							
943/944 95/96										4219 90
				2983 99						
										4220 32
				980 147						
●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△

Velocidade de corte recomendada vc m/min										
40	-	-	-	-	-	-	-	-	-	**25**
30	6	6	6	6	6	6	8	10	10	**20**
25	**10**	**10**	**10**	**12**	**12**	**10**	**12**	**15**	**15**	**15**

AÇO

CEGO
FUROS

	Profundidade de rosca	≤1,5xD							
	Material de corte	HSS-E							
	Tipo/forma	N/C	N/C	N/C	NR15/C	NR15/C	NR15/C	NR15/C	NR15/C
	Superfície	○	○	○	○	○	●	Ⓢ	○
	Fornecimento de refrigeração	☒	☒	☒	☒	☒	☒	☒	Axial
	Tolerância do cone	h9	h9	h9	h9	h9	h9	h9	h9
									
Tipo da rôsca	**Tolerância**	**No. Artigo / página**							
M	4H								
	6H	995 53		806/818 50/51	992 58	809/821 57	946/949 57	913/916 57	1891/1898 59
	6HX								
	6G			795 52		799 52			
MF	6H			830 100		833 102	2838 102	1971 102	1905 104
	6HX								
	6G			829 100					
UNC	2B			1977 121		1978 119	2839/2840 120		
	2BX								
UNF	2B			1987 126		1988 127	2841 127		
	2BX								
G				963 133		964 135	2842 135		
BSW									
NPT			973 146						
NPTF									
EG M	6H Mod.								
MJ	4HX								
MJF	4HX								
UNJC	3BX								
UNJF	3BX								
PG			979 147						
Lubrificante adequado		○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
● = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min							
P	aços estruturais e de fácil usinagem, aços sem ligas tratáveis termicamente	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**6**	**6**	**6**	**8**	**8**	**8**	**10**	**8**
	aços de fácil usinagem, aços endurecidos sem liga, aços de nitretação	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	-	-	-	-	-	-	-	-
	aços ligados tratáveis termicamente, aços ferramenta, aços rápido	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	-	-	-	-	-	-	-	-

≤1,5xD					≤2xD					≤3xD				
HSS-E			HSS-E-PM		HSS-E		HSS-E-PM			HSS-E				
NR15/C	NR15/C	NR15/E	HR15/C	HR15/C	H/C	H/C	H/C	H/E	HR15/C	NR40/C	NR40/C	NR40/C	NR40/C	NR40/C
S	C	C	○	A	C	C	C	C	C	○	○	○	●	S
Axial	☒	☒	☒	☒	Axial	Axial	Axial	Axial	Axial	☒	☒	☒	☒	☒
h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9
					 cavacos curtos	 cavacos curtos, extra longa	 cavacos curtos	 cavacos curtos	 cavacos curtos, cortes sem revest.		 extra longa			
No. Artigo / página														
2436/2437 59	4154 48	4155 48	872/935 76	1577/1578 76						993 65	888 88	810/822 60	783/784 60	914/917 60
					778 79	779 80	302/297 78	1091/4165 78	1188/1194 77					
												844/848 61		
	4156 103	4157 103	874 112							1970 106		834 105	2843 105	852 105
							1090 113	1007 113	1200 112					
												876/881 122	2844/2845 122	
												911 128	2846 128	
		4158 135										965 136	2849 136	
													2847/2848 143	
○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△/□	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△

Velocidade de corte recomendada vc m/min														
10	15	15	-	-	-	-	-	-	-	8	8	8	8	12
-	10	10	-	-	15	15	15	15	12	-	-	-	-	-
-	8	8	4	6	12	12	12	12	10	-	-		-	-

AÇO

CEGO
FUROS

Profundidade de rosca		≤3xD							
Material de corte		HSS-E							
Tipo/forma		NR40/C	NL40/C	NR40/C	NR40/C	NR40/C	NR40/E	NR40/C	NR40/C
Superfície		C	○	○	S	○	○	●	S
Fornecimento de refrigeração		☒	☒	Axial	Axial	☒	☒	☒	☒
Tolerância do cone		h9	h9	h9	h9	h9	h9	h9	h9
			 rosca esquerda						
Tipo da rôsca	**Tolerância**	**No. Artigo / página**							
M	4H								
	6H	1252/1254 60	786/787 62	1893 63	2438/2439 64	889/890 66	2790/2791 69	836/826 66	2440/2441 66
	6HX								
	6G							2994 73	2995 73
MF	6H					2424 107	2792 107	2853 107	
	6HX								
	6G					2998 108		2999 108	1049 108
UNC	2B					2854/2856 123		2855/2857 123	
	2BX								
UNF	2B							2859 129	
	2BX								
G						2860 137		2861 137	
BSW									
NPT									
NPTF									
EG M	6H Mod.								1011 145
MJ	4HX								
MJF	4HX								
UNJC	3BX								
UNJF	3BX								
PG									
Lubrificante adequado		●/△	●/△	●/△	●/△	●/△	●/△	●/△	●/△

= No 1

○ = Ar
● = Óleo integral
● = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min							
P	aços estruturais e de fácil usinagem, aços sem ligas tratáveis termicamente	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**12**	**8**	**8**	**12**	**10**	**10**	**10**	**15**
	aços de fácil usinagem, aços endurecidos sem liga, aços de nitretação	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	-	-	-	-	**8**	**8**	**8**	**10**
	aços ligados tratáveis termicamente, aços ferramenta, aços rápido	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	-	-	-	-	4	4	6	8

≤3xD

HSS-E		HSS-E-PM				HSS-E						HSS-E-PM		HSS-E
NR40/C	NR40/C	NR40/C	NR40/C	NR50/C	NR50/C	HR40/C	HR40/C	HR40/C	HR40/C	HR40/C	HR40/C	VAR50/C	VAR50/C	VAR45/C
S	S	S	C	S	C	○	○	●	S	C	○	S	C	A
☒	☒	☒	☒	☒	Axial	☒	☒	☒	☒	☒	Axial	☒	Axial	☒
h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h6	h6	h9
ferramenta com correção	extra longa											machos para rosca Synchro	machos para rosca Synchro	
No. Artigo / página														
174/196 70		1288/1289 72	1290 73	767/1098 74	1152/1293 74	811/823 81	947/950 81	2850/2851 81	361/362 82	1916/1917 82	1894/1901 83			
	4153 67											761/763 75	1139/1142 75	393 71
								2985 84	2986 84					
273 109		1292 109		1100 110	1294 110	835 114	2940 114	2852 114						
												764 111	1144 111	394 115
								2988 116	2989 116					
1837 124														
1838 131														
937 141												4159 138		395 139
○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△/□	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△/□	○/●/△

Velocidade de corte recomendada vc m/min														
15	15	15	15	15	20	-	-	-	-	-	-	15	20	20
10	10	10	10	12	15	-	-	-	-	-	-	12	15	15
8	8	8	8	8	10	6	6	6	8	10	6	8	10	10

AÇO

ATRAVÉS FUROS E
CEGO FUROS



		≤1,5xD			≤3xD		
Material de corte		HSS-E	HSS-E-PM	Metal duro	HSS-E		
Tipo/forma		N/C	N/C	N/C	N/C	N/C	N/C
Superfície		S	S	S	S	C	P
Fornecimento de refrigeração		☒	☒	Axial	☒	☒	☒
Tolerância do cone		h9	h9	h6	h9	h9	h9
Tipo da rôsca	**Tolerância**	**No. Artigo / página**					
M	4H						
	6HX	921/925 149	1255/1256 149	2518 151	919/923 152	2012/2013 152	1587/1589 152
	6G						
	6GX	920 150	903/952 149		918/922 153		1588/1590 153
MF	6HX	929 165	1257/1258 166		1275/927 169	2008 170	1591/1593 169
	6G						
	6GX	928 168	1740 167		1277/926 172		1592 171
UNC	2B						
	2BX	2273/2274 182			1582/1583 182		
UNF	2B						
	2BX	1283/2275 183			1584/1585 183		
G		966 184			1586 184		
BSW							
NPT							
NPTF							
EG M	6H Mod.						
MJ	4HX						
MJF	4HX						
UNJC	3BX						
UNJF	3BX						
PG							
Lubrificante adequado		○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min					
P	aços estruturais e de fácil usinagem, aços sem ligas tratáveis termicamente	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**12**	**15**	**35**	**15**	**15**	**15**
	aços de fácil usinagem, aços endurecidos sem liga, aços de nitretação	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	**12**	**15**	**35**	**15**	**15**	**15**
	aços ligados tratáveis termicamente, aços ferramenta, aços rápido	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	10	**12**	**25**	**12**	**12**	**12**

≤3xD

HSS-E		HSS-E-PM								Metal duro	
N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/E	N/C	N/E
S	C	S	S	P	S	S	C	A	S	C	C
Axial	Radial	⊠	⊠	⊠	Radial	Axial	Radial	Radial	Axial	Radial	Radial
h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h6	h6
											
No. Artigo / página											
2442/2444 156	2446/2448 156	322/339 154	1266/1267 155	1599/1707 155	323/342 158	4143 162	1270/1271 159	1717/1719 159	1725/1727 159	1972/1931 163	1927 164
2443/2445 156	2447 157			1705/1708 153			1713 160	1718/1720 161	1726/1728 161		
		333 173	1268/1269 174	1711 175	338 177	4145 180	1272/1273 178	1721/1723 178	1729/1731 178	1581 181	
				1710/1712 176			1715/1716 179		1730/1732 179		
○/●/△	○/●/△/□	○/●/△	○/●/△	●/△	○/●/△/□	○/●/△	○/●/△/□	○/●/△/□	○/●/△	○/●/△/□	○/●/△/□

Velocidade de corte recomendada vc m/min											
15	15	20	20	20	20	20	20	20	20	35	35
15	15	20	20	20	20	20	20	20	20	35	35
12	12	15	15	15	15	15	15	15	15	25	25

AÇO

ATRAVÉS FUROS E **CEGO** FUROS



Profundidade de rosca	≤2xD				≤2,5xD		≤1,5xD	
Material de corte		Metal duro						
Tipo	TM SP	TM SP	TM SP	TM SP	TM SP	TM SP	TMC SP	TMC SP
Superfície	C	C	C	C	C	C	C	C
Fornecimento de refrigeração	☒	☒	Axial	Axial	Axial	Axial	Axial	Axial
Forma da haste	HA	HB	HA	HB	HA	HB	HA	HA
Espiral	27°	27°	27°	27°	27°	27°	10°	10°

Tipo da rôsca	No. Artigo / página							
M	4132 186	4133 186	3737 186	3743 186	3735 187	3740 187	3525 188	3543 188
MF			3737 186	3743 186			3527 191	3545 191
UNC			4134 194	4135 194			3516 195	3534 195
UNF			4136 197	4137 197			3518 198	3536 1989
G			3745 200	3748 200	3746 201	3750 201	3514 202	3529 202
BSW								
NPT			3753 205	3754 205			3520 206	3538 206
NPTF			3756 207	3757 207			3521 208	3539 208
EG M	Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar							
MJ								
MJF								
UNJC								
UNJF								
PG								
Lubrificante adequado	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Recomendações de aplicação							
P	aços estruturais e de fácil usinagem, aços sem ligas tratáveis termicamente	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	++	++	++	++	++	++	++	++
	aços de fácil usinagem, aços endurecidos sem liga, aços de nitretação	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	++	++	++	++	++	++	++	++
	aços ligados tratáveis termicamente, aços ferramenta, aços rápido	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	+	+	+	+	+	+	++	++

≤2xD		≤2,5xD		universal				≤3xD	
Metal duro									
TMC SP	TMC SP	TMC SP	TMC SP	TMU SP	TMU SP	TMU SP	TMU SP	MTM 3 SP	MTM 1 SP
C	C	C	C	C	C	C	C	C	C
Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	☒	☒
HA	HB	HA	HB	HA	HB	HA	HB	HA	HA
10°	10°	27°	27°	15°	15°	15°	15°	15°	15°
									
No. Artigo / página									
3526 189	3544 189	3759 190	3760 190	3541 209	3556 209	4162 210	4163 210	4226 215	4225 217
3528 192	3546 192	3762 193	3763 193	3541 209	3556 209	4162 210	4163 210		4225 217
3517 196	3535 196			3595 211	3596 211				
3519 199	3537 199			3595 211	3596 211				
3515 203	3533 203	3765 204	3766 204	3542 212	3557 212	3542 212	3557 212	4228 212	
				3768 213	3769 213				
				3772 214	3773 214				
Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar									
○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

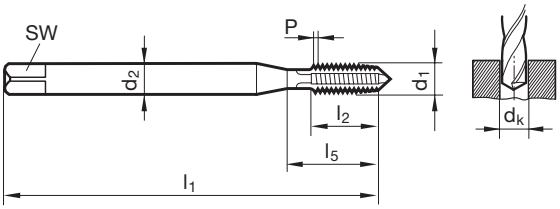
Recomendações de aplicação									
++	++	++	++	++	++	++	++	++	++
++	++	++	++	++	++	++	++	++	++
++	++	++	++	++	++	++	++	++	++

Machos para rosca métrica ISO

Material de corte	HSS-E				
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H	ISO2/6H	
Superfície	○	S	●	C	
Tipo	N	N	N	N	
Forma	B	B	B	B	
Refrigeração interna	✕	✕	✕	✕	

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19





DIN 2184-1 DIN 371 — Nr. do artigo: **803** | **912** | **945** | **1246**

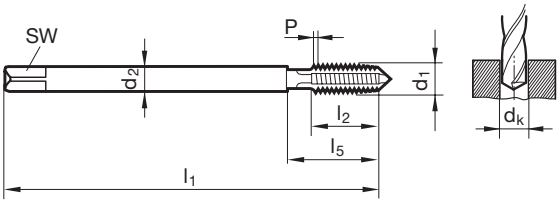
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,75	40,000	5,500	
M1,2	0,250	2,500	2,100	0,95	40,000	5,500	
M1,4	0,300	2,500	2,100	1,10	40,000	7,000	
M1,6	0,350	2,500	2,100	1,25	40,000	8,000	
M1,7	0,350	2,500	2,100	1,35	40,000	8,000	
M1,8	0,350	2,500	2,100	1,45	40,000	8,000	
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M2,3	0,400	2,800	2,100	1,90	45,000	9,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M7	1,000	7,000	5,500	6,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Machos para rosca métrica ISO

Material de corte		HSS-E			
Tolerância do Ø		ISO2/6H	ISO2/6H	ISO2/6H	ISO2/6H
Superfície		○	S	●	C
Tipo		N	N	N	N
Forma		B	B	B	B
Refrigeração interna		⊠	⊠	⊠	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19





DIN 2184-1 DIN 376	Nr. do artigo	815	915	948	1249

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1,6	0,350	1,200		1,25	40,000	8,000	
M1,8	0,350	1,200		1,45	40,000	8,000	
M2	0,400	1,400		1,60	45,000	8,000	13,500
M2,2	0,450	1,600		1,75	45,000	9,000	14,500
M2,3	0,400	1,600		1,90	45,000	9,000	14,500
M2,5	0,450	1,800		2,05	50,000	9,000	14,500
M2,6	0,450	1,800		2,15	50,000	9,000	14,500
M3	0,500	2,200		2,50	56,000	10,000	18,000
M3,5	0,600	2,500	2,100	2,90	56,000	12,000	20,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M7	1,000	5,500	4,300	6,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	29,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	32,00	200,000	50,000	102,000
M39	4,000	32,000	24,000	35,00	200,000	50,000	107,000
M42	4,500	32,000	24,000	37,50	200,000	56,000	112,000
M45	4,500	36,000	29,000	40,50	220,000	58,000	117,000
M48	5,000	36,000	29,000	43,00	250,000	65,000	127,000
M52	5,000	40,000	32,000	47,00	250,000	65,000	128,000

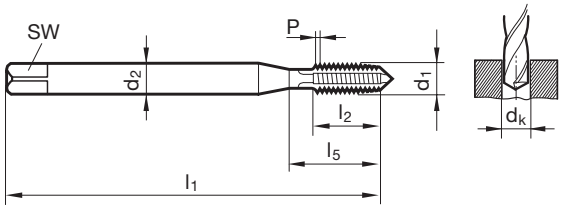
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N-LH
Forma	B
Refrigeração interna	⊠

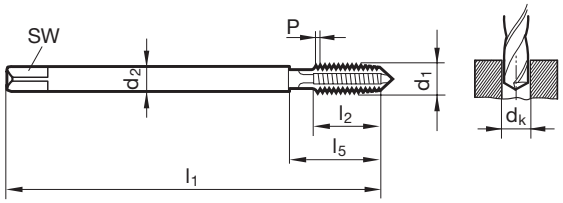
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **789**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **790**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

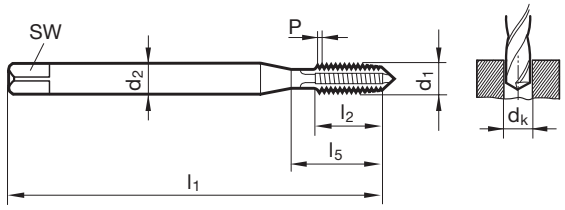
Machos para rosca métrica ISO

P	≤ 1000
M	○
K	
N	
S	
H	

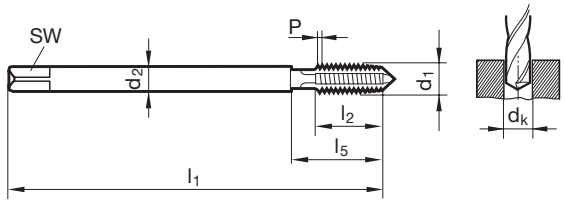
Página de dados de corte 20

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	S	A+M	
Tipo	N	N	N
Forma	B	B	B
Refrigeração interna			

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo: **313** | **2427** | **2876**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **315** | **2428** | **2877**

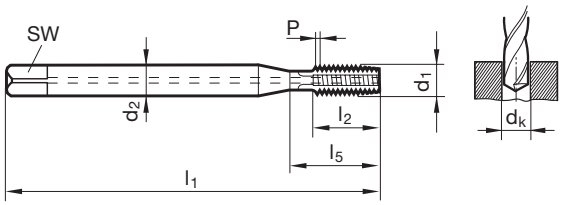
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000
M36	4,000	28,000	22,000	32,00	200,000	50,000	102,000

Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	ISO2/6H
Superfície	A+M
Tipo	N
Forma	B
Refrigeração interna	

P	≤ 1000
M	○
K	
N	
S	
H	

Página de dados de corte 20





DIN 2184-1 DIN 371 Nr. do artigo **2517**

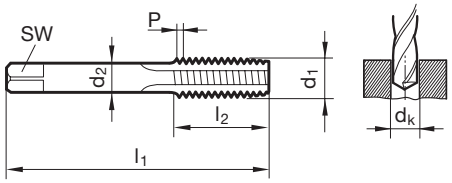
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19





DIN 2184-2 DIN 352 — Nr. do artigo **991**

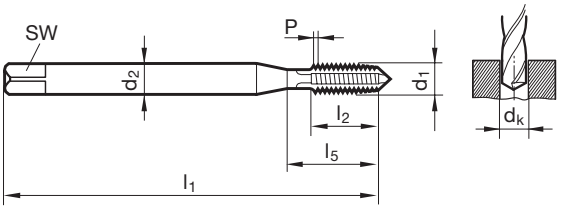
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	36,000	8,000	
M2,2	0,450	2,800	2,100	1,75	36,000	9,000	
M2,3	0,400	2,800	2,100	1,90	36,000	9,000	
M2,5	0,450	2,800	2,100	2,05	40,000	9,000	
M2,6	0,450	2,800	2,100	2,15	40,000	9,000	
M3	0,500	3,500	2,700	2,50	40,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	45,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	45,000	12,000	21,000
M4,5	0,750	6,000	4,900	3,70	50,000	14,000	24,000
M5	0,800	6,000	4,900	4,20	50,000	14,000	24,000
M6	1,000	6,000	4,900	5,00	56,000	16,000	27,000
M7	1,000	6,000	4,900	6,00	56,000	16,000	32,000
M8	1,250	6,000	4,900	6,80	63,000	17,000	32,000
M9	1,250	7,000	5,500	7,80	63,000	17,000	32,000
M10	1,500	7,000	5,500	8,50	70,000	20,000	36,000
M11	1,500	8,000	6,200	9,50	70,000	20,000	36,000
M12	1,750	9,000	7,000	10,20	75,000	24,000	40,000
M14	2,000	11,000	9,000	12,00	80,000	26,000	42,000
M16	2,000	12,000	9,000	14,00	80,000	26,000	45,000
M18	2,500	14,000	11,000	15,50	95,000	30,000	50,000
M20	2,500	16,000	12,000	17,50	95,000	32,000	50,000
M22	2,500	18,000	14,500	19,50	100,000	32,000	50,000
M24	3,000	18,000	14,500	21,00	110,000	36,000	60,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO1/4H
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊗

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19





DIN 2184-1 DIN 371 Nr. do artigo **794**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M7	1,000	7,000	5,500	6,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

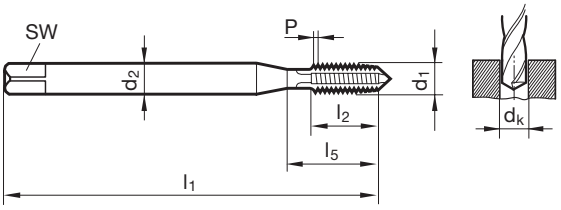
Machos para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	ISO3/6G
Superfície	○
Tipo	N
Forma	B
Refrigeração interna	⊠

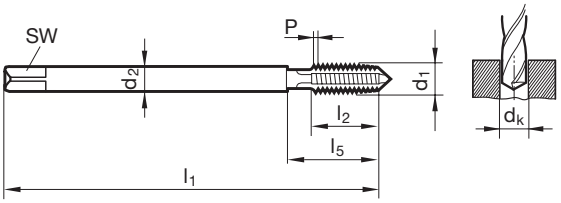
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **837**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1,4	0,300	2,500	2,100	1,10	40,000	7,000	
M1,6	0,350	2,500	2,100	1,25	40,000	8,000	
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **845**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	1,400	1,250	1,60	45,000	8,000	13,500
M3	0,500	2,200	1,800	2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

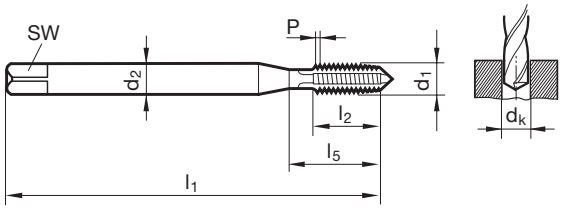
Machos para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	

NEW

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 21





DIN 2184-1 DIN 371/DIN 376 Nr. do artigo **4218**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

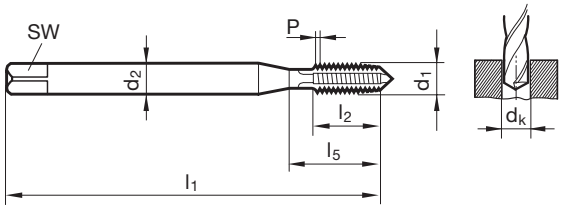
Machos para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	ISO2/6H
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	

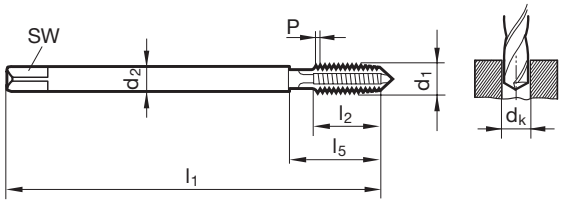
P	≤ 1000
M	○
K	
N	
S	
H	

Página de dados de corte 20

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **1285**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **1286**

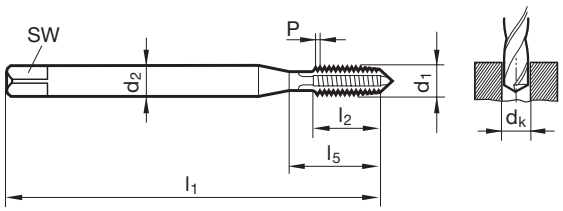
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Machos para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	ISO2/6H
Superfície	C
Tipo	N
Forma	B
Refrigeração interna	

P	≤ 1000
M	○
K	
N	
S	
H	

Página de dados de corte 20





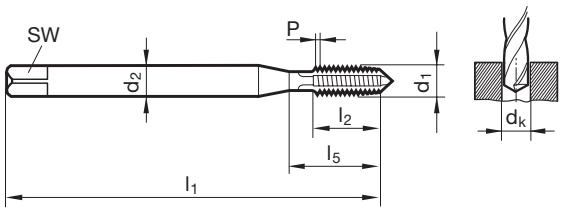
DIN 2184-1 DIN 371 Nr. do artigo **1287**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Machos para rosca métrica ISO

P	≤ 1000	Página de dados de corte 20
M	○	
K		
N		
S		
H		

Material de corte	HSS-E	
Tolerância do Ø	ISO3/6G	ISO3/6G
Superfície		S
Tipo	N	N
Forma	B	B
Refrigeração interna		







DIN 2184-1 DIN 371 Nr. do artigo **2990** **2991**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

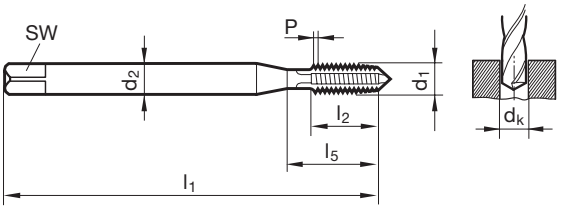
Machos para rosca métrica ISO



P	≤ 1000
M	
K	
N	
S	
H	

Página de dados de corte 21

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	B
Refrigeração interna	





DIN 2184-1 ~DIN 371 Nr. do artigo **942**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	12,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	15,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	19,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	22,500	39,000
M12	1,750	12,000	9,000	10,20	110,000	26,500	49,000

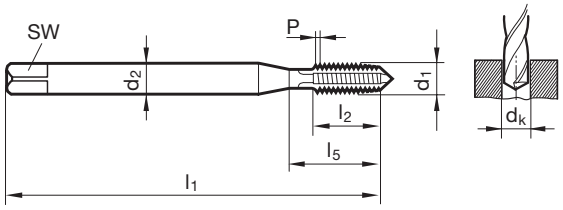
Machos para rosca métrica ISO

Material de corte	HSS-E				
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H	ISO2/6H	
Superfície	●	○	C	●	
Tipo	H	H	H	H	
Forma	B	B	B	B	
Refrigeração interna	✕	✕	✕	✕	

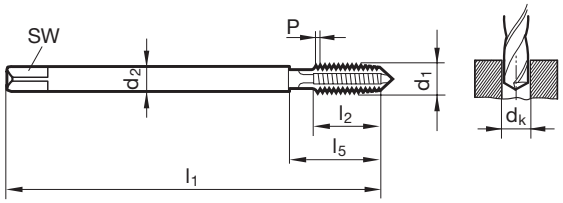
P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 21

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo: **733** | **804** | **1914** | **2941**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M2,3	0,400	2,800	2,100	1,90	45,000	9,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **734** | **816** | **1915** | **2942**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200	1,800	2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000

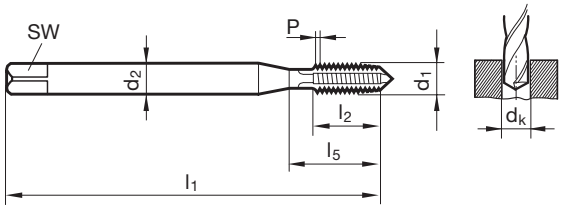
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	H AZ
Forma	B
Refrigeração interna	⊠

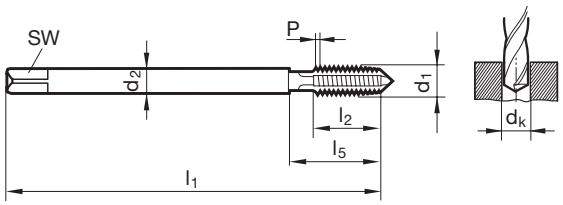
P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 21

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **791**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **849**

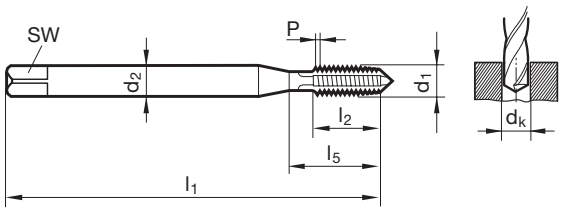
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Machos para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO3/6G	ISO3/6G
Superfície	◯	Ⓢ
Tipo	H	H
Forma	B	B
Refrigeração interna	⊠	⊠

P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 21







DIN 2184-1 DIN 371 — Nr. do artigo **2465** **2710**

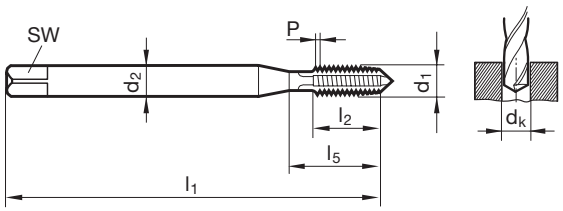
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Machos para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	H
Forma	B
Refrigeração interna	⊗

P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 21





DIN 2184-1 DIN 371 Nr. do artigo **875**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

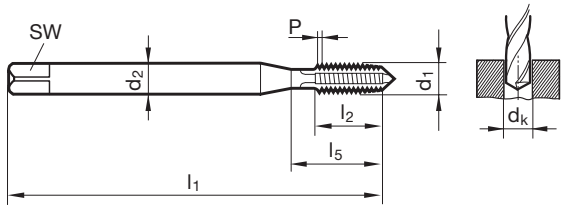
Machos para rosca métrica ISO

P	≤ 1200
M	
K	
N	
S	
H	

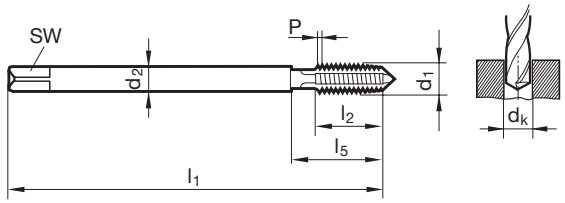
Página de dados de corte 21

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	A
Tipo	H	H
Forma	B	B
Refrigeração interna		

DIN 371



DIN 376







DIN 2184-1 DIN 371 — Nr. do artigo **57** **1575**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **58** **1576**

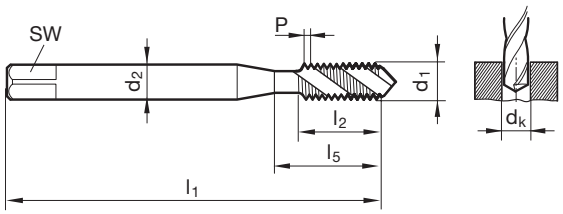
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

Machos para rosca métrica ISO

Material de corte		HSS-E	
Tolerância do Ø		ISO2/6H	ISO2/6H
Superfície		C	C
Tipo		N R15	N R15
Forma		C	E
Refrigeração interna			

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 23







DIN 2184-1 DIN 371/DIN 376 | Nr. do artigo | **4154** | **4155**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

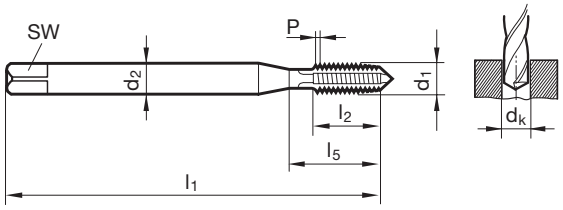
Machos para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	D
Refrigeração interna	⊠

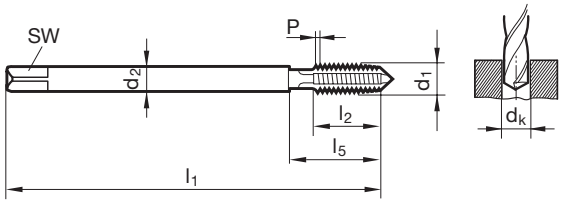
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **801**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M2,3	0,400	2,800	2,100	1,90	45,000	9,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **813**

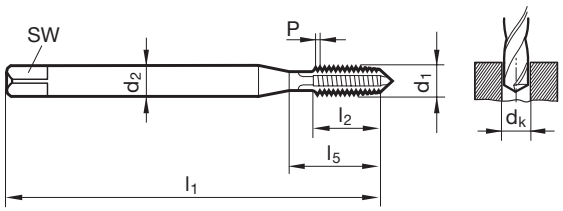
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	1,400		1,60	45,000	8,000	13,500
M2,3	0,400	1,600	1,250	1,90	45,000	9,000	14,500
M2,5	0,450	1,800		2,05	50,000	9,000	14,500
M2,6	0,450	1,800	1,400	2,15	50,000	9,000	14,500
M3	0,500	2,200		2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000
M27	3,000	20,000	16,000	24,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	C
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

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DIN 2184-1 DIN 371 Nr. do artigo **806**

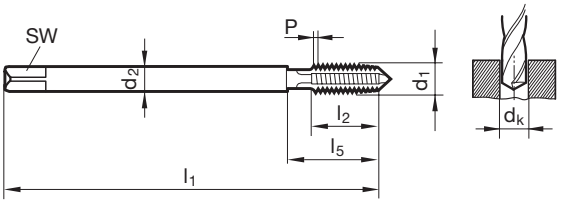
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,75	40,000	5,500	
M1,2	0,250	2,500	2,100	0,95	40,000	5,500	
M1,4	0,300	2,500	2,100	1,10	40,000	7,000	
M1,6	0,350	2,500	2,100	1,25	40,000	4,500	
M1,7	0,350	2,500	2,100	1,35	40,000	4,500	
M1,8	0,350	2,500	2,100	1,45	40,000	4,500	
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,3	0,400	2,800	2,100	1,90	45,000	4,500	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	C
Refrigeração interna	⊗

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18/22





DIN 2184-1 DIN 376 Nr. do artigo **818**

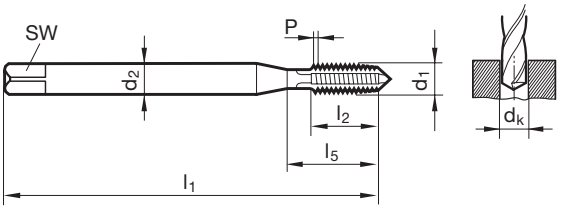
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1,6	0,350	1,200		1,25	40,000	4,500	
M1,7	0,350	1,200		1,35	40,000	4,500	
M2	0,400	1,400		1,60	45,000	4,500	13,500
M2,5	0,450	1,800		2,05	50,000	5,000	14,500
M2,6	0,450	1,800		2,15	50,000	5,000	14,500
M3	0,500	2,200		2,50	56,000	6,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000
M36	4,000	28,000	22,000	32,00	200,000	40,000	102,000
M42	4,500	32,000	24,000	37,50	200,000	45,000	112,000
M48	5,000	36,000	29,000	43,00	250,000	50,000	127,000

Machos para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO3/6G	ISO3/6G
Superfície	◯	◯
Tipo	N	N R15
Forma	C	C
Refrigeração interna	✕	✕

P	≤ 800
M	
K	
N	
S	
H	

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DIN 2184-1 DIN 371 — Nr. do artigo: **795** | **799**

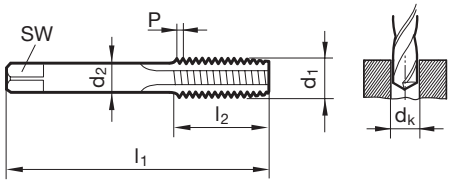
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	5,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	C
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18/22





DIN 2184-2 DIN 352 — Nr. do artigo **995**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2,2	0,450	2,800	2,100	1,75	36,000	9,000	
M2,3	0,400	2,800	2,100	1,90	36,000	9,000	
M2,5	0,450	2,800	2,100	2,05	40,000	9,000	
M3	0,500	3,500	2,700	2,50	40,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	45,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	45,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	50,000	8,500	24,000
M6	1,000	6,000	4,900	5,00	56,000	11,000	27,000
M8	1,250	6,000	4,900	6,80	63,000	14,000	32,000
M10	1,500	7,000	5,500	8,50	70,000	16,000	36,000
M12	1,750	9,000	7,000	10,20	75,000	18,500	40,000
M16	2,000	12,000	9,000	14,00	80,000	20,000	45,000

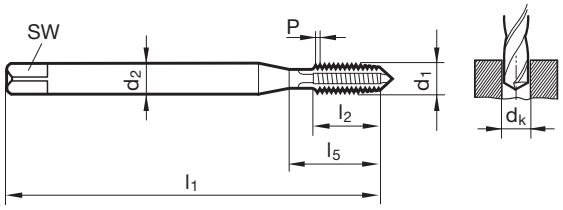
Machos para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	◯	◯
Tipo	N	N
Forma	B	B
Refrigeração interna	⊠	⊠

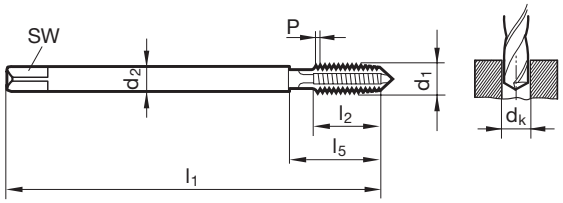
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **838** **839**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1,2	0,250	2,500	2,100	0,95	40,000	5,500	
M1,4	0,300	2,500	2,100	1,10	40,000	7,000	
M1,6	0,350	2,500	2,100	1,25	40,000	8,000	
M1,7	0,350	2,500	2,100	1,35	40,000	8,000	
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M2,3	0,400	2,800	2,100	1,90	45,000	9,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M7	1,000	7,000	5,500	6,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **846** **847**

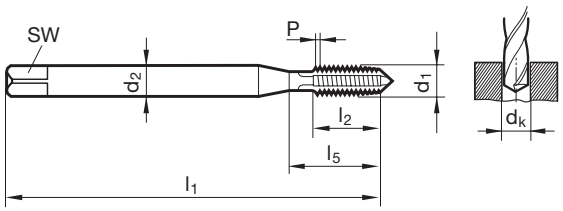
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200	1,800	2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊗

P	≤ 800
M	
K	
N	
S	
H	

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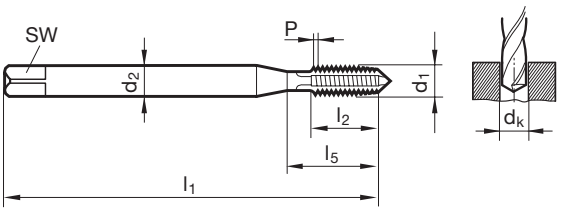
DIN 2184-1 DIN 371 Nr. do artigo **802**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Machos para rosca métrica ISO

P	≤ 800	Página de dados de corte 19
M		
K		
N		
S		
H		

Material de corte	HSS-E		
Tolerância do Ø	ISO3/6G	ISO3/6G	ISO3/6G
Superfície	◯	◯	◯
Tipo	N	N	N
Forma	B	B	B
Refrigeração interna	⊠	⊠	⊠





DIN 2184-1 DIN 371 — Nr. do artigo: **869** | **796** | **797**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M7	1,000	7,000	5,500	6,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

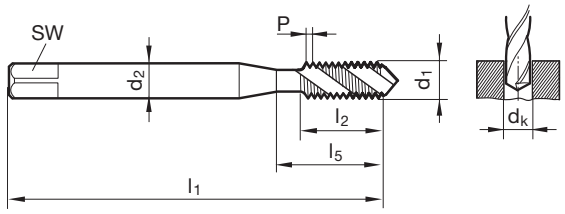
Machos para rosca métrica ISO

P	≤ 800
M	
K	
N	
S	
H	

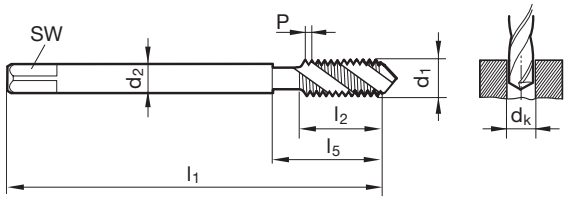
Página de dados de corte 22

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	(S)	●
Tipo	N R15	N R15	N R15
Forma	C	C	C
Refrigeração interna	✗	✗	✗

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo: **809** | **913** | **946**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	5,000	14,500
M2,3	0,400	2,800	2,100	1,90	45,000	4,500	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **821** | **916** | **949**

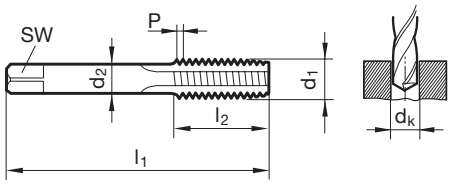
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	6,000	18,000
M3,5	0,600	2,500	2,100	2,90	56,000	7,000	20,000
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Machos para rosca métrica ISO

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 22

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N R15
Forma	C
Refrigeração interna	⊗





DIN 2184-2 DIN 352 Nr. do artigo **992**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	40,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	45,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	50,000	8,500	24,000
M6	1,000	6,000	4,900	5,00	56,000	11,000	27,000
M7	1,000	6,000	4,900	6,00	56,000	11,000	32,000
M8	1,250	6,000	4,900	6,80	63,000	14,000	32,000
M10	1,500	7,000	5,500	8,50	70,000	16,000	36,000
M12	1,750	9,000	7,000	10,20	75,000	18,500	40,000
M14	2,000	11,000	9,000	12,00	80,000	20,000	42,000
M16	2,000	12,000	9,000	14,00	80,000	20,000	45,000
M20	2,500	16,000	12,000	17,50	95,000	25,000	50,000

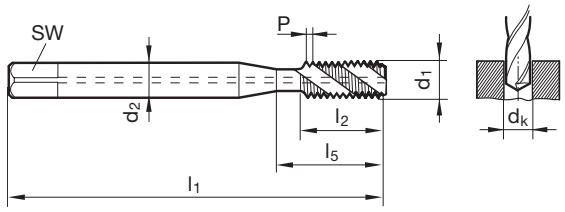
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	◯	Ⓢ
Tipo	N R15	N R15
Forma	C	C
Refrigeração interna		

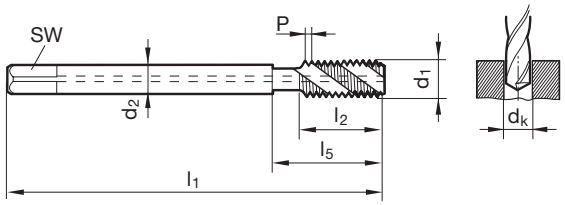
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 22/23

DIN 371



DIN 376







DIN 2184-1 DIN 371 — Nr. do artigo **1891** **2436**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **1898** **2437**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

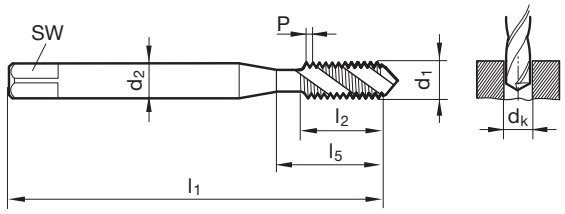
Machos para rosca métrica ISO

Material de corte		HSS-E			
Tolerância do Ø		ISO2/6H	ISO2/6H	ISO2/6H	ISO2/6H
Superfície				S	C
Tipo		N R40	N R40	N R40	N R40
Forma		C	C	C	C
Refrigeração interna					

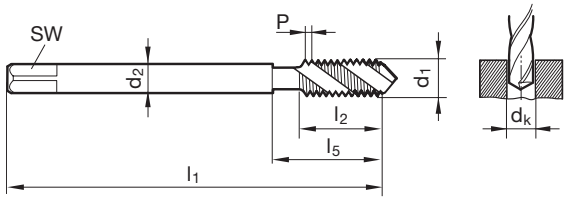
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23/24

DIN 371



DIN 376





DIN 2184-1 DIN 371	Nr. do artigo	783	810	914	1252

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	5,000	14,500
M2,3	0,400	2,800	2,100	1,90	45,000	4,500	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	784	822	917	1254

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	6,000	18,000
M3,5	0,600	2,500	2,100	2,90	56,000	7,000	20,000
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M7	1,000	5,500	4,300	6,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

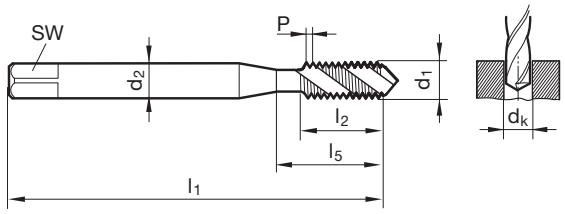
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO3/6G
Superfície	◯
Tipo	N R40
Forma	C
Refrigeração interna	⊠

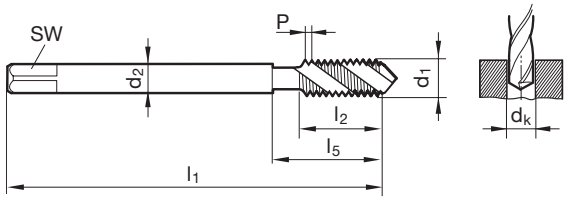
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **844**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **848**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200	1,800	2,50	56,000	6,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M7	1,000	5,500	4,300	6,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000

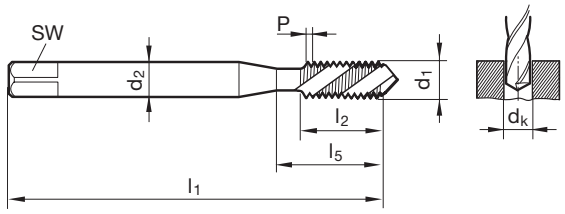
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N L40-LH
Forma	C
Refrigeração interna	⊠

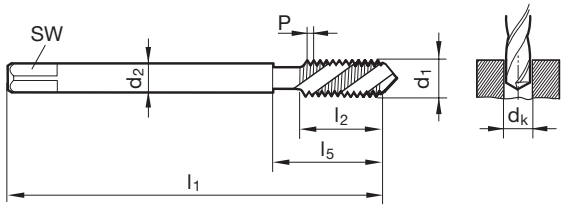
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 24

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **786**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **787**

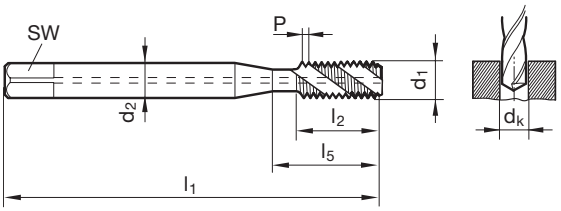
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Machos com canais de refrigeração para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N R40
Forma	C
Refrigeração interna	

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 24





DIN 2184-1 DIN 371 Nr. do artigo **1893**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

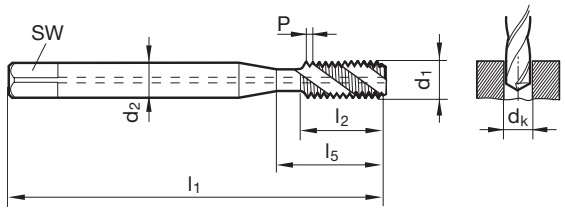
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	ISO2/6H
Superfície	S
Tipo	N R40
Forma	C
Refrigeração interna	

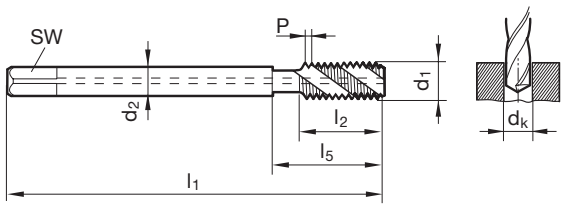
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 24

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **2438**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **2439**

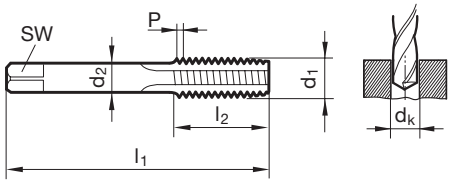
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N R40
Forma	C
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23





DIN 2184-2 DIN 352 — Nr. do artigo **993**

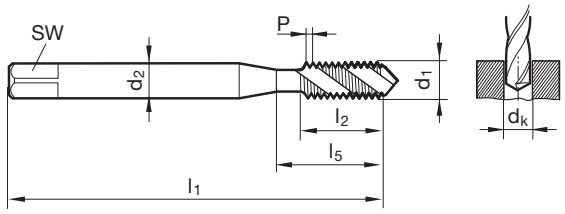
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	36,000	8,000	
M2,5	0,450	2,800	2,100	2,05	40,000	9,000	
M3	0,500	3,500	2,700	2,50	40,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	45,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	45,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	50,000	8,500	24,000
M6	1,000	6,000	4,900	5,00	56,000	11,000	27,000
M8	1,250	6,000	4,900	6,80	63,000	14,000	32,000
M10	1,500	7,000	5,500	8,50	70,000	16,000	36,000
M12	1,750	9,000	7,000	10,20	75,000	18,500	40,000
M16	2,000	12,000	9,000	14,00	80,000	20,000	45,000
M18	2,500	14,000	11,000	15,50	95,000	25,000	50,000
M20	2,500	16,000	12,000	17,50	95,000	25,000	50,000
M22	2,500	18,000	14,500	19,50	100,000	27,000	50,000

Machos para rosca métrica ISO

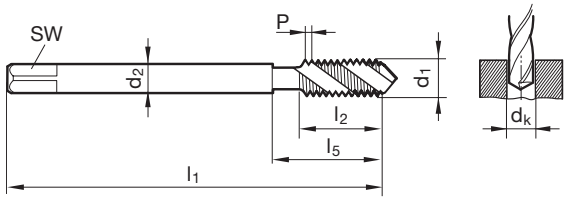
		Material de corte	HSS-E			
		Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H	ISO2/6H
		Superfície			A+M	S
		Tipo	N R40	N R40	N R40	N R40
		Forma	C	C	C	C
		Refrigeração interna				
P	≤ 1000					
M	○					
K	○					
N						
S						
H						

Página de dados de corte 24

DIN 371



DIN 376





DIN 2184-1 DIN 371	Nr. do artigo	836	889	2425	2440

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	5,000	14,500
M2,3	0,400	2,800	2,100	1,90	45,000	4,500	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	826	890	2426	2441

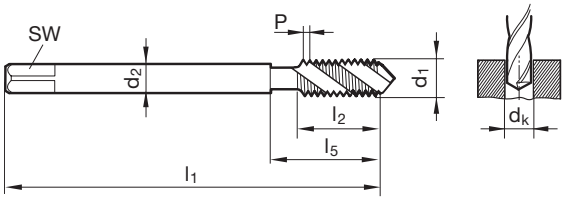
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	6,000	18,000
M3,5	0,600	2,500	2,100	2,90	56,000	7,000	20,000
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M7	1,000	5,500	4,300	6,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000
M36	4,000	28,000	22,000	32,00	200,000	40,000	102,000

Machos para rosca métrica ISO

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 25

Material de corte	**HSS-E**
Tolerância do Ø	6HX
Superfície	S
Tipo	N R40
Forma	C
Refrigeração interna	





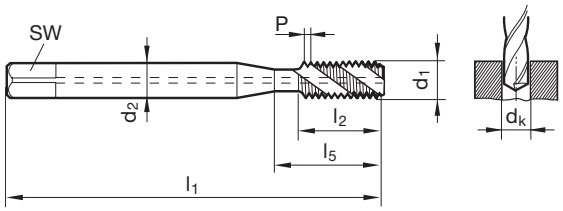
Norma da emp. Norma da emp. Nr. do artigo **4153**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	112,000	6,000	18,000
M4	0,700	2,800	2,100	3,30	112,000	7,500	77,000
M5	0,800	3,500	2,700	4,20	125,000	8,500	90,000
M6	1,000	4,500	3,400	5,00	125,000	11,000	90,000
M8	1,250	6,000	4,900	6,80	140,000	14,000	97,000
M10	1,500	7,000	5,500	8,50	160,000	16,000	117,000
M12	1,750	9,000	7,000	10,20	180,000	18,500	133,000
M16	2,000	12,000	9,000	14,00	220,000	20,000	168,000
M20	2,500	16,000	12,000	17,50	280,000	25,000	225,000

Machos com canais de refrigeração para rosca métrica ISO

P	≤ 1000
M	○
K	○
N	
S	
H	

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	A+M
Tipo	N R40
Forma	C
Refrigeração interna	





DIN 2184-1 DIN 371 Nr. do artigo **2514**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

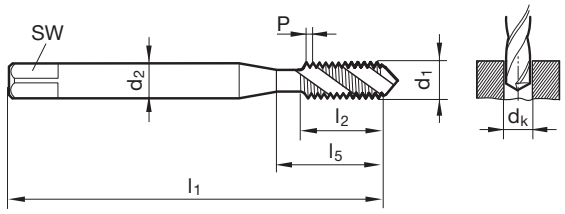
Machos para rosca métrica ISO

P	≤ 1000
M	○
K	○
N	○
S	
H	

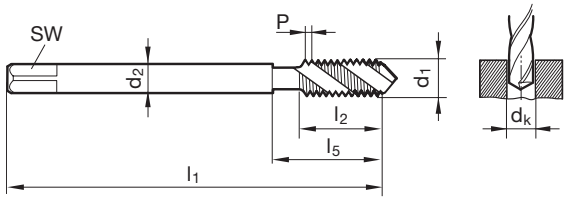
Página de dados de corte 24

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N R40
Forma	E
Refrigeração interna	⊠

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **2790**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **2791**

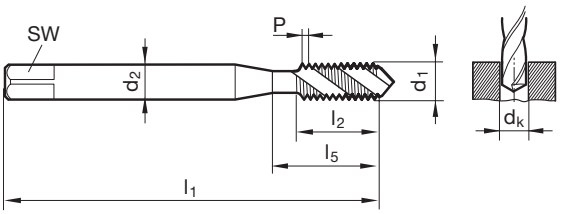
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000

Machos para rosca métrica ISO

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 25

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	S
Tipo	N R40
Forma	C
Refrigeração interna	





DIN 2184-1 DIN 371 Nr. do artigo **174**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **196**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

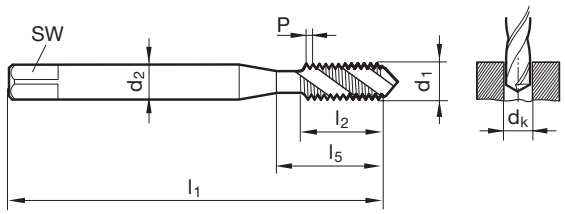
Machos para rosca métrica ISO

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 25

Material de corte	**HSS-E**
Tolerância do Ø	6HX
Superfície	A
Tipo	VA R45
Forma	C
Refrigeração interna	

NEW





DIN 2184-1 DIN 371/DIN 376 Nr. do artigo **393**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

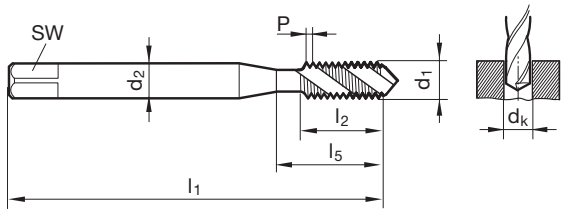
Machos para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	ISO2/6H
Superfície	S
Tipo	N R40
Forma	C
Refrigeração interna	

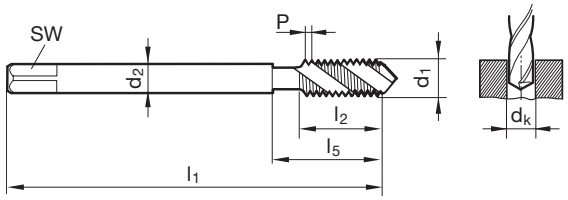
P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 25

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **1288**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **1289**

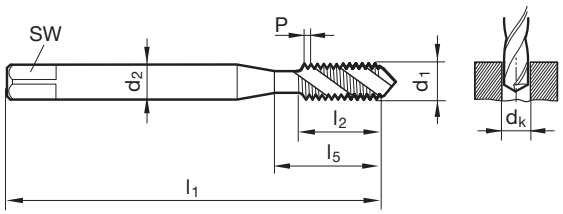
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Machos para rosca métrica ISO

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 24/25

Material de corte	HSS-E-PM	HSS-E	
Tolerância do Ø	ISO2/6H	ISO3/6G	ISO3/6G
Superfície	C		S
Tipo	N R40	N R40	N R40
Forma	C	C	C
Refrigeração interna			





DIN 2184-1 DIN 371 — Nr. do artigo: **1290** | **2994** | **2995**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

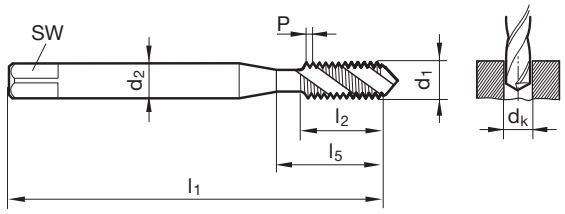
Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	C
Tipo	N R50	N R50
Forma	C	C
Refrigeração interna		

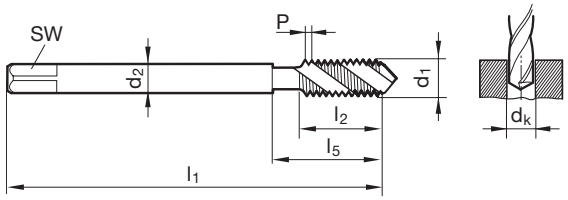
P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 25

DIN 371



DIN 376







DIN 2184-1 DIN 371	Nr. do artigo	767	1152

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	1098	1293

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

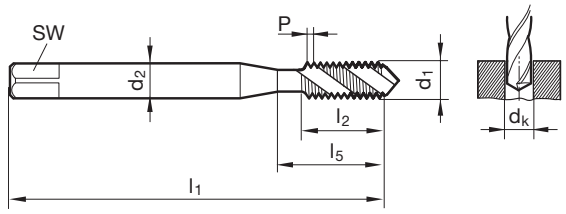
Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	S	C
Tipo	VA R50	VA R50
Forma	C	C
Refrigeração interna		

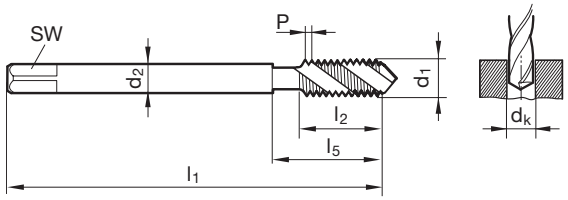
P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 25

DIN 371



DIN 376







DIN 2184-1 DIN 371 — Nr. do artigo: **761** | **1139**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	2,500	18,000
M4	0,700	4,500	3,400	3,30	63,000	3,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	4,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	5,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	6,300	35,000
M10	1,500	10,000	8,000	8,50	100,000	7,500	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **763** | **1142**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	8,800	63,000
M14	2,000	11,000	9,000	12,00	110,000	10,000	58,000
M16	2,000	12,000	9,000	14,00	110,000	10,000	58,000
M20	2,500	16,000	12,000	17,50	140,000	12,500	85,000

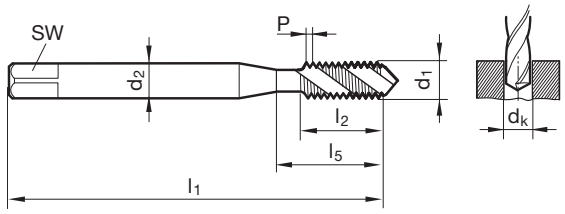
Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	◯	Ⓐ
Tipo	H R15	H R15
Forma	C	C
Refrigeração interna	✕	✕

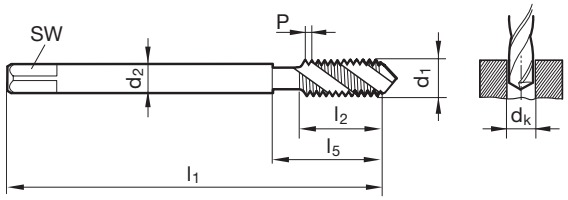
P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 23

DIN 371



DIN 376







DIN 2184-1 DIN 371	Nr. do artigo	872	1577

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	935	1578

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

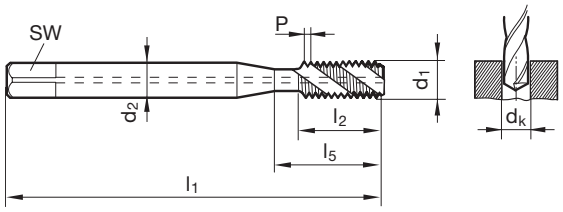
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	C
Tipo	H R15
Forma	C
Refrigeração interna	

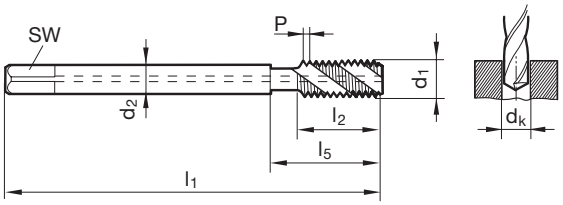
P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 23

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **1188**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **1194**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000

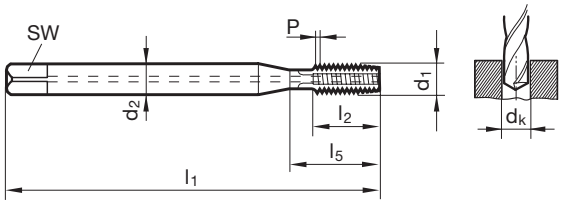
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	C
Tipo	H	H
Forma	C	E
Refrigeração interna		

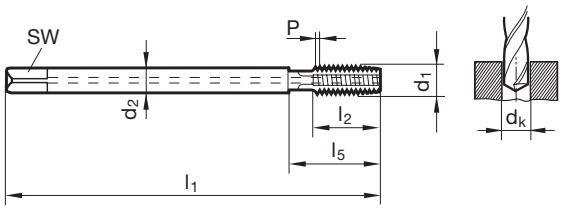
P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 23

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo: **302** | **1091**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **297** | **4165**

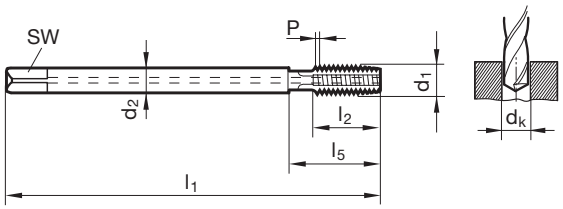
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	C
Refrigeração interna	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 23





DIN 2184-1 DIN 376 Nr. do artigo **778**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	29,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	32,00	200,000	50,000	102,000
M39	4,000	32,000	24,000	35,00	200,000	50,000	107,000

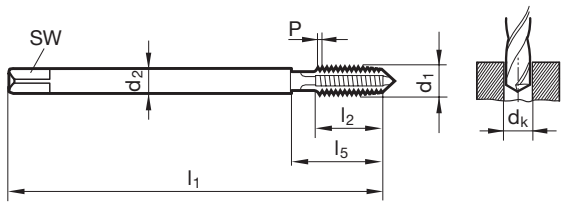
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	C
Refrigeração interna	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 23

NEW





Norma da emp. ~DIN 376 | Nr. do artigo **779**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M16	2,000	12,000	9,000	14,00	160,000	26,000	100,000
M20	2,500	16,000	12,000	17,50	180,000	32,000	120,000
M24	3,000	18,000	14,500	21,00	200,000	36,000	120,000
M27	3,000	20,000	16,000	24,00	225,000	36,000	145,000
M30	3,500	22,000	18,000	26,50	250,000	40,000	160,000
M33	3,500	25,000	20,000	29,50	275,000	40,000	170,000
M36	4,000	28,000	22,000	32,00	300,000	50,000	180,000
M39	4,000	32,000	24,000	35,00	325,000	50,000	210,000

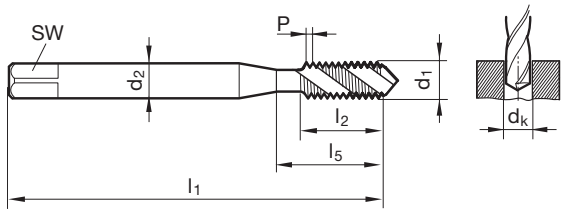
Machos para rosca métrica ISO

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	●	●
Tipo	H R40	H R40	H R40
Forma	C	C	C
Refrigeração interna	✗	✗	✗

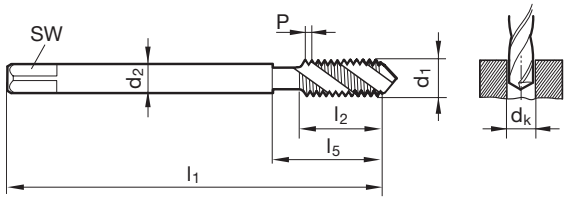
P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 25

DIN 371



DIN 376





DIN 2184-1 DIN 371	Nr. do artigo	811	947	2850

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,3	0,400	2,800	2,100	1,90	45,000	4,500	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M7	1,000	7,000	5,500	6,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	823	950	2851

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	6,000	18,000
M3,5	0,600	2,500	2,100	2,90	56,000	7,000	20,000
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

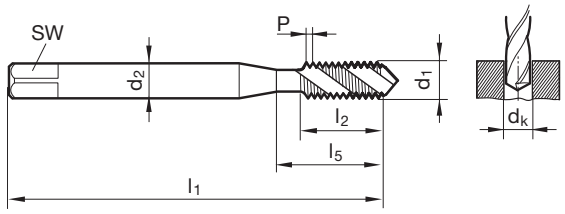
Machos para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	C
Tipo	H R40	H R40
Forma	C	C
Refrigeração interna		

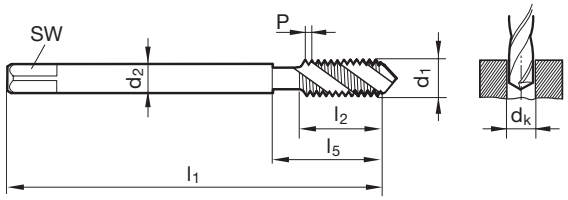
P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 25

DIN 371



DIN 376







DIN 2184-1 DIN 371 — Nr. do artigo: **361** | **1916**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M7	1,000	7,000	5,500	6,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **362** | **1917**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	6,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

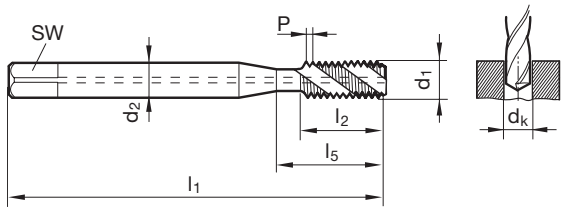
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	H R40
Forma	C
Refrigeração interna	

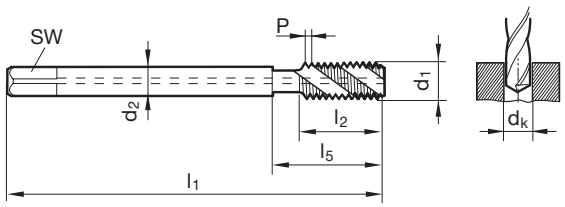
P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 25

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **1894**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **1901**

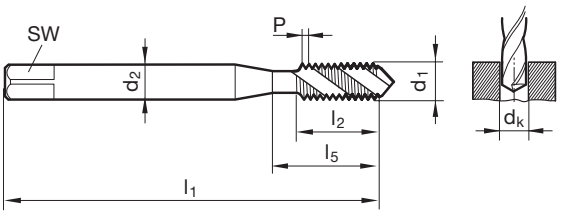
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Machos para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO3/6G	ISO3/6G
Superfície		S
Tipo	H R40	H R40
Forma	C	C
Refrigeração interna		

P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 25







DIN 2184-1 DIN 371 — Nr. do artigo **2985** **2986**

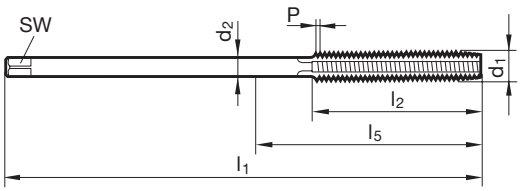
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Machos para máquinas para rosca métrica ISO para porcas

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	
Refrigeração interna	

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18





DIN 357 DIN 357 Nr. do artigo **851**

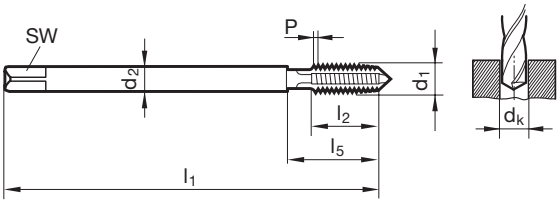
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	70,000	22,000	30,000
M4	0,700	2,800	2,100	3,30	90,000	25,000	33,000
M5	0,800	3,500	2,700	4,20	100,000	28,000	38,000
M6	1,000	4,500	3,400	5,00	110,000	32,000	44,000
M8	1,250	6,000	4,900	6,80	125,000	40,000	61,000
M10	1,500	7,000	5,500	8,50	140,000	45,000	85,000
M12	1,750	9,000	7,000	10,20	180,000	50,000	120,000
M16	2,000	12,000	9,000	14,00	200,000	63,000	145,000
M20	2,500	16,000	12,000	17,50	250,000	70,000	170,000
M30	3,500	22,000	18,000	26,50	315,000	100,000	230,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19





Norma da emp. Norma da emp. Nr. do artigo **998**

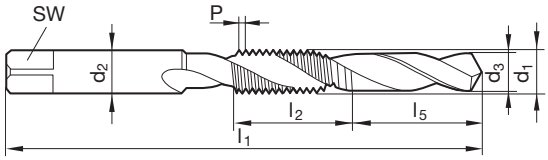
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	70,000	18,000	35,000
M4	0,700	2,800	2,100	3,30	90,000	22,000	55,000
M5	0,800	3,500	2,700	4,20	100,000	24,000	65,000
M6	1,000	4,500	3,400	5,00	110,000	25,000	75,000
M8	1,250	6,000	4,900	6,80	125,000	28,000	68,000
M10	1,500	7,000	5,500	8,50	140,000	30,000	80,000
M12	1,750	9,000	7,000	10,20	180,000	35,000	115,000
M14	2,000	11,000	9,000	12,00	200,000	35,000	125,000
M16	2,000	12,000	9,000	14,00	200,000	40,000	130,000
M20	2,500	16,000	12,000	17,50	250,000	45,000	165,000

Brocas macho para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	D
Refrigeração interna	

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18





Norma da emp. Norma da emp. Nr. do artigo **1839**

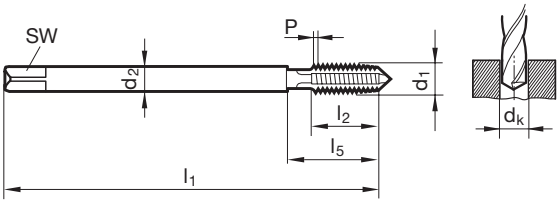
d1	P	d2	d3	SW	l1	l5	l2	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	
M3	0,500	3,500	2,500	2,700	62,000	11,000	12,000	3,000
M4	0,700	4,500	3,300	3,400	66,000	10,000	16,000	4,000
M5	0,800	6,000	4,200	4,900	75,000	12,000	18,000	5,000
M6	1,000	6,000	5,000	4,900	81,000	14,000	20,000	6,000
M8	1,250	6,000	6,800	4,900	93,000	20,000	12,000	8,000
M10	1,500	7,000	8,500	5,500	99,000	22,000	14,000	10,000
M12	1,750	9,000	10,200	7,000	106,000	25,000	16,000	12,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N R40
Forma	C
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23





Norma da emp. Norma da emp. | Nr. do artigo **888**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	90,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	125,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	140,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	160,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	180,000	14,000	
M10	1,500	7,000	5,500	8,50	200,000	16,000	140,000
M12	1,750	9,000	7,000	10,20	220,000	18,500	160,000
M14	2,000	11,000	9,000	12,00	220,000	20,000	160,000
M16	2,000	12,000	9,000	14,00	220,000	20,000	16,000
M20	2,500	16,000	12,000	17,50	280,000	25,000	220,000

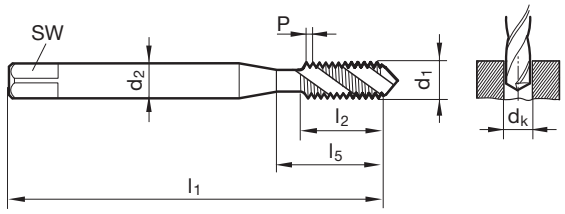
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N L15
Forma	D
Refrigeração interna	⊠

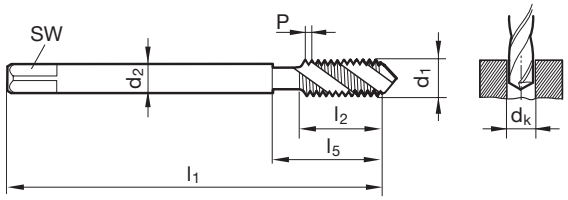
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **808**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **820**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200	1,800	2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

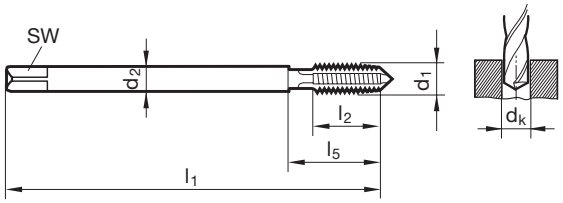
Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 21

NEW





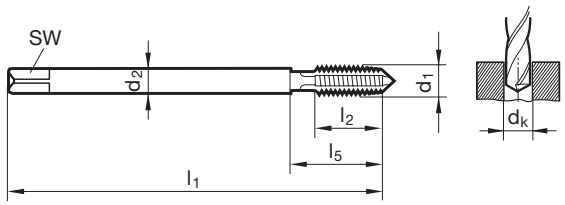
DIN 2184-1 DIN 374 Nr. do artigo **4219**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007

Machos manuais para rosca métrica fina ISO

P	≤ 800	Página de dados de corte 19
M		
K		
N		
S		
H		

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	(S)	●
Tipo	N	N	N
Forma	B	B	B
Refrigeração interna	⊠	⊠	⊠





DIN 2184-1 DIN 374 — Nr. do artigo: **827** | **832** | **2888**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M3 x 0,35	2,200		2,65	56,000	7,000	18,000	3,002
M3,5 x 0,35	2,500	2,100	3,15	56,000	8,000	20,000	3,502
M4 x 0,5	2,800	2,100	3,50	63,000	8,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	13,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M6 x 0,75	4,500	3,400	5,20	100,000	13,000	30,000	6,004
M7 x 0,75	5,500	4,300	6,20	80,000	13,000	30,000	7,004
M8 x 0,5	6,000	4,900	7,50	80,000	14,000	30,000	8,003
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M9 x 1	7,000	5,500	8,00	90,000	16,000	35,000	9,005
M10 x 0,75	7,000	5,500	9,20	90,000	16,000	35,000	10,004
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1	7,000	5,500	9,00	90,000	17,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M11 x 1	8,000	6,200	10,00	90,000	20,000	33,000	11,005
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M15 x 1	12,000	9,000	14,00	100,000	20,000	40,000	15,005
M15 x 1,5	12,000	9,000	13,50	100,000	20,000	44,000	15,007
M16 x 1	12,000	9,000	15,00	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,00	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M18 x 2	14,000	11,000	16,00	125,000	30,000	58,000	18,008
M20 x 1	16,000	12,000	19,00	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M20 x 2	16,000	12,000	18,00	140,000	32,000	60,000	20,008
M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000	22,007
M22 x 2	18,000	14,500	20,00	140,000	32,000	62,000	22,008
M24 x 1	18,000	14,500	23,00	140,000	28,000	48,000	24,005

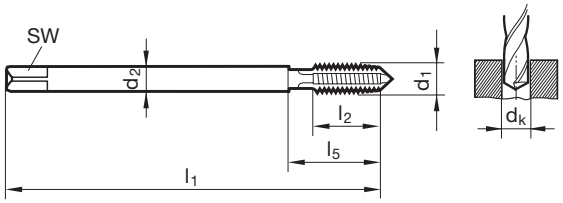
DIN 2184-1 DIN 374 Nr. do artigo **827** **832** **2888**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	28,000	48,000	24,008
M26 x 1,5	18,000	14,500	24,50	140,000	28,000	50,000	26,007
M27 x 1,5	20,000	16,000	25,50	140,000	28,000	53,000	27,007
M27 x 2	20,000	16,000	25,00	140,000	28,000	53,000	27,008
M28 x 1,5	20,000	16,000	26,50	140,000	28,000	53,000	28,007
M30 x 1,5	22,000	18,000	28,50	150,000	28,000	53,000	30,007
M30 x 2	22,000	18,000	28,00	150,000	28,000	53,000	30,008
M32 x 1,5	22,000	18,000	30,50	150,000	28,000	53,000	32,007
M33 x 1,5	25,000	20,000	31,50	160,000	30,000	56,000	33,007
M35 x 1,5	28,000	22,000	33,50	170,000	30,000	56,000	35,007
M36 x 1,5	28,000	22,000	34,50	170,000	30,000	56,000	36,007
M38 x 1,5	28,000	22,000	36,50	170,000	30,000	56,000	38,007
M40 x 1,5	32,000	24,000	38,50	170,000	30,000	57,000	40,007

Machos manuais para rosca métrica fina ISO

P	≤ 1000	Página de dados de corte 19/20
M	○	
K		
N		
S		
H		

Material de corte	HSS-E	
Tolerância do Ø	ISO3/6G	ISO3/6G
Superfície	(S)	○
Tipo	N	N
Forma	B	B
Refrigeração interna	⊠	⊠





DIN 2184-1 DIN 374 — Nr. do artigo: **2993** | **316**

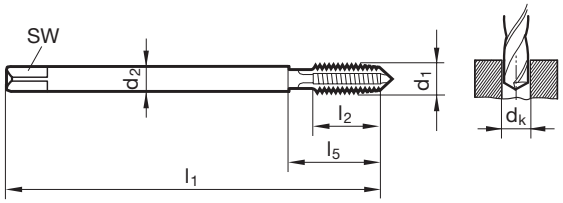
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

P	≤ 1000
M	○
K	
N	
S	
H	

Página de dados de corte 20

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	A+M	
Tipo	N	N
Forma	B	B
Refrigeração interna		







DIN 2184-1 DIN 374 — Nr. do artigo **2878** **2879**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	28,000	48,000	24,008
M26 x 1,5	18,000	14,500	24,50	140,000	28,000	50,000	26,007
M27 x 1,5	20,000	16,000	25,50	140,000	28,000	53,000	27,007
M27 x 2	20,000	16,000	25,00	140,000	28,000	53,000	27,008
M28 x 1,5	20,000	16,000	26,50	140,000	28,000	53,000	28,007
M30 x 1,5	22,000	18,000	28,50	150,000	28,000	53,000	30,007
M30 x 2	22,000	18,000	28,00	150,000	28,000	53,000	30,008
M32 x 1,5	22,000	18,000	30,50	150,000	28,000	53,000	32,007
M36 x 1,5	28,000	22,000	34,50	170,000	30,000	56,000	36,007
M40 x 1,5	32,000	24,000	38,50	170,000	30,000	57,000	40,007
M42 x 1,5	32,000	24,000	40,50	170,000	30,000	57,000	42,007
M45 x 1,5	36,000	29,000	43,50	180,000	32,000	60,000	45,007
M48 x 1,5	36,000	29,000	46,50	190,000	32,000	60,000	48,007
M50 x 1,5	36,000	29,000	48,50	190,000	32,000	60,000	50,007

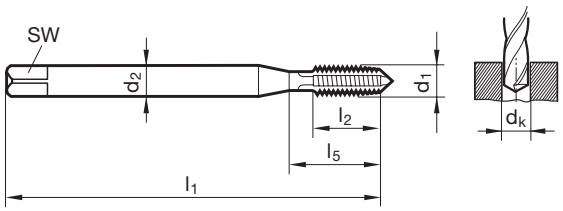
Machos manuais para rosca métrica fina ISO



Material de corte		**MD int.**
Tolerância do Ø		6HX
Superfície		C
Tipo		N
Forma		B
Refrigeração interna		

P	≤ 1000
M	
K	
N	
S	
H	

Página de dados de corte 21





DIN 2184-1 ~DIN 371 Nr. do artigo **943**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	6,000	4,900	4,50	70,000	7,500	25,000	5,003
M6 x 0,5	6,000	4,900	5,50	80,000	7,500	30,000	6,003
M6 x 0,75	6,000	4,900	5,20	80,000	11,500	30,000	6,004
M8 x 1	8,000	6,200	7,00	90,000	15,000	35,000	8,005
M10 x 1	10,000	8,000	9,00	90,000	15,000	35,000	10,005
M10 x 1,25	10,000	8,000	8,80	100,000	19,000	39,000	10,006
M12 x 1	12,000	9,000	11,00	100,000	15,000	40,000	12,005
M12 x 1,25	12,000	9,000	10,80	100,000	19,000	40,000	12,006
M12 x 1,5	12,000	9,000	10,50	100,000	22,500	40,000	12,007

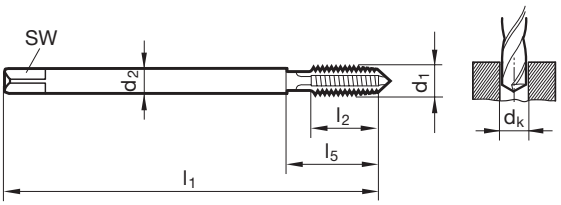
Machos manuais para rosca métrica fina ISO



P	≤ 1000
M	
K	
N	
S	
H	

Página de dados de corte 21

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	B
Refrigeração interna	





DIN 2184-1 DIN 374 Nr. do artigo **944**

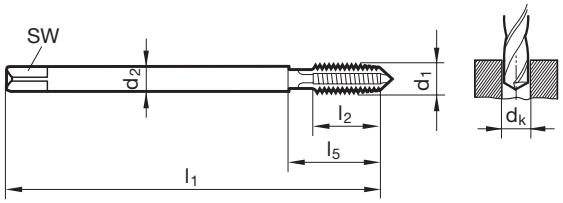
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M14 x 1,25	11,000	9,000	12,80	100,000	19,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	22,500	40,000	14,007
M16 x 1	12,000	9,000	15,00	100,000	15,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	22,500	44,000	16,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	○	●
Tipo	H	H
Forma	B	B
Refrigeração interna	⊠	⊠

P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 21





DIN 2184-1 DIN 374 — Nr. do artigo: **828** | **2943**

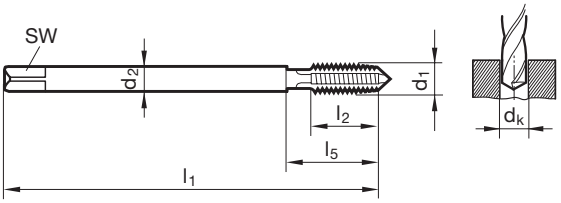
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M3 x 0,35	2,200		2,65	56,000	7,000	18,000	3,002
M4 x 0,5	2,800	2,100	3,50	63,000	8,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	13,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	ISO2/6H
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	

P	≤ 1000
M	•
K	
N	
S	
H	

Página de dados de corte 20





DIN 2184-1 DIN 374 Nr. do artigo **1291**

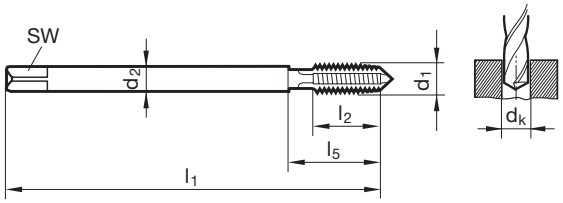
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,25	11,000	9,000	12,80	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	28,000	48,000	24,008

Machos manuais para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO3/6G
Superfície	S
Tipo	H
Forma	B
Refrigeração interna	

P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 21





DIN 2184-1 DIN 374 Nr. do artigo **2983**

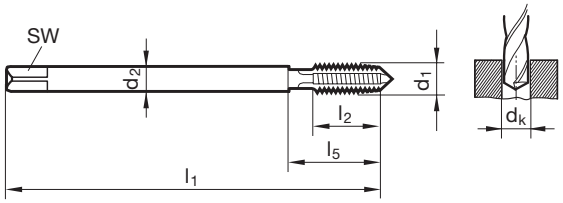
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18/22

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO3/6G
Superfície	◯	◯
Tipo	N	N
Forma	C	C
Refrigeração interna	⊠	⊠







DIN 2184-1 DIN 374 — Nr. do artigo: **830** | **829**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M3 x 0,35	2,200		2,65	56,000	4,000	18,000	3,002
M3,5 x 0,35	2,500	2,100	3,15	56,000	4,000	20,000	3,502
M4 x 0,5	2,800	2,100	3,50	63,000	5,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	5,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	5,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M7 x 0,75	5,500	4,300	6,20	80,000	8,000	30,000	7,004
M8 x 0,5	6,000	4,900	7,50	80,000	8,000	30,000	8,003
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M9 x 1	7,000	5,500	8,00	90,000	11,000	35,000	9,005
M10 x 0,75	7,000	5,500	9,20	90,000	11,000	35,000	10,004
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M11 x 1	8,000	6,200	10,00	90,000	11,000	33,000	11,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	11,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M15 x 1	12,000	9,000	14,00	100,000	11,000	40,000	15,005
M16 x 1	12,000	9,000	15,00	100,000	11,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1	14,000	11,000	17,00	110,000	12,000	44,000	18,005
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M18 x 2	14,000	11,000	16,00	125,000	20,000	58,000	18,008
M20 x 1	16,000	12,000	19,00	125,000	12,000	44,000	20,005
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M20 x 2	16,000	12,000	18,00	140,000	20,000	60,000	20,008
M22 x 1	18,000	14,500	21,00	125,000	12,000	44,000	22,005
M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000	22,007
M22 x 2	18,000	14,500	20,00	140,000	22,000	62,000	22,008
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	22,000	48,000	24,008
M25 x 1,5	18,000	14,500	23,50	140,000	20,000	50,000	25,007

DIN 2184-1 DIN 374 Nr. do artigo **830** **829**

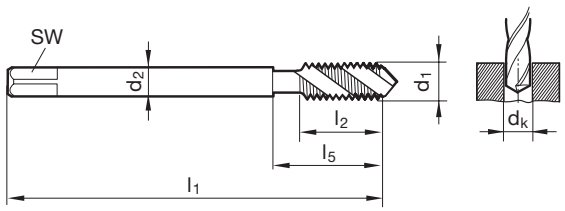
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M26 x 1,5	18,000	14,500	24,50	140,000	20,000	50,000	26,007
M27 x 2	20,000	16,000	25,00	140,000	20,000	53,000	27,008
M28 x 1,5	20,000	16,000	26,50	140,000	20,000	53,000	28,007
M30 x 1,5	22,000	18,000	28,50	150,000	20,000	53,000	30,007
M30 x 2	22,000	18,000	28,00	150,000	20,000	53,000	30,008
M32 x 1,5	22,000	18,000	30,50	150,000	25,000	53,000	32,007
M35 x 1,5	28,000	22,000	33,50	170,000	25,000	56,000	35,007
M36 x 1,5	28,000	22,000	34,50	170,000	25,000	56,000	36,007
M38 x 1,5	28,000	22,000	36,50	170,000	25,000	56,000	38,007
M40 x 1,5	32,000	24,000	38,50	170,000	25,000	57,000	40,007
M50 x 1,5	36,000	29,000	48,50	190,000	27,000	60,000	50,007
M63 x 1,5	50,000	39,000	61,50	275,000	25,000	62,000	63,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	Ⓢ	●
Tipo	N R15	N R15	N R15
Forma	C	C	C
Refrigeração interna	✗	✗	✗

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 22





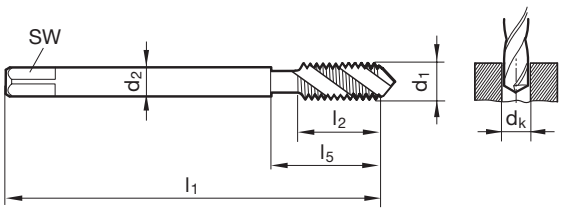
DIN 2184-1 DIN 374	Nr. do artigo	833	1971	2838

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M4 x 0,5	2,800	2,100	3,50	63,000	5,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	5,000	25,000	5,003
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	11,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1	12,000	9,000	15,00	100,000	11,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1	16,000	12,000	19,00	125,000	12,000	44,000	20,005
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	22,000	48,000	24,008
M27 x 1,5	20,000	16,000	25,50	140,000	20,000	53,000	27,007
M27 x 2	20,000	16,000	25,00	140,000	20,000	53,000	27,008
M30 x 1,5	22,000	18,000	28,50	150,000	20,000	53,000	30,007
M30 x 2	22,000	18,000	28,00	150,000	20,000	53,000	30,008

Machos manuais para rosca métrica fina ISO

P	≤ 1000	Página de dados de corte 23
M	○	
K	○	
N		
S		
H		

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	C	C
Tipo	N R15	N R15
Forma	C	E
Refrigeração interna		





DIN 2184-1 DIN 374 — Nr. do artigo: **4156** **4157**

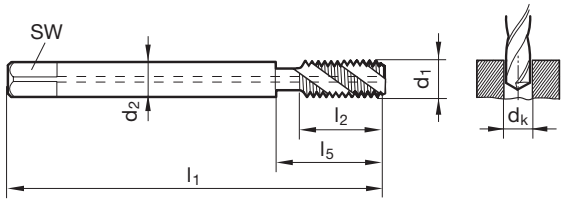
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007

Machos com canais de refrig. p.rosca métr. fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N R15
Forma	C
Refrigeração interna	

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 22





DIN 2184-1 DIN 374 Nr. do artigo **1905**

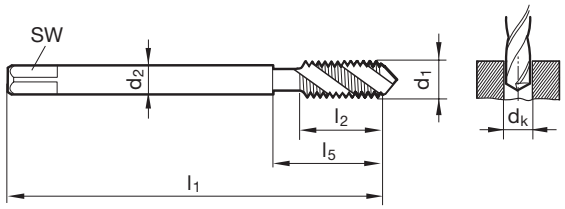
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	3,500	2,700	4,50	70,000	5,000	25,000	5,003
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	11,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	15,000	40,000	14,006
M16 x 1	12,000	9,000	15,00	100,000	11,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1	14,000	11,000	17,00	110,000	12,000	44,000	18,005
M20 x 1	16,000	12,000	19,00	125,000	12,000	44,000	20,005
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	(S)	●
Tipo	N R40	N R40	N R40
Forma	C	C	C
Refrigeração interna	⊠	⊠	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23





DIN 2184-1 DIN 374 — Nr. do artigo: **834** | **852** | **2843**

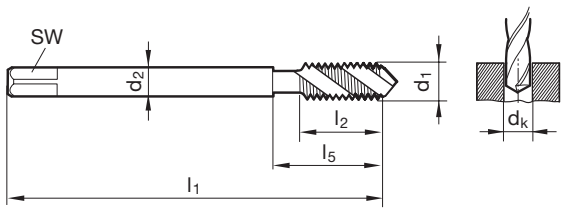
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M3 x 0,35	2,200		2,65	56,000	4,000	18,000	3,002
M3,5 x 0,35	2,500	2,100	3,15	56,000	4,000	20,000	3,502
M4 x 0,5	2,800	2,100	3,50	63,000	5,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	5,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	5,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,5	6,000	4,900	7,50	80,000	8,000	30,000	8,003
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 0,75	7,000	5,500	9,20	90,000	11,000	35,000	10,004
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	11,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1	12,000	9,000	15,00	100,000	11,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1	14,000	11,000	17,00	110,000	12,000	44,000	18,005
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1	16,000	12,000	19,00	125,000	12,000	44,000	20,005
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	22,000	48,000	24,008
M26 x 1,5	18,000	14,500	24,50	140,000	20,000	50,000	26,007
M27 x 1,5	20,000	16,000	25,50	140,000	20,000	53,000	27,007
M27 x 2	20,000	16,000	25,00	140,000	20,000	53,000	27,008
M28 x 1,5	20,000	16,000	26,50	140,000	20,000	53,000	28,007
M30 x 1,5	22,000	18,000	28,50	150,000	20,000	53,000	30,007
M30 x 2	22,000	18,000	28,00	150,000	20,000	53,000	30,008

Machos manuais para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N R40
Forma	C
Refrigeração interna	

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23





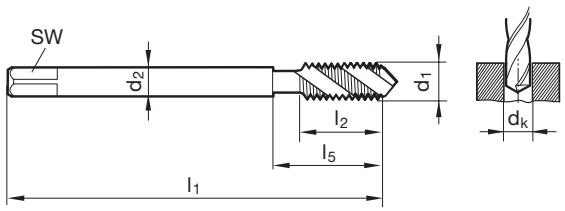
DIN 2184-2 DIN 2181 Nr. do artigo **1970**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	6,000	4,900	5,20	56,000	8,000	27,000	6,004
M8 x 0,5	6,000	4,900	7,50	56,000	8,000	30,000	8,003
M8 x 0,75	6,000	4,900	7,20	56,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	63,000	11,000	30,000	8,005
M10 x 0,75	7,000	5,500	9,20	63,000	11,000	32,000	10,004
M10 x 1	7,000	5,500	9,00	63,000	11,000	32,000	10,005
M11 x 1	8,000	6,200	10,00	63,000	11,000	33,000	11,005
M12 x 1	9,000	7,000	11,00	70,000	11,000	35,000	12,005
M12 x 1,5	9,000	7,000	10,50	70,000	16,000	35,000	12,007

Machos manuais para rosca métrica fina ISO

P	≤ 1000	Página de dados de corte 24
M	○	
K	○	
N	○	
S		
H		

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	●	○
Tipo	N R40	N R40	N R40
Forma	C	C	E
Refrigeração interna	⊠	⊠	⊠





DIN 2184-1 DIN 374 — Nr. do artigo: **2424** | **2853** | **2792**

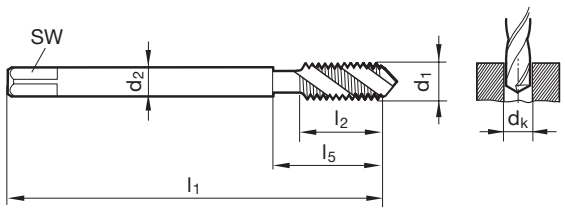
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	3,500	2,700	4,50	70,000	5,000	25,000	5,003
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	11,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1	12,000	9,000	15,00	100,000	11,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1	14,000	11,000	17,00	110,000	12,000	44,000	18,005
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	22,000	48,000	24,008
M26 x 1,5	18,000	14,500	24,50	140,000	20,000	50,000	26,007
M27 x 1,5	20,000	16,000	25,50	140,000	20,000	53,000	27,007
M27 x 2	20,000	16,000	25,00	140,000	20,000	53,000	27,008
M28 x 1,5	20,000	16,000	26,50	140,000	20,000	53,000	28,007
M30 x 1,5	22,000	18,000	28,50	150,000	20,000	53,000	30,007
M30 x 2	22,000	18,000	28,00	150,000	20,000	53,000	30,008

Machos manuais para rosca métrica fina ISO

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 24

Material de corte	HSS-E		
Tolerância do Ø	ISO3/6G	ISO3/6G	ISO3/6G
Superfície	S	○	●
Tipo	N R40	N R40	N R40
Forma	C	C	C
Refrigeração interna	⊠	⊠	⊠





DIN 2184-1 DIN 374	Nr. do artigo	1049	2998	2999

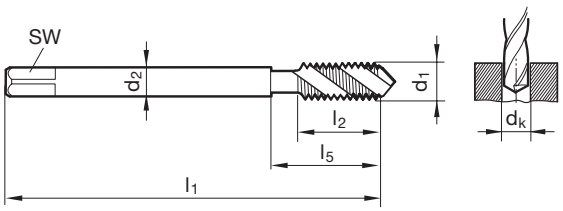
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 25

Material de corte	HSS-E	HSS-E-PM
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	S
Tipo	N R40	N R40
Forma	C	C
Refrigeração interna		







DIN 2184-1 DIN 374 — Nr. do artigo: **273** | **1292**

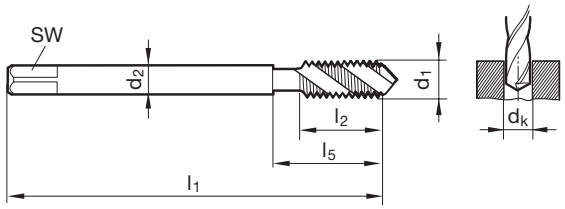
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,25	11,000	9,000	12,80	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	22,000	48,000	24,008

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	C
Tipo	N R50	N R50
Forma	C	C
Refrigeração interna		

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 25







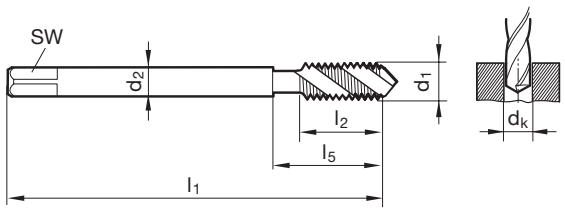
DIN 2184-1 DIN 374 — Nr. do artigo: **1100** | **1294**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

P	•	Página de dados de corte 25
M	•	
K	○	
N	•	
S	○	
H		

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	S	C
Tipo	VA R50	VA R50
Forma	C	C
Refrigeração interna		







DIN 2184-1 DIN 374 — Nr. do artigo: **764** | **1144**

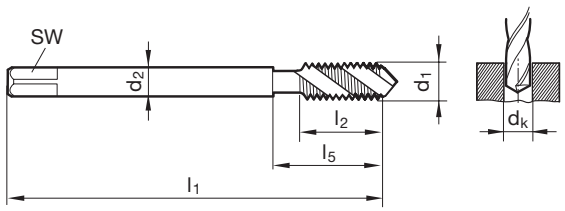
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	5,000	44,000	8,005
M8 x 1	6,000	4,900	7,00	90,000	5,000	47,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	5,000	47,000	10,005
M10 x 1	7,000	5,500	9,00	90,000	5,000	44,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	5,000	53,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	7,500	53,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	7,500	48,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	7,500	48,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	7,500	58,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	7,500	70,000	20,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	6HX
Superfície	◯	C
Tipo	H R15	H R15
Forma	C	C
Refrigeração interna		

P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 23





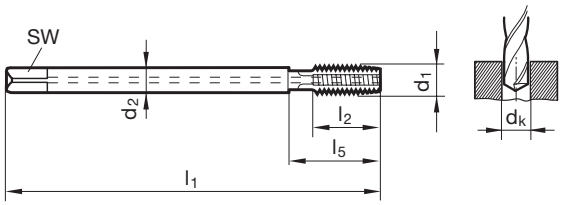
DIN 2184-1 DIN 374 — Nr. do artigo: **874** | **1200**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M9 x 1	7,000	5,500	8,00	90,000	11,000	35,000	9,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007

Machos com canais de refrig. p.rosca métr. fina ISO

P	≤ 1200	Página de dados de corte 23
M		
K	•	
N	≥ 7	
S		
H		

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	C
Tipo	H	H
Forma	E	C
Refrigeração interna		





DIN 2184-1 DIN 374 — Nr. do artigo: **1007** **1090**

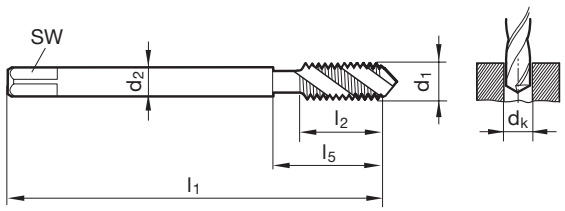
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	13,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M9 x 1	7,000	5,500	8,00	90,000	16,000	35,000	9,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,00	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007

Machos manuais para rosca métrica fina ISO

P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 25

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	●	●
Tipo	H R40	H R40	H R40
Forma	C	C	C
Refrigeração interna	✕	✕	✕





DIN 2184-1 DIN 374	Nr. do artigo	835	2852	2940

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007

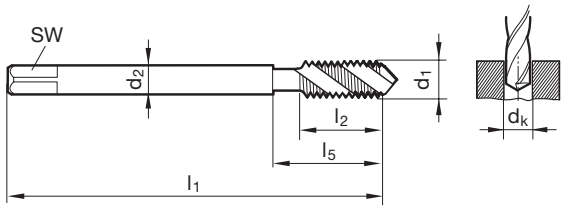
Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	A
Tipo	VA R45
Forma	C
Refrigeração interna	

NEW

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 25





DIN 2184-1 DIN 374 Nr. do artigo **394**

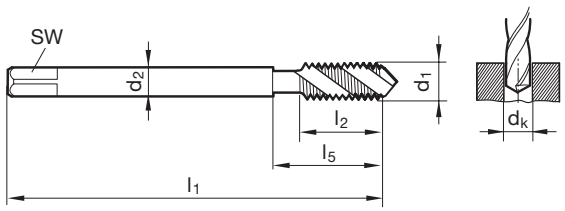
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO3/6G	ISO3/6G
Superfície	S	
Tipo	H R40	H R40
Forma	C	C
Refrigeração interna		

P	≤ 1200
M	
K	
N	
S	
H	

Página de dados de corte 25







DIN 2184-1 DIN 374 — Nr. do artigo **2989** **2988**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007

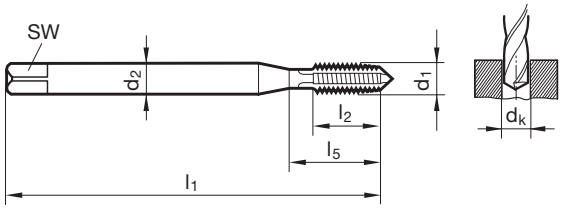
Machos para rosca UNC

P	≤ 800
M	
K	
N	
S	
H	

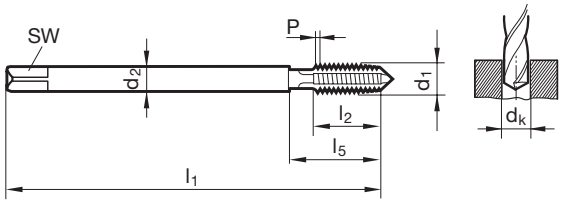
Página de dados de corte 19

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	N	N
Forma	B	B
Refrigeração interna	⊠	⊠

~ DIN 371



~ DIN 376







DIN 2184-1 ~DIN 371 — Nr. do artigo **873** **2889**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
1 - 64	2,800	2,100	1,55	45,000	8,000		1,854
2 - 56	2,800	2,100	1,85	45,000	9,000	14,500	2,184
3 - 48	2,800	2,100	2,10	50,000	9,000	14,500	2,515
4 - 40	3,500	2,700	2,35	56,000	11,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	11,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **878** **2890**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	9,40	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
9/16 - 12	11,000	9,000	12,20	110,000	28,000	53,000	14,288
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	35,000	62,000	22,225
1 - 8	18,000	14,500	22,25	160,000	38,000	73,000	25,400
1 1/8 - 7	22,000	18,000	25,00	180,000	44,000	85,000	28,575
1 1/4 - 7	22,000	18,000	28,00	180,000	44,000	85,000	31,750
1 1/2 - 6	28,000	22,000	34,00	200,000	50,000	102,000	38,100

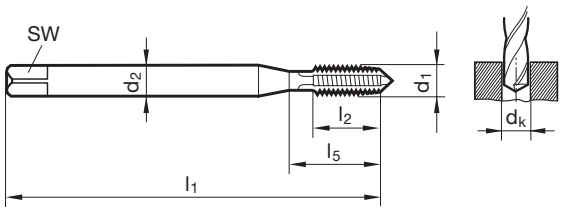
Machos para rosca UNC

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	
Tipo	N
Forma	B
Refrigeração interna	

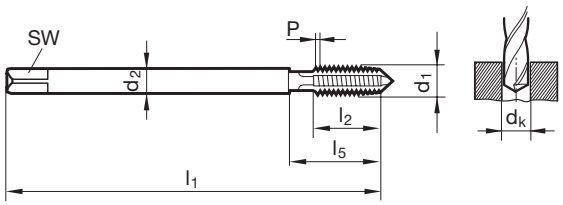
P	≤ 1000
M	○
K	
N	
S	
H	

Página de dados de corte 20

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 Nr. do artigo **2881**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,35	56,000	11,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	11,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 Nr. do artigo **2883**

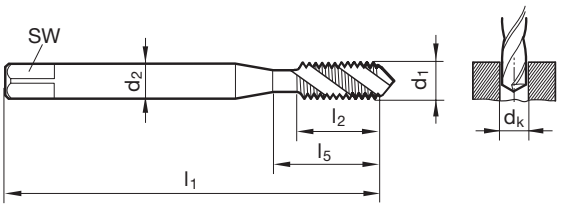
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	9,40	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	35,000	62,000	22,225
1 - 8	18,000	14,500	22,25	160,000	38,000	73,000	25,400

Machos para rosca UNC

Material de corte	**HSS-E**
Tolerância do Ø	2B
Superfície	◯
Tipo	N R15
Forma	C
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 22





DIN 2184-1 ~DIN 371 Nr. do artigo **1978**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,35	56,000	7,000	18,000	2,845
6 - 32	4,000	3,000	2,85	56,000	8,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	8,000	21,000	4,166
12 - 24	6,000	4,900	4,50	80,000	11,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	13,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	14,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	16,000	39,000	9,525

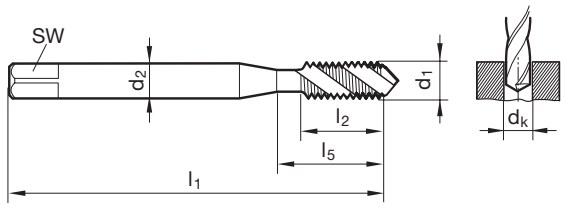
Machos para rosca UNC

Material de corte	**HSS-E**
Tolerância do Ø	2B
Superfície	
Tipo	N R15
Forma	C
Refrigeração interna	

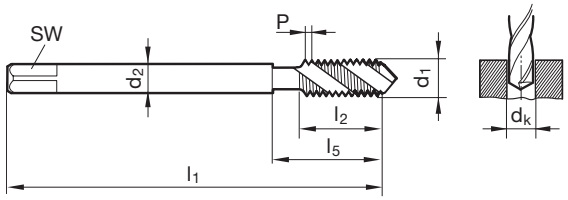
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 22

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 Nr. do artigo **2839**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,35	56,000	7,000	18,000	2,845
6 - 32	4,000	3,000	2,85	56,000	8,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	8,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	11,000	25,000	4,826

DIN 2184-1 ~DIN 376 Nr. do artigo **2840**

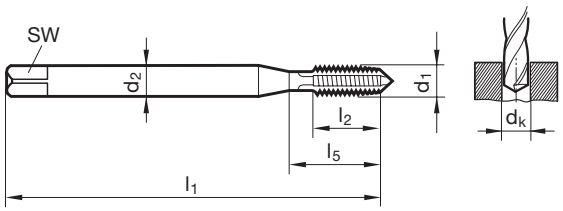
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
1/2 - 13	9,000	7,000	10,80	110,000	20,000	49,000	12,700
7/8 - 9	18,000	14,500	19,50	140,000	28,000	62,000	22,225
1 - 8	18,000	14,500	22,25	160,000	32,000	73,000	25,400

Machos para rosca UNC

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	◯
Tipo	N
Forma	C
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18/22





DIN 2184-1 ~DIN 371 Nr. do artigo **1977**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
3 - 48	2,800	2,100	2,10	50,000	6,000	14,500	2,515
4 - 40	3,500	2,700	2,35	56,000	7,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	7,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	8,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	8,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	11,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	11,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	13,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	14,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	16,000	39,000	9,525

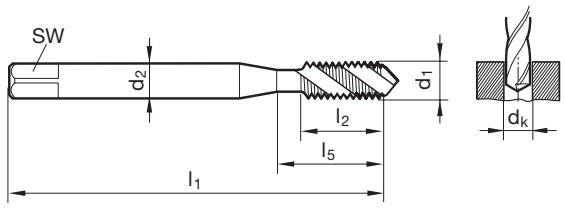
Machos para rosca UNC

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	N R40	N R40
Forma	C	C
Refrigeração interna	✕	✕

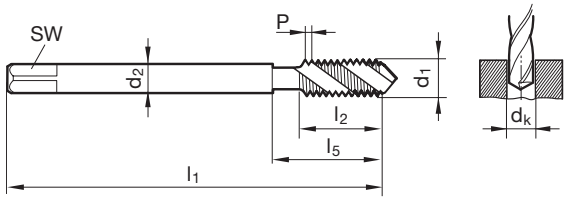
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23

~ DIN 371



~ DIN 376







DIN 2184-1 ~DIN 371 — Nr. do artigo **876** **2844**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
2 - 56	2,800	2,100	1,85	45,000	5,000	14,500	2,184
3 - 48	2,800	2,100	2,10	50,000	6,000	14,500	2,515
4 - 40	3,500	2,700	2,35	56,000	7,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	7,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	8,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	8,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	11,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	11,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	13,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	14,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	16,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **881** **2845**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	9,40	100,000	18,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	20,000	49,000	12,700
9/16 - 12	11,000	9,000	12,20	110,000	21,000	53,000	14,288
5/8 - 11	12,000	9,000	13,50	110,000	24,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	25,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	28,000	62,000	22,225
1 - 8	18,000	14,500	22,25	160,000	32,000	73,000	25,400

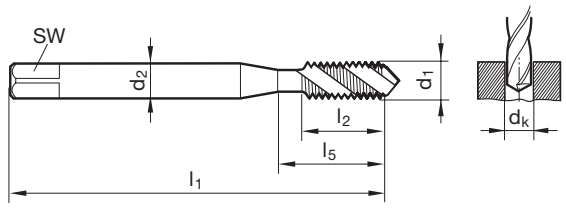
Machos para rosca UNC

P	≤ 1000
M	○
K	○
N	○
S	
H	

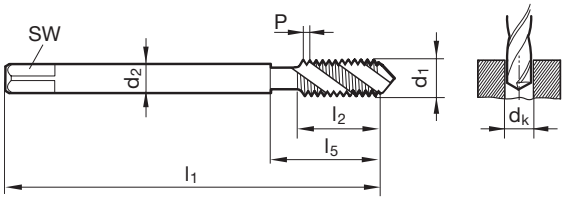
Página de dados de corte 24

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	N R40	N R40
Forma	C	C
Refrigeração interna	⊠	⊠

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo **2854** **2855**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
2 - 56	2,800	2,100	1,85	45,000	5,000	14,500	2,184
4 - 40	3,500	2,700	2,35	56,000	7,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	7,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	8,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	8,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	11,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	11,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	13,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	14,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	16,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **2856** **2857**

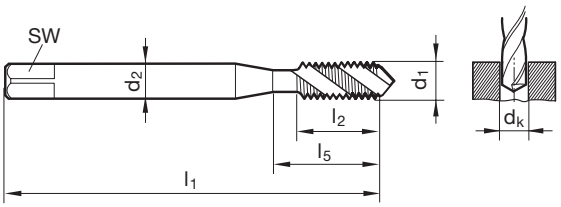
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	9,40	100,000	18,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	20,000	49,000	12,700
9/16 - 12	11,000	9,000	12,20	110,000	21,000	53,000	14,288
5/8 - 11	12,000	9,000	13,50	110,000	24,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	25,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	28,000	62,000	22,225
1 - 8	18,000	14,500	22,25	160,000	32,000	73,000	25,400

Machos para rosca UNC

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 25

Material de corte	**HSS-E**
Tolerância do Ø	2B
Superfície	S
Tipo	N R40
Forma	C
Refrigeração interna	





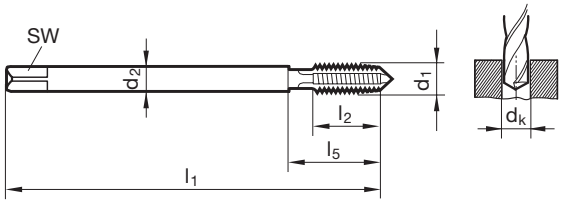
DIN 2184-1 ~DIN 371 Nr. do artigo **1837**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 24	6,000	4,900	3,90	70,000	11,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	11,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	13,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	14,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	16,000	39,000	9,525

Machos para rosca UNF

P	≤ 800	Página de dados de corte 19
M		
K		
N		
S		
H		

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	N	N
Forma	B	B
Refrigeração interna	⊠	⊠







DIN 2184-1 ~DIN 374 — Nr. do artigo **908** **2891**

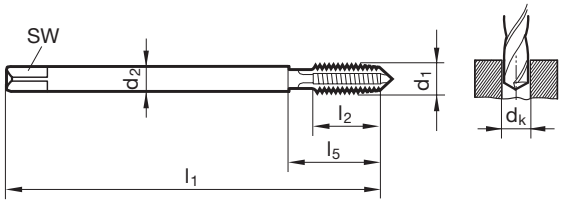
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
3 - 56	1,800		2,15	50,000	9,000	14,500	2,515
4 - 48	2,200		2,40	56,000	10,000	18,000	2,845
5 - 44	2,500	2,100	2,70	56,000	10,000	18,000	3,175
6 - 40	2,500	2,100	2,95	56,000	11,000	20,000	3,505
8 - 36	2,800	2,100	3,50	63,000	12,000	21,000	4,166
10 - 32	3,500	2,700	4,10	70,000	14,000	25,000	4,826
12 - 28	4,000	3,000	4,60	80,000	16,000	30,000	5,486
1/4 - 28	4,500	3,400	5,50	80,000	16,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	18,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	18,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	20,000	40,000	12,700
9/16 - 18	11,000	9,000	12,90	100,000	22,000	40,000	14,288
5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000	15,875
3/4 - 16	14,000	11,000	17,50	110,000	25,000	44,000	19,050
7/8 - 14	18,000	14,500	20,40	125,000	25,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	28,000	50,000	25,400
1 1/8 - 12	22,000	18,000	26,50	150,000	28,000	53,000	28,575
1 1/4 - 12	22,000	18,000	29,50	150,000	28,000	53,000	31,750

Machos para rosca UNF

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	◯
Tipo	N
Forma	C
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18/22





DIN 2184-1 ~DIN 374 Nr. do artigo **1987**

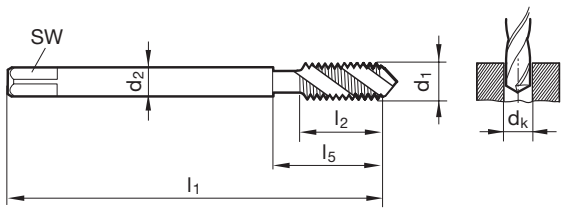
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
3 - 56	1,800	1,400	2,15	50,000	5,000	14,500	2,515
4 - 48	2,200	1,800	2,40	56,000	6,000	18,000	2,845
5 - 44	2,500	2,100	2,70	56,000	6,000	18,000	3,175
6 - 40	2,500	2,100	2,95	56,000	6,500	20,000	3,505
8 - 36	2,800	2,100	3,50	63,000	7,000	21,000	4,166
10 - 32	3,500	2,700	4,10	70,000	8,500	25,000	4,826
12 - 28	4,000	3,000	4,60	80,000	9,000	30,000	5,486
1/4 - 28	4,500	3,400	5,50	80,000	9,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	11,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	11,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	13,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000	12,700
9/16 - 18	11,000	9,000	12,90	100,000	14,000	40,000	14,288
5/8 - 18	12,000	9,000	14,50	100,000	15,000	44,000	15,875
3/4 - 16	14,000	11,000	17,50	110,000	16,000	44,000	19,050
7/8 - 14	18,000	14,500	20,40	125,000	19,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	22,000	50,000	25,400

Machos para rosca UNF

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	N R15	N R15
Forma	C	C
Refrigeração interna	✕	✕

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 22





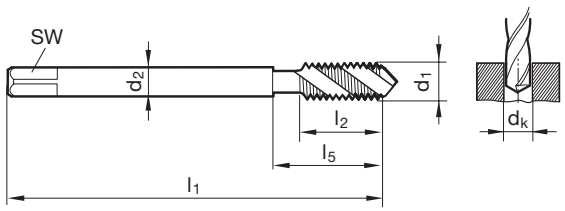
DIN 2184-1 ~DIN 374 — Nr. do artigo: **1988** | **2841**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
3 - 56	1,800	1,400	2,15	50,000	5,000	14,500	2,515
6 - 40	2,500	2,100	2,95	56,000	6,500	20,000	3,505
8 - 36	2,800	2,100	3,50	63,000	7,000	21,000	4,166
10 - 32	3,500	2,700	4,10	70,000	8,500	25,000	4,826
1/4 - 28	4,500	3,400	5,50	80,000	9,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	11,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	11,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	13,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000	12,700
9/16 - 18	11,000	9,000	12,90	100,000	14,000	40,000	14,288
5/8 - 18	12,000	9,000	14,50	100,000	15,000	44,000	15,875
3/4 - 16	14,000	11,000	17,50	110,000	16,000	44,000	19,050
1 - 12	18,000	14,500	23,25	140,000	22,000	50,000	25,400

Machos para rosca UNF

P	≤ 800	Página de dados de corte 23
M		
K		
N		
S		
H		

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	N R40	N R40
Forma	C	C
Refrigeração interna	⊠	⊠







DIN 2184-1 ~DIN 374 — Nr. do artigo **911** **2846**

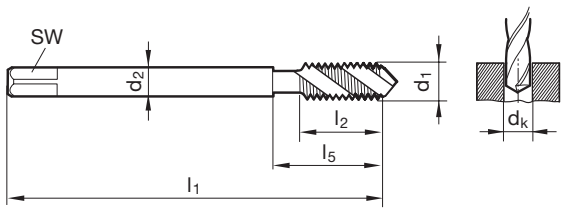
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
3 - 56	1,800	1,400	2,15	50,000	5,000	14,500	2,515
4 - 48	2,200	1,800	2,40	56,000	6,000	18,000	2,845
5 - 44	2,500	2,100	2,70	56,000	6,000	18,000	3,175
6 - 40	2,500	2,100	2,95	56,000	6,500	20,000	3,505
8 - 36	2,800	2,100	3,50	63,000	7,000	21,000	4,166
10 - 32	3,500	2,700	4,10	70,000	8,500	25,000	4,826
12 - 28	4,000	3,000	4,60	80,000	9,000	30,000	5,486
1/4 - 28	4,500	3,400	5,50	80,000	9,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	11,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	11,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	13,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000	12,700
9/16 - 18	11,000	9,000	12,90	100,000	14,000	40,000	14,288
5/8 - 18	12,000	9,000	14,50	100,000	15,000	44,000	15,875
3/4 - 16	14,000	11,000	17,50	110,000	16,000	44,000	19,050
7/8 - 14	18,000	14,500	20,40	125,000	19,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	22,000	50,000	25,400

Machos para rosca UNF

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 24

Material de corte	**HSS-E**
Tolerância do Ø	2B
Superfície	
Tipo	N R40
Forma	C
Refrigeração interna	





DIN 2184-1 ~DIN 374 Nr. do artigo **2859**

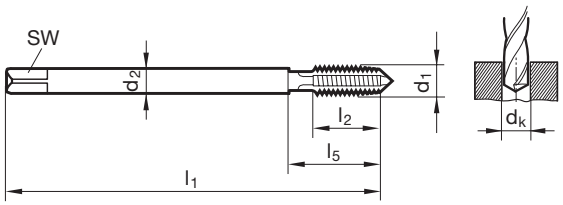
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 32	3,500	2,700	4,10	70,000	8,500	25,000	4,826
12 - 28	4,000	3,000	4,60	80,000	9,000	30,000	5,486
1/4 - 28	4,500	3,400	5,50	80,000	9,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	11,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	11,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	13,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	15,000	44,000	15,875
7/8 - 14	18,000	14,500	20,40	125,000	19,000	44,000	22,225

Machos para rosca UNF

P	≤ 1000
M	○
K	
N	
S	
H	

Página de dados de corte 20

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	
Tipo	N
Forma	B
Refrigeração interna	





DIN 2184-1 ~DIN 374 Nr. do artigo **2885**

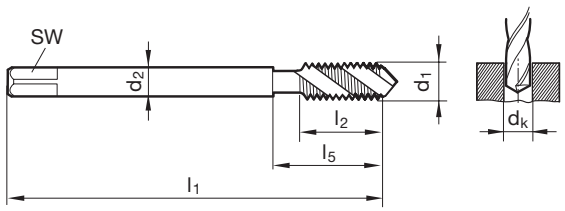
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
6 - 40	2,500	2,100	2,95	56,000	11,000	20,000	3,505
10 - 32	3,500	2,700	4,10	70,000	14,000	25,000	4,826
1/4 - 28	4,500	3,400	5,50	80,000	16,000	30,000	6,350
3/8 - 24	7,000	5,500	8,50	90,000	18,000	35,000	9,525
5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000	15,875
7/8 - 14	18,000	14,500	20,40	125,000	25,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	28,000	50,000	25,400

Machos para rosca UNF

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	S
Tipo	N R40
Forma	C
Refrigeração interna	

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 25





DIN 2184-1 ~DIN 374 — Nr. do artigo **1838**

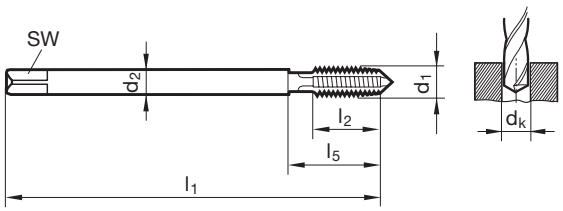
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 32	3,500	2,700	4,10	70,000	8,500	25,000	4,826
12 - 28	4,000	3,000	4,60	80,000	9,000	30,000	5,486
1/4 - 28	4,500	3,400	5,50	80,000	9,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	11,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	11,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	13,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	15,000	44,000	15,875
7/8 - 14	18,000	14,500	20,40	125,000	19,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	22,000	50,000	25,400

Machos para rosca gás Whitworth

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19

Material de corte	HSS-E	
Tolerância do Ø		
Superfície	○	●
Tipo	N	N
Forma	B	B
Refrigeração interna	⊠	⊠







DIN 2184-1 DIN 5156 — Nr. do artigo: **962** | **2894**

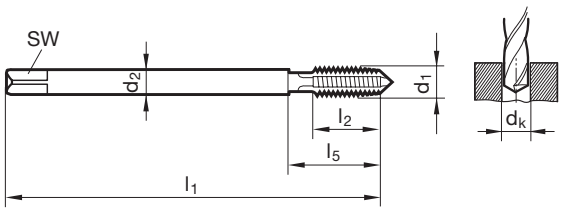
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	25,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	28,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000	33,249
G1 1/4	11,000	32,000	24,000	39,50	170,000	30,000	57,000	41,910
G1 3/8	11,000	36,000	29,000	41,75	180,000	32,000	60,000	44,323
G1 1/2	11,000	36,000	29,000	45,25	190,000	32,000	60,000	47,803
G2	11,000	45,000	35,000	57,00	220,000	40,000	95,000	59,614

Machos para rosca gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	
Superfície	◯
Tipo	N
Forma	C
Refrigeração interna	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18/22





DIN 2184-1 DIN 5156 — Nr. do artigo **963**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	11,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14	16,000	12,000	19,00	125,000	18,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	18,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	22,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000	33,249
G1 1/8	11,000	28,000	22,000	35,50	170,000	24,000	56,000	37,897
G1 1/4	11,000	32,000	24,000	39,50	170,000	25,000	57,000	41,910
G1 3/8	11,000	36,000	29,000	41,75	180,000	27,000	60,000	44,323
G1 1/2	11,000	36,000	29,000	45,25	190,000	27,000	60,000	47,803
G1 3/4	11,000	40,000	32,000	51,00	190,000	27,000	93,000	53,746
G2	11,000	45,000	35,000	57,00	220,000	32,000	95,000	59,614

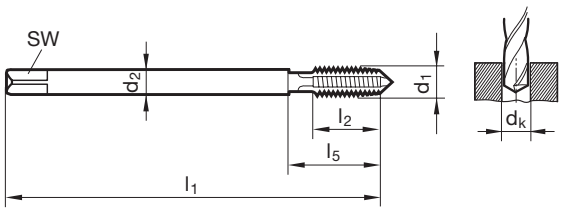
Machos para rosca gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	X
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	

NEW

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 21





DIN 2184-1 DIN 5156 Nr. do artigo **4220**

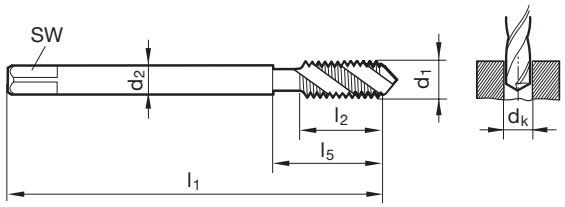
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	25,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	28,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000	33,249

Machos para rosca gás Whitworth

Material de corte	HSS-E		
Tolerância do Ø			
Superfície	○	●	C
Tipo	N R15	N R15	N R15
Forma	C	C	E
Refrigeração interna	✗	✗	✗

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 22/23





DIN 2184-1 DIN 5156 — Nr. do artigo: **964** | **2842** | **4158**

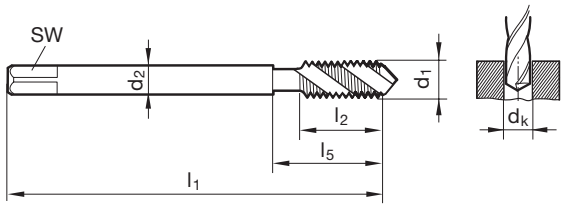
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	11,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	18,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	22,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000	33,249

Machos para rosca gás Whitworth

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23

Material de corte	HSS-E	
Tolerância do Ø		
Superfície	○	●
Tipo	N R40	N R40
Forma	C	C
Refrigeração interna	⊠	⊠







DIN 2184-1 DIN 5156 — Nr. do artigo: **965** | **2849**

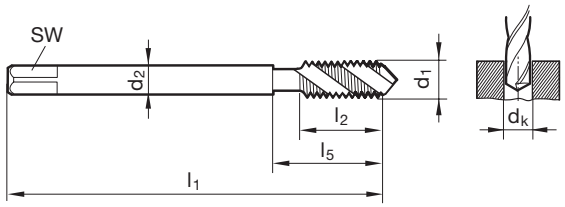
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	11,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	18,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000	26,441
G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000	33,249
G1 1/4	11,000	32,000	24,000	39,50	170,000	25,000	57,000	41,910
G1 1/2	11,000	36,000	29,000	45,25	190,000	27,000	60,000	47,803

Machos para rosca gás Whitworth

P	≤ 1000
M	○
K	○
N	○
S	
H	

Página de dados de corte 24

Material de corte	HSS-E	
Tolerância do Ø		
Superfície	○	●
Tipo	N R40	N R40
Forma	C	C
Refrigeração interna	✕	✕







DIN 2184-1 DIN 5156 — Nr. do artigo: **2860** | **2861**

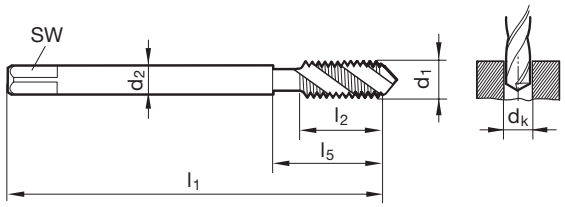
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	18,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	22,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000	33,249
G1 1/8	11,000	28,000	22,000	35,50	170,000	24,000	56,000	37,897
G1 1/4	11,000	32,000	24,000	39,50	170,000	25,000	57,000	41,910
G1 1/2	11,000	36,000	29,000	45,25	190,000	27,000	60,000	47,803
G2	11,000	45,000	35,000	57,00	220,000	32,000	95,000	59,614

Machos para rosca gás Whitworth

P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 25

Material de corte	HSS-E-PM
Tolerância do Ø	
Superfície	S
Tipo	VA R50
Forma	C
Refrigeração interna	





DIN 2184-1 DIN 5156 Nr. do artigo **4159**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	4,500	47,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	4,500	47,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	6,700	48,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	6,700	48,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	9,100	70,000	20,955

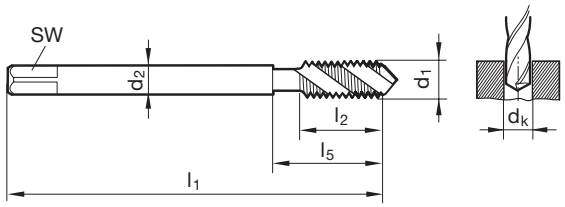
Machos para rosca gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	X
Superfície	A
Tipo	VA R45
Forma	C
Refrigeração interna	

NEW

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 25





DIN 2184-1 DIN 5156 — Nr. do artigo **395**

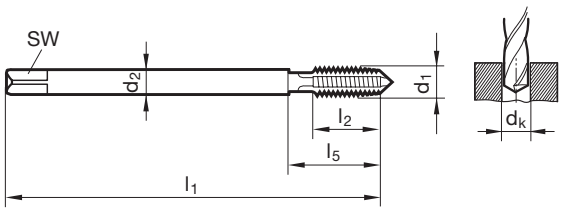
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	11,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	18,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	22,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000	33,249

Machos para rosca gás Whitworth

P	≤ 1000
M	○
K	
N	
S	
H	

Página de dados de corte 20

Material de corte	HSS-E	
Tolerância do Ø		
Superfície	A+M	
Tipo	N	N
Forma	B	B
Refrigeração interna		





DIN 2184-1 DIN 5156 — Nr. do artigo: **2886** **2887**

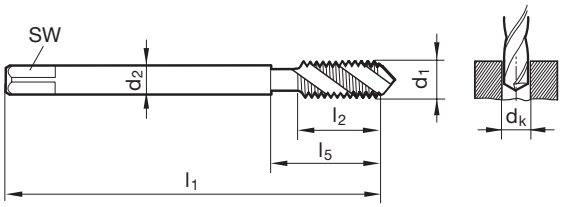
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000	26,441
G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000	33,249
G1 1/4	11,000	32,000	24,000	39,50	170,000	30,000	57,000	41,910
G1 1/2	11,000	36,000	29,000	45,25	190,000	32,000	60,000	47,803
G2	11,000	45,000	35,000	57,00	220,000	40,000	95,000	59,614

Machos para rosca gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	
Superfície	S
Tipo	N R40
Forma	C
Refrigeração interna	

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 25





DIN 2184-1 DIN 5156 — Nr. do artigo **937**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000	20,955
G3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	22,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000	33,249

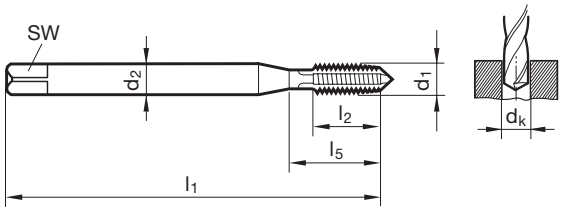
Machos para rosca BSW

Material de corte	HSS-E
Tolerância do Ø	
Superfície	
Tipo	N
Forma	B
Refrigeração interna	

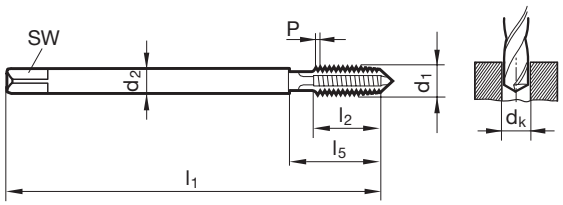
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 19

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo **2892**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
W1/8	40,000	3,500	2,700	2,50	56,000	11,000	18,000	3,175
W5/32	32,000	4,500	3,400	3,20	63,000	12,000	21,000	3,969
W3/16	24,000	6,000	4,900	3,60	70,000	14,000	25,000	4,762
W1/4	20,000	7,000	5,500	5,10	80,000	16,000	30,000	6,350
W5/16	18,000	8,000	6,200	6,50	90,000	18,000	35,000	7,938
W3/8	16,000	10,000	8,000	7,90	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **2893**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
W7/16	14,000	8,000	6,200	9,20	100,000	22,000	42,000	11,113
W1/2	12,000	9,000	7,000	10,50	110,000	25,000	49,000	12,700
W9/16	12,000	11,000	9,000	12,00	110,000	28,000	53,000	14,287
W5/8	11,000	12,000	9,000	13,50	110,000	30,000	53,000	15,876
W3/4	10,000	14,000	11,000	16,25	125,000	33,000	62,000	19,051
W7/8	9,000	18,000	14,500	19,25	140,000	35,000	62,000	22,226
W1	8,000	18,000	14,500	22,00	160,000	38,000	73,000	25,401

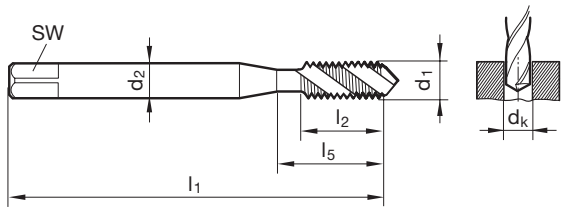
Machos para rosca BSW

Material de corte	HSS-E
Tolerância do Ø	
Superfície	
Tipo	N R40
Forma	C
Refrigeração interna	

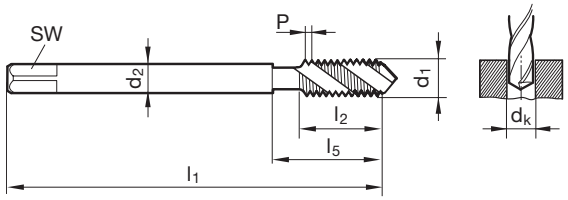
P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 23

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 Nr. do artigo **2847**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
W1/8	40,000	3,500	2,700	2,50	56,000	7,000	18,000	3,175
W3/16	24,000	6,000	4,900	3,60	70,000	11,000	25,000	4,762
W1/4	20,000	7,000	5,500	5,10	80,000	13,000	30,000	6,350
W5/16	18,000	8,000	6,200	6,50	90,000	14,000	35,000	7,938
W3/8	16,000	10,000	8,000	7,90	100,000	16,000	39,000	9,525

DIN 2184-1 ~DIN 376 Nr. do artigo **2848**

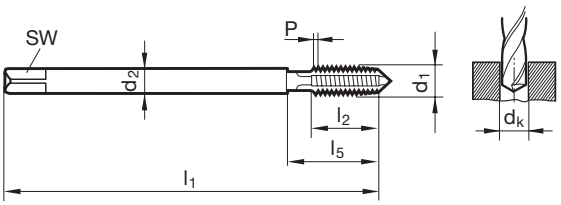
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
W3/8	16,000	7,000	5,500	7,90	100,000	16,000	39,000	9,525
W7/16	14,000	8,000	6,200	9,20	100,000	18,000	42,000	11,113
W1/2	12,000	9,000	7,000	10,50	110,000	20,000	49,000	12,700
W5/8	11,000	12,000	9,000	13,50	110,000	24,000	53,000	15,876
W3/4	10,000	14,000	11,000	16,25	125,000	25,000	62,000	19,051
W7/8	9,000	18,000	14,500	19,25	140,000	28,000	62,000	22,226
W1	8,000	18,000	14,500	22,00	160,000	32,000	73,000	25,401

Machos para rosca EG

P	≤ 1000
M	○
K	
N	
S	
H	

Página de dados de corte 20

Material de corte	**HSS-E**
Tolerância do Ø	6H mod
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	





DIN 40435 DIN 40435 Nr. do artigo **1010**

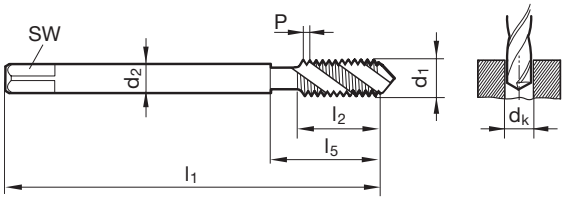
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
EG M4	0,700	6,000	4,900	4,20	70,000	12,000	25,000
EG M5	0,800	6,000	4,900	5,25	80,000	14,000	30,000
EG M6	1,000	8,000	6,200	6,30	90,000	17,000	35,000
EG M8	1,250	10,000	8,000	8,40	100,000	20,000	39,000
EG M10	1,500	9,000	7,000	10,50	100,000	20,000	40,000
EG M12	1,750	11,000	9,000	12,50	110,000	28,000	53,000
EG M14	2,000	12,000	9,000	14,50	110,000	26,000	54,000
EG M16	2,000	14,000	11,000	16,50	125,000	33,000	62,000

Machos para rosca EG

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 24

Material de corte	**HSS-E**
Tolerância do Ø	6H mod
Superfície	S
Tipo	N R40
Forma	C
Refrigeração interna	





DIN 40435 DIN 40435 Nr. do artigo **1011**

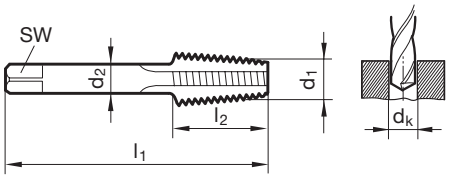
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
EG M4	0,700	6,000	4,900	4,20	70,000	7,500	25,000
EG M5	0,800	6,000	4,900	5,25	80,000	8,500	30,000
EG M6	1,000	8,000	6,200	6,30	90,000	11,000	35,000
EG M8	1,250	10,000	8,000	8,40	100,000	14,000	39,000
EG M10	1,500	9,000	7,000	10,50	100,000	16,000	40,000
EG M12	1,750	11,000	9,000	12,50	110,000	18,500	53,000
EG M14	2,000	12,000	9,000	14,50	110,000	20,000	54,000
EG M16	2,000	14,000	11,000	16,50	125,000	20,000	62,000

Machos para rosca NPT

Material de corte	HSS-E
Tolerância do Ø	
Superfície	◯
Tipo	N
Forma	C
Refrigeração interna	

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18/22





Norma da emp. Norma da emp. Nr. do artigo **973**

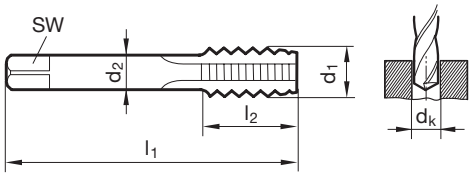
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
1/16	27,000	6,000	4,900	6,15	56,000	14,000	27,000	8,190
1/8	27,000	7,000	5,500	8,40	63,000	15,000	29,000	10,620
1/4	18,000	11,000	9,000	11,10	63,000	21,000	33,000	14,140
3/8	18,000	12,000	9,000	14,30	70,000	21,000	35,000	17,570
1/2	14,000	16,000	12,000	17,90	80,000	27,000	41,000	21,900
3/4	14,000	20,000	16,000	23,30	100,000	27,000	42,000	27,230
1	11,500	25,000	20,000	29,00	110,000	32,000	53,000	34,180
1 1/4	11,500	32,000	24,000	37,70	125,000	33,000	54,500	42,900
1 1/2	11,500	36,000	29,000	43,70	140,000	33,000	56,000	48,940
2	11,500	36,000	29,000	55,60	160,000	33,000	63,000	61,000

Machos para rosca gás blindada

Material de corte	HSS-E	
Tolerância do Ø		
Superfície	◯	◯
Tipo	N	N
Forma	B	C
Refrigeração interna	⊠	⊠

P	≤ 800
M	
K	
N	
S	
H	

Página de dados de corte 18-22







DIN 2184-2 DIN 40432 — Nr. do artigo: **980** | **979**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
PG7	20,000	9,000	7,000	11,40	70,000	22,000	35,000	12,500
PG9	18,000	12,000	9,000	14,00	70,000	22,000	35,000	15,200
PG11	18,000	14,000	11,000	17,30	80,000	22,000	40,000	18,600
PG13,5	18,000	16,000	12,000	19,00	80,000	22,000	40,000	20,400
PG16	18,000	18,000	14,500	21,30	80,000	22,000	40,000	22,500
PG21	16,000	22,000	18,000	26,90	90,000	22,000	42,000	28,300
PG29	16,000	28,000	22,000	35,50	100,000	25,000	45,000	37,000



MACHOS LAMINA-DORES

P

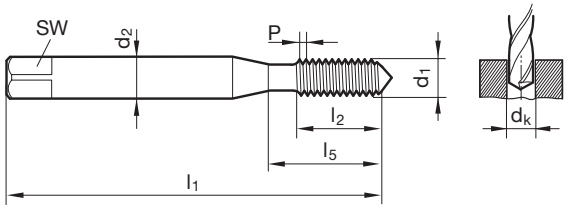
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM	HSS-E	HSS-E-PM
Tolerância do Ø	6GX	6HX	6HX
Superfície	S	S	S
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna	✕	✕	✕

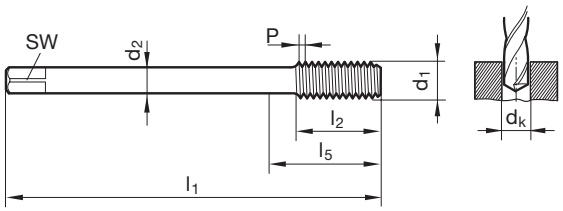
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo: **903** | **921** | **1255**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,90	40,000	4,000	
M1,2	0,250	2,500	2,100	1,10	40,000	4,800	
M1,4	0,300	2,500	2,100	1,25	40,000	5,600	
M1,6	0,350	2,500	2,100	1,45	40,000	6,400	
M1,7	0,350	2,500	2,100	1,55	40,000	6,800	
M1,8	0,350	2,500	2,100	1,65	40,000	7,300	
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo: **952** | **925** | **1256**

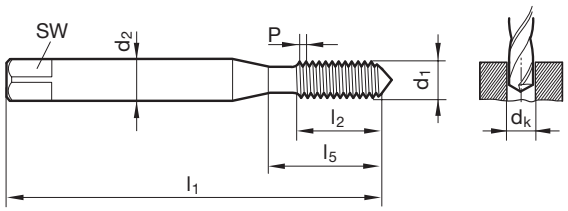
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26





DIN 2174 ~DIN 371 Nr. do artigo **920**

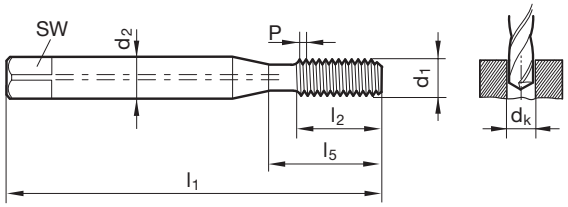
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 26





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **2518**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

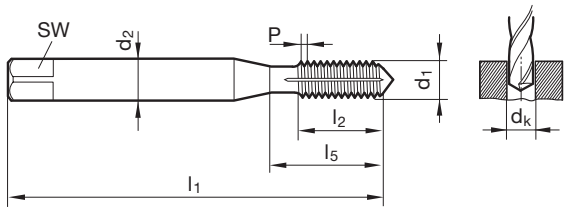
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E		
Tolerância do Ø	6HX	6HX	6HX
Superfície	S	P	C
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna	✗	✗	✗

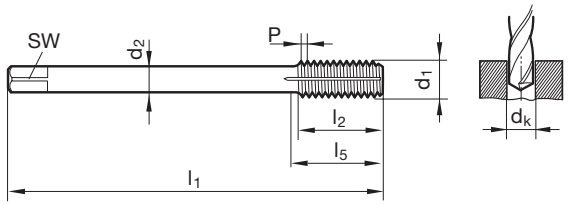
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 26

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo: **919** | **1587** | **2012**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo: **923** | **1589** | **2013**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M6	1,000	4,500	3,400	5,55	80,000	16,000	30,000
M8	1,250	6,000	4,900	7,40	90,000	17,000	35,000
M10	1,500	7,000	5,500	9,30	100,000	20,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000
M22	2,500	18,000	14,500	20,90	140,000	32,000	62,000
M24	3,000	18,000	14,500	22,70	160,000	36,000	73,000
M27	3,000	20,000	16,000	25,70	160,000	36,000	73,000
M30	3,500	22,000	18,000	28,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	31,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	34,30	200,000	50,000	102,000
M39	4,000	32,000	24,000	37,30	200,000	50,000	107,000

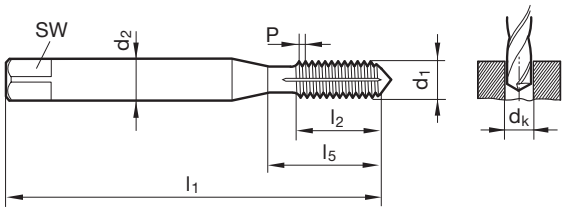
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E		HSS-E-PM
Tolerância do Ø	6GX	6GX	6GX
Superfície	S	P	P
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna	✗	✗	✗

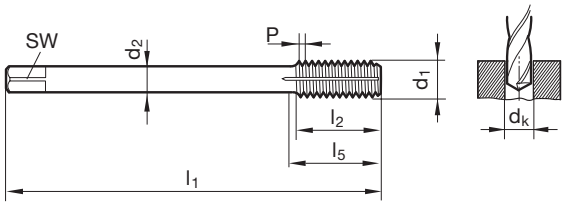
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 26/27

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	918	1588	1705

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	922	1590	1708

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M6	1,000	4,500	3,400	5,55	80,000	16,000	30,000
M8	1,250	6,000	4,900	7,40	90,000	17,000	35,000
M10	1,500	7,000	5,500	9,30	100,000	20,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

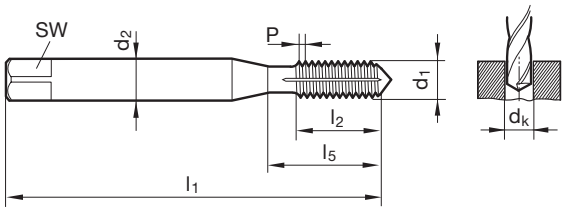
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

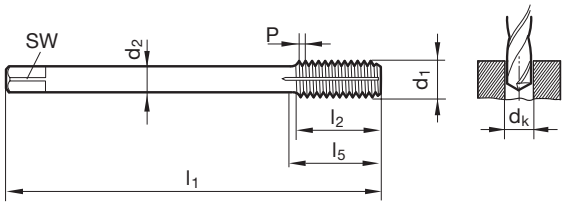
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 27

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **322**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **339**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

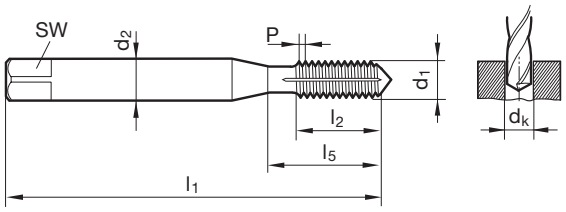
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	S	P
Tipo	N	N
Forma	C	C
Refrigeração interna		

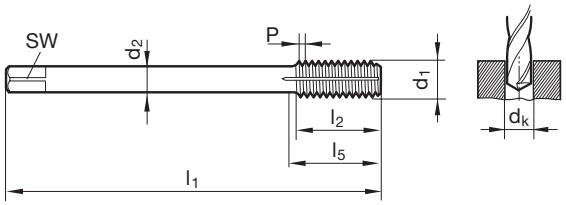
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 27

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **1266** **1599**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1267** **1707**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

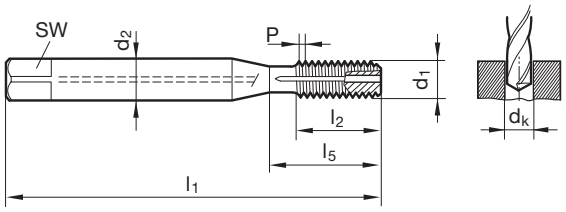
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E		
Tolerância do Ø	6HX	6GX	6HX
Superfície	S	S	C
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna			

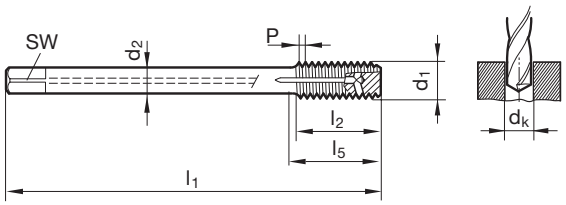
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 27

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	2442	2443	2446

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	2444	2445	2448

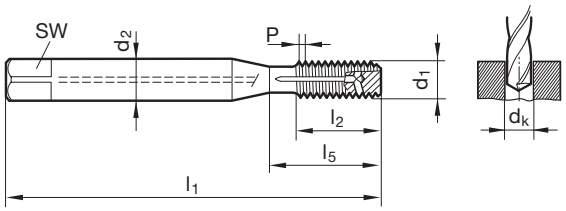
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**HSS-E**
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 27





DIN 2174 ~DIN 371 Nr. do artigo **2447**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

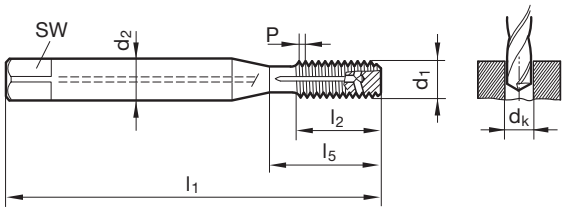
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

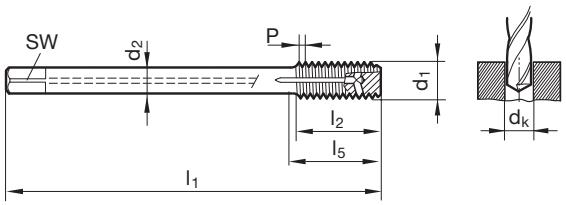
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 27

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **323**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **342**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

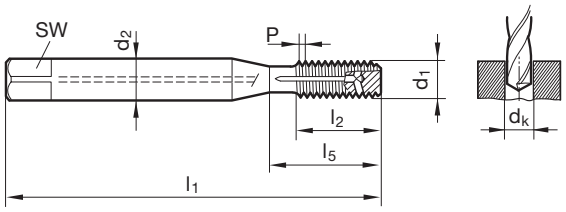
Machos laminadores para rosca métrica ISO com canais de refrigeração

P	•
M	•
K	
N	≥ 7
S	○
H	

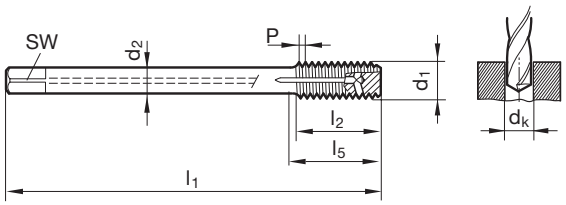
Página de dados de corte 27

Material de corte	HSS-E-PM		
Tolerância do Ø	6HX	6HX	6HX
Superfície	C	A	S
Tipo	N	N	N
Forma	C	C	E
Refrigeração interna			

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	1270	1717	1725

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	1271	1719	1727

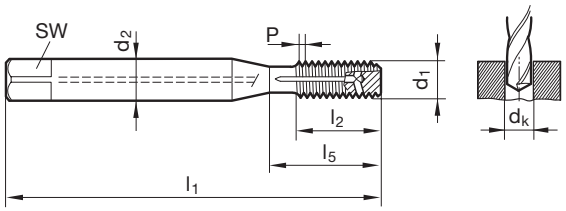
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 27





DIN 2174 ~DIN 371 Nr. do artigo **1713**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

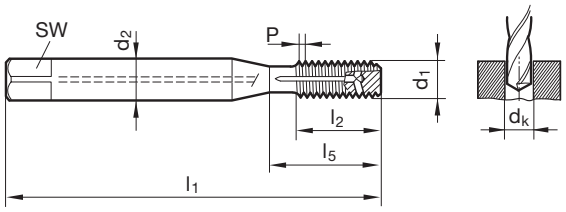
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	A	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

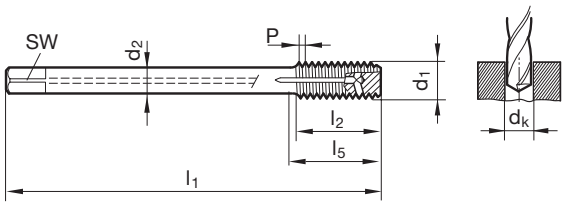
P	•
M	•
K	
N	
S	•
H	

Página de dados de corte 27

~ DIN 371



~ DIN 376







DIN 2174 ~DIN 371 — Nr. do artigo **1718** **1726**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1720** **1728**

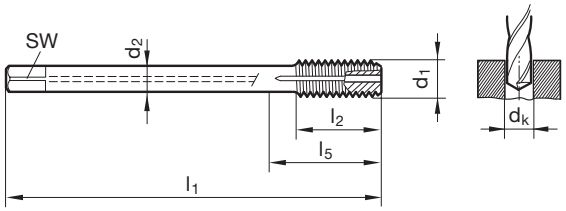
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 27





Norma da emp. Norma da emp. Nr. do artigo **4143**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	112,000	6,000	18,000
M4	0,700	2,800	2,100	3,70	112,000	7,500	77,000
M5	0,800	3,500	2,700	4,65	125,000	8,500	90,000
M6	1,000	4,500	3,400	5,55	125,000	11,000	90,000
M8	1,250	6,000	4,900	7,40	140,000	14,000	97,000
M10	1,500	7,000	5,500	9,30	160,000	16,000	117,000
M12	1,750	9,000	7,000	11,20	180,000	18,500	133,000
M16	2,000	12,000	9,000	15,10	220,000	20,000	168,000
M20	2,500	16,000	12,000	18,90	280,000	25,000	225,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

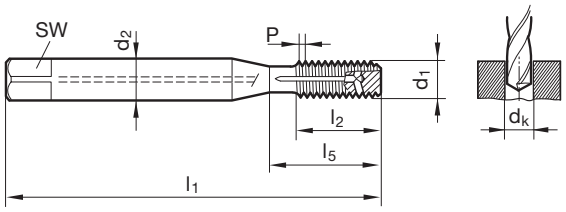


Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

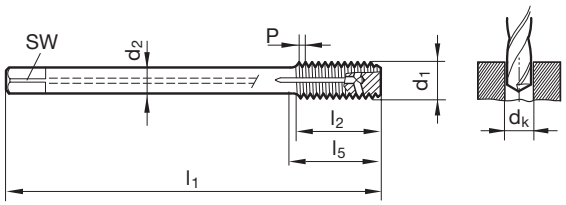
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 27

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 Nr. do artigo **1972**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 Nr. do artigo **1931**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	25,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

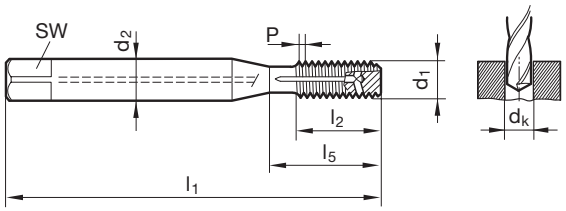
Machos laminadores para rosca métrica ISO com canais de refrigeração



P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 27

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	E
Refrigeração interna	





DIN 2174 ~DIN 371 Nr. do artigo **1927**

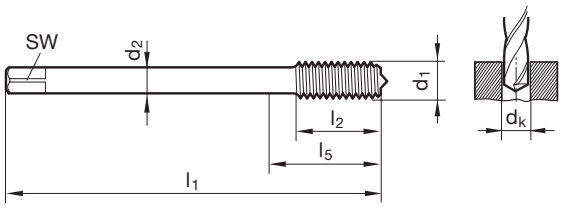
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26





DIN 2174 ~DIN 374 — Nr. do artigo **929**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

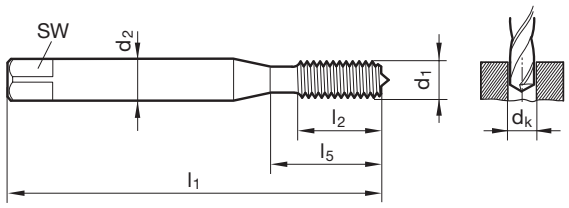
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

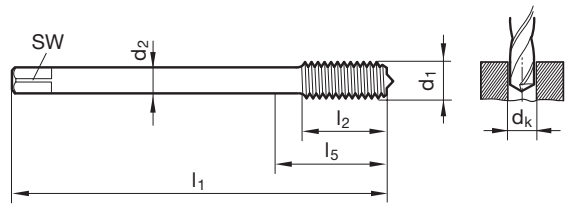
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1257**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1258**

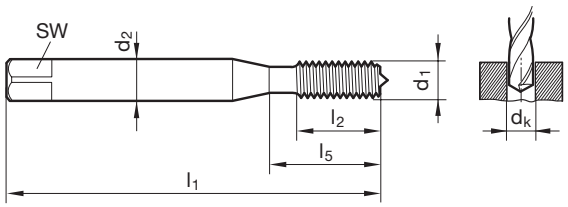
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26





DIN 2174 ~DIN 371 Nr. do artigo **1740**

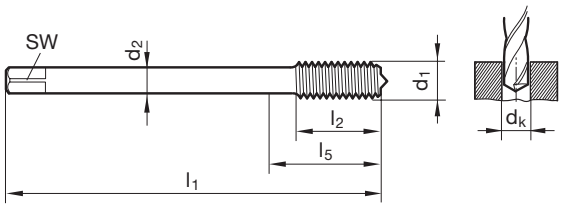
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26





DIN 2174 ~DIN 374 — Nr. do artigo **928**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007

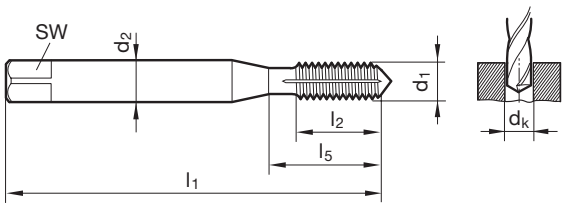
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E	
Tolerância do Ø	6HX	6HX
Superfície	S	P
Tipo	N	N
Forma	C	C
Refrigeração interna		

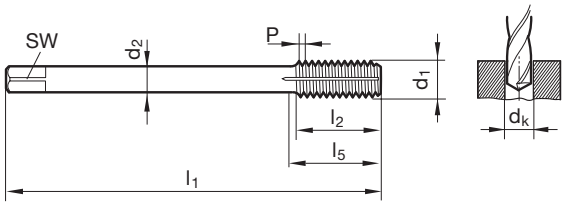
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 26

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1275** **1591**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	6,000	4,900	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	8,000	6,200	7,65	80,000	14,000	30,000	8,004
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **927** **1593**

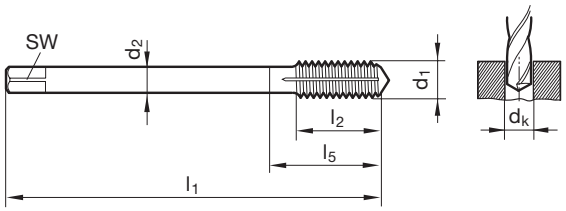
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 26





DIN 2174 ~DIN 374 Nr. do artigo **2008**

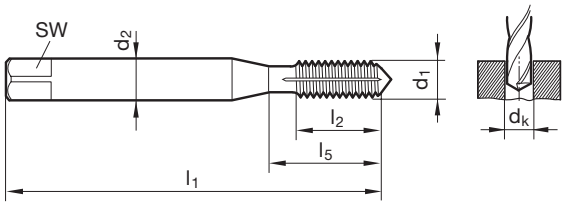
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000	10,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

Machos laminadores para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	6GX
Superfície	P
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	
K	
N	
S	
H	

Página de dados de corte 26





DIN 2174 ~DIN 371 Nr. do artigo **1592**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

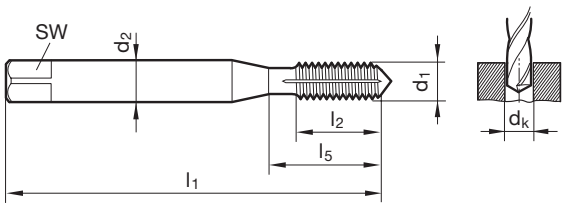
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

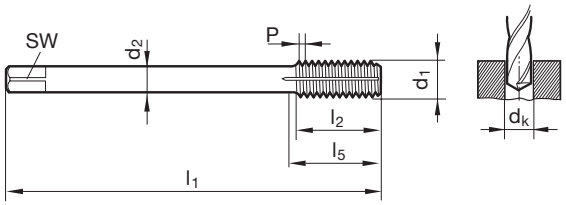
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 26

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1277**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **926**

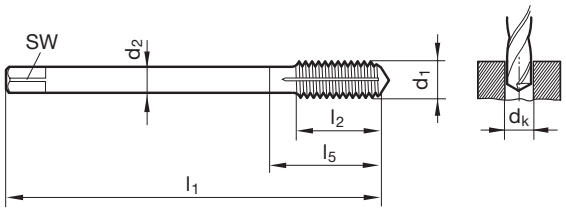
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 26





DIN 2174 ~DIN 374 — Nr. do artigo **333**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	16,000	44,000	20,007

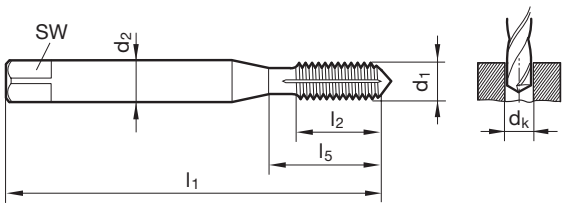
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

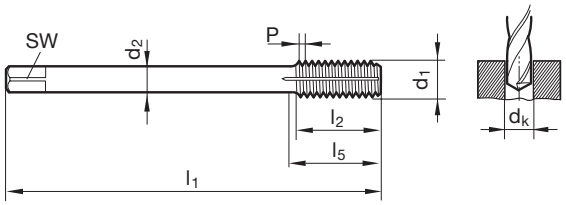
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 27

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1268**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1269**

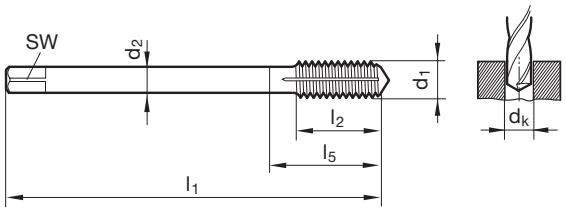
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	P
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	
K	
N	
S	
H	

Página de dados de corte 27





DIN 2174 ~DIN 374 Nr. do artigo **1711**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

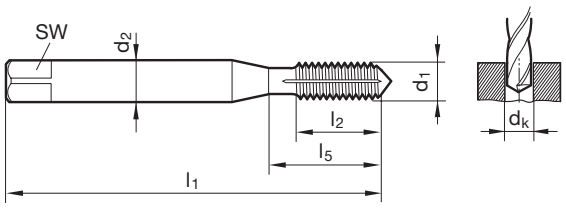
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	P
Tipo	N
Forma	C
Refrigeração interna	

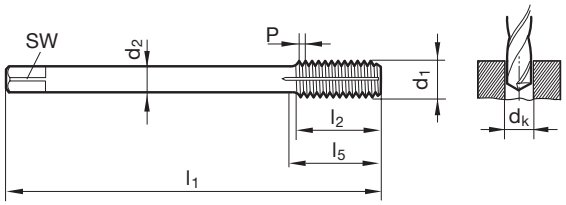
P	•
M	
K	
N	
S	
H	

Página de dados de corte 27

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1710**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1712**

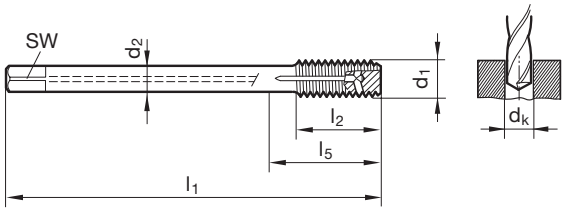
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 27





DIN 2174 ~DIN 374 Nr. do artigo **338**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007

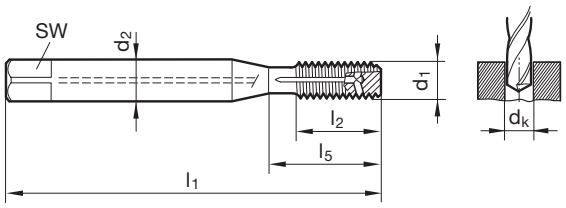
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM		
Tolerância do Ø	6HX	6HX	6HX
Superfície	C	A	S
Tipo	N	N	N
Forma	C	C	E
Refrigeração interna			

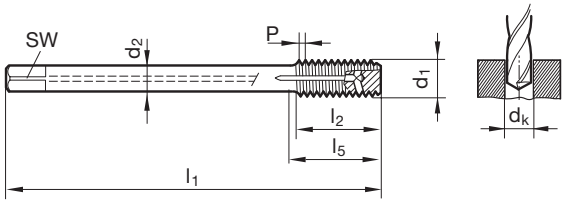
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 27

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo: **1272** | **1721** | **1729**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo: **1273** | **1723** | **1731**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

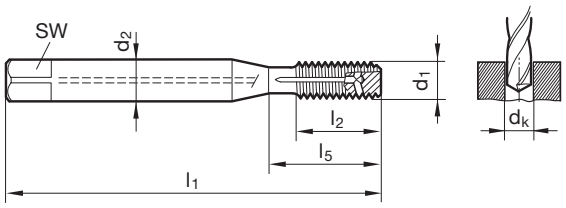
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	C	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

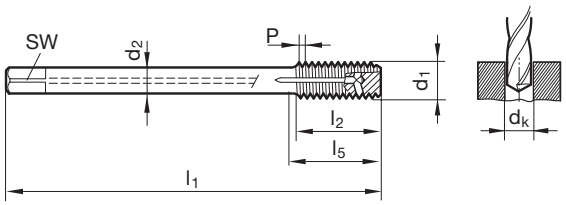
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 27

~ DIN 371



~ DIN 374







DIN 2174 ~DIN 371 — Nr. do artigo **1715** **1730**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **1716** **1732**

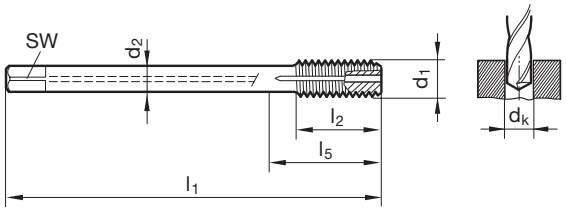
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 27





Norma da emp. Norma da emp. Nr. do artigo **4145**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	140,000	14,000	97,000	8,005
M10 x 1	7,000	5,500	9,55	160,000	16,000	117,000	10,005
M10 x 1,25	7,000	5,500	9,40	160,000	16,000	117,000	10,006
M12 x 1	9,000	7,000	11,55	180,000	18,500	133,000	12,005
M12 x 1,5	9,000	7,000	11,30	180,000	18,500	133,000	12,007
M14 x 1,5	11,000	9,000	13,30	220,000	20,000	168,000	14,007
M16 x 1,5	12,000	9,000	15,30	220,000	20,000	168,000	16,007

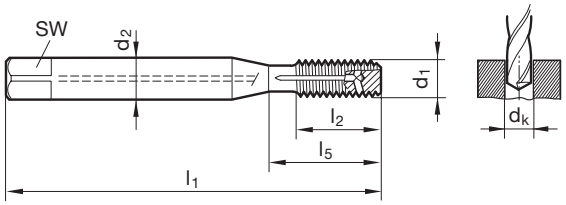
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

h6

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 27

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **1581**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M10 x 1	10,000	8,000	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	15,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	15,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	15,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	15,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	15,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	15,000	48,000	24,007

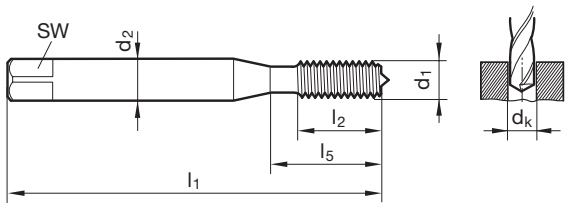
Machos laminadores para rosca UNC

Material de corte	HSS-E	
Tolerância do Ø	2BX	2BX
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

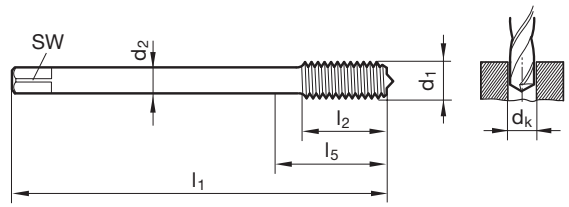
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo **2273** **1582**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,55	56,000	11,000	18,000	2,845
5 - 40	3,500	2,700	2,90	56,000	11,000	18,000	3,175
6 - 32	4,000	3,000	3,15	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,80	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	4,35	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	5,00	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,75	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	7,30	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,80	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **2274** **1583**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	10,30	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	11,80	110,000	25,000	49,000	12,700
9/16 - 12	11,000	9,000	13,30	110,000	28,000	53,000	14,288
5/8 - 11	12,000	9,000	14,80	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	17,90	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	21,00	140,000	35,000	62,000	22,225

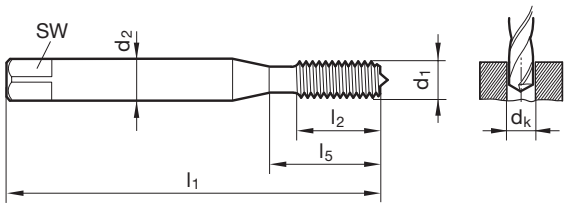
Machos laminadores para rosca UNF

Material de corte	HSS-E	
Tolerância do Ø	2BX	2BX
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

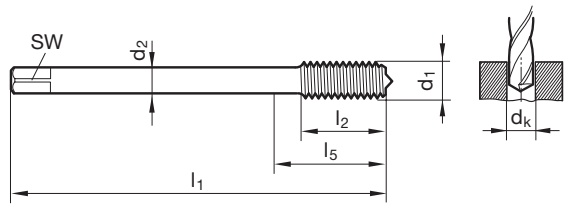
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo **1283** **1584**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 48	3,500	2,700	2,60	56,000	10,000	18,000	2,845
5 - 44	3,500	2,700	2,90	56,000	10,000	18,000	3,175
6 - 40	4,000	3,000	3,20	56,000	11,000	20,000	3,505
8 - 36	4,500	3,400	3,85	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,45	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	5,10	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,95	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	7,45	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	9,05	90,000	18,000	35,000	9,525

DIN 2184-1 ~DIN 374 — Nr. do artigo **2275** **1585**

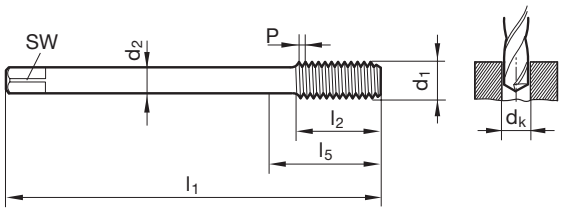
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 32	3,500	2,700	4,45	70,000	14,000	25,000	4,826
12 - 28	4,000	3,000	5,10	80,000	16,000	30,000	5,486
1/4 - 28	4,500	3,400	5,95	80,000	16,000	30,000	6,350
5/16 - 24	6,000	4,900	7,45	90,000	18,000	35,000	7,938
3/8 - 24	7,000	5,500	9,05	90,000	18,000	35,000	9,525
7/16 - 20	8,000	6,200	10,55	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	12,10	100,000	20,000	40,000	12,700
9/16 - 18	11,000	9,000	13,65	100,000	22,000	40,000	14,288
5/8 - 18	12,000	9,000	15,25	100,000	22,000	44,000	15,875
3/4 - 16	14,000	11,000	18,35	110,000	25,000	44,000	19,050
7/8 - 14	18,000	14,500	21,40	125,000	25,000	44,000	22,225
1 - 12	18,000	14,500	24,45	140,000	28,000	50,000	25,400

Machos laminadores para rosca Gás Whitworth

Material de corte	HSS-E	
Tolerância do Ø	X	X
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 26







DIN 2184-1 DIN 2189 — Nr. do artigo: **966** **1586**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	7,30	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	9,30	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	12,50	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	16,00	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	20,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	25,50	140,000	28,000	53,000	26,441
G1	11,000	25,000	20,000	32,00	160,000	30,000	56,000	33,249
G1 1/4	11,000	32,000	24,000	40,75	170,000	30,000	57,000	41,910



FRESAS DE ROSCAR

P

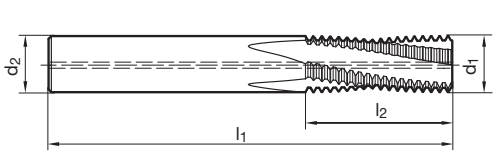
Fresas para rosca métrica ISO sem chanfro

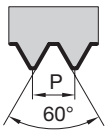
2xD

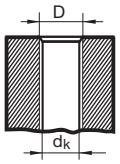
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 28

Material de corte	MD int.			
Superfície	C	C	C	C
Tipo	TM SP	TM SP	TM SP	TM SP
Refrigeração interna				
Forma da haste	HA	HB	HA	HB
		NEW		NEW









Norma da emp.	Nr. do artigo	3737	3743	4132	4133

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	13,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	18,100	3	8,000
M8 x 1	1,000	6,400	8,000	7,00	62,000	17,500	3	8,005
M10	1,500	7,950	10,000	8,50	74,000	21,800	3	10,000
M10 x 1	1,000	7,950	10,000	9,00	74,000	21,500	3	10,005
M10 x 1,25	1,250	7,950	10,000	8,80	74,000	21,900	3	10,006
M12	1,750	9,950	10,000	10,20	74,000	25,400	4	12,000
M12 x 1,5	1,500	9,950	10,000	10,50	74,000	26,300	4	12,007
M14	2,000	11,200	12,000	12,00	90,000	31,000	4	14,000
M14 x 1,5	1,500	11,200	12,000	12,50	90,000	30,800	4	14,007
M16	2,000	12,800	14,000	14,00	90,000	35,000	4	16,000
M16 x 1,5	1,500	12,800	14,000	14,50	90,000	33,800	4	16,007
M20	2,500	14,950	16,000	17,50	102,000	41,300	4	20,000
M20 x 1,5	1,500	14,950	16,000	18,50	102,000	42,800	4	20,007

Fresas para rosca métrica ISO sem chanfro

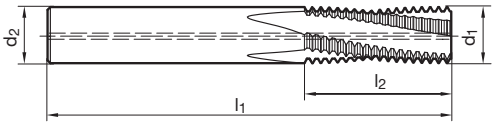
2,5xD

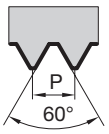
P	•
M	○
K	•
N	•
S	○
H	≤55

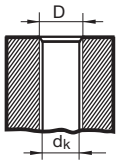
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3735	3740

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	16,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	21,900	3	8,000
M10	1,500	7,950	10,000	8,50	74,000	26,300	3	10,000
M12	1,750	9,950	10,000	10,20	74,000	32,400	4	12,000
M14	2,000	11,200	12,000	12,00	90,000	37,000	4	14,000
M16	2,000	12,800	14,000	14,00	90,000	43,000	4	16,000
M20	2,500	14,950	16,000	17,50	102,000	48,800	4	20,000

Fresas para rosca métrica ISO com chanfro

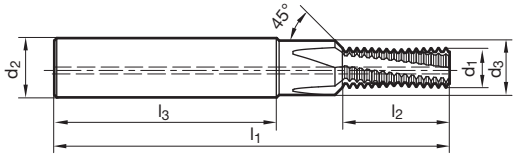
1,5xD

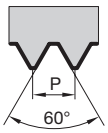
P	•
M	•
K	•
N	•
S	•
H	≤55

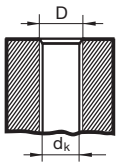
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3525** | **3543**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	5,300	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	7,400	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	9,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	10,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	13,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	17,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	20,100	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	25,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	27,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	33,800	4	20,000

Fresas para rosca métrica ISO com chanfro

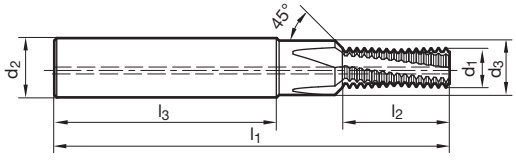
2xD

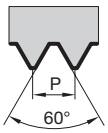
P	•
M	•
K	•
N	•
S	•
H	≤55

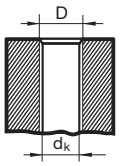
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. Nr. do artigo **3526** **3544**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	6,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	8,800	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	10,800	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	13,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	18,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	21,800	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	25,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	31,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	35,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	41,300	4	20,000

Fresas para rosca métrica ISO com chanfro

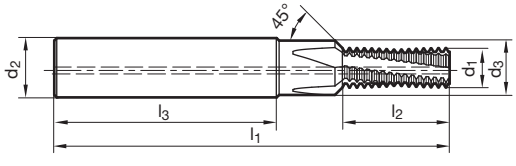
2,5xD

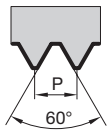
P	•
M	•
K	•
N	•
S	•
H	≤55

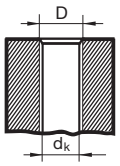
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3759** | **3760**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	7,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	35,600	10,900	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	13,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	16,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	21,900	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	26,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	32,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	37,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	43,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	48,800	4	20,000

Fresas para rosca métrica fina ISO com chanfro

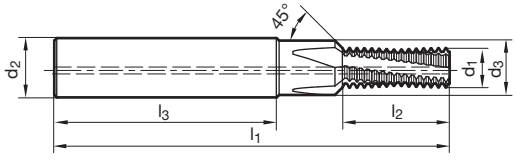


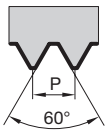
P	•
M	•
K	•
N	•
S	•
H	≤55

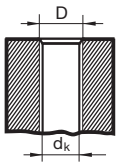
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3527** | **3545**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	7,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	8,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	9,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	10,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	13,100	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	13,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	16,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	16,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	19,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	20,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	23,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	26,300	4	16,007

Fresas para rosca métrica fina ISO com chanfro

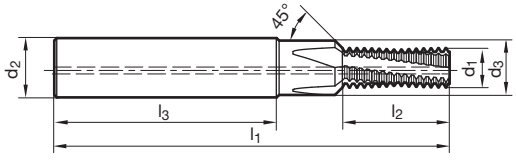
2xD

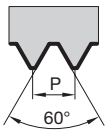
P	•
M	•
K	•
N	•
S	•
H	≤55

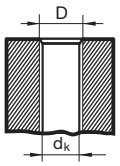
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3528** | **3546**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	8,800	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	10,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	12,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	13,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	16,900	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	17,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	21,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	21,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	25,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	26,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	30,800	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	33,800	4	16,007

Fresas para rosca métrica fina ISO com chanfro

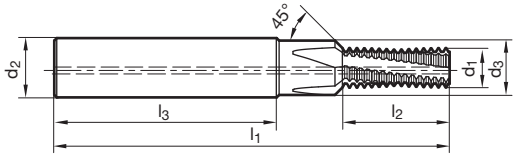


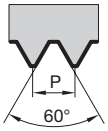
P	•
M	•
K	•
N	•
S	•
H	≤55

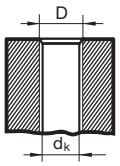
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3762	3763

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	10,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	12,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	15,300	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	15,400	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	20,600	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	20,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	25,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	25,600	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	30,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	30,800	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	38,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	41,300	4	16,007

Fresas para rosca UNC sem chanfro

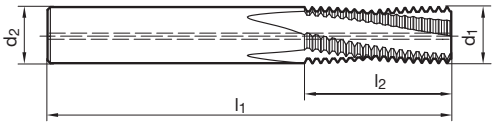
2xD

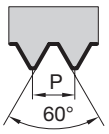
P	•
M	○
K	•
N	•
S	○
H	≤55

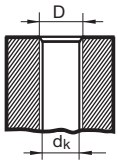
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4134	4135

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 24	3,400	6,000	3,90	54,000	11,100	3	4,826
12 - 24	4,100	6,000	4,50	54,000	12,200	3	5,486
1/4 - 20	4,700	6,000	5,10	54,000	14,600	3	6,350
5/16 - 18	6,100	8,000	6,60	64,000	17,600	3	7,938
3/8 - 16	7,600	8,000	8,00	64,000	21,400	3	9,525
7/16 - 14	9,000	10,000	9,40	74,000	24,500	3	11,113
1/2 - 13	9,950	10,000	10,80	74,000	28,300	4	12,700
9/16 - 12	11,400	12,000	12,20	90,000	30,700	4	14,288
5/8 - 11	12,700	14,000	13,50	90,000	35,800	4	15,875

Fresas para rosca UNC com chanfro

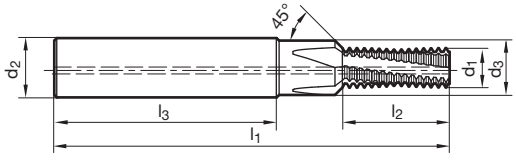


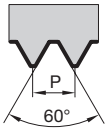
P	•
M	•
K	•
N	•
S	•
H	≤55

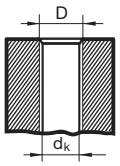
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3516	3534

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	12,100	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	14,800	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	16,700	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	19,000	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	22,500	4	12,700

Fresas para rosca UNC com chanfro

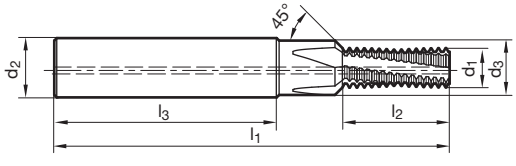
2xD

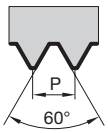
P	•
M	•
K	•
N	•
S	•
H	≤55

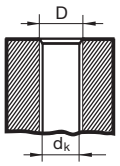
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3517	3535

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	14,600	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	17,600	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	21,400	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	24,500	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	28,300	4	12,700

Fresas para rosca UNF sem chanfro

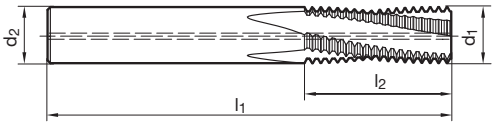
2xD

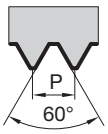
P	•
M	○
K	•
N	•
S	○
H	≤55

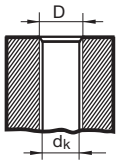
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4136	4137

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 32	3,800	6,000	4,10	54,000	11,500	3	4,826
12 - 28	4,300	6,000	4,60	54,000	12,200	3	5,486
1/4 - 28	5,100	6,000	5,50	54,000	14,100	3	6,350
5/16 - 24	6,300	8,000	6,90	64,000	17,500	3	7,938
3/8 - 24	7,800	8,000	8,50	64,000	20,600	3	9,525
7/16 - 20	9,400	10,000	9,90	74,000	24,800	3	11,113
1/2 - 20	9,950	10,000	11,50	74,000	27,300	4	12,700
9/16 - 18	11,400	12,000	12,90	90,000	30,300	4	14,288
5/8 - 18	12,700	14,000	14,50	90,000	33,200	4	15,875

Fresas para rosca UNF com chanfro

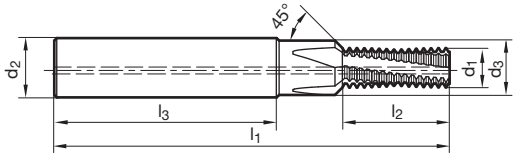


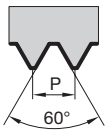
P	•
M	•
K	•
N	•
S	•
H	≤55

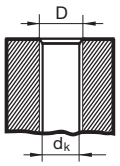
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3518	3536

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	11,300	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	13,200	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	16,400	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	18,400	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	21,000	4	12,700

Fresas para rosca UNF com chanfro

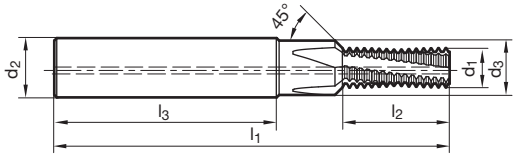
2xD

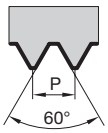
P	•
M	•
K	•
N	•
S	•
H	≤55

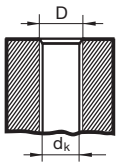
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3519	3537

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	14,100	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	17,500	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	20,600	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	24,800	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	27,300	4	12,700

Fresas para rosca gás Whitworth sem chanfro

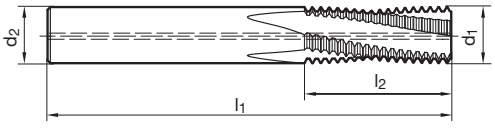
2xD

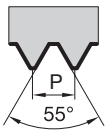
P	•
M	○
K	•
N	•
S	○
H	≤55

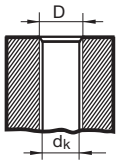
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3745	3748

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	21,300	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	28,700	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	35,400	4	16,662

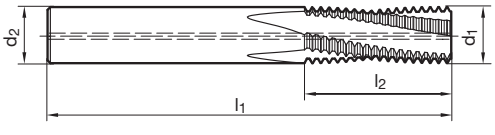
Fresas para rosca gás Whitworth sem chanfro

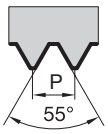


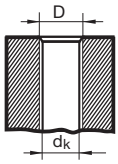
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3746	3750

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	24,900	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	35,400	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	43,500	4	16,662

Fresas para rosca gás Whitworth com chanfro

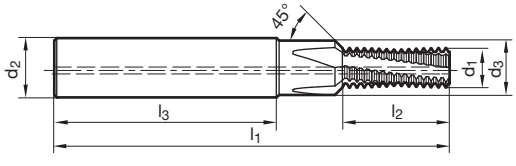
1,5xD

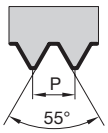
P	•
M	•
K	•
N	•
S	•
H	≤55

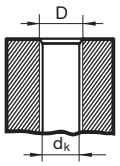
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3514** | **3529**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	15,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	22,100	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	27,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

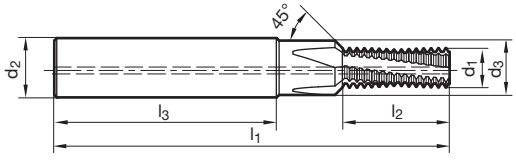
2xD

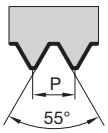
P	•
M	•
K	•
N	•
S	•
H	≤55

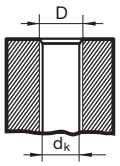
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3515	3533

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	21,300	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	28,700	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	35,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

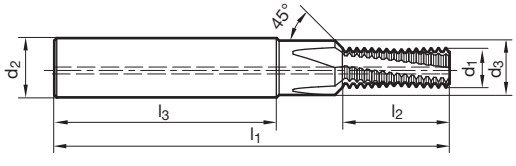
2,5xD

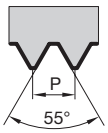
P	•
M	•
K	•
N	•
S	•
H	≤55

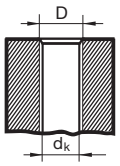
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3765	3766

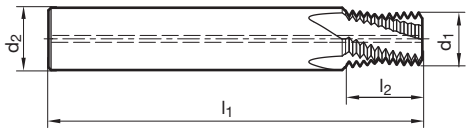
D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	24,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	35,400	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	43,500	4	16,662

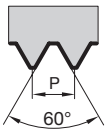
Fresas para rosca NPT sem chanfro

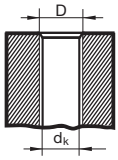
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3753	3754

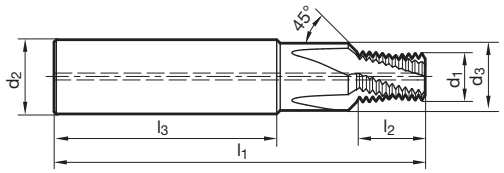
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

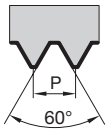
Fresas para rosca NPT com chanfro

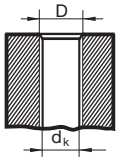
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3520	3538

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

Fresas para rosca NPTF sem chanfro

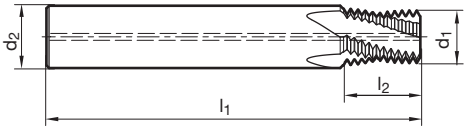


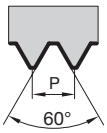
P	•
M	•
K	•
N	•
S	•
H	≤55

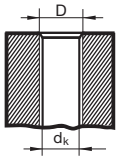
Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3756	3757

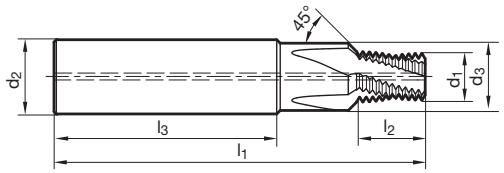
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

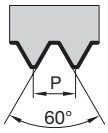
Fresas para rosca NPTF com chanfro

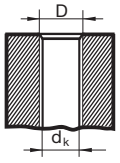
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 28

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3521	3539

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

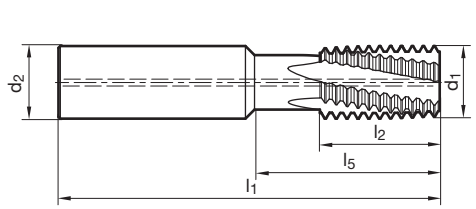
Fresas para roscas multiuso, para rosca métrica ISO

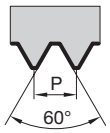
Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB

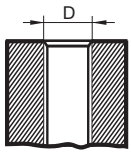
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 29











Norma da emp.	Nr. do artigo	3541	3556

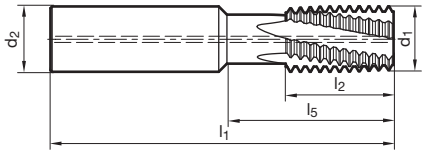
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 10	7,950	8,000	64,000		20,000	4	8,050
1,000	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,100
1,250	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,125
1,500	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,150
1,000	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,150
1,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,100
1,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,200
3,000	≥ 24	17,950	18,000	102,000	50,000	33,000	5	18,300
1,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,100
1,500	≥ 26	19,950	20,000	105,000	50,000	33,000	5	20,150
2,000	≥ 27	19,950	20,000	105,000	50,000	33,000	5	20,200
2,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,250
3,000	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,300
3,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,350

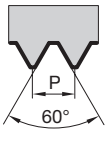
Fresamento externo de roscas

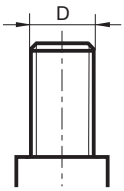
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp. Nr. do artigo **4162** **4163**

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 3	9,950	10,000	70,000	25,000	16,000	4	10,050
0,750	≥ 5	9,950	10,000	70,000	25,000	16,000	4	10,075
1,000	≥ 6	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 8	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 10	11,950	12,000	80,000	31,000	20,000	4	12,150
1,500	≥ 10	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 14	15,950	16,000	90,000	40,000	25,000	5	16,200
2,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,250
3,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,300

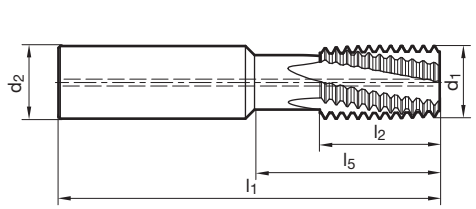
Fresas para roscas multiuso, para rosca UN

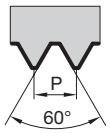
P	•
M	•
K	•
N	•
S	•
H	≤55

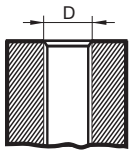
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU UN	TMU UN
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3595	3596

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
10,000	≥ 3/4	11,950	12,000	80,000	31,000	20,000	4	12,100
16,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,160
18,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,180
20,000	≥ 11/16	11,950	12,000	80,000	31,000	20,000	4	12,200
24,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,240
12,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,120
14,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,140
16,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,160
18,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,180
20,000	≥ 13/16	15,950	16,000	90,000	40,000	25,000	5	16,200
7,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,070
8,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,080
12,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,120
14,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,140
16,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,160

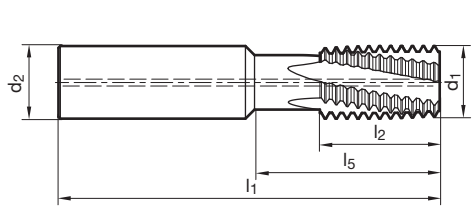
Fresas para roscas multiuso, para rosca gás Whitworth

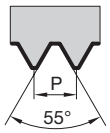
Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

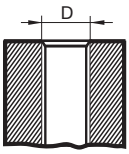
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 29











Norma da emp.	Nr. do artigo	3542	3557

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
19,000	≥ 1/4	9,950	10,000	70,000	25,000	16,000	4	10,190
14,000	≥ 1/2	15,950	16,000	90,000	40,000	25,000	5	16,140
11,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,110

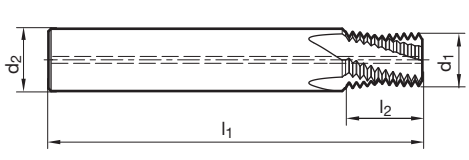
Fresas para roscas multiuso, para rosca NPT

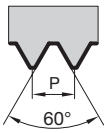
P	•
M	•
K	•
N	•
S	•
H	≤55

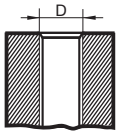
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3768	3769

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

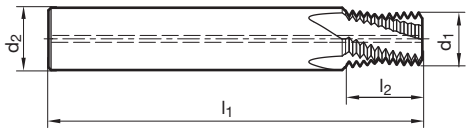
Fresas para roscas multiuso, para rosca NPTF

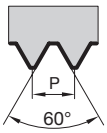
P	•
M	•
K	•
N	•
S	•
H	≤55

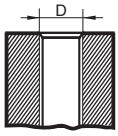
Página de dados de corte 29

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3772** | **3773**

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

Micro-fresas de rosquear

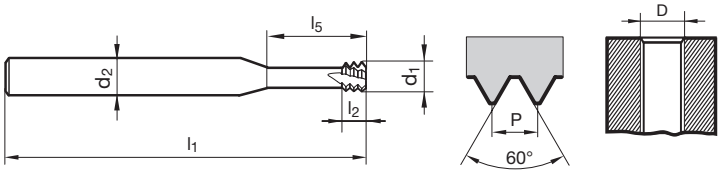
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 29

Material de corte	**MD int.**
Superfície	C
Tipo	SP M
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4226**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,6	0,350	1,200	3,000	39,000	1,100	4,800	3	1,600
M1,8	0,350	1,400	3,000	39,000	1,100	5,400	3	1,800
M2	0,400	1,550	3,000	39,000	1,200	6,000	4	2,000
M2,5	0,450	1,950	3,000	39,000	1,400	7,500	4	2,500
M3	0,500	2,400	6,000	58,000	1,500	9,500	4	3,000
M3,5	0,600	2,800	6,000	58,000	1,800	11,000	4	3,500
M4	0,700	3,200	6,000	58,000	2,100	12,500	4	4,000
M5	0,800	4,000	6,000	58,000	2,400	16,000	4	5,000
M6	1,000	4,800	6,000	58,000	3,000	20,000	4	6,000
M8	1,250	5,950	6,000	58,000	3,800	24,000	4	8,000
M10	1,500	7,800	8,000	73,000	4,500	33,000	4	10,000
M12	1,750	9,000	10,000	84,000	5,300	38,000	4	12,000
M16	2,000	11,800	10,000	84,000	6,000	35,000	5	16,000

Micro-fresas de rosquear

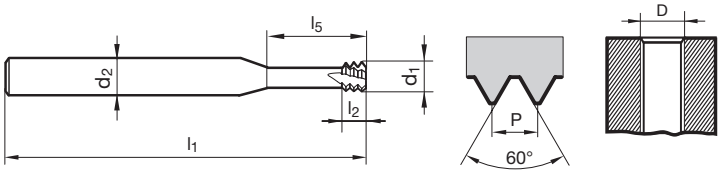
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 29

Material de corte	**MD int.**
Superfície	C
Tipo	SP G
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4228**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	6,200	8,000	64,000	2,700	19,500	4	9,728
G3/8	19,000	9,950	10,000	73,000	4,000	25,000	4	16,662
G7/8	14,000	11,950	12,000	84,000	5,400	37,000	4	30,201
G2	11,000	15,950	16,000	105,000	6,900	44,000	5	59,614

Micro-fresas de rosquear

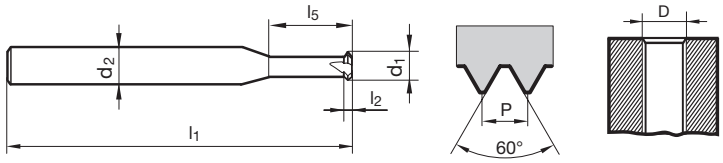
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 29

Material de corte	**MD int.**
Superfície	C
Tipo	SP M/MF
Rôscas	1,0
Forma da haste	HA

NEW





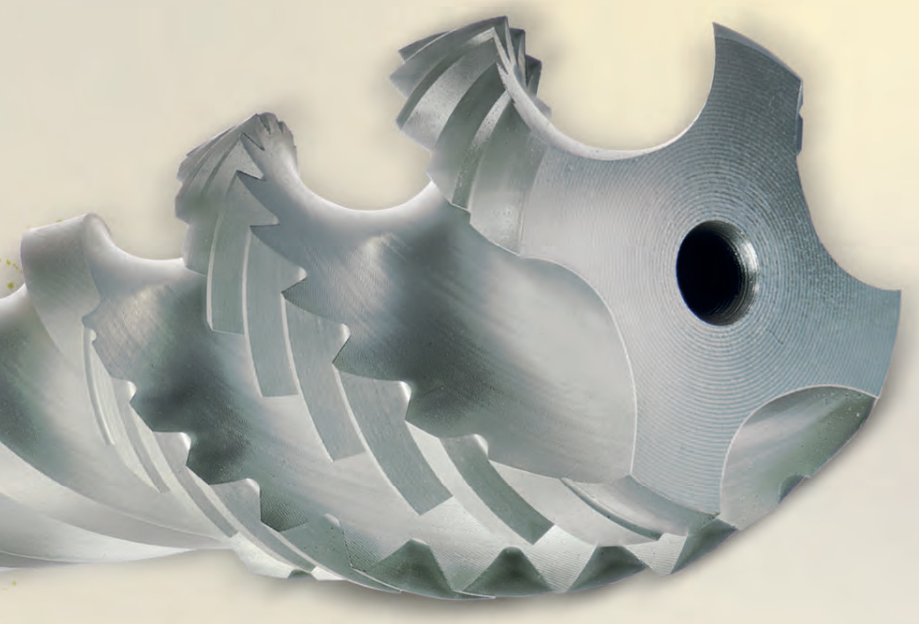
Norma da emp. Nr. do artigo **4225**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,4 - M1,8	0,350	1,050	3,000	39,000	0,400	3,800	3	1,800
M2 - M2,4	0,400	1,500	3,000	39,000	0,400	7,000	3	2,400
M2,5 - M3	0,500	2,000	3,000	39,000	0,500	9,000	4	3,000
M3,5 - M4,5	0,750	2,800	6,000	58,000	0,800	14,000	4	4,500
M5 - M7	1,000	4,000	6,000	58,000	1,000	19,000	4	7,000
M8 - M10	1,500	6,400	8,000	64,000	1,500	24,000	5	10,000

INOX



AÇO INOXIDÁVEL



M

Aços inoxidáveis e ácido-resistentes, sulforosos, austenísticos e martensíticos

AÇO INOXIDÁVEL

M

ISO 2/6H

No 1

M2 - M30
Nr. do art. 4218
a partir d. pág. 239

M2 - M30
Nr. do art. 2869/2870
a partir d. pág. 236

ISO 3/6G

MF

ISO 2/6H

No 1

M6x0,75 - M24x2
Nr. do art. 4219
a partir d. pág. 248

M3x0,35 - M24x1,5
Nr. do art. 2871
a partir d. pág. 257

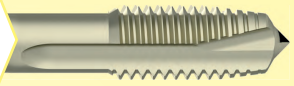
ISO 3/6G

No 1 ideal tool

QUICKFINDER

UNC	UNF	G	ATRAVÉS FUROS
2B	2B	-	

No 1
G1/16 - G1
Nr. do art. 4220
a partir d. pág. 264



HSS-E, Sirius, forma B

No 1
No. 4 - 1
Nr. do art. 2872/2873
a partir d. pág. 258

No 1
No. 4 - 1
Nr. do art. 2874
a partir d. pág. 260

G1/16 - G1
Nr. do art. 2875
a partir d. pág. 263



HSS-E, vaporizado, forma B

AÇO INOXIDÁVEL

M

ISO 2/6H

No 1
M2 - M30
Nr. do art. 393
a partir d. pág. 244

M3 - M30
Nr. do art. 2862/2863
a partir d. pág. 243

No 1
M3 - M20
Nr. do art. 761/763
a partir d. pág. 247

No 1
M3 - M20
Nr. do art. 1139/1142
a partir d. pág. 247

ISO 3/6G

MF

ISO 2/6H

No 1
M6x0,75 - M24x1,5
Nr. do art. 394
a partir d. pág. 252

M3x0,35 - M24x1,5
Nr. do art. 2864
a partir d. pág. 251

No 1
M8x1 - M20x1,5
Nr. do art. 764
a partir d. pág. 255

No 1
M8x1 - M20x1,5
Nr. do art. 1144
a partir d. pág. 255

ISO 3/6G

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2B	2B	-



C E G O F U R O S

No 1
G1/16 - G1
Nr. do art. 395
a partir d. pág. 267



HSS-E, TiAlN, forma C

No 1
No. 2 - 7/8
Nr. do art. 2865/2866
a partir d. pág. 259

No 1
No. 10 - 1
Nr. do art. 2868
a partir d. pág. 262

G1/16 - G1 1/2
Nr. do art. 968
a partir d. pág. 265



HSS-E, vaporizado, forma C

FOR
SYNCHRO MACHINING
TOLERÂNCIA DO CONE h6

No 1
G1/16 - G1/2
Nr. do art. 4159
a partir d. pág. 266



HSS-E-PM, TiN, forma C



HSS-E-PM, TiCN, forma C

AÇO INOXIDÁVEL

sem canais de refrig.

M

6HX

No 1
M1 - M20
Nr. do art. 921/925
a partir d. pág. 271

6GX

No 1
M2 - M10
Nr. do art. 920
a partir d. pág. 272

MF

6HX

No 1
M8x1 - M20x1,5
Nr. do art. 929
a partir d. pág. 286

6GX

No 1
M8x1 - M18x1,5
Nr. do art. 928
a partir d. pág. 290

com canais de refrig.

M3 - M39
Nr. do art. 919/923
a partir d. pág. 274

No 1
M3 - M39
Nr. do art. 918/922
a partir d. pág. 274

M6x0,75 - M24x1,5
Nr. do art. 1275/927
a partir d. pág. 288

No 1
M8x1 - M20x1,5
Nr. do art. 1277/926
a partir d. pág. 292

No 1
M3 - M39
Nr. do art. 2012/2013
a partir d. pág. 274

No 1
M6x0,75 - M20x1,5
Nr. do art. 2008
a partir d. pág. 291

com refrigeração interna

No 1
M3 - M20
Nr. do art. 1270/1271
a partir d. pág. 280

No 1
M5 - M10
Nr. do art. 1713
a partir d. pág. 281

No 1
M8x1 - M24x1,5
Nr. do art. 1272/1273
a partir d. pág. 296

No 1
M8x1 - M24x1,5
Nr. do art. 1715/1716
a partir d. pág. 297

No 1
M3 - M20
Nr. do art. 1725/1727
a partir d. pág. 280

No 1
M3 - M20
Nr. do art. 1726/1728
a partir d. pág. 282

No 1
M8x1 - M24x1,5
Nr. do art. 1729/1731
a partir d. pág. 296

No 1
M8x1 - M24x1,5
Nr. do art. 1730/1732
a partir d. pág. 297

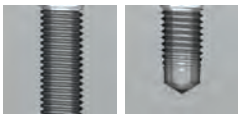
No 1
M3 - M20
Nr. do art. 1972/1931
a partir d. pág. 284

No 1
M10x1 - M24x1,5
Nr. do art. 1581
a partir d. pág. 299

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2BX	2BX	-

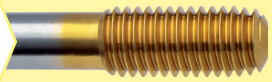


ATRAVÉS FUROS
CEGO FUROS

No 1
Nr. 4 - 7/8
Nr. do art. 2273/2274
a partir d. pág. 300

No 1
Nr. 4 - 1
Nr. do art. 1283/2275
a partir d. pág. 301

No 1
G1/16 - G1 1/4
Nr. do art. 966
a partir d. pág. 302

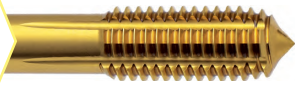


HSS-E, TiN, forma C

No 1
Nr. 4 - 7/8
Nr. do art. 1582/1583
a partir d. pág. 300

No 1
Nr. 4 - 1
Nr. do art. 1584/1585
a partir d. pág. 301

No 1
G1/16 - G1 1/4
Nr. do art. 1586
a partir d. pág. 302



HSS-E, TiN, forma C



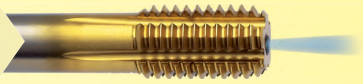
HSS-E, TiCN, forma C

FORMA C



HSS-E-PM, TiCN, forma C

FORMA E



HSS-E-PM, TiN, forma E

METAL DURO



Metal duro, TiCN, forma C

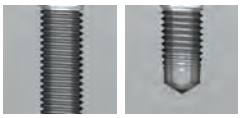
AÇO INOXIDÁVEL

	M UNIVERSAL	MF UNIVERSAL
1,5xD	No 1 M3 - M20 Nr. do art. 3525 a partir d. pág. 306	No 1 M4x0,5 - M16x1,5 Nr. do art. 3527 a partir d. pág. 309
2xD	No 1 M3 - M20 Nr. do art. 3526 a partir d. pág. 307	No 1 M4x0,5 - M16x1,5 Nr. do art. 3528 a partir d. pág. 310
2,5xD	No 1 M3 - M20 Nr. do art. 3759 a partir d. pág. 308	No 1 M4x0,5 - M16x1,5 Nr. do art. 3762 a partir d. pág. 311
3xD	No 1 M1,6 - M16 Nr. do art. 4226 a partir d. pág. 333	
universal	No 1 Ø8x0,5 - Ø30xP3,5 Nr. do art. 3541 a partir d. pág. 327	No 1 Ø8x0,5 - Ø30xP3,5 Nr. do art. 3541 a partir d. pág. 327

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
UNIVERSAL	UNIVERSAL	-



ATRAVÉS FUROS
CEGO FUROS

No 1
1/4 - 1/2
Nr. do art. 3516
a partir d. pág. 313

No 1
1/4 - 1/2
Nr. do art. 3518
a partir d. pág. 316

No 1
1/8 - 3/8
Nr. do art. 3514
a partir d. pág. 320



Metal duro, TiCN

No 1
1/4 - 1/2
Nr. do art. 3517
a partir d. pág. 314

No 1
1/4 - 1/2
Nr. do art. 3519
a partir d. pág. 317

No 1
1/8 - 3/8
Nr. do art. 3515
a partir d. pág. 321



Metal duro, TiCN



Metal duro, TiCN



Metal duro, TiCN

No 1
Ø10xUN24 - Ø20xUN7
Nr. do art. 3595
a partir d. pág. 329

No 1
Ø10xUN24 - Ø20xUN7
Nr. do art. 3595
a partir d. pág. 329

No 1
Ø10xG19 - Ø20xG11
Nr. do art. 3542
a partir d. pág. 330



Metal duro, TiCN



COMPASSO

M

AÇO INOXIDÁVEL



ATRAVÉS
FUROS

Profundidade de rosca		≤1,5xD						
Material de corte		HSS-E					HSS-E-PM	
Tipo/forma		VA/B	VA/B	VA/B	VA AZ/B	VA/B	VA/B	VA/B
Superfície		○	●	(S)	○	(S)	○	(S)
Fornecimento de refrigeração		☒	☒	☒	☒	☒	☒	☒
Tolerância do cone		h9	h9	h9	h9	h9	h9	h9
						 NEW		
Tipo da rôsca	**Tolerância**	**No. Artigo / página**						
M	4H							
	6H	1870/1872 236	2869/2870 236	2086/2087 236	1871/792 240		877/879 237	1002 238
	6HX					4218 239		
	6G							
MF	6H	1873 256	2871 257	1001 257			887 256	1291 248
	6HX					4219 248		
	6G							
UNC	2B	1980/1985 258	2872/2873 258					
	2BX							
UNF	2B	1990 260	2874 260					
	2BX							
G		967 263	2875 263			4220 264		
BSW								
NPT								
NPTF								
EG M	6H Mod.							
MJ	4HX							
MJF	4HX							
UNJC	3BX							
UNJF	3BX							
PG								
Óleo Solúvel		●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△

= No 1

○ = Ar
● = Óleo integral
● = Óleo Solúvel
△ = Colar
□ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min						
M	Aço inoxidável, com enxofre, austenítico	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	**8**	**8**	**10**	**8**	**10**	**8**	**10**
	Aços inoxidáveis e resistentes a ácidos, martensítico	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	**6**	**6**	**8**	**6**	**12**	**6**	**8**
	Duplex e Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	-	-	-	-	**10**	-	-

M

AÇO INOXIDÁVEL



CEGO
FUROS

	Profundidade de rosca	≤1,5xD					
	Material de corte	HSS-E					
	Tipo/forma	VA R15 / C	VA R15 / C	VA R25 / C	VA R25 / C	NR15 / C	NR15 / C
	Material de corte	●	(S)	●	(S)	(C)	(C)
	Fornecimento de refrigeração	☒	☒	☒	☒	☒	☒
	Tolerância do cone	h9	h9	h9	h9	h9	h9
							
Tipo da rôsca	**Tolerância**	**No. Artigo / página**					
M	4H						
	6H	843/785 241	2896/2895 241			4154 242	4155 242
	6HX						
	6G						
MF	6H	1874 249	2897 249			4156 250	4157 250
	6HX						
	6G						
UNC	2B						
	2BX						
UNF	2B	1991 261	2898 261				
	2BX						
G							
BSW							
NPT				1087 268	1088 268		
NPTF					4127 269		
EG M	6H Mod.						
MJ	4HX						
MJF	4HX						
UNJC	3BX						
UNJF	3BX						
PG							
	Lubrificante adequado	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
□ = Quantidade mínima de lubrificante (MQL)

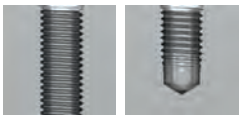
	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min					
M	Aço inoxidável, com enxofre, austenítico	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	**6**	**8**	**6**	**8**	**8**	**8**
	Aços inoxidáveis e resistentes a ácidos, martensítico	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	4	6	4	6	6	6
	Duplex e Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	-	-	-	-	-	-

≤3xD

HSS-E				HSS-E-PM					
NR40 / C	NR40 / C	NR40 / C	VA R45/C	NR40 / C	NR40 / C	NR50 / C	NR50 / C	VA R50/C	VA R50/C
○	●	○	A	○	S	S	C	S	C
☒	☒	Axial	☒	☒	☒	☒	Axial	☒	Axial
h9	h9	h9	h9	h9	h9	h9	h9	h6	h6
									
machos para rosca Synchro									
No. Artigo / página									
814/825 243	2862/2863 243	1892/1899 243		909/910 246	59/60 246	767/1098 245	1152/1293 245		
			393 244					761/763 247	1139/1142 247
	2864 251			936 253	1004 253	1100 254	1294 254		
			394 252					764 255	1144 255
1981/1986 259	2865/2866 259								
2867 262	2868 262								
	968 265		395 267	939 265				4159 266	
●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△

Velocidade de corte recomendada vc m/min									
6	**6**	**6**	**15**	**8**	**10**	**10**	**10**	**12**	**12**
4	4	**4**	**10**	**6**	**6**	6	6	**8**	**8**
-	-	-	**6**	-	-	-	-	-	-

AÇO INOXIDÁVEL



ATRAVÉS FUROS E
CEGO FUROS

Profundidade de rosca	1,5xD		
Material de corte	HSS-E	HSS-E-PM	Metal duro
Tipo/forma	N / C	N / C	N / C
Material de corte	S	S	S
Fornecimento de refrigeração	☒	☒	Axial
Tolerância do cone	h9	h9	h6





Tipo da rôsca	Tolerância	No. Artigo / página		
M	4H			
	6H			
	6HX	921/925 271	1255/1256 271	2518 273
	6GX	920 272	903/952 271	
MF	6H			
	6HX	929 286	1257/1258 287	
	6GX	928 290	1740 289	
UNC	2BX	2273/2274 300		
	3BX			
UNF	2BX	1283/2275 301		
	3BX			
G		966 302		
BSW				
NPT				
NPTF				
EG M	6H Mod.			
MJ	4HX			
MJF	4HX			
UNJC	3BX			
UNJF	3BX			
PG				
Lubrificante adequado		○/●/△	○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
□ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min		
M	Aço inoxidável, com enxofre, austenítico	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	4	4	15
	Aços inoxidáveis e resistentes a ácidos, martensítico	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	4	4	12
	Duplex e Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	-	-	-

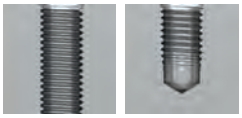
≤3xD

HSS-E				HSS-E-PM							Metal duro	
N / C	N / C	N / C	N / C	N / C	N / C	N / C	N / C	N / C	N / C	N / E	N / C	N / E
S	C	S+	C	S	S	S	S	C	A	S	C	C
☒	☒	Axial	Radial	☒	☒	Radial	Axial	Radial	Radial	Axial	Radial	Radial
h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h6	h6
												
No. Artigo / página												
919/923 274	2012/2013 274	2442/2444 277	2446/2448 277	322/339 275	1266/1267 276	323/342 279	4143 283	1270/1271 280	1717/1719 280	1725/1727 280	1972/1931 284	1927 285
918/922 274		2443/2445 277	2447 278					1713 281	1718/1720 282	1726/1728 282		
1275/927 288	2008 291			333 294	1268/1269 293	338 295	4145 298	1272/1273 296	1721/1723 296	1729/1731 296	1581 299	
1277/926 292								1715/1716 297		1730/1732 297		
1582/1583 300												
1584/1585 301												
1586 302												
○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△

Velocidade de corte recomendada vc m/min												
6	**8**	6	**8**	**8**	**8**	**8**	**8**	**10**	**10**	**8**	**15**	**15**
4	**6**	4	*6*	*6*	*6*	*6*	*6*	*8*	**8**	**6**	**12**	**12**
-	-	-	**8**	**8**	**8**	**8**	**8**	**10**	**10**	**8**	**15**	**15**

M

AÇO INOXIDÁVEL



ATRAVÉS FUROS E
CEGO FUROS

	Profundidade de rosca	≤2xD				≤2,5xD		≤1,5xD	
	Material de corte		Metal duro						
	Tipo	TM SP	TM SP	TM SP	TM SP	TM SP	TM SP	TMC SP	TMC SP
	Superfície	C	C	C	C	C	C	C	C
	Fornecimento de refrigeração	☒	☒	Axial	Axial	Axial	Axial	Axial	Axial
	Forma da haste	HA	HB	HA	HB	HA	HB	HA	HA
	Espiral	27°	27°	27°	27°	27°	27°	10°	10°
									
Tipo da rôsca		**No. Artigo / página**							
M		4132 304	4133 304	3737 304	3743 304	3735 305	3740 305	3525 306	3543 306
MF				3737 304	3743 304			3527 309	3545 309
UNC				4134 312	4135 312			3516 313	3534 313
UNF				4136 315	4137 315			3518 316	3536 316
G				3745 318	3748 318	3746 319	3750 319	3514 320	3529 320
BSW									
NPT				3753 323	3754 323			3520 324	3538 324
NPTF				3756 325	3757 325			3521 326	3539 326
EG M		Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar							
MJ									
MJF									
UNJC									
UNJF									
PG									
Lubrificante adequado		○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Recomendações de aplicação							
M	Aço inoxidável, com enxofre, austenítico	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	+	+	+	+	+	+	++	++
	Aços inoxidáveis e resistentes a ácidos, martensítico	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	+	+	+	+	+	+	++	++
	Duplex e Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	+	+	+	+	+	+	++	++

≤2xD		≤2,5xD		universal				≤3xD	
Metal duro									
TMC SP	TMC SP	TMC SP	TMC SP	TMU SP	TMU SP	TMU SP	TMU SP	MTM 3 SP	MTM 1 SP
C	C	C	C	C	C	C	C	C	C
Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	☒	☒
HA	HB	HA	HB	HA	HB	HA	HB	HA	HA
10°	10°	27°	27°	15°	15°	15°	15°	15°	15°
									
No. Artigo / página									
3526 307	3544 307	3759 308	3760 308	3541 327	3556 327	4162 328	4163 328	4226 333	4225 335
3528 310	3546 310	3762 311	3763 311	3541 327	3556 327	4162 328	4163 328		4225 335
3517 314	3535 314			3595 329	3596 329				
3519 317	3537 317			3595 329	3596 329				
3515 321	3533 321	3765 322	3766 322	3542 330	3557 330			4228 334	
				3768 331	3769 331				
				3772 332	3773 332				
Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar									
○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

Recomendações de aplicação									
++	++	++	++	++	++	++	++	++	++
++	++	++	++	++	++	++	++	++	++
++	++	++	++	++	++	++	++	++	++

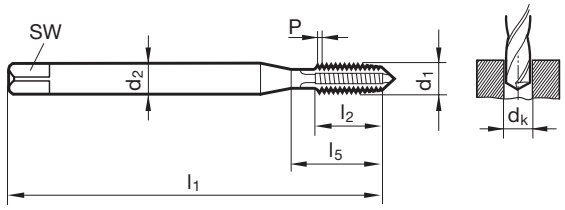
Machos para rosca métrica ISO

P	≤ 1000	
M	•	
K		
N	•	
S		
H		

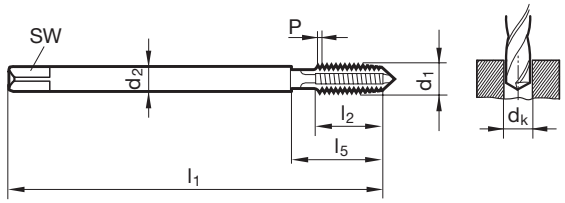
Página de dados de corte 229

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	(S)	●
Tipo	N	N	VA
Forma	B	B	B
Refrigeração interna	✕	✕	✕

DIN 371



DIN 376





DIN 2184-1 DIN 371	Nr. do artigo	1870	2086	2869

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	1872	2087	2870

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

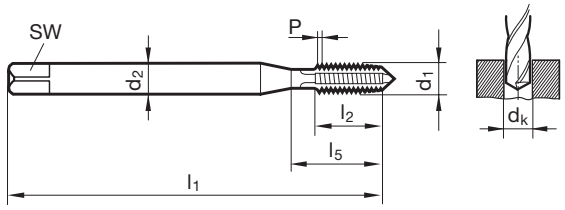
Machos para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊠

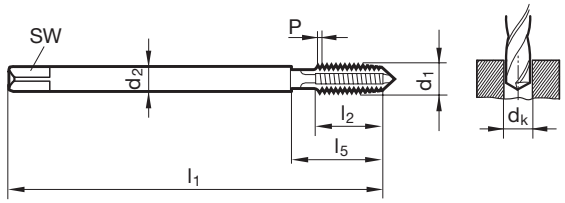
P	≤ 1000
M	•
K	
N	○
S	
H	

Página de dados de corte 229

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **877**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **879**

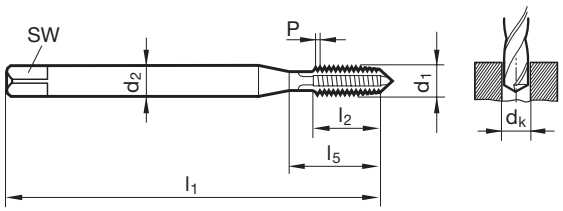
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Machos para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	ISO2/6H
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	

P	≤ 1000
M	•
K	
N	
S	
H	

Página de dados de corte 229





DIN 2184-1 DIN 371/DIN 376 Nr. do artigo **1002**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000

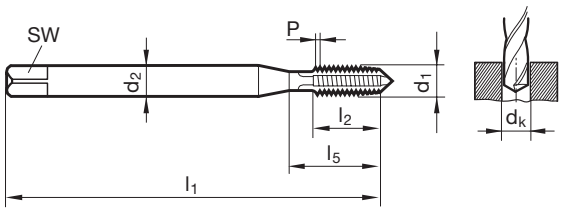
Machos para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	

NEW

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 229





DIN 2184-1 DIN 371/DIN 376 Nr. do artigo **4218**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

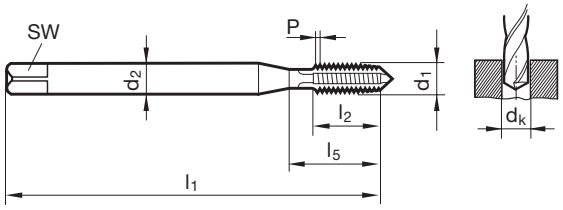
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	VA AZ
Forma	B
Refrigeração interna	⊠

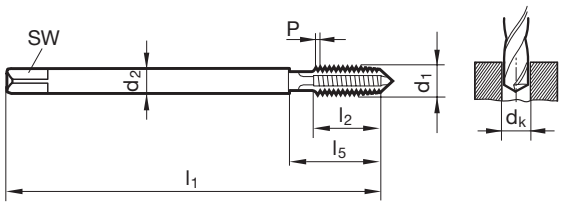
P	≤ 1000
M	•
K	
N	○
S	
H	

Página de dados de corte 229

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **1871**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **792**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

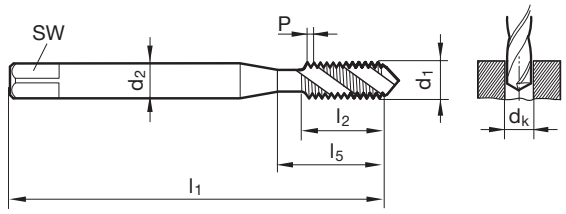
Machos para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície		S
Tipo	VA R15	VA R15
Forma	C	C
Refrigeração interna		

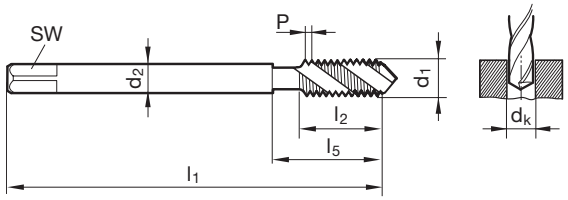
P	
M	•
K	
N	
S	
H	

Página de dados de corte 230

DIN 371



DIN 376







DIN 2184-1 DIN 371 — Nr. do artigo: **843** | **2896**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **785** | **2895**

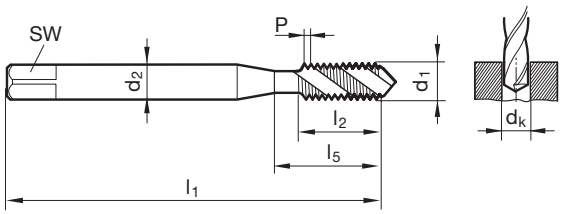
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000

Machos para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	C	C
Tipo	N R15	N R15
Forma	C	E
Refrigeração interna		

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 230







DIN 2184-1 DIN 371/DIN 376 — Nr. do artigo **4154** **4155**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

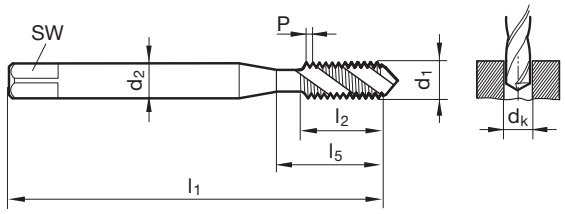
Machos para rosca métrica ISO

P			
M	•		
K			
N	•		
S			
H			

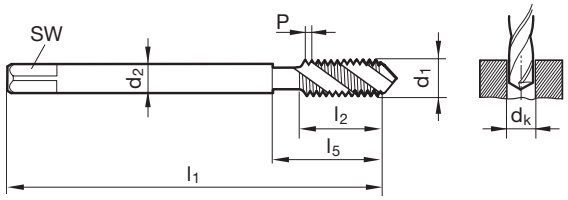
Página de dados de corte 231

Material de corte	HSS-E		
Tolerância do Ø	ISO2/6H	ISO2/6H	ISO2/6H
Superfície	○	○	●
Tipo	VA R40	VA R40	VA R40
Forma	C	C	C
Refrigeração interna	✕	≈	✕

DIN 371



DIN 376





DIN 2184-1 DIN 371	Nr. do artigo	814	1892	2862

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	825	1899	2863

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

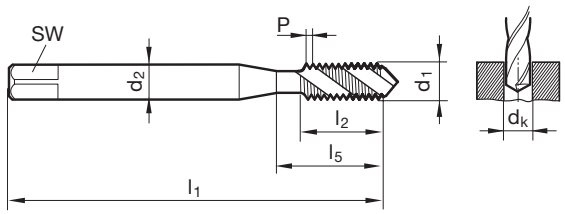
Machos para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	A
Tipo	VA R45
Forma	C
Refrigeração interna	

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 231

NEW





DIN 2184-1 DIN 371/DIN 376 Nr. do artigo **393**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

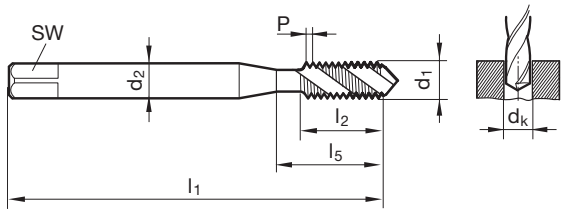
Machos para rosca métrica ISO

P	•
M	•
K	○
N	•
S	○
H	

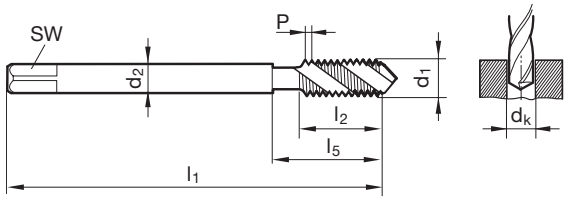
Página de dados de corte 231

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	C
Tipo	N R50	N R50
Forma	C	C
Refrigeração interna		

DIN 371



DIN 376







DIN 2184-1 DIN 371 — Nr. do artigo **767** **1152**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **1098** **1293**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

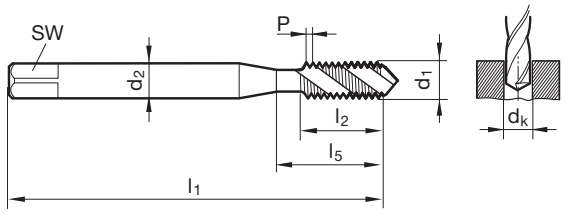
Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	○
Tipo	VA R40	VA R40
Forma	C	C
Refrigeração interna	⊠	⊠

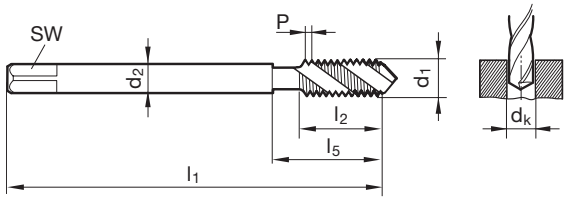
P	
M	•
K	
N	
S	
H	

Página de dados de corte 231

DIN 371



DIN 376







DIN 2184-1 DIN 371 — Nr. do artigo **59** **909**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **60** **910**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000

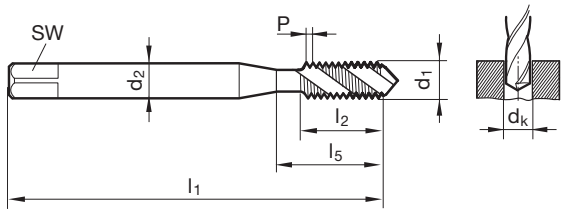
Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	S	C
Tipo	VA R50	VA R50
Forma	C	C
Refrigeração interna		

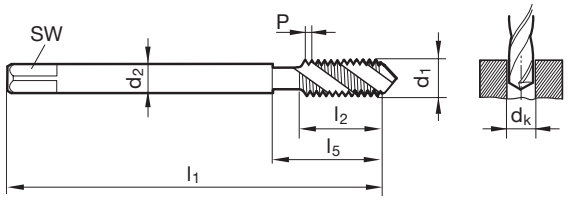
P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 231

DIN 371



DIN 376







DIN 2184-1 DIN 371 — Nr. do artigo: **761** | **1139**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	2,500	18,000
M4	0,700	4,500	3,400	3,30	63,000	3,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	4,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	5,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	6,300	35,000
M10	1,500	10,000	8,000	8,50	100,000	7,500	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **763** | **1142**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	8,800	63,000
M14	2,000	11,000	9,000	12,00	110,000	10,000	58,000
M16	2,000	12,000	9,000	14,00	110,000	10,000	58,000
M20	2,500	16,000	12,000	17,50	140,000	12,500	85,000

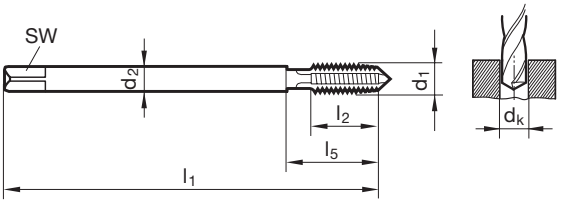
Machos manuais para rosca métrica fina ISO

P	≤ 1000
M	•
K	
N	
S	
H	

Página de dados de corte 229

Material de corte	HSS-E-PM	HSS-E
Tolerância do Ø	ISO2/6H	6HX
Superfície	S	S
Tipo	N	N
Forma	B	B
Refrigeração interna		

NEW







DIN 2184-1 DIN 374 — Nr. do artigo **1291** **4219**

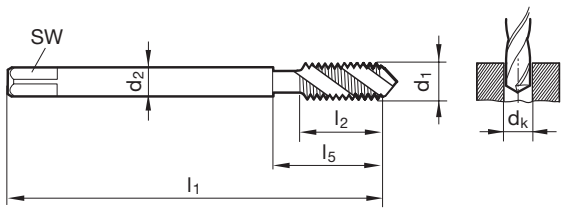
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,25	11,000	9,000	12,80	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	28,000	48,000	24,008

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície		S
Tipo	VA R15	VA R15
Forma	C	C
Refrigeração interna		

P	
M	•
K	
N	
S	
H	

Página de dados de corte 230







DIN 2184-1 DIN 374 — Nr. do artigo **1874** **2897**

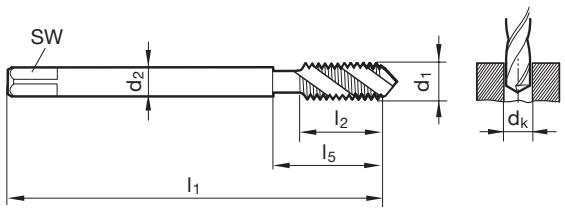
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M4 x 0,5	2,800	2,100	3,50	63,000	5,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	5,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	5,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M20 x 2	16,000	12,000	18,00	140,000	20,000	60,000	20,008
M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	C	C
Tipo	N R15	N R15
Forma	C	E
Refrigeração interna		

P	≤ 1000
M	○
K	○
N	
S	
H	

Página de dados de corte 230





DIN 2184-1 DIN 374 — Nr. do artigo: **4156** | **4157**

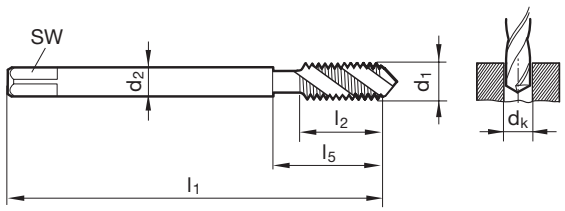
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007

Machos manuais para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	
Tipo	VA R40
Forma	C
Refrigeração interna	

P	
M	•
K	
N	
S	
H	

Página de dados de corte 231





DIN 2184-1 DIN 374 Nr. do artigo **2864**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M3 x 0,35	2,200		2,65	56,000	4,000	18,000	3,002
M4 x 0,5	2,800	2,100	3,50	63,000	5,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	5,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	5,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,5	6,000	4,900	7,50	80,000	8,000	30,000	8,003
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	16,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007

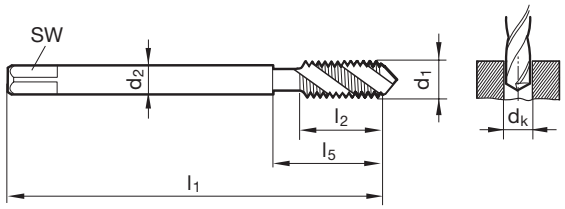
Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	A
Tipo	VA R45
Forma	C
Refrigeração interna	

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 231

NEW





DIN 2184-1 DIN 374 Nr. do artigo **394**

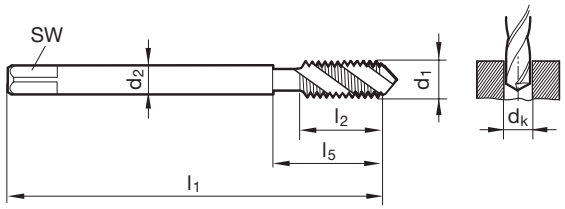
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,20	80,000	8,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	8,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	16,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007
M24 x 1,5	18,000	14,500	22,50	140,000	16,000	48,000	24,007

Machos manuais para rosca métrica fina ISO

P	
M	•
K	
N	•
S	
H	

Página de dados de corte 231

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	◯	Ⓢ
Tipo	VA R40	VA R40
Forma	C	C
Refrigeração interna	⊠	⊠







DIN 2184-1 DIN 374 — Nr. do artigo: **936** | **1004**

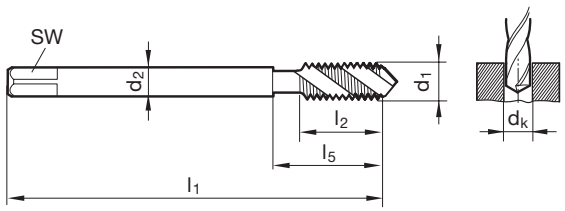
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	C
Tipo	N R50	N R50
Forma	C	C
Refrigeração interna		

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 231





DIN 2184-1 DIN 374 — Nr. do artigo: **1100** | **1294**

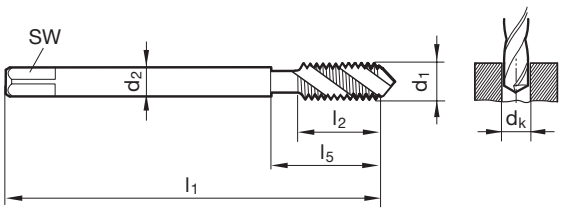
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 231

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	S	C
Tipo	VA R50	VA R50
Forma	C	C
Refrigeração interna		





DIN 2184-1 DIN 374 — Nr. do artigo: **764** | **1144**

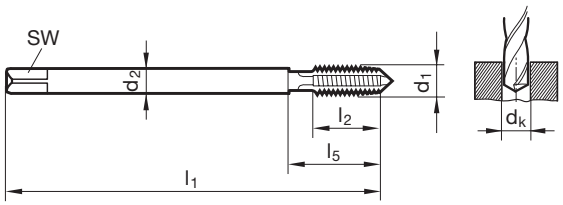
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	5,000	44,000	8,005
M8 x 1	6,000	4,900	7,00	90,000	5,000	47,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	5,000	47,000	10,005
M10 x 1	7,000	5,500	9,00	90,000	5,000	44,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	5,000	53,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	7,500	53,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	7,500	48,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	7,500	48,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	7,500	58,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	7,500	70,000	20,007

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM	HSS-E
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	◯	◯
Tipo	N	N
Forma	B	B
Refrigeração interna	⊠	⊠

P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 229







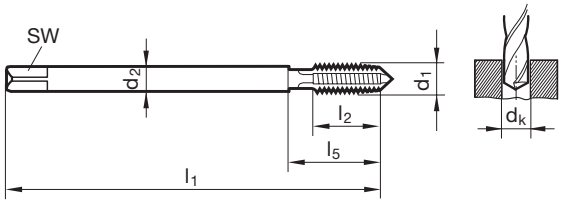
DIN 2184-1 DIN 374 — Nr. do artigo **887** **1873**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M7 x 0,75	5,500	4,300	6,20	80,000	13,000	30,000	7,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	28,000	48,000	24,008

Machos manuais para rosca métrica fina ISO

P	≤ 1000	Página de dados de corte 229
M	•	
K		
N		
S		
H		

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	
Tipo	N	N
Forma	B	B
Refrigeração interna		





DIN 2184-1 DIN 374 — Nr. do artigo **1001** **2871**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M3 x 0,35	2,200		2,65	56,000	7,000	18,000	3,002
M4 x 0,5	2,800	2,100	3,50	63,000	8,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007

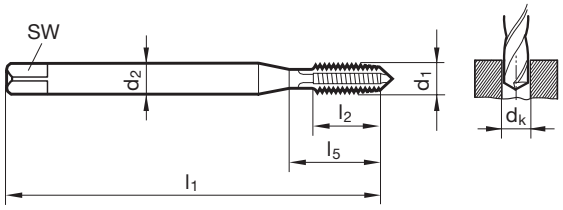
Machos para rosca UNC

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	N	VA
Forma	B	B
Refrigeração interna	⊠	⊠

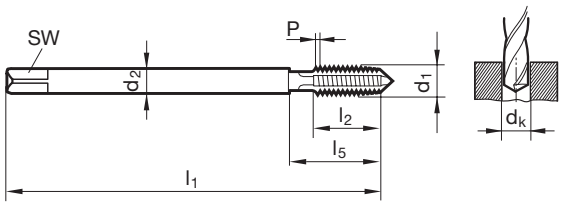
P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 229

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo **1980** **2872**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,35	56,000	11,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	11,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **1985** **2873**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
9/16 - 12	11,000	9,000	12,20	110,000	28,000	53,000	14,288
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	35,000	62,000	22,225
1 - 8	18,000	14,500	22,25	160,000	38,000	73,000	25,400

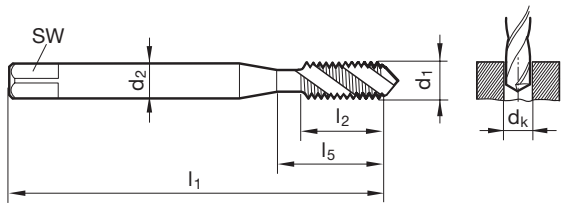
Machos para rosca UNC

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	VA R40	VA R40
Forma	C	C
Refrigeração interna	⊠	⊠

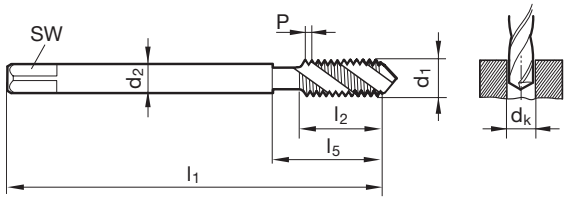
P	
M	•
K	
N	•
S	
H	

Página de dados de corte 231

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo **1981** **2865**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
2 - 56	2,800	2,100	1,85	45,000	5,000	14,500	2,184
4 - 40	3,500	2,700	2,35	56,000	7,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	7,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	8,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	8,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	11,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	11,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	13,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	14,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	16,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **1986** **2866**

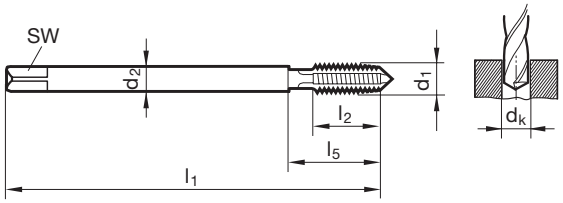
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	9,40	100,000	18,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	20,000	49,000	12,700
9/16 - 12	11,000	9,000	12,20	110,000	21,000	53,000	14,288
5/8 - 11	12,000	9,000	13,50	110,000	24,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	25,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	28,000	62,000	22,225

Machos para rosca UNF

P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 229

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	N	VA
Forma	B	B
Refrigeração interna	✕	✕







DIN 2184-1 ~DIN 374 — Nr. do artigo **1990** **2874**

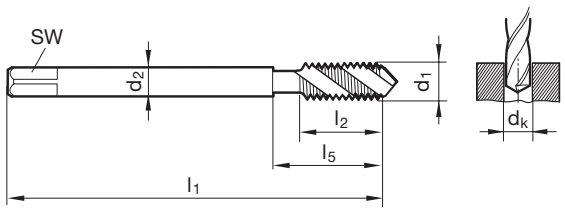
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 48	2,200		2,40	56,000	10,000	18,000	2,845
6 - 40	2,500	2,100	2,95	56,000	11,000	20,000	3,505
10 - 32	3,500	2,700	4,10	70,000	14,000	25,000	4,826
12 - 28	4,000	3,000	4,60	80,000	16,000	30,000	5,486
1/4 - 28	4,500	3,400	5,50	80,000	16,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	18,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	18,000	35,000	9,525
5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000	15,875
7/8 - 14	18,000	14,500	20,40	125,000	25,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	28,000	50,000	25,400

Machos para rosca UNF

P		
M	•	
K		
N		
S		
H		

Página de dados de corte 230

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície		S
Tipo	VA R15	VA R15
Forma	C	C
Refrigeração interna		







DIN 2184-1 ~DIN 374 — Nr. do artigo **1991** **2898**

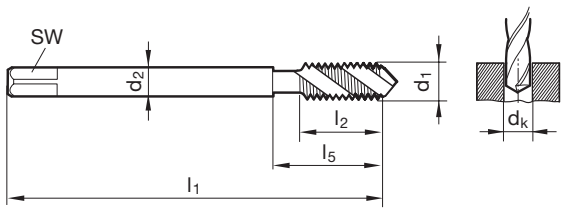
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
5 - 44	2,500	2,100	2,70	56,000	6,000	18,000	3,175
6 - 40	2,500	2,100	2,95	56,000	6,500	20,000	3,505
10 - 32	3,500	2,700	4,10	70,000	8,500	25,000	4,826
1/4 - 28	4,500	3,400	5,50	80,000	9,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	11,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	11,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	13,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	15,000	44,000	15,875
7/8 - 14	18,000	14,500	20,40	125,000	19,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	22,000	50,000	25,400

Machos para rosca UNF

Material de corte	HSS-E	
Tolerância do Ø	2B	2B
Superfície	○	●
Tipo	VA R40	VA R40
Forma	C	C
Refrigeração interna	✕	✕

P	
M	•
K	
N	•
S	
H	

Página de dados de corte 231





DIN 2184-1 ~DIN 374 — Nr. do artigo: **2867** | **2868**

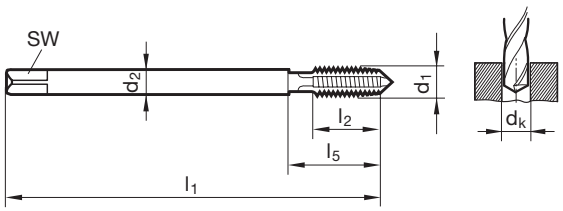
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 32	3,500	2,700	4,10	70,000	8,500	25,000	4,826
1/4 - 28	4,500	3,400	5,50	80,000	9,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	11,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	11,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	13,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	15,000	44,000	15,875
7/8 - 14	18,000	14,500	20,40	125,000	19,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	22,000	50,000	25,400

Machos para rosca gás Whitworth

P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 229

Material de corte	HSS-E	
Tolerância do Ø		
Superfície	○	●
Tipo	N	VA
Forma	B	B
Refrigeração interna	⊠	⊠







DIN 2184-1 DIN 5156 — Nr. do artigo: **967** | **2875**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	28,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000	33,249

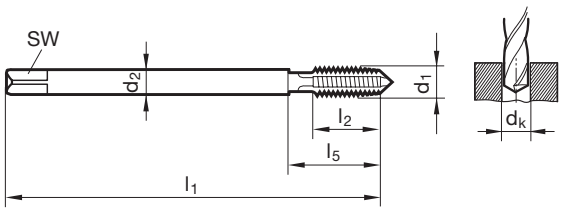
Machos para rosca gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	X
Superfície	S
Tipo	N
Forma	B
Refrigeração interna	

NEW

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 229





DIN 2184-1 DIN 5156 Nr. do artigo **4220**

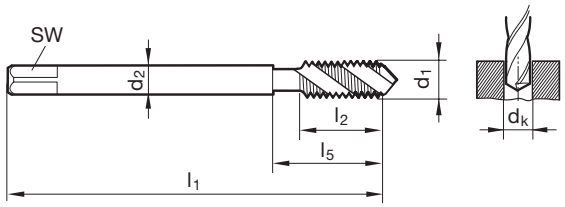
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	25,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	28,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000	33,249

Machos para rosca gás Whitworth

P	
M	•
K	
N	•
S	
H	

Página de dados de corte 231

Material de corte	HSS-E-PM	HSS-E
Tolerância do Ø		
Superfície	○	●
Tipo	VA R40	VA R40
Forma	C	C
Refrigeração interna	⊠	⊠





DIN 2184-1 DIN 5156 — Nr. do artigo: **939** **968**

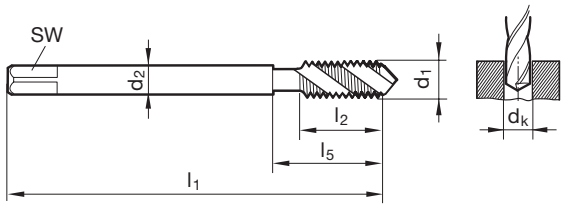
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	11,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	18,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	22,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000	33,249
G1 1/8	11,000	28,000	22,000	35,50	170,000	24,000	56,000	37,897
G1 1/4	11,000	32,000	24,000	39,50	170,000	25,000	57,000	41,910
G1 3/8	11,000	36,000	29,000	41,75	180,000	27,000	60,000	44,323
G1 1/2	11,000	36,000	29,000	45,25	190,000	27,000	60,000	47,803

Machos para rosca gás Whitworth

Material de corte	HSS-E-PM
Tolerância do Ø	
Superfície	S
Tipo	VA R50
Forma	C
Refrigeração interna	

P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 231





DIN 2184-1 DIN 5156 Nr. do artigo **4159**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	4,500	47,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	4,500	47,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	6,700	48,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	6,700	48,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	9,100	70,000	20,955

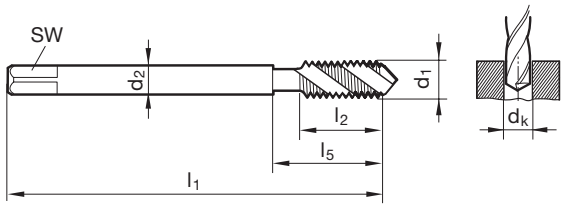
Machos para rosca gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	X
Superfície	A
Tipo	VA R45
Forma	C
Refrigeração interna	

NEW

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 231





DIN 2184-1 DIN 5156 Nr. do artigo **395**

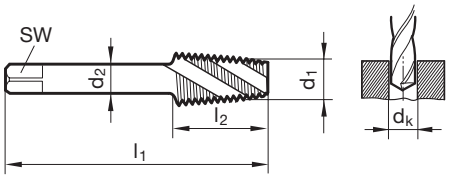
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	11,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000	20,955
G5/8	14,000	18,000	14,500	21,00	125,000	18,000	48,000	22,911
G3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	22,000	53,000	30,201
G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000	33,249

Machos para rosca NPT

P	
M	•
K	○
N	○
S	
H	

Página de dados de corte 230

Material de corte	HSS-E	
Tolerância do Ø		
Superfície		S
Tipo	N	N
Forma	C	C
Refrigeração interna		







Norma da emp. Norma da emp.	Nr. do artigo	1087	1088

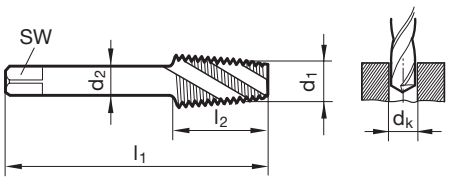
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
1/16	27,000	8,000	6,200	6,25	90,000	14,000	27,000	8,190
1/8	27,000	11,000	9,000	8,50	90,000	15,000	29,000	10,620
1/4	18,000	14,000	11,000	11,20	100,000	21,000	40,000	14,140
3/8	18,000	16,000	12,000	14,40	110,000	21,000	35,000	17,570
1/2	14,000	18,000	14,500	18,00	125,000	27,000	44,000	21,900
3/4	14,000	22,000	18,000	23,40	140,000	27,000	52,000	27,230
1	11,500	25,000	20,000	29,10	170,000	32,000	53,000	34,180

Machos para rosca NPTF

Material de corte	HSS-E
Tolerância do Ø	
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	
M	•
K	○
N	○
S	
H	

Página de dados de corte 230





Norma da emp. Norma da emp. Nr. do artigo **4127**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
1/16	27,000	8,000	6,200	6,25	90,000	14,000	27,000	8,190
1/8	27,000	11,000	9,000	8,50	90,000	15,000	29,000	10,620
1/4	18,000	14,000	11,000	11,20	100,000	21,000	40,000	14,140
3/8	18,000	16,000	12,000	14,40	110,000	21,000	35,000	17,570
1/2	14,000	18,000	14,500	18,00	125,000	27,000	44,000	21,900
3/4	14,000	22,000	18,000	23,40	140,000	27,000	52,000	27,230
1	11,500	25,000	20,000	29,10	170,000	32,000	53,000	34,180



MACHOS LAMINA-DORES

M

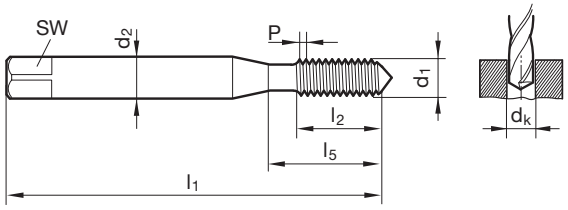
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM	HSS-E	HSS-E-PM
Tolerância do Ø	6GX	6HX	6HX
Superfície	S	S	S
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna	✕	✕	✕

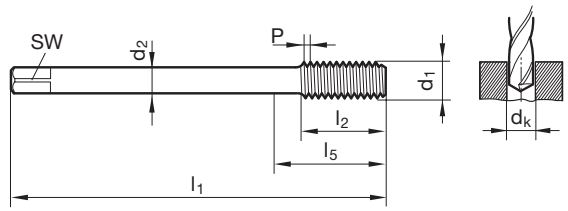
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 232

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	903	921	1255

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,90	40,000	4,000	
M1,2	0,250	2,500	2,100	1,10	40,000	4,800	
M1,4	0,300	2,500	2,100	1,25	40,000	5,600	
M1,6	0,350	2,500	2,100	1,45	40,000	6,400	
M1,7	0,350	2,500	2,100	1,55	40,000	6,800	
M1,8	0,350	2,500	2,100	1,65	40,000	7,300	
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	952	925	1256

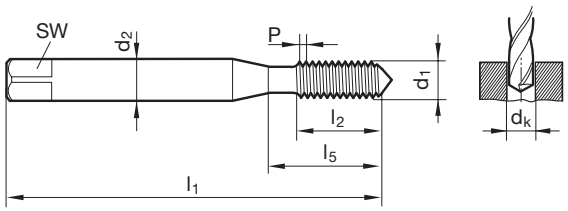
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 232





DIN 2174 ~DIN 371 Nr. do artigo **920**

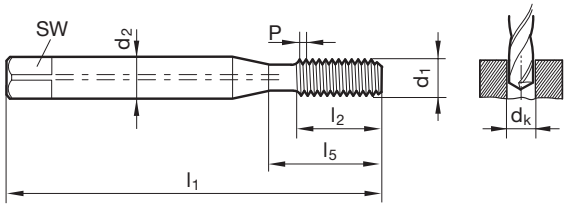
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 232





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **2518**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

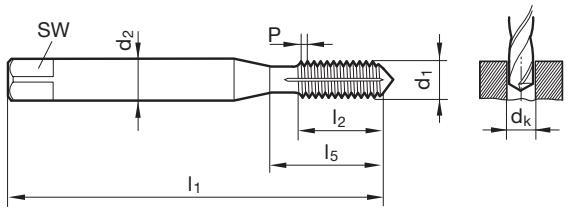
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E		
Tolerância do Ø	6GX	6HX	6HX
Superfície	S	S	C
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna	✗	✗	✗

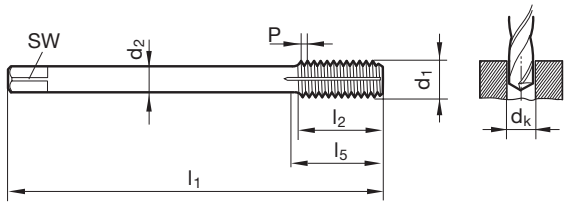
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	918	919	2012

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	922	923	2013

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M6	1,000	4,500	3,400	5,55	80,000	16,000	30,000
M8	1,250	6,000	4,900	7,40	90,000	17,000	35,000
M10	1,500	7,000	5,500	9,30	100,000	20,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000
M22	2,500	18,000	14,500	20,90	140,000	32,000	62,000
M24	3,000	18,000	14,500	22,70	160,000	36,000	73,000
M27	3,000	20,000	16,000	25,70	160,000	36,000	73,000
M30	3,500	22,000	18,000	28,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	31,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	34,30	200,000	50,000	102,000
M39	4,000	32,000	24,000	37,30	200,000	50,000	107,000

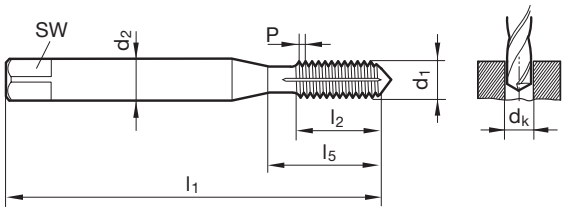
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

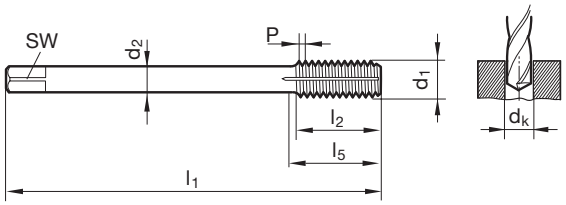
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **322**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **339**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

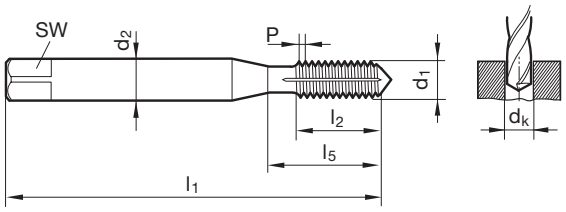
Machos laminadores para rosca métrica ISO

Material de corte	**HSS-E-PM**
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

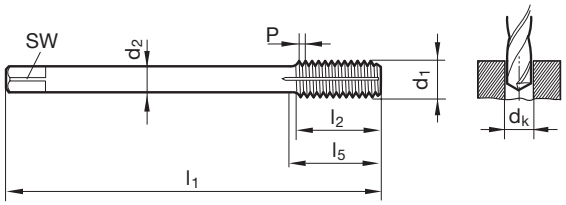
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **1266**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1267**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

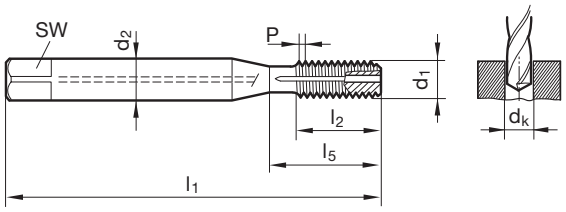
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E		
Tolerância do Ø	6HX	6GX	6HX
Superfície	S	S	C
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna			

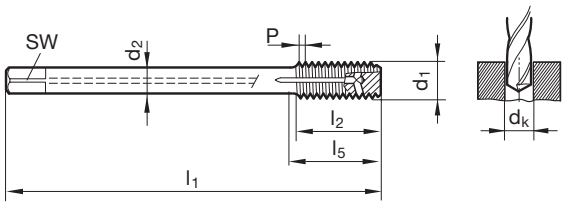
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo: **2442** | **2443** | **2446**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo: **2444** | **2445** | **2448**

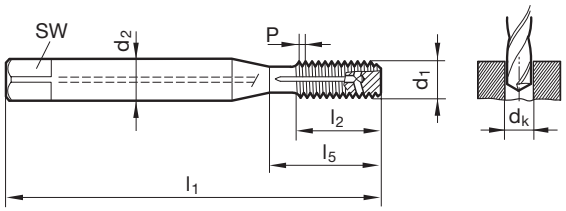
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 233





DIN 2174 ~DIN 371 Nr. do artigo **2447**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

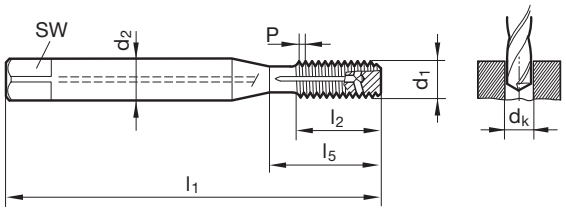
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

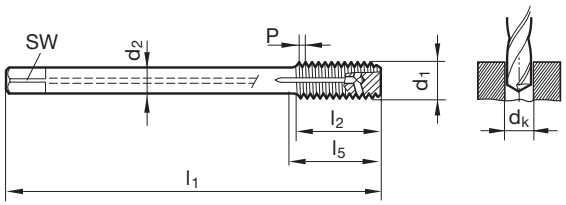
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 Nr. do artigo **323**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 Nr. do artigo **342**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

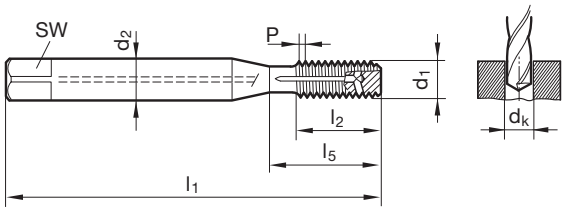
Machos laminadores para rosca métrica ISO com canais de refrigeração

P	•	
M	•	
K		
N	≥ 7	
S	•	
H		

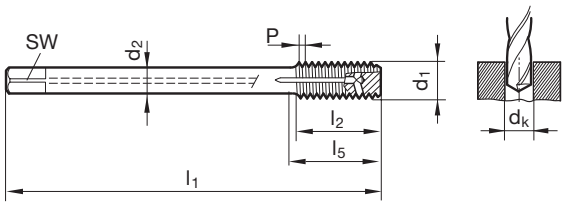
Página de dados de corte 233

Material de corte	HSS-E-PM		
Tolerância do Ø	6HX	6HX	6HX
Superfície	C	A	S
Tipo	N	N	N
Forma	C	C	E
Refrigeração interna			

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	1270	1717	1725

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	1271	1719	1727

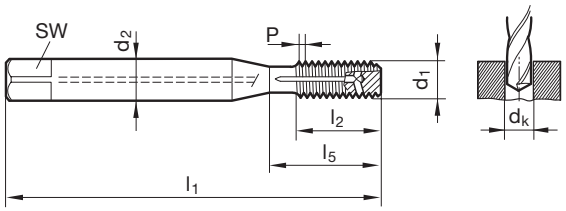
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 233





DIN 2174 ~DIN 371 Nr. do artigo **1713**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

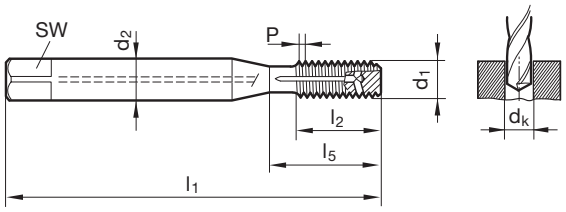
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	A	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

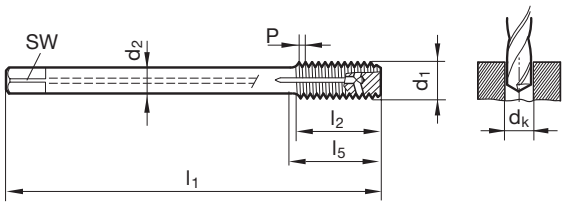
P	•
M	•
K	
N	
S	•
H	

Página de dados de corte 233

~ DIN 371



~ DIN 376







DIN 2174 ~DIN 371 — Nr. do artigo **1718** **1726**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1720** **1728**

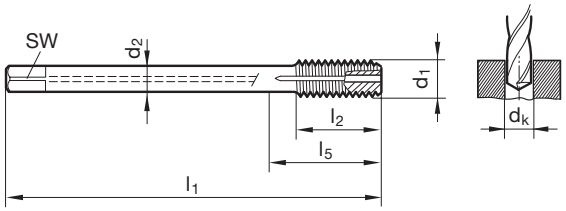
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233





Norma da emp. Norma da emp. Nr. do artigo **4143**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	112,000	6,000	18,000
M4	0,700	2,800	2,100	3,70	112,000	7,500	77,000
M5	0,800	3,500	2,700	4,65	125,000	8,500	90,000
M6	1,000	4,500	3,400	5,55	125,000	11,000	90,000
M8	1,250	6,000	4,900	7,40	140,000	14,000	97,000
M10	1,500	7,000	5,500	9,30	160,000	16,000	117,000
M12	1,750	9,000	7,000	11,20	180,000	18,500	133,000
M16	2,000	12,000	9,000	15,10	220,000	20,000	168,000
M20	2,500	16,000	12,000	18,90	280,000	25,000	225,000

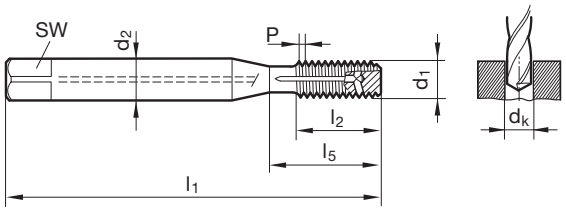
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

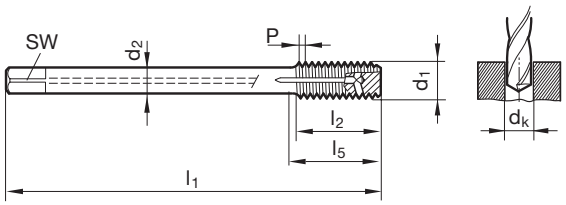
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 233

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **1972**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1931**

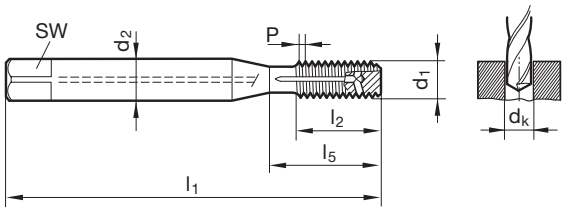
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	25,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	E
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 233





DIN 2174 ~DIN 371 Nr. do artigo **1927**

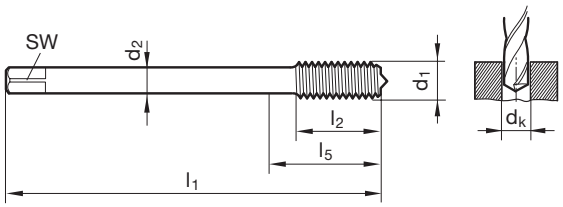
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

Machos laminadores para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	6HX
Superfície	(S)
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 232





DIN 2174 ~DIN 374 — Nr. do artigo **929**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

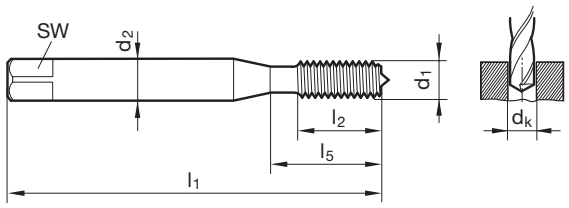
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

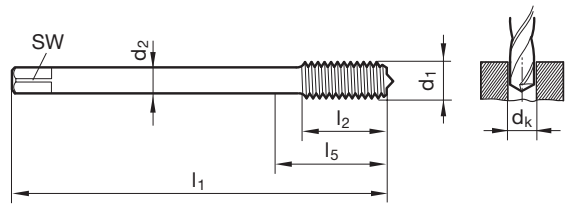
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 232

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1257**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1258**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

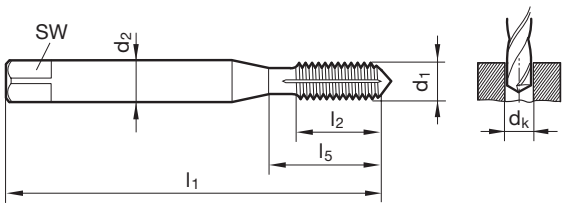
Machos laminadores para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

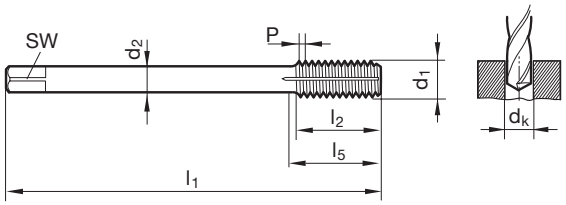
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1275**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	6,000	4,900	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	8,000	6,200	7,65	80,000	14,000	30,000	8,004
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **927**

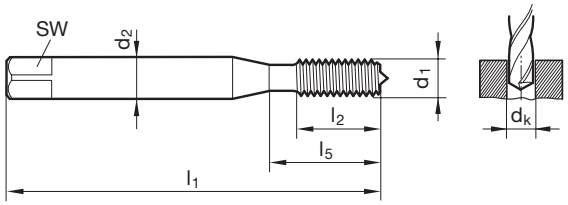
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 232





DIN 2174 ~DIN 371 — Nr. do artigo **1740**

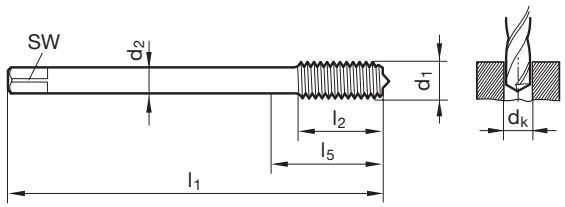
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 232





DIN 2174 ~DIN 374 — Nr. do artigo **928**

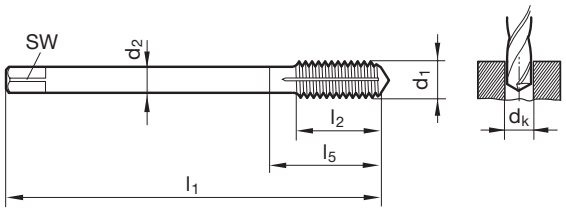
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007

Machos laminadores para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 233





DIN 2174 ~DIN 374 — Nr. do artigo **2008**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000	10,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

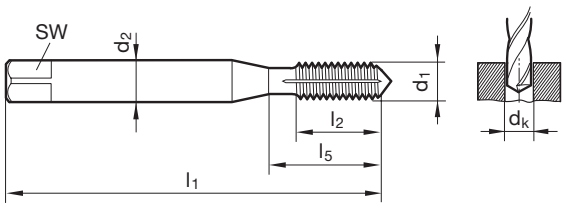
Machos laminadores para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

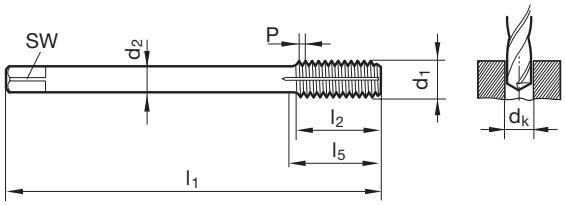
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1277**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **926**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

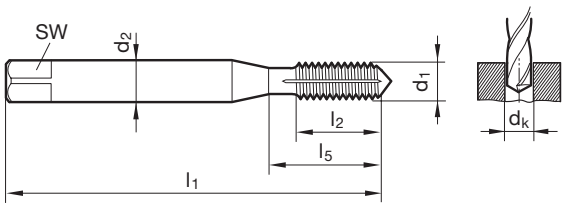
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

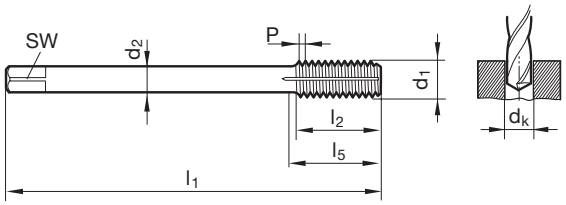
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1268**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1269**

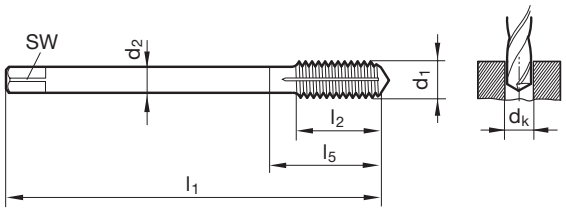
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

Machos laminadores para rosca métrica fina ISO

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233

Material de corte	**HSS-E-PM**
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	





DIN 2174 ~DIN 374 — Nr. do artigo **333**

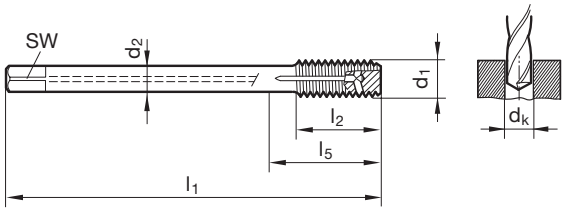
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	16,000	44,000	20,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233





DIN 2174 ~DIN 374 — Nr. do artigo **338**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007

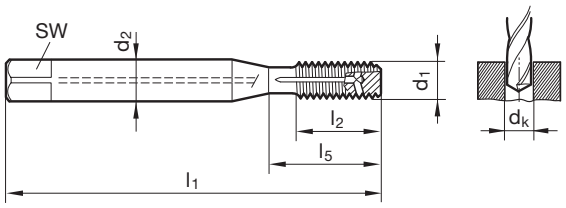
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM		
Tolerância do Ø	6HX	6HX	6HX
Superfície	C	A	S
Tipo	N	N	N
Forma	C	C	E
Refrigeração interna			

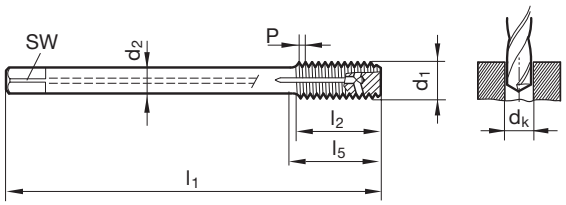
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 233

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo: **1272** | **1721** | **1729**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo: **1273** | **1723** | **1731**

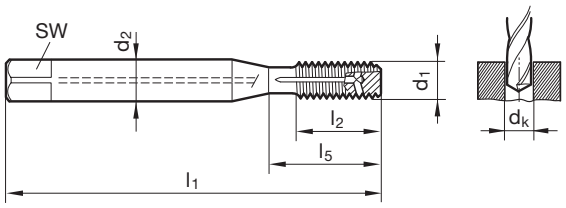
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

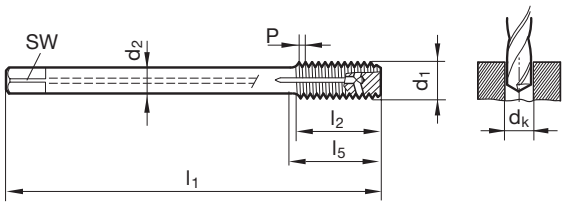
P	•	Página de dados de corte 233
M	•	
K		
N	≥ 7	
S	•	
H		

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	C	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

~ DIN 371



~ DIN 374







DIN 2174 ~DIN 371 — Nr. do artigo **1715** **1730**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **1716** **1732**

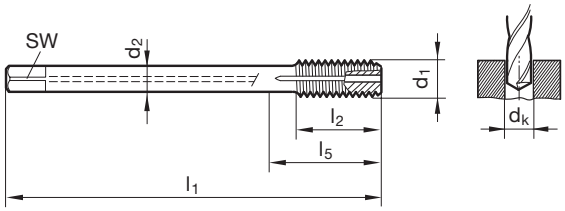
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 233





Norma da emp. Norma da emp. Nr. do artigo **4145**

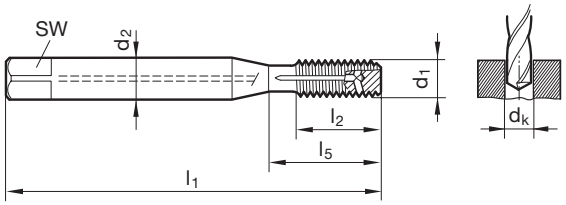
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	140,000	14,000	97,000	8,005
M10 x 1	7,000	5,500	9,55	160,000	16,000	117,000	10,005
M10 x 1,25	7,000	5,500	9,40	160,000	16,000	117,000	10,006
M12 x 1	9,000	7,000	11,55	180,000	18,500	133,000	12,005
M12 x 1,5	9,000	7,000	11,30	180,000	18,500	133,000	12,007
M14 x 1,5	11,000	9,000	13,30	220,000	20,000	168,000	14,007
M16 x 1,5	12,000	9,000	15,30	220,000	20,000	168,000	16,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 233





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **1581**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M10 x 1	10,000	8,000	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	15,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	15,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	15,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	15,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	15,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	15,000	48,000	24,007

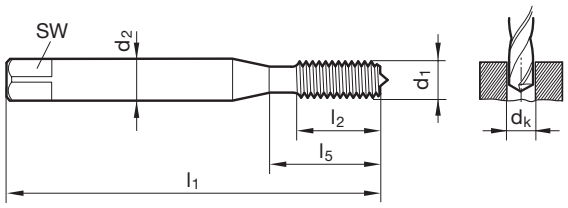
Machos laminadores para rosca UNC

Material de corte	HSS-E	
Tolerância do Ø	2BX	2BX
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

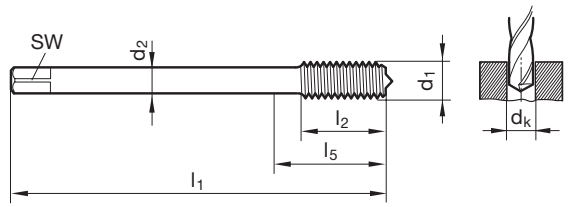
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 232/233

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo **2273** **1582**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,55	56,000	11,000	18,000	2,845
5 - 40	3,500	2,700	2,90	56,000	11,000	18,000	3,175
6 - 32	4,000	3,000	3,15	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,80	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	4,35	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	5,00	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,75	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	7,30	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,80	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **2274** **1583**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	10,30	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	11,80	110,000	25,000	49,000	12,700
9/16 - 12	11,000	9,000	13,30	110,000	28,000	53,000	14,288
5/8 - 11	12,000	9,000	14,80	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	17,90	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	21,00	140,000	35,000	62,000	22,225

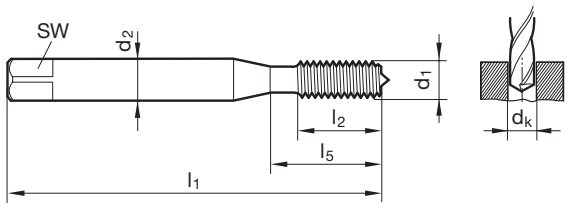
Machos laminadores para rosca UNF

P	•
M	•
K	
N	○
S	
H	

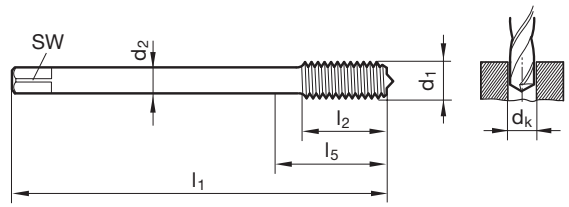
Página de dados de corte 232/233

Material de corte	HSS-E	
Tolerância do Ø	2BX	2BX
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo: **1283** | **1584**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 48	3,500	2,700	2,60	56,000	10,000	18,000	2,845
5 - 44	3,500	2,700	2,90	56,000	10,000	18,000	3,175
6 - 40	4,000	3,000	3,20	56,000	11,000	20,000	3,505
8 - 36	4,500	3,400	3,85	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,45	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	5,10	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,95	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	7,45	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	9,05	90,000	18,000	35,000	9,525

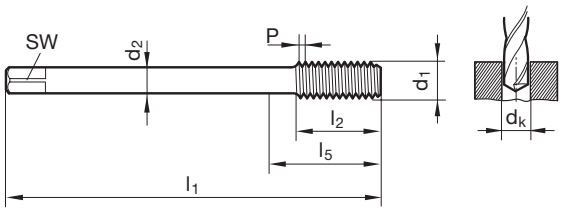
DIN 2184-1 ~DIN 374 — Nr. do artigo: **2275** | **1585**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 32	3,500	2,700	4,45	70,000	14,000	25,000	4,826
12 - 28	4,000	3,000	5,10	80,000	16,000	30,000	5,486
1/4 - 28	4,500	3,400	5,95	80,000	16,000	30,000	6,350
5/16 - 24	6,000	4,900	7,45	90,000	18,000	35,000	7,938
3/8 - 24	7,000	5,500	9,05	90,000	18,000	35,000	9,525
7/16 - 20	8,000	6,200	10,55	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	12,10	100,000	20,000	40,000	12,700
9/16 - 18	11,000	9,000	13,65	100,000	22,000	40,000	14,288
5/8 - 18	12,000	9,000	15,25	100,000	22,000	44,000	15,875
3/4 - 16	14,000	11,000	18,35	110,000	25,000	44,000	19,050
7/8 - 14	18,000	14,500	21,40	125,000	25,000	44,000	22,225
1 - 12	18,000	14,500	24,45	140,000	28,000	50,000	25,400

Machos laminadores para rosca Gás Whitworth

P	•	Página de dados de corte 232/233
M	•	
K		
N	○	
S		
H		

Material de corte	HSS-E	
Tolerância do Ø	X	X
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		







DIN 2184-1 DIN 2189	Nr. do artigo	966	1586

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	7,30	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	9,30	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	12,50	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	16,00	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	20,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	25,50	140,000	28,000	53,000	26,441
G1	11,000	25,000	20,000	32,00	160,000	30,000	56,000	33,249
G1 1/4	11,000	32,000	24,000	40,75	170,000	30,000	57,000	41,910



FRESAS DE ROSCAR

M

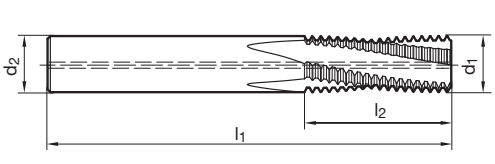
Fresas para rosca métrica ISO sem chanfro

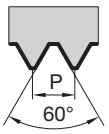
2xD

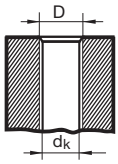
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 234

Material de corte	MD int.			
Superfície	C	C	C	C
Tipo	TM SP	TM SP	TM SP	TM SP
Refrigeração interna				
Forma da haste	HA	HB	HA	HB
		NEW		NEW









Norma da emp.	Nr. do artigo	3737	3743	4132	4133

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	13,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	18,100	3	8,000
M8 x 1	1,000	6,400	8,000	7,00	62,000	17,500	3	8,005
M10	1,500	7,950	10,000	8,50	74,000	21,800	3	10,000
M10 x 1	1,000	7,950	10,000	9,00	74,000	21,500	3	10,005
M10 x 1,25	1,250	7,950	10,000	8,80	74,000	21,900	3	10,006
M12	1,750	9,950	10,000	10,20	74,000	25,400	4	12,000
M12 x 1,5	1,500	9,950	10,000	10,50	74,000	26,300	4	12,007
M14	2,000	11,200	12,000	12,00	90,000	31,000	4	14,000
M14 x 1,5	1,500	11,200	12,000	12,50	90,000	30,800	4	14,007
M16	2,000	12,800	14,000	14,00	90,000	35,000	4	16,000
M16 x 1,5	1,500	12,800	14,000	14,50	90,000	33,800	4	16,007
M20	2,500	14,950	16,000	17,50	102,000	41,300	4	20,000
M20 x 1,5	1,500	14,950	16,000	18,50	102,000	42,800	4	20,007

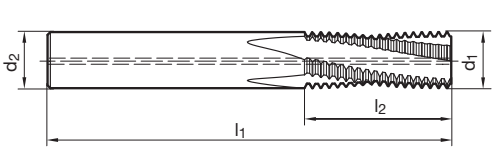
Fresas para rosca métrica ISO sem chanfro

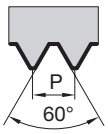
2,5xD

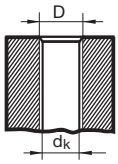
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3735	3740

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	16,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	21,900	3	8,000
M10	1,500	7,950	10,000	8,50	74,000	26,300	3	10,000
M12	1,750	9,950	10,000	10,20	74,000	32,400	4	12,000
M14	2,000	11,200	12,000	12,00	90,000	37,000	4	14,000
M16	2,000	12,800	14,000	14,00	90,000	43,000	4	16,000
M20	2,500	14,950	16,000	17,50	102,000	48,800	4	20,000

Fresas para rosca métrica ISO com chanfro

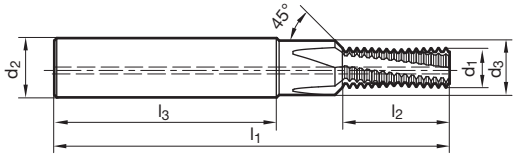


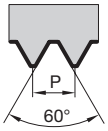
P	•
M	•
K	•
N	•
S	•
H	≤55

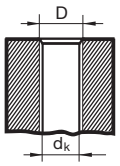
Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3525	3543

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	5,300	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	7,400	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	9,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	10,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	13,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	17,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	20,100	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	25,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	27,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	33,800	4	20,000

Fresas para rosca métrica ISO com chanfro

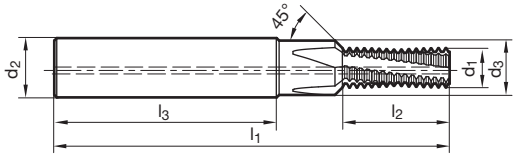


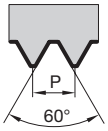
P	•
M	•
K	•
N	•
S	•
H	≤55

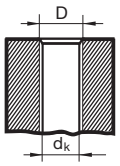
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3526	3544

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	6,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	8,800	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	10,800	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	13,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	18,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	21,800	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	25,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	31,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	35,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	41,300	4	20,000

Fresas para rosca métrica ISO com chanfro

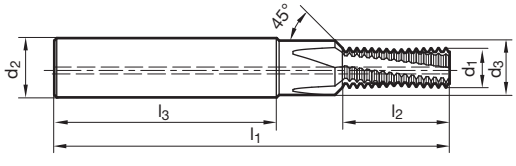
2,5xD

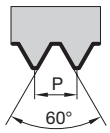
P	•
M	•
K	•
N	•
S	•
H	≤55

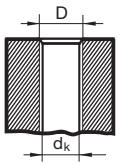
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3759	3760

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	7,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	35,600	10,900	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	13,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	16,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	21,900	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	26,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	32,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	37,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	43,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	48,800	4	20,000

Fresas para rosca métrica fina ISO com chanfro

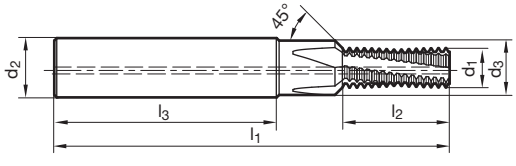


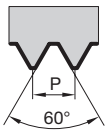
P	•
M	•
K	•
N	•
S	•
H	≤55

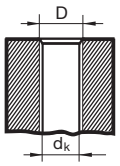
Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3527	3545

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	7,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	8,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	9,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	10,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	13,100	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	13,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	16,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	16,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	19,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	20,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	23,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	26,300	4	16,007

Fresas para rosca métrica fina ISO com chanfro

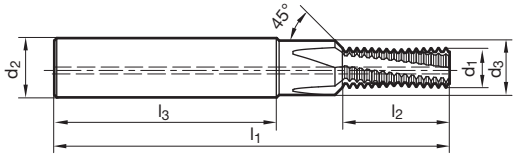
2xD

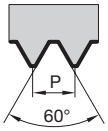
P	•
M	•
K	•
N	•
S	•
H	≤55

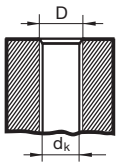
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3528	3546

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	8,800	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	10,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	12,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	13,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	16,900	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	17,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	21,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	21,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	25,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	26,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	30,800	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	33,800	4	16,007

Fresas para rosca métrica fina ISO com chanfro

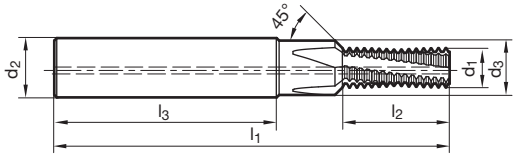


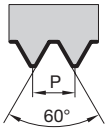
P	•
M	•
K	•
N	•
S	•
H	≤55

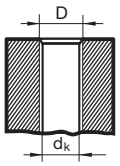
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3762	3763

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	10,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	12,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	15,300	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	15,400	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	20,600	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	20,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	25,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	25,600	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	30,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	30,800	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	38,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	41,300	4	16,007

Fresas para rosca UNC sem chanfro

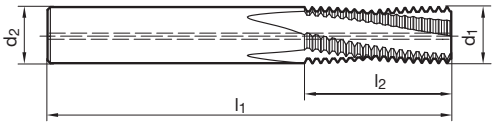
2xD

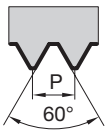
P	•
M	○
K	•
N	•
S	○
H	≤55

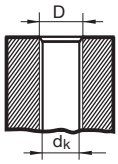
Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4134	4135

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 24	3,400	6,000	3,90	54,000	11,100	3	4,826
12 - 24	4,100	6,000	4,50	54,000	12,200	3	5,486
1/4 - 20	4,700	6,000	5,10	54,000	14,600	3	6,350
5/16 - 18	6,100	8,000	6,60	64,000	17,600	3	7,938
3/8 - 16	7,600	8,000	8,00	64,000	21,400	3	9,525
7/16 - 14	9,000	10,000	9,40	74,000	24,500	3	11,113
1/2 - 13	9,950	10,000	10,80	74,000	28,300	4	12,700
9/16 - 12	11,400	12,000	12,20	90,000	30,700	4	14,288
5/8 - 11	12,700	14,000	13,50	90,000	35,800	4	15,875

Fresas para rosca UNC com chanfro

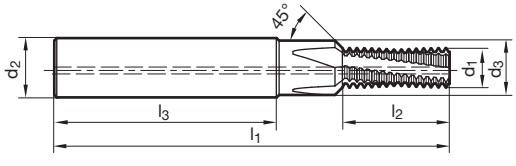


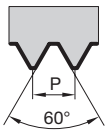
P	•
M	•
K	•
N	•
S	•
H	≤55

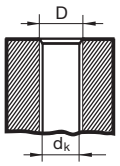
Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3516	3534

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	12,100	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	14,800	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	16,700	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	19,000	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	22,500	4	12,700

Fresas para rosca UNC com chanfro

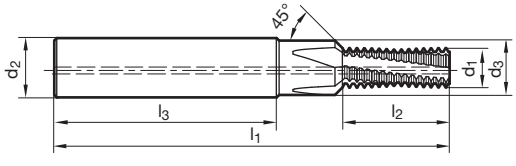
2xD

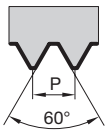
P	•
M	•
K	•
N	•
S	•
H	≤55

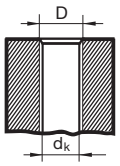
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3517	3535

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	14,600	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	17,600	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	21,400	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	24,500	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	28,300	4	12,700

Fresas para rosca UNF sem chanfro

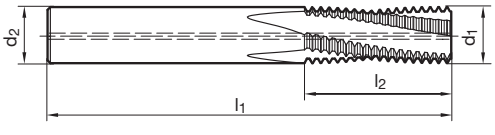
2xD

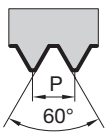
P	•
M	○
K	•
N	•
S	○
H	≤55

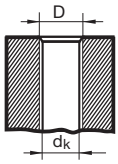
Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4136	4137

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 32	3,800	6,000	4,10	54,000	11,500	3	4,826
12 - 28	4,300	6,000	4,60	54,000	12,200	3	5,486
1/4 - 28	5,100	6,000	5,50	54,000	14,100	3	6,350
5/16 - 24	6,300	8,000	6,90	64,000	17,500	3	7,938
3/8 - 24	7,800	8,000	8,50	64,000	20,600	3	9,525
7/16 - 20	9,400	10,000	9,90	74,000	24,800	3	11,113
1/2 - 20	9,950	10,000	11,50	74,000	27,300	4	12,700
9/16 - 18	11,400	12,000	12,90	90,000	30,300	4	14,288
5/8 - 18	12,700	14,000	14,50	90,000	33,200	4	15,875

Fresas para rosca UNF com chanfro

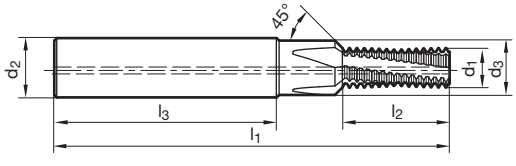


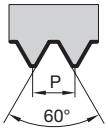
P	•
M	•
K	•
N	•
S	•
H	≤55

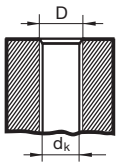
Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3518	3536

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	11,300	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	13,200	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	16,400	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	18,400	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	21,000	4	12,700

Fresas para rosca UNF com chanfro

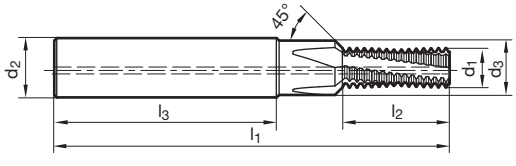


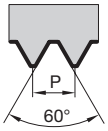
P	•
M	•
K	•
N	•
S	•
H	≤55

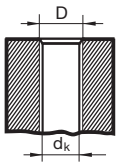
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3519	3537

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	14,100	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	17,500	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	20,600	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	24,800	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	27,300	4	12,700

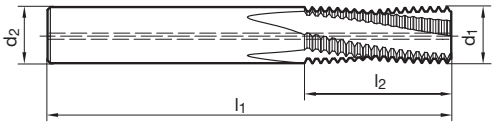
Fresas para rosca gás Whitworth sem chanfro

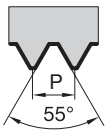
2xD

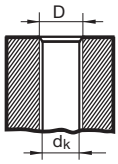
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3745	3748

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	21,300	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	28,700	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	35,400	4	16,662

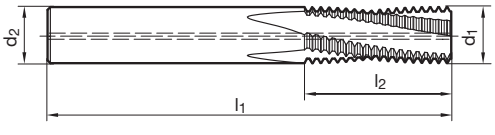
Fresas para rosca gás Whitworth sem chanfro

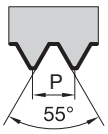


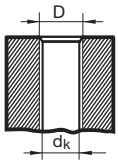
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3746	3750

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	24,900	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	35,400	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	43,500	4	16,662

Fresas para rosca gás Whitworth com chanfro

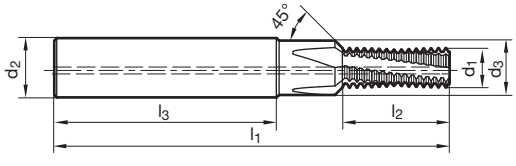


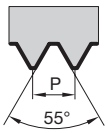
P	•
M	•
K	•
N	•
S	•
H	≤55

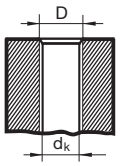
Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3514	3529

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	15,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	22,100	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	27,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

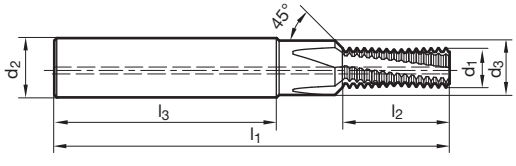


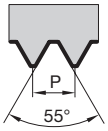
P	•
M	•
K	•
N	•
S	•
H	≤55

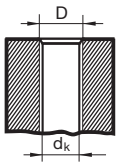
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3515	3533

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	21,300	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	28,700	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	35,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

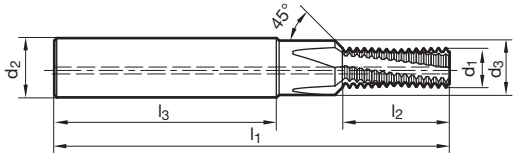
2,5xD

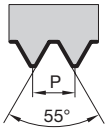
P	•
M	•
K	•
N	•
S	•
H	≤55

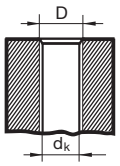
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3765	3766

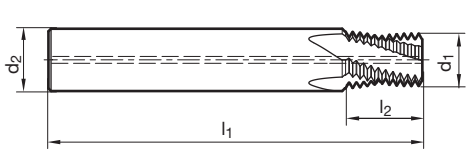
D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	24,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	35,400	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	43,500	4	16,662

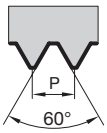
Fresas para rosca NPT sem chanfro

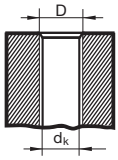
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3753	3754

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

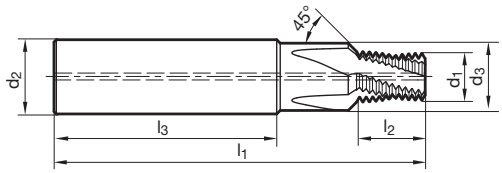
Fresas para rosca NPT com chanfro

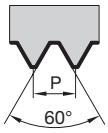
P	•
M	•
K	•
N	•
S	•
H	≤55

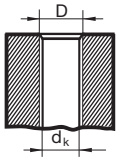
Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3520	3538

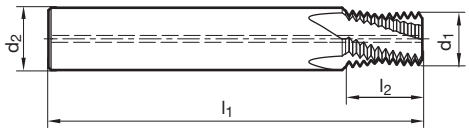
D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

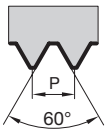
Fresas para rosca NPTF sem chanfro

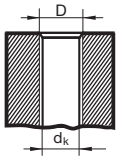
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3756	3757

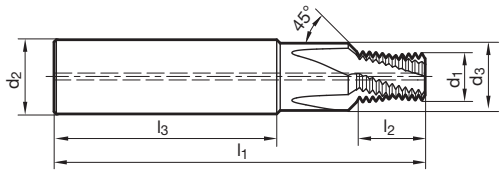
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

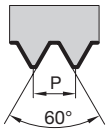
Fresas para rosca NPTF com chanfro

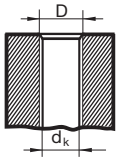
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 234

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3521	3539

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

Fresas para roscas multiuso, para rosca métrica ISO

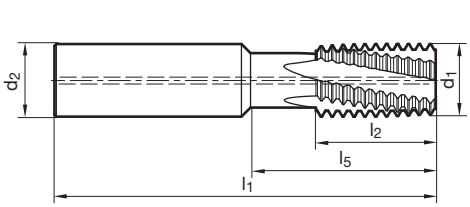


P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB

NEW





Norma da emp.	Nr. do artigo	3541	3556

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 10	7,950	8,000	64,000		20,000	4	8,050
1,000	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,100
1,250	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,125
1,500	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,150
1,000	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,150
1,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,100
1,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,200
3,000	≥ 24	17,950	18,000	102,000	50,000	33,000	5	18,300
1,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,100
1,500	≥ 26	19,950	20,000	105,000	50,000	33,000	5	20,150
2,000	≥ 27	19,950	20,000	105,000	50,000	33,000	5	20,200
2,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,250
3,000	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,300
3,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,350

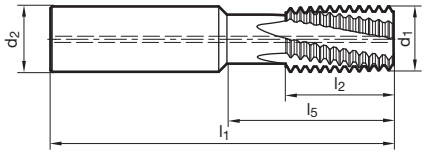
Fresamento externo de roscas

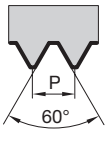
P	•
M	•
K	•
N	•
S	•
H	≤55

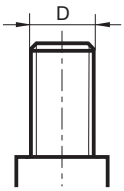
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. Nr. do artigo **4162** **4163**

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 3	9,950	10,000	70,000	25,000	16,000	4	10,050
0,750	≥ 5	9,950	10,000	70,000	25,000	16,000	4	10,075
1,000	≥ 6	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 8	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 10	11,950	12,000	80,000	31,000	20,000	4	12,150
1,500	≥ 10	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 14	15,950	16,000	90,000	40,000	25,000	5	16,200
2,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,250
3,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,300

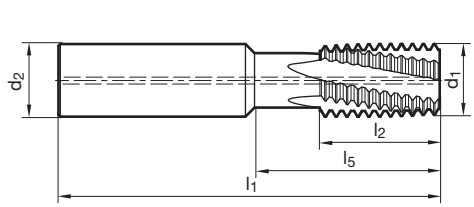
Fresas para roscas multiuso, para rosca UN

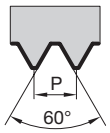
P	•
M	•
K	•
N	•
S	•
H	≤55

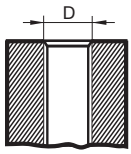
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU UN	TMU UN
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3595	3596

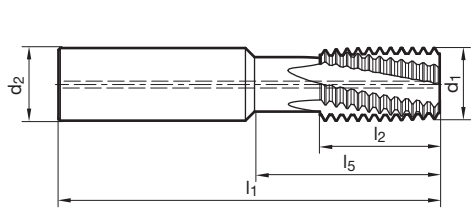
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
10,000	≥ 3/4	11,950	12,000	80,000	31,000	20,000	4	12,100
16,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,160
18,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,180
20,000	≥ 11/16	11,950	12,000	80,000	31,000	20,000	4	12,200
24,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,240
12,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,120
14,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,140
16,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,160
18,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,180
20,000	≥ 13/16	15,950	16,000	90,000	40,000	25,000	5	16,200
7,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,070
8,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,080
12,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,120
14,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,140
16,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,160

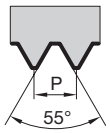
Fresas para roscas multiuso, para rosca gás Whitworth

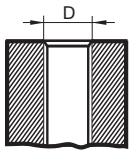
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3542	3557

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
19,000	≥ 1/4	9,950	10,000	70,000	25,000	16,000	4	10,190
14,000	≥ 1/2	15,950	16,000	90,000	40,000	25,000	5	16,140
11,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,110

Fresas para roscas multiuso, para rosca NPT

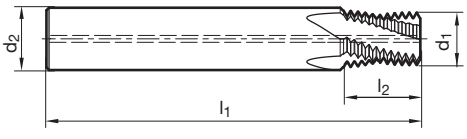


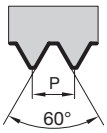
P	•
M	•
K	•
N	•
S	•
H	≤55

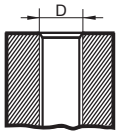
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3768	3769

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

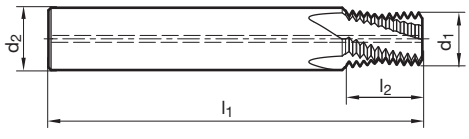
Fresas para roscas multiuso, para rosca NPTF

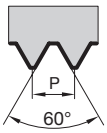
P	•
M	•
K	•
N	•
S	•
H	≤55

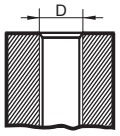
Página de dados de corte 235

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3772	3773

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

Micro-fresas de rosquear

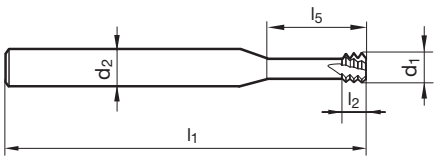


P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 235

Material de corte	**MD int.**
Superfície	C
Tipo	SP M
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4226**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,6	0,350	1,200	3,000	39,000	1,100	4,800	3	1,600
M1,8	0,350	1,400	3,000	39,000	1,100	5,400	3	1,800
M2	0,400	1,550	3,000	39,000	1,200	6,000	4	2,000
M2,5	0,450	1,950	3,000	39,000	1,400	7,500	4	2,500
M3	0,500	2,400	6,000	58,000	1,500	9,500	4	3,000
M3,5	0,600	2,800	6,000	58,000	1,800	11,000	4	3,500
M4	0,700	3,200	6,000	58,000	2,100	12,500	4	4,000
M5	0,800	4,000	6,000	58,000	2,400	16,000	4	5,000
M6	1,000	4,800	6,000	58,000	3,000	20,000	4	6,000
M8	1,250	5,950	6,000	58,000	3,800	24,000	4	8,000
M10	1,500	7,800	8,000	73,000	4,500	33,000	4	10,000
M12	1,750	9,000	10,000	84,000	5,300	38,000	4	12,000
M16	2,000	11,800	10,000	84,000	6,000	35,000	5	16,000

Micro-fresas de rosquear

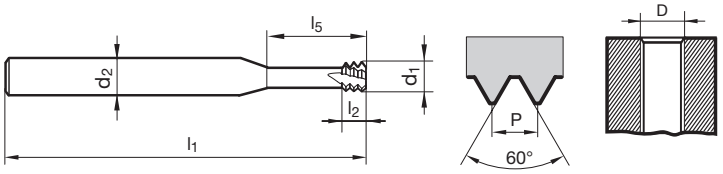
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 235

Material de corte	**MD int.**
Superfície	C
Tipo	SP G
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4228**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	6,200	8,000	64,000	2,700	19,500	4	9,728
G3/8	19,000	9,950	10,000	73,000	4,000	25,000	4	16,662
G7/8	14,000	11,950	12,000	84,000	5,400	37,000	4	30,201
G2	11,000	15,950	16,000	105,000	6,900	44,000	5	59,614

Micro-fresas de rosquear

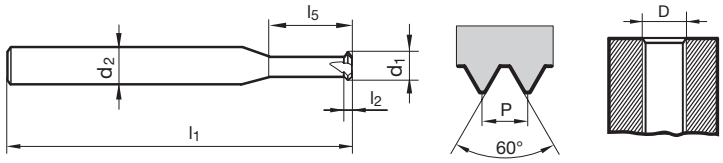
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 235

Material de corte	**MD int.**
Superfície	C
Tipo	SP M/MF
Rôscas	1,0
Forma da haste	HA

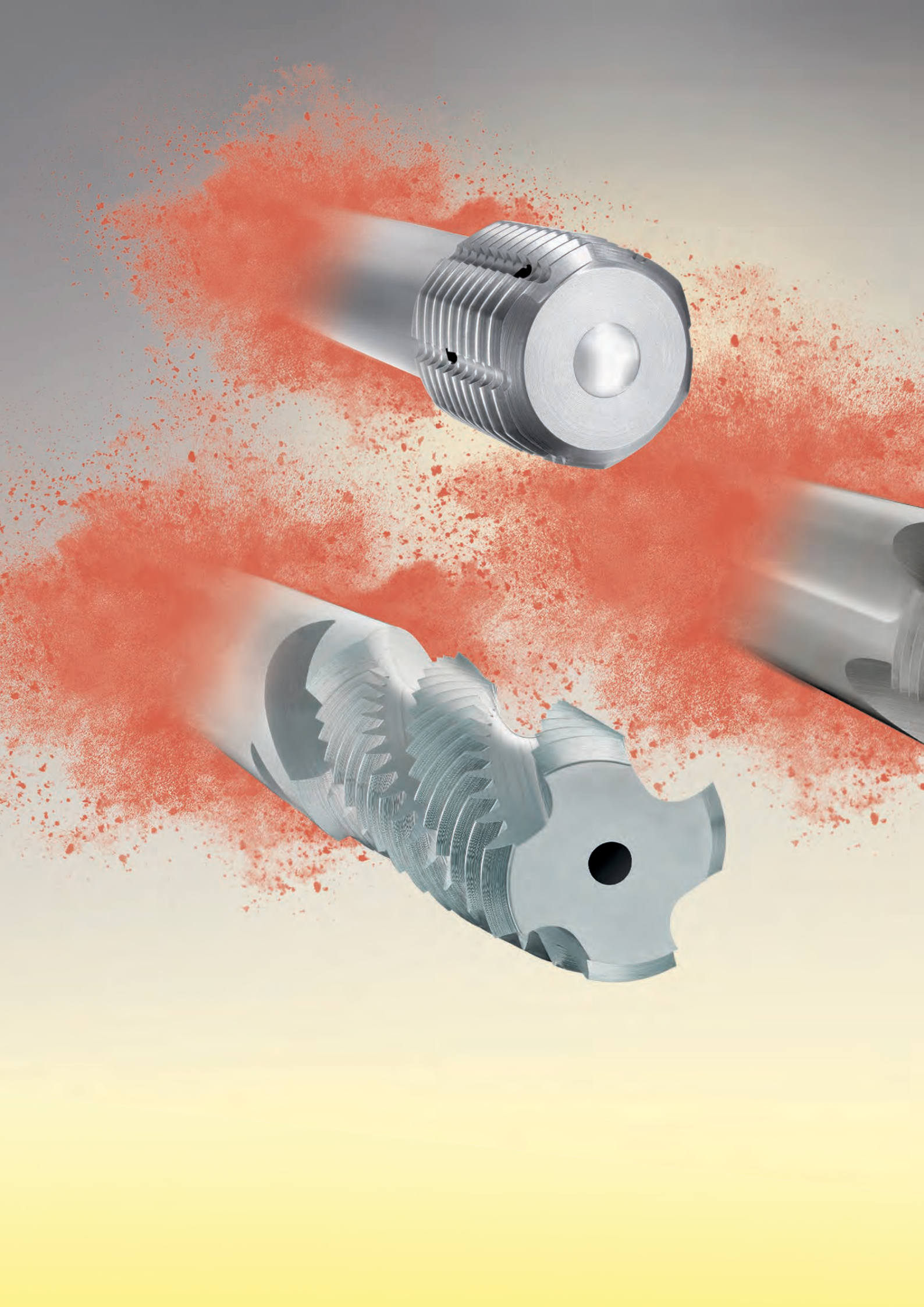
NEW





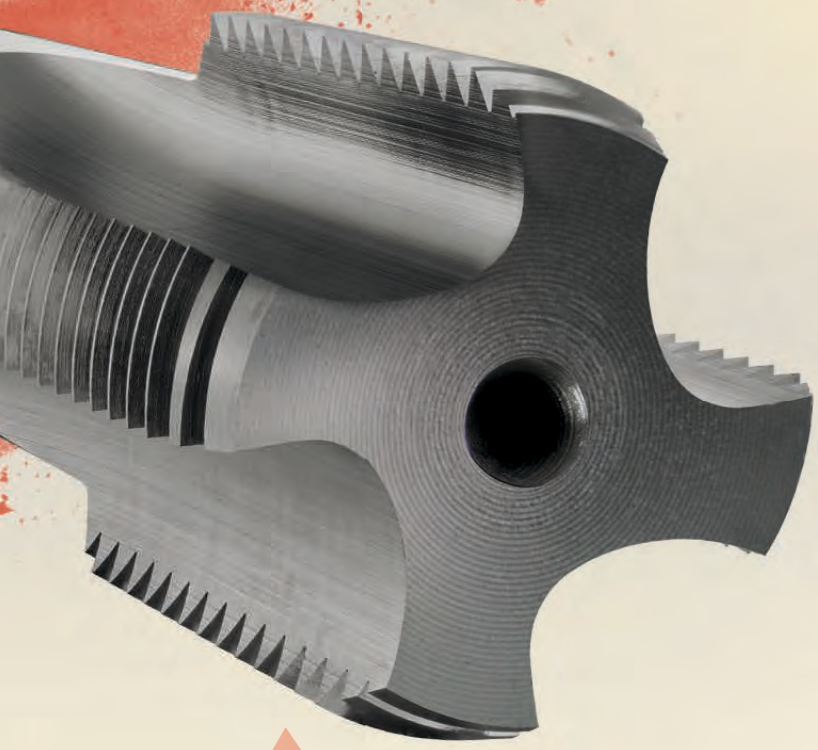
Norma da emp. Nr. do artigo **4225**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,4 - M1,8	0,350	1,050	3,000	39,000	0,400	3,800	3	1,800
M2 - M2,4	0,400	1,500	3,000	39,000	0,400	7,000	3	2,400
M2,5 - M3	0,500	2,000	3,000	39,000	0,500	9,000	4	3,000
M3,5 - M4,5	0,750	2,800	6,000	58,000	0,800	14,000	4	4,500
M5 - M7	1,000	4,000	6,000	58,000	1,000	19,000	4	7,000
M8 - M10	1,500	6,400	8,000	64,000	1,500	24,000	5	10,000



FUNDIDOS

FERRO FUNDIDO/ FUNDIÇÃO NODULAR/ FUNDIÇÃO MALEÁVEL/



K

Ferro fundido, como cinzento (EN-GJL-250), nodular, maleável e ligas fundidas especiais abrasivas

FERRO FUNDIDO

M

ISO 2/6H

No 1
M3 - M30
Nr. do art. 1918/1919
a partir d. pág. 356

M3 - M30
Nr. do art. 807/819
a partir d. pág. 356

ISO 3/6G

MF

ISO 2/6H

No 1
M4x0,5 - M30x1,5
Nr. do art. 169
a partir d. pág. 365

M4x0,5 - M30x1,5
Nr. do art. 831
a partir d. pág. 365

ISO 3/6G

sem refrigeração interna

com refrigeração interna

No 1
M3 - M10
Nr. do art. 2311
a partir d. pág. 364

M3 - M20
Nr. do art. 1858/1859
a partir d. pág. 362

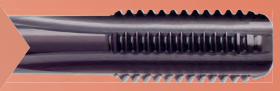
No 1
M5x0,5 - M20x1,5
Nr. do art. 1861/1860
a partir d. pág. 368

No 1 ideal tool

QUICKFINDER

UNC	UNF	G	
2B	2B	-	 ATRAVÉS FUROS

Ferro fundido, fundição nodular e fundição maleável



HSS-E, TiAlN, forma C

No 1
No. 2 - 3/4
Nr. do art. 1979/1984
a partir d. pág. 370

No 1
No. 4 - 1
Nr. do art. 1989
a partir d. pág. 372

No 1
G1/16 - G2
Nr. do art. 961
a partir d. pág. 374



HSS-E, a vapor, forma C

METAL DURO



Metal duro, TiAlN, forma C

METAL DURO



Metal duro, polido, forma C

FERRO FUNDIDO

M

ISO 2/6H

No 1
M3 - M30
Nr. do art. 1918/1919
a partir d. pág. 356

M3 - M30
Nr. do art. 807/819
a partir d. pág. 356

No 1
M5 - M20
Nr. do art. 318/319
a partir d. pág. 358

No 1
M5 - M10
Nr. do art. 2506
a partir d. pág. 363

M3 - M20
Nr. do art. 969/1883
a partir d. pág. 362

ISO 3/6G

MF

ISO 2/6H

No 1
M4x0,5 - M30x1,5
Nr. do art. 169
a partir d. pág. 365

M4x0,5 - M30x1,5
Nr. do art. 831
a partir d. pág. 365

No 1
M8x1 - M24x1,5
Nr. do art. 347
a partir d. pág. 366

No 1
M5x0,5 - M20x1,5
Nr. do art. 972/974
a partir d. pág. 368

ISO 3/6G

sem refrigeração interna

com refrigeração interna

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2B	2B	-



C E G O F U R O S

Ferro fundido, fundição nodular e fundição maleável



HSS-E, TiAlN, forma C

No 1
No. 2 - 3/4
Nr. do art. 1979/1984
a partir d. pág. 370

No 1
No. 4 - 1
Nr. do art. 1989
a partir d. pág. 372

G1/16 - G2
Nr. do art. 961
a partir d. pág. 374



HSS-E, a vapor, forma C

No 1
No. 10 - 7/8
Nr. do art. 1085/1086
a partir d. pág. 371

No 1
No. 10 - 7/8
Nr. do art. 1082
a partir d. pág. 373



HSS-E, TiAlN, forma C

METAL DURO



Metal duro, TiAlN, forma C

METAL DURO



Metal duro, polido, forma C

FERRO FUNDIDO

M

6HX

sem canais de refrig.

No 1
M1 - M20
Nr. do art. 921/925
a partir d. pág. 376

com canais de refrig.

M3 - M39
Nr. do art. 919/923
a partir d. pág. 379

com refrigeração interna

No 1
M3 - M20
Nr. do art. 1270/1271
a partir d. pág. 385

No 1
M3 - M20
Nr. do art. 1725/1727
a partir d. pág.385

No 1
M3 - M20
Nr. do art. 1972/1931
a partir d. pág. 389

6GX

sem canais de refrig.

No 1
M2 - M10
Nr. do art. 920
a partir d. pág. 377

com canais de refrig.

No 1
M3 - M39
Nr. do art. 918/922
a partir d. pág. 379

com refrigeração interna

No 1
M5 - M10
Nr. do art. 1713
a partir d. pág. 386

No 1
M3 - M20
Nr. do art. 1726/1728
a partir d. pág. 387

MF

6HX

sem canais de refrig.

No 1
M8x1 - M20x1,5
Nr. do art. 929
a partir d. pág. 391

com canais de refrig.

M6x0,75 - M24x1,5
Nr. do art. 1275/927
a partir d. pág. 395

No 1
M6x0,75 - M20x1,5
Nr. do art. 2008
a partir d. pág. 396

com refrigeração interna

No 1
M8x1 - M24x1,5
Nr. do art. 1272/1273
a partir d. pág. 401

No 1
M8x1 - M24x1,5
Nr. do art. 1729/1731
a partir d. pág. 401

No 1
M10x1 - M24x1,5
Nr. do art. 1581
a partir d. pág. 404

6GX

sem canais de refrig.

No 1
M8x1 - M18x1,5
Nr. do art. 928
a partir d. pág. 393

com canais de refrig.

No 1
M8x1 - M20x1,5
Nr. do art. 1277/926
a partir d. pág. 397

com refrigeração interna

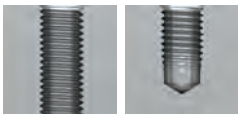
No 1
M8x1 - M24x1,5
Nr. do art. 1715/1716
a partir d. pág. 402

No 1
M8x1 - M24x1,5
Nr. do art. 1730/1732
a partir d. pág. 402

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2BX	2BX	-



ATRAVÉS FUROS
CEGO FUROS

No 1
Nr. 4 - 7/8
Nr. do art. 2273/2274
a partir d. pág. 405

No 1
Nr. 4 - 1
Nr. do art. 1283/2275
a partir d. pág. 406

No 1
G1/16 - G1 1/4
Nr. do art. 966
a partir d. pág. 407



HSS-E, TiN, forma C

No 1
Nr. 4 - 7/8
Nr. do art. 1582/1583
a partir d. pág. 405

No 1
Nr. 4 - 1
Nr. do art. 1584/1585
a partir d. pág. 406

No 1
G1/16 - G3/4
Nr. do art. 1586
a partir d. pág. 408



HSS-E, TiN, forma C



HSS-E, TiCN, forma C

FORMA C



HSS-E-PM, TiCN, forma C

FORMA E



HSS-E-PM, TiN, forma E

METAL DURO



Metal duro, TiCN, forma C

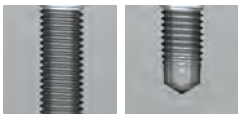
FERRO FUNDIDO

	M UNIVERSAL	MF UNIVERSAL
1,5xD	No 1 M3 - M20 Nr. do art. 3525 a partir d. pág. 413	No 1 M4x0,5 - M16x1,5 Nr. do art. 3527 a partir d. pág. 416
2xD	No 1 M3 - M20 Nr. do art. 3526 a partir d. pág. 414	No 1 M4x0,5 - M16x1,5 Nr. do art. 3528 a partir d. pág. 417
2,5xD	No 1 M3 - M20 Nr. do art. 3759 a partir d. pág. 415	No 1 M4x0,5 - M16x1,5 Nr. do art. 3762 a partir d. pág. 418
3xD	No 1 M1,6 - M16 Nr. do art. 4226 a partir d. pág. 440	
universal	No 1 Ø8xP0,5 - Ø20xP3,5 Nr. do art. 3541 a partir d. pág. 434	No 1 Ø8xP0,5 - Ø20xP3,5 Nr. do art. 3541 a partir d. pág. 434

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
UNIVERSAL	UNIVERSAL	-



ATRAVÉS FUROS
CEGO FUROS

Ferro fundido, fundição nodular e fundição maleável

No 1
1/4 - 1/2
Nr. do art. 3516
a partir d. pág. 420

No 1
1/4 - 1/2
Nr. do art. 3518
a partir d. pág. 423

No 1
1/8 - 3/8
Nr. do art. 3514
a partir d. pág. 429



Metal duro, TiCN

No 1
1/4 - 1/2
Nr. do art. 3517
a partir d. pág. 421

No 1
1/4 - 1/2
Nr. do art. 3519
a partir d. pág. 424

No 1
1/8 - 3/8
Nr. do art. 3515
a partir d. pág. 430



Metal duro, TiCN



Metal duro, TiCN



Metal duro, TiCN

No 1
Ø10xUN24 - Ø20xUN7
Nr. do art. 3595
a partir d. pág. 436

No 1
Ø10xUN24 - Ø20xUN7
Nr. do art. 3595
a partir d. pág. 436

No 1
Ø10xG19 - Ø20xG11
Nr. do art. 3542
a partir d. pág. 437



Metal duro, TiCN

FERRO FUNDIDO

M
UNIVERSAL

MF
UNIVERSAL

1,5xD

No 1
M3 - M16
Nr. do art. 3777
a partir d. pág. 443

No 1
M4x0,5 - M16x1,5
Nr. do art. 3789
a partir d. pág. 446

M3 - M16
Nr. do art. 3776
a partir d. pág. 443

M4x0,5 - M16x1,5
Nr. do art. 3788
a partir d. pág. 446

2xD

No 1
M3 - M16
Nr. do art. 3781
a partir d. pág. 444

No 1
M4x0,5 - M16x1,5
Nr. do art. 3793
a partir d. pág. 447

M3 - M16
Nr. do art. 3780
a partir d. pág. 444

M4x0,5 - M16x1,5
Nr. do art. 3792
a partir d. pág. 447

2,5xD

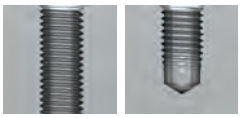
No 1
M3 - M16
Nr. do art. 3785
a partir d. pág. 445

M3 - M16
Nr. do art. 3784
a partir d. pág. 445

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
UNIVERSAL	UNIVERSAL	-



ATRAVÉS FUROS
CEGO FUROS

Ferro fundido, fundição nodular e fundição maleável



Metal duro, TiCN



Metal duro, TiCN

No 1
1/4 - 5/8
Nr. do art. 4139
a partir d. pág. 448

No 1
1/4 - 5/8
Nr. do art. 4141
a partir d. pág. 449



Metal duro, TiCN



Metal duro, TiCN



Metal duro, TiCN



Metal duro, TiCN



COMPASSO

K

FERRO FUNDIDO CINZENTO/ESFEROIDAL/MALEÁVEL



ATRAVÉS
FUROS

	Profundidade de rosca		≤3xD					
	Material de corte		HSS-E				Metal duro	
	Tipo/forma		GG/C	GG/C	GGT/C	GG/C	H/C	H/C
	Superfície		○	(S)	(S)	(A)	◯	(A)
	Fornecimento de refrigeração		☒	☒	☒	☒	Radial	Radial
	Tolerância do cone		h9	h9	h9	h9	h6	h6
								
	Tipo da rôsca	**Tolerância**	**No. Artigo / página**					
	M	4H						
		6H			1875/1876 357			
		6HX	807/819 356	930/931 356		1918/1919 356	1858/1859 362	2311 364
		6G						
	MF	6H						
		6HX	831 365	932 365		169 365	1861/1860 368	
		6G						
	UNC	2B	1979/1984 370					
		2BX						
	UNF	2B	1989 372					
		2BX						
	G		961 374					
	BSW							
	NPT							
	NPTF							
	EG M	6H Mod.						
	MJ	4HX						
	MJF	4HX						
	UNJC	3BX						
	UNJF	3BX						
	PG							
	Lubrificante adequado		○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min					
K	Ferro fundido	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	**15**	**20**	**20**	**25**	**45**	**45**
	Ferro fundido grafite esferoidal e ferro fundido maleável	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	**10**	**15**	**15**	**20**	**35**	**35**
	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		8	**12**	**12**	**15**	30	**30**

K

FERRO FUNDIDO CINZENTO/ESFE-ROIDAL/MALEÁVEL



CEGO
FUROS

	Profundidade de rosca		≤3xD					
	Material de corte		HSS-E					
	Tipo/forma		GG/C	GG/C	GGT/C	GG/C	GG/C	GGT/C
	Superfície		○	(S)	(S)	(A)	○	(A)
	Fornecimento de refrigeração		☒	☒	☒	☒	Axial	Axial
	Tolerância do cone		h9	h9	h9	h9	h9	h9
								
	Tipo da rôsca	**Tolerância**	**No. Artigo / página**					
	M	4H						
		6H			1875/1876 357			
		6HX	807/819 356	930/931 356		1918/1919 356	1890/1897 358	318/319 358
		6G						
	MF	6H						
		6HX	831 365	932 365		169 365	1904 366	347 366
		6G						
	UNC	2B	1979/1984 370					1085/1086 371
		2BX						
	UNF	2B	1989 372					1082 373
		2BX						
	G		961 374					
	BSW							
	NPT							
	NPTF							
	EG M	6H Mod.						
	MJ	4HX						
	MJF	4HX						
	UNJC	3BX						
	UNJF	3BX						
	PG							
		Lubrificante adequado	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min					
K	Ferro fundido	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	**15**	**20**	**20**	**25**	**15**	**25**
	Ferro fundido grafite esferoidal e ferro fundido maleável	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	**10**	**15**	**15**	**20**	**10**	**20**
	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		8	**12**	**12**	**15**	8	**15**

≤3xD

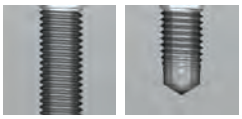
HSS-E-PM					VHM	
H/C	H/C	H/C	H/E	H/C	H/C	H/E
C	C	C	C	○	A	○
Axial	Axial	Axial	Axial	Axial	Axial	Axial
h9	h9	h9	h9	h6	h6	h6
						
No. Artigo / página						
778 360	779 361	302/297 359	1091/4165 359	969/1883 362	2506 363	1008 364
		1090 367	1007 367	972/974 368		1009 369
●/●/△	●/●/△	●/●/△	●/●/△	●/●/△	●/●/△/□	●/●/△

Velocidade de corte recomendada vc m/min						
25	25	30	30	45	45	45
20	20	20	20	35	35	35
15	15	15	15	30	30	30

Ferro fundido, fundição nodular e fundição maleável

K

FERRO FUNDIDO CINZENTO/ESFEROIDAL/MALEÁVEL



ATRAVÉS FUROS E **CEGO** FUROS

Profundidade de rosca		≤1,5xD			≤3xD	
Material de corte		HSS-E	HSS-E-PM	VHM	HSS-E	
Tipo/forma		N/C	N/C	N/C	N/C	N/C
Superfície		(S)	(S)	(S)	(S)	(C)
Fornecimento de refrigeração		☒	☒	Axial	☒	☒
Tolerância do cone		h9	h9	h6	h9	h9
						
Tipo da rôsca	**Tolerância**	**No. Artigo / página**				
M	4H					
	6H					
	6HX	921/925 376	1255/1256 376	2518 378	919/923 379	2012/2013 379
	6GX	920 377	903/952 376		918/922 379	
MF	6H					
	6HX	929 391	1257/1258 394		1275/927 395	2008 396
	6GX	928 393	1740 392		1277/926 397	
UNC	2B					
	2BX	2273/2274 405			1582/1583 405	
UNF	2B					
	2BX	1283/2275 406			1584/1585 406	
G		966 407			1586 408	
BSW						
NPT						
NPTF						
EG M	6H Mod.					
MJ	4HX					
MJF	4HX					
UNJC	3BX					
UNJF	3BX					
PG						
Lubrificante adequado		○/●/△	○/●/△	○/●/△	○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min				
K	Ferro fundido	300 HB	EN-GJL-150	0.6015	-	-	-	-	-
			EN-GJL-250	0.6025					
			EN-GJL-300	0.6030					
	Ferro fundido grafite esferoidal e ferro fundido maleável	350 HB	EN-GJS-400-15	0.7040	-	-	-	-	-
			EN-GJS-600-3	0.7060	**15**	**15**	**40**	**15**	**20**
			EN-GJS-700-2	0.7070					
	ADI GGV	1000 N/mm²	EN-GJS1000-5		**15**	**15**	**40**	**15**	**20**
		350 HB	EN-GJV250		-	-	-	-	-
			EN-GJV400						

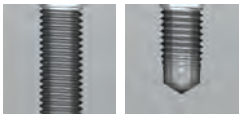
≤3xD

HSS-E		HSS-E-PM							VHM	
N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/E	N/C	N/E
S	C	S	S	S	S	C	A	S	C	C
Axial	Radial	⊠	⊠	Radial	Axial	Radial	Radial	Axial	Radial	Radial
h9	h9	h9	h9	h9	h9	h9	h9	h9	h6	h6
										
No. Artigo / página										
2442/2444 382	2446/2448 382	322/339 380	1266/1267 381	323/342 384	4143 388	1270/1271 385	1717/1719 385	1725/1727 385	1972/1931 389	1927 390
2443/2445 382	2447 383					1713 386	1718/1720 387	1726/1728 387		
		333 399	1268/1269 398	338 400	4145 403	1272/1273 401	1721/1723 401	1729/1731 401	1581 404	
						1715/1716 402		1730/1732 402		
○/●/△	○/●/△/□	○/●/△	○/●/△	○/●/△/□	○/●/△	○/●/△/□	○/●/△/□	○/●/△	○/●/△/□	○/●/△/□

Velocidade de corte recomendada vc m/min										
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
15	**20**	**15**	**15**	**15**	**15**	**25**	**25**	**15**	**40**	**40**
15	**20**	**15**	**15**	**15**	**15**	**20**	**20**	**15**	**40**	**40**
-	-	-	-	-	-	-	-	-	-	-

Ferro fundido, fundição nodular e fundição maleável

FERRO FUNDIDO CINZENTO/ESFEROIDAL/MALEÁVEL



ATRAVÉS FUROS E **CEGO** FUROS

Profundidade de rosca	≤2xD				≤2,5xD		≤1,5xD	
Material de corte		Metal duro						
Tipo	TM SP	TM SP	TM SP	TM SP	TM SP	TM SP	TMC SP	TMC SP
Superfície	C	C	C	C	C	C	C	C
Fornecimento de refrigeração	☒	☒	Axial	Axial	Axial	Axial	Axial	Axial
Forma da haste	HA	HB	HA	HB	HA	HB	HA	HA
Espiral	27°	27°	27°	27°	27°	27°	10°	10°



Tipo da rôsca	No. Artigo / página							
M	4132 411	4133 411	3737 410	3743 410	3735 412	3740 412	3525 413	3543 413
MF			3737 410	3743 410			3527 416	3545 416
UNC			4134 419	4135 419			3516 420	3534 420
UNF			4136 422	4137 422			3518 423	3536 423
G			3745 427	3748 427	3746 428	3750 428	3514 429	3529 429
BSW								
NPT			3753 425	3754 425			3520 426	3538 426
NPTF			3756 432	3757 432			3521 433	3539 433
EG M	Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar							
MJ								
MJF								
UNJC								
UNJF								
PG								
Lubrificante adequado	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Dureza	Exemplo de material	No. Material	Recomendações de aplicação							
K	Ferro fundido	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	++	++	++	++	++	++	++	++
	Ferro fundido grafite esferoidal e ferro fundido maleável	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	++	++	++	++	++	++	++	++
	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		++	++	++	++	++	++	++	++

≤2xD		≤2,5xD		universal				≤3xD		≤1,5xD		≤2xD		≤2,5xD	
Metal duro															
TMC SP	TMC SP	TMC SP	TMC SP	TMU SP	TMU SP	TMU SP	TMU SP	MTM 3 SP	MTM 1 SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP
C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	☒	☒	☒	Radial	☒	Radial	☒	Radial
HA	HB	HA	HB	HA	HB	HA	HB	HA	HA	HA	HA	HA	HA	HA	HA
10°	10°	27°	27°	15°	15°	15°	15°	15°	15°	27°	27°	27°	27°	27°	27°
															
No. Artigo / página															
3526 414	3544 414	3759 415	3760 415	3541 434	3556 434	4162 435	4163 435	4226 440	4225 442	3776 443	3777 443	3780 444	3781 444	3784 445	3785 445
3528 417	3546 417	3762 418	3763 418	3541 434	3556 434	4162 435	4163 435		4225 442	3788 446	3789 446	3792 447	3793 447		
3517 421	3535 421			3595 436	3596 436								4139 448		
3519 424	3537 424			3595 436	3596 436								4141 449		
3515 430	3533 430	3765 431	3766 431	3542 437	3557 437	3542 437	3557 437	4228 441							
				3768 438	3769 438										
				3772 439	3773 439										
Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar															
○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

Ferro fundido, fundição nodular e fundição maleável

Recomendações de aplicação															
++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
++	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++

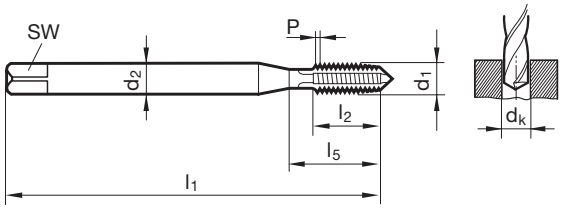
Machos para rosca métrica ISO

Material de corte	HSS-E		
Tolerância do Ø	6HX	6HX	6HX
Superfície	●	A	S
Tipo	GG	GG	GG
Forma	C	C	C
Refrigeração interna	⊠	⊠	⊠

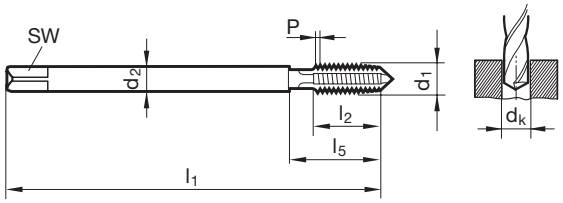
P
M
K •
N
S
H

Página de dados de corte 349/350

DIN 371



DIN 376





DIN 2184-1 DIN 371	Nr. do artigo	807	1918	930

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	819	1919	931

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

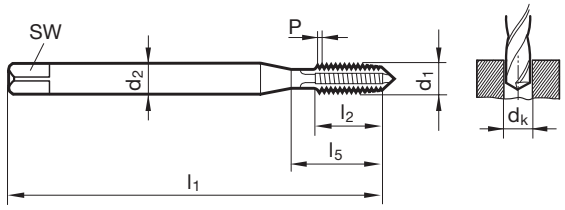
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	S
Tipo	GGT
Forma	C
Refrigeração interna	

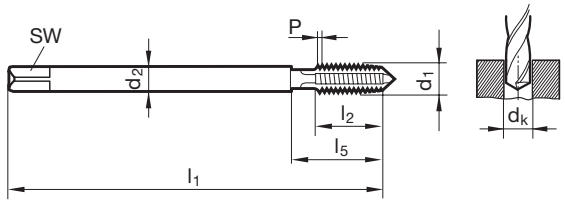
P	
M	
K	•
N	
S	
H	

Página de dados de corte 349/350

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **1875**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **1876**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

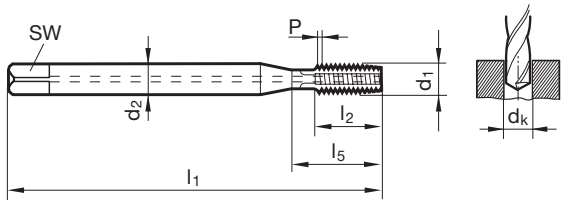
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E	
Tolerância do Ø	6HX	6HX
Superfície	●	A
Tipo	GG	GG
Forma	C	C
Refrigeração interna		

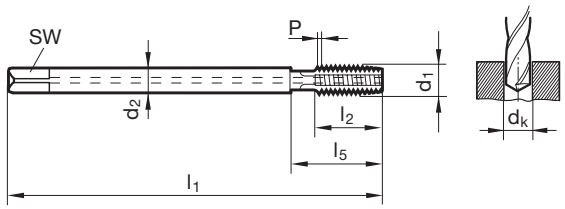
P
M
K •
N
S
H

Página de dados de corte 350

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **1890** **318**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **1897** **319**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

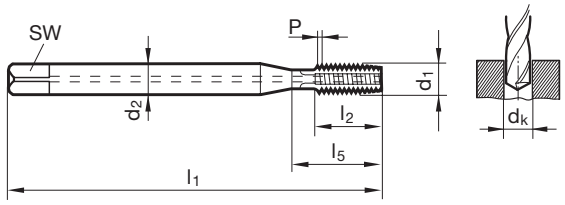
Machos com canais de refrigeração para rosca métrica ISO

P	≤ 1200	
M		
K	•	
N	≥ 7	
S		
H		

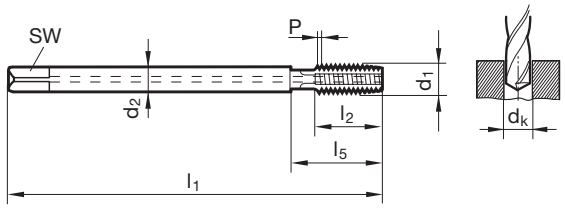
Página de dados de corte 351

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	C
Tipo	H	H
Forma	C	E
Refrigeração interna		

DIN 371



DIN 376







DIN 2184-1 DIN 371	Nr. do artigo	302	1091

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	297	4165

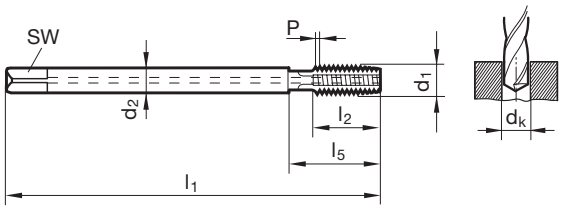
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	C
Refrigeração interna	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 351





DIN 2184-1 DIN 376 Nr. do artigo **778**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	29,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	32,00	200,000	50,000	102,000
M39	4,000	32,000	24,000	35,00	200,000	50,000	107,000

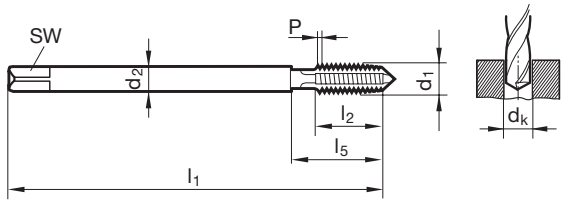
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	C
Refrigeração interna	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 351

NEW





Norma da emp. ~DIN 376 | Nr. do artigo **779**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M16	2,000	12,000	9,000	14,00	160,000	26,000	100,000
M20	2,500	16,000	12,000	17,50	180,000	32,000	120,000
M24	3,000	18,000	14,500	21,00	200,000	36,000	120,000
M27	3,000	20,000	16,000	24,00	225,000	36,000	145,000
M30	3,500	22,000	18,000	26,50	250,000	40,000	160,000
M33	3,500	25,000	20,000	29,50	275,000	40,000	170,000
M36	4,000	28,000	22,000	32,00	300,000	50,000	180,000
M39	4,000	32,000	24,000	35,00	325,000	50,000	210,000

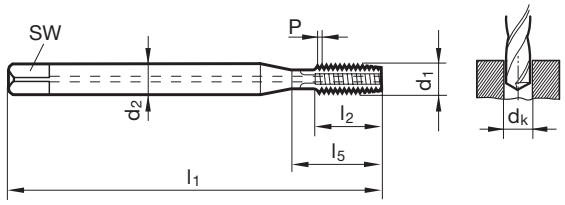
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	MD int.	
Tolerância do Ø	6HX	6HX
Superfície	◯	◯
Tipo	H	H
Forma	C	C
Refrigeração interna		

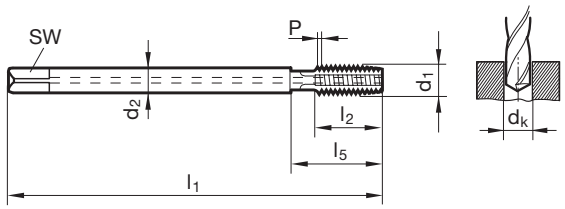
P	
M	
K	•
N	≥ 7
S	
H	

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DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo: **969** | **1858**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	8,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	10,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	10,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	12,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	16,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	18,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **1883** | **1859**

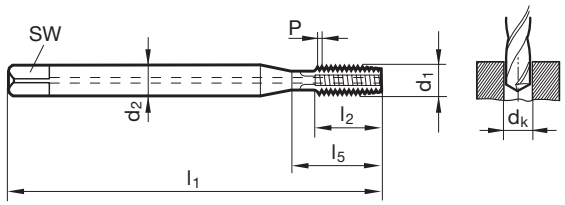
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	22,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	22,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	22,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	24,000	45,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	45,000

Machos com canais de refrigeração para rosca métrica ISO

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	A
Tipo	H
Forma	C
Refrigeração interna	

P
M
K •
N
S
H

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DIN 2184-1 DIN 371 Nr. do artigo **2506**

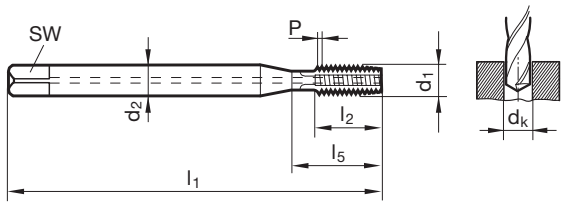
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	10,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	12,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	16,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	18,000	39,000

Machos com canais de refrigeração para rosca métrica ISO

Material de corte	MD int.		
Tolerância do Ø	6HX	6HX	6HX
Superfície	A	○	A
Tipo	H	H	N R15
Forma	C	E	C
Refrigeração interna			

P	
M	
K	•
N	
S	
H	

Página de dados de corte 349/351





DIN 2184-1 DIN 371	Nr. do artigo	2311	1008	2510

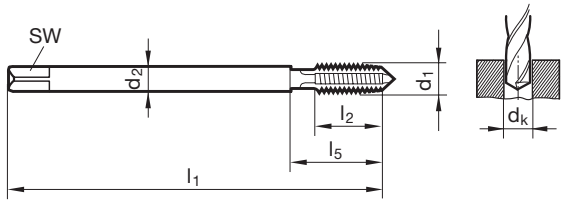
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	8,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	10,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	10,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	12,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	16,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	18,000	39,000

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E		
Tolerância do Ø	6HX	6HX	6HX
Superfície	●	S	A
Tipo	GG	GG	GG
Forma	C	C	C
Refrigeração interna	✕	✕	✕

P	
M	
K	•
N	
S	
H	

Página de dados de corte 349/350





DIN 2184-1 DIN 374 — Nr. do artigo: **831** | **932** | **169**

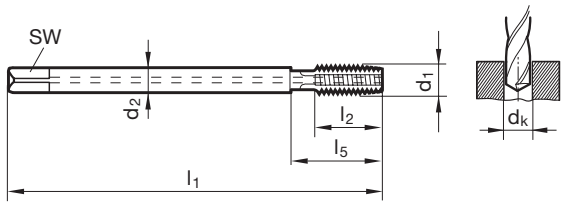
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M4 x 0,5	2,800	2,100	3,50	63,000	8,000	21,000	4,003
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,25	11,000	9,000	12,80	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007
M30 x 1,5	22,000	18,000	28,50	150,000	28,000	53,000	30,007

Machos com canais de refrig. p.rosca métr. fina ISO

Material de corte	HSS-E	
Tolerância do Ø	6HX	6HX
Superfície	●	A
Tipo	GG	GG
Forma	C	C
Refrigeração interna		

P	
M	
K	•
N	
S	
H	

Página de dados de corte 350/351





DIN 2184-1 DIN 374 — Nr. do artigo: **1904** | **347**

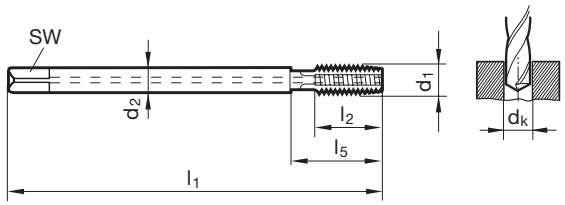
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	20,50	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007

Machos com canais de refrig. p.rosca métr. fina ISO

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 351

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	C
Tipo	H	H
Forma	C	E
Refrigeração interna		





DIN 2184-1 DIN 374 — Nr. do artigo: **1090** | **1007**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	13,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M9 x 1	7,000	5,500	8,00	90,000	16,000	35,000	9,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,00	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007

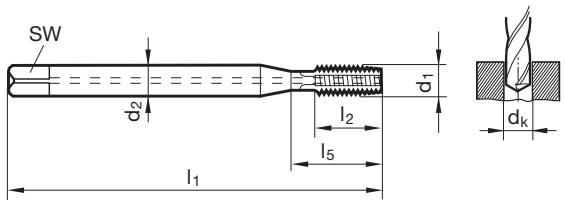
Machos com canais de refrig. p.rosca métr. fina ISO

Material de corte	MD int.	
Tolerância do Ø	6HX	6HX
Superfície	◯	◯
Tipo	H	H
Forma	C	C
Refrigeração interna		

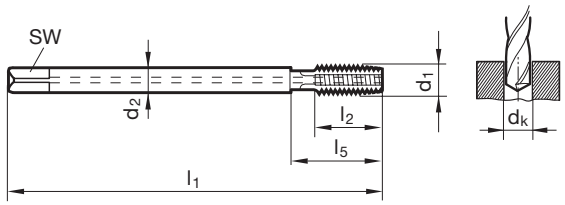
P	
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 349/351

DIN 371



DIN 374







DIN 2184-1 DIN 371 — Nr. do artigo **972** **1861**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	6,000	4,900	4,50	70,000	10,000	25,000	5,003
M8 x 1	8,000	6,200	7,00	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,00	90,000	18,000	35,000	10,005

DIN 2184-1 DIN 374 — Nr. do artigo **974** **1860**

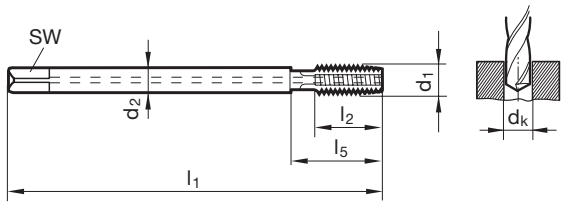
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,5	9,000	7,000	10,50	100,000	22,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	22,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	24,000	45,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	45,000	20,007

Machos com canais de refrig. p.rosca métr. fina ISO

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	◯
Tipo	H
Forma	E
Refrigeração interna	

P	
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 351





DIN 2184-1 ~DIN 371/~DIN 374 Nr. do artigo **1009**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M10 x 1	10,000	8,000	9,00	90,000	18,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	22,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	22,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	22,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007

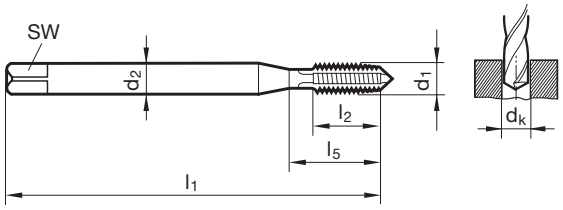
Machos para rosca UNC

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	●
Tipo	GG
Forma	C
Refrigeração interna	⊠

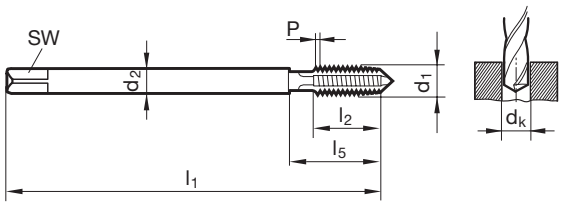
P	
M	
K	•
N	
S	
H	

Página de dados de corte 349/350

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 Nr. do artigo **1979**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
2 - 56	2,800	2,100	1,85	45,000	9,000	14,500	2,184
3 - 48	2,800	2,100	2,10	50,000	9,000	14,500	2,515
5 - 40	3,500	2,700	2,65	56,000	11,000	18,000	3,175
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 Nr. do artigo **1984**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	9,40	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
9/16 - 12	11,000	9,000	12,20	110,000	28,000	53,000	14,288
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	33,000	62,000	19,050

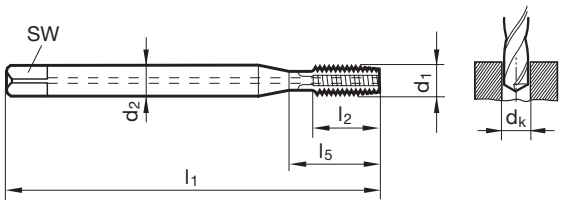
Machos com canais de refrigeração para rosca UNC

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	A
Tipo	GG
Forma	C
Refrigeração interna	

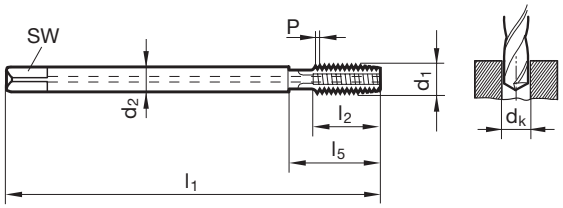
P	
M	
K	•
N	
S	
H	

Página de dados de corte 350

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 Nr. do artigo **1085**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 Nr. do artigo **1086**

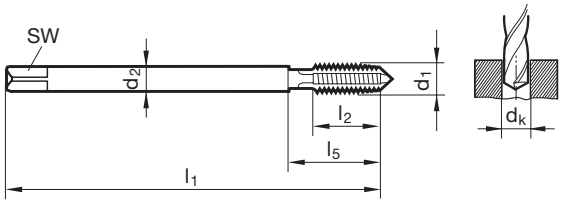
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	9,40	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	35,000	62,000	22,225

Machos para rosca UNF

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	●
Tipo	GG
Forma	C
Refrigeração interna	

P	
M	
K	•
N	
S	
H	

Página de dados de corte 349/350





DIN 2184-1 ~DIN 374 Nr. do artigo **1989**

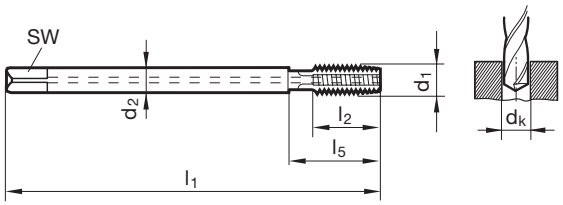
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 48	2,200		2,40	56,000	10,000	18,000	2,845
8 - 36	2,800	2,100	3,50	63,000	12,000	21,000	4,166
1/4 - 28	4,500	3,400	5,50	80,000	16,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	18,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	18,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	20,000	40,000	12,700
9/16 - 18	11,000	9,000	12,90	100,000	22,000	40,000	14,288
3/4 - 16	14,000	11,000	17,50	110,000	25,000	44,000	19,050
7/8 - 14	18,000	14,500	20,40	125,000	25,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	28,000	50,000	25,400

Machos para rosca UNF com canal de refrigeração

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	A
Tipo	GG
Forma	C
Refrigeração interna	

P	
M	
K	•
N	
S	
H	

Página de dados de corte 350





DIN 2184-1 ~DIN 374 Nr. do artigo **1082**

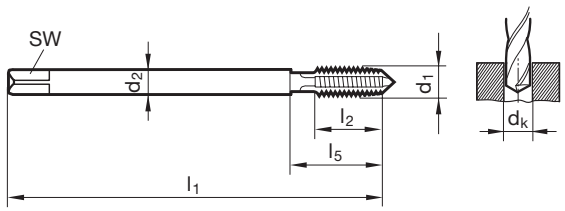
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 32	3,500	2,700	4,10	70,000	14,000	25,000	4,826
12 - 28	4,000	3,000	4,60	80,000	16,000	30,000	5,486
1/4 - 28	4,500	3,400	5,50	80,000	16,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	18,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	18,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	20,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000	15,875
3/4 - 16	14,000	11,000	17,50	110,000	25,000	44,000	19,050
7/8 - 14	18,000	14,500	20,40	125,000	25,000	44,000	22,225

Machos para rosca gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	
Superfície	●
Tipo	GG
Forma	C
Refrigeração interna	

P	
M	
K	•
N	
S	
H	

Página de dados de corte 349/350





DIN 2184-1 DIN 5156 — Nr. do artigo **961**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
G1/16	6,000	4,900	6,80	90,000	18,000	30,000	7,723
G1/8	7,000	5,500	8,80	90,000	18,000	35,000	9,728
G1/4	11,000	9,000	11,80	100,000	20,000	40,000	13,157
G3/8	12,000	9,000	15,25	100,000	22,000	44,000	16,662
G1/2	16,000	12,000	19,00	125,000	25,000	44,000	20,955
G5/8	18,000	14,500	21,00	125,000	25,000	48,000	22,911
G3/4	20,000	16,000	24,50	140,000	28,000	53,000	26,441
G7/8	22,000	18,000	28,25	150,000	28,000	53,000	30,201
G1	25,000	20,000	30,75	160,000	30,000	56,000	33,249
G1 1/8	28,000	22,000	35,50	170,000	30,000	56,000	37,897
G1 1/4	32,000	24,000	39,50	170,000	30,000	57,000	41,910
G1 3/8	36,000	29,000	41,75	180,000	32,000	60,000	44,323
G1 1/2	36,000	29,000	45,25	190,000	32,000	60,000	47,803
G1 3/4	40,000	32,000	51,00	190,000	40,000	93,000	53,746
G2	45,000	35,000	57,00	220,000	40,000	95,000	59,614



Ferro fundido, fundição nodular e fundição maleável

MACHOS LAMINA-DORES

K

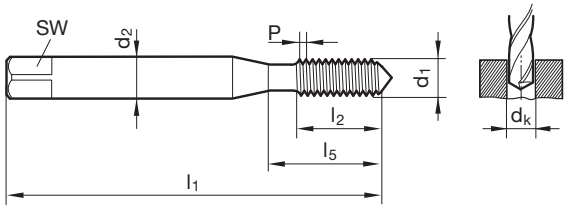
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM	HSS-E	HSS-E-PM
Tolerância do Ø	6GX	6HX	6HX
Superfície	S	S	S
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna	✕	✕	✕

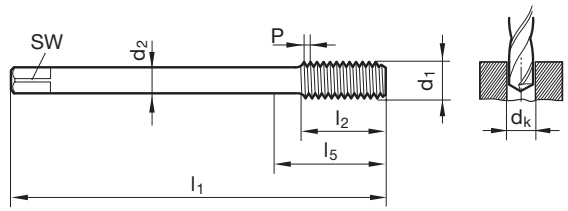
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	903	921	1255

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,90	40,000	4,000	
M1,2	0,250	2,500	2,100	1,10	40,000	4,800	
M1,4	0,300	2,500	2,100	1,25	40,000	5,600	
M1,6	0,350	2,500	2,100	1,45	40,000	6,400	
M1,7	0,350	2,500	2,100	1,55	40,000	6,800	
M1,8	0,350	2,500	2,100	1,65	40,000	7,300	
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	952	925	1256

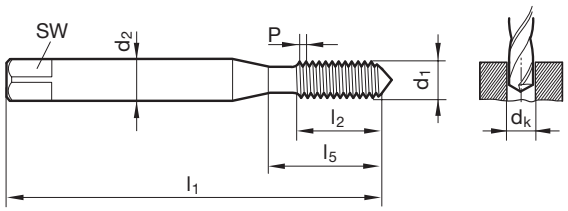
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352





DIN 2174 ~DIN 371 — Nr. do artigo **920**

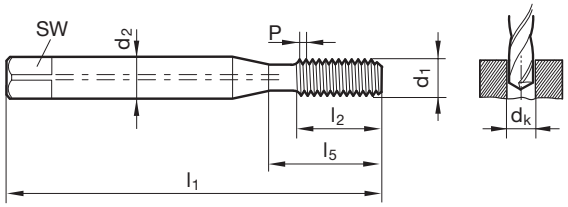
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 352





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **2518**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

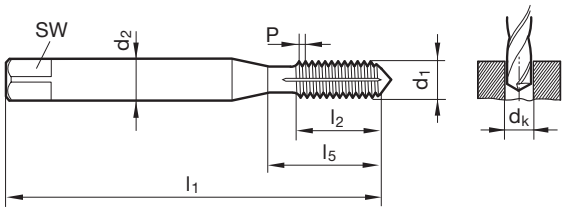
Machos laminadores para rosca métrica ISO

P	•
M	•
K	
N	○
S	○
H	

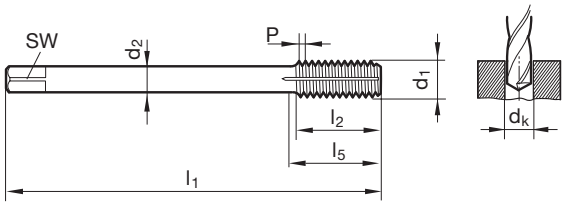
Página de dados de corte 352

Material de corte	HSS-E		
Tolerância do Ø	6GX	6HX	6HX
Superfície	S	S	C
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna	✕	✕	✕

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	918	919	2012

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	922	923	2013

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M6	1,000	4,500	3,400	5,55	80,000	16,000	30,000
M8	1,250	6,000	4,900	7,40	90,000	17,000	35,000
M10	1,500	7,000	5,500	9,30	100,000	20,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000
M22	2,500	18,000	14,500	20,90	140,000	32,000	62,000
M24	3,000	18,000	14,500	22,70	160,000	36,000	73,000
M27	3,000	20,000	16,000	25,70	160,000	36,000	73,000
M30	3,500	22,000	18,000	28,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	31,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	34,30	200,000	50,000	102,000
M39	4,000	32,000	24,000	37,30	200,000	50,000	107,000

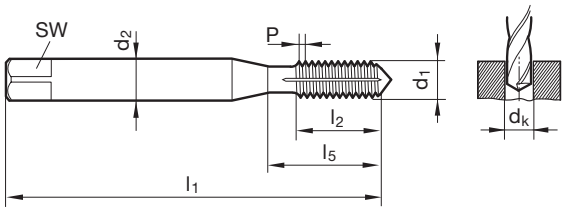
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

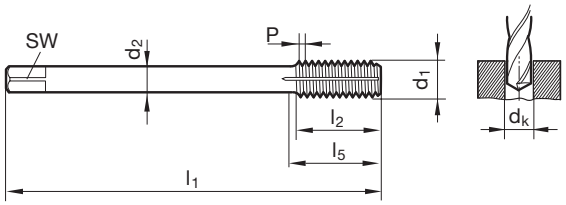
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **322**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **339**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

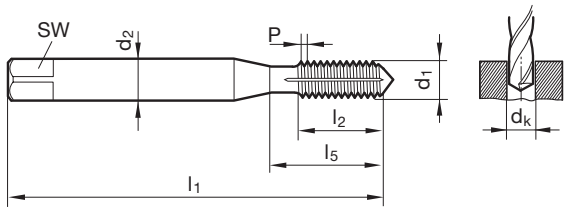
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

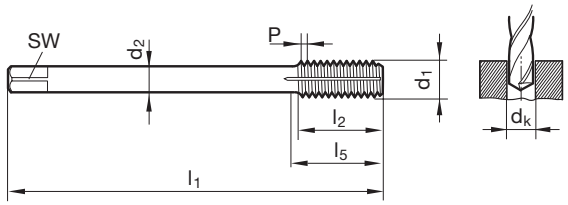
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **1266**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1267**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

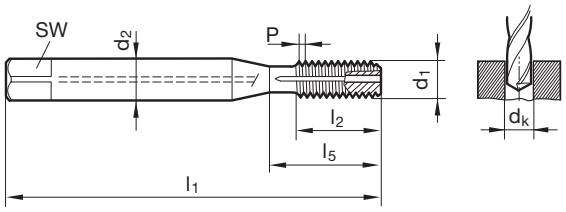
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E		
Tolerância do Ø	6HX	6GX	6HX
Superfície	S	S	C
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna			

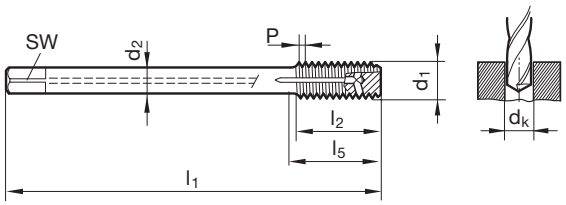
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	2442	2443	2446

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	2444	2445	2448

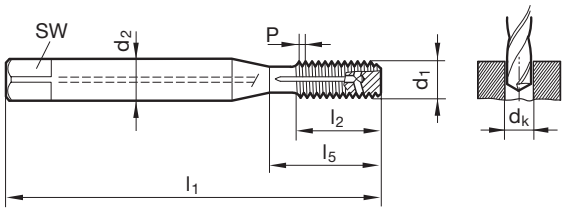
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 353





DIN 2174 ~DIN 371 Nr. do artigo **2447**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

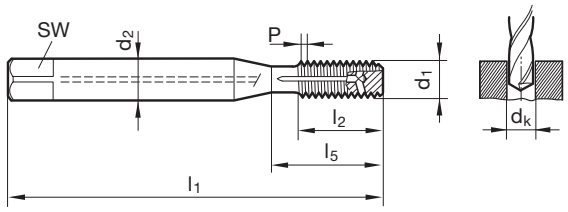
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

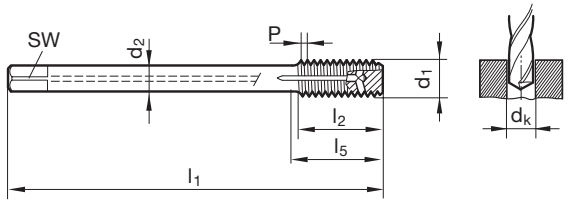
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **323**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **342**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

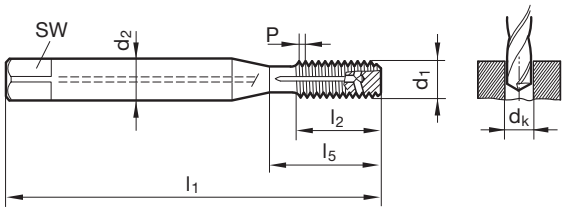
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM		
Tolerância do Ø	6HX	6HX	6HX
Superfície	C	A	S
Tipo	N	N	N
Forma	C	C	E
Refrigeração interna			

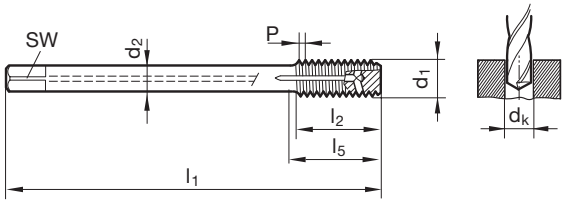
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 353

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo: **1270** | **1717** | **1725**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo: **1271** | **1719** | **1727**

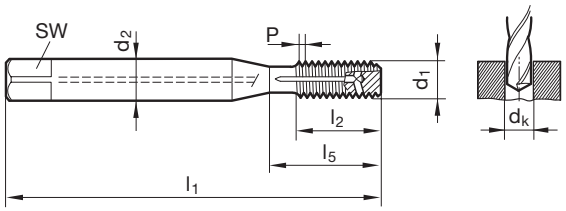
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 353





DIN 2174 ~DIN 371 — Nr. do artigo **1713**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

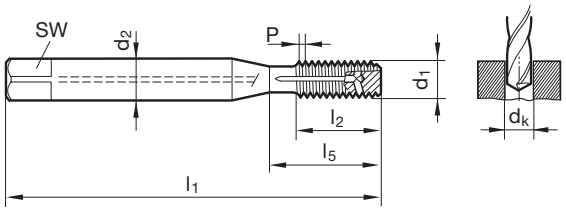
Machos laminadores para rosca métrica ISO com canais de refrigeração

P	•	
M	•	
K		
N		
S	•	
H		

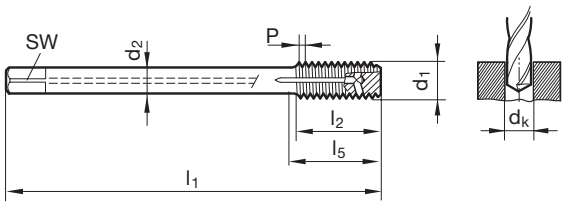
Página de dados de corte 353

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	A	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

~ DIN 371



~ DIN 376







DIN 2174 ~DIN 371	Nr. do artigo	1718	1726

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	1720	1728

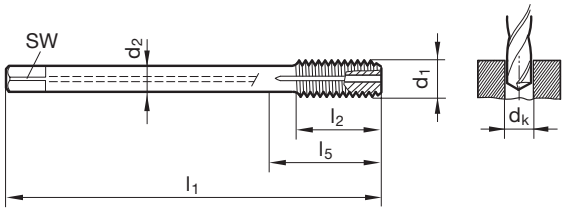
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353





Norma da emp. Norma da emp. Nr. do artigo **4143**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	112,000	6,000	18,000
M4	0,700	2,800	2,100	3,70	112,000	7,500	77,000
M5	0,800	3,500	2,700	4,65	125,000	8,500	90,000
M6	1,000	4,500	3,400	5,55	125,000	11,000	90,000
M8	1,250	6,000	4,900	7,40	140,000	14,000	97,000
M10	1,500	7,000	5,500	9,30	160,000	16,000	117,000
M12	1,750	9,000	7,000	11,20	180,000	18,500	133,000
M16	2,000	12,000	9,000	15,10	220,000	20,000	168,000
M20	2,500	16,000	12,000	18,90	280,000	25,000	225,000

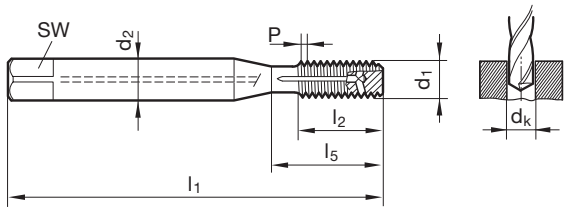
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

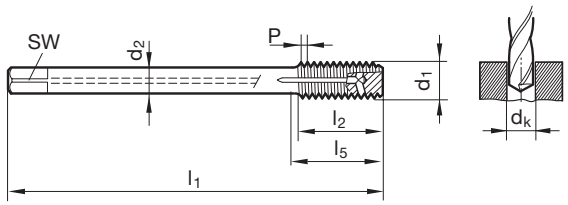
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 353

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 Nr. do artigo **1972**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 Nr. do artigo **1931**

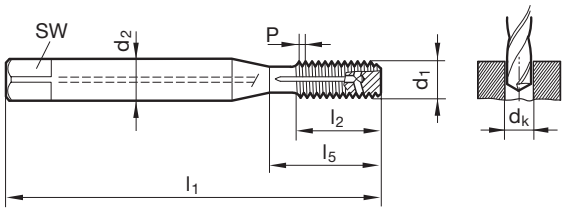
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	25,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	E
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 353





DIN 2174 ~DIN 371 Nr. do artigo **1927**

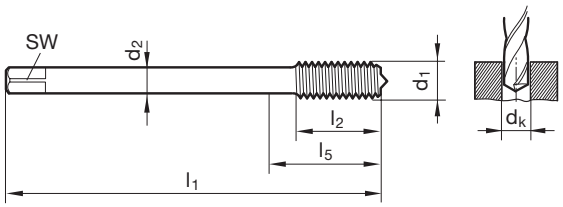
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

Machos laminadores para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352





DIN 2174 ~DIN 374 — Nr. do artigo **929**

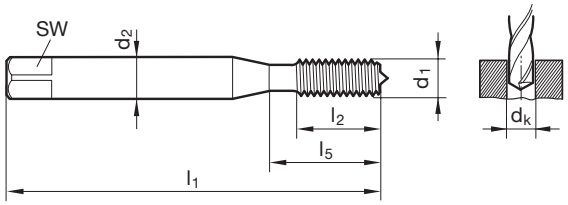
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352





DIN 2174 ~DIN 371 — Nr. do artigo **1740**

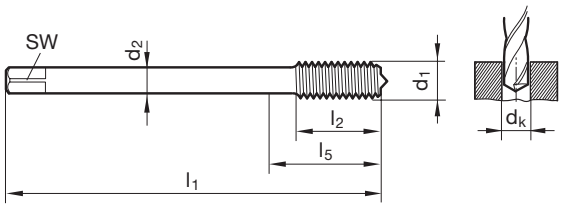
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

Machos laminadores para rosca métrica fina ISO

Material de corte	**HSS-E**
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352





DIN 2174 ~DIN 374 — Nr. do artigo **928**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007

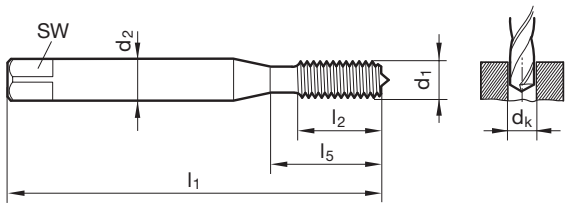
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

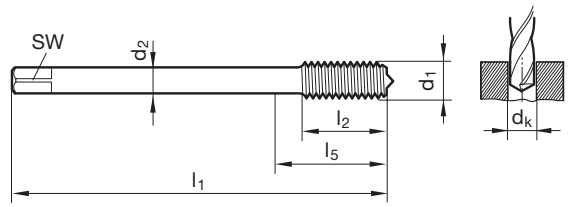
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1257**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1258**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

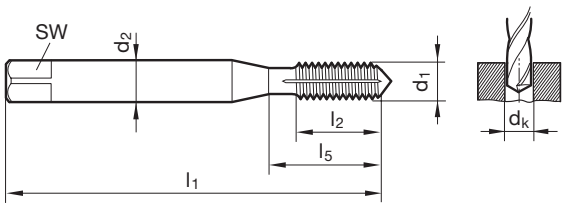
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

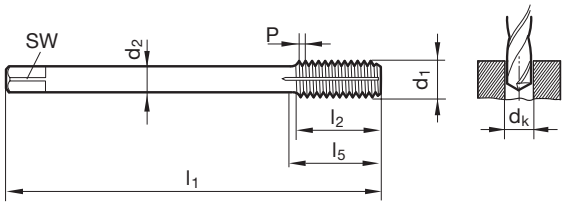
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 352

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1275**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	6,000	4,900	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	8,000	6,200	7,65	80,000	14,000	30,000	8,004
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **927**

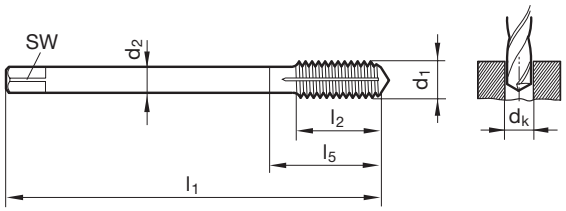
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 352





DIN 2174 ~DIN 374 — Nr. do artigo **2008**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000	10,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

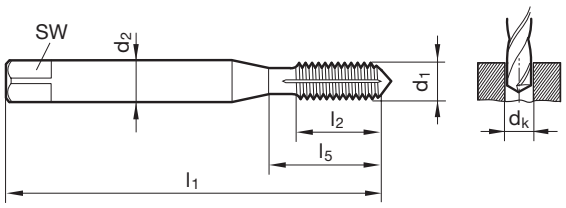
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

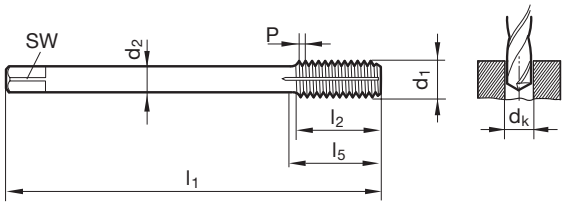
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 352

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1277**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **926**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

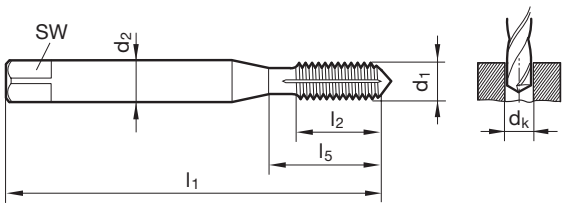
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

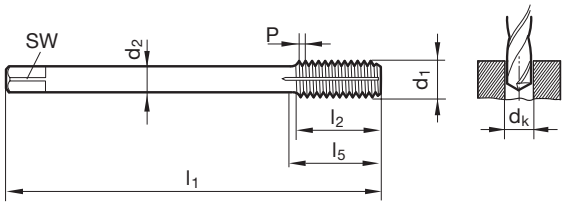
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1268**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1269**

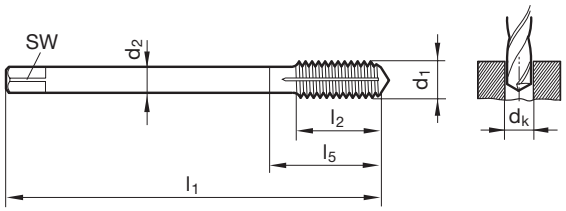
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353





DIN 2174 ~DIN 374 — Nr. do artigo **333**

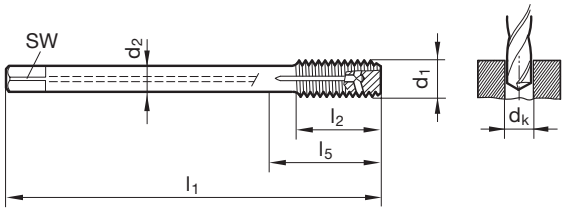
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	16,000	44,000	20,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353





DIN 2174 ~DIN 374 — Nr. do artigo **338**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007

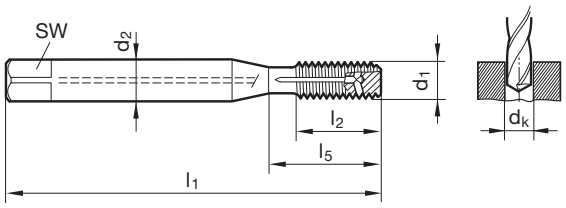
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

P	•
M	•
K	
N	≥ 7
S	•
H	

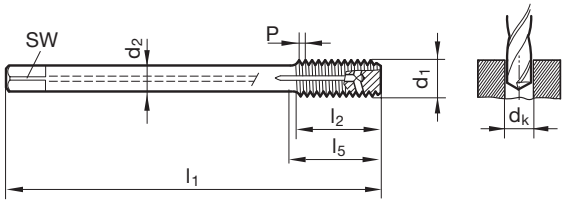
Página de dados de corte 353

Material de corte	HSS-E-PM		
Tolerância do Ø	6HX	6HX	6HX
Superfície	C	A	S
Tipo	N	N	N
Forma	C	C	E
Refrigeração interna			

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371	Nr. do artigo	1272	1721	1729

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374	Nr. do artigo	1273	1723	1731

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

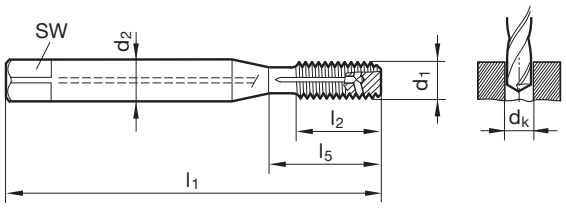
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	C	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

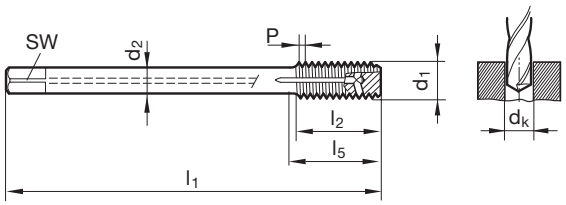
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 353

~ DIN 371



~ DIN 374







DIN 2174 ~DIN 371 — Nr. do artigo **1715** **1730**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **1716** **1732**

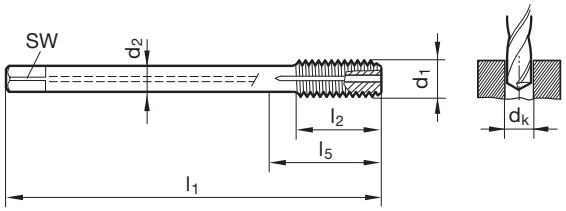
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 353





Norma da emp. Norma da emp. | Nr. do artigo **4145**

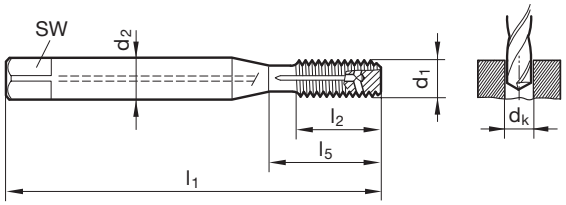
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	140,000	14,000	97,000	8,005
M10 x 1	7,000	5,500	9,55	160,000	16,000	117,000	10,005
M10 x 1,25	7,000	5,500	9,40	160,000	16,000	117,000	10,006
M12 x 1	9,000	7,000	11,55	180,000	18,500	133,000	12,005
M12 x 1,5	9,000	7,000	11,30	180,000	18,500	133,000	12,007
M14 x 1,5	11,000	9,000	13,30	220,000	20,000	168,000	14,007
M16 x 1,5	12,000	9,000	15,30	220,000	20,000	168,000	16,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 353





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **1581**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M10 x 1	10,000	8,000	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	15,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	15,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	15,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	15,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	15,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	15,000	48,000	24,007

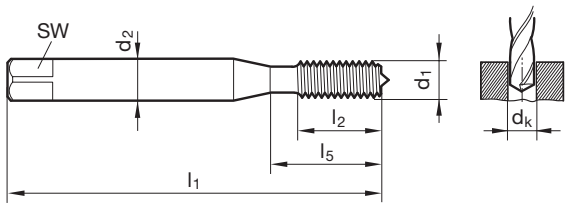
Machos laminadores para rosca UNC

Material de corte	HSS-E	
Tolerância do Ø	2BX	2BX
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

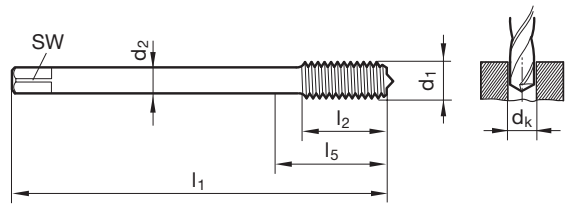
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 — Nr. do artigo **2273** **1582**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,55	56,000	11,000	18,000	2,845
5 - 40	3,500	2,700	2,90	56,000	11,000	18,000	3,175
6 - 32	4,000	3,000	3,15	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,80	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	4,35	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	5,00	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,75	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	7,30	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,80	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **2274** **1583**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	10,30	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	11,80	110,000	25,000	49,000	12,700
9/16 - 12	11,000	9,000	13,30	110,000	28,000	53,000	14,288
5/8 - 11	12,000	9,000	14,80	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	17,90	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	21,00	140,000	35,000	62,000	22,225

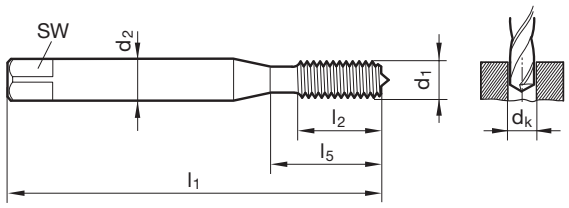
Machos laminadores para rosca UNF

Material de corte	HSS-E	
Tolerância do Ø	2BX	2BX
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

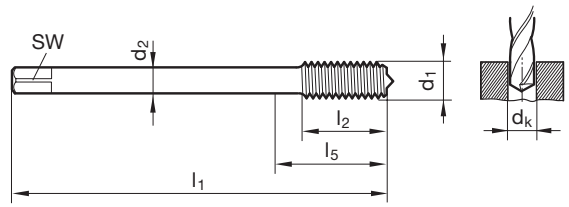
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352

~ DIN 371



~ DIN 374





DIN 2184-1 ~DIN 371 — Nr. do artigo **1283** **1584**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 48	3,500	2,700	2,60	56,000	10,000	18,000	2,845
5 - 44	3,500	2,700	2,90	56,000	10,000	18,000	3,175
6 - 40	4,000	3,000	3,20	56,000	11,000	20,000	3,505
8 - 36	4,500	3,400	3,85	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,45	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	5,10	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,95	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	7,45	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	9,05	90,000	18,000	35,000	9,525

DIN 2184-1 ~DIN 374 — Nr. do artigo **2275** **1585**

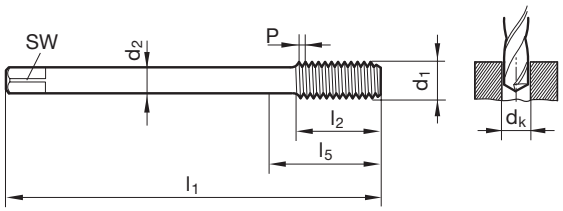
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
10 - 32	0,794	3,500	2,700	4,45	70,000	14,000	25,000
1/4 - 28	0,907	4,500	3,400	5,95	80,000	16,000	30,000
12 - 28	0,907	4,000	3,000	5,10	80,000	16,000	30,000
3/8 - 24	1,058	7,000	5,500	9,05	90,000	18,000	35,000
5/16 - 24	1,058	6,000	4,900	7,45	90,000	18,000	35,000
1/2 - 20	1,270	9,000	7,000	12,10	100,000	20,000	40,000
5/8 - 18	1,411	12,000	9,000	15,25	100,000	22,000	44,000
7/16 - 20	1,270	8,000	6,200	10,55	100,000	22,000	42,000
9/16 - 18	1,411	11,000	9,000	13,65	100,000	22,000	40,000
3/4 - 16	1,587	14,000	11,000	18,35	110,000	25,000	44,000
7/8 - 14	1,814	18,000	14,500	21,40	125,000	25,000	44,000
1 - 12	2,117	18,000	14,500	24,45	140,000	28,000	50,000

Machos laminadores para rosca Gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	X
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 352





DIN 2184-1 DIN 2189 — Nr. do artigo **966**

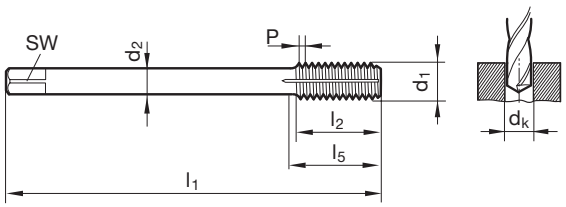
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	7,30	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	9,30	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	12,50	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	16,00	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	20,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	25,50	140,000	28,000	53,000	26,441
G1	11,000	25,000	20,000	32,00	160,000	30,000	56,000	33,249
G1 1/4	11,000	32,000	24,000	40,75	170,000	30,000	57,000	41,910

Machos laminadores para rosca Gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	X
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 352





DIN 2184-1 DIN 2189 Nr. do artigo **1586**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	7,30	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	9,30	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	12,50	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	16,00	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	20,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	25,50	140,000	28,000	53,000	26,441



Ferro fundido, fundição nodular e fundição maleável

FRESAS DE ROSCAR

K

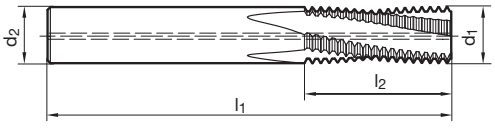
Fresas para rosca métrica ISO sem chanfro

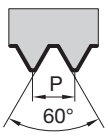
2xD

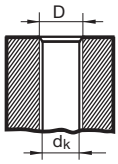
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 354

Material de corte	MD int.		
Superfície	C	C	◯
Tipo	TM SP	TM SP	TM SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













Norma da emp.	Nr. do artigo	3737	3743	3734

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	13,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	18,100	3	8,000
M8 x 1	1,000	6,400	8,000	7,00	62,000	17,500	3	8,005
M10	1,500	7,950	10,000	8,50	74,000	21,800	3	10,000
M10 x 1	1,000	7,950	10,000	9,00	74,000	21,500	3	10,005
M10 x 1,25	1,250	7,950	10,000	8,80	74,000	21,900	3	10,006
M12	1,750	9,950	10,000	10,20	74,000	25,400	4	12,000
M12 x 1,5	1,500	9,950	10,000	10,50	74,000	26,300	4	12,007
M14	2,000	11,200	12,000	12,00	90,000	31,000	4	14,000
M14 x 1,5	1,500	11,200	12,000	12,50	90,000	30,800	4	14,007
M16	2,000	12,800	14,000	14,00	90,000	35,000	4	16,000
M16 x 1,5	1,500	12,800	14,000	14,50	90,000	33,800	4	16,007
M20	2,500	14,950	16,000	17,50	102,000	41,300	4	20,000
M20 x 1,5	1,500	14,950	16,000	18,50	102,000	42,800	4	20,007

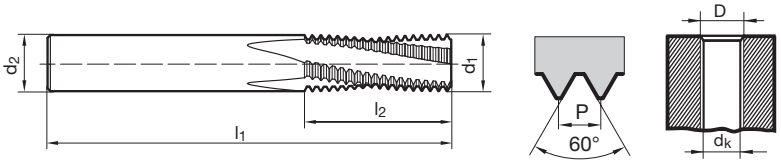
Fresas para rosca métrica ISO sem chanfro

2xD

P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW





Norma da emp.	Nr. do artigo	4132	4133

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	13,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	18,100	3	8,000
M10	1,500	7,950	10,000	8,50	74,000	21,800	3	10,000
M12	1,750	9,950	10,000	10,20	74,000	25,400	4	12,000
M14	2,000	11,200	12,000	12,00	90,000	31,000	4	14,000
M16	2,000	12,800	14,000	14,00	90,000	35,000	4	16,000
M20	2,500	14,950	16,000	17,50	102,000	41,300	4	20,000

Fresas para rosca métrica ISO sem chanfro

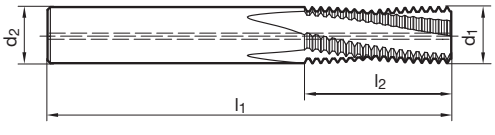


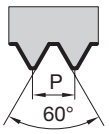
P	•
M	○
K	•
N	•
S	○
H	≤55

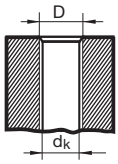
Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3735	3740

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	16,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	21,900	3	8,000
M10	1,500	7,950	10,000	8,50	74,000	26,300	3	10,000
M12	1,750	9,950	10,000	10,20	74,000	32,400	4	12,000
M14	2,000	11,200	12,000	12,00	90,000	37,000	4	14,000
M16	2,000	12,800	14,000	14,00	90,000	43,000	4	16,000
M20	2,500	14,950	16,000	17,50	102,000	48,800	4	20,000

Fresas para rosca métrica ISO com chanfro

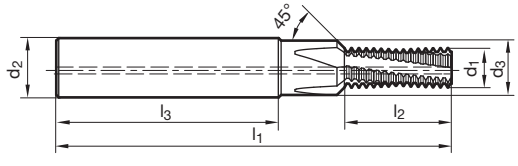


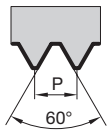
P	•
M	•
K	•
N	•
S	•
H	≤55

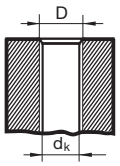
Página de dados de corte 354

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA

NEW









Norma da emp.	Nr. do artigo	3525	3543	3510

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	5,300	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	7,400	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	9,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	10,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	13,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	17,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	20,100	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	25,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	27,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	33,800	4	20,000

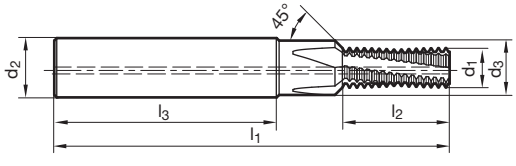
Fresas para rosca métrica ISO com chanfro

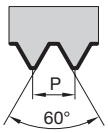
2xD

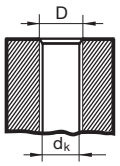
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 355

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













Norma da emp.	Nr. do artigo	3526	3544	3511

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	6,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	8,800	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	10,800	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	13,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	18,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	21,800	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	25,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	31,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	35,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	41,300	4	20,000

Fresas para rosca métrica ISO com chanfro

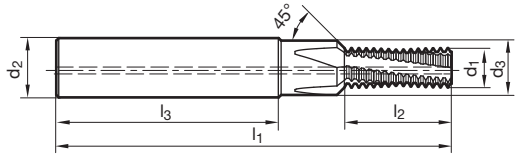


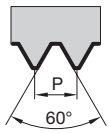
P	•
M	•
K	•
N	•
S	•
H	≤55

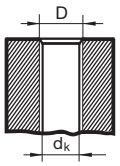
Página de dados de corte 355

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3759	3760

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	7,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	35,600	10,900	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	13,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	16,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	21,900	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	26,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	32,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	37,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	43,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	48,800	4	20,000

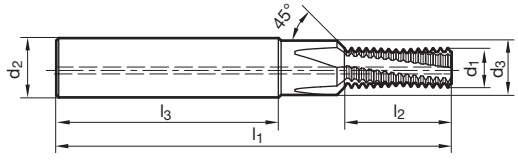
Fresas para rosca métrica fina ISO com chanfro

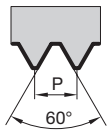
1,5xD

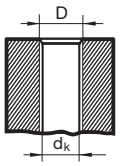
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 354

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













Norma da emp.	Nr. do artigo	3527	3545	3512

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	7,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	8,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	9,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	10,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	13,100	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	13,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	16,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	16,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	19,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	20,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	23,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	26,300	4	16,007

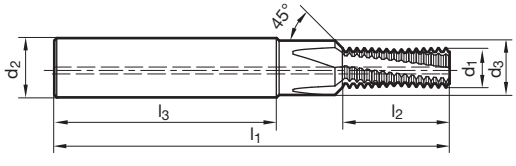
Fresas para rosca métrica fina ISO com chanfro

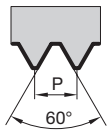
2xD

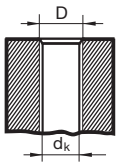
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 355

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













Norma da emp.	Nr. do artigo	3528	3546	3513

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	8,800	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	10,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	12,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	13,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	16,900	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	17,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	21,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	21,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	25,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	26,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	30,800	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	33,800	4	16,007

Fresas para rosca métrica fina ISO com chanfro

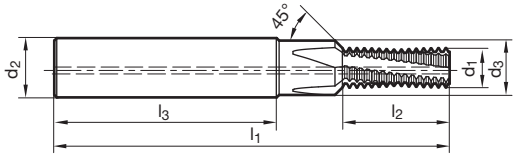
2,5xD

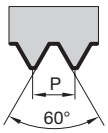
P	•
M	•
K	•
N	•
S	•
H	≤55

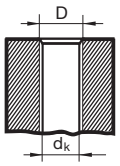
Página de dados de corte 355

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3762** | **3763**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	10,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	12,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	15,300	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	15,400	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	20,600	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	20,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	25,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	25,600	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	30,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	30,800	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	38,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	41,300	4	16,007

Fresas para rosca UNC sem chanfro

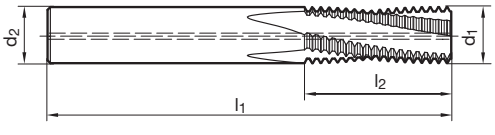
2xD

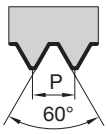
P	•
M	○
K	•
N	•
S	○
H	≤55

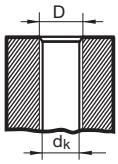
Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4134	4135

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 24	3,400	6,000	3,90	54,000	11,100	3	4,826
12 - 24	4,100	6,000	4,50	54,000	12,200	3	5,486
1/4 - 20	4,700	6,000	5,10	54,000	14,600	3	6,350
5/16 - 18	6,100	8,000	6,60	64,000	17,600	3	7,938
3/8 - 16	7,600	8,000	8,00	64,000	21,400	3	9,525
7/16 - 14	9,000	10,000	9,40	74,000	24,500	3	11,113
1/2 - 13	9,950	10,000	10,80	74,000	28,300	4	12,700
9/16 - 12	11,400	12,000	12,20	90,000	30,700	4	14,288
5/8 - 11	12,700	14,000	13,50	90,000	35,800	4	15,875

Fresas para rosca UNC com chanfro

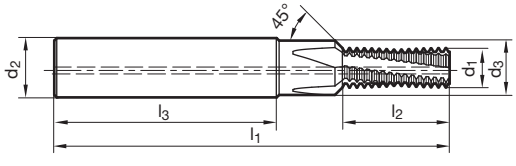


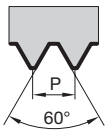
P	•
M	•
K	•
N	•
S	•
H	≤55

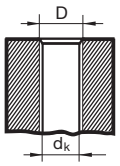
Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3516	3534

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	12,100	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	14,800	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	16,700	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	19,000	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	22,500	4	12,700

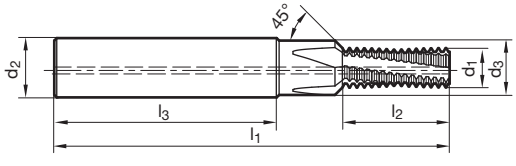
Fresas para rosca UNC com chanfro

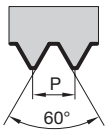
2xD

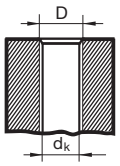
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 355

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3517	3535

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	14,600	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	17,600	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	21,400	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	24,500	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	28,300	4	12,700

Fresas para rosca UNF sem chanfro

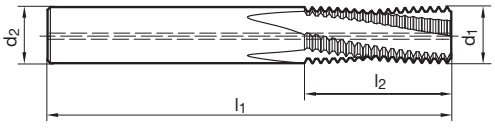
2xD

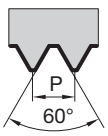
P	•
M	○
K	•
N	•
S	○
H	≤55

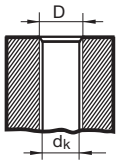
Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4136	4137

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 32	3,800	6,000	4,10	54,000	11,500	3	4,826
12 - 28	4,300	6,000	4,60	54,000	12,200	3	5,486
1/4 - 28	5,100	6,000	5,50	54,000	14,100	3	6,350
5/16 - 24	6,300	8,000	6,90	64,000	17,500	3	7,938
3/8 - 24	7,800	8,000	8,50	64,000	20,600	3	9,525
7/16 - 20	9,400	10,000	9,90	74,000	24,800	3	11,113
1/2 - 20	9,950	10,000	11,50	74,000	27,300	4	12,700
9/16 - 18	11,400	12,000	12,90	90,000	30,300	4	14,288
5/8 - 18	12,700	14,000	14,50	90,000	33,200	4	15,875

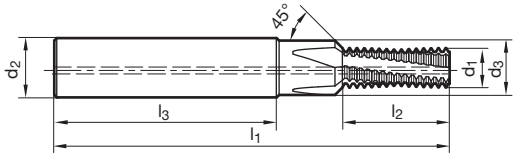
Fresas para rosca UNF com chanfro

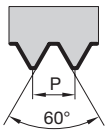
1,5xD

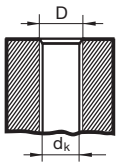
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3518	3536

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	11,300	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	13,200	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	16,400	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	18,400	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	21,000	4	12,700

Fresas para rosca UNF com chanfro

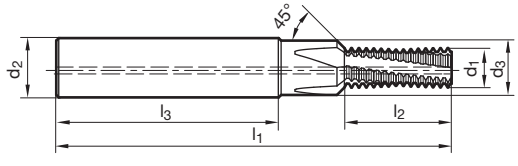
2xD

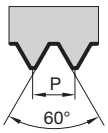
P	•
M	•
K	•
N	•
S	•
H	≤55

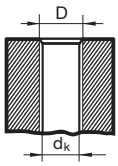
Página de dados de corte 355

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3519	3537

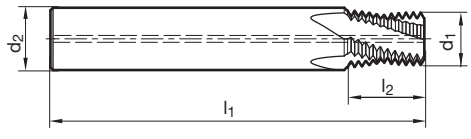
D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	14,100	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	17,500	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	20,600	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	24,800	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	27,300	4	12,700

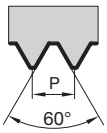
Fresas para rosca NPT sem chanfro

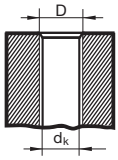
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3753	3754

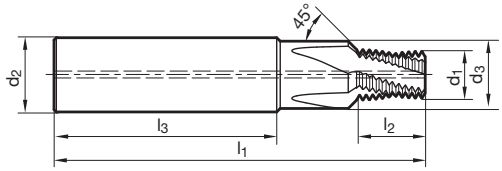
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

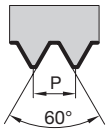
Fresas para rosca NPT com chanfro

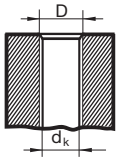
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3520	3538

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

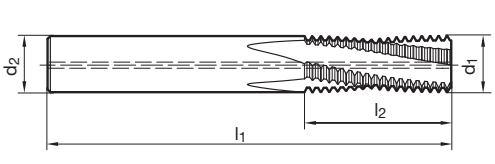
Fresas para rosca gás Whitworth sem chanfro

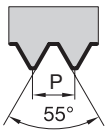
2xD

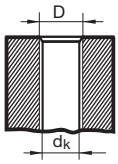
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3745	3748

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	21,300	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	28,700	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	35,400	4	16,662

Fresas para rosca gás Whitworth sem chanfro

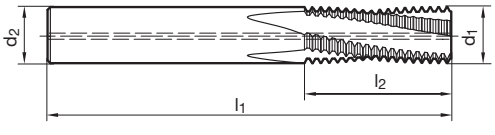


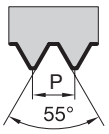
P	•
M	○
K	•
N	•
S	○
H	≤55

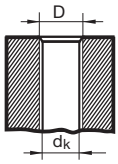
Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3746	3750

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	24,900	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	35,400	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	43,500	4	16,662

Fresas para rosca gás Whitworth com chanfro

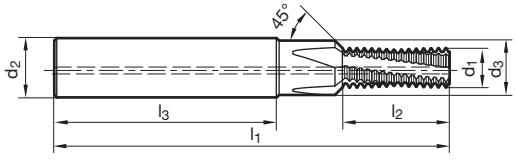
1,5xD

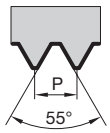
P	•
M	•
K	•
N	•
S	•
H	≤55

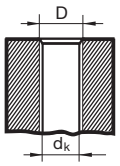
Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3514	3529

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	15,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	22,100	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	27,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

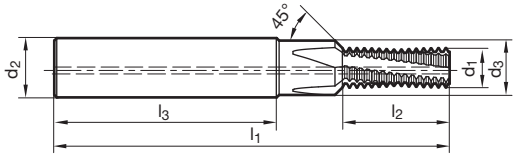
2xD

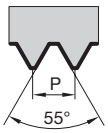
P	•
M	•
K	•
N	•
S	•
H	≤55

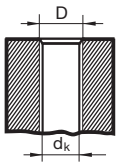
Página de dados de corte 355

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3515	3533

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	21,300	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	28,700	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	35,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

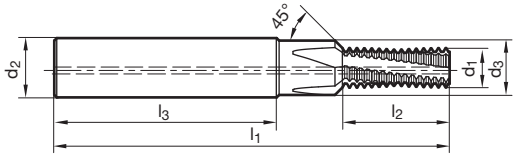
2,5xD

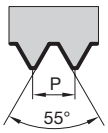
P	•
M	•
K	•
N	•
S	•
H	≤55

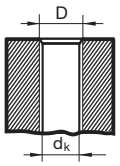
Página de dados de corte 355

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3765	3766

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	24,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	35,400	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	43,500	4	16,662

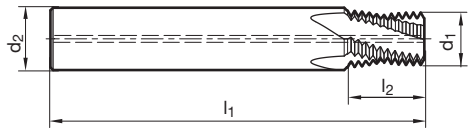
Fresas para rosca NPTF sem chanfro

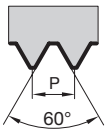
Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

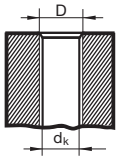
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 354











Norma da emp.	Nr. do artigo	3756	3757

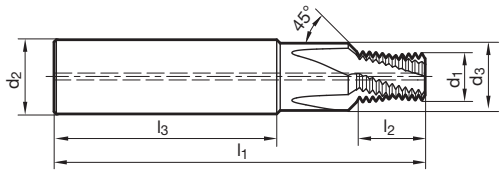
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

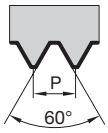
Fresas para rosca NPTF com chanfro

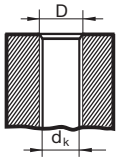
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 354

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3521	3539

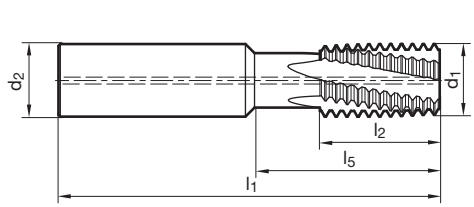
D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

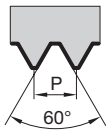
Fresas para roscas multiuso, para rosca métrica ISO

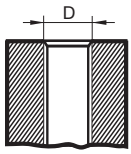
Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMU SP	TMU SP	TMU SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 355









Norma da emp.	Nr. do artigo	3541	3556	3523

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 10	7,950	8,000	64,000		20,000	4	8,050
1,000	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,100
1,250	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,125
1,500	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,150
1,000	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,150
1,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,100
1,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,200
3,000	≥ 24	17,950	18,000	102,000	50,000	33,000	5	18,300
1,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,100
1,500	≥ 26	19,950	20,000	105,000	50,000	33,000	5	20,150
2,000	≥ 27	19,950	20,000	105,000	50,000	33,000	5	20,200
2,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,250
3,000	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,300
3,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,350

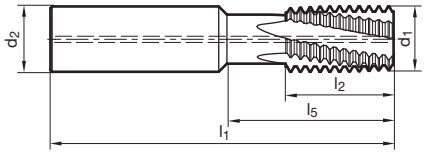
Fresamento externo de roscas

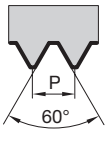
P	•
M	•
K	•
N	•
S	•
H	≤55

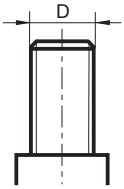
Página de dados de corte 355

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **4162** | **4163**

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 3	9,950	10,000	70,000	25,000	16,000	4	10,050
0,750	≥ 5	9,950	10,000	70,000	25,000	16,000	4	10,075
1,000	≥ 6	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 8	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 10	11,950	12,000	80,000	31,000	20,000	4	12,150
1,500	≥ 10	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 14	15,950	16,000	90,000	40,000	25,000	5	16,200
2,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,250
3,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,300

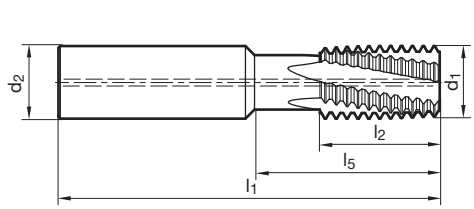
Fresas para roscas multiuso, para rosca UN

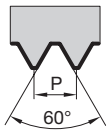
Material de corte	MD int.	
Superfície	C	C
Tipo	TMU UN	TMU UN
Refrigeração interna		
Forma da haste	HA	HB

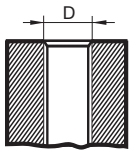
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 355











Norma da emp.	Nr. do artigo	3595	3596

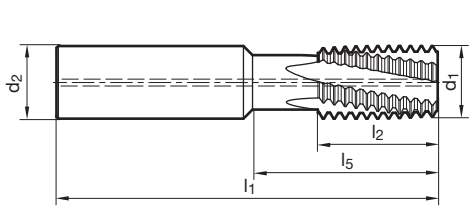
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
10,000	≥ 3/4	11,950	12,000	80,000	31,000	20,000	4	12,100
16,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,160
18,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,180
20,000	≥ 11/16	11,950	12,000	80,000	31,000	20,000	4	12,200
24,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,240
12,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,120
14,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,140
16,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,160
18,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,180
20,000	≥ 13/16	15,950	16,000	90,000	40,000	25,000	5	16,200
7,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,070
8,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,080
12,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,120
14,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,140
16,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,160

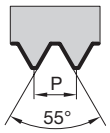
Fresas para roscas multiuso, para rosca gás Whitworth

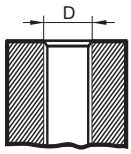
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 355

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TM SP	TM SP	TM SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













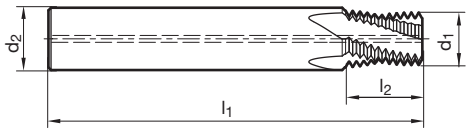
Norma da emp.	Nr. do artigo	3542	3557	3524

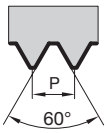
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
19,000	≥ 1/4	9,950	10,000	70,000	25,000	16,000	4	10,190
14,000	≥ 1/2	15,950	16,000	90,000	40,000	25,000	5	16,140
11,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,110

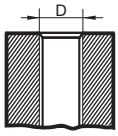
Fresas para roscas multiuso, para rosca NPT

P	•	Página de dados de corte 355
M	•	
K	•	
N	•	
S	•	
H	≤55	

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3768	3769

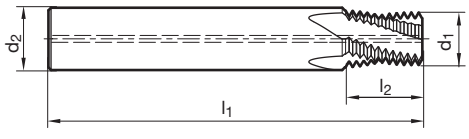
P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

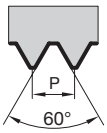
Fresas para roscas multiuso, para rosca NPTF

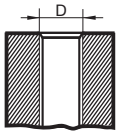
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 355

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3772	3773

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

Micro-fresas de rosquear

3xD

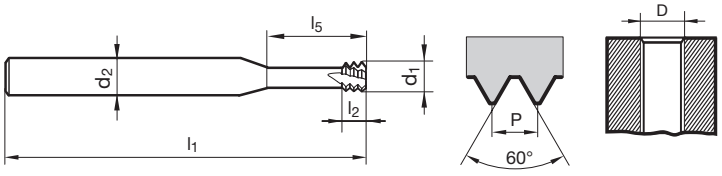
P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 355

Material de corte	**MD int.**
Superfície	C
Tipo	SP M
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4226**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,6	0,350	1,200	3,000	39,000	1,100	4,800	3	1,600
M1,8	0,350	1,400	3,000	39,000	1,100	5,400	3	1,800
M2	0,400	1,550	3,000	39,000	1,200	6,000	4	2,000
M2,5	0,450	1,950	3,000	39,000	1,400	7,500	4	2,500
M3	0,500	2,400	6,000	58,000	1,500	9,500	4	3,000
M3,5	0,600	2,800	6,000	58,000	1,800	11,000	4	3,500
M4	0,700	3,200	6,000	58,000	2,100	12,500	4	4,000
M5	0,800	4,000	6,000	58,000	2,400	16,000	4	5,000
M6	1,000	4,800	6,000	58,000	3,000	20,000	4	6,000
M8	1,250	5,950	6,000	58,000	3,800	24,000	4	8,000
M10	1,500	7,800	8,000	73,000	4,500	33,000	4	10,000
M12	1,750	9,000	10,000	84,000	5,300	38,000	4	12,000
M16	2,000	11,800	10,000	84,000	6,000	35,000	5	16,000

Micro-fresas de rosquear

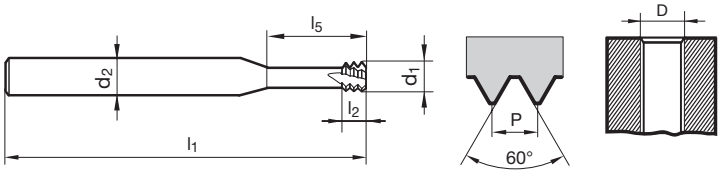
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 355

Material de corte	**MD int.**
Superfície	C
Tipo	SP G
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4228**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	6,200	8,000	64,000	2,700	19,500	4	9,728
G3/8	19,000	9,950	10,000	73,000	4,000	25,000	4	16,662
G7/8	14,000	11,950	12,000	84,000	5,400	37,000	4	30,201
G2	11,000	15,950	16,000	105,000	6,900	44,000	5	59,614

Micro-fresas de rosquear

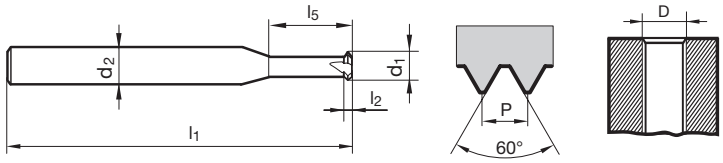
3xD

Material de corte	**MD int.**
Superfície	C
Tipo	SP M/MF
Rôscas	1,0
Forma da haste	HA

NEW

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 355





Norma da emp. Nr. do artigo **4225**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,4 - M1,8	0,350	1,050	3,000	39,000	0,400	3,800	3	1,800
M2 - M2,4	0,400	1,500	3,000	39,000	0,400	7,000	3	2,400
M2,5 - M3	0,500	2,000	3,000	39,000	0,500	9,000	4	3,000
M3,5 - M4,5	0,750	2,800	6,000	58,000	0,800	14,000	4	4,500
M5 - M7	1,000	4,000	6,000	58,000	1,000	19,000	4	7,000
M8 - M10	1,500	6,400	8,000	64,000	1,500	24,000	5	10,000

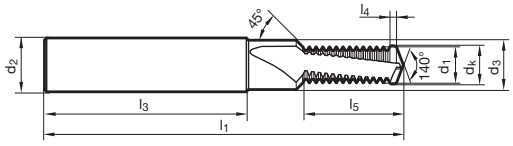
Fresas para roscas, para rosca métrica ISO

1,5xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 355

Material de corte	MD int.			
Superfície	○	○	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna	✕	≡	✕	≡
Forma da haste	HA	HA	HA	HA





Norma da emp.	Nr. do artigo	3774	3775	3776	3777

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,400	6,000	3,400	2,500	48,000	36,000	0,500	5,500	2	3,000
M4	0,700	3,200	6,000	4,500	3,300	48,000	36,000	0,700	6,900	2	4,000
M4	0,700	3,200	6,000	4,500	4,000	48,000	36,000	0,700	6,900	2	4,000
M5	0,800	4,000	6,000	5,500	4,200	54,000	36,000	0,800	8,800	2	5,000
M5	0,800	4,000	6,000	5,500	5,000	54,000	36,000	0,800	8,800	2	5,000
M6	1,000	4,750	8,000	6,600	5,000	62,000	36,000	1,000	10,900	2	6,000
M6	1,000	4,750	8,000	6,600	6,000	62,000	36,000	1,000	10,900	2	6,000
M8	1,250	6,350	10,000	9,000	6,800	74,000	40,000	1,250	13,700	2	8,000
M8	1,250	6,350	10,000	9,000	8,000	74,000	40,000	1,250	13,700	2	8,000
M10	1,500	7,950	12,000	11,000	10,000	80,000	45,000	1,500	18,000	2	10,000
M10	1,500	7,950	12,000	11,000	8,500	80,000	45,000	1,500	18,000	2	10,000
M12	1,750	9,950	14,000	13,500	10,200	90,000	45,000	1,500	20,900	2	12,000
M12	1,750	9,950	14,000	13,500	12,000	90,000	45,000	1,500	20,900	2	12,000
M14	2,000	11,200	16,000	15,500	12,000	102,000	48,000	1,500	23,700	2	14,000
M14	2,000	11,200	16,000	15,500	14,000	102,000	48,000	1,500	23,700	2	14,000
M16	2,000	13,200	18,000	17,500	16,000	102,000	48,000	1,500	26,000	2	16,000
M16	2,000	13,200	18,000	17,500	14,000	102,000	48,000	1,500	26,000	2	16,000

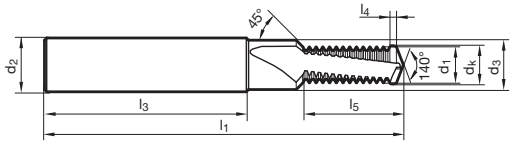
Fresas para roscas, para rosca métrica ISO

2xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 355

Material de corte	MD int.			
Superfície	○	○	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna	✕	≡	✕	≡
Forma da haste	HA	HA	HA	HA





Norma da emp.	Nr. do artigo	3778	3779	3780	3781

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,400	6,000	3,400	2,500	48,000	36,000	0,500	7,000	2	3,000
M4	0,700	3,200	6,000	4,500	3,300	48,000	36,000	0,700	9,000	2	4,000
M4	0,700	3,200	6,000	4,500	4,000	48,000	36,000	0,700	9,000	2	4,000
M5	0,800	4,000	6,000	5,500	4,200	54,000	36,000	0,800	11,200	2	5,000
M5	0,800	4,000	6,000	5,500	5,000	54,000	36,000	0,800	11,200	2	5,000
M6	1,000	4,750	8,000	6,600	5,000	62,000	36,000	1,000	13,900	2	6,000
M6	1,000	4,750	8,000	6,600	6,000	62,000	36,000	1,000	13,900	2	6,000
M8	1,250	6,350	10,000	9,000	6,800	74,000	40,000	1,250	18,700	2	8,000
M8	1,250	6,350	10,000	9,000	8,000	74,000	40,000	1,250	18,700	2	8,000
M10	1,500	7,950	12,000	11,000	8,500	80,000	45,000	1,500	22,500	2	10,000
M10	1,500	7,950	12,000	11,000	10,000	80,000	45,000	1,500	22,500	2	10,000
M12	1,750	9,950	14,000	13,500	10,200	90,000	45,000	1,500	26,100	2	12,000
M12	1,750	9,950	14,000	13,500	12,000	90,000	45,000	1,500	26,100	2	12,000
M14	2,000	11,200	16,000	15,500	12,000	102,000	48,000	1,500	31,700	2	14,000
M14	2,000	11,200	16,000	15,500	14,000	102,000	48,000	1,500	31,700	2	14,000
M16	2,000	13,200	18,000	17,500	16,000	102,000	48,000	1,500	36,000	2	16,000
M16	2,000	13,200	18,000	17,500	14,000	102,000	48,000	1,500	36,000	2	16,000

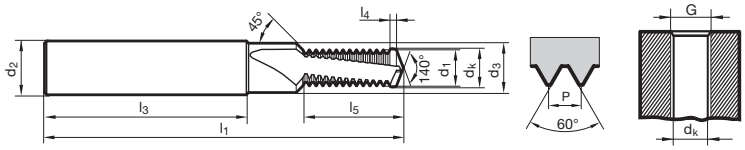
Fresas para roscas, para rosca métrica ISO

2,5xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 355

Material de corte	MD int.			
Superfície	○	○	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna	✕	≡	✕	≡
Forma da haste	HA	HA	HA	HA





Norma da emp.	Nr. do artigo	3782	3783	3784	3785

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,400	6,000	3,400	2,500	48,000	36,000	0,500	8,500	2	3,000
M4	0,700	3,200	6,000	4,500	3,300	48,000	36,000	0,700	11,100	2	4,000
M5	0,800	4,000	6,000	5,500	4,200	54,000	36,000	0,800	13,600	2	5,000
M6	1,000	4,750	8,000	6,600	5,000	62,000	36,000	1,000	16,900	2	6,000
M8	1,250	6,350	10,000	9,000	6,800	74,000	40,000	1,250	22,500	2	8,000
M10	1,500	7,950	12,000	11,000	8,500	80,000	45,000	1,500	27,000	2	10,000
M12	1,750	9,950	14,000	13,500	10,200	90,000	45,000	1,500	31,400	2	12,000
M14	2,000	11,200	16,000	15,500	12,000	102,000	48,000	1,500	39,700	2	14,000
M16	2,000	13,200	18,000	17,500	14,000	102,000	48,000	1,500	46,000	2	16,000

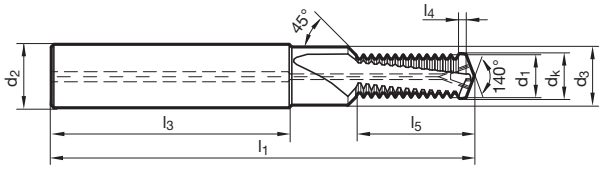
Fresas para roscas, para rosca métrica fina ISO

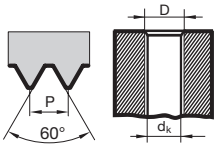
1,5xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 355

Material de corte	MD int.		
Superfície	◯	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna			
Forma da haste	HA	HA	HA







Norma da emp. Nr. do artigo **3787** **3788** **3789**

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,200	6,000	4,500	3,500	48,000	36,000	0,500	6,600	2	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,500	54,000	36,000	0,500	8,300	2	5,003
M 6 X0,75	0,750	4,750	8,000	6,600	5,200	62,000	36,000	0,750	9,900	2	6,004
M8 x 0,75	0,750	6,350	10,000	9,000	7,200	74,000	40,000	0,750	14,100	2	8,004
M8 x 1	1,000	6,350	10,000	9,000	7,000	74,000	40,000	1,000	14,300	2	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,000	80,000	45,000	1,000	16,600	2	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,800	80,000	45,000	1,250	16,600	2	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,000	90,000	45,000	1,000	20,000	2	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,500	90,000	45,000	1,500	21,400	2	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,500	102,000	48,000	1,500	23,300	2	14,007
M16 x 1,5	1,500	13,200	18,000	17,500	14,500	102,000	48,000	1,500	26,600	2	16,007

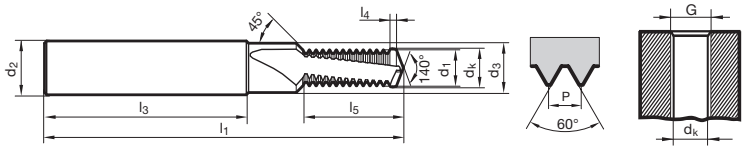
Fresas para roscas, para rosca métrica fina ISO

2xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 355

Material de corte	MD int.			
Superfície	○	○	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna	✕	≡	✕	≡
Forma da haste	HA	HA	HA	HA





Norma da emp.	Nr. do artigo	3790	3791	3792	3793

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,200	6,000	4,500	3,500	48,000	36,000	0,500	8,600	2	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,500	54,000	36,000	0,500	10,800	2	5,003
M 6 X0,75	0,750	4,750	8,000	6,600	5,200	62,000	36,000	0,750	12,900	2	6,004
M8 x 0,75	0,750	6,350	10,000	9,000	7,200	74,000	40,000	0,750	17,100	2	8,004
M8 x 1	1,000	6,350	10,000	9,000	7,000	74,000	40,000	1,000	17,300	2	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,000	80,000	45,000	1,000	21,600	2	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,800	80,000	45,000	1,250	21,600	2	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,000	90,000	45,000	1,000	26,000	2	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,500	90,000	45,000	1,500	27,400	2	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,500	102,000	48,000	1,500	30,800	2	14,007
M16 x 1,5	1,500	13,200	18,000	17,500	14,500	102,000	48,000	1,500	34,100	2	16,007

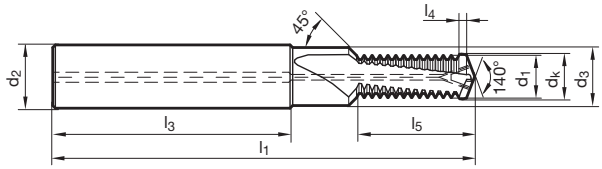
Fresas para roscas, para rosca UNC

2xD

P	
M	
K	•
N	•
S	
H	

Página de dados de corte 355

Material de corte	MD int.	
Superfície	◯	C
Tipo	DTMC SP	DTMC SP
Refrigeração interna	✕	
Forma da haste	HA	HA







Norma da emp.	Nr. do artigo	4138	4139

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	1,270	5,000	8,000	6,600	5,100	62,000	36,000	1,300	14,900	2	6,350
5/16 - 18	1,411	6,250	10,000	9,000	6,600	74,000	40,000	1,500	18,100	2	7,938
3/8 - 16	1,587	7,500	12,000	11,000	8,000	80,000	45,000	1,500	22,100	2	9,525
7/16 - 14	1,814	8,800	12,000	11,000	9,400	80,000	45,000	1,500	25,000	2	11,113
1/2 - 13	1,954	10,200	14,000	13,500	10,800	90,000	45,000	1,500	26,900	2	12,700
9/16 - 12	2,117	11,600	16,000	15,500	12,200	102,000	48,000	1,500	31,200	2	14,288
5/8 - 11	2,309	13,000	18,000	17,500	13,500	102,000	48,000	1,500	36,300	2	15,875

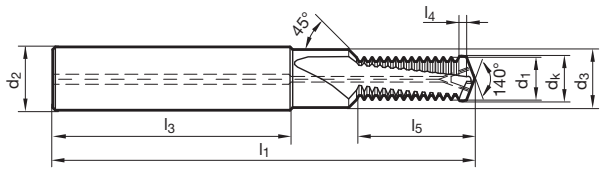
Fresas para roscas, para rosca UNF

2xD

P	
M	
K	•
N	•
S	
H	

Página de dados de corte 355

Material de corte	MD int.	
Superfície	◯	C
Tipo	DTMC SP	DTMC SP
Refrigeração interna	✕	
Forma da haste	HA	HA



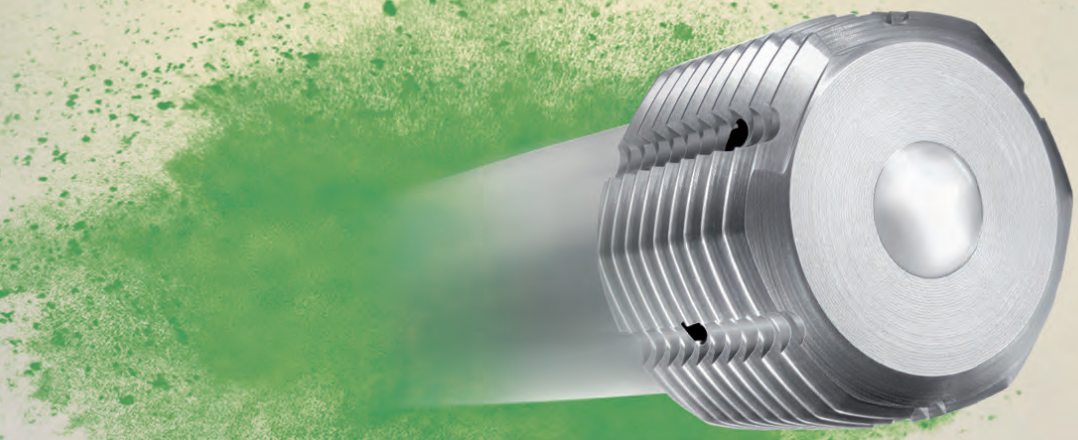


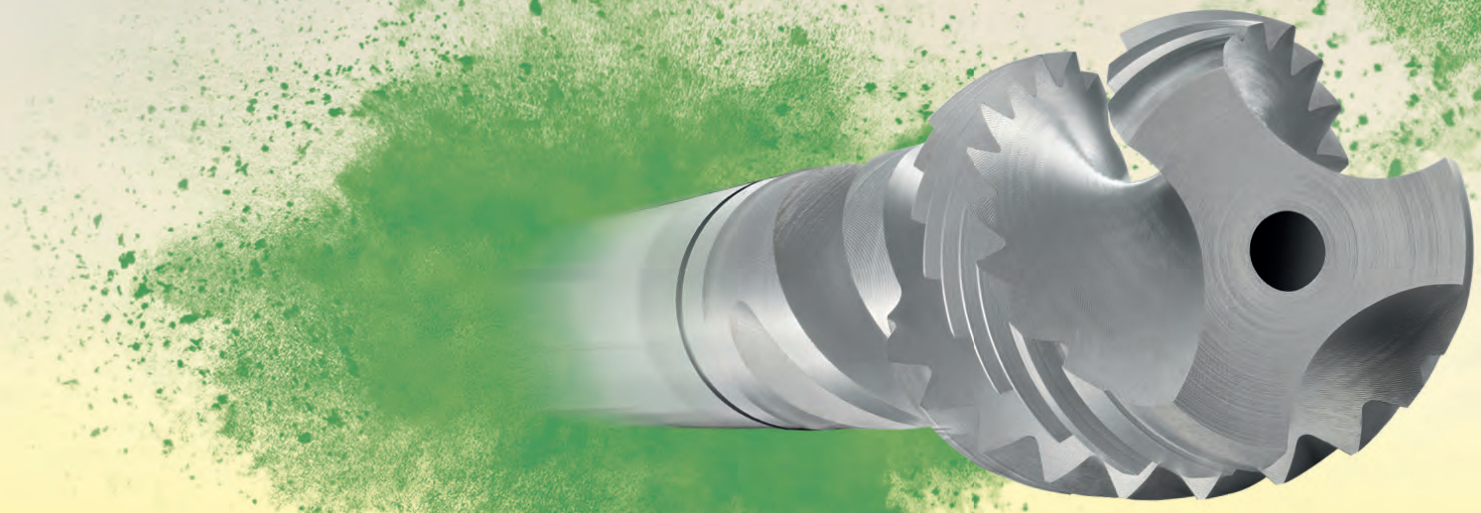
Norma da emp.	Nr. do artigo	4140	4141

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	0,907	5,000	8,000	6,600	5,500	62,000	36,000	1,000	12,800	2	6,350
5/16 - 24	1,058	6,250	10,000	9,000	6,900	74,000	40,000	1,100	18,200	2	7,938
3/8 - 24	1,058	7,950	12,000	11,000	8,500	80,000	45,000	1,100	20,600	2	9,525
7/16 - 20	1,270	9,500	12,000	11,000	9,900	80,000	45,000	1,300	24,700	2	11,113
1/2 - 20	1,270	10,200	14,000	13,500	11,500	90,000	45,000	1,300	27,500	2	12,700
9/16 - 18	1,411	11,600	16,000	15,500	12,900	102,000	48,000	1,500	30,600	2	14,288
5/8 - 18	1,411	13,000	18,000	17,500	14,500	102,000	48,000	1,500	33,700	2	15,875

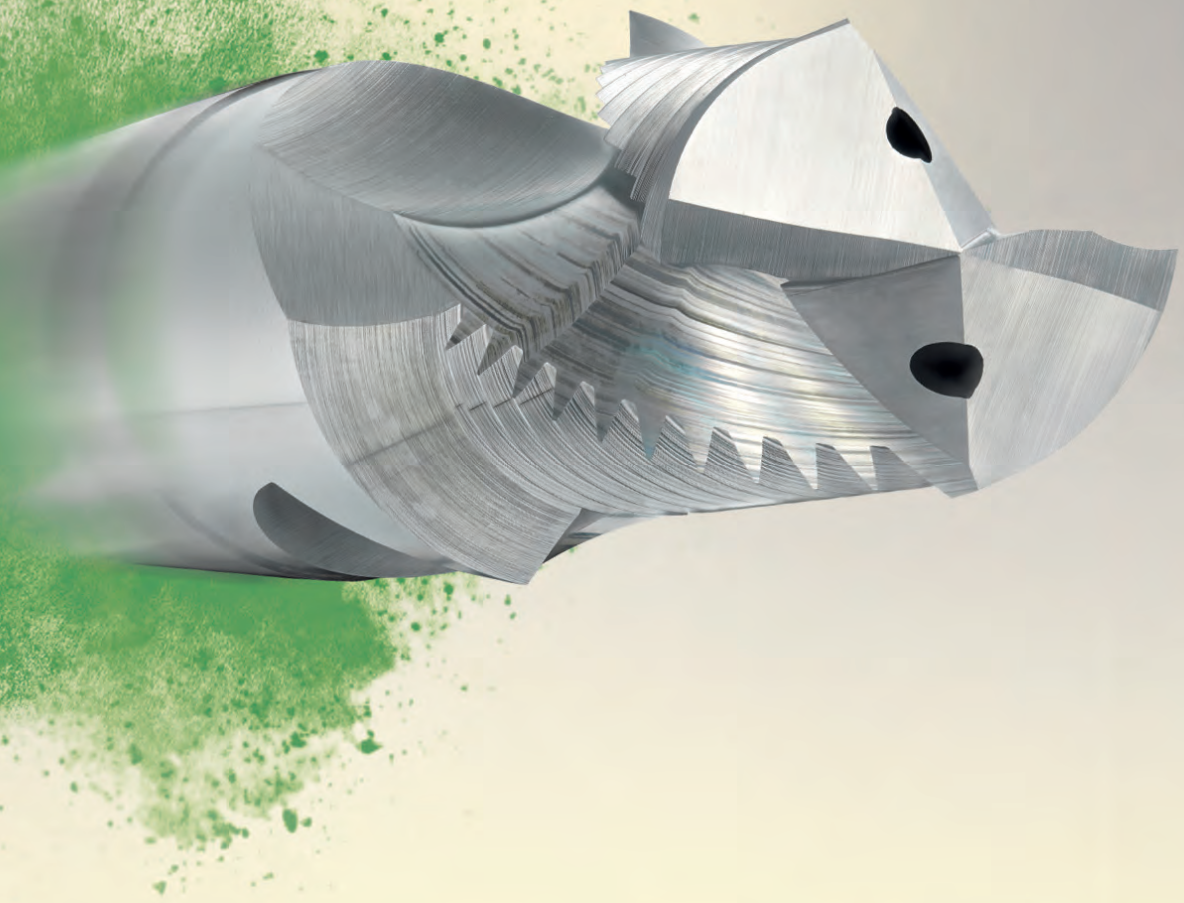
N

Alumínio, ligas forjadas e fundidas, alumínio de alta resistência, ligas de cobre e metais não-ferrosos





ALUMÍNIO



Alumínio, metais não ferrosos e plásticos

METAIS NÃO FERROSOS PLÁSTICOS

N ALUMÍNIO, NE, PLÁSTICOS

M

ISO 2/6H

alumínio ≤ 6% Si

No 1
M2 - M24
Nr. do art. 805/817
a partir d. pág. 472

M2 - M30
Nr. do art. 1870/1872
a partir d. pág. 473

alumínio ≥ 6% Si

No 1
M3 - M20
Nr. do art. 1858/1859
a partir d. pág. 476

cavaco curto anodizados

No 1
M3 - M10
Nr. do art. 800
a partir d. pág. 482

No 1
M3 - M20
Nr. do art. 1858/1859
a partir d. pág. 476

ISO 3/6G

No 1
M3 - M10
Nr. do art. 1084
a partir d. pág. 482

MF

ISO 2/6H

No 1
M5x0,5 - M24x2
Nr. do art. 1873
a partir d. pág. 487

No 1
M5x0,5 - M20x1,5
Nr. do art. 1861/1860
a partir d. pág. 491

No 1
M5x0,5 - M20x1,5
Nr. do art. 1861/1860
a partir d. pág. 491

ISO 3/6G

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2B	2B	-



ATRAVÉS FUROS



HSS-E, polido, forma B

No 1
Nr. 4 - 1
Nr. do art. 1980/1985
a partir d. pág. 498

No 1
Nr. 10 - 3/8
Nr. do art. 1990
a partir d. pág. 500

No 1
G1/16 - G7/8
Nr. do art. 967
a partir d. pág. 502



Form B, polido

Alumínio, metais não ferrosos e plásticos

METAL DURO



Metal duro, polido, forma C



HSS-E, polido, forma E

METAL DURO



Metal duro, polido, forma C

N ALUMÍNIO, NE, PLÁSTICOS

	M		MF	
	ISO 2/6H	ISO 3/6G	ISO 2/6H	ISO 3/6G
alumínio ≤ 6% Si	No 1 M1,6 - M24 Nr. do art. 812/824 a partir d. pág. 474			
	M3 - M30 Nr. do art. 814/825 a partir d. pág. 475			
alumínio ≥ 6% Si	No 1 M5 - M20 Nr. do art. 302/297 a partir d. pág. 479		No 1 M5x0,5 - M16x1,5 Nr. do art. 1090 a partir d. pág. 496	
	No 1 M3 - M20 Nr. do art. 969/1883 a partir d. pág. 476		No 1 M5x0,5 - M20x1,5 Nr. do art. 972/974 a partir d. pág. 491	
cavaco curto anodizados	No 1 M3 - M10 Nr. do art. 800 a partir d. pág. 482	No 1 M3 - M10 Nr. do art. 1084 a partir d. pág. 482		
	No 1 M3 - M20 Nr. do art. 969/1883 a partir d. pág. 476		No 1 M5x0,5 - M20x1,5 Nr. do art. 972/974 a partir d. pág. 491	

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2B	2B	-



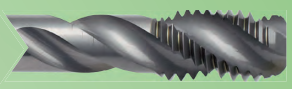
CEGO FUROS



HSS-E, polido, forma C

No 1
Nr. 2 - 7/8
Nr. do art. 1981/1986
a partir d. pág. 499

No 1
Nr. 1/4 - 1
Nr. do art. 2867
a partir d. pág. 501



HSS-E, polido, forma C

Alumínio, metais não ferrosos e plásticos



HSS-E-PM, TiCN, forma C

METAL DURO

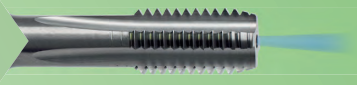


Metal duro, polido, forma C



HSS-E, polido, forma E

METAL DURO



Metal duro, polido, forma C

N ALUMÍNIO, NE, PLÁSTICOS

sem canais de refrig.

com canais de refrig.

com refrigeração interna

M

ISO 2/6HX

No 1
M1 - M20
Nr. do art. 1347/1566
a partir d. pág. 506

M1 - M20
Nr. do art. 921/925
a partir d. pág. 506

M3 - M39
Nr. do art. 919/923
a partir d. pág. 510

No 1
M3 - M39
Nr. do art. 2012/2013
a partir d. pág. 510

No 1
M5 - M20
Nr. do art. 2515
a partir d. pág. 517

No 1
M3 - M20
Nr. do art. 1725/1727
a partir d. pág. 516

No 1
M3 - M20
Nr. do art. 1972/1931
a partir d. pág. 522

ISO 3/6GX

No 1
M2 - M20
Nr. do art. 1565/1567
a partir d. pág. 508

M2 - M10
Nr. do art. 920
a partir d. pág. 507

No 1
M3 - M39
Nr. do art. 918/922
a partir d. pág. 510

No 1
M5 - M20
Nr. do art. 4146
a partir d. pág. 520

No 1
M3 - M20
Nr. do art. 1726/1728
a partir d. pág. 519

MF

ISO 2/6HX

No 1
M8x1 - M10x1
Nr. do art. 1568
a partir d. pág. 526

M8x1 - M20x1,5
Nr. do art. 929
a partir d. pág. 524

M6x0,75 - M24x1,5
Nr. do art. 1275/927
a partir d. pág. 530

No 1
M6x0,75 - M20x1,5
Nr. do art. 2008
a partir d. pág. 531

No 1
M8x1 - M16x1,5
Nr. do art. 4147
a partir d. pág. 537

No 1
M8x1 - M24x1,5
Nr. do art. 1729/1731
a partir d. pág. 536

No 1
M10x1 - M24x1,5
Nr. do art. 1581
a partir d. pág. 541

ISO 3/6GX

No 1
M8x1 - M24x1,5
Nr. do art. 1569/1580
a partir d. pág. 529

M8x1 - M18x1,5
Nr. do art. 928
a partir d. pág. 528

No 1
M8x1 - M20x1,5
Nr. do art. 1277/926
a partir d. pág. 532

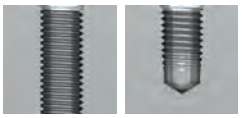
No 1
M8x1 - M16x1,5
Nr. do art. 4151
a partir d. pág. 539

No 1
M8x1 - M24x1,5
Nr. do art. 1730/1732
a partir d. pág. 538

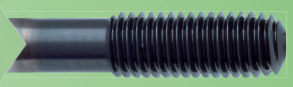
No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2BX	2BX	-



ATRAVÉS FUROS
CEGO FUROS

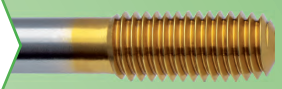


HSS-E-PM, Carbo, forma C

No 1
Nr. 4 - 7/8
Nr. do art. 2273/2274
a partir d. pág. 542

No 1
Nr. 4 - 1
Nr. do art. 1283/2275
a partir d. pág. 543

No 1
G1/16 - G1 1/4
Nr. do art. 966
a partir d. pág. 544



HSS-E, TiN, forma C

No 1
Nr. 4 - 7/8
Nr. do art. 1582/1583
a partir d. pág. 542

No 1
Nr. 4 - 1
Nr. do art. 1584/1585
a partir d. pág. 543

No 1
G1/16 - G3/4
Nr. do art. 1586
a partir d. pág. 545



HSS-E, TiN, forma C



HSS-E, TiCN, forma C

FORMA C

No 1
G1/16 - G1
Nr. do art. 4152
a partir d. pág. 546



HSS-E, Carbo, forma C

FORMA E



HSS-E-PM, TiN, forma E

METAL DURO



Metal duro, TiAlN, forma C

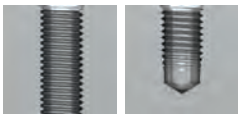
N ALUMÍNIO, NE, PLÁSTICOS

	M	MF
	UNIVERSAL	**UNIVERSAL**
1,5xD	No 1 M3 - M20 Nr. do art. 3510 a partir d. pág. 551	No 1 M4x0,5 - M16x1,5 Nr. do art. 3512 a partir d. pág. 554
2xD	No 1 M3 - M20 Nr. do art. 3511 a partir d. pág. 552	No 1 M4x0,5 - M16x1,5 Nr. do art. 3513 a partir d. pág. 555
2,5xD	No 1 M3 - M20 Nr. do art. 3759 a partir d. pág. 553	No 1 M4x0,5 - M16x1,5 Nr. do art. 3762 a partir d. pág. 556
3xD	No 1 M1,6 - M16 Nr. do art. 4226 a partir d. pág. 578	
universal	No 1 Ø8xP0,5 - Ø20xP3,5 Nr. do art. 3523 a partir d. pág. 572	No 1 Ø8xP0,5 - Ø20xP3,5 Nr. do art. 3523 a partir d. pág. 572

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
UNIVERSAL	UNIVERSAL	-



ATRAVÉS FUROS
CEGO FUROS

Alumínio, metais não ferrosos e plásticos

UNC	UNF	G	
No 1 1/4 - 1/2 Nr. do art. 3516 a partir d. pág. 558	No 1 1/4 - 1/2 Nr. do art. 3518 a partir d. pág. 561	No 1 1/8 - 3/8 Nr. do art. 3514 a partir d. pág. 565	 Metal duro, polido
No 1 1/4 - 1/2 Nr. do art. 3517 a partir d. pág. 559	No 1 1/4 - 1/2 Nr. do art. 3519 a partir d. pág. 562	No 1 1/8 - 3/8 Nr. do art. 3515 a partir d. pág. 566	 Metal duro, polido
			 Metal duro, TiCN
			 Metal duro, TiCN
No 1 Ø10xUN24 - Ø20xUN7 Nr. do art. 3595 a partir d. pág. 574	No 1 Ø10xUN24 - Ø20xUN7 Nr. do art. 3595 a partir d. pág. 574	No 1 Ø10xG19 - Ø20xG11 Nr. do art. 3542 a partir d. pág. 575	 Metal duro, polido

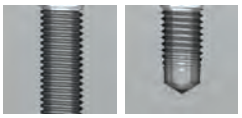
N ALUMÍNIO, NE, PLÁSTICOS

	M	MF
	UNIVERSAL	**UNIVERSAL**
1,5xD	No 1 M3 - M16 Nr. do art. 3775 a partir d. pág. 581	No 1 M4x0,5 - M16x1,5 Nr. do art. 3787 a partir d. pág. 584
1,5xD	M3 - M16 Nr. do art. 3774 a partir d. pág. 581	
2xD	No 1 M3 - M16 Nr. do art. 3779 a partir d. pág. 582	No 1 M4x0,5 - M16x1,5 Nr. do art. 3791 a partir d. pág. 585
2xD	M3 - M16 Nr. do art. 3778 a partir d. pág. 582	M4x0,5 - M16x1,5 Nr. do art. 3790 a partir d. pág. 585
2,5xD	No 1 M3 - M16 Nr. do art. 3783 a partir d. pág. 583	
2,5xD	M3 - M16 Nr. do art. 3782 a partir d. pág. 583	

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
UNIVERSAL	UNIVERSAL	-



ATRAVÉS FUROS
CEGO FUROS



Metal duro, polido



Metal duro, polido



Metal duro, polido



Metal duro, polido



Metal duro, polido



Metal duro, polido

Alumínio, metais não ferrosos e plásticos



N

COMPASSO

N

ALUMÍNIO, METAIS NÃO FERROSOS, PLÁSTICOS



ATRAVÉS
FUROS

	Profundidade de rosca		≤3xD				
	Material de corte		HSS-E			Metal duro	
	Tipo/forma		Al / B	VA / B	MS / E	H /C	NL15 /D
	Superfície		◯	◯	◯	◯	◯
	Fornecimento de refrigeração		☒	☒	☒	Radial	Radial
	Tolerância do cone		h9	h9	h9	h9	h9
							
	Tipo da rôsca	**Tolerância**	**No. Artigo / página**				
	M	4H					
		6H	805/817 472	1870/1872 473	800 482		
		6HX				1858/1859 476	
		6G			1084 482		
	MF	6H		1873 487			
		6HX				1861/1860 491	975/976 495
		6G					
	UNC	2B		1980/1985 498			
		2BX					
	UNF	2B		1990 500			
		2BX					
	G			967 502			
	BSW						
	NPT						
	NPTF						
	EG M	6H Mod.					
	MJ	4HX					
	MJF	4HX					
	UNJC	3BX					
	UNJF	3BX					
	PG						
	Lubrificante adequado		◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△

= No 1

◯ = Ar
● = Óleo integral
◯ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min				
N	Alumínio e ligas forjadas	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	**15**	**15**	-	-	-
	Ligas de alumínio fundido	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	-	-	-	**50**	**50**
	Ligas de magnésio	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	-	-	-	**50**	**50**
	Cobre e ligas de cobre	cavacos longos	CuZn20 CuZn37Pb0,5	2.0250 2.0332	**15**	**15**	-	-	-
		cavacos curtos	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	-	-	**20**	**50**	**50**
	Ligas especias de cobre	≤1400 N/mm²	Ampco		-	-	2	-	-

N **ALUMÍNIO, METAIS NÃO FERROSOS, PLÁSTICOS**	Profundidade de rosca		≤3xD			
	Material de corte		HSS-E			
	Tipo/forma		Al R45 / C	NR40 / C	MS / E	NAZ / E
	Superfície		○	○	○	A+M
	Fornecimento de refrigeração		⊠	⊠	⊠	Axial
	Tolerância do cone		h9	h9	h9	h9
 **CEGO** FUROS						
	Tipo da rôsca	**Tolerância**	**No. Artigo / página**			
	M	4H				
		6H	812/824 474	814/825 475	800 482	2899 484
		6HX				
		6G			1084 482	
	MF	6H		936 488		
		6HX				
		6G				
	UNC	2B		1981/1986 499		
		2BX				
	UNF	2B		2867 501		
		2BX				
	G			939 503		
	BSW					
	NPT					
	NPTF					
	EG M	6H Mod.				
	MJ	4HX				
	MJF	4HX				
	UNJC	3BX				
	UNJF	3BX				
	PG					
	Lubrificante adequado		○/●/△	○/●/△	○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
□ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min			
N	Alumínio e ligas forjadas	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	**15**	**15**	-	-
	Ligas de alumínio fundido	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	-	-	-	-
	Ligas de magnésio	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	-	-	-	**20**
	Cobre e ligas de cobre	cavacos longos	CuZn20 CuZn37Pb0,5	2.0250 2.0332	**15**	**15**	-	-
		cavacos curtos	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	-	-	**20**	-
	Ligas especias de cobre	≤1400 N/mm²	Ampco		-	-	2	-

≤3xD

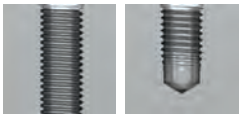
HSS-E		HSS-E-PM						Metal duro		
H / C	H / C	H / C	H / E	NR50 / C	NR50 / C	VA R50/C	VA R50/C	H / C	H / E	HR 15 / C
C	C	C	C	S	C	S	C	◯	◯	◯
Axial	Axial	Axial	Axial	☒	Axial	☒	Axial	Axial	Axial	Axial
h9	h9	h9	h9	h9	h9	h6	h6	h6	h6	h6
	 extra longa					 machos para rosca Synchro	 machos para rosca Synchro			
No. Artigo / página										
				767/1098 485	1152/1293 485					
778 480	779 481	302/297 479	1091/4165 479			761/763 486	1139/1142 486	969/1883 476	1008 477	971 478
				1100 489	1294 489					
		1090 496	1007 497			764 490	1144 490	972/974 491	1009 492	977/978 493
						4159 504				
◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△	◯/●/△

Velocidade de corte recomendada vc m/min										
-	-	-	-	-	-	-	-	-	-	-
25	25	30	30	20	25	25	25	50	50	50
-	-	-	-	-	-	-	-	50	50	50
-	-	-	-	20	25	25	25	-	-	-
-	-	-	-	-	-	-	-	50	50	50
-	-	-	-	-	-	-	-	-	-	-

Alumínio, metais não ferrosos e plásticos

N

ALUMÍNIO, METAIS NÃO FERROSOS, PLÁSTICOS



ATRAVÉS FUROS E **CEGO** FUROS

		Profundidade de rosca	1,5xD			
		Material de corte	HSS-E	HSS-E-PM		Metal duro
		Tipo/forma	N / C	N / C	N / C	N / C
		Superfície	(S)	(S)	(Cb)	(S)
		Fornecimento de refrigeração	☒	☒	☒	Axial
		Tolerância do cone	h9	h9	h9	h6
						
	Tipo da rôsca	**Tolerância**	**No. Artigo / página**			
	M	4H				
		6H				
		6HX	921/925 506	1255/1256 506	1347/1556 506	2518 509
		6GX	920 507	903/952 508	1565/1567 508	
	MF	6H				
		6HX	929 524	1257/1258 525	1568 526	
		6GX	928 528	1740 527	1569/1580 529	
	UNC	2B				
		2BX	2273/2274 542			
	UNF	2B				
		2BX	1283/2275 543			
	G		966 544			
	BSW					
	NPT					
	NPTF					
	EG M	6H Mod.				
	MJ	4HX				
	MJF	4HX				
	UNJC	3BX				
	UNJF	3BX				
	PG					
		Lubrificante adequado	○/●/△	○/●/△	○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min			
N	Alumínio e ligas forjadas	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	20	20	**30**	**45**
N	Ligas de alumínio fundido	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	**20**	**20**	**30**	**45**
N	Ligas de magnésio	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	-	-	-	-
N	Cobre e ligas de cobre	cavacos longos	CuZn20 CuZn37Pb0,5	2.0250 2.0332	20	20	**30**	**45**
N	Cobre e ligas de cobre	cavacos curtos	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	-	-	-	-
N	Ligas especias de cobre	≤1400 N/mm²	Ampco		-	-	-	-

≤3xD

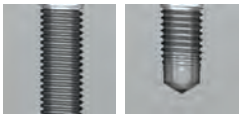
HSS-E					HSS-E-PM						Metal duro	
N / C	N / C	N / C	N / C	N / C	N / C	N / C	N / C	N / C	N / C	N / E	N / C	N / E
S	C	S+	C	Cb	S	S	S	S	C	S	C	C
☒	☒	Axial	Radial	Axial	☒	☒	Radial	Axial	Radial	Axial	Radial	Radial
h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h9	h6	h6
												
No. Artigo / página												
919/923 510	2012/2013 510	2442/2444 513	2446/2448 513	2515 517	322/339 511	1266/1267 512	323/342 515	4143 521	1270/1271 516	1725/1727 516	1972/1931 522	1927 523
918/922 510		2443/2445 513	2447 514	4146 520					1713 518	1726/1728 519		
1275/927 530	2008 531			4147 537	333 533	1268/1269 534	338 535	4145 540	1272/1273 536	1729/1731 536	1581 541	
1277/926 532				4151 539					1715/1716 538	1730/1732 538		
1582/1583 542												
1584/1585 543												
1586 545				4152 546								
○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△	○/●/△

Alumínio, metais não ferrosos e plásticos

Velocidade de corte recomendada vc m/min												
20	**25**	20	**25**	**30**	20	20	20	20	**20**	20	**45**	**45**
20	**25**	**20**	**25**	**30**	**20**	**20**	**20**	**20**	**25**	**20**	**45**	**45**
-	-	-	-	-	-	-	-	-	-	-	-	-
20	25	20	25	30	20	20	20	20	20	20	**45**	**45**
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

N

ALUMÍNIO, METAIS NÃO FERROSOS, PLÁSTICOS



ATRAVÉS FUROS E **CEGO** FUROS

Profundidade de rosca		≤2xD					≤2,5xD	
Material de corte		Metal duro						
Tipo		TM SP	TM SP	TM SP	TM SP	TM SP	TM SP	TM SP
Superfície		C	C	○	C	C	C	C
Fornecimento de refrigeração		☒	☒	Axial	Axial	Axial	Axial	Axial
Forma da haste		HA	HB	HA	HA	HB	HA	HB
Espiral		27°	27°	27°	27°	27°	27°	27°
								
Tipo da rôsca		**No. Artigo / página**						
M		4132 549	4133 549	3734 548	3737 548	3743 548	3735 550	3740 550
MF				3734 548	3737 548	3743 548		
UNC					4134 557	4135 557		
UNF					4136 560	4137 560		
G					3745 563	3748 563	3746 564	3750 564
BSW								
NPT					3753 568	3754 568		
NPTF					3756 570	3757 570		
EG M		Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar						
MJ								
MJF								
UNJC								
UNJF								
PG								
Lubrificante adequado		○/●	○/●	○/●	○/●	○/●	○/●	○/●

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

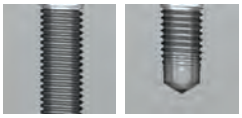
	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Recomendações de aplicação						
N	Alumínio e ligas forjadas	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	+	+	++	+	+	+	+
	Ligas de alumínio fundido	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3	3.2134 3.2162	+	+	++	+	+	+	+
			G-AlSi9Mg G-AlSi12	3.2373 3.2581	++	++	+	++	++	++	++
	Ligas de magnésio	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	++	++	+	++	++	++	++
	Cobre e ligas de cobre	cavacos longos	CuZn20 CuZn37Pb0,5	2.0250 2.0332	+	+	++	+	+	+	+
		cavacos curtos	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	+	+	++	+	+	+	+
	Ligas especias de cobre	≤1400 N/mm²	Ampco		+	+	+	+	+	+	+

≤1,5xD			≤2xD			≤2,5xD	
Metal duro							
TMC SP	TMC SP	TMC SP	TMC SP	TMC SP	TMC SP	TMC SP	TMC SP
○	C	C	○	C	C	C	C
Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial
HA	HA	HB	HA	HA	HB	HA	HB
10°	10°	10°	10°	10°	10°	27°	27°
							
No. Artigo / página							
3510 551	3525 551	3543 551	3511 552	3526 552	3544 552	3759 553	3760 553
3512 554	3527 554	3545 554	3513 555	3528 555	3546 555	3762 556	3763 556
	3516 558	3534 558		3517 559	3535 559		
	3518 561	3536 561		3519 562	3537 562		
	3514 565	3529 565		3515 566	3533 566	3765 567	3766 567
	3520 569	3538 569					
	3521 571	3539 571					
Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar							
○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

Recomendações de aplicação							
++	+	+	++	+	+	+	+
++	+	+	++	+	+	+	+
+	++	++	+	++	++	++	++
+	++	++	+	++	++	++	++
++	+	+	++	+	+	+	+
++	+	+	++	+	+	+	+
+	+	+	+	+	+	+	+

N

ALUMÍNIO, METAIS NÃO FERROSOS, PLÁSTICOS



ATRAVÉS FUROS E **CEGO** FUROS

Profundidade de rosca	**universal**					**≤3xD**	
Material de corte	**Metal duro**						
Tipo	TMU SP	TMU SP	TMU SP	TMU SP	TMU SP	MTM 3 SP	MTM 1 SP
Superfície	◯	C	C	C	C	C	C
Fornecimento de refrigeração	Axial	Axial	Axial	Axial	Axial	☒	☒
Forma da haste	HA	HA	HB	HA	HB	HA	HA
Espiral	15°	15°	15°	15°	15°	15°	15°
							

Tipo da rôsca	No. Artigo / página						
M	3523 572	3541 572	3556 572	4162 573	4163 573	4226 578	4225 580
MF	3523 572	3541 572	3556 572	4162 573	4163 573		4225 580
UNC		3595 574	3596 574				
UNF		3595 574	3596 574				
G	3524 575	3542 575	3557 575	3542 575	3557 575	4228 579	
BSW							
NPT		3769 576	3768 576				
NPTF		3772 577	3773 577				
EG M	Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar						
MJ							
MJF							
UNJC							
UNJF							
PG							
Lubrificante adequado	◯/●	◯/●	◯/●	◯/●	◯/●	◯/●	◯/●

= No 1

◯ = Ar
● = Óleo integral
◯ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Recomendações de aplicação						
N	Alumínio e ligas forjadas	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	++	+	+	+	+	++	++
	Ligas de alumínio fundido	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3	3.2134 3.2162	++	+	+	+	+	++	++
			G-AlSi9Mg G-AlSi12	3.2373 3.2581	+	++	++	++	++	++	++
	Ligas de magnésio	≤500 N/mm²	GDMgAl8Zn1	3.5812.08	+	++	++	++	++	++	++
	Cobre e ligas de cobre	cavacos longos	CuZn20 CuZn37Pb0,5	2.0250 2.0332	++	+	+	+	+	++	++
		cavacos curtos	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410	++	+	+	+	+	++	++
	Ligas especias de cobre	≤1400 N/mm²	Ampco		+	+	+	+	+	++	++

≤1,5xD				≤2xD				≤2,5xD			
Metal duro											
DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP	DTMC SP
◯	◯	Ⓒ	Ⓒ	◯	◯	Ⓒ	Ⓒ	◯	◯	Ⓒ	Ⓒ
☒	Radial	☒	Radial	☒	Radial	☒	Radial	☒	Radial	☒	Radial
HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
27°	27°	27°	27°	27°	27°	27°	27°	27°	27°	27°	27°
											
No. Artigo / página											
3774 581	3775 581	3776 581	3777 581	3778 582	3779 582	3780 582	3781 582	3782 583	3783 583	3784 583	3785 583
	3787 584	3788 584	3789 584	3790 585	3791 585	3792 585	3793 585				
				4138 586			4139 586				
				4140 587			4141 587				
Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar											
◯/●	◯/●	◯/●	◯/●	◯/●	◯/●	◯/●	◯/●	◯/●	◯/●	◯/●	◯/●

Alumínio, metais não ferrosos e plásticos

Recomendações de aplicação											
++	++	+	+	++	++	+	+	++	++	+	+
++	++	+	+	++	++	+	+	++	++	+	+
+	+	++	++	+	+	++	++	+	+	++	++
+	+	++	++	+	+	++	++	+	+	++	++
++	++	+	+	++	++	+	+	++	++	+	+
++	++	+	+	++	++	+	+	++	++	+	+
+	+	+	+	+	+	+	+	+	+	+	+

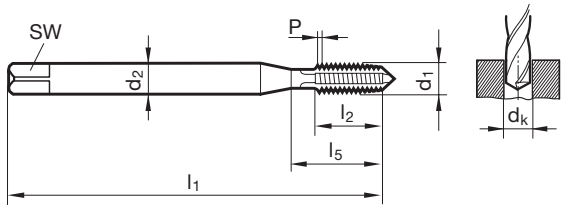
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	AI
Forma	B
Refrigeração interna	⊠

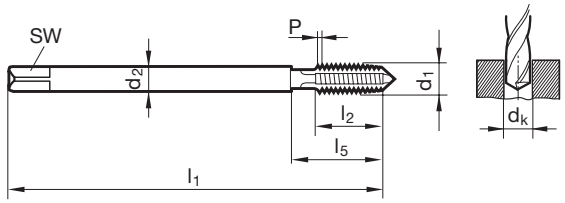
P	
M	
K	
N	•
S	
H	

Página de dados de corte 463

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **805**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **817**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000

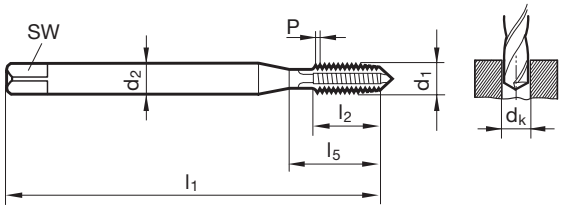
Machos para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊠

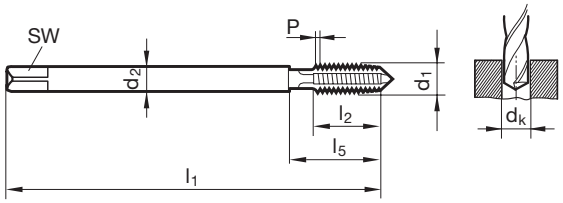
P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 463

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **1870**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **1872**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	10,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

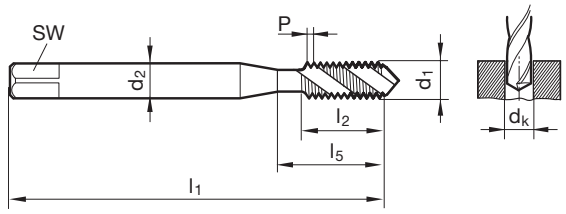
Machos para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	Al R45
Forma	C
Refrigeração interna	⊠

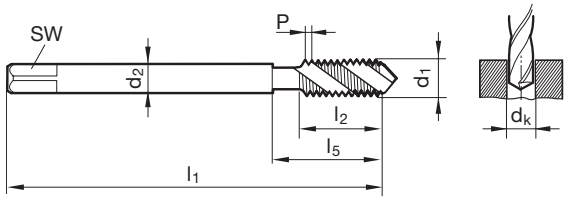
P	
M	
K	
N	•
S	
H	

Página de dados de corte 464

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **812**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1,6	0,350	2,500	2,100	1,25	40,000	4,500	
M2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	5,000	14,500
M2,3	0,400	2,800	2,100	1,90	45,000	4,500	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M2,6	0,450	2,800	2,100	2,15	50,000	5,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **824**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	2,200		2,50	56,000	6,000	18,000
M4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000

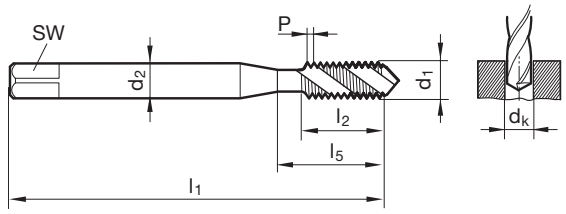
Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	VA R40
Forma	C
Refrigeração interna	⊠

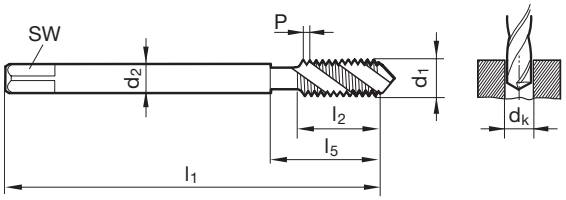
P	
M	•
K	
N	•
S	
H	

Página de dados de corte 464

DIN 371



DIN 376





DIN 2184-1 DIN 371 Nr. do artigo **814**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 Nr. do artigo **825**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Machos com canais de refrigeração para rosca métrica ISO

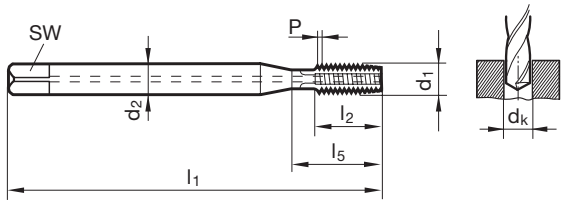


P	
M	
K	•
N	≥ 7
S	
H	

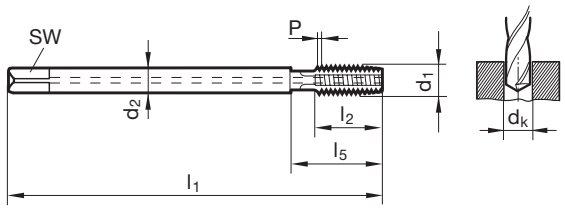
Página de dados de corte 463/465

Material de corte	MD int.	
Tolerância do Ø	6HX	6HX
Superfície	◯	◯
Tipo	H	H
Forma	C	C
Refrigeração interna		

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **969** **1858**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	8,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	10,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	10,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	12,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	16,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	18,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **1883** **1859**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	22,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	22,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	22,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	24,000	45,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	45,000

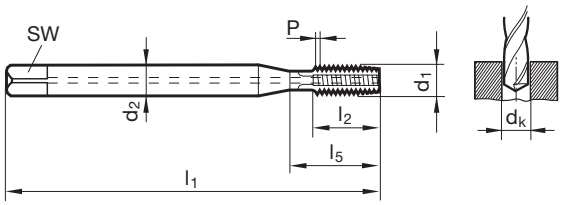
Machos com canais de refrigeração para rosca métrica ISO



P	
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 465

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	◯
Tipo	H
Forma	E
Refrigeração interna	





DIN 2184-1 DIN 371 Nr. do artigo **1008**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	8,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	10,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	10,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	12,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	16,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	18,000	39,000

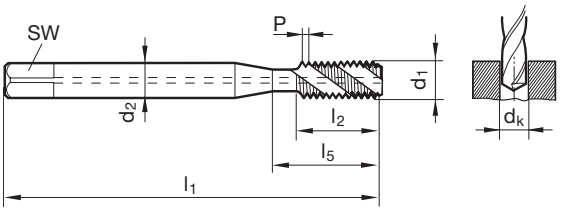
Machos com canais de refrigeração para rosca métrica ISO



P	
M	
K	○
N	≥ 7
S	
H	

Página de dados de corte 465

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	◯
Tipo	N R15
Forma	C
Refrigeração interna	





DIN 2184-1 DIN 371 Nr. do artigo **971**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	8,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	10,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	10,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	12,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	16,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	18,000	39,000

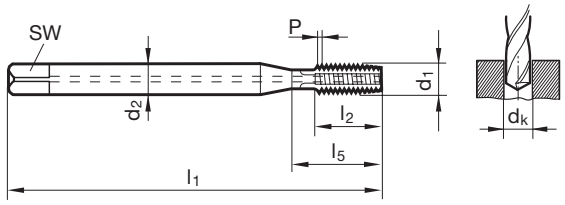
Machos com canais de refrigeração para rosca métrica ISO

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

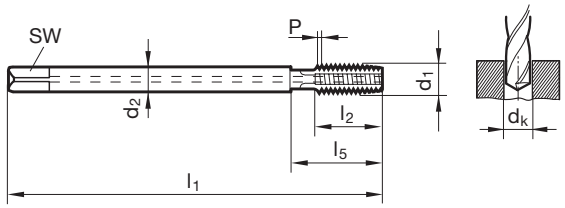
Página de dados de corte 465

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	C
Tipo	H	H
Forma	C	E
Refrigeração interna		

DIN 371



DIN 376







DIN 2184-1 DIN 371	Nr. do artigo	302	1091

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

DIN 2184-1 DIN 376	Nr. do artigo	297	4165

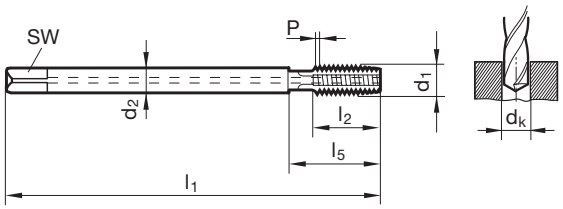
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	C
Refrigeração interna	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 465





DIN 2184-1 DIN 376 — Nr. do artigo **778**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	29,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	32,00	200,000	50,000	102,000
M39	4,000	32,000	24,000	35,00	200,000	50,000	107,000

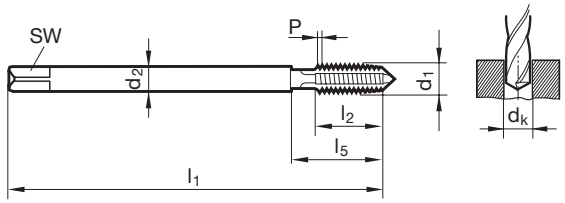
Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	C
Refrigeração interna	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 465

NEW





Norma da emp.	Nr. do artigo	779

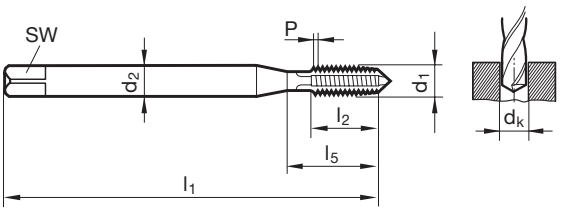
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M16	2,000	12,000	9,000	14,00	160,000	26,000	100,000
M20	2,500	16,000	12,000	17,50	180,000	32,000	120,000
M24	3,000	18,000	14,500	21,00	200,000	36,000	120,000
M27	3,000	20,000	16,000	24,00	225,000	36,000	145,000
M30	3,500	22,000	18,000	26,50	250,000	40,000	160,000
M33	3,500	25,000	20,000	29,50	275,000	40,000	170,000
M36	4,000	28,000	22,000	32,00	300,000	50,000	180,000
M39	4,000	32,000	24,000	35,00	325,000	50,000	210,000

Machos para rosca métrica ISO

P	
M	
K	○
N	≥ 7
S	
H	

Página de dados de corte 463/464

Material de corte	HSS-E	
Tolerância do Ø	ISO2/6H	ISO3/6G
Superfície	◯	◯
Tipo	Ms	Ms
Forma	E	E
Refrigeração interna	⊠	⊠







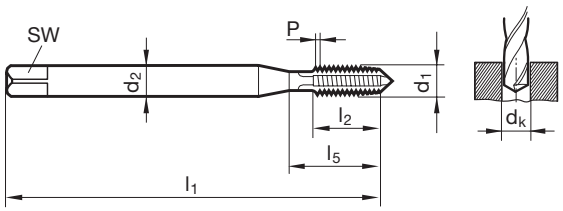
DIN 2184-1 DIN 371 — Nr. do artigo **800** **1084**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Machos para rosca métrica ISO

Material de corte	**HSS-E**
Tolerância do Ø	ISO2/6H
Superfície	●
Tipo	H AZ
Forma	C
Refrigeração interna	⊠

P	
M	
K	
N	○
S	
H	





DIN 2184-1 DIN 371 Nr. do artigo **788**

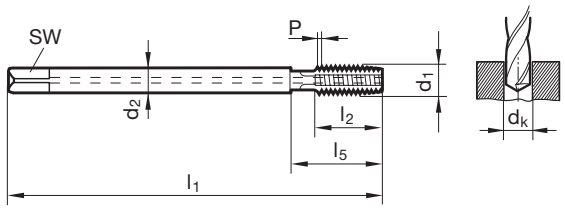
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Machos com canais de refrigeração para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	ISO2/6H
Superfície	A+M
Tipo	N AZ
Forma	E
Refrigeração interna	

P	
M	
K	
N	○
S	
H	

Página de dados de corte 464





DIN 2184-1 DIN 376 Nr. do artigo **2899**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000

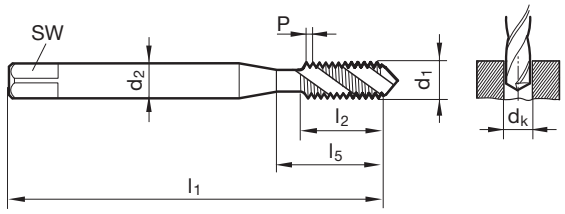
Machos para rosca métrica ISO

P	•
M	•
K	○
N	•
S	○
H	

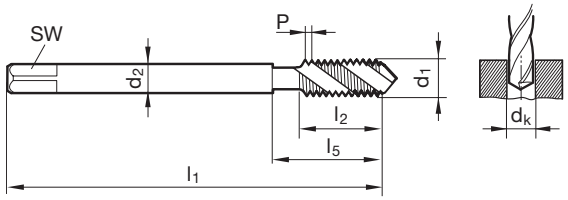
Página de dados de corte 465

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	C
Tipo	N R50	N R50
Forma	C	C
Refrigeração interna		

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo **767** **1152**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

DIN 2184-1 DIN 376 — Nr. do artigo **1098** **1293**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

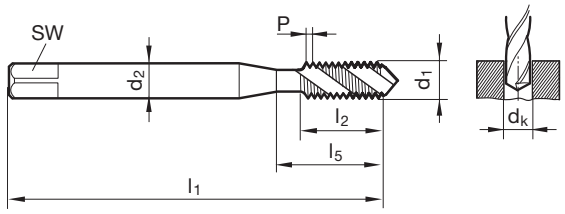
Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	S	C
Tipo	VA R50	VA R50
Forma	C	C
Refrigeração interna		

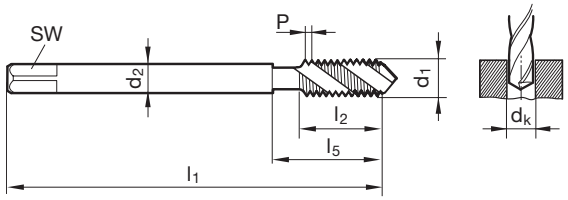
P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 465

DIN 371



DIN 376





DIN 2184-1 DIN 371 — Nr. do artigo: **761** | **1139**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	2,500	18,000
M4	0,700	4,500	3,400	3,30	63,000	3,500	21,000
M5	0,800	6,000	4,900	4,20	70,000	4,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	5,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	6,300	35,000
M10	1,500	10,000	8,000	8,50	100,000	7,500	39,000

DIN 2184-1 DIN 376 — Nr. do artigo: **763** | **1142**

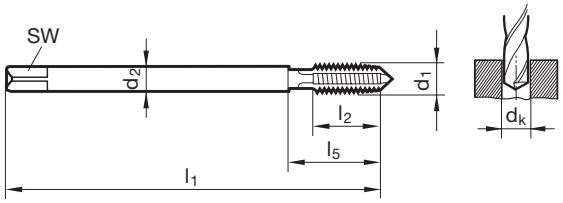
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	8,800	63,000
M14	2,000	11,000	9,000	12,00	110,000	10,000	58,000
M16	2,000	12,000	9,000	14,00	110,000	10,000	58,000
M20	2,500	16,000	12,000	17,50	140,000	12,500	85,000

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊠

P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 463





DIN 2184-1 DIN 374 — Nr. do artigo **1873**

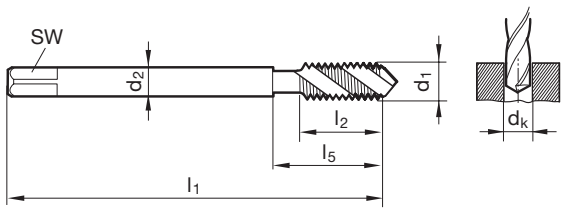
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M7 x 0,75	5,500	4,300	6,20	80,000	13,000	30,000	7,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	22,50	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	22,00	140,000	28,000	48,000	24,008

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	ISO2/6H
Superfície	◯
Tipo	VA R40
Forma	C
Refrigeração interna	⊠

P	
M	•
K	
N	•
S	
H	

Página de dados de corte 464





DIN 2184-1 DIN 374 — Nr. do artigo **936**

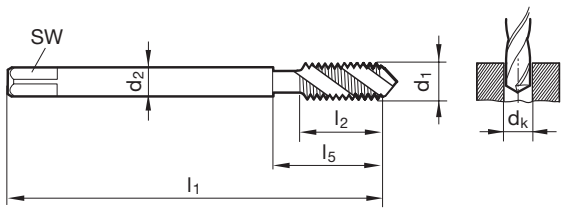
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

P	•
M	•
K	○
N	○
S	○
H	

Página de dados de corte 465

Material de corte	HSS-E-PM	
Tolerância do Ø	ISO2/6H	ISO2/6H
Superfície	S	C
Tipo	N R50	N R50
Forma	C	C
Refrigeração interna		





DIN 2184-1 DIN 374 — Nr. do artigo: **1100** | **1294**

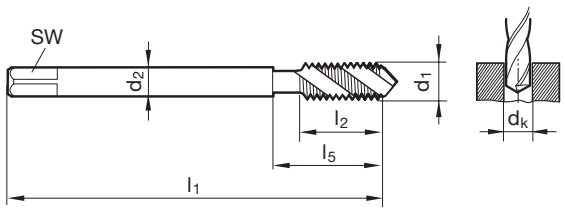
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	16,000	44,000	20,007

Machos manuais para rosca métrica fina ISO

P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 465

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	S	C
Tipo	VA R50	VA R50
Forma	C	C
Refrigeração interna		





DIN 2184-1 DIN 374 — Nr. do artigo: **764** | **1144**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	5,000	44,000	8,005
M8 x 1	6,000	4,900	7,00	90,000	5,000	47,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	5,000	47,000	10,005
M10 x 1	7,000	5,500	9,00	90,000	5,000	44,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	5,000	53,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	7,500	53,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	7,500	48,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	7,500	48,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	7,500	58,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	7,500	70,000	20,007

Machos com canais de refrig. p.rosca métr. fina ISO

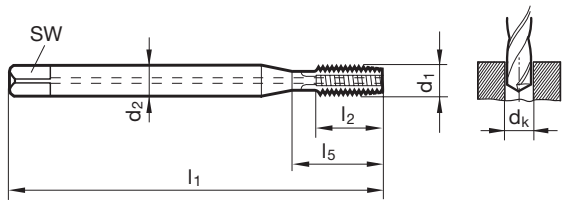


P	
M	
K	•
N	≥ 7
S	
H	

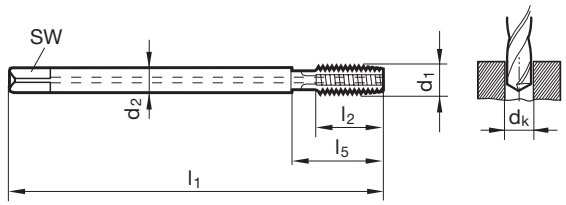
Página de dados de corte 463/465

Material de corte	MD int.	
Tolerância do Ø	6HX	6HX
Superfície	◯	◯
Tipo	H	H
Forma	C	C
Refrigeração interna		

DIN 371



DIN 374





DIN 2184-1 DIN 371 — Nr. do artigo **972** **1861**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	6,000	4,900	4,50	70,000	10,000	25,000	5,003
M8 x 1	8,000	6,200	7,00	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,00	90,000	18,000	35,000	10,005

DIN 2184-1 DIN 374 — Nr. do artigo **974** **1860**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,5	9,000	7,000	10,50	100,000	22,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	22,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	24,000	45,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	45,000	20,007

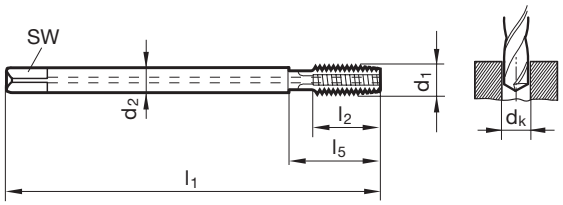
Machos com canais de refrig. p.rosca métr. fina ISO



P	
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 465

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	◯
Tipo	H
Forma	E
Refrigeração interna	





DIN 2184-1 ~DIN 371/~DIN 374 Nr. do artigo **1009**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M10 x 1	10,000	8,000	9,00	90,000	18,000	35,000	10,005
M12 x 1	9,000	7,000	11,00	100,000	22,000	40,000	12,005
M12 x 1,5	9,000	7,000	10,50	100,000	22,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	22,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007

Machos com canais de refrig. p.rosca métr. fina ISO

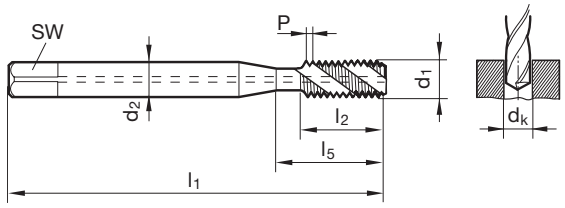


P	
M	
K	○
N	≥ 7
S	
H	

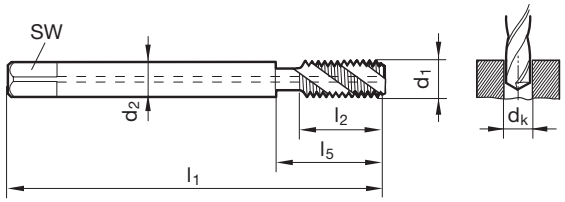
Página de dados de corte 465

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	◯
Tipo	N R15
Forma	C
Refrigeração interna	

~ DIN 371



DIN 374





DIN 2184-1 DIN 371 Nr. do artigo **977**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M4 x 0,5	4,500	3,400	3,50	63,000	10,000	21,000	4,003
M5 x 0,5	6,000	4,900	4,50	70,000	10,000	25,000	5,003
M6 x 0,5	6,000	4,900	5,50	80,000	12,000	30,000	6,003
M8 x 1	8,000	6,200	7,00	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,00	90,000	18,000	35,000	10,005

DIN 2184-1 DIN 374 Nr. do artigo **978**

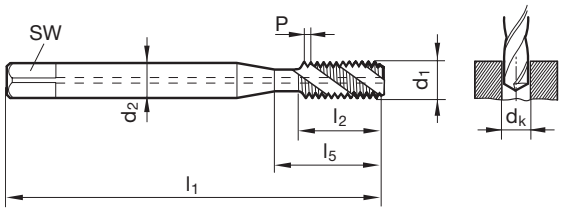
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,5	9,000	7,000	10,50	100,000	22,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	22,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	24,000	45,000	18,007
M20 x 1,5	16,000	12,000	18,50	125,000	25,000	45,000	20,007

Machos com canais de refrigeração para rosca métrica ISO

h6

P	
M	
K	
N	≥ 7
S	
H	

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	M
Tipo	N R15
Forma	C
Refrigeração interna	





DIN 2184-1 DIN 371 Nr. do artigo **2516**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5	6,000	4,900	4,20	70,000	10,000	25,000	5,000
M6	6,000	4,900	5,00	80,000	12,000	30,000	6,000
M8	8,000	6,200	6,80	90,000	16,000	35,000	8,000
M10	10,000	8,000	8,50	100,000	18,000	39,000	10,000

Machos com canais de refrig. p.rosca métr. fina ISO

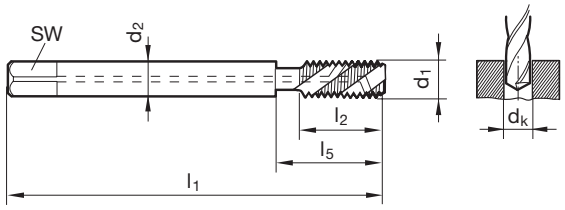


P	
M	
K	
N	≥ 7
S	
H	

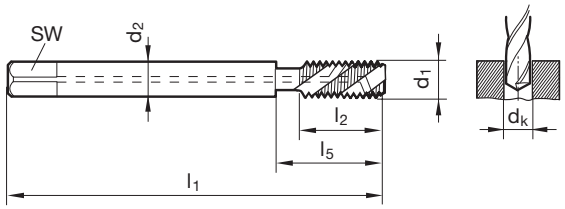
Página de dados de corte 463

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	◯
Tipo	N L15
Forma	D
Refrigeração interna	

~ DIN 371



DIN 374





DIN 2184-1 DIN 371 Nr. do artigo **975**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M4 x 0,5	4,500	3,400	3,50	63,000	10,000	21,000	4,003
M5 x 0,5	6,000	4,900	4,50	70,000	10,000	25,000	5,003
M6 x 0,5	6,000	4,900	5,50	80,000	12,000	30,000	6,003
M8 x 1	8,000	6,200	7,00	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,00	90,000	18,000	35,000	10,005

DIN 2184-1 DIN 374 Nr. do artigo **976**

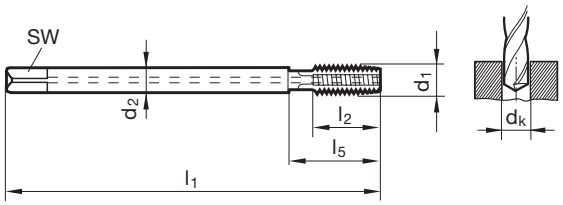
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,5	9,000	7,000	10,50	100,000	22,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	22,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	16,50	110,000	24,000	45,000	18,007

Machos com canais de refrig. p.rosca métr. fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	C
Refrigeração interna	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 465





DIN 2184-1 DIN 374 — Nr. do artigo **1090**

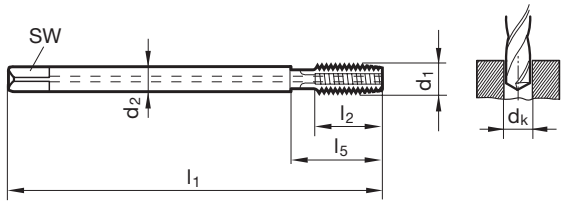
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M5 x 0,5	3,500	2,700	4,50	70,000	10,000	25,000	5,003
M6 x 0,5	4,500	3,400	5,50	80,000	13,000	30,000	6,003
M6 x 0,75	4,500	3,400	5,20	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,20	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007

Machos com canais de refrig. p.rosca métr. fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	E
Refrigeração interna	

P	≤ 1200
M	
K	•
N	≥ 7
S	
H	

Página de dados de corte 465





DIN 2184-1 DIN 374 — Nr. do artigo **1007**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,00	90,000	16,000	35,000	8,005
M9 x 1	7,000	5,500	8,00	90,000	16,000	35,000	9,005
M10 x 1	7,000	5,500	9,00	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	8,80	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,00	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	10,80	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	10,50	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,00	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	12,80	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	12,50	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,00	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	14,50	100,000	22,000	44,000	16,007

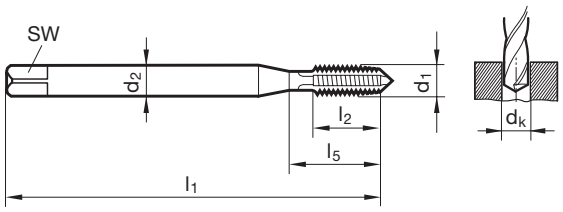
Machos para rosca UNC

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊠

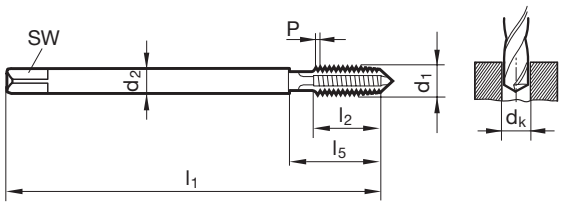
P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 463

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 Nr. do artigo **1980**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,35	56,000	11,000	18,000	2,845
6 - 32	4,000	3,000	2,85	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 Nr. do artigo **1985**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
9/16 - 12	11,000	9,000	12,20	110,000	28,000	53,000	14,288
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	35,000	62,000	22,225
1 - 8	18,000	14,500	22,25	160,000	38,000	73,000	25,400

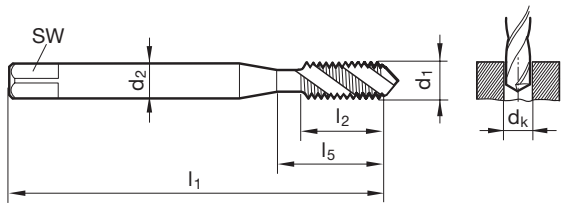
Machos para rosca UNC

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	◯
Tipo	VA R40
Forma	C
Refrigeração interna	⊠

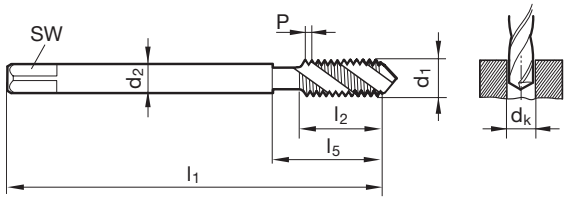
P	
M	•
K	
N	•
S	
H	

Página de dados de corte 464

~ DIN 371



~ DIN 376





DIN 2184-1 ~DIN 371 Nr. do artigo **1981**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
2 - 56	2,800	2,100	1,85	45,000	5,000	14,500	2,184
4 - 40	3,500	2,700	2,35	56,000	7,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	7,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	8,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	8,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	11,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	11,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	13,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	14,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	16,000	39,000	9,525

DIN 2184-1 ~DIN 376 Nr. do artigo **1986**

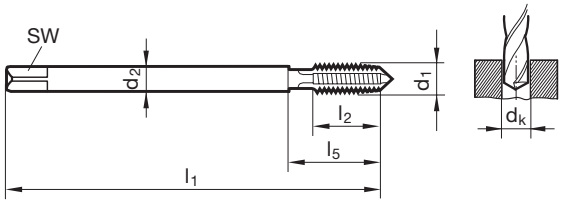
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	9,40	100,000	18,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	20,000	49,000	12,700
9/16 - 12	11,000	9,000	12,20	110,000	21,000	53,000	14,288
5/8 - 11	12,000	9,000	13,50	110,000	24,000	53,000	15,875
3/4 - 10	14,000	11,000	16,50	125,000	25,000	62,000	19,050
7/8 - 9	18,000	14,500	19,50	140,000	28,000	62,000	22,225

Machos para rosca UNF

Material de corte	HSS-E
Tolerância do Ø	2B
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊠

P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 463





DIN 2184-1 ~DIN 374 Nr. do artigo **1990**

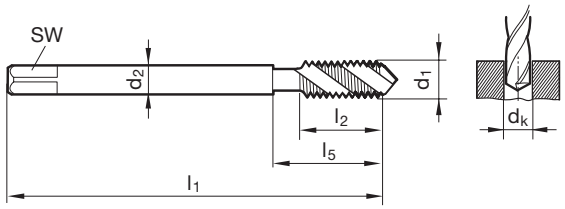
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 32	3,500	2,700	4,10	70,000	14,000	25,000	4,826
1/4 - 28	4,500	3,400	5,50	80,000	16,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	18,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	18,000	35,000	9,525

Machos para rosca UNF

Material de corte	**HSS-E**
Tolerância do Ø	2B
Superfície	◯
Tipo	VA R40
Forma	C
Refrigeração interna	⊠

P	
M	•
K	
N	•
S	
H	

Página de dados de corte 464





DIN 2184-1 ~DIN 374 Nr. do artigo **2867**

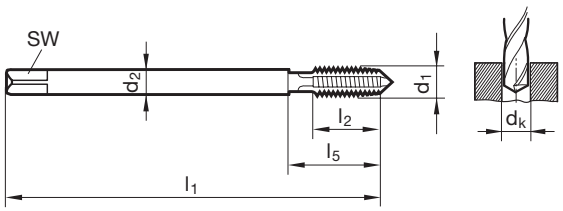
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
1/4 - 28	4,500	3,400	5,50	80,000	9,000	30,000	6,350
5/16 - 24	6,000	4,900	6,90	90,000	11,000	35,000	7,938
3/8 - 24	7,000	5,500	8,50	90,000	11,000	35,000	9,525
1/2 - 20	9,000	7,000	11,50	100,000	13,000	40,000	12,700
7/8 - 14	18,000	14,500	20,40	125,000	19,000	44,000	22,225
1 - 12	18,000	14,500	23,25	140,000	22,000	50,000	25,400

Machos para rosca gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	
Superfície	◯
Tipo	N
Forma	B
Refrigeração interna	⊘

P	≤ 1000
M	•
K	
N	•
S	
H	

Página de dados de corte 463





DIN 2184-1 DIN 5156 — Nr. do artigo **967**

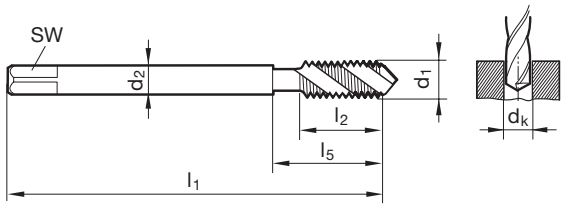
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000	26,441
G7/8	14,000	22,000	18,000	28,25	150,000	28,000	53,000	30,201

Machos para rosca gás Whitworth

Material de corte	HSS-E-PM
Tolerância do Ø	
Superfície	◯
Tipo	VA R40
Forma	C
Refrigeração interna	⊠

P	
M	•
K	
N	•
S	
H	

Página de dados de corte 464





DIN 2184-1 DIN 5156 Nr. do artigo **939**

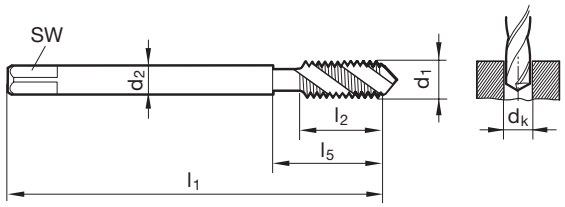
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000	20,955

Machos para rosca gás Whitworth

Material de corte	HSS-E-PM
Tolerância do Ø	
Superfície	S
Tipo	VA R50
Forma	C
Refrigeração interna	

P	•
M	•
K	○
N	•
S	○
H	

Página de dados de corte 465





DIN 2184-1 DIN 5156 Nr. do artigo **4159**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	6,80	90,000	4,500	47,000	7,723
G1/8	28,000	7,000	5,500	8,80	90,000	4,500	47,000	9,728
G1/4	19,000	11,000	9,000	11,80	100,000	6,700	48,000	13,157
G3/8	19,000	12,000	9,000	15,25	100,000	6,700	48,000	16,662
G1/2	14,000	16,000	12,000	19,00	125,000	9,100	70,000	20,955



Alumínio, metais não ferrosos e plásticos

MACHOS LAMINA-DORES

N

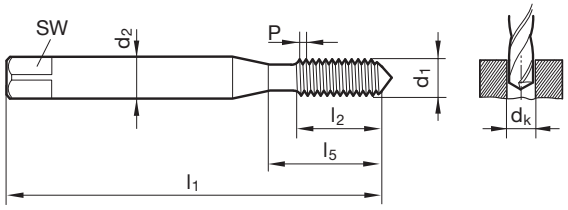
Machos laminadores para rosca métrica ISO

P	•	
M	•	
K		
N	○	
S		
H		

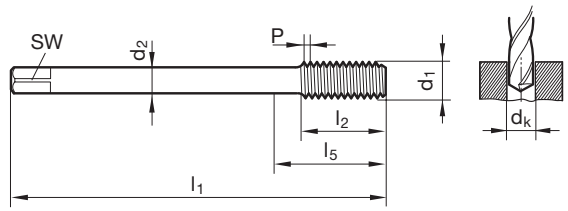
Página de dados de corte 466

Material de corte	HSS-E	HSS-E-PM	
Tolerância do Ø	6HX	6HX	6HX
Superfície	S	S	Cb
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna			

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	921	1255	1347

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,90	40,000	4,000	
M1,2	0,250	2,500	2,100	1,10	40,000	4,800	
M1,4	0,300	2,500	2,100	1,25	40,000	5,600	
M1,6	0,350	2,500	2,100	1,45	40,000	6,400	
M1,7	0,350	2,500	2,100	1,55	40,000	6,800	
M1,8	0,350	2,500	2,100	1,65	40,000	7,300	
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	925	1256	1566

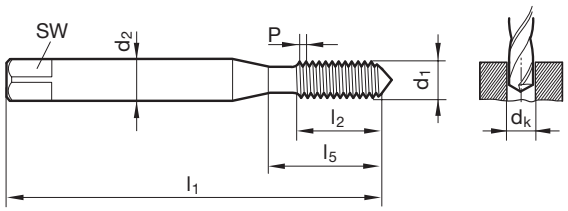
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 466





DIN 2174 ~DIN 371 — Nr. do artigo **920**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

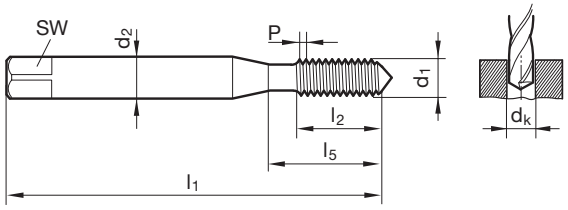
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	S	Cb
Tipo	N	N
Forma	C	C
Refrigeração interna		

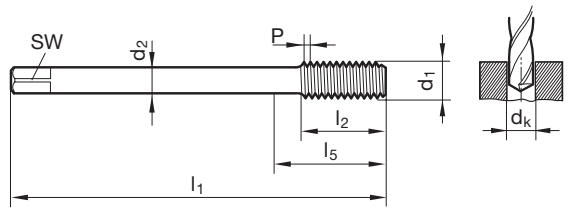
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 466

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **903** **1565**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **952** **1567**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

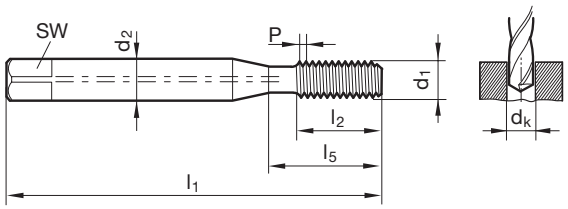
Machos laminadores para rosca métrica ISO com canais de refrigeração



P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 466

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **2518**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

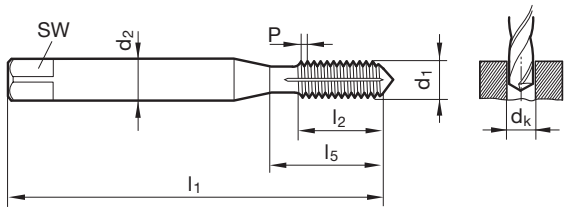
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E		
Tolerância do Ø	6GX	6HX	6HX
Superfície	S	S	C
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna	✗	✗	✗

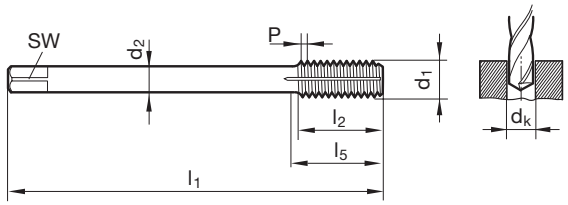
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo: **918** | **919** | **2012**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo: **922** | **923** | **2013**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M6	1,000	4,500	3,400	5,55	80,000	16,000	30,000
M8	1,250	6,000	4,900	7,40	90,000	17,000	35,000
M10	1,500	7,000	5,500	9,30	100,000	20,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000
M22	2,500	18,000	14,500	20,90	140,000	32,000	62,000
M24	3,000	18,000	14,500	22,70	160,000	36,000	73,000
M27	3,000	20,000	16,000	25,70	160,000	36,000	73,000
M30	3,500	22,000	18,000	28,50	180,000	40,000	85,000
M33	3,500	25,000	20,000	31,50	180,000	40,000	91,000
M36	4,000	28,000	22,000	34,30	200,000	50,000	102,000
M39	4,000	32,000	24,000	37,30	200,000	50,000	107,000

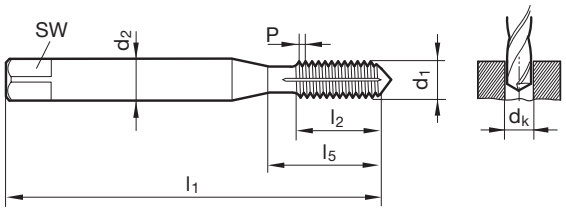
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

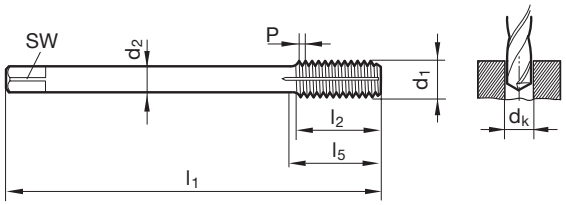
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **322**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **339**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

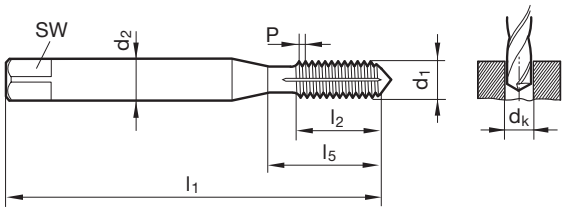
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

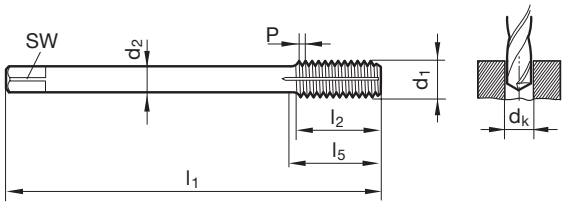
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **1266**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1267**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

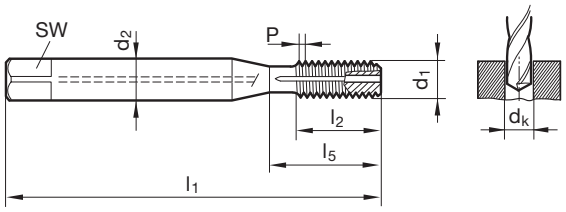
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E		
Tolerância do Ø	6HX	6GX	6HX
Superfície	S	S	C
Tipo	N	N	N
Forma	C	C	C
Refrigeração interna			

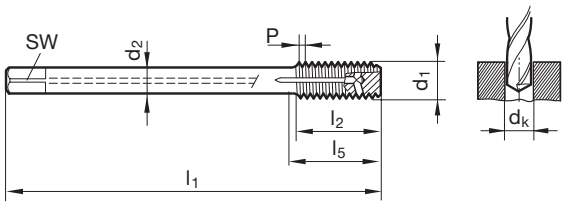
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	2442	2443	2446

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	2444	2445	2448

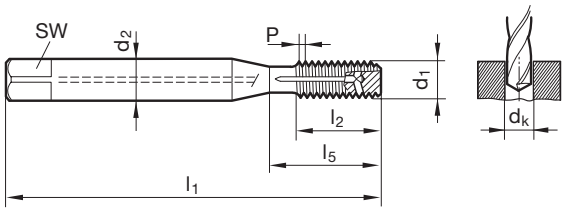
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 467





DIN 2174 ~DIN 371 Nr. do artigo **2447**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

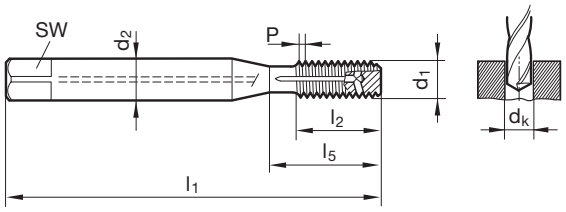
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

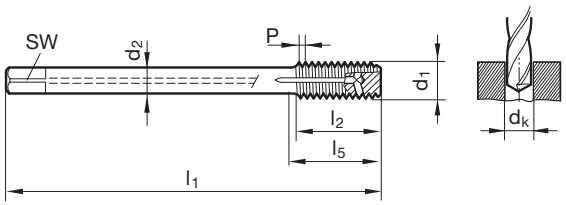
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **323**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **342**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

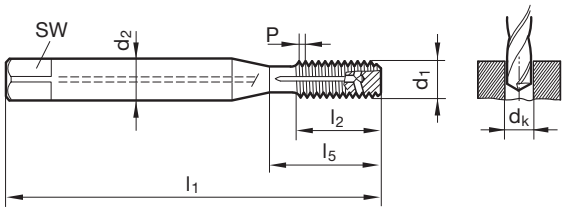
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

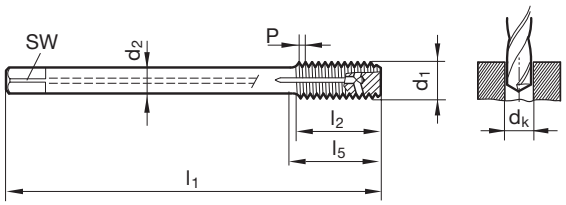
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 467

~ DIN 371



~ DIN 376







DIN 2174 ~DIN 371 — Nr. do artigo **1270** **1725**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1271** **1727**

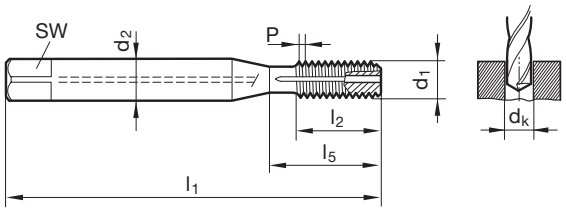
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	Cb
Tipo	N
Forma	C
Refrigeração interna	

P	
M	
K	
N	•
S	
H	

Página de dados de corte 467





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **2515**

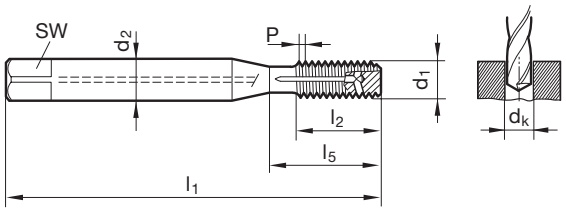
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 467





DIN 2174 ~DIN 371 Nr. do artigo **1713**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

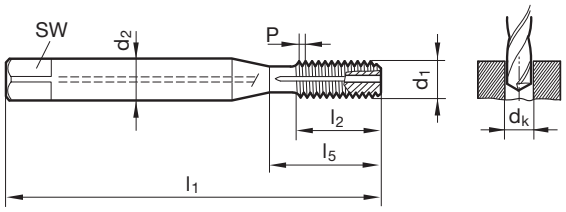
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	E
Refrigeração interna	

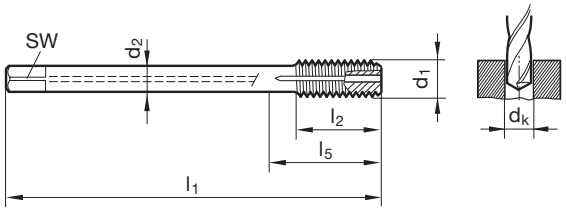
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **1726**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1728**

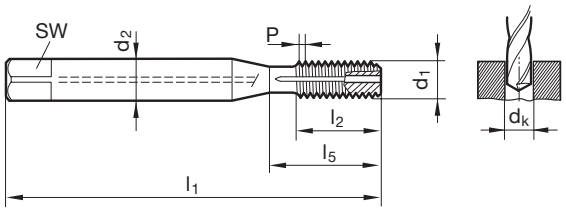
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	Cb
Tipo	N
Forma	C
Refrigeração interna	

P	
M	
K	
N	•
S	
H	

Página de dados de corte 467





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **4146**

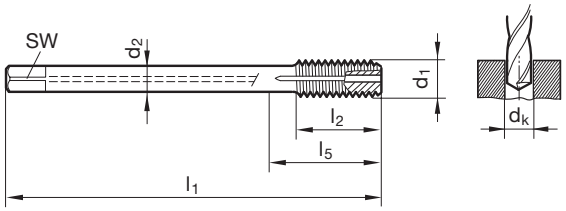
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467





Norma da emp. Norma da emp.	Nr. do artigo	4143

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	112,000	6,000	18,000
M4	0,700	2,800	2,100	3,70	112,000	7,500	77,000
M5	0,800	3,500	2,700	4,65	125,000	8,500	90,000
M6	1,000	4,500	3,400	5,55	125,000	11,000	90,000
M8	1,250	6,000	4,900	7,40	140,000	14,000	97,000
M10	1,500	7,000	5,500	9,30	160,000	16,000	117,000
M12	1,750	9,000	7,000	11,20	180,000	18,500	133,000
M16	2,000	12,000	9,000	15,10	220,000	20,000	168,000
M20	2,500	16,000	12,000	18,90	280,000	25,000	225,000

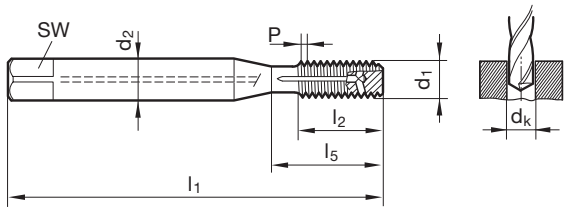
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

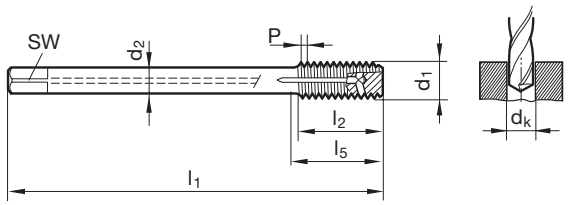
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 467

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 Nr. do artigo **1972**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 Nr. do artigo **1931**

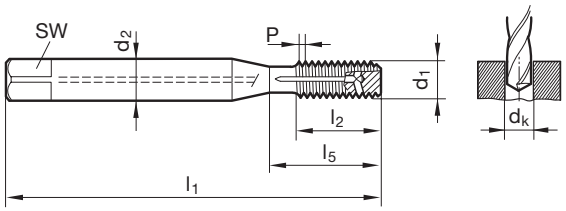
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	25,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	E
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 467





DIN 2174 ~DIN 371 Nr. do artigo **1927**

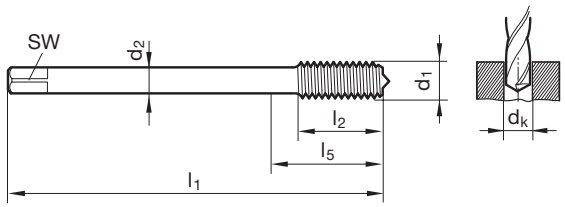
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 466





DIN 2174 ~DIN 374 — Nr. do artigo **929**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

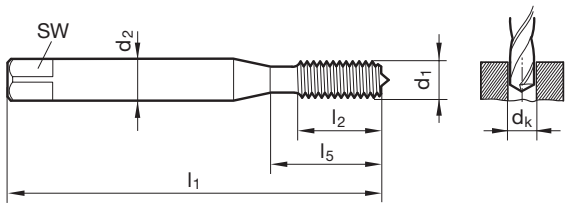
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

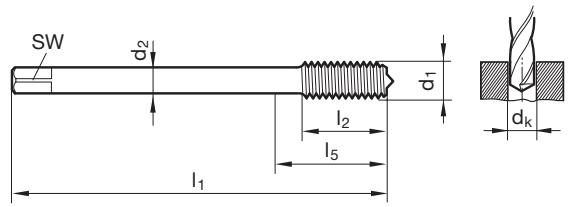
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 466

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1257**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1258**

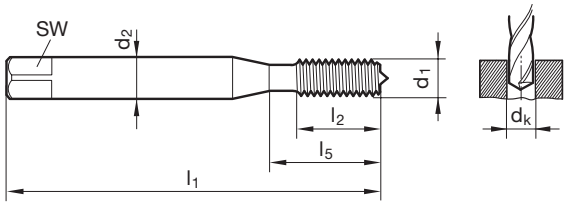
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	Cb
Tipo	N
Forma	C
Refrigeração interna	

P	
M	
K	
N	•
S	
H	

Página de dados de corte 466





DIN 2174 ~DIN 371 Nr. do artigo **1568**

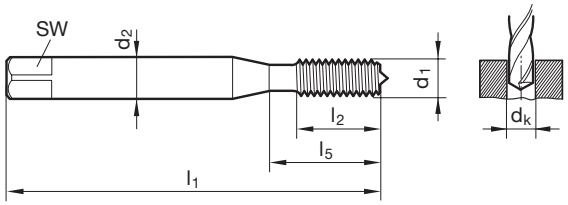
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 466





DIN 2174 ~DIN 371 Nr. do artigo **1740**

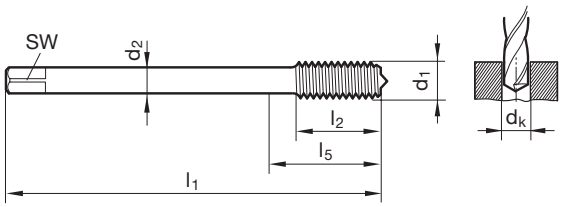
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 466





DIN 2174 ~DIN 374 — Nr. do artigo **928**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007

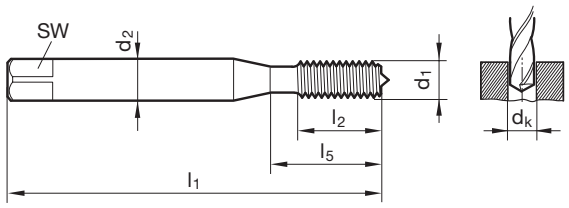
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	Cb
Tipo	N
Forma	C
Refrigeração interna	

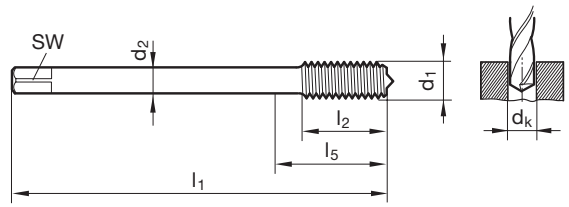
P	
M	
K	
N	•
S	
H	

Página de dados de corte 466

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1569**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1580**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

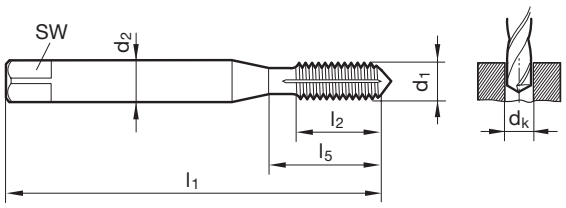
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

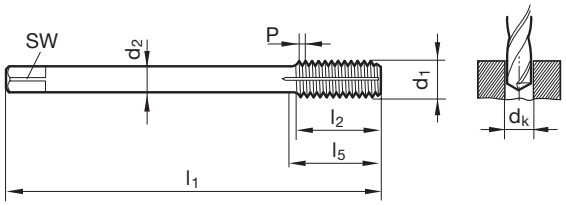
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1275**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	6,000	4,900	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	8,000	6,200	7,65	80,000	14,000	30,000	8,004
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **927**

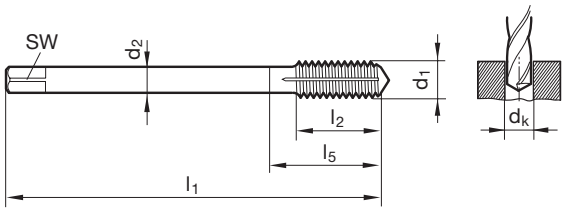
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000	10,006
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1	14,000	11,000	17,55	110,000	25,000	44,000	18,005
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	○
H	

Página de dados de corte 467





DIN 2174 ~DIN 374 — Nr. do artigo **2008**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M6 x 0,75	4,500	3,400	5,65	80,000	13,000	30,000	6,004
M8 x 0,75	6,000	4,900	7,65	80,000	14,000	30,000	8,004
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1,25	7,000	5,500	9,40	100,000	20,000	39,000	10,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

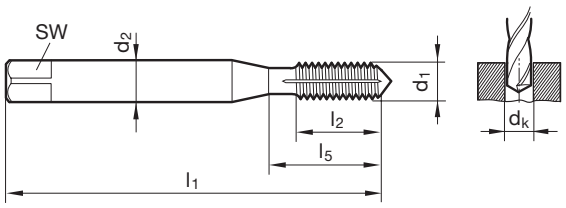
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

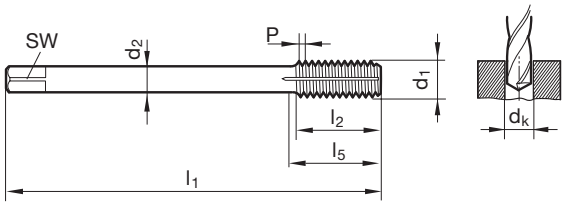
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1277**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **926**

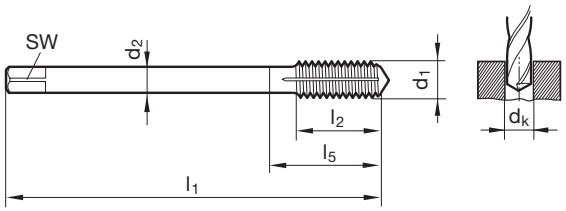
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	16,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	16,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1	12,000	9,000	15,55	100,000	22,000	44,000	16,005
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467





DIN 2174 ~DIN 374 — Nr. do artigo **333**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	16,000	44,000	20,007

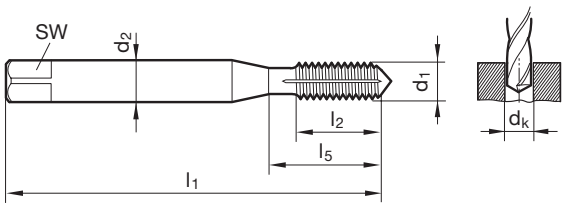
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

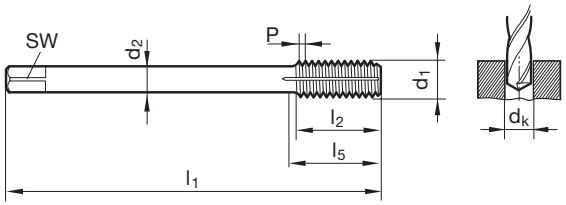
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1268**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1269**

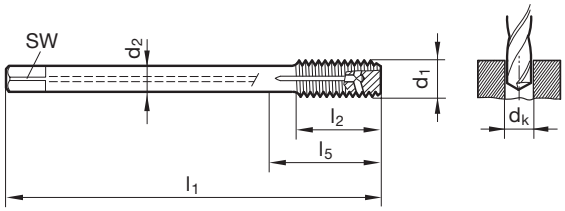
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467





DIN 2174 ~DIN 374 — Nr. do artigo **338**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007

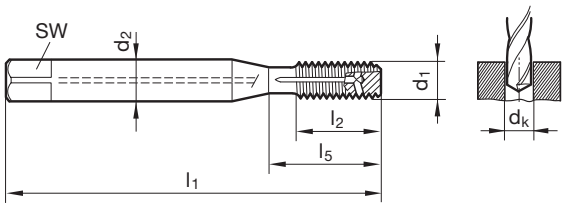
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

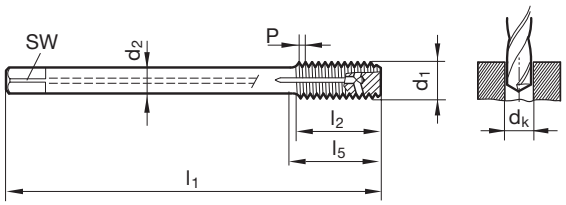
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 467

~ DIN 371



~ DIN 374







DIN 2174 ~DIN 371 — Nr. do artigo **1272** **1729**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **1273** **1731**

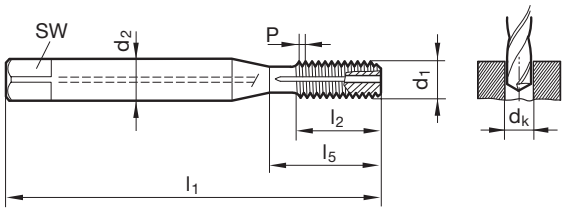
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E
Tolerância do Ø	6HX
Superfície	Cb
Tipo	N
Forma	C
Refrigeração interna	

P	
M	
K	
N	•
S	
H	

Página de dados de corte 467





DIN 2174 ~DIN 371/~DIN 374 Nr. do artigo **4147**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	11,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	11,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,55	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007

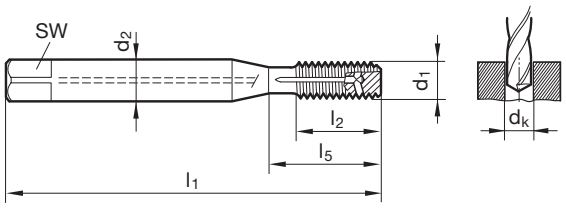
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	C	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

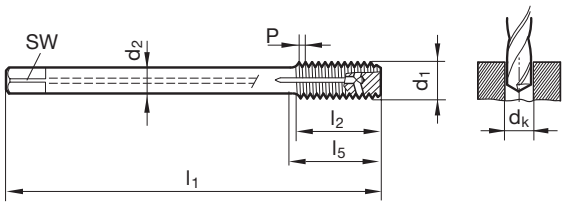
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 467

~ DIN 371



~ DIN 374







DIN 2174 ~DIN 371 — Nr. do artigo **1715** **1730**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **1716** **1732**

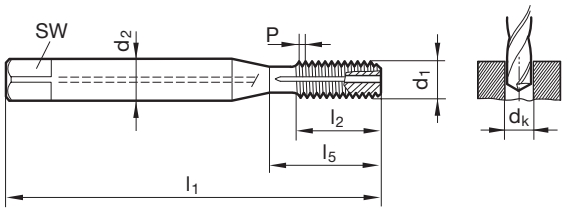
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E
Tolerância do Ø	6GX
Superfície	Cb
Tipo	N
Forma	C
Refrigeração interna	

P	
M	
K	
N	•
S	
H	

Página de dados de corte 467





DIN 2174 ~DIN 371/~DIN 374 Nr. do artigo **4151**

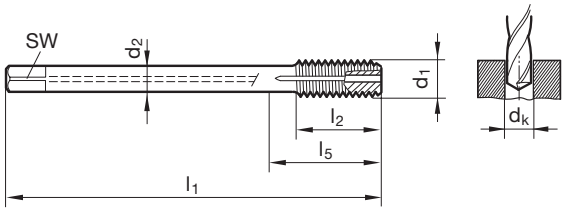
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	11,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	11,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	14,000	39,000	10,006
M12 x 1	9,000	7,000	11,55	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467





Norma da emp. Nr. do artigo **4145**

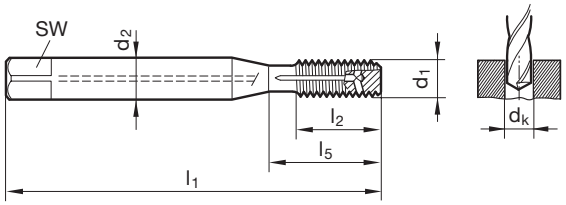
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	140,000	14,000	97,000	8,005
M10 x 1	7,000	5,500	9,55	160,000	16,000	117,000	10,005
M10 x 1,25	7,000	5,500	9,40	160,000	16,000	117,000	10,006
M12 x 1	9,000	7,000	11,55	180,000	18,500	133,000	12,005
M12 x 1,5	9,000	7,000	11,30	180,000	18,500	133,000	12,007
M14 x 1,5	11,000	9,000	13,30	220,000	20,000	168,000	14,007
M16 x 1,5	12,000	9,000	15,30	220,000	20,000	168,000	16,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 467





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **1581**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M10 x 1	10,000	8,000	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	15,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	15,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	15,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	15,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	15,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	15,000	48,000	24,007

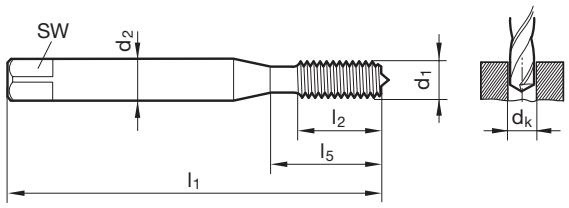
Machos laminadores para rosca UNC

Material de corte	HSS-E	
Tolerância do Ø	2BX	2BX
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

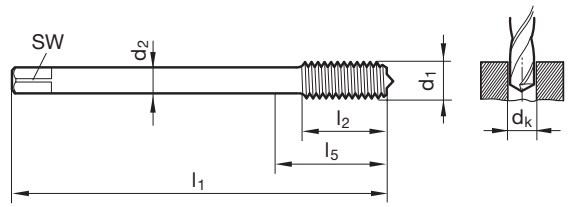
P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 466/467

~ DIN 371



~ DIN 374





DIN 2184-1 ~DIN 371 — Nr. do artigo **2273** **1582**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,55	56,000	11,000	18,000	2,845
5 - 40	3,500	2,700	2,90	56,000	11,000	18,000	3,175
6 - 32	4,000	3,000	3,15	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,80	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	4,35	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	5,00	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,75	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	7,30	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,80	100,000	20,000	39,000	9,525

DIN 2184-1 ~DIN 376 — Nr. do artigo **2274** **1583**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
7/16 - 14	8,000	6,200	10,30	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	11,80	110,000	25,000	49,000	12,700
9/16 - 12	11,000	9,000	13,30	110,000	28,000	53,000	14,288
5/8 - 11	12,000	9,000	14,80	110,000	30,000	53,000	15,875
3/4 - 10	14,000	11,000	17,90	125,000	33,000	62,000	19,050
7/8 - 9	18,000	14,500	21,00	140,000	35,000	62,000	22,225

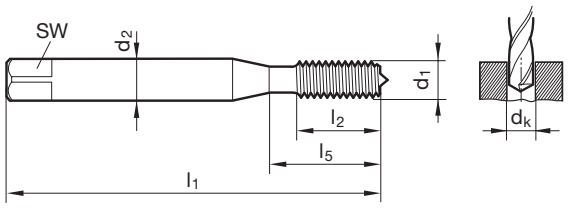
Machos laminadores para rosca UNF

P	•
M	•
K	
N	○
S	
H	

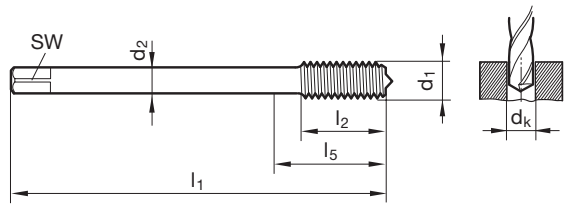
Página de dados de corte 466/467

Material de corte	HSS-E	
Tolerância do Ø	2BX	2BX
Superfície	S	S
Tipo	N	N
Forma	C	C
Refrigeração interna		

~ DIN 371



~ DIN 374





DIN 2184-1 ~DIN 371 — Nr. do artigo **1283** **1584**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 48	3,500	2,700	2,60	56,000	10,000	18,000	2,845
5 - 44	3,500	2,700	2,90	56,000	10,000	18,000	3,175
6 - 40	4,000	3,000	3,20	56,000	11,000	20,000	3,505
8 - 36	4,500	3,400	3,85	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,45	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	5,10	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,95	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	7,45	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	9,05	90,000	18,000	35,000	9,525

DIN 2184-1 ~DIN 374 — Nr. do artigo **1585** **2275**

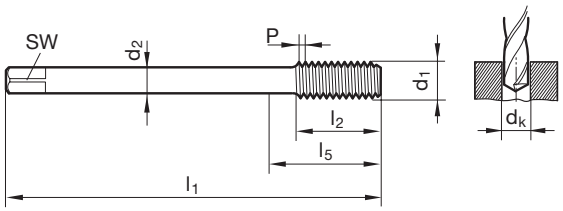
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
10 - 32	3,500	2,700	4,45	70,000	14,000	25,000	4,826
12 - 28	4,000	3,000	5,10	80,000	16,000	30,000	5,486
1/4 - 28	4,500	3,400	5,95	80,000	16,000	30,000	6,350
5/16 - 24	6,000	4,900	7,45	90,000	18,000	35,000	7,938
3/8 - 24	7,000	5,500	9,05	90,000	18,000	35,000	9,525
7/16 - 20	8,000	6,200	10,55	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	12,10	100,000	20,000	40,000	12,700
9/16 - 18	11,000	9,000	13,65	100,000	22,000	40,000	14,288
5/8 - 18	12,000	9,000	15,25	100,000	22,000	44,000	15,875
3/4 - 16	14,000	11,000	18,35	110,000	25,000	44,000	19,050
7/8 - 14	18,000	14,500	21,40	125,000	25,000	44,000	22,225
1 - 12	18,000	14,500	24,45	140,000	28,000	50,000	25,400

Machos laminadores para rosca Gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	
H	

Página de dados de corte 466





DIN 2184-1 DIN 2189 — Nr. do artigo **966**

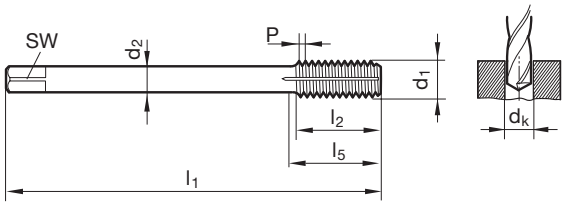
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	7,30	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	9,30	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	12,50	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	16,00	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	20,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	25,50	140,000	28,000	53,000	26,441
G1	11,000	25,000	20,000	32,00	160,000	30,000	56,000	33,249
G1 1/4	11,000	32,000	24,000	40,75	170,000	30,000	57,000	41,910

Machos laminadores para rosca Gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 467





DIN 2184-1 DIN 2189 — Nr. do artigo **1586**

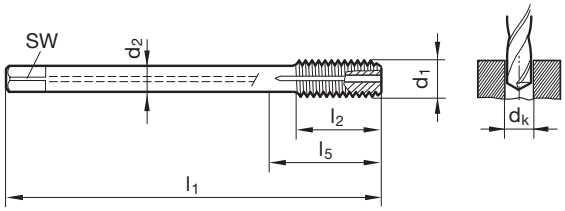
d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	7,30	90,000	18,000	30,000	7,723
G1/8	28,000	7,000	5,500	9,30	90,000	18,000	35,000	9,728
G1/4	19,000	11,000	9,000	12,50	100,000	20,000	40,000	13,157
G3/8	19,000	12,000	9,000	16,00	100,000	22,000	44,000	16,662
G1/2	14,000	16,000	12,000	20,00	125,000	25,000	44,000	20,955
G3/4	14,000	20,000	16,000	25,50	140,000	28,000	53,000	26,441

Machos laminadores para rosca Gás Whitworth

Material de corte	HSS-E
Tolerância do Ø	
Superfície	Cb
Tipo	N
Forma	C
Refrigeração interna	

P	
M	
K	
N	•
S	
H	

Página de dados de corte 467





DIN 2184-1 DIN 2189 — Nr. do artigo **4152**

d1	P	d2	SW	dk	l1	l2	l5	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	
G1/16	28,000	6,000	4,900	7,30	90,000	11,000	30,000	7,723
G1/8	28,000	7,000	5,500	9,30	90,000	11,000	35,000	9,728
G1/4	19,000	11,000	9,000	12,50	100,000	14,000	40,000	13,157
G3/8	19,000	12,000	9,000	16,00	100,000	14,000	44,000	16,662
G1/2	14,000	16,000	12,000	20,00	125,000	18,000	44,000	20,955
G3/4	14,000	20,000	16,000	25,50	140,000	20,000	53,000	26,441
G1	11,000	25,000	20,000	32,00	160,000	24,000	56,000	33,249



Alumínio, metais não ferrosos e plásticos

FRESAS DE ROSCAR

N

Fresas para rosca métrica ISO sem chanfro

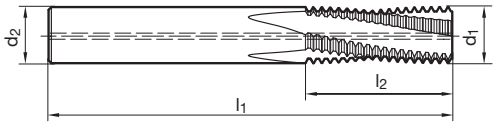
2xD

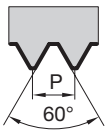
P	•
M	○
K	•
N	•
S	○
H	≤55

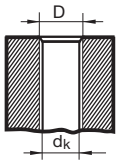
Página de dados de corte 468

Material de corte	MD int.		
Superfície	C	C	◯
Tipo	TM SP	TM SP	TM SP
Refrigeração interna			
Forma da haste	HA	HB	HA

NEW













Norma da emp.	Nr. do artigo	3737	3743	3734

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	13,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	18,100	3	8,000
M8 x 1	1,000	6,400	8,000	7,00	62,000	17,500	3	8,005
M10	1,500	7,950	10,000	8,50	74,000	21,800	3	10,000
M10 x 1	1,000	7,950	10,000	9,00	74,000	21,500	3	10,005
M10 x 1,25	1,250	7,950	10,000	8,80	74,000	21,900	3	10,006
M12	1,750	9,950	10,000	10,20	74,000	25,400	4	12,000
M12 x 1,5	1,500	9,950	10,000	10,50	74,000	26,300	4	12,007
M14	2,000	11,200	12,000	12,00	90,000	31,000	4	14,000
M14 x 1,5	1,500	11,200	12,000	12,50	90,000	30,800	4	14,007
M16	2,000	12,800	14,000	14,00	90,000	35,000	4	16,000
M16 x 1,5	1,500	12,800	14,000	14,50	90,000	33,800	4	16,007
M20	2,500	14,950	16,000	17,50	102,000	41,300	4	20,000
M20 x 1,5	1,500	14,950	16,000	18,50	102,000	42,800	4	20,007

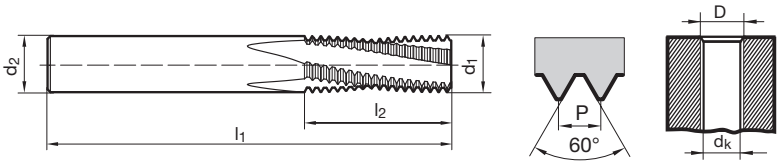
Fresas para rosca métrica ISO sem chanfro

2xD

P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 468

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW





Norma da emp.	Nr. do artigo	4132	4133

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	13,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	18,100	3	8,000
M10	1,500	7,950	10,000	8,50	74,000	21,800	3	10,000
M12	1,750	9,950	10,000	10,20	74,000	25,400	4	12,000
M14	2,000	11,200	12,000	12,00	90,000	31,000	4	14,000
M16	2,000	12,800	14,000	14,00	90,000	35,000	4	16,000
M20	2,500	14,950	16,000	17,50	102,000	41,300	4	20,000

Fresas para rosca métrica ISO sem chanfro

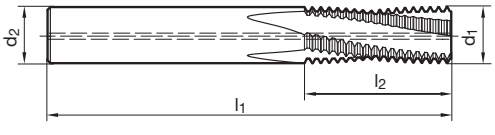
2,5xD

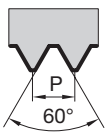
P	•
M	○
K	•
N	•
S	○
H	≤55

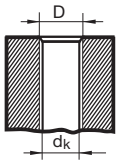
Página de dados de corte 468

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3735	3740

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	16,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	21,900	3	8,000
M10	1,500	7,950	10,000	8,50	74,000	26,300	3	10,000
M12	1,750	9,950	10,000	10,20	74,000	32,400	4	12,000
M14	2,000	11,200	12,000	12,00	90,000	37,000	4	14,000
M16	2,000	12,800	14,000	14,00	90,000	43,000	4	16,000
M20	2,500	14,950	16,000	17,50	102,000	48,800	4	20,000

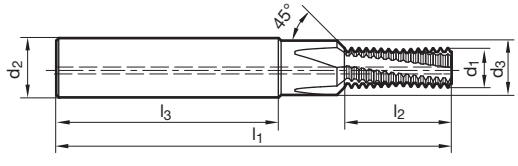
Fresas para rosca métrica ISO com chanfro

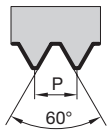


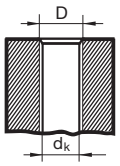
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 469

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	









Norma da emp.	Nr. do artigo	3525	3543	3510

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	5,300	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	7,400	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	9,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	10,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	13,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	17,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	20,100	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	25,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	27,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	33,800	4	20,000

Fresas para rosca métrica ISO com chanfro

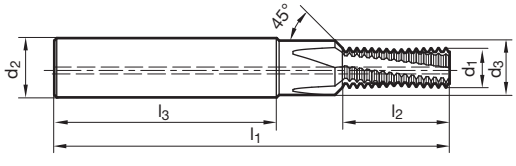
2xD

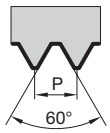
P	•
M	•
K	•
N	•
S	•
H	≤55

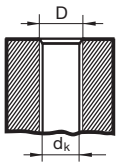
Página de dados de corte 469

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA

NEW













Norma da emp.	Nr. do artigo	3526	3544	3511

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	6,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	8,800	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	10,800	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	13,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	18,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	21,800	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	25,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	31,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	35,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	41,300	4	20,000

Fresas para rosca métrica ISO com chanfro

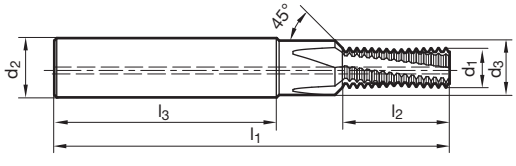


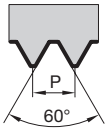
P	•
M	•
K	•
N	•
S	•
H	≤55

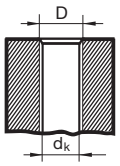
Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3759	3760

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	7,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	35,600	10,900	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	13,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	16,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	21,900	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	26,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	32,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	37,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	43,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	48,800	4	20,000

Fresas para rosca métrica fina ISO com chanfro

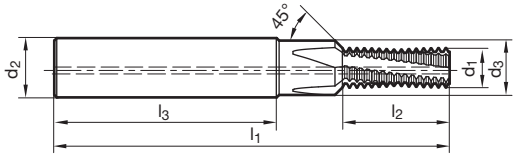


P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 469

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA

NEW





Norma da emp. | Nr. do artigo | **3527** | **3545** | **3512**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	7,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	8,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	9,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	10,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	13,100	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	13,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	16,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	16,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	19,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	20,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	23,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	26,300	4	16,007

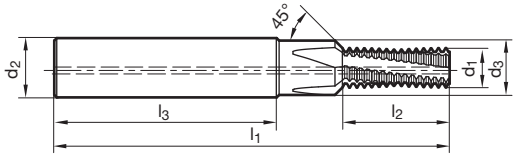
Fresas para rosca métrica fina ISO com chanfro

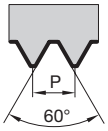
2xD

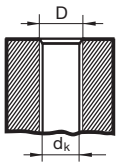
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 469

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













Norma da emp.	Nr. do artigo	3528	3546	3513

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	8,800	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	10,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	12,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	13,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	16,900	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	17,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	21,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	21,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	25,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	26,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	30,800	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	33,800	4	16,007

Fresas para rosca métrica fina ISO com chanfro

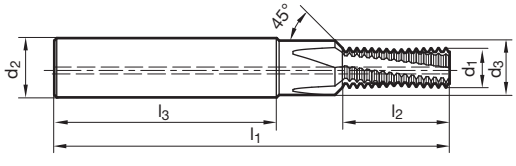
2,5xD

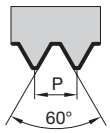
P	•
M	•
K	•
N	•
S	•
H	≤55

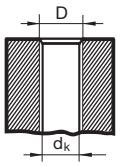
Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3762** | **3763**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	10,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	12,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	15,300	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	15,400	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	20,600	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	20,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	25,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	25,600	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	30,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	30,800	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	38,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	41,300	4	16,007

Fresas para rosca UNC sem chanfro

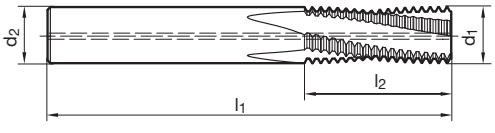
2xD

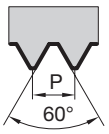
P	•
M	○
K	•
N	•
S	○
H	≤55

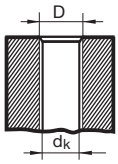
Página de dados de corte 468

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4134	4135

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 24	3,400	6,000	3,90	54,000	11,100	3	4,826
12 - 24	4,100	6,000	4,50	54,000	12,200	3	5,486
1/4 - 20	4,700	6,000	5,10	54,000	14,600	3	6,350
5/16 - 18	6,100	8,000	6,60	64,000	17,600	3	7,938
3/8 - 16	7,600	8,000	8,00	64,000	21,400	3	9,525
7/16 - 14	9,000	10,000	9,40	74,000	24,500	3	11,113
1/2 - 13	9,950	10,000	10,80	74,000	28,300	4	12,700
9/16 - 12	11,400	12,000	12,20	90,000	30,700	4	14,288
5/8 - 11	12,700	14,000	13,50	90,000	35,800	4	15,875

Fresas para rosca UNC com chanfro

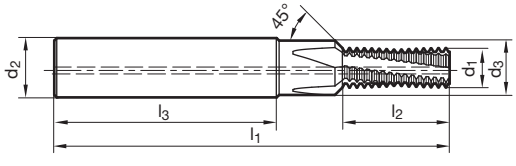


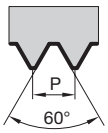
P	•
M	•
K	•
N	•
S	•
H	≤55

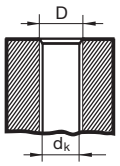
Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3516	3534

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	12,100	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	14,800	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	16,700	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	19,000	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	22,500	4	12,700

Fresas para rosca UNC com chanfro

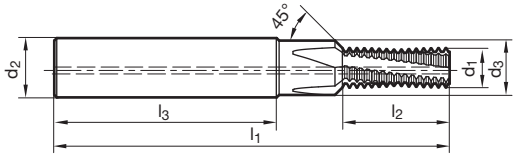
2xD

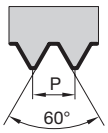
P	•
M	•
K	•
N	•
S	•
H	≤55

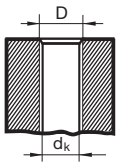
Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3517	3535

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	14,600	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	17,600	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	21,400	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	24,500	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	28,300	4	12,700

Fresas para rosca UNF sem chanfro

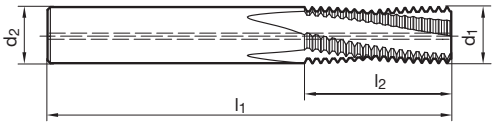
2xD

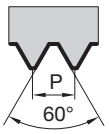
P	•
M	○
K	•
N	•
S	○
H	≤55

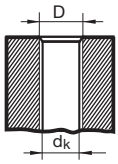
Página de dados de corte 468

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4136	4137

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 32	3,800	6,000	4,10	54,000	11,500	3	4,826
12 - 28	4,300	6,000	4,60	54,000	12,200	3	5,486
1/4 - 28	5,100	6,000	5,50	54,000	14,100	3	6,350
5/16 - 24	6,300	8,000	6,90	64,000	17,500	3	7,938
3/8 - 24	7,800	8,000	8,50	64,000	20,600	3	9,525
7/16 - 20	9,400	10,000	9,90	74,000	24,800	3	11,113
1/2 - 20	9,950	10,000	11,50	74,000	27,300	4	12,700
9/16 - 18	11,400	12,000	12,90	90,000	30,300	4	14,288
5/8 - 18	12,700	14,000	14,50	90,000	33,200	4	15,875

Fresas para rosca UNF com chanfro

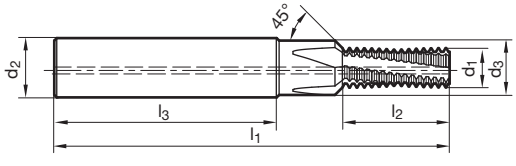


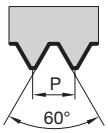
P	•
M	•
K	•
N	•
S	•
H	≤55

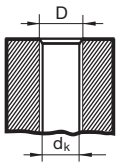
Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3518	3536

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	11,300	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	13,200	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	16,400	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	18,400	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	21,000	4	12,700

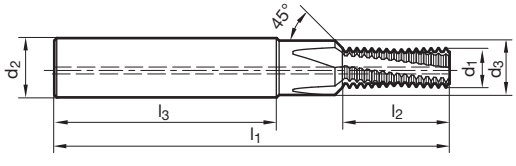
Fresas para rosca UNF com chanfro

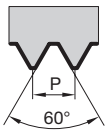
2xD

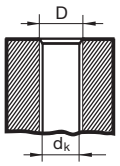
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3519	3537

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	14,100	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	17,500	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	20,600	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	24,800	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	27,300	4	12,700

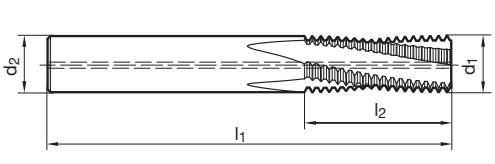
Fresas para rosca gás Whitworth sem chanfro

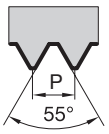
2xD

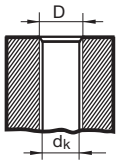
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 468

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3745	3748

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	21,300	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	28,700	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	35,400	4	16,662

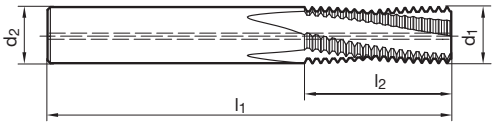
Fresas para rosca gás Whitworth sem chanfro

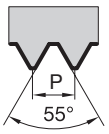
2,5xD

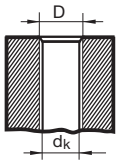
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 468

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3746	3750

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	24,900	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	35,400	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	43,500	4	16,662

Fresas para rosca gás Whitworth com chanfro

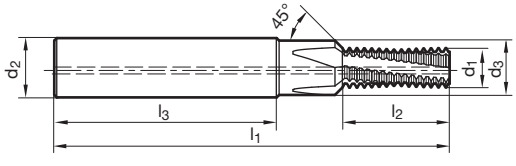


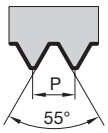
P	•
M	•
K	•
N	•
S	•
H	≤55

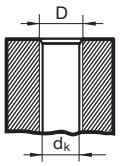
Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3514	3529

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	15,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	22,100	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	27,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

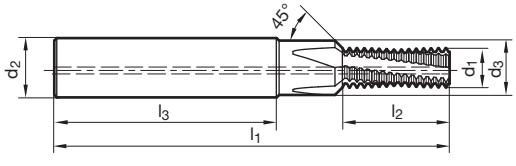
2xD

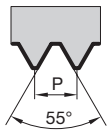
P	•
M	•
K	•
N	•
S	•
H	≤55

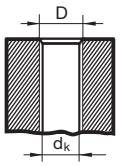
Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3515	3533

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	21,300	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	28,700	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	35,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

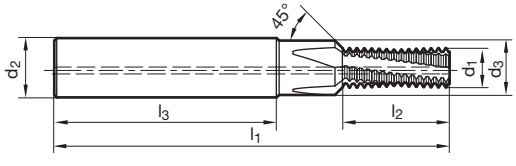
2,5xD

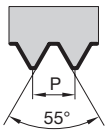
P	•
M	•
K	•
N	•
S	•
H	≤55

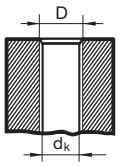
Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3765	3766

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	24,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	35,400	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	43,500	4	16,662

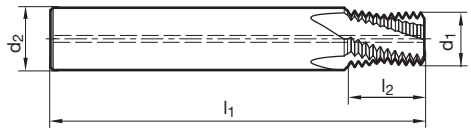
Fresas para rosca NPT sem chanfro

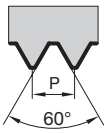
Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

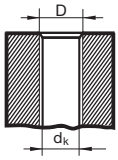
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 468











Norma da emp.	Nr. do artigo	3753	3754

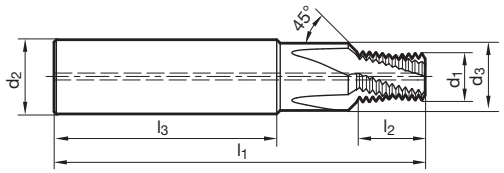
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

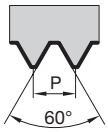
Fresas para rosca NPT com chanfro

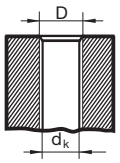
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3520	3538

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

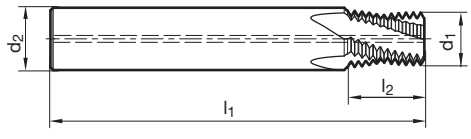
Fresas para rosca NPTF sem chanfro

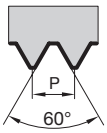
Material de corte		MD int.	
Superfície		C	C
Tipo		TM SP	TM SP
Refrigeração interna			
Forma da haste		HA	HB

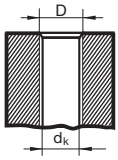
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 468











Norma da emp.	Nr. do artigo	3756	3757

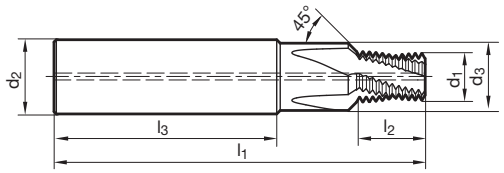
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

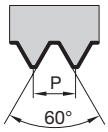
Fresas para rosca NPTF com chanfro

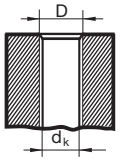
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 469

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3521	3539

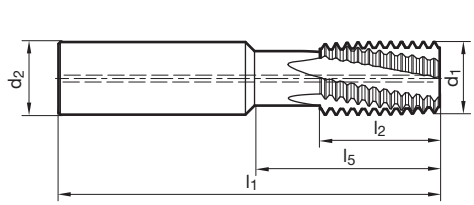
D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

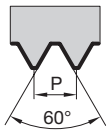
Fresas para roscas multiuso, para rosca métrica ISO

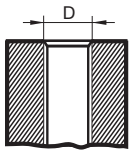
Material de corte	MD int.		
Superfície	C	C	◯
Tipo	TMU SP	TMU SP	TMU SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 470









Norma da emp.	Nr. do artigo	3541	3556	3523

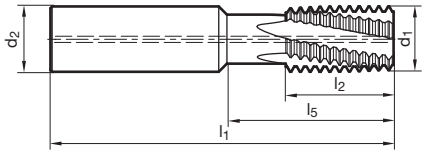
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 10	7,950	8,000	64,000		20,000	4	8,050
1,000	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,100
1,250	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,125
1,500	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,150
1,000	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,150
1,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,100
1,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,200
3,000	≥ 24	17,950	18,000	102,000	50,000	33,000	5	18,300
1,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,100
1,500	≥ 26	19,950	20,000	105,000	50,000	33,000	5	20,150
2,000	≥ 27	19,950	20,000	105,000	50,000	33,000	5	20,200
2,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,250
3,000	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,300
3,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,350

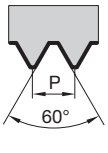
Fresamento externo de roscas

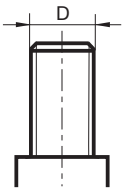
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 470

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	4162	4163

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 3	9,950	10,000	70,000	25,000	16,000	4	10,050
0,750	≥ 5	9,950	10,000	70,000	25,000	16,000	4	10,075
1,000	≥ 6	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 8	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 10	11,950	12,000	80,000	31,000	20,000	4	12,150
1,500	≥ 10	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 14	15,950	16,000	90,000	40,000	25,000	5	16,200
2,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,250
3,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,300

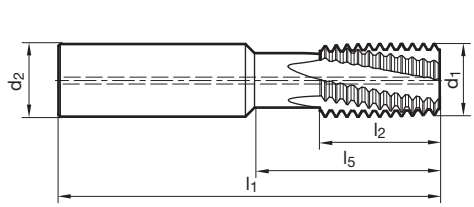
Fresas para roscas multiuso, para rosca UN

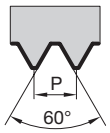
Material de corte	MD int.	
Superfície	C	C
Tipo	TMU UN	TMU UN
Refrigeração interna		
Forma da haste	HA	HB

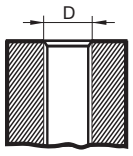
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 470











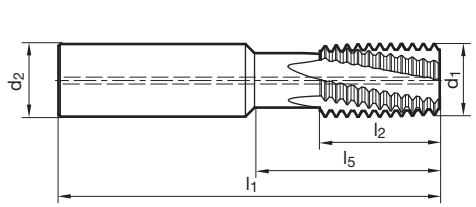
Norma da emp.	Nr. do artigo	3595	3596

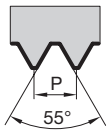
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
10,000	≥ 3/4	11,950	12,000	80,000	31,000	20,000	4	12,100
16,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,160
18,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,180
20,000	≥ 11/16	11,950	12,000	80,000	31,000	20,000	4	12,200
24,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,240
12,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,120
14,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,140
16,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,160
18,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,180
20,000	≥ 13/16	15,950	16,000	90,000	40,000	25,000	5	16,200
7,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,070
8,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,080
12,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,120
14,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,140
16,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,160

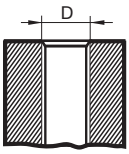
Fresas para roscas multiuso, para rosca gás Whitworth

P	•	Página de dados de corte 470
M	•	
K	•	
N	•	
S	•	
H	≤55	

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TM SP	TM SP	TM SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	









Norma da emp.	Nr. do artigo	3542	3557	3524

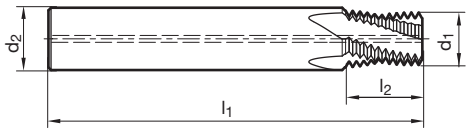
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
19,000	≥ 1/4	9,950	10,000	70,000	25,000	16,000	4	10,190
14,000	≥ 1/2	15,950	16,000	90,000	40,000	25,000	5	16,140
11,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,110

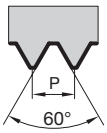
Fresas para roscas multiuso, para rosca NPT

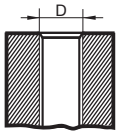
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 470

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3768	3769

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

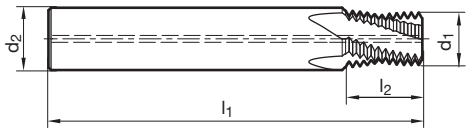
Fresas para roscas multiuso, para rosca NPTF

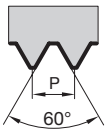
P	•
M	•
K	•
N	•
S	•
H	≤55

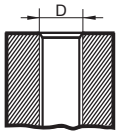
Página de dados de corte 470

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3772	3773

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

Micro-fresas de rosquear

3xD

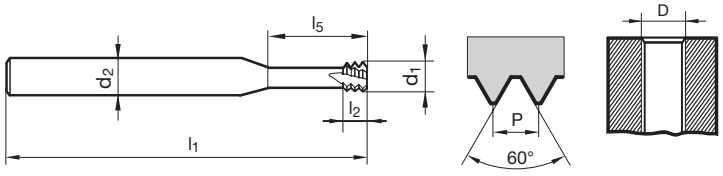
P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 470

Material de corte	**MD int.**
Superfície	C
Tipo	SP M
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4226**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,6	0,350	1,200	3,000	39,000	1,100	4,800	3	1,600
M1,8	0,350	1,400	3,000	39,000	1,100	5,400	3	1,800
M2	0,400	1,550	3,000	39,000	1,200	6,000	4	2,000
M2,5	0,450	1,950	3,000	39,000	1,400	7,500	4	2,500
M3	0,500	2,400	6,000	58,000	1,500	9,500	4	3,000
M3,5	0,600	2,800	6,000	58,000	1,800	11,000	4	3,500
M4	0,700	3,200	6,000	58,000	2,100	12,500	4	4,000
M5	0,800	4,000	6,000	58,000	2,400	16,000	4	5,000
M6	1,000	4,800	6,000	58,000	3,000	20,000	4	6,000
M8	1,250	5,950	6,000	58,000	3,800	24,000	4	8,000
M10	1,500	7,800	8,000	73,000	4,500	33,000	4	10,000
M12	1,750	9,000	10,000	84,000	5,300	38,000	4	12,000
M16	2,000	11,800	10,000	84,000	6,000	35,000	5	16,000

Micro-fresas de rosquear

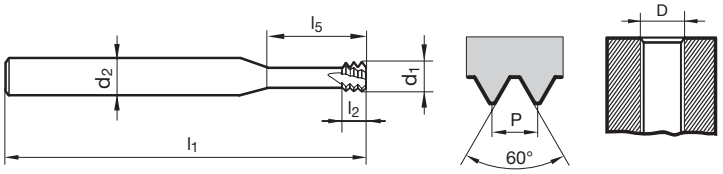
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 470

Material de corte	**MD int.**
Superfície	C
Tipo	SP G
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4228**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	6,200	8,000	64,000	2,700	19,500	4	9,728
G3/8	19,000	9,950	10,000	73,000	4,000	25,000	4	16,662
G7/8	14,000	11,950	12,000	84,000	5,400	37,000	4	30,201
G2	11,000	15,950	16,000	105,000	6,900	44,000	5	59,614

Micro-fresas de rosquear

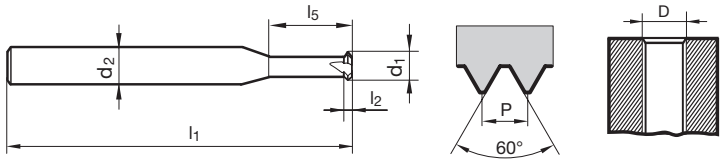
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 470

Material de corte	**MD int.**
Superfície	C
Tipo	SP M/MF
Rôscas	1,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4225**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,4 - M1,8	0,350	1,050	3,000	39,000	0,400	3,800	3	1,800
M2 - M2,4	0,400	1,500	3,000	39,000	0,400	7,000	3	2,400
M2,5 - M3	0,500	2,000	3,000	39,000	0,500	9,000	4	3,000
M3,5 - M4,5	0,750	2,800	6,000	58,000	0,800	14,000	4	4,500
M5 - M7	1,000	4,000	6,000	58,000	1,000	19,000	4	7,000
M8 - M10	1,500	6,400	8,000	64,000	1,500	24,000	5	10,000

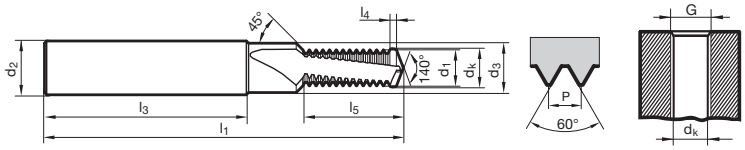
Fresas para roscas, para rosca métrica ISO

1,5xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 471

Material de corte	MD int.			
Superfície	◯	◯	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna	✕	≡	✕	≡
Forma da haste	HA	HA	HA	HA





Norma da emp.	Nr. do artigo	3774	3775	3776	3777

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,400	6,000	3,400	2,50	48,000	36,000	0,500	5,500	2	3,000
M4	0,700	3,200	6,000	4,500	3,30	48,000	36,000	0,700	6,900	2	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	0,800	8,800	2	5,000
M6	1,000	4,750	8,000	6,600	5,00	62,000	36,000	1,000	10,900	2	6,000
M8	1,250	6,350	10,000	9,000	6,80	74,000	40,000	1,250	13,700	2	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	1,500	18,000	2	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	1,500	20,900	2	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	1,500	23,700	2	14,000
M16	2,000	13,200	18,000	17,500	14,00	102,000	48,000	1,500	26,000	2	16,000

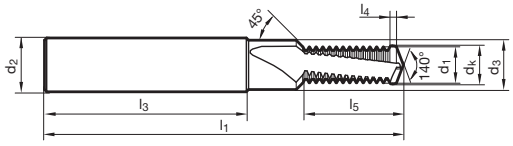
Fresas para roscas, para rosca métrica ISO

2xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 471

Material de corte	MD int.			
Superfície	◯	◯	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna	✕	≡	✕	≡
Forma da haste	HA	HA	HA	HA





Norma da emp.	Nr. do artigo	3778	3779	3780	3781

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,400	6,000	3,400	2,50	48,000	36,000	0,500	7,000	2	3,000
M4	0,700	3,200	6,000	4,500	3,30	48,000	36,000	0,700	9,000	2	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	0,800	11,200	2	5,000
M6	1,000	4,750	8,000	6,600	5,00	62,000	36,000	1,000	13,900	2	6,000
M8	1,250	6,350	10,000	9,000	6,80	74,000	40,000	1,250	18,700	2	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	1,500	22,500	2	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	1,500	26,100	2	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	1,500	31,700	2	14,000
M16	2,000	13,200	18,000	17,500	14,00	102,000	48,000	1,500	36,000	2	16,000

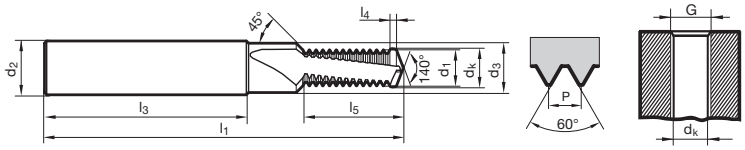
Fresas para roscas, para rosca métrica ISO

2,5xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 471

Material de corte	MD int.			
Superfície	○	○	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna	✕	≡	✕	≡
Forma da haste	HA	HA	HA	HA





Norma da emp.	Nr. do artigo	3782	3783	3784	3785

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,400	6,000	3,400	2,500	48,000	36,000	0,500	8,500	2	3,000
M4	0,700	3,200	6,000	4,500	3,300	48,000	36,000	0,700	11,100	2	4,000
M5	0,800	4,000	6,000	5,500	4,200	54,000	36,000	0,800	13,600	2	5,000
M6	1,000	4,750	8,000	6,600	5,000	62,000	36,000	1,000	16,900	2	6,000
M8	1,250	6,350	10,000	9,000	6,800	74,000	40,000	1,250	22,500	2	8,000
M10	1,500	7,950	12,000	11,000	8,500	80,000	45,000	1,500	27,000	2	10,000
M12	1,750	9,950	14,000	13,500	10,200	90,000	45,000	1,500	31,400	2	12,000
M14	2,000	11,200	16,000	15,500	12,000	102,000	48,000	1,500	39,700	2	14,000
M16	2,000	13,200	18,000	17,500	14,000	102,000	48,000	1,500	46,000	2	16,000

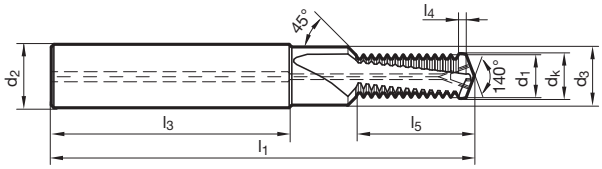
Fresas para roscas, para rosca métrica fina ISO

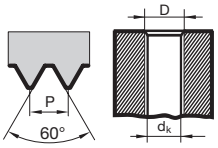
1,5xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 471

Material de corte	MD int.		
Superfície	◯	C	C
Tipo	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna			
Forma da haste	HA	HA	HA







Norma da emp. Nr. do artigo **3787** **3788** **3789**

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,200	6,000	4,500	3,500	48,000	36,000	0,500	6,600	2	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,500	54,000	36,000	0,500	8,300	2	5,003
M 6 X0,75	0,750	4,750	8,000	6,600	5,200	62,000	36,000	0,750	9,900	2	6,004
M8 x 0,75	0,750	6,350	10,000	9,000	7,200	74,000	40,000	0,750	14,100	2	8,004
M8 x 1	1,000	6,350	10,000	9,000	7,000	74,000	40,000	1,000	14,300	2	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,000	80,000	45,000	1,000	16,600	2	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,800	80,000	45,000	1,250	16,600	2	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,000	90,000	45,000	1,000	20,000	2	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,500	90,000	45,000	1,500	21,400	2	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,500	102,000	48,000	1,500	23,300	2	14,007
M16 x 1,5	1,500	13,200	18,000	17,500	14,500	102,000	48,000	1,500	26,600	2	16,007

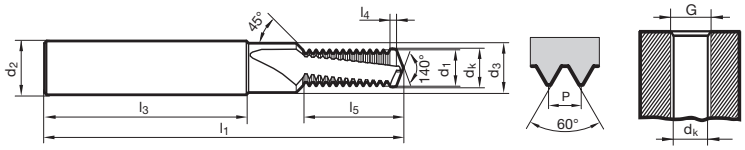
Fresas para roscas, para rosca métrica fina ISO

2xD

P	
M	
K	○
N	●
S	
H	

Página de dados de corte 471

Material de corte	MD int.			
Superfície	◯	◯	Ⓒ	Ⓒ
Tipo	DTMC SP	DTMC SP	DTMC SP	DTMC SP
Refrigeração interna	✕	≡	✕	≡
Forma da haste	HA	HA	HA	HA





Norma da emp.	Nr. do artigo	3790	3791	3792	3793

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,200	6,000	4,500	3,500	48,000	36,000	0,500	8,600	2	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,500	54,000	36,000	0,500	10,800	2	5,003
M 6 X0,75	0,750	4,750	8,000	6,600	5,200	62,000	36,000	0,750	12,900	2	6,004
M8 x 0,75	0,750	6,350	10,000	9,000	7,200	74,000	40,000	0,750	17,100	2	8,004
M8 x 1	1,000	6,350	10,000	9,000	7,000	74,000	40,000	1,000	17,300	2	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,000	80,000	45,000	1,000	21,600	2	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,800	80,000	45,000	1,250	21,600	2	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,000	90,000	45,000	1,000	26,000	2	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,500	90,000	45,000	1,500	27,400	2	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,500	102,000	48,000	1,500	30,800	2	14,007
M16 x 1,5	1,500	13,200	18,000	17,500	14,500	102,000	48,000	1,500	34,100	2	16,007

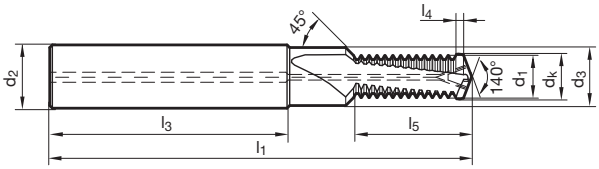
Fresas para roscas, para rosca UNC

2xD

P	
M	
K	•
N	•
S	
H	

Página de dados de corte 471

Material de corte	MD int.	
Superfície	◯	Ⓒ
Tipo	DTMC SP	DTMC SP
Refrigeração interna	✕	
Forma da haste	HA	HA





Norma da emp.	Nr. do artigo	4138	4139

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	20,000	5,000	8,000	6,600	5,100	62,000	36,000	1,300	14,900	2	6,350
5/16 - 18	18,000	6,250	10,000	9,000	6,600	74,000	40,000	1,500	18,100	2	7,938
3/8 - 16	16,000	7,500	12,000	11,000	8,000	80,000	45,000	1,500	22,100	2	9,525
7/16 - 14	14,000	8,800	12,000	11,000	9,400	80,000	45,000	1,500	25,000	2	11,113
1/2 - 13	13,000	10,200	14,000	13,500	10,800	90,000	45,000	1,500	26,900	2	12,700
9/16 - 12	12,000	11,600	16,000	15,500	12,200	102,000	48,000	1,500	31,200	2	14,288
5/8 - 11	11,000	13,000	18,000	17,500	13,500	102,000	48,000	1,500	36,300	2	15,875

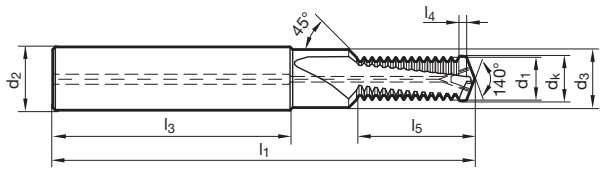
Fresas para roscas, para rosca UNF

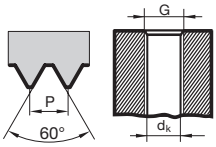
2xD

P	
M	
K	•
N	•
S	
H	

Página de dados de corte 471

Material de corte	MD int.	
Superfície	◯	C
Tipo	DTMC SP	DTMC SP
Refrigeração interna		
Forma da haste	HA	HA









Norma da emp.	Nr. do artigo	4140	4141

D	P	d1	d2	d3	dk	l1	l3	l4	l5	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	28,000	5,000	8,000	6,600	5,500	62,000	36,000	1,000	12,800	2	6,350
5/16 - 24	24,000	6,250	10,000	9,000	6,900	74,000	40,000	1,100	18,200	2	7,938
3/8 - 24	24,000	7,950	12,000	11,000	8,500	80,000	45,000	1,100	20,600	2	9,525
7/16 - 20	20,000	9,500	12,000	11,000	9,900	80,000	45,000	1,300	24,700	2	11,113
1/2 - 20	20,000	10,200	14,000	13,500	11,500	90,000	45,000	1,300	27,500	2	12,700
9/16 - 18	18,000	11,600	16,000	15,500	12,900	102,000	48,000	1,500	30,600	2	14,288
5/8 - 18	18,000	13,000	18,000	17,500	14,500	102,000	48,000	1,500	33,700	2	15,875



TITÂNIO

Ligas especiais altamente resistentes ao calor,
à base de níquel, ferro e cobalto, titânio e suas ligas

S



LIGAS ESPECIAS, SUPER, DE TITÂNIO

S TITÂNIO, LIGAS ESPECIAIS

titânio

níquel

M

ISO 2/6H

No 1
M3 - M16
Nr. do art. 2901
a partir d. pág. 602

No 1
M3 - M16
Nr. do art. 2909
a partir d. pág. 604

No 1
M3 - M16
Nr. do art. 2916
a partir d. pág. 602

No 1
M3 - M16
Nr. do art. 2920
a partir d. pág. 604

ISO 3/6G

MF

ISO 2/6H

No 1
M3x0,35 - M10x1,25
Nr. do art. 2903
a partir d. pág. 606

No 1
M3x0,35 - M10x1,25
Nr. do art. 2910
a partir d. pág. 608

No 1
M3x0,35 - M10x1,25
Nr. do art. 2917
a partir d. pág. 606

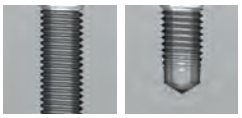
No 1
M3x0,35 - M10x1,25
Nr. do art. 2921
a partir d. pág. 608

ISO 3/6G

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2B	2B	-



ATRAVÉS FUROS
CEGO FUROS

No 1
Nr. 6 - 3/8
Nr. do art. 2905
a partir d. pág. 610



Através furos
HSS-E-PM, TiCN, forma B

No 1
Nr. 4 - 5/8
Nr. do art. 2912
a partir d. pág. 612

No 1
Nr. 4 - 5/8
Nr. do art. 2914
a partir d. pág. 617



Cego furos
HSS-E-PM, TiCN, forma C

No 1
Nr. 6 - 3/8
Nr. do art. 2918
a partir d. pág. 610

No 1
Nr. 6 - 3/8
Nr. do art. 2919
a partir d. pág. 614



Através furos
HSS-E-PM, TiAlN, forma B

No 1
Nr. 4 - 5/8
Nr. do art. 2922
a partir d. pág. 612

No 1
Nr. 4 - 5/8
Nr. do art. 2923
a partir d. pág. 616



Cego furos
HSS-E-PM, TiAlN, forma C

S TITÂNIO, LIGAS ESPECIAIS

com refrigeração interna

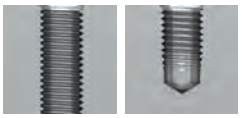
com canais de refrigeração

M		MF	
6HX	6GX	6HX	6GX
No 1 M3 - M20 Nr. do art. 1270/1271 a partir d. pág. 623	No 1 M5 - M10 Nr. do art. 1713 a partir d. pág. 624	No 1 M8x1 - M24x1,5 Nr. do art. 1272/1273 a partir d. pág. 632	No 1 M8x1 - M24x1,5 Nr. do art. 1715/1716 a partir d. pág. 633
No 1 M3 - M20 Nr. do art. 1725/1727 a partir d. pág. 623	No 1 M3 - M20 Nr. do art. 1726/1728 a partir d. pág. 625	No 1 M8x1 - M24x1,5 Nr. do art. 1729/1731 a partir d. pág. 632	No 1 M8x1 - M24x1,5 Nr. do art. 1730/1732 a partir d. pág. 633
No 1 M3 - M20 Nr. do art. 1972/1931 a partir d. pág. 627		No 1 M10x1 - M24x1,5 Nr. do art. 1581 a partir d. pág. 635	
M3 - M20 Nr. do art. 1266/1267 a partir d. pág. 621		M8x1 - M24x2 Nr. do art. 1268/1269 a partir d. pág. 630	

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2BX	2BX	-



ATRAVÉS FUROS
CEGO FUROS

FORMA C



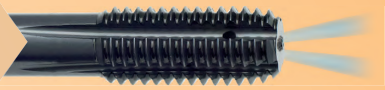
HSS-E-PM, TiCN, forma C

FORMA E



HSS-E-PM, TiN, forma E

METAL DURO



Metal duro, TiCN, forma C



HSS-E, TiN, forma C

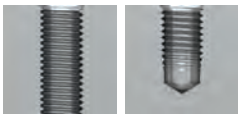
S TITÂNIO, LIGAS ESPECIAIS

	M UNIVERSAL	MF UNIVERSAL
1,5xD	No 1 M3 - M20 Nr. do art. 3525 a partir d. pág. 643	No 1 M4x0,5 - M16x1,5 Nr. do art. 3527 a partir d. pág. 646
2xD	No 1 M3 - M20 Nr. do art. 3526 a partir d. pág. 644	No 1 M4x0,5 - M16x1,5 Nr. do art. 3528 a partir d. pág. 647
2,5xD	No 1 M3 - M20 Nr. do art. 3759 a partir d. pág. 645	No 1 M4x0,5 - M16x1,5 Nr. do art. 3762 a partir d. pág. 648
3xD	No 1 M1,6 - M16 Nr. do art. 4226 a partir d. pág. 637	
universal	No 1 Ø8xP0,5 - Ø30xP3,5 Nr. do art. 3541 a partir d. pág. 664	No 1 Ø8xP0,5 - Ø30xP3,5 Nr. do art. 3541 a partir d. pág. 664

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
UNIVERSAL	UNIVERSAL	-



A T R A V É S F U R O S
C E G O F U R O S

ATRAVÉS FUROS

UNC	UNF	G	
No 1 1/4 - 1/2 Nr. do art. 3516 a partir d. pág. 650	No 1 1/4 - 1/2 Nr. do art. 3518 a partir d. pág. 653	No 1 1/8 - 3/8 Nr. do art. 3514 a partir d. pág. 657	 Metal duro, TiCN
No 1 1/4 - 1/2 Nr. do art. 3517 a partir d. pág. 651	No 1 1/4 - 1/2 Nr. do art. 3519 a partir d. pág. 654	No 1 1/8 - 3/8 Nr. do art. 3515 a partir d. pág. 658	 Metal duro, TiCN
			 Metal duro, TiCN
			 Metal duro, TiCN
No 1 Ø10xUN24 - Ø20xUN16 Nr. do art. 3595 a partir d. pág. 666	No 1 Ø10xUN24 - Ø20xUN16 Nr. do art. 3595 a partir d. pág. 666	No 1 Ø10xG19 - Ø20xG11 Nr. do art. 3542 a partir d. pág. 667	 Metal duro, TiCN

S

LIGAS ESPECIAS, SUPER, DE TITÂNIO



ATRAVÉS
FUROS

Profundidade de rosca		≤3xD	
Material de corte		HSS-E-PM	
Tipo/forma		TiNi/B	TiNi/B
Superfície		C	A
Fornecimento de refrigeração		☒	☒
Tolerância do cone		h9	h9
			
Tipo da rôsca	**Tolerância**	**No. Artigo / página**	
M	4H		
	6H		
	6HX	2901 602	2916 602
	6GX		
MF	6H		
	6HX	2903 606	2917 606
	6GX		
UNC	2B		
	2BX	2905 610	2918 610
UNF	2B		
	2BX		2919 614
G			
BSW			
NPT			
NPTF			
EG M	6H Mod.		
MJ	4HX	1057 603	
MJF	4HX	1058 607	
UNJC	3BX	1059 611	
UNJF	3BX	1060 615	
PG			
Lubrificante adequado		○/●/△	○/●/△

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min	
S	Titânio e ligas de titânio	≤ 1200 N/mm²	Titânio	3.7025	4	4
			TiAl5Sn2	3.7115		
			TiAl6V4	3.7165		
	Níquel, cobalto, ligas de ferro	≤ 1400 N/mm²	Hastelloy C4	2.4610	4	4
			Inconel 718	2.4668		
			Nimonic 105	2.4634		

S

LIGAS ESPECIAS, SUPER, DE TITÂNIO



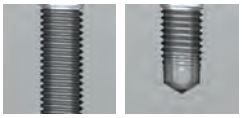
CEGO
FUROS

	Profundidade de rosca		≤3xD	
	Material de corte		HSS-E-PM	
	Tipo/forma		Ti R15/C	Ni R10/C (K)
	Superfície		C	A
	Fornecimento de refrigeração		☒	☒
	Tolerância do cone		h9	h9
				
	Tipo da rôsca	**Tolerância**	**No. Artigo / página**	
	M	4H		
		6H		
		6HX	2909 604	2920 604
		6G		
	MF	6H		
		6HX	2910 608	2921 608
		6G		
	UNC	2B		
		2BX	2912 612	2922 612
	UNF	2B		
		2BX	2914 617	2923 616
	G			
	BSW			
	NPT			
	NPTF			
	EG M	6H Mod.		
	MJ	4HX	1061 605	1065 605
	MJF	4HX	1062 609	1066 609
	UNJC	3BX	1063 613	1067 613
	UNJF	3BX	1064 618	1068 618
	PG			
	Lubrificante adequado		○/●/△	○/●/△

Especial-, super e Ligas-Ti

	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min	
S	Titânio e ligas de titânio	≤ 1200 N/mm²	Titânio TiAl5Sn2 TiAl6V4	3.7025 3.7115 3.7165	4	-
	Níquel, cobalto, ligas de ferro	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	-	4

LIGAS ESPECIAS, SUPER, DE TITÂNIO



ATRAVÉS FUROS E
CEGO FUROS

Profundidade de rosca		≤3xD			
Material de corte		HSS-E-PM			
Tipo/forma		N/C	N/C	N/C	N/C
Superfície		S	S	S	S
Fornecimento de refrigeração		☒	☒	Radial	Axial
Tolerância do cone		h9	h9	h9	h9
					
Tipo da rôsca	**Tolerância**	**No. Artigo / página**			
M	4H				
	6H				
	6HX	322/339 620	1266/1267 621	323/342 622	4143 626
	6GX				
MF	6H				
	6HX	333 629	1268/1269 630	338 631	4145 634
	6GX				
UNC	2B				
	2BX				
UNF	2B				
	2BX				
G					
BSW					
NPT					
NPTF					
EG M	6H Mod.				
MJ	4HX				
MJF	4HX				
UNJC	3BX				
UNJF	3BX				
PG					
Lubrificante adequado		●/●/△	●/●/△	●/●/△/□	●/●/△

= No 1

○ = Ar
● = Óleo integral
● = Óleo Solúvel
△ = Colar
□ = Quantidade mínima de lubrificante (MQL)

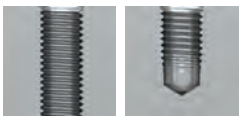
	Grupo de materiais	Resistência à tração	Exemplo de material	No. Material	Velocidade de corte recomendada vc m/min			
S	Titânio e ligas de titânio	≤ 1200 N/mm²	Titânio	3.7025	4	4	4	4
			TiAl5Sn2	3.7115				
			TiAl6V4	3.7165				
	Níquel, cobalto, ligas de ferro	≤ 1400 N/mm²	Hastelloy C4	2.4610	4	4	4	4
			Inconel 718	2.4668				
			Nimonic 105	2.4634				

≤3xD

HSS-E-PM			Metal duro	
N/C	N/C	N/E	N/C	N/E
C	A	S	C	C
Radial	Radial	Axial	Radial	Radial
h9	h9	h9	h6	h6
				
No. Artigo / página				
1270/1271 623	1717/1719 623	1725/1727 623	1972/1931 627	1927 628
1713 624	1718/1720 625	1726/1728 625		
1272/1273 632	1721/1723 632	1729/1731 632	1581 635	
1715/1716 633		1730/1732 633		
○/●/△/□	○/●/△/□	○/●/△	○/●/△/□	○/●/△/□

Velocidade de corte recomendada vc m/min				
4	4	4	10	10
4	4	4	10	10

LIGAS ESPECIAS, SUPER, DE TITÂNIO



ATRAVÉS FUROS E **CEGO** FUROS

	Profundidade de rosca	≤2xD				≤2,5xD		≤1,5xD	
	Material de corte		Metal duro						
	Tipo	TM SP	TM SP	TM SP	TM SP	TM SP	TM SP	TMC SP	TMC SP
	Superfície	C	C	C	C	C	C	C	C
	Fornecimento de refrigeração	☒	☒	Axial	Axial	Axial	Axial	Axial	Axial
	Forma da haste	HA	HB	HA	HB	HA	HB	HA	HA
	Espiral	27°	27°	27°	27°	27°	27°	10°	10°
									
	Tipo da rôsca		**No. Artigo / página**						
	M	4132 641	4133 641	3737 640	3743 640	3735 642	3740 642	3525 643	3543 643
	MF			3737 640	3743 640			3527 646	3545 646
	UNC			4134 649	4135 649			3516 650	3534 650
	UNF			4136 652	4137 652			3518 653	3536 653
	G			3745 655	3748 655	3746 656	3750 656	3514 657	3529 657
	BSW								
	NPT			3753 660	3754 660			3520 661	3538 661
	NPTF			3756 662	3757 662			3521 663	3539 663
	EG M	Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar							
	MJ								
	MJF								
	UNJC								
	UNJF								
	PG								
	Lubrificante adequado	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Dureza	Exemplo de material	No. Material	Recomendações de aplicação							
S	Titânio e ligas de titânio	≤ 1200 N/mm²	Titânio TiAl5Sn2 TiAl6V4	3.7025 3.7115 3.7165	+	+	+	+	+	+	++	++
	Níquel, cobalto, ligas de ferro	≤ 1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	+	+	+	+	+	+	++	++

≤2xD		≤2,5xD		universal				≤3xD	
Metal duro									
TMC SP	TMC SP	TMC SP	TMC SP	TMU SP	TMU SP	TMU SP	TMU SP	MTM 3 SP	MTM 1 SP
C	C	C	C	C	C	C	C	C	C
Axial	Axial	Axial	Axial	Axial	Axial	Axial	Axial	☒	☒
HA	HB	HA	HB	HA	HB	HA	HB	HA	HA
10°	10°	27°	27°	15°	15°	15°	15°	15°	15°
									
No. Artigo / página									
3526 644	3544 644	3759 645	3760 645	3541 664	3556 664	4162 665	4163 665	4226 637	4225 639
3528 647	3546 647	3762 648	3763 648	3541 664	3556 664	4162 665	4163 665		4225 639
3517 651	3535 651			3595 666	3596 666				
3519 654	3537 654			3595 666	3596 666				
3515 658	3533 658	3765 659	3766 659	3542 667	3557 667	3542 667	3557 667	4228 638	
				3768 668	3769 668				
				3772 669	3773 669				
Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar									
○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●	○/●

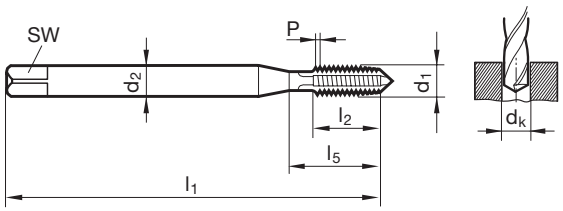
Recomendações de aplicação									
++	++	++	++	++	++	++	++	++	++
++	++	++	++	++	++	++	++	++	++

Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	A
Tipo	TiNi	TiNi
Forma	B	B
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 596





DIN 2184-1 DIN 371/DIN 376 — Nr. do artigo **2901** **2916**

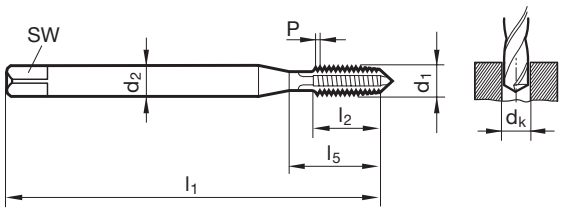
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Machos para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	4HX
Superfície	C
Tipo	TiNi
Forma	B
Refrigeração interna	

P	
M	
K	
N	
S	•
H	

Página de dados de corte 596





DIN 2184-1 DIN 371/DIN 376 Nr. do artigo **1057**

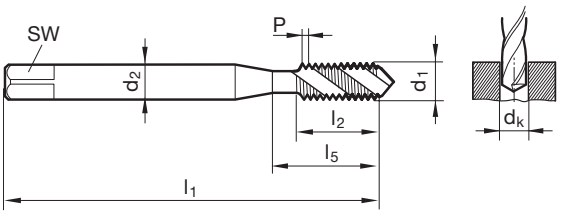
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
MJ3 x 0,5	0,500	3,500	2,700	2,60	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,40	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,30	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,10	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,90	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,60	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,40	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,20	110,000	26,000	54,000

Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	A
Tipo	Ti R15	Ni R10
Forma	C	C (K)
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597





DIN 2184-1 DIN 371/DIN 376 — Nr. do artigo **2909** **2920**

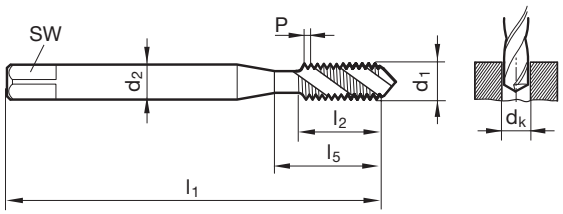
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Machos para rosca métrica ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	4HX	4HX
Superfície	C	A
Tipo	Ti R15	Ni R10
Forma	C	C (K)
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597





DIN 2184-1 DIN 371/DIN 376 — Nr. do artigo **1061** **1065**

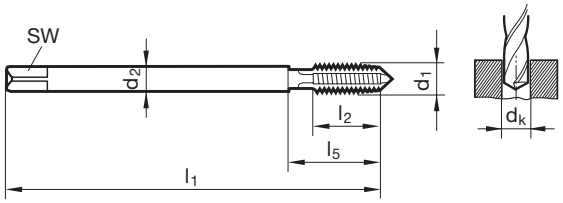
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
MJ3 x 0,5	0,500	3,500	2,700	2,60	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,40	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,30	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,10	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,90	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,60	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,40	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,20	110,000	26,000	54,000

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	A
Tipo	TiNi	TiNi
Forma	B	B
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 596





DIN 2184-1 DIN 371 — Nr. do artigo: **2903** | **2917**

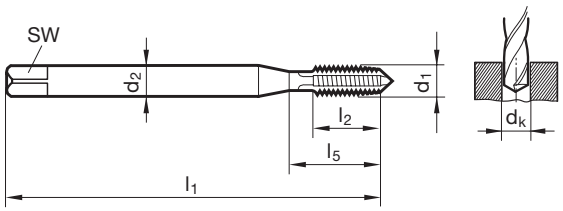
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M3 x 0,35	3,500	2,700	2,65	56,000	6,000	18,000	3,002
M4 x 0,5	4,500	3,400	3,50	63,000	7,500	21,000	4,003
M5 x 0,5	6,000	4,900	4,50	70,000	8,500	25,000	5,003
M6 x 0,5	6,000	4,900	5,50	80,000	11,000	30,000	6,003
M6 x 0,75	6,000	4,900	5,20	80,000	11,000	30,000	6,004
M8 x 0,5	8,000	6,200	7,50	80,000	14,000	30,000	8,003
M8 x 0,75	8,000	6,200	7,20	80,000	14,000	30,000	8,004
M8 x 1	8,000	6,200	7,00	90,000	14,000	35,000	8,005
M10 x 1	10,000	8,000	9,00	90,000	20,000	35,000	10,005
M10 x 1,25	10,000	8,000	8,80	100,000	20,000	39,000	10,006

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	4HX
Superfície	C
Tipo	TiNi
Forma	B
Refrigeração interna	

P	
M	
K	
N	
S	•
H	

Página de dados de corte 596





DIN 2184-1 DIN 371 Nr. do artigo **1058**

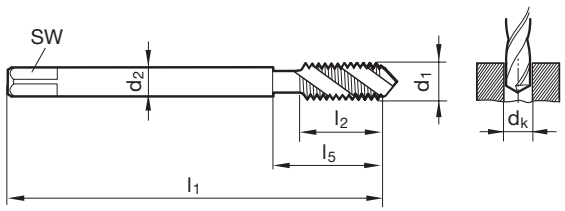
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
MJ6 x 0,5	6,000	4,900	5,60	80,000	11,000	30,000	6,003
MJ6 x 0,75	6,000	4,900	5,40	80,000	11,000	30,000	6,004
MJ8 x 1	8,000	6,200	7,10	90,000	14,000	35,000	8,005
MJ10 x 1	10,000	8,000	9,10	90,000	20,000	35,000	10,005
MJ10 x 1,25	10,000	8,000	8,90	100,000	20,000	39,000	10,006

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	6HX	6HX
Superfície	C	A
Tipo	Ti R15	Ni R10
Forma	C	C (K)
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597







DIN 2184-1 DIN 371 — Nr. do artigo **2910** **2921**

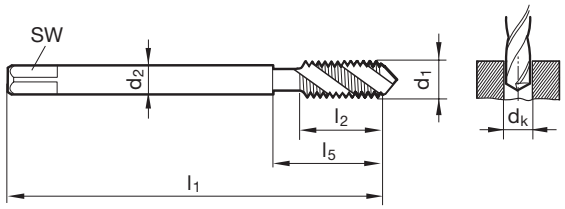
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M3 x 0,35	3,500	2,700	2,65	56,000	6,000	18,000	3,002
M4 x 0,5	4,500	3,400	3,50	63,000	7,500	21,000	4,003
M5 x 0,5	6,000	4,900	4,50	70,000	8,500	25,000	5,003
M6 x 0,5	6,000	4,900	5,50	80,000	11,000	30,000	6,003
M6 x 0,75	6,000	4,900	5,20	80,000	11,000	30,000	6,004
M8 x 0,5	8,000	6,200	7,50	80,000	14,000	30,000	8,003
M8 x 0,75	8,000	6,200	7,20	80,000	14,000	30,000	8,004
M8 x 1	8,000	6,200	7,00	90,000	14,000	35,000	8,005
M10 x 1	10,000	8,000	9,00	90,000	20,000	35,000	10,005
M10 x 1,25	10,000	8,000	8,80	100,000	20,000	39,000	10,006

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM	
Tolerância do Ø	4HX	4HX
Superfície	C	A
Tipo	Ti R15	Ni R10
Forma	C	C (K)
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597







DIN 2184-1 DIN 371 — Nr. do artigo **1062** **1066**

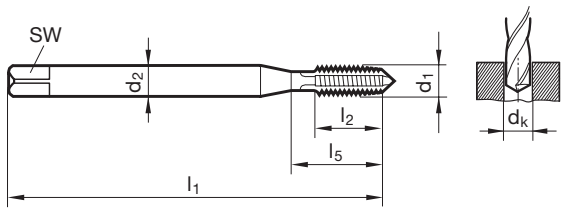
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
MJ6 x 0,5	6,000	4,900	5,60	80,000	11,000	30,000	6,003
MJ6 x 0,75	6,000	4,900	5,40	80,000	11,000	30,000	6,004
MJ8 x 0,5	8,000	6,200	7,60	80,000	14,000	30,000	8,003
MJ8 x 0,75	8,000	6,200	7,40	80,000	14,000	30,000	8,004
MJ8 x 1	8,000	6,200	7,10	90,000	14,000	35,000	8,005
MJ10 x 1	10,000	8,000	9,10	90,000	16,000	35,000	10,005
MJ10 x 1,25	10,000	8,000	8,90	100,000	16,000	39,000	10,006

Machos para rosca UNC

Material de corte	HSS-E-PM	
Tolerância do Ø	2BX	2BX
Superfície	C	A
Tipo	TiNi	TiNi
Forma	B	B
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 596





DIN 2184-1 ~DIN 371 — Nr. do artigo **2905** **2918**

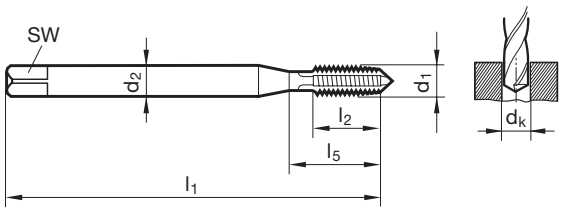
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
6 - 32	4,000	3,000	2,85	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525

Machos para rosca UNC

Material de corte	HSS-E-PM
Tolerância do Ø	3BX
Superfície	C
Tipo	TiNi
Forma	B
Refrigeração interna	

P	
M	
K	
N	
S	•
H	

Página de dados de corte 596





DIN 2184-1 ~DIN 371/~DIN 376 Nr. do artigo **1059**

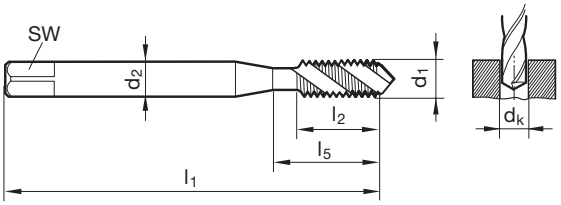
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
6 - 32	4,000	3,000	2,85	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525
7/16 - 14	8,000	6,200	9,40	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875

Machos para rosca UNC

Material de corte	HSS-E-PM	
Tolerância do Ø	2BX	2BX
Superfície	C	A
Tipo	Ti R15	Ni R10
Forma	C	C (K)
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597







DIN 2184-1 ~DIN 371/~DIN 376 — Nr. do artigo **2912** **2922**

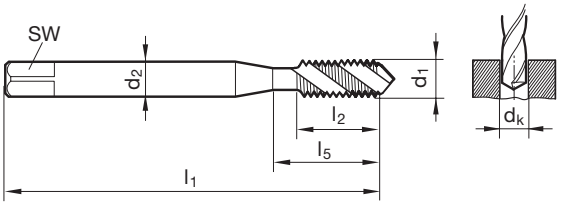
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 40	3,500	2,700	2,35	56,000	11,000	18,000	2,845
5 - 40	3,500	2,700	2,65	56,000	11,000	18,000	3,175
6 - 32	4,000	3,000	2,85	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525
7/16 - 14	8,000	6,200	9,40	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875

Machos para rosca UNC

Material de corte	HSS-E-PM	
Tolerância do Ø	3BX	3BX
Superfície	C	A
Tipo	Ti R15	Ni R10
Forma	C	C (K)
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597







DIN 2184-1 ~DIN 371/~DIN 376 — Nr. do artigo **1063** **1067**

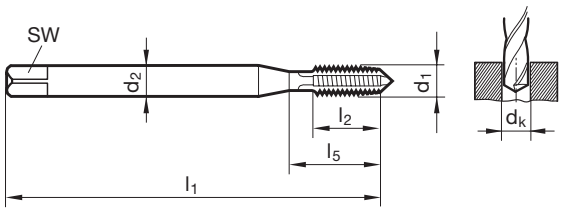
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
6 - 32	4,000	3,000	2,85	56,000	12,000	20,000	3,505
8 - 32	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 24	6,000	4,900	3,90	70,000	14,000	25,000	4,826
12 - 24	6,000	4,900	4,50	80,000	16,000	30,000	5,486
1/4 - 20	7,000	5,500	5,10	80,000	16,000	30,000	6,350
5/16 - 18	8,000	6,200	6,60	90,000	18,000	35,000	7,938
3/8 - 16	10,000	8,000	8,00	100,000	20,000	39,000	9,525
7/16 - 14	8,000	6,200	9,40	100,000	22,000	42,000	11,113
1/2 - 13	9,000	7,000	10,80	110,000	25,000	49,000	12,700
5/8 - 11	12,000	9,000	13,50	110,000	30,000	53,000	15,875

Machos para rosca UNF

Material de corte	HSS-E-PM
Tolerância do Ø	2BX
Superfície	A
Tipo	TiNi
Forma	B
Refrigeração interna	

P	
M	
K	
N	
S	•
H	

Página de dados de corte 596





DIN 2184-1 ~DIN 371 Nr. do artigo **2919**

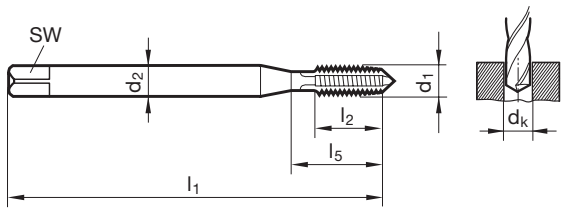
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
6 - 40	4,000	3,000	2,95	56,000	11,000	20,000	3,505
8 - 36	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,10	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	4,60	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,50	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	6,90	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	8,50	90,000	18,000	35,000	9,525

Machos para rosca UNF

Material de corte	HSS-E-PM
Tolerância do Ø	3BX
Superfície	C
Tipo	TiNi
Forma	B
Refrigeração interna	

P	
M	
K	
N	
S	•
H	

Página de dados de corte 596





DIN 2184-1 ~DIN 371/~DIN 374 — Nr. do artigo **1060**

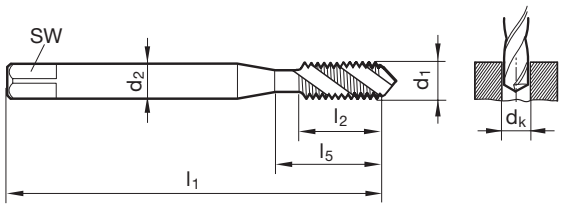
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
6 - 40	4,000	3,000	2,95	56,000	12,000	20,000	3,505
8 - 36	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,10	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	4,60	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,50	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	6,90	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	8,50	100,000	20,000	39,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	20,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000	15,875

Machos para rosca UNF

Material de corte	HSS-E-PM
Tolerância do Ø	2BX
Superfície	A
Tipo	Ni R10
Forma	C (K)
Refrigeração interna	

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597





DIN 2184-1 ~DIN 371/~DIN 374 Nr. do artigo **2923**

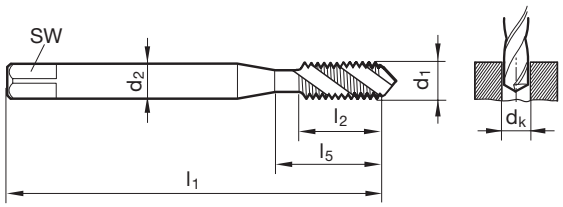
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 48	3,500	2,700	2,40	56,000	10,000	18,000	2,845
5 - 44	3,500	2,700	2,70	56,000	10,000	18,000	3,175
6 - 40	4,000	3,000	2,95	56,000	11,000	20,000	3,505
8 - 36	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,10	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	4,60	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,50	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	6,90	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	8,50	90,000	18,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	20,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000	15,875

Machos para rosca UNF

Material de corte	HSS-E-PM
Tolerância do Ø	2BX
Superfície	C
Tipo	Ti R15
Forma	C
Refrigeração interna	

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597





DIN 2184-1 ~DIN 371/~DIN 374 Nr. do artigo **2914**

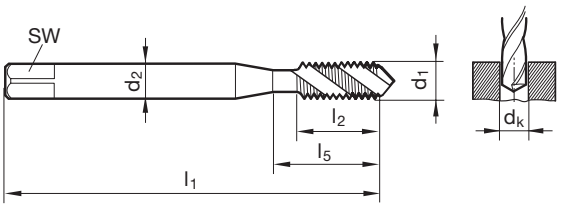
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
4 - 48	3,500	2,700	2,40	56,000	10,000	18,000	2,845
5 - 44	3,500	2,700	2,70	56,000	10,000	18,000	3,175
6 - 40	4,000	3,000	2,95	56,000	11,000	20,000	3,505
8 - 36	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,10	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	4,60	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,50	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	6,90	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	8,50	90,000	18,000	35,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	20,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000	15,875

Machos para rosca UNF

Material de corte	HSS-E-PM	
Tolerância do Ø	3BX	3BX
Superfície	C	A
Tipo	Ti R15	Ni R10
Forma	C	C (K)
Refrigeração interna		

P	
M	
K	
N	
S	•
H	

Página de dados de corte 597







DIN 2184-1 ~DIN 371/~DIN 374 — Nr. do artigo **1064** **1068**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
6 - 40	4,000	3,000	2,95	56,000	12,000	20,000	3,505
8 - 36	4,500	3,400	3,50	63,000	12,000	21,000	4,166
10 - 32	6,000	4,900	4,10	70,000	14,000	25,000	4,826
12 - 28	6,000	4,900	4,60	80,000	16,000	30,000	5,486
1/4 - 28	7,000	5,500	5,50	80,000	16,000	30,000	6,350
5/16 - 24	8,000	6,200	6,90	90,000	18,000	35,000	7,938
3/8 - 24	10,000	8,000	8,50	100,000	20,000	39,000	9,525
7/16 - 20	8,000	6,200	9,90	100,000	22,000	42,000	11,113
1/2 - 20	9,000	7,000	11,50	100,000	20,000	40,000	12,700
5/8 - 18	12,000	9,000	14,50	100,000	22,000	44,000	15,875



MACHOS LAMINA-DORES

S

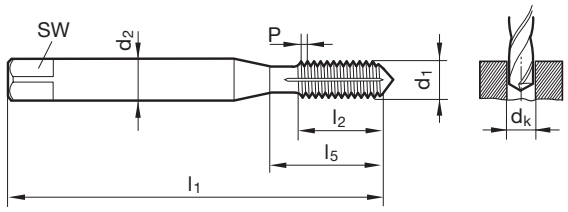
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

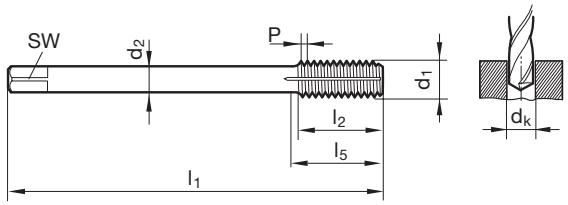
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 598

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **322**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **339**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

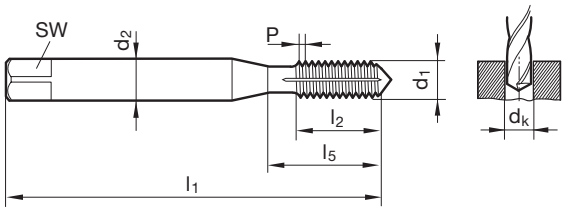
Machos laminadores para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

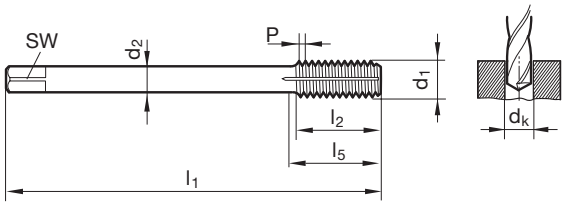
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 598

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **1266**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1267**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

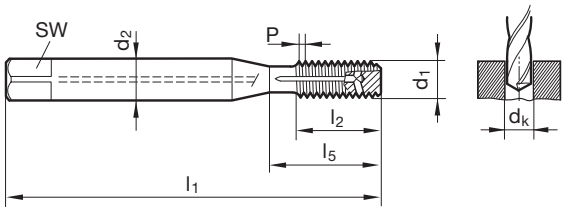
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

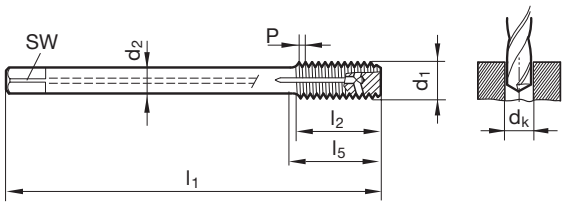
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 598

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 — Nr. do artigo **323**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **342**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000

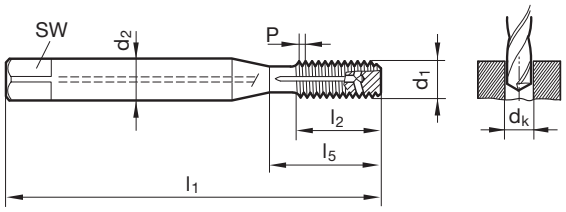
Machos laminadores para rosca métrica ISO com canais de refrigeração

P	•
M	•
K	
N	≥ 7
S	•
H	

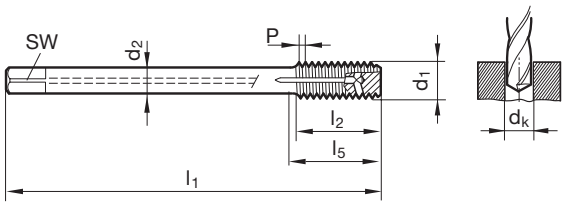
Página de dados de corte 599

Material de corte	HSS-E-PM		
Tolerância do Ø	6HX	6HX	6HX
Superfície	C	A	S
Tipo	N	N	N
Forma	C	C	E
Refrigeração interna			

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371	Nr. do artigo	1270	1717	1725

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376	Nr. do artigo	1271	1719	1727

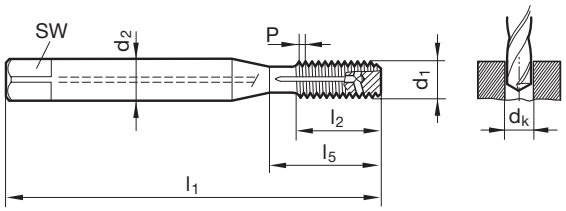
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	30,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6GX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 599





DIN 2174 ~DIN 371 Nr. do artigo **1713**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

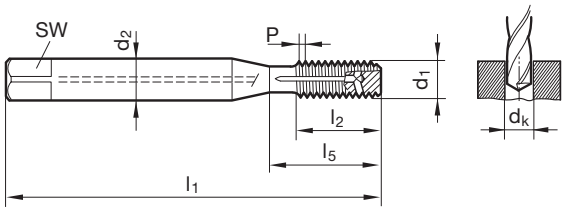
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	A	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

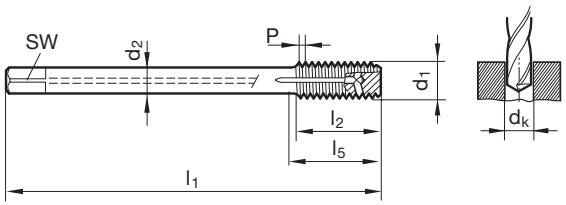
P	•
M	•
K	
N	
S	•
H	

Página de dados de corte 599

~ DIN 371



~ DIN 376







DIN 2174 ~DIN 371 — Nr. do artigo **1718** **1726**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

DIN 2174 ~DIN 376 — Nr. do artigo **1720** **1728**

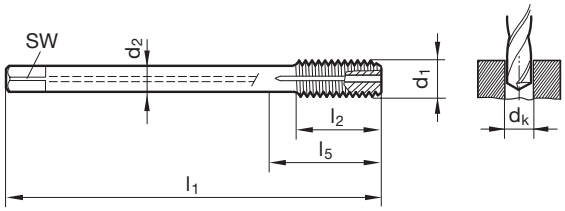
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 598





Norma da emp. Norma da emp. Nr. do artigo **4143**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	112,000	6,000	18,000
M4	0,700	2,800	2,100	3,70	112,000	7,500	77,000
M5	0,800	3,500	2,700	4,65	125,000	8,500	90,000
M6	1,000	4,500	3,400	5,55	125,000	11,000	90,000
M8	1,250	6,000	4,900	7,40	140,000	14,000	97,000
M10	1,500	7,000	5,500	9,30	160,000	16,000	117,000
M12	1,750	9,000	7,000	11,20	180,000	18,500	133,000
M16	2,000	12,000	9,000	15,10	220,000	20,000	168,000
M20	2,500	16,000	12,000	18,90	280,000	25,000	225,000

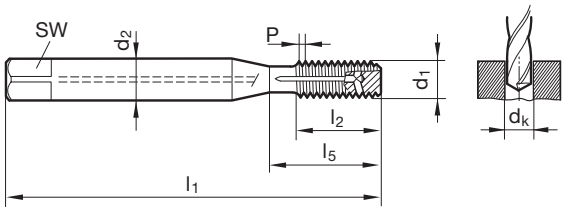
Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

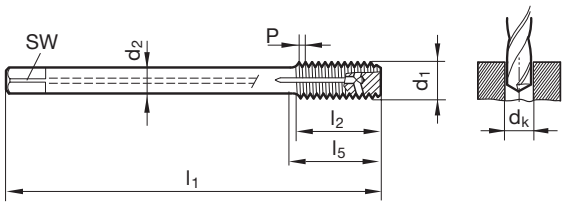
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 599

~ DIN 371



~ DIN 376





DIN 2174 ~DIN 371 Nr. do artigo **1972**

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

DIN 2174 ~DIN 376 Nr. do artigo **1931**

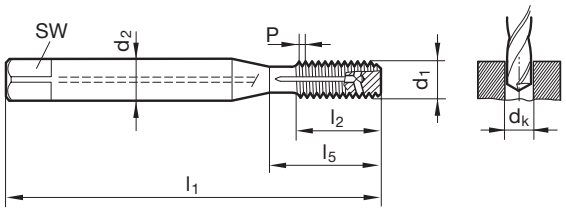
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	13,10	110,000	20,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	20,000	54,000
M18	2,500	14,000	11,000	16,90	125,000	25,000	62,000
M20	2,500	16,000	12,000	18,90	140,000	25,000	62,000

Machos laminadores para rosca métrica ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	E
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 599





DIN 2174 ~DIN 371 Nr. do artigo **1927**

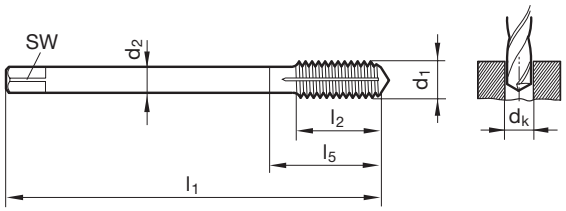
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 598





DIN 2174 ~DIN 374 — Nr. do artigo **333**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	11,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	16,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	16,000	44,000	20,007

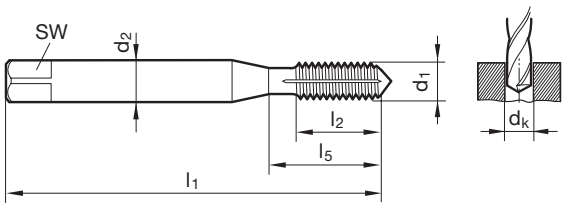
Machos laminadores para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

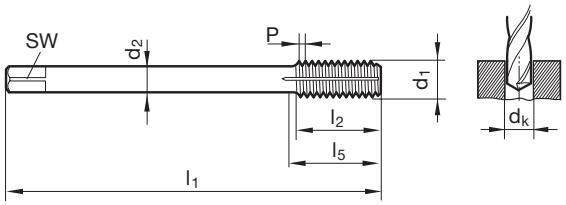
P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 598

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo **1268**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005

DIN 2174 ~DIN 374 — Nr. do artigo **1269**

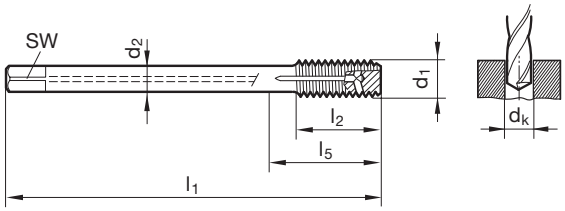
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 2	18,000	14,500	23,10	140,000	28,000	48,000	24,008

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 598





DIN 2174 ~DIN 374 — Nr. do artigo **338**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	90,000	11,000	35,000	8,005
M10 x 1	7,000	5,500	9,55	90,000	11,000	35,000	10,005
M12 x 1,5	9,000	7,000	11,30	100,000	16,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007

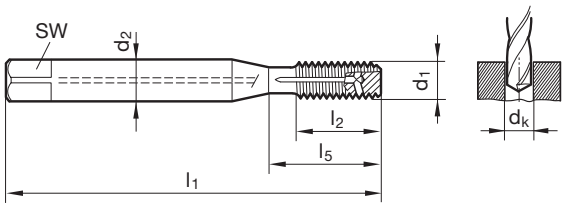
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM		
Tolerância do Ø	6HX	6HX	6HX
Superfície	C	A	S
Tipo	N	N	N
Forma	C	C	E
Refrigeração interna			

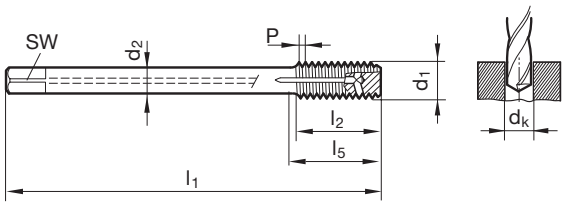
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 599

~ DIN 371



~ DIN 374





DIN 2174 ~DIN 371 — Nr. do artigo: **1272** | **1721** | **1729**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M9 x 1	9,000	7,000	8,55	90,000	16,000	35,000	9,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo: **1273** | **1723** | **1731**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,25	9,000	7,000	11,40	100,000	20,000	40,000	12,006
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	20,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	20,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1	16,000	12,000	19,55	125,000	25,000	44,000	20,005
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M22 x 1,5	18,000	14,500	21,30	125,000	25,000	44,000	22,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

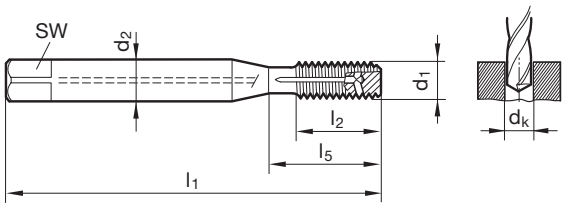
Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM	
Tolerância do Ø	6GX	6GX
Superfície	C	S
Tipo	N	N
Forma	C	E
Refrigeração interna		

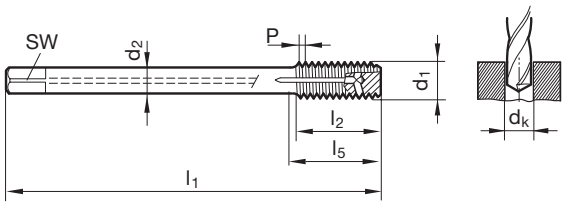
P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 599

~ DIN 371



~ DIN 374







DIN 2174 ~DIN 371 — Nr. do artigo **1715** **1730**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,55	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,55	90,000	16,000	35,000	10,005
M10 x 1,25	10,000	8,000	9,40	100,000	20,000	39,000	10,006

DIN 2174 ~DIN 374 — Nr. do artigo **1716** **1732**

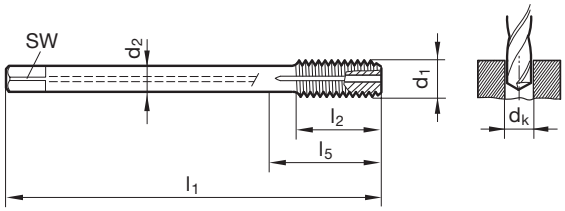
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M12 x 1	9,000	7,000	11,55	100,000	20,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	20,000	40,000	12,007
M14 x 1,5	11,000	9,000	13,30	100,000	20,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	22,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	25,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	25,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	28,000	48,000	24,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	S
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	○
S	○
H	

Página de dados de corte 598





Norma da emp. Norma da emp. Nr. do artigo **4145**

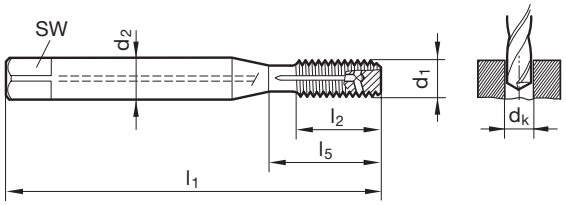
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	6,000	4,900	7,55	140,000	14,000	97,000	8,005
M10 x 1	7,000	5,500	9,55	160,000	16,000	117,000	10,005
M10 x 1,25	7,000	5,500	9,40	160,000	16,000	117,000	10,006
M12 x 1	9,000	7,000	11,55	180,000	18,500	133,000	12,005
M12 x 1,5	9,000	7,000	11,30	180,000	18,500	133,000	12,007
M14 x 1,5	11,000	9,000	13,30	220,000	20,000	168,000	14,007
M16 x 1,5	12,000	9,000	15,30	220,000	20,000	168,000	16,007

Machos laminadores para rosca métrica fina ISO com canais de refrigeração

Material de corte	**MD int.**
Tolerância do Ø	6HX
Superfície	C
Tipo	N
Forma	C
Refrigeração interna	

P	•
M	•
K	
N	≥ 7
S	•
H	

Página de dados de corte 599





DIN 2174 ~DIN 371/~DIN 376 Nr. do artigo **1581**

d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M10 x 1	10,000	8,000	9,55	90,000	11,000	35,000	10,005
M12 x 1	9,000	7,000	11,55	100,000	15,000	40,000	12,005
M12 x 1,5	9,000	7,000	11,30	100,000	15,000	40,000	12,007
M14 x 1	11,000	9,000	13,55	100,000	15,000	40,000	14,005
M14 x 1,25	11,000	9,000	13,40	100,000	15,000	40,000	14,006
M14 x 1,5	11,000	9,000	13,30	100,000	15,000	40,000	14,007
M16 x 1,5	12,000	9,000	15,30	100,000	15,000	44,000	16,007
M18 x 1,5	14,000	11,000	17,30	110,000	15,000	44,000	18,007
M20 x 1,5	16,000	12,000	19,30	125,000	15,000	44,000	20,007
M24 x 1,5	18,000	14,500	23,30	140,000	15,000	48,000	24,007



FRESAS DE ROSCAR

S

Micro-fresas de rosquear

3xD

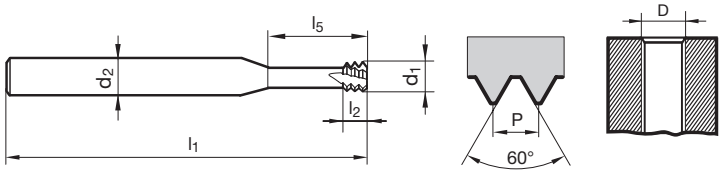
P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 601

Material de corte	**MD int.**
Superfície	C
Tipo	SP M
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4226**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,6	0,350	1,200	3,000	39,000	1,100	4,800	3	1,600
M1,8	0,350	1,400	3,000	39,000	1,100	5,400	3	1,800
M2	0,400	1,550	3,000	39,000	1,200	6,000	4	2,000
M2,5	0,450	1,950	3,000	39,000	1,400	7,500	4	2,500
M3	0,500	2,400	6,000	58,000	1,500	9,500	4	3,000
M3,5	0,600	2,800	6,000	58,000	1,800	11,000	4	3,500
M4	0,700	3,200	6,000	58,000	2,100	12,500	4	4,000
M5	0,800	4,000	6,000	58,000	2,400	16,000	4	5,000
M6	1,000	4,800	6,000	58,000	3,000	20,000	4	6,000
M8	1,250	5,950	6,000	58,000	3,800	24,000	4	8,000
M10	1,500	7,800	8,000	73,000	4,500	33,000	4	10,000
M12	1,750	9,000	10,000	84,000	5,300	38,000	4	12,000
M16	2,000	11,800	10,000	84,000	6,000	35,000	5	16,000

Micro-fresas de rosquear

3xD

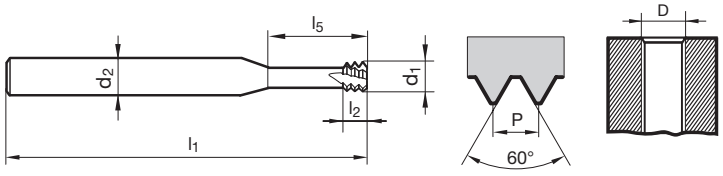
P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 601

Material de corte	**MD int.**
Superfície	C
Tipo	SP G
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4228**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	6,200	8,000	64,000	2,700	19,500	4	9,728
G3/8	19,000	9,950	10,000	73,000	4,000	25,000	4	16,662
G7/8	14,000	11,950	12,000	84,000	5,400	37,000	4	30,201
G2	11,000	15,950	16,000	105,000	6,900	44,000	5	59,614

Micro-fresas de rosquear

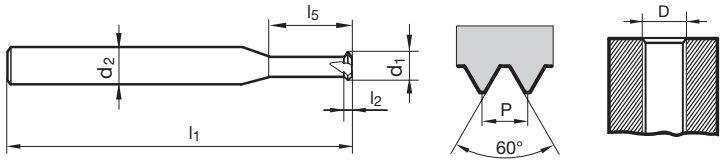
3xD

P	•
M	•
K	•
N	•
S	•
H	

Página de dados de corte 601

Material de corte	**MD int.**
Superfície	C
Tipo	SP M/MF
Rôscas	1,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4225**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M1,4 - M1,8	0,350	1,050	3,000	39,000	0,400	3,800	3	1,800
M2 - M2,4	0,400	1,500	3,000	39,000	0,400	7,000	3	2,400
M2,5 - M3	0,500	2,000	3,000	39,000	0,500	9,000	4	3,000
M3,5 - M4,5	0,750	2,800	6,000	58,000	0,800	14,000	4	4,500
M5 - M7	1,000	4,000	6,000	58,000	1,000	19,000	4	7,000
M8 - M10	1,500	6,400	8,000	64,000	1,500	24,000	5	10,000

Fresas para rosca métrica ISO sem chanfro

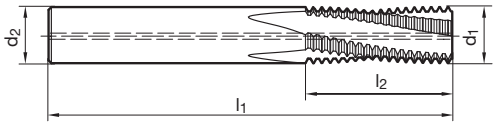
2xD

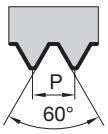
P	•
M	○
K	•
N	•
S	○
H	≤55

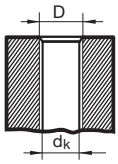
Página de dados de corte 600

Material de corte	MD int.		
Superfície	C	C	◯
Tipo	TM SP	TM SP	TM SP
Refrigeração interna			
Forma da haste	HA	HB	HA

NEW













Norma da emp.	Nr. do artigo	3737	3743	3734

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	13,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	18,100	3	8,000
M8 x 1	1,000	6,400	8,000	7,00	62,000	17,500	3	8,005
M10	1,500	7,950	10,000	8,50	74,000	21,800	3	10,000
M10 x 1	1,000	7,950	10,000	9,00	74,000	21,500	3	10,005
M10 x 1,25	1,250	7,950	10,000	8,80	74,000	21,900	3	10,006
M12	1,750	9,950	10,000	10,20	74,000	25,400	4	12,000
M12 x 1,5	1,500	9,950	10,000	10,50	74,000	26,300	4	12,007
M14	2,000	11,200	12,000	12,00	90,000	31,000	4	14,000
M14 x 1,5	1,500	11,200	12,000	12,50	90,000	30,800	4	14,007
M16	2,000	12,800	14,000	14,00	90,000	35,000	4	16,000
M16 x 1,5	1,500	12,800	14,000	14,50	90,000	33,800	4	16,007
M20	2,500	14,950	16,000	17,50	102,000	41,300	4	20,000
M20 x 1,5	1,500	14,950	16,000	18,50	102,000	42,800	4	20,007

Fresas para rosca métrica ISO sem chanfro

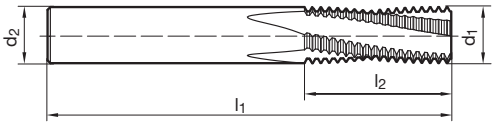


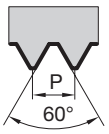
P	•
M	○
K	•
N	•
S	○
H	≤55

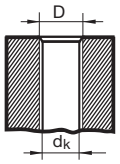
Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4132	4133

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	13,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	18,100	3	8,000
M10	1,500	7,950	10,000	8,50	74,000	21,800	3	10,000
M12	1,750	9,950	10,000	10,20	74,000	25,400	4	12,000
M14	2,000	11,200	12,000	12,00	90,000	31,000	4	14,000
M16	2,000	12,800	14,000	14,00	90,000	35,000	4	16,000
M20	2,500	14,950	16,000	17,50	102,000	41,300	4	20,000

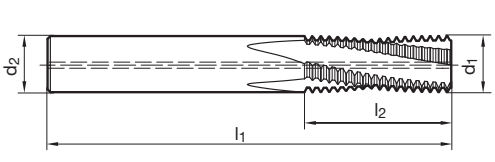
Fresas para rosca métrica ISO sem chanfro

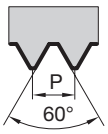
2,5xD

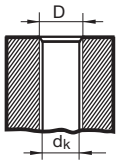
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3735	3740

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M6	1,000	4,800	6,000	5,00	54,000	16,500	3	6,000
M8	1,250	6,400	8,000	6,80	62,000	21,900	3	8,000
M10	1,500	7,950	10,000	8,50	74,000	26,300	3	10,000
M12	1,750	9,950	10,000	10,20	74,000	32,400	4	12,000
M14	2,000	11,200	12,000	12,00	90,000	37,000	4	14,000
M16	2,000	12,800	14,000	14,00	90,000	43,000	4	16,000
M20	2,500	14,950	16,000	17,50	102,000	48,800	4	20,000

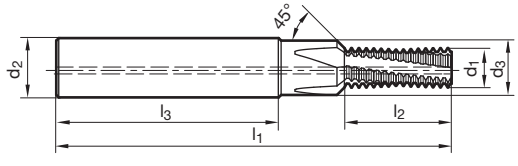
Fresas para rosca métrica ISO com chanfro

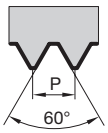


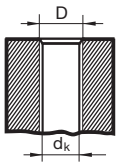
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 600

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	









Norma da emp.	Nr. do artigo	3525	3543	3510

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	5,300	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	7,400	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	9,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	10,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	13,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	17,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	20,100	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	25,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	27,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	33,800	4	20,000

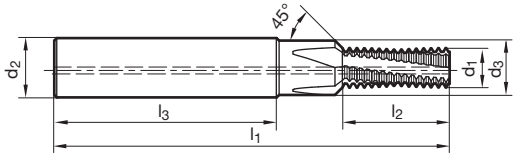
Fresas para rosca métrica ISO com chanfro

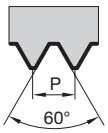
2xD

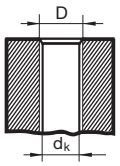
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 601

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













Norma da emp.	Nr. do artigo	3526	3544	3511

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	6,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	8,800	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	10,800	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	13,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	18,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	21,800	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	25,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	31,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	35,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	41,300	4	20,000

Fresas para rosca métrica ISO com chanfro

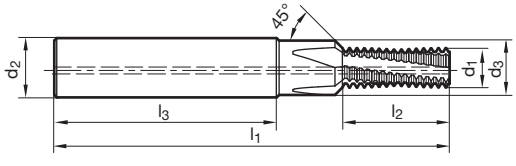


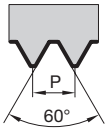
P	•
M	•
K	•
N	•
S	•
H	≤55

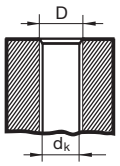
Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3759	3760

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	7,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	35,600	10,900	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	13,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	16,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	21,900	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	26,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	32,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	37,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	43,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	48,800	4	20,000

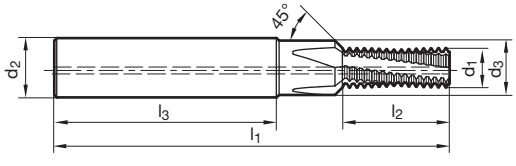
Fresas para rosca métrica fina ISO com chanfro

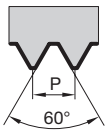


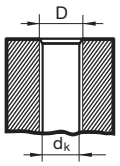
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 600

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













Norma da emp.	Nr. do artigo	3527	3545	3512

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	7,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	8,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	9,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	10,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	13,100	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	13,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	16,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	16,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	19,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	20,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	23,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	26,300	4	16,007

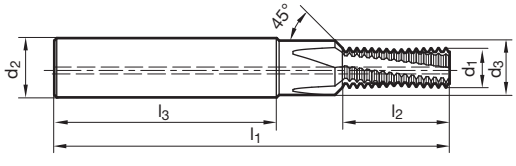
Fresas para rosca métrica fina ISO com chanfro

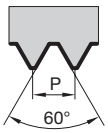
2xD

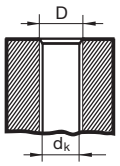
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 601

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMC SP	TMC SP	TMC SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	













Norma da emp.	Nr. do artigo	3528	3546	3513

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	8,800	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	10,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	12,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	13,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	16,900	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	17,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	21,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	21,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	25,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	26,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	30,800	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	33,800	4	16,007

Fresas para rosca métrica fina ISO com chanfro

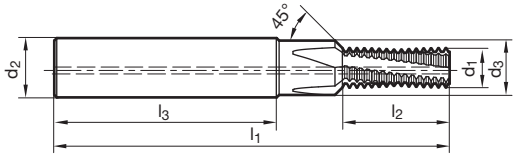
2,5xD

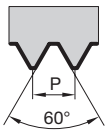
P	•
M	•
K	•
N	•
S	•
H	≤55

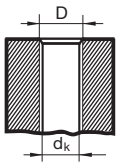
Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. Nr. do artigo **3762** **3763**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	10,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	12,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	15,300	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	15,400	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	20,600	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	20,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	25,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	25,600	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	30,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	30,800	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	38,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	41,300	4	16,007

Fresas para rosca UNC sem chanfro

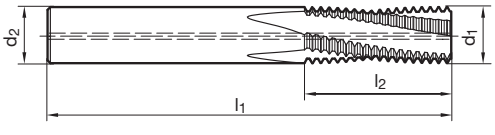
2xD

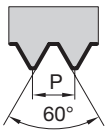
P	•
M	○
K	•
N	•
S	○
H	≤55

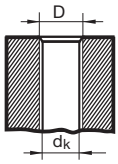
Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4134	4135

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 24	3,400	6,000	3,90	54,000	11,100	3	4,826
12 - 24	4,100	6,000	4,50	54,000	12,200	3	5,486
1/4 - 20	4,700	6,000	5,10	54,000	14,600	3	6,350
5/16 - 18	6,100	8,000	6,60	64,000	17,600	3	7,938
3/8 - 16	7,600	8,000	8,00	64,000	21,400	3	9,525
7/16 - 14	9,000	10,000	9,40	74,000	24,500	3	11,113
1/2 - 13	9,950	10,000	10,80	74,000	28,300	4	12,700
9/16 - 12	11,400	12,000	12,20	90,000	30,700	4	14,288
5/8 - 11	12,700	14,000	13,50	90,000	35,800	4	15,875

Fresas para rosca UNC com chanfro

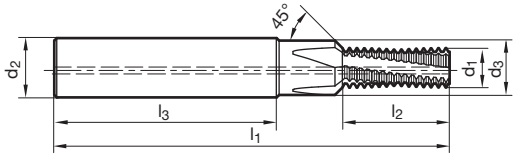


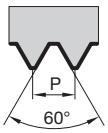
P	•
M	•
K	•
N	•
S	•
H	≤55

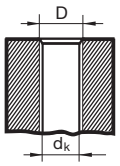
Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3516	3534

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	12,100	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	14,800	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	16,700	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	19,000	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	22,500	4	12,700

Fresas para rosca UNC com chanfro

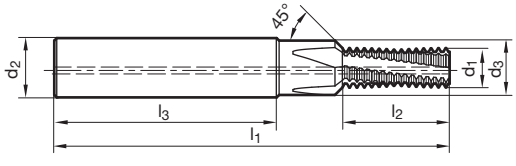


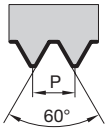
P	•
M	•
K	•
N	•
S	•
H	≤55

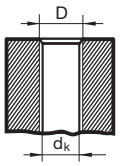
Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3517	3535

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	14,600	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	17,600	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	21,400	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	24,500	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	28,300	4	12,700

Fresas para rosca UNF sem chanfro

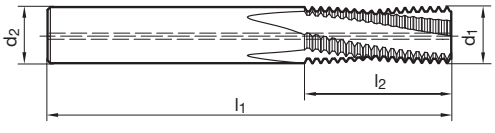
2xD

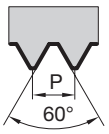
P	•
M	○
K	•
N	•
S	○
H	≤55

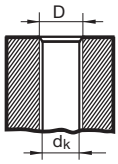
Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	4136	4137

D	d1	d2	dk	l1	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm		
10 - 32	3,800	6,000	4,10	54,000	11,500	3	4,826
12 - 28	4,300	6,000	4,60	54,000	12,200	3	5,486
1/4 - 28	5,100	6,000	5,50	54,000	14,100	3	6,350
5/16 - 24	6,300	8,000	6,90	64,000	17,500	3	7,938
3/8 - 24	7,800	8,000	8,50	64,000	20,600	3	9,525
7/16 - 20	9,400	10,000	9,90	74,000	24,800	3	11,113
1/2 - 20	9,950	10,000	11,50	74,000	27,300	4	12,700
9/16 - 18	11,400	12,000	12,90	90,000	30,300	4	14,288
5/8 - 18	12,700	14,000	14,50	90,000	33,200	4	15,875

Fresas para rosca UNF com chanfro

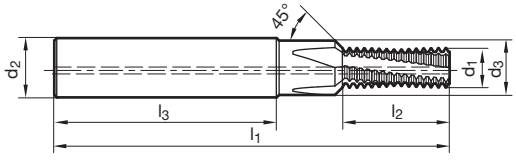


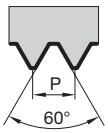
P	•
M	•
K	•
N	•
S	•
H	≤55

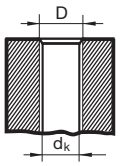
Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3518	3536

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	11,300	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	13,200	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	16,400	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	18,400	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	21,000	4	12,700

Fresas para rosca UNF com chanfro

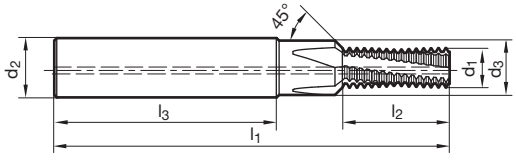
2xD

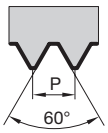
P	•
M	•
K	•
N	•
S	•
H	≤55

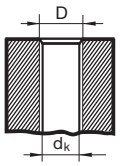
Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3519	3537

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	14,100	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	17,500	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	20,600	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	24,800	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	27,300	4	12,700

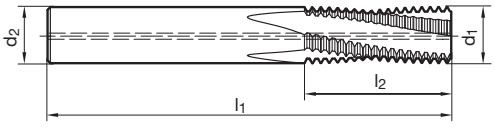
Fresas para rosca gás Whitworth sem chanfro

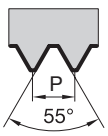
2xD

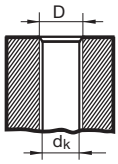
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3745	3748

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	21,300	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	28,700	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	35,400	4	16,662

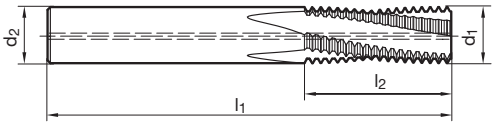
Fresas para rosca gás Whitworth sem chanfro

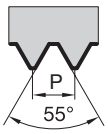
2,5xD

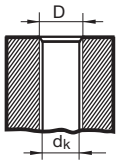
P	•
M	○
K	•
N	•
S	○
H	≤55

Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3746	3750

D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	8,000	8,80	64,000	24,900	3	9,728
G1/4	19,000	10,500	12,000	11,80	90,000	35,400	4	13,157
G3/8	19,000	13,600	14,000	15,25	90,000	43,500	4	16,662

Fresas para rosca gás Whitworth com chanfro

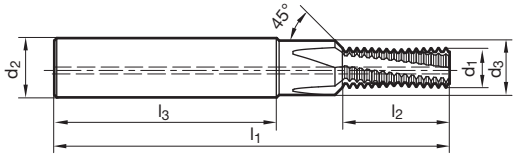


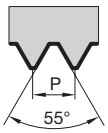
P	•
M	•
K	•
N	•
S	•
H	≤55

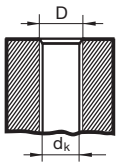
Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3514	3529

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	15,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	22,100	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	27,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

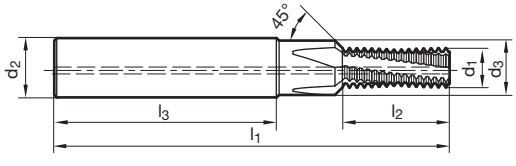
2xD

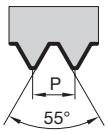
P	•
M	•
K	•
N	•
S	•
H	≤55

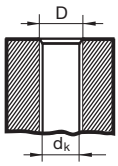
Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3515	3533

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	21,300	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	28,700	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	35,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

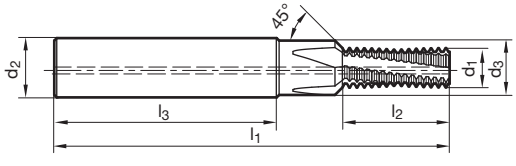


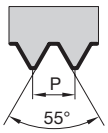
P	•
M	•
K	•
N	•
S	•
H	≤55

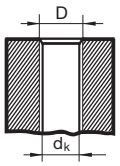
Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3765	3766

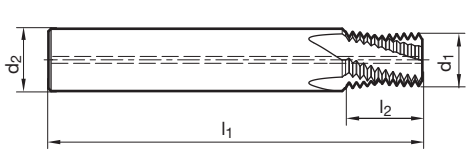
D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	24,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	35,400	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	43,500	4	16,662

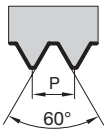
Fresas para rosca NPT sem chanfro

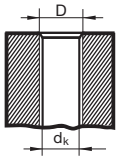
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3753	3754

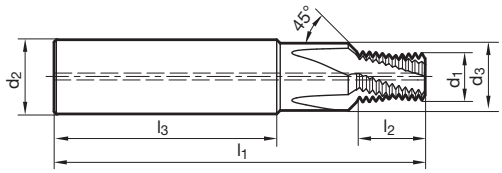
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

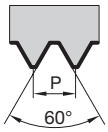
Fresas para rosca NPT com chanfro

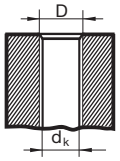
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3520	3538

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

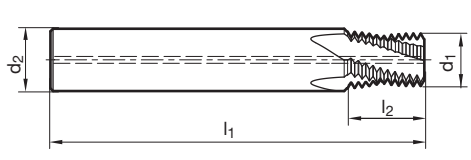
Fresas para rosca NPTF sem chanfro

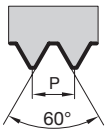
Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

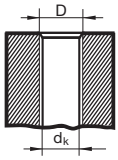
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 600











Norma da emp.	Nr. do artigo	3756	3757

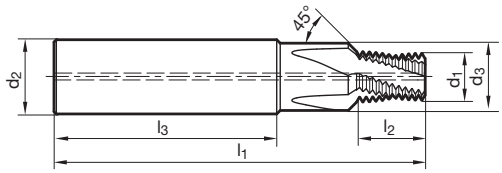
D	P	d1	d2	dk	l1	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm		
1/16	27,000	5,900	8,000	6,15	54,000	9,900	3	8,190
1/8	27,000	7,300	8,000	8,40	64,000	9,900	3	10,620
1/4	18,000	9,950	12,000	11,10	72,000	19,000	4	14,140
3/8	18,000	12,500	14,000	14,30	80,000	14,800	4	17,570

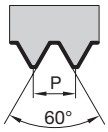
Fresas para rosca NPTF com chanfro

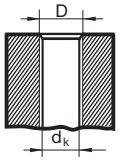
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 600

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3521	3539

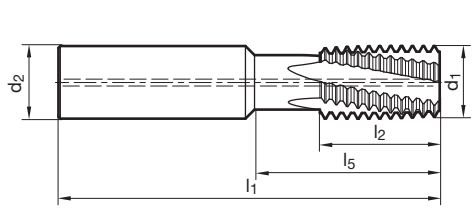
D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

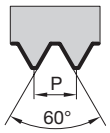
Fresas para roscas multiuso, para rosca métrica ISO

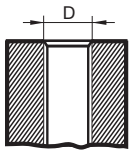
Material de corte	MD int.		
Superfície	C	C	○
Tipo	TMU SP	TMU SP	TMU SP
Refrigeração interna			
Forma da haste	HA	HB	HA
		NEW	

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 601









Norma da emp.	Nr. do artigo	3541	3556	3523

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 10	7,950	8,000	64,000		20,000	4	8,050
1,000	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,100
1,250	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,125
1,500	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,150
1,000	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,150
1,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,100
1,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,200
3,000	≥ 24	17,950	18,000	102,000	50,000	33,000	5	18,300
1,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,100
1,500	≥ 26	19,950	20,000	105,000	50,000	33,000	5	20,150
2,000	≥ 27	19,950	20,000	105,000	50,000	33,000	5	20,200
2,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,250
3,000	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,300
3,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,350

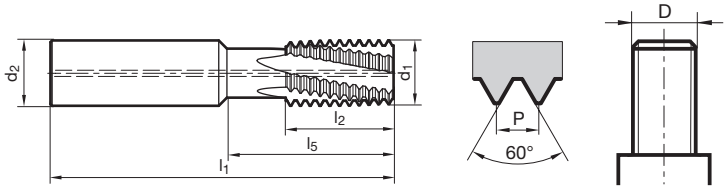
Fresamento externo de roscas

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB

NEW





Norma da emp.	Nr. do artigo	4162	4163

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 3	9,950	10,000	70,000	25,000	16,000	4	10,050
0,750	≥ 5	9,950	10,000	70,000	25,000	16,000	4	10,075
1,000	≥ 6	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 8	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 10	11,950	12,000	80,000	31,000	20,000	4	12,150
1,500	≥ 10	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 14	15,950	16,000	90,000	40,000	25,000	5	16,200
2,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,250
3,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,300

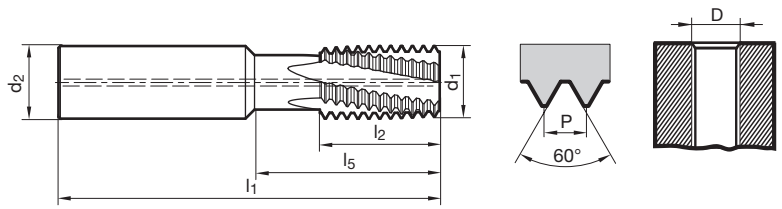
Fresas para roscas multiuso, para rosca UN

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU UN	TMU UN
Refrigeração interna		
Forma da haste	HA	HB

NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 601





Norma da emp. | Nr. do artigo | **3595** | **3596**

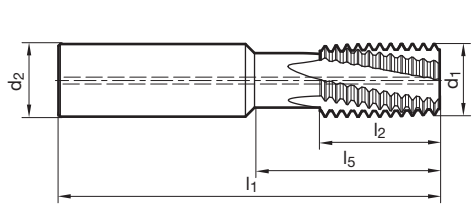
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
10,000	≥ 3/4	11,950	12,000	80,000	31,000	20,000	4	12,100
16,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,160
18,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,180
20,000	≥ 11/16	11,950	12,000	80,000	31,000	20,000	4	12,200
24,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,240
12,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,120
14,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,140
16,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,160
18,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,180
20,000	≥ 13/16	15,950	16,000	90,000	40,000	25,000	5	16,200
7,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,070
8,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,080
12,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,120
14,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,140
16,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,160

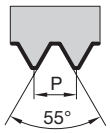
Fresas para roscas multiuso, para rosca gás Whitworth

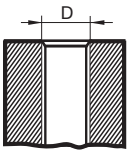
P	•	Página de dados de corte 601
M	•	
K	•	
N	•	
S	•	
H	≤55	

Material de corte	MD int.		
Superfície	C	C	○
Tipo	TM SP	TM SP	TM SP
Refrigeração interna			
Forma da haste	HA	HB	HA

NEW









Norma da emp.	Nr. do artigo	3542	3557	3524

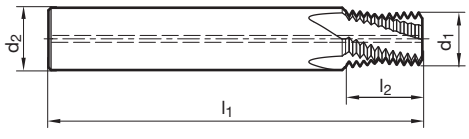
P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
19,000	≥ 1/4	9,950	10,000	70,000	25,000	16,000	4	10,190
14,000	≥ 1/2	15,950	16,000	90,000	40,000	25,000	5	16,140
11,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,110

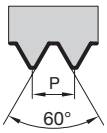
Fresas para roscas multiuso, para rosca NPT

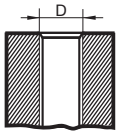
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3768	3769

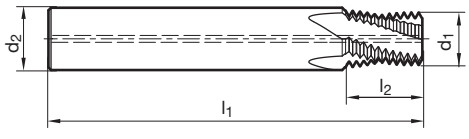
P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

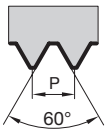
Fresas para roscas multiuso, para rosca NPTF

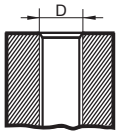
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 601

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3772	3773

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

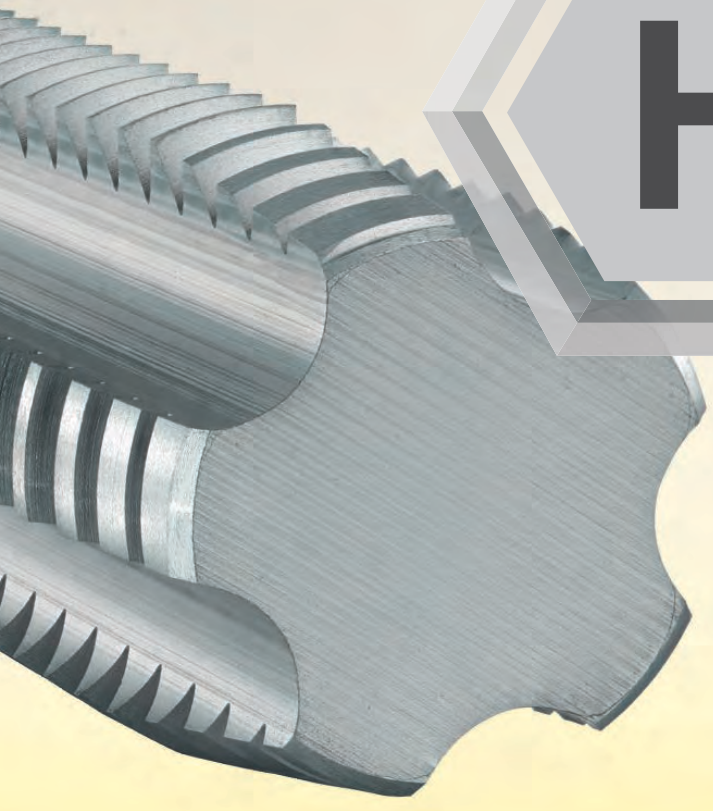


ENDURECIDOS

AÇOS ENDURECIDOS

Aços de alta resitência, aços endurecidos, fundição dura

H



H AÇOS ENDURECIDOS

M		MF	
ISO2/6H	**ISO3/6G**	**ISO2/6H**	**ISO3/6G**

45 – 55 HRC

No 1
M3 - M16
Nr. do art. 1201
a partir d. pág. 680

No 1
M8x1 - M12x1,5
Nr. do art. 4161
a partir d. pág. 682

55 – 62 HRC

No 1
M3 - M16
Nr. do art. 2944
a partir d. pág. 681

No 1
M6x0,5 - M12x1,5
Nr. do art. 1161
a partir d. pág. 683

furo de núcleo

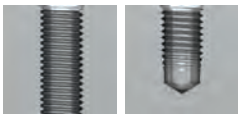
No 1
Nr. do art. 1946
a partir d. pág. 677

No 1
Nr. do art. 1946
a partir d. pág. 677

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
2B	2B	-



ATRAVÉS FURO
CEGO FURO



HSS-E-PM, TiCN, forma D



Metal duro, TiCN, forma D



Metal duro, TiAlN

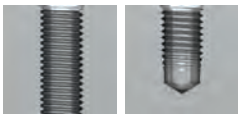
H AÇOS ENDURECIDOS

	M	MF
	UNIVERSAL	**UNIVERSAL**
max. 55 HRC 1.5xD	No 1 M3 - M20 Nr. do art. 3525 a partir d. pág. 685	No 1 M4x0,5 - M16x1,5 Nr. do art. 3527 a partir d. pág. 687
max. 55 HRC 2xD	No 1 M3 - M20 Nr. do art. 3526 a partir d. pág. 686	No 1 M4x0,5 - M16x1,5 Nr. do art. 3528 a partir d. pág. 688
max. 65 HRC 3xD	No 1 M2 - M12 Nr. do art. 4227 a partir d. pág. 703	
furo de núcleo	No 1 Nr. do art. 1946 a partir d. pág. 677	No 1 Nr. do art. 1946 a partir d. pág. 677

No 1 ideal tool

QUICKFINDER

UNC	UNF	G
UNIVERSAL	UNIVERSAL	-



A T R A V É S FURO
C E G O F U R O

No 1
1/4 - 1/2
Nr. do art. 3516
a partir d. pág. 689

No 1
1/4 - 1/2
Nr. do art. 3518
a partir d. pág. 691

No 1
1/8 - 3/8
Nr. do art. 3514
a partir d. pág. 693



Metal duro, TiCN

No 1
1/4 - 1/2
Nr. do art. 3517
a partir d. pág. 690

No 1
1/4 - 1/2
Nr. do art. 3519
a partir d. pág. 692

No 1
1/8 - 3/8
Nr. do art. 3515
a partir d. pág. 694



Metal duro, TiCN



Metal duro, TiCN



VHM, TiAlN

H

AÇOS ENDURECIDOS

ATRAVÉS
FUROS



Profundidade de rosca		≤1,5xD	≤3xD	
Material de corte		HSS-E	Metal duro	
Tipo/forma		H/D	H/D	H
Superfície		C	C	A
Fornecimento de refrigeração		☒	☒	☒
Tolerância do cone		h9	h9	HA
		 45 ... 55 HRC	 ≤ 65 HRC	 Furo de núcleo
Tipo da rôsca	**Tolerância**	**No. Artigo / página**		
M	4H			
	6H		2944 681	1946 677
	6HX	1201 680		1946 677
	6G			
MF	6H		1161 683	1946 677
	6HX	4161 682		1946 677
	6G			
UNC	2B			
	2BX			
UNF	2B			
	2BX			
G				
BSW				
NPT				
NPTF				
EG M	6H Mod.			
MJ	4HX			
MJF	4HX			
UNJC	3BX			
UNJF	3BX			
PG				
Lubrificante adequado		●/△	●/△	○/●

= No 1

○ = Ar
● = Óleo integral
○ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Dureza	Exemplo de material	No. Material	Recomendações de aplicação		
H	Aços de alta resitência, aços endurecidos	45 - 55 HRC	Hardox 500		**3**	-	
		55 - 62 HRC			-	**2**	

Diámetros especiales de núcleo para trabajar metales duros con art.nº 2944

Ø nominal rosca	Ø pretaladro		Ø núcleo rosca tuercas			
			min.		max.	
	según DIN 336 mm	para Art. 2944 mm	según DIN 336 mm	para Art. 2944 mm	según DIN 336 mm	para Art. 2944 mm
M3	2,50	2,60	2,495	2,559	2,599	2,699
M4	3,30	3,40	3,242	3,342	3,422	3,522
M5	4,20	4,30	4,134	4,234	4,334	4,434
M6	5,00	5,10	4,917	5,017	5,153	5,253
M8	6,80	6,90	6,647	6,747	6,912	7,012
M10	8,50	8,60	8,376	8,476	8,676	8,776
M12	10,20	10,40	10,106	10,206	10,441	10,541
M16	12,00	14,10	13,835	15,935	14,210	16,310

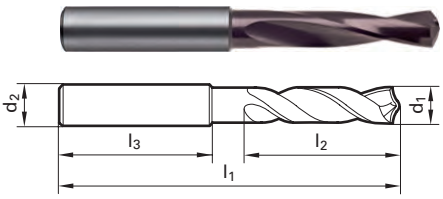
Diámetros especiales de núcleo para trabajar metales duros con art.nº 1161

Ø nominal rosca	Ø pretaladro		Ø núcleo rosca tuercas			
			min.		max.	
	según DIN 336 mm	para Art. 1161 mm	según DIN 336 mm	para Art. 1161 mm	según DIN 336 mm	para Art. 1161 mm
M6x0,5	5,50	5,60	5,459	5,559	5,599	5,699
M8x1	7,00	7,10	6,917	7,017	7,153	7,253
M10x1	9,00	9,10	8,917	9,017	9,153	9,253
M12x1	11,00	11,10	10,917	11,017	11,153	11,253
M12x1,5	10,50	10,60	10,376	10,476	10,676	10,776

Articulo n°	**1946**
Material de corte	**MD**
Calidad de metal duro	K
Typo	H
Acabado	A
Norma	DIN 6537
Forma de mango	HA

La broca Gühring para fabricar pretaladros en materiales duros!

La nueva broca Gühring para taladros duros permite la fabricación racional y segura en proceso de taladros en materiales endurecidos hasta 62 HRC.
Cortes convexos le dan a la herramienta su alta estabilidad y aseguran una óptima rotura de viruta. El perfil de ranuras adaptado al tipo de mecanizado desaloja la viruta con seguridad. Con mango cilíndrico seg.DIN 6535 HA esta herramienta queda estandarizada en un campo de diámetros comprendido desde 3,0 hasta 12,0 mm.



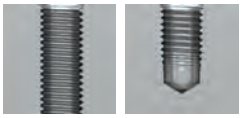
d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
2,600	6,000	62,00	20,00	36,00
3,000	6,000	62,00	20,00	36,00
3,400	6,000	62,00	20,00	36,00
4,000	6,000	66,00	24,00	36,00
4,300	6,000	66,00	24,00	36,00
5,000	6,000	66,00	28,00	36,00
5,100	6,000	66,00	28,00	36,00
5,600	6,000	66,00	28,00	36,00
6,000	6,000	66,00	28,00	36,00
6,900	8,000	79,00	34,00	36,00
7,100	8,000	79,00	34,00	36,00
8,000	8,000	79,00	41,00	36,00
8,600	10,000	89,00	47,00	40,00
9,100	10,000	89,00	47,00	40,00
10,000	10,000	89,00	47,00	40,00
10,400	12,000	102,00	55,00	45,00
10,600	12,000	102,00	55,00	45,00
11,100	12,000	102,00	55,00	45,00
12,000	12,000	102,00	55,00	45,00
14,100	16,000	115,00	65,00	48,00

Valores de corte en 3 x D con art.nº 1946

	Dureza	HRC 40…48	HRC 48 … 62
	Velocidad de corte v_c	40 m/min	30 m/min
	Avance	f (mm/rev):	f (mm/rev):
Ø-broca in mm	2,6	0,032	0,025
	3,4	0,040	0,032
	4,3	0,050	0,040
	5,1	0,050	0,040
	5,6	0,050	0,040
	6,9	0,070	0,055
	7,1	0,070	0,055
	8,6	0,090	0,070
	9,1	0,090	0,070
	10,4	0,110	0,090
	10,5	0,110	0,090
	11,0	0,120	0,100
	14,1	0,120	0,100

H

AÇOS ENDURECIDOS



ATRAVÉS FUROS E
CEGO FUROS

Profundidade de rosca	≤1,5xD	
Material de corte		
Tipo	TMC SP	TMC SP
Superfície	C	C
Fornecimento de refrigeração	Axial	Axial
Forma da haste	HA	HA
Espiral	10°	10°





Tipo da rôsca	No. Artigo / página	
M	3525 685	3543 685
MF	3527 687	3545 687
UNC	3516 689	3534 689
UNF	3518 691	3536 691
G	3514 693	3529 693
BSW		
NPT	3520 695	3538 695
NPTF	3521 696	3539 696
EG M		
MJ		
MJF		
UNJC		
UNJF		
PG		
Lubrificante adequado	◯/●	◯/●

= No 1

◯ = Ar
● = Óleo integral
◯ = Óleo Solúvel
△ = Colar
☐ = Quantidade mínima de lubrificante (MQL)

	Grupo de materiais	Dureza	Exemplo de material	No. Material	Recomendações de aplicação	
H	Aços de alta resitência, aços endurecidos	45 - 55 HRC	Hardox 500		++	++
		55 - 62 HRC			-	-

≤2xD		universal				≤3xD	
Metal duro							
TMC SP	TMC SP	TMU SP	TMU SP	TMU SP	TMU SP	MTM 3 SP	H
C	C	C	C	C	C	C	A
Axial	Axial	Axial	Axial	Axial	Axial	☒	☒
HA	HB	HA	HB	HA	HB	HA	HA
10°	10°	15°	15°	15°	15°	15°	15°
				 Fresamento externo de roscas	 Fresamento externo de roscas		
No. Artigo / página							
3526 686	3544 686	3541 697	3556 697	4162 698	4163 698	4227 703	1946 677
3528 688	3546 688	3541 697	3556 697	4162 698	4163 698		1946 677
3517 690	3535 690	3595 699	3596 699				
3519 692	3537 692	3595 699	3596 699				
3515 694	3533 694	3542 700	3557 700	3542 700	3557 700		
		3768 701	3769 701				
		3772 702	3773 702				
Rôscas EG podem ser produzidas com qualquer tipo e dimensão de fresas para roscar							
○/●	○/●	○/●	○/●	○/●	○/●	○	○/●

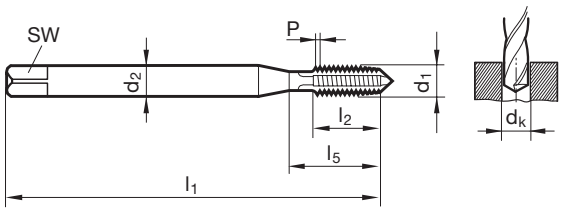
Recomendações de aplicação							
++	++	+	+	+	+	++	++
-	-	-	-	-	-	++	++

Machos para rosca métrica ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	D
Refrigeração interna	

P	
M	
K	
N	
S	
H	45-55

Página de dados de corte 676





DIN 2184-1 DIN 371 Nr. do artigo **1201**

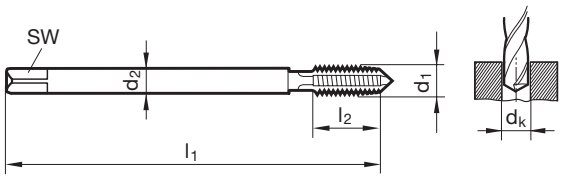
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,60	56,000	10,000	18,000
M4	0,700	4,500	3,400	3,40	63,000	12,000	21,000
M5	0,800	6,000	4,900	4,30	70,000	14,000	25,000
M6	1,000	6,000	4,900	5,10	80,000	16,000	30,000
M8	1,250	8,000	6,200	6,90	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,60	100,000	20,000	39,000
M12	1,750	12,000	9,000	10,40	110,000	24,000	49,000
M14	2,000	11,000	11,000	12,10	110,000	26,000	53,000
M16	2,000	12,000	12,000	14,10	110,000	26,000	54,000

Machos para rosca métrica ISO

Material de corte	**MD int.**
Tolerância do Ø	ISO2/6H
Superfície	C
Tipo	H
Forma	D
Refrigeração interna	

P	
M	
K	
N	
S	
H	≤62

Página de dados de corte 676





Norma da emp. ~DIN 371 | Nr. do artigo **2944**

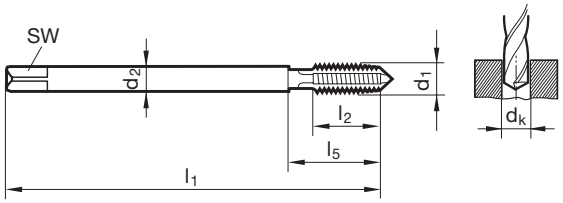
d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,60	56,000	12,000
M4	0,700	4,500	3,400	3,40	63,000	14,000
M5	0,800	6,000	4,900	4,30	70,000	17,000
M6	1,000	6,000	4,900	5,10	80,000	20,000
M8	1,250	8,000	6,200	6,90	90,000	20,000
M10	1,500	10,000	8,000	8,60	100,000	24,000
M12	1,750	12,000	9,000	10,40	110,000	28,000
M16	2,000	16,000	12,000	14,10	110,000	40,000

Machos manuais para rosca métrica fina ISO

Material de corte	HSS-E-PM
Tolerância do Ø	6HX
Superfície	C
Tipo	H
Forma	D
Refrigeração interna	

P	
M	
K	
N	
S	
H	45-55

Página de dados de corte 676





DIN 2184-1 DIN 371 Nr. do artigo **4161**

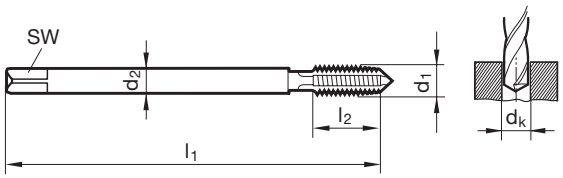
d1	d2	SW	dk	l1	l2	l5	Nº de cód.
	mm	mm	mm	mm	mm	mm	
M8 x 1	8,000	6,200	7,10	90,000	16,000	35,000	8,005
M10 x 1	10,000	8,000	9,10	90,000	16,000	35,000	10,005
M12 x 1	12,000	9,000	11,10	100,000	20,000	40,000	12,005
M12 x 1,5	12,000	9,000	10,60	100,000	20,000	40,000	12,007

Machos manuais para rosca métrica fina ISO

Material de corte	**MD int.**
Tolerância do Ø	ISO2/6H
Superfície	C
Tipo	H
Forma	D
Refrigeração interna	

P	
M	
K	
N	
S	
H	≤62

Página de dados de corte 676





Norma da emp. ~DIN 371 Nr. do artigo **1161**

d1	d2	SW	dk	l1	l2	Nº de cód.
	mm	mm	mm	mm	mm	
M6 x 0,5	6,000	4,900	5,60	80,000	15,000	6,003
M8 x 1	8,000	6,200	7,10	90,000	18,000	8,005
M10 x 1	10,000	8,000	9,10	90,000	22,000	10,005
M12 x 1	12,000	9,000	11,10	100,000	25,000	12,005
M12 x 1,5	12,000	9,000	10,60	100,000	28,000	12,007



FRESAS DE ROSCAR H

Fresas para rosca métrica ISO com chanfro

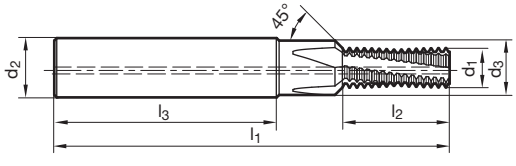


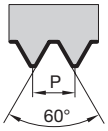
P	•
M	•
K	•
N	•
S	•
H	≤55

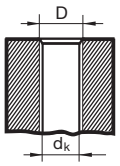
Página de dados de corte 678

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3525	3543

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	5,300	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	7,400	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	9,200	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	10,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	13,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	17,300	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	20,100	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	25,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	27,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	33,800	4	20,000

Fresas para rosca métrica ISO com chanfro

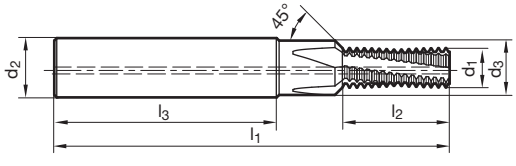
2xD

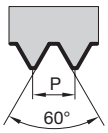
P	•
M	•
K	•
N	•
S	•
H	≤55

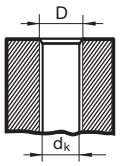
Página de dados de corte 679

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3526** | **3544**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M3	0,500	2,300	6,000	3,400	2,50	48,000	36,000	6,800	3	3,000
M4	0,700	3,000	6,000	4,500	3,30	48,000	36,000	8,800	3	4,000
M5	0,800	4,000	6,000	5,500	4,20	54,000	36,000	10,800	3	5,000
M6	1,000	4,800	8,000	6,600	5,00	62,000	36,000	13,500	3	6,000
M8	1,250	6,400	10,000	9,000	6,80	74,000	40,000	18,100	3	8,000
M10	1,500	7,950	12,000	11,000	8,50	80,000	45,000	21,800	4	10,000
M12	1,750	9,950	14,000	13,500	10,20	90,000	45,000	25,400	4	12,000
M14	2,000	11,200	16,000	15,500	12,00	102,000	48,000	31,000	4	14,000
M16	2,000	12,800	18,000	17,500	14,00	102,000	48,000	35,000	4	16,000
M20	2,500	14,500	20,000	21,500	17,50	125,000	50,000	41,300	4	20,000

Fresas para rosca métrica fina ISO com chanfro

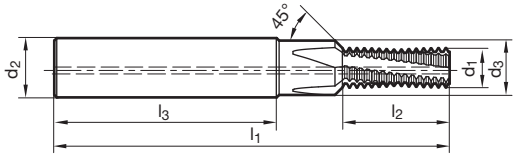


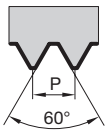
P	•
M	•
K	•
N	•
S	•
H	≤55

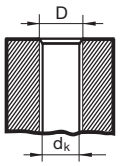
Página de dados de corte 678

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3527** | **3545**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	7,300	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	8,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	9,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	10,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	13,100	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	13,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	16,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	16,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	19,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	20,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	23,300	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	26,300	4	16,007

Fresas para rosca métrica fina ISO com chanfro

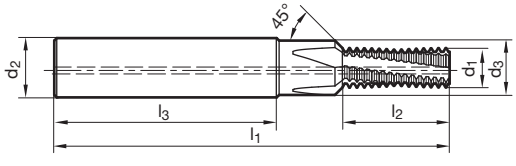
2xD

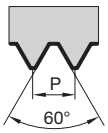
P	•
M	•
K	•
N	•
S	•
H	≤55

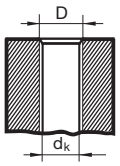
Página de dados de corte 679

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. Nr. do artigo **3528** **3546**

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm	mm		
M4 x 0,5	0,500	3,000	6,000	4,500	3,50	48,000	36,000	8,800	3	4,003
M5 x 0,5	0,500	4,000	6,000	5,500	4,50	54,000	36,000	10,800	3	5,003
M6 x 0,5	0,500	4,800	8,000	6,600	5,50	62,000	36,000	12,800	3	6,003
M6 x 0,75	0,750	4,800	8,000	6,600	5,20	62,000	36,000	13,100	3	6,004
M8 x 0,75	0,750	6,400	10,000	9,000	7,20	74,000	40,000	16,900	3	8,004
M8 x 1	1,000	6,400	10,000	9,000	7,00	74,000	40,000	17,500	3	8,005
M10 x 1	1,000	7,950	12,000	11,000	9,00	80,000	45,000	21,500	4	10,005
M10 x 1,25	1,250	7,950	12,000	11,000	8,80	80,000	45,000	21,900	4	10,006
M12 x 1	1,000	9,950	14,000	13,500	11,00	90,000	45,000	25,500	4	12,005
M12 x 1,5	1,500	9,950	14,000	13,500	10,50	90,000	45,000	26,300	4	12,007
M14 x 1,5	1,500	11,200	16,000	15,500	12,50	102,000	48,000	30,800	4	14,007
M16 x 1,5	1,500	12,800	18,000	17,500	14,50	102,000	48,000	33,800	4	16,007

Fresas para rosca UNC com chanfro

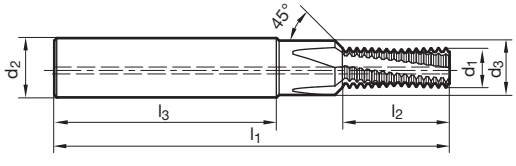


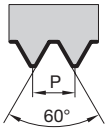
P	•
M	•
K	•
N	•
S	•
H	≤55

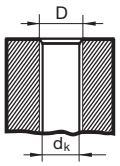
Página de dados de corte 678

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3516	3534

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	12,100	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	14,800	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	16,700	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	19,000	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	22,500	4	12,700

Fresas para rosca UNC com chanfro

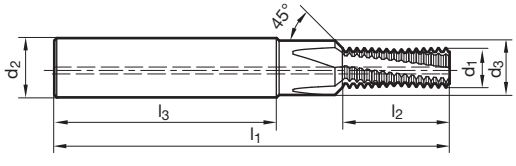
2xD

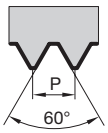
P	•
M	•
K	•
N	•
S	•
H	≤55

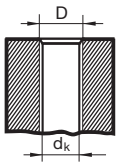
Página de dados de corte 679

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3517	3535

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 20	4,800	8,000	6,600	5,10	62,000	36,000	14,600	3	6,350
5/16 - 18	5,950	10,000	9,000	6,60	74,000	40,000	17,600	3	7,938
3/8 - 16	7,100	12,000	11,000	8,00	80,000	45,000	21,400	4	9,525
7/16 - 14	7,950	12,000	11,000	9,40	80,000	45,000	24,500	4	11,113
1/2 - 13	9,950	14,000	13,500	10,80	90,000	45,000	28,300	4	12,700

Fresas para rosca UNF com chanfro

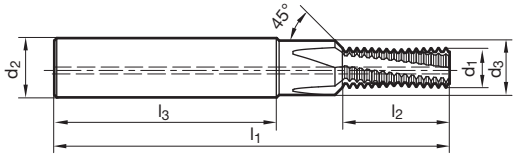


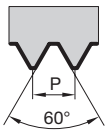
P	•
M	•
K	•
N	•
S	•
H	≤55

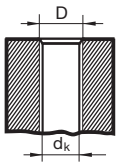
Página de dados de corte 678

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3518	3536

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	11,300	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	13,200	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	16,400	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	18,400	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	21,000	4	12,700

Fresas para rosca UNF com chanfro

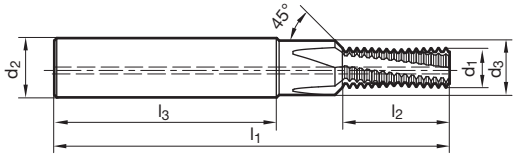


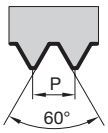
P	•
M	•
K	•
N	•
S	•
H	≤55

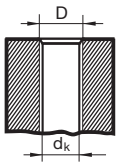
Página de dados de corte 679

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3519	3537

D	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm	mm		
1/4 - 28	4,800	8,000	6,600	5,50	62,000	36,000	14,100	3	6,350
5/16 - 24	5,950	10,000	9,000	6,90	74,000	40,000	17,500	3	7,938
3/8 - 24	7,950	12,000	11,000	8,50	80,000	45,000	20,600	4	9,525
7/16 - 20	7,950	12,000	11,000	9,90	80,000	45,000	24,800	4	11,113
1/2 - 20	9,950	14,000	13,500	11,50	90,000	45,000	27,300	4	12,700

Fresas para rosca gás Whitworth com chanfro

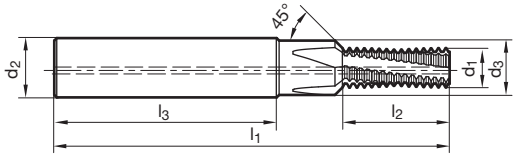


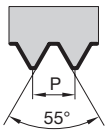
P	•
M	•
K	•
N	•
S	•
H	≤55

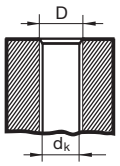
Página de dados de corte 678

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3514	3529

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	15,900	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	22,100	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	27,400	4	16,662

Fresas para rosca gás Whitworth com chanfro

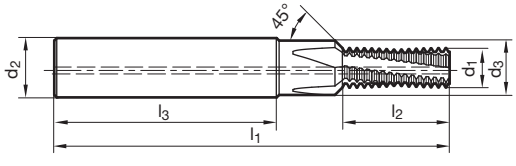
2xD

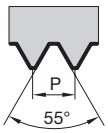
P	•
M	•
K	•
N	•
S	•
H	≤55

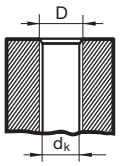
Página de dados de corte 679

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3515	3533

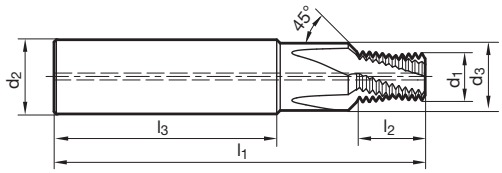
D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
G1/8	28,000	7,950	12,000	11,000	8,80	80,000	45,000	21,300	4	9,728
G1/4	19,000	9,950	14,000	13,900	11,80	90,000	45,000	28,700	4	13,157
G3/8	19,000	13,600	18,000	17,500	15,25	102,000	48,000	35,400	4	16,662

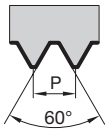
Fresas para rosca NPT com chanfro

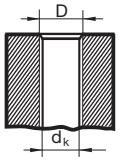
P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 678

Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB
		NEW











Norma da emp.	Nr. do artigo	3520	3538

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

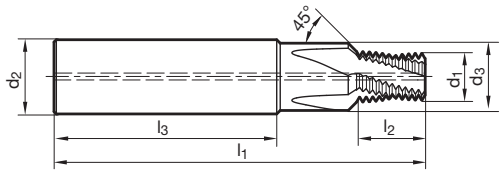
Fresas para rosca NPTF com chanfro

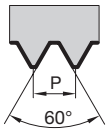
Material de corte	MD int.	
Superfície	C	C
Tipo	TMC SP	TMC SP
Refrigeração interna		
Forma da haste	HA	HB

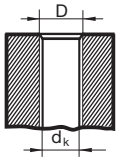
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 678











Norma da emp.	Nr. do artigo	3521	3539

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	mm	mm		
1/8	27,000	7,300	12,000	11,000	8,40	70,000	45,000	9,900	4	10,620
1/4	18,000	9,950	16,000	14,500	11,10	80,000	48,000	14,800	4	14,140
3/8	18,000	12,500	18,000	17,500	14,30	80,000	48,000	14,800	4	17,570

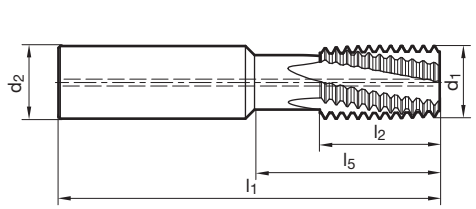
Fresas para roscas multiuso, para rosca métrica ISO

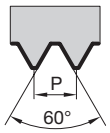
P	•
M	•
K	•
N	•
S	•
H	≤55

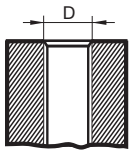
Página de dados de corte 679

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp. | Nr. do artigo | **3541** | **3556**

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 10	7,950	8,000	64,000		20,000	4	8,050
1,000	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,100
1,250	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,125
1,500	≥ 12	9,950	10,000	70,000	25,000	16,000	4	10,150
1,000	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 14	11,950	12,000	80,000	31,000	20,000	4	12,150
1,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,100
1,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,200
3,000	≥ 24	17,950	18,000	102,000	50,000	33,000	5	18,300
1,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,100
1,500	≥ 26	19,950	20,000	105,000	50,000	33,000	5	20,150
2,000	≥ 27	19,950	20,000	105,000	50,000	33,000	5	20,200
2,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,250
3,000	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,300
3,500	≥ 30	19,950	20,000	105,000	50,000	33,000	5	20,350

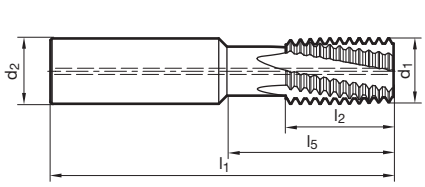
Fresamento externo de roscas

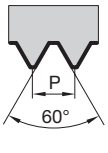
Material de corte	MD int.	
Superfície	C	C
Tipo	TMU SP	TMU SP
Refrigeração interna		
Forma da haste	HA	HB

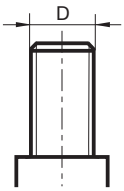
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 679











Norma da emp.	Nr. do artigo	4162	4163

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
mm		mm	mm	mm	mm	mm		
0,500	≥ 3	9,950	10,000	70,000	25,000	16,000	4	10,050
0,750	≥ 5	9,950	10,000	70,000	25,000	16,000	4	10,075
1,000	≥ 6	11,950	12,000	80,000	31,000	20,000	4	12,100
1,250	≥ 8	11,950	12,000	80,000	31,000	20,000	4	12,125
1,500	≥ 10	11,950	12,000	80,000	31,000	20,000	4	12,150
1,500	≥ 10	15,950	16,000	90,000	40,000	25,000	5	16,150
2,000	≥ 14	15,950	16,000	90,000	40,000	25,000	5	16,200
2,500	≥ 18	15,950	16,000	90,000	40,000	25,000	5	16,250
3,000	≥ 24	19,950	20,000	105,000	50,000	33,000	5	20,300

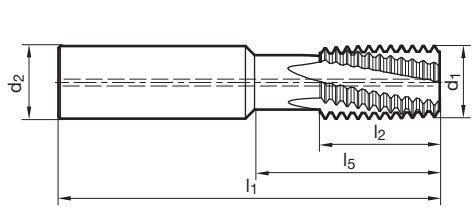
Fresas para roscas multiuso, para rosca UN

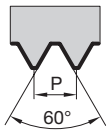
P	•
M	•
K	•
N	•
S	•
H	≤55

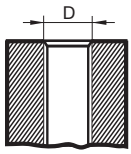
Página de dados de corte 679

Material de corte	MD int.	
Superfície	C	C
Tipo	TMU UN	TMU UN
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3595	3596

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
24,000	≥ 1/2	9,950	10,000	70,000	25,000	16,000	4	10,240
10,000	≥ 3/4	11,950	12,000	80,000	31,000	20,000	4	12,100
16,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,160
18,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,180
20,000	≥ 11/16	11,950	12,000	80,000	31,000	20,000	4	12,200
24,000	≥ 5/8	11,950	12,000	80,000	31,000	20,000	4	12,240
12,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,120
14,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,140
16,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,160
18,000	≥ 7/8	15,950	16,000	90,000	40,000	25,000	5	16,180
20,000	≥ 13/16	15,950	16,000	90,000	40,000	25,000	5	16,200
7,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,070
8,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,080
12,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,120
14,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,140
16,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,160

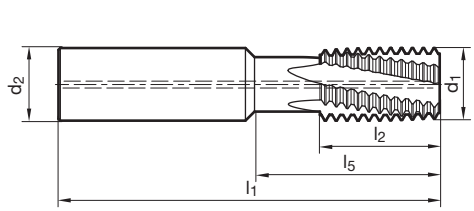
Fresas para roscas multiuso, para rosca gás Whitworth

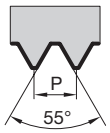
Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

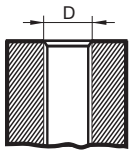
NEW

P	•
M	•
K	•
N	•
S	•
H	≤55

Página de dados de corte 679











Norma da emp.	Nr. do artigo	3542	3557

P	D	d1	d2	l1	l5	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm	mm		
19,000	≥ 1/4	9,950	10,000	70,000	25,000	16,000	4	10,190
14,000	≥ 1/2	15,950	16,000	90,000	40,000	25,000	5	16,140
11,000	≥ 1	19,950	20,000	105,000	50,000	33,000	5	20,110

Fresas para roscas multiuso, para rosca NPT

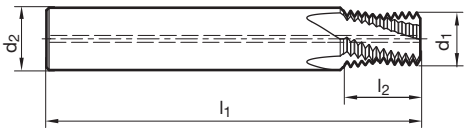


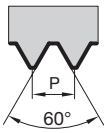
P	•
M	•
K	•
N	•
S	•
H	≤55

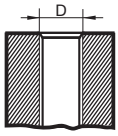
Página de dados de corte 679

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3768	3769

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

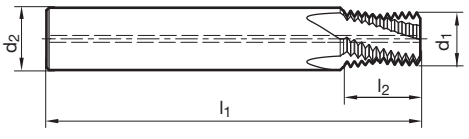
Fresas para roscas multiuso, para rosca NPTF

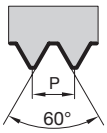


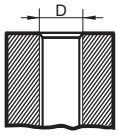
P	•	Página de dados de corte 679
M	•	
K	•	
N	•	
S	•	
H	≤55	

Material de corte	MD int.	
Superfície	C	C
Tipo	TM SP	TM SP
Refrigeração interna		
Forma da haste	HA	HB

NEW











Norma da emp.	Nr. do artigo	3772	3773

P	D	d1	d2	l1	l2	Z	Nº de cód.
G/inch		mm	mm	mm	mm		
14,000	≥ 1/2	14,500	16,000	90,000	19,050	5	21,900
11,500	≥ 1	18,500	20,000	90,000	23,190	5	34,180

Micro-fresas de rosquear

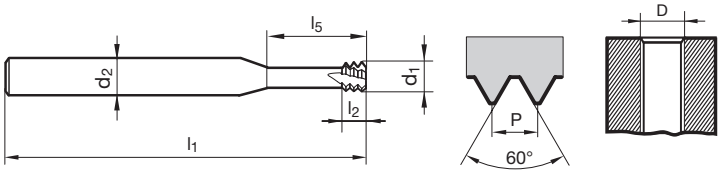
3xD

P	
M	
K	
N	
S	○
H	●

Página de dados de corte 679

Material de corte	**MD int.**
Superfície	A
Tipo	SP M
Rôscas	3,0
Forma da haste	HA

NEW





Norma da emp. Nr. do artigo **4227**

D	P	d1	d2	l1	l2	l5	Z	Nº de cód.
	mm	mm	mm	mm	mm	mm		
M2	0,400	1,550	3,000	39,000	1,200	6,000	4	2,000
M2,5	0,450	1,950	3,000	39,000	1,400	7,500	4	2,500
M3	0,500	2,350	6,000	58,000	1,500	9,500	4	3,000
M4	0,700	3,100	6,000	58,000	2,100	12,500	4	4,000
M5	0,800	3,800	6,000	58,000	2,400	16,000	4	5,000
M6	1,000	4,800	6,000	58,000	3,000	20,000	4	6,000
M8	1,250	5,950	6,000	58,000	3,800	24,000	4	8,000
M10	1,500	7,800	8,000	64,000	4,500	23,000	4	10,000
M12	1,750	9,000	10,000	73,000	5,300	26,000	5	12,000

COSS

MACH MAN

INETES

OS
UAIS

Cossinetes
Machos manuais

Grupo de materiais	Resistência à tração MPa (N/mm2)	Dureza HB	Velocidade de corte vc m/min	
			HSS	HSS-E
Aços de construção	≤ 800	–	8 - 12	–
Aços para máquinas automáticas	≤ 1000	–	10 - 14	–
Aços para cementação sem liga	≤ 750	–	6 - 10	–
Aços para beneficiamento sem liga	≤ 850	–	6 - 10	–
Aços para cementação com liga	≥ 850 … 1200	–	–	5 - 8
Aços para beneficiamento com liga	≥ 850 … 1200	–	–	5 - 8
Aços para ferramentas com liga	≤ 1000	–	–	5 - 8
Aços rápidos	≥ 650 … 1000	–	–	5 - 8
Aços resistentes a corosão e ácidos, sulfurados	≤ 850	–	–	4 - 6
austeníticos	≤ 850	–	–	4 - 6
martensíticos	≤ 850	–	–	4 - 6
Aços de construção	≤ 800	–	8 - 12	–
Aços para máquinas automáticas	≤ 1000	–	10 - 14	–
Aços para cementação	≤ 1000	–	6 - 10	–
Aços para beneficiamento	≤ 1200	–	6 - 10	–
Aços para nitretação	≤ 1200	–	–	5 - 8
Fundição nodular	–	≤ 240	5 - 8	–
Alumínio e ligas de alumínio	≤ 400	–	10 - 20	–
Ligas de alumínio forjáveis	≤ 400	–	10 - 20	–
Ligas de alumínio fundido ≤ 10 % Si	≤ 600	–	10 - 15	–
> 10 % Si	≤ 600	–	10 - 12	–
Ferro fundido	–	≤ 240	5 - 8	–
Fundição nodular	–	≤ 240	5 - 8	–
Fundição maleável	–	< 300	5 - 8	–
Latão, de cavacos curtos	≤ 600	–	5 - 8	–
de cavacos longos	≤ 600	–	20 - 30	–
Plásticos	–	–	12 - 18	–
Ligas de magnésio	≤ 450	–	10 - 20	–
Titânio e ligas de titânio	≤ 1200	–	–	2 - 6
Ligas de níquel	≤ 1200	–	–	2 - 6

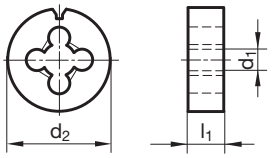
Grupo de materiais	Exemplos de material	Ângulo de saída	Meios de refrigeração
Aços de construção	St 37-2, St 50-2 etc.	17 - 22°	Óleo de corte
Aços para máquinas automáticas	9 S Mn 28, 9 S MnPb 28 etc.	17 - 22°	Óleo de corte
Aços para cementação	C 15, Ck 15, 16 MnCr 5 etc.	17 - 22°	Óleo de corte, óleo de corte especial
Aços para beneficiamento	C 35 Pb, C 45 etc.	13 - 18°	Óleo de corte, óleo de corte especial
Aços resistentes a corrosão e ácidos	x12 CrMoS 17, x12 CrNiS 188 etc.	13 - 18°	Óleo de corte especial
Ferro fundido	GG 15, GG25	8 - 12°	Óleo de corte, querosene
Latão de cavacos curtos,Ms 58	CuZn 39 Pb 2, CuZn 40 Pb 2	10 - 12°	Óleo de corte
Latão de cavacos longos, Ms 60	CuZn 20, CuZn 37	3 - 7°	Óleo de corte
Ligas de alumínio de cavacos longos	AlCuMg 1, AlMg 3 Si	23 - 28°	Óleo de corte especial, querosene
Ligas de alumínio de cavacos curtos	GD-AlSl 8 Cu 3, GD AlSi 12	13 - 18°	Óleo de corte especial, querosene

Cossinetes p. máquinas automáticas p. rosca métrica ISO

6g | R | WN | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	○
	> M 2,6
Comprimento da entrada	1,75xP





Norma da emp. Nr. do artigo **121**

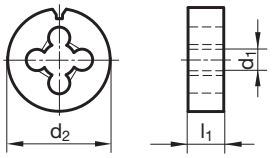
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	mm	
M3	0,500	16,000	5,000	2,92	3,010
M4	0,700	20,000	5,000	3,91	4,020
M5	0,800	16,000	5,000	4,90	5,010
M5	0,800	20,000	7,000	4,90	5,020
M6	1,000	16,000	5,000	5,88	6,010
M6	1,000	20,000	7,000	5,88	6,020
M8	1,250	25,000	9,000	7,87	8,000
M10	1,500	30,000	11,000	9,85	10,000
M12	1,750	38,000	14,000	11,83	12,000

Cossinetes p. máquinas automáticas p. rosca métrica ISO

6g | R | WN | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	◯
	> M 2,6
Comprimento da entrada	1,75xP





Norma da emp. Nr. do artigo **125**

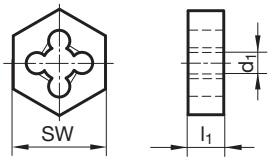
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	mm	
M2	0,400	16,000	3,500	1,94	2,000
M3	0,500	20,000	3,500	2,92	3,000
M5	0,800	20,000	7,000	4,90	5,000
M6	1,000	20,000	7,000	5,88	6,000
M8	1,250	25,000	9,000	7,87	8,000
M10	1,500	30,000	11,000	9,85	10,000

Cossinetes para rosca métrica ISO

6g | R | DIN 382

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	◯
Comprimento da entrada	1,75xP





DIN 382 Nr. do artigo **139**

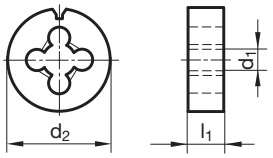
d1	P	SW	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	mm	
M5	0,800	18,000	7,000	4,90	5,000
M6	1,000	18,000	7,000	5,88	6,000
M8	1,250	21,000	9,000	7,87	8,000
M10	1,500	27,000	11,000	9,85	10,000
M12	1,750	36,000	14,000	11,83	12,000
M16	2,000	41,000	18,000	15,82	16,000
M20	2,500	41,000	18,000	19,79	20,000
M24	3,000	50,000	22,000	23,77	24,000
M52	5,000	85,000	36,000	51,66	52,000

Cossinetes para rosca métrica ISO

6g | R | DIN EN 22568 | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS	
Superfície	◯	◯
		> M 2,6
Comprimento da entrada	1,75xP	1,75xP







DIN EN 22568 — Nr. do artigo: **151** | **153**

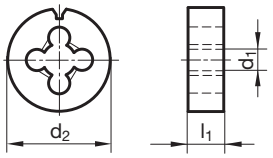
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	mm	
M1	0,250	16,000	5,000	0,97	1,000
M1,2	0,250	16,000	5,000	1,17	1,200
M1,4	0,300	16,000	5,000	1,36	1,400
M1,6	0,350	16,000	5,000	1,54	1,600
M2	0,400	16,000	5,000	1,94	2,000
M2,3	0,400	16,000	5,000	2,25	2,300
M2,5	0,450	16,000	5,000	2,43	2,500
M2,6	0,450	16,000	5,000	2,54	2,600
M3	0,500	20,000	5,000	2,92	3,000
M3,5	0,600	20,000	5,000	3,41	3,500
M4	0,700	20,000	5,000	3,91	4,000
M5	0,800	20,000	7,000	4,90	5,000
M6	1,000	20,000	7,000	5,88	6,000
M7	1,000	25,000	9,000	6,88	7,000
M8	1,250	25,000	9,000	7,87	8,000
M10	1,500	30,000	11,000	9,85	10,000
M12	1,750	38,000	14,000	11,83	12,000
M14	2,000	38,000	14,000	13,82	14,000
M16	2,000	45,000	18,000	15,82	16,000
M18	2,500	45,000	18,000	17,79	18,000
M20	2,500	45,000	18,000	19,79	20,000
M24	3,000	55,000	22,000	23,77	24,000
M30	3,500	65,000	25,000	29,73	30,000

Cossinetes para rosca métrica ISO

6g | R | DIN EN 22568 | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	◯
	> M 2,6
Comprimento da entrada	1,75xP





DIN EN 22568 Nr. do artigo **152**

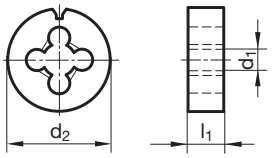
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	mm	
M3	0,500	20,000	5,000	2,92	3,000
M3,5	0,600	20,000	5,000	3,41	3,500
M4	0,700	20,000	5,000	3,91	4,000
M5	0,800	20,000	7,000	4,90	5,000
M6	1,000	20,000	7,000	5,88	6,000
M7	1,000	25,000	9,000	6,88	7,000
M8	1,250	25,000	9,000	7,87	8,000
M9	1,250	25,000	9,000	8,87	9,000
M10	1,500	30,000	11,000	9,85	10,000
M12	1,750	38,000	14,000	11,83	12,000
M14	2,000	38,000	14,000	13,82	14,000
M16	2,000	45,000	18,000	15,82	16,000
M18	2,500	45,000	18,000	17,79	18,000
M20	2,500	45,000	18,000	19,79	20,000
M22	2,500	55,000	22,000	21,79	22,000
M24	3,000	55,000	22,000	23,77	24,000
M27	3,000	65,000	25,000	26,77	27,000
M30	3,500	65,000	25,000	29,73	30,000

Cossinetes para rosca métrica ISO

6g | R | DIN EN 22568 | B

P	≤ 1200
M	•
K	
N	
S	
H	

Material de corte	**HSS-E**
Superfície	●
	> M 2,6
Comprimento da entrada	1,75xP





DIN EN 22568 Nr. do artigo **130**

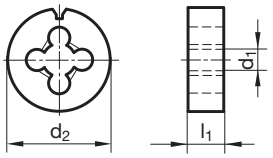
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	mm	
M2	0,400	16,000	3,500	1,94	2,000
M2,2	0,450	16,000	3,500	2,13	2,200
M2,5	0,450	16,000	5,000	2,43	2,500
M3	0,500	16,000	5,000	2,92	3,010
M3	0,500	20,000	5,000	2,92	3,020
M4	0,700	16,000	5,000	3,91	4,010
M4	0,700	20,000	5,000	3,91	4,020
M5	0,800	20,000	7,000	4,90	5,000
M6	1,000	20,000	7,000	5,88	6,000
M8	1,250	25,000	9,000	7,87	8,000
M10	1,500	30,000	11,000	9,85	10,000
M12	1,750	38,000	14,000	11,83	12,000
M14	2,000	38,000	14,000	13,82	14,000
M16	2,000	45,000	18,000	15,82	16,000
M20	2,500	45,000	18,000	19,79	20,000

Cossinetes para rosca métrica ISO

6g | L | DIN EN 22568 | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	◯
	> M 2,6
Comprimento da entrada	1,75xP





DIN EN 22568 Nr. do artigo **156**

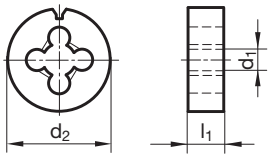
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	mm	
M3	0,500	20,000	5,000	2,92	3,000
M4	0,700	20,000	5,000	3,91	4,000
M5	0,800	20,000	7,000	4,90	5,000
M6	1,000	20,000	7,000	5,88	6,000
M8	1,250	25,000	9,000	7,87	8,000
M10	1,500	30,000	11,000	9,85	10,000
M12	1,750	38,000	14,000	11,83	12,000
M14	2,000	38,000	14,000	13,82	14,000
M16	2,000	45,000	18,000	15,82	16,000
M20	2,500	45,000	18,000	19,79	20,000

Cossinetes para rosca métrica fina ISO

6g | R | DIN EN 22568 | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS	
Superfície	◯	◯
		> M 2,6
Comprimento da entrada	1,75xP	1,75xP







DIN EN 22568 — Nr. do artigo **161** **162**

d1	d2	l1	Werkstück-Ø	N° de cód.
	mm	mm	mm	
M3 x 0,35	20,000	5,000	2,94	3,002
M4 x 0,5	20,000	5,000	3,92	4,003
M5 x 0,5	20,000	5,000	4,92	5,003
M6 x 0,5	20,000	5,000	5,92	6,003
M6 x 0,75	20,000	7,000	5,91	6,004
M7 x 0,5	25,000	9,000	6,92	7,003
M7 x 0,75	25,000	9,000	6,91	7,004
M8 x 0,5	25,000	9,000	7,92	8,003
M8 x 0,75	25,000	9,000	7,91	8,004
M8 x 1	25,000	9,000	7,88	8,005
M9 x 0,75	25,000	9,000	8,91	9,004
M9 x 1	25,000	9,000	8,88	9,005
M10 x 0,75	30,000	11,000	9,91	10,004
M10 x 1	30,000	11,000	9,88	10,005
M10 x 1,25	30,000	11,000	9,87	10,006
M11 x 1	30,000	11,000	10,88	11,005
M12 x 0,75	38,000	10,000	11,91	12,004
M12 x 1	38,000	10,000	11,88	12,005
M12 x 1,25	38,000	10,000	11,87	12,006
M12 x 1,5	38,000	10,000	11,85	12,007
M13 x 1	38,000	10,000	12,88	13,005
M14 x 1	38,000	10,000	13,88	14,005
M14 x 1,25	38,000	10,000	13,87	14,006
M14 x 1,5	38,000	10,000	13,85	14,007
M15 x 1	38,000	10,000	14,88	15,005
M16 x 1	45,000	14,000	15,88	16,005
M16 x 1,5	45,000	14,000	15,85	16,007
M17 x 1	45,000	14,000	16,88	17,005
M18 x 1	45,000	14,000	17,88	18,005
M18 x 1,5	45,000	14,000	17,85	18,007
M20 x 1	45,000	14,000	19,88	20,005
M20 x 1,5	45,000	14,000	19,85	20,007
M20 x 2	45,000	14,000	19,82	20,008
M22 x 1	55,000	16,000	21,88	22,005
M22 x 1,5	55,000	16,000	21,85	22,007
M24 x 1,5	55,000	16,000	23,85	24,007

DIN EN 22568 Nr. do artigo **161** **162**

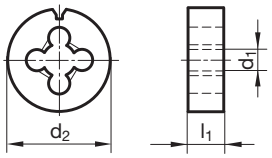
d1	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	
M24 x 2	55,000	16,000	23,82	24,008
M25 x 1,5	55,000	16,000	24,85	25,007
M26 x 1,5	55,000	16,000	25,85	26,007
M27 x 1,5	65,000	18,000	26,85	27,007
M27 x 2	65,000	18,000	26,82	27,008
M28 x 1,5	65,000	18,000	27,85	28,007
M30 x 1,5	65,000	18,000	29,85	30,007
M30 x 2	65,000	18,000	29,82	30,008

Cossinetes para rosca UNC

2a	R	DIN EN 22568	B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	◯
Comprimento da entrada	1,75xP





DIN EN 22568 Nr. do artigo **182**

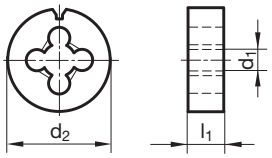
d1	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	
8 - 32	20,000	7,000	4,07	4,166
10 - 24	20,000	7,000	4,71	4,826
1/4 - 20	20,000	7,000	6,22	6,350
5/16 - 18	25,000	9,000	7,80	7,938
3/8 - 16	30,000	11,000	9,37	9,525
7/16 - 14	30,000	11,000	10,95	11,113
1/2 - 13	38,000	14,000	12,52	12,700
5/8 - 11	45,000	18,000	15,68	15,875
3/4 - 10	45,000	18,000	18,84	19,050

Cossinetes para rosca UNF

2a | R | DIN EN 22568 | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	◯
Comprimento da entrada	1,75xP





DIN EN 22568 — Nr. do artigo **185**

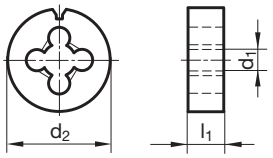
d1	d2	l1	Werkstück-Ø	Nº de cód.
	mm	mm	mm	
10 - 32	20,000	7,000	4,73	4,826
1/4 - 28	20,000	7,000	6,24	6,350
5/16 - 24	25,000	9,000	7,82	7,938
3/8 - 24	30,000	11,000	9,41	9,525
7/16 - 20	30,000	11,000	10,98	11,113
1/2 - 20	38,000	10,000	12,56	12,700
9/16 - 18	38,000	10,000	14,14	14,288
5/8 - 18	45,000	14,000	15,73	15,875
3/4 - 16	45,000	14,000	18,89	19,050
7/8 - 14	55,000	16,000	22,05	22,225

Cossinetes para rosca gás Whitworth

R | DIN EN 24231 | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS	
Superfície	◯	◯
Comprimento da entrada	1,75xP	1,75xP







DIN EN 24231 — Nr. do artigo: **175** | **176**

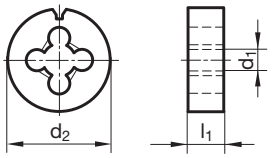
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	G/inch	mm	mm	mm	
G1/8	28,000	30,000	11,000	9,62	9,728
G1/4	19,000	38,000	10,000	13,03	13,157
G3/8	19,000	45,000	14,000	16,54	16,662
G1/2	14,000	45,000	14,000	20,81	20,955
G5/8	14,000	55,000	16,000	22,77	22,911
G3/4	14,000	55,000	16,000	26,30	26,441
G1	11,000	65,000	18,000	33,07	33,249
G1 1/4	11,000	75,000	20,000	41,73	41,910
G1 1/2	11,000	90,000	22,000	47,62	47,803

Cossinetes para rosca R BSPT

R | DIN EN 24230 | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	◯
Comprimento da entrada	1,75xP





DIN EN 24230 Nr. do artigo **198**

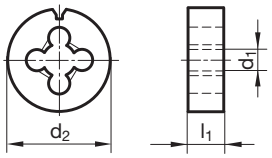
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	G/inch	mm	mm	mm	
R1/8	28	30,000	11,000	9,48	9,728
R1/4	19	38,000	14,000	12,78	13,157
R3/8	19	45,000	14,000	16,26	16,662
R1/2	14	45,000	18,000	20,44	20,955

Cossinetes para rosca NPT

R | DIN EN 22568 | B

P	≤ 1000
M	
K	•
N	•
S	
H	

Material de corte	HSS
Superfície	◯
Comprimento da entrada	1,75xP





DIN EN 22568 — Nr. do artigo **191**

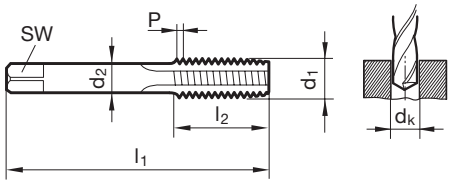
d1	P	d2	l1	Werkstück-Ø	Nº de cód.
	G/inch	mm	mm	mm	
1/8	27,000	30,000	11,000	9,93	10,620
1/4	18,000	38,000	14,000	13,18	14,140
3/8	18,000	45,000	14,000	16,60	17,570
1/2	14,000	45,000	18,000	20,63	21,900
3/4	14,000	55,000	22,000	25,95	27,230

Machos manuais para rosca métrica ISO

ISO2/6H R

P	≤ 800
M	
K	
N	○
S	
H	

Material de corte	HSS			
Superfície	○	○	○	○
Tipo	N	N	N	N
Denominação	conjunto	V	M	F





DIN 352 Nr. do artigo **861** **862** **863** **864**

d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,75	32,000	5,500
M1,1	0,250	2,500	2,100	0,85	32,000	5,500
M1,2	0,250	2,500	2,100	0,95	32,000	5,500
M1,4	0,300	2,500	2,100	1,10	32,000	7,000
M1,6	0,350	2,500	2,100	1,25	32,000	8,000
M1,7	0,350	2,500	2,100	1,35	32,000	8,000
M1,8	0,350	2,500	2,100	1,45	32,000	8,000
M2	0,400	2,800	2,100	1,60	36,000	8,000
M2,2	0,450	2,800	2,100	1,75	36,000	9,000
M2,3	0,400	2,800	2,100	1,90	36,000	9,000
M2,5	0,450	2,800	2,100	2,05	40,000	9,000
M2,6	0,450	2,800	2,100	2,15	40,000	9,000
M3	0,500	3,500	2,700	2,50	40,000	10,000
M3,5	0,600	4,000	3,000	2,90	45,000	12,000
M4	0,700	4,500	3,400	3,30	45,000	12,000
M4,5	0,750	6,000	4,900	3,70	50,000	14,000
M5	0,800	6,000	4,900	4,20	50,000	14,000
M6	1,000	6,000	4,900	5,00	56,000	16,000
M7	1,000	6,000	4,900	6,00	56,000	16,000
M8	1,250	6,000	4,900	6,80	63,000	17,000
M9	1,250	7,000	5,500	7,80	63,000	17,000
M10	1,500	7,000	5,500	8,50	70,000	20,000
M11	1,500	8,000	6,200	9,50	70,000	20,000
M12	1,750	9,000	7,000	10,20	75,000	24,000
M14	2,000	11,000	9,000	12,00	80,000	26,000
M16	2,000	12,000	9,000	14,00	80,000	26,000
M18	2,500	14,000	11,000	15,50	95,000	30,000
M20	2,500	16,000	12,000	17,50	95,000	32,000
M22	2,500	18,000	14,500	19,50	100,000	32,000
M24	3,000	18,000	14,500	21,00	110,000	36,000
M27	3,000	20,000	16,000	24,00	110,000	36,000
M30	3,500	22,000	18,000	26,50	125,000	40,000
M36	4,000	28,000	22,000	32,00	150,000	50,000
M42	4,500	32,000	24,000	37,50	150,000	56,000
M45	4,500	36,000	29,000	40,50	160,000	58,000
M60	5,500	45,000	35,000	54,50	200,000	70,000

DIN 352 Nr. do artigo **861** **862** **863** **864**

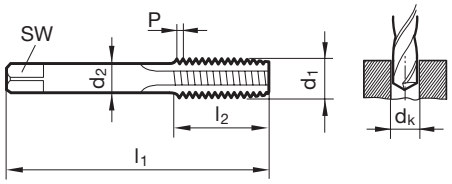
d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M64	6,000	50,000	39,000	58,00	220,000	75,000
M68	6,000	50,000	39,000	62,00	220,000	75,000

Machos manuais para rosca métrica ISO

ISO2/6H R

P	≤ 800
M	
K	
N	○
S	
H	

Material de corte	HSS		
Superfície	◯	◯	◯
Tipo	N	N	N
Denominação	conjunto	V	F





DIN 352 — Nr. do artigo: **882** | **883** | **864**

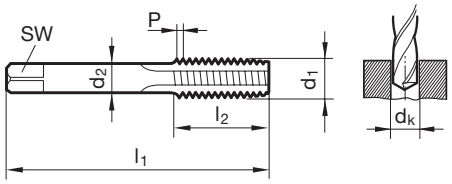
d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M1	0,250	2,500	2,100	0,75	32,000	5,500
M1,1	0,250	2,500	2,100	0,85	32,000	5,500
M1,2	0,250	2,500	2,100	0,95	32,000	5,500
M1,4	0,300	2,500	2,100	1,10	32,000	7,000
M1,6	0,350	2,500	2,100	1,25	32,000	8,000
M1,7	0,350	2,500	2,100	1,35	32,000	8,000
M1,8	0,350	2,500	2,100	1,45	32,000	8,000
M2	0,400	2,800	2,100	1,60	36,000	8,000
M2,2	0,450	2,800	2,100	1,75	36,000	9,000
M2,3	0,400	2,800	2,100	1,90	36,000	9,000
M2,5	0,450	2,800	2,100	2,05	40,000	9,000
M2,6	0,450	2,800	2,100	2,15	40,000	9,000
M3	0,500	3,500	2,700	2,50	40,000	10,000
M3,5	0,600	4,000	3,000	2,90	45,000	12,000
M4	0,700	4,500	3,400	3,30	45,000	12,000
M4,5	0,750	6,000	4,900	3,70	50,000	14,000
M5	0,800	6,000	4,900	4,20	50,000	14,000
M6	1,000	6,000	4,900	5,00	56,000	16,000
M7	1,000	6,000	4,900	6,00	56,000	16,000
M8	1,250	6,000	4,900	6,80	63,000	17,000
M9	1,250	7,000	5,500	7,80	63,000	17,000
M10	1,500	7,000	5,500	8,50	70,000	20,000
M11	1,500	8,000	6,200	9,50	70,000	20,000
M12	1,750	9,000	7,000	10,20	75,000	24,000
M14	2,000	11,000	9,000	12,00	80,000	26,000
M16	2,000	12,000	9,000	14,00	80,000	26,000
M18	2,500	14,000	11,000	15,50	95,000	30,000
M20	2,500	16,000	12,000	17,50	95,000	32,000
M22	2,500	18,000	14,500	19,50	100,000	32,000
M24	3,000	18,000	14,500	21,00	110,000	36,000
M27	3,000	20,000	16,000	24,00	110,000	36,000
M30	3,500	22,000	18,000	26,50	125,000	40,000
M36	4,000	28,000	22,000	32,00	150,000	50,000
M42	4,500	32,000	24,000	37,50	150,000	56,000
M45	4,500	36,000	29,000	40,50	160,000	58,000

Machos manuais para rosca métrica ISO

ISO2/6H L

P	≤ 800
M	
K	
N	○
S	
H	

Material de corte	HSS			
Superfície	○	○	○	○
Tipo	N	N-LH	N-LH	N-LH
Denominação	conjunto	V	M	F





DIN 352 — Nr. do artigo: **904** | **905** | **906** | **907**

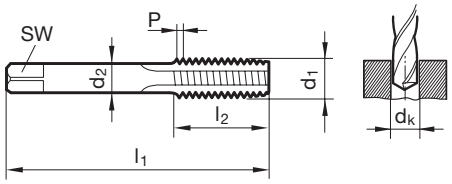
d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	36,000	8,000
M2,2	0,450	2,800	2,100	1,75	36,000	9,000
M2,5	0,450	2,800	2,100	2,05	40,000	9,000
M3	0,500	3,500	2,700	2,50	40,000	10,000
M4	0,700	4,500	3,400	3,30	45,000	12,000
M5	0,800	6,000	4,900	4,20	50,000	14,000
M6	1,000	6,000	4,900	5,00	56,000	16,000
M8	1,250	6,000	4,900	6,80	63,000	17,000
M10	1,500	7,000	5,500	8,50	70,000	20,000
M12	1,750	9,000	7,000	10,20	75,000	24,000
M14	2,000	11,000	9,000	12,00	80,000	26,000
M16	2,000	12,000	9,000	14,00	80,000	26,000
M18	2,500	14,000	11,000	15,50	95,000	30,000

Machos manuais para rosca métrica ISO

ISO2/6H R

P	≤ 1000
M	•
K	•
N	•
S	
H	

Material de corte	HSS-E			
Superfície	○	○	○	○
Tipo	VA	VA	VA	VA
Denominação	conjunto	V	M	F





DIN 352	Nr. do artigo	853	854	855	856

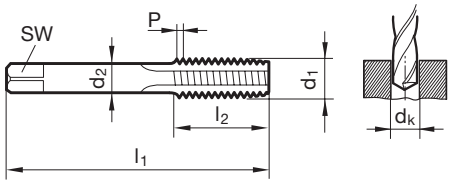
d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	36,000	8,000
M2,5	0,450	2,800	2,100	2,05	40,000	9,000
M3	0,500	3,500	2,700	2,50	40,000	10,000
M4	0,700	4,500	3,400	3,30	45,000	12,000
M5	0,800	6,000	4,900	4,20	50,000	14,000
M6	1,000	6,000	4,900	5,00	56,000	16,000
M8	1,250	6,000	4,900	6,80	63,000	17,000
M10	1,500	7,000	5,500	8,50	70,000	20,000
M12	1,750	9,000	7,000	10,20	75,000	24,000
M16	2,000	12,000	9,000	14,00	80,000	26,000
M20	2,500	16,000	12,000	17,50	95,000	32,000

Machos manuais para rosca métrica ISO

ISO2/6H R

P	•
M	•
K	•
N	•
S	
H	

Material de corte	HSS-E			
Superfície	●	●	●	●
Tipo	H	H	H	H
Denominação	conjunto	V	M	F





DIN 352 — Nr. do artigo: **857** | **858** | **859** | **860**

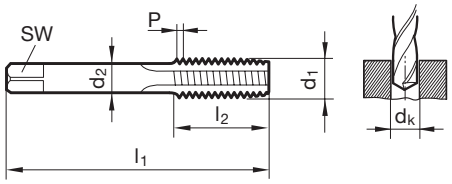
d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M2	0,400	2,800	2,100	1,60	36,000	6,400
M2	0,400	2,800	2,100	1,60	36,000	8,000
M2,5	0,450	2,800	2,100	2,05	40,000	7,000
M2,5	0,450	2,800	2,100	2,05	40,000	9,000
M3	0,500	3,500	2,700	2,50	40,000	8,000
M3	0,500	3,500	2,700	2,50	40,000	10,000
M3,5	0,600	4,000	3,000	2,90	45,000	12,000
M4	0,700	4,500	3,400	3,30	45,000	9,000
M4	0,700	4,500	3,400	3,30	45,000	12,000
M5	0,800	6,000	4,900	4,20	50,000	14,000
M5	0,800	6,000	4,900	4,20	50,000	11,000
M6	1,000	6,000	4,900	5,00	56,000	16,000
M6	1,000	6,000	4,900	5,00	56,000	12,000
M8	1,250	6,000	4,900	6,80	63,000	17,000
M8	1,250	6,000	4,900	6,80	63,000	11,000
M10	1,500	7,000	5,500	8,50	70,000	20,000
M10	1,500	7,000	5,500	8,50	70,000	14,000
M12	1,750	9,000	7,000	10,20	75,000	24,000
M12	1,750	9,000	7,000	10,20	75,000	18,000
M14	2,000	11,000	9,000	12,00	80,000	26,000
M14	2,000	11,000	9,000	12,00	80,000	19,000
M16	2,000	12,000	9,000	14,00	80,000	26,000
M16	2,000	12,000	9,000	14,00	80,000	18,000
M18	2,500	14,000	11,000	15,50	95,000	30,000
M18	2,500	14,000	11,000	15,50	95,000	21,000
M20	2,500	16,000	12,000	17,50	95,000	32,000
M20	2,500	16,000	12,000	17,50	95,000	22,000

Machos manuais para rosca métrica ISO

ISO2/6H R

P	•
M	•
K	•
N	•
S	
H	

Material de corte	HSS-E-PM			
Superfície	●	●	●	●
Tipo	H	H	H	H
Denominação	conjunto	V	M	F





DIN 352 Nr. do artigo **1818** **1819** **1820** **1821**

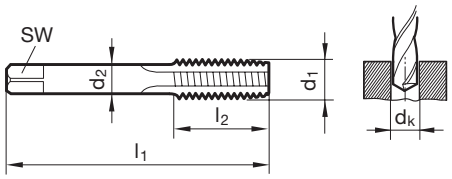
d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M3	0,500	3,500	2,700	2,50	40,000	8,000
M3	0,500	3,500	2,700	2,50	40,000	10,000
M4	0,700	4,500	3,400	3,30	45,000	12,000
M4	0,700	4,500	3,400	3,30	45,000	9,000
M5	0,800	6,000	4,900	4,20	50,000	14,000
M5	0,800	6,000	4,900	4,20	50,000	11,000
M6	1,000	6,000	4,900	5,00	56,000	16,000
M6	1,000	6,000	4,900	5,00	56,000	12,000
M8	1,250	6,000	4,900	6,80	63,000	17,000
M8	1,250	6,000	4,900	6,80	63,000	11,000
M10	1,500	7,000	5,500	8,50	70,000	20,000
M10	1,500	7,000	5,500	8,50	70,000	14,000
M12	1,750	9,000	7,000	10,20	75,000	24,000
M12	1,750	9,000	7,000	10,20	75,000	18,000

Machos manuais para rosca métrica fina ISO

ISO2/6H | R

P	≤ 800
M	
K	
N	○
S	
H	

Material de corte	HSS		
Superfície	◯	◯	◯
Tipo	N	N	N
Denominação	conjunto	V	F





DIN 2181 — Nr. do artigo: **884** | **885** | **886**

d1	d2	SW	dk	l1	l2	Nº de cód.
	mm	mm	mm	mm	mm	
M2 x 0,25	2,800	2,100	1,75	36,000	8,000	2,001
M2,2 x 0,25	2,800	2,100	1,95	36,000	9,000	2,201
M2,3 x 0,25	2,800	2,100	2,05	36,000	9,000	2,301
M2,6 x 0,35	2,800	2,100	2,25	40,000	9,000	2,602
M3 x 0,35	3,500	2,700	2,65	40,000	8,000	3,002
M4 x 0,35	4,500	3,400	3,65	45,000	9,000	4,002
M4 x 0,5	4,500	3,400	3,50	45,000	9,000	4,003
M5 x 0,5	6,000	4,900	4,50	50,000	11,000	5,003
M6 x 0,5	6,000	4,900	5,50	56,000	12,000	6,003
M6 x 0,75	6,000	4,900	5,20	56,000	12,000	6,004
M7 x 0,75	6,000	4,900	6,20	56,000	14,000	7,004
M8 x 0,5	6,000	4,900	7,50	56,000	14,000	8,003
M8 x 0,75	6,000	4,900	7,20	56,000	14,000	8,004
M8 x 1	6,000	4,900	7,00	63,000	17,000	8,005
M9 x 1	7,000	5,500	8,00	63,000	17,000	9,005
M10 x 0,75	7,000	5,500	9,20	63,000	18,000	10,004
M10 x 1	7,000	5,500	9,00	63,000	18,000	10,005
M10 x 1,25	7,000	5,500	8,80	70,000	20,000	10,006
M11 x 1	8,000	6,200	10,00	63,000	18,000	11,005
M12 x 1	9,000	7,000	11,00	70,000	18,000	12,005
M12 x 1,25	9,000	7,000	10,80	70,000	20,000	12,006
M12 x 1,5	9,000	7,000	10,50	70,000	20,000	12,007
M14 x 1	11,000	9,000	13,00	70,000	20,000	14,005
M14 x 1,25	11,000	9,000	12,80	70,000	20,000	14,006
M14 x 1,5	11,000	9,000	12,50	70,000	20,000	14,007
M15 x 1	12,000	9,000	14,00	70,000	20,000	15,005
M15 x 1,5	12,000	9,000	13,50	70,000	20,000	15,007
M16 x 1	12,000	9,000	15,00	70,000	20,000	16,005
M16 x 1,5	12,000	9,000	14,50	70,000	20,000	16,007
M18 x 1	14,000	11,000	17,00	80,000	22,000	18,005
M18 x 1,5	14,000	11,000	16,50	80,000	22,000	18,007
M18 x 2	14,000	11,000	16,00	80,000	22,000	18,008
M20 x 1	16,000	12,000	19,00	80,000	22,000	20,005
M20 x 1,5	16,000	12,000	18,50	80,000	22,000	20,007
M20 x 2	16,000	12,000	18,00	80,000	22,000	20,008
M22 x 1	18,000	14,500	21,00	80,000	22,000	22,005

DIN 2181 Nr. do artigo **884** **885** **886**

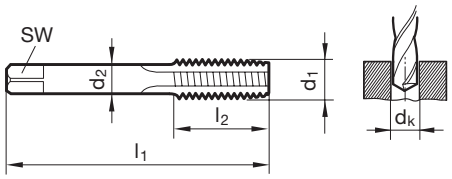
d1	d2	SW	dk	l1	l2	Nº de cód.
	mm	mm	mm	mm	mm	
M22 x 1,5	18,000	14,500	20,50	80,000	22,000	22,007
M22 x 2	18,000	14,500	20,00	80,000	22,000	22,008
M24 x 1	18,000	14,500	23,00	90,000	22,000	24,005
M24 x 1,5	18,000	14,500	22,50	90,000	22,000	24,007
M24 x 2	18,000	14,500	22,00	90,000	22,000	24,008
M26 x 1,5	18,000	14,500	24,50	90,000	22,000	26,007
M27 x 1,5	20,000	16,000	25,50	90,000	22,000	27,007
M27 x 2	20,000	16,000	25,00	90,000	22,000	27,008
M30 x 1	22,000	18,000	29,00	90,000	22,000	30,005
M30 x 1,5	22,000	18,000	28,50	90,000	22,000	30,007
M30 x 2	22,000	18,000	28,00	90,000	22,000	30,008
M32 x 1,5	22,000	18,000	30,50	90,000	22,000	32,007
M34 x 1,5	28,000	22,000	32,50	100,000	25,000	34,007
M35 x 1,5	28,000	22,000	33,50	100,000	25,000	35,007
M36 x 1,5	28,000	22,000	34,50	100,000	25,000	36,007
M38 x 1,5	28,000	22,000	36,50	100,000	25,000	38,007
M45 x 1,5	36,000	29,000	43,50	110,000	25,000	45,007
M52 x 1,5	40,000	32,000	50,50	140,000	32,000	52,007

Machos manuais para rosca UNC

2B | R

P	≤ 800
M	
K	
N	○
S	
H	

Material de corte	HSS			
Superfície	○	○	○	○
Tipo	N	N	N	N
Denominação	conjunto	V	M	F





~DIN 352 — Nr. do artigo: **981** | **982** | **983** | **984**

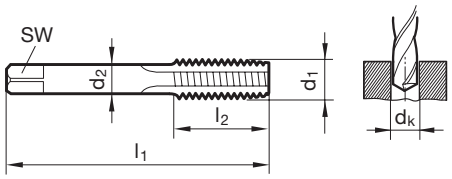
d1	d2	SW	dk	l1	l2	Nº de cód.
	mm	mm	mm	mm	mm	
1 - 64	2,800	2,100	1,55	36,000	8,000	1,854
2 - 56	2,800	2,100	1,85	36,000	9,000	2,184
3 - 48	2,800	2,100	2,10	40,000	9,000	2,515
4 - 40	3,500	2,700	2,35	40,000	11,000	2,845
5 - 40	4,000	2,700	2,65	40,000	11,000	3,175
5 - 40	3,500	2,700	2,65	40,000	11,000	3,175
6 - 32	4,000	3,000	2,85	45,000	12,000	3,505
8 - 32	4,500	3,400	3,50	45,000	12,000	4,166
10 - 24	6,000	4,900	3,90	50,000	14,000	4,826
12 - 24	6,000	4,900	4,50	56,000	16,000	5,486
1/4 - 20	6,000	4,900	5,10	56,000	16,000	6,350
5/16 - 18	6,000	4,900	6,60	63,000	18,000	7,938
3/8 - 16	7,000	5,500	8,00	70,000	20,000	9,525
7/16 - 14	8,000	6,200	9,40	70,000	22,000	11,113
1/2 - 13	9,000	7,000	10,80	75,000	25,000	12,700
9/16 - 12	11,000	9,000	12,20	80,000	28,000	14,288
5/8 - 11	12,000	9,000	13,50	80,000	30,000	15,875
3/4 - 10	16,000	11,000	16,50	95,000	33,000	19,050
3/4 - 10	14,000	11,000	16,50	95,000	33,000	19,050
7/8 - 9	18,000	14,500	19,50	100,000	35,000	22,225
1 - 8	18,000	14,500	22,25	110,000	38,000	25,400
1 1/8 - 7	22,000	18,000	25,00	125,000	44,000	28,575
1 1/4 - 7	22,000	18,000	28,00	125,000	44,000	31,750
1 3/8 - 6	28,000	22,000	30,75	150,000	50,000	34,925
1 1/2 - 6	32,000	22,000	34,00	150,000	50,000	38,100
1 3/4 - 5	36,000	29,000	39,50	160,000	58,000	44,450
2 - 4 1/2	40,000	32,000	45,00	180,000	65,000	50,800

Machos manuais para rosca UNF

2B R

P	≤ 800
M	
K	
N	○
S	
H	

Material de corte	HSS		
Superfície	◯	◯	◯
Tipo	N	N	N
Denominação	conjunto	V	F





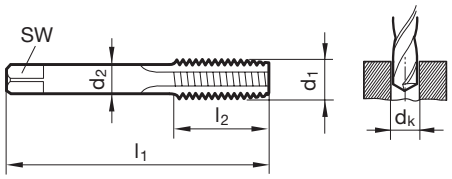
~DIN 2181	Nr. do artigo	985	986	987

d1	d2	SW	dk	l1	l2	Nº de cód.
	mm	mm	mm	mm	mm	
1 - 72	2,800	2,100	1,55	36,000	8,000	1,854
2 - 64	2,800	2,100	1,85	36,000	9,000	2,184
3 - 56	2,800	2,100	2,15	40,000	9,000	2,515
4 - 48	3,500	2,700	2,40	40,000	8,000	2,845
5 - 44	3,500	2,700	2,70	40,000	8,000	3,175
5 - 44	4,000	2,700	2,70	40,000	8,000	3,175
6 - 40	4,000	3,000	2,95	45,000	9,000	3,505
8 - 36	4,500	3,400	3,50	45,000	10,000	4,166
8 - 36	4,500	3,400	3,50	45,000	12,000	4,166
10 - 32	6,000	4,900	4,10	50,000	14,000	4,826
12 - 28	6,000	4,900	4,60	56,000	16,000	5,486
1/4 - 28	6,000	4,900	5,50	56,000	17,000	6,350
5/16 - 24	6,000	4,900	6,90	63,000	17,000	7,938
3/8 - 24	7,000	5,500	8,50	63,000	18,000	9,525
7/16 - 20	8,000	6,200	9,90	70,000	20,000	11,113
7/16 - 20	8,000	6,200	9,90	70,000	18,000	11,113
1/2 - 20	9,000	7,000	11,50	70,000	20,000	12,700
9/16 - 18	11,000	9,000	12,90	70,000	20,000	14,288
5/8 - 18	12,000	9,000	14,50	70,000	20,000	15,875
3/4 - 16	16,000	11,000	17,50	80,000	22,000	19,050
3/4 - 16	14,000	11,000	17,50	80,000	22,000	19,050
7/8 - 14	18,000	14,500	20,40	80,000	22,000	22,225
1 - 12	18,000	14,500	23,25	90,000	22,000	25,400

Machos manuais para rosca BSW

Material de corte	HSS			
Superfície	◯	◯	◯	◯
Tipo	N	N	N	N
Denominação	conjunto	V	M	F

P	≤ 800
M	
K	
N	○
S	
H	





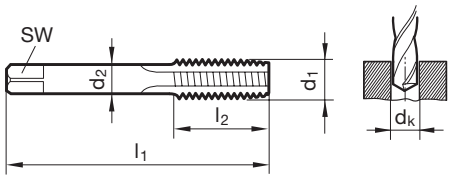
~DIN 352 — Nr. do artigo **954** **955** **956** **957**

d1	P	d2	SW	dk	l1	l2	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	
W3/32	48,000	2,800	2,100	1,80	40,000	9,000	2,381
W1/8	40,000	3,500	2,700	2,50	40,000	11,000	3,175
W1/8	40,000	4,000	2,700	2,50	40,000	11,000	3,175
W5/32	32,000	4,500	3,400	3,20	45,000	12,000	3,969
W3/16	24,000	6,000	4,900	3,60	50,000	14,000	4,762
W7/32	24,000	6,000	4,900	4,50	56,000	16,000	5,556
W1/4	20,000	6,000	4,900	5,10	56,000	16,000	6,350
W5/16	18,000	6,000	4,900	6,50	63,000	18,000	7,938
W3/8	16,000	7,000	5,500	7,90	70,000	20,000	9,525
W7/16	14,000	8,000	6,200	9,20	70,000	22,000	11,113
W1/2	12,000	9,000	7,000	10,50	75,000	25,000	12,700
W9/16	12,000	11,000	9,000	12,00	80,000	28,000	14,287
W5/8	11,000	12,000	9,000	13,50	80,000	30,000	15,876
W3/4	10,000	16,000	11,000	16,25	95,000	33,000	19,051
W1	8,000	18,000	14,500	22,00	110,000	38,000	25,401
W1 1/2	6,000	32,000	22,000	33,50	150,000	50,000	38,101
W1 5/8	5,000	32,000	24,000	35,50	150,000	58,000	41,277
W1 3/4	5,000	36,000	29,000	39,00	160,000	58,000	44,452
W2	4,500	40,000	32,000	44,50	180,000	65,000	50,802

Machos manuais para rosca gás

Material de corte	HSS		
Superfície	◯	◯	◯
Tipo	N	N	N
Denominação	conjunto	V	F

P	≤ 800
M	
K	
N	○
S	
H	





DIN 5157 — Nr. do artigo: **958** | **959** | **960**

d1	P	d2	SW	dk	l1	l2	Nº de cód.
	G/inch	mm	mm	mm	mm	mm	
G1/8	28,000	7,000	5,500	8,80	63,000	20,000	9,728
G1/8	28,000	7,000	5,500	8,80	63,000	18,000	9,728
G1/4	19,000	11,000	9,000	11,80	70,000	20,000	13,157
G3/8	19,000	12,000	9,000	15,25	70,000	20,000	16,662
G3/8	19,000	12,000	9,000	15,25	70,000	22,000	16,662
G1/2	14,000	16,000	12,000	19,00	80,000	22,000	20,955
G5/8	14,000	18,000	14,500	21,00	80,000	22,000	22,911
G3/4	14,000	20,000	16,000	24,50	90,000	22,000	26,441
G1	11,000	25,000	20,000	30,75	100,000	25,000	33,249
G1 1/4	11,000	32,000	24,000	39,50	125,000	40,000	41,910
G1 3/8	11,000	36,000	29,000	41,75	125,000	40,000	44,323
G1 1/2	11,000	36,000	29,000	45,25	140,000	40,000	47,803
G1 3/4	11,000	40,000	32,000	51,00	140,000	40,000	53,746
G2	11,000	45,000	35,000	57,00	160,000	40,000	59,614

M

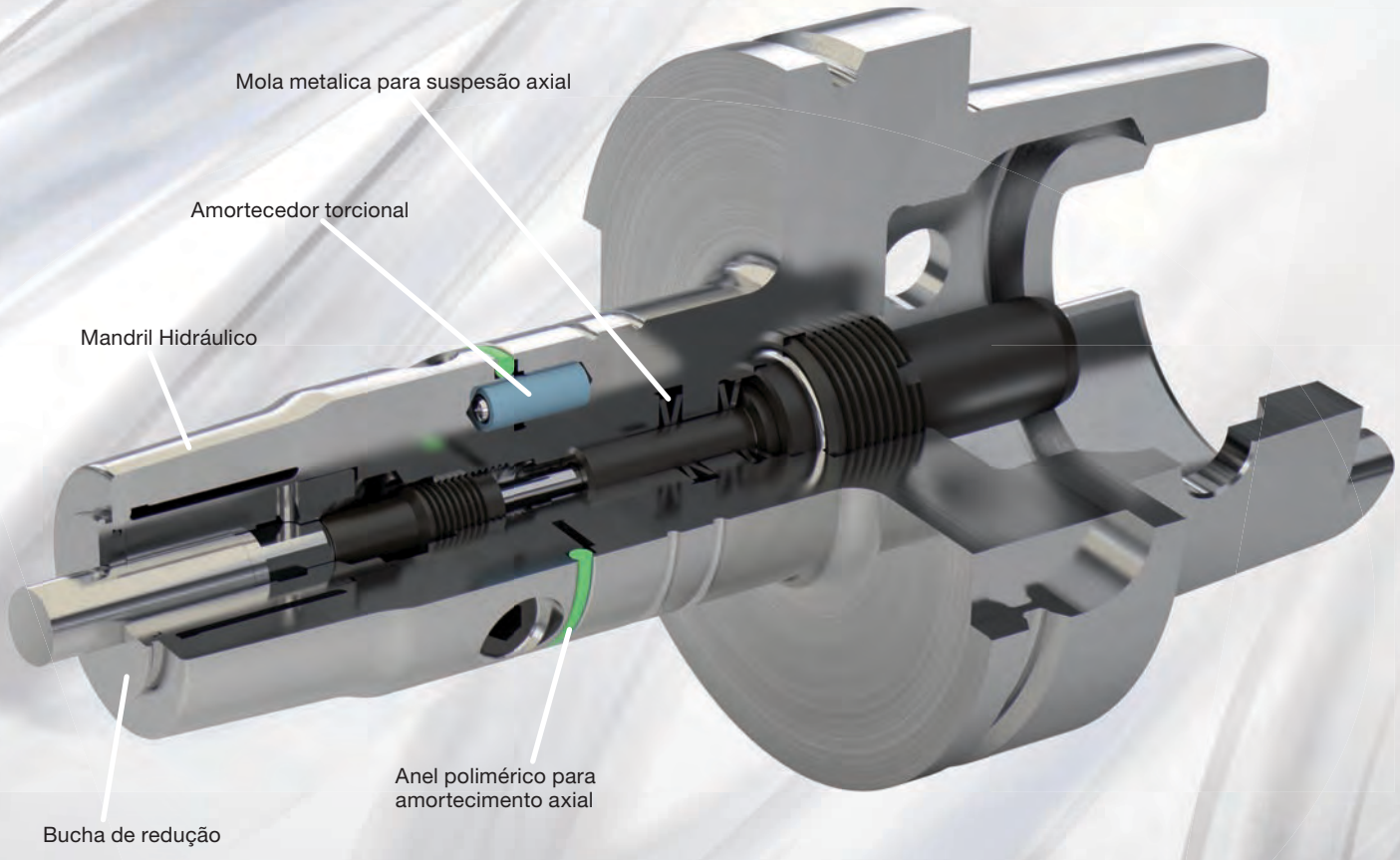
A

MANDRIS PARA ROSQUEAMENTO

Mandris para rosqueamento

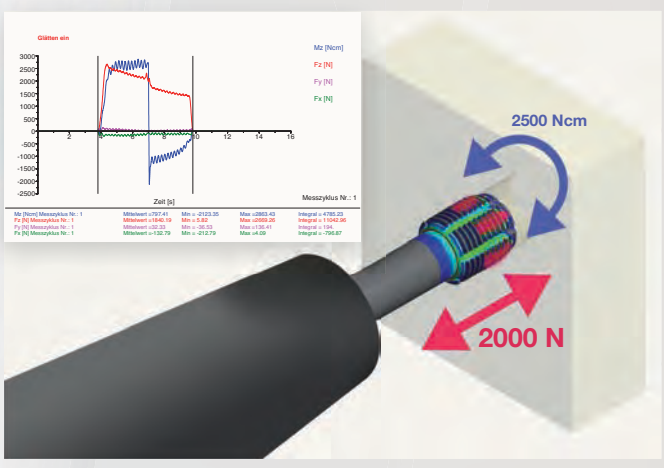
GUHROSYNC

O MELHOR CAMINHO PARA A ROSCA PERFEITA

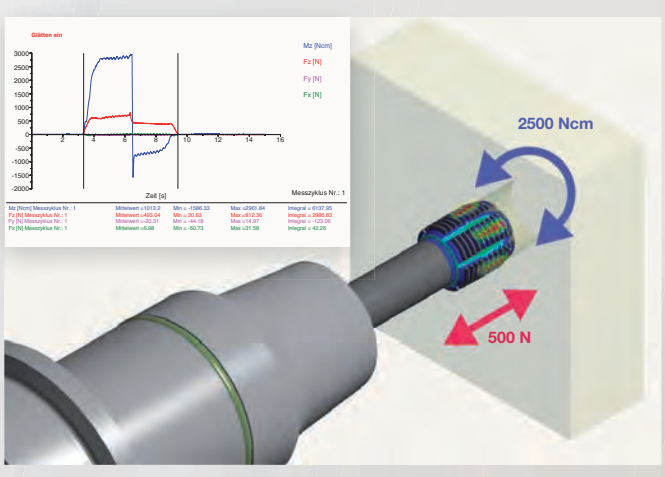


Design Inteligênte:
Assim como os elementos de amortecimento e compensação dos mandris GUHROSync (para redução de forças radiais e axiais durente o processo de rosqueamento) existem também alojamentos para sistema MQL ou convencional de refrigeração, e parafuso de ajuste.

A combinação perfeita de mola metálica e elementos de amortecimento poliméricos que reduzem consideravélmente as forças axiais e radiais.



Mandril Rígido

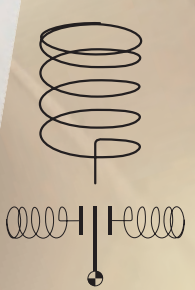


GUHROSync

MAIOR VIDA ÚTIL

EXCELENTE QUALIDADE DE ROSCA

ALTA CONFIABILIDADE DO PROCESSO



Visualização
Os simbolo de mola no mandril GUHROSync mostra o efeito das forças axiais e radiais.

- *REDUÇÃO DAS FORCAS RADIAIS E AXIAIS*
- *COMPENSAÇÃO DE ERROS DE SINCRONIZAÇÃO*
- *AJUSTE DE COMPRIMENTO DE FERRAMENTA RÁPIDO E PRECISO*
- *DESIGN MODULAR PARA DIFERENTES NORMAS E VERSÕES ESPECIAIS*
- *LONGA VIDA ÚTIL*
- *REDUÇÃO DE TEMPO DE CICLO*
- *MAIOR QUALIDADE DE ROSCA*
- *MAIOR CONFIABILIDADE DO PROCESSO*

O MELHOR DOS DOIS SISTEMAS

AS VANTAGENS DOS MANDRIS HIDRAULICO E SYNCHRO EM UM ÚNICO PORTA-FERRAMENTAS

AGORA DISPONIVEL TAMBÉM PARA ISO, MAS/BT E HASTE RETA



GUHROSync Mandris Synchro

Mandris térmicos

4736 HSK-A

4726 TSG 3000 HSK-A

4758 HSK-C

4738 ISO taper



Mandril hidráulico Synchro com maior força de fixação

4221 MAS-BT

4299 HSK-A

4267 HSK-C

4213 ISO taper



4949 Tubo de distribuição de refrigerante HSK-A para refrigeração convencional



Mandril hidráulico Synchro

4601 HSK-A



4925 Pinos de arraste para

4926 SK



Mandril hidráulico Synchro

4576 ISO taper



4927 Pinos de arraste para

4928 MAS/BT



Mandril hidráulico Synchro

4577 MAS-BT





4525

Hydro-Ø 12 / Ø 20
Mandril hidráulico cilindrico Synchro Ø 20 com refrigeração interna



4364

Parafuso de ajuste „face“ synchro com refrigeração interna



4605 Bucha de redução selada

4606 Bucha de redução GUHROJET



Ferramenta de roscar:
diâmetro da haste x quadrado



4949
Tubo de distribuição HSK-A para refrigeração convencional (traca automática)



4927
4928
Pino de arraste BT



4925
4926
Pino de arraste ISO



4949
Tubo de distribuição HSK-A para refrigeração convencional (traca automática)



4949
Tubo de distribuição HSK-A para refrigeração convencional (traca automática)



4328
Mandril de troca rápida HSK-A com refrige-ração interna



4233
Mandril Whistle-Notch MAS/BT



4322
Mandril Whistle-Notch ISO



4329
Weldon
4334
Mandrís para hastes cilínd-ricas Whistle Notch HSK-A
4343
Adaptadores básicos HSK-A para mandrís porta-machos



4327
Mandril synchro HSK-A com refri-geração interna



4340
Mandril de troca rápida sem refrige-ração interna



4342
Mandril de troca rápida com refrige-ração interna



4326
Mandril synchro para haste HA com refrigeração interna



4206
Adaptador de troca rápida



4364
Parafuso de ajuste „plano“ synchro com refrigeração interna



4308
Bucha para macho



4335
Anél de vedação para porca com retençao



Macho



Macho

Informações do produto

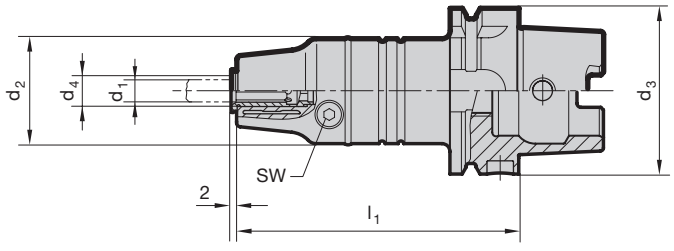
- HSK-A para ISO 12164-1/DIN 69893-1
- compensação de erros de sincronização
- garantia de melhor qualidade de rosca e vida útil otimizada
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- fixação hidráulica adequada com buchas de redução com arraste
- parafuso de ajuste permite correções de 3 mm
- adequado para refrigeração interna indentificado pelo anél preto
- máx. pressão do refrigerante até 80 bar

Escopo de entrega

- fornecido com chave hexagonal Artigo 4912
- fornecido com chave de ajuste para parafusos de ajuste

- adquirir parafuso de ajuste „face“ Artigo 4364 separadamente
- adquirir bucha de redução Artigo 4605 ou 4606 separadamente
- para refrigeração interna convencional adquirir tubo de distribuição Artigo 4949 separadamente





GÜHROSync

Nr. do artigo									4601
HSK-A d_3	d_4 mm	para Ø de haste d_1 x VKT	para roscas	d_2 mm	l_1 mm	tension/ compr. ± mm	SW	kg	Nº de cód.
63	12.00	2.8-10	M3-M12	40	106.5	0.3	4	1.5	12.063
63	20.00	6-16	M8-M20	40	120.5	0.3	5	1.6	20.063
100	12.00	2.8-10	M3-M12	40	113.0	0.3	4	2.8	12.100
100	20.00	6-16	M8-M20	40	127.0	0.3	5	2.9	20.100

Informações do produto

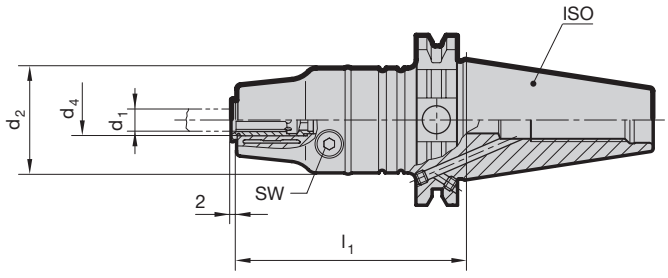
- SK30 para DIN ISO 7388-1 forma AD sem tubo de distribuição
- SK40 para DIN ISO 7388-1 forma AD/AF (AD/B)
- forma B fornecido com pinos roscados nos furos
- compensação de erros de sincronização
- garantia de melhor qualidade de rosca e vida útil otimizada
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- fixação hidráulica adequada com buchas de redução com arraste
- parafuso de ajuste permite correções de 3 mm
- adequado para refrigeração interna indentificado pelo anél preto
- máx. pressão do refrigerante até 80 bar

Escopo de entrega

- fornecido com chave hexagonal Artigo 4912
- fornecido com chave de ajuste para parafusos de ajuste

- adquirir parafuso de ajuste „face“ Artigo 4364 separadamente
- adquirir bucha de redução Artigo 4605 ou 4606 separadamente
- adquira pinos de arraste, Artigos 4925 ou 4926 separadamente





GÜHROSync

Nr. do artigo **4576**

SK	d_4 mm	para Ø de haste d_1	para roscas	d_2 mm	l_1 mm	tension/ compr. ± mm	SW	kg	Nº de cód.
30	12.00	2.8-10	M3-M12	40	81	0.3	4	0.8	12,030
30	20.00	6-16	M8-M20	40	95	0.3	5	0.9	20,030
40	12.00	2.8-10	M3-M12	40	85	0.3	4	1.3	12,040
40	20.00	6-16	M8-M20	40	99	0.3	5	1.4	20,040

Informações do produto

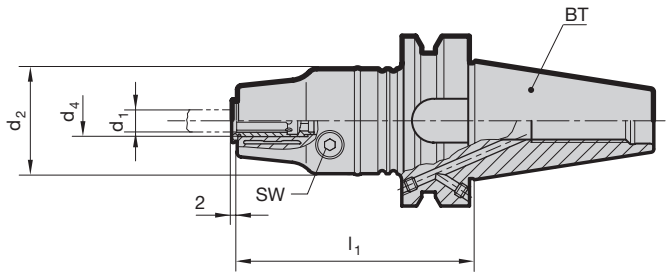
- MAS/BT30 para DIN ISO 7388-2 forma JD sem fornecimento de refrigerante sobre o colar
- MAS/BT40 para DIN ISO 7388-2 forma JD/JF (forma AD/B)
- MAS/BT40 para JIS B 6339-2 forma JD/JF (forma AD/B)
- forma B fornecido com pinos roscados nos furos
- compensação de erros de sincronização
- garantia de melhor qualidade de rosca e vida útil otimizada
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- fixação hidráulica adequada com buchas de redução com arraste
- parafuso de ajuste permite correções de 3 mm
- adequado para refrigeração interna indentificado pelo anél preto
- máx. pressão do refrigerante até 80 bar

Escopo de entrega

- fornecido com chave hexagonal Artigo 4912
- fornecido com chave de ajuste para parafusos de ajuste

- adquirir parafuso de ajuste „face“ Artigo 4364 separadamente
- adquirir bucha de redução Artigo 4605 ou 4606 separadamente
- adquira pinos de arraste, Artigos 4927 ou 4928 separadamente





GÜHROSync

Nr. do artigo **4577**

BT	d_4 mm	para Ø de haste d_1	para roscas	d_2 mm	l_1 mm	tension/ compr. ± mm	SW	kg	Nº de cód.
30	12.00	2.8-10	M3-M12	40	81	0.3	4	0.8	12,030
30	20.00	6-16	M8-M20	40	95	0.3	5	0.9	20,030
40	12.00	2.8-10	M3-M12	40	85	0.3	4	1.3	12,040
40	20.00	6-16	M8-M20	40	99	0.3	5	1.4	20,040

Informações do produto

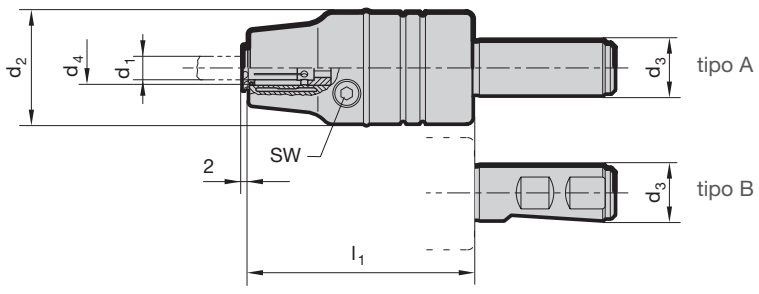
- compensação de erros de sincronização
- garantia de melhor qualidade de rosca e vida útil otimizada
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- fixação hidráulica adequada com buchas de redução com arraste
- parafuso de ajuste permite correções de 3 mm
- haste similar a DIN 1835 ou fixar em mandris de precisão (hidráulico, térmico ou com força aumentada)
- adequado para refrigeração interna indentificado pelo anél preto
- máx. pressão do refrigerante até 80 bar

Escopo de entrega

- fornecido com chave hexagonal Artigo 4912
- fornecido com chave de ajuste para parafusos de ajuste

- adquirir parafuso de ajuste „face“ Artigo 4364 separadamente
- adquirir bucha de redução Artigo 4605 ou 4606 separadamente





GÜHROSync

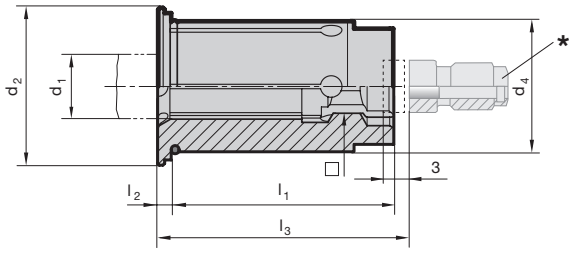
Nr. do artigo										4525
d_3 h6 mm	d_4 mm	tipo	para Ø de haste d_1	para roscas	d_2 mm	l_1 mm	tension/ compr. ± mm	SW	kg	Nº de cód.
20	12.00	A	2.8-10	M3-M12	40	80	0.3	4	0.7	12,020
20	20.00	A	6-16	M8-M20	40	94	0.3	5	0.8	20,020
25	12.00	B	2.8-10	M3-M12	40	80	0.3	4	0.7	12,025
25	20.00	B	6-16	M8-M20	40	94	0.3	5	0.8	20,025

Informações do produto

- para fixação de machos com haste com quadrado em mandris synchro ou porta-pinça
- fixação-Ø para tolerâncias de haste h6-h9
- lado frontal selado, a prova de vazamento para rosqueamento com refrigeração interna
- unidade positiva
- parafuso de ajuste de posição na haste do macho
- parafuso de ajuste permite correções de 3 mm

Escopo de entrega

- adquirir parafuso de ajuste „face“ Artigo 4364 separadamente
- adquirir parafuso de ajuste MQL Artigo 4305 separadamente





Nr. do artigo **4605**

d_4 mm	d_1 mm	□ mm	Norma	d_1 inch	□ inch	d_2 mm	l_1 mm	l_2 mm	l_3 mm	* para parafuso de ajuste		para roscas	Nº de cód.
12.00	2.800	2.100	DIN	-	-	16.50	29.00	2.00	-	-		M2 / M4	2,812
12.00	3.500	2.700	DIN	-	-	16.50	29.00	2.00	-	-		M3 / M4.5 / M5	3,512
12.00	4.000	3.200	JIS	-	-	16.50	29.00	2.00	-	-		M3	4,012
12.00	4.500	3.400	DIN	-	-	16.50	29.00	2.00	26.00	4364	5.020	M4 / M6	4,512
12.00	4.928	3.861	ANSI	0.194	0.152	16.50	29.00	2.00	26.00	4364	5.020	10-24 & 10-32	4,912
12.00	5.000	4.000	JIS	-	-	16.50	29.00	2.00	26.00	4364	5.020	M4	5,012
12.00	5.500	4.500	JIS	-	-	16.50	29.00	2.00	26.00	4364	5.020	M5	5,512
12.00	5.588	4.191	ANSI	0.220	0.165	16.50	29.00	2.00	26.00	4364	5.020	12-24 & 12-28	15,512
12.00	6.000	4.500	JIS	-	-	16.50	29.00	2.00	26.00	4364	5.020	M6	16,012
12.00	6.000	4.900	DIN	-	-	16.50	29.00	2.00	26.00	4364	6.020	M4.5 / M5 / M6 / M8	6,012
12.00	6.200	5.000	JIS	-	-	16.50	29.00	2.00	26.00	4364	6.020	M7 / M8	6,212
12.00	6.477	4.851	ANSI	0.255	0.191	16.50	29.00	2.00	26.00	4364	6.020	1/4-20 & 1/4-28	6,412
12.00	7.000	5.500	DIN / JIS	-	-	16.50	29.00	2.00	26.00	4364	7.020	M7 / M9 / M10	7,012
12.00	7.938	5.944	ANSI	0.3125	0.234	16.50	29.00	2.00	31.00	4364	7.020	1/16-27	7,912
12.00	8.000	6.200	DIN	-	-	16.50	29.00	2.00	31.00	4364	8.020	M8 / M11	8,012
12.00	8.000	6.500	JIS	-	-	16.50	29.00	2.00	31.00	4364	8.020	M11	18,012
12.00	8.077	6.045	ANSI	0.318	0.238	16.50	29.00	2.00	31.00	4364	7.020	5/16-18 & 5/16-24	28,012
12.00	8.204	6.147	ANSI	0.323	0.242	16.50	29.00	2.00	31.00	4364	7.020	7/16-14 & 7/16-20	8,212
12.00	8.500	6.500	JIS	-	-	16.50	29.00	2.00	31.00	4364	8.020	M12	8,512
12.00	9.000	7.000	DIN	-	-	16.50	29.00	2.00	32.00	4364	9.020	M9 / M12	9,012
12.00	9.322	6.985	ANSI	0.367	0.275	16.50	29.00	2.00	32.00	4364	9.020	1/2-13 & 1/2-20	9,312
12.00	9.677	7.264	ANSI	0.381	0.286	16.50	29.00	2.00	33.00	4364	9.020	3/8-16 & 3/8-24	9,612
12.00	10.000	8.000	DIN	-	-	16.50	29.00	2.00	36.00	4364	10.020	M10	10,012

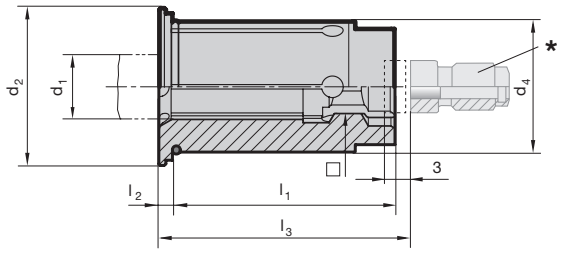
Informações do produto

- para fixação de machos com haste com quadrado em mandris synchro ou porta-pinça
- fixação-Ø para tolerâncias de haste h6-h9
- lado frontal selado, a prova de vazamento para rosqueamento com refrigeração interna
- unidade positiva
- parafuso de ajuste de posição na haste do macho
- parafuso de ajuste permite correções de 3 mm

Escopo de entrega

- adquirir parafuso de ajuste „face“ Artigo 4364 separadamente
- adquirir parafuso de ajuste MQL Artigo 4305 separadamente





Nr. do artigo **4605**

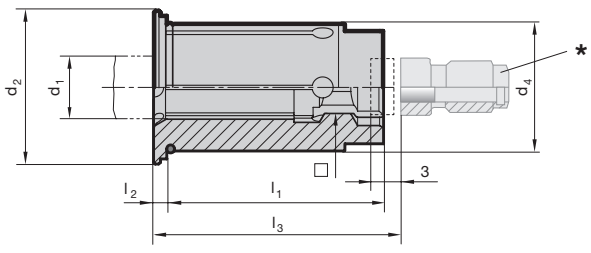
d_4 mm	d_1 mm	□ mm	Norma	d_1 inch	□ inch	d_2 mm	l_1 mm	l_2 mm	l_3 mm	* para parafuso de ajuste	para roscas	Nº de cód.
20.00	6.000	4.500	JIS	-	-	24.10	34.00	2.00	26.00	4364 6.032	M6	26,020
20.00	6.000	4.900	DIN	-	-	24.10	34.00	2.00	26.00	4364 6.032	M4.5/M5/M6/M8	6,020
20.00	6.200	5.000	JIS	-	-	24.10	34.00	2.00	26.00	4364 6.032	M7 / M8	6,220
20.00	6.477	4.851	ANSI	0.255	0.191	24.10	34.00	2.00	26.00	4364 6.032	1/4-20 & 1/4-28	6,420
20.00	7.000	5.500	DIN / JIS	-	-	24.10	34.00	2.00	26.00	4364 7.032	M7 / M9 / M10	7,020
20.00	7.938	5.944	ANSI	0.3125	0.234	24.10	34.00	2.00	31.00	4364 7.032	1/16-27	7,920
20.00	8.000	6.200	DIN	-	-	24.10	34.00	2.00	31.00	4364 8.032	M8 / M11	8,020
20.00	8.000	6.500	JIS	-	-	24.10	34.00	2.00	31.00	4364 8.032	M11	18,020
20.00	8.077	6.045	ANSI	0.318	0.238	24.10	34.00	2.00	31.00	4364 8.032	5/16-18 & 5/16-24	28,020
20.00	8.204	6.147	ANSI	0.323	0.242	24.10	34.00	2.00	31.00	4364 8.032	7/16-14 & 7/16-20	8,220
20.00	8.500	6.500	JIS	-	-	24.10	34.00	2.00	31.00	4364 8.032	M12	8,520
20.00	9.000	7.000	DIN	-	-	24.10	34.00	2.00	32.00	4364 9.032	M9 / M12	9,020
20.00	9.322	6.985	ANSI	0.367	0.275	24.10	34.00	2.00	32.00	4364 8.032	1/2-13 & 1/2-20	9,320
20.00	9.677	7.264	ANSI	0.381	0.286	24.10	34.00	2.00	33.00	4364 9.032	3/8-16 & 3/8-24	9,620
20.00	10.000	8.000	DIN	-	-	24.10	34.00	2.00	36.00	4364 10.032	M10	10,020
20.00	10.500	8.000	JIS	-	-	24.10	34.00	2.00	36.00	4364 10.032	M14	10,520
20.00	10.897	8.179	ANSI	0.4290	0.3220	24.10	34.00	2.00	35.00	4364 10.032	9/16-12 & 9/16-18	10,820
20.00	11.000	9.000	DIN	-	-	24.10	34.00	2.00	37.00	4364 11.032	M14	11,020
20.00	12.000	9.000	DIN	-	-	24.10	34.00	2.00	37.00	4364 11.032	M12 / M16	12,020
20.00	12.192	9.144	ANSI	0.480	0.36	24.10	34.00	2.00	36.00	4364 11.032	5/8-11 & 5/8-18	12,120
20.00	12.500	10.000	JIS	-	-	24.10	34.00	2.00	38.00	4364 11.032	M16	12,520
20.00	13.000	10.000	JIS	-	-	24.10	34.00	2.00	38.00	4364 11.032	M17	13,020
20.00	14.000	11.000	DIN / JIS	-	-	24.10	34.00	2.00	39.00	4364 11.032	M18	14,020
20.00	14.288	10.693	ANSI	0.5625	0.421	24.10	34.00	2.00	38.00	4364 11.032	1/4-18	14,220
20.00	14.986	11.227	ANSI	0.590	0.442	24.10	34.00	2.00	39.00	4364 11.032	3/4-10 & 3/4-16	14,920
20.00	15.000	12.000	JIS	-	-	24.10	34.00	2.00	40.00	4364 16.032	M20	15,020
20.00	16.000	12.000	DIN	-	-	24.10	34.00	2.00	41.00	4364 16.032	M20	16,020

Informações do produto

- para fixação de machos com haste com quadrado em mandris synchro ou porta-pinça
- fixação-Ø para tolerâncias de haste h6-h9
- unidade positiva para bucha de redução em Guhrosync e synchro
- ranhuras periféricas para refrigeração, por consequência melhoria de processo e vida útil
- parafuso de ajuste de posição na haste do macho
- parafuso de ajuste permite correções de 3 mm

Escopo de entrega

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir parafuso de ajuste „face“ Artigo 4364 separadamente





GÜHROJET

Nr. do artigo **4606**

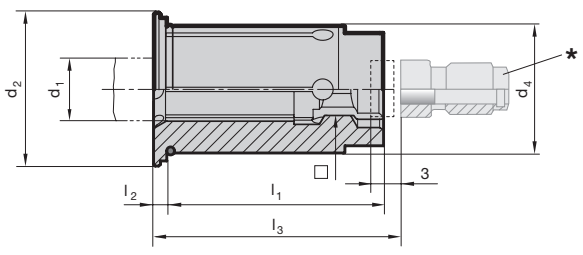
d_4 mm	d_1 mm	□ mm	Norma	d_1 inch	□ inch	d_2 mm	l_1 mm	l_2 mm	l_3 mm	* para parafuso de ajuste	para roscas	Nº de cód.
12.00	2.800	2.100	DIN	-	-	16.50	29.00	2.00	-	-	M2 / M4	2.812
12.00	3.500	2.700	DIN	-	-	16.50	29.00	2.00	-	-	M3 / M4.5 / M5	3.512
12.00	4.000	3.200	JIS	-	-	16.50	29.00	2.00	-	-	M3	4.012
12.00	4.500	3.400	DIN	-	-	16.50	29.00	2.00	-	-	M4 / M6	4.512
12.00	4.928	3.861	ANSI	0.194	0.152	16.50	29.00	2.00	-	-	10-24 & 10-32	4.912
12.00	5.000	4.000	JIS	-	-	16.50	29.00	2.00	-	-	M4	5.012
12.00	5.500	4.500	JIS	-	-	16.50	29.00	2.00	-	-	M5	5.512
12.00	5.588	4.191	ANSI	0.220	0.165	16.50	29.00	2.00	-	-	12-24 & 12-28	15.512
12.00	6.000	4.500	JIS	-	-	16.50	29.00	2.00	26.00	6.020	M6	16.012
12.00	6.000	4.900	DIN	-	-	16.50	29.00	2.00	26.00	6.020	M4.5/M5/M6/M8	6.012
12.00	6.200	5.000	JIS	-	-	16.50	29.00	2.00	26.00	6.020	M7 / M8	6.212
12.00	6.477	4.851	ANSI	0.255	0.191	16.50	29.00	2.00	26.00	6.020	1/4-20 & 1/4-28	6.412
12.00	7.000	5.500	DIN / JIS	-	-	16.50	29.00	2.00	26.00	7.020	M7 / M9 / M10	7.012
12.00	7.938	5.944	ANSI	0.3125	0.234	16.50	29.00	2.00	31.00	7.020	1/16-27	7.912
12.00	8.000	6.200	DIN	-	-	16.50	29.00	2.00	31.00	8.020	M8 / M11	8.012
12.00	8.000	6.500	JIS	-	-	16.50	29.00	2.00	31.00	8.020	M11	18.012
12.00	8.077	6.045	ANSI	0.318	0.238	16.50	29.00	2.00	31.00	7.020	5/16-18 & 5/16-24	28.012
12.00	8.204	6.147	ANSI	0.323	0.242	16.50	29.00	2.00	31.00	8.020	7/16-14 & 7/16-20	8.212
12.00	8.500	6.500	JIS	-	-	16.50	29.00	2.00	31.00	8.020	M12	8.512
12.00	9.000	7.000	DIN	-	-	16.50	29.00	2.00	32.00	9.020	M9 / M12	9.012
12.00	9.322	6.985	ANSI	0.367	0.275	16.50	29.00	2.00	32.00	9.020	1/2-13 & 1/2-20	9.312
12.00	9.677	7.264	ANSI	0.381	0.286	16.50	29.00	2.00	33.00	9.020	3/8-16 & 3/8-24	9.612
12.00	10.000	8.000	DIN	-	-	16.50	29.00	2.00	36.00	10.020	M10	10.012

Informações do produto

- para fixação de machos com haste com quadrado em mandris synchro ou porta-pinça
- fixação-Ø para tolerâncias de haste h6-h9
- unidade positiva para bucha de redução em Guhrosync e synchro
- ranhuras periféricas para refrigeração, por consequência melhoria de processo e vida útil
- parafuso de ajuste de posição na haste do macho
- parafuso de ajuste permite correções de 3 mm

Escopo de entrega

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir parafuso de ajuste „face“ Artigo 4364 separadamente





GÜHROJET

Nr. do artigo	4606

d_4 mm	d_1 mm	□ mm	Norma	d_1 inch	□ inch	d_2 mm	l_1 mm	l_2 mm	l_3 mm	* para parafuso de ajuste	para roscas	Nº de cód.
20.00	6.000	4.500	JIS	-	-	24.10	34.00	2.00	26.00	6.032	M6	26,020
20.00	6.000	4.900	DIN	-	-	24.10	34.00	2.00	26.00	6.032	M4.5/M5/M6/M8	6,020
20.00	6.200	5.000	JIS	-	-	24.10	34.00	2.00	26.00	6.032	M7 / M8	6,220
20.00	6.477	4.851	ANSI	0.255	0.191	24.10	34.00	2.00	26.00	6.032	1/4-20 & 1/4-28	6,420
20.00	7.000	5.500	DIN / JIS	-	-	24.10	34.00	2.00	26.00	7.032	M7 / M9 / M10	7,020
20.00	7.938	5.944	ANSI	0.3125	0.234	24.10	34.00	2.00	31.00	7.032	1/16-27	7,920
20.00	8.000	6.200	DIN	-	-	24.10	34.00	2.00	31.00	8.032	M8 / M11	8,020
20.00	8.000	6.500	JIS	-	-	24.10	34.00	2.00	31.00	8.032	M11	18,020
20.00	8.077	6.045	ANSI	0.318	0.238	24.10	34.00	2.00	31.00	8.032	5/16-18 & 5/16-24	28,020
20.00	8.204	6.147	ANSI	0.323	0.242	24.10	34.00	2.00	31.00	8.032	7/16-14 & 7/16-20	8,220
20.00	8.500	6.500	JIS	-	-	24.10	34.00	2.00	31.00	8.032	M12	8,520
20.00	9.000	7.000	DIN	-	-	24.10	34.00	2.00	32.00	9.032	M9 / M12	9,020
20.00	9.322	6.985	ANSI	0.367	0.275	24.10	34.00	2.00	32.00	9.032	1/2-13 & 1/2-20	9,320
20.00	9.677	7.264	ANSI	0.381	0.286	24.10	34.00	2.00	33.00	9.032	3/8-16 & 3/8-24	9,620
20.00	10.000	8.000	DIN	-	-	24.10	34.00	2.00	36.00	10.032	M10	10,020
20.00	10.500	8.000	JIS	-	-	24.10	34.00	2.00	36.00	10.032	M14	10,520
20.00	10.897	8.179	ANSI	0.4290	0.3220	24.10	34.00	2.00	35.00	10.032	9/16-12 & 9/16-18	10,820
20.00	11.000	9.000	DIN	-	-	24.10	34.00	2.00	37.00	11.032	M14	11,020
20.00	12.000	9.000	DIN	-	-	24.10	34.00	2.00	37.00	11.032	M12 / M16	12,020
20.00	12.192	9.144	ANSI	0.480	0.36	24.10	34.00	2.00	36.00	11.032	5/8-11 & 5/8-18	12,120
20.00	12.500	10.000	JIS	-	-	24.10	34.00	2.00	38.00	11.032	M16	12,520
20.00	13.000	10.000	JIS	-	-	24.10	34.00	2.00	38.00	11.032	M17	13,020
20.00	14.000	11.000	DIN / JIS	-	-	24.10	34.00	2.00	39.00	14.032	M18	14,020
20.00	14.288	10.693	ANSI	0.5625	0.421	24.10	34.00	2.00	38.00	11.032	1/4-18	14,220
20.00	14.986	11.227	ANSI	0.590	0.442	24.10	34.00	2.00	39.00	11.032	3/4-10 & 3/4-16	14,920
20.00	15.000	12.000	JIS	-	-	24.10	34.00	2.00	40.00	16.032	M20	15,020
20.00	16.000	12.000	DIN	-	-	24.10	34.00	2.00	41.00	16.032	M20	16,020

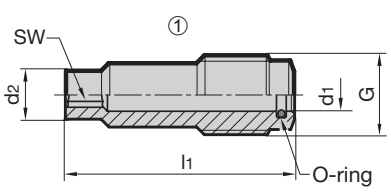
Informações do produto

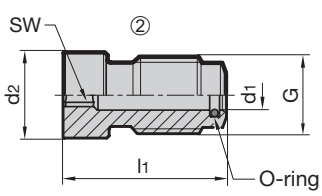
- para mandris hidráulicos synchro Artigos 4601, 4576, 4557 e 4525
- para mandris synchro Artigos 4326 e 4327
- para refrigeração interna convencional
- com encosto para hastes padrão
- parafuso de ajuste de posição na haste do macho
- parafuso de ajuste permite correções de 3 mm

Escopo de entrega

- com O-ring para selo seguro







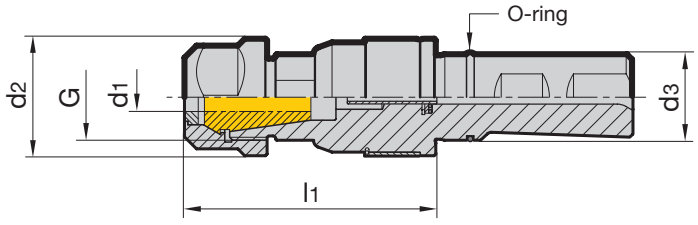
								Nr. do artigo	**4364**
for nominal size	para Ø de haste x □	G	d_1 mm	d_2 mm	l_1 mm	SW	O-ring	image	**Nº de cód.**
ER20 / Hydro12	< Ø6	M8x1	3.6	3.3	28.0	2.0	3.5x1	1	5,020
ER20 / Hydro12	6x4.9	M8x1	3.6	4.8	26.0	2.5	3.5x1	1	6,020
ER20 / Hydro12	7x5.5	M8x1	3.6	5.4	25.8	2.5	3.5x1	1	7,020
ER20 / Hydro12	8x6.2	M8x1	3.6	6.1	20.9	2.5	3.5x1	1	8,020
ER20 / Hydro12	9x7	M8x1	3.6	6.9	20.3	2.5	3.5x1	1	9,020
ER20 / Hydro12	10x8	M8x1	3.6	7.8	15.8	2.5	3.5x1	2	10,020
ER20 / Hydro12	11x9	M8x1	3.6	8.8	14.8	2.5	3.5x1	2	11,020
ER32 / Hydro20	< Ø6	M10x1	4.1	3.3	33.0	2.0	4x1	1	5,032
ER32 / Hydro20	6x4.9	M10x1	4.1	4.8	34.0	3.0	4x1	1	6,032
ER32 / Hydro20	7x5.5	M10x1	4.1	5.4	33.8	3.0	4x1	1	7,032
ER32 / Hydro20	8x6.2	M10x1	4.1	6.1	28.8	3.0	4x1	1	8,032
ER32 / Hydro20	9x7	M10x1	4.1	6.9	28.3	3.0	4x1	1	9,032
ER32 / Hydro20	10x8	M10x1	4.1	7.8	23.8	3.0	4x1	1	10,032
ER32 / Hydro20	11x9 & 12x9	M10x1	4.1	8.8	22.9	3.0	4x1	1	11,032
ER32 / Hydro20	14x11	M10x1	4.1	10.8	20.7	3.0	4x1	2	14,032
ER32 / Hydro20	16x12	M10x1	4.1	11.8	19.7	3.0	4x1	2	16,032
ER32 / Hydro20	18x14.5 & 20x16	M10x1	4.1	14.3	18.0	3.0	4x1	2	18,032

Informações do produto
- compensação de erros de sincronização
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho, que podem causar altas forças de atrito no flanco da rosca.
- parafuso de ajuste permite correções de 2 a 3 mm
- adequado para refrigeração interna
- máx. pressão do refrigerante até 50 bar

Escopo de entrega
- fornecido com porca de fixação selada IC/ER Artigo 4306 (vide torque)
- fornecido com chave de ajuste para parafusos de ajuste

- adquirir parafuso de ajuste „plano“ Artigo 4364, pinça Artigo 4308, anél de vedação Artigo 4335 e chave de fixação Artigo 4913, separadamente





Nr. do artigo	4326

d_3 ~DIN 1835 mm	tamanho nom.	para roscas	d_1 mm	d_2 mm	l_1 mm	tension/ compr. mm	torque* Nm	G	kg	Nº de cód.
25	ER20	M3.5-M14	4-11.0	34	73	0.15	40	M25x1.5	0.50	20,025
25	ER32	M3.5-M28	4-20.0	50	88	0.15	170	M40x1.5	1.30	32,025

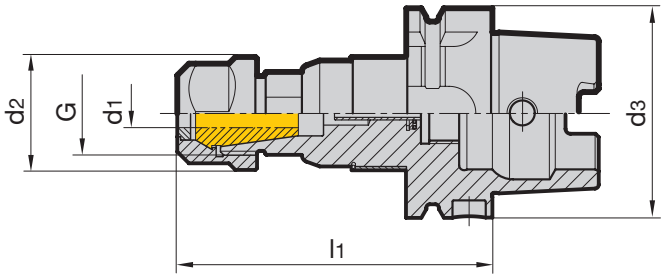
HSK-A MANDRIL PARA ROSQUEAMENTO SINCRONIZADO

Informações do produto
- compensação de erros de sincronização
- garante melhor qualidade de rosca e maior vida útil para machos convensionais
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- parafuso de ajuste permite correções de 2 a 3 mm
- adequado para refrigeração interna
- máx. pressão do refrigerante até 50 bar
- HSK-A para ISO 12164-1/DIN 69893-1

Escopo de entrega
- fornecido com porca de fixação selada IC/ER Artigo 4306 (vide torque)
- fornecido com chave de ajuste para parafusos de ajuste

- adquirir parafuso de ajuste „plano“ Artigo 4364, pinça Artigo 4308, anél de vedação Artigo 4335 e chave de fixação Artigo 4913, separadamente
- para refrigeração interna convencional adquirir tubo de distribuição Artigo 4949 separadamente





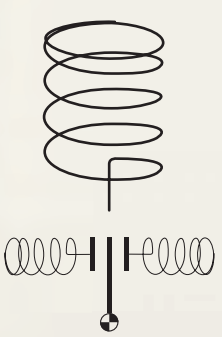
Nr. do artigo	4327

HSK-A d_3 mm	tamanho nom.	para roscas	d_1 mm	d_2 mm	l_1 mm	tension/ compr. mm	torque* Nm	G	kg	Nº de cód.
63	ER20	M3.5-M14	4-11.0	34	95.5	0.15	40	M25x1.5	1.00	20,063
63	ER20	M3.5-M14	4-11.0	34	160.0	0.15	40	M25x1.5	1.50	20,163
63	ER32	M3.5-M28	4-20.0	50	109.0	0.15	170	M40x1.5	1.70	32,063
100	ER20	M3.5-M14	4-11.0	34	102.0	0.15	40	M25x1.5	2.50	20,100
100	ER32	M3.5-M28	4-20.0	50	115.5	0.15	170	M40x1.5	2.70	32,100

Mandris GUHROSync + Machos VA

Mandris GUHROSync prorcionam excelente expulsão de cavaco e maior vida útil graças ao seu sistema de fixação otimizado em combinação com machos VA.





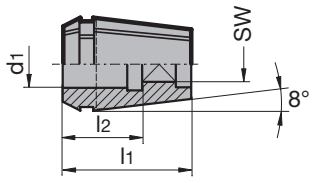
Visualização
Os simbolo de mola no mandril GUHROSync mostra o efeito das forças axiais e radiais.

GÜHROSync

Informações do produto

- para fixação de machos com haste com quadrado em mandris synchro ou porta-pinça
- diâmetros menores que Ø4 mm são fixados utilizando pinça, Artigo 4307 sem alojamento de quadrado
- torque requerido vide porcas de fixação Artigo 4306



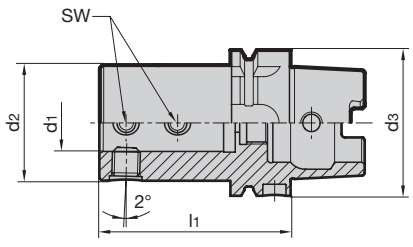


Nr. do artigo					4308
tamanho nom.	para Ø de haste d_1 mm	square SW	l_1 mm	l_2 mm	Nº de cód.
ER16	4.5	3.4	27.5	18	4,516
ER16	5.5	4.3	27.5	18	5,516
ER16	6.0	4.9	27.5	18	6,016
ER16	7.0	5.5	27.5	18	7,016
ER16	8.0	6.2	27.5	22	8,016
ER20	4.0	3.0	31.5	15	4,020
ER20	4.5	3.4	31.5	18	4,520
ER20	5.5	4.3	31.5	18	5,520
ER20	6.0	4.9	31.5	18	6,020
ER20	7.0	5.5	31.5	18	7,020
ER20	8.0	6.2	31.5	22	8,020
ER20	9.0	7.0	31.5	22	9,020
ER20	10.0	8.0	31.5	25	10,020
ER20	11.0	9.0	31.5	25	11,020
ER25	4.5	3.4	34.0	18	4,525
ER25	5.5	4.3	34.0	18	5,525
ER25	6.0	4.9	34.0	18	6,025
ER25	7.0	5.5	34.0	18	7,025
ER25	8.0	6.2	34.0	22	8,025
ER25	9.0	7.0	34.0	22	9,025
ER25	10.0	8.0	34.0	25	10,025
ER25	11.0	9.0	34.0	25	11,025
ER25	12.0	9.0	34.0	25	12,025
ER32	4.0	3.0	40.0	15	4,032
ER32	4.5	3.4	40.0	18	4,532
ER32	5.5	4.3	40.0	18	5,532
ER32	6.0	4.9	40.0	18	6,032
ER32	7.0	5.5	40.0	18	7,032
ER32	8.0	6.2	40.0	22	8,032
ER32	9.0	7.0	40.0	22	9,032
ER32	10.0	8.0	40.0	25	10,032
ER32	11.0	9.0	40.0	25	11,032
ER32	12.0	9.0	40.0	25	12,032
ER32	14.0	11.0	40.0	25	14,032
ER32	16.0	12.0	40.0	25	16,032
ER32	18.0	14.5	40.0	25	18,032
ER32	20.0	16.0	40.0	28	20,032
ER40	7.0	5.5	46.0	18	7,040
ER40	8.0	6.2	46.0	22	8,040
ER40	9.0	7.0	46.0	22	9,040
ER40	10.0	8.0	46.0	25	10,040
ER40	11.0	9.0	46.0	25	11,040
ER40	12.0	9.0	46.0	25	12,040
ER40	14.0	11.0	46.0	25	14,040
ER40	16.0	12.0	46.0	25	16,040
ER40	18.0	14.5	46.0	25	18,040
ER40	20.0	16.0	46.0	28	20,040
ER40	22.0	18.0	46.0	28	22,040

Informações do produto
- para mandris de troca rápida e mandris synchro com haste cilíndrica (exc. Nr. do artigo 4342)
- HSK-A para ISO 12164-1/DIN 69893-1

Escopo de entrega
- fornecido com parafuso de ajuste Artigo 4903, código 12,001
- adquirir tubo de distribuição Artigo 4949 separadamente



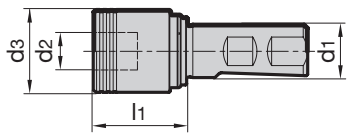


						Nr. do artigo	4343
HSK-A d_3	d_1 mm	d_2 mm	l_1 mm	SW	kg	Nº de cód.	
50	25	50	80	6	0.89	25,050	
63	25	50	82	6	1.26	25,063	
80	25	50	87	6	3.10	25,080	
100	25	50	89	6	4.08	25,100	

MANDRÍS PORTA-MACHOS DE TROCA RÁPIDA SEM REFRIGERAÇÃO INTERNA

Informações do produto
- mandris de troca rápida são fornecidos com guia esférica de compensação de comprimento que compensa qualquer diferença entre o avanço do spindle e o passo da rosca.



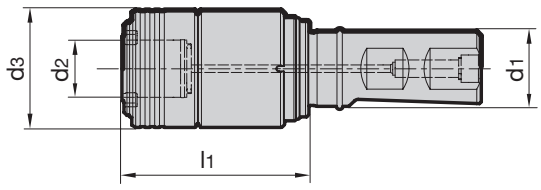


						Nr. do artigo	4340
para roscas	d_1 mm	d_2 mm	d_3 mm	l_1 mm	tension/ compression mm	kg	Nº de cód.
M3-M12	25	19	36	39	± 7.5	0.4	19,025
M8-M20	25	31	53	63	±10.0	0.9	31,025

Informações do produto

- mandris de troca rápida são fornecidos com guia esférica de compensação de comprimento que compensa qualquer diferença entre o avanço do spindle e o passo da rosca
- fornecido com refrigeração interna e adaptado para haste do macho. Todos elementos operantes são selados
- máx. pressão do refrigerante até 50 bar





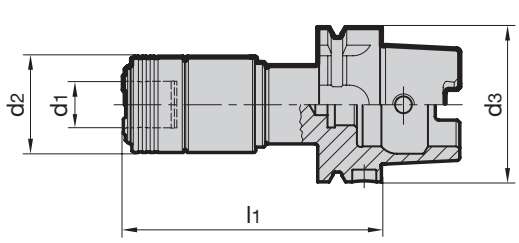
						Nr. do artigo	**4342**
para roscas	d_1 mm	d_2 mm	d_3 mm	l_1 mm	tension/ compression mm	kg	**Nº de cód.**
M3-M12	25	19	39	62	7.5/7.5	0.6	19,025
M8-M20	25	31	60	88	10/10	1.0	31,025

MANDRÍS PORTA-MACHOS DE TROCA RÁPIDA HSK-A COM REFRIGERAÇÃO INTERNA

Informações do produto

- mandris de troca rápida são fornecidos com guia esférica de compensação de comprimento que compensa qualquer diferença entre o avanço do spindle e o passo da rosca
- garante melhor qualidade de rosca e maior vida útil para machos convensionais
- máx. pressão do refrigerante até 50 bar.
- HSK-A para ISO 12164-1/DIN 69893-1



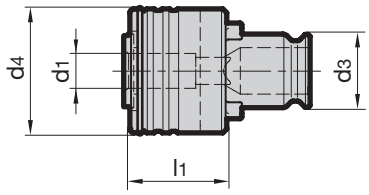


						Nr. do artigo	**4328**
HSK-A d_3 mm	para roscas	d_1 mm	d_2 mm	l_1 mm	tension/ compression ± mm	kg	**Nº de cód.**
63	M3-M12	19	39	105	7.5	1.13	19,063
63	M8-M20	31	60	140	10.0	2.28	31,063

Informações do produto

- com embreagem de segurança
- adequado para machos HSS
- para machos de metal duro é necessário canal de fixação na haste para fornecer um posicionamento adicional
- adequado para refrigeraçãi interna com pressão máx. 50 bar





					Nr. do artigo	4206
para roscas	Ø de haste x sq. d_1 mm	d_3 mm	d_4 mm	l_1 mm	Nº de cód.	
M3-M12	2.2	19	32	25	19,022	
M3-M12	2.5 x 2.1	19	32	25	19,025	
M3-M12	2.8 x 2.1	19	32	25	19,028	
M3-M12	3.5 x 2.7	19	32	25	19,035	
M3-M12	4 x 3	19	32	25	19,040	
M3-M12	4.5 x 3.4	19	32	25	19,045	
M3-M12	5.5 x 4.5	19	32	25	19,055	
M3-M12	6 x 4.9	19	32	25	19,060	
M3-M12	7 x5.5	19	32	25	19,070	
M3-M12	8 x 6.2	19	32	25	19,080	
M3-M12	9 x 7	19	32	25	19,090	
M3-M12	10 x 8	19	32	25	19,100	
M8-M20	6 x 4.9	31	50	34	31,060	
M8-M20	7 x 5.5	31	50	34	31,070	
M8-M20	8 x 6.2	31	50	34	31,080	
M8-M20	9 x 7	31	50	34	31,090	
M8-M20	10 x 8	31	50	34	31,100	
M8-M20	11 x 9	31	50	34	31,110	
M8-M20	12 x 9	31	50	34	31,120	
M8-M20	14 x 11	31	50	34	31,140	
M8-M20	16 x 12	31	50	34	31,160	

SISTEMAS MQL GÜHRING

Como um dos pioneiros em tecnologia MQL nós temos um extenso conhecimento na área de minima quantidade de lubrificação. Os mandris MQL Standard Gühring são fornecidos ao mundo todo e são reconhecidos pela indústria automotiva como solução ideal de sistema MQL de um ou dois canais.

Maiores parâmetros de corte e maior vida útil são possíveis graças ao sistema de refrigeração desenvolvido e também a alta qualidade superficial proporcionada pelo lubrificante puro. Peças e cavacos permanecem secos! Economize com limpeza e com estocagem de óleo e emulsões.

1 MQL BY GÜHRING

Nossos produtos com tecnologia MQL de um canal são identificados por este simbolo.

Característica visual do sistema MQL de um canal é identificado pelo parafuso de ajuste dourado.



2 MQL BY GÜHRING

Nossos produtos com tecnologia MQL de dois canais são identificados por este simbolo.

Característica visual do sistema MQL de dois canais é identificado pelo parafuso de ajuste preto.



4508 1 MQL
Tubo de distribuição MQL de um canal HSK-A



4511 2 MQL
Tubo de distribuição MQL de dois canais HSK-A



4513 1 MQL 2 MQL
Tubo de distribuição MQL HSK-A (funil)



Mandris térmicos MQL
HSK-A
troca automática

4741 1 MQL
4614 2 MQL

troca manual

4735 1 MQL
4613 2 MQL



Mandris hidráulicos MQL
HSK-A
troca automática

4210 1 MQL
4612 2 MQL

troca manual

4209 1 MQL
4611 2 MQL



Mandris hidráulicos synchro MQL de um canal
troca automática

4602 1 MQL



Mandris hidráulicos synchro MQL de dois canais
troca automática

4603 2 MQL



Mandris hidráulicos synchro MQL
troca manual

4604 1 MQL 2 MQL





4524 1 MQL 2 MQL
MQL Hydro-Ø 12 / Ø 20
Mandris synchro com refrigeração interna Ø 20



4305
Parafuso de ajuste MQL com cone interno para mandris synchro MQL



4605
Buchas de redução, selada

4606
Buchas de redução GUHROJET



Ferramenta de roscar com haste MQL:
diâmetro da haste x quadrado



Tubo de distribuição MQL
para trocas manuais



Tubo de distribuição para
trocas automáticas



Tubo de distribuição MQL
para trocas automáticas



4298

Mandris synchro com
sistema MQL de um canal
para trocas manuais



4330

Mandris synchro para com
sistema MQL de um canal
trocas automáticas



4341

Mandris synchro com
sistema MQL de dois
canais para trocas
automáticas



4305

Parafuso de ajuste MQL com cone interno
para mandris synchro MQL



4308

Pinça para macho



4335

Anel de vedação



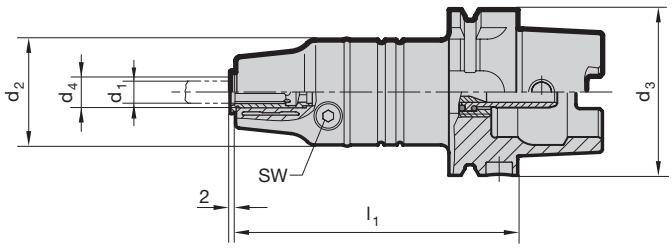
Macho

Informações do produto
- para sistema MQL de 1 canal
- máx. pressão do MQL até 16 bar
- compensação de erros de sincronização
- garantia de melhor qualidade de rosca e vida útil otimizada
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- fixação hidráulica adequada com buchas de redução com arraste
- parafuso de ajuste permite correções de 3 mm
- MQL Gühring identificavél pelo anél verde

Escopo de entrega
- fornecido com chave hexagonal Artigo 4912
- incl. Tubo de distribuição MQL para troca automática Art-Nr. 4508
- fornecido com chave de ajuste para parafusos de ajuste MQL

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir bucha de redução Artigo 4605 ou 4606 separadamente





1 MQL BY GÜHRING

GÜHROSync

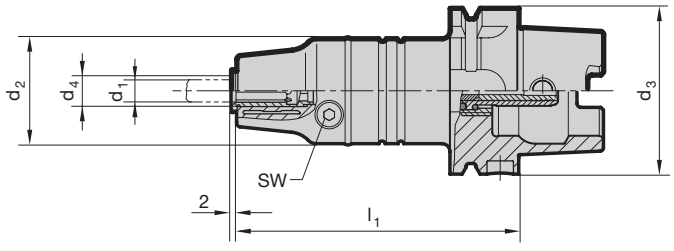
Nr. do artigo									**4602**
HSK-A d_3	d_4 mm	para Ø de haste d_1	para roscas	d_2 mm	l_1 mm	tension/ compr. ± mm	SW	kg	**Nº de cód.**
63	12.00	2.8-10	M3-M12	40	106.5	0.3	4	1.5	12.063
63	20.00	6-16	M8-M20	40	120.5	0.3	5	1.6	20.063
100	12.00	2.8-10	M3-M12	40	113.0	0.3	4	2.8	12.100
100	20.00	6-16	M8-M20	40	127.0	0.3	5	2.9	20.100

Informações do produto
- para sistema MQL de 2 canais
- máx. pressão do MQL até 16 bar
- compensação de erros de sincronização
- garantia de melhor qualidade de rosca e vida útil otimizada
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- fixação hidráulica adequada com buchas de redução com arraste
- parafuso de ajuste permite correções de 3 mm
- MQL Gühring identificavél pelo anél verde

Escopo de entrega
- fornecido com chave hexagonal Artigo 4912
- incl. Tubo de distribuição MQL para troca automática Art-Nr. 4511
- fornecido com chave de ajuste para parafusos de ajuste MQL

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir bucha de redução Artigo 4605 ou 4606 separadamente





2 MQL BY GÜHRING

GÜHROSync

Nr. do artigo									4603
HSK-A d_3	d_4 mm	para Ø de haste d_1	para roscas	d_2 mm	l_1 mm	tension/ compr. ± mm	SW	kg	Nº de cód.
63	12.00	2.8-10	M3-M12	40	106.5	0.3	4	1.5	12,063
63	20.00	6-16	M8-M20	40	120.5	0.3	5	1.6	20,063
100	12.00	2.8-10	M3-M12	40	113.0	0.3	4	2.8	12,100
100	20.00	6-16	M8-M20	40	127.0	0.3	5	2.9	20,100

Informações do produto

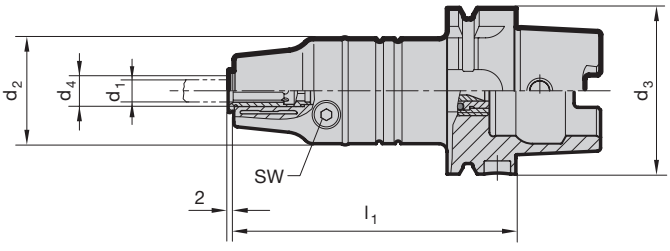
- para sistema MQL de 1 e 2 canais
- máx. pressão do MQL até 16 bar
- compensação de erros de sincronização
- garantia de melhor qualidade de rosca e vida útil otimizada
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- fixação hidráulica adequada com buchas de redução com arraste
- parafuso de ajuste permite correções de 3 mm
- MQL Gühring identificavél pelo anél verde

Escopo de entrega

- fornecido com chave hexagonal Artigo 4912
- incl. Tubo de distribuição MQL para troca manual (funil) Artigo Nr. 4513
- fornecido com chave de ajuste para parafusos de ajuste MQL

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir bucha de redução Artigo 4605 ou 4606 separadamente





1 MQL BY GÜHRING

2 MQL BY GÜHRING

GÜHROSync

Nr. do artigo									4604
HSK-A d_3	d_4 mm	para Ø de haste d_1	para roscas	d_2 mm	l_1 mm	tension/ compr. ± mm	SW	kg	Nº de cód.
63	12.00	2.8-10	M3-M12	40	106.5	0.3	4	1.5	12,063
63	20.00	6-16	M8-M20	40	120.5	0.3	5	1.6	20,063
100	12.00	2.8-10	M3-M12	40	113.0	0.3	4	2.8	12,100
100	20.00	6-16	M8-M20	40	127.0	0.3	5	2.9	20,100

Informações do produto

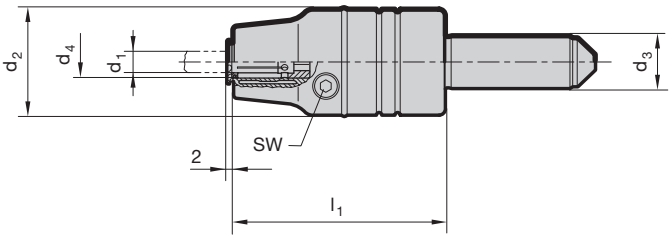
- para sistema MQL de 1 e 2 canais
- máx. pressão do MQL até 16 bar
- compensação de erros de sincronização
- garantia de melhor qualidade de rosca e vida útil otimizada
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho.
- reduz o aumento das forças axiais durante o ciclo aos valores mínimos
- fixação hidráulica adequada com buchas de redução com arraste
- parafuso de ajuste permite correções de 3 mm
- haste similar a DIN 1835-A ou fixar em mandris de precisão (hidráulico, térmico ou com força aumentada)
- MQL Gühring identificavél pelo anél verde

Escopo de entrega

- fornecido com chave hexagonal Artigo 4912
- fornecido com chave de ajuste para parafusos de ajuste MQL

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir bucha de redução Artigo 4605 ou 4606 separadamente





1 MQL BY GÜHRING

2 MQL BY GÜHRING

GÜHROSync

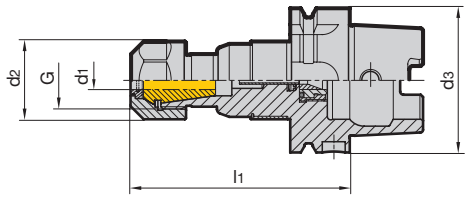
Nr. do artigo									4524
d_3 h6 mm	d_4 mm	para Ø de haste d_1	para roscas	d_2 mm	l_1 mm	tension/ compr. ± mm	SW	kg	Nº de cód.
20	12.00	2.8-10	M3-M12	40	80	0.3	4	0.7	12,020
20	20.00	6-16	M8-M20	40	94	0.3	5	0.8	20,020

Informações do produto
- para sistema MQL de 1 e 2 canais
- compensação de erros de sincronização
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho, que podem causar altas forças de atrito no flanco da rosca.
- parafuso de ajuste permite correções de 2 a 3 mm
- máx. pressão do MQL até 10 bar
- tubo de distribuição MQL montado
- MQL Gühring identificavél pelo anél verde

Escopo de entrega
- incl. Tubo de distribuição MQL para troca manual (funil)
- fornecido com porca de fixação selada IC/ER Artigo 4306 (vide torque)
- fornecido com chave de ajuste para parafusos de ajuste MQL

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir anél de vedação Artigo 4335 separadamente
- adquirir pinça Artigo 4308 separadamente
- adquirir chave de fixação Artigo 4913 para porcas ER separadamente





1 MQL BY GÜHRING 2 MQL BY GÜHRING

Nr. do artigo										4298
HSK-A d_3	tamanho nom.	para roscas	G	d_1 mm	d_2 mm	l_1 mm	tension/ compr. ± mm	torque* Nm	kg	Nº de cód.
63	ER20	M3.5-M14	M25x1.5	4.5-11	34	95.5	0.15	40	1.00	20,063
63	ER32	M3.5-M28	M40x1.5	4.5-20	50	109.0	0.15	170	1.50	32,063

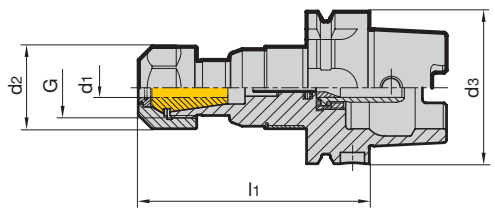
MQL 1 CANAL MANDRIL HSK-A ROSQUEAMENTO SINCRONIZADO

Informações do produto
- para sistema MQL de 1 canal
- compensação de erros de sincronização
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho, que podem causar altas forças de atrito no flanco da rosca.
- parafuso de ajuste permite correções de 2 a 3 mm
- Máx. pressão do MQL até 10 bar
- tubo de distribuição MQL montado
- MQL Gühring identificavél pelo anél verde

Escopo de entrega
- incl. Tubo de distribuição MQL para troca automática
- fornecido com porca de fixação selada IC/ER Artigo 4306 (vide torque)
- fornecido com chave de ajuste para parafusos de ajuste MQL

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir anél de vedação Artigo 4335 separadamente
- adquirir pinça Artigo 4308 separadamente
- adquirir chave de fixação Artigo 4913 para porcas ER separadamente





1 MQL BY GÜHRING

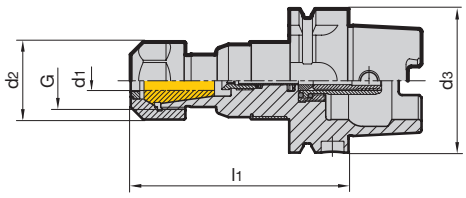
Nr. do artigo										4330
HSK-A d_3	tamanho nom.	para roscas	G	d_1 mm	d_2 mm	l_1 mm	tension/ compr. ± mm	torque* Nm	kg	Nº de cód.
63	ER20	M3.5-M14	M25x1.5	4.5-11	34	95.5	0.15	40	1.00	20,063
63	ER32	M3.5-M28	M40x1.5	4.5-20	50	109.0	0.15	170	1.50	32,063
100	ER20	M3.5-M14	M25x1.5	4.5-11	34	102.0	0.15	40	2.40	20,100
100	ER32	M3.5-M28	M40x1.5	4.5-20	50	115.5	0.15	170	3.00	32,100

Informações do produto
- para sistema MQL de 2 canais
- compensação de erros de sincronização
- Minima compensação no comprimento nas direções de tensão e compresssão e também pequenas diferenças de passo entre o fuso e o macho, que podem causar altas forças de atrito no flanco da rosca.
- parafuso de ajuste permite correções de 2 a 3 mm
- máx. pressão do MQL até 10 bar
- tubo de distribuição MQL montado
- MQL Gühring identificavél pelo anél verde

Escopo de entrega
- incl. Tubo de distribuição MQL para troca automática
- fornecido com porca de fixação selada IC/ER Artigo 4306 (vide torque)
- fornecido com chave de ajuste para parafusos de ajuste MQL

- adquirir parafuso de ajuste MQL Artigo 4305 separadamente
- adquirir anél de vedação Artigo 4335 separadamente
- adquirir pinça Artigo 4308 separadamente
- adquirir chave de fixação Artigo 4913 para porcas ER separadamente





2 MQL BY GÜHRING

Nr. do artigo										4341
HSK-A d_3	tamanho nom.	para roscas	G	d_1 mm	d_2 mm	l_1 mm	tension/ compr. ± mm	torque* Nm	kg	**Nº de cód.**
63	ER20	M3.5-M14	M25x1.5	4.5-11	34	95.5	0.15	40	1.00	20,063
63	ER32	M3.5-M28	M40x1.5	4.5-20	50	109.0	0.15	170	1.50	32,063
100	ER20	M3.5-M14	M25x1.5	4.5-11	34	102.0	0.15	40	2.40	20,100
100	ER32	M3.5-M28	M40x1.5	4.5-20	50	115.5	0.15	170	3.00	32,100

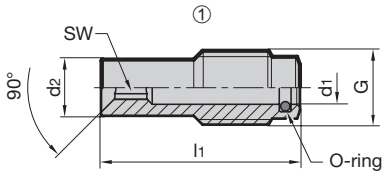
Informações do produto

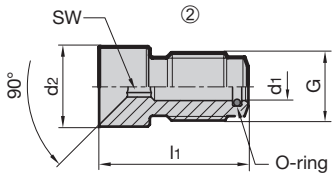
- parafuso de ajuste MQL com cone interno
- para sistema MQL de 1 e 2 canais
- para machos MQL com cone externo
- para mandris synchro MQL Artigos 4602, 4603 e 4604
- parafuso de ajuste de posição na haste do macho
- parafuso de ajuste permite correções de 3 mm

Escopo de entrega

- com O-ring para selo seguro







1 MQL BY GÜHRING

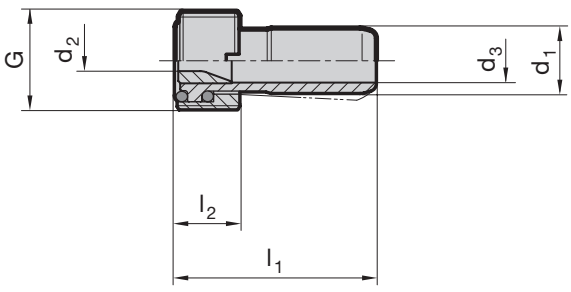
2 MQL BY GÜHRING

Nr. do artigo	4305

para tamanho nom.	fpara Ø de haste x □	G	d_1 mm	d_2 mm	l_1 mm	SW	O-ring	image	Nº de cód.
ER20 / Hydro12	6x4.9	M8x1	3.6	4.8	26.5	2.5	3.5x1	1	6,020
ER20 / Hydro12	7x5.5	M8x1	3.6	5.4	26.5	2.5	3.5x1	1	7,020
ER20 / Hydro12	8x6.2	M8x1	3.6	6.1	21.5	2.5	3.5x1	1	8,020
ER20 / Hydro12	9x7	M8x1	3.6	6.9	21.0	2.5	3.5x1	1	9,020
ER20 / Hydro12	10x8	M8x1	3.6	7.8	17.0	2.5	3.5x1	2	10,020
ER20 / Hydro12	11x9	M8x1	3.6	8.8	16.0	2.5	3.5x1	2	11,020
ER32 / Hydro20	6x4.9	M10x1	4.1	4.8	34.5	3.0	4x1	1	6,032
ER32 / Hydro20	7x5.5	M10x1	4.1	5.4	34.5	3.0	4x1	1	7,032
ER32 / Hydro20	8x6.2	M10x1	4.1	6.1	29.5	3.0	4x1	1	8,032
ER32 / Hydro20	9x7	M10x1	4.1	6.9	29.0	3.0	4x1	1	9,032
ER32 / Hydro20	10x8	M10x1	4.1	7.8	25.0	3.0	4x1	1	10,032
ER32 / Hydro20	11x9 & 12x9	M10x1	4.1	8.8	24.0	3.0	4x1	1	11,032
ER32 / Hydro20	14x11	M10x1	4.1	10.8	22.5	3.0	4x1	2	14,032
ER32 / Hydro20	16x12	M10x1	4.1	11.8	22.0	3.0	4x1	2	16,032
ER32 / Hydro20	18x14.5 & 20x16	M10x1	4.1	14.3	20.5	3.0	4x1	2	18,032

Informações do produto

- para padrão MQL
- versão similar a DIN 69895
- para sistema MQL de 1 canal
- para mandris com sistema de fixação automático
- dimensões d2 e l1 basedas em condições instaladas





MQL 1 BY GÜHRING

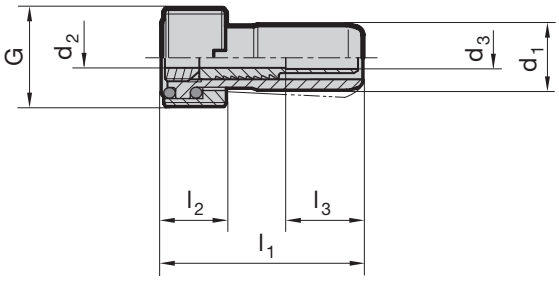
Nr. do artigo **4508**

para HSK-A	d_1 mm	d_2 mm	d_3 mm	l_1 mm	l_2 mm	G	Nº de cód.
32	6.00	3.00	4.00	26.00	5.50	M10x1	10,032
40	8.00	3.80	5.40	29.50	7.50	M12x1	12,040
50	10.00	3.80	6.40	33.00	9.50	M16x1	16,050
63	12.00	3.80	8.00	36.50	11.50	M18x1	18,063
80	14.00	3.80	10.00	40.00	13.50	M20x1.5	20,080
100	16.00	3.80	12.00	44.00	15.50	M24x1.5	24,100

MQL 2 CANAIS CONJUNTO DE FORNECIMENTO DE REFRIGERANTE PARA HSK-A

Informações do produto

- para padrão MQL
- versão similar a DIN 69895
- para sistema MQL de 2 canais
- para mandris com sistema de fixação automático
- „Crashsafe“ version similar to DIN 69090-2 neck design
- dimensões d2 e l1 basedas em condições instaladas





MQL 2 BY GÜHRING

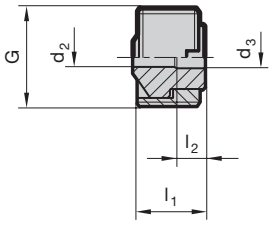
Nr. do artigo **4511**

para HSK-A	d_1 mm	d_2 mm	d_3 mm	l_1 mm	l_2 mm	l_3 mm	G	Nº de cód.
32	6.00	3.00	4.00	26.00	5.50	-	M10x1	10,032
40	8.00	3.80	5.40	29.50	7.50	-	M12x1	12,040
50	10.00	3.60	4.00	33.00	9.50	21.00	M16x1	16,050
63	12.00	3.60	4.00	36.50	11.50	13.80	M18x1	18,063
80	14.00	3.60	4.00	40.00	13.50	14.00	M20x1.5	20,080
100	16.00	3.60	4.00	44.00	15.50	14.00	M24x1.5	24,100

Informações do produto

- para padrão MQL
- para refrigeração interna MQL sistema de 1 e 2 canais
- para mandris com sistema de fixação manual
- idealmente selado para sistema de fixação MQL
- dimensões d2 e l1 basedas em condições instaladas





1 MQL BY GÜHRING

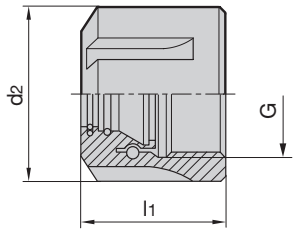
2 MQL BY GÜHRING

Nr. do artigo						4513
para HSK-A	d_2 mm	d_3 mm	l_1 mm	l_2 mm	G	Nº de cód.
32	3.00	3.00	6.30	-	M10x1	10,032
40	3.60	4.00	8.30	5.00	M12x1	12,040
50	3.60	4.00	10.30	5.00	M16x1	16,050
50	5.00	5.00	10.30	-	M16x1	16,150
63	3.60	4.00	12.30	5.00	M18x1	18,063
63	6.00	6.00	12.30	-	M18x1	18,163
80	3.60	4.00	14.40	5.00	M20x1.5	20,080
80	8.00	8.00	14.40	-	M20x1.5	20,180
100	3.60	4.00	16.40	5.00	M24x1.5	24,100
100	8.00	8.00	16.40	-	M24x1.5	24,101

Informações do produto
- para pinças DIN ISO 15488
- para aplicação com refrigeração interna IC/ER com anél de vedação
- para versão com maior força de fixação ER ou IC/ER com anél deslizante

Escopo de entrega
- versão com maior força de fixação: inclui anél deslizante
- versão para refrigeração interna IC/ER: adquirir anél de vedação Artigo 4335 separadamente





						Nr. do artigo	4306
p. anél d. ved. no. 4335	com anél deslizante	tamanho nom.	d_2 mm	l_1 mm	G	max. torque	**Nº de cód.**
–	–	ER16 mini	22	18.4	M19x1.0	55	16,200
–	–	ER20 mini	28	19.0	M24x1.0	75	20,200
–	–	ER25 mini	35	20.0	M30x1.0	100	25,200
–	–	ER11 (4008E)	19	11.3	M14x0.75	25	11,000
–	–	ER16 (426E)	28	17.5	M22x1.5	55	16,000
–	–	ER20 (428E)	34	19.0	M25x1.5	75	20,000
–	–	ER25 (430E)	42	20.0	M32x1.5	100	25,000
–	–	ER32 (470E)	50	22.5	M40x1.5	140	32,000
–	–	ER40 (472E)	63	25.5	M50x1.5	200	40,000
x	–	IC/ER16 mini	22	22.0	M19x1.0	55	16,300
x	–	IC/ER20 mini	28	24.0	M24x1.0	75	20,300
x	–	IC/ER25 mini	35	25.0	M30x1.0	100	25,300
x	–	IC/ER16	28	22.5	M22x1.5	55	16,600
x	–	IC/ER20	34	24.0	M25x1.5	75	20,600
x	–	IC/ER25	42	25.0	M32x1.5	100	25,600
x	–	IC/ER32	50	27.5	M40x1.5	140	32,600
x	–	IC/ER40	63	30.5	M50x1.5	200	40,600
–	x	ER16	28	20.3	M22x1.5	55	16,400
–	x	ER20	34	21.8	M25x1.5	75	20,400
–	x	ER25	42	22.4	M32x1.5	100	25,400
–	x	ER32	50	25.0	M40x1.5	140	32,400
–	x	ER40	63	28.3	M50x1.5	200	40,400
x	x	IC/ER16	28	22.7	M22x1.5	55	16,500
x	x	IC/ER20	34	24.2	M25x1.5	75	20,500
x	x	IC/ER25	42	25.2	M32x1.5	100	25,500
x	x	IC/ER32	50	27.4	M40x1.5	140	32,500
x	x	IC/ER40	63	30.7	M50x1.5	200	40,500

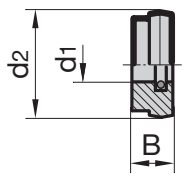
Informações do produto

- A gama de aplicação dos anéis de vedação, Artigo 4325, a partir do diâm. Nom. Ø d1 até a próxima dimensão abaixo, ex. para Ø 6.3 mm (tam. Nom. ER20) adquirir anél de vedação d1=6.5 mm (código 06,520)

Exemplo de requisição:

Ø d1	= 3.5
tamanho nom.	= ER 20
Artigo/Código	= 4335 03,520





	Nr. do artigo	4335

tamanho nom.	d_1 mm	d_2 mm	B mm	Nº de cód.
ER16	3.0…10 um 0.5 mm stg.	13	4	3,016 - 10,016
ER20	3.0…13 um 0.5 mm stg.	16	4	3,020 - 13,020
ER25	3.0…16 um 0.5 mm stg.	21	4	3,025 - 16,025
ER32	3.0…20 um 0.5 mm stg.	27	4	3,032 - 20,032
ER40	3.5…26 um 0.5 mm stg.	33.5	4	3,540 - 26,040

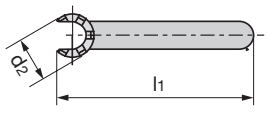
CHAVE DE FIXAÇÃO

Informações do produto

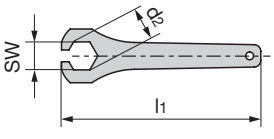
- para porcas de fixação
- Tipo A com gancho especial para sistema de porcas de fixação DIN 6499 mini
- Tipo B para porcas de fixação com design hexagonal
- Tipo C para porcas de fixação com ranhuras externas



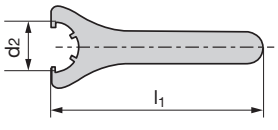
tipo A



tipo B



tipo C

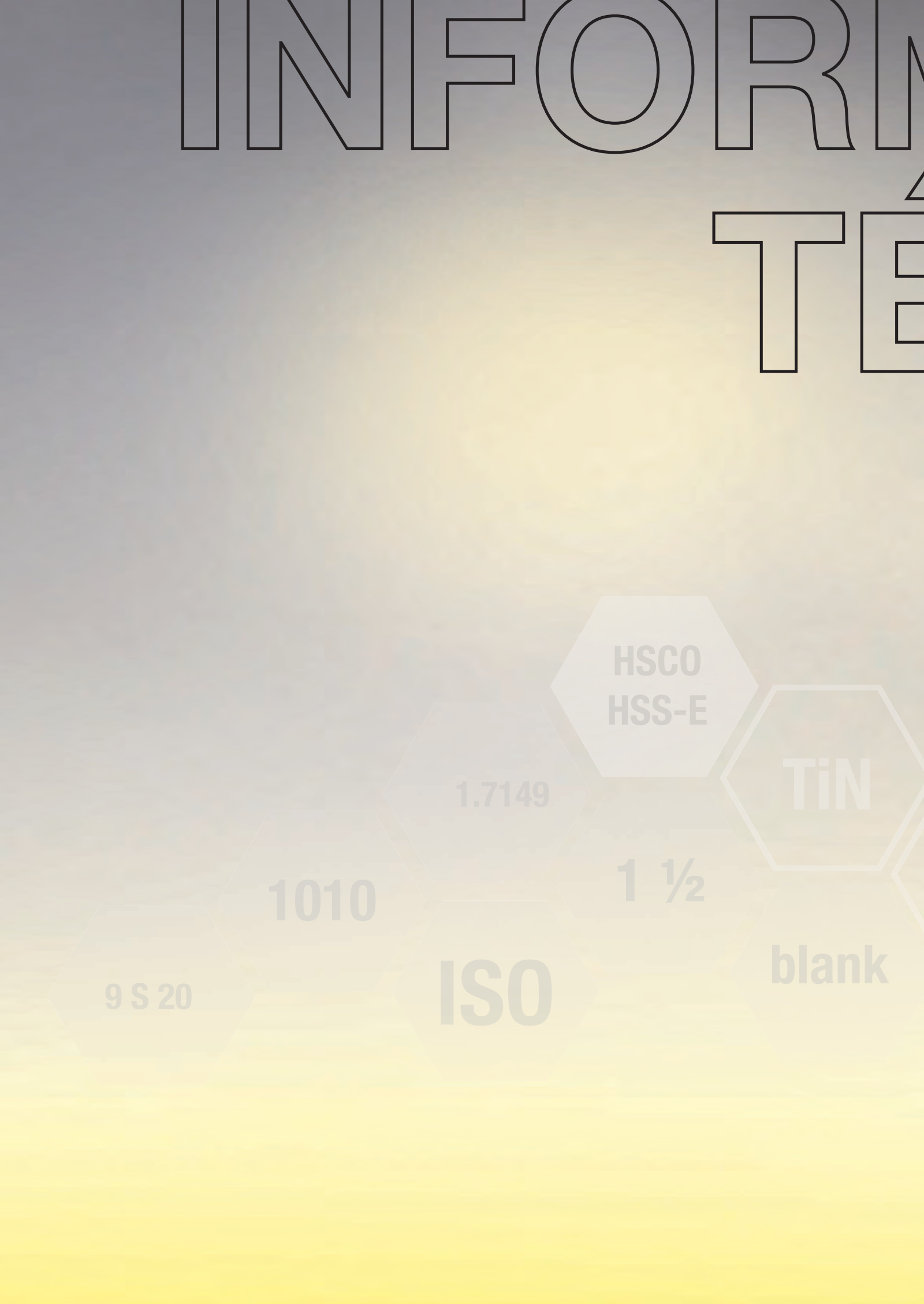


	Nr. do artigo	4913

tamanho nom. mm	tipo	l_1 mm	for ER d_2 mm	SW	Nº de cód.
ER16 mini	A	122	22	-	16,200
ER20 mini	A	139	28	-	20,200
ER25 mini	A	143	35	-	25,200
ER11	B	141	19	17	11,000
ER16	B	178	28	25	16,000
ER16	C	161	32	-	16,032
ER20	B	200	34	30	20,000
ER20	C	183	35	-	20,100
ER25	C	210	42	-	25,000
ER32	C	250	50	-	32,000
ER40	C	290	63	-	40,000


GÜHRO Sync
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5 INFORMAÇÕES TÉCNICAS



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Diâmetro de núcleo para roscas cortadas

Rosca métrica ISO DIN 13

Ø nom.	Passo P mm	Diâmetro do furo Ø DIN 336 mm	Ø do núcleo rosca interna 6H* min. mm	max. mm
M 1	0,25	**0,75**	0,729	0,785
M 1,1	0,25	**0,85**	0,829	0,885
M 1,2	0,25	**0,95**	0,929	0,985
M 1,4	0,30	**1,10**	1,075	1,142
M 1,6	0,35	**1,25**	1,221	1,321
M 1,8	0,35	**1,45**	1,421	1,521
M 2	0,40	**1,60**	1,567	1,679
M 2,2	0,45	**1,75**	1,713	1,838
M 2,5	0,45	**2,05**	2,013	2,138
M 3	0,50	**2,50**	2,459	2,599
M 3,5	0,60	**2,90**	2,850	3,010
M 4	0,70	**3,30**	3,242	3,422
M 4,5	0,75	**3,70**	3,688	3,878
M 5	0,80	**4,20**	4,134	4,334
M 6	1,00	**5,00**	4,917	5,153
M 7	1,00	**6,00**	5,917	6,153
M 8	1,25	**6,80**	6,647	6,912
M 9	1,25	**7,80**	7,647	7,912
M 10	1,50	**8,50**	8,376	8,676
M 11	1,50	**9,50**	9,376	9,676
M 12	1,75	**10,20**	10,106	10,441
M 14	2,00	**12,00**	11,835	12,210
M 16	2,00	**14,00**	13,835	14,210
M 18	2,50	**15,50**	15,294	15,744
M 20	2,50	**17,50**	17,294	17,744
M 22	2,50	**19,50**	19,294	19,744
M 24	3,00	**21,00**	20,752	21,252
M 27	3,00	**24,00**	23,752	24,252
M 30	3,50	**26,50**	26,211	26,771
M 33	3,50	**29,50**	29,211	29,771
M 36	4,00	**32,00**	31,670	32,270
M 39	4,00	**35,00**	34,670	35,270
M 42	4,50	**37,50**	37,129	37,799
M 45	4,50	**40,50**	40,129	40,799
M 48	5,00	**43,00**	42,587	43,297
M 52	5,00	**47,00**	46,587	47,297
M 56	5,50	**50,50**	50,046	50,796

* M 1,1 até M 1.4 Ø-núcleo rosca interna 5H

Rosca métrica fina ISO DIN 13

Ø x Passo nom. P mm	Diâmetro do furo Ø DIN 336 mm	Ø do núcleo rosca interna 6H min. mm	max. mm
M 2,5 x 0,35	**2,15**	2,121	2,221
M 3,0 x 0,35	**2,65**	2,621	2,721
M 3,5 x 0,35	**3,15**	3,121	3,221
M 4,0 x 0,50	**3,50**	3,459	3,599
M 4,5 x 0,50	**4,00**	3,959	4,099
M 5,0 x 0,50	**4,50**	4,459	4,599
M 5,5 x 0,50	**5,00**	4,959	5,099
M 6,0 x 0,75	**5,20**	5,188	5,378
M 7,0 x 0,75	**6,20**	6,188	6,378
M 8,0 x 0,50	**7,50**	7,459	7,599
M 8,0 x 0,75	**7,20**	7,188	7,378
M 8,0 x 1,00	**7,00**	6,917	7,153
M 9,0 x 0,75	**8,20**	8,188	8,378
M 9,0 x 1,00	**8,00**	7,917	8,153
M 10 x 0,75	**9,20**	9,188	9,378
M 10 x 1,00	**9,00**	8,917	9,153
M 10 x 1,25	**8,80**	8,647	8,912
M 11 x 0,75	**10,20**	10,188	10,378
M 11 x 1,00	**10,00**	9,917	10,153
M 12 x 1,00	**11,00**	10,917	11,153
M 12 x 1,25	**10,80**	10,647	10,912
M 12 x 1,50	**10,50**	10,376	10,676
M 14 x 1,00	**13,00**	12,917	13,153
M 14 x 1,25	**12,80**	12,647	12,912
M 14 x 1,50	**12,50**	12,376	12,676
M 15 x 1,00	**14,00**	13,917	14,153
M 15 x 1,50	**13,50**	13,376	13,676
M 16 x 1,00	**15,00**	14,917	15,153
M 16 x 1,25	**14,80**	14,647	14,912
M 16 x 1,50	**14,50**	14,376	14,676
M 17 x 1,00	**16,00**	15,917	16,153
M 17 x 1,50	**15,50**	15,376	15,676
M 18 x 1,00	**17,00**	16,917	17,153
M 18 x 1,50	**16,50**	16,376	16,676
M 20 x 1,00	**19,00**	18,917	19,153
M 20 x 1,50	**18,50**	18,376	18,676
M 20 x 2,00	**18,00**	17,835	18,210
M 22 x 1,00	**21,00**	20,917	21,153
M 22 x 1,50	**20,50**	20,376	20,676
M 22 x 2,00	**20,00**	19,835	20,210
M 24 x 1,00	**23,00**	22,917	23,153
M 24 x 1,50	**22,50**	22,376	22,676
M 24 x 2,00	**22,00**	21,835	22,210
M 25 x 1,00	**24,00**	23,917	24,153
M 25 x 1,50	**23,50**	23,376	23,676
M 25 x 2,00	**23,00**	22,835	23,210
M 27 x 1,00	**26,00**	25,917	26,153
M 27 x 1,50	**25,50**	25,376	25,676
M 27 x 2,00	**25,00**	24,835	25,210
M 28 x 1,00	**27,00**	26,917	27,153
M 28 x 1,50	**26,50**	26,376	26,676
M 28 x 2,00	**26,00**	25,835	26,210
M 30 x 1,00	**29,00**	28,917	29,153
M 30 x 1,50	**28,50**	28,376	28,676
M 30 x 2,00	**28,00**	27,835	28,210
M 30 x 3,00	**27,00**	26,752	27,252
M 32 x 1,50	**30,50**	30,376	30,676
M 32 x 2,00	**30,00**	29,835	30,210
M 33 x 1,50	**31,50**	31,376	31,676
M 33 x 2,00	**31,00**	30,835	31,210
M 33 x 3,00	**30,00**	29,752	30,252
M 35 x 1,50	**33,50**	33,376	33,676
M 36 x 1,50	**34,50**	34,376	34,676

Rosca UNC ASME B1.1

Ø nom.	Fio por poleg.	Diâmetro do furo Ø DIN 336 mm	Ø do núcleo rosca interna 2B min. mm	max. mm
Nr. 1	- 64	**1,55**	1,425	1,580
Nr. 2	- 56	**1,85**	1,694	1,872
Nr. 3	- 48	**2,10**	1,941	2,146
Nr. 4	- 40	**2,35**	2,157	2,385
Nr. 5	- 40	**2,65**	2,487	2,698
Nr. 6	- 32	**2,85**	2,642	2,896
Nr. 8	- 32	**3,50**	3,302	3,531
Nr. 10	- 24	**3,90**	3,683	3,937
Nr. 12	- 24	**4,50**	4,343	4,597
1/4	- 20	**5,10**	4,978	5,258
5/16	- 18	**6,60**	6,401	6,731
3/8	- 16	**8,00**	7,798	8,153
7/16	- 14	**9,40**	9,144	9,550
1/2	- 13	**10,80**	10,592	11,024
9/16	- 12	**12,20**	11,989	12,446
5/8	- 11	**13,50**	13,386	13,868
3/4	- 10	**16,50**	16,307	16,840
7/8	- 9	**19,50**	19,177	19,761
1	- 8	**22,25**	21,971	22,606
1 1/8	- 7	**25,00**	24,638	25,349
1 1/4	- 7	**28,00**	27,813	28,524
1 3/8	- 6	**30,75**	30,353	31,115
1 1/2	- 6	**34,00**	33,528	34,290
1 3/4	- 5	**39,50**	38,938	39,802
2	- 4,5	**45,00**	44,679	45,593

Rosca MJ DIN ISO 5855

Ø nom.	x Passo P mm	Diâmetro do furo Ø mm	Ø do núcleo rosca interna 5H* min. mm	max. mm
MJ 3	x 0,50	**2,60**	2,513	2,653
MJ 4	x 0,70	**3,40**	3,318	3,498
MJ 5	x 0,80	**4,30**	4,221	4,421
MJ 6	x 0,50	**5,55**	5,513	5,625
MJ 6	x 0,75	**5,35**	5,269	5,419
MJ 6	x 1,00	**5,10**	5,026	5,216
MJ 8	x 0,50	**7,55**	7,513	7,625
MJ 8	x 0,75	**7,35**	7,269	7,419
MJ 8	x 1,00	**7,10**	7,026	7,216
MJ 8	x 1,25	**6,90**	6,782	6,994
MJ 10	x 1,00	**9,10**	9,026	9,216
MJ 10	x 1,25	**8,90**	8,782	8,994
MJ 10	x 1,50	**8,60**	8,539	8,775
MJ 12	x 1,75	**10,40**	10,295	10,560
MJ 16	x 2,00	**14,20**	14,051	14,351

* MJ 3 x 0,50 até MJ 5 x 0,80 Ø-núcleo rosca interna 6H

Rosca UNC ISO 3161

Ø nom.	Fio por poleg.	Diâmetro do furo Ø mm	Ø do núcleo rosca interna 3B min. mm	max. mm
Nr. 6	- 32	**2,85**	2,733	2,939
Nr. 8	- 32	**3,55**	3,393	3,599
Nr. 10	- 24	**4,00**	3,795	4,064
Nr. 12	- 24	**4,60**	4,455	4,704
1/4	- 20	**5,30**	5,113	5,387
5/16	- 18	**6,75**	6,563	6,833
3/8	- 16	**8,20**	7,978	8,255
7/16	- 14	**9,60**	9,346	9,639
1/2	- 13	**11,00**	10,798	11,095
9/16	- 12	**12,40**	12,228	12,482
5/8	- 11	**13,80**	13,627	13,904

Rosca UNF ISO 3161

Ø nom.	Fio por poleg.	Diâmetro do furo Ø mm	Ø do núcleo rosca interna 3B min. mm	max. mm
Nr. 6	- 40	**3,00**	2,888	3,053
Nr. 8	- 36	**3,60**	3,480	3,663
Nr. 10	- 32	**4,20**	4,054	4,255
Nr. 12	- 28	**4,75**	4,602	4,816
1/4	- 28	**5,60**	5,466	5,662
5/16	- 24	**7,00**	6,906	7,109
3/8	- 24	**8,60**	8,494	8,679
7/16	- 20	**10,00**	9,876	10,084
1/2	- 20	**11,60**	11,463	11,661
9/16	- 18	**13,00**	12,913	13,122
5/8	- 18	**14,60**	14,501	14,702

Diâmetro de núcleo para roscas cortadas

Rosca UNF ASME B1.1

Ø nom.	Fio por poleg.	Diâmetro do furo Ø DIN 336 mm	Ø do núcleo rosca interna 2B min. mm	Ø do núcleo rosca interna 2B max. mm
Nr. 1	72	**1,55**	1,473	1,610
Nr. 2	64	**1,85**	1,755	1,910
Nr. 3	56	**2,15**	2,024	2,197
Nr. 4	48	**2,40**	2,271	2,459
Nr. 5	44	**2,70**	2,550	2,741
Nr. 6	40	**2,95**	2,819	3,023
Nr. 8	36	**3,50**	3,404	3,607
Nr. 10	32	**4,10**	3,962	4,166
Nr. 12	28	**4,60**	4,496	4,724
1/4	28	**5,50**	5,359	5,588
5/16	24	**6,90**	6,782	7,036
3/8	24	**8,50**	8,382	8,636
7/16	20	**9,90**	9,728	10,033
1/2	20	**11,50**	11,328	11,608
9/16	18	**12,90**	12,751	13,081
5/8	18	**14,50**	14,351	14,681
3/4	16	**17,50**	17,323	17,678
7/8	14	**20,40**	20,269	20,650
1	12	**23,25**	23,114	23,571
1 1/8	12	**26,50**	26,289	26,746
1 1/4	12	**29,50**	29,464	29,921
1 3/8	12	**32,75**	32,639	33,096
1 1/2	12	**36,00**	35,814	36,271

Rosca BSW-(Whitworth) BS84

Ø nom. poleg.	Fio por poleg.	Diâmetro do furo Ø mm	Ø do núcleo rosca interna min. mm	Ø do núcleo rosca interna max. mm
W 1/16	60	**1,20**	1,045	1,230
W 3/32	48	**1,80**	1,704	1,912
W 1/8	40	**2,50**	2,362	2,591
W 5/32	32	**3,20**	2,952	3,214
W 3/16	24	**3,60**	3,407	3,745
W 7/32	24	**4,50**	4,201	4,539
W 1/4	20	**5,10**	4,724	5,156
W 5/16	18	**6,50**	6,130	6,590
W 3/8	16	**7,90**	7,492	7,987
W 7/16	14	**9,20**	8,789	9,330
W 1/2	12	**10,50**	9,989	10,591
W 9/16	12	**12,00**	11,577	12,179
W 5/8	11	**13,50**	12,918	13,558
W 3/4	10	**16,25**	15,797	16,483
W 7/8	9	**19,25**	18,611	19,353
W 1	8	**22,00**	21,334	22,147
W 1 1/8	7	**24,50**	23,928	24,832
W 1 1/4	7	**27,75**	27,103	28,007
W 1 3/8	6	**30,50**	29,504	30,528
W 1 1/2	6	**33,50**	32,679	33,703
W 1 5/8	5	**35,50**	34,769	35,963
W 1 3/4	5	**39,00**	37,944	39,138
W 2	4,5	**44,50**	43,571	44,877

Rosca gás (Whitworth) (conforme DIN-ISO 228-1)

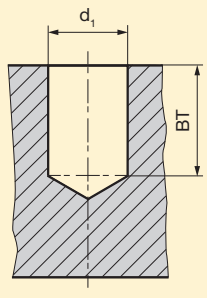
Ø nom. poleg.	Fio por poleg.	Diâmetro do furo Ø DIN 336 mm	Ø do núcleo rosca interna min. mm	Ø do núcleo rosca interna max. mm
G 1/16	28	**6,80**	6,561	6,843
G 1/8	28	**8,80**	8,566	8,848
G 1/4	19	**11,80**	11,445	11,890
G 3/8	19	**15,25**	14,950	15,395
G 1/2	14	**19,00**	18,631	19,172
G 5/8	14	**21,00**	20,587	21,128
G 3/4	14	**24,50**	24,117	24,658
G 7/8	14	**28,25**	27,877	28,418
G 1	11	**30,75**	30,291	30,931
G 1 1/8	11	**35,50**	34,939	35,579
G 1 1/4	11	**39,50**	38,952	39,592
G 1 1/2	11	**45,25**	44,845	45,485
G 1 3/4	11	**51,00**	50,788	51,428
G 2	11	**57,00**	56,656	57,296

Rosca blindada para aço conforme DIN 40430

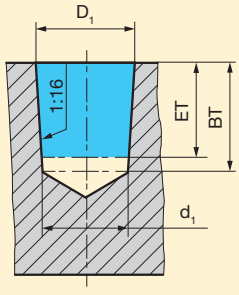
Ø nom. poleg.	Fio por poleg.	Diâmetro do furo Ø mm	Ø do núcleo rosca interna min. mm	Ø do núcleo rosca interna max. mm
Pg 7	20	**11,40**	11,280	11,430
Pg 9	18	**14,00**	13,860	14,010
Pg 11	18	**17,30**	17,260	17,410
Pg 13,5	18	**19,00**	19,060	19,210
Pg 16	18	**21,30**	21,160	21,310
Pg 21	16	**26,90**	26,780	27,030
Pg 29	16	**35,50**	35,480	35,730
Pg 36	16	**45,50**	45,480	45,730
Pg 42	16	**52,50**	52,480	52,730
Pg 48	16	**57,80**	57,780	58,030

NPT ANSI B 2.1
Rosca conica americana para tubos cone 1:16

Execução A (evitar se possível)



Execução B



Ø nom.	Fio por poleg.	Ø do furo do núcleo cilindr. (A) d_1	Ø do furo do núcleo conico (B) D_1	Profundidade da rosca ET mm	Profundidade do furo BT (min) mm
1/16	27	**6,15**	6,39	9,29	10,7
1/8	27	**8,40**	8,74	9,32	10,8
1/4	18	**11,10**	**11,36**	13,52	15,6
3/8	18	**14,30**	**14,80**	13,83	16,0
1/2	14	**17,90**	**18,32**	18,07	20,8
3/4	14	**23,30**	**23,67**	18,55	21,3
1	11,5	**29,00**	**29,69**	22,29	25,6
1 1/4	11,5	**37,70**	**38,45**	22,80	26,1
1 1/2	11,5	**43,70**	**44,52**	22,80	26,1
2	11,5	**55,60**	**56,56**	23,20	26,5
2 1/2	8	**66,30**	**67,62**	31,75	36,3
3	8	**82,30**	**83,52**	33,74	38,5

Rosca EG métr./métr. fina (EG M14 x 1,25) para roscas postiças DIN 8140

Ø nom.	x Passo P mm	Diâmetro do furo Ø mm	Ø do núcleo rosca interna min. mm	Ø do núcleo rosca interna max. mm
EG M 4	0,70	**4,20**	4,152	4,292
EG M 5	0,80	**5,25**	5,174	5,334
EG M 6	1,00	**6,30**	6,217	6,407
EG M 8	1,25	**8,40**	8,271	8,483
EG M10	1,50	**10,50**	10,324	10,560
EG M12	1,75	**12,50**	12,379	12,644
EG M14 x	1,25	**14,40**	14,271	14,483
EG M16	2,00	**16,50**	16,433	16,733

Rosca EG UNC (UNC-STI) para roscas postiças ASME B18.29.1

Ø nom.	Fio por poleg.	Diâmetro do furo Ø mm	Ø do núcleo rosca interna min. mm	Ø do núcleo rosca interna max. mm
EG Nr. 6	32	**3,80**	3,678	3,879
EG Nr. 8	32	**4,40**	4,338	4,524
EG Nr. 10	24	**5,20**	5,055	5,283
EG Nr. 12	24	**5,80**	5,715	5,944
EG 1/4	20	**6,70**	6,624	6,868
EG 5/16	18	**8,40**	8,242	8,489
EG 3/8	16	**10,00**	9,868	10,127
EG 7/16	14	**11,60**	11,506	11,783
EG 1/2	13	**13,30**	13,122	13,393
EG 9/16	12	**14,90**	14,747	15,032
EG 5/8	11	**16,50**	16,375	16,673

Rosca EG UNF (UNF-STI) para roscas postiças ASME B18.29.1

Ø nom.	Fio por poleg.	Diâmetro do furo Ø mm	Ø do núcleo rosca interna min. mm	Ø do núcleo rosca interna max. mm
EG Nr. 6	40	**3,70**	3,644	3,818
EG Nr. 8	36	**4,40**	4,321	4,498
EG Nr. 10	32	**5,10**	4,999	5,184
EG Nr. 12	28	**5,70**	5,682	5,809
EG 1/4	28	**6,60**	6,546	6,721
EG 5/16	24	**8,25**	8,166	8,352
EG 3/8	24	**9,80**	9,754	9,931
EG 7/16	20	**11,50**	11,389	11,585
EG 1/2	20	**13,10**	12,974	13,172
EG 9/16	18	**14,70**	14,592	14,798
EG 5/8	18	**16,25**	16,180	16,386

Diâmetros de brocas recomendados para a laminação de roscas

Rosca métrica ISO DIN 13

Ø nom.	Passo P	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 7H*	
mm		mm	min. mm	max. mm	min. mm	max. mm
M1	0,25	**0,90**	0,89	0,92	0,729	0,819
M1,2	0,25	**1,10**	1,09	1,12	0,929	1,019
M1,4	0,30	**1,28**	1,27	1,30	1,075	1,181
M1,6	0,35	**1,46**	1,45	1,48	1,221	1,346
M1,7	0,35	**1,56**	1,55	1,58	1,321	1,446
M1,8	0,35	**1,66**	1,65	1,68	1,421	1,546
M 2	0,40	**1,85**	1,84	1,88	1,567	1,679
M 2,2	0,45	**2,00**	2,01	2,05	1,713	1,838
M 2,5	0,45	**2,30**	2,28	2,32	2,013	2,138
M 3	0,50	**2,80**	2,78	2,85	2,459	2,639
M 3,5	0,60	**3,25**	3,23	3,30	2,850	3,050
M 4	0,70	**3,70**	3,68	3,76	3,242	3,466
M 4,5	0,75	**4,20**				
M 5	0,80	**4,65**	4,62	4,71	4,134	4,384
M 6	1,00	**5,55**	5,52	5,62	4,917	5,217
M 7	1,00	**6,55**	6,52	6,62	5,917	6,217
M 8	1,25	**7,40**	7,36	7,47	6,647	6,982
M 9	1,25	**8,40**	8,36	8,47	7,647	7,982
M 10	1,50	**9,30**	9,26	9,38	8,376	8,751
M 11	1,50	**10,30**	10,26	10,38	9,376	9,751
M 12	1,75	**11,20**	11,15	11,29	10,106	10,531
M 14	2,00	**13,10**	13,05	13,20	11,835	12,310
M 16	2,00	**15,10**	15,05	15,20	13,835	14,310
M 18	2,50	**16,90**	16,83	17,02	15,294	15,854
M 20	2,50	**18,90**	18,83	19,02	17,294	17,854
M 22	2,50	**20,90**	20,83	21,02	19,294	19,854
M 24	3,00	**22,70**	22,62	22,80	20,752	21,382
M 27	3,00	**25,70**	25,62	25,80	23,752	24,382
M 30	3,50	**28,50**	28,40	28,60	26,211	26,921
M 33	3,50	**31,50**	31,40	31,60	29,211	29,921
M 36	4,00	**34,30**	34,17	34,40	31,670	32,420
M 39	4,00	**37,30**	37,17	37,40	34,670	35,420
M 42	4,50	**40,10**	39,95	40,20	37,129	37,979

* M 2 até M 2,5 Ø-núcleo rosca interna 6H

Rosca métrica fina ISO DIN 13

Ø x Passo nom.	P	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 7H*	
mm		mm	min. mm	max. mm	min. mm	max. mm
M 2,5 x	0,35	**2,35**	2,35	2,38	2,121	2,221
M 3 x	0,35	**2,85**	2,85	2,88	2,621	2,721
M 4 x	0,35	**3,85**	3,85	3,88	3,621	3,721
M 4 x	0,50	**3,80**	3,78	3,83	3,459	3,639
M 5 x	0,50	**4,80**	4,78	4,83	4,459	4,639
M 5,5 x	0,50	**5,30**	5,28	5,33	4,959	5,139
M 6 x	0,75	**5,65**	5,62	5,70	5,188	5,424
M 7 x	0,75	**6,65**	6,62	6,70	6,188	6,424
M 8 x	0,75	**7,65**	7,62	7,70	7,188	7,424
M 8 x	1,00	**7,55**	7,52	7,62	6,917	7,217
M 9 x	0,75	**8,65**	8,62	8,70	8,188	8,424
M 9 x	1,00	**8,55**	8,52	8,62	7,917	8,217
M 10 x	0,75	**9,65**	9,62	9,70	9,188	9,424
M 10 x	1,00	**9,55**	9,52	9,62	8,917	9,217
M 10 x	1,25	**9,40**	9,36	9,47	8,647	8,982
M 11 x	0,75	**10,65**	10,62	10,70	10,188	10,424
M 11 x	1,00	**10,55**	10,52	10,62	9,917	10,217
M 12 x	1,00	**11,55**	11,52	11,62	10,917	11,217
M 12 x	1,25	**11,40**	11,36	11,47	10,647	10,982
M 12 x	1,50	**11,30**	11,26	11,38	10,376	10,751
M 14 x	1,00	**13,55**	13,52	13,62	12,917	13,217
M 14 x	1,25	**13,40**	13,36	13,47	12,647	12,982
M 14 x	1,50	**13,30**	13,26	13,38	12,376	12,751
M 15 x	1,00	**14,55**	14,52	14,62	13,917	14,217
M 15 x	1,50	**14,30**	14,26	14,38	13,376	13,751
M 16 x	1,00	**15,55**	15,52	15,62	14,917	15,217
M 16 x	1,50	**15,30**	15,26	15,38	14,376	14,751
M 17 x	1,00	**16,55**	16,52	16,62	15,917	16,217

* M 2,5 x 0,35 até M 4 x 0,35 Ø-núcleo rosca interna 6H

Ø x Passo nom.	P	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 7H*	
mm		mm	min. mm	max. mm	min. mm	max. mm
M 17 x	1,50	**16,30**	16,26	16,38	15,376	15,751
M 18 x	1,00	**17,55**	17,52	17,62	16,917	17,217
M 18 x	1,50	**17,30**	17,26	17,38	16,376	16,751
M 18 x	2,00	**17,10**	17,05	17,20	15,835	16,310
M 20 x	1,00	**19,55**	19,52	19,62	18,917	19,217
M 20 x	1,50	**19,30**	19,26	19,38	18,376	19,751
M 24 x	1,00	**23,55**	23,52	23,62	22,917	23,217
M 24 x	1,50	**23,30**	23,26	23,38	22,376	22,751
M 24 x	2,00	**23,10**	23,05	23,20	21,835	22,310
M 27 x	1,50	**26,30**	26,26	26,38	25,376	25,751
M 30 x	1,50	**29,30**	29,26	29,38	28,376	28,751
M 33 x	1,50	**32,30**	32,26	32,38	31,376	31,751
M 36 x	1,50	**35,30**	35,26	35,38	34,376	34,751
M 39 x	1,50	**38,30**	38,26	38,38	37,376	37,751
M 42 x	1,50	**41,30**	41,26	41,38	42,376	42,751

Campo de tolerâncias do diâmetro de núcleo para roscas laminadas (conforme DIN 13, parte 50)
Por motivos de resistência não é necessário manter as tolerâncias 6 H dos furos de núcleo; a tolerância 7 H atende as necessidades, a sobreposição dos flancos da rosca externa e interna não pode ser inferior a 0,32 x P. Além disto as roscas laminadas, devido a não terem seus filamentos cortados e por serem recalcadas a frio, tem em regra uma maior resistência do que as roscas cortadas.

Rosca UNC ASME B1.1

Ø nom.	Fio	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 2B	
	por poleg.	mm	min. mm	max. mm	min. mm	max. mm
Nr. 1 -	64	**1,68**	1,67	1,70	1,425	1,580
Nr. 2 -	56	**1,98**	1,97	2,01	1,694	1,872
Nr. 3 -	48	**2,28**	2,27	2,32	1,941	2,146
Nr. 4 -	40	**2,55**	2,54	2,59	2,157	2,385
Nr. 5 -	40	**2,90**	2,89	2,94	2,487	2,698
Nr. 6 -	32	**3,15**	3,14	3,19	2,642	2,896
Nr. 8 -	32	**3,80**	3,78	3,82	3,302	3,531
Nr. 10 -	24	**4,35**	4,33	4,39	3,683	3,937
Nr. 12 -	24	**5,00**	4,97	5,03	4,343	4,597
1/4 -	20	**5,75**	5,72	5,80	4,978	5,258
5/16 -	18	**7,30**	7,26	7,37	6,401	6,731
3/8 -	16	**8,80**	8,77	8,88	7,798	8,153
7/16 -	14	**10,30**	10,27	10,37	9,144	9,550
1/2 -	13	**11,80**	11,77	11,88	10,592	11,024
9/16 -	12	**13,30**	13,28	13,39	11,989	12,446
5/8 -	11	**14,80**	14,78	14,90	13,386	13,868
3/4 -	10	**17,90**	17,85	17,97	16,307	16,840
7/8 -	9	**21,00**	20,95	21,10	19,177	19,761
1 -	8	**24,00**	23,95	24,12	21,971	22,606

Rosca UNF ASME B1.1

Ø nom.	Fio	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 2B	
	por poleg.	mm	min. mm	max. mm	min. mm	max. mm
Nr. 1 -	72	**1,70**	1,69	1,72	1,473	1,610
Nr. 2 -	64	**2,00**	1,99	2,03	1,755	1,910
Nr. 3 -	56	**2,30**	2,29	2,34	2,024	2,197
Nr. 4 -	48	**2,60**	2,59	2,63	2,271	2,459
Nr. 5 -	44	**2,90**	2,89	2,93	2,550	2,741
Nr. 6 -	40	**3,20**	3,19	3,24	2,819	3,023
Nr. 8 -	36	**3,85**	3,83	3,88	3,404	3,607
Nr. 10 -	32	**4,45**	3,43	4,49	3,962	4,166
Nr. 12 -	28	**5,10**	5,07	5,13	4,496	4,724
1/4 -	28	**5,95**	5,92	5,99	5,359	5,588
5/16 -	24	**7,45**	7,42	7,50	6,782	7,036
3/8 -	24	**9,05**	9,02	9,10	8,838	8,636
7/16 -	20	**10,55**	10,48	10,58	9,728	10,033
1/2 -	20	**12,10**	12,08	12,18	11,328	11,608
9/16 -	18	**13,65**	13,61	13,72	12,751	13,081
5/8 -	18	**15,25**	15,21	15,32	14,351	14,681
3/4 -	16	**18,35**	15,30	18,41	17,323	17,678
7/8 -	14	**21,40**	21,35	21,49	20,269	20,650
1 -	12	**24,45**	24,40	24,54	23,114	23,571

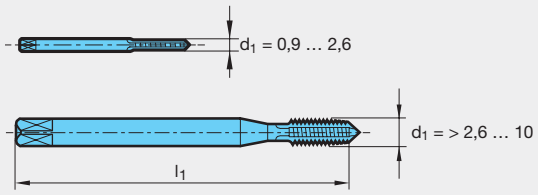
Rosca gás (Whitworth) DIN EN ISO 228-1

Ø nom.	Fio	Ø do furo	Ø do furo		Ø do núcleo Rosca interna	
poleg.	por poleg.	mm	min. mm	max. mm	min. mm	max. mm
G 1/16	28	**7,30**	7,28	7,35	6,561	6,843
G 1/8	28	**9,30**	9,28	9,35	8,566	8,848
G 1/4	19	**12,50**	12,48	12,55	11,445	11,890
G 3/8	19	**16,00**	15,98	16,05	14,950	15,395
G 1/2	14	**20,00**	19,98	20,12	18,631	19,172
G 5/8	14	**22,00**	21,98	22,12	20,587	21,128
G 3/4	14	**25,50**	25,48	25,62	24,117	24,658
G 7/8	14	**29,25**	29,23	29,37	27,877	28,418
G 1	11	**32,00**	31,98	32,15	30,291	30,931
G 1 1/4	11	**40,75**	40,70	40,85	38,952	39,592

Características das normas individuais

DIN 371

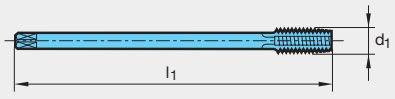
no plano geral DIN 2184-**1**



Norma para machos para máquinas para rosca métrica ISO e para rosca métrica fina ISO com haste reforçada. Execução longa.
On tipo da haste corresponde as gamas de diâmetros (mm) ao lado

DIN 376

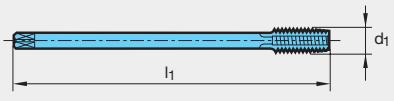
no plano geral DIN 2184-**1**



Norma para machos para máquinas para rosca métrica ISO com haste rebaixada (machos passantes). Execução longa.
Gama de diâmetros d1 = 1,6...68mm
(≤ Ø M3, execuçãod da haste sem quadrado)

DIN 374

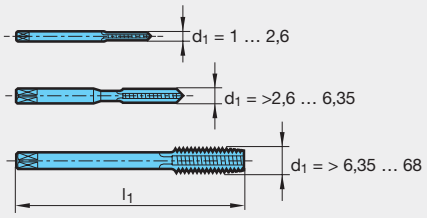
no plano geral DIN 2184-**1**



Norma para machos para máquinas para rosca métrica fina com haste rebaixada (machos passantes). Execução longa.
Gama de diâmetros d1 = 3...52mm

DIN 352

no plano geral DIN 2184-**2**

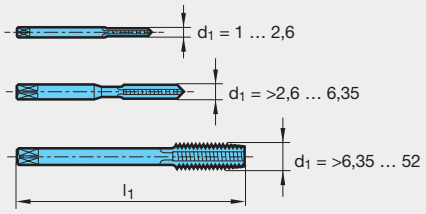


Norma para machos manuais e para máquinas para rosca métrica ISO. Execução curta.
O tipo da haste corresponde as gamas de diâmetros (mm) ao lado.

Características das normas individuais

DIN 2181

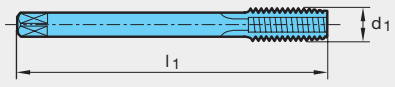
no plano geral DIN 2184-**2**



Norma para machos manuais e para máquinas para rosca métrica fina ISO. Execução curta.
O tipo da haste corresponde as gamas de diâmetros (mm) ao lado.

DIN 5156

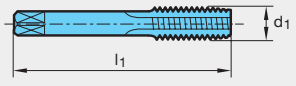
no plano geral DIN 2184-**1**



Norma para machos para máquinas para rosca gás G conforme DIN ISO 228 e para rosca para tubos conforme DIN 2999. Execução longa.
Gamas de diâmetros:
Rosca G G 1/16“ ... G 4“
Rsoca Whitworth Rp 1/16“... Rp 4“

DIN 5157

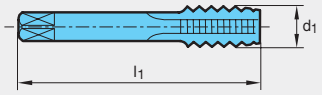
no plano geral DIN 2184-**2**



Norma para machos para rosca gás G conforme DIN ISO 228 e para rosca de tubos Withworth conforme DIN EN 10 226-1. Execução curta.
Gamas de diâmetros:
Rosca G G 1/16“ ... G 4“
Rosca Withworth Rp 1/16“... Rp 4“

DIN 40 432

no plano geral DIN 2184-**2**

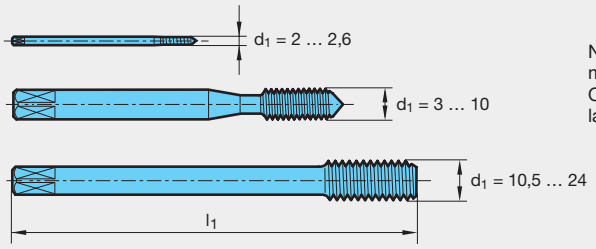


Normas para machos para máquinas para roscas blindadas conforme DIN 40 430. Execução curta.
Gama de diâmetros:
Pg 7 (12,5 mm) ... Pg 48 (59,3 mm)
Será subtituida pela DIN 374 ISO 3 6G.

Características das normas individuais

DIN 2174

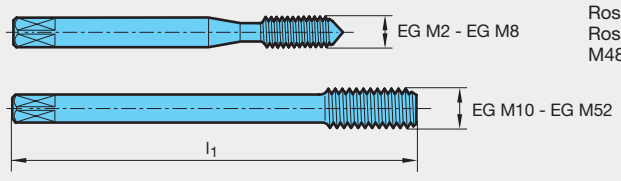
no plano geral DIN 2184-**1**



Norma para machos laminadores para rosca métrica ISO rosca métrica fina ISO. Execução longa.
O tipo da haste corresponde as gamas de diâmetros (mm) ao lado.

DIN 40 435

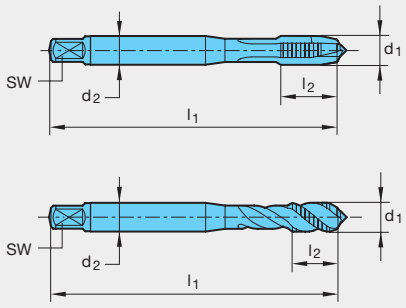
no plano geral DIN 2184-**1**



Norma para machos para máquina para roscas (EG) para inserção de roscas postiças com rosca métrica ISO conforme DIN 8140.
Rosca para inserção de rosca métrica EG M2 até EG M52 e Rosca para inserção de rosca métrica fina EG M8 x 1 até EG M48 x 3

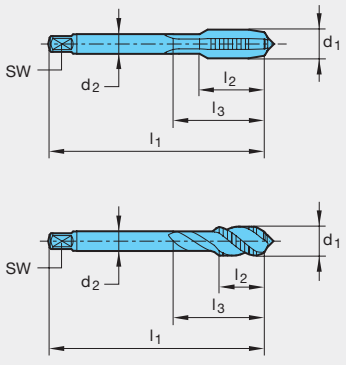
Normas internacionais DIN

DIN 2184-1
DIN 2184-2

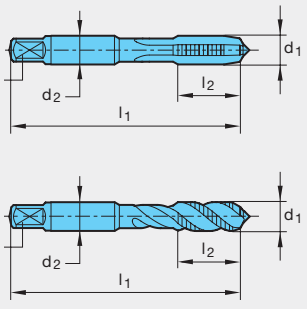


JIS B 4430

Norma Industrial Japonesa

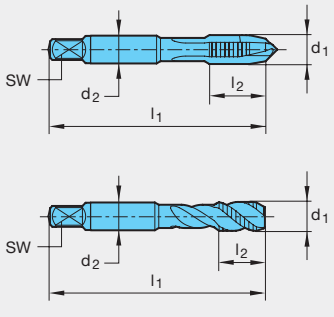


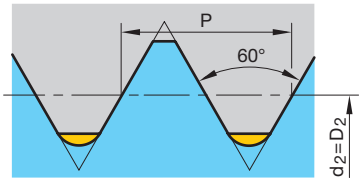
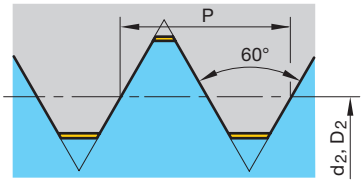
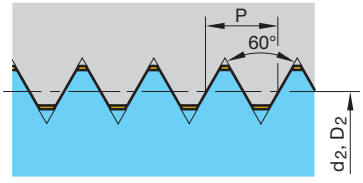
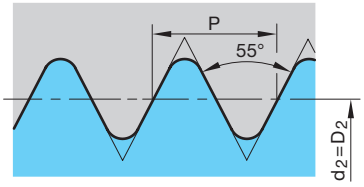
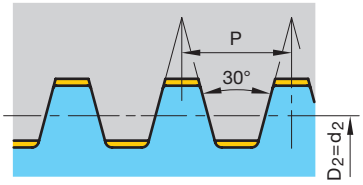
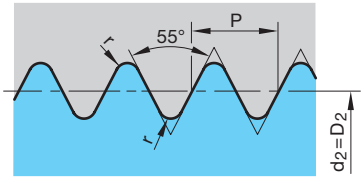
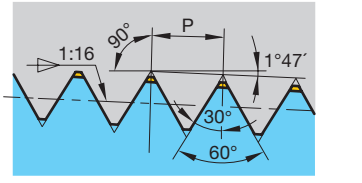
ISO 529

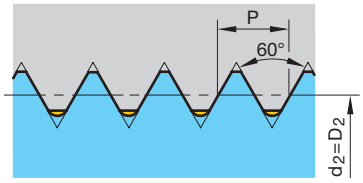
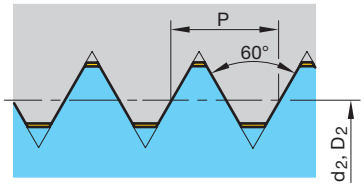
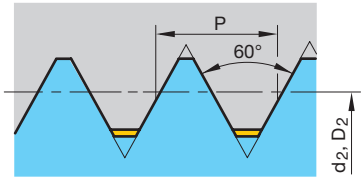
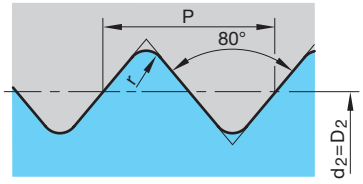
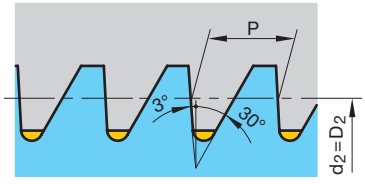
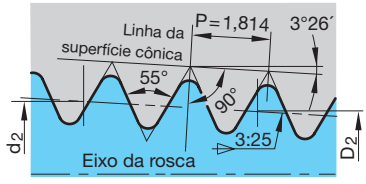
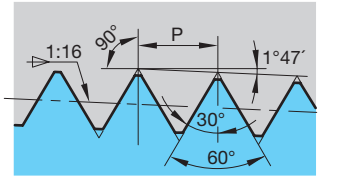


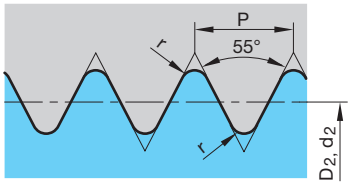
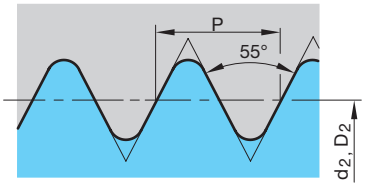
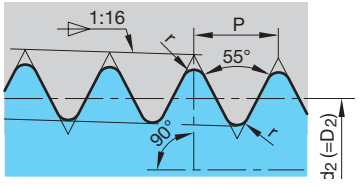
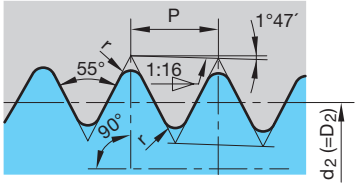
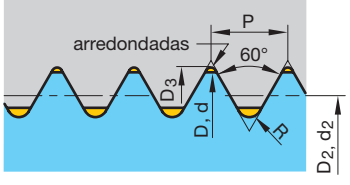
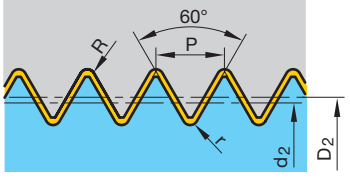
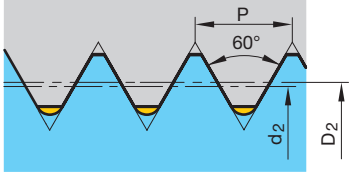
ASME B94.9

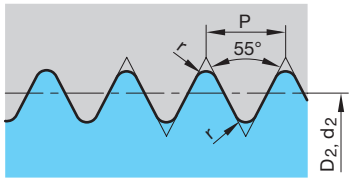
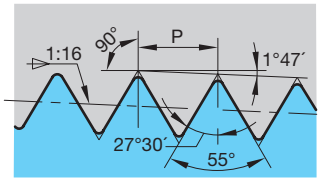
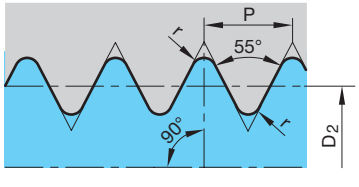
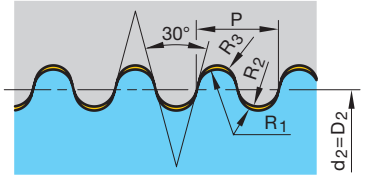
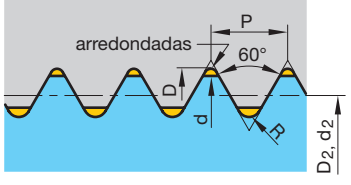
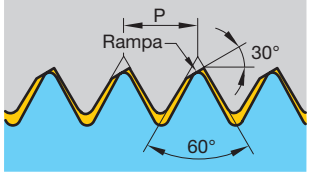
Sociedade Americana de Engenharia Mecânica



Croqui do perfil	Norma	Aplicação
M Rosca métrica ISO		
	DIN 13-1	Generalidades rosca normatizadas
Rosca UNC Unified Coarse Thread		
	ASME B1.1	Generalidades rosca normatizada UN
Rosca UNEF Unified Extra-Fine-Thread		
	ASME B1.1	Generalidades rosca extra fina UN
Rosca cilindrica G para tubos com rosca não vedante		
	DIN EN ISO 228-1	Roscas para tubos, uniões roscadas e instalações
Rosca métrica ISO trapezoidal TR		
	DIN 103	Generalidades, pinças para trens, veículos sobre trilhos
W Rosca cilindrica Whitworth		
	DIN 477	Bocais laterais e acessórios para válvulas de cilíndros para gás
Rosca NPT Standard para tubos cônica com vedação		
	ANSI/ ASME B1.20.1	Tubos e acessórios

Croqui do perfil	Norma	Aplicação
MF Rosca métrica fina ISO		
	DIN 13-2 até DIN 13-11	Generalidades rosca fina
Rosca UNF Unified Fine-Thread		
	Rosca trapezoidal métrica ISO ASME B 1.1	Generalidades rosca fina UN
Rosca UNS Unified Special Thread		
	ASME B1.1	Generalidades rosca especial UN
PG rosca blindada para aço		
	DIN 40430 rosca cilíndrica redonda	Eletrotécnica
S Rosca métrica em forma de serra		
	DIN 513	Para a recepção de forças com ação unilateral
W Rosca cônica Wihtworth		
	DIN 477	Bocais roscados e gargalos de cilindros para gás para válvulas de cilindros para gás
NPTF Rosca standard americana para tubos cônica para vedação seca		
	ANSI B1.20.3	Tubos e acessórios

Croqui do perfil	Norma	Aplicação
BSW Rosca cilíndrica Whitworth		
	B.S. 84 British Standard	Rosca para tubos, conexões e instalações
BSP Rosca cilíndrica para tubos (idêntica a G)		
	B.S. 93 British Standard	Rosca para tubos, conexões e instalações
R Rosca cônica externa para tubos		
	DIN EN 10226-1 (baseada na ISO 7-1) em substituição a DIN 2999-1	Rosca externa para tubos e acessórios (para conexões com vedação)
Rc Rosca cônica interna para tubos Whitworth		
	DIN EN 10226-2 (quase não usada na Europa substituível por roscas para tubos conforme ISO 7-1)	Rosca interna para tubos e acessórios (para conexões com vedação)
Rosca métrica MJ		
	DIN ISO 5855-1	para as indústrias, aeronáutica e espacial
Vg Rosca para válvulas		
	DIN 7756	Válvulas para pneus, carcaças de distribuição
MFS		
	DIN 8141	Assento firme em Ligas de alumínio fundido

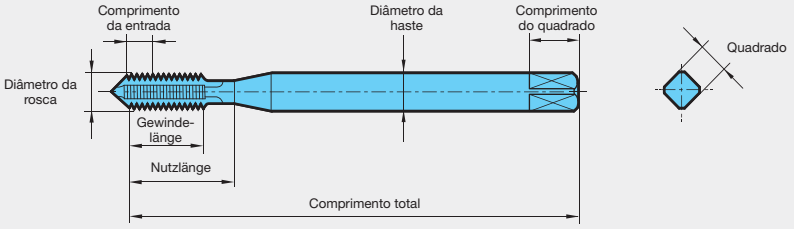
Croqui do perfil	Norma	Aplicação
BSF Rosca cilíndrica fina Whitworth		
	B.S. 84 British Standard Fine	Roscas para tubos, uniões roscadas e instalações
BSTP Rosca cônica para tubos (idêntica a Rc)		
	B.S. 93 British Standard	Rosca interna para tubos e conexões
Rp Rosca cilíndrica interna para tubos Whitworth		
	DIN EN 10226-1 (baseada na ISO 7-1) em substituição a DIN 2999-1	Rosca interna para tubos e conexões (para conexões com vedação)
RD Rosca cilíndrica redonda		
	DIN 405	Generalidades, ganchos para cargas, minas, indústria alimentícia
UNJ Rosca em poledadas		
	ISO 3161	para as indústrias, aeronáutica e espacial
MSG Rosca travante para porcas		
	Norma da empresa	Rosca autotravante, caixas de câmbio

Pino roscado

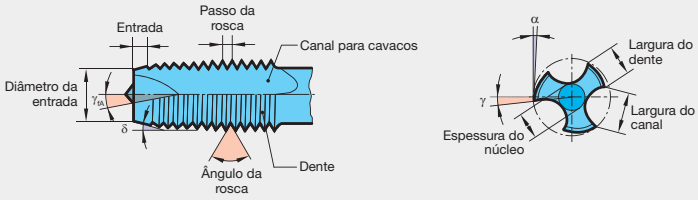
Porca

Folga

Conceitos e ângulos, centragens e tipos de canais



δ = Ângulo de entrada
γ_{fA} = Ângulo de entrada corrigida
α = Ângulo de folga
γ = Ângulo de saída



Tipos de canais



Canais retos, forma C **sem** entrada corrigida



canais retos, forma B **com** entrada corrigida



Ângulo da hélice **15°**



Ângulo da hélice **40°**

Centragens (utilização standard conforme DIN 2197/DIN 2175)

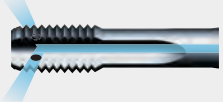


Gama de diâmetros de roscas mm	Tipo de centragem na parte cortante		Tipo de centragem na haste
	com forma de entrada A, C, D, E	com forma de entrada B	
≤ 4,2	①	①	④⑤⑥
> 4,2 … 5,6	①②	①	④⑤⑥
> 5,6 … 10,0	①②③	①②③	④⑤⑥
> 10,0	③	③	⑥

Geometrias de canais de refrigeração



subministração axial de refrigeração com saida axial



subministração axial de refrigeração com saida radial nos canais na área da entrada

Formas de entrada - seleção e utilização

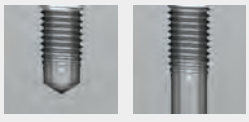
Ao se cortar roscas internas a totalidade da usinagem é realizada pelos dentes da entrada. Por isto a decisão sobre a forma de entrada mais adequada deve ser tomada com muito cuidado. Daí são influenciadas em alto grau tanto a vida útil do macho quanto a qualidade da rosca.

A forma e o comprimento da entrada são básicamente dependentes do tipo do furo do núcleo, se furo passante ou furo cego. O furo passante não necessita de nenhuma outra definição. Sendo que são definidos como furos cegos todos os furos onde ao se cortar a rosca os cavacos são transportados em sentido contrário ao do avanço e cisalhados no retorno do macho. Portanto em determinadas situações os furos passantes podem também ser definidos como cegos.

O comprimento da entrada é definido por considerações contrárias. Para evitar-se sobrecargas, desgaste prematuro e roscas muito grandes, a quantidade de fios na entrada não deveria ser muito pequena. Por outro lado uma entrada muito longa aumenta o torque e com isto o risco de quebra do macho. A entrada corrigida, forma B garante que os cavacos sempre sejam transportados no sentido do avanço.

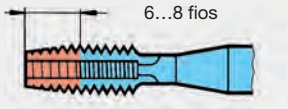
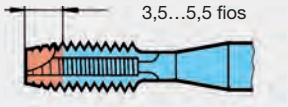
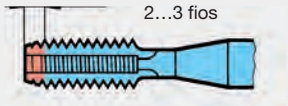
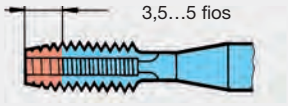
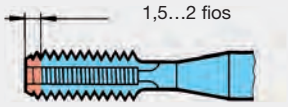
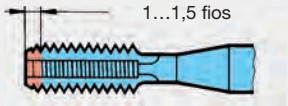


Furo passante



Furo cego

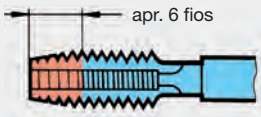
Formas de entradas conforme DIN 2197

Forma A	 6…8 fios	longa, 6 - 8 fios para furos passantes curtos
Forma B	 3,5…5,5 fios	média, 3,5 - 5,5 fios, com entrada corrigida, para todos furos passantes e roscas profundas em materiais com cavacos médios e longos
Forma C	 2…3 fios	curta, 2 - 3 fios para furos cegos Em geral para alumínio, fundição cinzenta e latão
Forma D	 3,5…5 fios	média, 3,5 - 5 fios para furos passantes curtos
Forma E	 1,5…2 fios	extremamente curta, 1,5 - 2 fios, para furos cegos com saida de rosca muito curta.
Forma F	 1…1,5 fios	extremamente curta, 1 - 1,5 fios para furos cegos com saida de rosca muito curta. Evitar se possível.

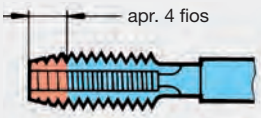
Formas de entrada - seleção e utilização

Comprimentos de entrada em jogos com 3 machos

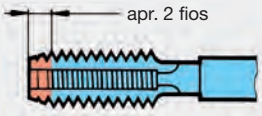
Forma A
para desbaste



Forma D
para semi-acabamento

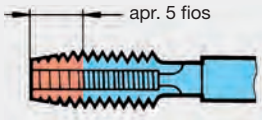


Forma C
para acabamento

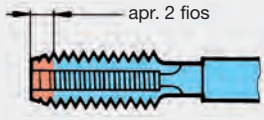


Comprimentos de entrada em jogos de 2 machos

Forma D
para desbaste



Forma C
para acabamento



Recomendações para utilização

Enquanto o tipo do furo do núcleo define primariamente a entrada, o restante da geometria do macho como forma, quantidade e sentido dos canais, ângulo de corte etc. depende também do material a ser usinado e do modo de utilização. Assim os machos para a fabrificação de roscas ISO ou para a usinagem de aço em geral até M16 tem em regra 3 canais, e acima 4 ou mais canais.

Machos com hélice à esquerda como também machos com entrada corrigida trasportam os cavacos no sentido do corte ou do avanço e por isto são principalmente apropriados para a usinagem de furos passantes. Também machos com canais retos e entrada mais longa (forma D) produzem bons resultados aqui.

Para furos cegos nós recomendamos machos com hélice à direita ou com canais retos e entrada curta. As ferramentas com hélice à direita transportam os cavacos para traz no sentido da haste. A entrada é projetada de maneira tal que os cavacos no retorno não engripem e que sejam seguramente cortados.

Para a usinagem de alumínio, fundição cinzenta e latão você precisa de machos com entrada curta, tanto para furos passantes como para furos cegos. Nestes materiais uma entrada longa funcionaria como uma broca calibradora com quebra cavacos que em vez de cortar a rosca alargaria o furo para o diâmetro nominal da rosca.

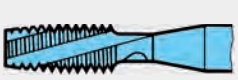
Machos com canais retos sem entrada corrigida são ferramentas universais com a desvantagem, de não obterem bons resultados em determinados materiais. Vale a pena fazer-se esforços para selecionar a ferramenta mais adequada para cada operação de usinagem.



Furo passante



Macho com canais retos e entrada corrigida



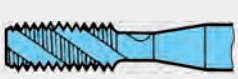
Macho com hélice à esquerda



Macho com canais retos com entrada longa



Furo cego



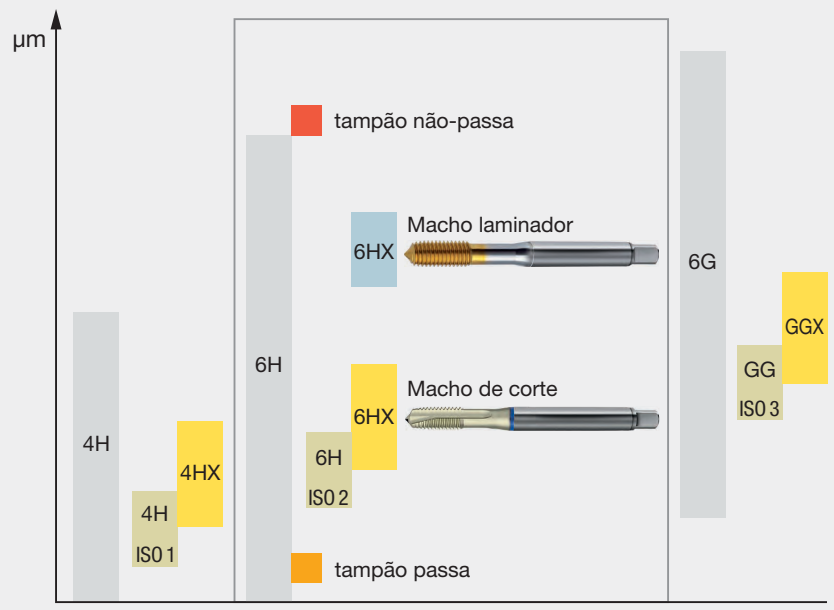
Macho com hélice à direita



Macho com canais retos e entrada curta

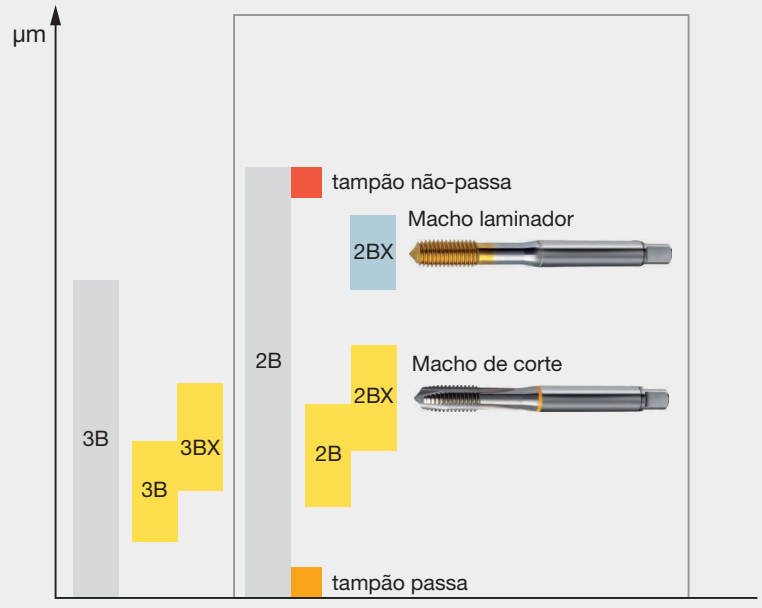
Campo de tolerância conforme DIN EN 22857

Rosca métrica



- Campo de tolerância de roscas internas conforme DIN EN 965-1
- Classe de Tolerância para machos de corte conforme DIN EN 22857
- Classe de tolerância para machos de corte conforme norma Gühring
- Classe de tolerância para machos laminadores conforme norma Gühring
- Classe de tolerância tampão não-passa conforme DIN ISO 1502
- Classe de tolerância tampão passa conforme DIN ISO 1502

Rosca unificada



- Campos de tolerância de roscas internas conforme ASME B1.1
- Classe de tolerância para machos de corte conforme norma Gühring
- Classe de tolerância para machos laminadores conforme norma Gühring
- Classe de tolerância tampão não-passa conforme ANSI/ASME B1.2
- Classe de tolerância tampão passa conforme ANSI/ASME B1.2

Machos para rosca métrica ISO DIN EN 22857 (extrato)

As tolerâncias de roscas
Combinações de roscas internas e externas são separadas por uma barra. p.ex. 6H/6g (porca/pino)
O ajuste deverá ser selecionado de acordo com a finalidade da união roscada.
Os campos de tolerância médio, fino e grosso deverão ser relacionados aos três comprimentos de enroscamento normal (N), curto (S) e longo (L). Em geral valem as seguintes regras para a seleção de classes de tolerância:

Classe de tolerância fina (S):
Para roscas de precisão , quando somente pequenas variações forem permitidas.

Classe de tolerância média (N):
Utilização geral

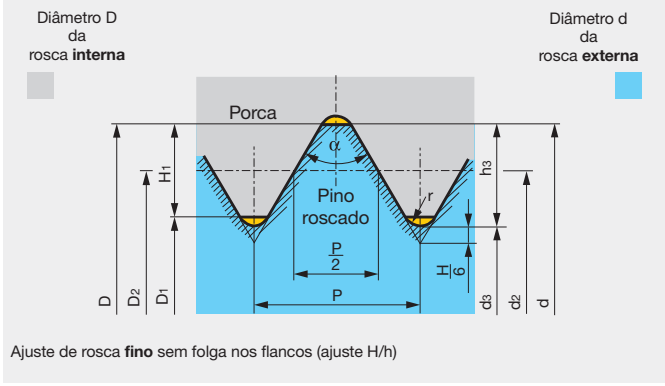
Classe de tolerância grossa (L):
Quando não houverem exigências especiais a qualidade e em casos onde puderem surgir dificuldades de usinagem, p. ex. roscas em barras laminadas a quente, roscas em furos profundos ou roscas em peças de plástico.

Os comprimentos de enroscamento
Os comprimentos dos enroscamentos também influem na qualidade da união roscada. O sistema de tolerâncias ISO adaptou especialmente para os diâmetros dos flancos três comprimentos de enroscamento.

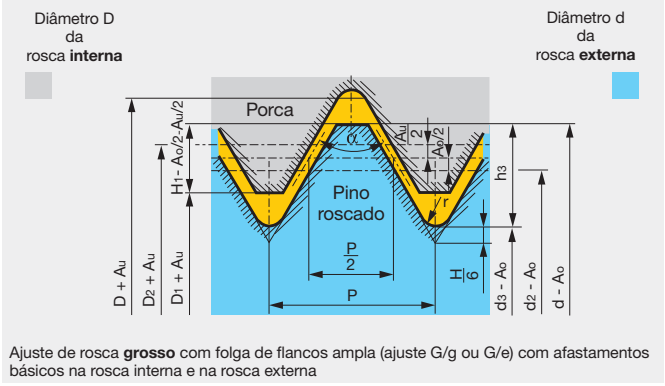
S	(Short)	= comprimento de enroscamento curto
N	(Normal)	= comprimento de enroscamento normal
L	(Long)	= comprimento de enroscamento longo

Para enroscamentos normais N deverão ser selecionadas as seguintes combinações:
No interesse de uma maior resistência a fadiga na união roscada nós recomendamos que sejam selecionadas combinações mais justas em comprimentos de enroscamento curtos. Para a compensação de diferenças de passo em enroscamentos longos deverão ser utilizadas combinações de tolerâncias com ajuste maior.

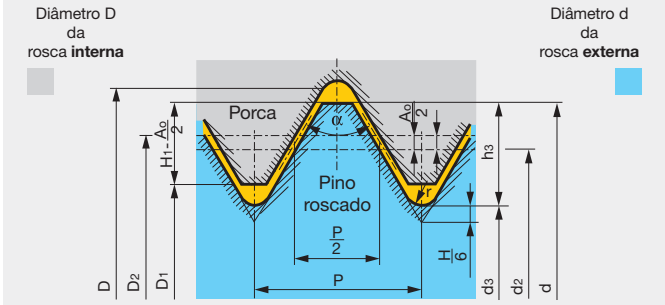
Os ajustes de rosca em folgas dos flancos diferentes



Ajuste de rosca **fino** sem folga nos flancos (ajuste H/h)



Ajuste de rosca **grosso** com folga de flancos ampla (ajuste G/g ou G/e) com afastamentos básicos na rosca interna e na rosca externa



Ajuste de rosca **médio** com folga de flancos justa (ajuste H/h ou H/e) com afastamento básico na rosca interna

Esclarecimentos sobre os símbolos

D	=	Diâmetro nominal da rosca interna
D_1	=	Diâmetro do núcleo da rosca interna
D_2	=	Diâmetro dos flancos da rosca interna
d	=	Diâmetro nominal da rosca externa
d_2	=	Diâmetro dos flancos da rosca externa
d_3	=	Diâmetro do núcleo da rosca externa
P	=	passo da rosca
α	=	ângulo da rosca
H	=	Altura da ponta do perfil da rosca estendido
A_o	=	afastamento superior
A_u	=	afastamento inferior

Macho de corte para usinagem de aços endurecidos (45 - 55 HRC)

Aplicações de machos de corte em materiais com resistência a tração acima de 1200N/mm2 desenvolvemos machos de corte em HSS-E-PM revestido com TICN.

Sua geometria especial permite confiabilidade no processo de produção de roscas em materiais de alta dureza com excelente durabilidade.

Indicado para aplicações em ferramentas e moldes, bem como para diversos componentes automotivos e de máquinas após tratamento térmico.

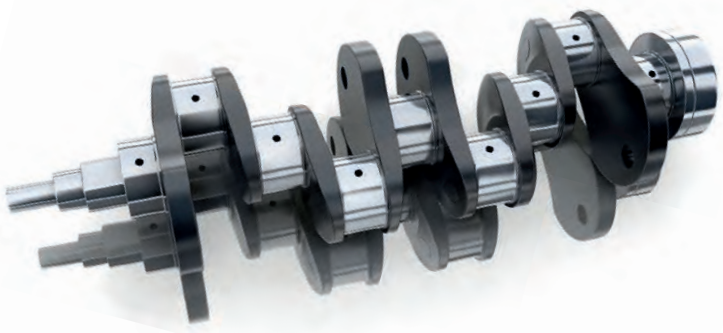
Recomenda-se velocidades de corte vc=2-8m/min, dependendo da resistência a tração do material usinado.



Confiabilidade na produção de roscas através da formação de cavaco curto

Na produção seriada em aços com alta resistência a ruptura (850 - 1250 N/mm2), como virabrequim, por exemplo, confiabilidade absoluta no processo e ótima vida útil são alcançados graças a formação de cavacos curtos. Isso é possível por causa da combinação de canais polidos / com correções. Gühring fornece a solução ideal em sua linha standard com os artigos 1188, 1194 e 1200.





Macho de corte universal com refrigeração interna para materiais de cavaco curto (GG, Al, Aço)

Machos de corte usualmente expulsam o cavaco através do canal helicoidal em furos cegos. Ferro fundido, ligas de AlSi, latão e ligas de cobre são materiais de cavacos curto. Temos macho de corte com canais retos para aplicação, que expulsa os cavacos para furo do furo com auxilio do fluido refrigerante.

Os machos de corte M com canais retos (Art.Nr. 302,297,1091,4165) e machos de corte MF (Art.Nr. 1007, 1090) com refrigeração interna são especialmente indicados para materiais de cavaco curto.

O transporte de cavacos longos em peças de aço através do canal helicoidal é um problema conhecido. O objetivo é gerar cavacos curtos através do perfil de canal reto e expulsá-lo do furo com o refrigerante.

A utilização do macho de corte com refrigeração interna alcança melhor durabilidade e um melhor acabamento superficial da rosca.

Aplicações típicas estão na usinagem de engrenagens, blocos e cabeçotes, virabrequim ou componentes hidráulicos.



Brilhante



Nossas ferramentas de aço rápido ou metal duro apresentam ótimo desempenho na aplicação em diferentes materiais.

Vaporizado



A vaporização causa uma reação química na superficie do aço de espessura micrométrica, onde é criada uma camada de óxido de ferro (3-10 mícrons). Esta camada aumenta as propriedades tribológicas da ferramenta. Devido a este tratamento de superfície o óleo refrigerante flui com mais facilidade para fora da ferramenta. Útil na usinagem de ferro carbono que em geral tem a tendência de criar arestas postiças de corte e solda do material na ferramenta a baixas velocidades de corte. Uma nitretação adicional da ferramenta causa um aumento na dureza da mesma, possibilitando também a aplicação em materiais abrasivos.

Revestimento TiN



Temperatura de operação: < 600° C
Cor: Dourada
Dureza: 2300 HV

desenvolvido pela Gühring nos anos 80, o revestimento TIN traz bons resultados especialmente em aplicações de rosqueamento.

Revestimento TiCN



Temperatura de operação: < 400° C
Cor: cinza-violeta
Dureza: 3000 HV

A adição de carbono do revestimento TiCN, faz com que tanto a tenacidade quanto a dureza sejam melhoradas além de um coeficiente de atrito reduzido em relação ao revestimento TiN. Devido sua alta resistência ao desgaste torna-se ideal para aplicação em materiais abrasivos.

Revestimento TiAlN



Temperatura de operação: < 800° C
Cor: violeta
Dureza: 3300 HV

O revestimento TiAlN traz maior dureza e melhores propriedades térmicas comparado aos revestimentos TiN e TiCN além de obter bons resultados em fundidos e na usinagem de aços em geral.

Revestimento SIRIUS



Temperatura de operação: < 900° C
Cor: dourado pálido
Dureza: 3400 HV

O Sirius é um revestimento com maior quantidade de camadas tendo como componente o TiAlN, com maior resistência ao desgaste e menor tendência de formação de arestas postiças. Indicado especialmente para furos com rosca passantes em aços inoxidáveis.

Revestimento Carbo



Temperatura de operação: < 500° C
Cor: cinza-preto
Dureza: 5000 HV

Com camadas amorfas de carbono (ta-C) abriu-se uma grande gama de aplicações em metais não ferrosos. O Carbo pode ser aplicado, tanto no corte como laminação, na usinagem de alumínio fundido (<12% Si) e alumínio forjado, cobre, latão e bronze.

Revestimento AlCrN



Temperatura de operação: < 1100° C
Cor: cinza-azul
Dureza: 3200 HV

Na laminação o AlCrN pode ser uma boa alternativa na usinagem de aços em relação ao TiN e TiCN. Este revestimento livre de Ti distingue-se pela sua excelente resistência ao desgaste e alta resistência a oxidação.

	Machos de corte			Fresas de rosca		Machos laminadores		
	Metal duro		HSS	Metal duro		Metal duro		HSS
	Convencional	MQL		Convencional	MQL	Convencional	MQL	
Aço carbono;	-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
Aço máquina,	-	-	TiAlN	-	-	TiN	TiN	TiN
Aço manganês	-	-	TiN	-	-	-	-	-
	-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
Aço, baixa liga	-	-	TiAlN	-	-	TiN	TiN	TiN
	-	-	TiN	-	-	-	-	AlCrN
	-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
Aço, ligado	-	-	TiAlN	-	-	TiN	TiN	TiN
	-	-	TiN	-	-	-	-	AlCrN
	-	-	TiCN	TiAlN	TiAlN	-	-	-
Aço, endurecido <55 HRC	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	TiCN	-	-	TiAlN	TiAlN	-	-	-
Aço, endurecido 55 - 65 HRC	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	Sirius[1]/TiAlN[2]	TiCN	TiCN	TiCN	TiCN	TiCN
Aços resistentes a corrosão e ácidos	-	-	TiN	-	-	TiN	-	TiN
	-	-	-	-	-	-	-	-
	TiAlN	TiAlN	TiAlN	TiCN	TiCN	TiCN	TiCN	TiCN
Ferro fundido	TiCN	-	TiCN	-	-	TiN	TiN	TiN
	-	-	TiN	-	-	-	-	-
	blank	blank	blank	blank	blank	Carbo	Carbo	Carbo
Alumínio forjado	Carbo	Carbo	Carbo	-	-	-	-	-
	-	-	-	-	-	-	-	-
	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
Alumínio fundido (<12% Silício)	-	-	-	blank	blank	Carbo	Carbo	Carbo
	-	-	-	-	-	-	-	-
	TiCN	TiCN	TiCN	TiCN	TiCN	-	-	-
Alumínio fundido (>12% Silício)	Cristall	-	-	Cristall	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
Ligas à base de Níquel (ex. Inconel)	-	-	TiAlN	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	TiCN	TiCN	TiCN	TiCN	TiCN	TiCN
Titânio e ligas de titânio	-	-	TiAlN	-	-	-	-	-
	blank	blank	blank	blank	-	Carbo	Carbo	Carbo
Cobre/Bronze/Latão	Carbo	Carbo	Carbo	-	-	-	-	-
	blank	-	blank	TiCN	TiCN	-	-	-
Ligas Cobalto-Cromo	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
Metais preciosos	-	-	-	-	-	-	-	-
Cerâmicos	-	-	-	-	-	-	-	-
Plásticos não reforçados	blank	-	blank	blank	blank	-	-	-
	TiCN	TiCN	-	TiCN	TiCN	-	-	-
Plásticos Fibro-reforçados	-	-	-	-	-	-	-	-

[1]... para furo passante [2]... para furo cego

Nota:

A tabela mostra as recomendações gerais de aplicação dos revestimentos-Gühring. Prioridade do revestimento adequado de cima para baixo.

Problemas e dificuldades com machos novos

Problemas	Causas	Ações corretivas
1. Superfície da rosca irregular 	Geometria não adequada para a usinagem em curso	Utilizar o macho „certo“ para o material a ser usinado
	Velocidade de corte muito alta	Reduzir a velocidade de corte Otimizar a refrigeração
	Meio de refrigeração ou subministração insuficiente	Providenciar meio de refrigeração adequado em quantidade suficiente
	Acúmulo de cavacos	Utilizar um tipo de macho adequado
	Furo de núcleo muito pequeno	Fabricar o furo de núcleo com o diâmetro correto, veja a tabela de furos de núcle
	Carga sobre a ferramenta muito alta ou passo muito grande em materiais muito tenazes e duros	Utilizar jogos de machos
	Arestas postiças	Utilizar machos com tratamento superficial
	Soldas a frio	Otimizar a refrigeração
2. Vida útil muito curta	Superfície do furo do núcleo endurecida	Verificar o desgaste (o fio de corte) da broca Executar tratamentos térmicos ou superficiais após o corte da rosca
	Veja todas as causas em: „Superfície da rosca irregular“	Veja todos os defeitos em: „Superfície da rosca irregular“
	Acúmulo de cavacos	Utilizar o macho adequado
3. Ruptura da ferramenta no avanço ou no retrocesso 	Furo de núcleo muito pequeno	Fabricar o furo de núcleo com o diâmetro correto, veja a tabela de furos de núcleo
	Cortes da entrada sobrecarregados	Entrada mais longa observar (furo cego ou passante) Aumentar a quantidade dos dentes da entrada através de mais canais Utilizar jogo de machos
	O macho encosta no fundo do furo de núcleo	Verificar a profundidade do furo Utilizar mandril porta-machos com compensação longitudinal ou com segurança de torque
	Falta de chanfro ou chanfro errado no furo de núcleo ou erro de posição ou de ângulo do furo de núcleo	Chanfrar o furo de núcleo no ângulo correto Observar se a peça está fixada corretamente. Utilizar mandril porta-machos com ação pendular paralela verificar o furo de núcleo
	A dureza da ferramenta não é adequada para a usinagem Geometria de corte da ferramenta inadequada para a usinagem	Utilizar macho adequado para a usinagem

Problemas e dificuldades com machos reafiados

Problemas	Causas	Ações corretivas
1. A rosca fica muito grande	Rebarbas da afiação	Retirar as rebarbas da afiação
	Geometrias de de corte (entrada, ângulos de saída e de folga como também ângulo de entrada corrigida) não mantidos.	Observar as informações técnicas ao reafiar as ferramentas. Observar as recomendações de reafiação
2. A rosca fica muito apertada	A parte desgastada não foi bem reafiada	Reafiar novamente ou utilizar uma ferramenta nova. Observar o limite máx. de vida da reafiação
	Macho muito pequeno por causa das reafiações muito freqüentes	Limite máx. de reafiações atingido. Utilizar novo macho
3. Superfície da rosca irregular	Rebarbas da afiação	Retirar as rebarbas da afiação
	Geometrias de de corte (entrada, ângulos de saída e de folga como também ângulo de entrada corrigida) não mantidos.	Observar as informações técnicas ao reafiar as ferramentas. Observar as recomendações de reafiação
	A rugosidade da superfície do macho reafiado está muito alta	Reafiar novamente ou utilizar uma ferramenta nova. Observar as recomendações de reafiação!
	Soldas frias nos flancos da rosca	Eliminar as soldas frias
4. Vida útil muito curta	Geometrias de de corte (entrada, ângulos de saída e de folga como também ângulo de entrada corrigida) não mantidos.	Observar as informações técnicas ao reafiar as ferramentas. Observar as recomendações de reafiação
	Perda da dureza do macho por influência do calor na reafiação	Verificar a qualidade do rebolo Verificar a subministração de refrigeração
	Dano no tratamento superficial	Revestir novamente Verificar se o revestimento está de acordo com o material a ser usinado

Produção de roscas por deformação com pressão

Os machos laminadores são utilizados para a formação de roscas internas sem remoção de cavacos. Ao contrário do corte de rosca convencional onde o material é cortado, na laminação de roscas trata-se de um processo sem remoção de cavacos onde o material é deformado a frio sob pressão formando uma rosca interna sem interromper seus filamentos.

Na norma DIN 8583 a laminação de roscas é descrita como o prensado de uma rosca em uma peça com uma ferramenta em forma de parafuso. Com uma parte da rosca em forma de polígono o macho laminador é „parafusado“ no pré-furo da peça com um avanço correspondente ao passo da rosca. Nisto o perfil da rosca é pressionado escalonadamente através da entrada do macho no material. Com isto a pressão na zona de deformação excede o limite de compressão e o material é deformado. O material sai radialmente ,flue através do perfil da rosca na base livre do dente formando assim o diâmetro de núcleo da rosca. Através do processo de fluxo do material formam-se nas pontas da rosca as bolsas (garras).

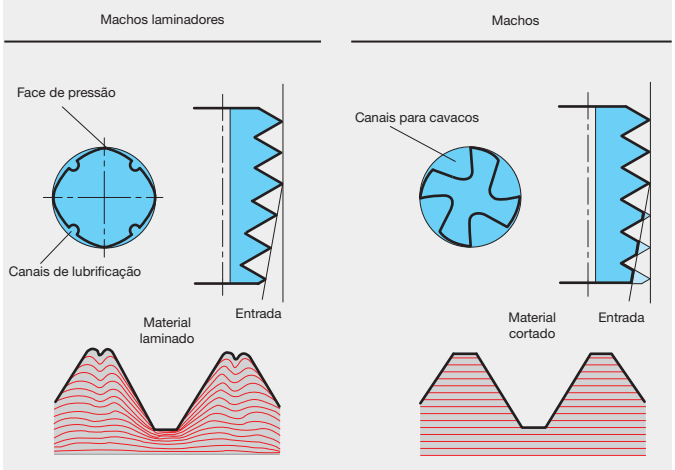
A dimensão do pré-furo depende muito da deformabilidade do material, da geometria da peça e da resistência desejada na rosca. Em comparação ao roscamento por corte deve-se eleger um furo de núcleo maior. Com um diâmetro de furo maior o esforço sobre a ferramenta é diminuído e paralelamente sua vida útil é aumentada. Graças ao fluxo do material e a deformação a frio a resistência da rosca em aços é suficiente mesmo com somente 50% de capacidade de carga. As cristas da roscas insuficientemente formadas são características típicas das roscas laminadas. Com um flanco totalmente definido não tem nenhuma influência sobre a resistência da rosca. Se necessário o nível de formação da rosca deverá ser definido através de um teste.

A lubrificação é muito importante na laminação de roscas. Ela evita que material se deposite no flancos e assegura que a torção não seja tão alta. Por esta razão a lubrificação nunca deve faltar! Lubrificantes contendo grafite ou óleos utilizados em outras operações de laminação são os mais indicados para a laminação de roscas. Siga sempre o lema: „bem lubrificado, bem laminado!“

As vantagens do roscamento por laminação

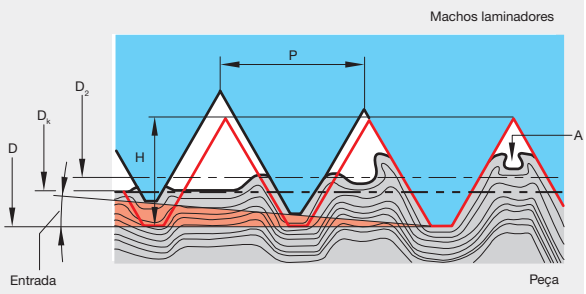
- Não resultam cavacos.
- Roscas em furos passantes e cegos podem ser usinadas com a mesma ferramenta.
- Pode ser usinada uma ampla gama de materiais.
- Não é possivel recortar-se uma rosca
- Não ocorrem erros no passo ou nos ângulos dos flancos como acontece com as roscas cortadas.
- Roscas laminadas têm uma resistência maior devido a deformação a frio e ao fluxo do material principalmente nos flancos da rosca.
- A qualidade superfícial da rosca é melhor.
- Machos laminadores podem ser utilizados com velocidades de corte maiores, pois a deformabilidade de muitos materiais aumenta com o aumento da velocidade. E isto não tem nenhum efeito negativo sobre a vida útil da ferramenta.
- Risco de quebra reduzido devido a uma construção de ferramenta mais sólida.

Modo de trabalho
A produção da rosca interna sem remoção de cavacos (laminação de roscas) em comparação ao roscado cortado



O comportamento do fluxo do material na deformação por pressão na laminação de roscas

D = Ø nominal
D2 = Ø dos flancos
Dk = Ø do furo
H = altura do perfil
P = passo da rosca
A = bolsa formada (garra)
– rosca interna pronta



Machos laminadores Guhring „Profile“ Características e vantagens

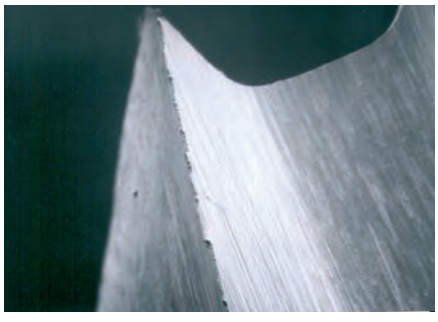
Os machos laminadores produzidos somente por retificação tem na superfície da ferramenta mais ou menos finas e microscópicas estrias de retificação. Isto também acontece na parte da rosca que deve fazer a laminação.

Esta topografia (estrutura) atua negativamente no atríto entre a ferramenta e o material a ser laminado como também o desenvolvimento de calor correspondente, sobre o momento de torção e sobre o desgaste das faces de pressão. Além disto as estrias de retificação favorecem a adesão do material a ser laminado aos flancos do macho laminador.

Com um processo especial para melhorar a topografia da superfície estas estrias de retificação não existem mais nos novos machos laminadores Profile. Isto é demonstrado por estudos e por testes de vida útil realizados sobre condições de produção em diversos materiais.

Com este processo especial o usuário ganha uma vida útil mais longa e velocidades de corte mais altas. Conforme o material a ser trabalhado e as condições de utilização as vidas úteis podem ser consideravelmente aumentadas. Vidas úteis duplicadas não são nenhuma raridade.

Não são somente as ferramentas brilhantes que se aproveitam da topografia de superfície melhorada. Ferramentas revestidas também se beneficiam com o novo processo. Contorno externo e entrada determinam em grande escala o rendimento de um macho de laminação. Assim tem-se demonstrado em numerosos testes, que nossos machos de laminação „Profile“ com uma ótima geometria poligonal e quantidade adequada alcançam longas vidas úteis e exatidão nas dimensões.
Nós alcançamos um outro progresso de qualidade, porque fabricamos a geometria total do macho laminador em uma só operação com um rebolo dressado com um rolo especial. Deste modo evitam-se erros de passo na transição da entrada como acontece com os processos de retificação usuais

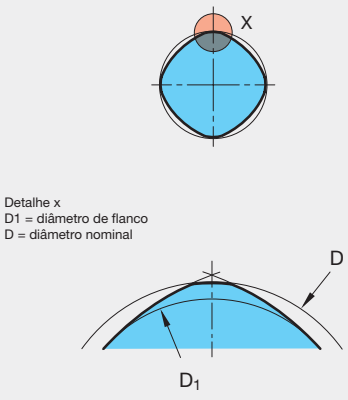


Dente de um macho laminador usual

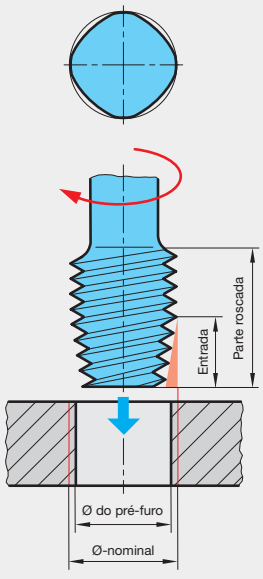


Superfície otimizada de um macho laminador Guhring-Profiles

A seção do macho de laminação



Princípio de ação



Os tipos de furos

Machos laminadores sem canais de lubrificação
Profundidade de rosca ≤ 1 x D



Profundidade da rosca ≥ 1 x D

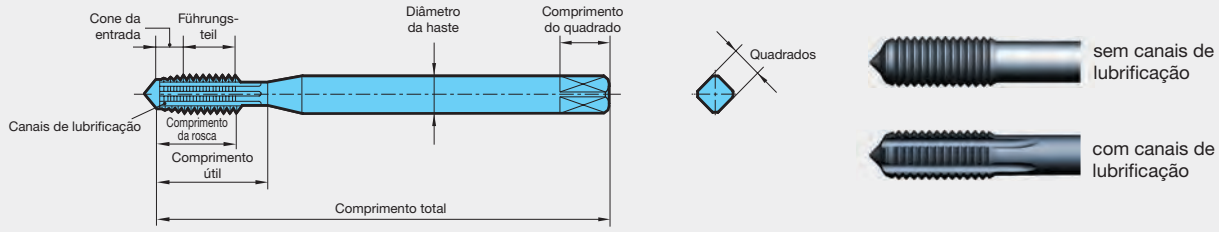


Machos laminadores com canais de lubrificação todas as profundidades de rosca

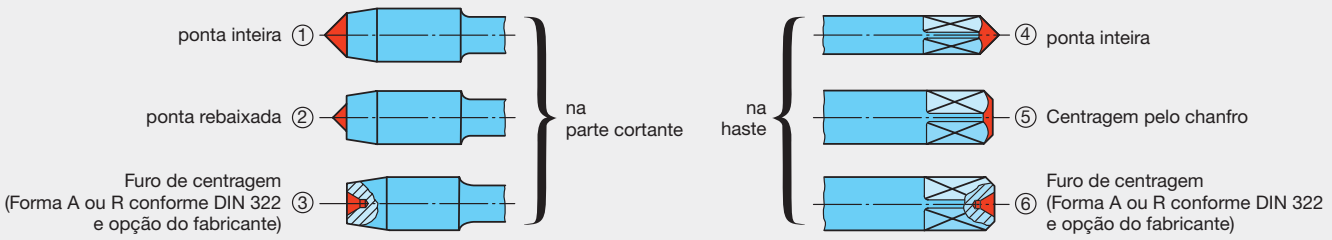


Conceitos e ângulos, centragens e ajustes de roscas

Parte roscada



Centragens (utilização standard), conforme DIN 2197/DIN2175)



Machos laminadores Gama de diâmetros mm	Tipo de centragem na parte de laminação		Tipo de centragem na haste
	com forma de entrada A, C, D, E	com forma de entrada B	
≤ 5,6	①	①	④⑤⑥
> 5,6 … 12,8	①②③	①②③	④⑤⑥
> 12,8	③	③	⑥

Tolerâncias de roscas

As combinações de roscas internas e externas são separadas por uma barra, p. ex. 6H/6g (porca/pino). O ajuste deverá ser selecionado de acordo com a finalidade da união roscada.
Os campos de tolerância média, fina e grossa são relacionados aos três tipos de enroscamento normal (N), curto (S) e longo (L). Em geral valem as seguintes regras para a seleção das classes de tolerância:

Classe de tolerância fina (S):
Para roscas de precisão , quando somente pequenas variações são permitidas

Classe de tolerância média (N):
Utilização geral

Classe de tolerância grossa (L):
Quando não houver exigências especiais de precisão e em casos onde podem surgir dificuldades na usinagem, p. ex. ao se roscar barras laminadas a quente, ou ao se cortar roscas em furos profundos.

Comprimentos de enroscamento
Também os comprimentos de enroscamento influenciam a qualidade da união roscada. O sistema de tolerâncias ISO foi especialmente adaptado para o diâmetro dos flancos- em três comprimentos de enroscamento:

S (Short) = comprimento curto de enroscamento
N (Normal) = comprimento normal de enroscamento
L (Long) = comprimento longo de enroscamento

Em comprimentos normais de enroscamento N deve-se selecionar as seguintes combinações:
No interesse de uma maior resistência a fadiga na união roscada nós recomendamos que sejam selecionadas combinações mais justos em comprimentos de enroscamentos curtos.

Diâmetro do pré-furo

Na laminação de roscas o diâmetro do pré-furo influência o desenvolvimento da rosca a ser formada. Um pré-furo muito pequeno leva a uma deformação da rosca e deve ser definitivamente evitado, pois pode levar a quebra do macho. Um pré-furo muito grande pode ser aceitado em determinadas tolerâncias já que roscas laminadas a partir 50% de sustentação oferecem suficiente resistência a fadiga

Utilizando o exemplo de uma rosca M18x1,5 mm, a influência do diâmetro escolhido para o orifício de broca de núcleo mostra claramente:

M 18 x 1,00	**17,55**	**17,52**	**17,62**	**16,917**	**17,217**
M 18 x 1,50	**17,30**	**17,26**	**17,38**	**16,376**	**16,751**
M 18 x 2,00	**17,10**	**17,05**	**17,20**	**15,835**	**16,310**

furo piloto Ø 17,1 mm



furo piloto Ø 17,3 mm



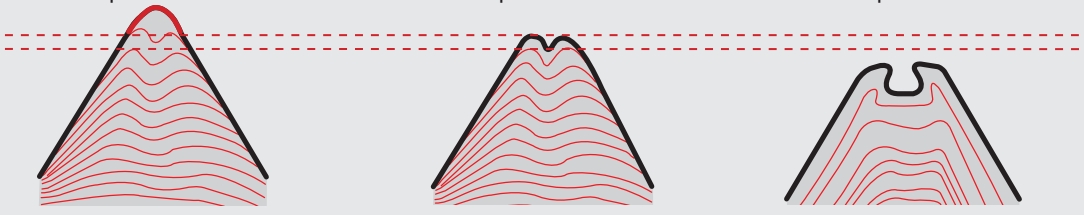
furo piloto Ø 17,4 mm



Ø do pré-furo muito pequeno:
- rosca sobreformada
- sem bolsa na crista da rosca (garra)
- altura do perfil muito alta

Ø do pré-furo ideal:
- rosca perfeitamente formada
- bolsa pequena (garra) na crista da rosca
- altura do perfil ideal

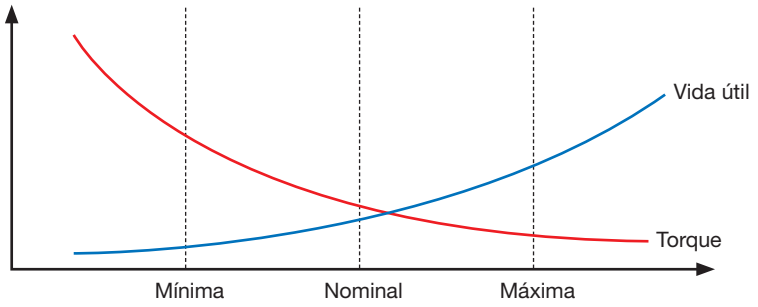
Ø diâmetro do pré-furo muito grande:
- rosca não perfeitamente formada
- bolsa muito grande (garra) na crista da rosca
- altura do perfil muito baixa



Campo de tolerância do diâmetro do furo conforme DIN 13, parte 50

Influência do diâmetro do pré-furo na vida útil, torque e confiabilidade do processo

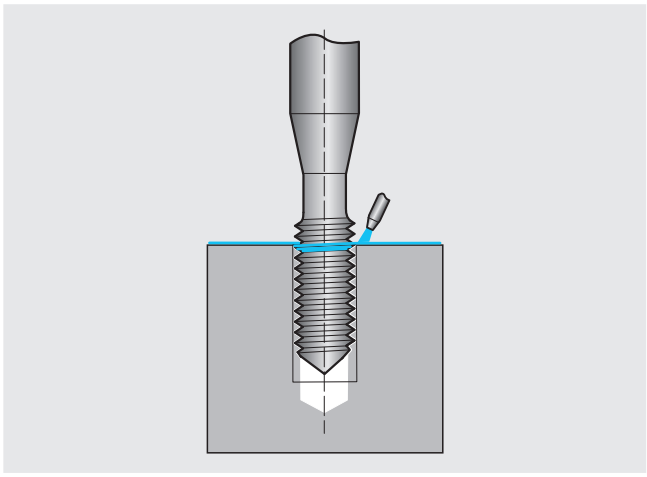
Especialmente em produções em massa é valido a otimização do diâmetro do furo piloto.
Quanto maior o furo piloto, maior se torna a vida útil e menor se torna o torque. Como mostrado no gráfico.



Lubrificação na laminação

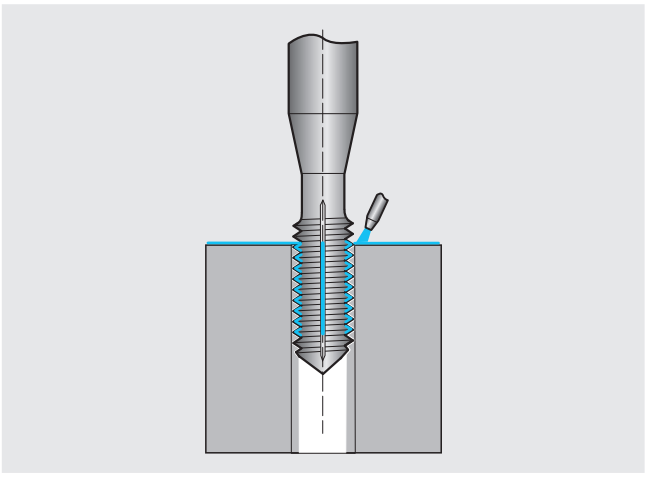
Para escolha da ferramenta 4 situações devem ser levadas em conta.

Usinagem vertical de furo cego



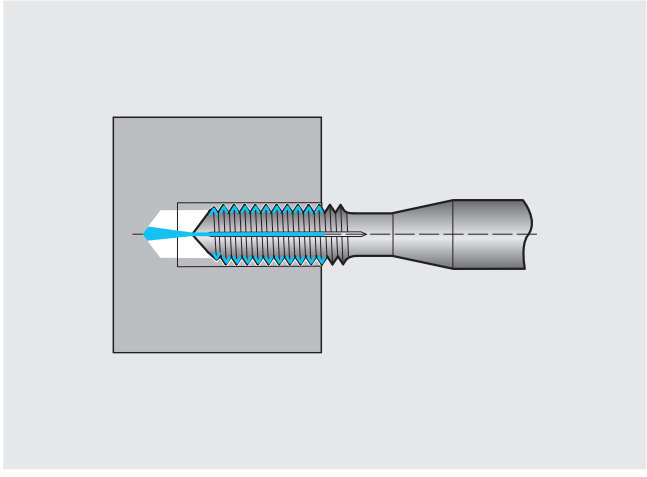
Canais de lubrificação e refrigeração interna não são necessários; Refrigeração externa é suficiente
(Refrigeração axial é recomendada para roscas profundas).

Usinagem vertical de furo passante (>1.5xDn)



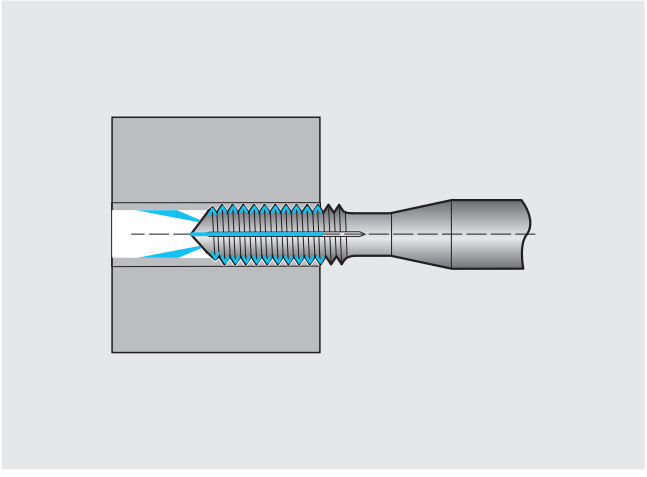
Necessários canais de lubrificação; refrigeração interna não é necessária. refrigeração externa penetra a partir dos canais de lubrificação.
(Refrigeração radial recomendada para roscas profundas).

Usinagem horizontal de furo cego



Canais de lubrificação e refrigeração interna são necessários; Refrigeração axial é suficiente.

Horizontale Durchgangslochbearbeitung



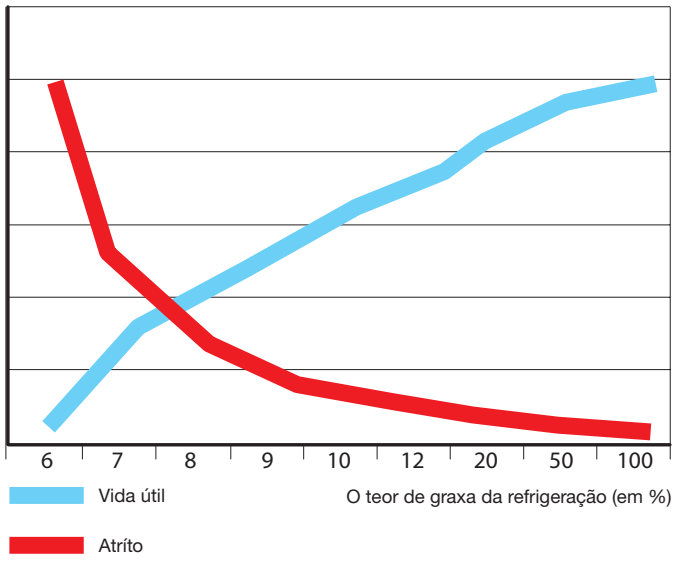
Necessários canais de lubrificação. Refrigeração radial recomendada.

Refrigeração na laminação de roscas

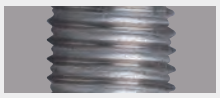
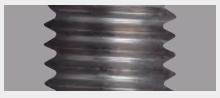
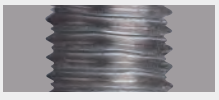
A principal função do refrigerante ao se laminar roscas é a lubrificação. Quanto mais refrigeração com a máxima proporção de graxa possível, melhor a vida útil.
Distinguem-se dois tipos de refrigerantes:

Refrigerante não miscível à água
Estes são óleos minerais com as melhores características de lubrificação. Eles reduzem o atríto e atingem a máxima vida útil.

Refrigerante miscível à água
Estes refrigerantes emulsionáveis são concentrados que antes de serem utilizados são diluídos em emulsão com água. Aqui a proporção de graxa não deve ser inferior a 6%. A proporção ideal é >12% para obter uma vida útil longa através de um bom efeito de lubrificação.



Problemas e dificuldades com machos laminadores novos

Problemas	Causas	Ações corretivas
1. Formação da rosca reduzida 	Diâmetro do pré-furo muito grande	Selecionar corretamente o diâmetro do pré-furo do núcleo conforme tabela
2. A rosca está sobreformada 	Diâmetro do pré-furo muito pequeno	Selecionar corretamente o diâmetro do pré-furo do núcleo conforme tabela
3. Superfície da rosca irregular 	Adesão de material na ferramenta	Aumentar o conteúdo da graxa no meio de refrigeração ou utilizar óleo
	Conteúdo de graxa do meio de refrigeração insuficiente	Aumentar o conteúdo da graxa no meio de refrigeração ou utilizar óleo
4. Vida útil muito curta	Conteúdo de graxa do meio de refrigeração insuficiente	Aumentar o conteúdo da graxa no meio de refrigeração ou utilizar óleo
	Diâmetro do pré-furo muito pequeno	Selecionar corretamente o diâmetro do pré-furo do núcleo conforme tabela
	Velocidade de corte muito alta	Acertar a velocidade de corte
	Meio refrigerante contaminado	Verificar a filtragem
5. Ruptura da ferramenta 	Conteúdo de graxa do meio de refrigeração insuficiente	Aumentar o conteúdo da graxa no meio de refrigeração ou utilizar óleo
	Diâmetro do pré-furo muito pequeno	Selecionar corretamente o diâmetro do pré-furo do núcleo conforme tabela
	Fixação da ferramenta defeituosa	Verificar a fixação da ferramenta

Quais as vantagens em utilizar fresas de rosca ou invés de machos de corte ou laminadores?

- Materiais diferentes podem ser usinados com uma ferramenta (Al, Aço, Fundidos, Inoxidáveis, Titânio, Inconel, máx. 65 HRC).
- Diferentes diametros e tolerancias podem ser obtidos com uma ferramenta (ex. 6H+0.1, 7G, EG, etc)
- Uma ferramenta para rosqueamento em furos passantes e cegos assim como roscas a direita ou esquerda.
- A profundidade da rosca pode alcançar a base do furo (0.5xP).
- sem mistura axial
- Economia na alocação de ferramentas (tipo TMC, tipo DTMC)
- Sem problemas de cavaco, devido a obtenção de cavacos curtos.
- Custo reduzido de ferramenta para um mesmo passo e diâmetros maiores (tipo TMU).
- Menor tempo de usinagem devido aos altos parâmetros de corte.
- Maior confiabilidade no processo mesmo no caso de quebra, uma vez que a ferramenta pode ser retirada da peça ou máquina.
- Maior rentabilidade devido aos serviços de afiação e revestimento da Gühring.



Tipos de fresa Gühring

TM SP - Fresa de rosca sem chanfro



- Variante barata e simples das fresas para roscas internas
- 2-3 tamanhos de rosca com mesmo passo são possíveis de ser obtidas a partir de uma dimensão nominal especificada
- Aplicação somente em materiais < 1000 N/mm2
- Com ou sem refrigeração interna

Tipos de rosca: M, MF, UNC, UNF, G, NPT, NPTF

TMC SP - Fresa de rosca com chanfro 45°



- Escareador e fresa de rosca em apenas uma ferramenta
- usinagem estável e com forças laterais reduzidas
- Desenvolvida para materiais de difícil usinagem, também oferecida sem chanfro
- 2-3 tamanhos de rosca com mesmo passo são possíveis de ser obtidas a partir de uma dimensão nominal especificada
- Oferecida apenas com refrigeração interna

Tipos de rosca: M, MF, UNC, UNF, G, NPT, NPTF

TMU SP - Fresa de rosca universal



- Para aplicação universal
- Para diferentes tamanhos de rosca com mesmo passo, ex. rosca M30x1.5, com fresa Ø12xM1.5, Ø16xM1.5 ou Ø20xM1.5
- Oferecida apenas com refrigeração interna

Tipos de rosca: M, MF, G, UN, NPT, NPTF e externa M, MF, G

DTMC SP - Fresa de rosca para furar com 2 cortes e chanfro 45°



- Broca, escareador e fresa de rosca em apenas uma ferramenta
- Redução do tempo de usinagem, custo de ferramenta e necessidade de espaço
- Aplicações apenas em alumínio, fundidos, latão e plásticos
- Oferecida apenas com ou sem refrigeração interna

Tipos de rosca: M, MF, UNC, UNF

MTM 3 SP - Micro-fresa de rosca (3 dentes)





- Tamanho de rosca e passo são fixos
- Desenvolvida para materiais de alta resistência como titânio, aço inoxidável, etc.
- indicado para usinagem de aços endurecidos 45 - 65 HRC
- Roscas até 3xD
- Oferecida com ou sem refrigeração interna

Tipos de rosca: M, MF, G, UNC, UNF, MJ, UNJC, UNJF

MTM 1 SP - Micro-fresa de rosca (1 dente)

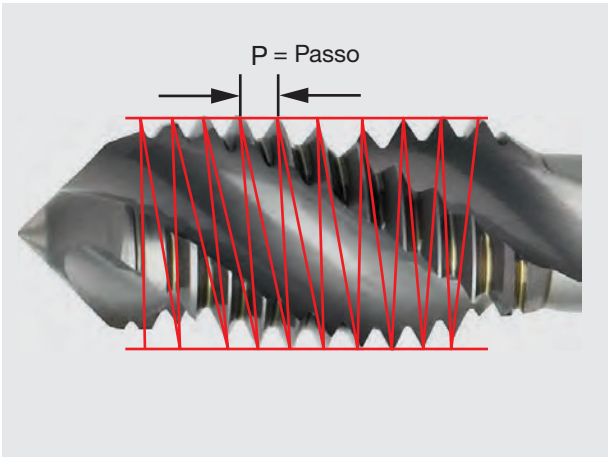




- Fabricação universal de roscas até um passo máximo
- Oferecida apenas sem refrigeração

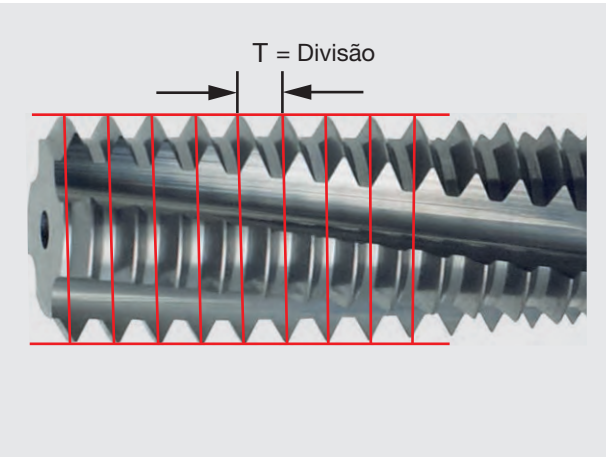
Tipos de rosca: M, MF

Macho de corte/laminador



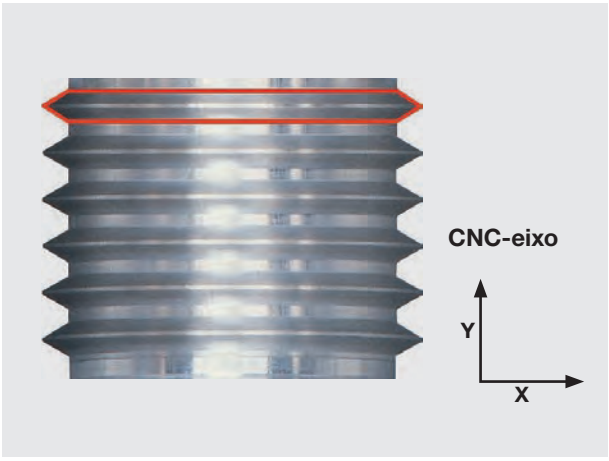
As linhas vermelhas mostram o angulo que existe no passo da rosca da ferramenta. Isso significa que o passo na rosca do material usinado é feito pela ferramenta.

Fresa de rosca

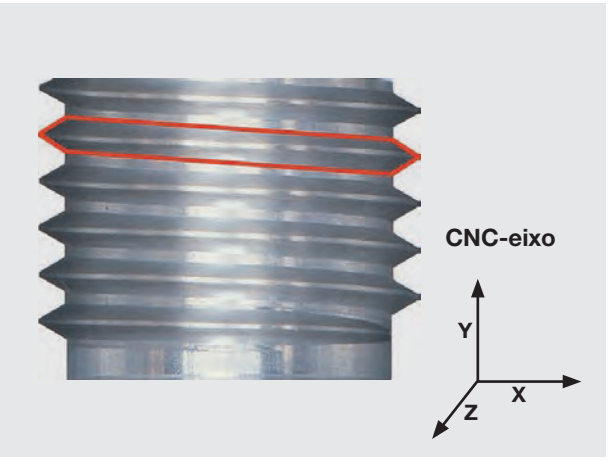


As linhas vermelhas mostram que não existe um passo em relação aos filetes da ferramenta. O passo é obtido através do movimento do eixo Z da máquina CNC.

Formação da rosca por fresamento



Perfil da rosca sem movimentação da máquina CNC (eixo-Z).
Obtêm-se um perfil de ronhuras sem passo.
Rosca sem nenhuma função de fixação.

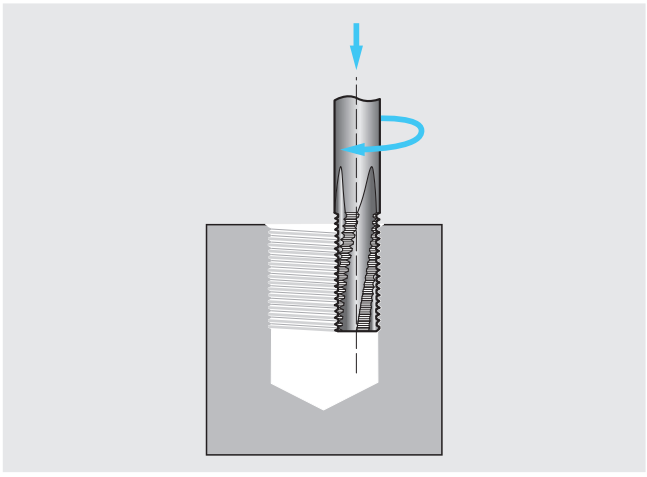


Através da programação adequada do eixo Z, obtêm-se o passo da rosca

Nota:
O perfil da rosca do peça usinada é uma cópia do perfil da rosca gerado a partir da movimentação do eixo-Z da máquina.
Quanto maior a diferença entre o diâmetro da fresa e o diâmetro nominal da rosca, maior é a distorção do perfil usinado.

Fresamento discordante

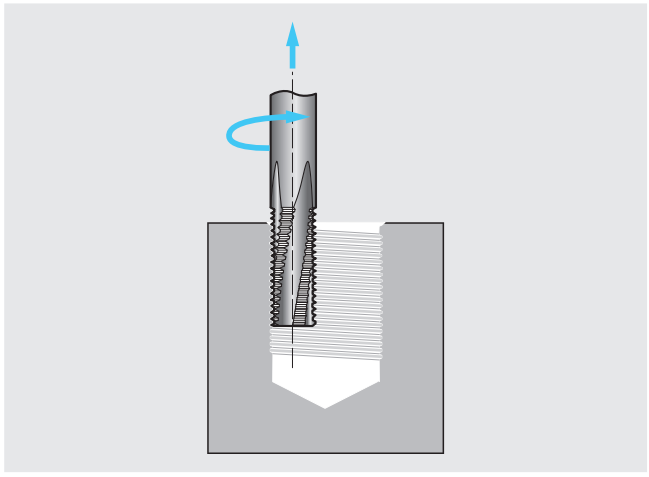
no sentido horário, com G02



O fresamento discordante é indicado para materiais de alta dureza ou para usinagem de roscas cônicas.

Fresamento concordante

no sentido anti-horário, com G03

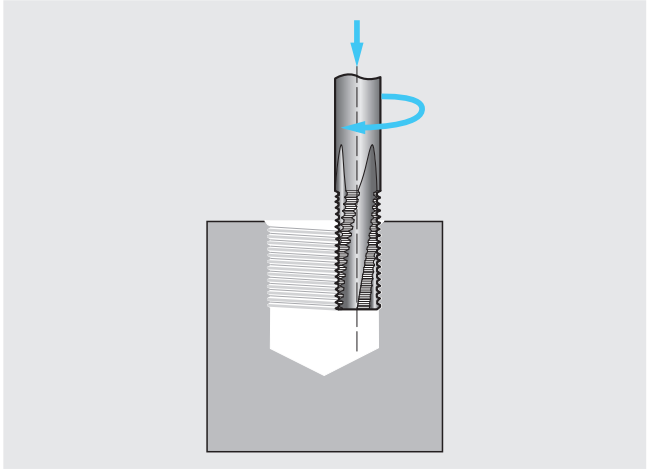


O fresamento concordante é indicado para profundidade de rosca de até 1.5xD.
Vantagem: Obtêm-se melhor acabamento superficial.

Fabricação da rosca com uma ferramenta

Rosca a direita

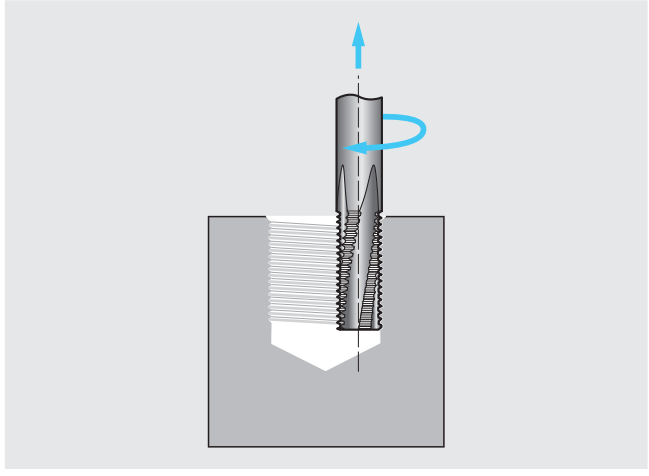
Fresamento discordante



De cima para baixo com rotação a direita

Rosca a esquerda

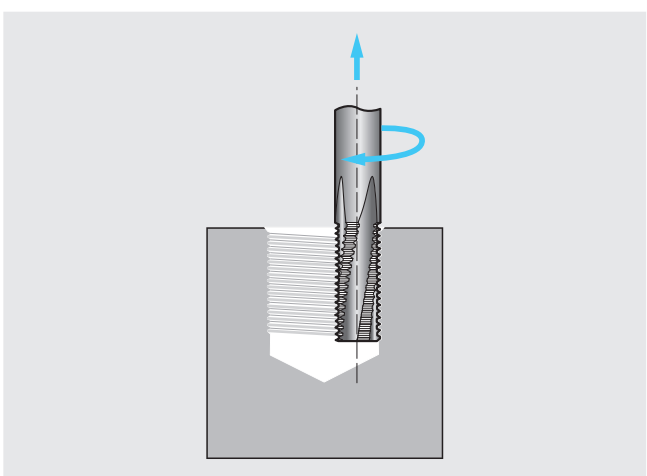
Fresamento discordante



De baixo para cima com rotação a direita

Rosca a direita

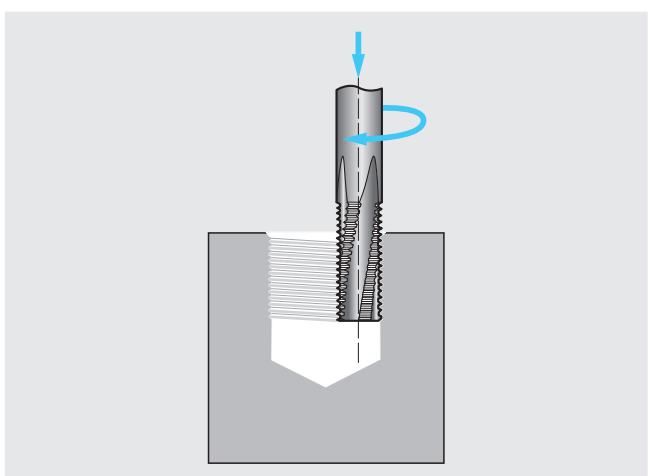
Fresamento concordante



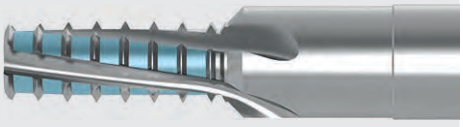
De baixo para cima com rotação a direita

Rosca a esquerda

Fresamento concordante



De cima para baixo com rotação a direita

Representação	Modificação	Efeito
	Canal de refrigeração na haste	Refrigeração direcionada sem enfraquecer a seção da ferramenta na área de corte
	Saída radial de fluido refrigerante	Refrigeração direcionada em roscas passantes
	remoção de filietes	Redução da força de corte com aumento do tempo de usinagem, devido a necessidade de dois ciclos de máquina
	Rebarbador	Remoção dos filetes incompletos e rebarbas sem operação adicional
	Chanfro de entrada	Usinagem do chanfro de entrada do núcleo do furo
	Pescoço	Possibilita distribuição axial de filetes, necessário em roscas profundas

Especificações do pragrama

Funções para fresas de rosca

G00	Interpolação linear com velocidade rápida	**G90**	Sistema de coordenadas absolutas
G01	Interpolação linear com velocidade programada	**G91**	Sistema de coordenadas relativas ou incrementais
G02	Interpolação circular no sentido horário	**M03**	Liga a rotação da árvore em sentido horário
G03	Interpolação circular no sentido anti-horário	**M05**	Desliga a rotação da árvore
G17	Plano de trabalho em X e Y. (ferramenta paralela a Z)	**M08**	Liga o fluido refrigerante
G18	Plano de trabalho em X e Z. (ferramenta paralela a Y)	**X**	Movimento em sentido do eixo X
G19	Plano de trabalho em Y e Z. (ferramenta paralela a X)	**Y**	Movimento em sentido do eixo Y
G40	Usinagem sem compensação do raio da ferramenta	**Z**	Movimento em sentido do eixo Z
G41	Usinagem com compensação do raio da ferramenta á esquerda do contorno.	**I**	Parâmetro de interpolação ou passo de rosca paralelo ao eixo X
G42	Usinagem com compensação do raio da ferramenta á direita do contorno.	**J**	Parâmetro de interpolação ou passo de rosca paralelo ao eixo Y
G43	Compensação do comprimento da ferramenta	**S**	Rotação da árvore principal
G49	Desliga compensação de comprimento de ferramenta	**F**	Avanço
G54	Definição do zero peça em relação ao zero máquina		

CNC Innengewindefräsen

1. Mover para posição inicial

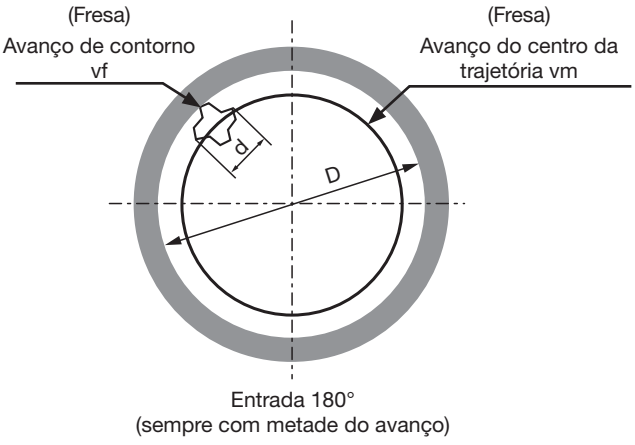
2. Mover para profundidade da rosca no furo

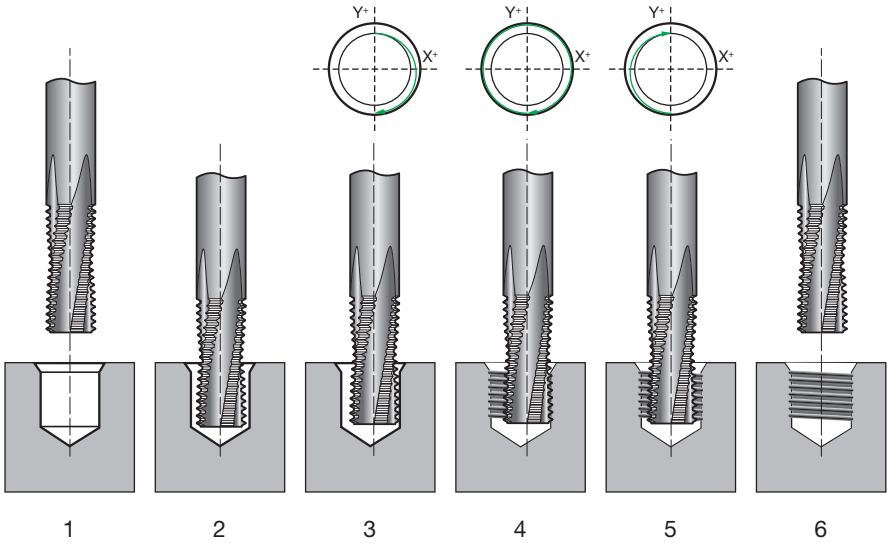
3. Mover 180° no contorno

4. 360° movimento circular completo da fresa de rosca

5. Mover 180° para o centro do furo

6. Movimento rápido do furo a posição inicial





Fórmulas de cálculo

$$v_c = \frac{d \cdot \pi \cdot n}{1000}$$

$$n = \frac{v_c \cdot 1000}{d \cdot \pi}$$

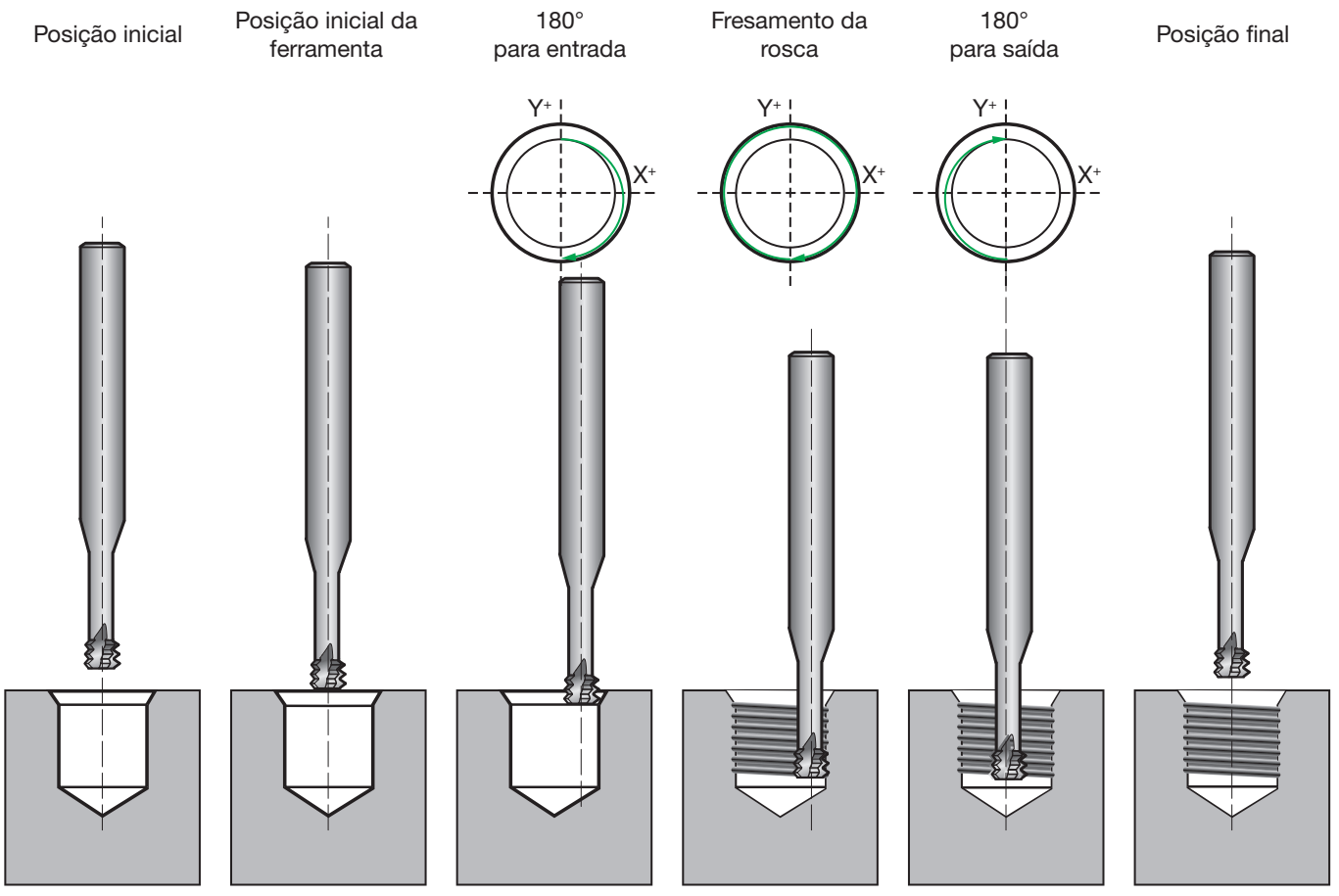
$$v_f = n \cdot z \cdot f_z$$

$$v_m = \frac{v_f \cdot (D - d)}{D}$$

$$v_b = n \cdot f_b$$

v_c = Velocidade de corte
v_f = Avanço de contorno
v_m = Avanço do centro da trajetória
n = Rotações
z = Quantidade de cortes
f_z = Avanço por dente
f_b = Avanço para furar por rotação*
v_b = Velocidade do avanço para furar*
D = Diâmetro nominal da rosca [mm]
d = Diâmetro externo da fresa [mm]
* para a furação e fresamento da rosca

Ciclo de máquina para micro-fresa (rosca a direita em usinagem discordante)



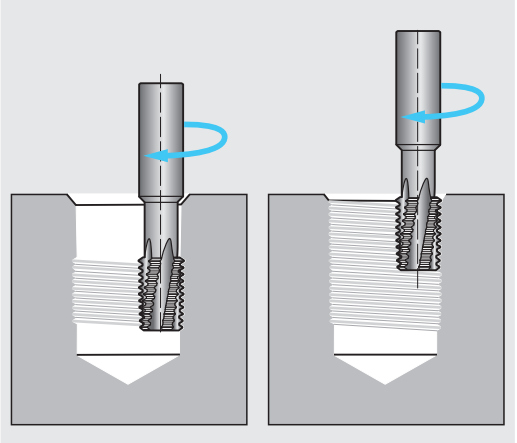
Possibilidades de redução das forças radiais

Para reduzir as forças radiais pode-se dividir a usinagem em etapas:

Vantagens:
- Para roscas muito profundas
- ajuda na obtenção de roscas cônicas
- Para usinagem instável

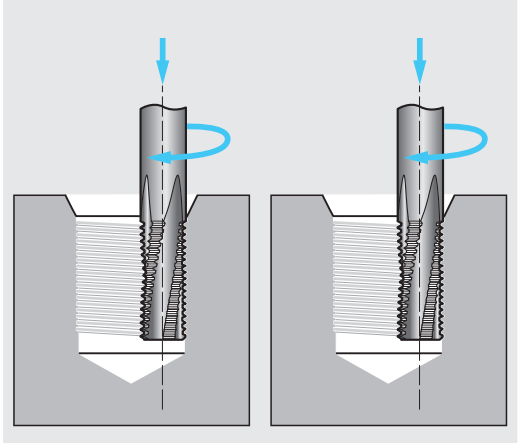
Desvantagens:
- Maior desgaste da ferramenta
- Maior tempo de ciclo

Divisão de etapas (axial)

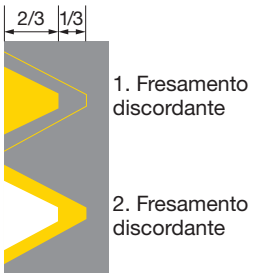


1. corte | 2. corte

Divisão de etapas (radial)



1. corte | 2. corte



Escolha do porta ferramentas correto

O sistema de fixação adequando é um ponto de extrema importância no fresamento de roscas. Para fresas de rosca deve-se usar uma fixação tão curta quanto possível. É preferível um sistema mecânico e compacto de fixação.
A concentricidade não deve ultrapassar 0,02 mm.

HPC (Mandril com força de fixação superior)



erro máx. de concentricidade admissível: 0,003 mm

Os mandris com força de fixação superior são distinguem-se por seu baixo erro de concentricidade. Sua força de fixação e ótima estabilidade o tornam a escolha perfeita para usinagem de roscas em todos os tipos de materiais em qualquer tamanho de passo.

Mandril com plano de fixação lateral (Weldon)



erro máx. de concentricidade admissível: 0,02 mm

O sistema de fixação para hastes HB/HE é robusto e uma opção econômica de mandril com grande força de fixação. Seu plano de fixação impede que a ferramenta rotacione ou seja puxada para fora do mandril. Por isso este mandril é indicado para usinagem de roscas em todos os materiais em qualquer tamanho de passo.

Mandril Térmico



erro máx. de concentricidade admissível: 0,005 mm

Os mandris térmicos criam uma interface rígida de fixação entre a ferramenta e o porta-ferrametas. Fixação incorreta e utilização de mandris antigos podem resultar no desacoplamento da ferramenta. Como consequência existe a possibilidade de quebra da ferramenta ou componente usinado. Por este motivo este sistema é indicado apenas para roscas com passo < P=1.5 mm.

Mandril Hidráulico



erro máx. de concentricidade admissível: 0,005 mm

Os mandris hidráulicos, similares aos mandris térmicos, tem aplicações limitadas em fresamento de roscas. Especialmente em aplicações com altas forças radiais, o sistema atinge seu limite. Por isso o mandril hidráulico é recomendado apenas na aplicação em materiais moles, como o alumínio, e passo <P=1.5 mm.

Mandril Porta-pinça



erro máx. de concentricidade admissível: 0,01 mm

O sistema porta-pinça é adequado na operação de micro-fresamento de roscas pois só existem forças axiais. Sua baixa força de fixação só permite a aplicação em materiais moles. Consequentemente este sistema não é adequando para fresamento de roscas em geral.

Aplicação prática de fresas de rosca

1.) Fixação da ferramenta:

Boa concentricidade é um fator importante, por isso deve-se fixar a ferramenta com menor comprimento de pre-set e maior rigidez possíveis.

2.) Dados da ferramenta devem ser salvos na máquina

1.) Comprimento da ferramenta a partir da face superior ou ponta (DTMC)

2.) Medir raio da ferramenta em equipamentos de pre-set. Em geral: raio medido - 0.022 x Passo resulta no valor a ser colocado no programa da máquina

3.) Input do programa CNC na máquina

(Integrado preferencialmente como subprogramas nas posições correspondentes)

a) chamada de ciclo auto controlado

b) Integração do arquivo proveniente do Threadmill Software (DIN ou Haidenhain)

4.) Teste do ciclo de usinagem

a) Aumentar o comprimento da ferramenta de acordo com o comprimento de contato (ex. 30 mm) ou deslocar o ponto de referência da máquina.

b) Rodar o programa e efetuar controle visual.

c) Permitir que o programa rode em modo automático.

Atenção:

Caso no comando CNC não for especificado se o calculo é feito a partir do avanço de contorno vf ou do avanço do centro da trajetória vm, verificar com responsavél. Como regra especificamos como vm.

5.) Aplicação no material usinado

Retornar comprimento da ferramenta o ponto de referencia ao valor correto. Depois rodar o programa no material a ser usinado a 100% de avanço. Caso a dimensão da rosca não calibre, o raio da ferramenta deve ser corrigido na máquina:

Exemplo:

- Rosca apertada: correção do raio - input
- Rosca larga: correção do raio + input



TM SP - Fresa de rosca sem chanfro





Exemplo de aplicação tipo TM			
Artigo Nr.:	3737 TiCN	**Velocidade de corte [vc]:**	80 m/min
Rosca:	M10x(1)	**Avanço p/ faca:**	0,05 mm
Profundidade da rosca:	20 mm / cego	**Tipo de usinagem:**	Discordante
Material:	St- 37	**Tempo de usinagem:**	6,9 sec.

Programa CNC	
N10 M6 T1	
N20 G90 G54 G00 X0 Y0	
N30 Z2 S3203 M3 M8	Posição inicial
N40 Z-18.70	Posição inicial do fresamento
N50 G91	Comutação incremental
N60 G42 G01 X0 Y3.975 F50	Compensação do raio da ferramenta
N70 G02 X0 Y-9.005 I0 J-4.503 Z-0.150	Ciclo de entrada a 180°
N80 G02 X0 Y0 I0 J5.030 Z-1.000 F101	Ciclo de fresamento a 360°
N90 G02 X0 Y9.005 I0 J4.503 Z-0.150	Ciclo de saída a 180°
N100 G40 G01 X0 Y-3.975	Desconectar compensação do raio da ferramenta
N110 G90	Comutação absoluta
N120 G00 Z2 M9	Deslocar à posição inicial
N130 M30	

TMC SP - Fresa de rosca com chanfro 45°





Exemplo de aplicação tipo TMC			
Artigo Nr.:	3528 TiCN	**Velocidade de corte [vc]:**	100 m/min
Rosca:	M12x(1,5)	**Avanço p/ faca:**	0,075 mm
Profundidade da rosca:	18 mm / cego	**Tipo de usinagem:**	Discordante
Material:	42CrMo4	**Tempo de usinagem:**	4,15 sec.

Programa CNC	
N10 M6 T1	
N20 G90 G54 G00 X0 Y0	
N30 Z2 S1600 M3 M8	Posição inicial
N40 Z-26.20	Posição inicial do fresamento (escareado 45°)
N50 G01 Z-27.57 F85	escarear (45°)
N60 G00 Z-16.05 S3199	Posição inicial do fresamento
N70 G91	Comutação incremental
N80 G42 G01 X0 Y4.975 F85	Compensação do raio da ferramenta
N90 G02 X0 Y-11.015 I0 J-5.508 Z-0.225	Ciclo de entrada a 180°
N100 G02 X0 Y0 I0 J6.040 Z-1.5 F169	Ciclo de fresamento a 360°
N110 G02 X0 Y11.015 I0 J5.508 Z-0.225	Ciclo de saída a 180°
N120 G40 G01 X0 Y-4.975	Desconectar compensação do raio da ferramenta
N130 G90	Comutação absoluta
N140 G00 Z2 M9	Deslocar à posição inicial
N150 M30	

TMU SP - Fresa universal para rosca





Exemplo de aplicação tipo TMU

Artigo Nr.:	3541 Ø 12xM1 TiCN	**Velocidade de corte [vc]:**	60 m/min
Rosca:	M28x1	**Avanço p/ faca:**	0,05 mm
Profundidade da rosca:	12 mm / cego	**Tipo de usinagem:**	Discordante
Material:	VA [1.4301]	**Tempo de usinagem:**	28,96 sec.

Programa CNC

N10 M6 T1	
N20 G90 G54 G00 X0 Y0	
N30 Z2 S1598 M3 M8	Posição inicial
N40 Z-10.70	Posição inicial do fresamento
N50 G91	Comutação incremental
N60 G42 G01 X0 Y5.975 F92	Compensação do raio da ferramenta
N70 G02 X0 Y-20.015 I0 J-10.008 Z-0.150	Ciclo de entrada a 180°
N80 G02 X0 Y0 I0 J14.040 Z-1.000 F184	Ciclo de fresamento a 360°
N90 G02 X0 Y20.015 I0 J10.008 Z-0.150	Ciclo de saída a 180°
N100 G40 G01 X0 Y-5.975	Desconectar compensação do raio da ferramenta
N110 G90	Comutação absoluta
N120 G00 Z2 M9	Deslocar à posição inicial
N130 M30	

DTMC SP - Fresa para furar e roscar





Exemplo de aplicação tipo DTMC

Artigo Nr.:	3779 blank	**Velocidade de corte [vc]:**	230 m/min
Rosca:	M8x(1,25)	**Avança na furação**	0,1 mm / U
Profundidade da rosca:	15 mm / cego	**Tipo de usinagem:**	0,05 mm
Material:	AlSi 10%	**Tempo de usinagem:**	Discordante
		Bearbeitungszeit:	3,44 sec.

Programa CNC

N10 M6 T1	
N20 G90 G54 G00 X0 Y0	
N30 Z2 S11529 M3 M8	Anstellen über Werkstück
N40 G01 Z-1 F577	Centrar (centro otimizado)
N50 G01 Z-19.86 F1153	Furar núcleo e chanfrar 45°
N60 G00 Z2 S11529	Recuar a ferramenta para extrair cavaco
N70 Z-13.38	Posição inicial do fresamento
N80 G91	Comutação incremental
N90 G42 G01 X0 Y3.175 F122	Compensação do raio da ferramenta
N100 G02 X0 Y-7.205 I0 J-3.603 Z-0.188	Ciclo de entrada a 180°
N110 G02 X0 Y0 I0 J4.030 Z-1.250 F245	Ciclo de fresamento a 360°
N120 G02 X0 Y7.205 I0 J3.603 Z-0.188	Ciclo de saída a 180°
N130 G40 G01 X0 Y-3.175	Desconectar compensação do raio da ferramenta
N140 G90	Comutação absoluta
N150 G00 Z2 M9	Deslocar à posição inicial
N160 M30	

TMU SP - Fresa universal para rosca (rosca externa)



Fornecemos programação-CNC sem custos adicionais, se requisitado.



Exemplo de aplicação M14x1,5 - 6g (rosca externa)		
Tipo de ferramenta:	TMU D12x20xM1,5-A TiCN Z=4 (ferramenta Ø 11,95 mm)	
	(Alternativamente TMU D16x25xM1,5-A TICN Z=5)	
Material:	38MnSiV5	
Parametros:	v_c = 130 m/min, f_z = 0,06 (Discordante) v_f = 831 mm/min, v_m = 1548 mm/min	
N10 M6 T1		
N20 G90 G54 G00 X0 Y0		
N30 Z2 S3463 M3 M8		Posição inicial sobre o eixo
N40 G91		Comutação incremental
N50 X7.033 Y11.99		Posição inicial para fresamento
N60 G01 Z-14.5		Deslocar à profundidade inicial
N70 G42 G01 X0 Y-5.975		Compensação do raio da ferramenta
N80 G01 X-7.033 Y0.000 F774		Deslocamento linear (aproximação)
N90 G03 X0.000 Y0.000 Z1.5 I0 J-6.015 F1548		Ciclo de fresamento a 360°
N100 G01 X-7.033 Y0.000		Deslocamento linear (saída)
N110 G40 G01 X0.000 Y5.975		Desconectar compensação do raio da ferramenta
N120 G90		Comutação absoluta
N130 G80 G00 Z2 M9		Posição final sobre o eixo
N140 M30		

TM SP - rosca NPT (cônica, 1:16)



Fornecemos programação-CNC sem custos adicionais, se requisitado.



Exemplo de aplicação NPT 1/4-18 (cônica, 1:16)	
Tipo de ferramenta:	TM D 9,95x19,05xNPT18 IK (4 corte)
Diâmetro da ferramenta:	d1 = 9,95 mm (medido no primeiro dente)
Comprimento da ferramenta:	A julgar pelo rosto
Diametro do núcleo:	Ø 11,10 mm cilíndrico (cônica de preferência pré-usinado D1 = 11,36 mm / d1 = 11,10 mm)
Material:	16 Mn Cr 5
Parametros:	v_c = 70 m/min, f_z = 0,05 (Discordante) v_f = 447 mm/min, v_m = 102 mm/min
N10 M6 T1	
N20 G90 G54 G00 X0.000 Y0.000	
N30 Z2.000 S2239 M3 D1	Posição inicial
N40 G00 Z-10.016	Posicionar no furo
N50 G91	Comutação incremental
N60 G42 G01 X0.000 Y4.975 F1000	Compensação do raio da ferramenta
N70 G02 X0.000 Y-11.432 I0.000 J-5.716 Z-0.212 F51	Ciclo de entrada a 180°
N80 G02 X-6.457 Y6.457 I0.000 J6.457 Z-0.353 F102	1/4 passo, sem correção
N90 G02 X6.445 Y6.445 I6.445 J0.000 Z-0.353	1/4 passo, com correção
N100 G02 X6.434 Y-6.434 I0.000 J-6.434 Z-0.353	1/4 passo, com correção
N110 G02 X-6.423 Y-6.423 I-6.423 J0.000 Z-0.353	1/4 passo, com correção
N120 G02 X0.000 Y11.387 I0.000 J5.694 Z-0.212	Ciclo de saída a 180°
N130 G40 G01 X0.000 Y-4.975 F1000	Desconectar compensação do raio da ferramenta
N140 G90	Comutação absoluta
N150 G53 G00 Z2.000	Deslocar à posição inicial
N160 M30	

MTM 3 SP - Micro-fresa de rosca





Fornecemos programação-CNC sem custos adicionais, se requisitado.

Micro-fresa de rosca

Micro-fresas especialmente desenvolvidas para roscas pequenas:

- excelentes características para materiais de alta resistência (ex. ligas de titânio, aço inoxidável, etc.)
- roscas em furos cegos ou passantes até 3xD
- baixa pressão de corte
- boa qualidade de rosca
- tempos de ciclo curtos
- aplicável também em materiais moles (ex. Alumínio ou plástico)



Exemplo de aplicação M3x(0.5) MTM 3 SP	
Material:	TiAl6V4
Rosca:	M3, Tiefe 7,0 mm / cego
Ferramenta:	MTM 3 SP M3x(0,5) ferramenta Ø 2,4 mm Z=3
Parametros:	v_c = 40 m/min, f_z = 0,025 (Discordante) v_f = 398 mm/min, v_m = 84 mm/min
N10 M6 T1	
N20 G90 G54 G00 X0 Y0	
N30 Z2 S5305 M3 M8	
N40 Z0.1	
N50 G91	
N60 G42 G01 X0 Y1.200 F42	
N70 G02 X0 Y-2.720 I0 J-1.360 Z-0.075	
N80 G02 X0 Y0 I0 J1.520 Z-0.500 F84	
Número de repetições a partir de N80=15	
N90 G02 X0 Y2.720 I0 J1.360 Z-0.075	
N100 G40 G01 X0 Y-1.200	
N110 G90	
N120 G00 Z2 M9	
N130 M30	

Parâmetros de corte para fresas de rosca

ISO	Grupo de material	Velocidade de corte v_c (m/min)	Avanço mm/faca fz para Ø (fresamento discordante) diâmetro da fresa Ø2 mm	Ø3 mm	Ø4 mm	Ø5 mm	Ø6 mm	Ø7 mm	Ø8 mm	Ø9 mm	Ø10 mm	Ø12 mm	Ø14 mm	Ø16 mm	Ø18 mm	Ø20 mm	Tipo TM	TMC	TMU
P	Aços estruturais Aços máquina Aços para cementação não ligados Aços para beneficiamento não ligados	110	0,02	0,02	0,025	0,03	0,035	0,045	0,05	0,055	0,06	0,06	0,065	0,065	0,07	0,08	++	++	++
P	Aços para cementação ligados Aços para beneficiamento ligados Aços ferramenta ligados	90	0,015	0,015	0,02	0,025	0,03	0,035	0,04	0,045	0,05	0,05	0,05	0,055	0,06	0,07	+	++	++
M	Aços resistentes a corrosão e ácidos, sulfurados austeníticos martensíticos	60	0,01	0,01	0,015	0,02	0,025	0,03	0,03	0,035	0,04	0,045	0,05	0,05	0,055	0,06	+	++	++
K	Ferro fundido cinzento, Ferro fundido, Ferro fundido nodular	120	0,02	0,02	0,025	0,03	0,035	0,045	0,05	0,055	0,06	0,06	0,065	0,07	0,08	0,1	++	++	++
N	Metais não ferrosos: Alumínio e outros materiais não ferrosos, ligas de cobre	250	0,03	0,035	0,04	0,045	0,05	0,055	0,06	0,065	0,07	0,08	0,085	0,09	0,1	0,12	++	++	++
N	Plásticos	350	0,03	0,04	0,045	0,05	0,055	0,055	0,06	0,07	0,075	0,085	0,09	0,1	0,12	0,15	++	++	++
S	Ligas especiais e Titânio	35	0,01	0,01	0,015	0,02	0,025	0,03	0,03	0,035	0,04	0,045	0,05	0,05	0,055	0,06	+	++	++
H	Aços endurecidos [<55 HRC]	25	-	0,005	0,005	0,01	0,012	0,014	0,018	0,02	0,02	0,022	0,025	0,03	0,035	0,04	+	++	+

Nota: **Materiais endurecidos até 55 HRC devem ser usinados em 3 passes!**

Parâmetros de corte para fresas de furar e roscar 2xD, 2.5xD

ISO	Grupo de material	Velocidade de corte v_c (m/min)	Avanço mm/faca fz para Ø (fresamento discordante) diâmetro da fresa M3 fb mm/U	M3 fz mm	M4 fb mm/U	M4 fz mm	M5 fb mm/U	M5 fz mm	M6 fb mm/U	M6 fz mm	M8 fb mm/U	M8 fz mm	M10 fb mm/U	M10 fz mm	M12 fb mm/U	M12 fz mm	Tipo DTMC
K	Ferro fundido cinzento, Ferro fundido, Ferro fundido nodular	100	0,05	0,01	0,06	0,02	0,07	0,025	0,08	0,035	0,1	0,04	0,12	0,055	0,14	0,065	+
N	Metais não ferrosos: Alumínio e outros materiais não ferrosos, ligas de cobre.	230	0,06	0,015	0,07	0,025	0,08	0,03	0,1	0,04	0,12	0,05	0,15	0,07	0,18	0,08	++
N	Plásticos	300	0,07	0,02	0,08	0,03	0,09	0,04	0,12	0,05	0,13	0,06	0,18	0,09	0,2	0,12	++

Parâmetros de corte para micro-fresas de rosca

ISO	Grupo de material	Velocidade de corte v_c (m/min)	Avanço mm/faca fz para Ø (fresamento discordante) diâmetro da fresa Ø1 mm	Ø1.5 mm	Ø2 mm	Ø3 mm	Ø4 mm	Ø5 mm	Ø6 mm	Ø7 mm	Ø8 mm	Ø9 mm	Ø10 mm	Ø12 mm	Ø14 mm	Tipo MTM 3	MTM 1	MTMH 3
P	Aços estruturais Aços máquina Aços para cementação não ligados Aços para beneficiamento não ligados	70 - 120	0,04	0,04	0,05	0,05	0,06	0,06	0,07	0,07	0,08	0,09	0,09	0,1	0,12	++	++	–
P	Aços para cementação ligados Aços para beneficiamento ligados Aços ferramenta ligados	60-90	0,03	0,03	0,04	0,04	0,05	0,05	0,06	0,06	0,07	0,07	0,08	0,09	0,1	++	++	–
M	Aços resistentes a corrosão e ácidos, sulfurados austeníticos	40-80	0,02	0,02	0,02	0,03	0,03	0,04	0,05	0,05	0,05	0,06	0,06	0,06	0,07	++	++	–
M	martensíticos	40-80	0,02	0,03	0,03	0,04	0,04	0,05	0,05	0,05	0,06	0,07	0,07	0,08	0,09	++	++	–
K	Ferro fundido cinzento, Ferro fundido, Ferro fundido nodular	60-80	0,04	0,04	0,05	0,05	0,06	0,06	0,07	0,07	0,08	0,09	0,09	0,1	0,12	++	++	–
N	Metais não ferrosos: Alumínio e outros materiais não ferrosos, ligas de cobre	80 - 150	0,04	0,05	0,05	0,06	0,06	0,07	0,07	0,08	0,09	0,1	0,11	0,12	0,14	++	++	–
N	Plásticos	60 - 200	0,05	0,05	0,06	0,07	0,07	0,08	0,09	0,09	0,1	0,11	0,12	0,13	0,15	++	++	–
S	Ligas especiais e Titânio	20-40	0,02	0,02	0,02	0,03	0,03	0,04	0,05	0,05	0,05	0,06	0,06	0,06	0,07	++	++	+
H	Aços endurecidos [<65 HRC]	40-50	0,01	0,02	0,02	0,03	0,03	0,035	0,035	0,04	0,045	0,045	0,05	0,055	0,06	–	–	++

Nota:
Os parâmetros indicados na tabela são apenas referências e devem ser alterados de acordo com as condiçoes de usinagem (material, condição da refrigeração, condição de fixação, tipo de máquina, etc.)
Parâmetros de corte ideias podem variar em até 30%!

++ muito adequado + adequado

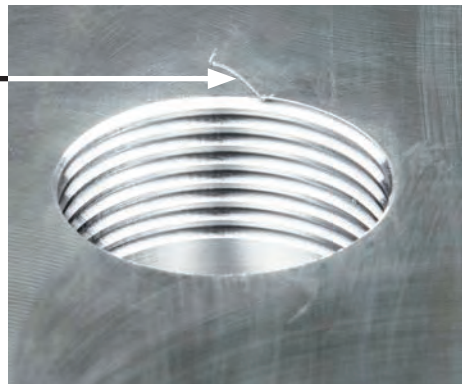
GühroThreadmill
(A programação CNC facilitada) O software Gühro Threadmill facilita consideravelmente a programação CNC. Com o auxílio de uma máscara de introdução o usuário introduz todos os dados necessários como por exemplo tipo de fresa para rosca, tipo de rosca e diâmetro, parâmetros de máquina, etc. e com esta base de dados obtém imediatamente o respectivo programa CNC.
Se requisitado fornecemos o software sem custos, para controles DIN ou Heidenhain

Problemas e dificuldades com fresas para rosca novas

Problemas	Causas	Ações corretivas
1. A rosca fica muito grande ou muito pequena 	Raio errado no programa CNC e por isto foi fresado um raio errado	Corrigir o raio da fresa até a rosca manter a dimensão
2. Rosca não cilíndrica 	Avanço muito alto Trajetória concordante em roscas longas	Reduzir o avanço Modificar o sentido da fresa para fresado discordante
3. A rosca tem uma má superfície, marcas de vibração 	Velocidade de corte muito alta Ferramenta ou fixação da peça não ideal	Acertar os valores de corte Verificar a ferramenta e a fixação da peça
4. Ruptura da ferramenta 	Defeito no programa CNC Valores de corte muito altos	Verificação do programa CNC Acertar os valores de corte
5. Vida útil muito baixa	Valores de corte muito altos Utilização de ferramenta sem revestimento Má lubrificação e mau transporte dos cavacos	Acertar os valores de corte Utilizar ferramenta com revestimento Melhorar a lubrificação, refrigeração da ferramenta através do fuso
6. Ruptura da broca/fresa 	Problemas com cavacos ao furar Valores de avanço muito altos ao furar	Utilizar ferramenta com refrigeração interna Inserir ciclo para retirada dos cavacos

Usinagem de rosca sem rebarbas - não é problema para as fresas de rosca Gühring

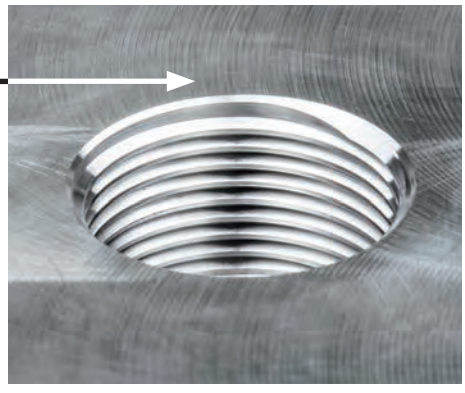
Problema:
Formação de rebarba
na entrada da rosca



Solução:
Ferramenta especial
Ferramenta especial com rebarbador



Resultado:
Ao final do fresamento a rebarba na entrada do furo é usinada.



Nosso departamento técnico e todo seu know-how esta a sua disposição para solução especiais.

Fresas de rosca especiais

Não encontrou a ferramenta adequada em nosso vasto programa de fresas de rosca?
Ficaremos satisfeitos em oferecer soluções especiais para seu processo.
Favor contatar-nos!



Reafiação e recobrimento

A Gühring oferece a muitos anos serviços de reafiação e recobrimento de fresas de rosca.
Através da reafiação e recobrimento utilizando as geometrias e revestimentos originais de sua ferramenta, reproduzimos 100% de sua eficiência.



Reafiação

Em nosso centro de reafiação removemos todo o desgaste das ferramentas.
Dependendo do desgaste é possível reafiar de 2 a 3 vezes cada ferramenta (d > 5 mm).



Recobrimento

Se uma fresa de rosca tinha um revestimento, recobrimos a ferramenta após a afiação, assim não apenas a resistência ao desgaste e corrosão são reproduzidos, assim como a vida útil da ferramenta é prolongada.



S

CO

SUMÁRIO DE CONTEÚDO

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Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 800							WN	N	D	ISO2/6H	HSS-E		M3 - M12	1839	18	87
≤ 800							WN	N	B	ISO2/6H	HSS-E		M3 - M20	998	19	86
≤ 800							WN	N R40	C	ISO2/6H	HSS-E		M3 - M20	888	23	88
≤ 1000	○	○					WN	N R40	C	6HX	HSS-E	S	M3 - M20	4153	25	67
≤ 800							DIN 352	N	C	ISO2/6H	HSS-E		M2,2 - M16	995	22	53
≤ 800							DIN 352	N	B	ISO2/6H	HSS-E		M2 - M24	991	19	35
≤ 800							DIN 352	N R15	C	ISO2/6H	HSS-E		M3 - M20	992	22	58
≤ 800							DIN 352	N R40	C	ISO2/6H	HSS-E		M2 - M22	993	23	65
≤ 800							DIN 357	N		ISO2/6H	HSS-E		M3 - M30	851	18	85
		•					DIN 371	GGT	C	ISO2/6H	HSS-E	S	M3 - M10	1875	349	357
≤ 800							DIN 371	N	C	ISO2/6H	HSS-E		M1 - M10	806	18	50
≤ 800							DIN 371	N	C	ISO3/6G	HSS-E		M2 - M10	795	22	52
≤ 800							DIN 371	N	D	ISO2/6H	HSS-E		M2 - M10	801	18	49
≤ 800							DIN 371	N	B	ISO1/4H	HSS-E		M2 - M10	794	18	36
≤ 1000	○						DIN 371	N	B	ISO2/6H	HSS-E	S	M2 - M10	313	20	33
≤ 800							DIN 371	N	B	ISO2/6H	HSS-E		M2 - M10	802	19	55
≤ 800							DIN 371	N	B	ISO2/6H	HSS-E		M1 - M10	803	19	30
≤ 800							DIN 371	N	B	ISO2/6H	HSS-E		M1,2 - M10	838	19	54
≤ 800							DIN 371	N	B	ISO2/6H	HSS-E		M1,2 - M10	839	19	54
≤ 800							DIN 371	N	B	ISO2/6H	HSS-E	S	M1 - M10	912	19	30
≤ 800							DIN 371	N	B	ISO2/6H	HSS-E		M1 - M10	945	19	30
≤ 800							DIN 371	N	B	ISO2/6H	HSS-E	C	M1 - M10	1246	19	30
≤ 1000	•		•				DIN 371	N	B	ISO2/6H	HSS-E		M2 - M10	1870	229	236
≤ 1000	•						DIN 371	N	B	ISO2/6H	HSS-E	S	M2 - M10	2086	229	236

Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 1000	○						DIN 371	N	B	ISO2/6H	HSS-E	A	M2 - M10	2427	20	33
≤ 1000	○						DIN 371	N	B	ISO2/6H	HSS-E	A	M5 - M10	2517	20	34
≤ 1000	○						DIN 371	N	B	ISO2/6H	HSS-E		M2 - M10	2876	20	33
≤ 1000	●		○				DIN 371	N	B	ISO2/6H	HSS-E-PM		M2 - M10	877	229	237
≤ 1000	○						DIN 371	N	B	ISO2/6H	HSS-E-PM	S	M2 - M10	1285	20	39
≤ 1000	○						DIN 371	N	B	ISO2/6H	HSS-E-PM	C	M3 - M20	1287	20	40
≤ 800							DIN 371	N	B	ISO3/6G	HSS-E		M2 - M10	796	19	56
≤ 800							DIN 371	N	B	ISO3/6G	HSS-E		M2 - M10	797	19	56
≤ 800							DIN 371	N	B	ISO3/6G	HSS-E		M1,4 - M10	837	19	37
≤ 800							DIN 371	N	B	ISO3/6G	HSS-E		M2 - M10	869	19	56
≤ 1000	○						DIN 371	N	B	ISO3/6G	HSS-E		M2 - M10	2990	20	41
≤ 1000	○						DIN 371	N	B	ISO3/6G	HSS-E	S	M2 - M10	2991	20	41
≤ 800							DIN 371	N-LH	B	ISO2/6H	HSS-E		M3 - M10	789	19	32
≤ 800							DIN 371	N R15	C	ISO2/6H	HSS-E		M2 - M10	809	22	57
≤ 800							DIN 371	N R15	C	ISO2/6H	HSS-E	S	M2 - M10	913	22	57
≤ 800							DIN 371	N R15	C	ISO2/6H	HSS-E		M2 - M10	946	22	57
≤ 800							DIN 371	N R15	C	ISO2/6H	HSS-E		M5 - M10	1891	22	59
≤ 800							DIN 371	N R15	C	ISO2/6H	HSS-E	S	M5 - M10	2436	23	59
		○	≥ 7				DIN 371	N R15	C	6HX	VHM		M3 - M10	971	465	478
		●					DIN 371	N R15	C	6HX	VHM	A	M3 - M10	2510	-	364
≤ 800							DIN 371	N R15	C	ISO3/6G	HSS-E		M2 - M10	799	22	52
≤ 800							DIN 371	N L15	D	ISO2/6H	HSS-E		M3 - M10	808	19	89
≤ 1000	○	○	○				DIN 371	N R40	E	ISO2/6H	HSS-E		M3 - M10	2790	24	69
≤ 1000	○	○					DIN 371	N R40	C	ISO2/6H	HSS-E	S	M5 - M10	174	25	70

Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 800							DIN 371	N R40	C	ISO2/6H	HSS-E	●	M2 - M10	783	23	60
≤ 800							DIN 371	N R40	C	ISO2/6H	HSS-E	○	M2 - M10	810	23	60
≤ 1000	○	○					DIN 371	N R40	C	ISO2/6H	HSS-E	●	M2 - M10	836	24	66
≤ 1000	○	○	○				DIN 371	N R40	C	ISO2/6H	HSS-E	○	M2 - M10	889	24	66
≤ 800							DIN 371	N R40	C	ISO2/6H	HSS-E	S	M2 - M10	914	23	60
≤ 800							DIN 371	N R40	C	ISO2/6H	HSS-E	C	M2 - M10	1252	24	60
≤ 800							DIN 371	N R40	C	ISO2/6H	HSS-E	○	M5 - M10	1893	24	63
≤ 1000	○	○					DIN 371	○ N R40	C	ISO2/6H	HSS-E	A	M2 - M10	2425	-	66
≤ 800							DIN 371	N R40	C	ISO2/6H	HSS-E	S	M5 - M10	2438	24	64
≤ 1000	○	○					DIN 371	N R40	C	ISO2/6H	HSS-E	S	M2 - M10	2440	24	66
≤ 1000	○	○					DIN 371	N R40	C	ISO2/6H	HSS-E	A	M5 - M10	2514	-	68
≤ 1000	○	○					DIN 371	N R40	C	ISO2/6H	HSS-E-PM	S	M2 - M10	1288	25	72
≤ 1000	○	○					DIN 371	N R40	C	ISO2/6H	HSS-E-PM	C	M2 - M20	1290	25	73
≤ 800							DIN 371	N R40	C	ISO3/6G	HSS-E	○	M3 - M10	844	23	61
≤ 1000	○	○					DIN 371	N R40	C	ISO3/6G	HSS-E	●	M2 - M20	2994	24	73
≤ 1000	○	○					DIN 371	N R40	C	ISO3/6G	HSS-E	S	M2 - M20	2995	24	73
≤ 800							DIN 371	N L40 LH	C	ISO2/6H	HSS-E	○	M3 - M10	786	24	62
●	●	○	●	○			DIN 371	N R50	C	ISO2/6H	HSS-E-PM	S	M3 - M10	767	25	74
●	●	○	●	○			DIN 371	N R50	C	ISO2/6H	HSS-E-PM	C	M3 - M10	1152	25	74
≤ 1200		●	≥ 7				DIN 371	H	E	6HX	HSS-E-PM	C	M5 - M10	1091	23	78
		●	≥ 7				DIN 371	H	E	6HX	VHM	○	M3 - M10	1008	351	364
≤ 1200		●	≥ 7				DIN 371	H	C	6HX	HSS-E-PM	C	M5 - M10	302	23	78
		●	≥ 7				DIN 371	H	C	6HX	VHM	○	M3 - M10	969	351	362
		●	≥ 7				DIN 371	H	C	6HX	VHM	○	M3 - M10	1858	349	362

Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
		•			45/55		DIN 371	H	C	6HX	VHM	A	M3 - M10	2311	349	364
		•					DIN 371	H	C	6HX	VHM	A	M5 - M10	2506	351	363
							DIN 371	H	D	6HX	HSS-E-PM	C	M3 - M16	1201	676	680
≤ 1200							DIN 371	H	B	ISO2/6H	HSS-E		M2 - M10	733	21	43
≤ 1200							DIN 371	H	B	ISO2/6H	HSS-E		M2 - M10	804	21	43
≤ 1200							DIN 371	H	B	ISO2/6H	HSS-E	C	M2 - M10	1914	21	43
≤ 1200							DIN 371	H	B	ISO2/6H	HSS-E		M2 - M10	2941	21	43
≤ 1200							DIN 371	H	B	ISO2/6H	HSS-E-PM	S	M3 - M10	57	21	47
≤ 1200							DIN 371	H	B	ISO2/6H	HSS-E-PM		M3 - M10	875	21	46
≤ 1200							DIN 371	H	B	ISO2/6H	HSS-E-PM	A	M3 - M10	1575	21	47
≤ 1200							DIN 371	H	B	ISO3/6G	HSS-E		M2 - M10	2465	21	45
≤ 1200							DIN 371	H	B	ISO3/6G	HSS-E	S	M2 - M10	2710	21	45
≤ 1200							DIN 371	H R15	C	ISO2/6H	HSS-E-PM		M3 - M10	872	23	76
≤ 1200							DIN 371	H R15	C	ISO2/6H	HSS-E-PM	A	M3 - M10	1577	23	76
≤ 1200							DIN 371	H R15	C	6HX	HSS-E-PM	C	M6 - M10	1188	23	77
≤ 1200							DIN 371	H R40	C	ISO2/6H	HSS-E	S	M2 - M10	361	25	82
≤ 1200							DIN 371	H R40	C	ISO2/6H	HSS-E		M2 - M10	811	25	81
≤ 1200							DIN 371	H R40	C	ISO2/6H	HSS-E		M2 - M10	947	25	81
≤ 1200							DIN 371	H R40	C	ISO2/6H	HSS-E		M5 - M10	1894	25	83
≤ 1200							DIN 371	H R40	C	ISO2/6H	HSS-E	C	M2 - M10	1916	25	82
≤ 1200							DIN 371	H R40	C	ISO2/6H	HSS-E		M2 - M10	2850	25	81
≤ 1200							DIN 371	H R40	C	ISO3/6G	HSS-E		M2 - M10	2985	25	84
≤ 1200							DIN 371	H R40	C	ISO3/6G	HSS-E	S	M2 - M10	2986	25	84
			○				DIN 371	H AZ	C	ISO2/6H	HSS-E		M2 - M10	788	-	483

Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 1200							DIN 371	H AZ	B	ISO2/6H	HSS-E	○	M2 - M10	791	21	44
≤ 1000	•						DIN 371	VA	B	ISO2/6H	HSS-E	●	M2 - M10	2869	229	236
	•						DIN 371	VA R15	C	ISO2/6H	HSS-E	●	M2 - M10	843	230	241
	•						DIN 371	VA R15	C	ISO2/6H	HSS-E	S	M2 - M10	2896	230	241
	•		•				DIN 371	VA R40	C	ISO2/6H	HSS-E	○	M3 - M10	814	231	243
	•		•				DIN 371	VA R40	C	ISO2/6H	HSS-E	○	M3 - M10	1892	231	243
	•						DIN 371	VA R40	C	ISO2/6H	HSS-E	●	M3 - M10	2862	231	243
	•						DIN 371	VA R40	C	ISO2/6H	HSS-E-PM	S	M3 - M10	59	231	246
	•		○				DIN 371	VA R40	C	ISO2/6H	HSS-E-PM	○	M3 - M10	909	231	246
•	•	○	•	○			DIN 371	VA R50	C	6HX	HSS-E-PM	S	M3 - M10	761	25	75
•	•	○	•	○			DIN 371	VA R50	C	6HX	HSS-E-PM	C	M3 - M10	1139	25	75
≤ 1000	•		○				DIN 371	VA AZ	B	ISO2/6H	HSS-E	○	M3 - M10	1871	229	240
			•				DIN 371	AI	B	ISO2/6H	HSS-E	○	M2 - M10	805	463	472
			•				DIN 371	AI R45	C	ISO2/6H	HSS-E	○	M1,6 - M10	812	464	474
		•					DIN 371	GG	C	6HX	HSS-E	A	M5 - M10	318	350	358
		•					DIN 371	GG	C	6HX	HSS-E	●	M3 - M10	807	349	356
		•					DIN 371	GG	C	6HX	HSS-E	S	M3 - M10	930	349	356
		•					DIN 371	GG	C	6HX	HSS-E	●	M5 - M10	1890	350	358
		•					DIN 371	GG	C	6HX	HSS-E	A	M3 - M10	1918	349	356
		○	≥ 7				DIN 371	Ms	E	ISO2/6H	HSS-E	○	M3 - M10	800	463	482
		○	≥ 7				DIN 371	Ms	E	ISO3/6G	HSS-E	○	M3 - M10	1084	463	482
≤ 1000							~DIN 371	N	B	6HX	VHM	C	M5 - M12	942	21	42
					≤ 62		~DIN 371	H	D	ISO2/6H	VHM	C	M3 - M16	2944	676	681
		•					DIN 376	GGT	C	ISO2/6H	HSS-E	S	M3 - M16	1876	349	357

Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 800							DIN 376	N	C	ISO2/6H	HSS-E	○	M1,6 - M48	818	22	51
≤ 800							DIN 376	N	D	ISO2/6H	HSS-E	○	M2 - M30	813	18	49
≤ 1000	○						DIN 376	N	B	ISO2/6H	HSS-E	S	M3 - M36	315	20	33
≤ 800							DIN 376	N	B	ISO2/6H	HSS-E	○	M1,6 - M52	815	19	31
≤ 800							DIN 376	N	B	ISO2/6H	HSS-E	○	M3 - M16	846	19	54
≤ 800							DIN 376	N	B	ISO2/6H	HSS-E	○	M3 - M16	847	19	54
≤ 800							DIN 376	N	B	ISO2/6H	HSS-E	S	M1,6 - M52	915	19	31
≤ 800							DIN 376	N	B	ISO2/6H	HSS-E	●	M1,6 - M52	948	19	31
≤ 800							DIN 376	N	B	ISO2/6H	HSS-E	C	M1,6 - M52	1249	19	31
≤ 1000	●		●				DIN 376	N	B	ISO2/6H	HSS-E	○	M3 - M30	1872	229	236
≤ 1000	○						DIN 376	N	B	ISO2/6H	HSS-E	A	M3 - M36	2428	20	33
≤ 1000	○						DIN 376	N	B	ISO2/6H	HSS-E	●	M3 - M36	2877	20	33
≤ 1000	●		○				DIN 376	N	B	ISO2/6H	HSS-E-PM	○	M12 - M20	879	229	237
≤ 1000	○						DIN 376	N	B	ISO2/6H	HSS-E-PM	S	M12 - M20	1286	20	39
≤ 1000	●						DIN 376	N	B	6HX	HSS-E	S	M3 - M30	2087	229	236
≤ 800							DIN 376	N	B	ISO3/6G	HSS-E	○	M2 - M20	845	19	37
≤ 800							DIN 376	N-LH	B	ISO2/6H	HSS-E	○	M12 - M20	790	19	32
≤ 800							DIN 376	N R15	C	ISO2/6H	HSS-E	○	M3 - M30	821	22	57
≤ 800							DIN 376	N R15	C	ISO2/6H	HSS-E	S	M3 - M30	916	22	57
≤ 800							DIN 376	N R15	C	ISO2/6H	HSS-E	●	M3 - M30	949	22	57
≤ 800							DIN 376	N R15	C	ISO2/6H	HSS-E	○	M12 - M20	1898	22	59
≤ 800							DIN 376	N R15	C	ISO2/6H	HSS-E	S	M12 - M20	2437	23	59
≤ 800							DIN 376	N L15	D	ISO2/6H	HSS-E	○	M3 - M16	820	19	89
≤ 1000	○	○	○				DIN 376	N R40	E	ISO2/6H	HSS-E	○	M4 - M16	2791	24	69

Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 1000	○	○					DIN 376	N R40	C	ISO2/6H	HSS-E	S	M5 - M30	196	25	70
≤ 800							DIN 376	N R40	C	ISO2/6H	HSS-E	●	M3 - M30	784	23	60
≤ 800							DIN 376	N R40	C	ISO2/6H	HSS-E	○	M3 - M30	822	23	60
≤ 1000	○	○					DIN 376	N R40	C	ISO2/6H	HSS-E	●	M3 - M36	826	24	66
≤ 1000	○	○	○				DIN 376	N R40	C	ISO2/6H	HSS-E	○	M3 - M36	890	24	66
≤ 800							DIN 376	N R40	C	ISO2/6H	HSS-E	S	M3 - M30	917	23	60
≤ 800							DIN 376	N R40	C	ISO2/6H	HSS-E	C	M3 - M30	1254	24	60
≤ 1000	○	○					DIN 376	N R40	C	ISO2/6H	HSS-E	A	M3 - M36	2426	-	66
≤ 800							DIN 376	N R40	C	ISO2/6H	HSS-E	S	M12 - M20	2439	24	64
≤ 1000	○	○					DIN 376	N R40	C	ISO2/6H	HSS-E-PM	S	M12 - M20	1289	25	72
≤ 1000	○	○					DIN 376	N R40	C	6HX	HSS-E	S	M3 - M36	2441	24	66
≤ 800							DIN 376	N R40	C	ISO3/6G	HSS-E	○	M3 - M24	848	23	61
≤ 800							DIN 376	N L40 LH	C	ISO2/6H	HSS-E	○	M12 - M20	787	24	62
●	●	○	○	○			DIN 376	N R50	C	ISO2/6H	HSS-E-PM	S	M12 - M20	1098	25	74
●	●	○	●	○			DIN 376	N R50	C	ISO2/6H	HSS-E-PM	C	M12 - M20	1293	25	74
			○				DIN 376	N AZ	E	ISO2/6H	HSS-E	A	M5 - M12	2899	464	484
≤ 1200		●	≥ 7				DIN 376	H	E	6HX	HSS-E-PM	C	M10 - M20	4165	351	359
≤ 1200		●	≥ 7				DIN 376	H	C	6HX	HSS-E	C	M16 - M39	778	23	79
≤ 1200		●	≥ 7				DIN 376	H	C	6HX	HSS-E-PM	C	M10 - M20	297	23	78
		●	≥ 7				DIN 376	H	C	6HX	VHM	○	M12 - M20	1859	349	362
		●	≥ 7				DIN 376	H	C	6HX	VHM	○	M12 - M20	1883	351	362
≤ 1200							DIN 376	H	B	ISO2/6H	HSS-E	●	M3 - M24	734	21	43
≤ 1200							DIN 376	H	B	ISO2/6H	HSS-E	○	M3 - M24	816	21	43
≤ 1200							DIN 376	H	B	ISO2/6H	HSS-E	C	M3 - M24	1915	21	43

Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 1200							DIN 376	H	B	ISO2/6H	HSS-E	●	M3 - M24	2942	21	43
≤ 1200							DIN 376	H	B	ISO2/6H	HSS-E-PM	S	M12 - M30	58	21	47
≤ 1200							DIN 376	H	B	ISO2/6H	HSS-E-PM	A	M12 - M30	1576	21	47
≤ 1200							DIN 376	H R15	C	ISO2/6H	HSS-E-PM	○	M12 - M20	935	23	76
≤ 1200							DIN 376	H R15	C	ISO2/6H	HSS-E-PM	A	M12 - M20	1578	23	76
≤ 1200							DIN 376	H R15	C	6HX	HSS-E-PM	C	M12 - M24	1194	23	77
≤ 1200							DIN 376	H R40	C	ISO2/6H	HSS-E	S	M3 - M30	362	25	82
≤ 1200							DIN 376	H R40	C	ISO2/6H	HSS-E	○	M3 - M30	823	25	81
≤ 1200							DIN 376	H R40	C	ISO2/6H	HSS-E	●	M3 - M30	950	25	81
≤ 1200							DIN 376	H R40	C	ISO2/6H	HSS-E	○	M12 - M20	1901	25	83
≤ 1200							DIN 376	H R40	C	ISO2/6H	HSS-E	C	M3 - M30	1917	25	82
≤ 1200							DIN 376	H R40	C	ISO2/6H	HSS-E	●	M3 - M30	2851	25	81
≤ 1200							DIN 376	H AZ	B	ISO2/6H	HSS-E	○	M12 - M16	849	21	44
≤ 1000	●						DIN 376	VA	B	ISO2/6H	HSS-E	●	M3 - M30	2870	229	236
	●						DIN 376	VA R15	C	ISO2/6H	HSS-E	●	M12 - M24	785	230	241
	●						DIN 376	VA R15	C	ISO2/6H	HSS-E	S	M12 - M24	2895	230	241
	●		●				DIN 376	VA R40	C	ISO2/6H	HSS-E	○	M12 - M30	825	231	243
	●		●				DIN 376	VA R40	C	ISO2/6H	HSS-E	○	M12 - M30	1899	231	243
	●						DIN 376	VA R40	C	ISO2/6H	HSS-E	●	M12 - M30	2863	231	243
	●						DIN 376	VA R40	C	ISO2/6H	HSS-E-PM	S	M12 - M24	60	231	246
	●		●				DIN 376	VA R40	C	ISO2/6H	HSS-E-PM	○	M12 - M24	910	231	246
●	●	○	●	○			DIN 376	VA R50	C	6HX	HSS-E-PM	S	M12 - M20	763	25	75
●	●	○	●	○			DIN 376	VA R50	C	6HX	HSS-E-PM	C	M12 - M20	1142	25	75
≤ 1000	●		○				DIN 376	VA AZ	B	ISO2/6H	HSS-E	○	M12 - M16	792	229	240

Machos para máquinas para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
			•				DIN 376	AI	B	ISO2/6H	HSS-E	○	M12 - M24	817	463	472
			•				DIN 376	AI R45	C	ISO2/6H	HSS-E	○	M3 - M24	824	464	474
		•					DIN 376	GG	C	6HX	HSS-E	A	M12 - M20	319	350	358
		•					DIN 376	GG	C	6HX	HSS-E	●	M3 - M30	819	349	356
		•					DIN 376	GG	C	6HX	HSS-E	S	M3 - M30	931	349	356
		•					DIN 376	GG	C	6HX	HSS-E	●	M12 - M20	1897	350	358
		•					DIN 376	GG	C	6HX	HSS-E	A	M3 - M30	1919	349	356
≤ 1200		•	≥ 7				~DIN 376	H	C	6HX	HSS-E	C	M16 - M39	779	23	80
≤ 1000	•						DIN 371/376	N	B	ISO2/6H	HSS-E-PM	S	M2 - M12	1002	229	238
•	•	○	○	○			DIN 371/376	N	B	6HX	HSS-E	S	M2 - M30	4218	21	38
≤ 1000	○	○					DIN 371/376	N R15	E	ISO2/6H	HSS-E	C	M3 - M20	4155	23	48
≤ 1000	○	○					DIN 371/376	N R15	C	ISO2/6H	HSS-E	C	M3 - M20	4154	23	48
•	•	○	○	○			DIN 371/376	VA R45	C	6HX	HSS-E	A	M2 - M30	393	25	71
				•			DIN 371/376	Ti R15	C	4HX	HSS-E-PM	C	MJ3 x 0,5 - M16	1061	597	605
				•			DIN 371/376	Ti R15	C	6HX	HSS-E-PM	C	M3 - M16	2909	597	604
				•			DIN 371/376	Ni R10	C	4HX	HSS-E-PM	A	MJ3 x 0,5 - M16	1065	597	605
				•			DIN 371/376	Ni R10	C	6HX	HSS-E-PM	A	M3 - M16	2920	597	604
				•			DIN 371/376	Ti Ni	B	4HX	HSS-E-PM	C	MJ3 x 0,5 - M16	1057	596	603
				•			DIN 371/376	Ti Ni	B	6HX	HSS-E-PM	C	M3 - M16	2901	596	602
				•			DIN 371/376	Ti Ni	B	6HX	HSS-E-PM	A	M3 - M16	2916	596	602

Machos manuais para rosca métrica fina ISO

≤ 800							DIN 2180	N R40	C	ISO2/6H	HSS-E	○	M 6 X0,75 - M12 X1,5	1970	23	106
≤ 800							DIN 374	N	C	ISO2/6H	HSS-E	○	M 3 X0,35 - M63 X1,5	830	18	100
≤ 800							DIN 374	N	C	ISO3/6G	HSS-E	○	M 3 X0,35 - M63 X1,5	829	18	100

Machos manuais para rosca métrica fina ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 800							DIN 374	N	B	ISO2/6H	HSS-E	○	M 3 X0,35 - M40 X1,5	827	19	91
≤ 800							DIN 374	N	B	ISO2/6H	HSS-E	S	M 3 X0,35 - M40 X1,5	832	19	91
≤ 1000	○						DIN 374	N	B	ISO2/6H	HSS-E	A + M	M 5 X0,5 - M50 X1,5	2878	20	94
≤ 1000	○						DIN 374	N	B	ISO2/6H	HSS-E	●	M 5 X0,5 - M50 X1,5	2879	20	94
≤ 800							DIN 374	N	B	ISO2/6H	HSS-E	●	M 3 X0,35 - M40 X1,5	2888	19	91
≤ 1000	●						DIN 374	N	B	ISO2/6H	HSS-E-PM	S	M 6 X0,75 - M24 X2	1291	20	98
●	●	○	○	○			DIN 374	N	B	6HX	HSS-E	S	M 6 X0,75 - M24 X1,5	4219	21	90
≤ 1000							DIN 374	N	B	6HX	VHM	C	M14 X1,25 - M16 X1,5	944	21	96
≤ 800							DIN 374	N	B	ISO3/6G	HSS-E	○	M 6 X0,75 - M20 X1,5	316	19	93
≤ 1000	○						DIN 374	N	B	ISO3/6G	HSS-E	S	M 6 X0,75 - M20 X1,5	2993	20	93
≤ 1000	○	○					DIN 374	N R15	E	ISO2/6H	HSS-E	C	M 8 X1 - M16 X1,5	4157	23	103
≤ 800							DIN 374	N R15	C	ISO2/6H	HSS-E	○	M 4 X0,5 - M30 X2	833	22	102
≤ 800							DIN 374	N R15	C	ISO2/6H	HSS-E	○	M 5 X0,5 - M20 X1,5	1905	22	104
≤ 800							DIN 374	N R15	C	ISO2/6H	HSS-E	S	M 4 X0,5 - M30 X2	1971	22	102
≤ 800							DIN 374	N R15	C	ISO2/6H	HSS-E	●	M 4 X0,5 - M30 X2	2838	22	102
≤ 1000	○	○					DIN 374	N R15	C	ISO2/6H	HSS-E	C	M 8 X1 - M16 X1,5	4156	23	103
		○	≥ 7				DIN 374	N R15	C	6HX	VHM	○	M12 X1,5 - M20 X1,5	978	465	493
			≥ 7				DIN 374	N L15	D	6HX	VHM	○	M12 X1,5 - M18 X1,5	976	463	495
≤ 1000	○	○	○				DIN 374	N R40	E	ISO2/6H	HSS-E	○	M 5 X0,5 - M30 X2	2792	24	107
≤ 800							DIN 374	N R40	C	ISO2/6H	HSS-E	○	M 3 X0,35 - M30 X2	834	23	105
≤ 800							DIN 374	N R40	C	ISO2/6H	HSS-E	S	M 3 X0,35 - M30 X2	852	23	105
≤ 1000	○	○	○				DIN 374	N R40	C	ISO2/6H	HSS-E	○	M 5 X0,5 - M30 X2	2424	24	107
≤ 800							DIN 374	N R40	C	ISO2/6H	HSS-E	●	M 3 X0,35 - M30 X2	2843	23	105
≤ 1000	○	○					DIN 374	N R40	C	ISO2/6H	HSS-E	●	M 5 X0,5 - M30 X2	2853	24	107

Machos manuais para rosca métrica fina ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 1000	○	○					DIN 374	N R40	C	ISO2/6H	HSS-E-PM	S	M 6 X0,75 - M24 X2	1292	25	109
≤ 1000	○	○					DIN 374	N R40	C	ISO3/6G	HSS-E	S	M 8 X1 - M20 X1,5	1049	24	108
≤ 1000	○	○	○				DIN 374	N R40	C	ISO3/6G	HSS-E	○	M 8 X1 - M20 X1,5	2998	24	108
≤ 1000	○	○					DIN 374	N R40	C	ISO3/6G	HSS-E	●	M 8 X1 - M20 X1,5	2999	24	108
≤ 1000	○	○					DIN 374	N R40	C(K)	ISO2/6H	HSS-E	S	M 6 X0,75 - M24 X2	273	25	109
●	●	○	○	○			DIN 374	N R50	C	ISO2/6H	HSS-E-PM	S	M 8 X1 - M20 X1,5	1100	25	110
●	●	○	●	○			DIN 374	N R50	C	ISO2/6H	HSS-E-PM	C	M 8 X1 - M20 X1,5	1294	25	110
≤ 1200		●	≥ 7				DIN 374	H	E	6HX	HSS-E-PM	C	M 5 X0,5 - M16 X1,5	1007	23	113
		●	≥ 7				DIN 374	H	E	6HX	VHM	○	M10 X1 - M16 X1,5	1009	351	369
≤ 1200		●	≥ 7				DIN 374	H	C	6HX	HSS-E-PM	C	M 5 X0,5 - M16 X1,5	1090	23	113
		●	≥ 7				DIN 374	H	C	6HX	VHM	○	M12 X1,5 - M20 X1,5	974	351	368
		●	≥ 7				DIN 374	H	C	6HX	VHM	○	M12 X1,5 - M20 X1,5	1860	349	368
≤ 1200							DIN 374	H	B	ISO2/6H	HSS-E	○	M 3 X0,35 - M24 X1,5	828	21	97
≤ 1200							DIN 374	H	B	ISO2/6H	HSS-E	●	M 3 X0,35 - M24 X1,5	2943	21	97
≤ 1200							DIN 374	H	B	ISO3/6G	HSS-E	S	M 8 X1 - M20 X1,5	2983	21	99
≤ 1200							DIN 374	H R15	C	ISO2/6H	HSS-E-PM	○	M 6 X0,75 - M24 X1,5	874	23	112
≤ 1200							DIN 374	H R15	C	6HX	HSS-E-PM	C	M 6 X0,75 - M24 X1,5	1200	23	112
≤ 1200							DIN 374	H R40	C	ISO2/6H	HSS-E	○	M 6 X0,75 - M24 X1,5	835	25	114
≤ 1200							DIN 374	H R40	C	ISO2/6H	HSS-E	●	M 6 X0,75 - M24 X1,5	2852	25	114
≤ 1200							DIN 374	H R40	C	ISO2/6H	HSS-E	●	M 6 X0,75 - M24 X1,5	2940	25	114
≤ 1200							DIN 374	H R40	C	ISO3/6G	HSS-E	●	M 8 X1 - M20 X1,5	2988	25	116
≤ 1200							DIN 374	H R40	C	ISO3/6G	HSS-E	S	M 8 X1 - M20 X1,5	2989	25	116
≤ 1000	●						DIN 374	VA	B	ISO2/6H	HSS-E	S	M 3 X0,35 - M24 X1,5	1001	229	257
≤ 1000	●		●				DIN 374	VA	B	ISO2/6H	HSS-E	○	M 5 X0,5 - M24 X2	1873	229	256

Machos manuais para rosca métrica fina ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 1000	•						DIN 374	VA	B	ISO2/6H	HSS-E	●	M 3 X0,35 - M24 X1,5	2871	229	257
≤ 1000	•						DIN 374	VA	B	ISO2/6H	HSS-E-PM	○	M 5 X0,5 - M24 X2	887	229	256
	•						DIN 374	VA R15	C	ISO2/6H	HSS-E	●	M 4 X0,5 - M24 X1,5	1874	230	249
	•						DIN 374	VA R15	C	ISO2/6H	HSS-E	S	M 4 X0,5 - M24 X1,5	2897	230	249
	•						DIN 374	VA R40	C	ISO2/6H	HSS-E	●	M 3 X0,35 - M24 X1,5	2864	231	251
	•		•				DIN 374	VA R40	C	ISO2/6H	HSS-E-PM	○	M 8 X1 - M20 X1,5	936	231	253
	•						DIN 374	VA R40	C	ISO2/6H	HSS-E-PM	S	M 8 X1 - M20 X1,5	1004	231	253
•	•	○	○	○			DIN 374	VA R45	C	6HX	HSS-E	A	M 6 X0,75 - M24 X1,5	394	25	115
•	•	○	•	○			DIN 374	VA R50	C	6HX	HSS-E-PM	S	M 8 X1 - M20 X1,5	764	25	111
•	•	○	•	○			DIN 374	VA R50	C	6HX	HSS-E-PM	C	M 8 X1 - M20 X1,5	1144	25	111
		•					DIN 374	GG	C	6HX	HSS-E	A	M 4 X0,5 - M30 X1,5	169	349	365
		•					DIN 374	GG	C	6HX	HSS-E	A	M 8 X1 - M24 X1,5	347	350	366
		•					DIN 374	GG	C	6HX	HSS-E	●	M 4 X0,5 - M30 X1,5	831	349	365
		•					DIN 374	GG	C	6HX	HSS-E	S	M 4 X0,5 - M30 X1,5	932	349	365
		•					DIN 374	GG	C	6HX	HSS-E	●	M 8 X1 - M24 X1,5	1904	350	366
		○	≥ 7				DIN 371	N R15	C	6HX	VHM	○	M 4 X0,5 - M10 X1	977	465	493
			≥ 7				DIN 371	N R15	C	6HX	VHM	M	M 5 - M10	2516	-	494
			≥ 7				DIN 371	N L15	D	6HX	VHM	○	M 4 X0,5 - M10 X1	975	463	495
		•	≥ 7				DIN 371	H	C	6HX	VHM	○	M 5 X0,5 - M10 X1	972	351	368
		•	≥ 7				DIN 371	H	C	6HX	VHM	○	M 5 X0,5 - M10 X1	1861	349	368
					45-55		DIN 371	H	D	6HX	HSS-E-PM	C	M 8 X1 - M12 X1,5	4161	676	682
				•			DIN 371	Ti R15	C	4HX	HSS-E-PM	C	MJ 6 X0,5 - MJ10 X1,25	1062	597	609
				•			DIN 371	Ti R15	C	6HX	HSS-E-PM	C	M 3 X0,35 - M10 X1,25	2910	597	608
				•			DIN 371	Ni R10	C(K)	4HX	HSS-E-PM	A	MJ 6 X0,5 - MJ10 X1,25	1066	597	609

Machos manuais para rosca métrica fina ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
				•			DIN 371	Ni R10	C(K)	6HX	HSS-E-PM	A	M 3 X0,35 - M10 X1,25	2921	597	608
				•			DIN 371	Ti Ni	B	4HX	HSS-E-PM	C	MJ 6 X0,5 - MJ10 X1,25	1058	596	607
				•			DIN 371	Ti Ni	B	6HX	HSS-E-PM	C	M 3 X0,35 - M10 X1,25	2903	596	606
				•			DIN 371	Ti Ni	B	6HX	HSS-E-PM	A	M 3 X0,35 - M10 X1,25	2917	596	606
≤ 1000							~DIN 371	N	B	6HX	VHM	C	M 5 X0,5 - M12 X1,5	943	21	95
					≤ 62		~DIN 371	H	D	ISO2/6H	VHM	C	M 6 X0,5 - M12 X1,5	1161	676	683

Machos para rosca UNC

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 800							~DIN 371	N	C	2B	HSS-E	○	3 - 48 - 3/8 - 16	1977	18	121
≤ 800							~DIN 371	N	B	2B	HSS-E	○	1 - 64 - 3/8 - 16	873	19	117
≤ 1000	•		•				~DIN 371	N	B	2B	HSS-E	○	4 - 40 - 3/8 - 16	1980	229	258
≤ 1000	○						~DIN 371	N	B	2B	HSS-E	●	4 - 40 - 3/8 - 16	2881	20	118
≤ 800							~DIN 371	N	B	2B	HSS-E	●	1 - 64 - 3/8 - 16	2889	19	117
≤ 800							~DIN 371	N R15	C	2B	HSS-E	○	4 - 40 - 3/8 - 16	1978	22	119
≤ 800							~DIN 371	N R15	C	2B	HSS-E	●	4 - 40 - 10 - 24	2839	22	120
≤ 800							~DIN 371	N R40	C	2B	HSS-E	○	2 - 56 - 3/8 - 16	876	23	122
≤ 1000	○	○					~DIN 371	N R40	C	2B	HSS-E	S	10 - 24 - 3/8 - 16	1837	25	124
≤ 800							~DIN 371	N R40	C	2B	HSS-E	●	2 - 56 - 3/8 - 16	2844	23	122
≤ 1000	○	○	○				~DIN 371	N R40	C	2B	HSS-E	○	2 - 56 - 3/8 - 16	2854	24	123
≤ 1000	○	○					~DIN 371	N R40	C	2B	HSS-E	●	2 - 56 - 3/8 - 16	2855	24	123
≤ 1000	•						~DIN 371	VA	B	2B	HSS-E	●	4 - 40 - 3/8 - 16	2872	229	258
	•		•				~DIN 371	VA R40	C	2B	HSS-E	○	2 - 56 - 3/8 - 16	1981	231	259
	•						~DIN 371	VA R40	C	2B	HSS-E	●	2 - 56 - 3/8 - 16	2865	231	259
		•					~DIN 371	GG	C	2B	HSS-E	A	10 - 24 - 3/8 - 16	1085	350	371
		•					~DIN 371	GG	C	2B	HSS-E	●	2 - 56 - 3/8 - 16	1979	349	370

Machos para rosca UNC

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
				•			~DIN 371	Ti Ni	B	2BX	HSS-E-PM	C	6 - 32 - 3/8 - 16	2905	596	610
				•			~DIN 371	Ti Ni	B	2BX	HSS-E-PM	A	6 - 32 - 3/8 - 16	2918	596	610
≤ 800 N/mm²							~DIN 376	N	B	2B	HSS-E	○	7/16 - 14 - 1 1/2 - 6	878	19	117
≤ 1000 N/mm²	•		•				~DIN 376	N	B	2B	HSS-E	○	1/2 - 13 - 1 - 8	1985	229	258
≤ 1000 N/mm²	○						~DIN 376	N	B	2B	HSS-E	●	7/16 - 14 - 1 - 8	2883	20	118
≤ 800 N/mm²							~DIN 376	N	B	2B	HSS-E	●	7/16 - 14 - 1 1/2 - 6	2890	19	117
≤ 800 N/mm²							~DIN 376	N R15	C	2B	HSS-E	●	1/2 - 13 - 1 - 8	2840	22	120
≤ 800 N/mm²							~DIN 376	N R40	C	2B	HSS-E	○	7/16 - 14 - 1 - 8	881	23	122
≤ 800 N/mm²							~DIN 376	N R40	C	2B	HSS-E	●	7/16 - 14 - 1 - 8	2845	23	122
≤ 1000 N/mm²	○	○	○				~DIN 376	N R40	C	2B	HSS-E	○	7/16 - 14 - 1 - 8	2856	24	123
≤ 1000 N/mm²	○	○					~DIN 376	N R40	C	2B	HSS-E	●	7/16 - 14 - 1 - 8	2857	24	123
≤ 1000 N/mm²	•						~DIN 376	VA	B	2B	HSS-E	●	1/2 - 13 - 1 - 8	2873	229	258
	•		•				~DIN 376	VA R40	C	2B	HSS-E	○	7/16 - 14 - 7/8 - 9	1986	231	259
	•						~DIN 376	VA R40	C	2B	HSS-E	●	7/16 - 14 - 7/8 - 9	2866	231	259
		•					~DIN 376	GG	C	2B	HSS-E	A	7/16 - 14 - 7/8 - 9	1086	350	371
		•					~DIN 376	GG	C	2B	HSS-E	■	7/16 - 14 - 3/4 - 10	1984	349	370
				•			~DIN 371/376	Ti R15	C	2BX	HSS-E-PM	C	4 - 40 - 5/8 - 11	2912	597	612
				•			~DIN 371/376	Ti R15	C	3BX	HSS-E-PM	C	6 - 32 - 5/8 - 11	1063	597	613
				•			~DIN 371/376	Ni R10	C	2BX	HSS-E-PM	A	4 - 40 - 5/8 - 11	2922	597	612
				•			~DIN 371/376	Ni R10	C	3BX	HSS-E-PM	A	6 - 32 - 5/8 - 11	1067	597	613
				•			~DIN 371/376	Ti Ni	B	3BX	HSS-E-PM	C	6 - 32 - 5/8 - 11	1059	596	611

Machos para rosca UNF

≤ 800 N/mm²							~DIN 374	N	C	2B	HSS-E	○	3 - 56 - 1 - 12	1987	18	126
≤ 800 N/mm²							~DIN 374	N	B	2B	HSS-E	○	3 - 56 - 1 1/4 - 12	908	18	125

Machos para rosca UNF

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 1000 ≤ 800	•		•				~DIN 374	N	B	2B	HSS-E	○	10 - 32 - 3/8 - 24	1990	229	260
≤ 1000 ≤ 800	○						~DIN 374	N	B	2B	HSS-E	●	6 - 40 - 1 - 12	2885	20	130
≤ 800							~DIN 374	N	B	2B	HSS-E	●	3 - 56 - 1 1/4 - 12	2891	19	125
≤ 800							~DIN 374	N R15	C	2B	HSS-E	○	3 - 56 - 1 - 12	1988	22	127
≤ 800							~DIN 374	N R15	C	2B	HSS-E	●	3 - 56 - 1 - 12	2841	22	127
≤ 800							~DIN 374	N R40	C	2B	HSS-E	○	3 - 56 - 1 - 12	911	23	128
≤ 1000 ≤ 800	○	○					~DIN 374	N R40	C	2B	HSS-E	S	10 - 32 - 1 - 12	1838	25	131
≤ 800							~DIN 374	N R40	C	2B	HSS-E	●	3 - 56 - 1 - 12	2846	23	128
≤ 1000 ≤ 800	○	○					~DIN 374	N R40	C	2B	HSS-E	●	10 - 32 - 7/8 - 14	2859	24	129
≤ 1000 ≤ 800	•						~DIN 374	VA	B	2B	HSS-E	●	4 - 48 - 1 - 12	2874	229	260
	•						~DIN 374	VA R15	C	2B	HSS-E	●	5 - 44 - 1 - 12	1991	230	261
	•						~DIN 374	VA R15	C	2B	HSS-E	S	5 - 44 - 1 - 12	2898	230	261
	•		•				~DIN 374	VA R40	C	2B	HSS-E	○	1/4 - 28 - 1 - 12	2867	231	262
	•						~DIN 374	VA R40	C	2B	HSS-E	●	10 - 32 - 1 - 12	2868	231	262
		•					~DIN 374	GG	C	2B	HSS-E	A	10 - 32 - 7/8 - 14	1082	350	373
		•					~DIN 374	GG	C	2B	HSS-E	■	4 - 48 - 1 - 12	1989	349	372
				•			~DIN 371	Ti Ni	B	2BX	HSS-E-PM	A	6 - 40 - 3/8 - 24	2919	596	614
				•			~DIN 371-374	Ti R15	C	2BX	HSS-E-PM	C	4 - 48 - 5/8 - 18	2914	597	617
				•			~DIN 371-374	Ti R15	C	3BX	HSS-E-PM	C	6 - 40 - 5/8 - 18	1064	597	618
				•			~DIN 371-374	Ni R10	C	2BX	HSS-E-PM	A	4 - 48 - 5/8 - 18	2923	597	616
				•			~DIN 371-374	Ni R10	C	3BX	HSS-E-PM	A	6 - 40 - 5/8 - 18	1068	597	618
				•			~DIN 371-374	Ti Ni	B	3BX	HSS-E-PM	C	6 - 40 - 5/8 - 18	1060	596	615
		•					DIN 5156	GG	C		HSS-E	■	G1/16 - G2	961	349	374

Machos para rosca gás Whitworth

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤ 800							DIN 5156	N	C		HSS-E	○	G 1/16 - G2	963	18	133
≤ 800							DIN 5156	N	B		HSS-E	○	G 1/16 - G2	962	19	132
≤ 1000	●		●				DIN 5156	N	B		HSS-E	○	G 1/16 - G1	967	229	263
≤ 1000	○						DIN 5156	N	B		HSS-E	A	G 1/8 - G2	2886	20	140
≤ 1000	○						DIN 5156	N	B		HSS-E	●	G 1/8 - G2	2887	20	140
≤ 800							DIN 5156	N	B		HSS-E	●	G 1/16 - G2	2894	19	132
●	●	○	○	○			DIN 5156	N	B		HSS-E	S	G 1/16 - G1	4220	21	134
≤ 1000	○	○					DIN 5156	N R15	E		HSS-E	C	G 1/16 - G1	4158	23	135
≤ 800							DIN 5156	N R15	C		HSS-E	○	G 1/16 - G1	964	22	135
≤ 800							DIN 5156	N R15	C		HSS-E	●	G 1/16 - G1	2842	22	135
≤ 1000	○	○					DIN 5156	N R40	C		HSS-E	S	G 1/8 - G1	937	25	141
≤ 800							DIN 5156	N R40	C		HSS-E	○	G 1/16 - G1 1/2	965	23	136
≤ 800							DIN 5156	N R40	C		HSS-E	●	G 1/16 - G1 1/2	2849	23	136
≤ 1000	○	○	○				DIN 5156	N R40	C		HSS-E	○	G 1/8 - G2	2860	24	137
≤ 1000	○	○					DIN 5156	N R40	C		HSS-E	●	G 1/8 - G2	2861	24	137
≤ 1000	●						DIN 5156	VA	B		HSS-E	●	G 1/16 - G1	2875	229	263
	●						DIN 5156	VA R40	C		HSS-E	●	G 1/16 - G1 1/2	968	231	265
	●		●				DIN 5156	VA R40	C		HSS-E-PM	○	G 1/16 - G1 1/2	939	231	265
●	●	○	○	○			DIN 5156	VA R45	C		HSS-E	A	G 1/16 - G1	395	25	139
●	●	○	●	○			DIN 5156	VA R50	C		HSS-E-PM	S	G 1/16 - G 1/2	4159	25	138

Machos para rosca BSW

≤ 800							~DIN 371	N	B		HSS-E	●	W 1/8 - W 3/8	2892	19	142
≤ 800							~DIN 371	N R40	C		HSS-E	●	W 1/8 - W 3/8	2847	23	143
≤ 800							~DIN 376	N	B		HSS-E	●	W 7/16 - W1	2893	19	142

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Toleância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
Machos para rosca BSW																
≤ 800							~DIN 376	N R40	C		HSS-E		W 3/8 - W1	2848	23	143
Machos para rosca EG																
≤ 1000	○						DIN 40435	N	B		HSS-E	S	EG M 4 - EG M16	1010	20	144
≤ 1000	○	○					DIN 40435	N R40	C		HSS-E	S	EG M 4 - EG M16	1011	24	145
Machos para rosca NPT																
≤ 800							WN	N	C		HSS-E		1/16 - 2	973	18	146
	●	○	○				WN	N	C		HSS-E		1/16 - 1	1087	230	268
	●	○	○				WN	N	C		HSS-E	S	1/16 - 1	1088	230	268
Machos para rosca NPTF																
	●	○	○				WN	N	C		HSS-E	S	1/16 - 1	4127	230	269
Machos para rosca gás blindada																
≤ 800							DIN 40432	N	C		HSS-E		PG7 - PG29	979	18	147
≤ 800							DIN 40432	N	B		HSS-E		PG7 - PG29	980	19	147
Machos laminadores para rosca métrica ISO																
●	●		○	○			~DIN 371	N	C	6HX	HSS-E-PM	S	M 3 - M10	322	27	154
●	●		○	○			~DIN 371	N	C	6HX	HSS-E-PM	S	M 5 - M10	323	27	158
●	●		○	○			~DIN 376	N	C	6HX	HSS-E-PM	S	M12 - M16	339	27	154
●	●		○	○			~DIN 376	N	C	6HX	HSS-E-PM	S	M12 - M16	342	27	158
●	●		○	○			~DIN 371	N	C	6HX	HSS-E	S	M 3 - M10	919	26	152
●	●		○	○			~DIN 371	N	C	6HX	HSS-E-PM	S	M 3 - M10	1266	27	155
●	●		○	○			~DIN 371	N	C	6GX	HSS-E	S	M 3 - M10	918	26	153
●	●		○				~DIN 371	N	C	6HX	HSS-E-PM	S	M 1 - M10	1255	26	149
●	●		○				~DIN 371	N	C	6GX	HSS-E-PM	S	M 1 - M10	903	26	149
●	●		○				~DIN 371	N	C	6GX	HSS-E	S	M 2 - M10	920	26	150
●	●		○				~DIN 371	N	C	6HX	HSS-E	S	M 1 - M10	921	26	149

Machos laminadores para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
•	•		○	○			~DIN 376	N	C	6HX	HSS-E	S	M 6 - M39	923	26	152
•	•		○	○			~DIN 376	N	C	6GX	HSS-E	S	M 6 - M39	922	26	153
•	•		○				~DIN 376	N	C	6HX	HSS-E	S	M12 - M20	925	26	149
•	•		○				~DIN 376	N	C	6HX	HSS-E-PM	S	M12 - M20	1256	26	149
•	•		○				~DIN 376	N	C	6GX	HSS-E-PM	S	M12 - M20	952	26	149
•	•		○	○			~DIN 376	N	C	6HX	HSS-E-PM	S	M12 - M20	1267	27	155
•	•		≥ 7	•			~DIN 371	N	C	6HX	HSS-E-PM	C	M 3 - M10	1270	27	159
•	•		≥ 7	•			~DIN 371	N	C	6GX	HSS-E-PM	C	M 5 - M10	1713	27	160
•	•		≥ 7	○			~DIN 376	N	C	6HX	HSS-E-PM	C	M12 - M20	1271	27	159
			•				~DIN 371	N	C	6HX	HSS-E-PM	Cb	M 1 - M10	1347	466	506
			•				~DIN 371	N	C	6GX	HSS-E-PM	Cb	M 2 - M10	1565	466	508
			•				~DIN 376	N	C	6HX	HSS-E-PM	Cb	M12 - M20	1566	466	506
			•				~DIN 376	N	C	6GX	HSS-E-PM	Cb	M12 - M20	1567	466	508
•	•		≥ 7	•			~DIN 376	N	C	6HX	VHM	C	M12 - M20	1931	27	163
•							~DIN 371	N	C	6HX	HSS-E	P	M 3 - M10	1587	26	152
•							~DIN 371	N	C	6HX	HSS-E-PM	P	M 3 - M10	1599	27	155
•							~DIN 371	N	C	6GX	HSS-E	P	M 3 - M10	1588	26	153
•							~DIN 371	N	C	6GX	HSS-E-PM	P	M 3 - M10	1705	27	153
•							~DIN 376	N	C	6HX	HSS-E	P	M 6 - M39	1589	26	152
•							~DIN 376	N	C	6HX	HSS-E-PM	P	M12 - M20	1707	27	155
•							~DIN 376	N	C	6GX	HSS-E	P	M 6 - M20	1590	26	153
•							~DIN 376	N	C	6GX	HSS-E-PM	P	M 6 - M20	1708	27	153
•	•			•			~DIN 371	N	C	6HX	HSS-E-PM	A	M 3 - M10	1717	27	159
•	•			•			~DIN 371	N	C	6GX	HSS-E-PM	A	M 3 - M10	1718	27	161

Machos laminadores para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
•	•			•			~DIN 376	N	C	6HX	HSS-E-PM	A	M12 - M20	1719	27	159
•	•			•			~DIN 376	N	C	6GX	HSS-E-PM	A	M12 - M20	1720	27	161
•	•		○	○			~DIN 371	N	C	6HX	HSS-E	S	M 5 - M10	2442	27	156
•	•		○	○			~DIN 371	N	C	6GX	HSS-E	S	M 5 - M10	2443	27	156
•	•		○	○			~DIN 371	N	E	6HX	HSS-E-PM	S	M 3 - M10	1725	27	159
•	•		○	○			~DIN 371	N	E	6GX	HSS-E-PM	S	M 3 - M10	1726	27	161
•	•		○	○			~DIN 376	N	C	6HX	HSS-E	S	M12 - M16	2444	27	156
•	•		○	○			~DIN 376	N	C	6GX	HSS-E	S	M12 - M16	2445	27	156
•	•		○	○			~DIN 376	N	E	6HX	HSS-E-PM	S	M12 - M20	1727	27	159
•	•		○	○			~DIN 376	N	E	6GX	HSS-E-PM	S	M12 - M20	1728	27	161
•	•		≥ 7	•			~DIN 371	N	E	6HX	VHM	C	M 3 - M10	1927	27	164
•	•		≥ 7	•			~DIN 371	N	C	6HX	VHM	C	M 3 - M10	1972	27	163
•	•		≥ 7	○			~DIN 376	N	C	6HX	HSS-E	C	M 6 - M39	2013	26	152
•	•		≥ 7	○			~DIN 371	N	C	6HX	HSS-E	C	M 3 - M10	2012	26	152
•	•		≥ 7	○			~DIN 371	N	C	6HX	HSS-E	C	M 5 - M10	2446	27	156
•	•		≥ 7	○			~DIN 371	N	C	6GX	HSS-E	C	M 5 - M10	2447	27	157
•	•		≥ 7	○			~DIN 376	N	C	6HX	HSS-E	C	M12 - M16	2448	27	156
			•				~DIN 371/376	N	C	6HX	HSS-E	Cb	M 5 - M20	2515	467	517
•	•		≥ 7	○			~DIN 371/376	N	C	6HX	VHM	S	M 5 - M16	2518	26	151
•	•		○	○		 ≤M5		N	C	6HX	HSS-E-PM	S	M 3 - M20	4143	27	162
			•				~DIN 371/376	N	C	6GX	HSS-E	Cb	M 5 - M20	4146	467	520

Machos laminadores para rosca métrica fina ISO

•	•		○	○			~DIN 374	N	C	6HX	HSS-E-PM	S	M 8 X1 - M20 X1,5	333	27	173
•	•		○	○			~DIN 374	N	C	6HX	HSS-E-PM	S	M 8 X1 - M16 X1,5	338	27	177

Machos laminadores para rosca métrica fina ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
•	•		○	○			~DIN 371	N	C	6HX	HSS-E	S	M 6 X0,75 - M10 X1,25	1275	26	169
•	•		○	○			~DIN 371	N	C	6GX	HSS-E	S	M 8 X1 - M10 X1	1277	26	172
•	•		○				~DIN 371	N	C	6HX	HSS-E-PM	S	M 8 X1 - M10 X1	1257	26	166
•	•		○				~DIN 371	N	C	6GX	HSS-E-PM	S	M 8 X1 - M10 X1,25	1740	26	167
•	•		○	○			~DIN 374	N	C	6HX	HSS-E	S	M 6 X0,75 - M24 X1,5	927	26	169
•	•		○	○			~DIN 374	N	C	6GX	HSS-E	S	M 8 X1 - M20 X1,5	926	26	172
•	•		○				~DIN 374	N	C	6HX	HSS-E	S	M 8 X1 - M20 X1,5	929	26	165
•	•		○				~DIN 374	N	C	6HX	HSS-E-PM	S	M12 X1 - M24 X2	1258	26	166
•	•		○				~DIN 374	N	C	6GX	HSS-E	S	M 8 X1 - M18 X1,5	928	26	168
•	•		○	○			~DIN 374	N	C	6HX	HSS-E-PM	S	M12 X1,25 - M24 X2	1269	27	174
•	•		○	○			~DIN 371	N	C	6HX	HSS-E-PM	S	M 8 X1 - M10 X1	1268	27	174
•	•		≥ 7	•			~DIN 371	N	C	6HX	HSS-E-PM	C	M 8 X1 - M10 X1,25	1272	27	178
•	•		≥ 7	•			~DIN 371	N	C	6GX	HSS-E-PM	C	M 8 X1 - M10 X1,25	1715	27	179
•	•		≥ 7	•			~DIN 374	N	C	6HX	HSS-E-PM	C	M12 X1 - M24 X1,5	1273	27	178
			•				~DIN 371	N	C	6HX	HSS-E-PM	Cb	M 8 X1 - M10 X1	1568	466	526
			•				~DIN 371	N	C	6GX	HSS-E-PM	Cb	M 8 X1 - M10 X1	1569	466	529
			•				~DIN 374	N	C	6GX	HSS-E-PM	Cb	M12 X1 - M24 X1,5	1580	466	529
•	•		≥ 7	•			~DIN 371/376	N	C	6HX	VHM	C	M10 X1 - M24 X1,5	1581	27	181
•							~DIN 374	N	C	6HX	HSS-E	P	M 6 X0,75 - M24 X1,5	1593	26	169
•							~DIN 374	N	C	6HX	HSS-E-PM	P	M12 X1 - M24 X1,5	1711	27	175
•							~DIN 374	N	C	6GX	HSS-E-PM	P	M12 X1 - M24 X1,5	1712	27	176
•							~DIN 371	N	C	6HX	HSS-E	P	M 6 X0,75 - M10 X1,25	1591	26	169
•							~DIN 371	N	C	6GX	HSS-E	P	M 8 X1 - M10 X1	1592	26	171
•							~DIN 371	N	C	6GX	HSS-E-PM	P	M 8 X1 - M10 X1	1710	27	176

Machos laminadores para rosca métrica fina ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
•	•		≥ 7	•			~DIN 374	N	C	6GX	HSS-E-PM	C	M12 X1 - M24 X1,5	1716	27	179
•	•			•			~DIN 371	N	C	6HX	HSS-E-PM	A	M 8 X1 - M10 X1,25	1721	27	178
•	•			•			~DIN 374	N	C	6HX	HSS-E-PM	A	M12 X1 - M24 X1,5	1723	27	178
•	•		○	○			~DIN 371	N	E	6HX	HSS-E-PM	S	M 8 X1 - M10 X1,25	1729	27	178
•	•		○	○			~DIN 371	N	E	6GX	HSS-E-PM	S	M 8 X1 - M10 X1,25	1730	27	179
•	•		○	○			~DIN 374	N	E	6HX	HSS-E-PM	S	M12 X1 - M24 X1,5	1731	27	178
•	•		○	○			~DIN 374	N	E	6GX	HSS-E-PM	S	M12 X1 - M24 X1,5	1732	27	179
•	•		≥ 7	○			~DIN 374	N	C	6HX	HSS-E	C	M 6 X0,75 - M20 X1,5	2008	26	170
•	•		○	○				N	C	6HX	HSS-E-PM	S	M 8 X1 - M16 X1,5	4145	27	180
			•				~DIN 371-374	N	C	6HX	HSS-E	Cb	M 8 X1 - M16 X1,5	4147	467	537
			•				~DIN 371-374	N	C	6GX	HSS-E	Cb	M 8 X1 - M16 X1,5	4151	467	539

Machos laminadores para rosca UNC

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
•	•		○	○			~DIN 371	N	C	2BX	HSS-E	S	4 - 40 - 3/8 - 16	1582	26	182
•	•		○				~DIN 371	N	C	2BX	HSS-E	S	4 - 40 - 3/8 - 16	2273	26	182
•	•		○	○			~DIN 376	N	C	2BX	HSS-E	S	7/16 - 14 - 7/8 - 9	1583	26	182
•	•		○				~DIN 376	N	C	2BX	HSS-E	S	7/16 - 14 - 7/8 - 9	2274	26	182

Machos laminadores para rosca UNF

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
•	•		○	○			~DIN 374	N	C	2BX	HSS-E	S	10 - 32 - 1 - 12	1585	26	183
•	•		○				~DIN 374	N	C	2BX	HSS-E	S	10 - 32 - 1 - 12	2275	26	183
•	•		○				~DIN 371	N	C	2BX	HSS-E	S	4 - 48 - 3/8 - 24	1283	26	183
•	•		○	○			~DIN 371	N	C	2BX	HSS-E	S	4 - 48 - 3/8 - 24	1584	26	183

Machos laminadorespara rosca Gás Whitworth

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
•	•		○				DIN 2189	N	C		HSS-E	S	G 1/16 - G1 1/4	966	26	184
•	•		○	○			DIN 2189	N	C		HSS-E	S	G 1/16 - G 3/4	1586	26	184
			•				DIN 2189	N	C		HSS-E	Cb	G 1/16 - G1	4152	467	546

Fresas para rosca métrica ISO sem chanfro

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
○	○	●	●				WN	TM SP			VHM	◯	M 6 - M20 X1,5	3734	468	548
●	○	●	●	○	≤55		WN	TM SP			VHM	C	M 6 - M20	3735	28	187
●	○	●	●	○	≤55		WN	TM SP			VHM	C	M 6 - M20 X1,5	3737	28	186
●	○	●	●	○	≤55		WN	TM SP			VHM	C	M 6 - M20	3740	28	187
●	○	●	●	○	≤55		WN	TM SP			VHM	C	M 6 - M20 X1,5	3743	28	186
●	○	●	●	○	≤55		WN	TM SP			VHM	C	M 6 - M20	4132	28	186
●	○	●	●	○	≤55		WN	TM SP			VHM	C	M 6 - M20	4133	28	186
○	○	●	●	○			WN	TMC SP			VHM	◯	M 3 - M20	3510	469	551
○	○	●	●	○			WN	TMC SP			VHM	◯	M 3 - M20	3511	469	552
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 3 - M20	3525	28	188
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 3 - M20	3526	29	189
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 3 - M20	3543	28	188
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 3 - M20	3544	29	189
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 3 - M20	3759	29	190
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 3 - M20	3760	29	190

Fresas para rosca métrica fina ISO com chanfro

○	○	●	●	○			WN	TMC SP			VHM	◯	M 4 X0,5 - M16 X1,5	3512	469	554
○		●	●				WN	TMC SP			VHM	◯	M 4 X0,5 - M16 X1,5	3513	469	555
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 4 X0,5 - M16 X1,5	3527	28	191
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 4 X0,5 - M16 X1,5	3528	29	192
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 4 X0,5 - M16 X1,5	3545	28	191
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 4 X0,5 - M16 X1,5	3546	29	192
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 4 X0,5 - M16 X1,5	3762	29	193
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	M 4 X0,5 - M16 X1,5	3763	29	193

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Toleran-cia do Ø	Material de corte	Su-perfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
Fresas para rosca UNC sem chanfro																
●	○	●	●	○	≤55		WN	TM SP			VHM	C	10 - 24 - 5/8 - 11	4134	28	194
●	○	●	●	○	≤55		WN	TM SP			VHM	C	10 - 24 - 5/8 - 11	4135	28	194
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	1/4 - 20 - 1/2 - 13	3516	28	195
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	1/4 - 20 - 1/2 - 13	3517	29	196
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	1/4 - 20 - 1/2 - 13	3534	28	195
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	1/4 - 20 - 1/2 - 13	3535	29	196
Fresas para rosca UNF sem chanfro																
●	○	●	●	○	≤55		WN	TM SP			VHM	C	10 - 32 - 5/8 - 18	4136	28	197
●	○	●	●	○	≤55		WN	TM SP			VHM	C	10 - 32 - 5/8 - 18	4137	28	197
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	1/4 - 28 - 1/2 - 20	3518	28	198
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	1/4 - 28 - 1/2 - 20	3519	29	199
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	1/4 - 28 - 1/2 - 20	3536	28	198
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	1/4 - 28 - 1/2 - 20	3537	29	199
Fresas para rosca gás Whitworth sem chanfro																
●	○	●	●	○	≤55		WN	TM SP			VHM	C	G 1/8 - G 3/8	3745	28	200
●	○	●	●	○	≤55		WN	TM SP			VHM	C	G 1/8 - G 3/8	3746	28	201
●	○	●	●	○	≤55		WN	TM SP			VHM	C	G 1/8 - G 3/8	3748	28	200
●	○	●	●	○	≤55		WN	TM SP			VHM	C	G 1/8 - G 3/8	3750	28	201
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	G 1/8 - G 3/8	3514	28	202
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	G 1/8 - G 3/8	3515	29	203
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	G 1/8 - G 3/8	3529	28	202
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	G 1/8 - G 3/8	3533	29	203
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	G 1/8 - G 3/8	3765	29	204
●	●	●	●	●	≤55		WN	TMC SP			VHM	C	G 1/8 - G 3/8	3766	29	204

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
Fresas para rosca NPT sem chanfro																
•	•	•	•	•	≤55		WN	TM SP			VHM	C	1/16 - 3/8	3753	28	205
•	•	•	•	•	≤55		WN	TM SP			VHM	C	1/16 - 3/8	3754	28	205
•	•	•	•	•	≤55		WN	TMC SP			VHM	C	1/8 - 3/8	3520	28	206
•	•	•	•	•	≤55		WN	TMC SP			VHM	C	1/8 - 3/8	3538	28	206
Fresas para rosca NPTF sem chanfro																
•	•	•	•	•	≤55		WN	TM SP			VHM	C	1/16 - 3/8	3756	28	207
•	•	•	•	•	≤55		WN	TM SP			VHM	C	1/16 - 3/8	3757	28	207
•	•	•	•	•	≤55		WN	TMC SP			VHM	C	1/8 - 3/8	3521	28	208
•	•	•	•	•	≤55		WN	TMC SP			VHM	C	1/8 - 3/8	3539	28	208
Fresas para roscas multiuso, para rosca gás Whitworth																
○	○	•	•	○			WN	TM SP	BSP		VHM	○	≥ 1/4 - ≥ 1	3524	470	575
•	•	•	•	•	≤55		WN	TM SP	BSP		VHM	C	≥ 1/4 - ≥ 1	3542	29	212
•	•	•	•	•	≤55		WN	TM SP	BSP		VHM	C	≥ 1/4 - ≥ 1	3557	29	212
•	•	•	•	•	≤55		WN	TM SP	NPT		VHM	C	≥ 1/2 - ≥ 1	3768	69	213
•	•	•	•	•	≤55		WN	TM SP	NPT		VHM	C	≥ 1/2 - ≥ 1	3769	69	213
•	•	•	•	•	≤55		WN	TM SP	NPTF		VHM	C	≥ 1/2 - ≥ 1	3772	29	214
•	•	•	•	•	≤55		WN	TM SP	NPTF		VHM	C	≥ 1/2 - ≥ 1	3773	29	214
○	○	•	•	○			WN	TMU SP	M		VHM	○	≥ 10 - ≥ 30	3523	470	572
•	•	•	•	•	≤55		WN	TMU SP	M		VHM	C	≥ 10 - ≥ 30	3541	29	209
•	•	•	•	•	≤55		WN	TMU SP	M		VHM	C	≥ 10 - ≥ 30	3556	29	209
•	•	•	•	•	≤55		WN	TMU SP	M		VHM	C	≥ 3 - ≥ 24	4162	29	210
•	•	•	•	•	≤55		WN	TMU SP	M		VHM	C	≥ 3 - ≥ 24	4163	29	210
•	•	•	•	•	≤55		WN	TMU UN	UN		VHM	C	≥ 1/2 - ≥ 1	3595	29	211
•	•	•	•	•	≤55		WN	TMU UN	UN		VHM	C	≥ 1/2 - ≥ 1	3596	29	211

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
Micro-fresas de rosquear																
•	•	•	•	•			WN	SP G	BSP		VHM	C	G 1/8 - G2	4228	29	216
•	•	•	•	•			WN	SP M	M		VHM	C	M 1,6 - M16	4226	29	215
				○	•		WN	SP M	M		VHM	A	M 2 - M12	4227	679	703
•	•	•	•	•			WN	SP M/MF	M		VHM	C	M1,4 - M1,8 - M8 - M10	4225	29	217
Fresas para roscas, para rosca métrica ISO																
		○	•				WN	DTMC SP	M		VHM		M3 - M16	3774	471	581
		○	•				WN	DTMC SP	M		VHM		M3 - M16	3775	471	581
		•	•				WN	DTMC SP	M		VHM	C	M3 - M16	3776	471	581
		•	•				WN	DTMC SP	M		VHM	C	M3 - M16	3777	471	581
		○	•				WN	DTMC SP	M		VHM		M3 - M16	3778	471	582
		○	•				WN	DTMC SP	M		VHM		M3 - M16	3779	471	582
		•	•				WN	DTMC SP	M		VHM	C	M3 - M16	3780	471	582
		•	•				WN	DTMC SP	M		VHM	C	M3 - M16	3781	471	582
		○	•				WN	DTMC SP	M		VHM		M3 - M16	3782	471	583
		○	•				WN	DTMC SP	M		VHM		M3 - M16	3783	471	583
		•	•				WN	DTMC SP	M		VHM	C	M3 - M16	3784	471	583
		•	•				WN	DTMC SP	M		VHM	C	M3 - M16	3785	471	583
		○	•				WN	DTMC SP	MF		VHM		M4 x 0,5 - M16 x 1,5	3787	471	584
		•	•				WN	DTMC SP	MF		VHM	C	M4 x 0,5 - M16 x 1,5	3788	471	584
		•	•				WN	DTMC SP	MF		VHM	C	M4 x 0,5 - M16 x 1,5	3789	471	584
		○	•				WN	DTMC SP	MF		VHM		M4 x 0,5 - M16 x 1,5	3790	471	585
		○	•				WN	DTMC SP	MF		VHM		M4 x 0,5 - M16 x 1,5	3791	471	585
		•	•				WN	DTMC SP	MF		VHM	C	M4 x 0,5 - M16 x 1,5	3792	471	585
		•	•				WN	DTMC SP	MF		VHM	C	M4 x 0,5 - M16 x 1,5	3793	471	585

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Toleância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
Fresas para roscas, para rosca métrica ISO																
		•	•				WN	DTMC SP	UNC		VHM	○	1/4 - 20 - 5/8 - 11	4138	471	586
		•	•				WN	DTMC SP	UNC		VHM	C	1/4 - 20 - 5/8 - 11	4139	471	586
		•	•				WN	DTMC SP	UNF		VHM	○	1/4 - 28 - 5/8 - 18	4140	471	587
		•	•				WN	DTMC SP	UNF		VHM	C	1/4 - 28 - 5/8 - 18	4141	471	587
Cossinetes p. máquinas automáticas p. rosca métrica ISO																
≤ 1000		•	•				WN		B	6g	HSS	○	M 3 - M12	121	706	707
≤ 1000		•	•				WN		B	6g	HSS	○	M 2 - M10	125	706	708
Cossinetes para rosca métrica ISO																
≤ 1000		•	•				DIN EN 22568		B	6g	HSS	○	M 1 - M30	151	706	710
≤ 1000		•	•				DIN EN 22568		B	6g	HSS	○	M 3 - M30	152	706	711
≤ 1000		•	•				DIN EN 22568		B	6g	HSS	○	M 1 - M30	153	706	710
≤ 1000		•	•				DIN EN 22568		B	6g	HSS	○	M 3 - M20	156	706	713
≤ 1000		•	•				DIN 382			6g	HSS	○	M 5 - M52	139	706	709
≤ 1200	•						DIN EN 22568		B	6g	HSS-E	●	M 2 - M20	130	706	712
Cossinetes para rosca métrica fina ISO																
≤ 1000		•	•				DIN EN 22568		B	6g	HSS	○	M 3 X0,35 - M30 X2	161	706	714
≤ 1000		•	•				DIN EN 22568		B	6g	HSS	○	M 3 X0,35 - M30 X2	162	706	714
Cossinetes para rosca UNC																
≤ 1000		•	•				DIN EN 22568		B	2a	HSS	○	8 -32 - 3/4 -10	182	706	716
Cossinetes para rosca UNF																
≤ 1000		•	•				DIN EN 22568		B	2a	HSS	○	10 - 32 - 7/8 - 14	185	706	717
Cossinetes para rosca gás Whitworth																
≤ 1000		•	•				DIN EN 24231		B		HSS	○	G 1/8 - G1 1/2	175	706	718
≤ 1000		•	•				DIN EN 24231		B		HSS	○	G 1/8 - G1 1/2	176	706	718
Cossinetes para rosca R BSPT																
≤ 1000		•	•				DIN EN 24230		B		HSS	○	R 1/8 - R 1/2	198	706	719

Cossinetes para rosca NPT

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
□1000		•	•				DIN EN 22568		B		HSS	○	1/8 - 3/4	191	706	720

Machos manuais para rosca métrica ISO

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Tolerância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
≤800			○				DIN 352	N		ISO2/6H	HSS	○	M 1 - M68	861		721
≤800			○				DIN 352	N	A	ISO2/6H	HSS	○	M 1 - M68	862		721
≤800			○				DIN 352	N	D	ISO2/6H	HSS	○	M 1 - M68	863		721
≤800			○				DIN 352	N	C	ISO2/6H	HSS	○	M 1 - M45	864		721
≤800			○				DIN 352	N		ISO2/6H	HSS	○	M 1 - M45	882		723
≤800			○				DIN 352	N	D	ISO2/6H	HSS	○	M 1 - M45	883		723
≤800			○				DIN 352	N		ISO2/6H	HSS	○	M 2 - M18	904		724
≤800			○				DIN 352	N-LH	A	ISO2/6H	HSS	○	M 2 - M18	905		724
≤800			○				DIN 352	N-LH	D	ISO2/6H	HSS	○	M 2 - M18	906		724
≤800			○				DIN 352	N-LH	C	ISO2/6H	HSS	○	M 2 - M18	907		724
•	•	•	•				DIN 352	H		ISO2/6H	HSS-E	●	M 2 - M20	857		726
•	•	•	•				DIN 352	H	A	ISO2/6H	HSS-E	●	M 2 - M20	858		726
•	•	•	•				DIN 352	H	D	ISO2/6H	HSS-E	●	M 2 - M20	859		726
•	•	•	•				DIN 352	H	C	ISO2/6H	HSS-E	●	M 2 - M20	860		726
≤1000	•	•	•				DIN 352	VA		ISO2/6H	HSS-E	○	M 2 - M20	853		725
≤1000	•	•	•				DIN 352	VA	A	ISO2/6H	HSS-E	○	M 2 - M20	854		725
≤1000	•	•	•				DIN 352	VA	D	ISO2/6H	HSS-E	○	M 2 - M20	855		725
≤1000	•	•	•				DIN 352	VA	C	ISO2/6H	HSS-E	○	M 2 - M20	856		725
•	•	•	•				DIN 352	H		ISO2/6H	HSS-E-PM	●	M 3 - M12	1818		727
•	•	•	•				DIN 352	H	A	ISO2/6H	HSS-E-PM	●	M 3 - M12	1819		727
•	•	•	•				DIN 352	H	D	ISO2/6H	HSS-E-PM	●	M 3 - M12	1820		727
•	•	•	•				DIN 352	H	C	ISO2/6H	HSS-E-PM	●	M 3 - M12	1821		727

P	M	K	N	S	H	Werkzeug-Darstellung	Norma	Tipo	Forma	Toleância do Ø	Material de corte	Superfície	d1/mm	Artigo Nr.	Página de dados de corte	Página
Machos manuais para rosca métrica fina ISO																
≤ 800 N/mm²			○				DIN 2180	N		ISO2/6H	HSS	◯	M 2 X0,25 - M52 X1,5	884		728
≤ 800 N/mm²			○				DIN 2180	N	D	ISO2/6H	HSS	◯	M 2 X0,25 - M52 X1,5	885		728
≤ 800 N/mm²			○				DIN 2180	N	C	ISO2/6H	HSS	◯	M 2 X0,25 - M52 X1,5	886		728
Machos manuais para rosca UNC																
≤ 800 N/mm²			○				~DIN 352	N		2B	HSS	◯	1 -64 - 2- 4 1/2	981		730
≤ 800 N/mm²			○				~DIN 352	N	A	2B	HSS	◯	1 -64 - 2- 4 1/2	982		730
≤ 800 N/mm²			○				~DIN 352	N	D	2B	HSS	◯	1 -64 - 2- 4 1/2	983		730
≤ 800 N/mm²			○				~DIN 352	N	C	2B	HSS	◯	1 -64 - 2- 4 1/2	984		730
Machos manuais para rosca UNF																
≤ 800 N/mm²			○				~DIN 2181	N		2B	HSS	◯	1 -72 - 1 -12	985		731
≤ 800 N/mm²			○				~DIN 2181	N	D	2B	HSS	◯	1 -72 - 1 -12	986		731
≤ 800 N/mm²			○				~DIN 2181	N	C	2B	HSS	◯	1 -72 - 1 -12	987		731
Machos manuais para rosca BSW																
≤ 800 N/mm²			○				~DIN 352	N			HSS	◯	W 3/32 - W2	954		732
≤ 800 N/mm²			○				~DIN 352	N	A		HSS	◯	W 3/32 - W2	955		732
≤ 800 N/mm²			○				~DIN 352	N	D		HSS	◯	W 3/32 - W2	956		732
≤ 800 N/mm²			○				~DIN 352	N	C		HSS	◯	W 3/32 - W2	957		732
Machos manuais para rosca gás																
≤ 800 N/mm²			○				DIN 5157	N			HSS	◯	G 1/8 - G2	958		733
≤ 800 N/mm²			○				DIN 5157	N	D		HSS	◯	G 1/8 - G2	959		733
≤ 800 N/mm²			○				DIN 5157	N	C		HSS	◯	G 1/8 - G2	960		733

Mandrís para Rosqueamento Sincronizado com refrig. interna

Representação da ferramenta		Forma da haste	Gama de diâmetros de fixação	Nr. do artigo	Página
	HSK-A Mandril Hidráulico para Rosqueamento Sincronizado com refrig. interna	HSK-A	HSK-A 63 - HSK-A 100	**4601**	742
	Mandril Hidráulico Cone ISO para Rosqueamento Sincronizado c. refrig. interna	SK	SK 30 - SK 40	**4576**	743
	MAS / BT Mandril Hidráulico para Rosqueamento Sincronizado c. refrig. interna	BT	BT 30 - BT 40	**4577**	744
	Mandril Hidráulico com haste reta, p. Rosqueamento Sincron. c. refrig. interna	cyl.	20,000 - 25,000	**4525**	745
	Bucha de redução selada, para mandril hidráulico para Rosqueamento Sincronizado		12,000 / 20,000	**4605**	746
	Bucha de redução GÜHROJET para Mandril Hidráulico para Rosqueamento sincronizado		12,000 / 20,000	**4606**	748
	Parafusos de ajuste „faces“ Mandril Synchro para refrigeração interna		ER20 - ER32	**4364**	750
	Mandril com haste reta, para Rosqueamento Sincronizado - mandris de sangria Synchro com haste reta	cyl.	25,000	**4326**	751
	HSK-A Mandril para Rosqueamento Sincronizado	HSK-A	HSK-A 63 - HSK-A 100	**4327**	751
	Pinças para machos		ER16 - ER40	**4308**	753
	Adaptadores básicos HSK-A para mandrís porta-machos	HSK-A	HSK-A 50 - HSK-A 100	**4343**	754
	Mandrís porta-machos de troca rápida sem refrigeração interna		M3 - M20	**4340**	754
	Mandrís porta-machos com refrigeração interna		M3 - M20	**4342**	755
	Mandrís porta-machos de troca rápida HSK-A com refrigeração interna	HSK-A	HSK-A 63	**4328**	755
	Adaptadores para mandrís porta machos de troca rápida		M3 - M20	**4206**	756

Mandrís MQL

Representação da ferramenta		Forma da haste	Gama de diâmetros de fixação	Nr. do artigo	Página
	Mandrís hidráulicos Syncro MQL HSK-A (para troca automática de ferramentas)	HSK-A	HSK-A 63 - HSK-A 100	**4602**	760
	MQL 2 canais HSK-A Mandril Hidráulico para Rosqueamento Sincronizado (para torca automática de ferramentas)	HSK-A	HSK-A 63 - HSK-A 100	**4603**	761
	MQL HSK-A Mandril Hidráulico para Rosqueamento Sincronizado (para troca de ferramenta manual)	HSK-A	HSK-A 63 - HSK-A 100	**4604**	762
	MQL Mandril Hidráulico para Rosqueamento Sincronizado com refrigeração interna	cyl.	20,000	**4524**	763
	MQL Mandril HSK-A para Rosqueamento Sincronizado e troca manual de ferramentas	HSK-A	HSK-A 63	**4298**	764
	MQL 1 canal Mandril HSK-A Rosqueamento Sincronizado para troca automática de ferramentas	HSK-A	HSK-A 63 - HSK-A 100	**4330**	764
	MQL 1 canal Mandril HSK-A Rosqueamento Sincronizado para troca automática de ferramentas	HSK-A	HSK-A 63 - HSK-A 100	**4341**	765
	parafusos de ajuste MQL com cone interno para Mandril MQL Rosqueamento sincronizado		ER20 - ER32	**4305**	766
	MQL 1 canal conjunto de fornecimento de refrigerante para HSK-A	HSK-A	HSK-A 32 - HSK-A 100	**4508**	767
	MQL 2 canais conjunto de fornecimento de refrigerante para HSK-A	HSK-A	HSK-A 32 - HSK-A 100	**4511**	767
	Jogo de passagem da refrigeração HSK-A -MQL (unidade de enchimento)	HSK-A	HSK-A 32 - HSK-A 100	**4513**	768
	Porcas de fixação, sistema DIN ISO 15488		ER16 - ER40	**4306**	769
	Discos de vedação		ER16 - ER40	**4335**	770
	Chave de fixação		ER16 mini - ER40	**4913**	770

Nr. do artigo	Página	Profundidade do furo	Norma	Denominação	Material de corte	Tipo	Forma
57	47		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	H	B
58	47		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	H	B
59	246		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	VA R40	C
60	246		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	VA R40	C
121	707			Cossinetes p. máquinas automáticas p. rosca métrica ISO	HSS		B
125	708			Cossinetes p. máquinas automáticas p. rosca métrica ISO	HSS		B
130	712			Cossinetes para rosca métrica ISO	HSS-E		B
139	709			Cossinetes para rosca métrica ISO	HSS		
151	710			Cossinetes para rosca métrica ISO	HSS		B
152	711			Cossinetes para rosca métrica ISO	HSS		B
153	710			Cossinetes para rosca métrica ISO	HSS		B
156	713			Cossinetes para rosca métrica ISO	HSS		B
161	714			Cossinetes para rosca métrica fina ISO	HSS		B
162	714			Cossinetes para rosca métrica fina ISO	HSS		B
169	365		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	GG	C
174	70		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C(K)
175	718			Cossinetes para rosca gás Whitworth	HSS		B
176	718			Cossinetes para rosca gás Whitworth	HSS		B
182	716			Cossinetes para rosca UNC	HSS		B
185	717			Cossinetes para rosca UNF	HSS		B
191	720			Cossinetes para rosca NPT	HSS		B
196	70		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C(K)
198	719			Cossinetes para rosca R BSPT	HSS		B
273	109		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C(K)
297	78, 359, 479		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	H	C
302	78, 359, 479		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	H	C
313	33		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
315	33		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
316	93		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	B
318	358		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	GG	C
319	358		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	GG	C
322	154, 275, 380, 511, 620		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
323	158, 279, 384, 515, 622		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
333	173, 294, 399, 533, 629		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
338	177, 295, 400, 535, 631		~DIN 374	Machos laminadores p. rosca métr. fina ISO com canais de refrig.	HSS-E-PM	N	C
339	154, 275, 380, 511, 620		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
342	158, 279, 384, 515, 622		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
347	366		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	HSS-E	GG	C
361	82		DIN 371	Machos para rosca métrica ISO	HSS-E	H R40	C
362	82		DIN 376	Machos para rosca métrica ISO	HSS-E	H R40	C
393	71, 244		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E	VA R45	C
394	115, 252		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	VA R45	C
395	139, 267		DIN 5156	Machos para rosca gás Whitworth	HSS-E	VA R45	C
733	43		DIN 371	Machos para rosca métrica ISO	HSS-E	H	B
734	43		DIN 376	Machos para rosca métrica ISO	HSS-E	H	B
761	75, 247, 486		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	VA R50	C
763	75, 247, 486		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	VA R50	C
764	111, 255, 490		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E-PM	VA R50	C
767	74, 245, 485		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	N R50	C
778	79, 360, 480		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	H	C
779	80, 361, 481			Machos com canais de refrigeração para rosca métrica ISO	HSS-E	H	C
783	60		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
784	60		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
785	241		DIN 376	Machos para rosca métrica ISO	HSS-E	VA R15	C
786	62		DIN 371	Machos para rosca métrica ISO	HSS-E	N L40-LH	C
787	62		DIN 376	Machos para rosca métrica ISO	HSS-E	N L40-LH	C
788	483		DIN 371	Machos para rosca métrica ISO	HSS-E	H AZ	C
789	32		DIN 371	Machos para rosca métrica ISO	HSS-E	N-LH	B
790	32		DIN 376	Machos para rosca métrica ISO	HSS-E	N-LH	B
791	44		DIN 371	Machos para rosca métrica ISO	HSS-E	H AZ	B
792	240		DIN 376	Machos para rosca métrica ISO	HSS-E	VA AZ	B
794	36		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
795	52		DIN 371	Machos para rosca métrica ISO	HSS-E	N	C
796	56		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
797	56		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
799	52		DIN 371	Machos para rosca métrica ISO	HSS-E	N R15	C
800	482		DIN 371	Machos para rosca métrica ISO	HSS-E	Ms	E
801	49		DIN 371	Machos para rosca métrica ISO	HSS-E	N	D
802	55		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
803	30		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
804	43		DIN 371	Machos para rosca métrica ISO	HSS-E	H	B
805	472		DIN 371	Machos para rosca métrica ISO	HSS-E	Al	B

Nr. do artigo	Página	Profundidade do furo	Norma	Denominação	Material de corte	Tipo	Forma
806	50		DIN 371	Machos para rosca métrica ISO	HSS-E	N	C
807	356		DIN 371	Machos para rosca métrica ISO	HSS-E	GG	C
808	89		DIN 371	Machos para rosca métrica ISO	HSS-E	N L15	D
809	57		DIN 371	Machos para rosca métrica ISO	HSS-E	N R15	C
810	60		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
811	81		DIN 371	Machos para rosca métrica ISO	HSS-E	H R40	C
812	474		DIN 371	Machos para rosca métrica ISO	HSS-E	Al R45	C
813	49		DIN 376	Machos para rosca métrica ISO	HSS-E	N	D
814	243, 475		DIN 371	Machos para rosca métrica ISO	HSS-E	VA R40	C
815	31		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
816	43		DIN 376	Machos para rosca métrica ISO	HSS-E	H	B
817	472		DIN 376	Machos para rosca métrica ISO	HSS-E	Al	B
818	51		DIN 376	Machos para rosca métrica ISO	HSS-E	N	C
819	356		DIN 376	Machos para rosca métrica ISO	HSS-E	GG	C
820	89		DIN 376	Machos para rosca métrica ISO	HSS-E	N L15	D
821	57		DIN 376	Machos para rosca métrica ISO	HSS-E	N R15	C
822	60		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
823	81		DIN 376	Machos para rosca métrica ISO	HSS-E	H R40	C
824	474		DIN 376	Machos para rosca métrica ISO	HSS-E	Al R45	C
825	243, 475		DIN 376	Machos para rosca métrica ISO	HSS-E	VA R40	C
826	66		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
827	91		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	B
828	97		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	H	B
829	100		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	C
830	100		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	C
831	365		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	GG	C
832	91		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	B
833	102		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R15	C
834	105		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
835	114		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	H R40	C
836	66		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
837	37		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
838	54		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
839	54		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
843	241		DIN 371	Machos para rosca métrica ISO	HSS-E	VA R15	C
844	61		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
845	37		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
846	54		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
847	54		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
848	61		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
849	44		DIN 376	Machos para rosca métrica ISO	HSS-E	H AZ	B
851	85			Machos para máquinas para rosca métrica ISO para porcas	HSS-E	N	
852	105		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
853	725		DIN 352	Machos manuais para rosca métrica ISO	HSS-E	VA	
854	725		DIN 352	Machos manuais para rosca métrica ISO	HSS-E	VA	A
855	725		DIN 352	Machos manuais para rosca métrica ISO	HSS-E	VA	D
856	725		DIN 352	Machos manuais para rosca métrica ISO	HSS-E	VA	C
857	726		DIN 352	Machos manuais para rosca métrica ISO	HSS-E	H	
858	726		DIN 352	Machos manuais para rosca métrica ISO	HSS-E	H	A
859	726		DIN 352	Machos manuais para rosca métrica ISO	HSS-E	H	D
860	726		DIN 352	Machos manuais para rosca métrica ISO	HSS-E	H	C
861	721		DIN 352	Machos manuais para rosca métrica ISO	HSS	N	
862	721		DIN 352	Machos manuais para rosca métrica ISO	HSS	N	A
863	721		DIN 352	Machos manuais para rosca métrica ISO	HSS	N	D
864	721, 723		DIN 352	Machos manuais para rosca métrica ISO	HSS	N	C
869	56		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
872	76		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	H R15	C
873	117		~DIN 371	Machos para rosca UNC	HSS-E	N	B
874	112		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E-PM	H R15	C
875	46		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	H	B
876	122		~DIN 371	Machos para rosca UNC	HSS-E	N R40	C
877	237		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	VA	B
878	117		~DIN 376	Machos para rosca UNC	HSS-E	N	B
879	237		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	VA	B
881	122		~DIN 376	Machos para rosca UNC	HSS-E	N R40	C
882	723		DIN 352	Machos manuais para rosca métrica ISO	HSS	N	
883	723		DIN 352	Machos manuais para rosca métrica ISO	HSS	N	D
884	728		DIN 2181	Machos manuais para rosca métrica fina ISO	HSS	N	
885	728		DIN 2181	Machos manuais para rosca métrica fina ISO	HSS	N	D
886	728		DIN 2181	Machos manuais para rosca métrica fina ISO	HSS	N	C
887	256		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E-PM	VA	B
888	88			Machos para rosca métrica ISO	HSS-E	N R40	C

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889	66		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
890	66		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
903	149, 271, 376, 508		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
904	724		DIN 352	Machos manuais para rosca métrica ISO	HSS	N-LH	
905	724		DIN 352	Machos manuais para rosca métrica ISO	HSS	N-LH	A
906	724		DIN 352	Machos manuais para rosca métrica ISO	HSS	N-LH	D
907	724		DIN 352	Machos manuais para rosca métrica ISO	HSS	N-LH	C
908	125		~DIN 374	Machos para rosca UNF	HSS-E	N	B
909	246		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	VA R40	C
910	246		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	VA R40	C
911	128		~DIN 374	Machos para rosca UNF	HSS-E	N R40	C
912	30		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
913	57		DIN 371	Machos para rosca métrica ISO	HSS-E	N R15	C
914	60		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
915	31		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
916	57		DIN 376	Machos para rosca métrica ISO	HSS-E	N R15	C
917	60		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
918	153, 274, 379, 510		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E	N	C
919	152, 274, 379, 510		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E	N	C
920	150, 272, 377, 507		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E	N	C
921	149, 271, 376, 506		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E	N	C
922	153, 274, 379, 510		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E	N	C
923	152, 274, 379, 510		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
925	149, 271, 376, 506		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E	N	C
926	172, 292, 397, 532		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
927	169, 288, 395, 530		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
928	168, 290, 393, 528		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
929	165, 286, 391, 524		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
930	356		DIN 371	Machos para rosca métrica ISO	HSS-E	GG	C
931	356		DIN 376	Machos para rosca métrica ISO	HSS-E	GG	C
932	365		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	GG	C
935	76		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	H R15	C
936	253, 488		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E-PM	VA R40	C
937	141		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N R40	C(K)
939	265, 503		DIN 5156	Machos para rosca gás Whitworth	HSS-E-PM	VA R40	C
942	42		~DIN 371	Machos para rosca métrica ISO	MD int.	N	B
943	95		~DIN 371	Machos manuais para rosca métrica fina ISO	MD int.	N	B
944	96		DIN 374	Machos manuais para rosca métrica fina ISO	MD int.	N	B
945	30		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
946	57		DIN 371	Machos para rosca métrica ISO	HSS-E	N R15	C
947	81		DIN 371	Machos para rosca métrica ISO	HSS-E	H R40	C
948	31		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
949	57		DIN 376	Machos para rosca métrica ISO	HSS-E	N R15	C
950	81		DIN 376	Machos para rosca métrica ISO	HSS-E	H R40	C
952	149, 271, 376, 508		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
954	732		~DIN 352	Machos manuais para rosca BSW	HSS	N	
955	732		~DIN 352	Machos manuais para rosca BSW	HSS	N	A
956	732		~DIN 352	Machos manuais para rosca BSW	HSS	N	D
957	732		~DIN 352	Machos manuais para rosca BSW	HSS	N	C
958	733		DIN 5157	Machos manuais para rosca gás	HSS	N	
959	733		DIN 5157	Machos manuais para rosca gás	HSS	N	D
960	733		DIN 5157	Machos manuais para rosca gás	HSS	N	C
961	374		DIN 5156	Machos para rosca gás Whitworth	HSS-E	GG	C
962	132		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N	B
963	133		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N	C
964	135		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N R15	C
965	136		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N R40	C
966	184, 302, 407, 544		DIN 2189	Machos laminadores para rosca Gás Whitworth	HSS-E	N	C
967	263, 502		DIN 5156	Machos para rosca gás Whitworth	HSS-E	VA	B
968	265		DIN 5156	Machos para rosca gás Whitworth	HSS-E	VA R40	C
969	362, 476		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	MD int.	H	C
971	478		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	MD int.	N R15	C
972	368, 491		DIN 371	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	H	C
973	146			Machos para rosca NPT	HSS-E	N	C
974	368, 491		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	H	C
975	495		DIN 371	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	N L15	D
976	495		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	N L15	D
977	493		DIN 371	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	N R15	C
978	493		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	N R15	C
979	147		DIN 40432	Machos para rosca gás blindada	HSS-E	N	C
980	147		DIN 40432	Machos para rosca gás blindada	HSS-E	N	B
981	730		~DIN 352	Machos manuais para rosca UNC	HSS	N	

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982	730		~DIN 352	Machos manuais para rosca UNC	HSS	N	A
983	730		~DIN 352	Machos manuais para rosca UNC	HSS	N	D
984	730		~DIN 352	Machos manuais para rosca UNC	HSS	N	C
985	731		~DIN 2181	Machos manuais para rosca UNF	HSS	N	
986	731		~DIN 2181	Machos manuais para rosca UNF	HSS	N	D
987	731		~DIN 2181	Machos manuais para rosca UNF	HSS	N	C
991	35		DIN 352	Machos para rosca métrica ISO	HSS-E	N	B
992	58		DIN 352	Machos para rosca métrica ISO	HSS-E	N R15	C
993	65		DIN 352	Machos para rosca métrica ISO	HSS-E	N R40	C
995	53		DIN 352	Machos para rosca métrica ISO	HSS-E	N	C
998	86			Machos para rosca métrica ISO	HSS-E	N	B
1001	257		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	VA	B
1002	238		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	VA	B
1004	253		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E-PM	VA R40	C
1007	113, 367, 497		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	HSS-E-PM	H	E
1008	364, 477		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	MD int.	H	E
1009	369, 492		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	H	E
1010	144			Machos para rosca EG	HSS-E	N	B
1011	145			Machos para rosca EG	HSS-E	N R40	C
1049	108		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
1057	603		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E-PM	TiNi	B
1058	607		DIN 371	Machos manuais para rosca métrica fina ISO	HSS-E-PM	TiNi	B
1059	611		~DIN 371/~DIN 376	Machos para rosca UNC	HSS-E-PM	TiNi	B
1060	615		~DIN 371/~DIN 374	Machos para rosca UNF	HSS-E-PM	TiNi	B
1061	605		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E-PM	Ti R15	C
1062	609		DIN 371	Machos manuais para rosca métrica fina ISO	HSS-E-PM	Ti R15	C
1063	613		~DIN 371/~DIN 376	Machos para rosca UNC	HSS-E-PM	Ti R15	C
1064	618		~DIN 371/~DIN 374	Machos para rosca UNF	HSS-E-PM	Ti R15	C
1065	605		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E-PM	Ni R10	C(K)
1066	609		DIN 371	Machos manuais para rosca métrica fina ISO	HSS-E-PM	Ni R10	C(K)
1067	613		~DIN 371/~DIN 376	Machos para rosca UNC	HSS-E-PM	Ni R10	C(K)
1068	618		~DIN 371/~DIN 374	Machos para rosca UNF	HSS-E-PM	Ni R10	C(K)
1082	373		~DIN 374	Machos para rosca UNF com canal de refrigeração	HSS-E	GG	C
1084	482		DIN 371	Machos para rosca métrica ISO	HSS-E	Ms	E
1085	371		~DIN 371	Machos com canais de refrigeração para rosca UNC	HSS-E	GG	C
1086	371		~DIN 376	Machos com canais de refrigeração para rosca UNC	HSS-E	GG	C
1087	268			Machos para rosca NPT	HSS-E	VA R25	C
1088	268			Machos para rosca NPT	HSS-E	VA R25	C
1090	113, 367, 496		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	HSS-E-PM	H	C
1091	78, 359, 479		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	H	E
1098	74, 245, 485		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	N R50	C
1100	110, 254, 489		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E-PM	N R50	C
1139	75, 247, 486		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	VA R50	C
1142	75, 247, 486		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	VA R50	C
1144	111, 255, 490		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	HSS-E-PM	VA R50	C
1152	74, 245, 485		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	N R50	C
1161	683		~DIN 371	Machos manuais para rosca métrica fina ISO	MD int.	H	D
1188	77		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	H R15	C
1194	77		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	H R15	C
1200	112		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	HSS-E-PM	H R15	C
1201	680		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E-PM	H	D
1246	30		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
1249	31		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
1252	60		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
1254	60		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
1255	149, 271, 376, 506		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1256	149, 271, 376, 506		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1257	166, 287, 394, 525		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1258	166, 287, 394, 525		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1266	155, 276, 381, 512, 621		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1267	155, 276, 381, 512, 621		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1268	174, 293, 398, 534, 630		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1269	174, 293, 398, 534, 630		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1270	159, 280, 385, 516, 623		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
1271	159, 280, 385, 516, 623		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
1272	178, 296, 401, 536, 632		~DIN 371	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	C
1273	178, 296, 401, 536, 632		~DIN 374	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	C
1275	169, 288, 395, 530		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
1277	172, 292, 397, 532		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
1283	183, 301, 406, 543		~DIN 371	Machos laminadores para rosca UNF	HSS-E	N	C
1285	39		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	N	B
1286	39		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	N	B

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1287	40		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	N	B
1288	72		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	N R40	C
1289	72		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	N R40	C
1290	73		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	N R40	C
1291	98, 248		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E-PM	N	B
1292	109		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E-PM	N R40	C
1293	74, 245, 485		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	N R50	C
1294	110, 254, 489		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	HSS-E-PM	N R50	C
1347	506		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1565	508		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1566	506		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1567	508		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1568	526		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1569	529		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1575	47		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	H	B
1576	47		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	H	B
1577	76		DIN 371	Machos para rosca métrica ISO	HSS-E-PM	H R15	C
1578	76		DIN 376	Machos para rosca métrica ISO	HSS-E-PM	H R15	C
1580	529		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1581	181, 299, 404, 541, 635		~DIN 371/~DIN 376	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	MD int.	N	C
1582	182, 300, 405, 542		~DIN 371	Machos laminadores para rosca UNC	HSS-E	N	C
1583	182, 300, 405, 542		~DIN 376	Machos laminadores para rosca UNC	HSS-E	N	C
1584	183, 301, 406, 543		~DIN 371	Machos laminadores para rosca UNF	HSS-E	N	C
1585	183, 301, 406, 543		~DIN 374	Machos laminadores para rosca UNF	HSS-E	N	C
1586	184, 302, 408, 545		DIN 2189	Machos laminadores para rosca Gás Whitworth	HSS-E	N	C
1587	152		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E	N	C
1588	153		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E	N	C
1589	152		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E	N	C
1590	153		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E	N	C
1591	169		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
1592	171		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
1593	169		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
1599	155		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1705	153		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1707	155		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1708	153		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E-PM	N	C
1710	176		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1711	175		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1712	176		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1713	160, 281, 386, 518, 624		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
1715	179, 297, 402, 538, 633		~DIN 371	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	C
1716	179, 297, 402, 538, 633		~DIN 374	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	C
1717	159, 280, 385, 623		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
1718	161, 282, 387, 625		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
1719	159, 280, 385, 623		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
1720	161, 282, 387, 625		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
1721	178, 296, 401, 632		~DIN 371	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	C
1723	178, 296, 401, 632		~DIN 374	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	C
1725	159, 280, 385, 516, 623		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	E
1726	161, 282, 387, 519, 625		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	E
1727	159, 280, 385, 516, 623		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	E
1728	161, 282, 387, 519, 625		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	E
1729	178, 296, 401, 536, 632		~DIN 371	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	E
1730	179, 297, 402, 538, 633		~DIN 371	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	E
1731	178, 296, 401, 536, 632		~DIN 374	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	E
1732	179, 297, 402, 538, 633		~DIN 374	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	E
1740	167, 289, 392, 527		~DIN 371	Machos laminadores para rosca métrica fina ISO	HSS-E-PM	N	C
1818	727		DIN 352	Machos manuais para rosca métrica ISO	HSS-E-PM	H	
1819	727		DIN 352	Machos manuais para rosca métrica ISO	HSS-E-PM	H	A
1820	727		DIN 352	Machos manuais para rosca métrica ISO	HSS-E-PM	H	D
1821	727		DIN 352	Machos manuais para rosca métrica ISO	HSS-E-PM	H	C
1837	124		~DIN 371	Machos para rosca UNC	HSS-E	N R40	C(K)
1838	131		~DIN 374	Machos para rosca UNF	HSS-E	N R40	C(K)
1839	87			Brocas macho para rosca métrica ISO	HSS-E	N	D
1858	362, 476		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	MD int.	H	C
1859	362, 476		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	MD int.	H	C
1860	368, 491		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	H	C
1861	368, 491		DIN 371	Machos com canais de refrig. p.rosca métr. fina ISO	MD int.	H	C
1870	236, 473		DIN 371	Machos para rosca métrica ISO	HSS-E	VA	B
1871	240		DIN 371	Machos para rosca métrica ISO	HSS-E	VA AZ	B
1872	236, 473		DIN 376	Machos para rosca métrica ISO	HSS-E	VA	B
1873	256, 487		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	VA	B

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1874	249		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	VA R15	C
1875	357		DIN 371	Machos para rosca métrica ISO	HSS-E	GGT	C
1876	357		DIN 376	Machos para rosca métrica ISO	HSS-E	GGT	C
1883	362, 476		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	MD int.	H	C
1890	358		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	GG	C
1891	59		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N R15	C
1892	243		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	VA R40	C
1893	63		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N R40	C
1894	83		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	H R40	C
1897	358		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	GG	C
1898	59		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N R15	C
1899	243		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	VA R40	C
1901	83		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	H R40	C
1904	366		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	HSS-E	GG	C
1905	104		DIN 374	Machos com canais de refrig. p.rosca métr. fina ISO	HSS-E	N R15	C
1914	43		DIN 371	Machos para rosca métrica ISO	HSS-E	H	B
1915	43		DIN 376	Machos para rosca métrica ISO	HSS-E	H	B
1916	82		DIN 371	Machos para rosca métrica ISO	HSS-E	H R40	C
1917	82		DIN 376	Machos para rosca métrica ISO	HSS-E	H R40	C
1918	356		DIN 371	Machos para rosca métrica ISO	HSS-E	GG	C
1919	356		DIN 376	Machos para rosca métrica ISO	HSS-E	GG	C
1927	164, 285, 390, 523, 628		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	MD int.	N	E
1931	163, 284, 389, 522, 627		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	MD int.	N	C
1970	106		DIN 2181	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
1971	102		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R15	C
1972	163, 284, 389, 522, 627		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	MD int.	N	C
1977	121		~DIN 371	Machos para rosca UNC	HSS-E	N	C
1978	119		~DIN 371	Machos para rosca UNC	HSS-E	N R15	C
1979	370		~DIN 371	Machos para rosca UNC	HSS-E	GG	C
1980	258, 498		~DIN 371	Machos para rosca UNC	HSS-E	VA	B
1981	259, 499		~DIN 371	Machos para rosca UNC	HSS-E	VA R40	C
1984	370		~DIN 376	Machos para rosca UNC	HSS-E	GG	C
1985	258, 498		~DIN 376	Machos para rosca UNC	HSS-E	VA	B
1986	259, 499		~DIN 376	Machos para rosca UNC	HSS-E	VA R40	C
1987	126		~DIN 374	Machos para rosca UNF	HSS-E	N	C
1988	127		~DIN 374	Machos para rosca UNF	HSS-E	N R15	C
1989	372		~DIN 374	Machos para rosca UNF	HSS-E	GG	C
1990	260, 500		~DIN 374	Machos para rosca UNF	HSS-E	VA	B
1991	261		~DIN 374	Machos para rosca UNF	HSS-E	VA R15	C
2008	170, 291, 396, 531		~DIN 374	Machos laminadores para rosca métrica fina ISO	HSS-E	N	C
2012	152, 274, 379, 510		~DIN 371	Machos laminadores para rosca métrica ISO	HSS-E	N	C
2013	152, 274, 379, 510		~DIN 376	Machos laminadores para rosca métrica ISO	HSS-E	N	C
2086	236		DIN 371	Machos para rosca métrica ISO	HSS-E	VA	B
2087	236		DIN 376	Machos para rosca métrica ISO	HSS-E	VA	B
2273	182, 300, 405, 542		~DIN 371	Machos laminadores para rosca UNC	HSS-E	N	C
2274	182, 300, 405, 542		~DIN 376	Machos laminadores para rosca UNC	HSS-E	N	C
2275	183, 301, 406, 543		~DIN 374	Machos laminadores para rosca UNF	HSS-E	N	C
2311	364		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	MD int.	H	C
2424	107		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
2425	66		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
2426	66		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
2427	33		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
2428	33		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
2436	59		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N R15	C
2437	59		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N R15	C
2438	64		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N R40	C
2439	64		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N R40	C
2440	66		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
2441	66		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	C
2442	156, 277, 382, 513		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
2443	156, 277, 382, 513		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
2444	156, 277, 382, 513		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
2445	156, 277, 382, 513		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
2446	156, 277, 382, 513		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
2447	157, 278, 383, 514		~DIN 371	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
2448	156, 277, 382, 513		~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
2465	45		DIN 371	Machos para rosca métrica ISO	HSS-E	H	B
2506	363		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	MD int.	H	C
2510	364		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	MD int.	N R15	C
2514	68		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N R40	C
2515	517		~DIN 371/~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
2516	494		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	MD int.	N R15	C

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2517	34		DIN 371	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N	B
2518	151, 273, 378, 509		~DIN 371/~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	MD int.	N	C
2710	45		DIN 371	Machos para rosca métrica ISO	HSS-E	H	B
2790	69		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	E
2791	69		DIN 376	Machos para rosca métrica ISO	HSS-E	N R40	E
2792	107		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	E
2838	102		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R15	C
2839	120		~DIN 371	Machos para rosca UNC	HSS-E	N R15	C
2840	120		~DIN 376	Machos para rosca UNC	HSS-E	N R15	C
2841	127		~DIN 374	Machos para rosca UNF	HSS-E	N R15	C
2842	135		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N R15	C
2843	105		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
2844	122		~DIN 371	Machos para rosca UNC	HSS-E	N R40	C
2845	122		~DIN 376	Machos para rosca UNC	HSS-E	N R40	C
2846	128		~DIN 374	Machos para rosca UNF	HSS-E	N R40	C
2847	143		~DIN 371	Machos para rosca BSW	HSS-E	N R40	C
2848	143		~DIN 376	Machos para rosca BSW	HSS-E	N R40	C
2849	136		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N R40	C
2850	81		DIN 371	Machos para rosca métrica ISO	HSS-E	H R40	C
2851	81		DIN 376	Machos para rosca métrica ISO	HSS-E	H R40	C
2852	114		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	H R40	C
2853	107		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
2854	123		~DIN 371	Machos para rosca UNC	HSS-E	N R40	C
2855	123		~DIN 371	Machos para rosca UNC	HSS-E	N R40	C
2856	123		~DIN 376	Machos para rosca UNC	HSS-E	N R40	C
2857	123		~DIN 376	Machos para rosca UNC	HSS-E	N R40	C
2859	129		~DIN 374	Machos para rosca UNF	HSS-E	N R40	C
2860	137		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N R40	C
2861	137		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N R40	C
2862	243		DIN 371	Machos para rosca métrica ISO	HSS-E	VA R40	C
2863	243		DIN 376	Machos para rosca métrica ISO	HSS-E	VA R40	C
2864	251		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	VA R40	C
2865	259		~DIN 371	Machos para rosca UNC	HSS-E	VA R40	C
2866	259		~DIN 376	Machos para rosca UNC	HSS-E	VA R40	C
2867	262, 501		~DIN 374	Machos para rosca UNF	HSS-E	VA R40	C
2868	262		~DIN 374	Machos para rosca UNF	HSS-E	VA R40	C
2869	236		DIN 371	Machos para rosca métrica ISO	HSS-E	VA	B
2870	236		DIN 376	Machos para rosca métrica ISO	HSS-E	VA	B
2871	257		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	VA	B
2872	258		~DIN 371	Machos para rosca UNC	HSS-E	VA	B
2873	258		~DIN 376	Machos para rosca UNC	HSS-E	VA	B
2874	260		~DIN 374	Machos para rosca UNF	HSS-E	VA	B
2875	263		DIN 5156	Machos para rosca gás Whitworth	HSS-E	VA	B
2876	33		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
2877	33		DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
2878	94		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	B
2879	94		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	B
2881	118		~DIN 371	Machos para rosca UNC	HSS-E	N	B
2883	118		~DIN 376	Machos para rosca UNC	HSS-E	N	B
2885	130		~DIN 374	Machos para rosca UNF	HSS-E	N	B
2886	140		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N	B
2887	140		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N	B
2888	91		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	B
2889	117		~DIN 371	Machos para rosca UNC	HSS-E	N	B
2890	117		~DIN 376	Machos para rosca UNC	HSS-E	N	B
2891	125		~DIN 374	Machos para rosca UNF	HSS-E	N	B
2892	142		~DIN 371	Machos para rosca BSW	HSS-E	N	B
2893	142		~DIN 376	Machos para rosca BSW	HSS-E	N	B
2894	132		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N	B
2895	241		DIN 376	Machos para rosca métrica ISO	HSS-E	VA R15	C
2896	241		DIN 371	Machos para rosca métrica ISO	HSS-E	VA R15	C
2897	249		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	VA R15	C
2898	261		~DIN 374	Machos para rosca UNF	HSS-E	VA R15	C
2899	484		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E	N AZ	E
2901	602		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E-PM	TiNi	B
2903	606		DIN 371	Machos manuais para rosca métrica fina ISO	HSS-E-PM	TiNi	B
2905	610		~DIN 371	Machos para rosca UNC	HSS-E-PM	TiNi	B
2909	604		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E-PM	Ti R15	C
2910	608		DIN 371	Machos manuais para rosca métrica fina ISO	HSS-E-PM	Ti R15	C
2912	612		~DIN 371/~DIN 376	Machos para rosca UNC	HSS-E-PM	Ti R15	C
2914	617		~DIN 371/~DIN 374	Machos para rosca UNF	HSS-E-PM	Ti R15	C
2916	602		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E-PM	TiNi	B

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2917	606		DIN 371	Machos manuais para rosca métrica fina ISO	HSS-E-PM	TiNi	B
2918	610		~DIN 371	Machos para rosca UNC	HSS-E-PM	TiNi	B
2919	614		~DIN 371	Machos para rosca UNF	HSS-E-PM	TiNi	B
2920	604		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E-PM	Ni R10	C(K)
2921	608		DIN 371	Machos manuais para rosca métrica fina ISO	HSS-E-PM	Ni R10	C(K)
2922	612		~DIN 371/~DIN 376	Machos para rosca UNC	HSS-E-PM	Ni R10	C(K)
2923	616		~DIN 371/~DIN 374	Machos para rosca UNF	HSS-E-PM	Ni R10	C(K)
2940	114		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	H R40	C
2941	43		DIN 371	Machos para rosca métrica ISO	HSS-E	H	B
2942	43		DIN 376	Machos para rosca métrica ISO	HSS-E	H	B
2943	97		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	H	B
2944	681		~DIN 371	Machos para rosca métrica ISO	MD int.	H	D
2983	99		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	H	B
2985	84		DIN 371	Machos para rosca métrica ISO	HSS-E	H R40	C
2986	84		DIN 371	Machos para rosca métrica ISO	HSS-E	H R40	C
2988	116		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	H R40	C
2989	116		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	H R40	C
2990	41		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
2991	41		DIN 371	Machos para rosca métrica ISO	HSS-E	N	B
2993	93		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	B
2994	73		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
2995	73		DIN 371	Machos para rosca métrica ISO	HSS-E	N R40	C
2998	108		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
2999	108		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R40	C
3510	413, 551, 643	1,5xD		Fresas para rosca métrica ISO com chanfro	MD int.	TMC SP	
3511	414, 552, 644	2xD		Fresas para rosca métrica ISO com chanfro	MD int.	TMC SP	
3512	416, 554, 646	1,5xD		Fresas para rosca métrica fina ISO com chanfro	MD int.	TMC SP	
3513	417, 555, 647	2xD		Fresas para rosca métrica fina ISO com chanfro	MD int.	TMC SP	
3514	202, 320, 429, 565, 657, 693	1,5xD		Fresas para rosca gás Whitworth com chanfro	MD int.	TMC SP	
3515	203, 321, 430, 566, 658, 694	2xD		Fresas para rosca gás Whitworth com chanfro	MD int.	TMC SP	
3516	195, 313, 420, 558, 650, 689	1,5xD		Fresas para rosca UNC com chanfro	MD int.	TMC SP	
3517	196, 314, 421, 559, 651, 690	2xD		Fresas para rosca UNC com chanfro	MD int.	TMC SP	
3518	198, 316, 423, 561, 653, 691	1,5xD		Fresas para rosca UNF com chanfro	MD int.	TMC SP	
3519	199, 317, 424, 562, 654, 692	2xD		Fresas para rosca UNF com chanfro	MD int.	TMC SP	
3520	206, 324, 426, 569, 661, 695			Fresas para rosca NPT com chanfro	MD int.	TMC SP	
3521	208, 326, 433, 571, 663, 696			Fresas para rosca NPTF com chanfro	MD int.	TMC SP	
3523	434, 572, 664			Fresas para roscas multiuso, para rosca métrica ISO	MD int.	TMU SP	
3524	437, 575, 667			Fresas para roscas multiuso, para rosca gás Whitworth	MD int.	TMU SP	
3525	188, 306, 413, 551, 643, 685	1,5xD		Fresas para rosca métrica ISO com chanfro	MD int.	TMC SP	
3526	189, 307, 414, 552, 644, 686	2xD		Fresas para rosca métrica ISO com chanfro	MD int.	TMC SP	
3527	191, 309, 416, 554, 646, 687	1,5xD		Fresas para rosca métrica fina ISO com chanfro	MD int.	TMC SP	
3528	192, 310, 417, 555, 647, 688	2xD		Fresas para rosca métrica fina ISO com chanfro	MD int.	TMC SP	
3529	202, 320, 429, 565, 657, 693	1,5xD		Fresas para rosca gás Whitworth com chanfro	MD int.	TMC SP	
3533	203, 321, 430, 566, 658, 694	2xD		Fresas para rosca gás Whitworth com chanfro	MD int.	TMC SP	
3534	195, 313, 420, 558, 650, 689	1,5xD		Fresas para rosca UNC com chanfro	MD int.	TMC SP	
3535	196, 314, 421, 559, 651, 690	2xD		Fresas para rosca UNC com chanfro	MD int.	TMC SP	
3536	198, 316, 423, 561, 653, 691	1,5xD		Fresas para rosca UNF com chanfro	MD int.	TMC SP	
3537	199, 317, 424, 562, 654, 692	2xD		Fresas para rosca UNF com chanfro	MD int.	TMC SP	
3538	206, 324, 426, 569, 661, 695			Fresas para rosca NPT com chanfro	MD int.	TMC SP	
3539	208, 326, 433, 571, 663, 696			Fresas para rosca NPTF com chanfro	MD int.	TMC SP	
3541	209, 327, 434, 572, 664, 697			Fresas para roscas multiuso, para rosca métrica ISO	MD int.	TMU SP	
3542	212, 330, 437, 575, 667, 700			Fresas para roscas multiuso, para rosca gás Whitworth	MD int.	TMU SP	
3543	188, 306, 413, 551, 643, 685	1,5xD		Fresas para rosca métrica ISO com chanfro	MD int.	TMC SP	
3544	189, 307, 414, 552, 644, 686	2xD		Fresas para rosca métrica ISO com chanfro	MD int.	TMC SP	
3545	191, 309, 416, 554, 646, 687	1,5xD		Fresas para rosca métrica fina ISO com chanfro	MD int.	TMC SP	
3546	192, 310, 417, 555, 647, 688	2xD		Fresas para rosca métrica fina ISO com chanfro	MD int.	TMC SP	
3556	209, 327, 434, 572, 664, 697			Fresas para roscas multiuso, para rosca métrica ISO	MD int.	TMU SP	
3557	212, 330, 437, 575, 667, 700			Fresas para roscas multiuso, para rosca gás Whitworth	MD int.	TMU SP	
3595	211, 329, 436, 574, 666, 699			Fresas para roscas multiuso, para rosca UN	MD int.	TMU UN	
3596	211, 329, 436, 574, 666, 699			Fresas para roscas multiuso, para rosca UN	MD int.	TMU UN	
3734	410, 548, 640	2xD		Fresas para rosca métrica ISO sem chanfro	MD int.	TM SP	
3735	187, 305, 412, 550, 642	2,5xD		Fresas para rosca métrica ISO sem chanfro	MD int.	TM SP	
3737	186, 304, 410, 548, 640	2xD		Fresas para rosca métrica ISO sem chanfro	MD int.	TM SP	
3740	187, 305, 412, 550, 642	2,5xD		Fresas para rosca métrica ISO sem chanfro	MD int.	TM SP	
3743	186, 304, 410, 548, 640	2xD		Fresas para rosca métrica ISO sem chanfro	MD int.	TM SP	
3745	200, 318, 427, 563, 655	2xD		Fresas para rosca gás Whitworth sem chanfro	MD int.	TM SP	
3746	201, 319, 428, 564, 656	2,5xD		Fresas para rosca gás Whitworth sem chanfro	MD int.	TM SP	
3748	200, 318, 427, 563, 655	2xD		Fresas para rosca gás Whitworth sem chanfro	MD int.	TM SP	
3750	201, 319, 428, 564, 656	2,5xD		Fresas para rosca gás Whitworth sem chanfro	MD int.	TM SP	
3753	205, 323, 425, 568, 660			Fresas para rosca NPT sem chanfro	MD int.	TM SP	
3754	205, 323, 425, 568, 660			Fresas para rosca NPT sem chanfro	MD int.	TM SP	
3756	207, 325, 432, 570, 662			Fresas para rosca NPTF sem chanfro	MD int.	TM SP	

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3757	207, 325, 432, 570, 662			Fresas para rosca NPTF sem chanfro	MD int.	TM SP	
3759	190, 308, 415, 553, 645	2,5xD		Fresas para rosca métrica ISO com chanfro	MD int.	TMC SP	
3760	190, 308, 415, 553, 645	2,5xD		Fresas para rosca métrica ISO com chanfro	MD int.	TMC SP	
3762	193, 311, 418, 556, 648	2,5xD		Fresas para rosca métrica fina ISO com chanfro	MD int.	TMC SP	
3763	193, 311, 418, 556, 648	2,5xD		Fresas para rosca métrica fina ISO com chanfro	MD int.	TMC SP	
3765	204, 322, 431, 567, 659	2,5xD		Fresas para rosca gás Whitworth com chanfro	MD int.	TMC SP	
3766	204, 322, 431, 567, 659	2,5xD	Norma da emp.	Fresas para rosca gás Whitworth com chanfro	MD int.	TMC SP	
3768	213, 331, 438, 576, 668, 701			Fresas para roscas multiuso, para rosca NPT	MD int.	TMU SP	
3769	213, 331, 438, 576, 668, 701			Fresas para roscas multiuso, para rosca NPT	MD int.	TMU SP	
3772	214, 332, 439, 577, 669, 702			Fresas para roscas multiuso, para rosca NPTF	MD int.	TMU SP	
3773	214, 332, 439, 577, 669, 702			Fresas para roscas multiuso, para rosca NPTF	MD int.	TMU SP	
3774	443, 581	1,5xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3775	443, 581	1,5xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3776	443, 581	1,5xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3777	443, 581	1,5xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3778	444, 582	2xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3779	444, 582	2xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3780	444, 582	2xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3781	444, 582	2xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3782	445, 583	2,5xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3783	445, 583	2,5xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3784	445, 583	2,5xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3785	445, 583	2,5xD		Fresas para roscas, para rosca métrica ISO	MD int.	DTMC SP	
3787	446, 584	1,5xD		Fresas para roscas, para rosca métrica fina ISO	MD int.	DTMC SP	
3788	446, 584	1,5xD		Fresas para roscas, para rosca métrica fina ISO	MD int.	DTMC SP	
3789	446, 584	1,5xD		Fresas para roscas, para rosca métrica fina ISO	MD int.	DTMC SP	
3790	447, 585	2xD		Fresas para roscas, para rosca métrica fina ISO	MD int.	DTMC SP	
3791	447, 585	2xD		Fresas para roscas, para rosca métrica fina ISO	MD int.	DTMC SP	
3792	447, 585	2xD		Fresas para roscas, para rosca métrica fina ISO	MD int.	DTMC SP	
3793	447, 585	2xD		Fresas para roscas, para rosca métrica fina ISO	MD int.	DTMC SP	
4127	269			Machos para rosca NPTF	HSS-E	VA R25	C
4132	186, 304, 411, 549, 641	2xD		Fresas para rosca métrica ISO sem chanfro	MD int.	TM SP	
4133	186, 304, 411, 549, 641	2xD		Fresas para rosca métrica ISO sem chanfro	MD int.	TM SP	
4134	194, 312, 419, 557, 649	2xD		Fresas para rosca UNC sem chanfro	MD int.	TM SP	
4135	194, 312, 419, 557, 649	2xD		Fresas para rosca UNC sem chanfro	MD int.	TM SP	
4136	197, 315, 422, 560, 652	2xD		Fresas para rosca UNF sem chanfro	MD int.	TM SP	
4137	197, 315, 422, 560, 652	2xD		Fresas para rosca UNF sem chanfro	MD int.	TM SP	
4138	448, 586	2xD		Fresas para roscas, para rosca UNC	MD int.	DTMC SP	
4139	448, 586	2xD		Fresas para roscas, para rosca UNC	MD int.	DTMC SP	
4140	449, 587	2xD		Fresas para roscas, para rosca UNF	MD int.	DTMC SP	
4141	449, 587	2xD		Fresas para roscas, para rosca UNF	MD int.	DTMC SP	
4143	162, 283, 388, 521, 626			Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E-PM	N	C
4145	180, 298, 403, 540, 634			Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E-PM	N	C
4146	520		~DIN 371/~DIN 376	Machos laminadores para rosca métrica ISO com canais de refrig.	HSS-E	N	C
4147	537		~DIN 371/~DIN 374	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E	N	C
4151	539		~DIN 371/~DIN 374	Machos lam. p. rosca métrica fina ISO com canais de refrigeração	HSS-E	N	C
4152	546			Machos laminadores para rosca Gás Whitworth	HSS-E	N	C
4153	67			Machos para rosca métrica ISO	HSS-E	N R40	C
4154	48, 242		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E	N R15	C
4155	48, 242		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E	N R15	E
4156	103, 250		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R15	C
4157	103, 250		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N R15	E
4158	135		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N R15	E
4159	138, 266, 504		DIN 5156	Machos para rosca gás Whitworth	HSS-E-PM	VA R40	C
4161	682		DIN 371	Machos manuais para rosca métrica fina ISO	HSS-E-PM	H	D
4162	210, 328, 435, 573, 665, 698			Fresamento externo de roscas	MD int.	TMU SP	
4163	210, 328, 435, 573, 665, 698			Fresamento externo de roscas	MD int.	TMU SP	
4165	78, 359, 479		DIN 376	Machos com canais de refrigeração para rosca métrica ISO	HSS-E-PM	H	E
4218	38, 239		DIN 371/DIN 376	Machos para rosca métrica ISO	HSS-E	N	B
4219	90, 248		DIN 374	Machos manuais para rosca métrica fina ISO	HSS-E	N	B
4220	134, 264		DIN 5156	Machos para rosca gás Whitworth	HSS-E	N	B
4225	217, 335, 442, 580, 639	3xD		Micro-fresas de rosquear	MD int.	SP M/MF	
4226	215, 333, 440, 578, 637	3xD		Micro-fresas de rosquear	MD int.	SP M	
4227	703	3xD		Micro-fresas de rosquear	MD int.	SP M	
4228	216, 334, 441, 579, 638	3xD		Micro-fresas de rosquear	MD int.	SP G	

Nr. do artigo	Página	Profundidade do furo	Norma	Denominação	Material de corte	Tipo	Forma
4206	756			Adaptadores para mandrís porta machos de troca rápida			
4298	764			MQL Mandril HSK-A p. Rosqu. Sinc. e troca manual de ferramentas		HSK-A	
4305	766			Parafusos de ajuste MQL com cone interno			
4306	769			Porcas de fixação, sistema DIN ISO 15488			
4308	753			Pinças para machos			
4326	751			Mandril com haste reta, para Rosqueamento Sincronizado		Cilíndrica	
4327	751			HSK-A Mandril para Rosqueamento Sincronizado		HSK-A	
4328	755			Mandrís porta-machos de troca rápida HSK-A com refrigeração interna		HSK-A	
4330	764			MQL 1 canal Mandril HSK-A Rosqueamento Sincronizado		HSK-A	
4335	770			Discos de vedação			
4340	754			Mandrís porta-machos de troca rápida sem refrigeração interna			
4341	765			MQL 2 canais Mandril HSK-A Rosqueamento Sincronizado		HSK-A	
4342	755			Mandrís porta-machos com refrigeração interna			
4343	754			Adaptadores básicos HSK-A para mandrís porta-machos		HSK-A	
4364	750			Parafusos de ajuste "faces" Mandril Synchro para refrigeração interna			
4508	767			MQL 1 canal conjunto de fornecimento de refrigerante para HSK-A		HSK-A	
4511	767			MQL 2 canais conjunto de fornecimento de refrigerante para HSK-A		HSK-A	
4513	768			Jogo de passagem da refrigeração HSK-A -MQL (unidade de enchimento)		HSK-A	
4524	763			MQL Mandril Hidráulico para Rosqueamento sincronizado com refrigeração interna		Cilíndrica	
4525	745			Mandril Hidráulico com haste reta, p. Rosqueamento Sincron. c. refrig. interna		Cilíndrica	
4576	743			Mandril Hidráulico Cone ISO para Rosqueamento Sincronizado c. refrig. interna		SK	
4577	744			MAS / BT Mandril Hidráulico para Rosqueamento Sincronizado c. refrig. interna		BT	
4601	742			HSK-A Mandril Hidráulico para Rosqueamento Sincronizado com refrig. interna		HSK-A	
4602	760			Mandrís hidráulicos Syncro MQL HSK-A (para troca automática de ferramentas)		HSK-A	
4603	761			MQL 2 canais HSK-A Mandril Hidráulico para Rosqueamento Sincronizado		HSK-A	
4604	762			MQL HSK-A Mandril Hidráulico para Rosqueamento Sincronizado		HSK-A	
4605	746, 747			Bucha de redução selada, para mandril hidráulico para Rosqueamento Sincronizado			
4606	748, 749			Bucha de redução GÜHROJET p. Mandril Hidráulico p. Rosqueamento Sincronizado			
4913	770			Chave de fixação			

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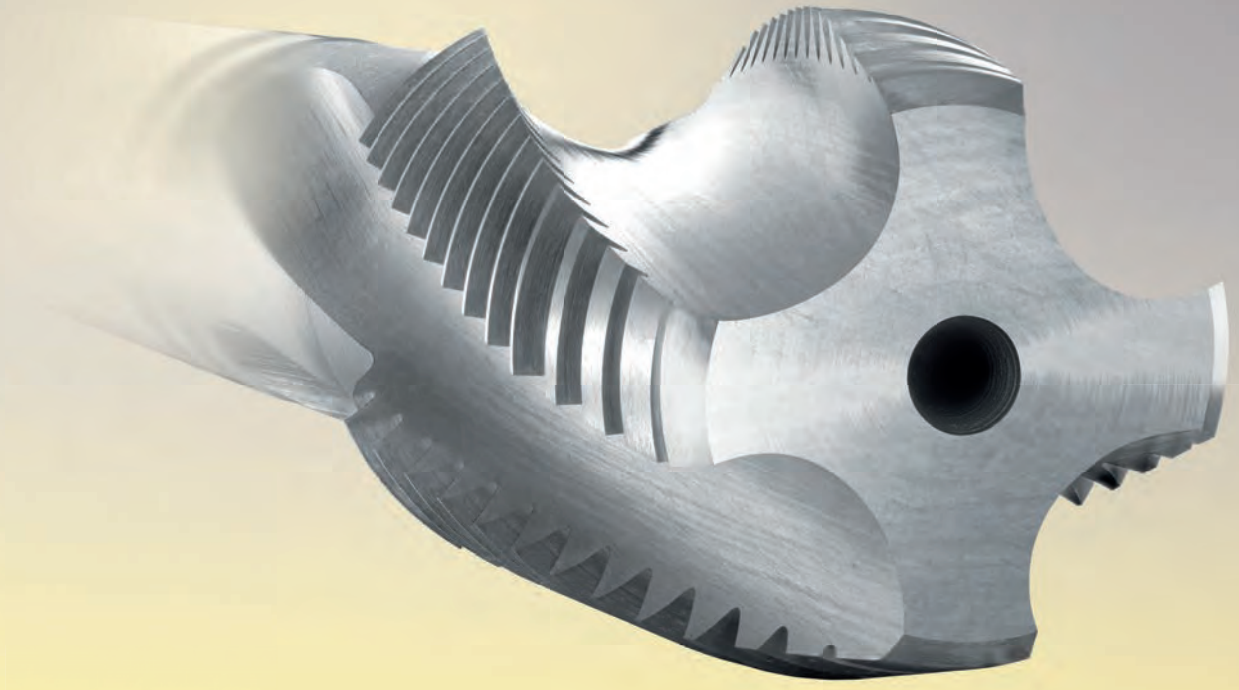
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