

GÜHRING

FERRAMENTAS PARA FURAR



PRECISÃO



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

90000

Artigos standard

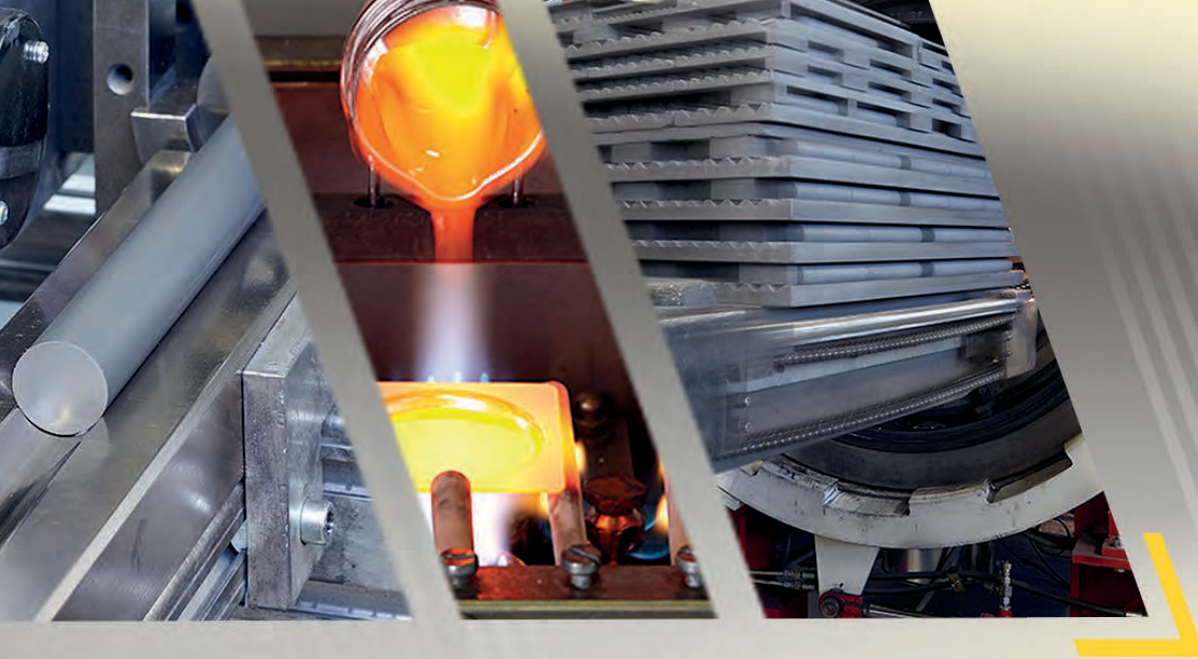
4000

Tipos de ferramentas

55%
45%



■ Ferramentas standard
■ Ferramentas especiais

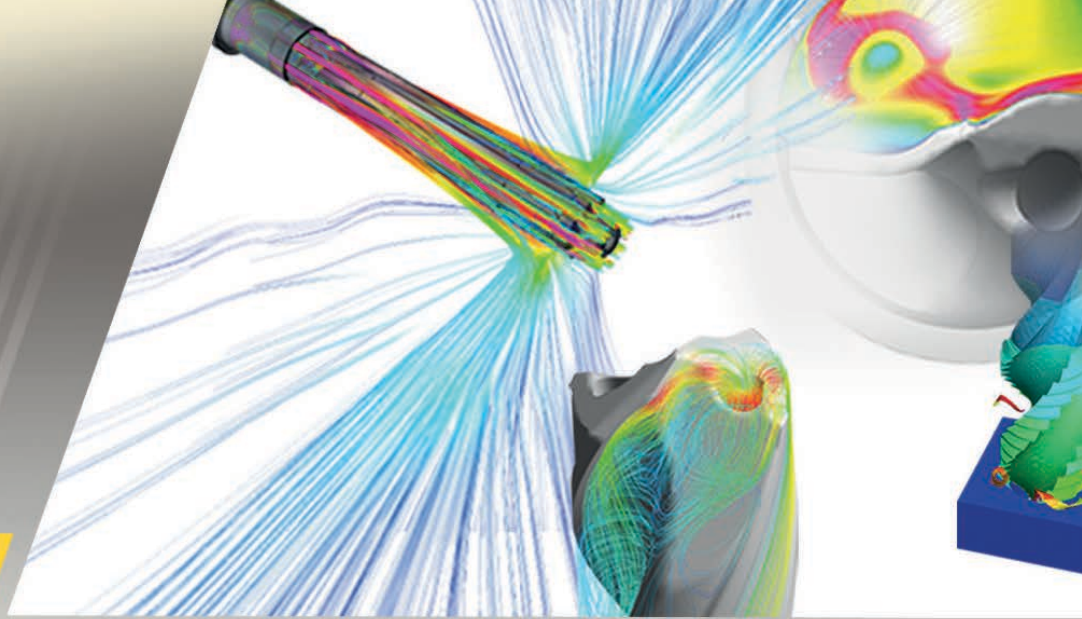


MATERIAIS DA FERRAMENTA
Produção própria de Metal Duro

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 revestimentos próprios

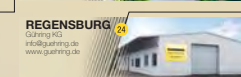
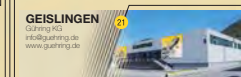
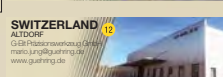
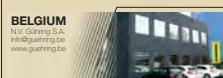
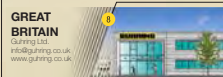
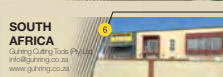
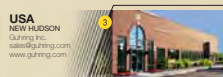
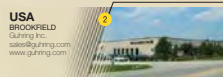
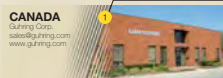


Tudo em um fornecedor - abrangente e global

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-ferramenta e mecânica geral contam com ferramentas inovadoras atendendo os maiores requisitos de qualidade produzidas mundialmente.

48
SUBSIDIÁRIAS

MAIS 70
CENTROS DE
PRODUÇÃO E SERVIÇO



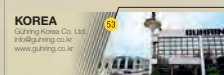
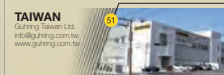
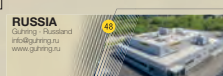
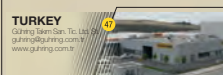
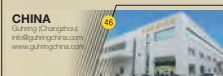
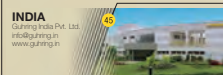
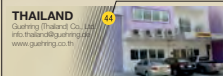
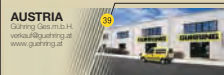
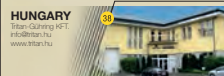
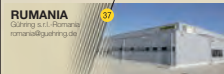
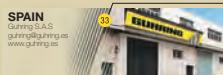
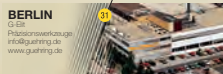
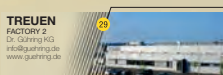
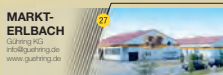
Com tecnologias inovadoras realiza necessidades específicas do cliente a partir do desenho de processos para implantação de ferramentas de precisão - flexíveis e rápidas, em um nível mundial. Para isso temos especialistas internacionais, que acompanham o cliente local. Produção, serviços e contactos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

Produção própria de Metal Duro

Produção de máquinas própria

Centros de revestimento próprios

Padrão de qualidade em todo o mundo



Tudo a partir DE UMA FONTE

Nossa variedade de brocas inclui micro brocas de precisão \varnothing 0,05 mm, soluções especiais \varnothing 180 mm em HSS, bem como metal duro, 50.000 produtos para cada aplicação.



BROCAS RATIO DE METAL DURO

a partir de página 3



HT 800 SISTEMA DE FURAÇÃO COM INSERTOS INTERCAMBIÁVEIS

a partir de página 123



BROCA HELICOIDAL HSS/HSCO

▄▄▄ Com haste paralela

▄▄▄ Cone Morse

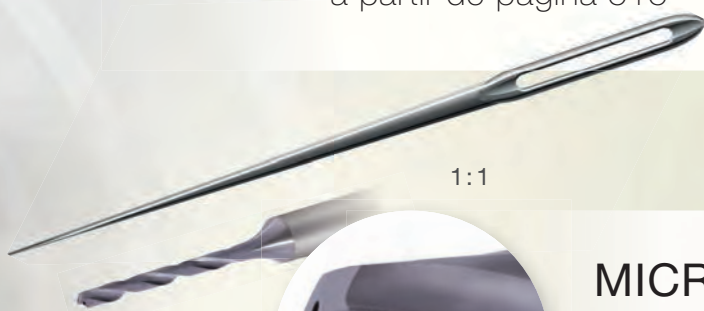
a partir de página 175, 435



BROCAS CANHÃO PARA FURAÇÃO PROFUNDA

- ▄▄▄ Brocas Canhão de um e dois canais
- ▄▄▄ Broca helicoidal para furação profunda

a partir de página 515



1:1



MICRO BROCAS METAL DURO + HSSE

a partir de página 645



BROCAS DE CENTRAGEM NC & BROCAS PARA CENTRAGEM

a partir de página 665



BROCAS ESCALONADAS & BROCAS CALIBRADORAS

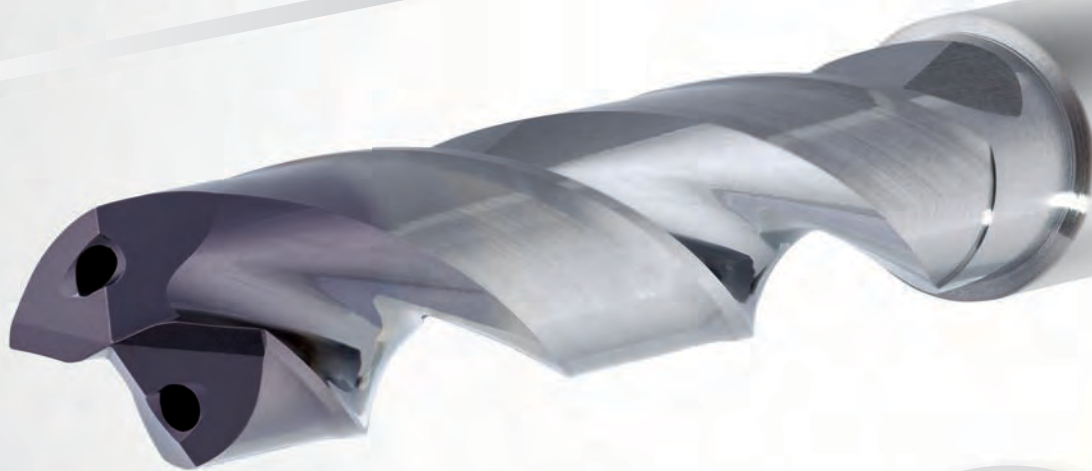
a partir de página 711

Inovações

Gühring define o padrão com toda inovação. Perfeição em pesquisa, desenvolvimento e fabricação de ferramentas. Perfeição na usinagem – é a nossa aspiração.

QUALIDADE PREMIUM
NA USINAGEM DE AÇO

NEW



//RATIO//

RT 100 S

- // micro-geometria otimizada para aço
- // altos parâmetros de corte
- // vida útil longa e consistente

→ a partir de página 59, 96





NEW

AeroX

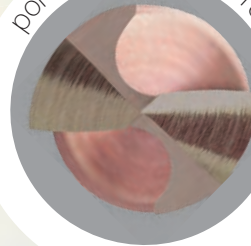
- // brocas helicoidais HSCO8 para o trabalho de montagem em materiais em geral ou de alta liga, titânio e ligas de alumínio
- // altas taxas de avanço graças a afiação de ponta otimizada de 135°

→ a partir de página 313

NÚCLEO DA BROCA OTIMIZADO

conicidade fortemente reduzida para a estabilidade adicional da ferramenta e minimizando forças simultaneamente

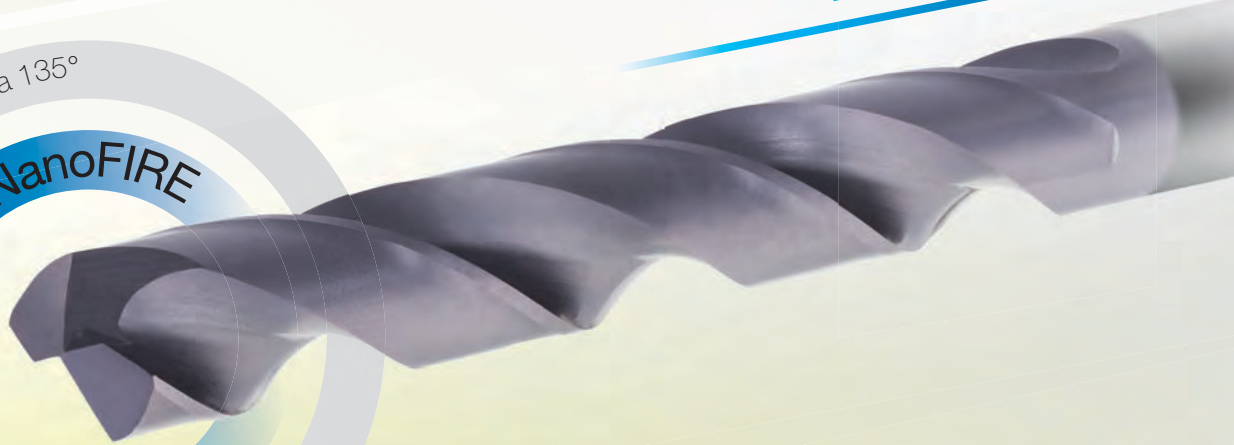
ponta otimizada de 135°



NEW

Afiação de ponta 135°

revestimento NanoFIRE



Para resistência máxima à desgaste e ao calor

M42 nanoFire

- // máxima performance especialmente com aços de alta liga, alta resistência e ligas especiais
- // design robusto graças ao núcleo rígido e afiação de ponta de 135°

→ a partir de página 317

GÜHRING

NEW

HSS Brocas com canais de refrigeração

- // para usinagem de vigas de aço e em condições instáveis
- // ótima refrigeração com fornecimento axial e radial
- // mínima geração de rebarbas
- a partir de página 499

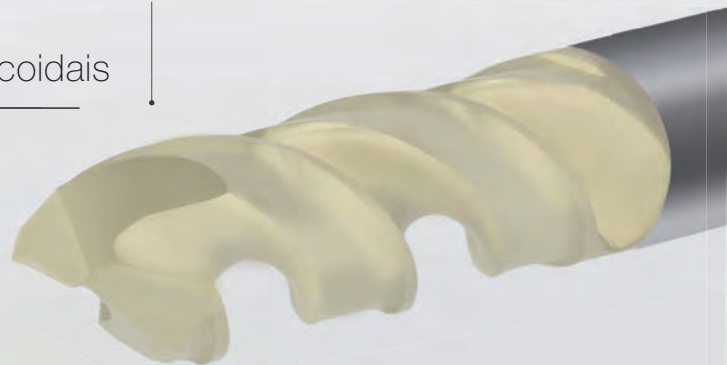


NEW

revestimento **SIRIUS**
para máxima performance
especialmente em aços inoxidáveis

VA-HSCO Sirius Brocas helicoidais

- // longa vida útil graças a grande resistência do revestimento Sirius combinado com a geometria otimizada de ponta de 135°
- a partir de página 231



Revestimento **NanoFIRE**
para máxima resistência à desgaste e ao calor

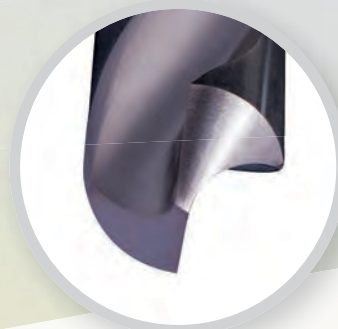
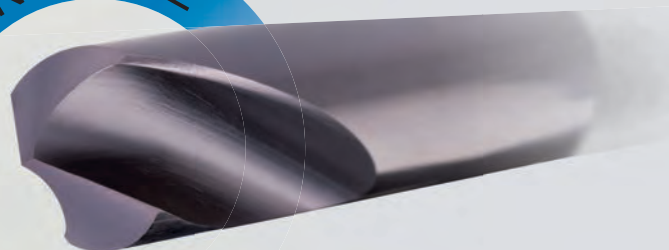
NEW

HSCO Brocas de centragem NC com revestimento NanoFire

- // furação precisa com máximo valores de parâmetros de corte
- // máxima performance graças ao revestimento NanoFire

→ a partir de página 705

revestimento NanoFIRE



NEW

EB800 guias e insertos com revestimento novo

- // ótima adaptação aos materiais à serem usinados graças as diferentes opções de revestimentos

→ a partir de página 556



GÜHRING

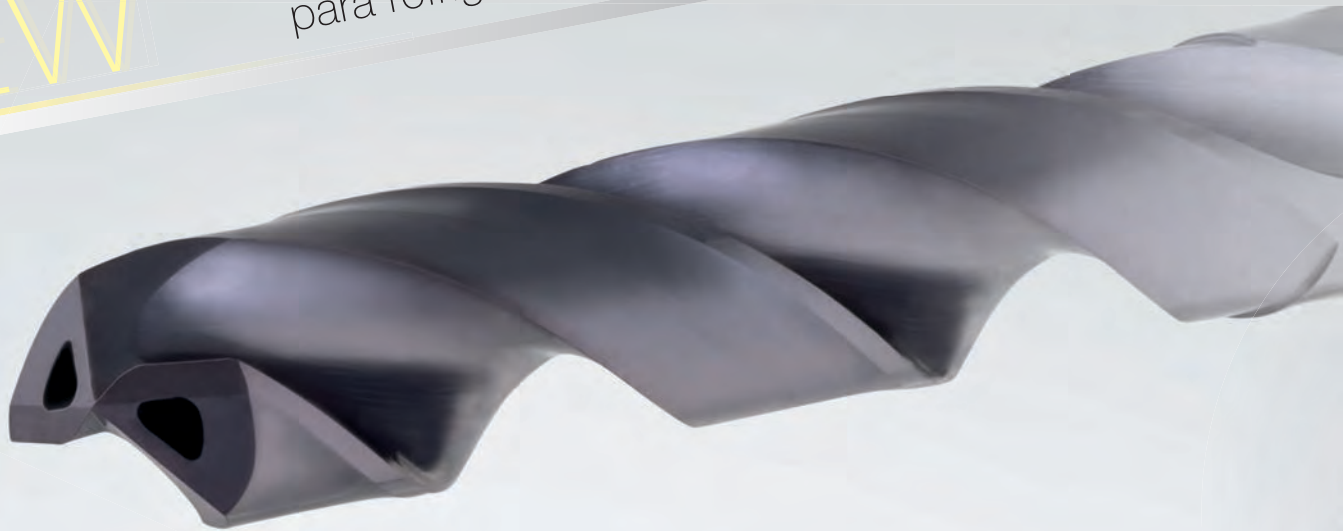
Inovações

Estado de arte dos materiais requer progressivos processos de usinagem. A Gühring assegura a liderança em tecnologia com a pesquisa em novas tendências e conceitos criativos para ferramentas de corte rotativas.

DESIGN INOVADOR
para refrigeração mais eficiente

NEW

NEW



//RATIO//

RT 100 Trigon®

- // velocidade de fluxo otimizado
- // especialmente indicado para usinagem de aços inoxidáveis, titânio e ligas especiais
- // maior volume de refrigeração

→ a partir de página 813



NEW

FURAÇÃO MAIS ECONÔMICA E EFICIENTE para ligas de alumínio

//RATIO//

RT 100 AL



- // toda gama dos materiais em alumínio tenaz e resistente, bem como ligas de alumínio fundido.
- // broca especial para Ø 3mm à 20 mm e profundidades até 12xD
- // possível para refrigeração convencional e MQL

→ a partir de página 815

NEW

NEW



//RATIO//

RT 100 Typ C

- // especialmente indicado para usinagem de aços de cavaco longo
- // excelente remoção de cavacos mesmo com parâmetros de corte reduzidos
- // forma de canal e geometria da areta de corte otimamente adaptada para usinagem

→ a partir de página 814



GÜHRING

P&D

FIBRA DE PLÁSTICO COMPOSTO (FCP)

soluções de ferramentas para materiais altamente abrasivos

USINAGEM DE FCP

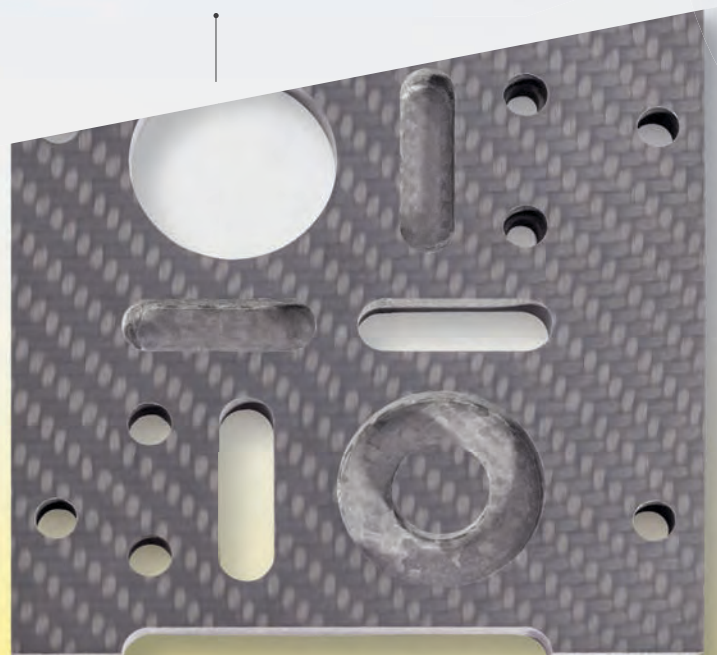
ferramentas otimizadas para a usinagem de plástico reforçado com fibra de vidro (PRFV) e fibra de plástico reforçado de carbono (CFRP), bem como materiais sobrepostos

- // Peças sem fibras salientes
- // superfícies de peças livres de delaminação
- // nenhum dano na peça através de „Peelup“ ou „Pushout“
- // impedir rupturas das fibras „Pullouts“ nas peças
- // minimizar a formação de rebarbas
- // impedir danos térmicos

→ a partir de página 816

FCP OPERAÇÃO DE FURAÇÃO

com ótima qualidade de usinagem



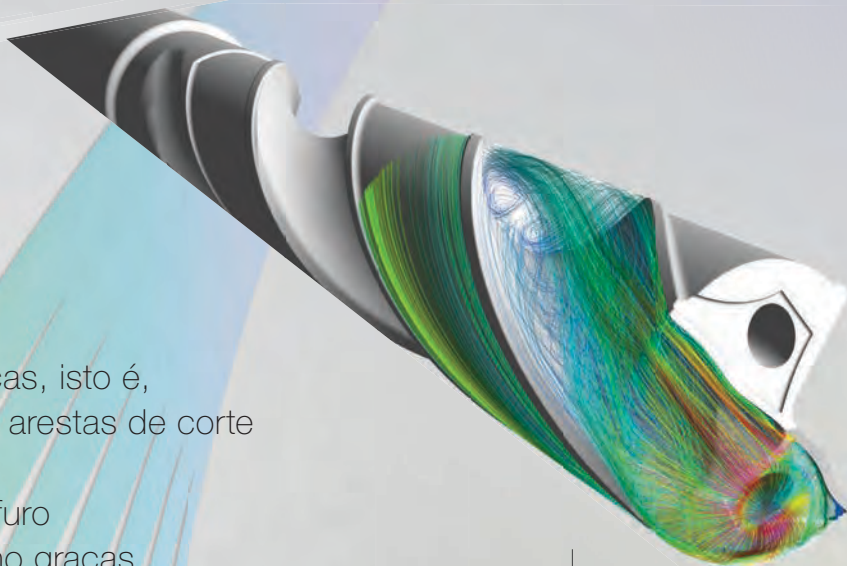
EW

REMOÇÃO COM LASER ESTRURADO

otimização da vida da ferramenta graças a refrigeração orientada para a localização alvo

- // redução de tensões térmicas, isto é, nos cantos externos e nas arestas de corte
- // melhor refrigeração
- // aumento na qualidade do furo
- // alta flexibilidade de desenho graças a usinagem a laser do perfil

→ a partir de página 819



Simulação com sistema CFD (Computational Fluid Dynamics)

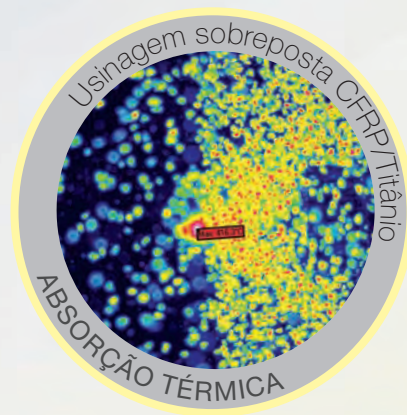
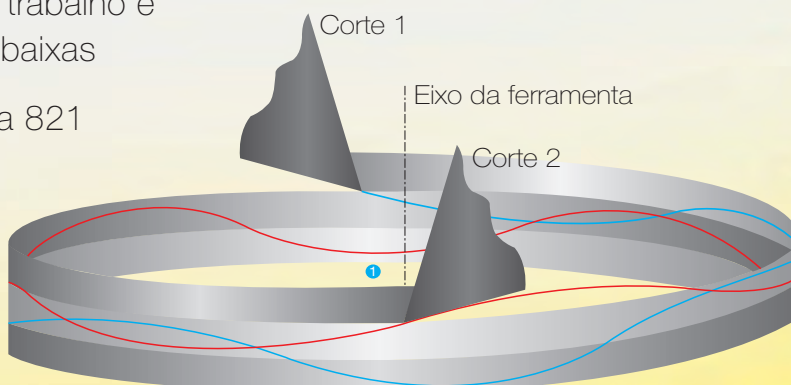
NEW

VIBRAÇÃO ASSISTIDA NA USINAGEM

otimização de processos graças ao movimento de sobreposição

- // formação mais favorável de cavacos / quebra de cavacos melhorada
- // melhor transporte de cavacos
- // gerar pontos definidos de quebra dos cavacos
- // diminuição da formação de arestas postizas
- // menores forças de trabalho e temperaturas mais baixas

→ a partir de página 821

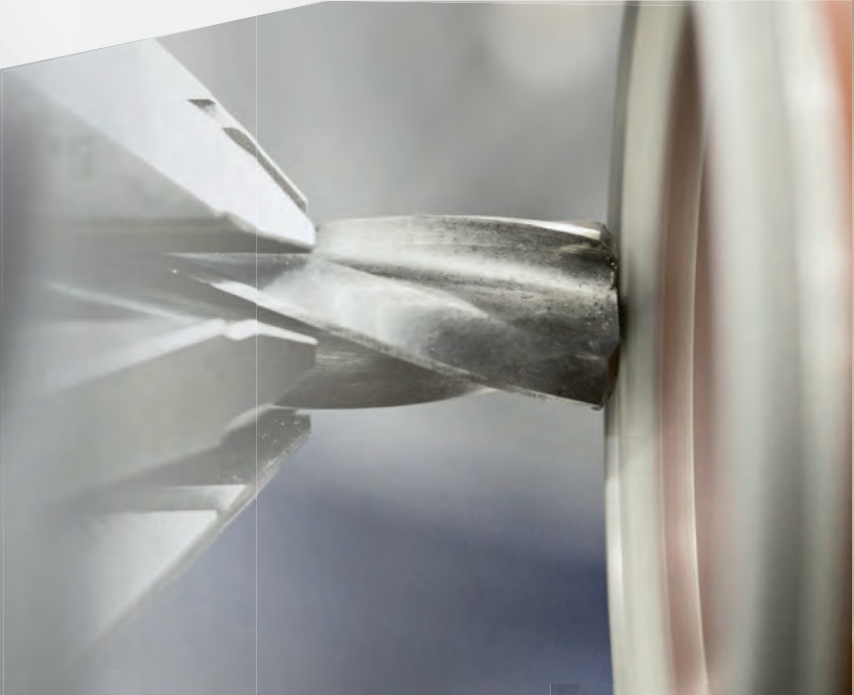


REAFIAÇÃO, REVESTIMENTO, DECAPAGEM, MODIFICAÇÃO
DA FERRAMENTA, FABRICAÇÃO DE PEQUENOS LOTES

PARA VOCÊ NO LOCAL



Serviço de afiação e
revestimento



Ferramentas especiais específicas para as necessidades dos clientes - Gühring é a receita para o sucesso

Nós respondemos às necessidades dos nossos clientes com perfeição em usinagem. Gühring fornece suporte com ideias e tecnologias inovadoras, bem como especialistas na elaboração de processo para produção de uma série específica de ferramentas de precisão.



GUHRING

Localização da Produção



GUHRING



LOCALIZAÇÃO

TREUEN





PICTOGRAMA

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 especiais, 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 tração e dureza:

- Aplicação ótima
- Aplicação limitada

Pictogramas

Material de corte	HSS	HSS-E	HSCO	M42	HSS-E-PM				
	Aço rápido								
	HM		VHM						
	Metal duro Grão mais fino (HM-UF)								
Profundidade de corte	1xD	1,5xD	3xD	4xD	5xD	7xD	8xD	10xD
Tolerance on Ø	m7	h5	h6	h7	h8	0/-0,004		
Forma da haste	HA	HB	HE		Cyl		MK		
	conforme DIN 6535				cilíndrica		cone Morse		
Sentido de corte	R			L			N		
	à direita			à esquerda			neutral		
Refrigeração interna									
	com RI			sem RI					
Forma	A	B	R					
Angulo da ponta	90°	118°	120°	130°	135°	140°	150°	
Redução da aresta transversal									
Norma	DIN 333	DIN 338	DIN 340	DIN 345	DIN 1869	DIN 6537K	DIN 6537L	DIN 6539
	conforme DIN								
	WN								
	conforme norma de empr.								
Tipo	EB 100	GT 100	HT 800 WP	H	N	RT 100 T	RT 100 U	W

Revestimentos

- | | | | |
|------------------|----------------|---------------|-----------|
| polido | marrom dourado | FIRE/nanoFIRE | Signum |
| parowane | TiAlN | TiCN | níquelado |
| a vapor | TiAlN SuperA | TiN | MolyGlide |
| guias nitretadas | TiAlN nanoA | Sirius | Carbo |

SELECIONE E COMPRE

PÁGINA DO PRODUTO

Todos os dados em uma vista!

Brocas Ratio com canais de refrigeração

3xD

RT 100
U

DIN
6537K

140°

m7

Material de corte **MD int.**

Superfície **S**

Forma da haste **HE**

P • Redução da aresta transversal $\geq \text{Ø } 3,300$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada

M ○

K •

N ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AISI

S ○

H ○

GÜHRINGNAVIGATOR
Página de dados de corte 750

Aplicação recomendada:

- Aplicação ótima
- Aplicação limitada

2 Tamanho nominal

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,300		6,000	62,000	20,000	36,000
3,400		6,000	62,000	20,000	36,000
4,000		6,000	66,000	24,000	36,000
5,000		6,000	66,000	28,000	36,000
5,500		6,000	66,000	28,000	36,000
5,600		6,000	66,000	28,000	36,000
5,800		6,000	66,000	28,000	36,000
6,000		6,000	66,000	28,000	36,000
6,100		8,000	79,000	34,000	36,000
6,200		8,000	79,000	34,000	36,000
6,300		8,000	79,000	34,000	36,000
6,400		8,000	79,000	34,000	36,000
6,600		8,000	79,000	34,000	36,000
6,800		8,000	79,000	34,000	36,000
7,000		8,000	79,000	34,000	36,000
7,100		8,000	79,000	41,000	36,000
7,140	9/32	8,000	79,000	41,000	36,000
7,400		8,000	79,000	41,000	36,000
7,500		8,000	79,000	41,000	36,000
7,540	19/64	8,000	79,000	41,000	36,000
7,800		8,000	79,000	41,000	36,000

1 Nr. do art.

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,510	29/64	12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,100		14,000	107,000	60,000	45,000
12,300	31/64	14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,900		14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,890	35/64	14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,500		16,000	115,000	65,000	48,000
14,680	37/64	16,000	115,000	65,000	48,000

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Por exemplo: Brocas Ratio com canais de refrigeração de tamanho nominal 5,5 = **1181 5,500**

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Brocas Ratio

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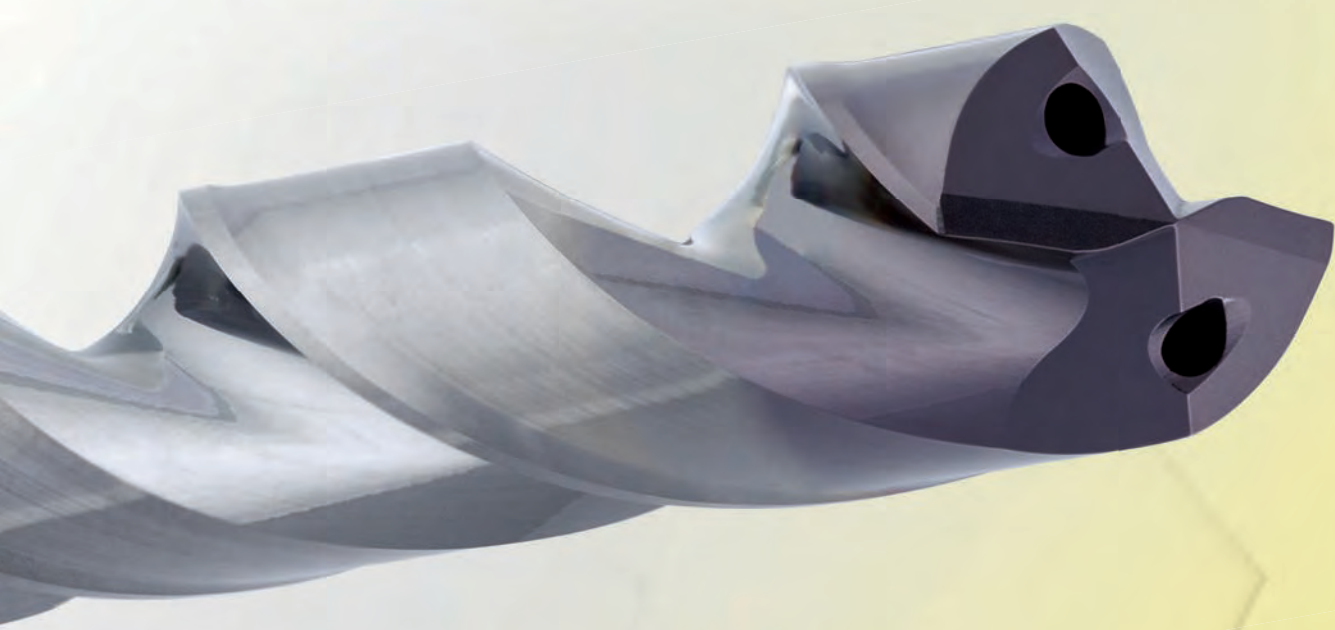
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BROCAS RATIO

Ratio®





P AÇO

H AÇOS ENDURECIDOS

3xD

4xD

5xD

7xD

≤ 1400 N/mm²

≤ 1400 N/mm²

≤ 1600 N/mm²

≤ 1400 N/mm²

≤ 1400 N/mm²

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 5759
a partir d. pág. 59

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 2477
a partir d. pág. 39

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 2479
a partir d. pág. 61

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 4044
a partir d. pág. 85

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 2480
a partir d. pág. 16

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 2996
a partir d. pág. 30

No 1

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 8520
a partir d. pág. 44

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 8521
a partir d. pág. 68

No 1

Ø 3,00 - 16,00 mm
Nr. do artigo 8522
a partir d. pág. 90

No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6405
a partir d. pág. 110

Ø 0,50 - 3,00 mm
Nr. do artigo 6400
a partir d. pág. 108

Ø 0,50 - 3,00 mm
Nr. do artigo 6401
a partir d. pág. 109

15xD

20xD

25xD

30xD

No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6412
a partir d. pág. 112

No 1

Ø 3,00 - 14,00 mm
Nr. do artigo 6509
a partir d. pág. 102

No 1

Ø 3,00 - 14,00 mm
Nr. do artigo 6511
a partir d. pág. 104

No 1

Ø 3,00 - 12,00 mm
Nr. do artigo 6512
a partir d. pág. 105

No 1

Ø 3,00 - 10,00 mm
Nr. do artigo 6513
a partir d. pág. 106



QUICKFINDER

8xD

12xD

No 1 Ferramenta ideal para usinagem de aços em geral

No 1 Ferramenta ideal usinagem de aços e aços com resistência até 1600N/mm²

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 5760
a partir d. pág. 96



RT100 S com dutos de refrigeração

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 5525
a partir d. pág. 100



RT100 U com dutos de refrigeração

Tipo H para aços endurecidos
até 62HRC
Nr. do artigo 1946, p. 389



RT100 U sem dutos de refrigeração



RT100 HF com dutos de refrigeração

No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6408
a partir d. pág. 111



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração



Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração

40xD

No 1

Ø 3,00 - 8,00 mm
Nr. do artigo 6514
a partir d. pág. 107



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração



RT 100 T



AÇOS RESISTENTES A CORROSÃO



TITÂNIO E LIGAS ESPECIAIS

3xD

4xD

5xD

7xD

No 1 No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 8510
a partir d. pág. 48

No 1 No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 8511
a partir d. pág. 72

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 8520
a partir d. pág. 44

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 8521
a partir d. pág. 68

No 1

Ø 3,00 - 16,00 mm
Nr. do artigo 8522
a partir d. pág. 90

S

Ø 3,50 - 20,00 mm
Nr. do artigo 2468
a partir d. pág. 52

S

Ø 3,00 - 20,00 mm
Nr. do artigo 2478
a partir d. pág. 76

No 1 No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6405
a partir d. pág. 110

15xD

20xD

25xD

30xD

No 1 No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6412
a partir d. pág. 112

No 1 No 1

Ø 3,00 - 14,00 mm
Nr. do artigo 6509
a partir d. pág. 102

No 1 No 1

Ø 3,00 - 14,00 mm
Nr. do artigo 6511
a partir d. pág. 104

No 1 No 1

Ø 3,00 - 12,00 mm
Nr. do artigo 6512
a partir d. pág. 105

No 1 No 1

Ø 3,00 - 10,00 mm
Nr. do artigo 6513
a partir d. pág. 106



QUICKFINDER

8xD

No 1 Ferramenta ideal para aços inoxidáveis

No 1 Ferramenta ideal para titânio e suas ligas especiais



RT100 VA



RT100 HF com dutos de refrigeração



RT100 F com dutos de refrigeração

No 1 **No 1**

Ø 1,40 - 3,00 mm
Nr. do artigo 6408
a partir d. pág. 111



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração

40xD



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração

No 1 **No 1**

Ø 3,00 - 8,00 mm
Nr. do artigo 6514
a partir d. pág. 107



RT 100 T



K FUNDIDOS

3xD	4xD	5xD	7xD
-----	-----	-----	-----

		No 1 Ø 3,00 - 20,00 mm Nr. do artigo 6501 a partir d. pág. 82	No 1 Ø 4,00 - 20,00 mm Nr. do artigo 6502 a partir d. pág. 91
--	--	---	---

No 1 Ø 3,00 - 20,00 mm Nr. do artigo 2477 a partir d. pág. 39		Ø 3,00 - 20,00 mm Nr. do artigo 2479 a partir d. pág. 61	Ø 3,00 - 20,00 mm Nr. do artigo 4044 a partir d. pág. 85
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Ø 3,00 - 20,00 mm Nr. do artigo 2480 a partir d. pág. 16		Ø 3,00 - 20,00 mm Nr. do artigo 2996 a partir d. pág. 30	
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	No 1 Ø 3,00 - 20,00 mm Nr. do artigo 768 a partir d. pág. 56		Ø 3,00 - 20,00 mm Nr. do artigo 769 a partir d. pág. 93
--	--	--	---

		No 1 Ø 1,40 - 3,00 mm Nr. do artigo 6405 a partir d. pág. 110	
--	--	---	--

	Ø 0,50 - 3,00 mm Nr. do artigo 6400 a partir d. pág. 108		Ø 0,50 - 3,00 mm Nr. do artigo 6401 a partir d. pág. 109
--	--	--	--

15xD	20xD	25xD	30xD
------	------	------	------

No 1 Ø 1,40 - 3,00 mm Nr. do artigo 6412 a partir d. pág. 112			
---	--	--	--

No 1 Ø 3,00 - 14,00 mm Nr. do artigo 6509 a partir d. pág. 102	No 1 Ø 3,00 - 14,00 mm Nr. do artigo 6511 a partir d. pág. 104	No 1 Ø 3,00 - 12,00 mm Nr. do artigo 6512 a partir d. pág. 105	No 1 Ø 3,00 - 10,00 mm Nr. do artigo 6513 a partir d. pág. 106
--	--	--	--

Ø 5,00 - 14,00 mm Nr. do artigo 773 a partir d. pág. 103			
--	--	--	--



QUICKFINDER

8xD

10xD

12xD

No 1 Ferramenta ideal


RT 100 R

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 5525
a partir d. pág. 100



RT100 U com dutos de refrigeração



RT100 U sem dutos de refrigeração

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 770
a partir d. pág. 98



RT100 GG Fundidos

No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6408
a partir d. pág. 111



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração



Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração

40xD



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração

No 1

Ø 3,00 - 8,00 mm
Nr. do artigo 6514
a partir d. pág. 107



RT 100 T



RT 150 GN



N ALUMÍNIO, NE, PLÁSTICOS

4xD

No 1

Ø 3,00 - 20,00 mm
Nr. do artigo 6068
a partir d. pág. 58

5xD

7xD

8xD

No 1

Ø 3,00 - 19,50 mm
Nr. do artigo 6069
a partir d. pág. 94



Ø 3,00 - 20,00 mm
Nr. do artigo 2713
a partir d. pág. 113



No 1

Ø 3,00 - 20,00 mm*



No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6405
a partir d. pág. 110



No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6408
a partir d. pág. 111

15xD

20xD

25xD

30xD

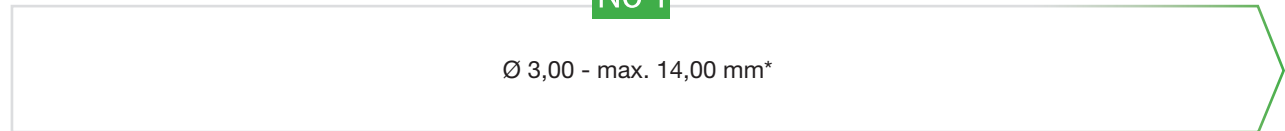
No 1

Ø 5,00 - 14,00 mm
Nr. do artigo 773
a partir d. pág. 103



No 1

Ø 3,00 - max. 14,00 mm*



No 1

Ø 1,40 - 3,00 mm
Nr. do artigo 6412
a partir d. pág. 112



*Ferramentas especiais sob ecomenda



QUICKFINDER

10xD

No 1 Ferramenta ideal

No 1

Ø 3,00 - 19,50 mm
Nr. do artigo 6070
a partir d. pág. 99



RT150 GG



FT 200 G com dutos de refrigeração



RT100 AL



Micro Brocas de precisão ExclusiveLine
com dutos de refrigeração



RT 150 GN

Brocas Kevlar
Nr. do artigo 1149 p. 431



RT 100 T Alumínio

Tipo N para usinagem de
alumiuo e plástico
Nr. do artigo 732 p. 319



Micro Brocas de precisão ExclusiveLine
com dutos de refrigeração



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Forma da haste	Tipo	Norma	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Brocas Ratio sem canais de refrigeração

•	○	•	○	○	○		3xD	HA	RT 100 U	DIN 6537K	VHM	F	3,000 - 20,000	2480	752	16
•	○	•	○	○	○		3xD	HE	RT 100 U	DIN 6537K	VHM	F	3,100 - 20,000	2472	752	18
•	○	•	○	○	○		3xD	Cyl	RT 100 U	DIN 6539	VHM	F	3,000 - 15,500	2473	752	20
•	○	•	○	○	○		3xD	HE	RT 100 U	DIN 6537K	VHM	S	3,000 - 20,000	1184	752	21
•	○	•	○	○	○		3xD	Cyl	RT 100 U	DIN 6539	VHM	S	3,000 - 16,000	1242	752	23
•	○	•	○	○	○		3xD	HA	RT 100 HF	DIN 6537K	VHM	Y	3,000 - 20,000	8524	752	25
○	○	○	○	•	○		3xD	HA	RT 100 F	DIN 6537K	VHM	F	3,700 - 12,000	2475	752	27
○	•	○	○	○	○		3xD	Cyl	RT 100 F	DIN 6539	VHM	S	3,000 - 14,000	1702	752	28
•	○	•	○	○	○		5xD	HA	RT 100 U	DIN 6537L	VHM	F	3,000 - 20,000	2996	756	30
•	○	•	○	○	○		5xD	HE	RT 100 U	DIN 6537L	VHM	F	3,100 - 20,000	2719	756	32
•	○	•	○	○	○		5xD	Cyl	RT 100 U	WN	VHM	F	5,000 - 14,000	2474	756	34
•	○	•	○	○	○		5xD	HA	RT 100 U	DIN 6537L	VHM	S	3,300 - 12,000	2717	756	35
•	○	•	○	○	○		5xD	Cyl	RT 100 U	WN	VHM	S	5,000 - 16,000	1243	756	36
○	○	○	○	•	○		5xD	HA	RT 100 F	DIN 6537L	VHM	F	3,000 - 15,000	2712	756	38

Brocas Ratio com canais de refrigeração

•	○	•	○	○	○		3xD	HA	RT 100 U	DIN 6537K	VHM	F	3,000 - 20,000	2477	750	39
•	○	•	○	○	○		3xD	HE	RT 100 U	DIN 6537K	VHM	F	3,000 - 20,000	2469	750	41
•	○	•	○	○	○		3xD	HE	RT 100 U	DIN 6537K	VHM	S	3,300 - 19,500	1181	750	43
•	○	•	○	○	○		3xD	HA	RT 100 HF	DIN 6537K	VHM	Y	3,000 - 20,000	8520	750	44
•	○	•	○	○	○		3xD	HE	RT 100 HF	DIN 6537K	VHM	Y	3,000 - 20,000	8620	750	46
•	○	•	○	○	○		3xD	HA	RT 100 VA	DIN 6537K	VHM	a	3,000 - 20,000	8510	750	48
•	○	•	○	○	○		3xD	HE	RT 100 VA	DIN 6537K	VHM	a	3,000 - 20,000	8610	750	50
○	○	○	○	•	○		3xD	HE	RT 100 F	DIN 6537K	VHM	F	3,500 - 20,000	2468	750	52
○	○	○	○	•	○		3xD	HA	RT 100 F	DIN 6537K	VHM	S	3,100 - 22,000	1660	750	53



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Forma da haste	Tipo	Norma	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Brocas Ratio com canais de refrigeração

○	○	○	○	●	○		3xD	HE	RT 100 F	DIN 6537 K	VHM	S	4,000 - 25,000	1180	750 54
●	○	○	○				3xD	HE	RT 80 U	DIN 6538 K	HM	S	9,500 - 25,500	1171	750 55
		●	○				4xD	HA	RT 150 GG	WN	VHM	○	3,000 - 20,000	768	752 56
		○	●				4xD	HA	RT 150 GG	WN	VHM	○	3,000 - 20,000	6068	752 58
●	○	○	○	○	○		5xD	HA	RT 100 S	DIN 6537 L	VHM	F	3,000 - 20,000	5759	754 59
●	○	●	○	○	○		5xD	HA	RT 100 U	DIN 6537 L	VHM	F	3,000 - 20,000	2479	754 61
●	○	●	○	○	○		5xD	HE	RT 100 U	DIN 6537 L	VHM	F	3,300 - 20,000	2471	754 63
●	○	●	○	○	○		5xD	HA	RT 100 U	DIN 6537 L	VHM	S	3,000 - 19,500	1663	754 65
●	○	●	○	○	○		5xD	HE	RT 100 U	DIN 6537 L	VHM	S	3,300 - 20,000	1183	754 66
●		●	○				5xD	HA	RT 100 HF	DIN 6537 L	VHM	Y	3,000 - 20,000	8521	756 68
●		●	○				5xD	HE	RT 100 HF	DIN 6537 L	VHM	Y	3,000 - 20,000	8621	756 70
	●		●				5xD	HA	RT 100 VA	DIN 6537 L	VHM	a	3,000 - 20,000	8511	756 72
	●		●				5xD	HE	RT 100 VA	DIN 6537 L	VHM	a	3,000 - 20,000	8611	756 74
○	○	○	○	●	○		5xD	HA	RT 100 F	DIN 6537 L	VHM	F	3,000 - 20,000	2478	754 76
○	○	○	○	●	○		5xD	HE	RT 100 F	DIN 6537 L	VHM	F	3,000 - 20,000	2470	754 77
○	○	○	○	●	○		5xD	HA	RT 100 F	DIN 6537 L	VHM	S	3,000 - 23,500	1662	754 78
○	○	○	○	●	○		5xD	HE	RT 100 F	DIN 6537 L	VHM	S	3,000 - 25,000	1182	754 80
		●					5xD	HA	RT 100 R	DIN 6537 L	VHM	F	3,000 - 20,000	6501	754 82
●	○	○	○				5xD	HE	RT 80 U	DIN 6538 M	HM	S	9,800 - 25,500	1172	754 84
●	○	●	○	○	○		7xD	HA	RT 100 U	WN	VHM	F	3,000 - 20,000	4044	758 85
●	○	●	○	○	○		7xD	HE	RT 100 U	WN	VHM	F	3,000 - 19,500	4045	758 87
●	○	●	○	○	○		7xD	HA	RT 100 U	WN	VHM	S	3,000 - 19,500	2711	758 89
●		●	○				7xD	HA	RT 100 HF	WN	VHM	Y	3,000 - 16,000	8522	758 90
	●		●				7xD	HA	RT 100 R	WN	VHM	F	4,000 - 20,000	6502	758 91

Brocas Ratio



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Forma da haste	Tipo	Norma	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Brocas Ratio com canais de refrigeração

		•	○				7xD	HA	RT 150 GG	WN	VHM	○	3,000 - 20,000	769	758 93
		○	•				7xD	HA	RT 150 GG	WN	VHM	○	3,000 - 19,500	6069	758 94
•	○	○	○				7xD	HE	RT80U	DIN 6538L	HM	Ⓢ	9,600 - 25,000	1173	758 95
•	○	○	○	○			7xD	HA	RT 100 S	WN	VHM	Ⓡ	3,000 - 20,000	5760	758 96
		•	○				10xD	HA	RT 150 GG	WN	VHM	○	3,000 - 20,000	770	758 98
		○	•				10xD	HA	RT 150 GG	WN	VHM	○	3,000 - 19,500	6070	758 99
•	○	•	○	○			12xD	HA	RT 100 U	WN	VHM	Ⓡ	3,000 - 20,000	5525	758 100
•	•	•	○	○			15xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 14,000	6509	760 102
		•	•				15xD	HA	RT 150 GN	WN	VHM	○	5,000 - 14,000	773	760 103
•	•	•	○	○			20xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 14,000	6511	760 104
•	•	•	○	○			25xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 12,000	6512	760 105
•	•	•	○	○			30xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 10,000	6513	760 106
•	•	•	○	○			40xD	HA	RT 100 T	WN	VHM	Ⓡ	3,000 - 8,000	6514	760 107

Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração

•	•	•	○	○			4xD	Cyl	N	WN	VHM	Ⓡ	0,500 - 3,000	6400	796 108
•	•	•	○	○			7xD	Cyl	N	WN	VHM	Ⓡ	0,500 - 3,000	6401	796 109

Micro Brocas de precisão ExclusiveLine com dutos de refrigeração

•	•	•	○	○			5xD	Cyl	N	WN	VHM	Ⓡ	1,400 - 3,000	6405	796 110
•	•	•	○	○			8xD	Cyl	N	WN	VHM	Ⓡ	1,400 - 3,000	6408	796 111
•	•	•	○	○			15xD	Cyl	N	WN	VHM	Ⓡ	1,400 - 3,000	6412	796 112





Brocas Ratio, 3 cortes

		•	•				5xD	HA	FT 200 G	DIN 6537L	VHM	○	3,000 - 20,000	2713	762 113
○	○	○					5xD	Cyl	GS 200 U	DIN 6539	VHM	Ⓢ	3,000 - 14,400	611	762 114
○	○	○					5xD	Cyl	GS 200 U	DIN 6539	VHM	○	3,000 - 20,000	731	762 115
		○	○				5xD	Cyl	GS 200 G	DIN 6539	VHM	○	3,570 - 12,500	745	762 116



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Forma da haste	Tipo	Norma	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Brocas Ratio, 3 cortes

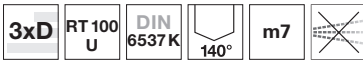
		○	○				5xD		GS 200 G	DIN 6539	VHM	○	3,000 - 20,000	1025	762 117
○		○	○				5xD		GS 200 F	DIN 6539	VHM	Ⓢ	3,000 - 11,000	1027	762 119

Brocas Ratio escalonadas, 3 cortes

		○	○				3xD		GS 200 G	WN	VHM	○	3,400 - 20,000	1032	120
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Brocas Ratio sem canais de refrigeração

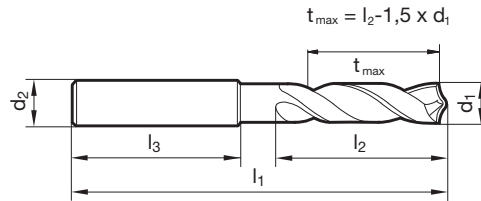


- P** ● Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** ●
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 752

Material de corte	MD int.
Superfície	F
Forma da haste	HA



Nr. do artigo **2480**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	7,000		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	7,200		8,000	79,000	41,000	36,000
3,600		6,000	62,000	20,000	36,000	7,300		8,000	79,000	41,000	36,000
3,700		6,000	62,000	20,000	36,000	7,500		8,000	79,000	41,000	36,000
3,800		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
3,900		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	8,000		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	8,100		10,000	89,000	47,000	40,000
4,300		6,000	66,000	24,000	36,000	8,200		10,000	89,000	47,000	40,000
4,400		6,000	66,000	24,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	8,400		10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	8,500		10,000	89,000	47,000	40,000
4,650		6,000	66,000	24,000	36,000	8,700		10,000	89,000	47,000	40,000
4,760	3/16	6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	9,400		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	9,900		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	10,000		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	10,100		12,000	102,000	55,000	45,000
5,550		6,000	66,000	28,000	36,000	10,200		12,000	102,000	55,000	45,000
5,560	7/32	6,000	66,000	28,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	10,400		12,000	102,000	55,000	45,000
5,650		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,700		6,000	66,000	28,000	36,000	10,700		12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	10,800		12,000	102,000	55,000	45,000
5,900		6,000	66,000	28,000	36,000	10,900		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	11,500		12,000	102,000	55,000	45,000
6,350	1/4	8,000	79,000	34,000	36,000	11,600		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	11,800		12,000	102,000	55,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,100		14,000	107,000	60,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,100	33/64	14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,400		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
14,800		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,100		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,600		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,500		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio sem canais de refrigeração

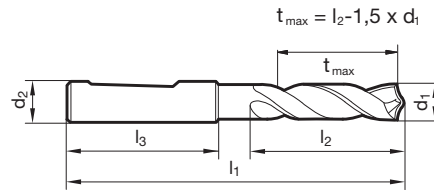


- P** • Redução da aresta transversal $\geq \varnothing 3,100$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 752

Material de corte	MD int.
Superfície	F
Forma da haste	HE



Nr. do artigo **2472**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,100		6,000	62,000	20,000	36,000	9,250		10,000	89,000	47,000	40,000
3,200		6,000	62,000	20,000	36,000	9,400		10,000	89,000	47,000	40,000
3,500		6,000	62,000	20,000	36,000	9,500		10,000	89,000	47,000	40,000
3,600		6,000	62,000	20,000	36,000	9,800		10,000	89,000	47,000	40,000
3,700		6,000	62,000	20,000	36,000	10,000		10,000	89,000	47,000	40,000
3,900		6,000	66,000	24,000	36,000	10,100		12,000	102,000	55,000	45,000
4,000		6,000	66,000	24,000	36,000	10,200		12,000	102,000	55,000	45,000
4,200		6,000	66,000	24,000	36,000	10,300		12,000	102,000	55,000	45,000
4,500		6,000	66,000	24,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
4,600		6,000	66,000	24,000	36,000	10,400		12,000	102,000	55,000	45,000
4,900		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	10,600		12,000	102,000	55,000	45,000
5,100		6,000	66,000	28,000	36,000	10,700		12,000	102,000	55,000	45,000
5,200		6,000	66,000	28,000	36,000	10,800		12,000	102,000	55,000	45,000
5,300		6,000	66,000	28,000	36,000	10,900		12,000	102,000	55,000	45,000
5,400		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	11,200		12,000	102,000	55,000	45,000
5,900		6,000	66,000	28,000	36,000	11,300		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,800		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	12,100		14,000	107,000	60,000	45,000
7,000		8,000	79,000	34,000	36,000	12,200		14,000	107,000	60,000	45,000
7,100		8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
7,200		8,000	79,000	41,000	36,000	12,600		14,000	107,000	60,000	45,000
7,300		8,000	79,000	41,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
7,700		8,000	79,000	41,000	36,000	13,300		14,000	107,000	60,000	45,000
7,900		8,000	79,000	41,000	36,000	13,500		14,000	107,000	60,000	45,000
8,000		8,000	79,000	41,000	36,000	14,000		14,000	107,000	60,000	45,000
8,100		10,000	89,000	47,000	40,000	14,200		16,000	115,000	65,000	48,000
8,200		10,000	89,000	47,000	40,000	14,290	9/16	16,000	115,000	65,000	48,000
8,300		10,000	89,000	47,000	40,000	14,500		16,000	115,000	65,000	48,000
8,500		10,000	89,000	47,000	40,000	14,700		16,000	115,000	65,000	48,000
8,600		10,000	89,000	47,000	40,000	15,000		16,000	115,000	65,000	48,000
8,700		10,000	89,000	47,000	40,000	15,200		16,000	115,000	65,000	48,000
8,900		10,000	89,000	47,000	40,000	15,500		16,000	115,000	65,000	48,000
9,000		10,000	89,000	47,000	40,000	15,700		16,000	115,000	65,000	48,000
9,100		10,000	89,000	47,000	40,000	15,800		16,000	115,000	65,000	48,000
9,200		10,000	89,000	47,000	40,000	16,200		18,000	123,000	73,000	48,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,300		20,000	131,000	79,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
18,500		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio sem canais de refrigeração

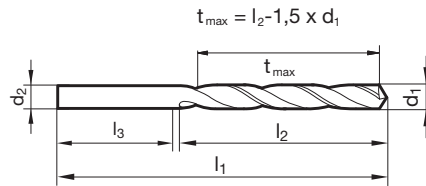


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 752

Material de corte	MD int.
Superfície	F
Forma da haste	Cilíndrica



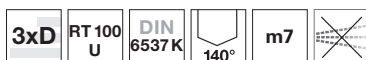
Nr. do artigo **2473**

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		3,000	46,000	16,000	30,000
3,200		3,200	49,000	18,000	31,000
3,300		3,300	49,000	18,000	31,000
3,500		3,500	52,000	20,000	32,000
3,800		3,800	55,000	22,000	33,000
3,900		3,900	55,000	22,000	33,000
4,000		4,000	55,000	22,000	33,000
4,200		4,200	55,000	22,000	33,000
4,500		4,500	58,000	24,000	34,000
4,600		4,600	58,000	24,000	34,000
4,900		4,900	62,000	26,000	36,000
5,000		5,000	62,000	26,000	36,000
5,200		5,200	62,000	26,000	36,000
5,500		5,500	66,000	28,000	38,000
5,800		5,800	66,000	28,000	38,000
6,000		6,000	66,000	28,000	38,000
6,100		6,100	70,000	31,000	39,000
6,200		6,200	70,000	31,000	39,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
6,400		6,400	70,000	31,000	39,000
7,000		7,000	74,000	34,000	40,000
7,400		7,400	74,000	34,000	40,000
8,100		8,100	79,000	37,000	42,000
8,500		8,500	79,000	37,000	42,000
8,800		8,800	84,000	40,000	44,000
9,100		9,100	84,000	40,000	44,000
9,400		9,400	84,000	40,000	44,000
10,000		10,000	89,000	43,000	46,000
10,200		10,200	89,000	43,000	46,000
10,500		10,500	89,000	43,000	46,000
11,500		11,500	95,000	47,000	48,000
11,800		11,800	95,000	47,000	48,000
12,000		12,000	102,000	51,000	51,000
12,500		12,500	102,000	51,000	51,000
14,000		14,000	107,000	54,000	53,000
15,500		15,500	115,000	58,000	57,000



Brocas Ratio sem canais de refrigeração



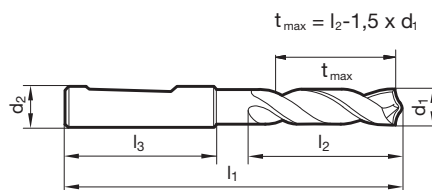
- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

Material de corte	MD int.
Superfície	S
Forma da haste	HE

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 752



Nr. do artigo **1184**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	7,000		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
3,500		6,000	62,000	20,000	36,000	7,200		8,000	79,000	41,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	7,300		8,000	79,000	41,000	36,000
3,600		6,000	62,000	20,000	36,000	7,400		8,000	79,000	41,000	36,000
3,700		6,000	62,000	20,000	36,000	7,500		8,000	79,000	41,000	36,000
3,800		6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
3,900		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	8,000		8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	8,100		10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	8,200		10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	8,300		10,000	89,000	47,000	40,000
4,700		6,000	66,000	24,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
4,760	3/16	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	9,400		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,520	3/8	10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,600		10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,900		10,000	89,000	47,000	40,000
6,100		8,000	79,000	34,000	36,000	9,920	25/64	10,000	89,000	47,000	40,000
6,200		8,000	79,000	34,000	36,000	10,000		10,000	89,000	47,000	40,000
6,300		8,000	79,000	34,000	36,000	10,100		12,000	102,000	55,000	45,000
6,350	1/4	8,000	79,000	34,000	36,000	10,200		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	10,300		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	10,500		12,000	102,000	55,000	45,000

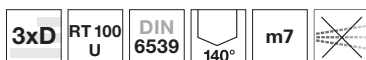


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,600		12,000	102,000	55,000	45,000
10,720	27/64	12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,100		14,000	107,000	60,000	45,000
12,200		14,000	107,000	60,000	45,000
12,300	31/64	14,000	107,000	60,000	45,000
12,400		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,100	33/64	14,000	107,000	60,000	45,000
13,200		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,400		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,800		14,000	107,000	60,000	45,000
13,890	35/64	14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,400		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
14,800		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,100		16,000	115,000	65,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,200		16,000	115,000	65,000	48,000
15,480	39/64	16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
15,800		16,000	115,000	65,000	48,000
15,870	5/8	16,000	115,000	65,000	48,000
15,900		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,100		18,000	123,000	73,000	48,000
16,270	41/64	18,000	123,000	73,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,800		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,460	11/16	18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
17,700		18,000	123,000	73,000	48,000
17,860	45/64	18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,100		20,000	131,000	79,000	50,000
18,300		20,000	131,000	79,000	50,000
18,500		20,000	131,000	79,000	50,000
18,650	47/64	20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,200		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
19,600		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio sem canais de refrigeração



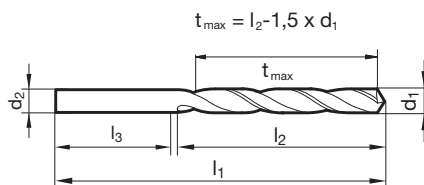
- P** ● Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** ●
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

Material de corte	MD int.
Superfície	S
Forma da haste	Cilíndrica

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 752



Nr. do artigo **1242**

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		3,000	46,000	16,000	30,000	6,350		6,350	70,000	31,000	39,000
3,100		3,100	49,000	18,000	31,000	6,400		6,400	70,000	31,000	39,000
3,170	1/8	3,170	49,000	18,000	31,000	6,500		6,500	70,000	31,000	39,000
3,200		3,200	49,000	18,000	31,000	6,600		6,600	70,000	31,000	39,000
3,300		3,300	49,000	18,000	31,000	6,700		6,700	70,000	31,000	39,000
3,400		3,400	52,000	20,000	32,000	6,750	17/64	6,750	74,000	34,000	40,000
3,500		3,500	52,000	20,000	32,000	6,800		6,800	74,000	34,000	40,000
3,570	9/64	3,570	52,000	20,000	32,000	6,900		6,900	74,000	34,000	40,000
3,600		3,600	52,000	20,000	32,000	7,000		7,000	74,000	34,000	40,000
3,700		3,700	52,000	20,000	32,000	7,100		7,100	74,000	34,000	40,000
3,800		3,800	55,000	22,000	33,000	7,140	9/32	7,140	74,000	34,000	40,000
3,900		3,900	55,000	22,000	33,000	7,200		7,200	74,000	34,000	40,000
3,970	5/32	3,970	55,000	22,000	33,000	7,300		7,300	74,000	34,000	40,000
4,000		4,000	55,000	22,000	33,000	7,400		7,400	74,000	34,000	40,000
4,100		4,100	55,000	22,000	33,000	7,500		7,500	74,000	34,000	40,000
4,200		4,200	55,000	22,000	33,000	7,540	19/64	7,540	79,000	37,000	42,000
4,300		4,300	58,000	24,000	34,000	7,600		7,600	79,000	37,000	42,000
4,370	11/64	4,370	58,000	24,000	34,000	7,700		7,700	79,000	37,000	42,000
4,400		4,400	58,000	24,000	34,000	7,800		7,800	79,000	37,000	42,000
4,500		4,500	58,000	24,000	34,000	7,900		7,900	79,000	37,000	42,000
4,600		4,600	58,000	24,000	34,000	7,940	5/16	7,940	79,000	37,000	42,000
4,700		4,700	58,000	24,000	34,000	8,000		8,000	79,000	37,000	42,000
4,760	3/16	4,760	62,000	26,000	36,000	8,100		8,100	79,000	37,000	42,000
4,800		4,800	62,000	26,000	36,000	8,200		8,200	79,000	37,000	42,000
4,900		4,900	62,000	26,000	36,000	8,300		8,300	79,000	37,000	42,000
5,000		5,000	62,000	26,000	36,000	8,330	21/64	8,330	79,000	37,000	42,000
5,100		5,100	62,000	26,000	36,000	8,400		8,400	79,000	37,000	42,000
5,160	13/64	5,160	62,000	26,000	36,000	8,500		8,500	79,000	37,000	42,000
5,200		5,200	62,000	26,000	36,000	8,600		8,600	84,000	40,000	44,000
5,300		5,300	62,000	26,000	36,000	8,700		8,700	84,000	40,000	44,000
5,400		5,400	66,000	28,000	38,000	8,730	11/32	8,730	84,000	40,000	44,000
5,500		5,500	66,000	28,000	38,000	8,800		8,800	84,000	40,000	44,000
5,560	7/32	5,560	66,000	28,000	38,000	8,900		8,900	84,000	40,000	44,000
5,600		5,600	66,000	28,000	38,000	9,000		9,000	84,000	40,000	44,000
5,700		5,700	66,000	28,000	38,000	9,100		9,100	84,000	40,000	44,000
5,800		5,800	66,000	28,000	38,000	9,130	23/64	9,130	84,000	40,000	44,000
5,900		5,900	66,000	28,000	38,000	9,200		9,200	84,000	40,000	44,000
5,950	15/64	5,950	66,000	28,000	38,000	9,300		9,300	84,000	40,000	44,000
6,000		6,000	66,000	28,000	38,000	9,400		9,400	84,000	40,000	44,000
6,100		6,100	70,000	31,000	39,000	9,500		9,500	84,000	40,000	44,000
6,200		6,200	70,000	31,000	39,000	9,520	3/8	9,520	89,000	43,000	46,000
6,300		6,300	70,000	31,000	39,000	9,600		9,600	89,000	43,000	46,000



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,700		9,700	89,000	43,000	46,000
9,800		9,800	89,000	43,000	46,000
9,900		9,900	89,000	43,000	46,000
9,920	25/64	9,920	89,000	43,000	46,000
10,000		10,000	89,000	43,000	46,000
10,100		10,100	89,000	43,000	46,000
10,200		10,200	89,000	43,000	46,000
10,300		10,300	89,000	43,000	46,000
10,320	13/32	10,320	89,000	43,000	46,000
10,400		10,400	89,000	43,000	46,000
10,500		10,500	89,000	43,000	46,000
10,600		10,600	89,000	43,000	46,000
10,700		10,700	95,000	47,000	48,000
10,720	27/64	10,720	95,000	47,000	48,000
10,800		10,800	95,000	47,000	48,000
10,900		10,900	95,000	47,000	48,000
11,000		11,000	95,000	47,000	48,000
11,100		11,100	95,000	47,000	48,000
11,110	7/16	11,110	95,000	47,000	48,000
11,200		11,200	95,000	47,000	48,000
11,300		11,300	95,000	47,000	48,000
11,400		11,400	95,000	47,000	48,000
11,500		11,500	95,000	47,000	48,000
11,510	29/64	11,510	95,000	47,000	48,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
11,600		11,600	95,000	47,000	48,000
11,800		11,800	95,000	47,000	48,000
11,900		11,900	102,000	51,000	51,000
11,910	15/32	11,910	102,000	51,000	51,000
12,000		12,000	102,000	51,000	51,000
12,500		12,500	102,000	51,000	51,000
12,700	1/2	12,700	102,000	51,000	51,000
13,000		13,000	102,000	51,000	51,000
13,500		13,500	107,000	54,000	53,000
14,000		14,000	107,000	54,000	53,000
14,500		14,500	111,000	56,000	55,000
15,000		15,000	111,000	56,000	55,000
15,500		15,500	115,000	58,000	57,000
16,000		16,000	115,000	58,000	57,000



Brocas Ratio sem canais de refrigeração



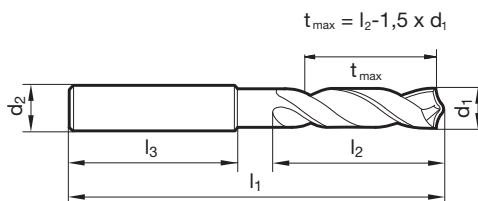
- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • forma principal de corte levemente concava • geometria de cortes otimizada
- K**
- N** aços com liga e de alta resistência até 1600 N/mm² • Inconel, Hastelloy, Monel • Titânio e ligas de titânio
- S** •
- H** ○

Material de corte	MD int.
Superfície	Y
Forma da haste	HA

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 752



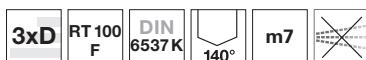
Nr. do artigo **8524**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000

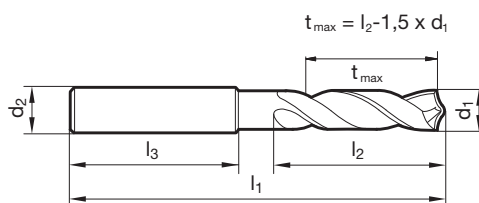
d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000


Brocas Ratio sem canais de refrigeração


P	○	Redução da aresta transversal $\geq \varnothing 5,000$ • afiação de superfície cônica
M	○	• formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
K	○	
N	○	aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
S	•	
H	○	

GÜHRING NAVIGATOR

Página de dados de corte 752



Nr. do artigo

2475

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,700		6,000	62,000	20,000	36,000
4,650		6,000	66,000	24,000	36,000
5,000		6,000	66,000	28,000	36,000
5,500		6,000	66,000	28,000	36,000
6,000		6,000	66,000	28,000	36,000
6,500		8,000	79,000	34,000	36,000
6,800		8,000	79,000	34,000	36,000
7,000		8,000	79,000	34,000	36,000
8,000		8,000	79,000	41,000	36,000
8,500		10,000	89,000	47,000	40,000
9,000		10,000	89,000	47,000	40,000
9,300		10,000	89,000	47,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,000		10,000	89,000	47,000	40,000
10,500		12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000



Brocas Ratio sem canais de refrigeração

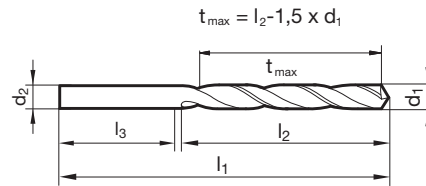


- P** ○ Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
- M** ● • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel
- S** ○ • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio
- H** ○ • Titânio e ligas de titânio • materiais sinterizados • aços de liga alta

GÜHRING NAVIGATOR

Página de dados de corte 752

Material de corte	MD int.
Superfície	Ⓢ
Forma da haste	Cilíndrica



Nr. do artigo 1702

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		3,000	46,000	16,000	30,000	6,400		6,400	70,000	31,000	39,000
3,100		3,100	49,000	18,000	31,000	6,500		6,500	70,000	31,000	39,000
3,170	1/8	3,170	49,000	18,000	31,000	6,600		6,600	70,000	31,000	39,000
3,200		3,200	49,000	18,000	31,000	6,700		6,700	70,000	31,000	39,000
3,300		3,300	49,000	18,000	31,000	6,750	17/64	6,750	74,000	34,000	40,000
3,400		3,400	52,000	20,000	32,000	6,800		6,800	74,000	34,000	40,000
3,500		3,500	52,000	20,000	32,000	6,900		6,900	74,000	34,000	40,000
3,570	9/64	3,570	52,000	20,000	32,000	7,000		7,000	74,000	34,000	40,000
3,600		3,600	52,000	20,000	32,000	7,100		7,100	74,000	34,000	40,000
3,700		3,700	52,000	20,000	32,000	7,140	9/32	7,140	74,000	34,000	40,000
3,800		3,800	55,000	22,000	33,000	7,200		7,200	74,000	34,000	40,000
3,900		3,900	55,000	22,000	33,000	7,300		7,300	74,000	34,000	40,000
3,970	5/32	3,970	55,000	22,000	33,000	7,400		7,400	74,000	34,000	40,000
4,000		4,000	55,000	22,000	33,000	7,540	19/64	7,540	79,000	37,000	42,000
4,100		4,100	55,000	22,000	33,000	7,600		7,600	79,000	37,000	42,000
4,200		4,200	55,000	22,000	33,000	7,700		7,700	79,000	37,000	42,000
4,300		4,300	58,000	24,000	34,000	7,800		7,800	79,000	37,000	42,000
4,370	11/64	4,370	58,000	24,000	34,000	7,900		7,900	79,000	37,000	42,000
4,400		4,400	58,000	24,000	34,000	7,940	5/16	7,940	79,000	37,000	42,000
4,500		4,500	58,000	24,000	34,000	8,000		8,000	79,000	37,000	42,000
4,600		4,600	58,000	24,000	34,000	8,100		8,100	79,000	37,000	42,000
4,700		4,700	58,000	24,000	34,000	8,200		8,200	79,000	37,000	42,000
4,760	3/16	4,760	62,000	26,000	36,000	8,300		8,300	79,000	37,000	42,000
4,800		4,800	62,000	26,000	36,000	8,330	21/64	8,330	79,000	37,000	42,000
4,900		4,900	62,000	26,000	36,000	8,400		8,400	79,000	37,000	42,000
5,000		5,000	62,000	26,000	36,000	8,500		8,500	79,000	37,000	42,000
5,100		5,100	62,000	26,000	36,000	8,600		8,600	84,000	40,000	44,000
5,160	13/64	5,160	62,000	26,000	36,000	8,700		8,700	84,000	40,000	44,000
5,200		5,200	62,000	26,000	36,000	8,730	11/32	8,730	84,000	40,000	44,000
5,300		5,300	62,000	26,000	36,000	8,800		8,800	84,000	40,000	44,000
5,400		5,400	66,000	28,000	38,000	8,900		8,900	84,000	40,000	44,000
5,500		5,500	66,000	28,000	38,000	9,000		9,000	84,000	40,000	44,000
5,560	7/32	5,560	66,000	28,000	38,000	9,100		9,100	84,000	40,000	44,000
5,600		5,600	66,000	28,000	38,000	9,130	23/64	9,130	84,000	40,000	44,000
5,700		5,700	66,000	28,000	38,000	9,400		9,400	84,000	40,000	44,000
5,800		5,800	66,000	28,000	38,000	9,500		9,500	84,000	40,000	44,000
5,950	15/64	5,950	66,000	28,000	38,000	9,520	3/8	9,520	89,000	43,000	46,000
6,000		6,000	66,000	28,000	38,000	9,600		9,600	89,000	43,000	46,000
6,100		6,100	70,000	31,000	39,000	9,700		9,700	89,000	43,000	46,000
6,200		6,200	70,000	31,000	39,000	9,800		9,800	89,000	43,000	46,000
6,300		6,300	70,000	31,000	39,000	9,900		9,900	89,000	43,000	46,000
6,350	1/4	6,350	70,000	31,000	39,000	9,920	25/64	9,920	89,000	43,000	46,000



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,000		10,000	89,000	43,000	46,000
10,200		10,200	89,000	43,000	46,000
10,300		10,300	89,000	43,000	46,000
10,320	13/32	10,320	89,000	43,000	46,000
10,720	27/64	10,720	95,000	47,000	48,000
11,000		11,000	95,000	47,000	48,000
11,110	7/16	11,110	95,000	47,000	48,000
11,300		11,300	95,000	47,000	48,000
11,500		11,500	95,000	47,000	48,000
11,510	29/64	11,510	95,000	47,000	48,000
11,910	15/32	11,910	102,000	51,000	51,000
12,000		12,000	102,000	51,000	51,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,300	31/64	12,300	102,000	51,000	51,000
12,500		12,500	102,000	51,000	51,000
12,700	1/2	12,700	102,000	51,000	51,000
13,000		13,000	102,000	51,000	51,000
13,500		13,500	107,000	54,000	53,000
14,000		14,000	107,000	54,000	53,000



Brocas Ratio sem canais de refrigeração

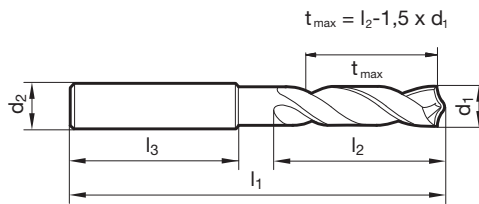


- P** ● Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** ●
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	F
Forma da haste	HA



Nr. do artigo **2996**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	7,000		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	7,100		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	7,200		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	7,300		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	7,500		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	7,600		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	7,700		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	7,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	7,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	8,000		8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	8,100		10,000	103,000	61,000	40,000
4,100		6,000	74,000	36,000	36,000	8,200		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	8,400		10,000	103,000	61,000	40,000
4,300		6,000	74,000	36,000	36,000	8,500		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	8,700		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	8,800		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	10,000		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,600		6,000	82,000	44,000	36,000	10,300		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	10,320	13/32	12,000	118,000	71,000	45,000
5,900		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	10,700		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	10,800		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	11,000		12,000	118,000	71,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,910	15/32	12,000	118,000	71,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,400		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,600		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,400		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
14,700		16,000	133,000	83,000	48,000
14,800		16,000	133,000	83,000	48,000
15,100		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,600		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio sem canais de refrigeração

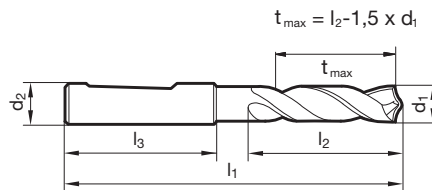


- P** • Redução da aresta transversal $\geq \varnothing 3,100$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	F
Forma da haste	HE



Nr. do artigo **2719**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,100		6,000	66,000	28,000	36,000	7,800		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	7,900		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	8,000		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	8,100		10,000	103,000	61,000	40,000
3,700		6,000	66,000	28,000	36,000	8,200		10,000	103,000	61,000	40,000
3,800		6,000	74,000	36,000	36,000	8,300		10,000	103,000	61,000	40,000
3,900		6,000	74,000	36,000	36,000	8,400		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	8,500		10,000	103,000	61,000	40,000
4,100		6,000	74,000	36,000	36,000	8,600		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	8,700		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	8,900		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	9,100		10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	9,600		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	9,900		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	10,320	13/32	12,000	118,000	71,000	45,000
5,550		6,000	82,000	44,000	36,000	10,400		12,000	118,000	71,000	45,000
5,600		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,700		6,000	82,000	44,000	36,000	10,600		12,000	118,000	71,000	45,000
5,900		6,000	82,000	44,000	36,000	10,700		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	10,800		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	11,300		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	11,400		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
7,100		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
7,200		8,000	91,000	53,000	36,000	11,900		12,000	118,000	71,000	45,000
7,300		8,000	91,000	53,000	36,000	11,910	15/32	12,000	118,000	71,000	45,000
7,500		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
7,600		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
7,700		8,000	91,000	53,000	36,000	12,700	1/2	14,000	124,000	77,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000

Brocas Ratio



Brocas Ratio sem canais de refrigeração

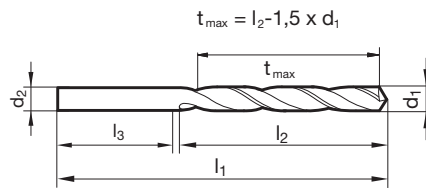


- P** • Redução da aresta transversal $\geq \varnothing 5,000$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	F
Forma da haste	Cilíndrica

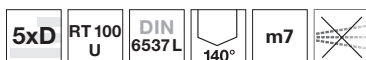


Nr. do artigo **2474**

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
5,000		5,000	73,000	34,000	39,000	9,000		9,000	98,000	55,000	43,000
5,400		5,400	76,000	38,000	38,000	9,200		9,200	102,000	58,000	44,000
5,500		5,500	76,000	38,000	38,000	9,300		9,300	102,000	58,000	44,000
5,600		5,600	81,000	41,000	40,000	9,700		9,700	105,000	60,000	45,000
5,700		5,700	81,000	41,000	40,000	9,800		9,800	105,000	60,000	45,000
6,200		6,200	81,000	41,000	40,000	10,200		10,200	112,000	66,000	46,000
6,400		6,400	81,000	41,000	40,000	10,300		10,300	112,000	66,000	46,000
6,500		6,500	81,000	41,000	40,000	10,400		10,400	112,000	66,000	46,000
6,600		6,600	83,000	43,000	40,000	10,500		10,500	112,000	66,000	46,000
6,800		6,800	83,000	43,000	40,000	10,600		10,600	114,000	68,000	46,000
7,100		7,100	87,000	45,000	42,000	10,800		10,800	114,000	68,000	46,000
7,200		7,200	87,000	45,000	42,000	10,900		10,900	114,000	68,000	46,000
7,400		7,400	87,000	45,000	42,000	11,000		11,000	114,000	68,000	46,000
7,700		7,700	90,000	48,000	42,000	11,600		11,600	121,000	73,000	48,000
8,000		8,000	90,000	48,000	42,000	11,800		11,800	121,000	73,000	48,000
8,100		8,100	96,000	53,000	43,000	13,000		13,000	137,000	78,000	59,000
8,500		8,500	96,000	53,000	43,000	14,000		14,000	147,000	86,000	61,000
8,700		8,700	98,000	55,000	43,000						



Brocas Ratio sem canais de refrigeração



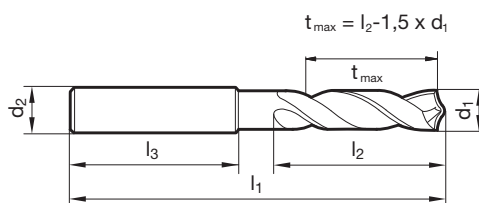
- P** • Redução da aresta transversal $\geq \varnothing 3,300$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	S
Forma da haste	HA

Brocas Ratio



Nr. do artigo **2717**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,300		6,000	66,000	28,000	36,000
3,500		6,000	66,000	28,000	36,000
5,000		6,000	82,000	44,000	36,000
5,500		6,000	82,000	44,000	36,000
6,800		8,000	91,000	53,000	36,000
7,500		8,000	91,000	53,000	36,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,000		8,000	91,000	53,000	36,000
8,500		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000



Brocas Ratio sem canais de refrigeração

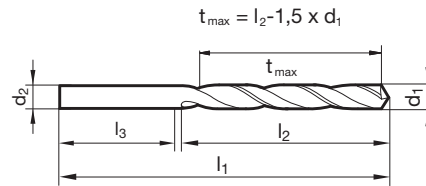


- P** ● Redução da aresta transversal ≥ Ø 5,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** ●
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	S
Forma da haste	Cilíndrica



Nr. do artigo 1243

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
5,000		5,000	73,000	34,000	39,000	8,330	21/64	8,330	96,000	53,000	43,000
5,100		5,100	76,000	38,000	38,000	8,400		8,400	96,000	53,000	43,000
5,160	13/64	5,160	76,000	38,000	38,000	8,500		8,500	96,000	53,000	43,000
5,200		5,200	76,000	38,000	38,000	8,600		8,600	98,000	55,000	43,000
5,300		5,300	76,000	38,000	38,000	8,700		8,700	98,000	55,000	43,000
5,400		5,400	76,000	38,000	38,000	8,730	11/32	8,730	98,000	55,000	43,000
5,500		5,500	76,000	38,000	38,000	8,800		8,800	98,000	55,000	43,000
5,560	7/32	5,560	81,000	41,000	40,000	8,900		8,900	98,000	55,000	43,000
5,600		5,600	81,000	41,000	40,000	9,000		9,000	98,000	55,000	43,000
5,700		5,700	81,000	41,000	40,000	9,100		9,100	102,000	58,000	44,000
5,800		5,800	81,000	41,000	40,000	9,130	23/64	9,130	102,000	58,000	44,000
5,900		5,900	81,000	41,000	40,000	9,200		9,200	102,000	58,000	44,000
5,950	15/64	5,950	81,000	41,000	40,000	9,300		9,300	102,000	58,000	44,000
6,000		6,000	81,000	41,000	40,000	9,500		9,500	102,000	58,000	44,000
6,100		6,100	81,000	41,000	40,000	9,520	3/8	9,520	105,000	60,000	45,000
6,200		6,200	81,000	41,000	40,000	9,600		9,600	105,000	60,000	45,000
6,300		6,300	81,000	41,000	40,000	9,700		9,700	105,000	60,000	45,000
6,350	1/4	6,350	81,000	41,000	40,000	9,800		9,800	105,000	60,000	45,000
6,400		6,400	81,000	41,000	40,000	9,900		9,900	105,000	60,000	45,000
6,500		6,500	81,000	41,000	40,000	9,920	25/64	9,920	105,000	60,000	45,000
6,600		6,600	83,000	43,000	40,000	10,000		10,000	105,000	60,000	45,000
6,700		6,700	83,000	43,000	40,000	10,100		10,100	112,000	66,000	46,000
6,750	17/64	6,750	83,000	43,000	40,000	10,200		10,200	112,000	66,000	46,000
6,800		6,800	83,000	43,000	40,000	10,300		10,300	112,000	66,000	46,000
6,900		6,900	83,000	43,000	40,000	10,320	13/32	10,320	112,000	66,000	46,000
7,000		7,000	83,000	43,000	40,000	10,400		10,400	112,000	66,000	46,000
7,100		7,100	87,000	45,000	42,000	10,500		10,500	112,000	66,000	46,000
7,140	9/32	7,140	87,000	45,000	42,000	10,600		10,600	114,000	68,000	46,000
7,200		7,200	87,000	45,000	42,000	10,700		10,700	114,000	68,000	46,000
7,300		7,300	87,000	45,000	42,000	10,720	27/64	10,720	114,000	68,000	46,000
7,400		7,400	87,000	45,000	42,000	10,800		10,800	114,000	68,000	46,000
7,500		7,500	87,000	45,000	42,000	10,900		10,900	114,000	68,000	46,000
7,540	19/64	7,540	90,000	48,000	42,000	11,000		11,000	114,000	68,000	46,000
7,600		7,600	90,000	48,000	42,000	11,100		11,100	118,000	71,000	47,000
7,700		7,700	90,000	48,000	42,000	11,110	7/16	11,110	118,000	71,000	47,000
7,800		7,800	90,000	48,000	42,000	11,400		11,400	118,000	71,000	47,000
7,900		7,900	90,000	48,000	42,000	11,500		11,500	118,000	71,000	47,000
7,940	5/16	7,940	90,000	48,000	42,000	11,600		11,600	121,000	73,000	48,000
8,000		8,000	90,000	48,000	42,000	11,700		11,700	121,000	73,000	48,000
8,100		8,100	96,000	53,000	43,000	11,800		11,800	121,000	73,000	48,000
8,200		8,200	96,000	53,000	43,000	11,900		11,900	121,000	73,000	48,000
8,300		8,300	96,000	53,000	43,000	11,910	15/32	11,910	121,000	73,000	48,000



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,000		12,000	121,000	73,000	48,000
12,500		12,500	135,000	76,000	59,000
12,700	1/2	12,700	137,000	78,000	59,000
13,000		13,000	137,000	78,000	59,000
13,500		13,500	144,000	84,000	60,000
14,000		14,000	147,000	86,000	61,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
14,500		14,500	151,000	89,000	62,000
15,000		15,000	153,000	91,000	62,000
15,500		15,500	157,000	94,000	63,000
16,000		16,000	160,000	96,000	64,000



Brocas Ratio sem canais de refrigeração

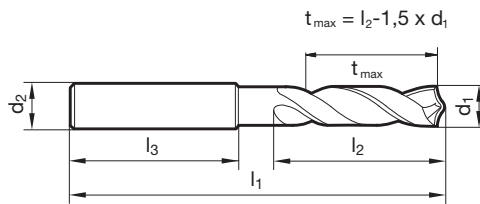


- P** ○ Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** ○ • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	F
Forma da haste	HA



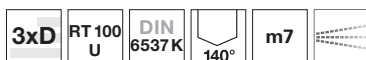
Nr. do artigo **2712**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000
3,300		6,000	66,000	28,000	36,000
3,500		6,000	66,000	28,000	36,000
4,000		6,000	74,000	36,000	36,000
4,500		6,000	74,000	36,000	36,000
5,000		6,000	82,000	44,000	36,000
6,800		8,000	91,000	53,000	36,000
7,000		8,000	91,000	53,000	36,000
7,500		8,000	91,000	53,000	36,000
8,000		8,000	91,000	53,000	36,000
10,000		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,500		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
15,000		16,000	133,000	83,000	48,000



Brocas Ratio com canais de refrigeração



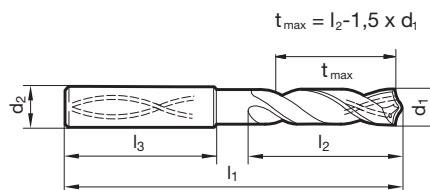
- P** ● Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** ●
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

Material de corte	MD int.
Superfície	F
Forma da haste	HA

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 750



Nr. do artigo **2477**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	5,700		6,000	66,000	28,000	36,000
3,100		6,000	62,000	20,000	36,000	5,750		6,000	66,000	28,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	5,800		6,000	66,000	28,000	36,000
3,200		6,000	62,000	20,000	36,000	5,900		6,000	66,000	28,000	36,000
3,250		6,000	62,000	20,000	36,000	5,950	15/64	6,000	66,000	28,000	36,000
3,300		6,000	62,000	20,000	36,000	6,000		6,000	66,000	28,000	36,000
3,400		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	6,500		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	6,530		8,000	79,000	34,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	6,600		8,000	79,000	34,000	36,000
4,000		6,000	66,000	24,000	36,000	6,700		8,000	79,000	34,000	36,000
4,040		6,000	66,000	24,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
4,100		6,000	66,000	24,000	36,000	6,800		8,000	79,000	34,000	36,000
4,200		6,000	66,000	24,000	36,000	6,900		8,000	79,000	34,000	36,000
4,300		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,450		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,450		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	7,550		8,000	79,000	41,000	36,000
4,900		6,000	66,000	28,000	36,000	7,600		8,000	79,000	41,000	36,000
5,000		6,000	66,000	28,000	36,000	7,650		8,000	79,000	41,000	36,000
5,100		6,000	66,000	28,000	36,000	7,700		8,000	79,000	41,000	36,000
5,110		6,000	66,000	28,000	36,000	7,800		8,000	79,000	41,000	36,000
5,160	13/64	6,000	66,000	28,000	36,000	7,900		8,000	79,000	41,000	36,000
5,200		6,000	66,000	28,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
5,300		6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
5,400		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
5,410		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,650		6,000	66,000	28,000	36,000	8,550		10,000	89,000	47,000	40,000

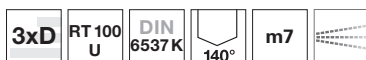


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,600		10,000	89,000	47,000	40,000
8,700		10,000	89,000	47,000	40,000
8,730	11/32	10,000	89,000	47,000	40,000
8,800		10,000	89,000	47,000	40,000
8,900		10,000	89,000	47,000	40,000
9,000		10,000	89,000	47,000	40,000
9,050		10,000	89,000	47,000	40,000
9,100		10,000	89,000	47,000	40,000
9,130	23/64	10,000	89,000	47,000	40,000
9,200		10,000	89,000	47,000	40,000
9,250		10,000	89,000	47,000	40,000
9,300		10,000	89,000	47,000	40,000
9,340		10,000	89,000	47,000	40,000
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,550		10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	15,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,720	27/64	12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,510	29/64	12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,100		14,000	107,000	60,000	45,000
12,200		14,000	107,000	60,000	45,000
12,300	31/64	14,000	107,000	60,000	45,000
12,400		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,600		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000
12,900		14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,200		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,490	17/32	14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,550		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
13,890	35/64	14,000	107,000	60,000	45,000
13,900		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,680	37/64	16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
14,900		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,080	19/32	16,000	115,000	65,000	48,000
15,100		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,480	39/64	16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
15,800		16,000	115,000	65,000	48,000
15,870	5/8	16,000	115,000	65,000	48,000
15,900		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,270	41/64	18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,670	21/32	18,000	123,000	73,000	48,000
16,700		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,070	43/64	18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,460	11/16	18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
17,700		18,000	123,000	73,000	48,000
17,860	45/64	18,000	123,000	73,000	48,000
17,900		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,260	23/32	20,000	131,000	79,000	50,000
18,300		20,000	131,000	79,000	50,000
18,500		20,000	131,000	79,000	50,000
18,700		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,250		20,000	131,000	79,000	50,000
19,446		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
19,700		20,000	131,000	79,000	50,000
19,840	25/32	20,000	131,000	79,000	50,000
19,900		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio com canais de refrigeração



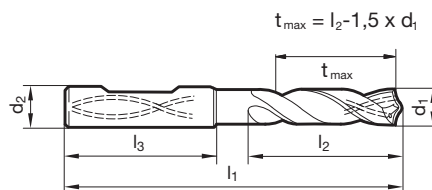
- P** ● Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** ●
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

Material de corte	MD int.
Superfície	F
Forma da haste	HE

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 750



Nr. do artigo **2469**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	8,550		10,000	89,000	47,000	40,000
3,200		6,000	62,000	20,000	36,000	8,600		10,000	89,000	47,000	40,000
3,250		6,000	62,000	20,000	36,000	8,700		10,000	89,000	47,000	40,000
3,300		6,000	62,000	20,000	36,000	8,800		10,000	89,000	47,000	40,000
3,400		6,000	62,000	20,000	36,000	9,000		10,000	89,000	47,000	40,000
3,500		6,000	62,000	20,000	36,000	9,050		10,000	89,000	47,000	40,000
3,800		6,000	66,000	24,000	36,000	9,200		10,000	89,000	47,000	40,000
3,970	5/32	6,000	66,000	24,000	36,000	9,250		10,000	89,000	47,000	40,000
4,000		6,000	66,000	24,000	36,000	9,300		10,000	89,000	47,000	40,000
4,100		6,000	66,000	24,000	36,000	9,500		10,000	89,000	47,000	40,000
4,200		6,000	66,000	24,000	36,000	9,550		10,000	89,000	47,000	40,000
4,300		6,000	66,000	24,000	36,000	9,600		10,000	89,000	47,000	40,000
4,370	11/64	6,000	66,000	24,000	36,000	9,800		10,000	89,000	47,000	40,000
4,400		6,000	66,000	24,000	36,000	10,100		12,000	102,000	55,000	45,000
4,450		6,000	66,000	24,000	36,000	10,200		12,000	102,000	55,000	45,000
4,500		6,000	66,000	24,000	36,000	10,300		12,000	102,000	55,000	45,000
4,700		6,000	66,000	24,000	36,000	10,400		12,000	102,000	55,000	45,000
4,800		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	10,700		12,000	102,000	55,000	45,000
5,100		6,000	66,000	28,000	36,000	10,900		12,000	102,000	55,000	45,000
5,300		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,110	7/16	12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	11,300		12,000	102,000	55,000	45,000
5,650		6,000	66,000	28,000	36,000	11,400		12,000	102,000	55,000	45,000
5,750		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	11,550		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,600		12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	11,700		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	11,800		12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	11,900		12,000	102,000	55,000	45,000
6,700		8,000	79,000	34,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	12,100		14,000	107,000	60,000	45,000
7,100		8,000	79,000	41,000	36,000	12,200		14,000	107,000	60,000	45,000
7,200		8,000	79,000	41,000	36,000	12,500		14,000	107,000	60,000	45,000
7,450		8,000	79,000	41,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
7,650		8,000	79,000	41,000	36,000	13,100	33/64	14,000	107,000	60,000	45,000
8,000		8,000	79,000	41,000	36,000	13,300		14,000	107,000	60,000	45,000
8,200		10,000	89,000	47,000	40,000	13,400		14,000	107,000	60,000	45,000
8,400		10,000	89,000	47,000	40,000	13,500		14,000	107,000	60,000	45,000
8,500		10,000	89,000	47,000	40,000	13,550		14,000	107,000	60,000	45,000



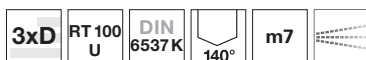
Brocas Ratio

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,700		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,800		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,100		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,550		16,000	115,000	65,000	48,000
15,600		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
15,900		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,100		18,000	123,000	73,000	48,000
16,200		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
17,550		18,000	123,000	73,000	48,000
17,900		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,300		20,000	131,000	79,000	50,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
19,550		20,000	131,000	79,000	50,000
19,900		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio com canais de refrigeração



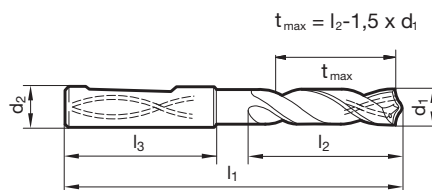
- P** • Redução da aresta transversal ≥ Ø 3,300 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

Material de corte	MD int.
Superfície	S
Forma da haste	HE

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 750



Nr. do artigo **1181**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,300		6,000	62,000	20,000	36,000	10,500		12,000	102,000	55,000	45,000
3,400		6,000	62,000	20,000	36,000	10,600		12,000	102,000	55,000	45,000
4,000		6,000	66,000	24,000	36,000	10,700		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	10,800		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	11,300		12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,510	29/64	12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
6,300		8,000	79,000	34,000	36,000	12,100		14,000	107,000	60,000	45,000
6,400		8,000	79,000	34,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
6,600		8,000	79,000	34,000	36,000	12,500		14,000	107,000	60,000	45,000
6,800		8,000	79,000	34,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
7,000		8,000	79,000	34,000	36,000	12,900		14,000	107,000	60,000	45,000
7,100		8,000	79,000	41,000	36,000	13,000		14,000	107,000	60,000	45,000
7,140	9/32	8,000	79,000	41,000	36,000	13,500		14,000	107,000	60,000	45,000
7,400		8,000	79,000	41,000	36,000	13,890	35/64	14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	14,000		14,000	107,000	60,000	45,000
7,540	19/64	8,000	79,000	41,000	36,000	14,500		16,000	115,000	65,000	48,000
7,800		8,000	79,000	41,000	36,000	14,680	37/64	16,000	115,000	65,000	48,000
7,940	5/16	8,000	79,000	41,000	36,000	14,900		16,000	115,000	65,000	48,000
8,000		8,000	79,000	41,000	36,000	15,000		16,000	115,000	65,000	48,000
8,100		10,000	89,000	47,000	40,000	15,480	39/64	16,000	115,000	65,000	48,000
8,200		10,000	89,000	47,000	40,000	15,500		16,000	115,000	65,000	48,000
8,400		10,000	89,000	47,000	40,000	16,100		18,000	123,000	73,000	48,000
8,500		10,000	89,000	47,000	40,000	16,200		18,000	123,000	73,000	48,000
8,700		10,000	89,000	47,000	40,000	16,500		18,000	123,000	73,000	48,000
8,800		10,000	89,000	47,000	40,000	17,000		18,000	123,000	73,000	48,000
9,000		10,000	89,000	47,000	40,000	17,500		18,000	123,000	73,000	48,000
9,200		10,000	89,000	47,000	40,000	17,700		18,000	123,000	73,000	48,000
9,700		10,000	89,000	47,000	40,000	18,000		18,000	123,000	73,000	48,000
9,800		10,000	89,000	47,000	40,000	18,700		20,000	131,000	79,000	50,000
10,000		10,000	89,000	47,000	40,000	19,000		20,000	131,000	79,000	50,000
10,200		12,000	102,000	55,000	45,000	19,500		20,000	131,000	79,000	50,000
10,300		12,000	102,000	55,000	45,000						



Brocas Ratio com canais de refrigeração

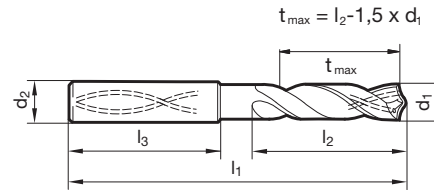


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • forma principal de corte levemente concava • geometria de cortes otimizada
- K**
- N** aços com liga e de alta resistência até 1600 N/mm² • Inconel, Hastelloy, Monel • Titânio e ligas de titânio
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 750

Material de corte	MD int.
Superfície	Y
Forma da haste	HA



Nr. do artigo **8520**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000

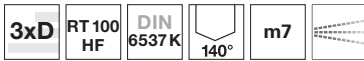


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,720	27/64	12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,300	31/64	14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,490	17/32	14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio com canais de refrigeração

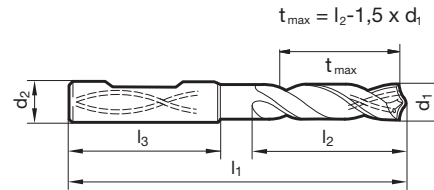


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • forma principal de corte levemente concava • geometria de cortes otimizada
- K**
- N** aços com liga e de alta resistência até 1600 N/mm² • Inconel, Hastelloy, Monel • Titânio e ligas de titânio
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 750

Material de corte	MD int.
Superfície	Y
Forma da haste	HE



Nr. do artigo **8620**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000

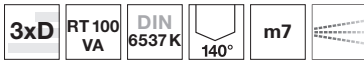


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio com canais de refrigeração

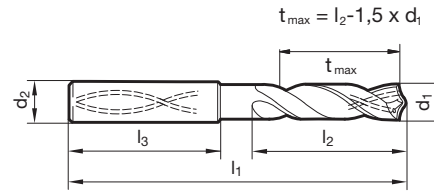


- P** Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** •
- K** •
- N** aços resistentes a corrosão-/ácidos-/calor • Titânio e ligas de titânio
- S** • Inconel, Hastelloy, Monel
- H** •

GÜHRING NAVIGATOR

Página de dados de corte 750

Material de corte	MD int.
Superfície	
Forma da haste	HA



Nr. do artigo **8510**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000

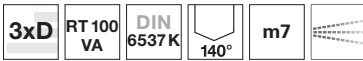


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio com canais de refrigeração

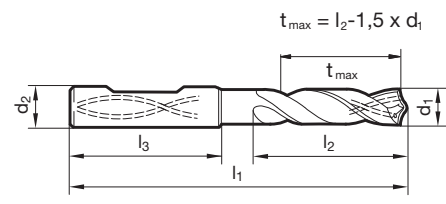


- P** Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** •
- K** •
- N** aços resistentes a corrosão-/ácidos-/calor • Titânio e ligas de titânio
- S** • Inconel, Hastelloy, Monel
- H** •

GÜHRING NAVIGATOR

Página de dados de corte 750

Material de corte	MD int.
Superfície	
Forma da haste	HE



Nr. do artigo **8610**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,100		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,200		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,300		8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,350	1/4	8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,400		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	6,500		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,500		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,600		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,700		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,800		6,000	66,000	24,000	36,000	7,000		8,000	79,000	34,000	36,000
3,900		6,000	66,000	24,000	36,000	7,100		8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,200		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,300		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,400		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,500		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,600		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,650		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,700		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,760	3/16	6,000	66,000	28,000	36,000	8,000		8,000	79,000	41,000	36,000
4,800		6,000	66,000	28,000	36,000	8,100		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,200		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,300		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,400		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	89,000	47,000	40,000
9,500		10,000	89,000	47,000	40,000
9,520	3/8	10,000	89,000	47,000	40,000
9,600		10,000	89,000	47,000	40,000
9,700		10,000	89,000	47,000	40,000
9,800		10,000	89,000	47,000	40,000
9,900		10,000	89,000	47,000	40,000
9,920	25/64	10,000	89,000	47,000	40,000
10,000		10,000	89,000	47,000	40,000
10,100		12,000	102,000	55,000	45,000
10,200		12,000	102,000	55,000	45,000
10,300		12,000	102,000	55,000	45,000
10,320	13/32	12,000	102,000	55,000	45,000
10,400		12,000	102,000	55,000	45,000
10,500		12,000	102,000	55,000	45,000
10,600		12,000	102,000	55,000	45,000
10,700		12,000	102,000	55,000	45,000
10,800		12,000	102,000	55,000	45,000
10,900		12,000	102,000	55,000	45,000
11,000		12,000	102,000	55,000	45,000
11,100		12,000	102,000	55,000	45,000
11,110	7/16	12,000	102,000	55,000	45,000
11,200		12,000	102,000	55,000	45,000
11,300		12,000	102,000	55,000	45,000
11,400		12,000	102,000	55,000	45,000
11,500		12,000	102,000	55,000	45,000
11,600		12,000	102,000	55,000	45,000
11,700		12,000	102,000	55,000	45,000
11,800		12,000	102,000	55,000	45,000
11,900		12,000	102,000	55,000	45,000
11,910	15/32	12,000	102,000	55,000	45,000
12,000		12,000	102,000	55,000	45,000
12,200		14,000	107,000	60,000	45,000
12,500		14,000	107,000	60,000	45,000
12,700	1/2	14,000	107,000	60,000	45,000
12,800		14,000	107,000	60,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	107,000	60,000	45,000
13,300		14,000	107,000	60,000	45,000
13,500		14,000	107,000	60,000	45,000
13,700		14,000	107,000	60,000	45,000
14,000		14,000	107,000	60,000	45,000
14,200		16,000	115,000	65,000	48,000
14,290	9/16	16,000	115,000	65,000	48,000
14,300		16,000	115,000	65,000	48,000
14,500		16,000	115,000	65,000	48,000
14,700		16,000	115,000	65,000	48,000
15,000		16,000	115,000	65,000	48,000
15,200		16,000	115,000	65,000	48,000
15,300		16,000	115,000	65,000	48,000
15,500		16,000	115,000	65,000	48,000
15,700		16,000	115,000	65,000	48,000
16,000		16,000	115,000	65,000	48,000
16,300		18,000	123,000	73,000	48,000
16,500		18,000	123,000	73,000	48,000
16,900		18,000	123,000	73,000	48,000
17,000		18,000	123,000	73,000	48,000
17,300		18,000	123,000	73,000	48,000
17,500		18,000	123,000	73,000	48,000
18,000		18,000	123,000	73,000	48,000
18,500		20,000	131,000	79,000	50,000
18,900		20,000	131,000	79,000	50,000
19,000		20,000	131,000	79,000	50,000
19,050	3/4	20,000	131,000	79,000	50,000
19,300		20,000	131,000	79,000	50,000
19,500		20,000	131,000	79,000	50,000
20,000		20,000	131,000	79,000	50,000



Brocas Ratio com canais de refrigeração

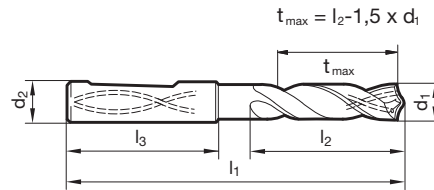


- P** ○ Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** ○ • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 750

Material de corte	MD int.
Superfície	F
Forma da haste	HE

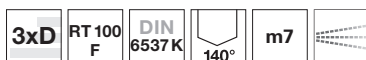


Nr. do artigo **2468**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,500		6,000	62,000	20,000	36,000	10,800		12,000	102,000	55,000	45,000
3,700		6,000	62,000	20,000	36,000	11,000		12,000	102,000	55,000	45,000
3,800		6,000	66,000	24,000	36,000	11,300		12,000	102,000	55,000	45,000
4,000		6,000	66,000	24,000	36,000	11,500		12,000	102,000	55,000	45,000
4,200		6,000	66,000	24,000	36,000	11,800		12,000	102,000	55,000	45,000
4,500		6,000	66,000	24,000	36,000	12,000		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	12,200		14,000	107,000	60,000	45,000
5,200		6,000	66,000	28,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
5,500		6,000	66,000	28,000	36,000	12,500		14,000	107,000	60,000	45,000
5,800		6,000	66,000	28,000	36,000	12,700	1/2	14,000	107,000	60,000	45,000
6,000		6,000	66,000	28,000	36,000	13,000		14,000	107,000	60,000	45,000
6,300		8,000	79,000	34,000	36,000	13,500		14,000	107,000	60,000	45,000
6,800		8,000	79,000	34,000	36,000	14,000		14,000	107,000	60,000	45,000
6,900		8,000	79,000	34,000	36,000	14,500		16,000	115,000	65,000	48,000
7,000		8,000	79,000	34,000	36,000	15,000		16,000	115,000	65,000	48,000
7,500		8,000	79,000	41,000	36,000	15,500		16,000	115,000	65,000	48,000
8,000		8,000	79,000	41,000	36,000	16,000		16,000	115,000	65,000	48,000
8,100		10,000	89,000	47,000	40,000	16,500		18,000	123,000	73,000	48,000
8,200		10,000	89,000	47,000	40,000	17,000		18,000	123,000	73,000	48,000
8,300		10,000	89,000	47,000	40,000	17,500		18,000	123,000	73,000	48,000
8,500		10,000	89,000	47,000	40,000	18,000		18,000	123,000	73,000	48,000
8,600		10,000	89,000	47,000	40,000	20,000		20,000	131,000	79,000	50,000
9,000		10,000	89,000	47,000	40,000						
9,500		10,000	89,000	47,000	40,000						
10,000		10,000	89,000	47,000	40,000						
10,100		12,000	102,000	55,000	45,000						
10,200		12,000	102,000	55,000	45,000						
10,300		12,000	102,000	55,000	45,000						
10,400		12,000	102,000	55,000	45,000						
10,500		12,000	102,000	55,000	45,000						



Brocas Ratio com canais de refrigeração



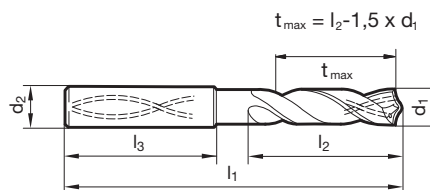
- P** ○ Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
- M** ○ • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
- S** •
- H** ○

Material de corte	MD int.
Superfície	S
Forma da haste	HA

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 750



Nr. do artigo **1660**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,100		6,000	62,000	20,000	36,000	9,500		10,000	89,000	47,000	40,000
4,000		6,000	66,000	24,000	36,000	9,700		10,000	89,000	47,000	40,000
4,100		6,000	66,000	24,000	36,000	9,800		10,000	89,000	47,000	40,000
4,200		6,000	66,000	24,000	36,000	10,000		10,000	89,000	47,000	40,000
4,300		6,000	66,000	24,000	36,000	10,200		12,000	102,000	55,000	45,000
4,700		6,000	66,000	24,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
5,300		6,000	66,000	28,000	36,000	10,700		12,000	102,000	55,000	45,000
5,400		6,000	66,000	28,000	36,000	11,000		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,200		12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	11,800		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	12,000		12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	12,500		14,000	107,000	60,000	45,000
6,500		8,000	79,000	34,000	36,000	13,000		14,000	107,000	60,000	45,000
6,700		8,000	79,000	34,000	36,000	13,100	33/64	14,000	107,000	60,000	45,000
6,800		8,000	79,000	34,000	36,000	13,200		14,000	107,000	60,000	45,000
7,000		8,000	79,000	34,000	36,000	13,500		14,000	107,000	60,000	45,000
7,400		8,000	79,000	41,000	36,000	14,000		14,000	107,000	60,000	45,000
7,500		8,000	79,000	41,000	36,000	15,000		16,000	115,000	65,000	48,000
7,600		8,000	79,000	41,000	36,000	15,500		16,000	115,000	65,000	48,000
7,800		8,000	79,000	41,000	36,000	16,500		18,000	123,000	73,000	48,000
8,000		8,000	79,000	41,000	36,000	19,600		20,000	131,000	79,000	50,000
8,100		10,000	89,000	47,000	40,000	20,500		25,000	146,000	84,000	56,000
8,300		10,000	89,000	47,000	40,000	21,500		25,000	146,000	84,000	56,000
8,400		10,000	89,000	47,000	40,000	22,000		25,000	146,000	84,000	56,000
8,500		10,000	89,000	47,000	40,000						
8,800		10,000	89,000	47,000	40,000						
9,000		10,000	89,000	47,000	40,000						
9,200		10,000	89,000	47,000	40,000						



Brocas Ratio com canais de refrigeração

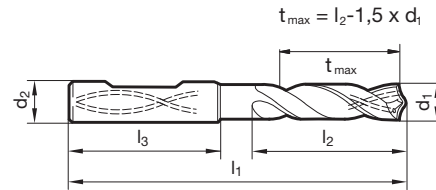


- P** ○ Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
- M** ○ • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
- S** •
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 750

Material de corte	MD int.
Superfície	S
Forma da haste	HE

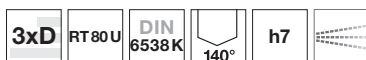


Nr. do artigo **1180**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
4,000		6,000	66,000	24,000	36,000	10,720	27/64	12,000	102,000	55,000	45,000
4,100		6,000	66,000	24,000	36,000	10,800		12,000	102,000	55,000	45,000
4,200		6,000	66,000	24,000	36,000	11,000		12,000	102,000	55,000	45,000
4,300		6,000	66,000	24,000	36,000	11,100		12,000	102,000	55,000	45,000
4,500		6,000	66,000	24,000	36,000	11,200		12,000	102,000	55,000	45,000
5,000		6,000	66,000	28,000	36,000	11,400		12,000	102,000	55,000	45,000
5,200		6,000	66,000	28,000	36,000	11,500		12,000	102,000	55,000	45,000
5,300		6,000	66,000	28,000	36,000	11,510	29/64	12,000	102,000	55,000	45,000
5,400		6,000	66,000	28,000	36,000	11,800		12,000	102,000	55,000	45,000
5,500		6,000	66,000	28,000	36,000	11,910	15/32	12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	12,000		12,000	102,000	55,000	45,000
5,950	15/64	6,000	66,000	28,000	36,000	12,200		14,000	107,000	60,000	45,000
6,000		6,000	66,000	28,000	36,000	12,300	31/64	14,000	107,000	60,000	45,000
6,200		8,000	79,000	34,000	36,000	12,600		14,000	107,000	60,000	45,000
6,300		8,000	79,000	34,000	36,000	13,000		14,000	107,000	60,000	45,000
6,500		8,000	79,000	34,000	36,000	13,500		14,000	107,000	60,000	45,000
6,600		8,000	79,000	34,000	36,000	14,000		14,000	107,000	60,000	45,000
6,800		8,000	79,000	34,000	36,000	14,290	9/16	16,000	115,000	65,000	48,000
7,000		8,000	79,000	34,000	36,000	14,500		16,000	115,000	65,000	48,000
7,140	9/32	8,000	79,000	41,000	36,000	15,000		16,000	115,000	65,000	48,000
7,300		8,000	79,000	41,000	36,000	15,500		16,000	115,000	65,000	48,000
7,600		8,000	79,000	41,000	36,000	16,000		16,000	115,000	65,000	48,000
7,800		8,000	79,000	41,000	36,000	16,500		18,000	123,000	73,000	48,000
8,000		8,000	79,000	41,000	36,000	17,500		18,000	123,000	73,000	48,000
8,100		10,000	89,000	47,000	40,000	18,000		18,000	123,000	73,000	48,000
8,200		10,000	89,000	47,000	40,000	18,500		20,000	131,000	79,000	50,000
8,330	21/64	10,000	89,000	47,000	40,000	19,000		20,000	131,000	79,000	50,000
8,400		10,000	89,000	47,000	40,000	19,450	49/64	20,000	131,000	79,000	50,000
8,500		10,000	89,000	47,000	40,000	20,000		20,000	131,000	79,000	50,000
8,800		10,000	89,000	47,000	40,000	20,500		25,000	146,000	84,000	56,000
9,200		10,000	89,000	47,000	40,000	21,000		25,000	146,000	84,000	56,000
9,500		10,000	89,000	47,000	40,000	22,000		25,000	146,000	84,000	56,000
9,600		10,000	89,000	47,000	40,000	22,500		25,000	153,000	91,000	56,000
9,700		10,000	89,000	47,000	40,000	23,000		25,000	153,000	91,000	56,000
9,800		10,000	89,000	47,000	40,000	24,000		25,000	153,000	91,000	56,000
10,000		10,000	89,000	47,000	40,000	25,000	63/64	25,000	153,000	91,000	56,000
10,100		12,000	102,000	55,000	45,000						
10,200		12,000	102,000	55,000	45,000						
10,300		12,000	102,000	55,000	45,000						
10,320	13/32	12,000	102,000	55,000	45,000						
10,400		12,000	102,000	55,000	45,000						
10,500		12,000	102,000	55,000	45,000						



Brocas Ratio com canais de refrigeração



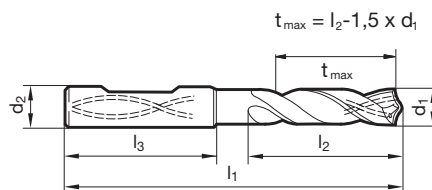
- P** • Redução da aresta transversal $\geq \varnothing 9,500$ • afiação de superfície cônica
- M** ○ suporte de HSS com pastilha de MD soldada • amortece vibrações e impactos
- K** ○
- N** ○ aços sem liga/com baixa liga • ferro fundido, fundição nodular • latão, bronze, plásticos, grafite
- S** ○
- H** ○

Material de corte	Metal duro
Superfície	S
Forma da haste	HE

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 750



Nr. do artigo **1171**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
9,500		16,000	103,000	51,000	48,000	15,100		20,000	122,000	68,000	50,000
9,700		16,000	103,000	51,000	48,000	15,500		20,000	122,000	68,000	50,000
9,800		16,000	103,000	51,000	48,000	15,600		20,000	122,000	68,000	50,000
9,900		16,000	103,000	51,000	48,000	15,700		20,000	122,000	68,000	50,000
10,000		16,000	103,000	51,000	48,000	15,800		20,000	122,000	68,000	50,000
10,100		16,000	103,000	51,000	48,000	16,000		20,000	122,000	68,000	50,000
10,200		16,000	103,000	51,000	48,000	16,200		20,000	130,000	76,000	50,000
10,400		16,000	103,000	51,000	48,000	16,500		20,000	130,000	76,000	50,000
10,500		16,000	103,000	51,000	48,000	16,700		20,000	130,000	76,000	50,000
10,600		16,000	103,000	51,000	48,000	17,000		20,000	130,000	76,000	50,000
10,700		16,000	103,000	51,000	48,000	17,300		20,000	130,000	76,000	50,000
10,800		16,000	103,000	51,000	48,000	17,500		20,000	130,000	76,000	50,000
10,900		16,000	103,000	51,000	48,000	17,700		20,000	130,000	76,000	50,000
11,000		16,000	103,000	51,000	48,000	17,800		20,000	130,000	76,000	50,000
11,200		16,000	103,000	51,000	48,000	17,860	45/64	20,000	130,000	76,000	50,000
11,500		16,000	103,000	51,000	48,000	18,000		20,000	130,000	76,000	50,000
11,600		16,000	103,000	51,000	48,000	18,500		25,000	144,000	84,000	56,000
11,700		16,000	103,000	51,000	48,000	19,000		25,000	144,000	84,000	56,000
12,000		16,000	103,000	51,000	48,000	19,500		25,000	144,000	84,000	56,000
12,100		16,000	111,000	59,000	48,000	19,600		25,000	144,000	84,000	56,000
12,200		16,000	111,000	59,000	48,000	19,700		25,000	144,000	84,000	56,000
12,300	31/64	16,000	111,000	59,000	48,000	20,000		25,000	144,000	84,000	56,000
12,400		16,000	111,000	59,000	48,000	20,500		25,000	153,000	93,000	56,000
12,500		16,000	111,000	59,000	48,000	21,000		25,000	153,000	93,000	56,000
12,600		16,000	111,000	59,000	48,000	21,500		25,000	153,000	93,000	56,000
12,700	1/2	16,000	111,000	59,000	48,000	22,000		25,000	153,000	93,000	56,000
13,000		16,000	111,000	59,000	48,000	22,220	7/8	25,000	161,000	101,000	56,000
13,500		16,000	111,000	59,000	48,000	22,500		25,000	161,000	101,000	56,000
13,700		16,000	111,000	59,000	48,000	23,000		25,000	161,000	101,000	56,000
13,800		16,000	111,000	59,000	48,000	23,500		25,000	161,000	101,000	56,000
14,000		16,000	111,000	59,000	48,000	24,000		25,000	161,000	101,000	56,000
14,200		20,000	122,000	68,000	50,000	24,500		32,000	174,000	110,000	60,000
14,400		20,000	122,000	68,000	50,000	25,000	63/64	32,000	174,000	110,000	60,000
14,600		20,000	122,000	68,000	50,000	25,500		32,000	174,000	110,000	60,000
14,700		20,000	122,000	68,000	50,000						
15,000		20,000	122,000	68,000	50,000						



Brocas Ratio com canais de refrigeração

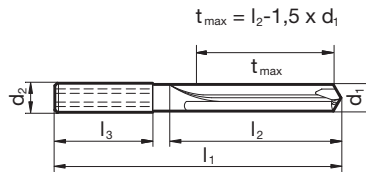


- P** Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
- M** • tolerâncias de diâmetros apertadas • muito boa qualidade superficial nos furos • observar pressão de refrigeração
- K** •
- N** ○ ferro fundido, fundição maleável, fundição nodular
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 752

Material de corte	MD int.
Superfície	○
Forma da haste	HA



Nr. do artigo **768**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	24,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,100		6,000	66,000	24,000	36,000	6,800		8,000	91,000	53,000	36,000
3,200		6,000	66,000	24,000	36,000	6,900		8,000	91,000	53,000	36,000
3,300		6,000	66,000	24,000	36,000	7,000		8,000	91,000	53,000	36,000
3,400		6,000	66,000	24,000	36,000	7,100		8,000	91,000	53,000	36,000
3,500		6,000	66,000	24,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
3,600		6,000	66,000	24,000	36,000	7,200		8,000	91,000	53,000	36,000
3,700		6,000	66,000	24,000	36,000	7,300		8,000	91,000	53,000	36,000
3,800		6,000	74,000	30,000	36,000	7,400		8,000	91,000	53,000	36,000
3,900		6,000	74,000	30,000	36,000	7,500		8,000	91,000	53,000	36,000
4,000		6,000	74,000	30,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,100		6,000	74,000	30,000	36,000	7,600		8,000	91,000	53,000	36,000
4,200		6,000	74,000	30,000	36,000	7,700		8,000	91,000	53,000	36,000
4,300		6,000	74,000	30,000	36,000	7,800		8,000	91,000	53,000	36,000
4,400		6,000	74,000	30,000	36,000	7,900		8,000	91,000	53,000	36,000
4,500		6,000	74,000	30,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,600		6,000	74,000	30,000	36,000	8,000		8,000	91,000	53,000	36,000
4,700		6,000	74,000	30,000	36,000	8,100		10,000	103,000	61,000	40,000
4,800		6,000	74,000	36,000	36,000	8,200		10,000	103,000	61,000	40,000
4,900		6,000	74,000	36,000	36,000	8,300		10,000	103,000	61,000	40,000
5,000		6,000	74,000	36,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,100		6,000	74,000	36,000	36,000	8,400		10,000	103,000	61,000	40,000
5,160	13/64	6,000	74,000	36,000	36,000	8,500		10,000	103,000	61,000	40,000
5,200		6,000	74,000	36,000	36,000	8,600		10,000	103,000	61,000	40,000
5,300		6,000	74,000	36,000	36,000	8,700		10,000	103,000	61,000	40,000
5,400		6,000	74,000	36,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,500		6,000	74,000	36,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	74,000	36,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	74,000	36,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	74,000	36,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	74,000	36,000	36,000	9,300		10,000	103,000	61,000	40,000
6,000		6,000	74,000	36,000	36,000	9,400		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,500		10,000	103,000	61,000	40,000
6,200		8,000	91,000	53,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
6,300		8,000	91,000	53,000	36,000	9,600		10,000	103,000	61,000	40,000
6,350	1/4	8,000	91,000	53,000	36,000	9,700		10,000	103,000	61,000	40,000
6,400		8,000	91,000	53,000	36,000	9,800		10,000	103,000	61,000	40,000
6,500		8,000	91,000	53,000	36,000	9,900		10,000	103,000	61,000	40,000
6,600		8,000	91,000	53,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
6,700		8,000	91,000	53,000	36,000	10,000		10,000	103,000	61,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,200		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,300	31/64	14,000	124,000	74,000	45,000
12,500		14,000	124,000	74,000	45,000
12,700	1/2	14,000	124,000	74,000	45,000
13,000		14,000	124,000	74,000	45,000
13,500		14,000	124,000	74,000	45,000
14,000		14,000	124,000	74,000	45,000
14,500		16,000	133,000	83,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,000		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração

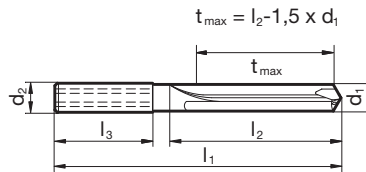


- P** Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • tolerâncias de diâmetros apertadas • muito boa qualidade superficial nos furos • observar ótima pressão de refrigeração
- M**
- K** ○
- N** • alumínio e ligas de alumínio • todos materiais com alto teor-SI
- S**
- H**

Material de corte	MD int.
Superfície	○
Forma da haste	HA

GÜHRING NAVIGATOR

Página de dados de corte 752



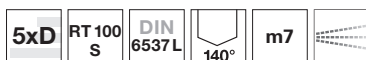
Nr. do artigo **6068**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	24,000	36,000
3,200		6,000	66,000	24,000	36,000
3,300		6,000	66,000	24,000	36,000
3,500		6,000	66,000	24,000	36,000
3,800		6,000	74,000	30,000	36,000
3,900		6,000	74,000	30,000	36,000
4,000		6,000	74,000	30,000	36,000
4,200		6,000	74,000	30,000	36,000
5,000		6,000	74,000	36,000	36,000
5,300		6,000	74,000	36,000	36,000
5,400		6,000	74,000	36,000	36,000
5,500		6,000	74,000	36,000	36,000
5,800		6,000	74,000	36,000	36,000
6,000		6,000	74,000	36,000	36,000
6,100		8,000	91,000	53,000	36,000
6,350	1/4	8,000	91,000	53,000	36,000
6,400		8,000	91,000	53,000	36,000
6,800		8,000	91,000	53,000	36,000
7,000		8,000	91,000	53,000	36,000
7,100		8,000	91,000	53,000	36,000
7,300		8,000	91,000	53,000	36,000
7,800		8,000	91,000	53,000	36,000
8,100		10,000	103,000	61,000	40,000
8,300		10,000	103,000	61,000	40,000
8,500		10,000	103,000	61,000	40,000
8,700		10,000	103,000	61,000	40,000
8,730	11/32	10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,200		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,000		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,300	31/64	14,000	124,000	74,000	45,000
12,500		14,000	124,000	74,000	45,000
12,700	1/2	14,000	124,000	74,000	45,000
13,000		14,000	124,000	74,000	45,000
13,500		14,000	124,000	74,000	45,000
14,000		14,000	124,000	74,000	45,000
15,000		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração



- P** • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada • máxima performance
- M** ○
- K** ○
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços (ligados/não-ligados) até 1400 N/mm²
- S** ○
- H** ○

Material de corte **MD int.**

Superfície **F**

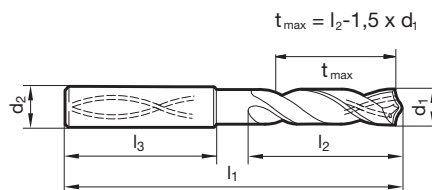
Forma da haste **HA**



Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 754



Nr. do artigo **5759**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	5,800		6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	5,900		6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	6,000		6,000	82,000	44,000	36,000
3,250		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,530		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	6,600		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	6,700		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	6,800		8,000	91,000	53,000	36,000
4,040		6,000	74,000	36,000	36,000	6,900		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,550		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	7,600		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	7,650		8,000	91,000	53,000	36,000
4,900		6,000	82,000	44,000	36,000	7,700		8,000	91,000	53,000	36,000
5,000		6,000	82,000	44,000	36,000	7,800		8,000	91,000	53,000	36,000
5,100		6,000	82,000	44,000	36,000	7,900		8,000	91,000	53,000	36,000
5,110		6,000	82,000	44,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
5,160	13/64	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
5,200		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,410		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,650		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000

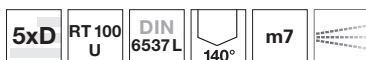


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,900		10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,100		10,000	103,000	61,000	40,000
9,130	23/64	10,000	103,000	61,000	40,000
9,200		10,000	103,000	61,000	40,000
9,250		10,000	103,000	61,000	40,000
9,300		10,000	103,000	61,000	40,000
9,340		10,000	103,000	61,000	40,000
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,550		10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,550		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,300	31/64	14,000	124,000	77,000	45,000
12,400		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,600		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
12,900		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000
13,200		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,400		14,000	124,000	77,000	45,000
13,490	17/32	14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,600		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
13,800		14,000	124,000	77,000	45,000
13,890	35/64	14,000	124,000	77,000	45,000
13,900		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,100		16,000	133,000	83,000	48,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,400		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,600		16,000	133,000	83,000	48,000
14,680	37/64	16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
14,800		16,000	133,000	83,000	48,000
14,900		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,080	19/32	16,000	133,000	83,000	48,000
15,100		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,400		16,000	133,000	83,000	48,000
15,480	39/64	16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,550		16,000	133,000	83,000	48,000
15,600		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
15,900		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,270	41/64	18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,670	21/32	18,000	143,000	93,000	48,000
16,700		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,070	43/64	18,000	143,000	93,000	48,000
17,460	11/16	18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
17,550		18,000	143,000	93,000	48,000
17,700		18,000	143,000	93,000	48,000
17,860	45/64	18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,260	23/32	20,000	153,000	101,000	50,000
18,500		20,000	153,000	101,000	50,000
18,700		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,250		20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,446		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
19,550		20,000	153,000	101,000	50,000
19,700		20,000	153,000	101,000	50,000
19,840	25/32	20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração



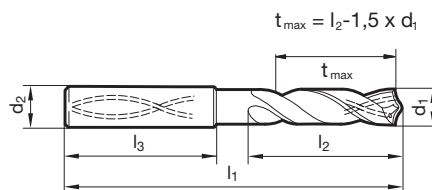
- P** ● Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** ●
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 754

Material de corte	MD int.
Superfície	F
Forma da haste	HA

Brocas Ratio



Nr. do artigo **2479**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	5,800		6,000	82,000	44,000	36,000
3,100		6,000	66,000	28,000	36,000	5,900		6,000	82,000	44,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	5,950	15/64	6,000	82,000	44,000	36,000
3,200		6,000	66,000	28,000	36,000	6,000		6,000	82,000	44,000	36,000
3,250		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,530		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	6,600		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	6,700		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	6,800		8,000	91,000	53,000	36,000
4,040		6,000	74,000	36,000	36,000	6,900		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,550		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	7,600		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	7,650		8,000	91,000	53,000	36,000
4,900		6,000	82,000	44,000	36,000	7,700		8,000	91,000	53,000	36,000
5,000		6,000	82,000	44,000	36,000	7,800		8,000	91,000	53,000	36,000
5,100		6,000	82,000	44,000	36,000	7,900		8,000	91,000	53,000	36,000
5,110		6,000	82,000	44,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
5,160	13/64	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
5,200		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,410		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,650		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000

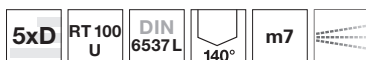


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,900		10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,100		10,000	103,000	61,000	40,000
9,130	23/64	10,000	103,000	61,000	40,000
9,200		10,000	103,000	61,000	40,000
9,250		10,000	103,000	61,000	40,000
9,300		10,000	103,000	61,000	40,000
9,340		10,000	103,000	61,000	40,000
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,550		10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,550		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,300	31/64	14,000	124,000	77,000	45,000
12,400		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,600		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,200		14,000	124,000	77,000	45,000
13,490	17/32	14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,600		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
13,800		14,000	124,000	77,000	45,000
13,890	35/64	14,000	124,000	77,000	45,000
13,900		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,100		16,000	133,000	83,000	48,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,680	37/64	16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
14,800		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,080	19/32	16,000	133,000	83,000	48,000
15,100		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,480	39/64	16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,600		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
15,900		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,270	41/64	18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,670	21/32	18,000	143,000	93,000	48,000
16,700		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,070	43/64	18,000	143,000	93,000	48,000
17,460	11/16	18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
17,700		18,000	143,000	93,000	48,000
17,860	45/64	18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,260	23/32	20,000	153,000	101,000	50,000
18,500		20,000	153,000	101,000	50,000
18,700		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,250		20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,446		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
19,700		20,000	153,000	101,000	50,000
19,840	25/32	20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração



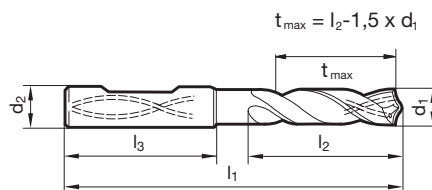
- P** • Redução da aresta transversal $\geq \varnothing 3,300$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

Material de corte	MD int.
Superfície	F
Forma da haste	HE

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 754



Nr. do artigo **2471**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,300		6,000	66,000	28,000	36,000	8,600		10,000	103,000	61,000	40,000
3,500		6,000	66,000	28,000	36,000	8,900		10,000	103,000	61,000	40,000
3,700		6,000	66,000	28,000	36,000	9,000		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
4,100		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	9,250		10,000	103,000	61,000	40,000
4,300		6,000	74,000	36,000	36,000	9,500		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	9,700		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	9,800		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	9,900		10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	10,000		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,000		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,100		6,000	82,000	44,000	36,000	10,300		12,000	118,000	71,000	45,000
5,200		6,000	82,000	44,000	36,000	10,400		12,000	118,000	71,000	45,000
5,300		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,400		6,000	82,000	44,000	36,000	10,600		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	10,800		12,000	118,000	71,000	45,000
5,550		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
5,700		6,000	82,000	44,000	36,000	11,100		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	11,300		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	11,400		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	11,900		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	12,100		14,000	124,000	77,000	45,000
6,900		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	12,300	31/64	14,000	124,000	77,000	45,000
7,100		8,000	91,000	53,000	36,000	12,400		14,000	124,000	77,000	45,000
7,200		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
7,300		8,000	91,000	53,000	36,000	12,700	1/2	14,000	124,000	77,000	45,000
7,500		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
7,700		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
7,800		8,000	91,000	53,000	36,000	13,800		14,000	124,000	77,000	45,000
8,000		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
8,100		10,000	103,000	61,000	40,000	14,100		16,000	133,000	83,000	48,000
8,200		10,000	103,000	61,000	40,000	14,200		16,000	133,000	83,000	48,000
8,300		10,000	103,000	61,000	40,000	14,500		16,000	133,000	83,000	48,000
8,500		10,000	103,000	61,000	40,000	14,700		16,000	133,000	83,000	48,000



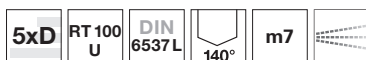
Brocas Ratio

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,200		20,000	153,000	101,000	50,000
18,500		20,000	153,000	101,000	50,000
18,600		20,000	153,000	101,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração



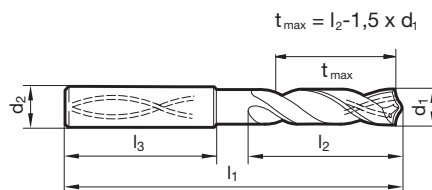
- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 754

Material de corte	MD int.
Superfície	S
Forma da haste	HA

Brocas Ratio

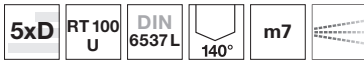


Nr. do artigo **1663**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	8,200		10,000	103,000	61,000	40,000
3,700		6,000	66,000	28,000	36,000	8,400		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	8,500		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	8,800		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	11,500		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
6,400		8,000	91,000	53,000	36,000	14,200		16,000	133,000	83,000	48,000
6,500		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
6,700		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
6,800		8,000	91,000	53,000	36,000	15,500		16,000	133,000	83,000	48,000
7,000		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
7,100		8,000	91,000	53,000	36,000	17,000		18,000	143,000	93,000	48,000
7,500		8,000	91,000	53,000	36,000	17,500		18,000	143,000	93,000	48,000
7,800		8,000	91,000	53,000	36,000	19,000		20,000	153,000	101,000	50,000
8,000		8,000	91,000	53,000	36,000	19,500		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração

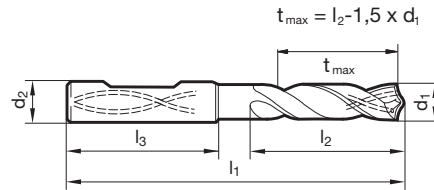


- P** • Redução da aresta transversal $\geq \varnothing 3,300$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 754

Material de corte	MD int.
Superfície	S
Forma da haste	HE



Nr. do artigo **1183**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,300		6,000	66,000	28,000	36,000	7,200		8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	8,000		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,500		10,000	103,000	61,000	40,000
6,200		8,000	91,000	53,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
6,300		8,000	91,000	53,000	36,000	9,600		10,000	103,000	61,000	40,000
6,350	1/4	8,000	91,000	53,000	36,000	9,700		10,000	103,000	61,000	40,000
6,400		8,000	91,000	53,000	36,000	9,800		10,000	103,000	61,000	40,000
6,500		8,000	91,000	53,000	36,000	9,900		10,000	103,000	61,000	40,000
6,600		8,000	91,000	53,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
6,700		8,000	91,000	53,000	36,000	10,000		10,000	103,000	61,000	40,000
6,750	17/64	8,000	91,000	53,000	36,000	10,100		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	10,200		12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	10,300		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	10,320	13/32	12,000	118,000	71,000	45,000
7,100		8,000	91,000	53,000	36,000	10,400		12,000	118,000	71,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	10,500		12,000	118,000	71,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,300	31/64	14,000	124,000	77,000	45,000
12,400		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,600		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
12,900		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000
13,200		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,400		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,600		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
13,800		14,000	124,000	77,000	45,000
13,890	35/64	14,000	124,000	77,000	45,000
13,900		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,100		16,000	133,000	83,000	48,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,400		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,600		16,000	133,000	83,000	48,000
14,680	37/64	16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
14,800		16,000	133,000	83,000	48,000
14,900		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,100		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,300		16,000	133,000	83,000	48,000
15,400		16,000	133,000	83,000	48,000
15,480	39/64	16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,100		18,000	143,000	93,000	48,000
16,200		18,000	143,000	93,000	48,000
16,270	41/64	18,000	143,000	93,000	48,000
16,400		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,600		18,000	143,000	93,000	48,000
16,700		18,000	143,000	93,000	48,000
16,800		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,070	43/64	18,000	143,000	93,000	48,000
17,200		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,400		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
17,600		18,000	143,000	93,000	48,000
17,700		18,000	143,000	93,000	48,000
17,800		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,100		20,000	153,000	101,000	50,000
18,200		20,000	153,000	101,000	50,000
18,300		20,000	153,000	101,000	50,000
18,400		20,000	153,000	101,000	50,000
18,500		20,000	153,000	101,000	50,000
18,600		20,000	153,000	101,000	50,000
18,650	47/64	20,000	153,000	101,000	50,000
18,700		20,000	153,000	101,000	50,000
18,800		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
19,700		20,000	153,000	101,000	50,000
19,800		20,000	153,000	101,000	50,000
19,900		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração

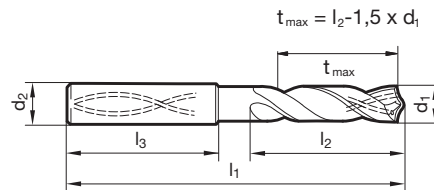


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • forma principal de corte levemente concava • geometria de cortes otimizada
- K**
- N** aços com liga e de alta resistência até 1600 N/mm² • Inconel, Hastelloy, Monel • Titânio e ligas de titânio
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	Y
Forma da haste	HA



Nr. do artigo **8521**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000

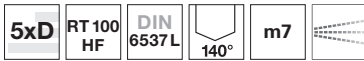


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,300		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração

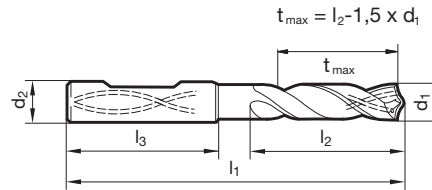


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • forma principal de corte levemente concava • geometria de cortes otimizada
- K**
- N** aços com liga e de alta resistência até 1600 N/mm² • Inconel, Hastelloy, Monel • Titânio e ligas de titânio
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	Y
Forma da haste	HE



Nr. do artigo **8621**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000

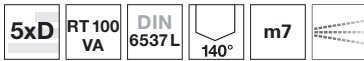


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,300		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração

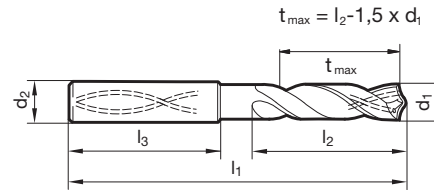


- P** Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** •
- K**
- N** aços resistentes a corrosão-/ácidos-/calor • Titânio e ligas de titânio
- S** • Inconel, Hastelloy, Monel
- H**

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	Ⓜ
Forma da haste	HA



Nr. do artigo 8511

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,300		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração



P Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada

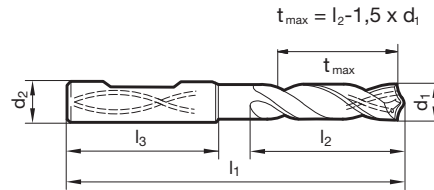
- M** •
- K** •
- N** açoes resistentes a corrosão-/ácidos-/calor • Titânio e ligas de titânio
- S** •
- H** •

• Inconel, Hastelloy, Monel

GÜHRING NAVIGATOR

Página de dados de corte 756

Material de corte	MD int.
Superfície	
Forma da haste	HE



Nr. do artigo **8611**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,400		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,400		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,700		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,400		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,600		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
10,900		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,600		12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,200		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,300		18,000	143,000	93,000	48,000
16,500		18,000	143,000	93,000	48,000
16,900		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,300		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
18,900		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,050	3/4	20,000	153,000	101,000	50,000
19,300		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração

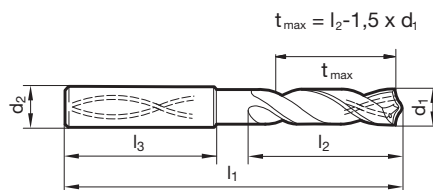


- P** ○ Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
- M** ○ • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 754

Material de corte	MD int.
Superfície	F
Forma da haste	HA



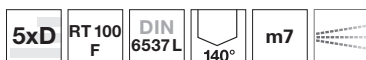
Nr. do artigo **2478**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000
3,300		6,000	66,000	28,000	36,000
3,500		6,000	66,000	28,000	36,000
4,000		6,000	74,000	36,000	36,000
4,200		6,000	74,000	36,000	36,000
4,800		6,000	82,000	44,000	36,000
5,000		6,000	82,000	44,000	36,000
5,500		6,000	82,000	44,000	36,000
6,000		6,000	82,000	44,000	36,000
6,500		8,000	91,000	53,000	36,000
6,800		8,000	91,000	53,000	36,000
7,000		8,000	91,000	53,000	36,000
7,400		8,000	91,000	53,000	36,000
7,500		8,000	91,000	53,000	36,000
7,550		8,000	91,000	53,000	36,000
7,700		8,000	91,000	53,000	36,000
8,000		8,000	91,000	53,000	36,000
8,500		10,000	103,000	61,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,000		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
13,000		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,500		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração



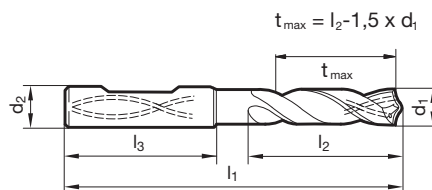
- P** ○ Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
- M** ○ • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
- S** •
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 754

Material de corte	MD int.
Superfície	F
Forma da haste	HE

Brocas Ratio



Nr. do artigo **2470**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	9,000		10,000	103,000	61,000	40,000
3,500		6,000	66,000	28,000	36,000	9,200		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	9,300		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	9,500		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	10,000		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,300		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,400		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
5,600		6,000	82,000	44,000	36,000	11,100		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	11,400		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	11,500		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	12,200		14,000	124,000	77,000	45,000
6,700		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
6,800		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
7,100		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
7,200		8,000	91,000	53,000	36,000	14,100		16,000	133,000	83,000	48,000
7,600		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
7,700		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
8,000		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
8,100		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
8,500		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
8,600		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
8,700		10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000
8,800		10,000	103,000	61,000	40,000	20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração

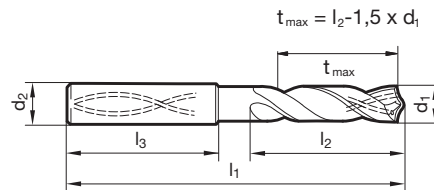


- P** ○ Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
- M** ○ • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 754

Material de corte	MD int.
Superfície	S
Forma da haste	HA



Nr. do artigo **1662**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,200		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,300		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,350	1/4	8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	6,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,000		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,100		8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,200		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,300		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,400		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	7,550		8,000	91,000	53,000	36,000
4,500		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,600		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,650		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,700		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,760	3/16	6,000	82,000	44,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,800		6,000	82,000	44,000	36,000	8,000		8,000	91,000	53,000	36,000
4,900		6,000	82,000	44,000	36,000	8,100		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,200		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,300		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,400		10,000	103,000	61,000	40,000

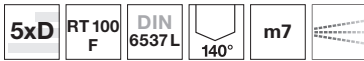


d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,500		10,000	103,000	61,000	40,000
9,520	3/8	10,000	103,000	61,000	40,000
9,600		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
9,900		10,000	103,000	61,000	40,000
9,920	25/64	10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
10,700		12,000	118,000	71,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000
10,800		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,100		12,000	118,000	71,000	45,000
11,110	7/16	12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,300		12,000	118,000	71,000	45,000
11,400		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,510	29/64	12,000	118,000	71,000	45,000
11,700		12,000	118,000	71,000	45,000
11,910	15/32	12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,300	31/64	14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,200		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,500		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
19,000		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000
20,500		25,000	165,000	105,000	56,000
21,000		25,000	165,000	105,000	56,000
22,500		25,000	180,000	117,000	56,000
23,500		25,000	180,000	117,000	56,000



Brocas Ratio com canais de refrigeração

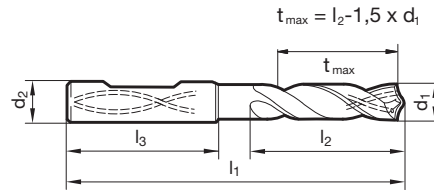


- P** ○ Redução da aresta transversal $\geq \varnothing 10,100$ • afiação de superfície cônica
- M** ○ • formato côncavo da aresta de corte principal • geometria de cortes otimizada • comportamento de corte agudo
- K** ○
- N** ○ aços de liga alta • aços resistentes a corrosão-/ácidos-/calor • Inconel, Hastelloy, Monel • latão, bronze • alumínio e ligas de alumínio • magnésio e ligas de magnésio • Titânio e ligas de titânio • materiais sinterizados
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 754

Material de corte	MD int.
Superfície	Ⓢ
Forma da haste	HE



Nr. do artigo **1182**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	9,000		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,300		6,000	74,000	36,000	36,000	9,300		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	9,400		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	9,500		10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	9,600		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	10,000		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,300		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,400		6,000	82,000	44,000	36,000	10,300		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
5,600		6,000	82,000	44,000	36,000	10,700		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	10,800		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	11,000		12,000	118,000	71,000	45,000
6,100		8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
6,200		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
6,300		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	11,800		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	12,500		14,000	124,000	77,000	45,000
6,800		8,000	91,000	53,000	36,000	12,800		14,000	124,000	77,000	45,000
6,900		8,000	91,000	53,000	36,000	12,900		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	13,000		14,000	124,000	77,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	13,200		14,000	124,000	77,000	45,000
7,200		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
7,400		8,000	91,000	53,000	36,000	13,890	35/64	14,000	124,000	77,000	45,000
7,500		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
7,600		8,000	91,000	53,000	36,000	14,100		16,000	133,000	83,000	48,000
7,800		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
7,900		8,000	91,000	53,000	36,000	14,600		16,000	133,000	83,000	48,000
8,000		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
8,100		10,000	103,000	61,000	40,000	15,500		16,000	133,000	83,000	48,000
8,200		10,000	103,000	61,000	40,000	16,000		16,000	133,000	83,000	48,000
8,300		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
8,500		10,000	103,000	61,000	40,000	16,600		18,000	143,000	93,000	48,000
8,600		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
8,700		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
8,800		10,000	103,000	61,000	40,000	18,000		18,000	143,000	93,000	48,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
20,000		20,000	153,000	101,000	50,000
20,500		25,000	165,000	105,000	56,000
21,000		25,000	165,000	105,000	56,000
21,500		25,000	165,000	105,000	56,000
22,000		25,000	165,000	105,000	56,000
22,500		25,000	180,000	117,000	56,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
24,000		25,000	180,000	117,000	56,000
24,500		25,000	180,000	117,000	56,000
25,000	63/64	25,000	180,000	117,000	56,000



Brocas Ratio com canais de refrigeração

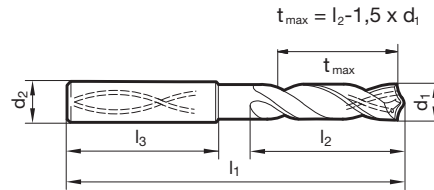


- P** Redução da aresta transversal ≥ Ø 3,000 • afiação de ponta em raio patenteada • formato reto da aresta de corte principal (depois da correção)
- M**
- K** •
- N** ferro fundido Vermicular GGV ,CDI e ADI • ferro fundido, fundição maleável, fundição nodular
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 754

Material de corte	MD int.
Superfície	F
Forma da haste	HA



Nr. do artigo 6501

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	8,000		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	8,100		10,000	103,000	61,000	40,000
3,300		6,000	66,000	28,000	36,000	8,200		10,000	103,000	61,000	40,000
3,400		6,000	66,000	28,000	36,000	8,300		10,000	103,000	61,000	40,000
3,500		6,000	66,000	28,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
3,600		6,000	66,000	28,000	36,000	8,500		10,000	103,000	61,000	40,000
3,800		6,000	74,000	36,000	36,000	8,600		10,000	103,000	61,000	40,000
4,000		6,000	74,000	36,000	36,000	8,700		10,000	103,000	61,000	40,000
4,100		6,000	74,000	36,000	36,000	8,800		10,000	103,000	61,000	40,000
4,200		6,000	74,000	36,000	36,000	8,900		10,000	103,000	61,000	40,000
4,300		6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	9,100		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	9,250		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	9,300		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	9,600		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	9,900		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	10,000		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	10,100		12,000	118,000	71,000	45,000
5,800		6,000	82,000	44,000	36,000	10,200		12,000	118,000	71,000	45,000
5,900		6,000	82,000	44,000	36,000	10,400		12,000	118,000	71,000	45,000
6,000		6,000	82,000	44,000	36,000	10,500		12,000	118,000	71,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	10,600		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	10,700		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	10,720	27/64	12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	10,800		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,000		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	11,100		12,000	118,000	71,000	45,000
7,200		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
7,300		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
7,400		8,000	91,000	53,000	36,000	11,300		12,000	118,000	71,000	45,000
7,500		8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
7,800		8,000	91,000	53,000	36,000	11,600		12,000	118,000	71,000	45,000
7,900		8,000	91,000	53,000	36,000	11,700		12,000	118,000	71,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
11,800		12,000	118,000	71,000	45,000
11,900		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,200		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
12,700	1/2	14,000	124,000	77,000	45,000
12,800		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,100	33/64	14,000	124,000	77,000	45,000
13,300		14,000	124,000	77,000	45,000
13,400		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
13,700		14,000	124,000	77,000	45,000
13,900		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,200		16,000	133,000	83,000	48,000
14,290	9/16	16,000	133,000	83,000	48,000
14,300		16,000	133,000	83,000	48,000
14,400		16,000	133,000	83,000	48,000
14,500		16,000	133,000	83,000	48,000
14,600		16,000	133,000	83,000	48,000
14,700		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,100		16,000	133,000	83,000	48,000
15,300		16,000	133,000	83,000	48,000
15,400		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,600		16,000	133,000	83,000	48,000
15,700		16,000	133,000	83,000	48,000
15,800		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
15,900		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
16,670	21/32	18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio com canais de refrigeração

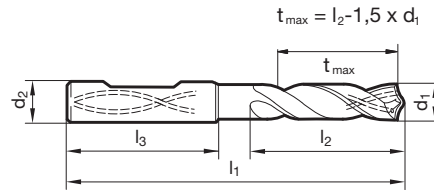


- P** • Redução da aresta transversal $\geq \varnothing 9,800$ • afiação de superfície cônica
- M** ○ suporte de HSS com pastilha de MD soldada • amortece vibrações e impactos
- K** ○
- N** ○ aços sem liga/com baixa liga • ferro fundido, fundição nodular • latão, bronze, plásticos, grafite
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 754

Material de corte	Metal duro
Superfície	S
Forma da haste	HE



Nr. do artigo **1172**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
9,800	W	16,000	127,000	75,000	48,000	16,700		20,000	166,000	112,000	50,000
10,000		16,000	127,000	75,000	48,000	16,800		20,000	166,000	112,000	50,000
10,200		16,000	127,000	75,000	48,000	17,000		20,000	166,000	112,000	50,000
10,500		16,000	127,000	75,000	48,000	17,200		20,000	166,000	112,000	50,000
10,600		16,000	127,000	75,000	48,000	17,300		20,000	166,000	112,000	50,000
10,700		16,000	127,000	75,000	48,000	17,500		20,000	166,000	112,000	50,000
10,800		16,000	127,000	75,000	48,000	18,000		20,000	166,000	112,000	50,000
11,000		16,000	127,000	75,000	48,000	18,500		25,000	184,000	124,000	56,000
11,500		16,000	127,000	75,000	48,000	19,000		25,000	184,000	124,000	56,000
11,900		16,000	127,000	75,000	48,000	19,500		25,000	184,000	124,000	56,000
12,000		16,000	127,000	75,000	48,000	19,600		25,000	184,000	124,000	56,000
12,300	31/64	16,000	139,000	87,000	48,000	19,700		25,000	184,000	124,000	56,000
12,500		16,000	139,000	87,000	48,000	20,000		25,000	184,000	124,000	56,000
12,700	1/2	16,000	139,000	87,000	48,000	20,500		25,000	197,000	137,000	56,000
12,900		16,000	139,000	87,000	48,000	21,000		25,000	197,000	137,000	56,000
13,000		16,000	139,000	87,000	48,000	21,500		25,000	197,000	137,000	56,000
13,100	33/64	16,000	139,000	87,000	48,000	22,000		25,000	197,000	137,000	56,000
13,500		16,000	139,000	87,000	48,000	22,220	7/8	25,000	209,000	149,000	56,000
13,700		16,000	139,000	87,000	48,000	22,500		25,000	209,000	149,000	56,000
13,900		16,000	139,000	87,000	48,000	23,000		25,000	209,000	149,000	56,000
14,000		16,000	139,000	87,000	48,000	23,500		25,000	209,000	149,000	56,000
14,500		20,000	154,000	100,000	50,000	24,000		25,000	209,000	149,000	56,000
14,600		20,000	154,000	100,000	50,000	24,500		32,000	226,000	162,000	60,000
15,000		20,000	154,000	100,000	50,000	25,000	63/64	32,000	226,000	162,000	60,000
15,200		20,000	154,000	100,000	50,000	25,500		32,000	226,000	162,000	60,000
15,500		20,000	154,000	100,000	50,000						
15,700		20,000	154,000	100,000	50,000						
16,000		20,000	154,000	100,000	50,000						
16,200		20,000	166,000	112,000	50,000						
16,500		20,000	166,000	112,000	50,000						



Brocas Ratio com canais de refrigeração



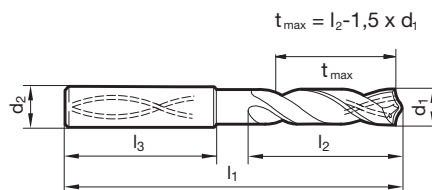
- P** ● Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** ●
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	F
Forma da haste	HA

Brocas Ratio



Nr. do artigo **4044**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	5,900		6,000	97,000	57,000	36,000
3,100		6,000	70,000	30,000	36,000	5,950	15/64	6,000	97,000	57,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000	6,000		6,000	97,000	57,000	36,000
3,200		6,000	70,000	30,000	36,000	6,100		8,000	106,000	66,000	36,000
3,250		6,000	70,000	30,000	36,000	6,200		8,000	106,000	66,000	36,000
3,300		6,000	70,000	30,000	36,000	6,300		8,000	106,000	66,000	36,000
3,400		6,000	75,000	35,500	36,000	6,350	1/4	8,000	106,000	66,000	36,000
3,500		6,000	75,000	35,500	36,000	6,400		8,000	106,000	66,000	36,000
3,570	9/64	6,000	75,000	35,500	36,000	6,500		8,000	106,000	66,000	36,000
3,600		6,000	75,000	35,500	36,000	6,530		8,000	106,000	66,000	36,000
3,700		6,000	75,000	35,500	36,000	6,600		8,000	106,000	66,000	36,000
3,800		6,000	75,000	37,500	36,000	6,700		8,000	106,000	66,000	36,000
3,900		6,000	75,000	37,500	36,000	6,750	17/64	8,000	106,000	66,000	36,000
3,970	5/32	6,000	75,000	37,500	36,000	6,800		8,000	106,000	66,000	36,000
4,000		6,000	75,000	37,500	36,000	6,900		8,000	116,000	76,000	36,000
4,040		6,000	75,000	37,500	36,000	7,000		8,000	116,000	76,000	36,000
4,100		6,000	75,000	37,500	36,000	7,100		8,000	116,000	76,000	36,000
4,200		6,000	75,000	37,500	36,000	7,140	9/32	8,000	116,000	76,000	36,000
4,300		6,000	85,000	45,000	36,000	7,200		8,000	116,000	76,000	36,000
4,370	11/64	6,000	85,000	45,000	36,000	7,300		8,000	116,000	76,000	36,000
4,400		6,000	85,000	45,000	36,000	7,400		8,000	116,000	76,000	36,000
4,500		6,000	85,000	45,000	36,000	7,500		8,000	116,000	76,000	36,000
4,600		6,000	85,000	45,000	36,000	7,540	19/64	8,000	116,000	76,000	36,000
4,650		6,000	85,000	45,000	36,000	7,600		8,000	116,000	76,000	36,000
4,700		6,000	85,000	45,000	36,000	7,700		8,000	116,000	76,000	36,000
4,760	3/16	6,000	90,000	50,000	36,000	7,800		8,000	116,000	76,000	36,000
4,800		6,000	90,000	50,000	36,000	7,900		8,000	116,000	76,000	36,000
4,900		6,000	90,000	50,000	36,000	7,940	5/16	8,000	116,000	76,000	36,000
5,000		6,000	90,000	50,000	36,000	8,000		8,000	116,000	76,000	36,000
5,100		6,000	90,000	50,000	36,000	8,100		10,000	131,000	87,000	40,000
5,110		6,000	90,000	50,000	36,000	8,200		10,000	131,000	87,000	40,000
5,160	13/64	6,000	90,000	50,000	36,000	8,300		10,000	131,000	87,000	40,000
5,200		6,000	90,000	50,000	36,000	8,330	21/64	10,000	131,000	87,000	40,000
5,300		6,000	90,000	50,000	36,000	8,400		10,000	131,000	87,000	40,000
5,400		6,000	97,000	57,000	36,000	8,500		10,000	131,000	87,000	40,000
5,410		6,000	97,000	57,000	36,000	8,600		10,000	131,000	87,000	40,000
5,500		6,000	97,000	57,000	36,000	8,700		10,000	131,000	87,000	40,000
5,550		6,000	97,000	57,000	36,000	8,730	11/32	10,000	131,000	87,000	40,000
5,560	7/32	6,000	97,000	57,000	36,000	8,800		10,000	131,000	87,000	40,000
5,600		6,000	97,000	57,000	36,000	8,900		10,000	131,000	87,000	40,000
5,700		6,000	97,000	57,000	36,000	9,000		10,000	131,000	87,000	40,000
5,800		6,000	97,000	57,000	36,000	9,100		10,000	139,000	95,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,130	23/64	10,000	139,000	95,000	40,000
9,200		10,000	139,000	95,000	40,000
9,250		10,000	139,000	95,000	40,000
9,300		10,000	139,000	95,000	40,000
9,340		10,000	139,000	95,000	40,000
9,400		10,000	139,000	95,000	40,000
9,500		10,000	139,000	95,000	40,000
9,520	3/8	10,000	139,000	95,000	40,000
9,600		10,000	139,000	95,000	40,000
9,700		10,000	139,000	95,000	40,000
9,800		10,000	139,000	95,000	40,000
9,900		10,000	139,000	95,000	40,000
9,920	25/64	10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,100		12,000	155,000	106,000	45,000
10,200		12,000	155,000	106,000	45,000
10,300		12,000	155,000	106,000	45,000
10,320	13/32	12,000	155,000	106,000	45,000
10,400		12,000	155,000	106,000	45,000
10,500		12,000	155,000	106,000	45,000
10,600		12,000	155,000	106,000	45,000
10,700		12,000	155,000	106,000	45,000
10,720	27/64	12,000	155,000	106,000	45,000
10,800		12,000	155,000	106,000	45,000
10,900		12,000	155,000	106,000	45,000
11,000		12,000	155,000	106,000	45,000
11,100		12,000	163,000	114,000	45,000
11,110	7/16	12,000	163,000	114,000	45,000
11,200		12,000	163,000	114,000	45,000
11,300		12,000	163,000	114,000	45,000
11,400		12,000	163,000	114,000	45,000
11,500		12,000	163,000	114,000	45,000
11,510	29/64	12,000	163,000	114,000	45,000
11,600		12,000	163,000	114,000	45,000
11,700		12,000	163,000	114,000	45,000
11,800		12,000	163,000	114,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
11,900		12,000	163,000	114,000	45,000
11,910	15/32	12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,100		14,000	182,000	133,000	45,000
12,200		14,000	182,000	133,000	45,000
12,300	31/64	14,000	182,000	133,000	45,000
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,100	33/64	14,000	182,000	133,000	45,000
13,490	17/32	14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
13,890	35/64	14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,100		16,000	204,000	152,000	48,000
14,200		16,000	204,000	152,000	48,000
14,290	9/16	16,000	204,000	152,000	48,000
14,500		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,100		16,000	204,000	152,000	48,000
15,480	39/64	16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
15,870	5/8	16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
16,900		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
18,900		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,050	3/4	20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000



Brocas Ratio com canais de refrigeração



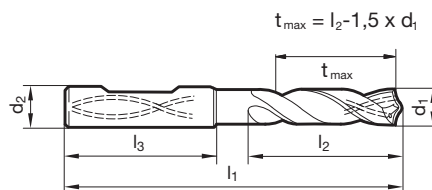
- P** • Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	F
Forma da haste	HE

Brocas Ratio



Nr. do artigo **4045**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	7,100		8,000	116,000	76,000	36,000
3,100		6,000	70,000	30,000	36,000	7,200		8,000	116,000	76,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000	7,400		8,000	116,000	76,000	36,000
3,200		6,000	70,000	30,000	36,000	7,500		8,000	116,000	76,000	36,000
3,250		6,000	70,000	30,000	36,000	7,600		8,000	116,000	76,000	36,000
3,300		6,000	70,000	30,000	36,000	7,700		8,000	116,000	76,000	36,000
3,400		6,000	75,000	35,500	36,000	8,000		8,000	116,000	76,000	36,000
3,500		6,000	75,000	35,500	36,000	8,100		10,000	131,000	87,000	40,000
3,570	9/64	6,000	75,000	35,500	36,000	8,200		10,000	131,000	87,000	40,000
3,600		6,000	75,000	35,500	36,000	8,400		10,000	131,000	87,000	40,000
3,700		6,000	75,000	35,500	36,000	8,500		10,000	131,000	87,000	40,000
3,800		6,000	75,000	37,500	36,000	8,600		10,000	131,000	87,000	40,000
3,900		6,000	75,000	37,500	36,000	8,700		10,000	131,000	87,000	40,000
3,970	5/32	6,000	75,000	37,500	36,000	9,000		10,000	131,000	87,000	40,000
4,000		6,000	75,000	37,500	36,000	9,100		10,000	139,000	95,000	40,000
4,100		6,000	75,000	37,500	36,000	9,300		10,000	139,000	95,000	40,000
4,300		6,000	85,000	45,000	36,000	9,400		10,000	139,000	95,000	40,000
4,400		6,000	85,000	45,000	36,000	9,500		10,000	139,000	95,000	40,000
4,500		6,000	85,000	45,000	36,000	9,700		10,000	139,000	95,000	40,000
4,650		6,000	85,000	45,000	36,000	9,800		10,000	139,000	95,000	40,000
4,700		6,000	85,000	45,000	36,000	9,900		10,000	139,000	95,000	40,000
4,900		6,000	90,000	50,000	36,000	10,000		10,000	139,000	95,000	40,000
5,000		6,000	90,000	50,000	36,000	10,200		12,000	155,000	106,000	45,000
5,100		6,000	90,000	50,000	36,000	10,300		12,000	155,000	106,000	45,000
5,160	13/64	6,000	90,000	50,000	36,000	10,500		12,000	155,000	106,000	45,000
5,200		6,000	90,000	50,000	36,000	10,800		12,000	155,000	106,000	45,000
5,300		6,000	90,000	50,000	36,000	11,000		12,000	155,000	106,000	45,000
5,400		6,000	97,000	57,000	36,000	11,200		12,000	163,000	114,000	45,000
5,500		6,000	97,000	57,000	36,000	11,500		12,000	163,000	114,000	45,000
5,700		6,000	97,000	57,000	36,000	11,800		12,000	163,000	114,000	45,000
5,800		6,000	97,000	57,000	36,000	12,000		12,000	163,000	114,000	45,000
5,900		6,000	97,000	57,000	36,000	12,200		14,000	182,000	133,000	45,000
6,000		6,000	97,000	57,000	36,000	12,500		14,000	182,000	133,000	45,000
6,200		8,000	106,000	66,000	36,000	13,500		14,000	182,000	133,000	45,000
6,300		8,000	106,000	66,000	36,000	14,000		14,000	182,000	133,000	45,000
6,350	1/4	8,000	106,000	66,000	36,000	14,200		16,000	204,000	152,000	48,000
6,500		8,000	106,000	66,000	36,000	14,500		16,000	204,000	152,000	48,000
6,600		8,000	106,000	66,000	36,000	15,000		16,000	204,000	152,000	48,000
6,700		8,000	106,000	66,000	36,000	15,500		16,000	204,000	152,000	48,000
6,800		8,000	106,000	66,000	36,000	16,000		16,000	204,000	152,000	48,000
6,900		8,000	116,000	76,000	36,000	16,500		18,000	223,000	171,000	48,000
7,000		8,000	116,000	76,000	36,000	17,000		18,000	223,000	171,000	48,000



Brocas Ratio

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,050	3/4	20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm



Brocas Ratio com canais de refrigeração



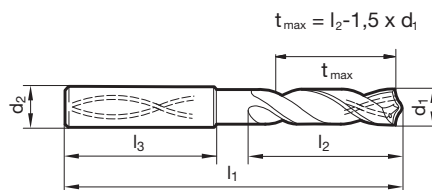
- P** • Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	S
Forma da haste	HA

Brocas Ratio



Nr. do artigo **2711**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000
3,100		6,000	70,000	30,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000
3,200		6,000	70,000	30,000	36,000
3,250		6,000	70,000	30,000	36,000
3,300		6,000	70,000	30,000	36,000
3,400		6,000	75,000	35,500	36,000
3,500		6,000	75,000	35,500	36,000
3,570	9/64	6,000	75,000	35,500	36,000
3,600		6,000	75,000	35,500	36,000
3,700		6,000	75,000	35,500	36,000
3,800		6,000	75,000	37,500	36,000
3,900		6,000	75,000	37,500	36,000
3,970	5/32	6,000	75,000	37,500	36,000
4,300		6,000	85,000	45,000	36,000
4,400		6,000	85,000	45,000	36,000
5,000		6,000	90,000	50,000	36,000
5,200		6,000	90,000	50,000	36,000
5,500		6,000	97,000	57,000	36,000
6,000		6,000	97,000	57,000	36,000
6,100		8,000	106,000	66,000	36,000
6,200		8,000	106,000	66,000	36,000
6,500		8,000	106,000	66,000	36,000
6,600		8,000	106,000	66,000	36,000
6,800		8,000	106,000	66,000	36,000
7,000		8,000	116,000	76,000	36,000
7,100		8,000	116,000	76,000	36,000
7,300		8,000	116,000	76,000	36,000
7,500		8,000	116,000	76,000	36,000
8,000		8,000	116,000	76,000	36,000
8,500		10,000	131,000	87,000	40,000
8,600		10,000	131,000	87,000	40,000
8,700		10,000	131,000	87,000	40,000
9,000		10,000	131,000	87,000	40,000
9,100		10,000	139,000	95,000	40,000
9,200		10,000	139,000	95,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,300		10,000	139,000	95,000	40,000
9,500		10,000	139,000	95,000	40,000
9,700		10,000	139,000	95,000	40,000
9,800		10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,200		12,000	155,000	106,000	45,000
10,500		12,000	155,000	106,000	45,000
11,000		12,000	155,000	106,000	45,000
11,500		12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,200		14,000	182,000	133,000	45,000
12,500		14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
13,800		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
15,000		16,000	204,000	152,000	48,000
15,200		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
15,800		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000



Brocas Ratio com canais de refrigeração

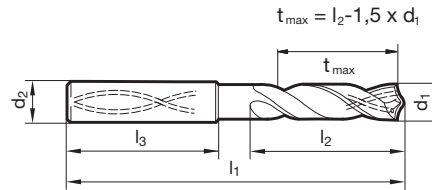


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • forma principal de corte levemente concava • geometria de cortes otimizada
- K**
- N** aços com liga e de alta resistência até 1600 N/mm² • Inconel, Hastelloy, Monel • Titânio e ligas de titânio
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	Y
Forma da haste	HA



Nr. do artigo **8522**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	8,730	11/32	10,000	131,000	87,000	40,000
3,170	1/8	6,000	70,000	30,000	36,000	8,800		10,000	131,000	87,000	40,000
3,250		6,000	70,000	30,000	36,000	9,000		10,000	131,000	87,000	40,000
3,300		6,000	70,000	30,000	36,000	9,130	23/64	10,000	139,000	95,000	40,000
3,400		6,000	75,000	35,500	36,000	9,250		10,000	139,000	95,000	40,000
3,500		6,000	75,000	35,500	36,000	9,340		10,000	139,000	95,000	40,000
3,570	9/64	6,000	75,000	35,500	36,000	9,400		10,000	139,000	95,000	40,000
3,700		6,000	75,000	35,500	36,000	9,500		10,000	139,000	95,000	40,000
3,970	5/32	6,000	75,000	37,500	36,000	9,520	3/8	10,000	139,000	95,000	40,000
4,000		6,000	75,000	37,500	36,000	9,920	25/64	10,000	139,000	95,000	40,000
4,200		6,000	75,000	37,500	36,000	10,000		10,000	139,000	95,000	40,000
4,300		6,000	85,000	45,000	36,000	10,200		12,000	155,000	106,000	45,000
4,370	11/64	6,000	85,000	45,000	36,000	10,320	13/32	12,000	155,000	106,000	45,000
4,500		6,000	85,000	45,000	36,000	10,400		12,000	155,000	106,000	45,000
4,650		6,000	85,000	45,000	36,000	10,500		12,000	155,000	106,000	45,000
4,760	3/16	6,000	90,000	50,000	36,000	10,720	27/64	12,000	155,000	106,000	45,000
5,000		6,000	90,000	50,000	36,000	10,800		12,000	155,000	106,000	45,000
5,100		6,000	90,000	50,000	36,000	11,000		12,000	155,000	106,000	45,000
5,160	13/64	6,000	90,000	50,000	36,000	11,110	7/16	12,000	163,000	114,000	45,000
5,200		6,000	90,000	50,000	36,000	11,300		12,000	163,000	114,000	45,000
5,500		6,000	97,000	57,000	36,000	11,400		12,000	163,000	114,000	45,000
5,550		6,000	97,000	57,000	36,000	11,500		12,000	163,000	114,000	45,000
5,560	7/32	6,000	97,000	57,000	36,000	11,510	29/64	12,000	163,000	114,000	45,000
5,950	15/64	6,000	97,000	57,000	36,000	11,910	15/32	12,000	163,000	114,000	45,000
6,000		6,000	97,000	57,000	36,000	12,000		12,000	163,000	114,000	45,000
6,350	1/4	8,000	106,000	66,000	36,000	12,300	31/64	14,000	182,000	133,000	45,000
6,500		8,000	106,000	66,000	36,000	12,500		14,000	182,000	133,000	45,000
6,530		8,000	106,000	66,000	36,000	12,700	1/2	14,000	182,000	133,000	45,000
6,750	17/64	8,000	106,000	66,000	36,000	13,000		14,000	182,000	133,000	45,000
6,800		8,000	106,000	66,000	36,000	13,100	33/64	14,000	182,000	133,000	45,000
6,900		8,000	116,000	76,000	36,000	13,490	17/32	14,000	182,000	133,000	45,000
7,000		8,000	116,000	76,000	36,000	13,500		14,000	182,000	133,000	45,000
7,140	9/32	8,000	116,000	76,000	36,000	14,000		14,000	182,000	133,000	45,000
7,400		8,000	116,000	76,000	36,000	14,290	9/16	16,000	204,000	152,000	48,000
7,500		8,000	116,000	76,000	36,000	14,500		16,000	204,000	152,000	48,000
7,540	19/64	8,000	116,000	76,000	36,000	15,000		16,000	204,000	152,000	48,000
7,800		8,000	116,000	76,000	36,000	15,100		16,000	204,000	152,000	48,000
7,940	5/16	8,000	116,000	76,000	36,000	15,500		16,000	204,000	152,000	48,000
8,000		8,000	116,000	76,000	36,000	15,870	5/8	16,000	204,000	152,000	48,000
8,330	21/64	10,000	131,000	87,000	40,000	16,000		16,000	204,000	152,000	48,000
8,500		10,000	131,000	87,000	40,000						
8,600		10,000	131,000	87,000	40,000						



Brocas Ratio com canais de refrigeração



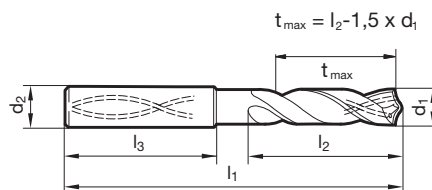
- P** Redução da aresta transversal $\geq \varnothing 4,000$ • afiação de ponta em raio patenteada • formato reto da aresta de corte principal (depois da correção)
- M**
- K** •
- N** ferro fundido Vermicular GGV ,CDI e ADI • ferro fundido, fundição maleável, fundição nodular
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	F
Forma da haste	HA

Brocas Ratio



Nr. do artigo **6502**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
4,000		6,000	75,000	37,500	36,000	8,800		10,000	131,000	87,000	40,000
4,300		6,000	85,000	45,000	36,000	8,900		10,000	131,000	87,000	40,000
4,370	11/64	6,000	85,000	45,000	36,000	9,000		10,000	131,000	87,000	40,000
4,400		6,000	85,000	45,000	36,000	9,100		10,000	139,000	95,000	40,000
4,500		6,000	85,000	45,000	36,000	9,250		10,000	139,000	95,000	40,000
4,600		6,000	85,000	45,000	36,000	9,300		10,000	139,000	95,000	40,000
4,700		6,000	85,000	45,000	36,000	9,400		10,000	139,000	95,000	40,000
4,760	3/16	6,000	90,000	50,000	36,000	9,500		10,000	139,000	95,000	40,000
4,900		6,000	90,000	50,000	36,000	9,600		10,000	139,000	95,000	40,000
5,000		6,000	90,000	50,000	36,000	9,700		10,000	139,000	95,000	40,000
5,160	13/64	6,000	90,000	50,000	36,000	9,800		10,000	139,000	95,000	40,000
5,300		6,000	90,000	50,000	36,000	9,900		10,000	139,000	95,000	40,000
5,500		6,000	97,000	57,000	36,000	10,000		10,000	139,000	95,000	40,000
5,550		6,000	97,000	57,000	36,000	10,100		12,000	155,000	106,000	45,000
5,560	7/32	6,000	97,000	57,000	36,000	10,200		12,000	155,000	106,000	45,000
5,600		6,000	97,000	57,000	36,000	10,300		12,000	155,000	106,000	45,000
5,700		6,000	97,000	57,000	36,000	10,320	13/32	12,000	155,000	106,000	45,000
5,800		6,000	97,000	57,000	36,000	10,400		12,000	155,000	106,000	45,000
5,900		6,000	97,000	57,000	36,000	10,500		12,000	155,000	106,000	45,000
6,000		6,000	97,000	57,000	36,000	10,700		12,000	155,000	106,000	45,000
6,100		8,000	106,000	66,000	36,000	10,800		12,000	155,000	106,000	45,000
6,200		8,000	106,000	66,000	36,000	10,900		12,000	155,000	106,000	45,000
6,300		8,000	106,000	66,000	36,000	11,000		12,000	155,000	106,000	45,000
6,400		8,000	106,000	66,000	36,000	11,100		12,000	163,000	114,000	45,000
6,500		8,000	106,000	66,000	36,000	11,200		12,000	163,000	114,000	45,000
6,700		8,000	106,000	66,000	36,000	11,300		12,000	163,000	114,000	45,000
6,800		8,000	106,000	66,000	36,000	11,500		12,000	163,000	114,000	45,000
6,900		8,000	116,000	76,000	36,000	11,600		12,000	163,000	114,000	45,000
7,000		8,000	116,000	76,000	36,000	11,700		12,000	163,000	114,000	45,000
7,140	9/32	8,000	116,000	76,000	36,000	11,800		12,000	163,000	114,000	45,000
7,200		8,000	116,000	76,000	36,000	12,000		12,000	163,000	114,000	45,000
7,500		8,000	116,000	76,000	36,000	12,100		14,000	182,000	133,000	45,000
7,600		8,000	116,000	76,000	36,000	12,300	31/64	14,000	182,000	133,000	45,000
7,700		8,000	116,000	76,000	36,000	12,400		14,000	182,000	133,000	45,000
8,000		8,000	116,000	76,000	36,000	12,500		14,000	182,000	133,000	45,000
8,100		10,000	131,000	87,000	40,000	12,600		14,000	182,000	133,000	45,000
8,200		10,000	131,000	87,000	40,000	12,700	1/2	14,000	182,000	133,000	45,000
8,300		10,000	131,000	87,000	40,000	12,800		14,000	182,000	133,000	45,000
8,330	21/64	10,000	131,000	87,000	40,000	13,000		14,000	182,000	133,000	45,000
8,400		10,000	131,000	87,000	40,000	13,100	33/64	14,000	182,000	133,000	45,000
8,500		10,000	131,000	87,000	40,000	13,300		14,000	182,000	133,000	45,000
8,600		10,000	131,000	87,000	40,000	13,500		14,000	182,000	133,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,700		14,000	182,000	133,000	45,000
13,900		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,100		16,000	204,000	152,000	48,000
14,290	9/16	16,000	204,000	152,000	48,000
14,400		16,000	204,000	152,000	48,000
14,500		16,000	204,000	152,000	48,000
14,600		16,000	204,000	152,000	48,000
14,700		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,100		16,000	204,000	152,000	48,000
15,200		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
15,600		16,000	204,000	152,000	48,000
15,800		16,000	204,000	152,000	48,000
15,900		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
16,670	21/32	18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000



Brocas Ratio com canais de refrigeração



P Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
 • tolerâncias de diâmetros apertadas • muito boa qualidade superficial nos furos • observar pressão de refrigeração

M

K •

N ○

S

H

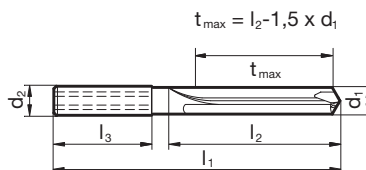
ferro fundido, fundição maleável, fundição nodular

GÜHRINGNAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	○
Forma da haste	HA

Brocas Ratio



Nr. do artigo **769**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	74,000	32,000	36,000
3,100		6,000	74,000	32,000	36,000
3,200		6,000	74,000	32,000	36,000
3,300		6,000	74,000	32,000	36,000
3,500		6,000	74,000	34,000	36,000
3,600		6,000	74,000	34,000	36,000
3,700		6,000	74,000	34,000	36,000
3,800		6,000	97,000	45,000	36,000
3,900		6,000	97,000	45,000	36,000
4,000		6,000	97,000	45,000	36,000
4,100		6,000	97,000	45,000	36,000
4,200		6,000	97,000	45,000	36,000
4,300		6,000	97,000	45,000	36,000
4,400		6,000	97,000	45,000	36,000
4,500		6,000	97,000	45,000	36,000
4,700		6,000	97,000	45,000	36,000
4,800		6,000	97,000	57,000	36,000
4,900		6,000	97,000	57,000	36,000
5,000		6,000	97,000	57,000	36,000
5,160	13/64	6,000	97,000	57,000	36,000
5,500		6,000	97,000	57,000	36,000
6,000		6,000	97,000	57,000	36,000
6,350	1/4	8,000	116,000	76,000	36,000
6,500		8,000	116,000	76,000	36,000
6,800		8,000	116,000	76,000	36,000
7,000		8,000	116,000	76,000	36,000
7,140	9/32	8,000	116,000	76,000	36,000
7,500		8,000	116,000	76,000	36,000
7,800		8,000	116,000	76,000	36,000
7,940	5/16	8,000	116,000	76,000	36,000
8,000		8,000	116,000	76,000	36,000
8,330	21/64	10,000	139,000	95,000	40,000
8,500		10,000	139,000	95,000	40,000
8,730	11/32	10,000	139,000	95,000	40,000
9,000		10,000	139,000	95,000	40,000
9,130	23/64	10,000	139,000	95,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,500		10,000	139,000	95,000	40,000
9,520	3/8	10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,200		12,000	163,000	114,000	45,000
10,320	13/32	12,000	163,000	114,000	45,000
10,500		12,000	163,000	114,000	45,000
10,720	27/64	12,000	163,000	114,000	45,000
11,000		12,000	163,000	114,000	45,000
11,110	7/16	12,000	163,000	114,000	45,000
11,500		12,000	163,000	114,000	45,000
11,510	29/64	12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,300	31/64	14,000	182,000	133,000	45,000
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,500		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000



Brocas Ratio com canais de refrigeração



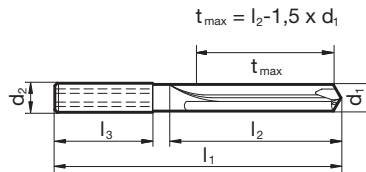
P Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • tolerâncias de diâmetros apertadas • muito boa qualidade superficial nos furos • observar ótima pressão de refrigeração

- M**
- K** ○
- N** ● alumínio e ligas de alumínio • todos materiais com alto teor-SI
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	○
Forma da haste	HA



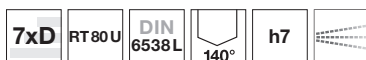
Nr. do artigo **6069**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	74,000	32,000	36,000
3,200		6,000	74,000	32,000	36,000
3,300		6,000	74,000	32,000	36,000
3,500		6,000	74,000	34,000	36,000
3,600		6,000	74,000	34,000	36,000
4,000		6,000	97,000	45,000	36,000
4,200		6,000	97,000	45,000	36,000
4,300		6,000	97,000	45,000	36,000
4,500		6,000	97,000	45,000	36,000
5,000		6,000	97,000	57,000	36,000
6,000		6,000	97,000	57,000	36,000
6,350	1/4	8,000	116,000	76,000	36,000
6,500		8,000	116,000	76,000	36,000
6,800		8,000	116,000	76,000	36,000
7,000		8,000	116,000	76,000	36,000
7,800		8,000	116,000	76,000	36,000
8,000		8,000	116,000	76,000	36,000
8,500		10,000	139,000	95,000	40,000
8,730	11/32	10,000	139,000	95,000	40,000
9,000		10,000	139,000	95,000	40,000
9,500		10,000	139,000	95,000	40,000
9,520	3/8	10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,200		12,000	163,000	114,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,320	13/32	12,000	163,000	114,000	45,000
10,500		12,000	163,000	114,000	45,000
10,720	27/64	12,000	163,000	114,000	45,000
11,000		12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,300	31/64	14,000	182,000	133,000	45,000
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,500		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000



Brocas Ratio com canais de refrigeração



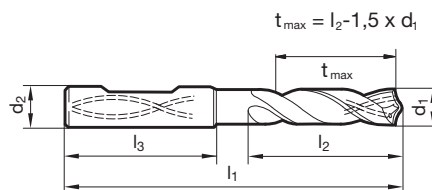
- P** • Redução da aresta transversal $\geq \varnothing 9,600$ • afiação de superfície cônica
- M** ○ suporte de HSS com pastilha de MD soldada • amortece vibrações e impactos
- K** ○
- N** ○ aços sem liga/com baixa liga • ferro fundido, fundição nodular • latão, bronze, plásticos, grafite
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 758

Material de corte	Metal duro
Superfície	S
Forma da haste	HE

Brocas Ratio



Nr. do artigo **1173**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,600		16,000	151,000	99,000	48,000
9,700		16,000	151,000	99,000	48,000
10,000		16,000	151,000	99,000	48,000
10,200		16,000	151,000	99,000	48,000
10,400		16,000	151,000	99,000	48,000
11,000		16,000	151,000	99,000	48,000
11,500		16,000	151,000	99,000	48,000
11,700		16,000	151,000	99,000	48,000
12,000		16,000	151,000	99,000	48,000
12,200		16,000	167,000	115,000	48,000
12,400		16,000	167,000	115,000	48,000
12,500		16,000	167,000	115,000	48,000
12,700	1/2	16,000	167,000	115,000	48,000
13,000		16,000	167,000	115,000	48,000
13,500		16,000	167,000	115,000	48,000
14,000		16,000	167,000	115,000	48,000
14,500		20,000	186,000	132,000	50,000
15,000		20,000	186,000	132,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
15,700		20,000	186,000	132,000	50,000
15,800		20,000	186,000	132,000	50,000
16,000		20,000	186,000	132,000	50,000
16,500		20,000	202,000	148,000	50,000
17,000		20,000	202,000	148,000	50,000
17,200		20,000	202,000	148,000	50,000
17,460	11/16	20,000	202,000	148,000	50,000
17,500		20,000	202,000	148,000	50,000
18,000		20,000	202,000	148,000	50,000
18,500		25,000	224,000	164,000	56,000
19,000		25,000	224,000	164,000	56,000
20,000		25,000	224,000	164,000	56,000
21,000		25,000	241,000	181,000	56,000
22,000		25,000	241,000	181,000	56,000
22,500		25,000	257,000	197,000	56,000
25,000	63/64	32,000	278,000	214,000	60,000



Brocas Ratio com canais de refrigeração

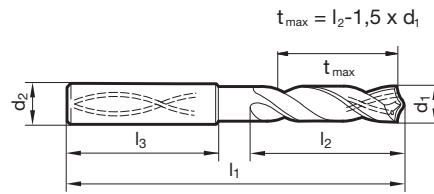


- P** • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada • máxima performance
- M** ○
- K** ○
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços (ligados/não-ligados) até 1400 N/mm²
- S** ○
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	F
Forma da haste	HA



Nr. do artigo **5760**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	5,900		6,000	97,000	57,000	36,000
3,100		6,000	70,000	30,000	36,000	5,950	15/64	6,000	97,000	57,000	36,000
3,170	1/8	6,000	70,000	30,000	36,000	6,000		6,000	97,000	57,000	36,000
3,200		6,000	70,000	30,000	36,000	6,100		8,000	106,000	66,000	36,000
3,250		6,000	70,000	30,000	36,000	6,200		8,000	106,000	66,000	36,000
3,300		6,000	70,000	30,000	36,000	6,300		8,000	106,000	66,000	36,000
3,400		6,000	75,000	35,500	36,000	6,350	1/4	8,000	106,000	66,000	36,000
3,500		6,000	75,000	35,500	36,000	6,400		8,000	106,000	66,000	36,000
3,570	9/64	6,000	75,000	35,500	36,000	6,500		8,000	106,000	66,000	36,000
3,600		6,000	75,000	35,500	36,000	6,530		8,000	106,000	66,000	36,000
3,700		6,000	75,000	35,500	36,000	6,600		8,000	106,000	66,000	36,000
3,800		6,000	75,000	37,500	36,000	6,700		8,000	106,000	66,000	36,000
3,900		6,000	75,000	37,500	36,000	6,750	17/64	8,000	106,000	66,000	36,000
3,970	5/32	6,000	75,000	37,500	36,000	6,800		8,000	106,000	66,000	36,000
4,000		6,000	75,000	37,500	36,000	6,900		8,000	116,000	76,000	36,000
4,040		6,000	75,000	37,500	36,000	7,000		8,000	116,000	76,000	36,000
4,100		6,000	75,000	37,500	36,000	7,100		8,000	116,000	76,000	36,000
4,200		6,000	75,000	37,500	36,000	7,140	9/32	8,000	116,000	76,000	36,000
4,300		6,000	85,000	45,000	36,000	7,200		8,000	116,000	76,000	36,000
4,370	11/64	6,000	85,000	45,000	36,000	7,300		8,000	116,000	76,000	36,000
4,400		6,000	85,000	45,000	36,000	7,400		8,000	116,000	76,000	36,000
4,500		6,000	85,000	45,000	36,000	7,500		8,000	116,000	76,000	36,000
4,600		6,000	85,000	45,000	36,000	7,540	19/64	8,000	116,000	76,000	36,000
4,650		6,000	85,000	45,000	36,000	7,600		8,000	116,000	76,000	36,000
4,700		6,000	85,000	45,000	36,000	7,700		8,000	116,000	76,000	36,000
4,760	3/16	6,000	90,000	50,000	36,000	7,800		8,000	116,000	76,000	36,000
4,800		6,000	90,000	50,000	36,000	7,900		8,000	116,000	76,000	36,000
4,900		6,000	90,000	50,000	36,000	7,940	5/16	8,000	116,000	76,000	36,000
5,000		6,000	90,000	50,000	36,000	8,000		8,000	116,000	76,000	36,000
5,100		6,000	90,000	50,000	36,000	8,100		10,000	131,000	87,000	40,000
5,110		6,000	90,000	50,000	36,000	8,200		10,000	131,000	87,000	40,000
5,160	13/64	6,000	90,000	50,000	36,000	8,300		10,000	131,000	87,000	40,000
5,200		6,000	90,000	50,000	36,000	8,330	21/64	10,000	131,000	87,000	40,000
5,300		6,000	90,000	50,000	36,000	8,400		10,000	131,000	87,000	40,000
5,400		6,000	97,000	57,000	36,000	8,500		10,000	131,000	87,000	40,000
5,410		6,000	97,000	57,000	36,000	8,600		10,000	131,000	87,000	40,000
5,500		6,000	97,000	57,000	36,000	8,700		10,000	131,000	87,000	40,000
5,550		6,000	97,000	57,000	36,000	8,730	11/32	10,000	131,000	87,000	40,000
5,560	7/32	6,000	97,000	57,000	36,000	8,800		10,000	131,000	87,000	40,000
5,600		6,000	97,000	57,000	36,000	8,900		10,000	131,000	87,000	40,000
5,700		6,000	97,000	57,000	36,000	9,000		10,000	131,000	87,000	40,000
5,800		6,000	97,000	57,000	36,000	9,100		10,000	139,000	95,000	40,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,130	23/64	10,000	139,000	95,000	40,000
9,200		10,000	139,000	95,000	40,000
9,250		10,000	139,000	95,000	40,000
9,300		10,000	139,000	95,000	40,000
9,340		10,000	139,000	95,000	40,000
9,400		10,000	139,000	95,000	40,000
9,500		10,000	139,000	95,000	40,000
9,520	3/8	10,000	139,000	95,000	40,000
9,600		10,000	139,000	95,000	40,000
9,700		10,000	139,000	95,000	40,000
9,800		10,000	139,000	95,000	40,000
9,900		10,000	139,000	95,000	40,000
9,920	25/64	10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,100		12,000	155,000	106,000	45,000
10,200		12,000	155,000	106,000	45,000
10,300		12,000	155,000	106,000	45,000
10,320	13/32	12,000	155,000	106,000	45,000
10,400		12,000	155,000	106,000	45,000
10,500		12,000	155,000	106,000	45,000
10,600		12,000	155,000	106,000	45,000
10,700		12,000	155,000	106,000	45,000
10,720	27/64	12,000	155,000	106,000	45,000
10,800		12,000	155,000	106,000	45,000
10,900		12,000	155,000	106,000	45,000
11,000		12,000	155,000	106,000	45,000
11,100		12,000	163,000	114,000	45,000
11,110	7/16	12,000	163,000	114,000	45,000
11,200		12,000	163,000	114,000	45,000
11,300		12,000	163,000	114,000	45,000
11,400		12,000	163,000	114,000	45,000
11,500		12,000	163,000	114,000	45,000
11,510	29/64	12,000	163,000	114,000	45,000
11,600		12,000	163,000	114,000	45,000
11,700		12,000	163,000	114,000	45,000
11,800		12,000	163,000	114,000	45,000
11,900		12,000	163,000	114,000	45,000
11,910	15/32	12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,100		14,000	182,000	133,000	45,000
12,200		14,000	182,000	133,000	45,000
12,300	31/64	14,000	182,000	133,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,100	33/64	14,000	182,000	133,000	45,000
13,490	17/32	14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
13,700		14,000	182,000	133,000	45,000
13,890	35/64	14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,100		16,000	204,000	152,000	48,000
14,200		16,000	204,000	152,000	48,000
14,290	9/16	16,000	204,000	152,000	48,000
14,500		16,000	204,000	152,000	48,000
14,700		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,100		16,000	204,000	152,000	48,000
15,480	39/64	16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
15,700		16,000	204,000	152,000	48,000
15,870	5/8	16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
16,900		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
17,700		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
18,900		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,050	3/4	20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000



Brocas Ratio com canais de refrigeração

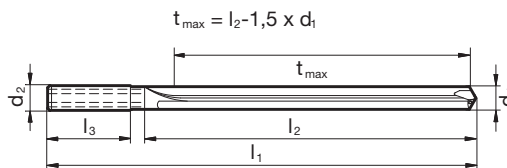


- P** Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • tolerâncias de diâmetros apertadas • muito boa qualidade superficial nos furos • observar pressão de refrigeração
- K** •
- N** ○ ferro fundido, fundição maleável, fundição nodular
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	○
Forma da haste	HA



Nr. do artigo **770**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	91,000	42,000	36,000	10,000		10,000	175,000	130,000	40,000
3,100		6,000	91,000	42,000	36,000	10,200		12,000	209,000	159,000	45,000
3,300		6,000	91,000	42,000	36,000	10,500		12,000	209,000	159,000	45,000
3,800		6,000	121,000	77,000	36,000	10,720	27/64	12,000	209,000	159,000	45,000
4,000		6,000	121,000	77,000	36,000	11,000		12,000	209,000	159,000	45,000
4,100		6,000	121,000	77,000	36,000	11,500		12,000	209,000	159,000	45,000
4,200		6,000	121,000	77,000	36,000	11,510	29/64	12,000	209,000	159,000	45,000
4,300		6,000	121,000	77,000	36,000	12,000		12,000	209,000	159,000	45,000
4,400		6,000	121,000	77,000	36,000	12,300	31/64	14,000	233,000	183,000	45,000
4,500		6,000	121,000	77,000	36,000	12,500		14,000	233,000	183,000	45,000
4,800		6,000	121,000	82,000	36,000	12,700	1/2	14,000	233,000	183,000	45,000
4,900		6,000	121,000	82,000	36,000	13,000		14,000	233,000	183,000	45,000
5,000		6,000	121,000	82,000	36,000	13,500		14,000	233,000	183,000	45,000
5,160	13/64	6,000	121,000	82,000	36,000	14,000		14,000	233,000	183,000	45,000
5,500		6,000	121,000	82,000	36,000	14,500		16,000	260,000	207,000	48,000
5,560	7/32	6,000	121,000	82,000	36,000	15,000		16,000	260,000	207,000	48,000
6,000		6,000	121,000	82,000	36,000	15,500		16,000	260,000	207,000	48,000
6,500		8,000	146,000	106,000	36,000	16,500		18,000	284,000	231,000	48,000
6,750	17/64	8,000	146,000	106,000	36,000	17,000		18,000	284,000	231,000	48,000
6,800		8,000	146,000	106,000	36,000	17,500		18,000	284,000	231,000	48,000
7,000		8,000	146,000	106,000	36,000	18,000		18,000	284,000	231,000	48,000
7,140	9/32	8,000	146,000	106,000	36,000	19,000		20,000	308,000	255,000	50,000
7,500		8,000	146,000	106,000	36,000	20,000		20,000	308,000	255,000	50,000
7,800		8,000	146,000	106,000	36,000						
7,940	5/16	8,000	146,000	106,000	36,000						
8,000		8,000	146,000	106,000	36,000						
8,500		10,000	175,000	130,000	40,000						
8,730	11/32	10,000	175,000	130,000	40,000						
9,000		10,000	175,000	130,000	40,000						
9,500		10,000	175,000	130,000	40,000						



Brocas Ratio com canais de refrigeração



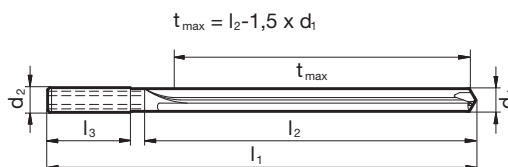
P	Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • tolerâncias de diâmetros apertadas • muito boa qualidade superficial nos furos • observar ótima pressão de refrigeração
M	
K	○
N	● alumínio e ligas de alumínio • todos materiais com alto teor-SI
S	
H	

GÜHRING NAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	○
Forma da haste	HA

Brocas Ratio



Nr. do artigo **6070**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	91,000	42,000	36,000	10,500		12,000	209,000	159,000	45,000
3,100		6,000	91,000	42,000	36,000	11,000		12,000	209,000	159,000	45,000
3,300		6,000	91,000	42,000	36,000	11,110	7/16	12,000	209,000	159,000	45,000
3,500		6,000	91,000	48,000	36,000	12,000		12,000	209,000	159,000	45,000
3,800		6,000	121,000	77,000	36,000	12,700	1/2	14,000	233,000	183,000	45,000
4,000		6,000	121,000	77,000	36,000	13,000		14,000	233,000	183,000	45,000
4,700		6,000	121,000	77,000	36,000	14,000		14,000	233,000	183,000	45,000
4,800		6,000	121,000	82,000	36,000	15,000		16,000	260,000	207,000	48,000
5,000		6,000	121,000	82,000	36,000	16,000		16,000	260,000	207,000	48,000
5,500		6,000	121,000	82,000	36,000	17,000		18,000	284,000	231,000	48,000
6,000		6,000	121,000	82,000	36,000	17,500		18,000	284,000	231,000	48,000
6,350	1/4	8,000	146,000	106,000	36,000	18,000		18,000	284,000	231,000	48,000
6,500		8,000	146,000	106,000	36,000	18,500		20,000	308,000	255,000	50,000
6,800		8,000	146,000	106,000	36,000	19,500		20,000	308,000	255,000	50,000
7,500		8,000	146,000	106,000	36,000						
7,800		8,000	146,000	106,000	36,000						
7,940	5/16	8,000	146,000	106,000	36,000						
8,000		8,000	146,000	106,000	36,000						
8,500		10,000	175,000	130,000	40,000						
8,730	11/32	10,000	175,000	130,000	40,000						
9,000		10,000	175,000	130,000	40,000						
9,500		10,000	175,000	130,000	40,000						
9,520	3/8	10,000	175,000	130,000	40,000						
10,000		10,000	175,000	130,000	40,000						



Brocas Ratio com canais de refrigeração

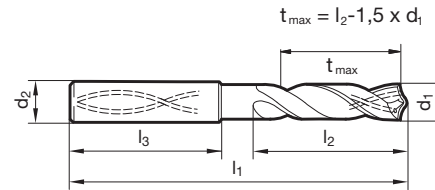


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • formato reto da aresta de corte principal • geometria de cortes otimizada
- M** ○
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos • bronze, latão • ligas altas de AlSi
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 758

Material de corte	MD int.
Superfície	F
Forma da haste	HA



Nr. do artigo **5525**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	90,000	50,000	36,000	7,000		8,000	146,000	108,000	36,000
3,100		6,000	90,000	50,000	36,000	7,100		8,000	146,000	108,000	36,000
3,170	1/8	6,000	90,000	50,000	36,000	7,200		8,000	146,000	108,000	36,000
3,200		6,000	90,000	50,000	36,000	7,300		8,000	146,000	108,000	36,000
3,300		6,000	90,000	50,000	36,000	7,400		8,000	146,000	108,000	36,000
3,400		6,000	90,000	50,000	36,000	7,500		8,000	146,000	108,000	36,000
3,500		6,000	90,000	50,000	36,000	7,600		8,000	146,000	108,000	36,000
3,600		6,000	90,000	50,000	36,000	7,700		8,000	146,000	108,000	36,000
3,700		6,000	90,000	50,000	36,000	7,800		8,000	146,000	108,000	36,000
3,800		6,000	102,000	64,000	36,000	7,900		8,000	146,000	108,000	36,000
3,900		6,000	102,000	64,000	36,000	8,000		8,000	146,000	108,000	36,000
4,000		6,000	102,000	64,000	36,000	8,100		10,000	162,000	120,000	40,000
4,100		6,000	102,000	64,000	36,000	8,200		10,000	162,000	120,000	40,000
4,200		6,000	102,000	64,000	36,000	8,300		10,000	162,000	120,000	40,000
4,300		6,000	102,000	64,000	36,000	8,400		10,000	162,000	120,000	40,000
4,400		6,000	102,000	64,000	36,000	8,500		10,000	162,000	120,000	40,000
4,500		6,000	102,000	64,000	36,000	8,600		10,000	162,000	120,000	40,000
4,600		6,000	102,000	64,000	36,000	8,700		10,000	162,000	120,000	40,000
4,700		6,000	102,000	64,000	36,000	8,800		10,000	162,000	120,000	40,000
4,800		6,000	116,000	78,000	36,000	8,900		10,000	162,000	120,000	40,000
4,900		6,000	116,000	78,000	36,000	9,000		10,000	162,000	120,000	40,000
5,000		6,000	116,000	78,000	36,000	9,100		10,000	162,000	120,000	40,000
5,100		6,000	116,000	78,000	36,000	9,200		10,000	162,000	120,000	40,000
5,200		6,000	116,000	78,000	36,000	9,300		10,000	162,000	120,000	40,000
5,300		6,000	116,000	78,000	36,000	9,400		10,000	162,000	120,000	40,000
5,400		6,000	116,000	78,000	36,000	9,500		10,000	162,000	120,000	40,000
5,500		6,000	116,000	78,000	36,000	9,520	3/8	10,000	162,000	120,000	40,000
5,600		6,000	116,000	78,000	36,000	9,600		10,000	162,000	120,000	40,000
5,700		6,000	116,000	78,000	36,000	9,700		10,000	162,000	120,000	40,000
5,800		6,000	116,000	78,000	36,000	9,800		10,000	162,000	120,000	40,000
5,900		6,000	116,000	78,000	36,000	9,900		10,000	162,000	120,000	40,000
6,000		6,000	116,000	78,000	36,000	10,000		10,000	162,000	120,000	40,000
6,100		8,000	146,000	108,000	36,000	10,200		12,000	204,000	156,000	45,000
6,200		8,000	146,000	108,000	36,000	10,500		12,000	204,000	156,000	45,000
6,300		8,000	146,000	108,000	36,000	11,000		12,000	204,000	156,000	45,000
6,350	1/4	8,000	146,000	108,000	36,000	11,500		12,000	204,000	156,000	45,000
6,400		8,000	146,000	108,000	36,000	12,000		12,000	204,000	156,000	45,000
6,500		8,000	146,000	108,000	36,000	12,500		14,000	230,000	182,000	45,000
6,600		8,000	146,000	108,000	36,000	12,700	1/2	14,000	230,000	182,000	45,000
6,700		8,000	146,000	108,000	36,000	13,000		14,000	230,000	182,000	45,000
6,800		8,000	146,000	108,000	36,000	13,500		14,000	230,000	182,000	45,000
6,900		8,000	146,000	108,000	36,000	14,000		14,000	230,000	182,000	45,000



d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
14,500		16,000	260,000	208,000	48,000
15,000		16,000	260,000	208,000	48,000
15,500		16,000	260,000	208,000	48,000
16,000		16,000	260,000	208,000	48,000
16,500		18,000	285,000	234,000	48,000
17,000		18,000	285,000	234,000	48,000
17,500		18,000	285,000	234,000	48,000
18,000		18,000	285,000	234,000	48,000
18,500		20,000	310,000	258,000	50,000
19,000		20,000	310,000	258,000	50,000
19,050	3/4	20,000	310,000	258,000	50,000
19,500		20,000	310,000	258,000	50,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
20,000		20,000	310,000	258,000	50,000



Brocas Ratio com canais de refrigeração

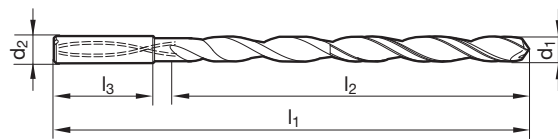


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • formato côncavo da aresta de corte principal • seção de canal otimizada
- K** • máxima seção de canal de refrigeração • observar pressão de refrigeração
- N** ○ aços para construção e cementação • aços para máquinas automáticas,
- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços
- H** ○ inoxidáveis • materiais fundidos

GÜHRING NAVIGATOR

Página de dados de corte 760

Material de corte	MD int.
Superfície	A
Forma da haste	HA



Nr. do artigo **6509**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	95,000	55,000	36,000	7,940	5/16	8,000	183,000	143,000	36,000
3,170	1/8	6,000	106,000	67,000	36,000	8,000		8,000	183,000	143,000	36,000
3,500		6,000	116,000	76,000	36,000	8,330	21/64	10,000	204,000	160,000	40,000
3,570	9/64	6,000	116,000	76,000	36,000	8,500		10,000	204,000	160,000	40,000
3,970	5/32	6,000	116,000	76,000	36,000	8,730	11/32	10,000	204,000	160,000	40,000
4,000		6,000	116,000	76,000	36,000	9,000		10,000	204,000	160,000	40,000
4,370	11/64	6,000	133,000	93,000	36,000	9,130	23/64	10,000	221,000	177,000	40,000
4,500		6,000	133,000	93,000	36,000	9,520	3/8	10,000	221,000	177,000	40,000
4,760	3/16	6,000	133,000	93,000	36,000	9,920	25/64	10,000	221,000	177,000	40,000
5,000		6,000	133,000	93,000	36,000	10,000		10,000	221,000	177,000	40,000
5,100		6,000	150,000	110,000	36,000	10,320	13/32	12,000	247,000	198,000	45,000
5,160	13/64	6,000	150,000	110,000	36,000	10,720	27/64	12,000	247,000	198,000	45,000
5,410		6,000	150,000	110,000	36,000	11,000		12,000	247,000	198,000	45,000
5,500		6,000	150,000	110,000	36,000	11,110	7/16	12,000	263,000	214,000	45,000
5,560	7/32	6,000	150,000	110,000	36,000	11,510	29/64	12,000	263,000	214,000	45,000
5,950	15/64	6,000	150,000	110,000	36,000	11,910	15/32	12,000	263,000	214,000	45,000
6,000		6,000	150,000	110,000	36,000	12,000		12,000	263,000	214,000	45,000
6,350	1/4	8,000	167,000	127,000	36,000	12,300	31/64	14,000	297,000	248,000	45,000
6,500		8,000	167,000	127,000	36,000	12,700	1/2	14,000	297,000	248,000	45,000
6,750	17/64	8,000	167,000	127,000	36,000	13,100	33/64	14,000	297,000	248,000	45,000
7,000		8,000	167,000	127,000	36,000	13,490	17/32	14,000	297,000	248,000	45,000
7,140	9/32	8,000	183,000	143,000	36,000	13,890	35/64	14,000	297,000	248,000	45,000
7,500		8,000	183,000	143,000	36,000	14,000		14,000	297,000	248,000	45,000
7,540	19/64	8,000	183,000	143,000	36,000						



Brocas Ratio com canais de refrigeração



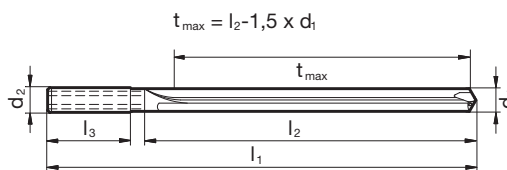
- P** Redução da aresta transversal $\geq \varnothing 5,000$ • afiação de superfície cônica
- M** • passo negativo • para furos muito precisos • muito boa qualidade superficial nos furos • observar pressão de refrigeração
- K** •
- N** • alumínio e ligas de alumínio • todos materiais com alto teor-SI • ferro fundido, fundição maleável, fundição nodular
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 760

Material de corte	MD int.
Superfície	○
Forma da haste	HA

Brocas Ratio



Nr. do artigo **773**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
5,000		6,000	145,000	105,000	36,000
6,000		6,000	145,000	105,000	36,000
8,000		8,000	180,000	137,000	36,000
9,000		10,000	217,000	170,000	40,000
10,000		10,000	217,000	170,000	40,000
11,000		12,000	258,000	205,000	45,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
12,000		12,000	258,000	205,000	45,000
14,000		14,000	290,000	236,000	45,000



Brocas Ratio com canais de refrigeração

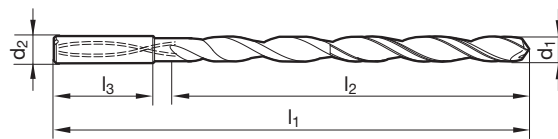


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • formato côncavo da aresta de corte principal • seção de canal otimizada
- K** • máxima seção de canal de refrigeração • observar pressão de refrigeração
- N** ○ aços para construção e cementação • aços para máquinas automáticas,
- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços
- H** ○ inoxidáveis • materiais fundidos

GÜHRING NAVIGATOR

Página de dados de corte 760

Material de corte	MD int.
Superfície	A
Forma da haste	HA



Nr. do artigo **6511**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	110,000	70,000	36,000	8,730	11/32	10,000	249,000	205,000	40,000
3,100		6,000	123,000	83,000	36,000	9,000		10,000	249,000	205,000	40,000
3,170	1/8	6,000	123,000	83,000	36,000	9,130	23/64	10,000	271,000	227,000	40,000
3,500		6,000	136,000	96,000	36,000	9,520	3/8	10,000	271,000	227,000	40,000
3,570	9/64	6,000	136,000	96,000	36,000	9,920	25/64	10,000	271,000	227,000	40,000
3,970	5/32	6,000	136,000	96,000	36,000	10,000		10,000	271,000	227,000	40,000
4,000		6,000	136,000	96,000	36,000	10,320	13/32	12,000	302,000	253,000	45,000
4,200		6,000	158,000	118,000	36,000	10,720	27/64	12,000	302,000	253,000	45,000
4,370	11/64	6,000	158,000	118,000	36,000	11,000		12,000	302,000	253,000	45,000
4,500		6,000	158,000	118,000	36,000	11,110	7/16	12,000	323,000	274,000	45,000
4,760	3/16	6,000	158,000	118,000	36,000	11,510	29/64	12,000	323,000	274,000	45,000
5,000		6,000	158,000	118,000	36,000	11,910	15/32	12,000	323,000	274,000	45,000
5,100		6,000	180,000	140,000	36,000	12,000		12,000	323,000	274,000	45,000
5,160	13/64	6,000	180,000	140,000	36,000	12,300	31/64	14,000	367,000	318,000	45,000
5,410		6,000	180,000	140,000	36,000	12,700	1/2	14,000	367,000	318,000	45,000
5,500		6,000	180,000	140,000	36,000	13,100	33/64	14,000	367,000	318,000	45,000
5,560	7/32	6,000	180,000	140,000	36,000	13,490	17/32	14,000	367,000	318,000	45,000
5,950	15/64	6,000	180,000	140,000	36,000	13,890	35/64	14,000	367,000	318,000	45,000
6,000		6,000	180,000	140,000	36,000	14,000		14,000	367,000	318,000	45,000
6,350	1/4	8,000	202,000	162,000	36,000						
6,500		8,000	202,000	162,000	36,000						
6,750	17/64	8,000	202,000	162,000	36,000						
7,000		8,000	202,000	162,000	36,000						
7,140	9/32	8,000	223,000	183,000	36,000						
7,500		8,000	223,000	183,000	36,000						
7,540	19/64	8,000	223,000	183,000	36,000						
7,940	5/16	8,000	223,000	183,000	36,000						
8,000		8,000	223,000	183,000	36,000						
8,330	21/64	10,000	249,000	205,000	40,000						
8,500		10,000	249,000	205,000	40,000						



Brocas Ratio com canais de refrigeração



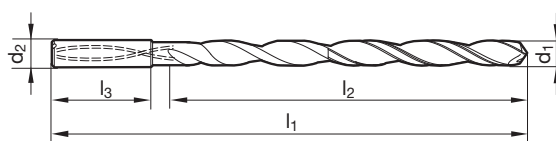
- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • • formato côncavo da aresta de corte principal • seção de canal otimizada
- K** • • máxima seção de canal de refrigeração • observar pressão de refrigeração
- N** ○ aços para construção e cementação • aços para máquinas automáticas,
- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços
- H** ○ inoxidáveis • materiais fundidos

GÜHRING NAVIGATOR

Página de dados de corte 760

Material de corte	MD int.
Superfície	A
Forma da haste	HA

Brocas Ratio



Nr. do artigo **6512**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	125,000	85,000	36,000	7,000		8,000	237,000	197,000	36,000
3,100		6,000	141,000	101,000	36,000	7,140	9/32	8,000	263,000	223,000	36,000
3,170	1/8	6,000	141,000	101,000	36,000	7,500		8,000	263,000	223,000	36,000
3,500		6,000	156,000	116,000	36,000	7,540	19/64	8,000	263,000	223,000	36,000
3,570	9/64	6,000	156,000	116,000	36,000	7,940	5/16	8,000	263,000	223,000	36,000
3,800		6,000	156,000	116,000	36,000	8,000		8,000	263,000	223,000	36,000
3,970	5/32	6,000	156,000	116,000	36,000	8,330	21/64	10,000	294,000	250,000	40,000
4,000		6,000	156,000	116,000	36,000	8,500		10,000	294,000	250,000	40,000
4,200		6,000	183,000	143,000	36,000	8,730	11/32	10,000	294,000	250,000	40,000
4,370	11/64	6,000	183,000	143,000	36,000	8,800		10,000	294,000	250,000	40,000
4,500		6,000	183,000	143,000	36,000	9,000		10,000	294,000	250,000	40,000
4,760	3/16	6,000	183,000	143,000	36,000	9,130	23/64	10,000	321,000	277,000	40,000
5,000		6,000	183,000	143,000	36,000	9,520	3/8	10,000	321,000	277,000	40,000
5,100		6,000	210,000	170,000	36,000	9,920	25/64	10,000	321,000	277,000	40,000
5,160	13/64	6,000	210,000	170,000	36,000	10,000		10,000	321,000	277,000	40,000
5,410		6,000	210,000	170,000	36,000	10,320	13/32	12,000	359,000	310,000	45,000
5,500		6,000	210,000	170,000	36,000	10,720	27/64	12,000	359,000	310,000	45,000
5,560	7/32	6,000	210,000	170,000	36,000	11,000		12,000	359,000	310,000	45,000
5,950	15/64	6,000	210,000	170,000	36,000	11,110	7/16	12,000	386,000	337,000	45,000
6,000		6,000	210,000	170,000	36,000	11,510	29/64	12,000	386,000	337,000	45,000
6,300		8,000	237,000	197,000	36,000	11,910	15/32	12,000	386,000	337,000	45,000
6,350	1/4	8,000	237,000	197,000	36,000	12,000		12,000	386,000	337,000	45,000
6,500		8,000	237,000	197,000	36,000						
6,750	17/64	8,000	237,000	197,000	36,000						



Brocas Ratio com canais de refrigeração

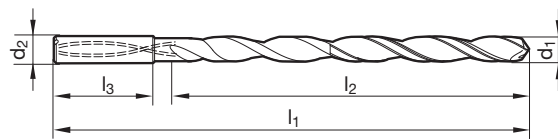


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • formato côncavo da aresta de corte principal • seção de canal otimizada
- K** • máxima seção de canal de refrigeração • observar pressão de refrigeração
- N** ○ aços para construção e cementação • aços para máquinas automáticas,
- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços
- H** ○ inoxidáveis • materiais fundidos

GÜHRING NAVIGATOR

Página de dados de corte 760

Material de corte	MD int.
Superfície	A
Forma da haste	HA



Nr. do artigo **6513**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	140,000	100,000	36,000	7,000		8,000	272,000	232,000	36,000
3,100		6,000	158,000	118,000	36,000	7,140	9/32	8,000	303,000	263,000	36,000
3,170	1/8	6,000	158,000	118,000	36,000	7,500		8,000	303,000	263,000	36,000
3,500		6,000	176,000	136,000	36,000	7,540	19/64	8,000	303,000	263,000	36,000
3,570	9/64	6,000	176,000	136,000	36,000	7,940	5/16	8,000	303,000	263,000	36,000
3,800		6,000	176,000	136,000	36,000	8,000		8,000	303,000	263,000	36,000
3,970	5/32	6,000	176,000	136,000	36,000	8,330	21/64	10,000	339,000	295,000	40,000
4,000		6,000	176,000	136,000	36,000	8,500		10,000	339,000	295,000	40,000
4,200		6,000	208,000	168,000	36,000	8,730	11/32	10,000	339,000	295,000	40,000
4,370	11/64	6,000	208,000	168,000	36,000	8,800		10,000	339,000	295,000	40,000
4,500		6,000	208,000	168,000	36,000	9,000		10,000	339,000	295,000	40,000
4,760	3/16	6,000	208,000	168,000	36,000	9,130	23/64	10,000	371,000	327,000	40,000
5,000		6,000	208,000	168,000	36,000	9,520	3/8	10,000	371,000	327,000	40,000
5,100		6,000	240,000	200,000	36,000	9,920	25/64	10,000	371,000	327,000	40,000
5,160	13/64	6,000	240,000	200,000	36,000	10,000		10,000	371,000	327,000	40,000
5,410		6,000	240,000	200,000	36,000						
5,500		6,000	240,000	200,000	36,000						
5,560	7/32	6,000	240,000	200,000	36,000						
5,950	15/64	6,000	240,000	200,000	36,000						
6,000		6,000	240,000	200,000	36,000						
6,300		8,000	272,000	232,000	36,000						
6,350	1/4	8,000	272,000	232,000	36,000						
6,500		8,000	272,000	232,000	36,000						
6,750	17/64	8,000	272,000	232,000	36,000						


Brocas Ratio com canais de refrigeração


P	•	Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
M	•	• formato côncavo da aresta de corte principal • seção de canal otimizada
K	•	• máxima seção de canal de refrigeração • observar pressão de refrigeração
N	○	aços para construção e cementação • aços para máquinas automáticas,
S	○	aços para beneficiamento • aços com liga até 1200 N/mm ² • aços
H	○	inoxidáveis • materiais fundidos

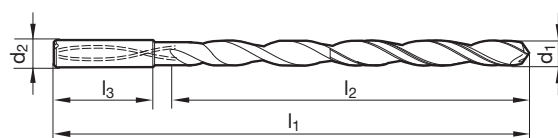
GÜHRING NAVIGATOR

Página de dados de corte 760

 Material de corte **MD int.**

 Superfície **A**

Forma da haste HA



Nr. do artigo

6514

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	170,000	130,000	36,000	5,950	15/64	6,000	300,000	260,000	36,000
3,100		6,000	193,000	153,000	36,000	6,000		6,000	300,000	260,000	36,000
3,170	1/8	6,000	193,000	153,000	36,000	6,300		8,000	322,000	282,000	36,000
3,500		6,000	193,000	153,000	36,000	6,350	1/4	8,000	322,000	282,000	36,000
3,570	9/64	6,000	216,000	176,000	36,000	6,500		8,000	322,000	282,000	36,000
3,800		6,000	216,000	176,000	36,000	6,750	17/64	8,000	342,000	302,000	36,000
3,970	5/32	6,000	216,000	176,000	36,000	7,000		8,000	342,000	302,000	36,000
4,000		6,000	216,000	176,000	36,000	7,140	9/32	8,000	363,000	323,000	36,000
4,200		6,000	238,000	198,000	36,000	7,500		8,000	363,000	323,000	36,000
4,370	11/64	6,000	238,000	198,000	36,000	7,540	19/64	8,000	383,000	343,000	36,000
4,500		6,000	238,000	198,000	36,000	7,940	5/16	8,000	383,000	343,000	36,000
4,760	3/16	6,000	258,000	218,000	36,000	8,000		8,000	383,000	343,000	36,000
5,000		6,000	258,000	218,000	36,000						
5,100		6,000	280,000	240,000	36,000						
5,160	13/64	6,000	280,000	240,000	36,000						
5,410		6,000	280,000	240,000	36,000						
5,500		6,000	280,000	240,000	36,000						
5,560	7/32	6,000	300,000	260,000	36,000						



Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração



P • Redução da aresta transversal $\geq \varnothing 0,500$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado

M •

K •

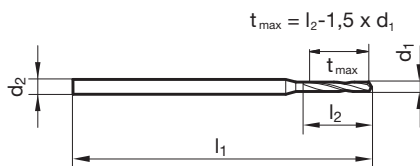
N ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos

H

Material de corte	MD int.
Superfície	A
Sentido de corte	R

GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo **6400**

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	3,000
0,550	3,000	47,000	3,300
0,600	3,000	47,000	3,600
0,650	3,000	47,000	3,900
0,700	3,000	47,000	4,200
0,750	3,000	47,000	4,500
0,800	3,000	47,000	4,800
0,850	3,000	47,000	5,100
0,900	3,000	47,000	5,400
0,950	3,000	47,000	5,700
1,000	3,000	47,000	6,000
1,050	3,000	47,000	6,300
1,100	3,000	47,000	6,600
1,150	3,000	47,000	6,900
1,200	3,000	47,000	7,200
1,250	3,000	47,000	7,500
1,300	3,000	47,000	7,800
1,350	3,000	47,000	8,100
1,400	3,000	47,000	8,400
1,450	3,000	47,000	8,700
1,500	3,000	47,000	9,000
1,550	3,000	47,000	9,300
1,590	3,000	47,000	9,600
1,600	3,000	47,000	9,600
1,650	3,000	47,000	9,900
1,700	3,000	47,000	10,200
1,750	3,000	47,000	10,500
1,800	3,000	52,000	10,800
1,850	3,000	52,000	11,100
1,900	3,000	52,000	11,400

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	11,700
1,980	4,000	59,000	12,000
2,000	4,000	59,000	12,000
2,050	4,000	59,000	12,300
2,100	4,000	59,000	12,600
2,150	4,000	59,000	12,900
2,200	4,000	59,000	13,200
2,250	4,000	59,000	13,500
2,300	4,000	59,000	13,800
2,350	4,000	59,000	14,100
2,380	4,000	59,000	14,400
2,400	4,000	59,000	14,400
2,450	4,000	59,000	14,700
2,500	4,000	59,000	15,000
2,550	4,000	59,000	15,300
2,600	4,000	59,000	15,600
2,650	4,000	59,000	15,900
2,700	4,000	59,000	16,200
2,750	4,000	59,000	16,500
2,780	4,000	59,000	16,800
2,800	4,000	59,000	16,800
2,850	4,000	59,000	17,100
2,900	4,000	59,000	17,400
2,950	4,000	59,000	17,700
3,000	4,000	59,000	18,000


Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração
Material de corte **MD int.**Superfície **A**Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 0,500$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado

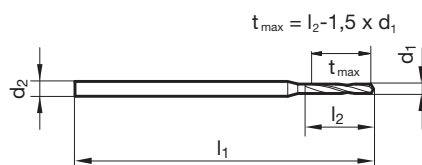
M •**K** •

N ○ aços para construção e cementação • aços para máquinas automáticas,

S ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos

H
GÜHRING NAVIGATOR

Página de dados de corte 796

Nr. do artigo **6401**

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	4,000
0,550	3,000	47,000	4,400
0,600	3,000	47,000	4,800
0,650	3,000	47,000	5,200
0,700	3,000	47,000	5,600
0,750	3,000	47,000	6,000
0,800	3,000	47,000	6,400
0,850	3,000	47,000	6,800
0,900	3,000	47,000	7,200
0,950	3,000	47,000	7,600
1,000	3,000	47,000	8,000
1,050	3,000	47,000	8,400
1,100	3,000	47,000	8,800
1,150	3,000	47,000	9,200
1,200	3,000	52,000	10,800
1,250	3,000	52,000	11,300
1,300	3,000	52,000	11,700
1,350	3,000	52,000	12,200
1,400	3,000	52,000	12,600
1,450	3,000	52,000	13,100
1,500	3,000	52,000	13,500
1,550	3,000	52,000	14,000
1,590	3,000	52,000	14,400
1,600	3,000	52,000	14,400
1,650	3,000	52,000	14,900
1,700	3,000	52,000	15,300
1,750	3,000	52,000	15,800
1,800	3,000	52,000	16,200
1,850	3,000	52,000	16,700
1,900	3,000	52,000	17,100

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	17,600
1,980	4,000	63,000	18,000
2,000	4,000	63,000	18,000
2,050	4,000	63,000	18,500
2,100	4,000	63,000	18,900
2,150	4,000	63,000	19,400
2,200	4,000	63,000	19,800
2,250	4,000	63,000	20,300
2,300	4,000	63,000	20,700
2,350	4,000	63,000	21,200
2,380	4,000	63,000	21,600
2,400	4,000	63,000	21,600
2,450	4,000	63,000	22,100
2,500	4,000	63,000	22,500
2,550	4,000	63,000	23,000
2,600	4,000	67,000	23,400
2,650	4,000	67,000	23,900
2,700	4,000	67,000	24,300
2,750	4,000	67,000	24,800
2,780	4,000	67,000	25,200
2,800	4,000	67,000	25,200
2,850	4,000	67,000	25,700
2,900	4,000	67,000	26,100
2,950	4,000	67,000	26,600
3,000	4,000	67,000	27,000



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração



Material de corte	MD int.
Superfície	A
Sentido de corte	R

P • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado

M •

K •

N ○ aços para construção e cementação • aços para máquinas automáticas,

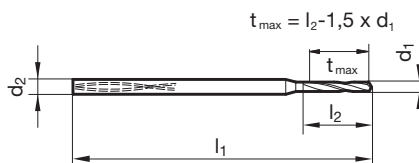
S ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos

H



GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo **6405**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	11,000
1,450	4,000	52,000	12,000
1,500	4,000	52,000	12,000
1,550	4,000	52,000	12,000
1,590	4,000	52,000	13,000
1,600	4,000	52,000	13,000
1,650	4,000	52,000	13,000
1,700	4,000	56,000	14,000
1,750	4,000	56,000	14,000
1,800	4,000	56,000	14,000
1,850	4,000	56,000	15,000
1,900	4,000	56,000	15,000
1,950	4,000	56,000	16,000
1,980	4,000	56,000	16,000
2,000	4,000	56,000	16,000
2,050	4,000	56,000	16,000
2,100	4,000	62,000	17,000
2,150	4,000	62,000	17,000
2,200	4,000	62,000	18,000
2,250	4,000	62,000	18,000
2,300	4,000	62,000	18,000
2,350	4,000	62,000	19,000
2,380	4,000	62,000	19,000
2,400	4,000	62,000	19,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,450	4,000	62,000	20,000
2,500	4,000	62,000	20,000
2,550	4,000	62,000	20,000
2,600	4,000	66,000	21,000
2,650	4,000	66,000	21,000
2,700	4,000	66,000	22,000
2,750	4,000	66,000	22,000
2,780	4,000	66,000	22,000
2,800	4,000	66,000	22,000
2,850	4,000	66,000	23,000
2,900	4,000	66,000	23,000
2,950	4,000	66,000	24,000
3,000	4,000	66,000	24,000


Micro Brocas de precisão ExclusiveLine com dutos de refrigeração
Material de corte **MD int.**Superfície **A**Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado

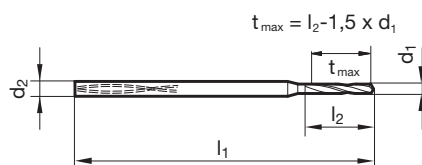
M •**K** •

N ○ aços para construção e cementação • aços para máquinas automáticas,

S ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos

H
GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo

6408

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	15,000
1,450	4,000	52,000	16,000
1,500	4,000	52,000	17,000
1,550	4,000	52,000	17,000
1,590	4,000	52,000	18,000
1,600	4,000	52,000	18,000
1,650	4,000	52,000	18,000
1,700	4,000	56,000	19,000
1,750	4,000	56,000	19,000
1,800	4,000	56,000	20,000
1,850	4,000	56,000	20,000
1,900	4,000	56,000	21,000
1,950	4,000	56,000	21,000
1,980	4,000	56,000	22,000
2,000	4,000	56,000	22,000
2,050	4,000	56,000	23,000
2,100	4,000	62,000	23,000
2,150	4,000	62,000	24,000
2,200	4,000	62,000	24,000
2,250	4,000	62,000	25,000
2,300	4,000	62,000	25,000
2,320	4,000	62,000	26,000
2,350	4,000	62,000	26,000
2,380	4,000	62,000	26,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,400	4,000	62,000	26,000
2,450	4,000	62,000	27,000
2,500	4,000	62,000	28,000
2,550	4,000	62,000	28,000
2,600	4,000	66,000	29,000
2,650	4,000	66,000	29,000
2,700	4,000	66,000	30,000
2,750	4,000	66,000	30,000
2,780	4,000	66,000	31,000
2,800	4,000	66,000	31,000
2,850	4,000	66,000	31,000
2,900	4,000	66,000	32,000
2,950	4,000	66,000	32,000
3,000	4,000	66,000	33,000



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração



Material de corte **MD int.**

Superfície **A**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado

M •

K •

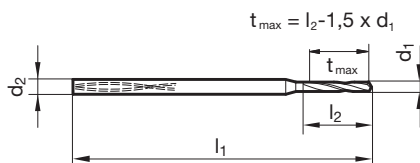
N ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos

S ○

H

GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo **6412**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	62,000	25,000
1,500	4,000	62,000	27,000
1,590	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,700	4,000	70,000	31,000
1,800	4,000	70,000	32,000
1,900	4,000	70,000	34,000
1,980	4,000	70,000	36,000
2,000	4,000	70,000	36,000
2,100	4,000	78,000	38,000
2,200	4,000	78,000	40,000
2,300	4,000	78,000	42,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,380	4,000	78,000	44,000
2,400	4,000	78,000	44,000
2,500	4,000	78,000	45,000
2,600	4,000	87,000	47,000
2,700	4,000	87,000	48,000
2,780	4,000	87,000	50,000
2,800	4,000	87,000	50,000
2,900	4,000	87,000	52,000
3,000	4,000	87,000	54,000



Brocas Ratio, 3 cortes



Material de corte **MD int.**

Superfície ○

Forma da haste HA

P Redução da aresta transversal ≥ Ø 3,000 • afiação Spiropoint • canais largos
• ótima centragem • adequado para corte interrompido

M

K •

N •

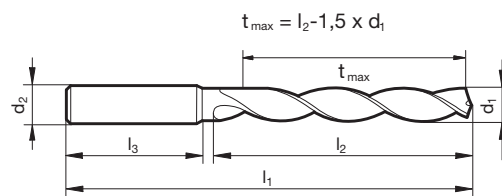
fundidos • ligas de Al com cavacos longos • latão, bronze

S

H

GÜHRING NAVIGATOR

Página de dados de corte 762



Nr. do artigo **2713**

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000
3,100		6,000	66,000	28,000	36,000
3,200		6,000	66,000	28,000	36,000
3,300		6,000	66,000	28,000	36,000
3,500		6,000	66,000	28,000	36,000
3,700		6,000	66,000	28,000	36,000
3,800		6,000	74,000	36,000	36,000
4,000		6,000	74,000	36,000	36,000
4,100		6,000	74,000	36,000	36,000
4,200		6,000	74,000	36,000	36,000
4,500		6,000	74,000	36,000	36,000
4,800		6,000	82,000	44,000	36,000
5,000		6,000	82,000	44,000	36,000
5,100		6,000	82,000	44,000	36,000
5,200		6,000	82,000	44,000	36,000
5,300		6,000	82,000	44,000	36,000
5,500		6,000	82,000	44,000	36,000
5,800		6,000	82,000	44,000	36,000
6,000		6,000	82,000	44,000	36,000
6,100		8,000	91,000	53,000	36,000
6,200		8,000	91,000	53,000	36,000
6,400		8,000	91,000	53,000	36,000
6,500		8,000	91,000	53,000	36,000
6,700		8,000	91,000	53,000	36,000
6,800		8,000	91,000	53,000	36,000
7,000		8,000	91,000	53,000	36,000
7,100		8,000	91,000	53,000	36,000
7,400		8,000	91,000	53,000	36,000
7,500		8,000	91,000	53,000	36,000
7,800		8,000	91,000	53,000	36,000
8,000		8,000	91,000	53,000	36,000
8,100		10,000	103,000	61,000	40,000
8,200		10,000	103,000	61,000	40,000
8,400		10,000	103,000	61,000	40,000
8,500		10,000	103,000	61,000	40,000
8,600		10,000	103,000	61,000	40,000

d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
8,700		10,000	103,000	61,000	40,000
8,800		10,000	103,000	61,000	40,000
9,000		10,000	103,000	61,000	40,000
9,100		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
9,800		10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,100		12,000	118,000	71,000	45,000
10,200		12,000	118,000	71,000	45,000
10,300		12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,200		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
11,800		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,100		14,000	124,000	77,000	45,000
12,500		14,000	124,000	77,000	45,000
13,000		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,500		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas Ratio, 3 cortes



Material de corte **MD int.**

Superfície **S**

Forma da haste Cilíndrica

P ○ Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • para furos muito precisos • muito boa qualidade superficial nos furos • adequado para corte interrompido

M

K ○

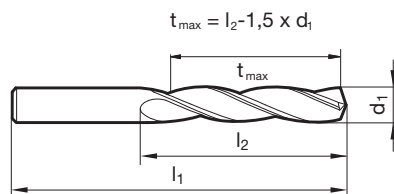
N ○ aços fundidos • aços com e sem liga acima de 1000·N/mm²

S

H

GÜHRING NAVIGATOR

Página de dados de corte 762



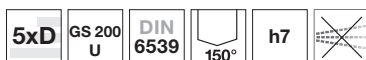
Nr. do artigo **611**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	22,000
3,100		49,000	24,000
3,900		55,000	30,000
4,000		55,000	30,000
4,100		55,000	30,000
4,200		55,000	30,000
5,000		62,000	35,000
6,000		66,000	39,000
6,200		70,000	42,000
6,800		74,000	45,000
7,000		74,000	45,000
8,000		79,000	48,000

d1		l1	l2
mm	inch	mm	mm
8,500		79,000	48,000
10,000		89,000	55,000
10,200		89,000	55,000
12,000		102,000	65,000
14,000		107,000	66,000
14,400		111,000	70,000



Brocas Ratio, 3 cortes



Material de corte **MD int.**

Superfície ○

Forma da haste Cilíndrica

P ○ Redução da aresta transversal ≥ Ø 3,000 • afiação facetada • para furos muito precisos • muito boa qualidade superficial nos furos • adequado para corte interrompido

M

K ○

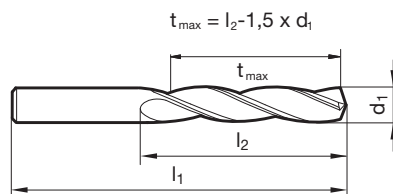
N ○ aços fundidos • aços com e sem liga acima de 1000·N/mm²

S

H

GÜHRING NAVIGATOR

Página de dados de corte 762



Nr. do artigo **731**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	22,000
3,100		49,000	24,000
3,200		49,000	24,000
3,300		49,000	24,000
3,400		52,000	27,000
3,500		52,000	27,000
3,600		52,000	27,000
3,700		52,000	27,000
3,800		55,000	30,000
3,900		55,000	30,000
3,970	5/32	55,000	30,000
4,000		55,000	30,000
4,200		55,000	30,000
4,300		58,000	32,000
4,500		58,000	32,000
4,700		58,000	32,000
4,760	3/16	62,000	35,000
4,800		62,000	35,000
5,000		62,000	35,000
5,100		62,000	35,000
5,200		62,000	35,000
5,300		62,000	35,000
5,400		66,000	39,000
5,500		66,000	39,000
5,600		66,000	39,000
5,800		66,000	39,000
6,000		66,000	39,000
6,100		70,000	42,000
6,400		70,000	42,000
6,500		70,000	42,000
6,700		70,000	42,000
6,750	17/64	74,000	45,000
6,800		74,000	45,000
7,000		74,000	45,000
7,500		74,000	45,000
7,700		79,000	48,000

d1		l1	l2
mm	inch	mm	mm
7,800		79,000	48,000
8,000		79,000	48,000
8,100		79,000	48,000
8,300		79,000	48,000
8,400		79,000	48,000
8,500		79,000	48,000
9,000		84,000	52,000
9,600		89,000	55,000
9,700		89,000	55,000
9,800		89,000	55,000
9,900		89,000	55,000
10,000		89,000	55,000
10,200		89,000	55,000
10,320	13/32	89,000	55,000
10,400		89,000	55,000
10,500		89,000	55,000
10,800		95,000	60,000
11,000		95,000	60,000
11,300		95,000	60,000
11,500		95,000	60,000
11,600		95,000	60,000
11,700		95,000	60,000
12,000		102,000	65,000
12,100		102,000	65,000
12,500		102,000	65,000
13,000		102,000	65,000
13,200		102,000	65,000
13,500		107,000	66,000
14,000		107,000	66,000
14,300		111,000	70,000
16,000		115,000	73,000
17,500		123,000	76,000
20,000		131,000	79,000



Brocas Ratio, 3 cortes



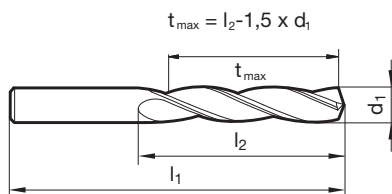
P Redução da aresta transversal $\geq \varnothing 3,570$ • afiação facetada • para furos muito precisos • muito boa qualidade superficial nos furos • adequado para corte interrompido

- M**
- K** ○
- N** ○ materiais fundidos • ligas de alumínio fundido
- S**
- H**

Material de corte	MD int.
Superfície	○
Forma da haste	Cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 762



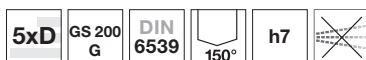
Nr. do artigo **745**

d1		l1	l2
mm	inch		
3,570	9/64	52,000	27,000
4,370	11/64	58,000	32,000
6,900		74,000	45,000
7,300		74,000	45,000
7,940	5/16	79,000	48,000
8,330	21/64	79,000	48,000

d1		l1	l2
mm	inch		
8,800		84,000	52,000
9,700		89,000	55,000
10,720	27/64	95,000	60,000
12,500		102,000	65,000



Brocas Ratio, 3 cortes



P Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • para furos muito precisos • muito boa qualidade superficial nos furos • adequado para corte interrompido

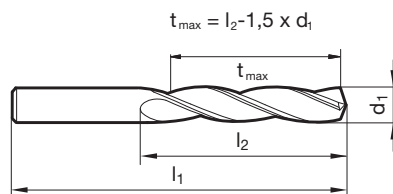
- M**
- K** ○
- N** ○ materiais fundidos • ligas de alumínio fundido
- S**
- H**

Material de corte	MD int.
Superfície	○
Forma da haste	Cilíndrica

Brocas Ratio

GÜHRING NAVIGATOR

Página de dados de corte 762



Nr. do artigo **1025**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,000		46,000	22,000	7,100		74,000	45,000
3,100		49,000	24,000	7,200		74,000	45,000
3,200		49,000	24,000	7,300		74,000	45,000
3,300		49,000	24,000	7,400		74,000	45,000
3,400		52,000	27,000	7,500		74,000	45,000
3,500		52,000	27,000	7,600		79,000	48,000
3,570	9/64	52,000	27,000	7,700		79,000	48,000
3,600		52,000	27,000	7,800		79,000	48,000
3,700		52,000	27,000	7,900		79,000	48,000
3,800		55,000	30,000	8,000		79,000	48,000
3,900		55,000	30,000	8,100		79,000	48,000
3,970	5/32	55,000	30,000	8,200		79,000	48,000
4,000		55,000	30,000	8,400		79,000	48,000
4,100		55,000	30,000	8,500		79,000	48,000
4,200		55,000	30,000	8,600		84,000	52,000
4,300		58,000	32,000	8,700		84,000	52,000
4,370	11/64	58,000	32,000	8,800		84,000	52,000
4,500		58,000	32,000	9,000		84,000	52,000
4,600		58,000	32,000	9,100		84,000	52,000
4,700		58,000	32,000	9,300		84,000	52,000
4,800		62,000	35,000	9,500		84,000	52,000
4,900		62,000	35,000	9,520	3/8	89,000	55,000
5,000		62,000	35,000	9,600		89,000	55,000
5,100		62,000	35,000	9,700		89,000	55,000
5,200		62,000	35,000	9,800		89,000	55,000
5,300		62,000	35,000	10,000		89,000	55,000
5,400		66,000	39,000	10,100		89,000	55,000
5,500		66,000	39,000	10,200		89,000	55,000
5,600		66,000	39,000	10,300		89,000	55,000
5,700		66,000	39,000	10,500		89,000	55,000
5,800		66,000	39,000	10,700		95,000	60,000
5,900		66,000	39,000	11,000		95,000	60,000
6,000		66,000	39,000	11,110	7/16	95,000	60,000
6,100		70,000	42,000	11,200		95,000	60,000
6,200		70,000	42,000	11,500		95,000	60,000
6,300		70,000	42,000	11,510	29/64	95,000	60,000
6,400		70,000	42,000	11,700		95,000	60,000
6,500		70,000	42,000	11,800		95,000	60,000
6,600		70,000	42,000	11,910	15/32	102,000	65,000
6,700		70,000	42,000	12,000		102,000	65,000
6,800		74,000	45,000	12,200		102,000	65,000
7,000		74,000	45,000	12,500		102,000	65,000



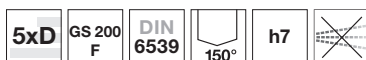
Brocas Ratio

d1		l1	l2
mm	inch	mm	mm
12,700	1/2	102,000	65,000
13,000		102,000	65,000
13,500		107,000	66,000
13,800		107,000	66,000
14,000		107,000	66,000
14,300		111,000	70,000
14,500		111,000	70,000
15,000		111,000	70,000
15,870	5/8	115,000	73,000
16,000		115,000	73,000
17,000		119,000	73,000
18,500		127,000	76,000

d1		l1	l2
mm	inch	mm	mm
19,000		127,000	76,000
20,000		131,000	79,000



Brocas Ratio, 3 cortes

Material de corte **MD int.**Superfície **S**

Forma da haste Cilíndrica

P ○ Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • para furos muito precisos • muito boa qualidade superficial nos furos • adequado para corte interrompido

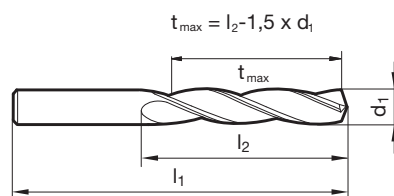
M**K** ○**N** ○

aços para máquinas automáticas, aços para construção • aços com e sem liga acima de 1000-N/mm²

S**H**

GÜHRING NAVIGATOR

Página de dados de corte 762



Nr. do artigo

1027

d1		l1	l2
mm	inch		
3,000		46,000	22,000
3,200		49,000	24,000
3,900		55,000	30,000
4,000		55,000	30,000
4,900		62,000	35,000
5,000		62,000	35,000
5,300		62,000	35,000
5,500		66,000	39,000
6,000		66,000	39,000
6,200		70,000	42,000
7,000		74,000	45,000
9,000		84,000	52,000

d1		l1	l2
mm	inch		
10,000		89,000	55,000
11,000		95,000	60,000



Brocas Ratio escalonadas, 3 cortes



P Redução da aresta transversal $\geq \varnothing 3,400$ • afiação facetada • para furos muito precisos • muito boa qualidade superficial nos furos • adequado para corte interrompido

M

K ○

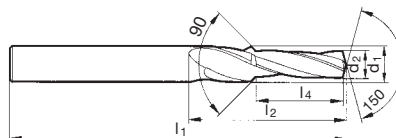
N ○

S

H

materiais fundidos • ligas de alumínio fundido

Material de corte	MD int.
Superfície	○
Forma da haste	Cilíndrica



Nr. do artigo **1032**

d1	d2	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
3,400	2,500	52,000	27,000	9,000	M 3
4,500	3,300	58,000	32,000	11,000	M 4
5,500	4,200	66,000	39,000	14,000	M 5
5,500	4,700	66,000	39,000	14,000	
6,600	5,000	70,000	42,000	16,000	M 6
9,000	6,800	84,000	52,000	22,000	M 8
11,000	8,500	95,000	60,000	28,000	M10
11,000	8,800	95,000	60,000	28,000	M10X1,25
13,500	10,200	107,000	66,000	33,000	M12
15,500	13,200	115,000	73,000	38,000	
17,500	15,000	123,000	76,000	41,000	M16 X1
20,000	16,000	131,000	79,000	43,000	M18X2



GM 300

Porta-ferramentas
e dispositivos de fixação
para todas aplicações

Mais informações podem ser
encontradas no nosso catálogo GM300.





SISTEMA DE FURAÇÃO COM INSERTOS T 800





Sistema modular HT 800 WP

Com o novo sistema de furação intercambiável HT 800 a Gühring fornece alta performance e custo eficiente em porta ferramentas para furos na gama de diâmetro de 11,00 à 40,0 mm.

O sistema para furação HT 800 WP é ideal para produções em larga escala que necessitam de precisão em diferentes materiais para aplicações na indústria de energia, automotiva, construção e engenharia mecânica.

LONGA VIDA ÚTIL

- insertos intercambiáveis perfeitamente adaptados para cada campo de aplicação de acordo com o material usinado, geometria e acabamento superficial
- optimal machining results in steel, stainless steel, cast iron or aluminium

REMOÇÃO DE CAVACO OTIMIZADO

- canal especial corte-transversal
- acabamento superficial ultra-liso

SUPORTES ROBUSTOS

- escalonamento apertado dos Ø- dos tamanhos dos suportes, desgaste reduzido
- melhor acabamento superficial
- melhor guia da ferramenta eleva a estabilidade
- vida útil da ferramenta mais longa

ALOJAMENTO DA PASTILHA DE ALTA PRECISÃO E ESTABILIDADE

- troca da pastilha na máquina
- o suporte permanece fixado
- as trocas de ferramentas e nova regulagem são suprimidas
- segurança de processo elevada e tempos de preparação mais curtos

REFRIGERAÇÃO PERFEITA

- seção máxima nos canais de refrigeração
- extração de cavacos pelo canal de saída





O inserto correto para diferentes materiais e aplicações



Sistema de furação com insertos T 800

HT 800 WP

O porta ferramentas correto para diferentes profundidades de furação e aplicações

Nr. do artigo	4105	4106	4107	4108	4109	4110
Prof. do furo	1 x D	1,5 x D	3 x D	5 x D	7 x D	10 x D
Diâmetro do furo	11,0 - 40,00	11,0 - 40,00	11,0 - 40,00	11,0 - 40,00	11,0 - 31,99	11,0 - 31,99
Forma da haste	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE	DIN 6535-HE



O suporte para piloto Art. N°. 4105 é provido com um ponto de separação (interface) para pastilhas de chanfrar. Na execução do furo piloto pode-se com isso chanfrar 45° ao mesmo tempo



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Forma da haste	Tipo	Norma	MATERIAL de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Suporte para pastilhas intercambiáveis HT 800

Sistema de furação com insertos T 800

	1xD	HE	HT 800 WP	WN	Ni	4105	764	138
	1,5xD	HE	HT 800 WP	WN	Ni	4106	764	128
	3xD	HE	HT 800 WP	WN	Ni	4107	764	130
	5xD	HE	HT 800 WP	WN	Ni	4108	766	132
	7xD	HE	HT 800 WP	WN	Ni	4109	766	134
	10xD	HE	HT 800 WP	WN	Ni	4110	768	136

Pastilhas intercambiáveis HT 800

	HT 800 WP	WN	VHM	F	11,000 - 40,000	4113	764	142
	HT 800 WP	WN	VHM	O	11,000 - 40,000	4114	764	148
	HT 800 WP	WN	VHM	F	11,000 - 40,000	4112	764	139
	HT 800 WP	WN	VHM	a	11,000 - 40,000	4115	764	145
	HT 800 WP	WN	VHM	a	11,000 - 40,000	4111	768	151

Pastilhas para escarear HT 800

	WN	VHM	O	7635	156
	WN	VHM	S	7645	154
	WN	VHM	A	7632	155

Parafusos de fixação

	WN	6128	157
	WN	4071	158

Suporte para pastilhas intercambiáveis RT 800

	3xD	HE	RT800 WP	WN	Ni	5242	770	159
	5xD	HE	RT800 WP	WN	Ni	5243	770	160
	7xD	HE	RT800 WP	WN	Ni	5248	770	161

Pastilhas intercambiáveis RT 800

	RT 800 WP	WN	VHM	F	16,000 - 40,500	2485	770	164
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P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Forma da haste	Tipo	Norma	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Pastilhas intercambiáveis RT 800

						16,000 - 40,000	2747	770	166
						16,000 - 40,500	1047	770	162

Parafusos de fixação RT 800

		1071	168
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Torquímetro

		4915	169
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Pontas intercambiáveis Torx

		4917	170
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Chave Torx

		1612	171
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Sistema de furação com insertos T 800



Suporte para pastilhas intercambiáveis HT 800



P níquelado • especialmente alta resistência ao desgaste • seção de canal otimizada • saída otimizada do duto de refrigeração
M • parafusos de fixação do produto no. 4071 incluso • Chave de fenda Art. No. 1612 incluso
K
N
S
H

Sistema de furação com insertos T 800

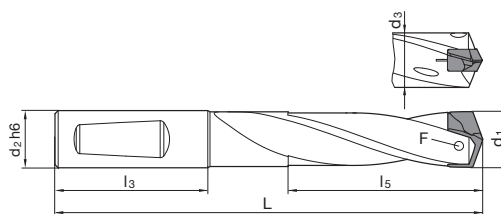
Material de corte

Superfície **Ni**

Forma da haste HE

GÜHRINGNAVIGATOR

Página de dados de corte 764-768



Nr. do artigo **4106**

d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	84,000	45,000	19,300	4071 2.200	11,000
11,00-11,49	12,700	10,700	84,000	45,000	19,300	4071 2.200	11,005
11,50-11,99	12,000	11,200	85,000	45,000	20,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	85,000	45,000	20,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	87,000	45,000	21,000	4071 2.201	12,000
12,00-12,49	12,700	11,700	87,000	45,000	21,000	4071 2.201	12,005
12,50-12,99	14,000	12,200	89,000	45,000	21,900	4071 2.201	12,500
12,50-12,99	15,875	12,200	89,000	45,000	21,900	4071 2.201	12,505
13,00-13,49	14,000	12,700	90,000	45,000	22,600	4071 2.500	13,000
13,00-13,49	15,875	12,700	90,000	45,000	22,600	4071 2.500	13,005
13,50-13,99	14,000	13,200	92,000	45,000	23,600	4071 2.500	13,500
13,50-13,99	15,875	13,200	92,000	45,000	23,600	4071 2.500	13,505
14,00-14,49	14,000	13,700	93,000	45,000	24,500	4071 3.000	14,000
14,00-14,49	15,875	13,700	93,000	45,000	24,500	4071 3.000	14,005
14,50-14,99	16,000	14,200	98,000	48,000	25,300	4071 3.000	14,500
14,50-14,99	15,875	14,200	98,000	48,000	25,300	4071 3.000	14,505
15,00-15,49	16,000	14,700	100,000	48,000	26,100	4071 3.001	15,000
15,00-15,49	15,875	14,700	100,000	48,000	26,100	4071 3.001	15,005
15,50-15,99	16,000	15,200	101,000	48,000	27,000	4071 3.001	15,500
15,50-15,99	15,875	15,200	101,000	48,000	27,000	4071 3.001	15,505
16,00-16,49	16,000	15,700	102,000	48,000	27,800	4071 3.500	16,000
16,00-16,49	15,875	15,700	102,000	48,000	27,800	4071 3.500	16,005
16,50-16,99	18,000	16,200	105,000	48,000	28,700	4071 3.500	16,500
16,50-16,99	19,050	16,200	105,000	48,000	28,700	4071 3.500	16,505
17,00-17,49	18,000	16,700	106,000	48,000	29,600	4071 3.500	17,000
17,00-17,49	19,050	16,700	106,000	48,000	29,600	4071 3.500	17,005
17,50-17,99	18,000	17,200	107,000	48,000	30,400	4071 3.500	17,500
17,50-17,99	19,050	17,200	107,000	48,000	30,400	4071 3.500	17,505
18,00-18,49	18,000	17,700	109,000	48,000	31,200	4071 4.000	18,000
18,00-18,49	19,050	17,700	109,000	48,000	31,200	4071 4.000	18,005
18,50-18,99	20,000	18,200	113,000	50,000	32,100	4071 4.000	18,500
18,50-18,99	19,050	18,200	113,000	50,000	32,100	4071 4.000	18,505
19,00-19,49	20,000	18,700	114,000	50,000	32,900	4071 4.000	19,000
19,00-19,49	19,050	18,700	114,000	50,000	32,900	4071 4.000	19,005
19,50-19,99	20,000	19,200	116,000	50,000	33,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	116,000	50,000	33,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	117,000	50,000	34,600	4071 4.500	20,000
20,00-20,49	19,050	19,700	117,000	50,000	34,600	4071 4.500	20,005
20,50-20,99	25,000	20,200	128,000	56,000	35,500	4071 4.500	20,500
20,50-20,99	25,400	20,200	128,000	56,000	35,500	4071 4.500	20,505
21,00-21,49	25,000	20,700	129,000	56,000	36,400	4071 4.500	21,000
21,00-21,49	25,400	20,700	129,000	56,000	36,400	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	130,000	56,000	37,200	4071 4.500	21,500
21,50-21,99	25,400	21,200	130,000	56,000	37,200	4071 4.500	21,505
22,00-22,49	25,000	21,700	131,000	56,000	38,000	4071 5.000	22,000
22,00-22,49	25,400	21,700	131,000	56,000	38,000	4071 5.000	22,005
22,50-22,99	25,000	22,200	134,000	56,000	38,900	4071 5.000	22,500
22,50-22,99	25,400	22,200	134,000	56,000	38,900	4071 5.000	22,505
23,00-23,49	25,000	22,700	135,000	56,000	39,800	4071 5.000	23,000
23,00-23,49	25,400	22,700	135,000	56,000	39,800	4071 5.000	23,005
23,50-23,99	25,000	23,200	137,000	56,000	40,600	4071 5.000	23,500
23,50-23,99	25,400	23,200	137,000	56,000	40,600	4071 5.000	23,505
24,00-24,49	25,000	23,700	138,000	56,000	41,500	4071 5.001	24,000
24,00-24,49	25,400	23,700	138,000	56,000	41,500	4071 5.001	24,005
24,50-24,99	25,000	24,200	140,000	56,000	42,300	4071 5.001	24,500
24,50-24,99	25,400	24,200	140,000	56,000	42,300	4071 5.001	24,505
25,00-25,49	25,000	24,700	142,000	56,000	43,200	4071 5.001	25,000
25,00-25,49	25,400	24,700	142,000	56,000	43,200	4071 5.001	25,005
25,50-25,99	32,000	25,200	148,000	60,000	44,000	4071 5.001	25,500
25,50-25,99	31,750	25,200	148,000	60,000	44,000	4071 5.001	25,505
26,00-26,49	32,000	25,700	151,000	60,000	44,300	4071 5.003	26,000
26,00-26,49	31,750	25,700	151,000	60,000	44,300	4071 5.003	26,005
26,50-26,99	32,000	26,200	153,000	60,000	45,100	4071 5.003	26,500
26,50-26,99	31,750	26,200	153,000	60,000	45,100	4071 5.003	26,505
27,00-27,49	32,000	26,700	155,000	60,000	46,000	4071 5.003	27,000
27,00-27,49	31,750	26,700	155,000	60,000	46,000	4071 5.003	27,005
27,50-27,99	32,000	27,200	156,000	60,000	46,800	4071 5.003	27,500
27,50-27,99	31,750	27,200	156,000	60,000	46,800	4071 5.003	27,505
28,00-28,49	32,000	27,700	157,000	60,000	47,700	4071 5.003	28,000
28,00-28,49	31,750	27,700	157,000	60,000	47,700	4071 5.003	28,005
28,50-28,99	32,000	28,200	159,000	60,000	48,500	4071 5.003	28,500
28,50-28,99	31,750	28,200	159,000	60,000	48,500	4071 5.003	28,505
29,00-29,49	32,000	28,700	161,000	60,000	49,400	4071 5.003	29,000
29,00-29,49	31,750	28,700	161,000	60,000	49,400	4071 5.003	29,005
29,50-29,99	32,000	29,200	162,000	60,000	50,200	4071 5.003	29,500
29,50-29,99	31,750	29,200	162,000	60,000	50,200	4071 5.003	29,505
30,00-30,49	32,000	29,700	164,000	60,000	50,900	4071 6.000	30,000
30,00-30,49	31,750	29,700	164,000	60,000	50,900	4071 6.000	30,005
30,50-30,99	32,000	30,200	166,000	60,000	51,700	4071 6.000	30,500
30,50-30,99	31,750	30,200	166,000	60,000	51,700	4071 6.000	30,505
31,00-31,49	32,000	30,700	167,000	60,000	52,600	4071 6.000	31,000
31,00-31,49	31,750	30,700	167,000	60,000	52,600	4071 6.000	31,005
31,50-31,99	32,000	31,200	168,000	60,000	53,400	4071 6.000	31,500
31,50-31,99	31,750	31,200	168,000	60,000	53,400	4071 6.000	31,505
32,00-32,99	32,000	31,700	172,000	60,000	55,100	4071 6.001	32,000
32,00-32,99	31,750	31,700	172,000	60,000	55,100	4071 6.001	32,005
33,00-33,99	32,000	32,700	175,000	60,000	56,800	4071 6.001	33,000
33,00-33,99	31,750	32,700	175,000	60,000	56,800	4071 6.001	33,005
34,00-34,99	32,000	33,700	178,000	60,000	58,500	4071 6.001	34,000
34,00-34,99	31,750	33,700	178,000	60,000	58,500	4071 6.001	34,005
35,00-35,99	32,000	34,700	181,000	60,000	60,200	4071 6.001	35,000
35,00-35,99	31,750	34,700	181,000	60,000	60,200	4071 6.001	35,005
36,00-36,99	32,000	35,700	184,000	60,000	61,800	4071 6.002	36,000
36,00-36,99	31,750	35,700	184,000	60,000	61,800	4071 6.002	36,005
37,00-37,99	32,000	36,700	188,000	60,000	63,500	4071 6.002	37,000
37,00-37,99	31,750	36,700	188,000	60,000	63,500	4071 6.002	37,005
38,00-38,99	32,000	37,700	191,000	60,000	65,200	4071 6.002	38,000
38,00-38,99	31,750	37,700	191,000	60,000	65,200	4071 6.002	38,005
39,00-40,00	32,000	38,700	194,000	60,000	66,900	4071 6.002	39,000
39,00-40,00	31,750	38,700	194,000	60,000	66,900	4071 6.002	39,005

Sistema de furação
com insertos T 800



Suporte para pastilhas intercambiáveis HT 800



P níquelado • especialmente alta resistência ao desgaste • seção de canal otimizada • saída otimizada do duto de refrigeração
M • parafusos de fixação do produto no. 4071 incluso • Chave de fenda Art. No. 1612 incluso
K
N
S
H

Sistema de furação com insertos T 800

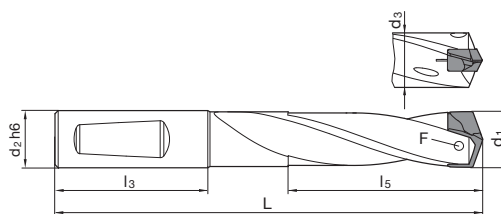
Material de corte

Superfície **Ni**

Forma da haste HE

GÜHRINGNAVIGATOR

Página de dados de corte 764-768



Nr. do artigo **4107**

d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	101,000	45,000	36,600	4071 2.200	11,000
11,00-11,49	12,700	10,700	101,000	45,000	36,600	4071 2.200	11,005
11,50-11,99	12,000	11,200	103,000	45,000	38,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	103,000	45,000	38,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	106,000	45,000	39,700	4071 2.201	12,000
12,00-12,49	12,700	11,700	106,000	45,000	39,700	4071 2.201	12,005
12,50-12,99	14,000	12,200	108,000	45,000	41,300	4071 2.201	12,500
12,50-12,99	15,875	12,200	108,000	45,000	41,300	4071 2.201	12,505
13,00-13,49	14,000	12,700	110,000	45,000	42,900	4071 2.500	13,000
13,00-13,49	15,875	12,700	110,000	45,000	42,900	4071 2.500	13,005
13,50-13,99	14,000	13,200	113,000	45,000	44,600	4071 2.500	13,500
13,50-13,99	15,875	13,200	113,000	45,000	44,600	4071 2.500	13,505
14,00-14,49	14,000	13,700	115,000	45,000	46,200	4071 3.000	14,000
14,00-14,49	15,875	13,700	115,000	45,000	46,200	4071 3.000	14,005
14,50-14,99	16,000	14,200	120,000	48,000	47,800	4071 3.000	14,500
14,50-14,99	15,875	14,200	120,000	48,000	47,800	4071 3.000	14,505
15,00-15,49	16,000	14,700	123,000	48,000	49,300	4071 3.001	15,000
15,00-15,49	15,875	14,700	123,000	48,000	49,300	4071 3.001	15,005
15,50-15,99	16,000	15,200	125,000	48,000	50,900	4071 3.001	15,500
15,50-15,99	15,875	15,200	125,000	48,000	50,900	4071 3.001	15,505
16,00-16,49	16,000	15,700	127,000	48,000	52,900	4071 3.500	16,000
16,00-16,49	15,875	15,700	127,000	48,000	52,900	4071 3.500	16,005
16,50-16,99	18,000	16,200	130,000	48,000	54,100	4071 3.500	16,500
16,50-16,99	19,050	16,200	130,000	48,000	54,100	4071 3.500	16,505
17,00-17,49	18,000	16,700	132,000	48,000	55,800	4071 3.500	17,000
17,00-17,49	19,050	16,700	132,000	48,000	55,800	4071 3.500	17,005
17,50-17,99	18,000	17,200	134,000	48,000	57,400	4071 3.500	17,500
17,50-17,99	19,050	17,200	134,000	48,000	57,400	4071 3.500	17,505
18,00-18,49	18,000	17,700	137,000	48,000	58,900	4071 4.000	18,000
18,00-18,49	19,050	17,700	137,000	48,000	58,900	4071 4.000	18,005
18,50-18,99	20,000	18,200	141,000	50,000	60,500	4071 4.000	18,500
18,50-18,99	19,050	18,200	141,000	50,000	60,500	4071 4.000	18,505
19,00-19,49	20,000	18,700	143,000	50,000	62,100	4071 4.000	19,000
19,00-19,49	19,050	18,700	143,000	50,000	62,100	4071 4.000	19,005
19,50-19,99	20,000	19,200	146,000	50,000	63,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	146,000	50,000	63,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	148,000	50,000	65,300	4071 4.500	20,000
20,00-20,49	19,050	19,700	148,000	50,000	65,300	4071 4.500	20,005
20,50-20,99	25,000	20,200	159,000	56,000	67,000	4071 4.500	20,500
20,50-20,99	25,400	20,200	159,000	56,000	67,000	4071 4.500	20,505
21,00-21,49	25,000	20,700	161,000	56,000	68,600	4071 4.500	21,000
21,00-21,49	25,400	20,700	161,000	56,000	68,600	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	163,000	56,000	70,100	4071 4.500	21,500
21,50-21,99	25,400	21,200	163,000	56,000	70,100	4071 4.500	21,505
22,00-22,49	25,000	21,700	165,000	56,000	71,700	4071 5.000	22,000
22,00-22,49	25,400	21,700	165,000	56,000	71,700	4071 5.000	22,005
22,50-22,99	25,000	22,200	168,000	56,000	73,300	4071 5.000	22,500
22,50-22,99	25,400	22,200	168,000	56,000	73,300	4071 5.000	22,505
23,00-23,49	25,000	22,700	170,000	56,000	74,900	4071 5.000	23,000
23,00-23,49	25,400	22,700	170,000	56,000	74,900	4071 5.000	23,005
23,50-23,99	25,000	23,200	173,000	56,000	76,500	4071 5.000	23,500
23,50-23,99	25,400	23,200	173,000	56,000	76,500	4071 5.000	23,505
24,00-24,49	25,000	23,700	175,000	56,000	78,100	4071 5.001	24,000
24,00-24,49	25,400	23,700	175,000	56,000	78,100	4071 5.001	24,005
24,50-24,99	25,000	24,200	177,000	56,000	79,700	4071 5.001	24,500
24,50-24,99	25,400	24,200	177,000	56,000	79,700	4071 5.001	24,505
25,00-25,49	25,000	24,700	180,000	56,000	81,300	4071 5.001	25,000
25,00-25,49	25,400	24,700	180,000	56,000	81,300	4071 5.001	25,005
25,50-25,99	32,000	25,200	187,000	60,000	82,900	4071 5.001	25,500
25,50-25,99	31,750	25,200	187,000	60,000	82,900	4071 5.001	25,505
26,00-26,49	32,000	25,700	191,000	60,000	84,000	4071 5.003	26,000
26,00-26,49	31,750	25,700	191,000	60,000	84,000	4071 5.003	26,005
26,50-26,99	32,000	26,200	193,000	60,000	86,100	4071 5.003	26,500
26,50-26,99	31,750	26,200	193,000	60,000	86,100	4071 5.003	26,505
27,00-27,49	32,000	26,700	196,000	60,000	87,200	4071 5.003	27,000
27,00-27,49	31,750	26,700	196,000	60,000	87,200	4071 5.003	27,005
27,50-27,99	32,000	27,200	198,000	60,000	88,900	4071 5.003	27,500
27,50-27,99	31,750	27,200	198,000	60,000	88,900	4071 5.003	27,505
28,00-28,49	32,000	27,700	200,000	60,000	90,400	4071 5.003	28,000
28,00-28,49	31,750	27,700	200,000	60,000	90,400	4071 5.003	28,005
28,50-28,99	32,000	28,200	202,000	60,000	92,500	4071 5.003	28,500
28,50-28,99	31,750	28,200	202,000	60,000	92,500	4071 5.003	28,505
29,00-29,49	32,000	28,700	205,000	60,000	94,600	4071 5.003	29,000
29,00-29,49	31,750	28,700	205,000	60,000	94,600	4071 5.003	29,005
29,50-29,99	32,000	29,200	207,000	60,000	95,100	4071 5.003	29,500
29,50-29,99	31,750	29,200	207,000	60,000	95,100	4071 5.003	29,505
30,00-30,49	32,000	29,700	210,000	60,000	96,700	4071 6.000	30,000
30,00-30,49	31,750	29,700	210,000	60,000	96,700	4071 6.000	30,005
30,50-30,99	32,000	30,200	212,000	60,000	98,300	4071 6.000	30,500
30,50-30,99	31,750	30,200	212,000	60,000	98,300	4071 6.000	30,505
31,00-31,49	32,000	30,700	214,000	60,000	99,800	4071 6.000	31,000
31,00-31,49	31,750	30,700	214,000	60,000	99,800	4071 6.000	31,005
31,50-31,99	32,000	31,200	216,000	60,000	101,400	4071 6.000	31,500
31,50-31,99	31,750	31,200	216,000	60,000	101,400	4071 6.000	31,505
32,00-32,99	32,000	31,700	221,000	60,000	104,600	4071 6.001	32,000
32,00-32,99	31,750	31,700	221,000	60,000	104,600	4071 6.001	32,005
33,00-33,99	32,000	32,700	226,000	60,000	107,800	4071 6.001	33,000
33,00-33,99	31,750	32,700	226,000	60,000	107,800	4071 6.001	33,005
34,00-34,99	32,000	33,700	230,000	60,000	111,000	4071 6.001	34,000
34,00-34,99	31,750	33,700	230,000	60,000	111,000	4071 6.001	34,005
35,00-35,99	32,000	34,700	235,000	60,000	114,200	4071 6.001	35,000
35,00-35,99	31,750	34,700	235,000	60,000	114,200	4071 6.001	35,005
36,00-36,99	32,000	35,700	240,000	60,000	117,300	4071 6.002	36,000
36,00-36,99	31,750	35,700	240,000	60,000	117,300	4071 6.002	36,005
37,00-37,99	32,000	36,700	245,000	60,000	120,500	4071 6.002	37,000
37,00-37,99	31,750	36,700	245,000	60,000	120,500	4071 6.002	37,005
38,00-38,99	32,000	37,700	249,000	60,000	123,700	4071 6.002	38,000
38,00-38,99	31,750	37,700	249,000	60,000	123,700	4071 6.002	38,005
39,00-40,00	32,000	38,700	254,000	60,000	126,900	4071 6.002	39,000
39,00-40,00	31,750	38,700	254,000	60,000	126,900	4071 6.002	39,005

Sistema de furação
com insertos T 800



Suporte para pastilhas intercambiáveis HT 800



P níquelado • especialmente alta resistência ao desgaste • seção de canal otimizada • saída otimizada do duto de refrigeração
M • parafusos de fixação do produto no. 4071 incluso • Chave de fenda Art. No. 1612 incluso
K
N
S
H

Sistema de furação com insertos T 800

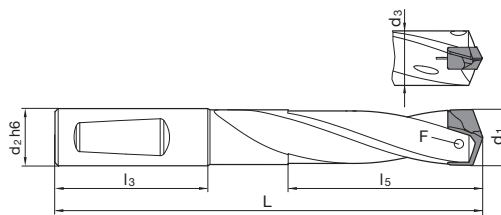
Material de corte

Superfície **Ni**

Forma da haste HE

GÜHRINGNAVIGATOR

Página de dados de corte 764-768



Nr. do artigo **4108**

d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	124,000	45,000	59,600	4071 2.200	11,000
11,00-11,49	12,700	10,700	124,000	45,000	59,600	4071 2.200	11,005
11,50-11,99	12,000	11,200	127,000	45,000	62,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	127,000	45,000	62,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	131,000	45,000	64,700	4071 2.201	12,000
12,00-12,49	12,700	11,700	131,000	45,000	64,700	4071 2.201	12,005
12,50-12,99	14,000	12,200	134,000	45,000	67,300	4071 2.201	12,500
12,50-12,99	15,875	12,200	134,000	45,000	67,300	4071 2.201	12,505
13,00-13,49	14,000	12,700	137,000	45,000	69,900	4071 2.500	13,000
13,00-13,49	15,875	12,700	137,000	45,000	69,900	4071 2.500	13,005
13,50-13,99	14,000	13,200	141,000	45,000	72,600	4071 2.500	13,500
13,50-13,99	15,875	13,200	141,000	45,000	72,600	4071 2.500	13,505
14,00-14,49	14,000	13,700	144,000	45,000	75,200	4071 3.000	14,000
14,00-14,49	15,875	13,700	144,000	45,000	75,200	4071 3.000	14,005
14,50-14,99	16,000	14,200	150,000	48,000	77,800	4071 3.000	14,500
14,50-14,99	15,875	14,200	150,000	48,000	77,800	4071 3.000	14,505
15,00-15,49	16,000	14,700	154,000	48,000	80,300	4071 3.001	15,000
15,00-15,49	15,875	14,700	154,000	48,000	80,300	4071 3.001	15,005
15,50-15,99	16,000	15,200	157,000	48,000	82,900	4071 3.001	15,500
15,50-15,99	15,875	15,200	157,000	48,000	82,900	4071 3.001	15,505
16,00-16,49	16,000	15,700	160,000	48,000	85,900	4071 3.500	16,000
16,00-16,49	15,875	15,700	160,000	48,000	85,900	4071 3.500	16,005
16,50-16,99	18,000	16,200	164,000	48,000	88,100	4071 3.500	16,500
16,50-16,99	19,050	16,200	164,000	48,000	88,100	4071 3.500	16,505
17,00-17,49	18,000	16,700	167,000	48,000	90,800	4071 3.500	17,000
17,00-17,49	19,050	16,700	167,000	48,000	90,800	4071 3.500	17,005
17,50-17,99	18,000	17,200	170,000	48,000	93,400	4071 3.500	17,500
17,50-17,99	19,050	17,200	170,000	48,000	93,400	4071 3.500	17,505
18,00-18,49	18,000	17,700	174,000	48,000	95,900	4071 4.000	18,000
18,00-18,49	19,050	17,700	174,000	48,000	95,900	4071 4.000	18,005
18,50-18,99	20,000	18,200	179,000	50,000	98,500	4071 4.000	18,500
18,50-18,99	19,050	18,200	179,000	50,000	98,500	4071 4.000	18,505
19,00-19,49	20,000	18,700	182,000	50,000	101,100	4071 4.000	19,000
19,00-19,49	19,050	18,700	182,000	50,000	101,100	4071 4.000	19,005
19,50-19,99	20,000	19,200	186,000	50,000	103,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	186,000	50,000	103,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	189,000	50,000	106,300	4071 4.500	20,000
20,00-20,49	19,050	19,700	189,000	50,000	106,300	4071 4.500	20,005
20,50-20,99	25,000	20,200	201,000	56,000	109,000	4071 4.500	20,500
20,50-20,99	25,400	20,200	201,000	56,000	109,000	4071 4.500	20,505
21,00-21,49	25,000	20,700	204,000	56,000	111,600	4071 4.500	21,000
21,00-21,49	25,400	20,700	204,000	56,000	111,600	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	207,000	56,000	114,100	4071 4.500	21,500
21,50-21,99	25,400	21,200	207,000	56,000	114,100	4071 4.500	21,505
22,00-22,49	25,000	21,700	210,000	56,000	116,700	4071 5.000	22,000
22,00-22,49	25,400	21,700	210,000	56,000	116,700	4071 5.000	22,005
22,50-22,99	25,000	22,200	214,000	56,000	119,300	4071 5.000	22,500
22,50-22,99	25,400	22,200	214,000	56,000	119,300	4071 5.000	22,505
23,00-23,49	25,000	22,700	217,000	56,000	121,900	4071 5.000	23,000
23,00-23,49	25,400	22,700	217,000	56,000	121,900	4071 5.000	23,005
23,50-23,99	25,000	23,200	221,000	56,000	124,500	4071 5.000	23,500
23,50-23,99	25,400	23,200	221,000	56,000	124,500	4071 5.000	23,505
24,00-24,49	25,000	23,700	224,000	56,000	127,100	4071 5.001	24,000
24,00-24,49	25,400	23,700	224,000	56,000	127,100	4071 5.001	24,005
24,50-24,99	25,000	24,200	227,000	56,000	129,700	4071 5.001	24,500
24,50-24,99	25,400	24,200	227,000	56,000	129,700	4071 5.001	24,505
25,00-25,49	25,000	24,700	231,000	56,000	132,300	4071 5.001	25,000
25,00-25,49	25,400	24,700	231,000	56,000	132,300	4071 5.001	25,005
25,50-25,99	32,000	25,200	239,000	60,000	134,900	4071 5.001	25,500
25,50-25,99	31,750	25,200	239,000	60,000	134,900	4071 5.001	25,505
26,00-26,49	32,000	25,700	244,000	60,000	137,000	4071 5.003	26,000
26,00-26,49	31,750	25,700	244,000	60,000	137,000	4071 5.003	26,005
26,50-26,99	32,000	26,200	247,000	60,000	140,000	4071 5.003	26,500
26,50-26,99	31,750	26,200	247,000	60,000	140,000	4071 5.003	26,505
27,00-27,49	32,000	26,700	251,000	60,000	142,200	4071 5.003	27,000
27,00-27,49	31,750	26,700	251,000	60,000	142,200	4071 5.003	27,005
27,50-27,99	32,000	27,200	254,000	60,000	144,800	4071 5.003	27,500
28,00-28,49	32,000	27,700	257,000	60,000	147,400	4071 5.003	28,000
28,00-28,49	31,750	27,700	257,000	60,000	147,400	4071 5.003	28,005
28,50-28,99	32,000	28,200	260,000	60,000	150,400	4071 5.003	28,500
28,50-28,99	31,750	28,200	260,000	60,000	150,400	4071 5.003	28,505
29,00-29,49	32,000	28,700	264,000	60,000	153,500	4071 5.003	29,000
29,00-29,49	31,750	28,700	264,000	60,000	153,500	4071 5.003	29,005
29,50-29,99	32,000	29,200	267,000	60,000	155,100	4071 5.003	29,500
30,00-30,49	32,000	29,700	271,000	60,000	157,600	4071 6.000	30,000
30,00-30,49	31,750	29,700	271,000	60,000	157,600	4071 6.000	30,005
30,50-30,99	32,000	30,200	274,000	60,000	160,200	4071 6.000	30,500
31,00-31,49	32,000	30,700	277,000	60,000	162,800	4071 6.000	31,000
31,50-31,99	32,000	31,200	280,000	60,000	165,400	4071 6.000	31,500
32,00-32,99	32,000	31,700	287,000	60,000	170,600	4071 6.001	32,000
32,00-32,99	31,750	31,700	287,000	60,000	170,600	4071 6.001	32,005
33,00-33,99	32,000	32,700	294,000	60,000	175,800	4071 6.001	33,000
33,00-33,99	31,750	32,700	294,000	60,000	175,800	4071 6.001	33,005
34,00-34,99	32,000	33,700	300,000	60,000	181,000	4071 6.001	34,000
34,00-34,99	31,750	33,700	300,000	60,000	181,000	4071 6.001	34,005
35,00-35,99	32,000	34,700	307,000	60,000	186,200	4071 6.001	35,000
35,00-35,99	31,750	34,700	307,000	60,000	186,200	4071 6.001	35,005
36,00-36,99	32,000	35,700	314,000	60,000	191,300	4071 6.002	36,000
37,00-37,99	32,000	36,700	321,000	60,000	196,500	4071 6.002	37,000
37,00-37,99	31,750	36,700	321,000	60,000	196,500	4071 6.002	37,005
38,00-38,99	32,000	37,700	327,000	60,000	201,700	4071 6.002	38,000
38,00-38,99	31,750	37,700	327,000	60,000	201,700	4071 6.002	38,005
39,00-40,00	32,000	38,700	334,000	60,000	206,900	4071 6.002	39,000

Sistema de furação
com insertos T 800



Suporte para pastilhas intercambiáveis HT 800



P níquelado • especialmente alta resistência ao desgaste • seção de canal otimizada • saída otimizada do duto de refrigeração
M • parafusos de fixação do produto no. 4071 incluso • Chave de fenda Art. No. 1612 incluso
K
N
S
H

Sistema de furação com insertos T 800

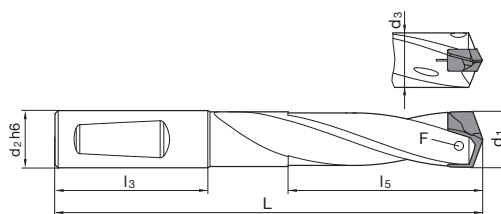
GÜHRINGNAVIGATOR

Página de dados de corte 764-768

Material de corte

Superfície

Forma da haste HE



Nr. do artigo **4109**

d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	147,000	45,000	82,600	4071 2.200	11,000
11,00-11,49	12,700	10,700	147,000	45,000	82,600	4071 2.200	11,005
11,50-11,99	12,000	11,200	151,000	45,000	86,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	151,000	45,000	86,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	156,000	45,000	89,700	4071 2.201	12,000
12,00-12,49	12,700	11,700	156,000	45,000	89,700	4071 2.201	12,005
12,50-12,99	14,000	12,200	160,000	45,000	93,300	4071 2.201	12,500
12,50-12,99	15,875	12,200	160,000	45,000	93,300	4071 2.201	12,505
13,00-13,49	14,000	12,700	164,000	45,000	96,900	4071 2.500	13,000
13,00-13,49	15,875	12,700	164,000	45,000	96,900	4071 2.500	13,005
13,50-13,99	14,000	13,200	169,000	45,000	100,600	4071 2.500	13,500
13,50-13,99	15,875	13,200	169,000	45,000	100,600	4071 2.500	13,505
14,00-14,49	14,000	13,700	173,000	45,000	104,200	4071 3.000	14,000
14,00-14,49	15,875	13,700	173,000	45,000	104,200	4071 3.000	14,005
14,50-14,99	16,000	14,200	180,000	48,000	107,800	4071 3.000	14,500
14,50-14,99	15,875	14,200	180,000	48,000	107,800	4071 3.000	14,505
15,00-15,49	16,000	14,700	185,000	48,000	111,300	4071 3.001	15,000
15,00-15,49	15,875	14,700	185,000	48,000	111,300	4071 3.001	15,005
15,50-15,99	16,000	15,200	189,000	48,000	114,900	4071 3.001	15,500
15,50-15,99	15,875	15,200	189,000	48,000	114,900	4071 3.001	15,505
16,00-16,49	16,000	15,700	193,000	48,000	118,900	4071 3.500	16,000
16,00-16,49	15,875	15,700	193,000	48,000	118,900	4071 3.500	16,005
16,50-16,99	18,000	16,200	198,000	48,000	122,100	4071 3.500	16,500
16,50-16,99	19,050	16,200	198,000	48,000	122,100	4071 3.500	16,505
17,00-17,49	18,000	16,700	202,000	48,000	125,800	4071 3.500	17,000
17,00-17,49	19,050	16,700	202,000	48,000	125,800	4071 3.500	17,005
17,50-17,99	18,000	17,200	206,000	48,000	129,400	4071 3.500	17,500
17,50-17,99	19,050	17,200	206,000	48,000	129,400	4071 3.500	17,505
18,00-18,49	18,000	17,700	211,000	48,000	132,900	4071 4.000	18,000
18,00-18,49	19,050	17,700	211,000	48,000	132,900	4071 4.000	18,005
18,50-18,99	20,000	18,200	217,000	50,000	136,500	4071 4.000	18,500
18,50-18,99	19,050	18,200	217,000	50,000	136,500	4071 4.000	18,505
19,00-19,49	20,000	18,700	221,000	50,000	140,100	4071 4.000	19,000
19,00-19,49	19,050	18,700	221,000	50,000	140,100	4071 4.000	19,005
19,50-19,99	20,000	19,200	226,000	50,000	143,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	226,000	50,000	143,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	230,000	50,000	147,300	4071 4.500	20,000
20,00-20,49	19,050	19,700	230,000	50,000	147,300	4071 4.500	20,005
20,50-20,99	25,000	20,200	243,000	56,000	151,000	4071 4.500	20,500
20,50-20,99	25,400	20,200	243,000	56,000	151,000	4071 4.500	20,505
21,00-21,49	25,000	20,700	247,000	56,000	154,600	4071 4.500	21,000
21,00-21,49	25,400	20,700	247,000	56,000	154,600	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	251,000	56,000	158,100	4071 4.500	21,500
21,50-21,99	25,400	21,200	251,000	56,000	158,100	4071 4.500	21,505
22,00-22,49	25,000	21,700	255,000	56,000	161,700	4071 5.000	22,000
22,00-22,49	25,400	21,700	255,000	56,000	161,700	4071 5.000	22,005
22,50-22,99	25,000	22,200	260,000	56,000	165,300	4071 5.000	22,500
22,50-22,99	25,400	22,200	260,000	56,000	165,300	4071 5.000	22,505
23,00-23,49	25,000	22,700	264,000	56,000	168,900	4071 5.000	23,000
23,00-23,49	25,400	22,700	264,000	56,000	168,900	4071 5.000	23,005
23,50-23,99	25,000	23,200	269,000	56,000	172,500	4071 5.000	23,500
23,50-23,99	25,400	23,200	269,000	56,000	172,500	4071 5.000	23,505
24,00-24,49	25,000	23,700	273,000	56,000	176,100	4071 5.001	24,000
24,00-24,49	25,400	23,700	273,000	56,000	176,100	4071 5.001	24,005
24,50-24,99	25,000	24,200	277,000	56,000	179,700	4071 5.001	24,500
24,50-24,99	25,400	24,200	277,000	56,000	179,700	4071 5.001	24,505
25,00-25,49	25,000	24,700	282,000	56,000	183,300	4071 5.001	25,000
25,00-25,49	25,400	24,700	282,000	56,000	183,300	4071 5.001	25,005
25,50-25,99	32,000	25,200	291,000	60,000	186,900	4071 5.001	25,500
25,50-25,99	31,750	25,200	291,000	60,000	186,900	4071 5.001	25,505
26,00-26,49	32,000	25,700	297,000	60,000	190,000	4071 5.003	26,000
26,00-26,49	31,750	25,700	297,000	60,000	190,000	4071 5.003	26,005
26,50-26,99	32,000	26,200	301,000	60,000	194,000	4071 5.003	26,500
26,50-26,99	31,750	26,200	301,000	60,000	194,000	4071 5.003	26,505
27,00-27,49	32,000	26,700	306,000	60,000	197,200	4071 5.003	27,000
27,00-27,49	31,750	26,700	306,000	60,000	197,200	4071 5.003	27,005
27,50-27,99	32,000	27,200	310,000	60,000	200,800	4071 5.003	27,500
27,50-27,99	31,750	27,200	310,000	60,000	200,800	4071 5.003	27,505
28,00-28,49	32,000	27,700	314,000	60,000	204,400	4071 5.003	28,000
28,00-28,49	31,750	27,700	314,000	60,000	204,400	4071 5.003	28,005
28,50-28,99	32,000	28,200	318,000	60,000	208,400	4071 5.003	28,500
28,50-28,99	31,750	28,200	318,000	60,000	208,400	4071 5.003	28,505
29,00-29,49	32,000	28,700	323,000	60,000	212,500	4071 5.003	29,000
29,00-29,49	31,750	28,700	323,000	60,000	212,500	4071 5.003	29,005
29,50-29,99	32,000	29,200	327,000	60,000	215,100	4071 5.003	29,500
29,50-29,99	31,750	29,200	327,000	60,000	215,100	4071 5.003	29,505
30,00-30,49	32,000	29,700	332,000	60,000	218,600	4071 6.000	30,000
30,00-30,49	31,750	29,700	332,000	60,000	218,600	4071 6.000	30,005
30,50-30,99	32,000	30,200	336,000	60,000	222,200	4071 6.000	30,500
30,50-30,99	31,750	30,200	336,000	60,000	222,200	4071 6.000	30,505
31,00-31,49	32,000	30,700	340,000	60,000	225,800	4071 6.000	31,000
31,00-31,49	31,750	30,700	340,000	60,000	225,800	4071 6.000	31,005
31,50-31,99	32,000	31,200	344,000	60,000	229,400	4071 6.000	31,500
31,50-31,99	31,750	31,200	344,000	60,000	229,400	4071 6.000	31,505
33,00-33,99	32,000	32,700	362,000	60,000	244,600	4071 6.001	33,000
39,00-40,00	32,000	38,700	413,000	60,000	287,400	4071 6.002	39,000



Suporte para pastilhas intercambiáveis HT 800



P níquelado • especialmente alta resistência ao desgaste • seção de canal otimizada • saída otimizada do duto de refrigeração
M • parafusos de fixação do produto no. 4071 incluso • Chave de fenda Art. No. 1612 incluso
K
N
S
H

Sistema de furação com insertos T 800

GÜHRINGNAVIGATOR

Página de dados de corte 764-768

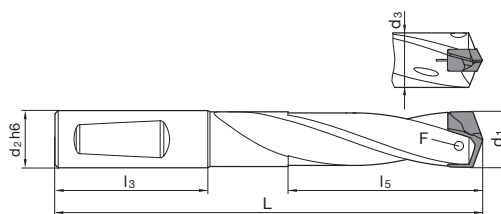
Material de corte

Superfície

Ni

Forma da haste

HE



Nr. do artigo **4110**

d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
11,00-11,49	12,000	10,700	182,000	45,000	117,100	4071 2.200	11,000
11,00-11,49	12,700	10,700	182,000	45,000	117,100	4071 2.200	11,005
11,50-11,99	12,000	11,200	187,000	45,000	122,100	4071 2.200	11,500
11,50-11,99	12,700	11,200	187,000	45,000	122,100	4071 2.200	11,505
12,00-12,49	12,000	11,700	194,000	45,000	127,200	4071 2.201	12,000
12,00-12,49	12,700	11,700	194,000	45,000	127,200	4071 2.201	12,005
12,50-12,99	14,000	12,200	199,000	45,000	132,300	4071 2.201	12,500
12,50-12,99	15,875	12,200	199,000	45,000	132,300	4071 2.201	12,505
13,00-13,49	14,000	12,700	205,000	45,000	137,500	4071 2.500	13,000
13,00-13,49	15,875	12,700	205,000	45,000	137,500	4071 2.500	13,005
13,50-13,99	14,000	13,200	211,000	45,000	142,500	4071 2.500	13,500
13,50-13,99	15,875	13,200	211,000	45,000	142,500	4071 2.500	13,505
14,00-14,49	14,000	13,700	217,000	45,000	147,700	4071 3.000	14,000
14,00-14,49	15,875	13,700	217,000	45,000	147,700	4071 3.000	14,005
14,50-14,99	16,000	14,200	225,000	48,000	152,800	4071 3.000	14,500
14,50-14,99	15,875	14,200	225,000	48,000	152,800	4071 3.000	14,505
15,00-15,49	16,000	14,700	232,000	48,000	157,800	4071 3.001	15,000
15,00-15,49	15,875	14,700	232,000	48,000	157,800	4071 3.001	15,005
15,50-15,99	16,000	15,200	237,000	48,000	162,900	4071 3.001	15,500
15,50-15,99	15,875	15,200	237,000	48,000	162,900	4071 3.001	15,505
16,00-16,49	16,000	15,700	243,000	48,000	168,000	4071 3.500	16,000
16,00-16,49	15,875	15,700	243,000	48,000	168,000	4071 3.500	16,005
16,50-16,99	18,000	16,200	249,000	48,000	170,000	4071 3.500	16,500
16,50-16,99	19,050	16,200	249,000	48,000	170,000	4071 3.500	16,505
17,00-17,49	18,000	16,700	255,000	48,000	178,300	4071 3.500	17,000
17,00-17,49	19,050	16,700	255,000	48,000	178,300	4071 3.500	17,005
17,50-17,99	18,000	17,200	260,000	48,000	183,500	4071 3.500	17,500
17,50-17,99	19,050	17,200	260,000	48,000	183,500	4071 3.500	17,505
18,00-18,49	18,000	17,700	267,000	48,000	188,400	4071 4.000	18,000
18,00-18,49	19,050	17,700	267,000	48,000	188,400	4071 4.000	18,005
18,50-18,99	20,000	18,200	274,000	50,000	193,500	4071 4.000	18,500
18,50-18,99	19,050	18,200	274,000	50,000	193,500	4071 4.000	18,505
19,00-19,49	20,000	18,700	280,000	50,000	198,700	4071 4.000	19,000
19,00-19,49	19,050	18,700	280,000	50,000	198,700	4071 4.000	19,005
19,50-19,99	20,000	19,200	286,000	50,000	203,700	4071 4.000	19,500
19,50-19,99	19,050	19,200	286,000	50,000	203,700	4071 4.000	19,505
20,00-20,49	20,000	19,700	292,000	50,000	208,900	4071 4.500	20,000
20,00-20,49	19,050	19,700	292,000	50,000	208,900	4071 4.500	20,005
20,50-20,99	25,000	20,200	306,000	56,000	214,000	4071 4.500	20,500
20,50-20,99	25,400	20,200	306,000	56,000	214,000	4071 4.500	20,505
21,00-21,49	25,000	20,700	312,000	56,000	219,100	4071 4.500	21,000
21,00-21,49	25,400	20,700	312,000	56,000	219,100	4071 4.500	21,005



d1	d2 h6	d3	L	l3	l5	F	Nº de cód.
mm	mm	mm	mm	mm	mm		
21,50-21,99	25,000	21,200	317,000	56,000	224,200	4071 4.500	21,500
21,50-21,99	25,400	21,200	317,000	56,000	224,200	4071 4.500	21,505
22,00-22,49	25,000	21,700	323,000	56,000	229,300	4071 5.000	22,000
22,00-22,49	25,400	21,700	323,000	56,000	229,300	4071 5.000	22,005
22,50-22,99	25,000	22,200	329,000	56,000	234,400	4071 5.000	22,500
22,50-22,99	25,400	22,200	329,000	56,000	234,400	4071 5.000	22,505
23,00-23,49	25,000	22,700	335,000	56,000	239,500	4071 5.000	23,000
23,00-23,49	25,400	22,700	335,000	56,000	239,500	4071 5.000	23,005
23,50-23,99	25,000	23,200	341,000	56,000	244,600	4071 5.000	23,500
23,50-23,99	25,400	23,200	341,000	56,000	244,600	4071 5.000	23,505
24,00-24,49	25,000	23,700	347,000	56,000	249,700	4071 5.001	24,000
24,00-24,49	25,400	23,700	347,000	56,000	249,700	4071 5.001	24,005
24,50-24,99	25,000	24,200	352,000	56,000	254,800	4071 5.001	24,500
24,50-24,99	25,400	24,200	352,000	56,000	254,800	4071 5.001	24,505
25,00-25,49	25,000	24,700	359,000	56,000	259,900	4071 5.001	25,000
25,00-25,49	25,400	24,700	359,000	56,000	259,900	4071 5.001	25,005
25,50-25,99	32,000	25,200	369,000	60,000	265,000	4071 5.001	25,500
25,50-25,99	31,750	25,200	369,000	60,000	265,000	4071 5.001	25,505
26,00-26,49	32,000	25,700	377,000	60,000	270,000	4071 5.003	26,000
26,00-26,49	31,750	25,700	377,000	60,000	270,000	4071 5.003	26,005
26,50-26,99	32,000	26,200	382,000	60,000	275,000	4071 5.003	26,500
26,50-26,99	31,750	26,200	382,000	60,000	275,000	4071 5.003	26,505
27,00-27,49	32,000	26,700	388,000	60,000	280,100	4071 5.003	27,000
27,00-27,49	31,750	26,700	388,000	60,000	280,100	4071 5.003	27,005
27,50-27,99	32,000	27,200	394,000	60,000	285,200	4071 5.003	27,500
27,50-27,99	31,750	27,200	394,000	60,000	285,200	4071 5.003	27,505
28,00-28,49	32,000	27,700	400,000	60,000	290,300	4071 5.003	28,000
28,00-28,49	31,750	27,700	400,000	60,000	290,300	4071 5.003	28,005
28,50-28,99	32,000	28,200	405,000	60,000	295,400	4071 5.003	28,500
28,50-28,99	31,750	28,200	405,000	60,000	295,400	4071 5.003	28,505
29,00-29,49	32,000	28,700	412,000	60,000	300,500	4071 5.003	29,000
29,00-29,49	31,750	28,700	412,000	60,000	300,500	4071 5.003	29,005
29,50-29,99	32,000	29,200	418,000	60,000	305,600	4071 5.003	29,500
29,50-29,99	31,750	29,200	418,000	60,000	305,600	4071 5.003	29,505
30,00-30,49	32,000	29,700	424,000	60,000	310,600	4071 6.000	30,000
30,00-30,49	31,750	29,700	424,000	60,000	310,600	4071 6.000	30,005
30,50-30,99	32,000	30,200	429,000	60,000	315,700	4071 6.000	30,500
30,50-30,99	31,750	30,200	429,000	60,000	315,700	4071 6.000	30,505
31,00-31,49	32,000	30,700	435,000	60,000	320,800	4071 6.000	31,000
31,00-31,49	31,750	30,700	435,000	60,000	320,800	4071 6.000	31,005
31,50-31,99	32,000	31,200	441,000	60,000	325,900	4071 6.000	31,500
31,50-31,99	31,750	31,200	441,000	60,000	325,900	4071 6.000	31,505

Sistema de furação
com insertos T 800



Suporte para pastilhas intercambiáveis HT 800



- P** níquelado • especialmente alta resistência ao desgaste • seção de canal otimizada • saída otimizada do duto de refrigeração
- M** • parafusos de fixação do produto no. 4071 e 6128 inclusos
- K** • Chave de fenda Art. No. 1612 incluso
- N**
- S** para pilotar e escarear 45°
- H**

Sistema de furação com insertos T 800

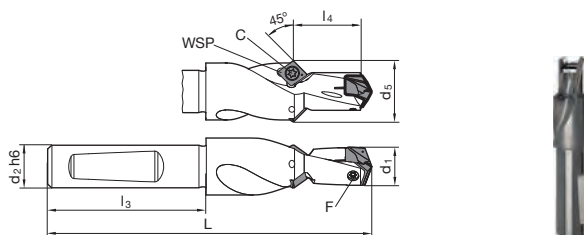
Material de corte

Superfície **Ni**

Forma da haste HE

GÜHRING NAVIGATOR

Página de dados de corte 764-768



Nr. do artigo **4105**

d1	d2 h6	d5	L	l3	l4	WSP	C	F	Nº de cód.
mm	mm	mm	mm	mm	mm				
11,00-11,99	12,000	17,000	81,000	45,000	12,000	CP..0502..	6128 2.000	4071 2.200	11,000
11,00-11,99	12,700	17,000	81,000	45,000	12,000	CP..0502..	6128 2.000	4071 2.200	11,005
12,00-12,99	12,000	18,000	84,000	45,000	13,000	CP..0502..	6128 2.000	4071 2.201	12,000
12,00-12,99	12,700	18,000	84,000	45,000	13,000	CP..0502..	6128 2.000	4071 2.201	12,005
13,00-13,99	14,000	18,000	86,000	45,000	14,000	CP..0502..	6128 2.000	4071 2.500	13,000
13,00-13,99	15,875	18,000	86,000	45,000	14,000	CP..0502..	6128 2.000	4071 2.500	13,005
14,00-15,99	16,000	18,000	93,000	48,000	16,000	CP..0502..	6128 2.000	4071 3.000	14,000
14,00-15,99	15,875	18,000	93,000	48,000	16,000	CP..0502..	6128 2.000	4071 3.000	14,005
16,00-17,99	18,000	20,000	99,000	48,000	18,000	CP..0602..	6128 2.500	4071 3.500	16,000
16,00-17,99	19,050	20,000	99,000	48,000	18,000	CP..0602..	6128 2.500	4071 3.500	16,005
18,00-19,99	20,000	22,000	106,000	50,000	20,000	CP..0602..	6128 2.500	4071 4.000	18,000
18,00-19,99	19,050	22,000	106,000	50,000	20,000	CP..0602..	6128 2.500	4071 4.000	18,005
20,00-21,99	25,000	25,000	117,000	56,000	22,000	CP..0602..	6128 2.500	4071 4.500	20,000
20,00-21,99	25,400	25,400	117,000	56,000	22,000	CP..0602..	6128 2.500	4071 4.500	20,005
22,00-23,99	25,000	26,000	122,000	56,000	24,000	CP..0602..	6128 2.500	4071 5.000	22,000
22,00-23,99	25,400	26,000	122,000	56,000	24,000	CP..0602..	6128 2.500	4071 5.000	22,005
24,00-25,99	25,000	28,000	128,000	56,000	26,000	CP..0602..	6128 2.500	4071 5.001	24,000
24,00-25,99	25,400	28,000	128,000	56,000	26,000	CP..0602..	6128 2.500	4071 5.001	24,005
26,00-27,99	32,000	32,000	142,000	60,000	28,000	CP..0602..	6128 2.500	4071 5.003	26,000
26,00-27,99	31,750	32,000	142,000	60,000	28,000	CP..0602..	6128 2.500	4071 5.003	26,005
28,00-29,99	32,000	34,000	147,000	60,000	30,000	CP..0602..	6128 2.500	4071 5.003	28,000
28,00-29,99	31,750	34,000	147,000	60,000	30,000	CP..09T3..	6128 2.500	4071 5.003	28,005
30,00-31,99	32,000	38,000	152,000	60,000	32,000	CP..09T3..	6128 4.006	4071 6.000	30,000
30,00-31,99	31,750	38,000	152,000	60,000	32,000	CP..09T3..	6128 4.006	4071 6.000	30,005
32,00-35,99	32,000	42,000	163,000	60,000	36,000	CP..09T3..	6128 4.006	4071 6.001	32,000
32,00-35,99	31,750	42,000	163,000	60,000	36,000	CP..09T3..	6128 4.006	4071 6.001	32,005
36,00-40,00	32,000	46,000	173,000	60,000	40,000	CP..09T3..	6128 4.006	4071 6.002	36,000
36,00-40,00	31,750	46,000	173,000	60,000	40,000	CP..09T3..	6128 4.006	4071 6.002	36,005



Pastilhas intercambiáveis HT 800



Material de corte **MD int.**

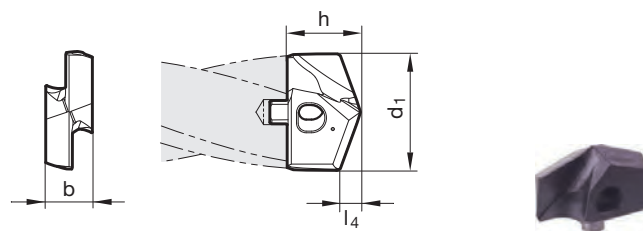
Superfície **F**

Forma da haste

- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • afiação facetada
- M** ○ • formato reto da aresta de corte principal (depois da correção)
- K** ○ • parafusos de fixação do produto no. 4071 incluso
- N** ○
- S** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm²
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 764-768



Sistema de furação com insertos T 800

Nr. do artigo **4112**

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
11,000		2,100	4,500	7,500	11,000
11,200		2,100	4,500	7,500	11,200
11,500		2,100	4,500	7,500	11,500
11,510	29/64	2,100	4,500	7,500	11,510
11,700		2,200	4,500	7,500	11,700
11,800		2,200	4,500	7,500	11,800
11,910	15/32	2,200	4,500	7,500	11,910
12,000		2,200	5,000	7,700	12,000
12,100		2,300	5,000	7,700	12,100
12,200		2,300	5,000	7,700	12,200
12,300	31/64	2,300	5,000	7,700	12,300
12,500		2,300	5,000	7,700	12,500
12,600		2,300	5,000	7,700	12,600
12,700	1/2	2,400	5,000	7,700	12,700
12,800		2,400	5,000	7,700	12,800
12,900		2,400	5,000	7,700	12,900
13,000		2,400	5,500	8,500	13,000
13,100	33/64	2,400	5,500	8,500	13,100
13,300		2,500	5,500	8,500	13,300
13,490	17/32	2,500	5,500	8,500	13,490
13,500		2,500	5,500	8,500	13,500
13,600		2,500	5,500	8,500	13,600
13,700		2,500	5,500	8,500	13,700
13,800		2,600	5,500	8,500	13,800
13,890	35/64	2,600	5,500	8,500	13,890
14,000		2,600	6,000	9,600	14,000
14,100		2,600	6,000	9,600	14,100
14,290	9/16	2,700	6,000	9,600	14,290
14,400		2,700	6,000	9,600	14,400
14,500		2,700	6,000	9,600	14,500
14,600		2,700	6,000	9,600	14,600
14,680	37/64	2,700	6,000	9,600	14,680
14,700		2,700	6,000	9,600	14,700
14,800		2,700	6,000	9,600	14,800
15,000		2,800	6,000	9,800	15,000
15,080	19/32	2,800	6,000	9,800	15,080
15,100		2,800	6,000	9,800	15,100
15,200		2,800	6,000	9,800	15,200
15,300		2,800	6,000	9,800	15,300
15,480	39/64	2,900	6,000	9,800	15,480
15,500		2,900	6,000	9,800	15,500
15,600		2,900	6,000	9,800	15,600



Sistema de furação
com insertos T 800

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
15,700		2,900	6,000	9,800	15,700
15,800		2,900	6,000	9,800	15,800
15,870	5/8	2,900	6,000	9,800	15,870
16,000		3,000	7,000	11,000	16,000
16,270	41/64	3,000	7,000	11,000	16,270
16,500		3,100	7,000	11,000	16,500
16,670	21/32	3,100	7,000	11,000	16,670
17,000		3,100	7,000	11,000	17,000
17,070	43/64	3,200	7,000	11,000	17,070
17,300		3,200	7,000	11,000	17,300
17,460	11/16	3,200	7,000	11,000	17,460
17,500		3,200	7,000	11,000	17,500
17,600		3,300	7,000	11,000	17,600
17,860	45/64	3,300	7,000	11,000	17,860
18,000		3,300	8,000	12,600	18,000
18,260	23/32	3,400	8,000	12,600	18,260
18,500		3,400	8,000	12,600	18,500
18,650	47/64	3,400	8,000	12,600	18,650
18,900		3,500	8,000	12,600	18,900
19,000		3,500	8,000	12,600	19,000
19,050	3/4	3,500	8,000	12,600	19,050
19,250		3,600	8,000	12,600	19,250
19,300		3,600	8,000	12,600	19,300
19,450	49/64	3,600	8,000	12,600	19,450
19,500		3,600	8,000	12,600	19,500
19,600		3,600	8,000	12,600	19,600
19,840	25/32	3,700	8,000	12,600	19,840
20,000		3,700	9,000	13,900	20,000
20,240	51/64	3,700	9,000	13,900	20,240
20,500		3,800	9,000	13,900	20,500
20,640	13/16	3,800	9,000	13,900	20,640
20,900		3,900	9,000	13,900	20,900
21,000		3,900	9,000	13,900	21,000
21,030	53/64	3,900	9,000	13,900	21,030
21,100		3,900	9,000	13,900	21,100
21,430	27/32	3,900	9,000	13,900	21,430
21,500		4,000	9,000	13,900	21,500
21,700		4,000	9,000	13,900	21,700
21,830	55/64	4,000	9,000	13,900	21,830
22,000		4,100	10,000	15,300	22,000
22,220	7/8	4,100	10,000	15,300	22,220
22,500		4,100	10,000	15,300	22,500
22,620	57/64	4,200	10,000	15,300	22,620
22,700		4,200	10,000	15,300	22,700
23,000		4,200	10,000	15,300	23,000
23,020	29/32	4,200	10,000	15,300	23,020
23,420	59/64	4,300	10,000	15,300	23,420
23,500		4,300	10,000	15,300	23,500
23,700		4,400	10,000	15,300	23,700
23,810	15/16	4,400	10,000	15,300	23,810
24,000		4,400	11,000	15,800	24,000
24,100		4,400	11,000	15,800	24,100
24,210	61/64	4,500	11,000	15,800	24,210
24,500		4,500	11,000	15,800	24,500
24,610	31/32	4,500	11,000	15,800	24,610
25,000	63/64	4,600	11,000	15,800	25,000
25,400	1	4,700	11,000	15,800	25,400
25,500		4,700	11,000	15,800	25,500
25,670		4,700	11,000	15,800	25,670
25,700		4,700	11,000	15,800	25,700
25,810		4,700	11,000	15,800	25,810
26,000		4,800	12,000	20,000	26,000
26,190	1 1/32	4,800	12,000	20,000	26,190
26,500		4,900	12,000	20,000	26,500
26,590	1 3/64	4,900	12,000	20,000	26,590
27,000		5,000	12,000	20,000	27,000
27,500		5,100	12,000	20,000	27,500
27,700		5,100	12,000	20,000	27,700
27,780	1 3/32	5,100	12,000	20,000	27,780
28,000		5,100	13,000	20,700	28,000
28,180	1 7/64	5,200	13,000	20,700	28,180
28,500		5,200	13,000	20,700	28,500



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
28,580		5,300	13,000	20,700	28,580
29,000		5,300	13,000	20,700	29,000
29,370	1 5/32	5,400	13,000	20,700	29,370
29,500		5,400	13,000	20,700	29,500
29,600		5,400	13,000	20,700	29,600
29,770	1 11/64	5,500	13,000	20,700	29,770
30,000		5,500	14,000	22,300	30,000
30,160	1 3/16	5,500	14,000	22,300	30,160
30,500		5,600	14,000	22,300	30,500
30,960	1 7/32	5,700	14,000	22,300	30,960
31,000		5,700	14,000	22,300	31,000
31,500		5,800	14,000	22,300	31,500
31,750	1 1/4	5,800	14,000	22,300	31,750
32,000		5,900	15,000	23,100	32,000
32,500		6,000	15,000	23,100	32,500
32,540	1 9/32	6,000	15,000	23,100	32,540
32,940	1 19/64	6,000	15,000	23,100	32,940
33,000		6,100	15,000	23,100	33,000
33,340	1 5/16	6,100	15,000	23,100	33,340
33,500		6,100	15,000	23,100	33,500
34,000		6,200	15,000	23,100	34,000
34,130	1 11/32	6,300	15,000	23,100	34,130
34,500		6,300	15,000	23,100	34,500
34,930		6,400	15,000	23,100	34,930
35,000		6,400	15,000	23,100	35,000
35,500		6,500	15,000	23,100	35,500
35,720	1 13/32	6,600	15,000	23,100	35,720
36,000		6,600	16,000	23,900	36,000
36,500		6,700	16,000	23,900	36,500
36,510	1 7/16	6,700	16,000	23,900	36,510
37,000		6,800	16,000	23,900	37,000
37,310	1 15/32	6,800	16,000	23,900	37,310
37,500		6,900	16,000	23,900	37,500
38,000		7,000	16,000	23,900	38,000
38,100	1 1/2	7,000	16,000	23,900	38,100
38,500	1 33/64	7,100	16,000	23,900	38,500
39,000		7,100	16,000	23,900	39,000
39,500		7,200	16,000	23,900	39,500
40,000		7,300	16,000	23,900	40,000



Pastilhas intercambiáveis HT 800



Material de corte **MD int.**

Superfície **F**

Forma da haste

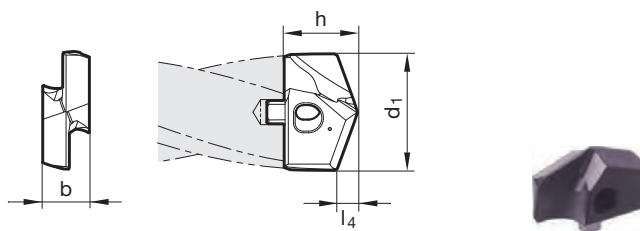
- P** ○ Redução da aresta transversal $\geq \varnothing 11,000$ • afiação facetada
- M** ○ formato reto da aresta de corte principal (depois da correção)
- K** •
- N** ○
- S** ○
- H** ○

ferro fundido Vermicular GGV • ferro fundido, fundição maleável, fundição nodular

Sistema de furação com insertos T 800

GÜHRING NAVIGATOR

Página de dados de corte 764-768



Nr. do artigo **4113**

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
11,000		2,700	4,500	7,500	11,000
11,200		2,700	4,500	7,500	11,200
11,500		2,800	4,500	7,500	11,500
11,510	29/64	2,800	4,500	7,500	11,510
11,700		2,800	4,500	7,500	11,700
11,800		2,800	4,500	7,500	11,800
11,910	15/32	2,800	4,500	7,500	11,910
12,000		2,900	5,000	7,700	12,000
12,100		2,900	5,000	7,700	12,100
12,200		2,900	5,000	7,700	12,200
12,300	31/64	2,900	5,000	7,700	12,300
12,500		3,100	5,000	7,700	12,500
12,600		3,100	5,000	7,700	12,600
12,700	1/2	3,100	5,000	7,700	12,700
12,800		3,100	5,000	7,700	12,800
12,900		3,100	5,000	7,700	12,900
13,000		3,200	5,500	8,500	13,000
13,100	33/64	3,200	5,500	8,500	13,100
13,300		3,200	5,500	8,500	13,300
13,490	17/32	3,200	5,500	8,500	13,490
13,500		3,300	5,500	8,500	13,500
13,600		3,300	5,500	8,500	13,600
13,700		3,300	5,500	8,500	13,700
13,800		3,300	5,500	8,500	13,800
13,890	35/64	3,300	5,500	8,500	13,890
14,000		3,400	6,000	9,600	14,000
14,100		3,400	6,000	9,600	14,100
14,290	9/16	3,400	6,000	9,600	14,290
14,400		3,400	6,000	9,600	14,400
14,500		3,600	6,000	9,600	14,500
14,600		3,600	6,000	9,600	14,600
14,680	37/64	3,600	6,000	9,600	14,680
14,700		3,600	6,000	9,600	14,700
14,800		3,600	6,000	9,600	14,800
15,000		3,700	6,000	9,800	15,000
15,080	19/32	3,700	6,000	9,800	15,080
15,100		3,700	6,000	9,800	15,100
15,200		3,700	6,000	9,800	15,200
15,300		3,700	6,000	9,800	15,300
15,480	39/64	3,700	6,000	9,800	15,480
15,500		3,800	6,000	9,800	15,500
15,600		3,800	6,000	9,800	15,600



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
15,700		3,800	6,000	9,800	15,700
15,800		3,800	6,000	9,800	15,800
15,870	5/8	3,800	6,000	9,800	15,870
16,000		3,900	7,000	11,000	16,000
16,270	41/64	3,900	7,000	11,000	16,270
16,500		4,100	7,000	11,000	16,500
16,670	21/32	4,100	7,000	11,000	16,670
17,000		4,200	7,000	11,000	17,000
17,070	43/64	4,200	7,000	11,000	17,070
17,300		4,200	7,000	11,000	17,300
17,460	11/16	4,200	7,000	11,000	17,460
17,500		4,300	7,000	11,000	17,500
17,600		4,300	7,000	11,000	17,600
17,860	45/64	4,300	7,000	11,000	17,860
18,000		4,400	8,000	12,600	18,000
18,260	23/32	4,400	8,000	12,600	18,260
18,500		4,500	8,000	12,600	18,500
18,650	47/64	4,500	8,000	12,600	18,650
18,900		4,500	8,000	12,600	18,900
19,000		4,700	8,000	12,600	19,000
19,050	3/4	4,700	8,000	12,600	19,050
19,250		4,700	8,000	12,600	19,250
19,300		4,700	8,000	12,600	19,300
19,450	49/64	4,700	8,000	12,600	19,450
19,500		4,800	8,000	12,600	19,500
19,600		4,800	8,000	12,600	19,600
19,840	25/32	4,800	8,000	12,600	19,840
20,000		4,900	9,000	13,900	20,000
20,240	51/64	4,900	9,000	13,900	20,240
20,500		5,100	9,000	13,900	20,500
20,640	13/16	5,100	9,000	13,900	20,640
20,900		5,100	9,000	13,900	20,900
21,000		5,200	9,000	13,900	21,000
21,030	53/64	5,200	9,000	13,900	21,030
21,100		5,200	9,000	13,900	21,100
21,430	27/32	5,200	9,000	13,900	21,430
21,500		5,300	9,000	13,900	21,500
21,700		5,300	9,000	13,900	21,700
21,830	55/64	5,300	9,000	13,900	21,830
22,000		5,400	10,000	15,300	22,000
22,220	7/8	5,400	10,000	15,300	22,220
22,500		5,600	10,000	15,300	22,500
22,620	57/64	5,600	10,000	15,300	22,620
22,700		5,600	10,000	15,300	22,700
23,000		5,700	10,000	15,300	23,000
23,020	29/32	5,700	10,000	15,300	23,020
23,420	59/64	5,700	10,000	15,300	23,420
23,500		5,800	10,000	15,300	23,500
23,700		5,800	10,000	15,300	23,700
23,810	15/16	5,800	10,000	15,300	23,810
24,000		6,000	11,000	15,800	24,000
24,100		6,000	11,000	15,800	24,100
24,210	61/64	6,000	11,000	15,800	24,210
24,500		6,100	11,000	15,800	24,500
24,610	31/32	6,100	11,000	15,800	24,610
25,000	63/64	6,200	11,000	15,800	25,000
25,400	1	6,200	11,000	15,800	25,400
25,500		6,300	11,000	15,800	25,500
25,670		6,300	11,000	15,800	25,670
25,700		6,300	11,000	15,800	25,700
25,810		6,300	11,000	15,800	25,810
26,000		6,400	12,000	20,000	26,000
26,190	1 1/32	6,400	12,000	20,000	26,190
26,500		6,500	12,000	20,000	26,500
26,590	1 3/64	6,500	12,000	20,000	26,590
27,000		6,600	12,000	20,000	27,000
27,500		6,700	12,000	20,000	27,500
27,700		6,700	12,000	20,000	27,700
27,780	1 3/32	6,700	12,000	20,000	27,780
28,000		6,800	13,000	20,700	28,000
28,180	1 7/64	6,800	13,000	20,700	28,180
28,500		6,900	13,000	20,700	28,500

Sistema de furação
com insertos T 800



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
28,580		6,900	13,000	20,700	28,580
29,000		7,100	13,000	20,700	29,000
29,370	1 5/32	7,100	13,000	20,700	29,370
29,500		7,200	13,000	20,700	29,500
29,770	1 11/64	7,200	13,000	20,700	29,770
30,000		7,300	14,000	22,300	30,000
30,160	1 3/16	7,300	14,000	22,300	30,160
30,500		7,400	14,000	22,300	30,500
30,960	1 7/32	7,400	14,000	22,300	30,960
31,000		7,500	14,000	22,300	31,000
31,500		7,600	14,000	22,300	31,500
31,750	1 1/4	7,600	14,000	22,300	31,750
32,000		7,700	15,000	23,100	32,000
32,500		7,800	15,000	23,100	32,500
32,540	1 9/32	7,800	15,000	23,100	32,540
32,940	1 19/64	7,800	15,000	23,100	32,940
33,000		7,900	15,000	23,100	33,000
33,340	1 5/16	7,900	15,000	23,100	33,340
33,500		8,100	15,000	23,100	33,500
34,000		8,200	15,000	23,100	34,000
34,130	1 11/32	8,200	15,000	23,100	34,130
34,500		8,400	15,000	23,100	34,500
34,930		8,400	15,000	23,100	34,930
35,000		8,500	15,000	23,100	35,000
35,500		8,600	15,000	23,100	35,500
35,720	1 13/32	8,600	15,000	23,100	35,720
36,000		8,700	16,000	23,900	36,000
36,500		8,800	16,000	23,900	36,500
36,510	1 7/16	8,800	16,000	23,900	36,510
37,000		9,000	16,000	23,900	37,000
37,310	1 15/32	9,000	16,000	23,900	37,310
37,500		9,100	16,000	23,900	37,500
38,000		9,200	16,000	23,900	38,000
38,100	1 1/2	9,200	16,000	23,900	38,100
38,500	1 33/64	9,400	16,000	23,900	38,500
39,000		9,500	16,000	23,900	39,000
39,500		9,700	16,000	23,900	39,500
40,000		9,700	16,000	23,900	40,000



Pastilhas intercambiáveis HT 800



Material de corte **MD int.**

Superfície **a**

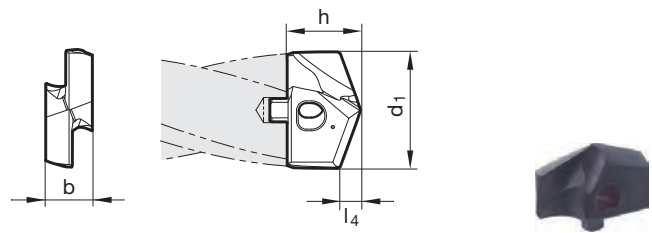
Forma da haste

- P** ○ Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica • formato reto da aresta de corte principal (depois da correção) • parafusos de fixação do produto no. 4071 incluso
- M** ●
- K**
- N**
- S** ○ aços inoxidáveis
- H** ○

Sistema de furação com insertos T 800

GÜHRING NAVIGATOR

Página de dados de corte 764-768



Nr. do artigo **4115**

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
11,000		2,100	4,500	7,500	11,000
11,200		2,100	4,500	7,500	11,200
11,500		2,100	4,500	7,500	11,500
11,510	29/64	2,100	4,500	7,500	11,510
11,700		2,200	4,500	7,500	11,700
11,800		2,200	4,500	7,500	11,800
11,910	15/32	2,200	4,500	7,500	11,910
12,000		2,200	5,000	7,700	12,000
12,100		2,300	5,000	7,700	12,100
12,200		2,300	5,000	7,700	12,200
12,300	31/64	2,300	5,000	7,700	12,300
12,500		2,300	5,000	7,700	12,500
12,600		2,300	5,000	7,700	12,600
12,700	1/2	2,400	5,000	7,700	12,700
12,800		2,400	5,000	7,700	12,800
12,900		2,400	5,000	7,700	12,900
13,000		2,400	5,500	8,500	13,000
13,100	33/64	2,400	5,500	8,500	13,100
13,490	17/32	2,500	5,500	8,500	13,490
13,500		2,500	5,500	8,500	13,500
13,600		2,500	5,500	8,500	13,600
13,700		2,500	5,500	8,500	13,700
13,800		2,600	5,500	8,500	13,800
13,890	35/64	2,600	5,500	8,500	13,890
14,000		2,600	6,000	9,600	14,000
14,100		2,600	6,000	9,600	14,100
14,290	9/16	2,700	6,000	9,600	14,290
14,400		2,700	6,000	9,600	14,400
14,500		2,700	6,000	9,600	14,500
14,600		2,700	6,000	9,600	14,600
14,700		2,700	6,000	9,600	14,700
14,800		2,700	6,000	9,600	14,800
15,000		2,800	6,000	9,800	15,000
15,080	19/32	2,800	6,000	9,800	15,080
15,100		2,800	6,000	9,800	15,100
15,200		2,800	6,000	9,800	15,200
15,300		2,800	6,000	9,800	15,300
15,500		2,900	6,000	9,800	15,500
15,600		2,900	6,000	9,800	15,600
15,700		2,900	6,000	9,800	15,700
15,800		2,900	6,000	9,800	15,800
15,870	5/8	2,900	6,000	9,800	15,870



Sistema de furação
com insertos T 800

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
16,000		3,000	7,000	11,000	16,000
16,270	41/64	3,000	7,000	11,000	16,270
16,500		3,100	7,000	11,000	16,500
16,670	21/32	3,100	7,000	11,000	16,670
17,000		3,100	7,000	11,000	17,000
17,070	43/64	3,200	7,000	11,000	17,070
17,460	11/16	3,200	7,000	11,000	17,460
17,500		3,200	7,000	11,000	17,500
17,600		3,300	7,000	11,000	17,600
17,860	45/64	3,300	7,000	11,000	17,860
18,000		3,300	8,000	12,600	18,000
18,260	23/32	3,400	8,000	12,600	18,260
18,500		3,400	8,000	12,600	18,500
18,650	47/64	3,400	8,000	12,600	18,650
19,000		3,500	8,000	12,600	19,000
19,050	3/4	3,500	8,000	12,600	19,050
19,250		3,600	8,000	12,600	19,250
19,450	49/64	3,600	8,000	12,600	19,450
19,500		3,600	8,000	12,600	19,500
19,600		3,600	8,000	12,600	19,600
19,840	25/32	3,700	8,000	12,600	19,840
20,000		3,700	9,000	13,900	20,000
20,240	51/64	3,700	9,000	13,900	20,240
20,500		3,800	9,000	13,900	20,500
20,640	13/16	3,800	9,000	13,900	20,640
21,000		3,900	9,000	13,900	21,000
21,030	53/64	3,900	9,000	13,900	21,030
21,100		3,900	9,000	13,900	21,100
21,430	27/32	3,900	9,000	13,900	21,430
21,500		4,000	9,000	13,900	21,500
21,830	55/64	4,000	9,000	13,900	21,830
22,000		4,100	10,000	15,300	22,000
22,220	7/8	4,100	10,000	15,300	22,220
22,500		4,100	10,000	15,300	22,500
22,620	57/64	4,200	10,000	15,300	22,620
23,000		4,200	10,000	15,300	23,000
23,020	29/32	4,200	10,000	15,300	23,020
23,420	59/64	4,300	10,000	15,300	23,420
23,500		4,300	10,000	15,300	23,500
23,810	15/16	4,400	10,000	15,300	23,810
24,000		4,400	11,000	15,800	24,000
24,100		4,400	11,000	15,800	24,100
24,210	61/64	4,500	11,000	15,800	24,210
24,500		4,500	11,000	15,800	24,500
24,610	31/32	4,500	11,000	15,800	24,610
25,000	63/64	4,600	11,000	15,800	25,000
25,400	1	4,700	11,000	15,800	25,400
25,500		4,700	11,000	15,800	25,500
25,700		4,700	11,000	15,800	25,700
26,000		4,800	12,000	20,000	26,000
26,190	1 1/32	4,800	12,000	20,000	26,190
26,500		4,900	12,000	20,000	26,500
26,590	1 3/64	4,900	12,000	20,000	26,590
27,000		5,000	12,000	20,000	27,000
27,500		5,100	12,000	20,000	27,500
27,700		5,100	12,000	20,000	27,700
27,780	1 3/32	5,100	12,000	20,000	27,780
28,000		5,100	13,000	20,700	28,000
28,180	1 7/64	5,200	13,000	20,700	28,180
28,500		5,200	13,000	20,700	28,500
28,580		5,300	13,000	20,700	28,580
29,000		5,300	13,000	20,700	29,000
29,370	1 5/32	5,400	13,000	20,700	29,370
29,500		5,400	13,000	20,700	29,500
29,770	1 11/64	5,500	13,000	20,700	29,770
30,000		5,500	14,000	22,300	30,000
30,160	1 3/16	5,500	14,000	22,300	30,160
30,500		5,600	14,000	22,300	30,500
30,960	1 7/32	5,700	14,000	22,300	30,960
31,000		5,700	14,000	22,300	31,000
31,500		5,800	14,000	22,300	31,500
31,750	1 1/4	5,800	14,000	22,300	31,750



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
32,000		5,900	15,000	23,100	32,000
32,500		6,000	15,000	23,100	32,500
32,540	1 9/32	6,000	15,000	23,100	32,540
33,000		6,100	15,000	23,100	33,000
33,340	1 5/16	6,100	15,000	23,100	33,340
33,500		6,100	15,000	23,100	33,500
34,000		6,200	15,000	23,100	34,000
34,130	1 11/32	6,300	15,000	23,100	34,130
34,500		6,300	15,000	23,100	34,500
34,930		6,400	15,000	23,100	34,930
35,000		6,400	15,000	23,100	35,000
35,500		6,500	15,000	23,100	35,500
35,720	1 13/32	6,600	15,000	23,100	35,720
36,000		6,600	16,000	23,900	36,000
36,500		6,700	16,000	23,900	36,500
36,510	1 7/16	6,700	16,000	23,900	36,510
37,000		6,800	16,000	23,900	37,000
37,310	1 15/32	6,800	16,000	23,900	37,310
37,500		6,900	16,000	23,900	37,500
38,000		7,000	16,000	23,900	38,000
38,100	1 1/2	7,000	16,000	23,900	38,100
38,500	1 33/64	7,100	16,000	23,900	38,500
39,000		7,100	16,000	23,900	39,000
39,500		7,200	16,000	23,900	39,500
40,000		7,300	16,000	23,900	40,000

Sistema de furação
com insertos T 800



Pastilhas intercambiáveis HT 800



Material de corte **MD int.**

Superfície ○

Forma da haste

P Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica • formato côncavo da aresta de corte principal

M • parafusos de fixação do produto no. 4071 incluso

K

N •

alumínio e ligas de alumínio • metais não ferrosos

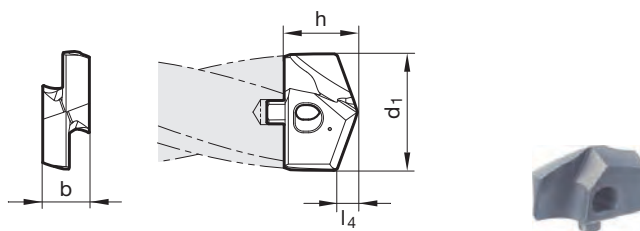
S

H

Sistema de furação com insertos T 800

GÜHRINGNAVIGATOR

Página de dados de corte 764-768



Nr. do artigo **4114**

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
11,000		2,100	4,500	7,500	11,000
11,200		2,100	4,500	7,500	11,200
11,500		2,100	4,500	7,500	11,500
11,510	29/64	2,100	4,500	7,500	11,510
11,700		2,200	4,500	7,500	11,700
11,800		2,200	4,500	7,500	11,800
11,910	15/32	2,200	4,500	7,500	11,910
12,000		2,200	5,000	7,700	12,000
12,100		2,300	5,000	7,700	12,100
12,200		2,300	5,000	7,700	12,200
12,300	31/64	2,300	5,000	7,700	12,300
12,500		2,300	5,000	7,700	12,500
12,600		2,300	5,000	7,700	12,600
12,700	1/2	2,400	5,000	7,700	12,700
12,800		2,400	5,000	7,700	12,800
12,900		2,400	5,000	7,700	12,900
13,000		2,400	5,500	8,500	13,000
13,100	33/64	2,400	5,500	8,500	13,100
13,490	17/32	2,500	5,500	8,500	13,490
13,500		2,500	5,500	8,500	13,500
13,600		2,500	5,500	8,500	13,600
13,700		2,500	5,500	8,500	13,700
13,800		2,600	5,500	8,500	13,800
13,890	35/64	2,600	5,500	8,500	13,890
14,000		2,600	6,000	9,600	14,000
14,100		2,600	6,000	9,600	14,100
14,290	9/16	2,700	6,000	9,600	14,290
14,400		2,700	6,000	9,600	14,400
14,500		2,700	6,000	9,600	14,500
14,600		2,700	6,000	9,600	14,600
14,680	37/64	2,700	6,000	9,600	14,680
14,700		2,700	6,000	9,600	14,700
14,800		2,700	6,000	9,600	14,800
15,000		2,800	6,000	9,800	15,000
15,080	19/32	2,800	6,000	9,800	15,080
15,100		2,800	6,000	9,800	15,100
15,200		2,800	6,000	9,800	15,200
15,300		2,800	6,000	9,800	15,300
15,480	39/64	2,900	6,000	9,800	15,480
15,500		2,900	6,000	9,800	15,500
15,600		2,900	6,000	9,800	15,600
15,700		2,900	6,000	9,800	15,700



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
15,800		2,900	6,000	9,800	15,800
15,870	5/8	2,900	6,000	9,800	15,870
16,000		3,000	7,000	11,000	16,000
16,270	41/64	3,000	7,000	11,000	16,270
16,500		3,100	7,000	11,000	16,500
16,670	21/32	3,100	7,000	11,000	16,670
17,000		3,100	7,000	11,000	17,000
17,070	43/64	3,200	7,000	11,000	17,070
17,460	11/16	3,200	7,000	11,000	17,460
17,500		3,200	7,000	11,000	17,500
17,600		3,300	7,000	11,000	17,600
17,860	45/64	3,300	7,000	11,000	17,860
18,000		3,300	8,000	12,600	18,000
18,260	23/32	3,400	8,000	12,600	18,260
18,500		3,400	8,000	12,600	18,500
18,650	47/64	3,400	8,000	12,600	18,650
19,000		3,500	8,000	12,600	19,000
19,050	3/4	3,500	8,000	12,600	19,050
19,250		3,600	8,000	12,600	19,250
19,450	49/64	3,600	8,000	12,600	19,450
19,500		3,600	8,000	12,600	19,500
19,600		3,600	8,000	12,600	19,600
19,840	25/32	3,700	8,000	12,600	19,840
20,000		3,700	9,000	13,900	20,000
20,240	51/64	3,700	9,000	13,900	20,240
20,500		3,800	9,000	13,900	20,500
20,640	13/16	3,800	9,000	13,900	20,640
21,000		3,900	9,000	13,900	21,000
21,030	53/64	3,900	9,000	13,900	21,030
21,100		3,900	9,000	13,900	21,100
21,430	27/32	3,900	9,000	13,900	21,430
21,500		4,000	9,000	13,900	21,500
21,830	55/64	4,000	9,000	13,900	21,830
22,000		4,100	10,000	15,300	22,000
22,220	7/8	4,100	10,000	15,300	22,220
22,500		4,100	10,000	15,300	22,500
22,620	57/64	4,200	10,000	15,300	22,620
23,000		4,200	10,000	15,300	23,000
23,020	29/32	4,200	10,000	15,300	23,020
23,420	59/64	4,300	10,000	15,300	23,420
23,500		4,300	10,000	15,300	23,500
23,810	15/16	4,400	10,000	15,300	23,810
24,000		4,400	11,000	15,800	24,000
24,100		4,400	11,000	15,800	24,100
24,210	61/64	4,500	11,000	15,800	24,210
24,500		4,500	11,000	15,800	24,500
24,610	31/32	4,500	11,000	15,800	24,610
25,000	63/64	4,600	11,000	15,800	25,000
25,400	1	4,700	11,000	15,800	25,400
25,500		4,700	11,000	15,800	25,500
25,670		4,700	11,000	15,800	25,670
25,700		4,700	11,000	15,800	25,700
25,810		4,700	11,000	15,800	25,810
26,000		4,800	12,000	20,000	26,000
26,190	1 1/32	4,800	12,000	20,000	26,190
26,500		4,900	12,000	20,000	26,500
26,590	1 3/64	4,900	12,000	20,000	26,590
27,000		5,000	12,000	20,000	27,000
27,500		5,100	12,000	20,000	27,500
27,700		5,100	12,000	20,000	27,700
27,780	1 3/32	5,100	12,000	20,000	27,780
28,000		5,100	13,000	20,700	28,000
28,180	1 7/64	5,200	13,000	20,700	28,180
28,500		5,200	13,000	20,700	28,500
28,580		5,300	13,000	20,700	28,580
29,000		5,300	13,000	20,700	29,000
29,370	1 5/32	5,400	13,000	20,700	29,370
29,500		5,400	13,000	20,700	29,500
29,770	1 11/64	5,500	13,000	20,700	29,770
30,000		5,500	14,000	22,300	30,000
30,160	1 3/16	5,500	14,000	22,300	30,160
30,500		5,600	14,000	22,300	30,500



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
30,960	1 7/32	5,700	14,000	22,300	30,960
31,000		5,700	14,000	22,300	31,000
31,500		5,800	14,000	22,300	31,500
31,750	1 1/4	5,800	14,000	22,300	31,750
32,000		5,900	15,000	23,100	32,000
32,500		6,000	15,000	23,100	32,500
32,540	1 9/32	6,000	15,000	23,100	32,540
32,940	1 19/64	6,000	15,000	23,100	32,940
33,000		6,100	15,000	23,100	33,000
33,340	1 5/16	6,100	15,000	23,100	33,340
33,500		6,100	15,000	23,100	33,500
34,000		6,200	15,000	23,100	34,000
34,130	1 11/32	6,300	15,000	23,100	34,130
34,500		6,300	15,000	23,100	34,500
34,930		6,400	15,000	23,100	34,930
35,000		6,400	15,000	23,100	35,000
35,500		6,500	15,000	23,100	35,500
35,720	1 13/32	6,600	15,000	23,100	35,720
36,000		6,600	16,000	23,900	36,000
36,500		6,700	16,000	23,900	36,500
36,510	1 7/16	6,700	16,000	23,900	36,510
37,000		6,800	16,000	23,900	37,000
37,310	1 15/32	6,800	16,000	23,900	37,310
37,500		6,900	16,000	23,900	37,500
38,000		7,000	16,000	23,900	38,000
38,100	1 1/2	7,000	16,000	23,900	38,100
38,500	1 33/64	7,100	16,000	23,900	38,500
39,000		7,100	16,000	23,900	39,000
39,500		7,200	16,000	23,900	39,500
40,000		7,300	16,000	23,900	40,000



Pastilhas intercambiáveis HT 800



Material de corte **MD int.**

Superfície **a**

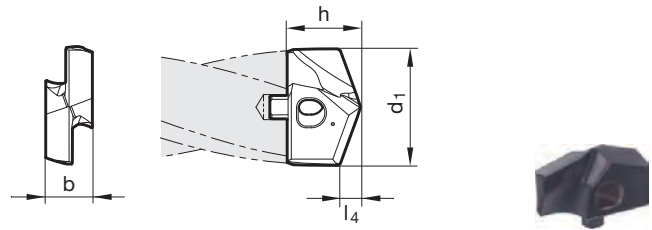
Forma da haste

- P** ○ Redução da aresta transversal $\geq \varnothing 11,000$ • afiação facetada
 - formato reto da aresta de corte principal (depois da correção)
- M** ○ • parafusos de fixação do produto no. 4071 incluso
- K** ○
- N** ○
- S** ○ Pilotando em todo o material
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 768

Sistema de furação com insertos T 800



Nr. do artigo **4111**

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
11,000		1,800	4,500	7,200	11,000
11,200		1,800	4,500	7,200	11,200
11,500		1,900	4,500	7,200	11,500
11,510	29/64	1,900	4,500	7,200	11,510
11,700		1,900	4,500	7,200	11,700
11,800		1,900	4,500	7,200	11,800
11,910	15/32	1,900	4,500	7,200	11,910
12,000		1,900	5,000	7,400	12,000
12,100		2,000	5,000	7,400	12,100
12,200		2,000	5,000	7,400	12,200
12,300	31/64	2,000	5,000	7,400	12,300
12,500		2,000	5,000	7,400	12,500
12,600		2,000	5,000	7,400	12,600
12,700	1/2	2,100	5,000	7,400	12,700
12,800		2,100	5,000	7,400	12,800
12,900		2,100	5,000	7,400	12,900
13,000		2,100	5,500	8,200	13,000
13,100	33/64	2,100	5,500	8,200	13,100
13,490	17/32	2,200	5,500	8,200	13,490
13,500		2,200	5,500	8,200	13,500
13,600		2,200	5,500	8,200	13,600
13,700		2,200	5,500	8,200	13,700
13,800		2,200	5,500	8,200	13,800
13,890	35/64	2,200	5,500	8,200	13,890
14,000		2,300	6,000	9,400	14,000
14,100		2,300	6,000	9,400	14,100
14,290	9/16	2,300	6,000	9,400	14,290
14,400		2,300	6,000	9,400	14,400
14,500		2,300	6,000	9,400	14,500
14,600		2,400	6,000	9,400	14,600
14,680	37/64	2,400	6,000	9,400	14,680
14,700		2,400	6,000	9,400	14,700
14,800		2,400	6,000	9,400	14,800
15,000		2,400	6,000	9,400	15,000
15,080	19/32	2,400	6,000	9,400	15,080
15,100		2,400	6,000	9,400	15,100
15,200		2,400	6,000	9,400	15,200
15,300		2,500	6,000	9,400	15,300
15,480	39/64	2,500	6,000	9,400	15,480
15,500		2,500	6,000	9,400	15,500
15,600		2,500	6,000	9,400	15,600
15,700		2,500	6,000	9,400	15,700



Sistema de furação
com insertos T 800

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
15,800		2,500	6,000	9,400	15,800
15,870	5/8	2,600	6,000	9,400	15,870
16,000		2,600	7,000	10,600	16,000
16,270	41/64	2,600	7,000	10,600	16,270
16,500		2,700	7,000	10,600	16,500
16,670	21/32	2,700	7,000	10,600	16,670
17,000		2,700	7,000	10,600	17,000
17,070	43/64	2,700	7,000	10,600	17,070
17,460	11/16	2,800	7,000	10,600	17,460
17,500		2,800	7,000	10,600	17,500
17,600		2,800	7,000	10,600	17,600
17,860	45/64	2,900	7,000	10,600	17,860
18,000		2,900	8,000	12,100	18,000
18,260	23/32	2,900	8,000	12,100	18,260
18,500		3,000	8,000	12,100	18,500
18,650	47/64	3,000	8,000	12,100	18,650
19,000		3,000	8,000	12,100	19,000
19,050	3/4	3,100	8,000	12,100	19,050
19,450	49/64	3,100	8,000	12,100	19,450
19,500		3,100	8,000	12,100	19,500
19,600		3,100	8,000	12,100	19,600
19,840	25/32	3,200	8,000	12,100	19,840
20,000		3,200	9,000	13,300	20,000
20,240	51/64	3,200	9,000	13,300	20,240
20,500		3,300	9,000	13,300	20,500
20,640	13/16	3,300	9,000	13,300	20,640
21,000		3,400	9,000	13,300	21,000
21,030	53/64	3,400	9,000	13,300	21,030
21,100		3,400	9,000	13,300	21,100
21,430	27/32	3,400	9,000	13,300	21,430
21,500		3,400	9,000	13,300	21,500
21,830	55/64	3,500	9,000	13,300	21,830
22,000		3,500	10,000	14,800	22,000
22,220	7/8	3,600	10,000	14,800	22,220
22,500		3,600	10,000	14,800	22,500
22,620	57/64	3,600	10,000	14,800	22,620
23,000		3,700	10,000	14,800	23,000
23,020	29/32	3,700	10,000	14,800	23,020
23,420	59/64	3,700	10,000	14,800	23,420
23,500		3,800	10,000	14,800	23,500
23,810	15/16	3,800	10,000	14,800	23,810
24,000		3,800	11,000	15,300	24,000
24,100		3,800	11,000	15,300	24,100
24,210	61/64	3,900	11,000	15,300	24,210
24,500		3,900	11,000	15,300	24,500
24,610	31/32	3,900	11,000	15,300	24,610
25,000	63/64	4,000	11,000	15,300	25,000
25,400	1	4,100	11,000	15,300	25,400
25,500		4,100	11,000	15,300	25,500
25,700		4,100	11,000	15,300	25,700
26,000		4,100	12,000	19,400	26,000
26,190	1 1/32	4,200	12,000	19,400	26,190
26,500		4,200	12,000	19,400	26,500
26,590	1 3/64	4,200	12,000	19,400	26,590
27,000		4,300	12,000	19,400	27,000
27,500		4,400	12,000	19,400	27,500
27,700		4,400	12,000	19,400	27,700
27,780	1 3/32	4,400	12,000	19,400	27,780
28,000		4,500	13,000	20,100	28,000
28,180	1 7/64	4,500	13,000	20,100	28,180
28,500		4,500	13,000	20,100	28,500
28,580		4,600	13,000	20,100	28,580
29,000		4,600	13,000	20,100	29,000
29,370	1 5/32	4,700	13,000	20,100	29,370
29,500		4,700	13,000	20,100	29,500
30,000		4,800	14,000	21,700	30,000
30,160	1 3/16	4,800	14,000	21,700	30,160
30,500		4,900	14,000	21,700	30,500
30,960	1 7/32	4,900	14,000	21,700	30,960
31,000		4,900	14,000	21,700	31,000
31,500		5,000	14,000	21,700	31,500
31,750	1 1/4	5,100	14,000	21,700	31,750



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
32,000		5,100	15,000	22,400	32,000
32,500		5,200	15,000	22,400	32,500
32,540	1 9/32	5,200	15,000	22,400	32,540
33,000		5,300	15,000	22,400	33,000
33,340	1 5/16	5,300	15,000	22,400	33,340
33,500		5,300	15,000	22,400	33,500
34,000		5,400	15,000	22,400	34,000
34,130	1 11/32	5,400	15,000	22,400	34,130
34,500		5,500	15,000	22,400	34,500
34,930		5,600	15,000	22,400	34,930
35,000		5,600	15,000	22,400	35,000
35,500		5,600	15,000	22,400	35,500
35,720	1 13/32	5,700	15,000	22,400	35,720
36,000		5,700	16,000	23,200	36,000
36,500		5,800	16,000	23,200	36,500
36,510	1 7/16	5,800	16,000	23,200	36,510
37,000		5,900	16,000	23,200	37,000
37,310	1 15/32	5,900	16,000	23,200	37,310
37,500		6,000	16,000	23,200	37,500
38,000		6,000	16,000	23,200	38,000
38,100	1 1/2	6,100	16,000	23,200	38,100
38,500	1 33/64	6,100	16,000	23,200	38,500
39,000		6,200	16,000	23,200	39,000
39,500		6,300	16,000	23,200	39,500
40,000		6,400	16,000	23,200	40,000

Sistema de furação
com insertos T 800



Pastilhas para escarear HT 800



Material de corte **MD int.**

Superfície **S**

Forma da haste

P ● Parafusos de aperto art. no. 6128 não incluído

M ○

K ○

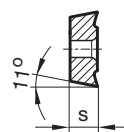
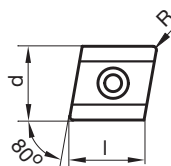
N ○

S ○

H ○

aço e aço fundido (com liga e sem liga)

Sistema de furação com insertos T 800



Nr. do artigo **7645**

ISO	d mm	s mm	R mm	l mm	Nº de cód.
CPGT050202FR-P	5,560	2,380	0,200	5,640	52,020
CPGT050204FR-P	5,560	2,380	0,400	5,640	52,040
CPGT060202FR-P	6,350	2,380	0,200	6,450	62,020
CPGT060204FR-P	6,350	2,380	0,400	6,450	62,040
CPGT09T308FR-P	9,525	3,970	0,800	9,670	93,080



Pastilhas para escarear HT 800



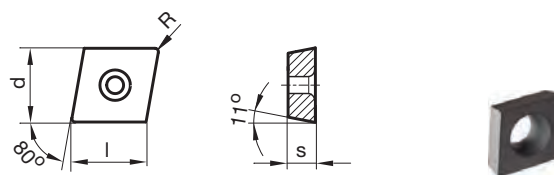
Material de corte **MD int.**

Superfície **A**

Forma da haste

- P** ○ Parafusos de aperto art. no. 6128 não incluído
- M** □
- K** ●
- N** □
- S** □ ferro fundido, fundição maleável, fundição nodular
- H** □

Sistema de furação com insertos T 800



Nr. do artigo **7632**

ISO	d	s	R	l	Nº de cód.
	mm	mm	mm	mm	
CPGW050202FN-K	5,560	2,380	0,200	5,640	52,020
CPGW050204FN-K	5,560	2,380	0,400	5,640	52,040
CPGW060202FN-K	6,350	2,380	0,200	6,450	62,020
CPGW060204FN-K	6,350	2,380	0,400	6,450	62,040
CPGW09T308FN-K	9,525	3,970	0,800	9,670	93,080



Pastilhas para escarear HT 800



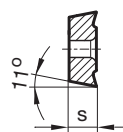
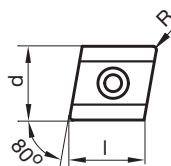
Material de corte **MD int.**

Superfície ○

Forma da haste

P	Parafusos de aperto art. no. 6128 não incluído
M	
K	
N	●
S	alumínio e ligas de alumínio ● metais não ferrosos
H	

Sistema de furação com insertos T 800

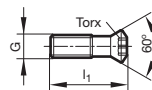


Nr. do artigo **7635**

ISO	d	s	R	l	Nº de cód.
	mm	mm	mm	mm	
CPGT050202FR-AL	5,560	2,380	0,200	5,640	52,020
CPGT050204FR-AL	5,560	2,380	0,400	5,640	52,040
CPGT060202FR-AL	6,350	2,380	0,200	6,450	62,020
CPGT060204FR-AL	6,350	2,380	0,400	6,450	62,040
CPGT09T308FR-AL	9,525	3,970	0,800	9,670	93,080



Parafusos de fixação



Nr. do artigo

6128

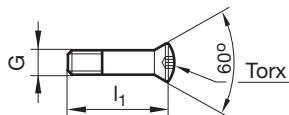
G	l1	Torx	Nº de cód.
	mm		
M2 x 5,5	5,500	T6	2,000
M2,2 x 5	5,000	T6	2,200
M2 x 5,3	5,300	T7	2,500
M2,5 x 6,5	6,500	T7	2,501
M2,5 x 5,7	5,700	T7	2,502
M3,5 x 10	10,000	T15	3,500
M3,5 x 12	12,000	T15	3,501
M3,5 x 8,5	8,500	T15	3,502
M3,5 x 8	8,000	T15	3,503
M4 x 13,5	13,500	T15	4,000
M4 x 8,4	8,400	T15	4,001
M4 x 10,8	10,800	T15	4,002
M4 x 0,5	11,000	T15	4,003
M4 x 9,5	9,500	T20	4,004
M4 x 0,5	9,000	T15	4,005
M4 x 9,5	9,500	T15	4,006
M4,5 x 11	11,000	T15	4,500
M4,5 x 7,5	7,500	T15	4,501
M4,5 x 11	11,000	T20	4,502
M5 x 17	17,000	T20	5,000
M5 x 11	11,000	T20	5,001



Parafusos de fixação



Sistema de furação
com insertos T 800



Nr. do artigo 4071

G	l1 mm	Torx	Nº de cód.
M1,6	4,000	T5	1,600
M1,6	4,400	T5	1,601
M2,2	9,500	T7	2,200
M2,2	10,500	T7	2,201
M2,2	5,600	T7	2,202
M2,2	4,600	T7	2,203
M2,5	11,400	T8	2,500
M2,5	6,400	T8	2,501
M2,5	5,200	T8	2,502
M3	13,100	T9	3,001
M3	6,400	T9	3,002
M3	8,000	T9	3,003
M3,5	14,250	T10	3,500
M4	16,000	T15	4,000
M4	7,700	T15	4,001
M4	10,600	T15	4,002
M4,5	18,000	T15	4,500
M5	19,750	T20	5,000
M5	21,750	T20	5,001
M5	14,200	T20	5,002
M5	23,400	T20	5,003
M6	27,000	T25	6,000
M6	28,500	T25	6,001
M6	32,500	T25	6,002



Suporte para pastilhas intercambiáveis RT 800



- P** Redução da aresta transversal $\geq \varnothing 17,000$ • construção compacta • fixação segura da pastilha intercambiável no suporte
- M** • parafusos de fixação do produto no. 1071 incluso • Chave de fenda Art. No. 1612 incluso
- K**
- N**
- S**
- H**

Material de corte

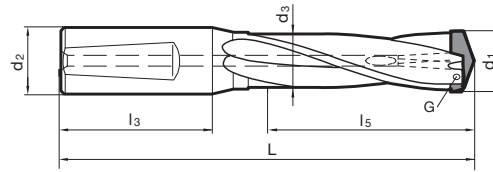
Superfície **Ni**

Forma da haste HE

Sistema de furação com insertos T 800

GÜHRING NAVIGATOR

Página de dados de corte 770



Nr. do artigo **5242**

d1	d2	d3	L	l3	l5	G	Nº de cód.
mm	mm	mm	mm	mm	mm		
16,00-17,00	20,000	15,700	130,000	50,000	54,000	1071 3.006	17,000
16,00-17,00	19,050	15,700	130,000	50,000	54,000	1071 3.006	17,005
17,01-17,99	20,000	16,700	130,000	50,000	54,000	1071 3.006	17,990
17,01-17,99	19,050	16,700	130,000	50,000	54,000	1071 3.006	17,995
18,00-19,00	20,000	17,700	138,000	50,000	60,000	1071 3.000	19,000
18,00-19,00	19,050	17,700	138,000	50,000	60,000	1071 3.000	19,005
19,01-20,00	20,000	18,700	138,000	50,000	60,000	1071 3.000	20,000
19,01-20,00	19,050	18,700	138,000	50,000	60,000	1071 3.000	20,005
20,01-21,00	25,000	19,700	153,000	56,000	66,000	1071 3.000	21,000
20,01-21,00	25,400	19,700	153,000	56,000	66,000	1071 3.000	21,005
21,01-22,50	25,000	20,700	153,000	56,000	66,000	1071 3.000	22,500
21,01-22,50	25,400	21,200	153,000	56,000	66,000	1071 3.000	22,505
22,51-24,00	25,000	22,200	161,000	56,000	72,000	1071 3.500	24,000
22,51-24,00	25,400	22,700	161,000	56,000	72,000	1071 3.500	24,005
24,01-25,50	25,000	23,700	170,000	56,000	78,000	1071 3.500	25,500
24,01-25,50	25,400	24,200	170,000	56,000	78,000	1071 3.500	25,505
25,51-27,50	32,000	25,200	182,000	60,000	84,000	1071 4.000	27,500
25,51-27,50	31,750	26,200	182,000	60,000	84,000	1071 4.000	27,505
27,51-29,50	32,000	27,200	190,000	60,000	90,000	1071 4.000	29,500
27,51-29,50	31,750	28,200	190,000	60,000	90,000	1071 4.000	29,505
29,51-32,00	32,000	29,200	198,000	60,000	96,000	1071 4.500	32,000
29,51-32,00	31,750	30,700	198,000	60,000	96,000	1071 4.500	32,005
32,01-34,50	32,000	31,700	206,000	60,000	102,000	1071 4.500	34,500
32,01-34,50	31,750	33,200	206,000	60,000	102,000	1071 4.500	34,505
34,51-37,50	32,000	34,000	218,000	60,000	114,000	1071 5.000	37,500
34,51-37,50	31,750	36,200	218,000	60,000	114,000	1071 5.000	37,505
37,51-40,50	32,000	37,000	231,000	60,000	120,000	1071 5.000	40,500
37,51-40,50	31,750	39,200	231,000	60,000	120,000	1071 5.000	40,505



Suporte para pastilhas intercambiáveis RT 800



Material de corte

Superfície

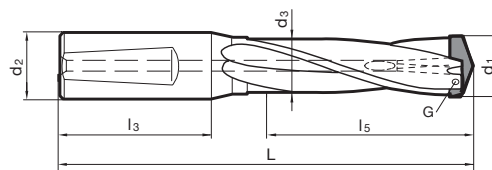
Forma da haste HE

P Redução da aresta transversal $\geq \varnothing 17,000$ • construção compacta • fixação segura da pastilha intercambiável no suporte
M • parafusos de fixação do produto no. 1071 incluso • Chave de fenda Art. No. 1612 incluso
K
N
S
H

Sistema de furação com insertos T 800

GÜHRINGNAVIGATOR

Página de dados de corte 770



Nr. do artigo **5243**

d1	d2	d3	L	l3	l5	G	Nº de cód.
mm	mm	mm	mm	mm	mm		
16,00-17,00	20,000	15,700	166,000	50,000	90,000	1071 3.006	17,000
16,00-17,00	19,050	15,700	166,000	50,000	90,000	1071 3.006	17,005
17,01-17,99	20,000	16,700	166,000	50,000	90,000	1071 3.006	17,990
17,01-17,99	19,050	16,700	166,000	50,000	90,000	1071 3.006	17,995
18,00-19,00	20,000	17,700	178,000	50,000	100,000	1071 3.000	19,000
18,00-19,00	19,050	17,700	178,000	50,000	100,000	1071 3.000	19,005
19,01-20,00	20,000	18,700	178,000	50,000	100,000	1071 3.000	20,000
19,01-20,00	19,050	18,700	178,000	50,000	100,000	1071 3.000	20,005
20,01-21,00	25,000	19,700	197,000	56,000	110,000	1071 3.000	21,000
20,01-21,00	25,400	19,700	197,000	56,000	110,000	1071 3.000	21,005
21,01-22,50	25,000	20,700	197,000	56,000	110,000	1071 3.000	22,500
21,01-22,50	25,400	21,200	197,000	56,000	110,000	1071 3.000	22,505
22,51-24,00	25,000	22,200	209,000	56,000	120,000	1071 3.500	24,000
22,51-24,00	25,400	22,700	209,000	56,000	120,000	1071 3.500	24,005
24,01-25,50	25,000	23,700	222,000	56,000	130,000	1071 3.500	25,500
24,01-25,50	25,400	24,200	222,000	56,000	130,000	1071 3.500	25,505
25,51-27,50	32,000	25,200	238,000	60,000	140,000	1071 4.000	27,500
25,51-27,50	31,750	26,200	238,000	60,000	140,000	1071 4.000	27,505
27,51-29,50	32,000	27,200	250,000	60,000	150,000	1071 4.000	29,500
27,51-29,50	31,750	28,200	250,000	60,000	150,000	1071 4.000	29,505
29,51-32,00	32,000	29,200	262,000	60,000	160,000	1071 4.500	32,000
29,51-32,00	31,750	30,700	262,000	60,000	160,000	1071 4.500	32,005
32,01-34,50	32,000	31,700	274,000	60,000	170,000	1071 4.500	34,500
32,01-34,50	31,750	33,200	274,000	60,000	170,000	1071 4.500	34,505
34,51-37,50	32,000	34,000	292,000	60,000	190,000	1071 5.000	37,500
34,51-37,50	31,750	36,200	292,000	60,000	190,000	1071 5.000	37,505
37,51-40,50	32,000	37,000	311,000	60,000	200,000	1071 5.000	40,500
37,51-40,50	31,750	39,200	311,000	60,000	200,000	1071 5.000	40,505



Suporte para pastilhas intercambiáveis RT 800



Material de corte

Superfície **Ni**

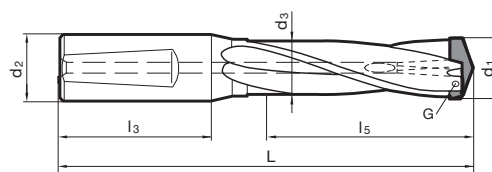
Forma da haste HE

P Redução da aresta transversal $\geq \varnothing 17,000$ • construção compacta • fixação segura da pastilha intercambiável no suporte
M • parafusos de fixação do produto no. 1071 incluso • Chave de fenda Art. No. 1612 incluso
K
N
S
H

GÜHRING NAVIGATOR

Página de dados de corte 770

Sistema de furação com insertos T 800



Nr. do artigo **5248**

d1	d2	d3	L	l3	l5	G	Nº de cód.
mm	mm	mm	mm	mm	mm		
16,00-17,00	20,000	15,700	202,000	50,000	126,000	1071 3.006	17,000
16,00-17,00	19,050	15,700	202,000	50,000	126,000	1071 3.006	17,005
17,01-17,99	20,000	16,700	202,000	50,000	126,000	1071 3.006	17,990
17,01-17,99	19,050	16,700	202,000	50,000	126,000	1071 3.006	17,995
18,00-19,00	20,000	17,700	218,000	50,000	140,000	1071 3.000	19,000
18,00-19,00	19,050	17,700	218,000	50,000	140,000	1071 3.000	19,005
19,01-20,00	20,000	18,700	218,000	50,000	140,000	1071 3.000	20,000
19,01-20,00	19,050	18,700	218,000	50,000	140,000	1071 3.000	20,005
20,01-21,00	25,000	19,700	241,000	56,000	154,000	1071 3.000	21,000
20,01-21,00	25,400	19,700	241,000	56,000	154,000	1071 3.000	21,005
21,01-22,50	25,000	20,700	241,000	56,000	154,000	1071 3.000	22,500
21,01-22,50	25,400	21,200	241,000	56,000	154,000	1071 3.000	22,505
22,51-24,00	25,000	22,200	257,000	56,000	168,000	1071 3.500	24,000
22,51-24,00	25,400	22,700	257,000	56,000	168,000	1071 3.500	24,005
24,01-25,50	25,000	23,700	274,000	56,000	182,000	1071 3.500	25,500
24,01-25,50	25,400	24,200	274,000	56,000	182,000	1071 3.500	25,505
25,51-27,50	32,000	25,200	294,000	60,000	196,000	1071 4.000	27,500
25,51-27,50	31,750	26,200	294,000	60,000	196,000	1071 4.000	27,505
27,51-29,50	32,000	27,200	310,000	60,000	210,000	1071 4.000	29,500
27,51-29,50	31,750	28,200	310,000	60,000	210,000	1071 4.000	29,505
29,51-32,00	32,000	29,200	326,000	60,000	224,000	1071 4.500	32,000
29,51-32,00	31,750	30,700	326,000	60,000	224,000	1071 4.500	32,005
32,01-34,50	32,000	31,700	342,000	60,000	238,000	1071 4.500	34,500
32,01-34,50	31,750	33,200	342,000	60,000	238,000	1071 4.500	34,505
34,51-37,50	32,000	34,000	366,000	60,000	266,000	1071 5.000	37,500
34,51-37,50	31,750	36,200	366,000	60,000	266,000	1071 5.000	37,505
37,51-40,50	32,000	37,000	391,000	60,000	280,000	1071 5.000	40,500
37,51-40,50	31,750	39,200	391,000	60,000	280,000	1071 5.000	40,505



Pastilhas intercambiáveis RT 800



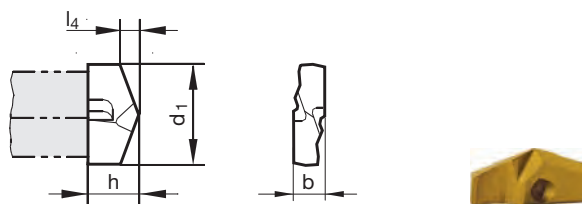
Material de corte	MD int.
Superfície	S
Forma da haste	

Sistema de furação com insertos T 800

P	•	Redução da aresta transversal $\geq \varnothing 16,000$ • afiação de superfície cônica • formato côncavo da aresta de corte principal
M	○	• parafusos de fixação do produto no. 1071 incluso
K	•	
N	○	
S		aços até 1000 N/mm ²
H		

GÜHRINGNAVIGATOR

Página de dados de corte 770



Nr. do artigo **1047**

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
16,000		3,000	4,500	8,000	16,000
16,270	41/64	3,000	4,500	8,000	16,270
16,500		3,100	4,500	8,000	16,500
16,670	21/32	3,100	4,500	8,000	16,670
17,000		3,100	4,500	8,000	17,000
17,070	43/64	3,200	4,500	8,000	17,070
17,460	11/16	3,200	4,500	8,000	17,460
17,500		3,200	4,500	8,000	17,500
17,860	45/64	3,300	4,500	8,000	17,860
18,000		3,300	5,000	8,000	18,000
18,260	23/32	3,400	5,000	8,000	18,260
18,500		3,400	5,000	8,000	18,500
18,650	47/64	3,400	5,000	8,000	18,650
19,000		3,500	5,000	8,000	19,000
19,050	3/4	3,500	5,000	8,000	19,050
19,250		3,600	5,000	8,000	19,250
19,450	49/64	3,600	5,000	8,000	19,450
19,500		3,600	5,000	8,000	19,500
19,840	25/32	3,700	5,000	8,000	19,840
20,000		3,700	5,000	8,000	20,000
20,240	51/64	3,700	5,500	8,800	20,240
20,500		3,800	5,500	8,800	20,500
20,640	13/16	3,800	5,500	8,800	20,640
21,000		3,900	5,500	8,800	21,000
21,030	53/64	3,900	5,500	8,800	21,030
21,430	27/32	3,900	5,500	8,800	21,430
21,500		4,000	5,500	8,800	21,500
21,830	55/64	4,000	5,500	8,800	21,830
22,000		4,100	5,500	8,800	22,000
22,220	7/8	4,100	5,500	8,800	22,220
22,500		4,100	5,500	8,800	22,500
22,620	57/64	4,200	6,300	10,000	22,620
23,000		4,200	6,300	10,000	23,000
23,020	29/32	4,200	6,300	10,000	23,020
23,420	59/64	4,300	6,300	10,000	23,420
23,500		4,300	6,300	10,000	23,500
23,810	15/16	4,400	6,300	10,000	23,810
24,000		4,400	6,300	10,000	24,000
24,210	61/64	4,500	6,300	10,000	24,210
24,500		4,500	6,300	10,000	24,500
24,610	31/32	4,500	6,300	10,000	24,610
25,000	63/64	4,600	6,300	10,000	25,000



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
25,400	1	4,700	6,300	10,000	25,400
25,500		4,700	6,300	10,000	25,500
26,000		4,800	7,300	11,600	26,000
26,500		4,900	7,300	11,600	26,500
27,000		5,000	7,300	11,600	27,000
27,500		5,100	7,300	11,600	27,500
28,000		5,100	7,300	11,600	28,000
28,500		5,200	7,300	11,600	28,500
29,000		5,300	7,300	11,600	29,000
29,500		5,400	7,300	11,600	29,500
30,000		5,500	8,500	13,600	30,000
30,500		5,600	8,500	13,600	30,500
31,000		5,700	8,500	13,600	31,000
31,500		5,800	8,500	13,600	31,500
32,000		5,900	8,500	13,600	32,000
32,500		6,000	8,500	13,600	32,500
33,000		6,100	8,500	13,600	33,000
33,500		6,100	8,500	13,600	33,500
34,000		6,200	8,500	13,600	34,000
34,500		6,300	8,500	13,600	34,500
35,000		6,400	10,000	16,000	35,000
36,000		6,600	10,000	16,000	36,000
37,000		6,800	10,000	16,000	37,000
37,500		6,900	10,000	16,000	37,500
38,000		7,000	10,000	16,000	38,000
39,000		7,100	10,000	16,000	39,000
40,000		7,300	10,000	16,000	40,000
40,500		7,400	10,000	16,000	40,500

Sistema de furação
com insertos T 800



Pastilhas intercambiáveis RT 800



Material de corte **MD int.**

Superfície **F**

Forma da haste

P • Redução da aresta transversal $\geq \varnothing 16,000$ • afiação de superfície cônica • formato côncavo da aresta de corte principal

M ○ • parafusos de fixação do produto no. 1071 incluso

K •

N ○

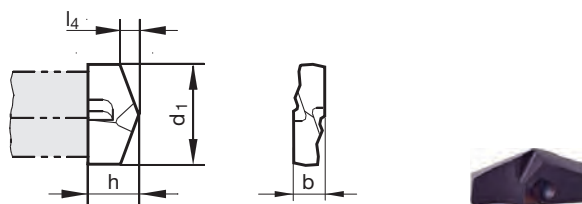
S aços até 1000 N/mm²

H

Sistema de furação com insertos T 800

GÜHRINGNAVIGATOR

Página de dados de corte 770



Nr. do artigo **2485**

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
16,000		3,000	4,500	8,000	16,000
16,270	41/64	3,000	4,500	8,000	16,270
16,500		3,100	4,500	8,000	16,500
16,670	21/32	3,100	4,500	8,000	16,670
17,000		3,100	4,500	8,000	17,000
17,070	43/64	3,200	4,500	8,000	17,070
17,460	11/16	3,200	4,500	8,000	17,460
17,500		3,200	4,500	8,000	17,500
17,860	45/64	3,300	4,500	8,000	17,860
18,000		3,300	5,000	8,000	18,000
18,260	23/32	3,400	5,000	8,000	18,260
18,500		3,400	5,000	8,000	18,500
18,650	47/64	3,400	5,000	8,000	18,650
19,000		3,500	5,000	8,000	19,000
19,050	3/4	3,500	5,000	8,000	19,050
19,250		3,600	5,000	8,000	19,250
19,450	49/64	3,600	5,000	8,000	19,450
19,500		3,600	5,000	8,000	19,500
19,840	25/32	3,700	5,000	8,000	19,840
20,000		3,700	5,000	8,000	20,000
20,240	51/64	3,700	5,500	8,800	20,240
20,500		3,800	5,500	8,800	20,500
20,640	13/16	3,800	5,500	8,800	20,640
21,000		3,900	5,500	8,800	21,000
21,030	53/64	3,900	5,500	8,800	21,030
21,430	27/32	3,900	5,500	8,800	21,430
21,500		4,000	5,500	8,800	21,500
21,830	55/64	4,000	5,500	8,800	21,830
22,000		4,100	5,500	8,800	22,000
22,220	7/8	4,100	5,500	8,800	22,220
22,500		4,100	5,500	8,800	22,500
22,620	57/64	4,200	6,300	10,000	22,620
23,000		4,200	6,300	10,000	23,000
23,020	29/32	4,200	6,300	10,000	23,020
23,420	59/64	4,300	6,300	10,000	23,420
23,500		4,300	6,300	10,000	23,500
23,810	15/16	4,400	6,300	10,000	23,810
24,000		4,400	6,300	10,000	24,000
24,210	61/64	4,500	6,300	10,000	24,210
24,500		4,500	6,300	10,000	24,500
24,610	31/32	4,500	6,300	10,000	24,610
25,000	63/64	4,600	6,300	10,000	25,000



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
25,400	1	4,700	6,300	10,000	25,400
25,500		4,700	6,300	10,000	25,500
26,000		4,800	7,300	11,600	26,000
26,500		4,900	7,300	11,600	26,500
27,000		5,000	7,300	11,600	27,000
27,500		5,100	7,300	11,600	27,500
28,000		5,100	7,300	11,600	28,000
28,500		5,200	7,300	11,600	28,500
29,000		5,300	7,300	11,600	29,000
29,500		5,400	7,300	11,600	29,500
30,000		5,500	8,500	13,600	30,000
30,500		5,600	8,500	13,600	30,500
31,000		5,700	8,500	13,600	31,000
31,500		5,800	8,500	13,600	31,500
32,000		5,900	8,500	13,600	32,000
32,500		6,000	8,500	13,600	32,500
33,000		6,100	8,500	13,600	33,000
33,500		6,100	8,500	13,600	33,500
34,000		6,200	8,500	13,600	34,000
34,500		6,300	8,500	13,600	34,500
35,000		6,400	10,000	16,000	35,000
36,000		6,600	10,000	16,000	36,000
37,000		6,800	10,000	16,000	37,000
37,500		6,900	10,000	16,000	37,500
38,000		7,000	10,000	16,000	38,000
39,000		7,100	10,000	16,000	39,000
40,000		7,300	10,000	16,000	40,000
40,500		7,400	10,000	16,000	40,500

Sistema de furação
com insertos T 800



Pastilhas intercambiáveis RT 800



Material de corte **MD int.**

Superfície ○

Forma da haste

P Redução da aresta transversal $\geq \varnothing 16,000$ • afiação de superfície cônica • formato côncavo da aresta de corte principal

M

K ○

N •

S

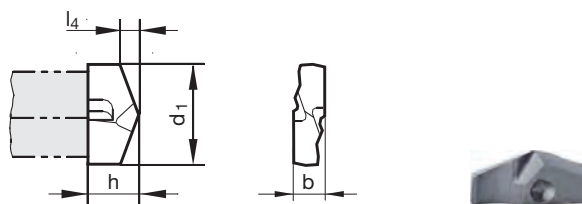
H

fundição e ligas-AISI

Sistema de furação com insertos T 800

GÜHRINGNAVIGATOR

Página de dados de corte 770



Nr. do artigo **2747**

d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
16,000		3,000	4,500	8,000	16,000
16,500		3,100	4,500	8,000	16,500
17,000		3,100	4,500	8,000	17,000
17,070	43/64	3,200	4,500	8,000	17,070
17,500		3,200	4,500	8,000	17,500
18,000		3,300	5,000	8,000	18,000
18,260	23/32	3,400	5,000	8,000	18,260
18,650	47/64	3,400	5,000	8,000	18,650
19,000		3,500	5,000	8,000	19,000
19,050	3/4	3,500	5,000	8,000	19,050
19,250		3,600	5,000	8,000	19,250
19,450	49/64	3,600	5,000	8,000	19,450
19,500		3,600	5,000	8,000	19,500
19,840	25/32	3,700	5,000	8,000	19,840
20,000		3,700	5,000	8,000	20,000
20,500		3,800	5,500	8,800	20,500
20,640	13/16	3,800	5,500	8,800	20,640
21,000		3,900	5,500	8,800	21,000
21,030	53/64	3,900	5,500	8,800	21,030
21,430	27/32	3,900	5,500	8,800	21,430
21,830	55/64	4,000	5,500	8,800	21,830
22,000		4,100	5,500	8,800	22,000
23,000		4,200	6,300	10,000	23,000
23,420	59/64	4,300	6,300	10,000	23,420
23,500		4,300	6,300	10,000	23,500
24,000		4,400	6,300	10,000	24,000
24,210	61/64	4,500	6,300	10,000	24,210
24,500		4,500	6,300	10,000	24,500
25,000	63/64	4,600	6,300	10,000	25,000
25,500		4,700	6,300	10,000	25,500
26,000		4,800	7,300	11,600	26,000
26,500		4,900	7,300	11,600	26,500
27,000		5,000	7,300	11,600	27,000
27,500		5,100	7,300	11,600	27,500
28,000		5,100	7,300	11,600	28,000
29,500		5,400	7,300	11,600	29,500
30,000		5,500	8,500	13,600	30,000
30,500		5,600	8,500	13,600	30,500
31,000		5,700	8,500	13,600	31,000
31,500		5,800	8,500	13,600	31,500
32,000		5,900	8,500	13,600	32,000
32,500		6,000	8,500	13,600	32,500



d1		l4	b	h	Nº de cód.
mm	inch	mm	mm	mm	
33,000		6,100	8,500	13,600	33,000
33,500		6,100	8,500	13,600	33,500
34,000		6,200	8,500	13,600	34,000
34,500		6,300	8,500	13,600	34,500
35,000		6,400	10,000	16,000	35,000
36,000		6,600	10,000	16,000	36,000
37,000		6,800	10,000	16,000	37,000
39,000		7,100	10,000	16,000	39,000
40,000		7,300	10,000	16,000	40,000

Sistema de furação
com insertos T 800



Parafusos de fixação RT 800



Sistema de furação
com insertos T 800



Nr. do artigo **1071**

G	l1	Torx	Nº de cód.
	mm		
M3 x 0,35	7,000	T6	3,000
M3 x 0,35	6,000	T6	3,006
M3,5 x 0,35	8,000	T7	3,500
M4 x 0,5	9,000	T8	4,000
M4 x 0,5	10,000	T8	4,500
M5 x 0,5	11,000	T10	5,000



Torquímetro



Nr. do artigo

4915

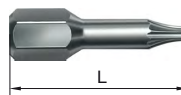
Acionamento		Nm	Tipo	Nº de cód.
1/4"	hexágono	0,4-1	A	1,001
1/4"	hexágono	0,8-2	A	2,000
1/4"	hexágono	1-5	A	5,001
1/4"	hexágono	2-8	A	8,000
1/4"	hexágono	12	D	12,000
1/4"	hexágono	5-14	D	14,000
3/8"	square	5-50	B	50,000
1/2"	square	20-200	C	200,000



Pontas intercambiáveis Torx



Sistema de furação
com insertos T 800

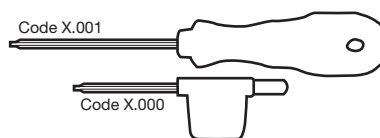


Nr. do artigo **4917**

Acionamento		Torx	L mm	Nº de cód.
1/4	hexágono	T5	25,000	5,000
1/4	hexágono	T6	25,000	6,000
1/4	hexágono	T7	25,000	7,000
1/4	hexágono	T8	25,000	8,000
1/4	hexágono	T9	25,000	9,000
1/4	hexágono	T10	25,000	10,000
1/4	hexágono	T15	25,000	15,000
1/4	hexágono	T20	25,000	20,000
1/2	square	T25	25,000	25,000



Chave Torx



Nr. do artigo

1612

Torx	Nº de cód.
T5	5,001
T6	6,000
T6	6,001
T7	7,001
T8	8,000
T8	8,001
T9	9,001
T10	10,001
T15	15,000
T15	15,001
T20	20,001
T25	25,001
T30	30,001



HT 800 WP

Na utilização de ferramentas HT 800 da Gühring observem as seguintes indicações e observações:

Nós recomendamos que em todas as trocas de pastilhas também sejam trocados os parafusos de fixação! Por isso, todo suporte é fornecido com um parafuso de fixação Nr. do artigo 4071 e chave Nr. do artigo 1612. E toda pastilha é igualmente fornecida com um parafuso de fixação Nr. do artigo 4071.

Na troca de pastilhas observem os seguintes momentos de torque para os parafusos de fixação. Pois seu cumprimento é absolutamente necessário para se obter ótimos resultados na usinagem!

Gama de diâmetros	11,0 - 12,99	13,0 - 13,99	14,0 - 15,99	16,0 - 17,99	18,0 - 19,99	20,0 - 21,99	22,0 - 29,99	30,0 - 40,00
Rosca	M2,2	M2,5	M3	M3,5	M4	M4,5	M5	M6
Medida Torx	T7	T8	T9	T10	T15	T15	T20	T25
Torque de aperto [Nm]	0,8	1,0	1,7	2,7	4,0	6,0	8,0	14,0

Aplicam-se a trava de rosca (Loctite)!

- Em furos passantes deve ser observado, que as guias das ferramentas permaneçam em ação (em contato com a peça). Além disso recomendamos que o avanço seja reduzido quando a ferramenta sair do furo.
- Em geral recomendamos em profundidade de furos acima de 5xD a utilização de suportes Art. Nº 4101 e pastilha de pilotagem Art. Nº. 4111 para centrar, ou alternativamente dependendo do material a ser usinado podem ser utilizadas brocas Ratio do tipo RT 100 U ou alternativamente RT 100 VA para a pilotagem.
- Ao furar sem centragem recomendamos uma redução do avanço ao se iniciar o furo.
- No caso de corte interrompido (canais, furos transversais) a ferramenta de furar não deve ser utilizada sem um teste prévio.
- Recomendamos também no caso de corte interrompido (máx. 0,2xD) reduzir o avanço de acordo com as possibilidades.
- Ao contrário das brocas com pastilhas intercambiáveis clássicas a broca HT 800 é adequada também para furar pacotes de chapas.
- No caso de tornos (ferramenta parada) deve-se observar que a ferramenta esteja exatamente no centro.
- Condição para um cisalhamento ideal é um abastecimento de refrigeração suficiente com emulsão ou óleo de corte.
- A ferramenta é condicionalmente adequada para usinagem a seco ou MQL Para a utilização de MQL recomendamos o uso de uma extremidade de ferramenta cônica MQL, como também, acessórios MQL da Gühring. (Nossa assistência técnica os aconselhará com prazer). cisalhamento

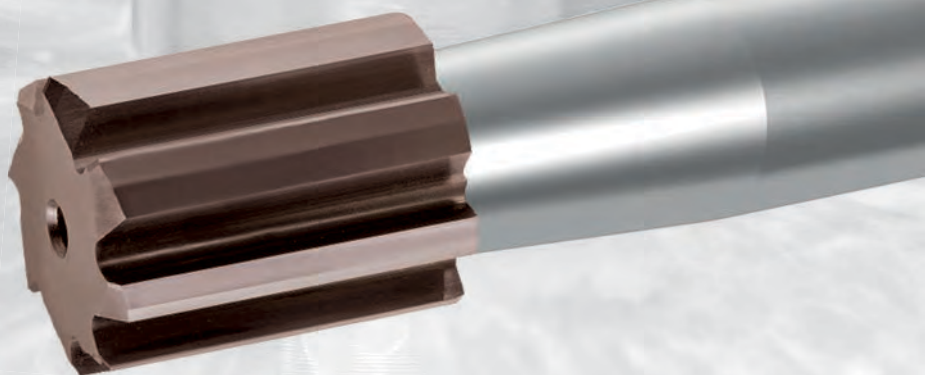
RT 800 WP

Na utilização de brocas RT 800 WP observem por favor as seguintes indicações e recomendações:

- Em furos passantes deve-se observar, que as guias da broca permaneçam em ação (em contato com a peça)
- Na execução 7xD recomendamos centrar com o mesmo ângulo de ponta de 140° ou maior no mínimo com 2/3 do diâmetro de corte.
- As ferramentas não deverão ser utilizadas sem um teste prévio em corte interrompido (canais, furos transversais).
- Em corte interrompido (máx. 0,2xD) recomendamos que o avanço seja reduzido de acordo com as possibilidades.
- Ao contrário das brocas com pastilhas intercambiáveis clássicas as ferramentas RT 800 também são adequadas para furar pacotes de chapas.
- Na troca das pastilhas intercambiáveis recomendamos, substituir também o parafuso de fixação atual pelo parafuso (com fio de segurança especial).

HR 500 T

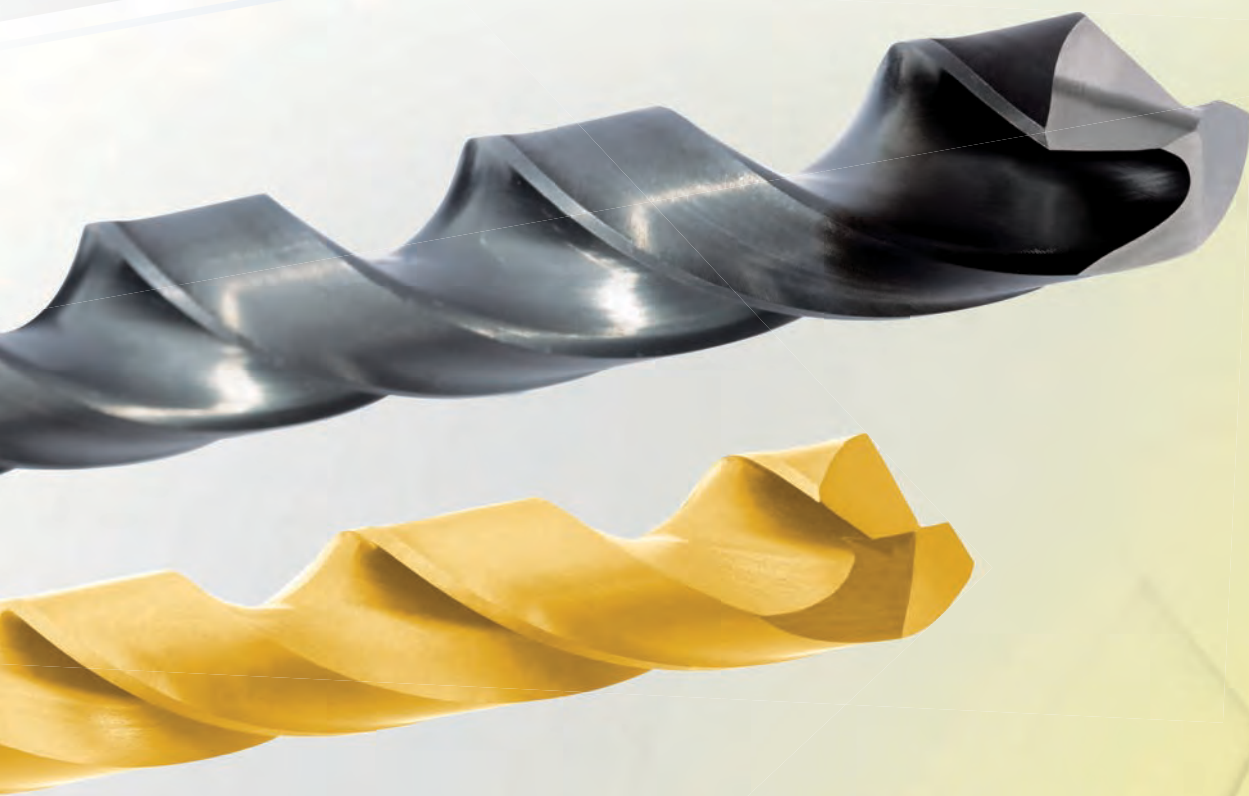
Alargadores de alto desempenho de metal duro com opções flexíveis de fixação graças à haste HA.



Mais informações podem ser encontradas no nosso catálogo alargadores.



BROCAS HELICOIDAIS COM HASTE CILÍNDRICA





P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
•	•	•	•	•	•		~3xD	DIN 1897	N	R	HSS		0,350 - 44,000	223	772 192
•	•	•	•	•	•		~3xD	DIN 1897	N	R	HSS		0,500 - 30,160	653	772 196
•	•	•	•	•	•		~3xD	DIN 1897	N	R	HSS		1,000 - 15,000	2460	772 199
•	•	•	•	•	•		~3xD	DIN 1897	N	L	HSS		0,320 - 50,000	226	772 200
•	•	•	•	•	•		~3xD	DIN 1897	N	L	HSS		0,900 - 13,000	672	772 203
•	•	•	•	•	•		~3xD	DIN 1897	H	R	HSS		0,690 - 21,000	224	772 204
•	•	•	•	•	•		~3xD	DIN 1897	H	L	HSS		0,750 - 24,000	227	772 206
•	•	•	•	•	•		~3xD	DIN 1897	W	R	HSS		1,000 - 20,000	225	772 208
•	•	•	•	•	•		~3xD	DIN 1897	W	L	HSS		1,000 - 20,000	228	772 210
•	•	•	•	•	•		~3xD	DIN 1897	GT 80	R	HSS		1,000 - 20,000	552	772 212
•	•	•	•	•	•		~3xD	DIN 1897	GT 80	L	HSS		1,000 - 19,840	553	772 215
•	•	•	•	•	•		~3xD	DIN 1897	GV 120	R	HSCO		0,400 - 48,000	329	772 218
•	•	•	•	•	•		~3xD	DIN 1897	GV 120	R	HSCO		0,500 - 15,500	659	774 222
•	•	•	•	•	•		~3xD	DIN 1897	GV 120	R	HSCO		1,000 - 13,000	2461	774 224
•	•	•	•	•	•		~3xD	DIN 1897	GV 120	L	HSCO		0,450 - 32,000	330	772 225
•	•	•	•	•	•		~3xD	DIN 1897	GT 80	R	HSCO		1,000 - 20,000	1228	774 227
•	•	•	•	•	•		~3xD	DIN 1897	GT 80	R	HSCO		1,000 - 16,000	2498	774 229
•	•	•	•	•	•		~3xD	DIN 1897	VA	R	HSCO		1,000 - 12,000	1261	772 230
•	•	•	•	•	•		~3xD	DIN 1897	VA	R	HSCO		1,000 - 13,000	572	774 231
•	•	•	•	•	•		~3xD	DIN 1897	P2000	R	HSCO		1,000 - 13,000	2048	774 233
•	•	•	•	•	•		~3xD	DIN 1897	N	R	M42		1,000 - 15,870	1259	772 235
•	•	•	•	•	•		~3xD	DIN 1897	GT 500 DZ	R	HSS-E-PM		1,000 - 14,290	515	774 237
•	•	•	•	•	•		3xD	DIN 6539	N	R	VHM		0,500 - 16,000	730	776 239
•	•	•	•	•	•		~3xD	DIN 6539	N	R	VHM		1,000 - 16,000	2463	776 241

Brocas helicoidais com haste cilíndrica



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Brocas helicoidais extras curtas

							~3xD	WN	N	R	VHM	○	0,500 - 6,500	702	776 243
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Brocas espirais curtas

•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	○ _{2,36} ^{>0}	0,200 - 20,000	205	778 244
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	Ⓢ	0,200 - 19,000	651	780 250
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	F	1,000 - 14,500	2456	780 254
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	○	2,400 - 5,610	560	778 256
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSS	●	3,000 - 16,000	240	778 257
•	•	•	•	•	•		~5xD	DIN 338	N	L	HSS	○ _{6,00} ^{>0}	0,200 - 20,000	208	778 258
•	•	•	•	•	•		~5xD	DIN 338	N	L	HSS	Ⓢ	0,250 - 14,250	664	780 261
•	•	•	•	•	•		~5xD	DIN 338	H	R	HSS	○	0,200 - 20,000	206	778 263
•	•	•	•	•	•		~5xD	DIN 338	H	L	HSS	○	0,300 - 20,000	209	778 266
•	•	•	•	•	•		~5xD	DIN 338	W	R	HSS	○	0,200 - 20,000	207	778 269
•	•	•	•	•	•		~5xD	DIN 338	W	L	HSS	○	0,250 - 20,000	210	778 272
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSS	○ _{2,36} ^{>0}	0,600 - 16,000	549	778 274
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSS	Ⓢ	1,000 - 15,000	652	780 277
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSS	F	1,000 - 15,000	2457	780 280
•	•	•	•	•	•		~5xD	DIN 338	GT 100	L	HSS	○ _{2,36} ^{>0}	1,000 - 15,500	550	778 281
•	•	•	•	•	•		~5xD	DIN 338	GT 100	L	HSS	Ⓢ	1,300 - 9,800	665	780 283
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSCO	○ _{2,36} ^{>0}	0,200 - 20,000	305	780 284
•	•	•	•	•	•		~5xD	DIN 338	N	R	HSCO	Ⓢ	1,200 - 13,000	2997	782 288
•	•	•	•	•	•		~5xD	DIN 338	N	L	HSCO	○ _{6,00} ^{>0}	0,360 - 18,500	308	780 289
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSCO	○ _{2,36} ^{>0}	1,000 - 16,000	622	780 291
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSCO	Ⓢ	1,000 - 15,000	658	782 294
•	•	•	•	•	•		~5xD	DIN 338	GT 100	R	HSCO	F	1,000 - 14,000	2459	782 296

Brocas helicoidais com haste cilíndrica



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Brocas espirais curtas

Brocas helicoidais com haste cilíndrica

•	○						~5xD	DIN 338	GT 100	(R)	HSCO	C	3,000 - 11,910	1221	782 298
○	•	○					~5xD	DIN 338	GT 100	(R)	HSCO	A	3,000 - 12,000	1223	782 299
○	•		•				~5xD	DIN 338	Ti	(R)	HSCO	○	0,200 - 19,000	605	780 301
○	•		•				~5xD	DIN 338	Ti	(R)	HSCO	S	0,500 - 14,500	657	782 304
○	•		•				~5xD	DIN 338	Ti	(R)	HSCO	F	0,400 - 15,000	2458	782 306
○	•		•				~5xD	DIN 338	Ti	(L)	HSCO	○	1,300 - 9,500	608	780 308
○	•	○	○				~5xD	DIN 338	VA	(R)	HSCO	○	1,000 - 13,000	1260	780 309
•	○	○	○				~5xD	DIN 338	P2000	(R)	HSCO	●	1,000 - 13,000	2047	784 311
•	•	•	•	○			~5xD	DIN 338	AeroX	(R)	M42	●	1,000 - 13,000	1018	784 313
•	○	○	•	•	○		~5xD	DIN 338	N	(R)	M42	○	0,400 - 16,000	1146	780 315
•	•	•	○	•			~5xD	DIN 338	N	(R)	M42	F	1,000 - 16,000	1199	784 317
○	○	○	•	•			~5xD	WN	N	(R)	VHM	○	1,000 - 12,700	732	784 319
○	○	○	•	○			~5xD	WN	N	(R)	VHM	F	1,000 - 12,700	2464	784 321
○	○		•				~5xD	WN	Duro 150	(R)	HM	○	3,000 - 14,000	710	776 323

Brocas para furar através de buchas

•	•	○					~10xD	DIN 339	N	(R)	HSS	○ _{2,36} ^{>0}	0,800 - 20,000	211	786 325
•	•	○					~10xD	DIN 339	N	(R)	HSS	○	2,400 - 5,000	561	786 327
•	•	•					~10xD	DIN 339	N	(R)	HSS	S	1,000 - 13,000	666	786 328
•	○	•	•	○			~10xD	DIN 339	N	(R)	HSCO	○ _{2,36} ^{>0}	1,100 - 19,000	311	792 330

Brocas helicoidais longas

•	•	○					~10xD	DIN 340	N	(R)	HSS	○ _{2,36} ^{>0}	0,400 - 36,510	217	786 331
•	•	○					~10xD	DIN 340	N	(R)	HSS	S	0,500 - 22,220	667	786 334
•	•	○					~10xD	DIN 340	N	(L)	HSS	○ _{6,00} ^{>0}	0,450 - 29,000	220	786 336
•	•	○					~10xD	DIN 340	N	(R)	HSS	○	2,950 - 25,250	204	786 338
•	•	•					~10xD	DIN 340	H	(R)	HSS	○	0,500 - 16,000	218	786 339



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Brocas helicoidais longas

							~10xD	DIN 340	H	L	HSS	○	0,450 - 15,000	221	786 341
							~10xD	DIN 340	W	R	HSS	○	0,500 - 20,640	219	786 342
							~10xD	DIN 340	GT 100	R	HSS	○	1,000 - 14,000	535	786 344
							~10xD	DIN 340	GT 100	R	HSS	Ⓢ	1,000 - 14,000	668	786 347
							~10xD	DIN 340	GT 100	R	HSS	F	1,000 - 10,000	2462	786 349
							~10xD	DIN 340	GT 100	L	HSS	○	1,400 - 13,000	506	786 350
							~10xD	DIN 340	GT 50	R	HSS	○	1,000 - 32,600	501	786 351
							~10xD	DIN 340	N	R	HSCO	○	0,500 - 22,000	317	792 353
							~10xD	DIN 340	GT 100	R	HSCO	○	1,000 - 16,000	336	792 355
							~10xD	DIN 340	GT 100	R	HSCO	F	1,000 - 12,000	396	792 357
							~10xD	DIN 340	Ti	R	HSCO	○	1,000 - 15,000	617	792 358
							~10xD	DIN 340	Ti	R	HSCO	Ⓢ	1,000 - 10,200	669	792 360
							~10xD	WN	N	R	VHM	○	0,500 - 1,450	706	792 362

Brocas helicoidais com haste cilíndrica

Brocas helicoidais extra longas, série 1

							~15xD	DIN 1869	N	R	HSS	○	1,600 - 13,000	235	788 363
							~15xD	DIN 1869	GT 100	R	HSS	○	1,950 - 13,000	502	790 365
							~15xD	DIN 1869	GT 100	R	HSS	Ⓢ	2,000 - 12,700	670	790 367
							~15xD	DIN 1869	GT 50	R	HSS	○	2,000 - 12,700	524	788 368
							~15xD	DIN 1869	GT 100	R	HSCO	○	2,700 - 10,000	618	794 370

Brocas helicoidais extra longas, série 2

							~20xD	DIN 1869	N	R	HSS	○	2,700 - 13,000	236	788 371
							~20xD	DIN 1869	GT 100	R	HSS	○	2,000 - 13,000	503	790 372
							~20xD	DIN 1869	GT 100	R	HSS	Ⓢ	2,700 - 8,500	671	790 374
							~20xD	DIN 1869	GT 50	R	HSS	○	3,000 - 13,000	528	788 375
							~20xD	DIN 1869	GT 100	R	HSCO	○	3,000 - 10,000	619	794 376



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Brocas helicoidais extra longas, série 3

•	•	•	•	•	•		~25xD	DIN 1869	N		HSS	○	3,500 - 13,000	237	788 377
•	•	•	•	•	•		~25xD	DIN 1869	GT 100		HSS	◐	2,500 - 13,000	504	790 378
○	•	•	•	•	•		~25xD	DIN 1869	GT 50		HSS	○	2,500 - 10,000	529	788 379
•	•	•	•	•	•		~25xD	DIN 1869	GT 100		HSCO	◐	2,500 - 13,000	571	794 380

Brocas helicoidais extra longas

•	•	•	•	•	•		>25xD	WN	GT 100		HSS	◐	6,000 - 12,000	242	790 381
•	•	•	•	•	•		>25xD	WN	GT 100		HSS	○	8,000 - 12,000	243	790 382
•	•	•	•	•	•		>25xD	WN	GT 100		HSS	○	10,000 - 12,000	244	790 383

Brocas helicoidais com haste reforçada

•	•	•	•	•	•		~3xD	WN	GU 500		HSCO	Ⓢ	2,000 - 20,000	512	774 384
•	•	•	•	•	•		~5xD	WN	GU 500		HSCO	Ⓢ	2,000 - 20,000	511	784 386
•	•	•	•	•	•		~5xD	WN	GT 500		HSS-E-PM	Ⓢ	2,000 - 12,900	513	784 388
○	•	•	•	•	•		~3xD	DIN 6537 K	H		VHM	Ⓢ	2,600 - 14,100	1946	776 389

Brocas extra-longas, compr. 6 polegadas

•	•	•	•	•	•		NAS 907	N		HSS	○	1,500 - 8,000	577	390
•	•	•	•	•	•		NAS 907	N		HSS	◐	1,500 - 8,000	579	391

Brocas extra-longas, compr. 12 polegadas

•	•	•	•	•	•		NAS 907	N		HSS	○	1,500 - 8,000	578	392
•	•	•	•	•	•		NAS 907	N		HSS	◐	1,500 - 8,000	580	393

Brocas com canais de refrigeração

•	•	•	•	•	•		~10xD	WN	N		HSS	○	3,000 - 13,000	390	788 394
•	•	•	•	•	•		~5xD	WN	GT 80 IK		HSCO	○	5,000 - 20,000	1131	784 395
•	•	•	•	•	•		~5xD	WN	GT 80 IK		HSCO	Ⓢ	5,000 - 20,000	1132	784 396

Micro brocas de precisão HSS-E-PM sem dutos de refrigeração

•	•	•	•	•	•		~5xD	DIN 1899	N		HSS-E-PM	○	0,050 - 1,920	301	796 397
•	•	•	•	•	•		~5xD	DIN 1899	N		HSS-E-PM	Ⓢ	0,160 - 1,900	660	796 400

Brocas helicoidais com haste cilíndrica



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
Micro brocas de precisão HSS-E-PM sem dutos de refrigeração							~5xD	DIN 1899	N	L	HSS-E-PM	○	0,130 - 1,850	303	796 402
Micro brocas de precisão Metal duro sem dutos de refrigeração							~5xD	WN	N	R	VHM	○	0,200 - 1,400	701	796 404
								WN	N	R	VHM	Ⓜ	0,100 - 3,000	3899	796 405
Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração							4xD	WN	N	R	VHM	Ⓜ	0,500 - 3,000	6400	796 407
							7xD	WN	N	R	VHM	Ⓜ	0,500 - 3,000	6401	796 408
Micro Brocas de precisão ExclusiveLine com dutos de refrigeração							5xD	WN	N	R	VHM	Ⓜ	1,400 - 3,000	6405	796 409
							8xD	WN	N	R	VHM	Ⓜ	1,400 - 3,000	6408	796 410
							15xD	WN	N	R	VHM	Ⓜ	1,400 - 3,000	6412	796 411
Brocas helicoidais curtas, haste-Ø 12,7 mm								WN	N	R	HSS	●	13,000 - 28,570	268	778 412
Brocas helicoidais curtas, haste-Ø 16,0 mm								WN	V72	R	HSCO	○	16,000 - 40,000	128	772 413
Brocas helicoidais curtas, haste-Ø 25,4 mm								WN	V72	R	HSCO	○	25,000 - 40,000	129	772 414
								WN	V72	L	HSCO	○	25,000 - 39,000	136	772 415
Brocas para furos de pinos							DIN 1898	N	R	HSS	○	$\frac{>0}{2,36}$	2,000 - 12,000	531	416
Jogos de brocas helicoidais							~5xD	DIN 338	N	R	HSS	○	$\frac{>0}{2,36}$	201	417

Brocas helicoidais com haste cilíndrica



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Jogos de brocas helicoidais

Brocas helicoidais com haste cilíndrica

•	•	○					~5xD	DIN 338	N	R	HSS	$\begin{matrix} >0 \\ 2,36 \end{matrix}$		200	418
•	•	○					~5xD	DIN 338	N	R	HSS	S		17	419
•	○	•	○				~5xD	DIN 338	N	R	HSCO	○		16	420
○	•		•				~5xD	DIN 338	Ti	R	HSCO	○		18	421
○	•	○	○				~5xD	DIN 338	VA	R	HSCO	○		195	422
•	○	○	○				~5xD	DIN 338	P2000	R	HSCO	●		2049	423
•	○	○	○				~3xD	DIN 1897	P2000	R	HSCO	M		2050	424
•	•	•	•	○			~5xD	DIN 338	AeroX	R	M42	●		1083	425



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Jogos de brocas helicoidais

								WN						36	426
								WN						73	427
								WN						11	428

Brocas helicoidais com haste cilíndrica

Brocas especiais com cortes de metal duro

○	○	○					DIN 8037	N	R	HM	○	1,700 - 24,000	703	776	429
							DIN 8038	N	R	HM	○	1,900 - 24,000	704	776	430

Brocas helicoidais FK

							WN	FK	R	VHM	○	2,500 - 10,000	1149	776	431
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Brocas ponta de lança

○	○	○					WN	H	R	HM	○	3,000 - 12,000	707	776	432
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Brocas para pedras

							WN	N	R	HM	○	4,000 - 12,000	716		433
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P AÇO

~ 3xD
DIN 1897

~ 5xD
DIN 338

~ 10xD
DIN 340

~ 15xD
DIN 1869
R1

No 1

Ø 1,00 - 14,00 mm
Nr. do artigo 2459
a partir d. pág. 296



No 1

Ø 1,00 - 12,00 mm
Nr. do artigo 396
a partir d. pág. 357



No 1

Ø 2,70 - 10,00 mm
Nr. do artigo 618
a partir d. pág. 370



Ø 1,00 - 15,00 mm
Nr. do artigo 2457
a partir d. pág. 280



Ø 1,00 - 10,00 mm
Nr. do artigo 2462
a partir d. pág. 349



Ø 2,00 - 12,70 mm
Nr. do artigo 670
a partir d. pág. 367



No 1

Ø 1,00 - 13,00 mm
Nr. do artigo 2461
a partir d. pág. 224



Ø 1,00 - 15,00 mm
Nr. do artigo 2460
a partir d. pág. 199



Ø 1,00 - 14,50 mm
Nr. do artigo 2456
a partir d. pág. 254



Ø 0,50 - 22,22 mm
Nr. do artigo 667
a partir d. pág. 334



Ø 1,60 - 13,00 mm
Nr. do artigo 235
a partir d. pág. 363



Ø 1,20 - 13,00 mm
Nr. do artigo 2997
a partir d. pág. 288



Ø 0,50 - 22,00 mm
Nr. do artigo 317
a partir d. pág. 353



No 1

Ø 2,00 - 20,00 mm
Nr. do artigo 512
a partir d. pág. 384



No 1

Ø 2,00 - 20,00 mm
Nr. do artigo 511
a partir d. pág. 386



Ø 2,00 - 12,90 mm
Nr. do artigo 513
a partir d. pág. 388



No 1

Ø 5,00 - 20,00 mm
Nr. do artigo 1132
a partir d. pág. 396



PARA REDUZIR
ESFORÇO DURANTE
A FIXAÇÃO

PARA APLICAÇÕES
COM REFRIGERAÇÃO
INTERNA

Brocas helicoidais
com haste cilíndrica

haste cilíndrica reta

haste
universal

com
refrigeração
interna



QUICKFINDER

~20xD
DIN 1869
R2

~25xD
DIN 1869
R3

>25xD
Norma de empr.
extra curto

No 1 Ferramenta
ideal

No 1

Ø 3,00 - 10,00 mm
Nr. do artigo 619
a partir d. pág. 376



No 1

Ø 2,50 - 13,00 mm
Nr. do artigo 571
a partir d. pág. 380



GT100, HSCO

No 1

Ø 2,70 - 8,50 mm
Nr. do artigo 671
a partir d. pág. 374



No 1

Ø 2,50 - 13,00 mm
Nr. do artigo 504
a partir d. pág. 378



Ø 6,00 - 12,00 mm
Nr. do artigo 242
a partir d. pág. 381



GT100, HSS



GV120, HSCO

Ø 2,70 - 13,00 mm
Nr. do artigo 236
a partir d. pág. 371



Ø 3,50 - 13,00 mm
Nr. do artigo 237
a partir d. pág. 377



Tipo N, HSS



Tipo N, HSCO



GU500, HSCO



GT500, HSS-E-PM



GT80IK, HSCO

Brocas helicoidais
com haste cilíndrica



AÇOS RESISTENTES
A CORROSÃO



TITÂNIO,
SUAS LIGAS ESPECIAIS

~ 3xD
DIN 1897

~ 5xD
DIN 338

~ 10xD
DIN 340

~ 15xD
DIN 1869
R1

No 1 No 1

Ø 0,40 - 15,00 mm
Nr. do artigo 2458
a partir d. pág. 306

F S ○

No 1 No 1

Ø 1,00 - 10,2 mm
Nr. do artigo 669
a partir d. pág. 360

S ○

No 1 No 1

Ø 1,00 - 13,00 mm
Nr. do artigo 572
a partir d. pág. 231

S ○

Ø 1,00 - 13,00 mm
Nr. do artigo 1260
a partir d. pág. 309

○

Ø 1,00 - 14,00 mm
Nr. do artigo 2459
a partir d. pág. 296

F S ○

Ø 1,00 - 12,00 mm
Nr. do artigo 396
a partir d. pág. 357

F ○

No 1 No 1

Ø 2,70 - 10,00 mm
Nr. do artigo 618
a partir d. pág. 370

○

Ø 1,00 - 13,00 mm
Nr. do artigo 2461
a partir d. pág. 224

F S ○

Ø 1,00 - 15,87 mm
Nr. do artigo 1259
a partir d. pág. 235

○

Ø 1,00 - 16,00 mm
Nr. do artigo 1199
a partir d. pág. 317

F ○

No 1

Ø 2,00 - 20,00 mm
Nr. do artigo 512
a partir d. pág. 384

S

No 1

Ø 2,00 - 20,00 mm
Nr. do artigo 511
a partir d. pág. 386

S

Ø 2,00 - 12,900 mm
Nr. do artigo 513
a partir d. pág. 388

F

No 1 No 1

Ø 5,00 - 20,00 mm
Nr. do artigo 1132
a partir d. pág. 396

S ○

PARA REDUZIR
ESFORÇO DURANTE
A FIXAÇÃO

PARA APLICAÇÕES
COM REFRIGERAÇÃO
INTERNA

Brocas helicoidais
com haste cilíndrica

haste cilíndrica reta

haste
universal

com
refrigeração
interna



QUICKFINDER

~20xD
DIN 1869
R2

~25xD
DIN 1869
R3

>25xD
Norma de empr.
extra curto

No 1 Ferramenta ideal
para aço inox

No 1 Ferramenta ideal
para Titânio e suas ligas especiais



Tipo Ti, HSCO



Tipo VA, HSCO

No 1 **No 1**

Ø 3,00 - 10,00 mm
Nr. do artigo 619
a partir d. pág. 376



No 1 **No 1**

Ø 2,50 - 13,00 mm
Nr. do artigo 571
a partir d. pág. 380



GT100, HSCO



GV120, HSCO



Tipo N, M42



GU500, HSCO



GT500, HSS-E-PM



GT801K, HSCO

Brocas helicoidais
com haste cilíndrica



K FUNDIDOS

~ 3xD
DIN 1897

~ 5xD
DIN 338

~ 10xD
DIN 340

~ 15xD
DIN 1869
R1

Brocas helicoidais
com haste cilíndrica

haste cilíndrica reta

haste
universal

com
refrigeração
interna

No 1

Ø 1,00 - 14,00 mm
Nr. do artigo 2459
a partir d. pág. 296



No 1

Ø 1,00 - 12,00 mm
Nr. do artigo 396
a partir d. pág. 357



No 1

Ø 2,70 - 10,00 mm
Nr. do artigo 618
a partir d. pág. 370



Ø 1,00 - 15,00 mm
Nr. do artigo 2457
a partir d. pág. 280



Ø 1,00 - 10,00 mm
Nr. do artigo 2462
a partir d. pág. 349



Ø 2,00 - 12,70 mm
Nr. do artigo 670
a partir d. pág. 367



No 1

Ø 1,00 - 15,00 mm
Nr. do artigo 2460
a partir d. pág. 199



Ø 1,00 - 14,50 mm
Nr. do artigo 2456
a partir d. pág. 254



Ø 0,50 - 22,22 mm
Nr. do artigo 667
a partir d. pág. 334



Ø 1,60 - 13,00 mm
Nr. do artigo 235
a partir d. pág. 363



Ø 1,20 - 13,00 mm
Nr. do artigo 2997
a partir d. pág. 288



Ø 0,50 - 22,00 mm
Nr. do artigo 317
a partir d. pág. 353



No 1

Ø 2,00 - 20,00 mm
Nr. do artigo 512
a partir d. pág. 384



No 1

Ø 2,00 - 20,00 mm
Nr. do artigo 511
a partir d. pág. 386



Ø 2,00 - 12,90 mm
Nr. do artigo 513
a partir d. pág. 388



PARA REDUZIR
ESFORÇO DURANTE
A FIXAÇÃO

No 1

Ø 5,00 - 20,00 mm
Nr. do artigo 1132
a partir d. pág. 396



PARA APLICAÇÕES
COM REFRIGERAÇÃO
INTERNA



QUICKFINDER

~20xD
DIN 1869
R2

~25xD
DIN 1869
R3

>25xD
Norma de empr.
extra curto

No 1 Ferramenta
ideal

No 1

Ø 3,00 - 10,00 mm
Nr. do artigo 619
a partir d. pág. 376



No 1

Ø 2,50 - 13,00 mm
Nr. do artigo 571
a partir d. pág. 380



GT100, HSCO

No 1

Ø 2,70 - 8,50 mm
Nr. do artigo 671
a partir d. pág. 374



Ø 2,50 - 13,00 mm
Nr. do artigo 504
a partir d. pág. 378



Ø 6,00 - 12,00 mm
Nr. do artigo 242
a partir d. pág. 381



GT100, HSS

Ø 2,70 - 13,00 mm
Nr. do artigo 236
a partir d. pág. 371



Ø 3,50 - 13,00 mm
Nr. do artigo 237
a partir d. pág. 377



Tipo N, HSS



Tipo N, HSCO



GU500, HSCO



GT500, HSS-E-PM



GT80IK, HSCO

Brocas helicoidais
com haste cilíndrica



N ALUMÍNIO, NE, PLÁSTICOS

~ 3xD
DIN 1897

~ 5xD
DIN 338

~ 10xD
DIN 340

~ 15xD
DIN 1869
R1

No 1

Ø 1,00 - 20,00 mm
Nr. do artigo 225
a partir d. pág. 208



No 1

Ø 0,20 - 20,00 mm
Nr. do artigo 207
a partir d. pág. 269



No 1

Ø 0,50 - 20,64 mm
Nr. do artigo 219
a partir d. pág. 342



Tipo W para materiais de baixa liga e de cavacos longos

No 1

Ø 0,69 - 21,00 mm
Nr. do artigo 224
a partir d. pág. 204



No 1

Ø 0,20 - 20,00 mm
Nr. do artigo 206
a partir d. pág. 263



No 1

Ø 0,50 - 16,00 mm
Nr. do artigo 218
a partir d. pág. 339



Tipo H para materiais duros e quebradiços

No 1

Tipo GT50 para materiais de baixa liga e de cavacos longos

Ø 1,00 - 32,60 mm
Nr. do artigo 501
a partir d. pág. 351



Ø 2,00 - 12,70 mm
Nr. do artigo 524
a partir d. pág. 368



Ø 1,00 - 15,50 mm
Nr. do artigo 550
a partir d. pág. 281



Ø 1,00 - 14,00 mm
Nr. do artigo 535
a partir d. pág. 344



Ø 1,95 - 13,00 mm
Nr. do artigo 502
a partir d. pág. 365



Ø 1,00 - 16,00 mm
Nr. do artigo 622
a partir d. pág. 291



Ø 1,00 - 16,00 mm
Nr. do artigo 336
a partir d. pág. 355



Ø 2,70 - 10,00 mm
Nr. do artigo 618
a partir d. pág. 370



No 1

Ø 2,00 - 20,00 mm
Nr. do artigo 512
a partir d. pág. 384



No 1

Ø 2,00 - 20,00 mm
Nr. do artigo 511
a partir d. pág. 386



PARA REDUZIR ESFORÇO DURANTE A FIXAÇÃO

No 1

Ø 5,00 - 20,00 mm
Nr. do artigo 1131
a partir d. pág. 395



PARA APLICAÇÕES COM REFRIGERAÇÃO INTERNA

Brocas helicoidais com haste cilíndrica

haste cilíndrica reta

haste universal

com refrigeração interna



QUICKFINDER

~20xD
DIN 1869
R2

~25xD
DIN 1869
R3

>25xD
Norma de empr.
extra curto

No 1 Ferramenta ideal



Tipo W, HSS



Tipo H, HSS

No 1

Ø 3,00 - 13,00 mm
Nr. do artigo 528
a partir d. pág. 375



No 1

Ø 2,50 - 10,00 mm
Nr. do artigo 529
a partir d. pág. 379



GT50, HSS

No 1

Ø 2,70 - 8,50 mm
Nr. do artigo 671
a partir d. pág. 374



Ø 2,50 - 13,00 mm
Nr. do artigo 504
a partir d. pág. 378



Ø 6,00 - 12,00 mm
Nr. do artigo 242
a partir d. pág. 381



GT100, HSS

Ø 3,00 - 10,00 mm
Nr. do artigo 619
a partir d. pág. 376



Ø 2,50 - 13,00 mm
Nr. do artigo 571
a partir d. pág. 380



GT100, HSCO



GU500, HSCO



GT80IK, HSCO

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais extras curtas



P • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
 • para tornos automáticos/revólver • também para furadeiras manuais

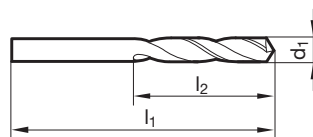
- M**
- K** •
- N** ○ materiais de paredes finas
- S**
- H**

Material de corte	HSS
Superfície	$\geq 2,36$
Sentido de corte	

GÜHRING NAVIGATOR

Página de dados de corte 772

Brocas helicoidais com haste cilíndrica



Nr. do artigo **223**

d1		l1	l2
mm	inch	mm	mm
0,350		19,000	2,000
0,400	1/64	19,000	2,500
0,480		19,000	2,500
0,500		20,000	3,000
0,550		21,000	3,500
0,575		21,000	3,500
0,600		21,000	3,500
0,650		22,000	4,000
0,660		22,000	4,000
0,700		23,000	4,500
0,720		23,000	4,500
0,750		23,000	4,500
0,790	1/32	24,000	5,000
0,800		24,000	5,000
0,820		24,000	5,000
0,850		24,000	5,000
0,890		25,000	5,500
0,900		25,000	5,500
0,930		25,000	5,500
0,950		25,000	5,500
0,980		26,000	6,000
1,000		26,000	6,000
1,020		26,000	6,000
1,030		26,000	6,000
1,040		26,000	6,000
1,050		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,110		28,000	7,000
1,120		28,000	7,000
1,150		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,220		30,000	8,000
1,250		30,000	8,000
1,260		30,000	8,000
1,280		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000

d1		l1	l2
mm	inch	mm	mm
1,400		32,000	9,000
1,430		32,000	9,000
1,450		32,000	9,000
1,480		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,520		34,000	10,000
1,550		34,000	10,000
1,570		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,720		36,000	11,000
1,730		36,000	11,000
1,740		36,000	11,000
1,750		36,000	11,000
1,770		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950		38,000	12,000
1,970		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,020		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,120		38,000	12,000
2,150		40,000	13,000
2,180		40,000	13,000
2,200		40,000	13,000
2,220		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000



d1		l1	l2
mm	inch	mm	mm
2,350		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,420		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,480		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,520		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,920		46,000	16,000
2,950		46,000	16,000
2,970		46,000	16,000
3,000		46,000	16,000
3,020		49,000	18,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,220		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,550		52,000	20,000
3,570	9/64	52,000	20,000
3,580		52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,800		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,960		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,020		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,080		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000

d1		l1	l2
mm	inch	mm	mm
4,220		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,380		58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,550		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,020		62,000	26,000
5,050		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,150		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,350		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,450		66,000	28,000
5,500		66,000	28,000
5,550		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,450		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,550		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,760		74,000	34,000

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Brocas helicoidais
com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
6,800		74,000	34,000
6,850		74,000	34,000
6,900		74,000	34,000
6,950		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,050		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,150		74,000	34,000
7,200		74,000	34,000
7,250		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,450		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,550		79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,750		79,000	37,000
7,800		79,000	37,000
7,850		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,050		79,000	37,000
8,100		79,000	37,000
8,150		79,000	37,000
8,200		79,000	37,000
8,250		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,450		79,000	37,000
8,500		79,000	37,000
8,550		84,000	40,000
8,600		84,000	40,000
8,610		84,000	40,000
8,650		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,750		84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
8,950		84,000	40,000
9,000		84,000	40,000
9,050		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,150		84,000	40,000
9,200		84,000	40,000
9,250		84,000	40,000
9,270		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,350		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,650		89,000	43,000
9,700		89,000	43,000
9,750		89,000	43,000

d1		l1	l2
mm	inch	mm	mm
9,800		89,000	43,000
9,850		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,050		89,000	43,000
10,080		89,000	43,000
10,100		89,000	43,000
10,150		89,000	43,000
10,200		89,000	43,000
10,250		89,000	43,000
10,260		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,400		89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,600		89,000	43,000
10,700		95,000	47,000
10,720	27/64	95,000	47,000
10,750		95,000	47,000
10,800		95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,100		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,250		95,000	47,000
11,300		95,000	47,000
11,400		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,600		95,000	47,000
11,700		95,000	47,000
11,750		95,000	47,000
11,800		95,000	47,000
11,900		102,000	51,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,050		102,000	51,000
12,100		102,000	51,000
12,150		102,000	51,000
12,200		102,000	51,000
12,250		102,000	51,000
12,300	31/64	102,000	51,000
12,400		102,000	51,000
12,500		102,000	51,000
12,600		102,000	51,000
12,700	1/2	102,000	51,000
12,750		102,000	51,000
12,800		102,000	51,000
12,900		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,200		102,000	51,000
13,250		107,000	54,000
13,300		107,000	54,000
13,400		107,000	54,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,600		107,000	54,000
13,700		107,000	54,000
13,750		107,000	54,000
13,800		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,100		111,000	56,000
14,200		111,000	56,000
14,290	9/16	111,000	56,000
14,300		111,000	56,000
14,400		111,000	56,000
14,500		111,000	56,000



d1		l1	l2
mm	inch	mm	mm
14,600		111,000	56,000
14,680	37/64	111,000	56,000
14,700		111,000	56,000
14,750		111,000	56,000
14,800		111,000	56,000
14,900		111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,100		115,000	58,000
15,200		115,000	58,000
15,250		115,000	58,000
15,400		115,000	58,000
15,480	39/64	115,000	58,000
15,500		115,000	58,000
15,600		115,000	58,000
15,700		115,000	58,000
15,750		115,000	58,000
15,800		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,100		119,000	60,000
16,150		119,000	60,000
16,200		119,000	60,000
16,250		119,000	60,000
16,270	41/64	119,000	60,000
16,300		119,000	60,000
16,500		119,000	60,000
16,670	21/32	119,000	60,000
16,750		119,000	60,000
17,000		119,000	60,000
17,070	43/64	123,000	62,000
17,100		123,000	62,000
17,200		123,000	62,000
17,250		123,000	62,000
17,460	11/16	123,000	62,000
17,500		123,000	62,000
17,600		123,000	62,000
17,750		123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,100		127,000	64,000
18,200		127,000	64,000
18,250		127,000	64,000
18,260	23/32	127,000	64,000
18,500		127,000	64,000
18,650	47/64	127,000	64,000
18,750		127,000	64,000
19,000		127,000	64,000

d1		l1	l2
mm	inch	mm	mm
19,050		131,000	66,000
19,100	3/4	131,000	66,000
19,250		131,000	66,000
19,500		131,000	66,000
19,840	25/32	131,000	66,000
20,000		131,000	66,000
20,100		136,000	68,000
20,240	51/64	136,000	68,000
20,250		136,000	68,000
20,500		136,000	68,000
20,640	13/16	136,000	68,000
20,750		136,000	68,000
20,800		136,000	68,000
21,000		136,000	68,000
21,030	53/64	136,000	68,000
21,430	27/32	141,000	70,000
21,500		141,000	70,000
21,830	55/64	141,000	70,000
22,000		141,000	70,000
22,220	7/8	141,000	70,000
22,500		146,000	72,000
23,000		146,000	72,000
23,020	29/32	146,000	72,000
23,420	59/64	146,000	72,000
23,500		146,000	72,000
23,810	15/16	151,000	75,000
24,000		151,000	75,000
24,210	61/64	151,000	75,000
24,500		151,000	75,000
24,610	31/32	151,000	75,000
25,000	63/64	151,000	75,000
25,400	1	156,000	78,000
26,000		156,000	78,000
26,500		156,000	78,000
27,000		162,000	81,000
27,500		162,000	81,000
28,000		162,000	81,000
28,570	1 1/8	168,000	84,000
29,000		168,000	84,000
29,370	1 5/32	168,000	84,000
30,000		168,000	84,000
31,000		174,000	87,000
32,000		180,000	90,000
33,000		180,000	90,000
40,000		200,000	100,000
44,000		214,000	108,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais extras curtas



P • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
 • também para furadeiras manuais • para tornos automáticos/revólver

M
K •
N ○ materiais de paredes finas
S
H

Material de corte **HSS**

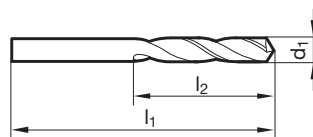
Superfície **S**

Sentido de corte **R**

GÜHRING NAVIGATOR

Página de dados de corte 772

Brocas helicoidais com haste cilíndrica



Nr. do artigo **653**

d1		l1	l2
mm	inch	mm	mm
0,500		20,000	3,000
0,600		21,000	3,500
0,700		23,000	4,500
0,750		23,000	4,500
0,790	1/32	24,000	5,000
0,800		24,000	5,000
0,900		25,000	5,500
1,000		26,000	6,000
1,020		26,000	6,000
1,050		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,110		28,000	7,000
1,120		28,000	7,000
1,150		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,250		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000
1,400		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,550		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000

d1		l1	l2
mm	inch	mm	mm
2,000		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,150		40,000	13,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000



d1		l1	l2
mm	inch	mm	mm
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,550		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,800		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,050		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,450		66,000	28,000
5,500		66,000	28,000
5,520		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000

d1		l1	l2
mm	inch	mm	mm
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,450		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,250		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,250		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,550		84,000	40,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,750		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,250		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,400		89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,600		89,000	43,000
10,720	27/64	95,000	47,000
10,750		95,000	47,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
10,800		95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,300		95,000	47,000
11,400		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,750		95,000	47,000
11,800		95,000	47,000
11,900		102,000	51,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,100		102,000	51,000
12,200		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,700		107,000	54,000
13,800		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,200		111,000	56,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,800		111,000	56,000
14,900		111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,250		115,000	58,000
15,500		115,000	58,000
15,800		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,250		119,000	60,000
16,270	41/64	119,000	60,000
16,500		119,000	60,000

d1		l1	l2
mm	inch	mm	mm
16,670	21/32	119,000	60,000
17,000		119,000	60,000
17,460	11/16	123,000	62,000
17,500		123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,250		127,000	64,000
18,260	23/32	127,000	64,000
18,500		127,000	64,000
18,650	47/64	127,000	64,000
19,000		127,000	64,000
19,050	3/4	131,000	66,000
19,500		131,000	66,000
20,000		131,000	66,000
20,500		136,000	68,000
20,640	13/16	136,000	68,000
21,000		136,000	68,000
21,500		141,000	70,000
22,000		141,000	70,000
22,500		146,000	72,000
22,620	57/64	146,000	72,000
23,000		146,000	72,000
23,420	59/64	146,000	72,000
24,000		151,000	75,000
24,500		151,000	75,000
25,000	63/64	151,000	75,000
25,400	1	156,000	78,000
27,500		162,000	81,000
28,500		168,000	84,000
29,370	1 5/32	168,000	84,000
29,500		168,000	84,000
30,000		168,000	84,000
30,160	1 3/16	174,000	87,000



Brocas helicoidais extras curtas



Material de corte **HSS**

Superfície **F**

Sentido de corte **R**

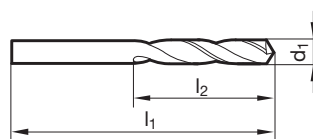
P • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
• para tornos automáticos/revólver • também para furadeiras manuais

- M**
- K** •
- N** • materiais de paredes finas
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 772

Brocas helicoidais com haste cilíndrica



Nr. do artigo **2460**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
2,000		38,000	12,000
2,200		40,000	13,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,900		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,700		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000

d1		l1	l2
mm	inch	mm	mm
6,200		70,000	31,000
6,300		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,800		74,000	34,000
7,100		74,000	34,000
7,300		74,000	34,000
7,500		74,000	34,000
7,800		79,000	37,000
8,300		79,000	37,000
8,500		79,000	37,000
8,700		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,300		84,000	40,000
9,600		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,500		89,000	43,000
11,200		95,000	47,000
12,200		102,000	51,000
12,300	31/64	102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,500		107,000	54,000
14,500		111,000	56,000
15,000		111,000	56,000



Brocas helicoidais extras curtas



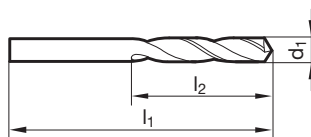
Material de corte	HSS
Superfície	
Sentido de corte	

- P** • Redução da aresta transversal ≥ Ø 14,050 • afiação de superfície cônica
- para tornos automáticos/revólver
- M**
- K** •
- N** ○ materiais de paredes finas
- S**
- H**

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 772



Nr. do artigo **226**

d1		l1	l2
mm	inch	mm	mm
0,320		19,000	2,000
0,500		20,000	3,000
0,550		21,000	3,500
0,580		21,000	3,500
0,620		22,000	4,000
0,650		22,000	4,000
0,700		23,000	4,500
0,740		23,000	4,500
0,750		23,000	4,500
0,800		24,000	5,000
0,810		24,000	5,000
0,850		24,000	5,000
0,875		25,000	5,500
0,890		25,000	5,500
0,900		25,000	5,500
0,950		25,000	5,500
0,970		26,000	6,000
0,975		26,000	6,000
1,000		26,000	6,000
1,020		26,000	6,000
1,030		26,000	6,000
1,040		26,000	6,000
1,050		26,000	6,000
1,060		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,150		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,220		30,000	8,000
1,250		30,000	8,000
1,320		30,000	8,000
1,330		32,000	9,000
1,350		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,550		34,000	10,000
1,580		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000

d1		l1	l2
mm	inch	mm	mm
1,610		34,000	10,000
1,650		34,000	10,000
1,670		34,000	10,000
1,700		34,000	10,000
1,720		36,000	11,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,810		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,940		38,000	12,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,010		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,220		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,360		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,520		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000



d1		l1	l2
mm	inch	mm	mm
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,720		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,870		46,000	16,000
2,880		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,020		49,000	18,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,230		49,000	18,000
3,250		49,000	18,000
3,300		49,000	18,000
3,330		49,000	18,000
3,400		52,000	20,000
3,420		52,000	20,000
3,450		52,000	20,000
3,480		52,000	20,000
3,500		52,000	20,000
3,530		52,000	20,000
3,700		52,000	20,000
3,710		52,000	20,000
3,720		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,770		55,000	22,000
3,800		55,000	22,000
3,840		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,020		55,000	22,000
4,030		55,000	22,000
4,033		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,230		55,000	22,000
4,250		55,000	22,000
4,290		58,000	24,000
4,300		58,000	24,000
4,350		58,000	24,000
4,370	11/64	58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,520		58,000	24,000
4,560		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,920		62,000	26,000
4,930		62,000	26,000
4,950		62,000	26,000
4,970		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000

d1		l1	l2
mm	inch	mm	mm
5,050		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,150		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,450		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,620		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,150		70,000	31,000
6,170		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,540		70,000	31,000
6,550		70,000	31,000
6,570		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
6,920		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,250		74,000	34,000
7,350		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,450		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,550		79,000	37,000
7,700		79,000	37,000
7,750		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,850		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,130	23/64	84,000	40,000
9,150		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,350		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,700		89,000	43,000
9,750		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,050		89,000	43,000
10,080		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,600		89,000	43,000
10,800		95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,250		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,750		95,000	47,000
11,800		95,000	47,000
12,000		102,000	51,000
12,200		102,000	51,000
12,450		102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,900		102,000	51,000
13,000		102,000	51,000
13,200		102,000	51,000
13,250		107,000	54,000
13,750		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,050		111,000	56,000
14,200		111,000	56,000

d1		l1	l2
mm	inch	mm	mm
14,250		111,000	56,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,700		111,000	56,000
15,000		111,000	56,000
15,200		115,000	58,000
15,480	39/64	115,000	58,000
15,600		115,000	58,000
15,750		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,200		119,000	60,000
16,500		119,000	60,000
16,670	21/32	119,000	60,000
17,000		119,000	60,000
17,070	43/64	123,000	62,000
17,750		123,000	62,000
18,000		123,000	62,000
18,500		127,000	64,000
19,050	3/4	131,000	66,000
19,840	25/32	131,000	66,000
20,000		131,000	66,000
20,640	13/16	136,000	68,000
21,000		136,000	68,000
21,250		141,000	70,000
21,750		141,000	70,000
21,830	55/64	141,000	70,000
22,000		141,000	70,000
22,400		141,000	70,000
23,000		146,000	72,000
24,000		151,000	75,000
25,500		156,000	78,000
26,190	1 1/32	156,000	78,000
26,590	1 3/64	162,000	81,000
26,990	1 1/16	162,000	81,000
27,380	1 5/64	162,000	81,000
29,000		168,000	84,000
30,960	1 7/32	174,000	87,000
31,500		174,000	87,000
32,150	1 17/64	180,000	90,000
32,940	1 19/64	180,000	90,000
33,000		180,000	90,000
34,500		186,000	93,000
34,920	1 3/8	186,000	93,000
36,000		193,000	96,000
37,000		193,000	96,000
40,000		200,000	100,000
45,000		214,000	108,000
48,000		228,000	116,000
50,000		228,000	116,000



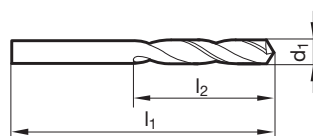
Brocas helicoidais extras curtas

Material de corte **HSS**Superfície **S**Sentido de corte **L**

P • Redução da aresta transversal $\geq \varnothing 2,400$ • afiação de superfície cônica
• para tornos automáticos/revólver

M**K** •**N** ○ materiais de paredes finas**S****H****GÜHRING**NAVIGATOR

Página de dados de corte 772

Nr. do artigo **672**

d1		l1	l2
mm	inch	mm	mm
0,900		25,000	5,500
0,950		25,000	5,500
1,000		26,000	6,000
1,100		28,000	7,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,800		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,550		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,920		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,150		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
4,000		55,000	22,000
4,200		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000

d1		l1	l2
mm	inch	mm	mm
4,900		62,000	26,000
5,000		62,000	26,000
5,200		62,000	26,000
5,600		66,000	28,000
5,700		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,500		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,500		74,000	34,000
7,900		79,000	37,000
8,000		79,000	37,000
8,500		79,000	37,000
8,700		84,000	40,000
8,800		84,000	40,000
9,000		84,000	40,000
9,500		84,000	40,000
9,800		89,000	43,000
10,000		89,000	43,000
11,000		95,000	47,000
11,500		95,000	47,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000



Brocas helicoidais extras curtas



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

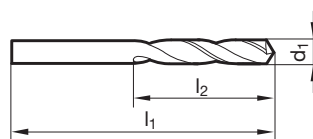
P Redução da aresta transversal ≥ Ø 14,500 • afiação de superfície cônica

- M**
- K**
- N** • materiais duros e quebradiços • latão e ligas de magnésio • bronze e bronze fosforoso • ardósia, mica, pertinax
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 772

Brocas helicoidais com haste cilíndrica



Nr. do artigo **224**

d1		l1	l2
mm	inch	mm	mm
0,690		23,000	4,500
0,900		25,000	5,500
0,950		25,000	5,500
1,000		26,000	6,000
1,100		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,550		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,620		34,000	10,000
1,700		34,000	10,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
2,000		38,000	12,000
2,020		38,000	12,000
2,050		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,250		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,450		43,000	14,000
2,500		43,000	14,000
2,550		43,000	14,000
2,600		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,780	7/64	46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	16,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,850		55,000	22,000
3,900		55,000	22,000
3,970	5/32	55,000	22,000
4,000		55,000	22,000
4,050		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000



d1		l1	l2
mm	inch	mm	mm
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,140	9/32	74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,750		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
9,000		84,000	40,000

d1		l1	l2
mm	inch	mm	mm
9,200		84,000	40,000
9,500		84,000	40,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,320	13/32	89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000
14,000		107,000	54,000
14,500		111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000
17,000		119,000	60,000
18,000		123,000	62,000
19,000		127,000	64,000
20,000		131,000	66,000
21,000		136,000	68,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais extras curtas



Material de corte **HSS**

Superfície

Sentido de corte

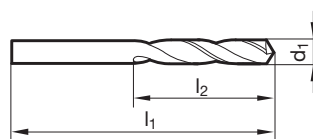
P Redução da aresta transversal $\geq \varnothing 15,000$ • afiação de superfície cônica

- M**
- K**
- N** • para materiais duros e quebradiços • latão e ligas de magnésio • bronze e bronze fosforoso • ardósia, mica, pertinax
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 772

Brocas helicoidais com haste cilíndrica



Nr. do artigo **227**

d1		l1	l2
mm	inch	mm	mm
0,750		23,000	4,500
1,040		26,000	6,000
1,150		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,350		32,000	9,000
1,540		34,000	10,000
1,590	1/16	34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
2,100		38,000	12,000
2,150		40,000	13,000
2,200		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,480		43,000	14,000
2,500		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,780	7/64	46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,970	5/32	55,000	22,000
4,100		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,600		58,000	24,000

d1		l1	l2
mm	inch	mm	mm
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,150		62,000	26,000
5,160	13/64	62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,600		70,000	31,000
6,750	17/64	74,000	34,000
7,000		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,750		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,500		79,000	37,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
9,130	23/64	84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,320	13/32	89,000	43,000
10,720	27/64	95,000	47,000



d1		l1	l2
mm	inch	mm	mm
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,510	29/64	95,000	47,000
11,910	15/32	102,000	51,000
13,500		107,000	54,000
15,000		111,000	56,000

d1		l1	l2
mm	inch	mm	mm
22,200		141,000	70,000
24,000		151,000	75,000



Brocas helicoidais extras curtas



Material de corte **HSS**

Superfície

Sentido de corte

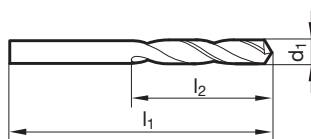
P Redução da aresta transversal $\geq \varnothing 2,380$ • afiação de superfície cônica

- M**
- K**
- N** • materiais moles com cavacos longos • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • plásticos moles, madeira
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 772

Brocas helicoidais com haste cilíndrica



Nr. do artigo **225**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
1,980	5/64	38,000	12,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,250		40,000	13,000
2,300		40,000	13,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,500		43,000	14,000
2,550		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
3,970	5/32	55,000	22,000

d1		l1	l2
mm	inch	mm	mm
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,560	7/32	66,000	28,000
5,700		66,000	28,000
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,300		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,800		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,200		79,000	37,000



d1		l1	l2
mm	inch	mm	mm
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,730		84,000	40,000
8,900	11/32	84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,400		84,000	40,000
9,520	3/8	89,000	43,000
9,800		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,500		89,000	43,000

d1		l1	l2
mm	inch	mm	mm
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
12,000		102,000	51,000
12,100		102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
14,500		111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000
17,500		123,000	62,000
18,000	3/4	123,000	62,000
19,050		131,000	66,000
19,750		131,000	66,000
20,000		131,000	66,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais extras curtas



Material de corte **HSS**

Superfície

Sentido de corte

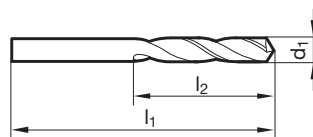
P Redução da aresta transversal $\geq \varnothing 2,380$ • afiação de superfície cônica

- M**
- K**
- N** • materiais moles com cavacos longos • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • plásticos moles, madeira
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 772

Brocas helicoidais com haste cilíndrica



Nr. do artigo **228**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,150		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
1,980	5/64	38,000	12,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,420		43,000	14,000
2,500		43,000	14,000
2,570		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,780	7/64	46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
2,920		46,000	16,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,970	5/32	55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000

d1		l1	l2
mm	inch	mm	mm
4,200		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,100		62,000	26,000
5,160	13/64	62,000	26,000
5,200		62,000	26,000
5,400		66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,950	15/64	66,000	28,000
6,100		70,000	31,000
6,150		70,000	31,000
6,350	1/4	70,000	31,000
6,500		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,140	9/32	74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,800		79,000	37,000
7,940	5/16	79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,730	11/32	84,000	40,000
9,000		84,000	40,000
9,130	23/64	84,000	40,000
9,500		84,000	40,000
9,920	25/64	89,000	43,000
10,320	13/32	89,000	43,000



d1		l1	l2
mm	inch	mm	mm
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,910	15/32	102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
13,500		107,000	54,000
14,000		107,000	54,000

d1		l1	l2
mm	inch	mm	mm
14,500		111,000	56,000
14,700		111,000	56,000
15,000		111,000	56,000
15,500		115,000	58,000
16,500		119,000	60,000
18,000		123,000	62,000
20,000		131,000	66,000



Brocas helicoidais extras curtas



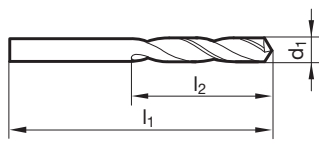
- P** ● Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- para aços de alta resistência • brilhante $< 2,36$ mm
- M** ○
- K** ○
- N** ● aços para máquinas automáticas • aços resistentes a corrosão e ácidos
- aços para cementação-/beneficiamento até 800 N/mm² • ligas de Al e Cu com cavacos curtos e médios
- S** ○
- H** ○

Material de corte	HSS
Superfície	$\geq \varnothing 16,0$
Sentido de corte	R

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 772



Nr. do artigo **552**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,020		26,000	6,000
1,040		26,000	6,000
1,050		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,150		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,250		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000
1,400		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,530		34,000	10,000
1,550		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,820		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950	5/64	38,000	12,000
1,980		38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,130		40,000	13,000

d1		l1	l2
mm	inch	mm	mm
2,150		40,000	13,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,320		40,000	13,000
2,350		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000



d1		l1	l2
mm	inch	mm	mm
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,550		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,800		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,350		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,550		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,050		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000

d1		l1	l2
mm	inch	mm	mm
6,000		66,000	28,000
6,040		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
10,500		89,000	43,000
10,600		89,000	43,000
10,720	27/64	95,000	47,000
10,800		95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,300		95,000	47,000
11,400		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,800		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,400		102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,900		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,890	35/64	107,000	54,000

d1		l1	l2
mm	inch	mm	mm
14,000		107,000	54,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,680	37/64	111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,480	39/64	115,000	58,000
15,500		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,270	41/64	119,000	60,000
16,500		119,000	60,000
17,000		119,000	60,000
17,070	43/64	123,000	62,000
17,460	11/16	123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,260	23/32	127,000	64,000
19,000		127,000	64,000
19,050	3/4	131,000	66,000
19,840	25/32	131,000	66,000
20,000		131,000	66,000



Brocas helicoidais extras curtas

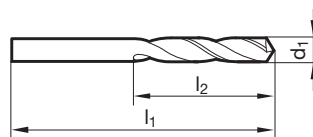


Material de corte	HSS
Superfície	$\geq \frac{\sigma}{16.0}$
Sentido de corte	(L)

- P** ● Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- para aços de alta resistência • brilhante < 2,36 mm
- M** ○
- K** ○
- N** ● aços para máquinas automáticas • aços resistentes a corrosão e ácidos
- aços para cementação-/beneficiamento até 800 N/mm² • ligas de Al e Cu com cavacos curtos e médios
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 772



Brocas helicoidais com haste cilíndrica

Nr. do artigo **553**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,020		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,150		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,250		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000
1,400		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,550		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000

d1		l1	l2
mm	inch	mm	mm
2,350		40,000	13,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,650		52,000	20,000
3,660		52,000	20,000
3,680		52,000	20,000
3,700		52,000	20,000
3,750		52,000	20,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
3,800		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,550		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000

d1		l1	l2
mm	inch	mm	mm
7,030		74,000	34,000
7,140	9/32	74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,200		79,000	37,000
8,330	21/64	79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,730	11/32	84,000	40,000
8,840		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,130	23/64	84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,700		95,000	47,000
10,720	27/64	95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,100		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,800		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,250		111,000	56,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,680	37/64	111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,480	39/64	115,000	58,000
15,500		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,270	41/64	119,000	60,000



d1		l1	l2
mm	inch	mm	mm
17,070	43/64	123,000	62,000
17,460	11/16	123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,260	23/32	127,000	64,000
18,500		127,000	64,000

d1		l1	l2
mm	inch	mm	mm
18,650	47/64	127,000	64,000
19,000		127,000	64,000
19,500		131,000	66,000
19,840	25/32	131,000	66,000



Brocas helicoidais extras curtas



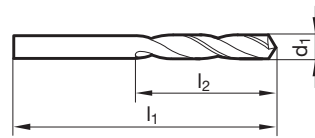
- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** •
- K** •
- N** ○ aços resistentes a corrosão e ácidos • aços para molas • aços austeníticos • Hastelloy, Inconel, Nimonic
- S** •
- H** ○

Material de corte	HSCO
Superfície	
Sentido de corte	

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 772



Nr. do artigo **329**

d1		l1	l2
mm	inch	mm	mm
0,400	1/64	19,000	2,500
0,500		20,000	3,000
0,510		20,000	3,000
0,520		20,000	3,000
0,550		21,000	3,500
0,570		21,000	3,500
0,580		21,000	3,500
0,590		21,000	3,500
0,600		21,000	3,500
0,610		22,000	4,000
0,640		22,000	4,000
0,650		22,000	4,000
0,700		23,000	4,500
0,730		23,000	4,500
0,740		23,000	4,500
0,750		23,000	4,500
0,790	1/32	24,000	5,000
0,800		24,000	5,000
0,810		24,000	5,000
0,820		24,000	5,000
0,840		24,000	5,000
0,850		24,000	5,000
0,860		25,000	5,500
0,870		25,000	5,500
0,900		25,000	5,500
0,910		25,000	5,500
0,940		25,000	5,500
0,950		25,000	5,500
0,960		26,000	6,000
0,970		26,000	6,000
0,990		26,000	6,000
1,000		26,000	6,000
1,020		26,000	6,000
1,030		26,000	6,000
1,050		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,150		28,000	7,000
1,170		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000

d1		l1	l2
mm	inch	mm	mm
1,200		30,000	8,000
1,210		30,000	8,000
1,230		30,000	8,000
1,250		30,000	8,000
1,280		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,330		32,000	9,000
1,350		32,000	9,000
1,370		32,000	9,000
1,400		32,000	9,000
1,450		32,000	9,000
1,470		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,550		34,000	10,000
1,570		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,630		34,000	10,000
1,650		34,000	10,000
1,680		34,000	10,000
1,700		34,000	10,000
1,730		36,000	11,000
1,750		36,000	11,000
1,780		36,000	11,000
1,800		36,000	11,000
1,820		36,000	11,000
1,830		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,950		38,000	12,000
1,970		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,030		38,000	12,000
2,050		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000



d1		l1	l2
mm	inch	mm	mm
2,100		38,000	12,000
2,150		40,000	13,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,320		40,000	13,000
2,350		40,000	13,000
2,360		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,420		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,470		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,520		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,650		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,750		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,830		46,000	16,000
2,850		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,020		49,000	18,000
3,050		49,000	18,000
3,100		49,000	18,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,520		52,000	20,000
3,550		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,750		52,000	20,000
3,800		55,000	22,000
3,850		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,950		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000

d1		l1	l2
mm	inch	mm	mm
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,350		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,450		58,000	24,000
4,500		58,000	24,000
4,550		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,750		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,950		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,020		62,000	26,000
5,050		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,150		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,250		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,350		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,450		66,000	28,000
5,500		66,000	28,000
5,550		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,850		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,320		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,450		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,550		70,000	31,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,850		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,050		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,250		74,000	34,000
7,300		74,000	34,000
7,350		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,550		79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,750		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,050		79,000	37,000
8,100		79,000	37,000
8,150		79,000	37,000
8,200		79,000	37,000
8,250		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,520		84,000	40,000
8,550		84,000	40,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,750		84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,050		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,250		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,750		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,050		89,000	43,000

d1		l1	l2
mm	inch	mm	mm
10,080		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,400		89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,600		89,000	43,000
10,700		95,000	47,000
10,720	27/64	95,000	47,000
10,800		95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,100		95,000	47,000
11,110	7/16	95,000	47,000
11,200		95,000	47,000
11,250		95,000	47,000
11,300		95,000	47,000
11,400		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,600		95,000	47,000
11,700		95,000	47,000
11,800		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,100		102,000	51,000
12,200		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,600		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
12,900		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,200		102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
13,600		107,000	54,000
13,750		107,000	54,000
13,800		107,000	54,000
13,890	35/64	107,000	54,000
14,000		107,000	54,000
14,200		111,000	56,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
14,680	37/64	111,000	56,000
14,750		111,000	56,000
15,000		111,000	56,000
15,080	19/32	115,000	58,000
15,480	39/64	115,000	58,000
15,500		115,000	58,000
15,870	5/8	115,000	58,000
16,000		115,000	58,000
16,200		119,000	60,000
16,270	41/64	119,000	60,000
16,500		119,000	60,000
16,670	21/32	119,000	60,000
17,000		119,000	60,000
17,070	43/64	123,000	62,000
17,460	11/16	123,000	62,000
17,500		123,000	62,000
17,860	45/64	123,000	62,000
18,000		123,000	62,000
18,500		127,000	64,000
18,650	47/64	127,000	64,000
19,000		127,000	64,000
19,050	3/4	131,000	66,000
19,450	49/64	131,000	66,000
19,500		131,000	66,000



d1		l1	l2
mm	inch	mm	mm
19,840	25/32	131,000	66,000
20,000		131,000	66,000
20,250		136,000	68,000
20,500	13/16	136,000	68,000
20,640		136,000	68,000
21,000		136,000	68,000
22,000		141,000	70,000
22,200	63/64	141,000	70,000
23,000		146,000	72,000
24,000		151,000	75,000
24,500		151,000	75,000
25,000		151,000	75,000

d1		l1	l2
mm	inch	mm	mm
25,400	1	156,000	78,000
25,500		156,000	78,000
26,000		156,000	78,000
28,000		162,000	81,000
48,000		228,000	116,000



Brocas helicoidais extras curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** •
- K** •
- N** ○ aços resistentes a corrosão e ácidos • aços para molas • aços austeníticos • Hastelloy, Inconel, Nimonic
- S** •
- H** ○

Material de corte **HSCO**

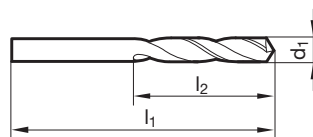
Superfície **S**

Sentido de corte **R**

Brocas helicoidais com haste cilíndrica

GÜHRINGNAVIGATOR

Página de dados de corte 774



Nr. do artigo **659**

d1		l1	l2
mm	inch	mm	mm
0,500		20,000	3,000
0,600		21,000	3,500
0,650		22,000	4,000
0,700		23,000	4,500
0,740		23,000	4,500
0,750		23,000	4,500
0,780		24,000	5,000
0,790	1/32	24,000	5,000
0,800		24,000	5,000
0,850		24,000	5,000
0,900		25,000	5,500
0,950		25,000	5,500
1,000		26,000	6,000
1,020		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,150		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,250		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,400		32,000	9,000
1,450		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,530		34,000	10,000
1,550		34,000	10,000
1,570		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,700		34,000	10,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,970		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000

d1		l1	l2
mm	inch	mm	mm
2,000		38,000	12,000
2,050		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,250		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,350		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,450		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,550		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,780	7/64	46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,850		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,030		49,000	18,000
3,050		49,000	18,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,250		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,350		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000



d1		l1	l2
mm	inch	mm	mm
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,800		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,050		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,150		55,000	22,000
4,200		55,000	22,000
4,250		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,160	13/64	62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,050		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000

d1		l1	l2
mm	inch	mm	mm
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,250		89,000	43,000
10,320	13/32	89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
10,800		95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
12,000		102,000	51,000
12,100		102,000	51,000
12,200		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
12,800		102,000	51,000
13,000		102,000	51,000
13,300		107,000	54,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
14,000		107,000	54,000
14,290	9/16	111,000	56,000
14,500		111,000	56,000
15,000		111,000	56,000
15,500		115,000	58,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais extras curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** •
- K** •
- N** ○ aços resistentes a corrosão e ácidos • aços para molas • aços austeníticos • Hastelloy, Inconel, Nimonic
- S** •
- H** ○

Material de corte **HSCO**

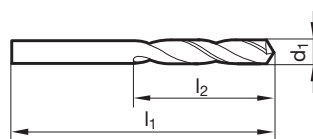
Superfície **F**

Sentido de corte **R**

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 774



Nr. do artigo **2461**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
4,000		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000

d1		l1	l2
mm	inch	mm	mm
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,600		66,000	28,000
5,800		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,800		79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
9,000		84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,500		84,000	40,000
9,800		89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,500		89,000	43,000
11,000		95,000	47,000
11,500		95,000	47,000
12,000		102,000	51,000
13,000		102,000	51,000



Brocas helicoidais extras curtas

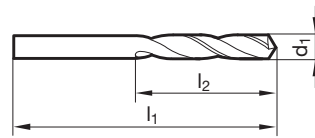


- P** • Redução da aresta transversal $\geq \varnothing 2,370$ • afiação de superfície cônica
- M** •
- K** •
- N** ○ aços resistentes a corrosão e ácidos • aços para molas • aços austeníticos • Hastelloy, Inconel, Nimonic
- S** •
- H** ○

Material de corte	HSCO
Superfície	$\frac{0,063}{6,00}$
Sentido de corte	

GÜHRING NAVIGATOR

Página de dados de corte 772



Brocas helicoidais com haste cilíndrica

Nr. do artigo **330**

d1		l1	l2
mm	inch	mm	mm
0,450		19,000	2,500
0,500		20,000	3,000
0,620		22,000	4,000
0,700		23,000	4,500
0,710		23,000	4,500
0,750		23,000	4,500
0,800		24,000	5,000
0,900		25,000	5,500
1,000		26,000	6,000
1,030		26,000	6,000
1,040		26,000	6,000
1,050		26,000	6,000
1,060		26,000	6,000
1,090		28,000	7,000
1,150		28,000	7,000
1,170		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,210		30,000	8,000
1,220		30,000	8,000
1,230		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,350		32,000	9,000
1,420		32,000	9,000
1,450		32,000	9,000
1,470		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,530		34,000	10,000
1,550		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,650		34,000	10,000
1,700		34,000	10,000
1,780		36,000	11,000
1,800		36,000	11,000
1,930		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000

d1		l1	l2
mm	inch	mm	mm
2,000		38,000	12,000
2,020		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,440		43,000	14,000
2,500		43,000	14,000
2,550		43,000	14,000
2,600		43,000	14,000
2,640		43,000	14,000
2,750		46,000	16,000
2,770		46,000	16,000
2,780	7/64	46,000	16,000
2,820		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,150		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,860		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,570		58,000	24,000
4,620		58,000	24,000
4,760	3/16	62,000	26,000
4,850		62,000	26,000
4,920		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,750		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,050		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,370		74,000	34,000
7,490		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,700		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,330	21/64	79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,610		84,000	40,000

d1		l1	l2
mm	inch	mm	mm
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,700		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,260		89,000	43,000
10,490		89,000	43,000
10,720	27/64	95,000	47,000
10,900		95,000	47,000
11,000		95,000	47,000
11,100		95,000	47,000
11,200		95,000	47,000
11,300		95,000	47,000
11,510	29/64	95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,400		102,000	51,000
13,000		102,000	51,000
13,500		107,000	54,000
14,000		107,000	54,000
14,700		111,000	56,000
15,100		115,000	58,000
15,500		115,000	58,000
16,000		115,000	58,000
19,500		131,000	66,000
19,750		131,000	66,000
22,500		146,000	72,000
23,500		146,000	72,000
24,000		151,000	75,000
25,000	63/64	151,000	75,000
25,500		156,000	78,000
26,000		156,000	78,000
27,000		162,000	81,000
32,000		180,000	90,000



Brocas helicoidais extras curtas



Material de corte **HSCO**

Superfície **S**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
• aço-HSS ligado com Co • alta resistência ao desgaste

M ○

K ○

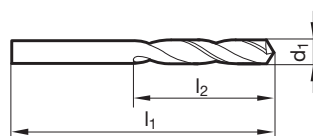
N ○ para aços de alta resistência • materiais com cavacos longos até 1000 N/mm² • ligas de Al e cobre • bronze mole • cobre eletrolítico • latão tenaz

S

H

GÜHRING NAVIGATOR

Página de dados de corte 774



Brocas helicoidais com haste cilíndrica

Nr. do artigo **1228**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
3,970	5/32	55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000

d1		l1	l2
mm	inch	mm	mm
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,160	13/64	62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,800		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,500		79,000	37,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch		
8,600		84,000	40,000
8,700		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,320	13/32	89,000	43,000
10,500		89,000	43,000
11,000		95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,800		95,000	47,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000

d1		l1	l2
mm	inch		
12,800		102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
14,000		107,000	54,000
14,500		111,000	56,000
15,000		111,000	56,000
15,500		115,000	58,000
16,000		115,000	58,000
16,500		119,000	60,000
17,000		119,000	60,000
17,500		123,000	62,000
18,000		123,000	62,000
18,500		127,000	64,000
19,000		127,000	64,000
20,000		131,000	66,000



Brocas helicoidais extras curtas



Material de corte **HSCO**

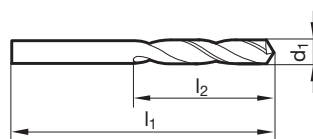
Superfície **F**

Sentido de corte **R**

- P** ● Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- aço-HSS ligado com Co • resistência ao desgaste ampliada
- M** ○
- K** ○
- N** ○ materiais com cavacos longos até 1000 N/mm² • ligas de Al e cobre
- bronze mole • cobre eletrolítico • latão tenaz
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 774



Brocas helicoidais com haste cilíndrica

Nr. do artigo **2498**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,200		30,000	8,000
1,300		30,000	8,000
1,500		32,000	9,000
1,600		34,000	10,000
1,800		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,500		66,000	28,000

d1		l1	l2
mm	inch	mm	mm
5,600		66,000	28,000
6,000		66,000	28,000
6,200		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
8,000		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
9,000		84,000	40,000
9,300		84,000	40,000
9,500		84,000	40,000
10,000		89,000	43,000
10,200		89,000	43,000
10,500		89,000	43,000
10,800		95,000	47,000
11,000		95,000	47,000
11,800		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000
13,500		107,000	54,000
14,000		107,000	54,000
14,500		111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000



Brocas helicoidais extras curtas



- P** ○ afiação de superfície cônica • aço-HSS ligado com Co • resistência ao desgaste ampliada
- M** ●
- K** ●
- N** ○ aços austeníticos resistentes a corrosão-/ácidos-/calor (V2A e V4A)
- S** ○
- H** ●

Material de corte **HSCO**

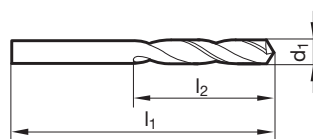
Superfície ○

Sentido de corte

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 772



Nr. do artigo **1261**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,500		32,000	9,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,700		34,000	10,000
1,900		36,000	11,000
2,000		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,500		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,500		66,000	28,000
5,600		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000

d1		l1	l2
mm	inch	mm	mm
6,100		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,300		84,000	40,000
9,500		84,000	40,000
9,900		89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,900		95,000	47,000
11,500		95,000	47,000
12,000		102,000	51,000



Brocas helicoidais extras curtas



- P** ○ Redução da aresta transversal $\geq \varnothing 1,000$ • afiação em cruz otimizada
• aço-HSS ligado com Co • resistência ao desgaste ampliada
- M** ●
- K** ○
- N** ○ aços austeníticos resistentes a corrosão-/ácidos-/calor (V2A e V4A)
• ligas especiais
- S** ●
- H** ●

Material de corte **HSCO**

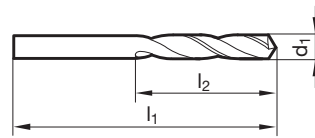
Superfície **S**

Sentido de corte **R**



GÜHRING NAVIGATOR

Página de dados de corte 774



Nr. do artigo **572**

Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000

d1		l1	l2
mm	inch	mm	mm
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,550		66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,450		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000



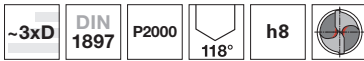
d1		l1	l2
mm	inch	mm	mm
9,100		84,000	40,000
9,200		84,000	40,000
9,250		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000

d1		l1	l2
mm	inch	mm	mm
10,500		89,000	43,000
11,000		95,000	47,000
11,200		95,000	47,000
11,500		95,000	47,000
11,800		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais extras curtas

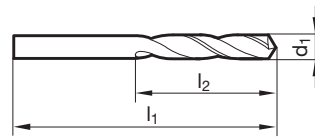


- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** ○ aplicação universal com afiação ondulada • aço-HSS ligado com Co
- K** ○ resistência ao desgaste ampliada • para a utilização profissional em montagens • também para furadeiras manuais
- N** ○ aços com cavacos longos até 1000 N/mm² • fundição e ligas-AISI
- S** ○
- H** ○

Material de corte	HSCO
Superfície	M
Sentido de corte	R

GÜHRING NAVIGATOR

Página de dados de corte 774



Brocas helicoidais com haste cilíndrica

Nr. do artigo **2048**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000

d1		l1	l2
mm	inch	mm	mm
5,800		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000



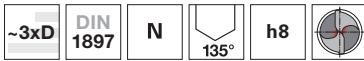
d1		l1	l2
mm	inch	mm	mm
10,500		89,000	43,000
11,500		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000

d1		l1	l2
mm	inch	mm	mm

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais extras curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** ○ alta proporção de Co e Mo • especialmente alta resistência ao desgaste
- K** ○
- N** • ligas de alta resistência a base de CrNi • Hastelloy, Inconel, Nimonic
- S** • aços resistentes a corrosão-ácidos-/calor • chapas resistentes ao desgaste • aços/bronzes até 1400 N/mm²
- H** ○

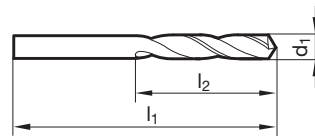
Material de corte **M42**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 772



Brocas helicoidais com haste cilíndrica

Nr. do artigo **1259**

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,780	7/64	46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
3,970	5/32	55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000

d1		l1	l2
mm	inch	mm	mm
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,800		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,800		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000



d1		l1	l2
mm	inch	mm	mm
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
9,000		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,500		89,000	43,000
11,000		95,000	47,000

d1		l1	l2
mm	inch	mm	mm
11,500		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000
14,000		107,000	54,000
15,000		111,000	56,000
15,870	5/8	115,000	58,000

Brocas helicoidais com haste cilíndrica



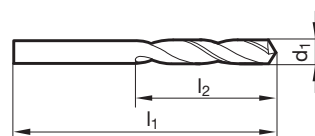
Brocas helicoidais extras curtas



P ●	Redução da aresta transversal $\geq \varnothing 1,000$ • geometria da ponta aliviada por uma redução do núcleo especial tipo B • PM HSS ligado com Co
M ○	• especialmente com alta estabilidade • especialmente alta resistência ao desgaste
K ●	
N ○	materiais de alta resistência, aços de alta liga • aços para beneficiamento e cementação • ferro fundido, latão, bronze
S ○	
H ○	

GÜHRING NAVIGATOR

Página de dados de corte 774

Material de corte **HSS-E-PM**Superfície **F**Sentido de corte **R**

Nr. do artigo

515

d1		l1	l2
mm	inch	mm	mm
1,000		26,000	6,000
1,020		26,000	6,000
1,040		26,000	6,000
1,070		28,000	7,000
1,090		28,000	7,000
1,100		28,000	7,000
1,180		28,000	7,000
1,190	3/64	30,000	8,000
1,200		30,000	8,000
1,300		30,000	8,000
1,320		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,510		34,000	10,000
1,590	1/16	34,000	10,000
1,600		34,000	10,000
1,610		34,000	10,000
1,700		34,000	10,000
1,780		36,000	11,000
1,800		36,000	11,000
1,850		36,000	11,000
1,900		36,000	11,000
1,930		38,000	12,000
1,980	5/64	38,000	12,000
1,990		38,000	12,000
2,000		38,000	12,000
2,060		38,000	12,000
2,080		38,000	12,000
2,100		38,000	12,000
2,180		40,000	13,000
2,200		40,000	13,000
2,260		40,000	13,000
2,300		40,000	13,000
2,370		43,000	14,000
2,380	3/32	43,000	14,000
2,400		43,000	14,000
2,440		43,000	14,000
2,490		43,000	14,000
2,500		43,000	14,000
2,530		43,000	14,000
2,580		43,000	14,000
2,600		43,000	14,000

d1		l1	l2
mm	inch	mm	mm
2,640		43,000	14,000
2,700		46,000	16,000
2,710		46,000	16,000
2,780	7/64	46,000	16,000
2,790		46,000	16,000
2,800		46,000	16,000
2,820		46,000	16,000
2,870		46,000	16,000
2,900		46,000	16,000
2,950		46,000	16,000
3,000		46,000	16,000
3,050		49,000	18,000
3,100		49,000	18,000
3,170	1/8	49,000	18,000
3,200		49,000	18,000
3,260		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,450		52,000	20,000
3,500		52,000	20,000
3,570	9/64	52,000	20,000
3,600		52,000	20,000
3,660		52,000	20,000
3,700		52,000	20,000
3,730		52,000	20,000
3,800		55,000	22,000
3,860		55,000	22,000
3,900		55,000	22,000
3,910		55,000	22,000
3,970	5/32	55,000	22,000
3,990		55,000	22,000
4,000		55,000	22,000
4,040		55,000	22,000
4,090		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,220		55,000	22,000
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000



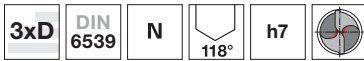
Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,650		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000

d1		l1	l2
mm	inch	mm	mm
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,350		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,800		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000
13,100	33/64	102,000	51,000
13,490	17/32	107,000	54,000
13,500		107,000	54,000
14,000		107,000	54,000
14,290	9/16	111,000	56,000



Brocas helicoidais extras curtas

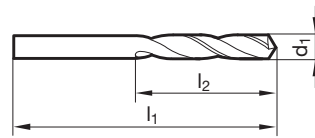


Material de corte	MD int.
Superfície	○
Sentido de corte	Ⓜ

- P** ○ Redução da aresta transversal ≥ Ø 2,060 • afiação facetada • formato reto da aresta de corte principal
- M** ○
- K** ○
- N** ● aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • ferro fundido cinzento • bronze, latão
- S** ○ • alumínio e ligas de alumínio • magnésio e ligas de magnésio • plásticos e plásticos reforçados com fibra
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 776



Brocas helicoidais com haste cilíndrica

Nr. do artigo **730**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		20,000	3,000	2,440		43,000	14,000
0,600		21,000	3,500	2,490		43,000	14,000
0,700		23,000	4,500	2,500		43,000	14,000
0,800		24,000	5,000	2,530		43,000	14,000
0,900		25,000	5,500	2,580		43,000	14,000
1,000		26,000	6,000	2,600		43,000	14,000
1,020		26,000	6,000	2,640		43,000	14,000
1,040		26,000	6,000	2,700		46,000	16,000
1,070		28,000	7,000	2,710		46,000	16,000
1,090		28,000	7,000	2,780	7/64	46,000	16,000
1,100		28,000	7,000	2,790		46,000	16,000
1,180		28,000	7,000	2,800		46,000	16,000
1,190	3/64	30,000	8,000	2,820		46,000	16,000
1,200		30,000	8,000	2,870		46,000	16,000
1,300		30,000	8,000	2,900		46,000	16,000
1,320		30,000	8,000	2,950		46,000	16,000
1,400		32,000	9,000	3,000		46,000	16,000
1,500		32,000	9,000	3,050		49,000	18,000
1,510		34,000	10,000	3,100		49,000	18,000
1,590	1/16	34,000	10,000	3,170	1/8	49,000	18,000
1,600		34,000	10,000	3,200		49,000	18,000
1,610		34,000	10,000	3,260		49,000	18,000
1,700		34,000	10,000	3,300		49,000	18,000
1,780		36,000	11,000	3,400		52,000	20,000
1,800		36,000	11,000	3,450		52,000	20,000
1,850		36,000	11,000	3,500		52,000	20,000
1,900		36,000	11,000	3,570	9/64	52,000	20,000
1,930		38,000	12,000	3,600		52,000	20,000
1,980	5/64	38,000	12,000	3,660		52,000	20,000
1,990		38,000	12,000	3,700		52,000	20,000
2,000		38,000	12,000	3,730		52,000	20,000
2,060		38,000	12,000	3,800		55,000	22,000
2,080		38,000	12,000	3,860		55,000	22,000
2,100		38,000	12,000	3,900		55,000	22,000
2,180		40,000	13,000	3,910		55,000	22,000
2,200		40,000	13,000	3,970	5/32	55,000	22,000
2,250		40,000	13,000	3,990		55,000	22,000
2,260		40,000	13,000	4,000		55,000	22,000
2,300		40,000	13,000	4,040		55,000	22,000
2,370		43,000	14,000	4,100		55,000	22,000
2,380	3/32	43,000	14,000	4,200		55,000	22,000
2,400		43,000	14,000	4,220		55,000	22,000



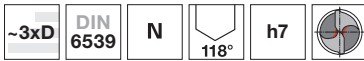
Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,300		58,000	24,000
4,370	11/64	58,000	24,000
4,390		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,490		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000

d1		l1	l2
mm	inch	mm	mm
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,700		95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,500		102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000
13,490	17/32	107,000	54,000
14,000		107,000	54,000
14,290	9/16	111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000



Brocas helicoidais extras curtas



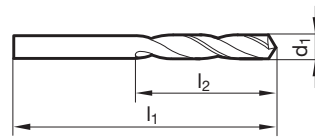
- P** ○ Redução da aresta transversal $\geq \varnothing 2,060$ • afiação facetada • formato reto da aresta de corte principal
- M** ○
- K** ○
- N** ● aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • materiais fundidos • latão • todos materiais com alto teor-SI • magnésio e ligas de magnésio • plásticos e plásticos reforçados com fibra
- S** ○
- H** ○

Material de corte	MD int.
Superfície	F
Sentido de corte	R

GÜHRING NAVIGATOR

Página de dados de corte 776

Brocas helicoidais com haste cilíndrica



Nr. do artigo **2463**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		26,000	6,000	2,600		43,000	14,000
1,020		26,000	6,000	2,640		43,000	14,000
1,040		26,000	6,000	2,700		46,000	16,000
1,070		28,000	7,000	2,710		46,000	16,000
1,090		28,000	7,000	2,780	7/64	46,000	16,000
1,100		28,000	7,000	2,790		46,000	16,000
1,180		28,000	7,000	2,800		46,000	16,000
1,190	3/64	30,000	8,000	2,820		46,000	16,000
1,200		30,000	8,000	2,870		46,000	16,000
1,300		30,000	8,000	2,900		46,000	16,000
1,320		30,000	8,000	2,950		46,000	16,000
1,400		32,000	9,000	3,000		46,000	16,000
1,500		32,000	9,000	3,050		49,000	18,000
1,510		34,000	10,000	3,100		49,000	18,000
1,590	1/16	34,000	10,000	3,170	1/8	49,000	18,000
1,600		34,000	10,000	3,200		49,000	18,000
1,610		34,000	10,000	3,260		49,000	18,000
1,700		34,000	10,000	3,300		49,000	18,000
1,780		36,000	11,000	3,400		52,000	20,000
1,800		36,000	11,000	3,450		52,000	20,000
1,850		36,000	11,000	3,500		52,000	20,000
1,900		36,000	11,000	3,570	9/64	52,000	20,000
1,930		38,000	12,000	3,600		52,000	20,000
1,980	5/64	38,000	12,000	3,660		52,000	20,000
1,990		38,000	12,000	3,700		52,000	20,000
2,000		38,000	12,000	3,730		52,000	20,000
2,060		38,000	12,000	3,800		55,000	22,000
2,080		38,000	12,000	3,860		55,000	22,000
2,100		38,000	12,000	3,900		55,000	22,000
2,180		40,000	13,000	3,910		55,000	22,000
2,200		40,000	13,000	3,970	5/32	55,000	22,000
2,250		40,000	13,000	3,990		55,000	22,000
2,260		40,000	13,000	4,000		55,000	22,000
2,300		40,000	13,000	4,040		55,000	22,000
2,370		43,000	14,000	4,090		55,000	22,000
2,380	3/32	43,000	14,000	4,100		55,000	22,000
2,400		43,000	14,000	4,200		55,000	22,000
2,440		43,000	14,000	4,220		55,000	22,000
2,490		43,000	14,000	4,300		58,000	24,000
2,500		43,000	14,000	4,370	11/64	58,000	24,000
2,530		43,000	14,000	4,390		58,000	24,000
2,580		43,000	14,000	4,400		58,000	24,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,500		58,000	24,000
4,570		58,000	24,000
4,600		58,000	24,000
4,620		58,000	24,000
4,700		58,000	24,000
4,760	3/16	62,000	26,000
4,800		62,000	26,000
4,850		62,000	26,000
4,900		62,000	26,000
4,920		62,000	26,000
4,980		62,000	26,000
5,000		62,000	26,000
5,060		62,000	26,000
5,100		62,000	26,000
5,110		62,000	26,000
5,160	13/64	62,000	26,000
5,180		62,000	26,000
5,200		62,000	26,000
5,220		62,000	26,000
5,300		62,000	26,000
5,310		66,000	28,000
5,400		66,000	28,000
5,410		66,000	28,000
5,500		66,000	28,000
5,560	7/32	66,000	28,000
5,600		66,000	28,000
5,610		66,000	28,000
5,700		66,000	28,000
5,790		66,000	28,000
5,800		66,000	28,000
5,900		66,000	28,000
5,940		66,000	28,000
5,950	15/64	66,000	28,000
6,000		66,000	28,000
6,040		70,000	31,000
6,100		70,000	31,000
6,150		70,000	31,000
6,200		70,000	31,000
6,250		70,000	31,000
6,300		70,000	31,000
6,350	1/4	70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,530		70,000	31,000
6,600		70,000	31,000
6,630		70,000	31,000
6,700		70,000	31,000
6,750	17/64	74,000	34,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,030		74,000	34,000
7,100		74,000	34,000
7,140	9/32	74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,370		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,540	19/64	79,000	37,000
7,600		79,000	37,000
7,670		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
7,940	5/16	79,000	37,000

d1		l1	l2
mm	inch	mm	mm
8,000		79,000	37,000
8,030		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,330	21/64	79,000	37,000
8,400		79,000	37,000
8,430		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,610		84,000	40,000
8,700		84,000	40,000
8,730	11/32	84,000	40,000
8,800		84,000	40,000
8,840		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,090		84,000	40,000
9,100		84,000	40,000
9,130	23/64	84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,340		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,520	3/8	89,000	43,000
9,580		89,000	43,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
9,920	25/64	89,000	43,000
10,000		89,000	43,000
10,080		89,000	43,000
10,200		89,000	43,000
10,260		89,000	43,000
10,300		89,000	43,000
10,320	13/32	89,000	43,000
10,490		89,000	43,000
10,500		89,000	43,000
10,720	27/64	95,000	47,000
11,000		95,000	47,000
11,110	7/16	95,000	47,000
11,500		95,000	47,000
11,510	29/64	95,000	47,000
11,910	15/32	102,000	51,000
12,000		102,000	51,000
12,300	31/64	102,000	51,000
12,700	1/2	102,000	51,000
13,000		102,000	51,000
13,490	17/32	107,000	54,000
14,000		107,000	54,000
14,290	9/16	111,000	56,000
15,000		111,000	56,000
16,000		115,000	58,000



Brocas helicoidais extras curtas



- P** afiação facetada • formato reto da aresta de corte principal
- M**
- K**
- N** plásticos reforçados com fibras de vidro • duroplásticos com ação abrasiva nos cortes e guias
- S**
- H**

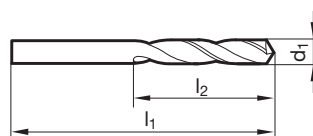
Material de corte **MD int.**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 776



Brocas helicoidais com haste cilíndrica

Nr. do artigo **702**

d1		l1	l2
mm	inch	mm	mm
0,500		30,000	6,500
0,550		30,000	6,500
0,600		30,000	6,500
0,650		30,000	6,500
0,700		30,000	6,500
0,750		30,000	8,500
0,800		30,000	8,500
0,900		30,000	9,500
1,000		30,000	11,000
1,050		30,000	11,000
1,100		30,000	11,000
1,200		30,000	13,000
1,350		30,000	13,000
1,400		30,000	13,000
1,450		30,000	13,000
1,500		30,000	13,000
1,600		40,000	17,500
1,650		40,000	17,500
1,700		40,000	17,500
1,800		40,000	17,500
1,850		40,000	17,500
1,900		40,000	17,500
2,000		40,000	17,500
2,010		40,000	17,500
2,050		40,000	17,500
2,100		40,000	17,500
2,200		40,000	17,500
2,260		40,000	17,500
2,300		40,000	17,500
2,400		40,000	17,500
2,490		40,000	17,500
2,500		40,000	17,500
2,530		45,000	20,000
2,600		45,000	20,000
2,700		45,000	20,000
2,800		45,000	20,000

d1		l1	l2
mm	inch	mm	mm
3,000		45,000	20,000
3,050		50,000	22,000
3,100		50,000	22,000
3,200		50,000	22,000
3,260		50,000	22,000
3,300		50,000	22,000
3,400		50,000	22,000
3,450		50,000	22,000
3,500		50,000	22,000
3,570	9/64	50,000	22,000
3,600		50,000	22,000
3,910		50,000	22,000
4,000		50,000	22,000
4,200		50,000	25,000
4,300		50,000	25,000
4,400		50,000	25,000
4,700		50,000	25,000
5,000		50,000	25,000
5,200		50,000	25,000
5,310		50,000	25,000
5,610		50,000	25,000
5,790		50,000	25,000
5,950	15/64	50,000	25,000
6,000		50,000	25,000
6,250		65,000	30,000
6,350	1/4	65,000	30,000
6,500		65,000	30,000



Brocas espirais curtas



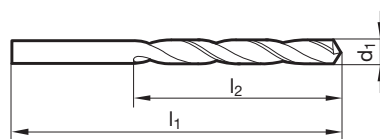
Material de corte	HSS
Superfície	
Sentido de corte	

P •	Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
M	
K •	
N ○	aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
S	
H	

GÜHRING NAVIGATOR

Página de dados de corte 778

Brocas helicoidais com haste cilíndrica



Nr. do artigo **205**

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,210		19,000	2,500
0,220		19,000	2,500
0,230		19,000	2,500
0,240		19,000	2,500
0,250		19,000	3,000
0,260		19,000	3,000
0,270		19,000	3,000
0,280		19,000	3,000
0,290		19,000	3,000
0,300		19,000	3,000
0,310		19,000	4,000
0,320		19,000	4,000
0,330		19,000	4,000
0,340		19,000	4,000
0,350		19,000	4,000
0,360		19,000	4,000
0,370		19,000	4,000
0,380		19,000	4,000
0,390		20,000	5,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,420		20,000	5,000
0,430		20,000	5,000
0,440		20,000	5,000
0,450		20,000	5,000
0,460		20,000	5,000
0,470		20,000	5,000
0,480		20,000	5,000
0,490		22,000	6,000
0,500		22,000	6,000
0,510		22,000	6,000
0,520		22,000	6,000
0,530		22,000	6,000
0,540		24,000	7,000
0,550		24,000	7,000
0,560		24,000	7,000
0,570		24,000	7,000
0,580		24,000	7,000
0,590		24,000	7,000
0,600		24,000	7,000
0,610		26,000	8,000

d1		l1	l2
mm	inch	mm	mm
0,620		26,000	8,000
0,630		26,000	8,000
0,640		26,000	8,000
0,650		26,000	8,000
0,660		26,000	8,000
0,670		26,000	8,000
0,680		28,000	9,000
0,690		28,000	9,000
0,700		28,000	9,000
0,710		28,000	9,000
0,720		28,000	9,000
0,730		28,000	9,000
0,740		28,000	9,000
0,750		28,000	9,000
0,760		30,000	10,000
0,770		30,000	10,000
0,780		30,000	10,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,820		30,000	10,000
0,830		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,880		32,000	11,000
0,890		32,000	11,000
0,900		32,000	11,000
0,910		32,000	11,000
0,920		32,000	11,000
0,930		32,000	11,000
0,940		32,000	11,000
0,950		32,000	11,000
0,960		34,000	12,000
0,970		34,000	12,000
0,980		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,010		34,000	12,000
1,020		34,000	12,000
1,030		34,000	12,000



d1		l1	l2
mm	inch	mm	mm
1,040		34,000	12,000
1,050		34,000	12,000
1,060		34,000	12,000
1,070		36,000	14,000
1,080		36,000	14,000
1,090		36,000	14,000
1,100		36,000	14,000
1,110		36,000	14,000
1,120		36,000	14,000
1,130		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,160		36,000	14,000
1,170		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,220		38,000	16,000
1,230		38,000	16,000
1,240		38,000	16,000
1,250		38,000	16,000
1,260		38,000	16,000
1,270		38,000	16,000
1,280		38,000	16,000
1,290		38,000	16,000
1,300		38,000	16,000
1,310		38,000	16,000
1,320		38,000	16,000
1,330		40,000	18,000
1,340		40,000	18,000
1,350		40,000	18,000
1,360		40,000	18,000
1,370		40,000	18,000
1,380		40,000	18,000
1,390		40,000	18,000
1,400		40,000	18,000
1,410		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,440		40,000	18,000
1,450		40,000	18,000
1,460		40,000	18,000
1,470		40,000	18,000
1,480		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,540		43,000	20,000
1,550		43,000	20,000
1,560		43,000	20,000
1,570		43,000	20,000
1,580		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,630		43,000	20,000
1,640		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,670		43,000	20,000
1,680		43,000	20,000
1,690		43,000	20,000
1,700		43,000	20,000
1,710		46,000	22,000
1,720		46,000	22,000
1,730		46,000	22,000
1,740		46,000	22,000
1,750		46,000	22,000

d1		l1	l2
mm	inch	mm	mm
1,760		46,000	22,000
1,770		46,000	22,000
1,780		46,000	22,000
1,790		46,000	22,000
1,800		46,000	22,000
1,810		46,000	22,000
1,820		46,000	22,000
1,830		46,000	22,000
1,840		46,000	22,000
1,850		46,000	22,000
1,860		46,000	22,000
1,870		46,000	22,000
1,880		46,000	22,000
1,890		46,000	22,000
1,900		46,000	22,000
1,910		49,000	24,000
1,920		49,000	24,000
1,930		49,000	24,000
1,940		49,000	24,000
1,950		49,000	24,000
1,960		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,010		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,040		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,070		49,000	24,000
2,080		49,000	24,000
2,090		49,000	24,000
2,100		49,000	24,000
2,110		49,000	24,000
2,120		49,000	24,000
2,130		53,000	27,000
2,140		53,000	27,000
2,150		53,000	27,000
2,170		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,210		53,000	27,000
2,220		53,000	27,000
2,230		53,000	27,000
2,240		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,270		53,000	27,000
2,280		53,000	27,000
2,290		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,330		53,000	27,000
2,340		53,000	27,000
2,350		53,000	27,000
2,360		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,390		57,000	30,000
2,400		57,000	30,000
2,420		57,000	30,000
2,430		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,460		57,000	30,000
2,470		57,000	30,000
2,480		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,510		57,000	30,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
2,520		57,000	30,000
2,530		57,000	30,000
2,540		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,610		57,000	30,000
2,620		57,000	30,000
2,630		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,660		61,000	33,000
2,670		61,000	33,000
2,680		61,000	33,000
2,700		61,000	33,000
2,710		61,000	33,000
2,720		61,000	33,000
2,730		61,000	33,000
2,750		61,000	33,000
2,760		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,830		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,880		61,000	33,000
2,900		61,000	33,000
2,910		61,000	33,000
2,920		61,000	33,000
2,930		61,000	33,000
2,940		61,000	33,000
2,950		61,000	33,000
2,960		61,000	33,000
2,970		61,000	33,000
2,980		61,000	33,000
2,990		61,000	33,000
3,000		61,000	33,000
3,010		65,000	36,000
3,020		65,000	36,000
3,030		65,000	36,000
3,040		65,000	36,000
3,050		65,000	36,000
3,060		65,000	36,000
3,070		65,000	36,000
3,080		65,000	36,000
3,100		65,000	36,000
3,120		65,000	36,000
3,130		65,000	36,000
3,150		65,000	36,000
3,160		65,000	36,000
3,170	1/8	65,000	36,000
3,180		65,000	36,000
3,200		65,000	36,000
3,220		65,000	36,000
3,230		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,320		65,000	36,000
3,330		65,000	36,000
3,350		65,000	36,000
3,360		70,000	39,000
3,370		70,000	39,000
3,380		70,000	39,000
3,400		70,000	39,000
3,420		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,520		70,000	39,000

d1		l1	l2
mm	inch	mm	mm
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,610		70,000	39,000
3,620		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,680		70,000	39,000
3,700		70,000	39,000
3,725		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,820		75,000	43,000
3,830		75,000	43,000
3,850		75,000	43,000
3,860		75,000	43,000
3,870		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,920		75,000	43,000
3,930		75,000	43,000
3,940		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
3,980		75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,010		75,000	43,000
4,020		75,000	43,000
4,030		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,060		75,000	43,000
4,070		75,000	43,000
4,080		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,120		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,270		80,000	47,000
4,300		80,000	47,000
4,320		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,380		80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,420		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,520		80,000	47,000
4,530		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,730		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,770		86,000	52,000
4,800		86,000	52,000
4,830		86,000	52,000
4,850		86,000	52,000
4,860		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000



d1		l1	l2
mm	inch	mm	mm
4,930		86,000	52,000
4,950		86,000	52,000
4,970		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,020		86,000	52,000
5,025		86,000	52,000
5,030		86,000	52,000
5,050		86,000	52,000
5,060		86,000	52,000
5,080		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,120		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,190		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,260		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,350		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,420		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,630		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,920		93,000	57,000
5,930		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
5,960		93,000	57,000
5,970		93,000	57,000
5,980		93,000	57,000
5,990		93,000	57,000
6,000		93,000	57,000
6,030		101,000	63,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,170		101,000	63,000
6,200		101,000	63,000
6,210		101,000	63,000
6,220		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,380		101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,650		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,760		109,000	69,000
6,800		109,000	69,000
6,850		109,000	69,000
6,900		109,000	69,000
6,950		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,040		109,000	69,000
7,050		109,000	69,000
7,070		109,000	69,000
7,100		109,000	69,000
7,130		109,000	69,000
7,140	9/32	109,000	69,000
7,150		109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,320		109,000	69,000
7,350		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,450		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,550		117,000	75,000
7,600		117,000	75,000
7,650		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,850		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
7,950		117,000	75,000
7,980		117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,130		117,000	75,000
8,150		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,350		117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,450		117,000	75,000
8,500		117,000	75,000
8,550		125,000	81,000
8,600		125,000	81,000
8,610		125,000	81,000
8,650		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,850		125,000	81,000
8,900		125,000	81,000
8,950		125,000	81,000
9,000		125,000	81,000
9,050		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,150		125,000	81,000

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d1		l1	l2
mm	inch	mm	mm
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,350		125,000	81,000
9,400		125,000	81,000
9,450		125,000	81,000
9,500		125,000	81,000
9,510		133,000	87,000
9,520	3/8	133,000	87,000
9,570		133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,650		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
9,850		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
9,950		133,000	87,000
10,000		133,000	87,000
10,050		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,150		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,350		133,000	87,000
10,400		133,000	87,000
10,450		133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,550		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,750		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,050		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,150		142,000	94,000
11,200		142,000	94,000
11,250		142,000	94,000
11,300		142,000	94,000
11,350		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,050		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000
12,300	31/64	151,000	101,000
12,400		151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,650		151,000	101,000
12,700	1/2	151,000	101,000

d1		l1	l2
mm	inch	mm	mm
12,750		151,000	101,000
12,800		151,000	101,000
12,850		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,250		160,000	108,000
13,300		160,000	108,000
13,400		160,000	108,000
13,490	17/32	160,000	108,000
13,500		160,000	108,000
13,530		160,000	108,000
13,600		160,000	108,000
13,700		160,000	108,000
13,750		160,000	108,000
13,800		160,000	108,000
13,890	35/64	160,000	108,000
13,900		160,000	108,000
14,000		160,000	108,000
14,100		169,000	114,000
14,200		169,000	114,000
14,250		169,000	114,000
14,290	9/16	169,000	114,000
14,300		169,000	114,000
14,400		169,000	114,000
14,450		169,000	114,000
14,500		169,000	114,000
14,600		169,000	114,000
14,680	37/64	169,000	114,000
14,700		169,000	114,000
14,750		169,000	114,000
14,800		169,000	114,000
14,900		169,000	114,000
15,000		169,000	114,000
15,080	19/32	178,000	120,000
15,100		178,000	120,000
15,200		178,000	120,000
15,250		178,000	120,000
15,300		178,000	120,000
15,400		178,000	120,000
15,480	39/64	178,000	120,000
15,500		178,000	120,000
15,600		178,000	120,000
15,700		178,000	120,000
15,750		178,000	120,000
15,800		178,000	120,000
15,870	5/8	178,000	120,000
15,900		178,000	120,000
16,000		178,000	120,000
16,100		184,000	125,000
16,200		184,000	125,000
16,250		184,000	125,000
16,270	41/64	184,000	125,000
16,300		184,000	125,000
16,400		184,000	125,000
16,500		184,000	125,000
16,600		184,000	125,000
16,670	21/32	184,000	125,000
16,700		184,000	125,000
16,750		184,000	125,000
16,800		184,000	125,000
16,900		184,000	125,000
17,000		184,000	125,000
17,070	43/64	191,000	130,000
17,200		191,000	130,000
17,250		191,000	130,000
17,300		191,000	130,000
17,400		191,000	130,000
17,460	11/16	191,000	130,000
17,500		191,000	130,000
17,600		191,000	130,000



d1		l1	l2
mm	inch	mm	mm
17,700		191,000	130,000
17,750		191,000	130,000
17,800		191,000	130,000
17,860	45/64	191,000	130,000
17,900		191,000	130,000
18,000		191,000	130,000
18,100		198,000	135,000
18,200		198,000	135,000
18,260	23/32	198,000	135,000
18,400		198,000	135,000
18,500		198,000	135,000
18,650	47/64	198,000	135,000

d1		l1	l2
mm	inch	mm	mm
18,750		198,000	135,000
18,800		198,000	135,000
19,000		198,000	135,000
19,050	3/4	205,000	140,000
19,100		205,000	140,000
19,200		205,000	140,000
19,250		205,000	140,000
19,500		205,000	140,000
19,600		205,000	140,000
19,750		205,000	140,000
19,840	25/32	205,000	140,000
20,000		205,000	140,000



Brocas espirais curtas



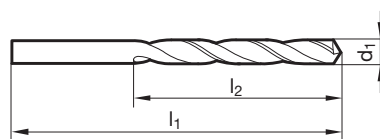
Material de corte	HSS
Superfície	S
Sentido de corte	R

P	•	Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
M		
K	•	
N	○	aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
S		
H		

GÜHRING NAVIGATOR

Página de dados de corte 780

Brocas helicoidais com haste cilíndrica



Nr. do artigo **651**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,200		19,000	2,500	0,720		28,000	9,000
0,250		19,000	3,000	0,740		28,000	9,000
0,280		19,000	3,000	0,750		28,000	9,000
0,300		19,000	3,000	0,770		30,000	10,000
0,310		19,000	4,000	0,780		30,000	10,000
0,320		19,000	4,000	0,790	1/32	30,000	10,000
0,330		19,000	4,000	0,800		30,000	10,000
0,340		19,000	4,000	0,810		30,000	10,000
0,360		19,000	4,000	0,820		30,000	10,000
0,370		19,000	4,000	0,830		30,000	10,000
0,380		19,000	4,000	0,840		30,000	10,000
0,390		20,000	5,000	0,850		30,000	10,000
0,400	1/64	20,000	5,000	0,860		32,000	11,000
0,410		20,000	5,000	0,870		32,000	11,000
0,420		20,000	5,000	0,880		32,000	11,000
0,430		20,000	5,000	0,890		32,000	11,000
0,440		20,000	5,000	0,900		32,000	11,000
0,450		20,000	5,000	0,910		32,000	11,000
0,460		20,000	5,000	0,920		32,000	11,000
0,470		20,000	5,000	0,930		32,000	11,000
0,480		20,000	5,000	0,940		32,000	11,000
0,490		22,000	6,000	0,950		32,000	11,000
0,500		22,000	6,000	0,960		34,000	12,000
0,510		22,000	6,000	0,970		34,000	12,000
0,520		22,000	6,000	0,980		34,000	12,000
0,530		22,000	6,000	0,990		34,000	12,000
0,540		24,000	7,000	1,000		34,000	12,000
0,550		24,000	7,000	1,020		34,000	12,000
0,570		24,000	7,000	1,030		34,000	12,000
0,580		24,000	7,000	1,040		34,000	12,000
0,590		24,000	7,000	1,050		34,000	12,000
0,600		24,000	7,000	1,060		34,000	12,000
0,610		26,000	8,000	1,070		36,000	14,000
0,620		26,000	8,000	1,080		36,000	14,000
0,630		26,000	8,000	1,090		36,000	14,000
0,640		26,000	8,000	1,100		36,000	14,000
0,650		26,000	8,000	1,110		36,000	14,000
0,660		26,000	8,000	1,120		36,000	14,000
0,680		28,000	9,000	1,130		36,000	14,000
0,690		28,000	9,000	1,140		36,000	14,000
0,700		28,000	9,000	1,150		36,000	14,000
0,710		28,000	9,000	1,160		36,000	14,000



d1		l1	l2
mm	inch	mm	mm
1,170		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,220		38,000	16,000
1,240		38,000	16,000
1,250		38,000	16,000
1,260		38,000	16,000
1,270		38,000	16,000
1,280		38,000	16,000
1,300		38,000	16,000
1,320		38,000	16,000
1,330		40,000	18,000
1,340		40,000	18,000
1,350		40,000	18,000
1,400		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,450		40,000	18,000
1,460		40,000	18,000
1,470		40,000	18,000
1,480		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,540		43,000	20,000
1,550		43,000	20,000
1,560		43,000	20,000
1,570		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,640		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,680		43,000	20,000
1,700		43,000	20,000
1,710		46,000	22,000
1,720		46,000	22,000
1,730		46,000	22,000
1,750		46,000	22,000
1,770		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,830		46,000	22,000
1,850		46,000	22,000
1,870		46,000	22,000
1,900		46,000	22,000
1,910		49,000	24,000
1,930		49,000	24,000
1,950		49,000	24,000
1,960		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000

d1		l1	l2
mm	inch	mm	mm
2,300		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,520		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,720		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,020		65,000	36,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,850		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,070		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,390		80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,950		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,020		86,000	52,000
5,050		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,650		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,850		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,020		109,000	69,000

d1		l1	l2
mm	inch	mm	mm
7,030		109,000	69,000
7,050		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,450		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,150		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,450		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,850		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,050		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,350		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,550		133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,060		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000



d1		l1	l2
mm	inch	mm	mm
10,400		133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,550		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,750		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,250		142,000	94,000
11,300		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,650		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000
12,300	31/64	151,000	101,000
12,400		151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,490	17/32	160,000	108,000
13,500		160,000	108,000

d1		l1	l2
mm	inch	mm	mm
13,700		160,000	108,000
13,750		160,000	108,000
13,800		160,000	108,000
13,890	35/64	160,000	108,000
13,900		160,000	108,000
14,000		160,000	108,000
14,100		169,000	114,000
14,200		169,000	114,000
14,250		169,000	114,000
14,290	9/16	169,000	114,000
14,300		169,000	114,000
14,400		169,000	114,000
14,500		169,000	114,000
14,680	37/64	169,000	114,000
15,000		169,000	114,000
15,080	19/32	178,000	120,000
15,250		178,000	120,000
15,480	39/64	178,000	120,000
15,500		178,000	120,000
15,800		178,000	120,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000
16,500		184,000	125,000
16,750		184,000	125,000
17,000		184,000	125,000
17,250		191,000	130,000
17,500		191,000	130,000
18,000		191,000	130,000
18,500		198,000	135,000
18,800		198,000	135,000
19,000		198,000	135,000

Brocas helicoidais com haste cilíndrica



Brocas espirais curtas



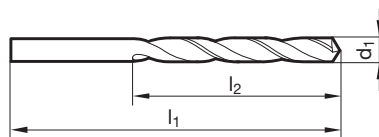
- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M**
- K** •
- N** • aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

Material de corte	HSS
Superfície	F
Sentido de corte	R

GÜHRING NAVIGATOR

Página de dados de corte 780

Brocas helicoidais com haste cilíndrica



Nr. do artigo **2456**

d1		l1	l2
mm	inch	mm	mm
1,000		34,000	12,000
1,100		36,000	14,000
1,200		38,000	16,000
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,300		53,000	27,000
2,400		57,000	30,000
2,500		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,800		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,500		93,000	57,000

d1		l1	l2
mm	inch	mm	mm
5,600		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000



d1		l1	l2
mm	inch	mm	mm
10,400		133,000	87,000
10,700		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,400		142,000	94,000
11,700		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,900		151,000	101,000
12,700	1/2	151,000	101,000
13,000		151,000	101,000
14,000		160,000	108,000
14,500		169,000	114,000



Brocas espirais curtas



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P • Redução da aresta transversal ≥ Ø 2,370 • afiação de superfície cônica

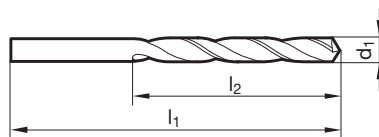
- M**
- K** •
- N** ○
- S**
- H**

aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

GÜHRINGNAVIGATOR

Página de dados de corte 778

Brocas helicoidais com haste cilíndrica



Nr. do artigo **560**

d1		l1	l2
mm	inch	mm	mm
2,400		57,000	30,000
2,500		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,050		65,000	36,000
3,200		65,000	36,000
3,240		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,800		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
3,860		75,000	43,000
3,900		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,950		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,610		93,000	57,000



Brocas espirais curtas



Material de corte **HSS**

Superfície

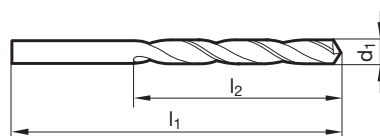
Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
• com arraste conforme DIN 1809

- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 778



Brocas helicoidais com haste cilíndrica

Nr. do artigo **240**

d1		l1	l2
mm	inch	mm	mm
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,200		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,800		133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000
11,500		142,000	94,000
12,000		151,000	101,000
13,000		151,000	101,000
13,490	17/32	160,000	108,000
15,000		169,000	114,000
16,000		178,000	120,000



Brocas espirais curtas



Material de corte **HSS**

Superfície

Sentido de corte

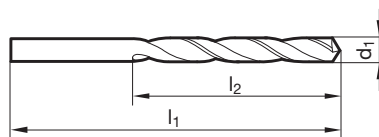
P • Redução da aresta transversal $\geq \varnothing 14,700$ • afiação de superfície cônica

- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 778

Brocas helicoidais com haste cilíndrica



Nr. do artigo **208**

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,240		19,000	2,500
0,290		19,000	3,000
0,300		19,000	3,000
0,340		19,000	4,000
0,350		19,000	4,000
0,360		19,000	4,000
0,370		19,000	4,000
0,390		20,000	5,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,420		20,000	5,000
0,430		20,000	5,000
0,440		20,000	5,000
0,450		20,000	5,000
0,460		20,000	5,000
0,470		20,000	5,000
0,480		20,000	5,000
0,500		22,000	6,000
0,510		22,000	6,000
0,520		22,000	6,000
0,530		22,000	6,000
0,540		24,000	7,000
0,550		24,000	7,000
0,560		24,000	7,000
0,570		24,000	7,000
0,580		24,000	7,000
0,600		24,000	7,000
0,610		26,000	8,000
0,620		26,000	8,000
0,630		26,000	8,000
0,640		26,000	8,000
0,650		26,000	8,000
0,660		26,000	8,000
0,670		26,000	8,000
0,680		28,000	9,000
0,690		28,000	9,000
0,700		28,000	9,000
0,710		28,000	9,000
0,720		28,000	9,000
0,730		28,000	9,000
0,740		28,000	9,000

d1		l1	l2
mm	inch	mm	mm
0,750		28,000	9,000
0,770		30,000	10,000
0,775		30,000	10,000
0,780		30,000	10,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,820		30,000	10,000
0,830		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,880		32,000	11,000
0,890		32,000	11,000
0,900		32,000	11,000
0,910		32,000	11,000
0,930		32,000	11,000
0,950		32,000	11,000
0,960		34,000	12,000
0,970		34,000	12,000
0,980		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,020		34,000	12,000
1,040		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,080		36,000	14,000
1,090		36,000	14,000
1,100		36,000	14,000
1,110		36,000	14,000
1,120		36,000	14,000
1,130		36,000	14,000
1,150		36,000	14,000
1,170		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,220		38,000	16,000
1,250		38,000	16,000



d1		l1	l2
mm	inch	mm	mm
1,270		38,000	16,000
1,290		38,000	16,000
1,300		38,000	16,000
1,310		38,000	16,000
1,320		38,000	16,000
1,350		40,000	18,000
1,380		40,000	18,000
1,390		40,000	18,000
1,400		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,450		40,000	18,000
1,465		40,000	18,000
1,470		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,630		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,700		43,000	20,000
1,720		46,000	22,000
1,750		46,000	22,000
1,760		46,000	22,000
1,770		46,000	22,000
1,780		46,000	22,000
1,790		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,830		46,000	22,000
1,840		46,000	22,000
1,850		46,000	22,000
1,880		46,000	22,000
1,900		46,000	22,000
1,930		49,000	24,000
1,940		49,000	24,000
1,950		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,040		49,000	24,000
2,050		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,120		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,240		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,360		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,420		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000
2,580		57,000	30,000

d1		l1	l2
mm	inch	mm	mm
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,660		61,000	33,000
2,670		61,000	33,000
2,700		61,000	33,000
2,710		61,000	33,000
2,730		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,870		61,000	33,000
2,880		61,000	33,000
2,900		61,000	33,000
2,910		61,000	33,000
2,950		61,000	33,000
2,970		61,000	33,000
3,000		61,000	33,000
3,020		65,000	36,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,220		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,280		65,000	36,000
3,300		65,000	36,000
3,320		65,000	36,000
3,330		65,000	36,000
3,340		65,000	36,000
3,370		70,000	39,000
3,380		70,000	39,000
3,400		70,000	39,000
3,450		70,000	39,000
3,470		70,000	39,000
3,500		70,000	39,000
3,530		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,850		75,000	43,000
3,870		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,130		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,520		80,000	47,000
4,530		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,680		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,930		86,000	52,000
4,950		86,000	52,000
4,970		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,080		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,520		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,570		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,880		109,000	69,000
6,900		109,000	69,000
6,910		109,000	69,000
6,950		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,040		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,220		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,520		117,000	75,000
7,540	19/64	117,000	75,000
7,550		117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,850		117,000	75,000
7,900		117,000	75,000

d1		l1	l2
mm	inch	mm	mm
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,330	21/64	117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,650		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,500		133,000	87,000
10,750		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,250		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
12,750		151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,250		160,000	108,000
13,400		160,000	108,000
13,600		160,000	108,000
13,750		160,000	108,000
13,800		160,000	108,000
14,000		160,000	108,000
14,700		169,000	114,000
14,800		169,000	114,000
14,900		169,000	114,000
15,000		169,000	114,000
15,050		178,000	120,000
15,500		178,000	120,000
15,600		178,000	120,000
15,700		178,000	120,000
15,750		178,000	120,000
15,800		178,000	120,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000
17,250		191,000	130,000
17,500		191,000	130,000
19,000		198,000	135,000
19,050	3/4	205,000	140,000
19,500		205,000	140,000
20,000		205,000	140,000



Brocas espirais curtas

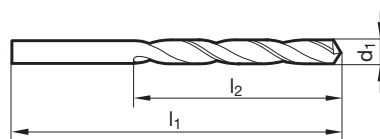


Material de corte	HSS
Superfície	S
Sentido de corte	L

- P** • Redução da aresta transversal $\geq \varnothing 2,380$ • afiação de superfície cônica
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 780



Brocas helicoidais com haste cilíndrica

Nr. do artigo **664**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,250		19,000	3,000	2,050		49,000	24,000
0,420		20,000	5,000	2,100		49,000	24,000
0,430		20,000	5,000	2,150		53,000	27,000
0,450		20,000	5,000	2,300		53,000	27,000
0,500		22,000	6,000	2,360		53,000	27,000
0,550		24,000	7,000	2,380	3/32	57,000	30,000
0,575		24,000	7,000	2,400		57,000	30,000
0,600		24,000	7,000	2,450		57,000	30,000
0,670		26,000	8,000	2,500		57,000	30,000
0,680		28,000	9,000	2,580		57,000	30,000
0,770		30,000	10,000	2,600		57,000	30,000
0,800		30,000	10,000	2,650		57,000	30,000
0,900		32,000	11,000	2,700		61,000	33,000
0,950		32,000	11,000	2,710		61,000	33,000
1,000		34,000	12,000	2,750		61,000	33,000
1,040		34,000	12,000	2,780	7/64	61,000	33,000
1,050		34,000	12,000	2,800		61,000	33,000
1,070		36,000	14,000	2,850		61,000	33,000
1,090		36,000	14,000	2,870		61,000	33,000
1,100		36,000	14,000	2,900		61,000	33,000
1,150		36,000	14,000	2,950		61,000	33,000
1,180		36,000	14,000	3,000		61,000	33,000
1,190	3/64	38,000	16,000	3,050		65,000	36,000
1,200		38,000	16,000	3,100		65,000	36,000
1,250		38,000	16,000	3,170	1/8	65,000	36,000
1,300		38,000	16,000	3,200		65,000	36,000
1,320		38,000	16,000	3,300		65,000	36,000
1,400		40,000	18,000	3,400		70,000	39,000
1,420		40,000	18,000	3,500		70,000	39,000
1,450		40,000	18,000	3,570	9/64	70,000	39,000
1,500		40,000	18,000	3,700		70,000	39,000
1,550		43,000	20,000	3,750		70,000	39,000
1,580		43,000	20,000	3,800		75,000	43,000
1,590	1/16	43,000	20,000	3,970	5/32	75,000	43,000
1,600		43,000	20,000	4,000		75,000	43,000
1,650		43,000	20,000	4,100		75,000	43,000
1,700		43,000	20,000	4,200		75,000	43,000
1,750		46,000	22,000	4,300		80,000	47,000
1,800		46,000	22,000	4,370	11/64	80,000	47,000
1,850		46,000	22,000	4,400		80,000	47,000
1,900		46,000	22,000	4,500		80,000	47,000
2,000		49,000	24,000	4,700		80,000	47,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000	13/64	86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,160		86,000	52,000
5,200	7/32	86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,410	15/64	93,000	57,000
5,500		93,000	57,000
5,560		93,000	57,000
5,700		93,000	57,000
5,950	1/4	93,000	57,000
6,000		93,000	57,000
6,200		101,000	63,000
6,250	9/32	101,000	63,000
6,350		101,000	63,000
6,400		101,000	63,000
6,700		101,000	63,000
6,800	19/64	109,000	69,000
7,000		109,000	69,000
7,140		109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,500	9/32	109,000	69,000
7,540		109,000	69,000
7,850		117,000	75,000
7,900		117,000	75,000

d1		l1	l2
mm	inch	mm	mm
8,000	11/32	117,000	75,000
8,500		117,000	75,000
8,730		125,000	81,000
8,800	23/64	125,000	81,000
9,100		125,000	81,000
9,130		125,000	81,000
9,400		125,000	81,000
9,500	25/64	125,000	81,000
9,600		133,000	87,000
9,800		133,000	87,000
9,920	13/32	133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,320		133,000	87,000
10,900	1/4	142,000	94,000
11,000		142,000	94,000
12,000		151,000	101,000
12,400	9/32	151,000	101,000
12,500		151,000	101,000
13,500		160,000	108,000
14,250		169,000	114,000



Brocas espirais curtas



Material de corte **HSS**

Superfície ○

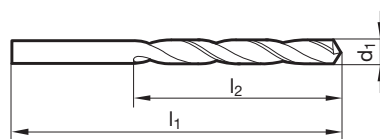
Sentido de corte (R)

P Redução da aresta transversal ≥ Ø 14,500 • afiação de superfície cônica

- M**
- K**
- N** • materiais duros e quebradiços • latão e ligas de magnésio • bronze e bronze fosforoso • ardósia, mica, pertinax
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 778



Brocas helicoidais com haste cilíndrica

Nr. do artigo **206**

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,210		19,000	2,500
0,220		19,000	2,500
0,240		19,000	2,500
0,250		19,000	3,000
0,280		19,000	3,000
0,290		19,000	3,000
0,300		19,000	3,000
0,310		19,000	4,000
0,320		19,000	4,000
0,340		19,000	4,000
0,350		19,000	4,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,420		20,000	5,000
0,440		20,000	5,000
0,450		20,000	5,000
0,460		20,000	5,000
0,480		20,000	5,000
0,500		22,000	6,000
0,520		22,000	6,000
0,530		22,000	6,000
0,550		24,000	7,000
0,560		24,000	7,000
0,570		24,000	7,000
0,600		24,000	7,000
0,620		26,000	8,000
0,640		26,000	8,000
0,650		26,000	8,000
0,660		26,000	8,000
0,670		26,000	8,000
0,680		28,000	9,000
0,690		28,000	9,000
0,700		28,000	9,000
0,710		28,000	9,000
0,720		28,000	9,000
0,730		28,000	9,000
0,740		28,000	9,000
0,750		28,000	9,000
0,760		30,000	10,000
0,770		30,000	10,000
0,780		30,000	10,000

d1		l1	l2
mm	inch	mm	mm
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,820		30,000	10,000
0,830		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,880		32,000	11,000
0,890		32,000	11,000
0,900		32,000	11,000
0,910		32,000	11,000
0,930		32,000	11,000
0,950		32,000	11,000
0,960		34,000	12,000
0,970		34,000	12,000
0,980		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,020		34,000	12,000
1,030		34,000	12,000
1,040		34,000	12,000
1,050		34,000	12,000
1,060		34,000	12,000
1,070		36,000	14,000
1,080		36,000	14,000
1,100		36,000	14,000
1,120		36,000	14,000
1,130		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,160		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,220		38,000	16,000
1,230		38,000	16,000
1,250		38,000	16,000
1,270		38,000	16,000
1,280		38,000	16,000
1,300		38,000	16,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
1,320		38,000	16,000
1,330		40,000	18,000
1,350		40,000	18,000
1,370		40,000	18,000
1,380		40,000	18,000
1,400		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,440		40,000	18,000
1,450		40,000	18,000
1,470		40,000	18,000
1,480		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,520		43,000	20,000
1,530		43,000	20,000
1,540		43,000	20,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,620		43,000	20,000
1,650		43,000	20,000
1,670		43,000	20,000
1,700		43,000	20,000
1,720		46,000	22,000
1,730		46,000	22,000
1,750		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,850		46,000	22,000
1,870		46,000	22,000
1,900		46,000	22,000
1,920		49,000	24,000
1,950		49,000	24,000
1,960		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,010		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,040		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,070		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,120		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,220		53,000	27,000
2,230		53,000	27,000
2,250		53,000	27,000
2,270		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,450		57,000	30,000
2,470		57,000	30,000
2,480		57,000	30,000
2,500		57,000	30,000
2,520		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000

d1		l1	l2
mm	inch	mm	mm
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,840		61,000	33,000
2,850		61,000	33,000
2,900		61,000	33,000
2,920		61,000	33,000
2,950		61,000	33,000
2,970		61,000	33,000
3,000		61,000	33,000
3,010		65,000	36,000
3,020		65,000	36,000
3,030		65,000	36,000
3,040		65,000	36,000
3,050		65,000	36,000
3,060		65,000	36,000
3,070		65,000	36,000
3,100		65,000	36,000
3,120		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,220		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,410		70,000	39,000
3,450		70,000	39,000
3,470		70,000	39,000
3,500		70,000	39,000
3,520		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,720		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,830		75,000	43,000
3,850		75,000	43,000
3,870		75,000	43,000
3,880		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,020		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,070		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,420		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000



d1		l1	l2
mm	inch	mm	mm
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,950		86,000	52,000
5,000		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,050		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,350		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,850		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000

d1		l1	l2
mm	inch	mm	mm
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,150		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,700		142,000	94,000
11,900		151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,200		151,000	101,000
13,500		160,000	108,000
14,000		160,000	108,000
14,500		169,000	114,000
15,000		169,000	114,000
15,500		178,000	120,000
16,000		178,000	120,000
17,000		184,000	125,000
18,000		191,000	130,000
19,000		198,000	135,000
20,000		205,000	140,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



Material de corte **HSS**

Superfície ○

Sentido de corte Ⓛ

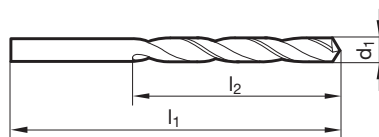
P Redução da aresta transversal ≥ Ø 14,200 • afiação de superfície cônica

- M**
- K**
- N** • materiais duros e quebradiços • latão e ligas de magnésio • bronze e bronze fosforoso • ardósia, mica, pertinax
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 778

Brocas helicoidais com haste cilíndrica



Nr. do artigo **209**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,300		19,000	3,000	1,130		36,000	14,000
0,400	1/64	20,000	5,000	1,150		36,000	14,000
0,450		20,000	5,000	1,160		36,000	14,000
0,480		20,000	5,000	1,165		36,000	14,000
0,490		22,000	6,000	1,170		36,000	14,000
0,500		22,000	6,000	1,200		38,000	16,000
0,530		22,000	6,000	1,210		38,000	16,000
0,540		24,000	7,000	1,220		38,000	16,000
0,550		24,000	7,000	1,230		38,000	16,000
0,580		24,000	7,000	1,240		38,000	16,000
0,590		24,000	7,000	1,250		38,000	16,000
0,600		24,000	7,000	1,260		38,000	16,000
0,620		26,000	8,000	1,270		38,000	16,000
0,640		26,000	8,000	1,280		38,000	16,000
0,660		26,000	8,000	1,300		38,000	16,000
0,670		26,000	8,000	1,320		38,000	16,000
0,680		28,000	9,000	1,380		40,000	18,000
0,700		28,000	9,000	1,400		40,000	18,000
0,710		28,000	9,000	1,410		40,000	18,000
0,720		28,000	9,000	1,450		40,000	18,000
0,730		28,000	9,000	1,480		40,000	18,000
0,740		28,000	9,000	1,500		40,000	18,000
0,750		28,000	9,000	1,520		43,000	20,000
0,780		30,000	10,000	1,550		43,000	20,000
0,800		30,000	10,000	1,560		43,000	20,000
0,810		30,000	10,000	1,600		43,000	20,000
0,860		32,000	11,000	1,610		43,000	20,000
0,880		32,000	11,000	1,620		43,000	20,000
0,900		32,000	11,000	1,640		43,000	20,000
0,910		32,000	11,000	1,650		43,000	20,000
0,920		32,000	11,000	1,670		43,000	20,000
0,940		32,000	11,000	1,680		43,000	20,000
0,950		32,000	11,000	1,700		43,000	20,000
0,960		34,000	12,000	1,720		46,000	22,000
0,970		34,000	12,000	1,730		46,000	22,000
1,000		34,000	12,000	1,740		46,000	22,000
1,020		34,000	12,000	1,750		46,000	22,000
1,030		34,000	12,000	1,800		46,000	22,000
1,060		34,000	12,000	1,810		46,000	22,000
1,080		36,000	14,000	1,820		46,000	22,000
1,100		36,000	14,000	1,830		46,000	22,000
1,120		36,000	14,000	1,850		46,000	22,000



d1		l1	l2
mm	inch	mm	mm
1,860		46,000	22,000
1,870		46,000	22,000
1,890		46,000	22,000
1,900		46,000	22,000
1,930		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,030		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,100		49,000	24,000
2,140		53,000	27,000
2,150		53,000	27,000
2,200		53,000	27,000
2,220		53,000	27,000
2,230		53,000	27,000
2,240		53,000	27,000
2,250		53,000	27,000
2,280		53,000	27,000
2,290		53,000	27,000
2,300		53,000	27,000
2,350		53,000	27,000
2,380	3/32	57,000	30,000
2,390		57,000	30,000
2,400		57,000	30,000
2,420		57,000	30,000
2,450		57,000	30,000
2,470		57,000	30,000
2,500		57,000	30,000
2,520		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,750		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,830		61,000	33,000
2,850		61,000	33,000
2,900		61,000	33,000
2,930		61,000	33,000
3,000		61,000	33,000
3,030		65,000	36,000
3,050		65,000	36,000
3,070		65,000	36,000
3,080		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,160		65,000	36,000
3,170	1/8	65,000	36,000
3,175		65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,270		65,000	36,000
3,300		65,000	36,000
3,340		65,000	36,000
3,350		65,000	36,000
3,380		70,000	39,000
3,400		70,000	39,000
3,450		70,000	39,000
3,470		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,580		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,710		70,000	39,000
3,730		70,000	39,000
3,830		75,000	43,000
3,900		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
3,950		75,000	43,000
3,960		75,000	43,000
4,000		75,000	43,000
4,050		75,000	43,000
4,070		75,000	43,000
4,100		75,000	43,000
4,120		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,280		80,000	47,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,850		86,000	52,000
4,870		86,000	52,000
4,950		86,000	52,000
5,000		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,650		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,100		101,000	63,000
6,120		101,000	63,000
6,130		101,000	63,000
6,150		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,650		101,000	63,000
6,700		101,000	63,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,150		109,000	69,000
7,200		109,000	69,000
7,220		109,000	69,000
7,300		109,000	69,000
7,350		109,000	69,000
7,550		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
8,000		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,450		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,250		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,750		133,000	87,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
9,800		133,000	87,000
9,850		133,000	87,000
10,000		133,000	87,000
10,500		133,000	87,000
11,100		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
12,050		151,000	101,000
12,100		151,000	101,000
12,150		151,000	101,000
12,200		151,000	101,000
12,300	31/64	151,000	101,000
12,800		151,000	101,000
13,100	33/64	151,000	101,000
13,300		160,000	108,000
13,500		160,000	108,000
13,800		160,000	108,000
14,200		169,000	114,000

d1		l1	l2
mm	inch	mm	mm
14,300		169,000	114,000
14,400		169,000	114,000
14,500		169,000	114,000
15,100		178,000	120,000
15,300		178,000	120,000
15,500		178,000	120,000
16,000		178,000	120,000
17,000		184,000	125,000
18,000		191,000	130,000
20,000		205,000	140,000



Brocas espirais curtas



Material de corte **HSS**

Superfície ○

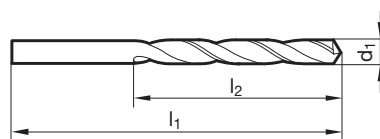
Sentido de corte

P Redução da aresta transversal ≥ Ø 14,500 • afiação de superfície cônica

- M**
- K**
- N** • materiais moles com cavacos longos • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • plásticos (moles)
- S** • madeira
- H**

GÜHRING NAVIGATOR

Página de dados de corte 778



Brocas helicoidais com haste cilíndrica

Nr. do artigo **207**

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,250		19,000	3,000
0,300		19,000	3,000
0,340		19,000	4,000
0,350		19,000	4,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,450		20,000	5,000
0,460		20,000	5,000
0,500		22,000	6,000
0,520		22,000	6,000
0,550		24,000	7,000
0,570		24,000	7,000
0,600		24,000	7,000
0,610		26,000	8,000
0,620		26,000	8,000
0,650		26,000	8,000
0,660		26,000	8,000
0,700		28,000	9,000
0,720		28,000	9,000
0,750		28,000	9,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,900		32,000	11,000
0,950		32,000	11,000
0,970		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,010		34,000	12,000
1,020		34,000	12,000
1,050		34,000	12,000
1,100		36,000	14,000
1,110		36,000	14,000
1,120		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,180		36,000	14,000

d1		l1	l2
mm	inch	mm	mm
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,220		38,000	16,000
1,250		38,000	16,000
1,270		38,000	16,000
1,280		38,000	16,000
1,300		38,000	16,000
1,330		40,000	18,000
1,350		40,000	18,000
1,380		40,000	18,000
1,400		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,450		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,550		43,000	20,000
1,570		43,000	20,000
1,580		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,630		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,680		43,000	20,000
1,700		43,000	20,000
1,750		46,000	22,000
1,770		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,850		46,000	22,000
1,900		46,000	22,000
1,920		49,000	24,000
1,930		49,000	24,000
1,950		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,020		49,000	24,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
2,030		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,270		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,450		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,730		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,830		61,000	33,000
2,850		61,000	33,000
2,900		61,000	33,000
2,930		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,380		70,000	39,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,850		75,000	43,000
3,900		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,030		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000

d1		l1	l2
mm	inch	mm	mm
4,500		80,000	47,000
4,550		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,030		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,650		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,850		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000



d1		l1	l2
mm	inch	mm	mm
8,450		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,700		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,000		142,000	94,000
11,100		142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,500		160,000	108,000
13,800		160,000	108,000
14,000		160,000	108,000
14,500		169,000	114,000
14,700		169,000	114,000
15,000		169,000	114,000
15,600		178,000	120,000
16,000		178,000	120,000
16,500		184,000	125,000
17,000		184,000	125,000
17,500		191,000	130,000
18,000		191,000	130,000
20,000		205,000	140,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



Material de corte **HSS**

Superfície ○

Sentido de corte Ⓛ

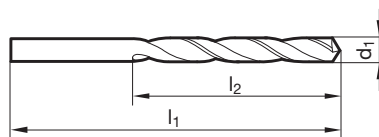
P Redução da aresta transversal ≥ Ø 14,500 • afiação de superfície cônica

- M**
- K**
- N** • materiais moles com cavacos longos • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • plásticos (moles)
- S** • madeira
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 778

Brocas helicoidais com haste cilíndrica



Nr. do artigo **210**

d1		l1	l2
mm	inch	mm	mm
0,250		19,000	3,000
0,270		19,000	3,000
0,280		19,000	3,000
0,320		19,000	4,000
0,330		19,000	4,000
0,340		19,000	4,000
0,360		19,000	4,000
0,390		20,000	5,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,420		20,000	5,000
0,430		20,000	5,000
0,450		20,000	5,000
0,470		20,000	5,000
0,490		22,000	6,000
0,500		22,000	6,000
0,525		22,000	6,000
0,530		22,000	6,000
0,560		24,000	7,000
0,590		24,000	7,000
0,600		24,000	7,000
0,610		26,000	8,000
0,660		26,000	8,000
0,710		28,000	9,000
0,720		28,000	9,000
0,730		28,000	9,000
0,740		28,000	9,000
0,750		28,000	9,000
0,760		30,000	10,000
0,770		30,000	10,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,825		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,880		32,000	11,000
0,890		32,000	11,000
0,900		32,000	11,000
0,950		32,000	11,000
0,970		34,000	12,000

d1		l1	l2
mm	inch	mm	mm
0,980		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,020		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,100		36,000	14,000
1,120		36,000	14,000
1,150		36,000	14,000
1,210		38,000	16,000
1,220		38,000	16,000
1,250		38,000	16,000
1,290		38,000	16,000
1,300		38,000	16,000
1,320		38,000	16,000
1,400		40,000	18,000
1,450		40,000	18,000
1,480		40,000	18,000
1,500		40,000	18,000
1,540		43,000	20,000
1,550		43,000	20,000
1,580		43,000	20,000
1,600		43,000	20,000
1,630		43,000	20,000
1,700		43,000	20,000
1,750		46,000	22,000
1,800		46,000	22,000
1,850		46,000	22,000
1,950		49,000	24,000
2,000		49,000	24,000
2,150		53,000	27,000
2,200		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,340		53,000	27,000
2,350		53,000	27,000
2,380	3/32	57,000	30,000
2,450		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,570		57,000	30,000



d1		l1	l2
mm	inch	mm	mm
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,750		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
2,970		61,000	33,000
3,000		61,000	33,000
3,130		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,280		65,000	36,000
3,300		65,000	36,000
3,380		70,000	39,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,820		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,920		75,000	43,000
4,000		75,000	43,000
4,030		75,000	43,000
4,050		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,400		80,000	47,000
4,500		80,000	47,000
4,520		80,000	47,000
4,550		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,720		80,000	47,000
4,750		80,000	47,000
4,850		86,000	52,000
4,900		86,000	52,000
4,950		86,000	52,000
5,000		86,000	52,000
5,020		86,000	52,000
5,100		86,000	52,000
5,150		86,000	52,000
5,200		86,000	52,000
5,400		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,620		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,030		101,000	63,000
6,050		101,000	63,000
6,080		101,000	63,000
6,100		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,150		101,000	63,000
6,200		101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
6,950		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,250		109,000	69,000
7,350		109,000	69,000
7,400		109,000	69,000
7,450		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,900		117,000	75,000
8,050		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,750		125,000	81,000
9,350		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,650		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
10,700		142,000	94,000
10,750		142,000	94,000
11,100		142,000	94,000
11,500		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,950		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000
12,500		151,000	101,000
12,800		151,000	101,000
13,200		151,000	101,000
14,500		169,000	114,000
15,000		169,000	114,000
15,500		178,000	120,000
16,000		178,000	120,000
16,200		184,000	125,000
17,000		184,000	125,000
17,300		191,000	130,000
17,500		191,000	130,000
17,600		191,000	130,000
18,000		191,000	130,000
19,000		198,000	135,000
19,500		205,000	140,000
19,800		205,000	140,000
20,000		205,000	140,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



P • Redução da aresta transversal $\geq \varnothing 0,970$ • afiação de superfície cônica
 • canais largos • especialmente para profundidades acima de 3xD

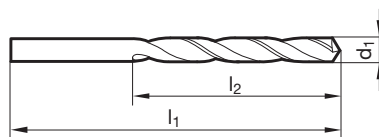
- M**
- K** •
- N** • ferro fundido cinzento • aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

Material de corte	HSS
Superfície	
Sentido de corte	

GÜHRINGNAVIGATOR

Página de dados de corte 778

Brocas helicoidais com haste cilíndrica



Nr. do artigo **549**

d1		l1	l2
mm	inch	mm	mm
0,600		24,000	7,000
0,700		28,000	9,000
0,710		28,000	9,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,890		32,000	11,000
0,900		32,000	11,000
0,950		32,000	11,000
0,970		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,020		34,000	12,000
1,040		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,090		36,000	14,000
1,100		36,000	14,000
1,150		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,220		38,000	16,000
1,230		38,000	16,000
1,240		38,000	16,000
1,250		38,000	16,000
1,300		38,000	16,000
1,305		38,000	16,000
1,320		38,000	16,000
1,350		40,000	18,000
1,400		40,000	18,000
1,450		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,550		43,000	20,000
1,560		43,000	20,000
1,570		43,000	20,000
1,580		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000

d1		l1	l2
mm	inch	mm	mm
1,620		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,670		43,000	20,000
1,680		43,000	20,000
1,690		43,000	20,000
1,700		43,000	20,000
1,720		46,000	22,000
1,750		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,850		46,000	22,000
1,860		46,000	22,000
1,900		46,000	22,000
1,930		49,000	24,000
1,950		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,020		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,330		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,420		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,480		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000



d1		l1	l2
mm	inch	mm	mm
2,530		57,000	30,000
2,550		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
2,980		61,000	33,000
3,000		61,000	33,000
3,030		65,000	36,000
3,050		65,000	36,000
3,080		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,220		65,000	36,000
3,230		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,580		70,000	39,000
3,600		70,000	39,000
3,660		70,000	39,000
3,680		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,860		75,000	43,000
3,870		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,210		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000

d1		l1	l2
mm	inch	mm	mm
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,950		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,030		86,000	52,000
5,050		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,350		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,550		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,830		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,040		109,000	69,000
7,050		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,290		109,000	69,000
7,300		109,000	69,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,580		117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,350		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,750		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,300		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,150		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000
12,300	31/64	151,000	101,000
12,400		151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,750		151,000	101,000
12,800		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,490	17/32	160,000	108,000
13,500		160,000	108,000
13,600		160,000	108,000
13,700		160,000	108,000
13,890	35/64	160,000	108,000
14,000		160,000	108,000
14,250		169,000	114,000
14,290	9/16	169,000	114,000
14,500		169,000	114,000
14,680	37/64	169,000	114,000
15,000		169,000	114,000
15,080	19/32	178,000	120,000
15,400		178,000	120,000
15,480	39/64	178,000	120,000
15,500		178,000	120,000
15,750		178,000	120,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000



Brocas espirais curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • canais largos • especialmente para profundidades acima de 3xD
- K** •
- N** • ferro fundido cinzento • aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

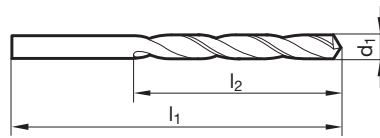
Material de corte **HSS**

Superfície **S**

Sentido de corte **R**

GÜHRING NAVIGATOR

Página de dados de corte 780



Brocas helicoidais com haste cilíndrica

Nr. do artigo **652**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,250		53,000	27,000
1,020		34,000	12,000	2,260		53,000	27,000
1,040		34,000	12,000	2,300		53,000	27,000
1,070		36,000	14,000	2,350		53,000	27,000
1,090		36,000	14,000	2,370		57,000	30,000
1,100		36,000	14,000	2,380	3/32	57,000	30,000
1,180		36,000	14,000	2,400		57,000	30,000
1,190	3/64	38,000	16,000	2,440		57,000	30,000
1,200		38,000	16,000	2,450		57,000	30,000
1,220		38,000	16,000	2,490		57,000	30,000
1,250		38,000	16,000	2,500		57,000	30,000
1,300		38,000	16,000	2,530		57,000	30,000
1,320		38,000	16,000	2,550		57,000	30,000
1,350		40,000	18,000	2,580		57,000	30,000
1,400		40,000	18,000	2,600		57,000	30,000
1,450		40,000	18,000	2,640		57,000	30,000
1,500		40,000	18,000	2,650		57,000	30,000
1,510		43,000	20,000	2,700		61,000	33,000
1,530		43,000	20,000	2,710		61,000	33,000
1,550		43,000	20,000	2,750		61,000	33,000
1,590	1/16	43,000	20,000	2,780	7/64	61,000	33,000
1,600		43,000	20,000	2,790		61,000	33,000
1,610		43,000	20,000	2,800		61,000	33,000
1,650		43,000	20,000	2,820		61,000	33,000
1,700		43,000	20,000	2,850		61,000	33,000
1,720		46,000	22,000	2,870		61,000	33,000
1,750		46,000	22,000	2,900		61,000	33,000
1,780		46,000	22,000	2,950		61,000	33,000
1,800		46,000	22,000	3,000		61,000	33,000
1,850		46,000	22,000	3,050		65,000	36,000
1,900		46,000	22,000	3,100		65,000	36,000
1,930		49,000	24,000	3,170	1/8	65,000	36,000
1,950		49,000	24,000	3,200		65,000	36,000
1,980	5/64	49,000	24,000	3,250		65,000	36,000
1,990		49,000	24,000	3,260		65,000	36,000
2,000		49,000	24,000	3,300		65,000	36,000
2,060		49,000	24,000	3,350		65,000	36,000
2,080		49,000	24,000	3,400		70,000	39,000
2,100		49,000	24,000	3,450		70,000	39,000
2,150		53,000	27,000	3,500		70,000	39,000
2,180		53,000	27,000	3,570	9/64	70,000	39,000
2,200		53,000	27,000	3,600		70,000	39,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,490	17/32	160,000	108,000
13,890	35/64	160,000	108,000

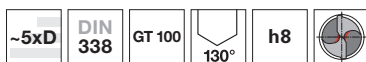


d1		l1	l2
mm	inch	mm	mm
14,000		160,000	108,000
14,290	9/16	169,000	114,000
15,000		169,000	114,000

d1		l1	l2
mm	inch	mm	mm



Brocas espirais curtas



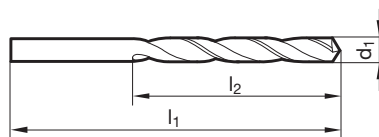
- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • canais largos • especialmente para profundidades acima de 3xD
- K** •
- N** • ferro fundido cinzento • aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

Material de corte	HSS
Superfície	F
Sentido de corte	R

GÜHRING NAVIGATOR

Página de dados de corte 780

Brocas helicoidais com haste cilíndrica



Nr. do artigo **2457**

d1		l1	l2
mm	inch	mm	mm
1,000		34,000	12,000
1,300		38,000	16,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,400		57,000	30,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,800		75,000	43,000
4,000		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000

d1		l1	l2
mm	inch	mm	mm
5,600		93,000	57,000
5,700		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,600		101,000	63,000
6,800		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,700		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,100		125,000	81,000
9,400		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
10,300		133,000	87,000
10,700		142,000	94,000
11,400		142,000	94,000
11,700		142,000	94,000
11,800		142,000	94,000
15,000		169,000	114,000



Brocas espirais curtas

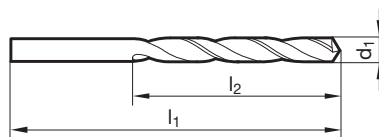


- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • canais largos • especialmente para profundidades acima de 3xD
- K** •
- N** • ferro fundido cinzento • aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

Material de corte	HSS
Superfície	
Sentido de corte	

GÜHRING NAVIGATOR

Página de dados de corte 778



Brocas helicoidais com haste cilíndrica

Nr. do artigo **550**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,750		61,000	33,000
1,300		38,000	16,000	2,780	7/64	61,000	33,000
1,350		40,000	18,000	2,790		61,000	33,000
1,400		40,000	18,000	2,800		61,000	33,000
1,450		40,000	18,000	2,870		61,000	33,000
1,485		40,000	18,000	2,900		61,000	33,000
1,490		40,000	18,000	2,950		61,000	33,000
1,500		40,000	18,000	3,000		61,000	33,000
1,550		43,000	20,000	3,020		65,000	36,000
1,580		43,000	20,000	3,050		65,000	36,000
1,590	1/16	43,000	20,000	3,100		65,000	36,000
1,600		43,000	20,000	3,150		65,000	36,000
1,650		43,000	20,000	3,170	1/8	65,000	36,000
1,700		43,000	20,000	3,175	1/8	65,000	36,000
1,780		46,000	22,000	3,200		65,000	36,000
1,800		46,000	22,000	3,250		65,000	36,000
1,850		46,000	22,000	3,260		65,000	36,000
1,900		46,000	22,000	3,300		65,000	36,000
1,950		49,000	24,000	3,350		65,000	36,000
1,980	5/64	49,000	24,000	3,400		70,000	39,000
2,000		49,000	24,000	3,450		70,000	39,000
2,030		49,000	24,000	3,500		70,000	39,000
2,050		49,000	24,000	3,550		70,000	39,000
2,080		49,000	24,000	3,570	9/64	70,000	39,000
2,100		49,000	24,000	3,600		70,000	39,000
2,150		53,000	27,000	3,650		70,000	39,000
2,200		53,000	27,000	3,660		70,000	39,000
2,250		53,000	27,000	3,700		70,000	39,000
2,260		53,000	27,000	3,750		70,000	39,000
2,300		53,000	27,000	3,800		75,000	43,000
2,350		53,000	27,000	3,860		75,000	43,000
2,370		57,000	30,000	3,900		75,000	43,000
2,380	3/32	57,000	30,000	3,990		75,000	43,000
2,400		57,000	30,000	4,000		75,000	43,000
2,490		57,000	30,000	4,040		75,000	43,000
2,500		57,000	30,000	4,100		75,000	43,000
2,530		57,000	30,000	4,200		75,000	43,000
2,550		57,000	30,000	4,300		80,000	47,000
2,580		57,000	30,000	4,370	11/64	80,000	47,000
2,600		57,000	30,000	4,450		80,000	47,000
2,670		61,000	33,000	4,500		80,000	47,000
2,700		61,000	33,000	4,600		80,000	47,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,620		80,000	47,000
4,760	3/16	86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000

d1		l1	l2
mm	inch	mm	mm
7,700		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,200		125,000	81,000
9,400		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,600		133,000	87,000
10,800		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,900		151,000	101,000
12,400		151,000	101,000
12,800		151,000	101,000
14,290	9/16	169,000	114,000
15,000		169,000	114,000
15,500		178,000	120,000



Brocas espirais curtas



Material de corte **HSS**

Superfície **S**

Sentido de corte **L**

P • Redução da aresta transversal $\geq \varnothing 1,300$ • afiação de superfície cônica
• canais largos • especialmente para profundidades acima de 3xD

M

K •

N • ferro fundido cinzento • aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

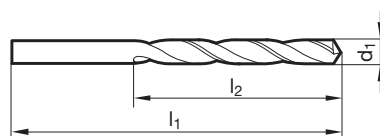
S

H

GÜHRING NAVIGATOR

Página de dados de corte 780

Brocas helicoidais com haste cilíndrica



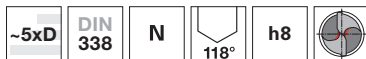
Nr. do artigo **665**

d1		l1	l2
mm	inch	mm	mm
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,650		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,570	9/64	70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
3,900		75,000	43,000
4,000		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,500		101,000	63,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,540	19/64	117,000	75,000
7,800		117,000	75,000
7,940	5/16	117,000	75,000
8,600		125,000	81,000
9,130	23/64	125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,800		133,000	87,000



Brocas espirais curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** ○
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • materiais fundidos acima de 800 N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** ○
- H** ○

Material de corte **HSCO**

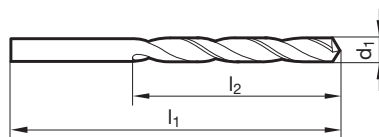
Superfície

Sentido de corte

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 780



Nr. do artigo **305**

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,220		19,000	2,500
0,230		19,000	2,500
0,250		19,000	3,000
0,260		19,000	3,000
0,270		19,000	3,000
0,280		19,000	3,000
0,300		19,000	3,000
0,310		19,000	4,000
0,320		19,000	4,000
0,330		19,000	4,000
0,340		19,000	4,000
0,350		19,000	4,000
0,360		19,000	4,000
0,370		19,000	4,000
0,380		19,000	4,000
0,390		20,000	5,000
0,400	1/64	20,000	5,000
0,410		20,000	5,000
0,420		20,000	5,000
0,430		20,000	5,000
0,440		20,000	5,000
0,450		20,000	5,000
0,460		20,000	5,000
0,470		20,000	5,000
0,480		20,000	5,000
0,490		22,000	6,000
0,500		22,000	6,000
0,510		22,000	6,000
0,520		22,000	6,000
0,530		22,000	6,000
0,540		24,000	7,000
0,550		24,000	7,000
0,560		24,000	7,000
0,570		24,000	7,000
0,580		24,000	7,000
0,590		24,000	7,000
0,600		24,000	7,000
0,610		26,000	8,000
0,620		26,000	8,000
0,640		26,000	8,000
0,650		26,000	8,000

d1		l1	l2
mm	inch	mm	mm
0,660		26,000	8,000
0,670		26,000	8,000
0,680		28,000	9,000
0,700		28,000	9,000
0,710		28,000	9,000
0,720		28,000	9,000
0,730		28,000	9,000
0,740		28,000	9,000
0,750		28,000	9,000
0,760		30,000	10,000
0,770		30,000	10,000
0,780		30,000	10,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,820		30,000	10,000
0,830		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,880		32,000	11,000
0,890		32,000	11,000
0,900		32,000	11,000
0,910		32,000	11,000
0,920		32,000	11,000
0,930		32,000	11,000
0,940		32,000	11,000
0,950		32,000	11,000
0,960		34,000	12,000
0,970		34,000	12,000
0,980		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,010		34,000	12,000
1,020		34,000	12,000
1,030		34,000	12,000
1,040		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,080		36,000	14,000
1,090		36,000	14,000



d1		l1	l2
mm	inch	mm	mm
1,100		36,000	14,000
1,120		36,000	14,000
1,130		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,160		36,000	14,000
1,170		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,220		38,000	16,000
1,230		38,000	16,000
1,250		38,000	16,000
1,260		38,000	16,000
1,280		38,000	16,000
1,290		38,000	16,000
1,300		38,000	16,000
1,310		38,000	16,000
1,320		38,000	16,000
1,330		40,000	18,000
1,350		40,000	18,000
1,360		40,000	18,000
1,370		40,000	18,000
1,380		40,000	18,000
1,400		40,000	18,000
1,410		40,000	18,000
1,420		40,000	18,000
1,430		40,000	18,000
1,440		40,000	18,000
1,450		40,000	18,000
1,460		40,000	18,000
1,470		40,000	18,000
1,480		40,000	18,000
1,490		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,540		43,000	20,000
1,550		43,000	20,000
1,560		43,000	20,000
1,570		43,000	20,000
1,580		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,640		43,000	20,000
1,650		43,000	20,000
1,660		43,000	20,000
1,670		43,000	20,000
1,680		43,000	20,000
1,700		43,000	20,000
1,710		46,000	22,000
1,720		46,000	22,000
1,730		46,000	22,000
1,740		46,000	22,000
1,750		46,000	22,000
1,760		46,000	22,000
1,780		46,000	22,000
1,790		46,000	22,000
1,800		46,000	22,000
1,810		46,000	22,000
1,820		46,000	22,000
1,830		46,000	22,000
1,840		46,000	22,000
1,850		46,000	22,000
1,860		46,000	22,000
1,900		46,000	22,000
1,910		49,000	24,000
1,930		49,000	24,000

d1		l1	l2
mm	inch	mm	mm
1,950		49,000	24,000
1,960		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,010		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,040		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,070		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,120		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,230		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,470		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,510		57,000	30,000
2,520		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,920		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,020		65,000	36,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,330		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,850		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,020		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,070		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,120		75,000	43,000
4,150		75,000	43,000
4,170		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,020		86,000	52,000
5,050		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,150		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,450		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,650		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000

d1		l1	l2
mm	inch	mm	mm
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,450		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,760		109,000	69,000
6,800		109,000	69,000
6,850		109,000	69,000
6,900		109,000	69,000
6,950		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,050		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,050		117,000	75,000
8,100		117,000	75,000
8,150		117,000	75,000
8,200		117,000	75,000
8,250		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,250		125,000	81,000
9,300		125,000	81,000



d1		l1	l2
mm	inch	mm	mm
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,750		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,050		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,750		142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,250		142,000	94,000
11,300		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,250		151,000	101,000

d1		l1	l2
mm	inch	mm	mm
12,300	31/64	151,000	101,000
12,400		151,000	101,000
12,500		151,000	101,000
12,600		151,000	101,000
12,700	1/2	151,000	101,000
12,750		151,000	101,000
12,800		151,000	101,000
12,900		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,200		151,000	101,000
13,300		160,000	108,000
13,490	17/32	160,000	108,000
13,500		160,000	108,000
13,600		160,000	108,000
13,700		160,000	108,000
13,750		160,000	108,000
13,800		160,000	108,000
13,890	35/64	160,000	108,000
13,900		160,000	108,000
14,000		160,000	108,000
14,100		169,000	114,000
14,200		169,000	114,000
14,290	9/16	169,000	114,000
14,500		169,000	114,000
14,680	37/64	169,000	114,000
15,000		169,000	114,000
15,250		178,000	120,000
15,480	39/64	178,000	120,000
15,500		178,000	120,000
15,750		178,000	120,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000
16,500		184,000	125,000
16,670	21/32	184,000	125,000
17,000		184,000	125,000
17,460	11/16	191,000	130,000
17,500		191,000	130,000
18,000		191,000	130,000
18,500		198,000	135,000
19,000		198,000	135,000
19,500		205,000	140,000
20,000		205,000	140,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,200$ • afiação de superfície cônica
- aço-HSS ligado com Co • alta resistência ao desgaste
- M** ○
- K** •
- N** ○ aços com e sem liga • materiais fundidos acima de 800 N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras
- S** ○ aços de liga alta • aços para beneficiamento e cementação
- H** ○

Material de corte **HSCO**

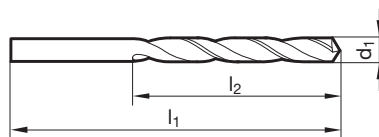
Superfície **S**

Sentido de corte **R**

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 782



Nr. do artigo **2997**

d1		l1	l2
mm	inch	mm	mm
1,200		38,000	16,000
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,300		53,000	27,000
2,500		57,000	30,000
2,700		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,500		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,600		93,000	57,000
5,800		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
8,000		117,000	75,000
8,200		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,300		133,000	87,000
10,500		133,000	87,000
10,800		142,000	94,000
11,000		142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
12,000		151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
13,000		151,000	101,000



Brocas espirais curtas



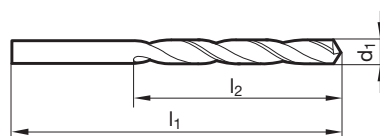
Material de corte	HSCO
Superfície	$\geq 6,00$
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 2,370$ • afiação de superfície cônica
- aço-HSS ligado com Co • alta resistência ao desgaste
- M** ○
- K** •
- N** ○ aços com e sem liga • materiais fundidos acima de 800 N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras
- S** ○ aços de liga alta • aços para beneficiamento e cementação
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 780

Brocas helicoidais com haste cilíndrica



Nr. do artigo **308**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,360		19,000	4,000	1,600		43,000	20,000
0,390		20,000	5,000	1,610		43,000	20,000
0,500		22,000	6,000	1,620		43,000	20,000
0,560		24,000	7,000	1,700		43,000	20,000
0,590		24,000	7,000	1,720		46,000	22,000
0,600		24,000	7,000	1,750		46,000	22,000
0,620		26,000	8,000	1,780		46,000	22,000
0,630		26,000	8,000	1,800		46,000	22,000
0,650		26,000	8,000	1,830		46,000	22,000
0,750		28,000	9,000	1,850		46,000	22,000
0,780		30,000	10,000	1,900		46,000	22,000
0,800		30,000	10,000	1,930		49,000	24,000
0,820		30,000	10,000	1,950		49,000	24,000
0,900		32,000	11,000	1,980	5/64	49,000	24,000
0,910		32,000	11,000	2,000		49,000	24,000
0,920		32,000	11,000	2,050		49,000	24,000
0,930		32,000	11,000	2,060		49,000	24,000
0,950		32,000	11,000	2,080		49,000	24,000
0,980		34,000	12,000	2,100		49,000	24,000
1,000		34,000	12,000	2,180		53,000	27,000
1,020		34,000	12,000	2,200		53,000	27,000
1,030		34,000	12,000	2,250		53,000	27,000
1,050		34,000	12,000	2,260		53,000	27,000
1,080		36,000	14,000	2,350		53,000	27,000
1,100		36,000	14,000	2,370		57,000	30,000
1,150		36,000	14,000	2,380	3/32	57,000	30,000
1,180		36,000	14,000	2,400		57,000	30,000
1,190	3/64	38,000	16,000	2,500		57,000	30,000
1,200		38,000	16,000	2,520		57,000	30,000
1,210		38,000	16,000	2,530		57,000	30,000
1,230		38,000	16,000	2,600		57,000	30,000
1,320		38,000	16,000	2,640		57,000	30,000
1,330		40,000	18,000	2,750		61,000	33,000
1,350		40,000	18,000	2,780	7/64	61,000	33,000
1,400		40,000	18,000	2,790		61,000	33,000
1,430		40,000	18,000	2,800		61,000	33,000
1,450		40,000	18,000	2,820		61,000	33,000
1,470		40,000	18,000	2,950		61,000	33,000
1,480		40,000	18,000	3,000		61,000	33,000
1,490		40,000	18,000	3,030		65,000	36,000
1,510		43,000	20,000	3,050		65,000	36,000
1,520		43,000	20,000	3,100		65,000	36,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,420		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,530		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,830		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,570		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,530		101,000	63,000
6,700		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,750	17/64	109,000	69,000
7,040		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,040		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,260		133,000	87,000
10,320	13/32	133,000	87,000
10,490		133,000	87,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,050		151,000	101,000
12,250		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
13,750		160,000	108,000
14,300		169,000	114,000
14,500		169,000	114,000
16,200		184,000	125,000
16,500		184,000	125,000
18,000		191,000	130,000
18,500		198,000	135,000



Brocas espirais curtas



Material de corte	HSCO
Superfície	
Sentido de corte	

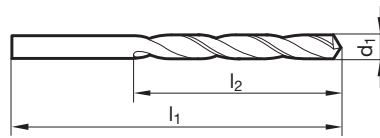
- P** • Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • especialmente para profundidades acima de 3xD
- K** •
- N** • aços (com liga e sem liga) • materiais fundidos acima de 800 N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 780



Brocas helicoidais com haste cilíndrica



Nr. do artigo **622**

d1		l1	l2
mm	inch	mm	mm
1,000		34,000	12,000
1,020		34,000	12,000
1,040		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,090		36,000	14,000
1,100		36,000	14,000
1,130		36,000	14,000
1,150		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,250		38,000	16,000
1,270		38,000	16,000
1,300		38,000	16,000
1,320		38,000	16,000
1,350		40,000	18,000
1,400		40,000	18,000
1,430		40,000	18,000
1,440		40,000	18,000
1,450		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,650		43,000	20,000
1,700		43,000	20,000
1,780		46,000	22,000
1,800		46,000	22,000
1,850		46,000	22,000
1,900		46,000	22,000
1,920		49,000	24,000
1,930		49,000	24,000
1,950		49,000	24,000
1,960		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000

d1		l1	l2
mm	inch	mm	mm
2,080		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,420		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
3,300		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,730		70,000	39,000
3,800		75,000	43,000
3,860		75,000	43,000
3,900		75,000	43,000
3,910		75,000	43,000
3,970	5/32	75,000	43,000
3,990		75,000	43,000
4,000		75,000	43,000
4,020		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,390		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,550		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,050		101,000	63,000
6,100		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,650		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,450		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,750		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,250		133,000	87,000
10,260		133,000	87,000



d1		l1	l2
mm	inch	mm	mm
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
10,900		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,300		142,000	94,000
11,400		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,700		142,000	94,000
11,800		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,500		160,000	108,000
13,800		160,000	108,000
14,000		160,000	108,000
16,000		178,000	120,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • especialmente para profundidades acima de 3xD
- K** •
- N** ○ aços com e sem liga • materiais fundidos acima de 800 N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras
- S** ○ aços de liga alta • aços para beneficiamento e cementação
- H**

Material de corte **HSCO**

Superfície **S**

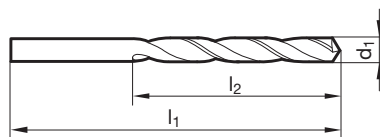
Sentido de corte **R**



GÜHRING NAVIGATOR

Página de dados de corte 782

Brocas helicoidais com haste cilíndrica



Nr. do artigo **658**

d1		l1	l2
mm	inch	mm	mm
1,000		34,000	12,000
1,020		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,100		36,000	14,000
1,130		36,000	14,000
1,150		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,300		38,000	16,000
1,320		38,000	16,000
1,350		40,000	18,000
1,400		40,000	18,000
1,430		40,000	18,000
1,450		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,630		43,000	20,000
1,650		43,000	20,000
1,700		43,000	20,000
1,780		46,000	22,000
1,800		46,000	22,000
1,850		46,000	22,000
1,900		46,000	22,000
1,930		49,000	24,000
1,950		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,050		49,000	24,000
2,060		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000

d1		l1	l2
mm	inch	mm	mm
2,300		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,440		57,000	30,000
2,450		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,580		57,000	30,000
2,600		57,000	30,000
2,640		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,050		65,000	36,000
3,100		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,860		75,000	43,000



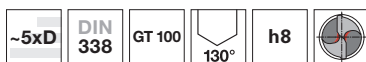
d1		l1	l2
mm	inch	mm	mm
3,900		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,030		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000
4,090		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,850		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000

d1		l1	l2
mm	inch	mm	mm
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,750		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,700		142,000	94,000
11,800		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,500		151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,500		160,000	108,000
13,800		160,000	108,000
14,000		160,000	108,000
14,500		169,000	114,000
15,000		169,000	114,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • especialmente para profundidades acima de 3xD
- K** •
- N** • aços com e sem liga • materiais fundidos acima de 800 N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras
- S** • aços de liga alta • aços para beneficiamento e cementação
- H** ○

Material de corte **HSCO**

Superfície **F**

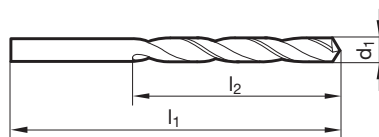
Sentido de corte **R**



GÜHRINGNAVIGATOR

Página de dados de corte 782

Brocas helicoidais com haste cilíndrica



Nr. do artigo **2459**

d1		l1	l2
mm	inch	mm	mm
1,000		34,000	12,000
1,100		36,000	14,000
1,200		38,000	16,000
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,300		53,000	27,000
2,400		57,000	30,000
2,500		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000

d1		l1	l2
mm	inch	mm	mm
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,200		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000

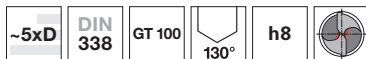


d1		l1	l2
mm	inch	mm	mm
10,000		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,500		142,000	94,000
12,000		151,000	101,000
13,000		151,000	101,000
14,000		160,000	108,000



Brocas espirais curtas



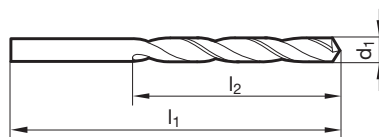
- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • especialmente para profundidades acima de 3xD
- K** ○
- N** aços com e sem liga • materiais fundidos acima de 800 N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras
- S** • aços de liga alta • aços para beneficiamento e cementação
- H**

Material de corte	HSCO
Superfície	G
Sentido de corte	R

Brocas helicoidais com haste cilíndrica

GÜHRINGNAVIGATOR

Página de dados de corte 782



Nr. do artigo **1221**

d1		l1	l2
mm	inch	mm	mm
3,000		61,000	33,000
3,050		65,000	36,000
3,100		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,660		70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,050		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,370	11/64	80,000	47,000
4,500		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,700		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000

d1		l1	l2
mm	inch	mm	mm
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,400		109,000	69,000
7,800		117,000	75,000
7,900		117,000	75,000
8,000		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,130	23/64	125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,400		133,000	87,000
10,700		142,000	94,000
11,200		142,000	94,000
11,910	15/32	151,000	101,000



Brocas espirais curtas



- P** ○ Redução da aresta transversal ≥ Ø 3,000 • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • especialmente para profundidades acima de 3xD
- K** ●
- N** ○ aços com e sem liga • materiais fundidos acima de 800 N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras
- S** ○ aços de liga alta • aços para beneficiamento e cementação
- H** ○

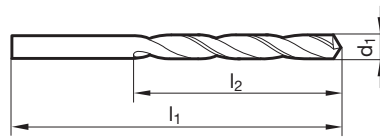
Material de corte **HSCO**

Superfície **A**

Sentido de corte **R**

GÜHRINGNAVIGATOR

Página de dados de corte 782



Brocas helicoidais com haste cilíndrica

Nr. do artigo **1223**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,000		61,000	33,000	6,300		101,000	63,000
3,050		65,000	36,000	6,350	1/4	101,000	63,000
3,100		65,000	36,000	6,400		101,000	63,000
3,170	1/8	65,000	36,000	6,500		101,000	63,000
3,200		65,000	36,000	6,600		101,000	63,000
3,300		65,000	36,000	6,700		101,000	63,000
3,500		70,000	39,000	6,900		109,000	69,000
3,600		70,000	39,000	7,000		109,000	69,000
3,700		70,000	39,000	7,100		109,000	69,000
3,800		75,000	43,000	7,200		109,000	69,000
3,860		75,000	43,000	7,300		109,000	69,000
3,900		75,000	43,000	7,400		109,000	69,000
3,970	5/32	75,000	43,000	7,500		109,000	69,000
4,000		75,000	43,000	7,600		117,000	75,000
4,040		75,000	43,000	7,700		117,000	75,000
4,100		75,000	43,000	7,800		117,000	75,000
4,200		75,000	43,000	7,900		117,000	75,000
4,300		80,000	47,000	7,940	5/16	117,000	75,000
4,370	11/64	80,000	47,000	8,000		117,000	75,000
4,400		80,000	47,000	8,100		117,000	75,000
4,500		80,000	47,000	8,200		117,000	75,000
4,600		80,000	47,000	8,300		117,000	75,000
4,700		80,000	47,000	8,400		117,000	75,000
4,760	3/16	86,000	52,000	8,500		117,000	75,000
4,800		86,000	52,000	8,600		125,000	81,000
4,900		86,000	52,000	8,700		125,000	81,000
4,920		86,000	52,000	8,730	11/32	125,000	81,000
4,980		86,000	52,000	8,800		125,000	81,000
5,000		86,000	52,000	9,000		125,000	81,000
5,100		86,000	52,000	9,130	23/64	125,000	81,000
5,160	13/64	86,000	52,000	9,200		125,000	81,000
5,200		86,000	52,000	9,500		125,000	81,000
5,300		86,000	52,000	9,520	3/8	133,000	87,000
5,400		93,000	57,000	9,530		133,000	87,000
5,500		93,000	57,000	9,800		133,000	87,000
5,600		93,000	57,000	9,900		133,000	87,000
5,700		93,000	57,000	9,920	25/64	133,000	87,000
5,800		93,000	57,000	10,000		133,000	87,000
5,900		93,000	57,000	10,100		133,000	87,000
5,950	15/64	93,000	57,000	10,200		133,000	87,000
6,000		93,000	57,000	10,300		133,000	87,000
6,100		101,000	63,000	10,400		133,000	87,000



d1		l1	l2
mm	inch	mm	mm
10,500		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,200		142,000	94,000
11,500		142,000	94,000
11,700		142,000	94,000
12,000		151,000	101,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



Material de corte **HSCO**

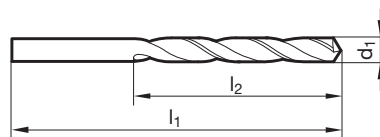
Superfície ○

Sentido de corte (R)

- P** ○ Redução da aresta transversal ≥ Ø 0,970 • afiação de superfície cônica
- aço-HSS ligado com Co • resistência ao desgaste ampliada
- M** •
- K** •
- N** Titânio e ligas de titânio • aços austeníticos resistentes a corrosão-/ácidos-/calor • aços de alta resistência de cavacos curtos acima de 900 N/mm² • Hastelloy, Inconel, Nimonic
- S** •
- H** •

GÜHRING NAVIGATOR

Página de dados de corte 780



Brocas helicoidais com haste cilíndrica

Nr. do artigo **605**

d1		l1	l2
mm	inch	mm	mm
0,200		19,000	2,500
0,300		19,000	3,000
0,380		19,000	4,000
0,400	1/64	20,000	5,000
0,440		20,000	5,000
0,450		20,000	5,000
0,500		22,000	6,000
0,510		22,000	6,000
0,530		22,000	6,000
0,550		24,000	7,000
0,570		24,000	7,000
0,580		24,000	7,000
0,600		24,000	7,000
0,610		26,000	8,000
0,640		26,000	8,000
0,650		26,000	8,000
0,700		28,000	9,000
0,710		28,000	9,000
0,720		28,000	9,000
0,750		28,000	9,000
0,760		30,000	10,000
0,790	1/32	30,000	10,000
0,800		30,000	10,000
0,810		30,000	10,000
0,820		30,000	10,000
0,830		30,000	10,000
0,840		30,000	10,000
0,850		30,000	10,000
0,860		32,000	11,000
0,870		32,000	11,000
0,880		32,000	11,000
0,887		32,000	11,000
0,890		32,000	11,000
0,900		32,000	11,000
0,910		32,000	11,000
0,920		32,000	11,000
0,940		32,000	11,000
0,950		32,000	11,000
0,980		34,000	12,000
0,990		34,000	12,000
1,000		34,000	12,000
1,020		34,000	12,000

d1		l1	l2
mm	inch	mm	mm
1,040		34,000	12,000
1,050		34,000	12,000
1,070		36,000	14,000
1,080		36,000	14,000
1,090		36,000	14,000
1,100		36,000	14,000
1,140		36,000	14,000
1,150		36,000	14,000
1,160		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,220		38,000	16,000
1,230		38,000	16,000
1,250		38,000	16,000
1,290		38,000	16,000
1,300		38,000	16,000
1,320		38,000	16,000
1,350		40,000	18,000
1,400		40,000	18,000
1,450		40,000	18,000
1,460		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,530		43,000	20,000
1,550		43,000	20,000
1,570		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,650		43,000	20,000
1,680		43,000	20,000
1,700		43,000	20,000
1,730		46,000	22,000
1,750		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,820		46,000	22,000
1,850		46,000	22,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
1,900		46,000	22,000
1,930		49,000	24,000
1,950		49,000	24,000
1,970		49,000	24,000
1,980	5/64	49,000	24,000
1,990		49,000	24,000
2,000		49,000	24,000
2,020		49,000	24,000
2,030		49,000	24,000
2,050		49,000	24,000
2,080		49,000	24,000
2,100		49,000	24,000
2,120		49,000	24,000
2,150		53,000	27,000
2,180		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,320		53,000	27,000
2,350		53,000	27,000
2,370		57,000	30,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,450		57,000	30,000
2,490		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,600		57,000	30,000
2,650		57,000	30,000
2,700		61,000	33,000
2,710		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,790		61,000	33,000
2,800		61,000	33,000
2,810		61,000	33,000
2,820		61,000	33,000
2,850		61,000	33,000
2,870		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,030		65,000	36,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,450		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,750		70,000	39,000
3,790		75,000	43,000
3,800		75,000	43,000
3,900		75,000	43,000
3,950		75,000	43,000
3,970	5/32	75,000	43,000
3,980		75,000	43,000
4,000		75,000	43,000
4,040		75,000	43,000
4,050		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
4,100		75,000	43,000
4,150		75,000	43,000
4,200		75,000	43,000
4,220		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,450		80,000	47,000
4,500		80,000	47,000
4,570		80,000	47,000
4,600		80,000	47,000
4,650		80,000	47,000
4,700		80,000	47,000
4,750		80,000	47,000
4,760	3/16	86,000	52,000
4,790		86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,250		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,550		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,750		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,050		101,000	63,000
6,080		101,000	63,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000



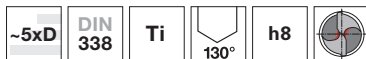
d1		l1	l2
mm	inch	mm	mm
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,550		125,000	81,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,700		142,000	94,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000
11,100		142,000	94,000
11,110	7/16	142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,200		142,000	94,000
11,300		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,600		142,000	94,000
11,700		142,000	94,000
11,750		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,200		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,500		160,000	108,000
13,800		160,000	108,000
13,890	35/64	160,000	108,000
13,970		160,000	108,000
14,000		160,000	108,000
14,290	9/16	169,000	114,000
14,500		169,000	114,000
14,680	37/64	169,000	114,000
15,000		169,000	114,000
15,500		178,000	120,000
16,000		178,000	120,000
16,500		184,000	125,000
17,000		184,000	125,000
17,500		191,000	130,000
18,000		191,000	130,000
19,000		198,000	135,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



- P** ○ Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
- aço-HSS ligado com Co • resistência ao desgaste ampliada
- M** •
- K** •
- N** Titânio e ligas de titânio • aços austeníticos resistentes a corrosão-/ácidos-/calor • aços de alta resistência de cavacos curtos acima de 900 N/mm² • Hastelloy, Inconel, Nimonic
- S** •
- H** •

Material de corte **HSCO**

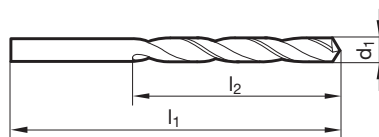
Superfície **S**

Sentido de corte **R**

Brocas helicoidais com haste cilíndrica

GÜHRINGNAVIGATOR

Página de dados de corte 782



Nr. do artigo **657**

d1		l1	l2
mm	inch	mm	mm
0,500		22,000	6,000
0,530		22,000	6,000
0,600		24,000	7,000
0,650		26,000	8,000
0,700		28,000	9,000
0,750		28,000	9,000
0,800		30,000	10,000
0,850		30,000	10,000
0,880		32,000	11,000
0,900		32,000	11,000
0,920		32,000	11,000
0,940		32,000	11,000
0,950		32,000	11,000
1,000		34,000	12,000
1,050		34,000	12,000
1,100		36,000	14,000
1,150		36,000	14,000
1,180		36,000	14,000
1,190	3/64	38,000	16,000
1,200		38,000	16,000
1,210		38,000	16,000
1,250		38,000	16,000
1,300		38,000	16,000
1,320		38,000	16,000
1,350		40,000	18,000
1,390		40,000	18,000
1,400		40,000	18,000
1,450		40,000	18,000
1,500		40,000	18,000
1,510		43,000	20,000
1,520		43,000	20,000
1,550		43,000	20,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,610		43,000	20,000
1,620		43,000	20,000
1,650		43,000	20,000
1,700		43,000	20,000
1,750		46,000	22,000
1,780		46,000	22,000
1,800		46,000	22,000
1,850		46,000	22,000

d1		l1	l2
mm	inch	mm	mm
1,900		46,000	22,000
1,950		49,000	24,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,050		49,000	24,000
2,100		49,000	24,000
2,150		53,000	27,000
2,200		53,000	27,000
2,250		53,000	27,000
2,260		53,000	27,000
2,300		53,000	27,000
2,350		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,440		57,000	30,000
2,500		57,000	30,000
2,530		57,000	30,000
2,550		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,750		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,820		61,000	33,000
2,900		61,000	33,000
2,950		61,000	33,000
3,000		61,000	33,000
3,050		65,000	36,000
3,100		65,000	36,000
3,150		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,250		65,000	36,000
3,260		65,000	36,000
3,300		65,000	36,000
3,350		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,570	9/64	70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000



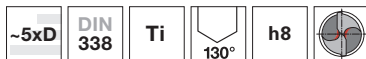
d1		l1	l2
mm	inch	mm	mm
3,750		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,050		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,350		80,000	47,000
4,370	11/64	80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,050		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000

d1		l1	l2
mm	inch	mm	mm
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,550		125,000	81,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,100		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
13,000		151,000	101,000
13,500		160,000	108,000
14,000		160,000	108,000
14,500		169,000	114,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



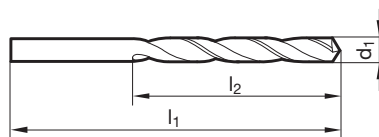
- P** ○ Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
- aço-HSS ligado com Co • resistência ao desgaste ampliada
- M** ●
- K** ●
- N** ● Titânio e ligas de titânio • aços austeníticos resistentes a corrosão-/ácidos-/calor • aços de alta resistência de cavacos curtos acima de 900 N/mm² • Hastelloy, Inconel, Nimonic
- S** ●
- H** ●

Material de corte	HSCO
Superfície	F
Sentido de corte	R

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 782



Nr. do artigo **2458**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,400	1/64	20,000	5,000	3,800		75,000	43,000
0,810		30,000	10,000	3,900		75,000	43,000
1,000		34,000	12,000	3,970	5/32	75,000	43,000
1,100		36,000	14,000	4,000		75,000	43,000
1,190	3/64	38,000	16,000	4,100		75,000	43,000
1,200		38,000	16,000	4,150		75,000	43,000
1,300		38,000	16,000	4,200		75,000	43,000
1,400		40,000	18,000	4,220		75,000	43,000
1,500		40,000	18,000	4,300		80,000	47,000
1,530		43,000	20,000	4,370	11/64	80,000	47,000
1,590	1/16	43,000	20,000	4,400		80,000	47,000
1,600		43,000	20,000	4,500		80,000	47,000
1,650		43,000	20,000	4,600		80,000	47,000
1,700		43,000	20,000	4,700		80,000	47,000
1,800		46,000	22,000	4,760	3/16	86,000	52,000
1,900		46,000	22,000	4,800		86,000	52,000
1,980	5/64	49,000	24,000	4,900		86,000	52,000
2,000		49,000	24,000	5,000		86,000	52,000
2,050		49,000	24,000	5,050		86,000	52,000
2,100		49,000	24,000	5,100		86,000	52,000
2,200		53,000	27,000	5,160	13/64	86,000	52,000
2,300		53,000	27,000	5,200		86,000	52,000
2,370		57,000	30,000	5,300		86,000	52,000
2,380	3/32	57,000	30,000	5,400		93,000	57,000
2,400		57,000	30,000	5,500		93,000	57,000
2,500		57,000	30,000	5,560	7/32	93,000	57,000
2,600		57,000	30,000	5,600		93,000	57,000
2,700		61,000	33,000	5,700		93,000	57,000
2,750		61,000	33,000	5,800		93,000	57,000
2,780	7/64	61,000	33,000	5,900		93,000	57,000
2,800		61,000	33,000	5,950	15/64	93,000	57,000
2,900		61,000	33,000	6,000		93,000	57,000
3,000		61,000	33,000	6,100		101,000	63,000
3,100		65,000	36,000	6,200		101,000	63,000
3,170	1/8	65,000	36,000	6,300		101,000	63,000
3,200		65,000	36,000	6,350	1/4	101,000	63,000
3,300		65,000	36,000	6,400		101,000	63,000
3,400		70,000	39,000	6,500		101,000	63,000
3,500		70,000	39,000	6,600		101,000	63,000
3,570	9/64	70,000	39,000	6,700		101,000	63,000
3,600		70,000	39,000	6,750	17/64	109,000	69,000
3,700		70,000	39,000	6,800		109,000	69,000



d1		l1	l2
mm	inch	mm	mm
6,900		109,000	69,000
7,000		109,000	69,000
7,140	9/32	109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
9,000		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
9,800		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,490	17/32	160,000	108,000
14,000		160,000	108,000
14,290	9/16	169,000	114,000
14,500		169,000	114,000
15,000		169,000	114,000

Brocas helicoidais
com haste cilíndrica



Brocas espirais curtas



- P** ○ Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
- M** ● aço-HSS ligado com Co • alta resistência ao desgaste
- K** ●
- N** ● Titânio e ligas de titânio • aços austeníticos resistentes a corrosão-/ácidos-/calor • aços de alta resistência de cavacos curtos acima de 900 N/mm² • Hastelloy, Inconel, Nimonic
- S** ●
- H** ●

Material de corte **HSCO**

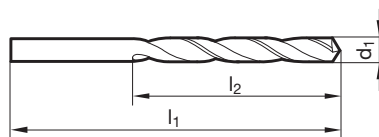
Superfície ○

Sentido de corte

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 780



Nr. do artigo **608**

d1		l1	l2
mm	inch	mm	mm
1,300		38,000	16,000
1,320		38,000	16,000
1,350		40,000	18,000
1,400		40,000	18,000
1,600		43,000	20,000
1,620		43,000	20,000
1,640		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
1,950		49,000	24,000
2,000		49,000	24,000
2,150		53,000	27,000
2,400		57,000	30,000
2,500		57,000	30,000
2,600		57,000	30,000
2,750		61,000	33,000
2,800		61,000	33,000
3,000		61,000	33,000
3,300		65,000	36,000
3,320		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,550		70,000	39,000
3,600		70,000	39,000
3,650		70,000	39,000
3,700		70,000	39,000
3,900		75,000	43,000
4,000		75,000	43,000
4,250		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000

d1		l1	l2
mm	inch	mm	mm
4,920		86,000	52,000
5,000		86,000	52,000
5,200		86,000	52,000
5,400		93,000	57,000
5,450		93,000	57,000
5,580		93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,300		101,000	63,000
6,600		101,000	63,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
8,100		117,000	75,000
8,400		117,000	75,000
8,750		125,000	81,000
8,800		125,000	81,000
9,100		125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,500		125,000	81,000



Brocas espirais curtas



- P** ○ afiação de superfície cônica • aço-HSS ligado com Co • resistência ao desgaste ampliada
- M** ●
- K** ●
- N** ○ aços austeníticos resistentes a corrosão-/ácidos-/calor (V2A e V4A)
- S** ○
- H** ●

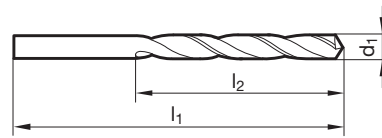
Material de corte **HSCO**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 780



Brocas helicoidais com haste cilíndrica

Nr. do artigo **1260**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	5,100		86,000	52,000
1,100		36,000	14,000	5,200		86,000	52,000
1,200		38,000	16,000	5,300		86,000	52,000
1,300		38,000	16,000	5,400		93,000	57,000
1,400		40,000	18,000	5,500		93,000	57,000
1,500		40,000	18,000	5,600		93,000	57,000
1,600		43,000	20,000	5,700		93,000	57,000
1,700		43,000	20,000	5,800		93,000	57,000
1,800		46,000	22,000	5,900		93,000	57,000
1,900		46,000	22,000	6,000		93,000	57,000
2,000		49,000	24,000	6,100		101,000	63,000
2,100		49,000	24,000	6,200		101,000	63,000
2,200		53,000	27,000	6,300		101,000	63,000
2,300		53,000	27,000	6,400		101,000	63,000
2,400		57,000	30,000	6,500		101,000	63,000
2,500		57,000	30,000	6,600		101,000	63,000
2,600		57,000	30,000	6,700		101,000	63,000
2,700		61,000	33,000	6,800		109,000	69,000
2,800		61,000	33,000	6,900		109,000	69,000
2,900		61,000	33,000	7,000		109,000	69,000
3,000		61,000	33,000	7,100		109,000	69,000
3,100		65,000	36,000	7,200		109,000	69,000
3,200		65,000	36,000	7,300		109,000	69,000
3,300		65,000	36,000	7,400		109,000	69,000
3,400		70,000	39,000	7,500		109,000	69,000
3,500		70,000	39,000	7,700		117,000	75,000
3,570	9/64	70,000	39,000	7,800		117,000	75,000
3,600		70,000	39,000	7,900		117,000	75,000
3,700		70,000	39,000	8,000		117,000	75,000
3,800		75,000	43,000	8,100		117,000	75,000
3,900		75,000	43,000	8,200		117,000	75,000
4,000		75,000	43,000	8,300		117,000	75,000
4,100		75,000	43,000	8,400		117,000	75,000
4,200		75,000	43,000	8,500		117,000	75,000
4,300		80,000	47,000	8,600		125,000	81,000
4,400		80,000	47,000	8,700		125,000	81,000
4,500		80,000	47,000	8,800		125,000	81,000
4,600		80,000	47,000	8,900		125,000	81,000
4,700		80,000	47,000	9,000		125,000	81,000
4,800		86,000	52,000	9,100		125,000	81,000
4,900		86,000	52,000	9,200		125,000	81,000
5,000		86,000	52,000	9,400		125,000	81,000



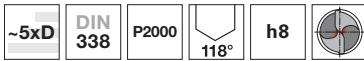
d1		l1	l2
mm	inch	mm	mm
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,500		133,000	87,000
10,600		133,000	87,000
10,800		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,000		142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,800		142,000	94,000
11,900		151,000	101,000
12,000		151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000

Brocas helicoidais com haste cilíndrica



Brocas espirais curtas

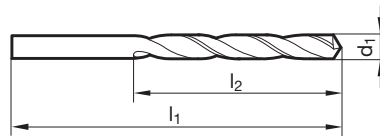


- P** ● Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** ○ • aplicação universal com afiação ondulada • aço-HSS ligado com Co
- K** ○ • resistência ao desgaste ampliada
- N** ○ aços até 1000 N/mm² • ligas de AISi
- S** ○
- H** ○

Material de corte	HSCO
Superfície	●
Sentido de corte	Ⓜ

GÜHRING NAVIGATOR

Página de dados de corte 784



Brocas helicoidais com haste cilíndrica

Nr. do artigo **2047**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	5,200		86,000	52,000
1,100		36,000	14,000	5,300		86,000	52,000
1,200		38,000	16,000	5,400		93,000	57,000
1,300		38,000	16,000	5,500		93,000	57,000
1,400		40,000	18,000	5,600		93,000	57,000
1,500		40,000	18,000	5,700		93,000	57,000
1,600		43,000	20,000	5,800		93,000	57,000
1,700		43,000	20,000	5,900		93,000	57,000
1,800		46,000	22,000	6,000		93,000	57,000
1,900		46,000	22,000	6,100		101,000	63,000
2,000		49,000	24,000	6,200		101,000	63,000
2,100		49,000	24,000	6,300		101,000	63,000
2,200		53,000	27,000	6,400		101,000	63,000
2,300		53,000	27,000	6,500		101,000	63,000
2,400		57,000	30,000	6,600		101,000	63,000
2,500		57,000	30,000	6,700		101,000	63,000
2,600		57,000	30,000	6,800		109,000	69,000
2,700		61,000	33,000	6,900		109,000	69,000
2,800		61,000	33,000	7,000		109,000	69,000
2,900		61,000	33,000	7,100		109,000	69,000
3,000		61,000	33,000	7,200		109,000	69,000
3,100		65,000	36,000	7,300		109,000	69,000
3,200		65,000	36,000	7,400		109,000	69,000
3,300		65,000	36,000	7,500		109,000	69,000
3,400		70,000	39,000	7,600		117,000	75,000
3,500		70,000	39,000	7,700		117,000	75,000
3,600		70,000	39,000	7,800		117,000	75,000
3,700		70,000	39,000	7,900		117,000	75,000
3,800		75,000	43,000	8,000		117,000	75,000
3,900		75,000	43,000	8,100		117,000	75,000
4,000		75,000	43,000	8,200		117,000	75,000
4,100		75,000	43,000	8,300		117,000	75,000
4,200		75,000	43,000	8,400		117,000	75,000
4,300		80,000	47,000	8,500		117,000	75,000
4,400		80,000	47,000	8,600		125,000	81,000
4,500		80,000	47,000	8,700		125,000	81,000
4,600		80,000	47,000	8,800		125,000	81,000
4,700		80,000	47,000	8,900		125,000	81,000
4,800		86,000	52,000	9,000		125,000	81,000
4,900		86,000	52,000	9,100		125,000	81,000
5,000		86,000	52,000	9,200		125,000	81,000
5,100		86,000	52,000	9,300		125,000	81,000



d1		l1	l2
mm	inch	mm	mm
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000
11,500		142,000	94,000
12,000		151,000	101,000

d1		l1	l2
mm	inch	mm	mm
12,500		151,000	101,000
13,000		151,000	101,000

Brocas helicoidais com haste cilíndrica



Broca helicoidal AeroX afiação em cruz



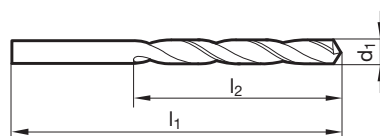
- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação em cruz otimizada
- M** • liga de aço rápido HSCO com 8% de cobalto, para vida útil máxima, alta resistência térmica e dureza
- K** •
- N** • aço não ligado e de alta liga • materiais fundidos • metais não ferrosos
- S** • Titânio e ligas de titânio
- H** ○

Material de corte	M42
Superfície	
Sentido de corte	



GÜHRINGNAVIGATOR

Página de dados de corte 784



Brocas helicoidais com haste cilíndrica

Nr. do artigo **1018**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	4,400		80,000	47,000
1,100		36,000	14,000	4,500		80,000	47,000
1,200		38,000	16,000	4,600		80,000	47,000
1,300		38,000	16,000	4,700		80,000	47,000
1,400		40,000	18,000	4,760	3/16	86,000	52,000
1,500		40,000	18,000	4,800		86,000	52,000
1,590	1/16	43,000	20,000	4,900		86,000	52,000
1,600		43,000	20,000	5,000		86,000	52,000
1,700		43,000	20,000	5,100		86,000	52,000
1,800		46,000	22,000	5,160	13/64	86,000	52,000
1,900		46,000	22,000	5,200		86,000	52,000
1,980	5/64	49,000	24,000	5,300		86,000	52,000
2,000		49,000	24,000	5,400		93,000	57,000
2,100		49,000	24,000	5,500		93,000	57,000
2,200		53,000	27,000	5,560	7/32	93,000	57,000
2,300		53,000	27,000	5,600		93,000	57,000
2,380	3/32	57,000	30,000	5,700		93,000	57,000
2,400		57,000	30,000	5,800		93,000	57,000
2,500		57,000	30,000	5,900		93,000	57,000
2,600		57,000	30,000	5,950	15/64	93,000	57,000
2,700		61,000	33,000	6,000		93,000	57,000
2,780	7/64	61,000	33,000	6,100		101,000	63,000
2,800		61,000	33,000	6,200		101,000	63,000
2,900		61,000	33,000	6,300		101,000	63,000
3,000		61,000	33,000	6,350	1/4	101,000	63,000
3,100		65,000	36,000	6,400		101,000	63,000
3,170	1/8	65,000	36,000	6,500		101,000	63,000
3,200		65,000	36,000	6,600		101,000	63,000
3,250		65,000	36,000	6,700		101,000	63,000
3,300		65,000	36,000	6,800		109,000	69,000
3,400		70,000	39,000	6,900		109,000	69,000
3,500		70,000	39,000	7,000		109,000	69,000
3,570	9/64	70,000	39,000	7,100		109,000	69,000
3,600		70,000	39,000	7,140	9/32	109,000	69,000
3,700		70,000	39,000	7,200		109,000	69,000
3,800		75,000	43,000	7,300		109,000	69,000
3,900		75,000	43,000	7,400		109,000	69,000
3,970	5/32	75,000	43,000	7,500		109,000	69,000
4,000		75,000	43,000	7,540	19/64	117,000	75,000
4,100		75,000	43,000	7,600		117,000	75,000
4,200		75,000	43,000	7,700		117,000	75,000
4,300		80,000	47,000	7,800		117,000	75,000



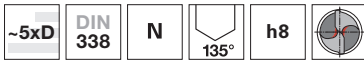
Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,200		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
12,700	1/2	151,000	101,000
12,800		151,000	101,000
13,000		151,000	101,000



Brocas espirais curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** ○ alta proporção de Co e Mo • especialmente alta resistência ao desgaste
- K** ○
- N** • ligas de alta resistência a base de CrNi • Hastelloy, Inconel, Nimonic
- S** • aços resistentes a corrosão/ácidos/calor • chapas resistentes ao desgaste • aços/bronzes até 1400 N/mm²
- H** ○

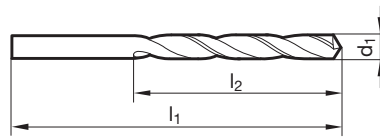
Material de corte **M42**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 780



Brocas helicoidais com haste cilíndrica

Nr. do artigo **1146**

d1		l1	l2
mm	inch	mm	mm
0,400	1/64	20,000	5,000
0,500		22,000	6,000
0,800		30,000	10,000
0,900		32,000	11,000
1,000		34,000	12,000
1,100		36,000	14,000
1,200		38,000	16,000
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,590	1/16	43,000	20,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
1,980	5/64	49,000	24,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,300		53,000	27,000
2,380	3/32	57,000	30,000
2,400		57,000	30,000
2,500		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,780	7/64	61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,170	1/8	65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
3,970	5/32	75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000

d1		l1	l2
mm	inch	mm	mm
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000
13,100	33/64	151,000	101,000
13,500		160,000	108,000
14,000		160,000	108,000
15,000		169,000	114,000
15,870	5/8	178,000	120,000
16,000		178,000	120,000



Brocas espirais curtas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação em cruz otimizada
- M** • liga de aço rápido HSCO com 8% de cobalto • especialmente alta resistência ao desgaste
- K** •
- N** ○ ligas de alta resistência a base de CrNi • Hastelloy, Inconel, Nimonic
- S** • aços resistentes a corrosão/ácidos/calor • chapas resistentes ao desgaste • aços/bronzes até 1400 N/mm²
- H**

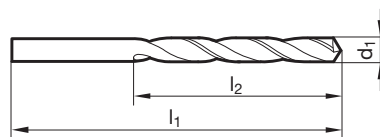
Material de corte	M42
Superfície	F
Sentido de corte	R



Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 784



Nr. do artigo **1199**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	4,760	3/16	86,000	52,000
1,100		36,000	14,000	4,800		86,000	52,000
1,200		38,000	16,000	4,900		86,000	52,000
1,300		38,000	16,000	5,000		86,000	52,000
1,400		40,000	18,000	5,100		86,000	52,000
1,500		40,000	18,000	5,160	13/64	86,000	52,000
1,590	1/16	43,000	20,000	5,200		86,000	52,000
1,600		43,000	20,000	5,300		86,000	52,000
1,700		43,000	20,000	5,400		93,000	57,000
1,800		46,000	22,000	5,500		93,000	57,000
1,900		46,000	22,000	5,600		93,000	57,000
2,000		49,000	24,000	5,700		93,000	57,000
2,100		49,000	24,000	5,800		93,000	57,000
2,200		53,000	27,000	5,900		93,000	57,000
2,300		53,000	27,000	5,950	15/64	93,000	57,000
2,380	3/32	57,000	30,000	6,000		93,000	57,000
2,400		57,000	30,000	6,100		101,000	63,000
2,500		57,000	30,000	6,200		101,000	63,000
2,600		57,000	30,000	6,300		101,000	63,000
2,700		61,000	33,000	6,350	1/4	101,000	63,000
2,800		61,000	33,000	6,400		101,000	63,000
2,900		61,000	33,000	6,500		101,000	63,000
3,000		61,000	33,000	6,600		101,000	63,000
3,100		65,000	36,000	6,700		101,000	63,000
3,170	1/8	65,000	36,000	6,750	17/64	109,000	69,000
3,200		65,000	36,000	6,800		109,000	69,000
3,300		65,000	36,000	6,900		109,000	69,000
3,400		70,000	39,000	7,000		109,000	69,000
3,500		70,000	39,000	7,100		109,000	69,000
3,600		70,000	39,000	7,200		109,000	69,000
3,700		70,000	39,000	7,300		109,000	69,000
3,800		75,000	43,000	7,400		109,000	69,000
3,900		75,000	43,000	7,500		109,000	69,000
3,970	5/32	75,000	43,000	7,600		117,000	75,000
4,000		75,000	43,000	7,700		117,000	75,000
4,100		75,000	43,000	7,800		117,000	75,000
4,200		75,000	43,000	7,900		117,000	75,000
4,300		80,000	47,000	8,000		117,000	75,000
4,400		80,000	47,000	8,100		117,000	75,000
4,500		80,000	47,000	8,200		117,000	75,000
4,600		80,000	47,000	8,300		117,000	75,000
4,700		80,000	47,000	8,400		117,000	75,000



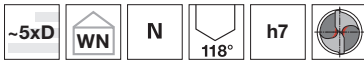
Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,730		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
10,100		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
10,800		142,000	94,000
11,000		142,000	94,000
11,200		142,000	94,000
11,500		142,000	94,000
11,800		142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,200		151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000
14,000		160,000	108,000
15,000		169,000	114,000
16,000		178,000	120,000



Brocas espirais curtas

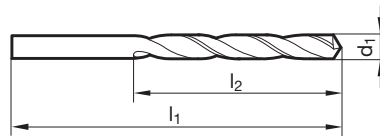


- P** ○ Redução da aresta transversal $\geq \varnothing 2,060$ • afiação facetada • formato reto da aresta de corte principal
- M** ○
- K** ○
- N** ● aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • ferro fundido cinzento • bronze, latão
- S** ○ • alumínio e ligas de alumínio • magnésio e ligas de magnésio • plásticos e plásticos reforçados com fibra
- H** ○

Material de corte	MD int.
Superfície	○
Sentido de corte	Ⓜ

GÜHRING NAVIGATOR

Página de dados de corte 784



Brocas helicoidais com haste cilíndrica

Nr. do artigo **732**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,640		57,000	30,000
1,020		34,000	12,000	2,700		61,000	33,000
1,040		34,000	12,000	2,710		61,000	33,000
1,070		36,000	14,000	2,780	7/64	61,000	33,000
1,090		36,000	14,000	2,790		61,000	33,000
1,100		36,000	14,000	2,800		61,000	33,000
1,180		36,000	14,000	2,820		61,000	33,000
1,190	3/64	38,000	16,000	2,870		61,000	33,000
1,200		38,000	16,000	2,900		61,000	33,000
1,300		38,000	16,000	2,950		61,000	33,000
1,320		38,000	16,000	3,000		61,000	33,000
1,400		40,000	18,000	3,050		65,000	36,000
1,500		40,000	18,000	3,100		65,000	36,000
1,510		43,000	20,000	3,170	1/8	65,000	36,000
1,590	1/16	43,000	20,000	3,200		65,000	36,000
1,600		43,000	20,000	3,260		65,000	36,000
1,610		43,000	20,000	3,300		65,000	36,000
1,700		43,000	20,000	3,400		70,000	39,000
1,780		46,000	22,000	3,450		70,000	39,000
1,800		46,000	22,000	3,500		70,000	39,000
1,850		46,000	22,000	3,570	9/64	70,000	39,000
1,900		46,000	22,000	3,600		70,000	39,000
1,930		49,000	24,000	3,660		70,000	39,000
1,980	5/64	49,000	24,000	3,700		70,000	39,000
1,990		49,000	24,000	3,730		70,000	39,000
2,000		49,000	24,000	3,800		75,000	43,000
2,060		49,000	24,000	3,860		75,000	43,000
2,080		49,000	24,000	3,900		75,000	43,000
2,100		49,000	24,000	3,910		75,000	43,000
2,180		53,000	27,000	3,970	5/32	75,000	43,000
2,200		53,000	27,000	3,990		75,000	43,000
2,260		53,000	27,000	4,000		75,000	43,000
2,300		53,000	27,000	4,040		75,000	43,000
2,370		57,000	30,000	4,090		75,000	43,000
2,380	3/32	57,000	30,000	4,100		75,000	43,000
2,400		57,000	30,000	4,200		75,000	43,000
2,440		57,000	30,000	4,220		75,000	43,000
2,490		57,000	30,000	4,300		80,000	47,000
2,500		57,000	30,000	4,370	11/64	80,000	47,000
2,530		57,000	30,000	4,390		80,000	47,000
2,580		57,000	30,000	4,400		80,000	47,000
2,600		57,000	30,000	4,500		80,000	47,000



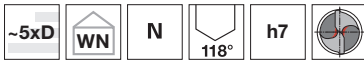
Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000

d1		l1	l2
mm	inch	mm	mm
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,200		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,700	1/2	151,000	101,000



Brocas espirais curtas

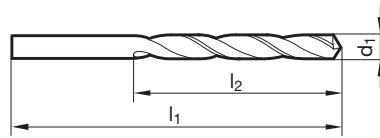


- P** ○ Redução da aresta transversal $\geq \varnothing 2,060$ • afiação facetada • formato reto da aresta de corte principal
- M** ○
- K** ○
- N** ● aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • materiais fundidos • latão • todos materiais com alto teor-SI • magnésio e ligas de magnésio • plásticos e plásticos reforçados com fibra
- S** ○
- H** ○

Material de corte	MD int.
Superfície	F
Sentido de corte	R

GÜHRING NAVIGATOR

Página de dados de corte 784



Brocas helicoidais com haste cilíndrica

Nr. do artigo **2464**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		34,000	12,000	2,640		57,000	30,000
1,020		34,000	12,000	2,700		61,000	33,000
1,040		34,000	12,000	2,710		61,000	33,000
1,070		36,000	14,000	2,780	7/64	61,000	33,000
1,090		36,000	14,000	2,790		61,000	33,000
1,100		36,000	14,000	2,800		61,000	33,000
1,180		36,000	14,000	2,820		61,000	33,000
1,190	3/64	38,000	16,000	2,870		61,000	33,000
1,200		38,000	16,000	2,900		61,000	33,000
1,300		38,000	16,000	2,950		61,000	33,000
1,320		38,000	16,000	3,000		61,000	33,000
1,400		40,000	18,000	3,050		65,000	36,000
1,500		40,000	18,000	3,100		65,000	36,000
1,510		43,000	20,000	3,170	1/8	65,000	36,000
1,590	1/16	43,000	20,000	3,200		65,000	36,000
1,600		43,000	20,000	3,260		65,000	36,000
1,610		43,000	20,000	3,300		65,000	36,000
1,700		43,000	20,000	3,400		70,000	39,000
1,780		46,000	22,000	3,450		70,000	39,000
1,800		46,000	22,000	3,500		70,000	39,000
1,850		46,000	22,000	3,570	9/64	70,000	39,000
1,900		46,000	22,000	3,600		70,000	39,000
1,930		49,000	24,000	3,660		70,000	39,000
1,980	5/64	49,000	24,000	3,700		70,000	39,000
1,990		49,000	24,000	3,730		70,000	39,000
2,000		49,000	24,000	3,800		75,000	43,000
2,060		49,000	24,000	3,860		75,000	43,000
2,080		49,000	24,000	3,900		75,000	43,000
2,100		49,000	24,000	3,910		75,000	43,000
2,180		53,000	27,000	3,970	5/32	75,000	43,000
2,200		53,000	27,000	3,990		75,000	43,000
2,260		53,000	27,000	4,000		75,000	43,000
2,300		53,000	27,000	4,040		75,000	43,000
2,370		57,000	30,000	4,090		75,000	43,000
2,380	3/32	57,000	30,000	4,100		75,000	43,000
2,400		57,000	30,000	4,200		75,000	43,000
2,440		57,000	30,000	4,220		75,000	43,000
2,490		57,000	30,000	4,300		80,000	47,000
2,500		57,000	30,000	4,370	11/64	80,000	47,000
2,530		57,000	30,000	4,390		80,000	47,000
2,580		57,000	30,000	4,400		80,000	47,000
2,600		57,000	30,000	4,500		80,000	47,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,570		80,000	47,000
4,600		80,000	47,000
4,620		80,000	47,000
4,700		80,000	47,000
4,760	3/16	86,000	52,000
4,800		86,000	52,000
4,850		86,000	52,000
4,900		86,000	52,000
4,920		86,000	52,000
4,980		86,000	52,000
5,000		86,000	52,000
5,060		86,000	52,000
5,100		86,000	52,000
5,110		86,000	52,000
5,160	13/64	86,000	52,000
5,180		86,000	52,000
5,200		86,000	52,000
5,220		86,000	52,000
5,300		86,000	52,000
5,310		93,000	57,000
5,400		93,000	57,000
5,410		93,000	57,000
5,500		93,000	57,000
5,560	7/32	93,000	57,000
5,600		93,000	57,000
5,610		93,000	57,000
5,700		93,000	57,000
5,790		93,000	57,000
5,800		93,000	57,000
5,900		93,000	57,000
5,940		93,000	57,000
5,950	15/64	93,000	57,000
6,000		93,000	57,000
6,040		101,000	63,000
6,100		101,000	63,000
6,150		101,000	63,000
6,200		101,000	63,000
6,250		101,000	63,000
6,300		101,000	63,000
6,350	1/4	101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,530		101,000	63,000
6,600		101,000	63,000
6,630		101,000	63,000
6,700		101,000	63,000
6,750	17/64	109,000	69,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,030		109,000	69,000
7,100		109,000	69,000
7,140	9/32	109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,370		109,000	69,000
7,400		109,000	69,000
7,490		109,000	69,000
7,500		109,000	69,000
7,540	19/64	117,000	75,000

d1		l1	l2
mm	inch	mm	mm
7,600		117,000	75,000
7,670		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
7,940	5/16	117,000	75,000
8,000		117,000	75,000
8,030		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,330	21/64	117,000	75,000
8,400		117,000	75,000
8,430		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,610		125,000	81,000
8,700		125,000	81,000
8,730	11/32	125,000	81,000
8,800		125,000	81,000
8,840		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,090		125,000	81,000
9,100		125,000	81,000
9,130	23/64	125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,340		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,520	3/8	133,000	87,000
9,580		133,000	87,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
9,920	25/64	133,000	87,000
10,000		133,000	87,000
10,080		133,000	87,000
10,200		133,000	87,000
10,260		133,000	87,000
10,300		133,000	87,000
10,320	13/32	133,000	87,000
10,490		133,000	87,000
10,500		133,000	87,000
10,720	27/64	142,000	94,000
11,000		142,000	94,000
11,110	7/16	142,000	94,000
11,500		142,000	94,000
11,510	29/64	142,000	94,000
11,910	15/32	151,000	101,000
12,000		151,000	101,000
12,300	31/64	151,000	101,000
12,700	1/2	151,000	101,000



Brocas espirais curtas



Material de corte **Metal duro**

Superfície ○

Sentido de corte (R)

P ○ Redução da aresta transversal $\geq \varnothing 2,700$ • afiação facetada • broca especial • providas com metal duro

M

K ○

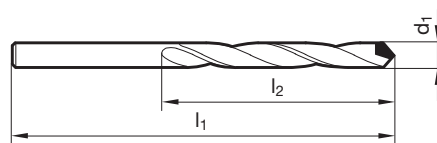
N materiais altamente abrasivos • aço tratado térmicamente e temperado
S • fundição dura, aço-manganês bronzes duros

S

H •

GÜHRING NAVIGATOR

Página de dados de corte 776



Brocas helicoidais com haste cilíndrica

Nr. do artigo **710**

d1		l1	l2
mm	inch	mm	mm
3,000		61,000	33,000
3,100		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
4,000		75,000	43,000
4,200		75,000	43,000
4,500		80,000	47,000
4,700		80,000	47,000
5,000		86,000	52,000
5,100		86,000	52,000
5,500		93,000	57,000
6,000		93,000	57,000
6,300		101,000	63,000
6,500		101,000	63,000
6,800		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000

d1		l1	l2
mm	inch	mm	mm
7,200		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
8,000		117,000	75,000
8,500		117,000	75,000
9,000		125,000	81,000
9,500		125,000	81,000
10,000		133,000	87,000
10,200		133,000	87,000
11,000		142,000	94,000
12,000		151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000
14,000		160,000	108,000

Especialista em HSS

Brocas de aço rápido com designs especiais para tarefas especiais de usinagem

Guhring se destaca especialmente na fabricação de aço rápido graças a um know-how de mais de cem anos, tecnologias de fabricação state-of-the-art(estado de arte), produção rápida de ferramentas especiais, revestimentos de aplicação orientada e uma melhor relação custo-benefício.

Nos seguimentos de micro brocas de precisão, brocas escalonadas ou ferramentas multi-canais – Confie na nossa excelente experiência no segmento de HSS!





Brocas para furar através de buchas

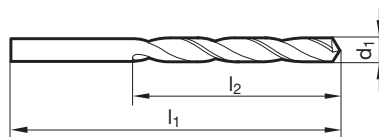


Material de corte	HSS
Superfície	$\geq \frac{0}{2,36}$
Sentido de corte	R

- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- para furar através de buchas
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Brocas helicoidais com haste cilíndrica

Nr. do artigo **211**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,800		42,000	22,000	2,350		70,000	44,000
1,000		48,000	26,000	2,360		70,000	44,000
1,050		48,000	26,000	2,400		74,000	47,000
1,080		50,000	28,000	2,450		74,000	47,000
1,100		50,000	28,000	2,470		74,000	47,000
1,110		50,000	28,000	2,500		74,000	47,000
1,150		50,000	28,000	2,550		74,000	47,000
1,200		52,000	30,000	2,600		74,000	47,000
1,230		52,000	30,000	2,620		74,000	47,000
1,250		52,000	30,000	2,650		74,000	47,000
1,300		52,000	30,000	2,680		79,000	51,000
1,350		55,000	33,000	2,700		79,000	51,000
1,380		55,000	33,000	2,730		79,000	51,000
1,400		55,000	33,000	2,800		79,000	51,000
1,430		55,000	33,000	2,900		79,000	51,000
1,450		55,000	33,000	2,950		79,000	51,000
1,460		55,000	33,000	2,960		79,000	51,000
1,480		55,000	33,000	3,000		79,000	51,000
1,500		55,000	33,000	3,050		84,000	55,000
1,520		58,000	35,000	3,070		84,000	55,000
1,580		58,000	35,000	3,100		84,000	55,000
1,600		58,000	35,000	3,150		84,000	55,000
1,620		58,000	35,000	3,170	1/8	84,000	55,000
1,650		58,000	35,000	3,200		84,000	55,000
1,700		58,000	35,000	3,250		84,000	55,000
1,800		62,000	38,000	3,300		84,000	55,000
1,810		62,000	38,000	3,400		91,000	60,000
1,850		62,000	38,000	3,480		91,000	60,000
1,870		62,000	38,000	3,500		91,000	60,000
1,900		62,000	38,000	3,600		91,000	60,000
1,930		66,000	41,000	3,700		91,000	60,000
1,980	5/64	66,000	41,000	3,730		91,000	60,000
1,990		66,000	41,000	3,800		96,000	64,000
2,000		66,000	41,000	3,900		96,000	64,000
2,020		66,000	41,000	3,950		96,000	64,000
2,030		66,000	41,000	4,000		96,000	64,000
2,050		66,000	41,000	4,100		96,000	64,000
2,100		66,000	41,000	4,200		96,000	64,000
2,150		70,000	44,000	4,300		102,000	69,000
2,200		70,000	44,000	4,400		102,000	69,000
2,220		70,000	44,000	4,500		102,000	69,000
2,320		70,000	44,000	4,580		102,000	69,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,600		102,000	69,000
4,700		102,000	69,000
4,750		102,000	69,000
4,800		108,000	74,000
4,900		108,000	74,000
4,950		108,000	74,000
5,000		108,000	74,000
5,100		108,000	74,000
5,200		108,000	74,000
5,300		108,000	74,000
5,330		116,000	80,000
5,350		116,000	80,000
5,400		116,000	80,000
5,500		116,000	80,000
5,550		116,000	80,000
5,600		116,000	80,000
5,700		116,000	80,000
5,800		116,000	80,000
5,900		116,000	80,000
6,000		116,000	80,000
6,100		124,000	86,000
6,150		124,000	86,000
6,200		124,000	86,000
6,350	1/4	124,000	86,000
6,400		124,000	86,000
6,500		124,000	86,000
6,600		124,000	86,000
6,700		124,000	86,000
6,800		133,000	93,000
6,900		133,000	93,000
7,000		133,000	93,000
7,050		133,000	93,000
7,100		133,000	93,000
7,150		133,000	93,000
7,200		133,000	93,000
7,300		133,000	93,000
7,400		133,000	93,000
7,600		142,000	100,000
7,750		142,000	100,000
7,800		142,000	100,000
7,950		142,000	100,000
8,000		142,000	100,000
8,100		142,000	100,000
8,120		142,000	100,000
8,200		142,000	100,000
8,300		142,000	100,000
8,500		142,000	100,000
8,600		151,000	107,000

d1		l1	l2
mm	inch	mm	mm
8,700		151,000	107,000
8,730	11/32	151,000	107,000
8,900		151,000	107,000
9,000		151,000	107,000
9,100		151,000	107,000
9,200		151,000	107,000
9,300		151,000	107,000
9,500		151,000	107,000
9,600		162,000	116,000
9,650		162,000	116,000
9,700		162,000	116,000
9,750		162,000	116,000
9,800		162,000	116,000
10,000		162,000	116,000
10,200		162,000	116,000
10,500		162,000	116,000
10,800		173,000	125,000
10,900		173,000	125,000
11,000		173,000	125,000
11,300		173,000	125,000
11,400		173,000	125,000
11,500		173,000	125,000
11,700		173,000	125,000
11,750		173,000	125,000
12,000		184,000	134,000
12,100		184,000	134,000
12,300	31/64	184,000	134,000
12,500		184,000	134,000
13,000		184,000	134,000
13,200		184,000	134,000
13,500		194,000	142,000
13,800		194,000	142,000
14,200		202,000	147,000
14,500		202,000	147,000
15,000		202,000	147,000
15,500		211,000	153,000
16,500		218,000	159,000
17,000		218,000	159,000
18,000		226,000	165,000
18,250		234,000	171,000
18,500		234,000	171,000
19,000		234,000	171,000
19,500		242,000	177,000
20,000		242,000	177,000



Brocas para furar através de buchas

Material de corte **HSS**

Superfície

Sentido de corte

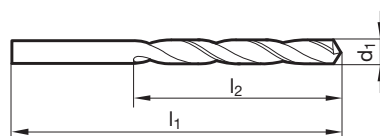
P • Redução da aresta transversal $\geq \varnothing 2,400$ • afiação de superfície cônica
• para furar através de buchas

M**K** •

N ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

S**H****GÜHRING** NAVIGATOR

Página de dados de corte 786



Brocas helicoidais com haste cilíndrica

Nr. do artigo **561**

d1		l1	l2
mm	inch	mm	mm
2,400		74,000	47,000
2,500		74,000	47,000
2,600		74,000	47,000
3,000		79,000	51,000
3,100		84,000	55,000
3,120		84,000	55,000
3,200		84,000	55,000
3,300		84,000	55,000
4,000		96,000	64,000
4,250		96,000	64,000
4,400		102,000	69,000
4,800		108,000	74,000

d1		l1	l2
mm	inch	mm	mm
5,000		108,000	74,000



Brocas para furar através de buchas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M**
- K** • para furar através de buchas
- N** • aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

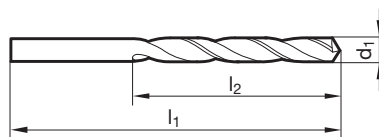
Material de corte	HSS
Superfície	S
Sentido de corte	R



GÜHRINGNAVIGATOR

Página de dados de corte 786

Brocas helicoidais com haste cilíndrica



Nr. do artigo **666**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		48,000	26,000	4,100		96,000	64,000
1,100		50,000	28,000	4,200		96,000	64,000
1,200		52,000	30,000	4,300		102,000	69,000
1,280		52,000	30,000	4,400		102,000	69,000
1,300		52,000	30,000	4,500		102,000	69,000
1,350		55,000	33,000	4,600		102,000	69,000
1,400		55,000	33,000	4,800		108,000	74,000
1,450		55,000	33,000	5,000		108,000	74,000
1,500		55,000	33,000	5,100		108,000	74,000
1,510		58,000	35,000	5,150		108,000	74,000
1,550		58,000	35,000	5,300		108,000	74,000
1,600		58,000	35,000	5,400		116,000	80,000
1,700		58,000	35,000	5,500		116,000	80,000
1,800		62,000	38,000	5,600		116,000	80,000
1,900		62,000	38,000	5,700		116,000	80,000
1,980	5/64	66,000	41,000	5,800		116,000	80,000
1,990		66,000	41,000	6,000		116,000	80,000
2,000		66,000	41,000	6,100		124,000	86,000
2,020		66,000	41,000	6,200		124,000	86,000
2,100		66,000	41,000	6,350	1/4	124,000	86,000
2,200		70,000	44,000	6,400		124,000	86,000
2,300		70,000	44,000	6,500		124,000	86,000
2,400		74,000	47,000	6,600		124,000	86,000
2,450		74,000	47,000	6,700		124,000	86,000
2,500		74,000	47,000	6,800		133,000	93,000
2,550		74,000	47,000	6,900		133,000	93,000
2,600		74,000	47,000	7,000		133,000	93,000
2,800		79,000	51,000	7,100		133,000	93,000
2,900		79,000	51,000	7,200		133,000	93,000
3,000		79,000	51,000	7,300		133,000	93,000
3,100		84,000	55,000	7,500		133,000	93,000
3,150		84,000	55,000	7,600		142,000	100,000
3,200		84,000	55,000	7,700		142,000	100,000
3,300		84,000	55,000	7,800		142,000	100,000
3,400		91,000	60,000	7,900		142,000	100,000
3,500		91,000	60,000	7,940	5/16	142,000	100,000
3,570	9/64	91,000	60,000	8,000		142,000	100,000
3,600		91,000	60,000	8,200		142,000	100,000
3,700		91,000	60,000	8,500		142,000	100,000
3,800		96,000	64,000	8,600		151,000	107,000
3,900		96,000	64,000	9,000		151,000	107,000
4,000		96,000	64,000	9,600		162,000	116,000

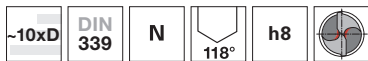


d1		l1	l2
mm	inch	mm	mm
9,800		162,000	116,000
10,000		162,000	116,000
10,200		162,000	116,000
11,000		173,000	125,000
11,500		173,000	125,000
11,910	15/32	184,000	134,000

d1		l1	l2
mm	inch	mm	mm
12,500		184,000	134,000
13,000		184,000	134,000



Brocas para furar através de buchas



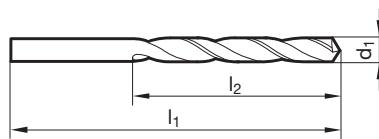
- P** • Redução da aresta transversal $\geq \varnothing 1,100$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • alta resistência ao desgaste • para furar através de buchas
- K** •
- N** • aços com, sem liga e fundidos acima de 800-N/mm^2 • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** ○
- H**

Material de corte	HSCO
Superfície	$\geq 2,36$
Sentido de corte	

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 792



Nr. do artigo **311**

d1		l1	l2
mm	inch	mm	mm
1,100		50,000	28,000
1,300		52,000	30,000
1,500		55,000	33,000
1,600		58,000	35,000
1,800		62,000	38,000
1,900		62,000	38,000
1,950		66,000	41,000
2,000		66,000	41,000
2,500		74,000	47,000
3,000		79,000	51,000
3,100		84,000	55,000
3,200		84,000	55,000
4,000		96,000	64,000
4,500		102,000	69,000
5,000		108,000	74,000
5,100		108,000	74,000
6,100		124,000	86,000
6,400		124,000	86,000

d1		l1	l2
mm	inch	mm	mm
6,800		133,000	93,000
7,000		133,000	93,000
8,200		142,000	100,000
8,500		142,000	100,000
10,000		162,000	116,000
10,800		173,000	125,000
17,500		226,000	165,000
19,000		234,000	171,000



Brocas helicoidais longas

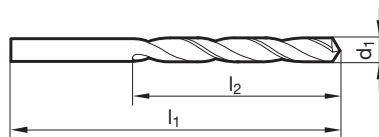


Material de corte	HSS
Superfície	>0.2,36
Sentido de corte	R

- P** • Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica • para furos profundos
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **217**

d1		l1	l2
mm	inch	mm	mm
0,400	1/64	30,000	10,000
0,440		30,000	10,000
0,450		30,000	10,000
0,470		30,000	10,000
0,500		32,000	12,000
0,520		32,000	12,000
0,550		35,000	15,000
0,570		35,000	15,000
0,600		35,000	15,000
0,620		38,000	18,000
0,650		38,000	18,000
0,700		42,000	21,000
0,730		42,000	21,000
0,750		42,000	21,000
0,760		46,000	25,000
0,790	1/32	46,000	25,000
0,800		46,000	25,000
0,820		46,000	25,000
0,850		46,000	25,000
0,900		51,000	29,000
0,910		51,000	29,000
0,920		51,000	29,000
0,950		51,000	29,000
0,970		56,000	33,000
1,000		56,000	33,000
1,040		56,000	33,000
1,050		56,000	33,000
1,080		60,000	37,000
1,090		60,000	37,000
1,100		60,000	37,000
1,120		60,000	37,000
1,130		60,000	37,000
1,150		60,000	37,000
1,180		60,000	37,000
1,190	3/64	65,000	41,000
1,200		65,000	41,000
1,250		65,000	41,000
1,300		65,000	41,000
1,350		70,000	45,000
1,400		70,000	45,000
1,450		70,000	45,000
1,490		70,000	45,000

d1		l1	l2
mm	inch	mm	mm
1,500		70,000	45,000
1,510		76,000	50,000
1,550		76,000	50,000
1,590	1/16	76,000	50,000
1,600		76,000	50,000
1,610		76,000	50,000
1,650		76,000	50,000
1,700		76,000	50,000
1,750		80,000	53,000
1,780		80,000	53,000
1,800		80,000	53,000
1,850		80,000	53,000
1,900		80,000	53,000
1,930		85,000	56,000
1,950		85,000	56,000
1,980	5/64	85,000	56,000
2,000		85,000	56,000
2,030		85,000	56,000
2,050		85,000	56,000
2,060		85,000	56,000
2,080		85,000	56,000
2,100		85,000	56,000
2,150		90,000	59,000
2,200		90,000	59,000
2,250		90,000	59,000
2,260		90,000	59,000
2,300		90,000	59,000
2,350		90,000	59,000
2,370		95,000	62,000
2,380	3/32	95,000	62,000
2,400		95,000	62,000
2,420		95,000	62,000
2,440		95,000	62,000
2,450		95,000	62,000
2,490		95,000	62,000
2,500		95,000	62,000
2,550		95,000	62,000
2,580		95,000	62,000
2,600		95,000	62,000
2,620		95,000	62,000
2,640		95,000	62,000
2,650		95,000	62,000

Brocas helicoidais com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
2,700		100,000	66,000
2,710		100,000	66,000
2,750		100,000	66,000
2,780	7/64	100,000	66,000
2,790		100,000	66,000
2,800		100,000	66,000
2,820		100,000	66,000
2,850		100,000	66,000
2,870		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,030		106,000	69,000
3,050		106,000	69,000
3,100		106,000	69,000
3,150		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,260		106,000	69,000
3,300		106,000	69,000
3,350		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,650		112,000	73,000
3,660		112,000	73,000
3,700		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,850		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,950		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,030		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,450		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,650		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,950		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,030		132,000	87,000
5,050		132,000	87,000

d1		l1	l2
mm	inch	mm	mm
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,150		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,350		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,450		139,000	91,000
5,500		139,000	91,000
5,550		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,750		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,060		148,000	97,000
6,100		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,700		165,000	109,000
7,750		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000



d1		l1	l2
mm	inch	mm	mm
9,200		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,600		184,000	121,000
9,700		184,000	121,000
9,750		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,250		184,000	121,000
10,300		184,000	121,000
10,320	13/32	184,000	121,000
10,400		184,000	121,000
10,500		184,000	121,000
10,700		195,000	128,000
10,720	27/64	195,000	128,000
10,750		195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,600		195,000	128,000
11,700		195,000	128,000
11,750		195,000	128,000
11,800		195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,100		205,000	134,000
12,200		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
12,800		205,000	134,000
13,000		205,000	134,000
13,200		205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,800		214,000	140,000
13,890	35/64	214,000	140,000
14,000		214,000	140,000
14,200		220,000	144,000
14,250		220,000	144,000
14,290	9/16	220,000	144,000
14,490		220,000	144,000
14,500		220,000	144,000
14,900		220,000	144,000

d1		l1	l2
mm	inch	mm	mm
15,000		220,000	144,000
15,080	19/32	227,000	149,000
15,200		227,000	149,000
15,250		227,000	149,000
15,400		227,000	149,000
15,480	39/64	227,000	149,000
15,500		227,000	149,000
15,600		227,000	149,000
15,870	5/8	227,000	149,000
16,000		227,000	149,000
16,270	41/64	235,000	154,000
16,500		235,000	154,000
16,670	21/32	235,000	154,000
17,000		235,000	154,000
17,070	43/64	241,000	158,000
17,460	11/16	241,000	158,000
17,500		241,000	158,000
18,000		241,000	158,000
18,500		247,000	162,000
18,650	47/64	247,000	162,000
19,000		247,000	162,000
19,050	3/4	254,000	166,000
19,500		254,000	166,000
20,000		254,000	166,000
20,500		261,000	171,000
20,640	13/16	261,000	171,000
21,000		261,000	171,000
21,500		268,000	176,000
22,000		268,000	176,000
23,300		275,000	180,000
23,810	15/16	282,000	185,000
24,000		282,000	185,000
25,000	63/64	282,000	185,000
26,190	1 1/32	290,000	190,000
26,500		290,000	190,000
26,990	1 1/16	298,000	195,000
28,570	1 1/8	307,000	201,000
29,000		307,000	201,000
29,370	1 5/32	307,000	201,000
29,500		307,000	201,000
30,160	1 3/16	316,000	207,000
30,960	1 7/32	316,000	207,000
31,000		316,000	207,000
36,510	1 7/16	345,000	225,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais longas



Material de corte **HSS**

Superfície **S**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
• para furos profundos • para furar através de buchas

M

K •

N ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

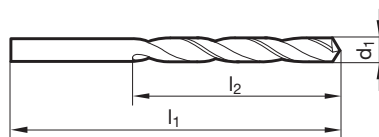
S

H

GÜHRINGNAVIGATOR

Página de dados de corte 786

Brocas helicoidais com haste cilíndrica



Nr. do artigo **667**

d1		l1	l2
mm	inch	mm	mm
0,500		32,000	12,000
0,600		35,000	15,000
0,700		42,000	21,000
0,750		42,000	21,000
0,800		46,000	25,000
0,900		51,000	29,000
0,950		51,000	29,000
1,000		56,000	33,000
1,100		60,000	37,000
1,150		60,000	37,000
1,200		65,000	41,000
1,250		65,000	41,000
1,300		65,000	41,000
1,350		70,000	45,000
1,400		70,000	45,000
1,450		70,000	45,000
1,500		70,000	45,000
1,550		76,000	50,000
1,590	1/16	76,000	50,000
1,600		76,000	50,000
1,650		76,000	50,000
1,700		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
1,900		80,000	53,000
1,950		85,000	56,000
1,980	5/64	85,000	56,000
2,000		85,000	56,000
2,100		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,350		90,000	59,000
2,370		95,000	62,000
2,380	3/32	95,000	62,000
2,440		95,000	62,000
2,450		95,000	62,000
2,500		95,000	62,000
2,530		95,000	62,000
2,650		95,000	62,000
2,700		100,000	66,000
2,750		100,000	66,000
2,780	7/64	100,000	66,000

d1		l1	l2
mm	inch	mm	mm
2,800		100,000	66,000
2,850		100,000	66,000
2,870		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,030		106,000	69,000
3,050		106,000	69,000
3,100		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,260		106,000	69,000
3,300		106,000	69,000
3,350		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,650		112,000	73,000
3,700		112,000	73,000
3,730		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,850		119,000	78,000
3,900		119,000	78,000
3,950		119,000	78,000
3,970	5/32	119,000	78,000
4,000		119,000	78,000
4,050		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,370	11/64	126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,650		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000



d1		l1	l2	
mm	inch	mm	mm	
4,760	3/16	132,000	87,000	
4,850		132,000	87,000	
4,900		132,000	87,000	
5,000	13/64	132,000	87,000	
5,100		132,000	87,000	
5,160		132,000	87,000	
5,200		132,000	87,000	
5,250		132,000	87,000	
5,300	7/32	132,000	87,000	
5,310		139,000	91,000	
5,400		139,000	91,000	
5,410		139,000	91,000	
5,500		139,000	91,000	
5,560		139,000	91,000	
5,600		139,000	91,000	
5,610	1/4	139,000	91,000	
5,700		139,000	91,000	
5,790		139,000	91,000	
5,900		139,000	91,000	
6,000		139,000	91,000	
6,100		148,000	97,000	
6,200		148,000	97,000	
6,250		148,000	97,000	
6,350		148,000	97,000	
6,400		148,000	97,000	
6,500	17/64	148,000	97,000	
6,600		148,000	97,000	
6,750		156,000	102,000	
6,800		156,000	102,000	
7,000		156,000	102,000	
7,100		9/32	156,000	102,000
7,140			156,000	102,000
7,200			156,000	102,000
7,250			156,000	102,000
7,300		19/64	156,000	102,000
7,370			156,000	102,000
7,400			156,000	102,000
7,500	156,000		102,000	
7,540	165,000		109,000	
7,700	165,000		109,000	
7,940	165,000		109,000	
8,000	165,000		109,000	
8,050	165,000		109,000	
8,100	165,000		109,000	
8,200	5/16	165,000	109,000	
8,250		165,000	109,000	
8,300		165,000	109,000	
8,400		165,000	109,000	
8,500		165,000	109,000	
8,700		175,000	115,000	
8,730		175,000	115,000	
8,800	11/32	175,000	115,000	
8,900		175,000	115,000	
9,000		175,000	115,000	

d1		l1	l2
mm	inch	mm	mm
9,100		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,900	25/64	184,000	121,000
9,920		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000	7/16	195,000	128,000
11,110		195,000	128,000
11,500		195,000	128,000
11,750		195,000	128,000
11,910		205,000	134,000
12,000	15/32	205,000	134,000
12,500		205,000	134,000
12,700		205,000	134,000
13,000		205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,800	35/64	214,000	140,000
13,890		214,000	140,000
14,000		214,000	140,000
14,290		220,000	144,000
14,500		220,000	144,000
14,750	9/16	220,000	144,000
14,800		220,000	144,000
14,900		220,000	144,000
15,000		220,000	144,000
15,080	19/32	227,000	149,000
16,000		227,000	149,000
16,500		235,000	154,000
16,670	21/32	235,000	154,000
16,750		235,000	154,000
17,000	11/16	235,000	154,000
17,460		241,000	158,000
18,000		241,000	158,000
18,250		247,000	162,000
22,220	7/8	268,000	176,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais longas



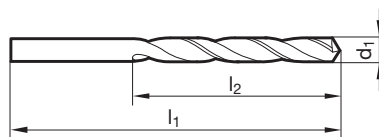
Material de corte	HSS
Superfície	
Sentido de corte	

P	•	Redução da aresta transversal $\geq \varnothing 14,750$ • afiação de superfície cônica
M		• para furos profundos • para furar através de buchas
K	•	
N	o	aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
S		
H		

GÜHRING NAVIGATOR

Página de dados de corte 786

Brocas helicoidais com haste cilíndrica



Nr. do artigo **220**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,450		30,000	10,000	4,500		126,000	82,000
0,470		30,000	10,000	4,600		126,000	82,000
0,900		51,000	29,000	4,780		132,000	87,000
0,950		51,000	29,000	4,800		132,000	87,000
1,100		60,000	37,000	4,950		132,000	87,000
1,150		60,000	37,000	5,000		132,000	87,000
1,200		65,000	41,000	5,100		132,000	87,000
1,250		65,000	41,000	5,200		132,000	87,000
1,400		70,000	45,000	5,600		139,000	91,000
1,450		70,000	45,000	5,700		139,000	91,000
1,500		70,000	45,000	6,000		139,000	91,000
1,600		76,000	50,000	6,050		148,000	97,000
1,630		76,000	50,000	6,100		148,000	97,000
1,660		76,000	50,000	6,400		148,000	97,000
1,730		80,000	53,000	6,500		148,000	97,000
1,800		80,000	53,000	6,600		148,000	97,000
1,850		80,000	53,000	6,800		156,000	102,000
1,900		80,000	53,000	7,200		156,000	102,000
2,000		85,000	56,000	7,500		156,000	102,000
2,300		90,000	59,000	7,800		165,000	109,000
2,500		95,000	62,000	8,000		165,000	109,000
2,700		100,000	66,000	8,100		165,000	109,000
2,750		100,000	66,000	8,250		165,000	109,000
2,900		100,000	66,000	8,400		165,000	109,000
2,950		100,000	66,000	8,800		175,000	115,000
3,000		100,000	66,000	9,000		175,000	115,000
3,050		106,000	69,000	9,520	3/8	184,000	121,000
3,070		106,000	69,000	9,700		184,000	121,000
3,100		106,000	69,000	9,800		184,000	121,000
3,250		106,000	69,000	9,900		184,000	121,000
3,300		106,000	69,000	10,000		184,000	121,000
3,350		106,000	69,000	10,100		184,000	121,000
3,400		112,000	73,000	10,500		184,000	121,000
3,500		112,000	73,000	11,000		195,000	128,000
3,550		112,000	73,000	11,500		195,000	128,000
3,600		112,000	73,000	11,900		205,000	134,000
3,700		112,000	73,000	12,000		205,000	134,000
3,800		119,000	78,000	12,200		205,000	134,000
4,000		119,000	78,000	12,500		205,000	134,000
4,050		119,000	78,000	13,000		205,000	134,000
4,250		119,000	78,000	13,500		214,000	140,000
4,300		126,000	82,000	14,750		220,000	144,000

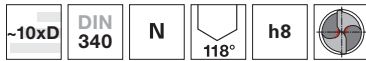


d1		l1	l2
mm	inch	mm	mm
19,000		247,000	162,000
20,000		254,000	166,000
22,000		268,000	176,000
25,000	63/64	282,000	185,000
25,500		290,000	190,000
29,000		307,000	201,000

d1		l1	l2
mm	inch	mm	mm



Brocas helicoidais longas



- P** • Redução da aresta transversal $\geq \varnothing 2,950$ • afiação de superfície cônica • com arraste
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

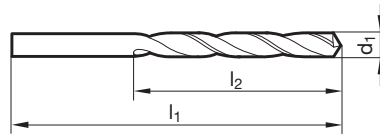
Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ



Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 786



Nr. do artigo **204**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,950		100,000	66,000	7,000		156,000	102,000
3,000		100,000	66,000	7,400		156,000	102,000
3,100		106,000	69,000	7,500		156,000	102,000
3,170	1/8	106,000	69,000	7,600		165,000	109,000
3,200		106,000	69,000	7,700		165,000	109,000
3,300		106,000	69,000	7,800		165,000	109,000
3,400		112,000	73,000	8,000		165,000	109,000
3,500		112,000	73,000	8,100		165,000	109,000
3,600		112,000	73,000	8,200		165,000	109,000
3,800		119,000	78,000	8,250		165,000	109,000
3,900		119,000	78,000	8,400		165,000	109,000
4,000		119,000	78,000	8,450		165,000	109,000
4,050		119,000	78,000	8,500		165,000	109,000
4,100		119,000	78,000	8,600		175,000	115,000
4,200		119,000	78,000	8,750		175,000	115,000
4,250		119,000	78,000	8,800		175,000	115,000
4,300		126,000	82,000	9,000		175,000	115,000
4,400		126,000	82,000	9,300		175,000	115,000
4,500		126,000	82,000	9,400		175,000	115,000
4,760	3/16	132,000	87,000	9,700		184,000	121,000
4,800		132,000	87,000	9,800		184,000	121,000
5,000		132,000	87,000	9,900		184,000	121,000
5,080		132,000	87,000	10,000		184,000	121,000
5,100		132,000	87,000	10,200		184,000	121,000
5,200		132,000	87,000	10,300		184,000	121,000
5,500		139,000	91,000	10,400		184,000	121,000
5,600		139,000	91,000	10,500		184,000	121,000
5,800		139,000	91,000	10,800		195,000	128,000
5,850		139,000	91,000	11,600		195,000	128,000
5,900		139,000	91,000	12,000		205,000	134,000
6,000		139,000	91,000	13,000		205,000	134,000
6,100		148,000	97,000	25,250		290,000	190,000
6,200		148,000	97,000				
6,300		148,000	97,000				
6,350	1/4	148,000	97,000				
6,400		148,000	97,000				
6,500		148,000	97,000				
6,600		148,000	97,000				
6,700		148,000	97,000				
6,750	17/64	156,000	102,000				
6,800		156,000	102,000				
6,900		156,000	102,000				



Brocas helicoidais longas



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P Redução da aresta transversal ≥ Ø 15,000 • afiação de superfície cônica
• para furos profundos

M

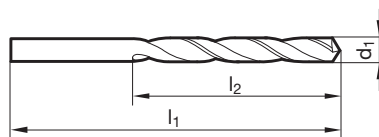
K

N • materiais duros e quebradiços • latão e ligas de magnésio • bronze e
S bronze fosforoso • ardósia, mica, pertinax

H

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **218**

d1		l1	l2
mm	inch	mm	mm
0,500		32,000	12,000
0,520		32,000	12,000
0,550		35,000	15,000
0,600		35,000	15,000
0,650		38,000	18,000
0,700		42,000	21,000
0,750		42,000	21,000
0,800		46,000	25,000
0,820		46,000	25,000
0,840		46,000	25,000
0,850		46,000	25,000
0,900		51,000	29,000
0,950		51,000	29,000
0,970		56,000	33,000
1,000		56,000	33,000
1,050		56,000	33,000
1,100		60,000	37,000
1,150		60,000	37,000
1,200		65,000	41,000
1,250		65,000	41,000
1,300		65,000	41,000
1,400		70,000	45,000
1,500		70,000	45,000
1,550		76,000	50,000
1,560		76,000	50,000
1,570		76,000	50,000
1,580		76,000	50,000
1,600		76,000	50,000
1,650		76,000	50,000
1,700		76,000	50,000
1,750		80,000	53,000
1,800		80,000	53,000
1,820		80,000	53,000
1,850		80,000	53,000
1,900		80,000	53,000
1,950		85,000	56,000
2,000		85,000	56,000
2,050		85,000	56,000
2,100		85,000	56,000
2,180		90,000	59,000
2,200		90,000	59,000
2,250		90,000	59,000

d1		l1	l2
mm	inch	mm	mm
2,300		90,000	59,000
2,350		90,000	59,000
2,400		95,000	62,000
2,500		95,000	62,000
2,550		95,000	62,000
2,600		95,000	62,000
2,650		95,000	62,000
2,700		100,000	66,000
2,800		100,000	66,000
2,830		100,000	66,000
2,870		100,000	66,000
2,900		100,000	66,000
2,940		100,000	66,000
3,000		100,000	66,000
3,020		106,000	69,000
3,050		106,000	69,000
3,060		106,000	69,000
3,100		106,000	69,000
3,150		106,000	69,000
3,180		106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,270		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,600		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
4,000		119,000	78,000
4,030		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,600		126,000	82,000
4,700		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,900		132,000	87,000

Brocas helicoidais com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,450		139,000	91,000
5,500		139,000	91,000
5,600		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,420		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,200		156,000	102,000
7,350		156,000	102,000
7,500		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,700		175,000	115,000
9,000		175,000	115,000
9,500		175,000	115,000
9,700		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
11,250		195,000	128,000
12,100		205,000	134,000
14,000		214,000	140,000
15,000		220,000	144,000
16,000		227,000	149,000



Brocas helicoidais longas



Material de corte **HSS**

Superfície ○

Sentido de corte Ⓛ

P Redução da aresta transversal ≥ Ø 15,000 • afiação de superfície cônica
• para furos profundos

M

K

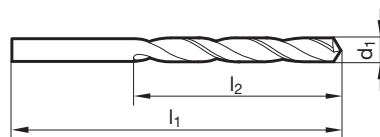
N • materiais duros e quebradiços • latão e ligas de magnésio • bronze e
bronze fosforoso • ardósia, mica, pertinax

S

H

GÜHRINGNAVIGATOR

Página de dados de corte 786



Brocas helicoidais
com haste cilíndrica

Nr. do artigo **221**

d1		l1	l2
mm	inch	mm	mm
0,450		30,000	10,000
0,600		35,000	15,000
0,650		38,000	18,000
0,900		51,000	29,000
1,100		60,000	37,000
1,240		65,000	41,000
1,300		65,000	41,000
1,320		65,000	41,000
1,370		70,000	45,000
1,400		70,000	45,000
1,500		70,000	45,000
1,550		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
2,000		85,000	56,000
2,160		90,000	59,000
2,180		90,000	59,000
2,200		90,000	59,000
2,270		90,000	59,000
2,350		90,000	59,000
2,850		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000

d1		l1	l2
mm	inch	mm	mm
3,510		112,000	73,000
3,700		112,000	73,000
4,100		119,000	78,000
4,200		119,000	78,000
4,400		126,000	82,000
4,500		126,000	82,000
4,900		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,100		132,000	87,000
5,400		139,000	91,000
5,600		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,800		156,000	102,000
8,000		165,000	109,000
9,000		175,000	115,000
12,800		205,000	134,000
15,000		220,000	144,000



Brocas helicoidais longas



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P Redução da aresta transversal ≥ Ø 14,500 • afiação de superfície cônica
• para furos profundos

M

K

N • materiais moles com cavacos longos • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • plásticos moles, madeira

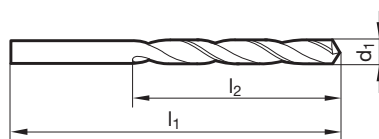
S

H

GÜHRING NAVIGATOR

Página de dados de corte 786

Brocas helicoidais com haste cilíndrica



Nr. do artigo **219**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,100		85,000	56,000
0,600		35,000	15,000	2,150		90,000	59,000
0,650		38,000	18,000	2,200		90,000	59,000
0,700		42,000	21,000	2,250		90,000	59,000
0,740		42,000	21,000	2,300		90,000	59,000
0,750		42,000	21,000	2,350		90,000	59,000
0,800		46,000	25,000	2,380	3/32	95,000	62,000
0,850		46,000	25,000	2,400		95,000	62,000
0,900		51,000	29,000	2,430		95,000	62,000
0,950		51,000	29,000	2,450		95,000	62,000
0,970		56,000	33,000	2,490		95,000	62,000
0,980		56,000	33,000	2,500		95,000	62,000
1,000		56,000	33,000	2,550		95,000	62,000
1,100		60,000	37,000	2,600		95,000	62,000
1,180		60,000	37,000	2,650		95,000	62,000
1,190	3/64	65,000	41,000	2,700		100,000	66,000
1,200		65,000	41,000	2,710		100,000	66,000
1,220		65,000	41,000	2,750		100,000	66,000
1,250		65,000	41,000	2,800		100,000	66,000
1,300		65,000	41,000	2,850		100,000	66,000
1,350		70,000	45,000	2,880		100,000	66,000
1,370		70,000	45,000	2,900		100,000	66,000
1,400		70,000	45,000	2,950		100,000	66,000
1,440		70,000	45,000	3,000		100,000	66,000
1,500		70,000	45,000	3,100		106,000	69,000
1,520		76,000	50,000	3,170	1/8	106,000	69,000
1,600		76,000	50,000	3,180		106,000	69,000
1,610		76,000	50,000	3,200		106,000	69,000
1,650		76,000	50,000	3,250		106,000	69,000
1,700		76,000	50,000	3,260		106,000	69,000
1,750		80,000	53,000	3,300		106,000	69,000
1,760		80,000	53,000	3,350		106,000	69,000
1,770		80,000	53,000	3,400		112,000	73,000
1,780		80,000	53,000	3,500		112,000	73,000
1,800		80,000	53,000	3,550		112,000	73,000
1,850		80,000	53,000	3,600		112,000	73,000
1,900		80,000	53,000	3,650		112,000	73,000
1,950		85,000	56,000	3,700		112,000	73,000
1,970		85,000	56,000	3,750		112,000	73,000
2,000		85,000	56,000	3,800		119,000	78,000
2,050		85,000	56,000	3,830		119,000	78,000
2,070		85,000	56,000	3,900		119,000	78,000



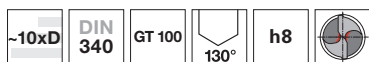
d1		l1	l2
mm	inch	mm	mm
3,920		119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,100		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,700		126,000	82,000
4,800		132,000	87,000
4,830		132,000	87,000
4,870		132,000	87,000
4,900		132,000	87,000
4,950		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,430		139,000	91,000
5,500		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,980		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,450		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,550		165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000

d1		l1	l2
mm	inch	mm	mm
7,850		165,000	109,000
7,900		165,000	109,000
7,950		165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,500		165,000	109,000
8,550		175,000	115,000
8,600		175,000	115,000
8,700		175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,500		175,000	115,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,300		184,000	121,000
10,700		195,000	128,000
10,750		195,000	128,000
11,000		195,000	128,000
11,300		195,000	128,000
11,400		195,000	128,000
12,000		205,000	134,000
13,100	33/64	205,000	134,000
13,500		214,000	140,000
13,750		214,000	140,000
14,000		214,000	140,000
14,500		220,000	144,000
15,000		220,000	144,000
15,500		227,000	149,000
17,000		235,000	154,000
18,000		241,000	158,000
18,250		247,000	162,000
19,000		247,000	162,000
19,840	25/32	254,000	166,000
20,000		254,000	166,000
20,640	13/16	261,000	171,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais longas



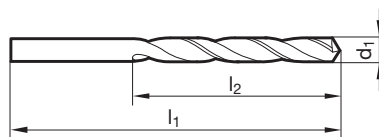
Material de corte	HSS
Superfície	$>0_{2,36}$
Sentido de corte	(R)

- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- canais largos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786

Brocas helicoidais com haste cilíndrica



Nr. do artigo **535**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,200		90,000	59,000
1,020		56,000	33,000	2,250		90,000	59,000
1,040		56,000	33,000	2,260		90,000	59,000
1,050		56,000	33,000	2,300		90,000	59,000
1,070		60,000	37,000	2,350		90,000	59,000
1,090		60,000	37,000	2,370		95,000	62,000
1,100		60,000	37,000	2,380	3/32	95,000	62,000
1,150		60,000	37,000	2,400		95,000	62,000
1,180		60,000	37,000	2,440		95,000	62,000
1,190	3/64	65,000	41,000	2,450		95,000	62,000
1,200		65,000	41,000	2,480		95,000	62,000
1,250		65,000	41,000	2,490		95,000	62,000
1,300		65,000	41,000	2,500		95,000	62,000
1,320		65,000	41,000	2,530		95,000	62,000
1,350		70,000	45,000	2,550		95,000	62,000
1,400		70,000	45,000	2,580		95,000	62,000
1,450		70,000	45,000	2,600		95,000	62,000
1,500		70,000	45,000	2,640		95,000	62,000
1,510		76,000	50,000	2,650		95,000	62,000
1,520		76,000	50,000	2,700		100,000	66,000
1,550		76,000	50,000	2,710		100,000	66,000
1,590	1/16	76,000	50,000	2,750		100,000	66,000
1,600		76,000	50,000	2,780	7/64	100,000	66,000
1,650		76,000	50,000	2,790		100,000	66,000
1,670		76,000	50,000	2,800		100,000	66,000
1,700		76,000	50,000	2,820		100,000	66,000
1,750		80,000	53,000	2,830		100,000	66,000
1,780		80,000	53,000	2,850		100,000	66,000
1,800		80,000	53,000	2,870		100,000	66,000
1,850		80,000	53,000	2,900		100,000	66,000
1,900		80,000	53,000	2,940		100,000	66,000
1,930		85,000	56,000	2,950		100,000	66,000
1,950		85,000	56,000	3,000		100,000	66,000
1,980	5/64	85,000	56,000	3,050		106,000	69,000
1,990		85,000	56,000	3,100		106,000	69,000
2,000		85,000	56,000	3,150		106,000	69,000
2,050		85,000	56,000	3,170	1/8	106,000	69,000
2,060		85,000	56,000	3,200		106,000	69,000
2,080		85,000	56,000	3,250		106,000	69,000
2,100		85,000	56,000	3,260		106,000	69,000
2,150		90,000	59,000	3,270		106,000	69,000
2,180		90,000	59,000	3,300		106,000	69,000



d1		l1	l2
mm	inch	mm	mm
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,660		112,000	73,000
3,700		112,000	73,000
3,730		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,130		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,750		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,050		148,000	97,000
6,100		148,000	97,000

d1		l1	l2
mm	inch	mm	mm
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
6,910		156,000	102,000
7,000		156,000	102,000
7,030		156,000	102,000
7,040		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000
7,750		165,000	109,000
7,800		165,000	109,000
7,850		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,840		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,340		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,600		184,000	121,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,080		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
10,300		184,000	121,000
10,320	13/32	184,000	121,000
10,400		184,000	121,000
10,490		184,000	121,000
10,500		184,000	121,000
10,600		184,000	121,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,100		195,000	128,000
11,110	7/16	195,000	128,000
11,300		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,800		195,000	128,000
11,900		205,000	134,000
11,910	15/32	205,000	134,000

d1		l1	l2
mm	inch	mm	mm
12,000		205,000	134,000
12,150		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,600		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,700		214,000	140,000
13,890	35/64	214,000	140,000
13,900		214,000	140,000
14,000		214,000	140,000



Brocas helicoidais longas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • canais largos • na expulsão difícil dos cavacos
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

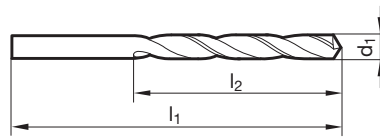
Material de corte **HSS**

Superfície **S**

Sentido de corte **R**

GÜHRING NAVIGATOR

Página de dados de corte 786



Brocas helicoidais com haste cilíndrica

Nr. do artigo **668**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,800		100,000	66,000
1,090		60,000	37,000	2,820		100,000	66,000
1,100		60,000	37,000	2,850		100,000	66,000
1,180		60,000	37,000	2,870		100,000	66,000
1,190	3/64	65,000	41,000	2,900		100,000	66,000
1,200		65,000	41,000	2,950		100,000	66,000
1,300		65,000	41,000	3,000		100,000	66,000
1,320		65,000	41,000	3,050		106,000	69,000
1,400		70,000	45,000	3,100		106,000	69,000
1,500		70,000	45,000	3,170	1/8	106,000	69,000
1,510		76,000	50,000	3,200		106,000	69,000
1,590	1/16	76,000	50,000	3,250		106,000	69,000
1,600		76,000	50,000	3,260		106,000	69,000
1,650		76,000	50,000	3,300		106,000	69,000
1,700		76,000	50,000	3,400		112,000	73,000
1,800		80,000	53,000	3,450		112,000	73,000
1,850		80,000	53,000	3,500		112,000	73,000
1,900		80,000	53,000	3,570	9/64	112,000	73,000
1,930		85,000	56,000	3,600		112,000	73,000
1,950		85,000	56,000	3,700		112,000	73,000
1,980	5/64	85,000	56,000	3,730		112,000	73,000
1,990		85,000	56,000	3,750		112,000	73,000
2,000		85,000	56,000	3,800		119,000	78,000
2,060		85,000	56,000	3,860		119,000	78,000
2,080		85,000	56,000	3,870		119,000	78,000
2,100		85,000	56,000	3,900		119,000	78,000
2,180		90,000	59,000	3,910		119,000	78,000
2,200		90,000	59,000	3,970	5/32	119,000	78,000
2,260		90,000	59,000	4,000		119,000	78,000
2,300		90,000	59,000	4,040		119,000	78,000
2,380	3/32	95,000	62,000	4,090		119,000	78,000
2,400		95,000	62,000	4,100		119,000	78,000
2,490		95,000	62,000	4,200		119,000	78,000
2,500		95,000	62,000	4,220		119,000	78,000
2,530		95,000	62,000	4,300		126,000	82,000
2,550		95,000	62,000	4,370	11/64	126,000	82,000
2,580		95,000	62,000	4,400		126,000	82,000
2,600		95,000	62,000	4,500		126,000	82,000
2,640		95,000	62,000	4,600		126,000	82,000
2,700		100,000	66,000	4,700		126,000	82,000
2,710		100,000	66,000	4,760	3/16	132,000	87,000
2,780	7/64	100,000	66,000	4,800		132,000	87,000



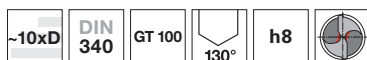
Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
4,850		132,000	87,000
4,900		132,000	87,000
4,910		132,000	87,000
4,920		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,100		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,760		156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000

d1		l1	l2
mm	inch	mm	mm
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,340		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,300	31/64	205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
14,000		214,000	140,000



Brocas helicoidais longas



Material de corte **HSS**

Superfície **F**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
• canais largos • na expulsão difícil dos cavacos

M

K •

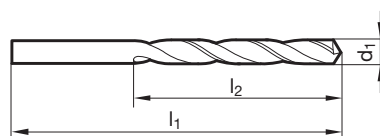
N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

GÜHRING NAVIGATOR

Página de dados de corte 786



Brocas helicoidais com haste cilíndrica

Nr. do artigo **2462**

d1		l1	l2
mm	inch	mm	mm
1,000		56,000	33,000
1,100		60,000	37,000
1,200		65,000	41,000
1,300		65,000	41,000
1,500		70,000	45,000
1,600		76,000	50,000
1,700		76,000	50,000
1,800		80,000	53,000
1,900		80,000	53,000
2,000		85,000	56,000
2,100		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,400		95,000	62,000
2,500		95,000	62,000
2,600		95,000	62,000
2,800		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000

d1		l1	l2
mm	inch	mm	mm
3,800		119,000	78,000
4,000		119,000	78,000
4,200		119,000	78,000
4,300		126,000	82,000
4,500		126,000	82,000
4,800		132,000	87,000
5,000		132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,800		156,000	102,000
7,000		156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,600		165,000	109,000
8,000		165,000	109,000
9,000		175,000	115,000
10,000		184,000	121,000



Brocas helicoidais longas



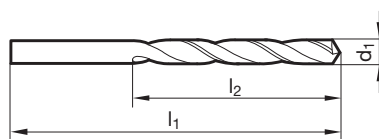
Material de corte	HSS
Superfície	
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação de superfície cônica
- canais largos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786

Brocas helicoidais com haste cilíndrica



Nr. do artigo **506**

d1		l1	l2
mm	inch	mm	mm
1,400		70,000	45,000
1,500		70,000	45,000
1,600		76,000	50,000
1,680		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
2,000		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,350		90,000	59,000
2,500		95,000	62,000
2,800		100,000	66,000
3,000		100,000	66,000
3,050		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,800		119,000	78,000
3,950		119,000	78,000
4,000		119,000	78,000
4,400		126,000	82,000
4,500		126,000	82,000

d1		l1	l2
mm	inch	mm	mm
4,600		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,950		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
7,400		156,000	102,000
7,800		165,000	109,000
8,500		165,000	109,000
9,000		175,000	115,000
9,900		184,000	121,000
10,320	13/32	184,000	121,000
11,000		195,000	128,000
11,500		195,000	128,000
11,600		195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000



Brocas helicoidais longas



- P** ○ Redução da aresta transversal $\geq \varnothing 2,370$ • afiação de superfície cônica
• canal especialmente longo
- M**
- K**
- N** • materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira
- S**
- H**

Material de corte **HSS**

Superfície ○

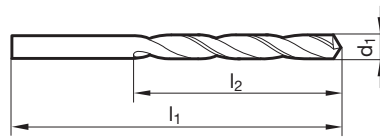
Sentido de corte



Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 786



Nr. do artigo **501**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,350		90,000	59,000
1,020		56,000	33,000	2,370		95,000	62,000
1,030		56,000	33,000	2,380	3/32	95,000	62,000
1,040		56,000	33,000	2,400		95,000	62,000
1,070		60,000	37,000	2,440		95,000	62,000
1,090		60,000	37,000	2,450		95,000	62,000
1,100		60,000	37,000	2,490		95,000	62,000
1,180		60,000	37,000	2,500		95,000	62,000
1,190	3/64	65,000	41,000	2,520		95,000	62,000
1,200		65,000	41,000	2,530		95,000	62,000
1,250		65,000	41,000	2,550		95,000	62,000
1,300		65,000	41,000	2,580		95,000	62,000
1,320		65,000	41,000	2,600		95,000	62,000
1,400		70,000	45,000	2,640		95,000	62,000
1,450		70,000	45,000	2,650		95,000	62,000
1,480		70,000	45,000	2,700		100,000	66,000
1,500		70,000	45,000	2,710		100,000	66,000
1,510		76,000	50,000	2,750		100,000	66,000
1,550		76,000	50,000	2,780	7/64	100,000	66,000
1,590	1/16	76,000	50,000	2,790		100,000	66,000
1,600		76,000	50,000	2,800		100,000	66,000
1,610		76,000	50,000	2,820		100,000	66,000
1,700		76,000	50,000	2,850		100,000	66,000
1,750		80,000	53,000	2,870		100,000	66,000
1,780		80,000	53,000	2,900		100,000	66,000
1,800		80,000	53,000	2,950		100,000	66,000
1,850		80,000	53,000	3,000		100,000	66,000
1,900		80,000	53,000	3,050		106,000	69,000
1,930		85,000	56,000	3,100		106,000	69,000
1,950		85,000	56,000	3,170	1/8	106,000	69,000
1,980	5/64	85,000	56,000	3,200		106,000	69,000
1,990		85,000	56,000	3,250		106,000	69,000
2,000		85,000	56,000	3,260		106,000	69,000
2,050		85,000	56,000	3,300		106,000	69,000
2,060		85,000	56,000	3,350		106,000	69,000
2,080		85,000	56,000	3,400		112,000	73,000
2,100		85,000	56,000	3,450		112,000	73,000
2,180		90,000	59,000	3,500		112,000	73,000
2,200		90,000	59,000	3,570	9/64	112,000	73,000
2,250		90,000	59,000	3,600		112,000	73,000
2,260		90,000	59,000	3,650		112,000	73,000
2,300		90,000	59,000	3,660		112,000	73,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
3,700		112,000	73,000
3,800		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,030		148,000	97,000
6,040		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,040		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,670		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,025		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,330	21/64	165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,750		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000
9,300		175,000	115,000
9,340		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,580		184,000	121,000
9,600		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,080		184,000	121,000
10,200		184,000	121,000
10,260		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,600		184,000	121,000
10,700		195,000	128,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,750		195,000	128,000
11,800		195,000	128,000
11,900		205,000	134,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,200		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,490	17/32	214,000	140,000
14,000		214,000	140,000
32,600		325,000	213,000



Brocas helicoidais longas



Material de corte	HSCO
Superfície	$\geq \frac{0}{2,36}$
Sentido de corte	R

P • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
 • aço-HSS ligado com Co • resistência ao desgaste ampliada

M ○

K •

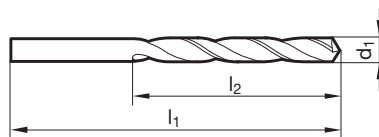
N • aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação

S ○

H

GÜHRING NAVIGATOR

Página de dados de corte 792



Brocas helicoidais com haste cilíndrica

Nr. do artigo **317**

d1		l1	l2
mm	inch	mm	mm
0,500		32,000	12,000
0,600		35,000	15,000
0,700		42,000	21,000
0,750		42,000	21,000
0,800		46,000	25,000
0,850		46,000	25,000
0,900		51,000	29,000
0,950		51,000	29,000
0,960		56,000	33,000
1,000		56,000	33,000
1,020		56,000	33,000
1,050		56,000	33,000
1,100		60,000	37,000
1,150		60,000	37,000
1,190	3/64	65,000	41,000
1,200		65,000	41,000
1,250		65,000	41,000
1,300		65,000	41,000
1,350		70,000	45,000
1,400		70,000	45,000
1,450		70,000	45,000
1,500		70,000	45,000
1,510		76,000	50,000
1,550		76,000	50,000
1,590	1/16	76,000	50,000
1,600		76,000	50,000
1,650		76,000	50,000
1,700		76,000	50,000
1,780		80,000	53,000
1,800		80,000	53,000
1,850		80,000	53,000
1,900		80,000	53,000
1,950		85,000	56,000
1,980	5/64	85,000	56,000
2,000		85,000	56,000
2,050		85,000	56,000
2,060		85,000	56,000
2,100		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,380	3/32	95,000	62,000
2,400		95,000	62,000

d1		l1	l2
mm	inch	mm	mm
2,500		95,000	62,000
2,600		95,000	62,000
2,700		100,000	66,000
2,780	7/64	100,000	66,000
2,800		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,050		106,000	69,000
3,100		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,700		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
3,970	5/32	119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,300		126,000	82,000
4,370	11/64	126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,600		126,000	82,000
4,700		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,100		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
5,400		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,330	21/64	165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
9,000		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,500		175,000	115,000

d1		l1	l2
mm	inch	mm	mm
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,720	27/64	195,000	128,000
10,750		195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,500		214,000	140,000
13,700		214,000	140,000
13,890	35/64	214,000	140,000
13,900		214,000	140,000
14,000		214,000	140,000
14,290	9/16	220,000	144,000
14,400		220,000	144,000
14,600		220,000	144,000
14,680	37/64	220,000	144,000
14,700		220,000	144,000
14,750		220,000	144,000
14,900		220,000	144,000
15,000		220,000	144,000
15,080	19/32	227,000	149,000
15,480	39/64	227,000	149,000
15,800		227,000	149,000
15,870	5/8	227,000	149,000
16,000		227,000	149,000
22,000		268,000	176,000



Brocas helicoidais longas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • na expulsão difícil dos cavacos
- K** •
- N** • aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** •
- H** •

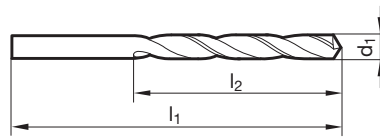
Material de corte	HSCO
Superfície	
Sentido de corte	



Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 792



Nr. do artigo **336**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,440		95,000	62,000
1,020		56,000	33,000	2,450		95,000	62,000
1,040		56,000	33,000	2,490		95,000	62,000
1,070		60,000	37,000	2,500		95,000	62,000
1,090		60,000	37,000	2,530		95,000	62,000
1,100		60,000	37,000	2,550		95,000	62,000
1,180		60,000	37,000	2,580		95,000	62,000
1,190	3/64	65,000	41,000	2,600		95,000	62,000
1,200		65,000	41,000	2,640		95,000	62,000
1,250		65,000	41,000	2,700		100,000	66,000
1,300		65,000	41,000	2,710		100,000	66,000
1,320		65,000	41,000	2,750		100,000	66,000
1,400		70,000	45,000	2,780	7/64	100,000	66,000
1,500		70,000	45,000	2,790		100,000	66,000
1,510		76,000	50,000	2,800		100,000	66,000
1,550		76,000	50,000	2,820		100,000	66,000
1,590	1/16	76,000	50,000	2,850		100,000	66,000
1,600		76,000	50,000	2,870		100,000	66,000
1,610		76,000	50,000	2,900		100,000	66,000
1,700		76,000	50,000	2,950		100,000	66,000
1,750		80,000	53,000	3,000		100,000	66,000
1,780		80,000	53,000	3,050		106,000	69,000
1,800		80,000	53,000	3,100		106,000	69,000
1,850		80,000	53,000	3,170	1/8	106,000	69,000
1,900		80,000	53,000	3,200		106,000	69,000
1,930		85,000	56,000	3,260		106,000	69,000
1,980	5/64	85,000	56,000	3,300		106,000	69,000
1,990		85,000	56,000	3,400		112,000	73,000
2,000		85,000	56,000	3,440		112,000	73,000
2,050		85,000	56,000	3,450		112,000	73,000
2,060		85,000	56,000	3,500		112,000	73,000
2,080		85,000	56,000	3,570	9/64	112,000	73,000
2,100		85,000	56,000	3,600		112,000	73,000
2,180		90,000	59,000	3,660		112,000	73,000
2,200		90,000	59,000	3,700		112,000	73,000
2,250		90,000	59,000	3,730		112,000	73,000
2,260		90,000	59,000	3,750		112,000	73,000
2,300		90,000	59,000	3,800		119,000	78,000
2,350		90,000	59,000	3,860		119,000	78,000
2,370		95,000	62,000	3,900		119,000	78,000
2,380	3/32	95,000	62,000	3,910		119,000	78,000
2,400		95,000	62,000	3,970	5/32	119,000	78,000



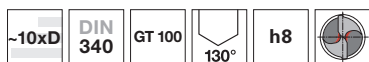
Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,300		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,100		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
6,900		156,000	102,000
7,000		156,000	102,000
7,030		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,840		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,750		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
10,750		195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,500		195,000	128,000
11,800		195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000
15,500		227,000	149,000
16,000		227,000	149,000



Brocas helicoidais longas



Material de corte **HSCO**

Superfície **F**

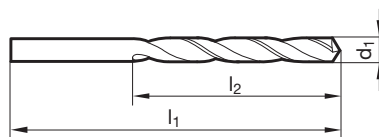
Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica • aço-HSS ligado com Co • canais largos • especialmente alta resistência ao desgaste • na expulsão difícil dos cavacos
- M** •
- K** •
- N** • aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 792

Brocas helicoidais com haste cilíndrica



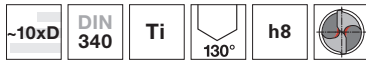
Nr. do artigo **396**

d1		l1	l2
mm	inch	mm	mm
1,000		56,000	33,000
1,100		60,000	37,000
1,200		65,000	41,000
1,300		65,000	41,000
1,500		70,000	45,000
1,600		76,000	50,000
1,800		80,000	53,000
1,900		80,000	53,000
2,000		85,000	56,000
2,100		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,400		95,000	62,000
2,500		95,000	62,000
2,700		100,000	66,000
2,800		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,600		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
4,000		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,500		126,000	82,000
4,800		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000

d1		l1	l2
mm	inch	mm	mm
5,800		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,200		148,000	97,000
6,500		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
7,000		156,000	102,000
7,200		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,500		175,000	115,000
9,600		184,000	121,000
9,700		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
11,500		195,000	128,000
12,000		205,000	134,000



Brocas helicoidais longas



- P** ○ Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
- M** • • aço-HSS ligado com Co • resistência ao desgaste ampliada
- K** ○
- N** ○ Titânio e ligas de titânio • aços austeníticos resistentes a corrosão-/ácidos-/calor • aços de alta resistência de cavacos curtos acima de 900 N/mm² • aços para mancais de laminadoras • Hastelloy, Inconel, Nimonic
- S** •
- H** ○

Material de corte **HSCO**

Superfície ○

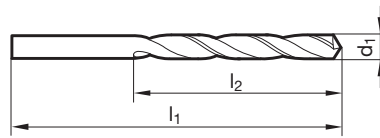
Sentido de corte



Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 792



Nr. do artigo **617**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	3,300		106,000	69,000
1,100		60,000	37,000	3,400		112,000	73,000
1,200		65,000	41,000	3,450		112,000	73,000
1,300		65,000	41,000	3,500		112,000	73,000
1,400		70,000	45,000	3,570	9/64	112,000	73,000
1,450		70,000	45,000	3,600		112,000	73,000
1,500		70,000	45,000	3,700		112,000	73,000
1,590	1/16	76,000	50,000	3,800		119,000	78,000
1,600		76,000	50,000	3,900		119,000	78,000
1,610		76,000	50,000	3,970	5/32	119,000	78,000
1,650		76,000	50,000	4,000		119,000	78,000
1,700		76,000	50,000	4,050		119,000	78,000
1,750		80,000	53,000	4,100		119,000	78,000
1,800		80,000	53,000	4,200		119,000	78,000
1,850		80,000	53,000	4,300		126,000	82,000
1,900		80,000	53,000	4,400		126,000	82,000
1,930		85,000	56,000	4,500		126,000	82,000
1,950		85,000	56,000	4,600		126,000	82,000
1,980	5/64	85,000	56,000	4,700		126,000	82,000
2,000		85,000	56,000	4,760	3/16	132,000	87,000
2,050		85,000	56,000	4,800		132,000	87,000
2,100		85,000	56,000	4,900		132,000	87,000
2,150		90,000	59,000	4,950		132,000	87,000
2,200		90,000	59,000	5,000		132,000	87,000
2,260		90,000	59,000	5,100		132,000	87,000
2,300		90,000	59,000	5,160	13/64	132,000	87,000
2,380	3/32	95,000	62,000	5,200		132,000	87,000
2,400		95,000	62,000	5,300		132,000	87,000
2,450		95,000	62,000	5,400		139,000	91,000
2,500		95,000	62,000	5,500		139,000	91,000
2,550		95,000	62,000	5,600		139,000	91,000
2,600		95,000	62,000	5,700		139,000	91,000
2,700		100,000	66,000	5,800		139,000	91,000
2,780	7/64	100,000	66,000	6,000		139,000	91,000
2,800		100,000	66,000	6,100		148,000	97,000
2,900		100,000	66,000	6,200		148,000	97,000
3,000		100,000	66,000	6,300		148,000	97,000
3,050		106,000	69,000	6,350	1/4	148,000	97,000
3,100		106,000	69,000	6,400		148,000	97,000
3,170	1/8	106,000	69,000	6,500		148,000	97,000
3,200		106,000	69,000	6,600		148,000	97,000
3,250		106,000	69,000	6,700		148,000	97,000



d1		l1	l2
mm	inch	mm	mm
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,250		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000

d1		l1	l2
mm	inch	mm	mm
9,000		175,000	115,000
9,100		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,800		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,510	29/64	195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000
15,000		220,000	144,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais longas

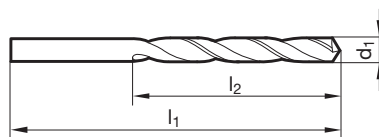


- P** ○ Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
- M** ● aço-HSS ligado com Co • resistência ao desgaste ampliada
- K** ●
- N** ● Titânio e ligas de titânio • aços austeníticos resistentes a corrosão-/ácidos-/calor • aços de alta resistência de cavacos curtos acima de 900 N/mm² • aços para mancais de laminadoras • Hastelloy, Inconel, Nimonic
- S** ●
- H** ●

GÜHRINGNAVIGATOR

Página de dados de corte 792

Material de corte	HSCO
Superfície	S
Sentido de corte	R



Nr. do artigo **669**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	4,300		126,000	82,000
1,200		65,000	41,000	4,370	11/64	126,000	82,000
1,300		65,000	41,000	4,400		126,000	82,000
1,400		70,000	45,000	4,500		126,000	82,000
1,500		70,000	45,000	4,700		126,000	82,000
1,590	1/16	76,000	50,000	4,760	3/16	132,000	87,000
1,600		76,000	50,000	4,800		132,000	87,000
1,700		76,000	50,000	5,000		132,000	87,000
1,800		80,000	53,000	5,100		132,000	87,000
1,900		80,000	53,000	5,160	13/64	132,000	87,000
1,980	5/64	85,000	56,000	5,200		132,000	87,000
2,000		85,000	56,000	5,300		132,000	87,000
2,050		85,000	56,000	5,500		139,000	91,000
2,100		85,000	56,000	5,600		139,000	91,000
2,200		90,000	59,000	5,700		139,000	91,000
2,300		90,000	59,000	5,800		139,000	91,000
2,380	3/32	95,000	62,000	6,000		139,000	91,000
2,400		95,000	62,000	6,100		148,000	97,000
2,500		95,000	62,000	6,200		148,000	97,000
2,600		95,000	62,000	6,300		148,000	97,000
2,700		100,000	66,000	6,350	1/4	148,000	97,000
2,750		100,000	66,000	6,400		148,000	97,000
2,780	7/64	100,000	66,000	6,500		148,000	97,000
2,800		100,000	66,000	6,700		148,000	97,000
2,900		100,000	66,000	6,750	17/64	156,000	102,000
3,000		100,000	66,000	6,800		156,000	102,000
3,100		106,000	69,000	7,000		156,000	102,000
3,170	1/8	106,000	69,000	7,100		156,000	102,000
3,200		106,000	69,000	7,140	9/32	156,000	102,000
3,250		106,000	69,000	7,200		156,000	102,000
3,300		106,000	69,000	7,400		156,000	102,000
3,400		112,000	73,000	7,500		156,000	102,000
3,500		112,000	73,000	7,540	19/64	165,000	109,000
3,570	9/64	112,000	73,000	7,800		165,000	109,000
3,600		112,000	73,000	7,900		165,000	109,000
3,700		112,000	73,000	7,940	5/16	165,000	109,000
3,800		119,000	78,000	8,000		165,000	109,000
3,900		119,000	78,000	8,200		165,000	109,000
3,970	5/32	119,000	78,000	8,500		165,000	109,000
4,000		119,000	78,000	8,730	11/32	175,000	115,000
4,100		119,000	78,000	9,000		175,000	115,000
4,200		119,000	78,000	9,130	23/64	175,000	115,000

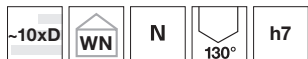


d1		l1	l2
mm	inch	mm	mm
9,300		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000

d1		l1	l2
mm	inch	mm	mm



Brocas helicoidais longas



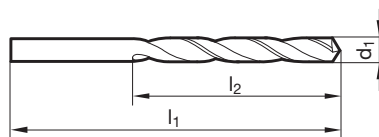
- P** afiação facetada • formato reto da aresta de corte principal
- M**
- K**
- N** plásticos reforçados com fibras de vidro • duroplásticos com ação abrasiva nos cortes e guias
- S**
- H**

Material de corte	MD int.
Superfície	○
Sentido de corte	Ⓜ

GÜHRING NAVIGATOR

Página de dados de corte 792

Brocas helicoidais com haste cilíndrica



Nr. do artigo **706**

d1		l1	l2
mm	inch	mm	mm
0,500		38,000	8,500
0,600		38,000	9,500
0,650		38,000	10,500
0,700		38,000	10,500
0,750		38,000	12,500
0,800		38,000	12,500
0,850		38,000	14,500
0,900		38,000	14,500
1,000		38,000	17,000
1,050		38,000	17,000
1,100		38,000	17,000
1,400		38,000	17,000

d1		l1	l2
mm	inch	mm	mm
1,450		38,000	17,000



Brocas helicoidais extra longas, série1



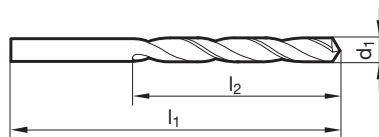
Material de corte	HSS
Superfície	$\geq \frac{0}{2,36}$
Sentido de corte	R

- P** • Redução da aresta transversal $\geq \varnothing 2,380$ • afiação de superfície cônica
• para furos extremamente profundos
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 788

Brocas helicoidais com haste cilíndrica



Nr. do artigo **235**

d1		l1	l2
mm	inch	mm	mm
1,600		115,000	75,000
1,700		115,000	75,000
1,800		120,000	80,000
1,900		120,000	80,000
1,930		125,000	85,000
1,950		125,000	85,000
2,000		125,000	85,000
2,050		125,000	85,000
2,100		125,000	85,000
2,200		135,000	90,000
2,300		135,000	90,000
2,350		135,000	90,000
2,380	3/32	140,000	95,000
2,400		140,000	95,000
2,500		140,000	95,000
2,600		140,000	95,000
2,700		150,000	100,000
2,800		150,000	100,000
2,900		150,000	100,000
3,000		150,000	100,000
3,100		155,000	105,000
3,170	1/8	155,000	105,000
3,200		155,000	105,000
3,250		155,000	105,000
3,300		155,000	105,000
3,400		165,000	115,000
3,500		165,000	115,000
3,570	9/64	165,000	115,000
3,600		165,000	115,000
3,650		165,000	115,000
3,700		165,000	115,000
3,750		165,000	115,000
3,800		175,000	120,000
3,900		175,000	120,000
3,970	5/32	175,000	120,000
4,000		175,000	120,000
4,100		175,000	120,000
4,200		175,000	120,000
4,300		185,000	125,000
4,370	11/64	185,000	125,000
4,400		185,000	125,000
4,500		185,000	125,000

d1		l1	l2
mm	inch	mm	mm
4,600		185,000	125,000
4,700		185,000	125,000
4,760	3/16	195,000	135,000
4,800		195,000	135,000
4,900		195,000	135,000
5,000		195,000	135,000
5,100		195,000	135,000
5,200		195,000	135,000
5,300		195,000	135,000
5,340		205,000	140,000
5,400		205,000	140,000
5,500		205,000	140,000
5,560	7/32	205,000	140,000
5,600		205,000	140,000
5,700		205,000	140,000
5,800		205,000	140,000
5,900		205,000	140,000
6,000		205,000	140,000
6,100		215,000	150,000
6,200		215,000	150,000
6,250		215,000	150,000
6,300	1/4	215,000	150,000
6,350		215,000	150,000
6,400		215,000	150,000
6,500		215,000	150,000
6,600		215,000	150,000
6,700		215,000	150,000
6,750	17/64	225,000	155,000
6,800		225,000	155,000
7,000		225,000	155,000
7,200		225,000	155,000
7,400		225,000	155,000
7,500		225,000	155,000
7,700		240,000	165,000
7,800		240,000	165,000
7,900		240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,100		240,000	165,000
8,200		240,000	165,000
8,330	21/64	240,000	165,000
8,400		240,000	165,000



Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
8,500		240,000	165,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
8,900		250,000	175,000
9,000		250,000	175,000
9,130	23/64	250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000
9,700		265,000	185,000
9,800		265,000	185,000
9,900		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,100		265,000	185,000
10,200		265,000	185,000
10,250		265,000	185,000

d1		l1	l2
mm	inch	mm	mm
10,320	13/32	265,000	185,000
10,500		265,000	185,000
11,000		280,000	195,000
11,500		280,000	195,000
11,510	29/64	280,000	195,000
11,800		280,000	195,000
12,000		295,000	205,000
12,100		295,000	205,000
12,250		295,000	205,000
12,300	31/64	295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000
13,000		295,000	205,000



Brocas helicoidais extra longas, série1

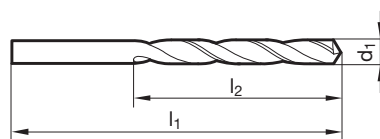


Material de corte	HSS
Superfície	
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 1,950$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790



Brocas helicoidais com haste cilíndrica

Nr. do artigo **502**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,950		125,000	85,000	4,400		185,000	125,000
2,000		125,000	85,000	4,500		185,000	125,000
2,050		125,000	85,000	4,570		185,000	125,000
2,100		125,000	85,000	4,600		185,000	125,000
2,200		135,000	90,000	4,700		185,000	125,000
2,300		135,000	90,000	4,760	3/16	195,000	135,000
2,370		140,000	95,000	4,800		195,000	135,000
2,380	3/32	140,000	95,000	4,900		195,000	135,000
2,400		140,000	95,000	5,000		195,000	135,000
2,500		140,000	95,000	5,100		195,000	135,000
2,550		140,000	95,000	5,110		195,000	135,000
2,580		140,000	95,000	5,160	13/64	195,000	135,000
2,600		140,000	95,000	5,200		195,000	135,000
2,700		150,000	100,000	5,300		195,000	135,000
2,780	7/64	150,000	100,000	5,400		205,000	140,000
2,800		150,000	100,000	5,500		205,000	140,000
2,850		150,000	100,000	5,560	7/32	205,000	140,000
2,870		150,000	100,000	5,600		205,000	140,000
2,900		150,000	100,000	5,700		205,000	140,000
2,950		150,000	100,000	5,750		205,000	140,000
3,000		150,000	100,000	5,800		205,000	140,000
3,030		155,000	105,000	5,900		205,000	140,000
3,100		155,000	105,000	5,950	15/64	205,000	140,000
3,170	1/8	155,000	105,000	6,000		205,000	140,000
3,200		155,000	105,000	6,100		215,000	150,000
3,250		155,000	105,000	6,200		215,000	150,000
3,300		155,000	105,000	6,250		215,000	150,000
3,400		165,000	115,000	6,300		215,000	150,000
3,500		165,000	115,000	6,350	1/4	215,000	150,000
3,570	9/64	165,000	115,000	6,400		215,000	150,000
3,600		165,000	115,000	6,500		215,000	150,000
3,700		165,000	115,000	6,600		215,000	150,000
3,750		165,000	115,000	6,700		215,000	150,000
3,800		175,000	120,000	6,750	17/64	225,000	155,000
3,860		175,000	120,000	6,800		225,000	155,000
3,900		175,000	120,000	6,900		225,000	155,000
3,970	5/32	175,000	120,000	7,000		225,000	155,000
4,000		175,000	120,000	7,100		225,000	155,000
4,100		175,000	120,000	7,200		225,000	155,000
4,200		175,000	120,000	7,300		225,000	155,000
4,300		185,000	125,000	7,500		225,000	155,000
4,370	11/64	185,000	125,000	7,540	19/64	240,000	165,000



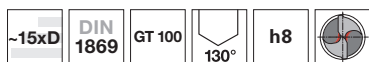
Brocas helicoidais com haste cilíndrica

d1		l1	l2
mm	inch	mm	mm
7,700		240,000	165,000
7,750		240,000	165,000
7,800		240,000	165,000
7,900		240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,100		240,000	165,000
8,200		240,000	165,000
8,300		240,000	165,000
8,330	21/64	240,000	165,000
8,400		240,000	165,000
8,430		240,000	165,000
8,500		240,000	165,000
8,600		250,000	175,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
9,000		250,000	175,000
9,200		250,000	175,000
9,300		250,000	175,000
9,400		250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000

d1		l1	l2
mm	inch	mm	mm
9,700		265,000	185,000
9,800		265,000	185,000
9,900		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,200		265,000	185,000
10,320	13/32	265,000	185,000
10,500		265,000	185,000
10,720	27/64	280,000	195,000
11,000		280,000	195,000
11,110	7/16	280,000	195,000
11,200		280,000	195,000
11,500		280,000	195,000
11,510	29/64	280,000	195,000
11,750		280,000	195,000
11,800		280,000	195,000
12,000		295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000
13,000		295,000	205,000



Brocas helicoidais extra longas, série1

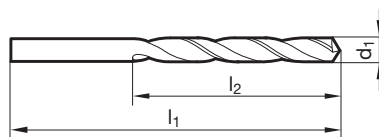


Material de corte	HSS
Superfície	S
Sentido de corte	R

- P** • Redução da aresta transversal $\geq \varnothing 1,980$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S** ○
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790



Brocas helicoidais com haste cilíndrica

Nr. do artigo **670**

d1		l1	l2
mm	inch	mm	mm
2,000		125,000	85,000
2,100		125,000	85,000
2,200		135,000	90,000
2,300		135,000	90,000
2,380	3/32	140,000	95,000
2,400		140,000	95,000
2,500		140,000	95,000
2,780	7/64	150,000	100,000
2,800		150,000	100,000
2,950		150,000	100,000
3,000		150,000	100,000
3,100		155,000	105,000
3,170	1/8	155,000	105,000
3,200		155,000	105,000
3,300		155,000	105,000
3,500		165,000	115,000
3,570	9/64	165,000	115,000
3,600		165,000	115,000
3,800		175,000	120,000
3,970	5/32	175,000	120,000
4,000		175,000	120,000
4,200		175,000	120,000
4,370	11/64	185,000	125,000
4,500		185,000	125,000
4,600		185,000	125,000
4,760	3/16	195,000	135,000
4,800		195,000	135,000
5,000		195,000	135,000
5,100		195,000	135,000
5,160	13/64	195,000	135,000
5,200		195,000	135,000
5,500		205,000	140,000
5,560	7/32	205,000	140,000
6,000		205,000	140,000
6,100		215,000	150,000
6,200		215,000	150,000

d1		l1	l2
mm	inch	mm	mm
6,350	1/4	215,000	150,000
6,500		215,000	150,000
6,600		215,000	150,000
6,800		225,000	155,000
7,000		225,000	155,000
7,140	9/32	225,000	155,000
7,500		225,000	155,000
7,540	19/64	240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,200		240,000	165,000
8,500		240,000	165,000
8,730	11/32	250,000	175,000
9,000		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,900		280,000	195,000
11,000		280,000	195,000
11,900		295,000	205,000
11,910	15/32	295,000	205,000
12,000		295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000



Brocas helicoidais extra longas, série1



Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

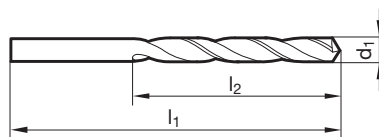
P ○ Redução da aresta transversal ≥ Ø 2,380 • afiação de superfície cônica
• para furos extremamente profundos

- M**
- K**
- N** • materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 788

Brocas helicoidais com haste cilíndrica



Nr. do artigo **524**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		125,000	85,000	5,200		195,000	135,000
2,100		125,000	85,000	5,400		205,000	140,000
2,200		135,000	90,000	5,600		205,000	140,000
2,300		135,000	90,000	5,700		205,000	140,000
2,350		135,000	90,000	5,800		205,000	140,000
2,380	3/32	140,000	95,000	5,900		205,000	140,000
2,400		140,000	95,000	5,950	15/64	205,000	140,000
2,450		140,000	95,000	6,000		205,000	140,000
2,500		140,000	95,000	6,100		215,000	150,000
2,600		140,000	95,000	6,350	1/4	215,000	150,000
2,780	7/64	150,000	100,000	6,400		215,000	150,000
2,800		150,000	100,000	6,500		215,000	150,000
2,900		150,000	100,000	6,600		215,000	150,000
2,950		150,000	100,000	6,750	17/64	225,000	155,000
3,000		150,000	100,000	6,800		225,000	155,000
3,100		155,000	105,000	7,000		225,000	155,000
3,170	1/8	155,000	105,000	7,100		225,000	155,000
3,200		155,000	105,000	7,140	9/32	225,000	155,000
3,300		155,000	105,000	7,300		225,000	155,000
3,350		155,000	105,000	7,400		225,000	155,000
3,400		165,000	115,000	7,500		225,000	155,000
3,450		165,000	115,000	7,540	19/64	240,000	165,000
3,500		165,000	115,000	7,800		240,000	165,000
3,530		165,000	115,000	7,900		240,000	165,000
3,570	9/64	165,000	115,000	7,940	5/16	240,000	165,000
3,600		165,000	115,000	8,000		240,000	165,000
3,800		175,000	120,000	8,100		240,000	165,000
3,900		175,000	120,000	8,330	21/64	240,000	165,000
3,970	5/32	175,000	120,000	8,600		250,000	175,000
4,000		175,000	120,000	8,730	11/32	250,000	175,000
4,100		175,000	120,000	8,900		250,000	175,000
4,200		175,000	120,000	9,000		250,000	175,000
4,250		175,000	120,000	9,130	23/64	250,000	175,000
4,300		185,000	125,000	9,200		250,000	175,000
4,370	11/64	185,000	125,000	9,500		250,000	175,000
4,400		185,000	125,000	9,520	3/8	265,000	185,000
4,500		185,000	125,000	9,920	25/64	265,000	185,000
4,760	3/16	195,000	135,000	10,000		265,000	185,000
4,900		195,000	135,000	10,320	13/32	265,000	185,000
5,000		195,000	135,000	10,500		265,000	185,000
5,100		195,000	135,000	11,000		280,000	195,000
5,160	13/64	195,000	135,000	11,110	7/16	280,000	195,000

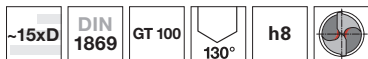


d1		l1	l2
mm	inch	mm	mm
11,500		280,000	195,000
11,910	15/32	295,000	205,000
12,000		295,000	205,000
12,700	1/2	295,000	205,000

d1		l1	l2
mm	inch	mm	mm



Brocas helicoidais extra longas, série1



- P** • Redução da aresta transversal $\geq \varnothing 2,700$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • para furos extremamente profundos • na expulsão difícil dos cavacos
- K** •
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** •

Material de corte **HSCO**

Superfície

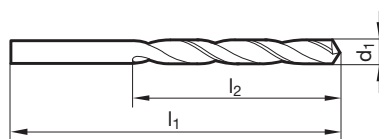
Sentido de corte



GÜHRINGNAVIGATOR

Página de dados de corte 794

Brocas helicoidais com haste cilíndrica



Nr. do artigo **618**

d1		l1	l2
mm	inch	mm	mm
2,700		150,000	100,000
2,900		150,000	100,000
3,000		150,000	100,000
3,100		155,000	105,000
3,170	1/8	155,000	105,000
3,200		155,000	105,000
3,300		155,000	105,000
3,400		165,000	115,000
3,500		165,000	115,000
3,570	9/64	165,000	115,000
3,600		165,000	115,000
3,700		165,000	115,000
3,750		165,000	115,000
3,800		175,000	120,000
3,970	5/32	175,000	120,000
4,000		175,000	120,000
4,100		175,000	120,000
4,200		175,000	120,000
4,300		185,000	125,000
4,370	11/64	185,000	125,000
4,400		185,000	125,000
4,500		185,000	125,000
4,600		185,000	125,000
4,760	3/16	195,000	135,000
4,800		195,000	135,000
4,850		195,000	135,000
5,000		195,000	135,000
5,100		195,000	135,000
5,160	13/64	195,000	135,000
5,200		195,000	135,000
5,300		195,000	135,000
5,400		205,000	140,000
5,500		205,000	140,000
5,560	7/32	205,000	140,000
5,600		205,000	140,000
5,700		205,000	140,000

d1		l1	l2
mm	inch	mm	mm
5,800		205,000	140,000
6,000		205,000	140,000
6,100		215,000	150,000
6,200		215,000	150,000
6,300		215,000	150,000
6,350	1/4	215,000	150,000
6,400		215,000	150,000
6,500		215,000	150,000
6,600		215,000	150,000
6,700		215,000	150,000
6,750	17/64	225,000	155,000
6,800		225,000	155,000
7,000		225,000	155,000
7,140	9/32	225,000	155,000
7,400		225,000	155,000
7,500		225,000	155,000
7,540	19/64	240,000	165,000
7,700		240,000	165,000
7,800		240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,200		240,000	165,000
8,330	21/64	240,000	165,000
8,500		240,000	165,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
9,000		250,000	175,000
9,130	23/64	250,000	175,000
9,400		250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,700		265,000	185,000
10,000		265,000	185,000



Brocas helicoidais extra longas, série 2



Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 2,700$ • afiação de superfície cônica
• para furos extremamente profundos

M

K •

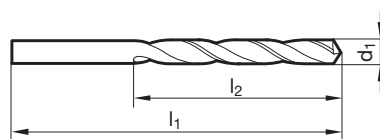
N ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

S

H

GÜHRING NAVIGATOR

Página de dados de corte 788



Brocas helicoidais com haste cilíndrica

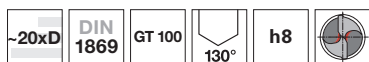
Nr. do artigo **236**

d1		l1	l2
mm	inch	mm	mm
2,700		190,000	130,000
2,800		190,000	130,000
2,900		190,000	130,000
3,000		190,000	130,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,300		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,600		210,000	145,000
3,800		220,000	150,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,100		220,000	150,000
4,200		220,000	150,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
4,900		245,000	170,000
5,000		245,000	170,000
5,200		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
5,800		260,000	180,000
5,900		260,000	180,000
5,950	15/64	260,000	180,000
6,000		260,000	180,000
6,200		275,000	190,000
6,350	1/4	275,000	190,000

d1		l1	l2
mm	inch	mm	mm
6,500		275,000	190,000
6,700		275,000	190,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,500		290,000	200,000
7,540	19/64	305,000	210,000
7,800		305,000	210,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,100		305,000	210,000
8,500		305,000	210,000
8,700		320,000	220,000
8,730	11/32	320,000	220,000
8,800		320,000	220,000
8,900		320,000	220,000
9,000		320,000	220,000
9,130	23/64	320,000	220,000
9,500		320,000	220,000
9,800		340,000	235,000
10,000		340,000	235,000
10,200		340,000	235,000
10,500		340,000	235,000
11,000		365,000	250,000
11,110	7/16	365,000	250,000
11,500		365,000	250,000
11,510	29/64	365,000	250,000
11,750		365,000	250,000
12,000		375,000	260,000
13,000		375,000	260,000



Brocas helicoidais extra longas, série 2



- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

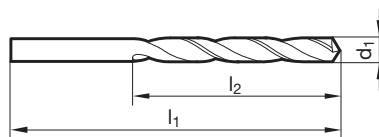
Material de corte	HSS
Superfície	
Sentido de corte	



GÜHRINGNAVIGATOR

Página de dados de corte 790

Brocas helicoidais com haste cilíndrica



Nr. do artigo **503**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		160,000	110,000	6,100		275,000	190,000
2,200		170,000	115,000	6,150		275,000	190,000
2,300		170,000	115,000	6,200		275,000	190,000
2,500		180,000	120,000	6,350	1/4	275,000	190,000
2,800		190,000	130,000	6,400		275,000	190,000
3,000		190,000	130,000	6,500		275,000	190,000
3,030		200,000	135,000	6,600		275,000	190,000
3,100		200,000	135,000	6,700		275,000	190,000
3,170	1/8	200,000	135,000	6,750	17/64	290,000	200,000
3,200		200,000	135,000	6,800		290,000	200,000
3,300		200,000	135,000	6,900		290,000	200,000
3,400		210,000	145,000	7,000		290,000	200,000
3,500		210,000	145,000	7,140	9/32	290,000	200,000
3,570	9/64	210,000	145,000	7,500		290,000	200,000
3,600		210,000	145,000	7,540	19/64	305,000	210,000
3,700		210,000	145,000	7,800		305,000	210,000
3,800		220,000	150,000	7,940	5/16	305,000	210,000
3,900		220,000	150,000	8,000		305,000	210,000
3,970	5/32	220,000	150,000	8,200		305,000	210,000
4,000		220,000	150,000	8,330	21/64	305,000	210,000
4,100		220,000	150,000	8,500		305,000	210,000
4,200		220,000	150,000	8,600		320,000	220,000
4,300		235,000	160,000	8,730	11/32	320,000	220,000
4,370	11/64	235,000	160,000	8,800		320,000	220,000
4,400		235,000	160,000	9,000		320,000	220,000
4,500		235,000	160,000	9,100		320,000	220,000
4,760	3/16	245,000	170,000	9,130	23/64	320,000	220,000
4,800		245,000	170,000	9,500		320,000	220,000
4,900		245,000	170,000	9,520	3/8	340,000	235,000
5,000		245,000	170,000	9,700		340,000	235,000
5,100		245,000	170,000	9,800		340,000	235,000
5,160	13/64	245,000	170,000	9,920	25/64	340,000	235,000
5,200		245,000	170,000	10,000		340,000	235,000
5,300		245,000	170,000	10,200		340,000	235,000
5,400		260,000	180,000	10,500		340,000	235,000
5,500		260,000	180,000	10,720	27/64	365,000	250,000
5,560	7/32	260,000	180,000	11,000		365,000	250,000
5,700		260,000	180,000	11,110	7/16	365,000	250,000
5,800		260,000	180,000	11,500		365,000	250,000
5,900		260,000	180,000	11,510	29/64	365,000	250,000
5,950	15/64	260,000	180,000	11,750		365,000	250,000
6,000		260,000	180,000	11,910	15/32	375,000	260,000

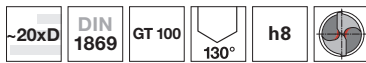


d1		l1	l2
mm	inch	mm	mm
12,000		375,000	260,000
12,300	31/64	375,000	260,000
12,500		375,000	260,000
12,700	1/2	375,000	260,000
13,000		375,000	260,000

d1		l1	l2
mm	inch	mm	mm



Brocas helicoidais extra longas, série 2



- P** • Redução da aresta transversal $\geq \varnothing 2,300$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S** ○
- H**

Material de corte **HSS**

Superfície **S**

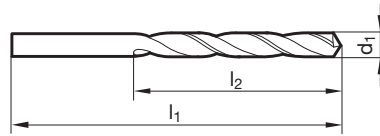
Sentido de corte **R**



Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **671**

d1		l1	l2
mm	inch	mm	mm
2,700		190,000	130,000
2,800		190,000	130,000
3,000		190,000	130,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,090		220,000	150,000
4,370	11/64	235,000	160,000
4,400		235,000	160,000
4,500		235,000	160,000
4,600		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
5,000		245,000	170,000

d1		l1	l2
mm	inch	mm	mm
5,300		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
6,000		260,000	180,000
6,350	1/4	275,000	190,000
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,500		290,000	200,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,500		305,000	210,000



Brocas helicoidais extra longas, série 2



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P ○ Redução da aresta transversal $\geq \varnothing 2,800$ • afiação de superfície cônica
• para furos extremamente profundos

M

K

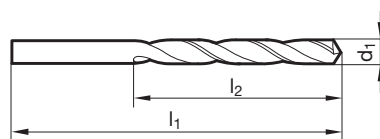
N • materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira

S

H

GÜHRING NAVIGATOR

Página de dados de corte 788



Brocas helicoidais com haste cilíndrica

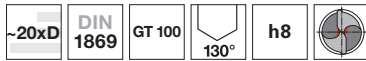
Nr. do artigo **528**

d1		l1	l2
mm	inch	mm	mm
3,000		190,000	130,000
3,030		200,000	135,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,500		210,000	145,000
3,650		210,000	145,000
3,800		220,000	150,000
4,000		220,000	150,000
4,200		220,000	150,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
5,000		245,000	170,000
5,110		245,000	170,000
5,500		260,000	180,000
5,800		260,000	180,000
6,000		260,000	180,000
7,000		290,000	200,000

d1		l1	l2
mm	inch	mm	mm
7,500		290,000	200,000
8,000		305,000	210,000
8,500		305,000	210,000
9,000		320,000	220,000
10,000		340,000	235,000
10,500		340,000	235,000
11,500		365,000	250,000
13,000		375,000	260,000



Brocas helicoidais extra longas, série 2



- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • para furos extremamente profundos • na expulsão difícil dos cavacos
- K** •
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** ○

Material de corte **HSCO**

Superfície

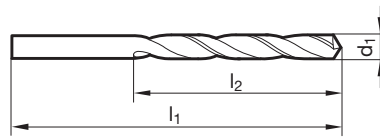
Sentido de corte



Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **619**

d1		l1	l2
mm	inch	mm	mm
3,000		190,000	130,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,300		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,100		220,000	150,000
4,200		220,000	150,000
4,370	11/64	235,000	160,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
4,900		245,000	170,000
5,000		245,000	170,000
5,200		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
5,950	15/64	260,000	180,000
6,000		260,000	180,000
6,100		275,000	190,000
6,200		275,000	190,000
6,350	1/4	275,000	190,000

d1		l1	l2
mm	inch	mm	mm
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,400		290,000	200,000
7,500		290,000	200,000
7,540	19/64	305,000	210,000
7,600		305,000	210,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,200		305,000	210,000
8,500		305,000	210,000
8,730	11/32	320,000	220,000
9,000		320,000	220,000
9,130	23/64	320,000	220,000
9,500		320,000	220,000
9,520	3/8	340,000	235,000
9,600		340,000	235,000
9,900		340,000	235,000
10,000		340,000	235,000



Brocas helicoidais extra longas, série 3



Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 3,500$ • afiação de superfície cônica
• para furos extremamente profundos

M

K •

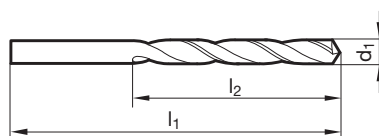
N ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

S

H

GÜHRING NAVIGATOR

Página de dados de corte 788



Brocas helicoidais com haste cilíndrica

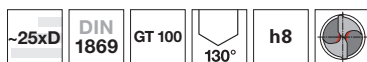
Nr. do artigo **237**

d1		l1	l2
mm	inch	mm	mm
3,500		265,000	180,000
3,800		280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,800		330,000	225,000
5,900		330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000
6,800		370,000	250,000
7,000		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
7,500		370,000	250,000
7,800		390,000	265,000
8,000		390,000	265,000
8,500		390,000	265,000
9,000		410,000	280,000
9,500		410,000	280,000
9,800		430,000	295,000
10,000		430,000	295,000
10,300		430,000	295,000
10,500		430,000	295,000
11,000		455,000	310,000
11,500		455,000	310,000
11,750		455,000	310,000
12,000		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000



Brocas helicoidais extra longas, série 3



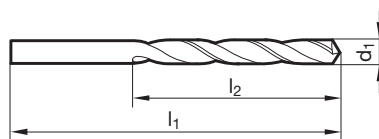
Material de corte	HSS
Superfície	
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 2,500$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790

Brocas helicoidais com haste cilíndrica



Nr. do artigo **504**

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,100		250,000	170,000
3,170	1/8	250,000	170,000
3,200		250,000	170,000
3,300		250,000	170,000
3,400		265,000	180,000
3,500		265,000	180,000
3,570	9/64	265,000	180,000
3,600		265,000	180,000
3,700		265,000	180,000
3,800		280,000	190,000
3,900		280,000	190,000
3,970	5/32	280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,300		295,000	200,000
4,370	11/64	295,000	200,000
4,400		295,000	200,000
4,500		295,000	200,000
4,600		295,000	200,000
4,760	3/16	315,000	210,000
4,800		315,000	210,000
4,900		315,000	210,000
5,000		315,000	210,000
5,100		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,560	7/32	330,000	225,000
5,800		330,000	225,000
5,950	15/64	330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,300		350,000	235,000
6,350	1/4	350,000	235,000
6,400		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000
6,750	17/64	370,000	250,000
6,800		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
7,000		370,000	250,000
7,140	9/32	370,000	250,000
7,200		370,000	250,000
7,500		370,000	250,000
7,540	19/64	390,000	265,000
7,750		390,000	265,000
7,800		390,000	265,000
7,940	5/16	390,000	265,000
8,000		390,000	265,000
8,200		390,000	265,000
8,330	21/64	390,000	265,000
8,500		390,000	265,000
8,600		410,000	280,000
8,730	11/32	410,000	280,000
8,800		410,000	280,000
8,900		410,000	280,000
9,000		410,000	280,000
9,200		410,000	280,000
9,500		410,000	280,000
9,520	3/8	430,000	295,000
9,530		430,000	295,000
9,920	25/64	430,000	295,000
10,000		430,000	295,000
10,320	13/32	430,000	295,000
10,500		430,000	295,000
10,720	27/64	455,000	310,000
11,000		455,000	310,000
11,110	7/16	455,000	310,000
11,500		455,000	310,000
12,000		480,000	330,000
12,200		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000



Brocas helicoidais extra longas, série 3



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P ○ Redução da aresta transversal $\geq \varnothing 2,500$ • afiação de superfície cônica
• para furos extremamente profundos

M

K

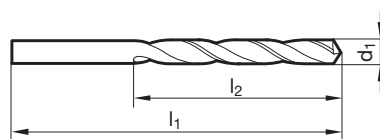
N • materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira

S

H

GÜHRING NAVIGATOR

Página de dados de corte 788



Brocas helicoidais com haste cilíndrica

Nr. do artigo **529**

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,500		265,000	180,000
3,800		280,000	190,000
4,000		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
6,000		330,000	225,000
6,500		350,000	235,000
6,700		350,000	235,000
6,800		370,000	250,000
7,500		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
8,000		390,000	265,000
9,500		410,000	280,000
10,000		430,000	295,000



Brocas helicoidais extra longas, série 3



- P** • Redução da aresta transversal $\geq \varnothing 2,500$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • alta resistência ao desgaste
- K** • para furos extremamente profundos • na expulsão difícil dos cavacos
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** •

Material de corte **HSCO**

Superfície

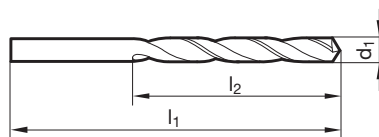
Sentido de corte



GÜHRINGNAVIGATOR

Página de dados de corte 794

Brocas helicoidais com haste cilíndrica



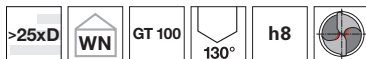
Nr. do artigo **571**

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,100		250,000	170,000
3,170	1/8	250,000	170,000
3,200		250,000	170,000
3,300		250,000	170,000
3,400		265,000	180,000
3,500		265,000	180,000
3,700		265,000	180,000
3,800		280,000	190,000
3,900		280,000	190,000
3,970	5/32	280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,300		295,000	200,000
4,500		295,000	200,000
4,600		295,000	200,000
4,760	3/16	315,000	210,000
4,800		315,000	210,000
4,900		315,000	210,000
5,000		315,000	210,000
5,100		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,560	7/32	330,000	225,000
5,800		330,000	225,000
5,950	15/64	330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,300		350,000	235,000
6,350	1/4	350,000	235,000
6,400		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000

d1		l1	l2
mm	inch	mm	mm
6,750	17/64	370,000	250,000
6,800		370,000	250,000
7,000		370,000	250,000
7,140	9/32	370,000	250,000
7,200		370,000	250,000
7,500		370,000	250,000
7,750		390,000	265,000
7,800		390,000	265,000
7,940	5/16	390,000	265,000
8,000		390,000	265,000
8,200		390,000	265,000
8,500		390,000	265,000
8,600		410,000	280,000
8,730	11/32	410,000	280,000
8,800		410,000	280,000
9,000		410,000	280,000
9,500		410,000	280,000
9,520	3/8	430,000	295,000
10,000		430,000	295,000
10,320	13/32	430,000	295,000
10,500		430,000	295,000
10,720	27/64	455,000	310,000
11,000		455,000	310,000
11,110	7/16	455,000	310,000
11,500		455,000	310,000
12,000		480,000	330,000
12,200		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000



Brocas helicoidais extra longas



P • Redução da aresta transversal $\geq \varnothing 6,000$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos

M

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

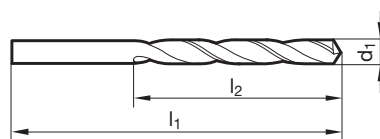
Material de corte **HSS**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 790



Brocas helicoidais com haste cilíndrica

Nr. do artigo **242**

d1		l1	l2
mm	inch		
6,000		500,000	400,000
8,000		500,000	400,000
10,000		600,000	500,000
11,000		600,000	500,000
12,000		600,000	500,000

d1		l1	l2
mm	inch		



Brocas helicoidais extra longas



- P** • Redução da aresta transversal $\geq \varnothing 8,000$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

Material de corte **HSS**

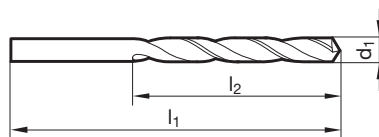
Superfície ○

Sentido de corte (R)

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 790



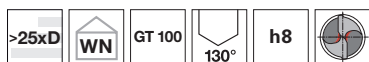
Nr. do artigo **243**

d1		l1	l2
mm	inch		
8,000		750,000	650,000
10,000		750,000	650,000
11,000		750,000	650,000
12,000		750,000	650,000

d1		l1	l2
mm	inch		



Brocas helicoidais extra longas



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos

M

K •

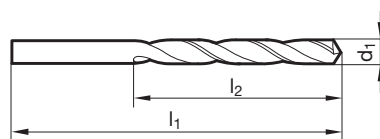
N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

GÜHRING NAVIGATOR

Página de dados de corte 790



Brocas helicoidais com haste cilíndrica

Nr. do artigo **244**

d1		l1	l2
mm	inch		
10,000		1000,000	850,000
11,000		1000,000	850,000
12,000		1000,000	850,000

d1		l1	l2
mm	inch		



Brocas helicoidais com haste reforçada



Material de corte **HSCO**

Superfície **S**

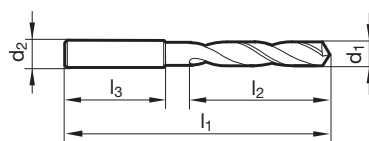
Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação facetada • aço-HSS ligado com Co • é necessária força de avanço reduzida • é necessário torque reduzido • resistência ao desgaste ampliada • uso universal
- M** •
- K** •
- N** • aços com e sem liga acima de $800 \cdot \text{N/mm}^2$ • aços para trabalhos a frio/-quente • aços inoxidáveis • metais não ferrosos • materiais fundidos
- S** • plásticos
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 774

Brocas helicoidais com haste cilíndrica



Nr. do artigo **512**

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
2,000	3,000	44,000	12,000	28,000
2,100	3,000	44,000	12,000	28,000
2,200	3,000	45,000	13,000	28,000
2,300	3,000	45,000	13,000	28,000
2,400	3,000	46,000	14,000	28,000
2,500	3,000	46,000	14,000	28,000
2,600	3,000	46,000	14,000	28,000
2,700	3,000	48,000	16,000	28,000
2,780	3,000	48,000	16,000	28,000
2,800	3,000	48,000	16,000	28,000
2,900	3,000	48,000	16,000	28,000
3,000	3,000	48,000	16,000	28,000
3,100	4,000	50,000	18,000	28,000
3,170	4,000	50,000	18,000	28,000
3,200	4,000	50,000	18,000	28,000
3,300	4,000	50,000	18,000	28,000
3,400	4,000	52,000	20,000	28,000
3,500	4,000	52,000	20,000	28,000
3,570	4,000	52,000	20,000	28,000
3,600	4,000	52,000	20,000	28,000
3,700	4,000	52,000	20,000	28,000
3,800	4,000	54,000	22,000	28,000
3,900	4,000	54,000	22,000	28,000
4,000	4,000	54,000	22,000	28,000
4,100	6,000	66,000	22,000	36,000
4,200	6,000	66,000	22,000	36,000
4,300	6,000	68,000	24,000	36,000
4,370	6,000	68,000	24,000	36,000
4,400	6,000	68,000	24,000	36,000
4,500	6,000	68,000	24,000	36,000
4,700	6,000	68,000	24,000	36,000
4,760	6,000	70,000	26,000	36,000
4,800	6,000	70,000	26,000	36,000
4,900	6,000	70,000	26,000	36,000
5,000	6,000	70,000	26,000	36,000
5,100	6,000	70,000	26,000	36,000
5,200	6,000	70,000	26,000	36,000
5,300	6,000	70,000	26,000	36,000
5,400	6,000	72,000	28,000	36,000
5,500	6,000	72,000	28,000	36,000
5,560	6,000	72,000	28,000	36,000
5,600	6,000	72,000	28,000	36,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
5,800	6,000	72,000	28,000	36,000
5,900	6,000	72,000	28,000	36,000
5,950	6,000	72,000	28,000	36,000
6,000	6,000	72,000	28,000	36,000
6,100	8,000	75,000	31,000	36,000
6,200	8,000	75,000	31,000	36,000
6,300	8,000	75,000	31,000	36,000
6,350	8,000	75,000	31,000	36,000
6,400	8,000	75,000	31,000	36,000
6,500	8,000	75,000	31,000	36,000
6,600	8,000	75,000	31,000	36,000
6,750	8,000	78,000	34,000	36,000
6,800	8,000	78,000	34,000	36,000
6,900	8,000	78,000	34,000	36,000
7,000	8,000	78,000	34,000	36,000
7,100	8,000	78,000	34,000	36,000
7,140	8,000	78,000	34,000	36,000
7,200	8,000	78,000	34,000	36,000
7,300	8,000	78,000	34,000	36,000
7,500	8,000	78,000	34,000	36,000
7,600	8,000	81,000	37,000	36,000
7,800	8,000	81,000	37,000	36,000
7,900	8,000	81,000	37,000	36,000
7,940	8,000	81,000	37,000	36,000
8,000	8,000	81,000	37,000	36,000
8,100	10,000	87,000	37,000	40,000
8,200	10,000	87,000	37,000	40,000
8,300	10,000	87,000	37,000	40,000
8,330	10,000	87,000	37,000	40,000
8,500	10,000	87,000	37,000	40,000
8,600	10,000	91,000	40,000	40,000
8,730	10,000	91,000	40,000	40,000
8,800	10,000	91,000	40,000	40,000
8,900	10,000	91,000	40,000	40,000
9,000	10,000	91,000	40,000	40,000
9,100	10,000	91,000	40,000	40,000
9,130	10,000	91,000	40,000	40,000
9,200	10,000	91,000	40,000	40,000
9,300	10,000	91,000	40,000	40,000
9,400	10,000	91,000	40,000	40,000
9,500	10,000	91,000	40,000	40,000
9,520	10,000	93,000	43,000	40,000



d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
9,800	10,000	93,000	43,000	40,000
9,900	10,000	93,000	43,000	40,000
9,920	10,000	93,000	43,000	40,000
10,000	10,000	93,000	43,000	40,000
10,100	12,000	100,000	43,000	45,000
10,200	12,000	100,000	43,000	45,000
10,300	12,000	100,000	43,000	45,000
10,320	12,000	100,000	43,000	45,000
10,500	12,000	100,000	43,000	45,000
10,800	12,000	104,000	47,000	45,000
11,000	12,000	104,000	47,000	45,000
11,100	12,000	104,000	47,000	45,000
11,110	12,000	104,000	47,000	45,000
11,200	12,000	104,000	47,000	45,000
11,300	12,000	104,000	47,000	45,000
11,400	12,000	104,000	47,000	45,000
11,500	12,000	104,000	47,000	45,000
11,510	12,000	104,000	47,000	45,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
11,700	12,000	104,000	47,000	45,000
11,800	12,000	104,000	47,000	45,000
12,000	12,000	108,000	51,000	45,000
12,300	16,000	111,000	51,000	48,000
12,500	16,000	111,000	51,000	48,000
13,000	16,000	111,000	51,000	48,000
13,490	16,000	114,000	54,000	48,000
13,500	16,000	114,000	54,000	48,000
14,000	16,000	114,000	54,000	48,000
15,000	16,000	116,000	56,000	48,000
16,000	16,000	118,000	58,000	48,000
16,500	20,000	126,000	60,000	50,000
16,670	20,000	126,000	60,000	50,000
17,500	20,000	128,000	62,000	50,000
18,000	20,000	128,000	62,000	50,000
18,500	20,000	130,000	64,000	50,000
19,500	20,000	132,000	66,000	50,000
20,000	20,000	132,000	66,000	50,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste reforçada



Material de corte **HSCO**

Superfície **S**

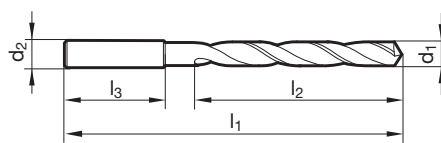
Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação facetada • aço-HSS ligado com Co • é necessária força de avanço reduzida • é necessário torque reduzido • resistência ao desgaste ampliada • uso universal
- M** •
- K** •
- N** • aços com e sem liga acima de 800-N/mm^2 • aços para trabalhos a frio-/quente • aços inoxidáveis • metais não ferrosos • materiais fundidos
- S** • plásticos
- H**

GÜHRINGNAVIGATOR

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Brocas helicoidais com haste cilíndrica



Nr. do artigo **511**

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
2,000	3,000	56,000	24,000	28,000
2,100	3,000	56,000	24,000	28,000
2,300	3,000	59,000	27,000	28,000
2,380	3,000	62,000	30,000	28,000
2,400	3,000	62,000	30,000	28,000
2,500	3,000	62,000	30,000	28,000
2,600	3,000	62,000	30,000	28,000
2,780	3,000	65,000	33,000	28,000
2,800	3,000	65,000	33,000	28,000
2,900	3,000	65,000	33,000	28,000
3,000	3,000	65,000	33,000	28,000
3,100	4,000	68,000	36,000	28,000
3,200	4,000	68,000	36,000	28,000
3,300	4,000	68,000	36,000	28,000
3,400	4,000	71,000	39,000	28,000
3,500	4,000	71,000	39,000	28,000
3,570	4,000	71,000	39,000	28,000
3,900	4,000	75,000	43,000	28,000
3,970	4,000	75,000	43,000	28,000
4,000	4,000	75,000	43,000	28,000
4,200	6,000	87,000	43,000	36,000
4,300	6,000	91,000	47,000	36,000
4,370	6,000	91,000	47,000	36,000
4,400	6,000	91,000	47,000	36,000
4,500	6,000	91,000	47,000	36,000
4,650	6,000	91,000	47,000	36,000
4,700	6,000	91,000	47,000	36,000
4,760	6,000	96,000	52,000	36,000
4,800	6,000	96,000	52,000	36,000
4,900	6,000	96,000	52,000	36,000
5,000	6,000	96,000	52,000	36,000
5,100	6,000	96,000	52,000	36,000
5,160	6,000	96,000	52,000	36,000
5,200	6,000	96,000	52,000	36,000
5,300	6,000	96,000	52,000	36,000
5,400	6,000	101,000	57,000	36,000
5,500	6,000	101,000	57,000	36,000
5,600	6,000	101,000	57,000	36,000
5,800	6,000	101,000	57,000	36,000
5,900	6,000	101,000	57,000	36,000
6,000	6,000	101,000	57,000	36,000
6,100	8,000	107,000	63,000	36,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
6,300	8,000	107,000	63,000	36,000
6,350	8,000	107,000	63,000	36,000
6,400	8,000	107,000	63,000	36,000
6,500	8,000	107,000	63,000	36,000
6,600	8,000	107,000	63,000	36,000
6,750	8,000	113,000	69,000	36,000
6,800	8,000	113,000	69,000	36,000
6,900	8,000	113,000	69,000	36,000
7,000	8,000	113,000	69,000	36,000
7,100	8,000	113,000	69,000	36,000
7,140	8,000	113,000	69,000	36,000
7,200	8,000	113,000	69,000	36,000
7,300	8,000	113,000	69,000	36,000
7,400	8,000	113,000	69,000	36,000
7,500	8,000	113,000	69,000	36,000
7,540	8,000	119,000	75,000	36,000
7,550	8,000	119,000	75,000	36,000
7,600	8,000	119,000	75,000	36,000
7,700	8,000	119,000	75,000	36,000
7,800	8,000	119,000	75,000	36,000
7,900	8,000	119,000	75,000	36,000
8,000	8,000	119,000	75,000	36,000
8,100	10,000	125,000	75,000	40,000
8,200	10,000	125,000	75,000	40,000
8,300	10,000	125,000	75,000	40,000
8,330	10,000	125,000	75,000	40,000
8,500	10,000	125,000	75,000	40,000
8,600	10,000	131,000	81,000	40,000
8,730	10,000	131,000	81,000	40,000
8,800	10,000	131,000	81,000	40,000
8,900	10,000	131,000	81,000	40,000
9,000	10,000	131,000	81,000	40,000
9,100	10,000	131,000	81,000	40,000
9,130	10,000	131,000	81,000	40,000
9,400	10,000	131,000	81,000	40,000
9,500	10,000	131,000	81,000	40,000
9,520	10,000	137,000	87,000	40,000
9,550	10,000	137,000	87,000	40,000
9,600	10,000	137,000	87,000	40,000
9,900	10,000	137,000	87,000	40,000
9,920	10,000	137,000	87,000	40,000
10,000	10,000	137,000	87,000	40,000



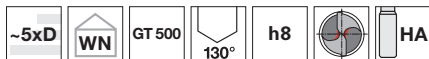
d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
10,100	12,000	144,000	87,000	45,000
10,200	12,000	144,000	87,000	45,000
10,400	12,000	144,000	87,000	45,000
10,500	12,000	144,000	87,000	45,000
10,600	12,000	144,000	87,000	45,000
10,800	12,000	151,000	94,000	45,000
11,000	12,000	151,000	94,000	45,000
11,110	12,000	151,000	94,000	45,000
11,200	12,000	151,000	94,000	45,000
11,300	12,000	151,000	94,000	45,000
11,510	12,000	151,000	94,000	45,000
11,800	12,000	151,000	94,000	45,000
11,910	12,000	158,000	101,000	45,000
12,000	12,000	158,000	101,000	45,000
12,200	16,000	161,000	101,000	48,000
12,500	16,000	161,000	101,000	48,000
12,700	16,000	161,000	101,000	48,000
13,000	16,000	161,000	101,000	48,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
13,500	16,000	166,000	106,000	48,000
13,890	16,000	166,000	106,000	48,000
14,000	16,000	166,000	106,000	48,000
14,500	16,000	169,000	109,000	48,000
15,000	16,000	169,000	109,000	48,000
15,500	16,000	172,000	112,000	48,000
16,000	16,000	172,000	112,000	48,000
16,500	20,000	181,000	115,000	50,000
17,000	20,000	181,000	115,000	50,000
17,460	20,000	184,000	118,000	50,000
17,500	20,000	184,000	118,000	50,000
18,000	20,000	184,000	118,000	50,000
19,000	20,000	188,000	122,000	50,000
19,500	20,000	191,000	125,000	50,000
20,000	20,000	191,000	125,000	50,000

Brocas helicoidais
com haste cilíndrica



Brocas helicoidais com haste reforçada



- P** • Redução da aresta transversal $\geq \text{Ø } 2,000$ • geometria da ponta aliviada por uma redução do núcleo especial tipo B • PM HSS ligado com Co
- M** ○ • especialmente com alta estabilidade • especialmente alta resistência ao desgaste
- K** •
- N** ○ materiais de alta resistência, aços de alta liga • aços para beneficiamento e cementação • ferro fundido, latão, bronze
- S** ○
- H** ○

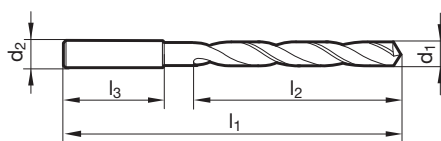
Material de corte	HSS-E-PM
Superfície	F
Sentido de corte	R



GÜHRINGNAVIGATOR

Página de dados de corte 784

Brocas helicoidais com haste cilíndrica



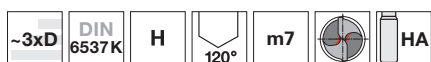
Nr. do artigo **513**

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
2,000	3,000	56,000	24,000	28,000
2,100	3,000	56,000	24,000	28,000
2,380	3,000	62,000	30,000	28,000
2,500	3,000	62,000	30,000	28,000
2,780	3,000	65,000	33,000	28,000
3,000	3,000	65,000	33,000	28,000
3,170	4,000	68,000	36,000	28,000
3,300	4,000	68,000	36,000	28,000
3,500	4,000	71,000	39,000	28,000
3,570	4,000	71,000	39,000	28,000
3,970	4,000	75,000	43,000	28,000
4,000	4,000	75,000	43,000	28,000
4,200	6,000	87,000	43,000	36,000
4,370	6,000	91,000	47,000	36,000
4,500	6,000	91,000	47,000	36,000
4,650	6,000	91,000	47,000	36,000
4,760	6,000	96,000	52,000	36,000
4,800	6,000	96,000	52,000	36,000
5,000	6,000	96,000	52,000	36,000
5,100	6,000	96,000	52,000	36,000
5,160	6,000	96,000	52,000	36,000
5,200	6,000	96,000	52,000	36,000
5,300	6,000	96,000	52,000	36,000
5,500	6,000	101,000	57,000	36,000
5,800	6,000	101,000	57,000	36,000
6,000	6,000	101,000	57,000	36,000
6,350	8,000	107,000	63,000	36,000
6,500	8,000	107,000	63,000	36,000
6,600	8,000	107,000	63,000	36,000
6,750	8,000	113,000	69,000	36,000
6,800	8,000	113,000	69,000	36,000
7,000	8,000	113,000	69,000	36,000
7,140	8,000	113,000	69,000	36,000
7,400	8,000	113,000	69,000	36,000
7,500	8,000	113,000	69,000	36,000
7,540	8,000	119,000	75,000	36,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
7,800	8,000	119,000	75,000	36,000
7,940	8,000	119,000	75,000	36,000
8,000	8,000	119,000	75,000	36,000
8,330	10,000	125,000	75,000	40,000
8,500	10,000	125,000	75,000	40,000
8,730	10,000	131,000	81,000	40,000
8,800	10,000	131,000	81,000	40,000
9,000	10,000	131,000	81,000	40,000
9,130	10,000	131,000	81,000	40,000
9,300	10,000	131,000	81,000	40,000
9,500	10,000	131,000	81,000	40,000
9,520	10,000	137,000	87,000	40,000
9,600	10,000	137,000	87,000	40,000
9,800	10,000	137,000	87,000	40,000
9,920	10,000	137,000	87,000	40,000
10,000	10,000	137,000	87,000	40,000
10,200	12,000	144,000	87,000	45,000
10,500	12,000	144,000	87,000	45,000
10,600	12,000	144,000	87,000	45,000
10,700	12,000	151,000	94,000	45,000
10,900	12,000	151,000	94,000	45,000
11,000	12,000	151,000	94,000	45,000
11,100	12,000	151,000	94,000	45,000
11,300	12,000	151,000	94,000	45,000
11,400	12,000	151,000	94,000	45,000
11,500	12,000	151,000	94,000	45,000
11,900	12,000	158,000	101,000	45,000
12,000	12,000	158,000	101,000	45,000
12,200	14,000	161,000	101,000	45,000
12,300	14,000	161,000	101,000	45,000
12,400	14,000	161,000	101,000	45,000
12,500	14,000	161,000	101,000	45,000
12,600	14,000	161,000	101,000	45,000
12,700	14,000	161,000	101,000	45,000
12,900	14,000	161,000	101,000	45,000



Brocas helicoidais com haste reforçada



Material de corte **MD int.**

Superfície **A**

Sentido de corte **R**

P ○ Redução da aresta transversal ≥ Ø 2,600 • afiação facetada • formato reto da aresta de corte principal (depois da correção)

M

K ○

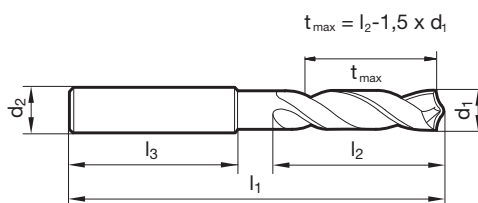
N aços temperados até 62 HRC

S

H •

GÜHRING NAVIGATOR

Página de dados de corte 776



Brocas helicoidais com haste cilíndrica

Nr. do artigo **1946**

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
2,600	6,000	62,000	20,000	36,000
3,000	6,000	62,000	20,000	36,000
3,400	6,000	62,000	20,000	36,000
4,000	6,000	66,000	24,000	36,000
4,300	6,000	66,000	24,000	36,000
5,000	6,000	66,000	28,000	36,000
5,100	6,000	66,000	28,000	36,000
5,600	6,000	66,000	28,000	36,000
6,000	6,000	66,000	28,000	36,000
6,900	8,000	79,000	34,000	36,000
7,100	8,000	79,000	41,000	36,000
8,000	8,000	79,000	41,000	36,000

d1	d2 h6	l1	l2	l3
mm	mm	mm	mm	mm
8,600	10,000	89,000	47,000	40,000
9,100	10,000	89,000	47,000	40,000
10,000	10,000	89,000	47,000	40,000
10,400	12,000	102,000	55,000	45,000
10,600	12,000	102,000	55,000	45,000
11,100	12,000	102,000	55,000	45,000
12,000	12,000	102,000	55,000	45,000
14,100	16,000	115,000	65,000	48,000



Brocas extra-longas, compr. 6 polegadas



Material de corte **HSS**

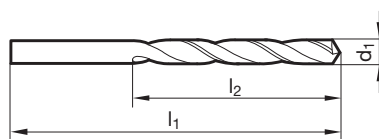
Superfície ○

Sentido de corte (R)

P • Redução da aresta transversal $\geq \varnothing 1,500$ • afiação de superfície cônica

- M**
- K** •
- N** • chapas de liga de Al • pacote de chapas • aço e fundição
- S**
- H**

Brocas helicoidais com haste cilíndrica



Nr. do artigo **577**

d1		l1	l2
mm	inch	mm	mm
1,500		153,000	23,000
1,590	1/16	153,000	26,000
1,650		153,000	26,000
1,750		153,000	26,000
1,780		153,000	26,000
1,900		153,000	26,000
1,930		153,000	29,000
1,980	5/64	153,000	29,000
1,990		153,000	29,000
2,000		153,000	29,000
2,100		153,000	29,000
2,300		153,000	32,500
2,380	3/32	153,000	37,000
2,400		153,000	37,000
2,490		153,000	37,000
2,500		153,000	37,000
2,530		153,000	37,000
2,580		153,000	37,000
2,870		153,000	42,000
2,950		153,000	42,000
3,000		153,000	42,000
3,170	1/8	153,000	42,000
3,200		153,000	42,000
3,260		153,000	42,000
3,500		154,000	49,000
3,570	9/64	154,000	49,000
3,800		154,000	55,000
3,860		154,000	55,000
3,910		154,000	55,000
3,970	5/32	154,000	55,000
4,000		154,000	55,000
4,040		154,000	55,000
4,090		154,000	55,000
4,220		154,000	55,000
4,390		154,000	60,000
4,500		154,000	60,000

d1		l1	l2
mm	inch	mm	mm
4,570		154,000	60,000
4,700		154,000	60,000
4,760	3/16	154,000	63,500
4,800		154,000	63,500
4,850		154,000	63,500
4,920		154,000	63,500
4,980		154,000	63,500
5,000		154,000	63,500
5,160	13/64	154,000	63,500
5,500		154,000	68,500
5,560	7/32	154,000	68,500
5,800		154,000	68,500
5,940		154,000	68,500
5,950	15/64	154,000	68,500
6,040		154,000	75,000
6,150		154,000	75,000
6,200		154,000	75,000
6,250		154,000	75,000
6,350	1/4	154,000	75,000
6,530		154,000	75,000
6,800		155,000	80,000
7,000		155,000	80,000
7,700		155,000	90,000
7,940	5/16	155,000	90,000
8,000		155,000	90,000

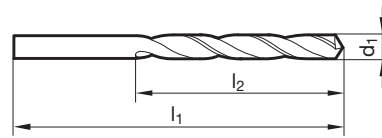


Brocas extra-longas, compr. 6 polegadas



Material de corte	HSS
Superfície	$\geq 0,2,36$
Sentido de corte	(R)

- P** • Redução da aresta transversal $\geq \varnothing 1,500$ • afiação de superfície cônica
- M**
- K** •
- N** • chapas de liga de Al • pacote de chapas • aço e fundição
- S**
- H**



Brocas helicoidais com haste cilíndrica

Nr. do artigo **579**

d1		l1	l2
mm	inch	mm	mm
1,500		153,000	23,000
1,590	1/16	153,000	26,000
1,780		153,000	26,000
1,980	5/64	153,000	29,000
2,000		153,000	29,000
2,380	3/32	153,000	37,000
2,400		153,000	37,000
2,490		153,000	37,000
2,500		153,000	37,000
2,580		153,000	37,000
2,640		153,000	37,000
2,710		153,000	42,000
2,780	7/64	153,000	42,000
2,790		153,000	42,000
2,820		153,000	42,000
2,870		153,000	42,000
2,950		153,000	42,000
3,000		153,000	42,000
3,050		153,000	42,000
3,170	1/8	153,000	42,000
3,200		153,000	42,000
3,260		153,000	42,000
3,450		154,000	49,000
3,500		154,000	49,000
3,570	9/64	154,000	49,000
3,600		154,000	49,000
3,660		154,000	49,000
3,700		154,000	49,000
3,800		154,000	55,000
3,970	5/32	154,000	55,000

d1		l1	l2
mm	inch	mm	mm
3,990		154,000	55,000
4,000		154,000	55,000
4,040		154,000	55,000
4,090		154,000	55,000
4,370	11/64	154,000	60,000
4,390		154,000	60,000
4,500		154,000	60,000
4,570		154,000	60,000
4,620		154,000	60,000
4,760	3/16	154,000	63,500
4,800		154,000	63,500
4,850		154,000	63,500
4,920		154,000	63,500
4,980		154,000	63,500
5,000		154,000	63,500
5,160	13/64	154,000	63,500
5,560	7/32	154,000	68,500
5,800		154,000	68,500
5,940		154,000	68,500
5,950	15/64	154,000	68,500
6,040		154,000	75,000
6,250		154,000	75,000
6,350	1/4	154,000	75,000
6,450		154,000	75,000
6,530		154,000	75,000
6,750	17/64	155,000	80,000
7,940	5/16	155,000	90,000
8,000		155,000	90,000



Brocas extra-longas, compr. 12 polegadas



Material de corte **HSS**

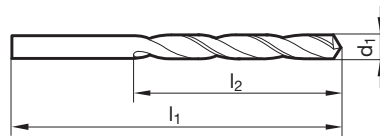
Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 1,500$ • afiação de superfície cônica

- M**
- K** •
- N** • chapas de liga de Al • pacote de chapas • aço e fundição
- S**
- H**

Brocas helicoidais com haste cilíndrica



Nr. do artigo **578**

d1		l1	l2
mm	inch	mm	mm
1,500		306,000	23,000
1,590	1/16	306,000	26,000
1,780		306,000	26,000
1,850		306,000	26,000
1,930		306,000	29,000
2,000		306,000	29,000
2,180		306,000	32,500
2,260		306,000	32,500
2,380	3/32	306,000	37,000
2,440		306,000	37,000
2,490		306,000	37,000
2,500		306,000	37,000
2,580		306,000	37,000
2,640		306,000	37,000
2,790		306,000	42,000
2,820		306,000	42,000
3,000		306,000	42,000
3,170	1/8	306,000	42,000
3,200		306,000	42,000
3,260		306,000	42,000
3,500		308,000	49,000
3,570	9/64	308,000	49,000
3,660		308,000	49,000
3,800		308,000	55,000
3,970	5/32	308,000	55,000
4,000		308,000	55,000
4,040		308,000	55,000
4,090		308,000	55,000
4,220		308,000	55,000
4,370	11/64	308,000	60,000

d1		l1	l2
mm	inch	mm	mm
4,390		308,000	60,000
4,500		308,000	60,000
4,570		308,000	60,000
4,620		308,000	60,000
4,700		308,000	60,000
4,760	3/16	308,000	63,500
4,800		308,000	63,500
4,850		308,000	63,500
4,920		308,000	63,500
4,980		308,000	63,500
5,000		308,000	63,500
5,160	13/64	308,000	63,500
5,500		308,000	68,500
5,800		308,000	68,500
5,950	15/64	308,000	68,500
6,000		308,000	68,500
6,040		308,000	75,000
6,350	1/4	308,000	75,000
6,530		308,000	75,000
7,000		310,000	80,000
8,000		310,000	90,000



Brocas extra-longas, compr. 12 polegadas



Material de corte **HSS**

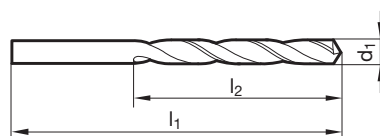
Superfície $\text{Ra} > 0,2,36$

Sentido de corte

P • Redução da aresta transversal $\geq \text{Ø } 1,500$ • afiação de superfície cônica

P	•
M	
K	•
N	•
S	
H	

N • chapas de liga de Al • pacote de chapas • aço e fundição



Brocas helicoidais com haste cilíndrica

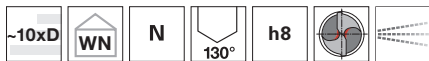
Nr. do artigo **580**

d1		l1	l2
mm	inch	mm	mm
1,500		306,000	23,000
1,590	1/16	306,000	26,000
1,780		306,000	26,000
1,980	5/64	306,000	29,000
2,000		306,000	29,000
2,380	3/32	306,000	37,000
2,490		306,000	37,000
2,500		306,000	37,000
2,580		306,000	37,000
2,640		306,000	37,000
2,710		306,000	42,000
2,780	7/64	306,000	42,000
2,790		306,000	42,000
2,820		306,000	42,000
2,870		306,000	42,000
2,950		306,000	42,000
3,000		306,000	42,000
3,170	1/8	306,000	42,000
3,260		306,000	42,000
3,450		308,000	49,000
3,500		308,000	49,000
3,660		308,000	49,000
3,730		308,000	49,000
3,800		308,000	55,000
3,970	5/32	308,000	55,000
3,990		308,000	55,000
4,000		308,000	55,000
4,040		308,000	55,000
4,300		308,000	60,000
4,370	11/64	308,000	60,000

d1		l1	l2
mm	inch	mm	mm
4,390		308,000	60,000
4,500		308,000	60,000
4,570		308,000	60,000
4,620		308,000	60,000
4,700		308,000	60,000
4,760	3/16	308,000	63,500
4,800		308,000	63,500
4,850		308,000	63,500
4,920		308,000	63,500
4,980		308,000	63,500
5,000		308,000	63,500
5,060		308,000	63,500
5,110		308,000	63,500
5,160	13/64	308,000	63,500
5,560	7/32	308,000	68,500
5,790		308,000	68,500
5,940		308,000	68,500
5,950	15/64	308,000	68,500
6,000		308,000	68,500
6,040		308,000	75,000
6,150		308,000	75,000
6,250		308,000	75,000
6,350	1/4	308,000	75,000
6,530		308,000	75,000
7,940	5/16	310,000	90,000
8,000		310,000	90,000



Brocas com canais de refrigeração



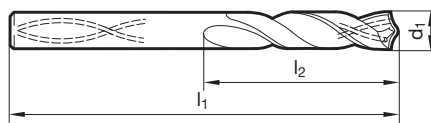
- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica • também para furar através de buchas • especialmente para profundidades acima de 5xD
- M** ○
- K** •
- N** • pacotes de chapas • aço e aço fundido, ferro fundido • aços austeníticos até 800 N/mm²
- S** ○
- H** ○

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

Brocas helicoidais com haste cilíndrica

GÜHRINGNAVIGATOR

Página de dados de corte 788



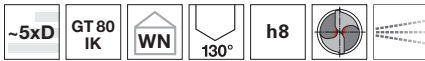
Nr. do artigo **390**

d1	l1	l2
mm	mm	mm
3,000	100,000	66,000
3,300	106,000	69,000
3,500	112,000	73,000
4,000	119,000	78,000
4,200	119,000	78,000
4,500	126,000	82,000
5,000	132,000	87,000
5,500	139,000	91,000
6,000	139,000	91,000
6,500	148,000	97,000
6,800	156,000	102,000
6,900	156,000	102,000
7,000	156,000	102,000
7,500	156,000	102,000
8,000	165,000	109,000
8,500	165,000	109,000
9,000	175,000	115,000
9,500	175,000	115,000

d1	l1	l2
mm	mm	mm
10,000	184,000	121,000
10,200	184,000	121,000
10,500	184,000	121,000
11,000	195,000	128,000
11,500	195,000	128,000
12,000	205,000	134,000
13,000	205,000	134,000



Brocas com canais de refrigeração



- P** • Redução da aresta transversal $\geq \varnothing 5,000$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co
- K** •
- N** • materiais com cavacos longos até 1000 N/mm² • aços inoxidáveis
- S** • materiais fundidos • metais não ferrosos
- H** ○

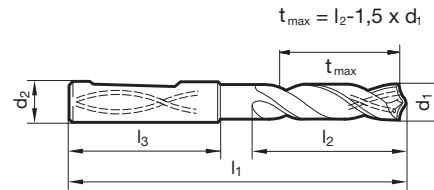
Material de corte **HSCO**

Superfície ○

Forma da haste HE

GÜHRING NAVIGATOR

Página de dados de corte 784



Brocas helicoidais com haste cilíndrica

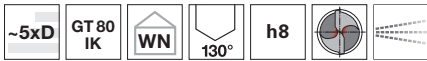
Nr. do artigo **1131**

d1		d6 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
5,000		6,000	82,000	44,000	36,000
5,500		6,000	82,000	44,000	36,000
6,000		6,000	82,000	44,000	36,000
6,350	1/4	8,000	91,000	53,000	36,000
6,800		8,000	91,000	53,000	36,000
7,140	9/32	8,000	91,000	53,000	36,000
7,800		8,000	91,000	53,000	36,000
8,000		8,000	91,000	53,000	36,000
9,000		10,000	103,000	61,000	40,000
9,500		10,000	103,000	61,000	40,000
10,000		10,000	103,000	61,000	40,000
10,200		12,000	118,000	71,000	45,000
10,320	13/32	12,000	118,000	71,000	45,000
10,500		12,000	118,000	71,000	45,000
11,000		12,000	118,000	71,000	45,000
11,500		12,000	118,000	71,000	45,000
12,000		12,000	118,000	71,000	45,000
12,500		14,000	124,000	77,000	45,000

d1		d6 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm
13,000		14,000	124,000	77,000	45,000
13,500		14,000	124,000	77,000	45,000
14,000		14,000	124,000	77,000	45,000
14,290	9/16	16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
15,870	5/8	16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000
18,500		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000



Brocas com canais de refrigeração



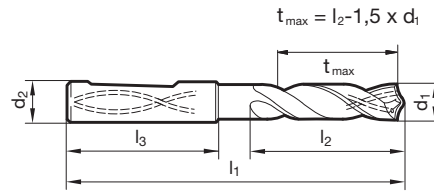
- P** • Redução da aresta transversal $\geq \varnothing 5,000$ • afiação de superfície cônica
- M** •
- K** •
- N** • materiais com cavacos longos até 1000 N/mm² • aços inoxidáveis
- S** • materiais fundidos • metais não ferrosos
- H** ○

Material de corte	HSCO
Superfície	S
Forma da haste	HE

Brocas helicoidais com haste cilíndrica

GÜHRINGNAVIGATOR

Página de dados de corte 784

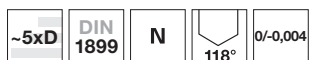


Nr. do artigo **1132**

d1		d6 h6	l1	l2	l3	d1		d6 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
5,000		6,000	82,000	44,000	36,000	12,000		12,000	118,000	71,000	45,000
5,500		6,000	82,000	44,000	36,000	12,500		14,000	124,000	77,000	45,000
6,000		6,000	82,000	44,000	36,000	13,000		14,000	124,000	77,000	45,000
6,500		8,000	91,000	53,000	36,000	13,500		14,000	124,000	77,000	45,000
6,800		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
7,000		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
7,500		8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
7,800		8,000	91,000	53,000	36,000	15,500		16,000	133,000	83,000	48,000
8,000		8,000	91,000	53,000	36,000	15,870	5/8	16,000	133,000	83,000	48,000
8,500		10,000	103,000	61,000	40,000	16,000		16,000	133,000	83,000	48,000
9,000		10,000	103,000	61,000	40,000	16,500		18,000	143,000	93,000	48,000
9,500		10,000	103,000	61,000	40,000	17,000		18,000	143,000	93,000	48,000
10,000		10,000	103,000	61,000	40,000	17,500		18,000	143,000	93,000	48,000
10,200		12,000	118,000	71,000	45,000	18,000		18,000	143,000	93,000	48,000
10,320	13/32	12,000	118,000	71,000	45,000	19,000		20,000	153,000	101,000	50,000
10,500		12,000	118,000	71,000	45,000	19,500		20,000	153,000	101,000	50,000
11,000		12,000	118,000	71,000	45,000	20,000		20,000	153,000	101,000	50,000
11,500		12,000	118,000	71,000	45,000						



Micro brocas de precisão HSS-E-PM sem dutos de refrigeração



Material de corte **HSS-E-PM**

Superfície

Sentido de corte

P • afiação facetada • com haste reforçada • <math>\varnothing < 0,15 \text{ mm}</math> aço-HSS ligado com Co

M •

K •

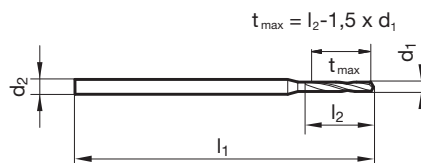
N • aços de liga alta

S ○

H

GÜHRINGNAVIGATOR

Página de dados de corte 796



Brocas helicoidais com haste cilíndrica

Nr. do artigo **301**

d1	d2	l1	l2
mm	mm	mm	mm
0,050	1,000	25,000	0,400
0,060	1,000	25,000	0,400
0,070	1,000	25,000	0,500
0,075	1,000	25,000	0,500
0,080	1,000	25,000	0,500
0,090	1,000	25,000	0,500
0,100	1,000	25,000	0,500
0,105	1,000	25,000	0,500
0,110	1,000	25,000	0,500
0,115	1,000	25,000	0,500
0,120	1,000	25,000	0,500
0,121	1,000	25,000	0,800
0,125	1,000	25,000	0,800
0,128	1,000	25,000	0,800
0,130	1,000	25,000	0,800
0,140	1,000	25,000	0,800
0,143	1,000	25,000	0,800
0,145	1,000	25,000	0,800
0,147	1,000	25,000	0,800
0,150	1,000	25,000	0,800
0,155	1,000	25,000	1,100
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,175	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,195	1,000	25,000	1,500
0,200	1,000	25,000	1,500
0,205	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,215	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,225	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,235	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,245	1,000	25,000	1,900
0,250	1,000	25,000	1,900
0,255	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,265	1,000	25,000	1,900
0,270	1,000	25,000	1,900

d1	d2	l1	l2
mm	mm	mm	mm
0,275	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,285	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,295	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,305	1,000	25,000	2,400
0,310	1,000	25,000	2,400
0,315	1,000	25,000	2,400
0,320	1,000	25,000	2,400
0,325	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,335	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,345	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,355	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,365	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,375	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,385	1,000	25,000	3,000
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000
0,405	1,000	25,000	3,000
0,410	1,000	25,000	3,000
0,415	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,425	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,432	1,000	25,000	3,000
0,435	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,445	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,455	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,475	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,485	1,000	25,000	3,400



Brocas helicoidais com haste cilíndrica

d1	d2	l1	l2
mm	mm	mm	mm
0,490	1,000	25,000	3,400
0,495	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,505	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,515	1,000	25,000	3,400
0,520	1,000	25,000	3,400
0,525	1,000	25,000	3,400
0,530	1,000	25,000	3,400
0,535	1,000	25,000	3,900
0,540	1,000	25,000	3,900
0,545	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,560	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,585	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,595	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,605	1,000	25,000	4,200
0,610	1,000	25,000	4,200
0,615	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,625	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,632	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,655	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,665	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,675	1,000	25,000	4,800
0,680	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,695	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,705	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800
0,725	1,000	25,000	4,800
0,730	1,000	25,000	4,800
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,795	1,500	25,000	5,300
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,825	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,845	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,925	1,500	25,000	6,000
0,930	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800

d1	d2	l1	l2
mm	mm	mm	mm
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,010	1,500	25,000	6,800
1,020	1,500	25,000	6,800
1,030	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,055	1,500	25,000	6,800
1,060	1,500	25,000	6,800
1,070	1,500	25,000	7,600
1,080	1,500	25,000	7,600
1,090	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,110	1,500	25,000	7,600
1,120	1,500	25,000	7,600
1,130	1,500	25,000	7,600
1,140	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,160	1,500	25,000	7,600
1,170	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,190	1,500	25,000	8,500
1,200	1,500	25,000	8,500
1,210	1,500	25,000	8,500
1,220	1,500	25,000	8,500
1,230	1,500	25,000	8,500
1,240	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,260	1,500	25,000	8,500
1,265	1,500	25,000	8,500
1,270	1,500	25,000	8,500
1,280	1,500	25,000	8,500
1,290	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,310	1,500	25,000	8,500
1,320	1,500	25,000	8,500
1,325	1,500	25,000	9,500
1,330	1,500	25,000	9,500
1,340	1,500	25,000	9,500
1,350	1,500	25,000	9,500
1,370	1,500	25,000	9,500
1,380	1,500	25,000	9,500
1,390	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,410	1,500	25,000	9,500
1,420	1,500	25,000	9,500
1,430	1,500	25,000	9,500
1,440	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,460	2,000	30,000	9,500
1,470	2,000	30,000	9,500
1,500	2,000	30,000	9,500
1,520	2,000	30,000	10,600
1,530	2,000	30,000	10,600
1,540	2,000	30,000	10,600
1,550	2,000	30,000	10,600
1,590	2,000	30,000	10,600
1,600	2,000	30,000	10,600
1,610	2,000	30,000	10,600
1,630	2,000	30,000	10,600
1,640	2,000	30,000	10,600
1,650	2,000	30,000	10,600
1,660	2,000	30,000	10,600
1,690	2,000	30,000	10,600
1,700	2,000	30,000	10,600
1,710	2,000	30,000	11,800
1,715	2,000	30,000	11,800
1,730	2,000	30,000	11,800
1,745	2,000	30,000	11,800
1,750	2,000	30,000	11,800
1,775	2,000	30,000	11,800
1,800	2,000	30,000	11,800

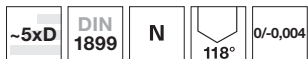


d1	d2	l1	l2
mm	mm	mm	mm
1,830	2,000	30,000	11,800
1,840	2,000	30,000	11,800
1,850	2,000	30,000	11,800
1,860	2,000	30,000	11,800
1,900	2,000	30,000	11,800
1,920	2,000	30,000	13,200

d1	d2	l1	l2
mm	mm	mm	mm



Micro brocas de precisão HSS-E-PM sem dutos de refrigeração



Material de corte **HSS-E-PM**

Superfície **S**

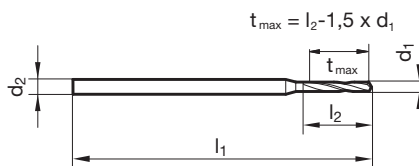
Sentido de corte **R**

- P** • afiação facetada • com haste reforçada • resistência ao desgaste ampliada
- M** •
- K** •
- N** • aços de liga alta
- S** ○
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 796

Brocas helicoidais com haste cilíndrica



Nr. do artigo **660**

d1	d2	l1	l2
mm	mm	mm	mm
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,200	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,250	1,000	25,000	1,900
0,255	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,265	1,000	25,000	1,900
0,270	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,295	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,305	1,000	25,000	2,400
0,310	1,000	25,000	2,400
0,320	1,000	25,000	2,400
0,325	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000
0,410	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,490	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,520	1,000	25,000	3,400

d1	d2	l1	l2
mm	mm	mm	mm
0,530	1,000	25,000	3,400
0,540	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,560	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,610	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,680	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800
0,730	1,000	25,000	4,800
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800

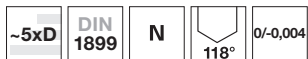


d1	d2	l1	l2
mm	mm	mm	mm
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,020	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,070	1,500	25,000	7,600
1,080	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,190	1,500	25,000	8,500

d1	d2	l1	l2
mm	mm	mm	mm
1,200	1,500	25,000	8,500
1,220	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,350	1,500	25,000	9,500
1,390	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,420	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,500	2,000	30,000	9,500
1,800	2,000	30,000	11,800
1,900	2,000	30,000	11,800



Micro brocas de precisão HSS-E-PM sem dutos de refrigeração



Material de corte **HSS-E-PM**

Superfície



Sentido de corte



P • afiação facetada • com haste reforçada • $\varnothing 0,15\text{ mm}$ aço-HSS ligado com Co

M •

K •

N • aços de liga alta

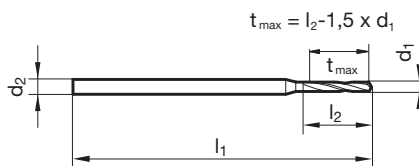
S ○

H

GÜHRINGNAVIGATOR

Página de dados de corte 796

Brocas helicoidais com haste cilíndrica



Nr. do artigo **303**

d1	d2	l1	l2
mm	mm	mm	mm
0,130	1,000	25,000	0,800
0,140	1,000	25,000	0,800
0,150	1,000	25,000	0,800
0,155	1,000	25,000	1,100
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,175	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,185	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,195	1,000	25,000	1,500
0,200	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,215	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,225	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,235	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,245	1,000	25,000	1,900
0,250	1,000	25,000	1,900
0,255	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,265	1,000	25,000	1,900
0,270	1,000	25,000	1,900
0,275	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,295	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,310	1,000	25,000	2,400
0,315	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,345	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,355	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000

d1	d2	l1	l2
mm	mm	mm	mm
0,410	1,000	25,000	3,000
0,415	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,435	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,465	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,485	1,000	25,000	3,400
0,490	1,000	25,000	3,400
0,495	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,520	1,000	25,000	3,400
0,525	1,000	25,000	3,400
0,540	1,000	25,000	3,900
0,545	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,555	1,000	25,000	3,900
0,565	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,615	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,675	1,000	25,000	4,800
0,680	1,000	25,000	4,800
0,685	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,695	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800



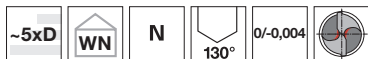
d1	d2	l1	l2
mm	mm	mm	mm
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,800	1,500	25,000	5,300
0,805	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,855	1,500	25,000	6,000
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,885	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,915	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,925	1,500	25,000	6,000
0,935	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,975	1,500	25,000	6,800
0,980	1,500	25,000	6,800
0,985	1,500	25,000	6,800
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,005	1,500	25,000	6,800
1,020	1,500	25,000	6,800

d1	d2	l1	l2
mm	mm	mm	mm
1,030	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,060	1,500	25,000	6,800
1,080	1,500	25,000	7,600
1,085	1,500	25,000	7,600
1,090	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,110	1,500	25,000	7,600
1,120	1,500	25,000	7,600
1,125	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,160	1,500	25,000	7,600
1,170	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,200	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,270	1,500	25,000	8,500
1,280	1,500	25,000	8,500
1,285	1,500	25,000	8,500
1,290	1,500	25,000	8,500
1,310	1,500	25,000	8,500
1,330	1,500	25,000	9,500
1,350	1,500	25,000	9,500
1,360	1,500	25,000	9,500
1,375	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,405	1,500	25,000	9,500
1,425	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,460	2,000	30,000	9,500
1,500	2,000	30,000	9,500
1,600	2,000	30,000	10,600
1,615	2,000	30,000	10,600
1,800	2,000	30,000	11,800
1,850	2,000	30,000	11,800

Brocas helicoidais
com haste cilíndrica



Micro brocas de precisão Metal duro sem dutos de refrigeração



Material de corte **MD int.**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 0,800$ • afiação facetada • formato reto da aresta de corte principal

M ○

K •

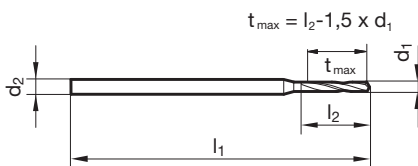
N ○ aços para construção e cementação • materiais fundidos • bronze, latão
S ○ alumínio e ligas de alumínio • magnésio e ligas de magnésio • plásticos e plásticos reforçados com fibra

H ○

GÜHRINGNAVIGATOR

Página de dados de corte 796

Brocas helicoidais com haste cilíndrica



Nr. do artigo **701**

d1	d2	l1	l2
mm	mm	mm	mm
0,200	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,250	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,330	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,400	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,500	1,000	25,000	3,400
0,600	1,000	25,000	3,900
0,650	1,000	25,000	4,200
0,700	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,830	1,500	25,000	5,300

d1	d2	l1	l2
mm	mm	mm	mm
0,850	1,500	25,000	5,300
0,900	1,500	25,000	6,000
1,000	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,100	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,200	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,350	1,500	25,000	9,500
1,400	1,500	25,000	9,500



Micro brocas de precisão Metal duro sem dutos de refrigeração



P • Redução da aresta transversal $\geq \varnothing 0,800$ • afiação facetada

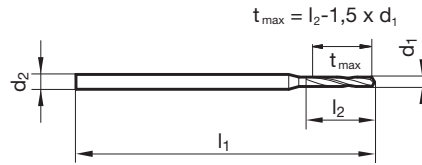
- M**
- K** •
- N**
- S**
- H**

aços para construção e cementação • aços para máquinas automáticas,
aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos

Material de corte	MD int.
Superfície	A
Sentido de corte	R

GÜHRINGNAVIGATOR

Página de dados de corte 796



Brocas helicoidais com haste cilíndrica

Nr. do artigo **3899**

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,100	3,000	38,000	1,200
0,150	3,000	38,000	2,000
0,200	3,000	38,000	2,500
0,250	3,000	38,000	3,000
0,260	3,000	38,000	3,000
0,270	3,000	38,000	3,000
0,280	3,000	38,000	3,000
0,300	3,000	38,000	5,000
0,310	3,000	38,000	5,000
0,330	3,000	38,000	5,000
0,350	3,000	38,000	6,000
0,360	3,000	38,000	6,000
0,370	3,000	38,000	6,000
0,380	3,000	38,000	6,000
0,400	3,000	38,000	7,000
0,410	3,000	38,000	7,000
0,430	3,000	38,000	7,000
0,440	3,000	38,000	7,000
0,450	3,000	38,000	7,000
0,480	3,000	38,000	7,000
0,500	3,000	38,000	7,000
0,510	3,000	38,000	7,000
0,530	3,000	38,000	7,000
0,550	3,000	38,000	7,000
0,570	3,000	38,000	7,000
0,600	3,000	38,000	7,000
0,640	3,000	38,000	7,000
0,650	3,000	38,000	7,000
0,660	3,000	38,000	7,000
0,680	3,000	38,000	7,000
0,700	3,000	38,000	8,000
0,710	3,000	38,000	8,000
0,720	3,000	38,000	8,000
0,740	3,000	38,000	8,000
0,750	3,000	38,000	8,000
0,760	3,000	38,000	8,000
0,770	3,000	38,000	8,000
0,780	3,000	38,000	8,000
0,790	3,000	38,000	8,000
0,800	3,000	38,000	10,000
0,810	3,000	38,000	10,000
0,820	3,000	38,000	10,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,830	3,000	38,000	10,000
0,840	3,000	38,000	10,000
0,850	3,000	38,000	10,000
0,860	3,000	38,000	10,000
0,870	3,000	38,000	10,000
0,880	3,000	38,000	10,000
0,890	3,000	38,000	10,000
0,900	3,000	38,000	10,000
0,910	3,000	38,000	10,000
0,920	3,000	38,000	10,000
0,930	3,000	38,000	10,000
0,940	3,000	38,000	10,000
0,950	3,000	38,000	10,000
0,960	3,000	38,000	10,000
0,970	3,000	38,000	10,000
0,980	3,000	38,000	10,000
0,990	3,000	38,000	10,000
1,000	3,000	38,000	10,000
1,010	3,000	38,000	10,000
1,020	3,000	38,000	10,000
1,050	3,000	38,000	10,000
1,060	3,000	38,000	10,000
1,070	3,000	38,000	10,000
1,090	3,000	38,000	10,000
1,100	3,000	38,000	10,000
1,110	3,000	38,000	10,000
1,150	3,000	38,000	10,000
1,170	3,000	38,000	10,000
1,190	3,000	38,000	10,000
1,200	3,000	38,000	10,000
1,210	3,000	38,000	10,000
1,220	3,000	38,000	10,000
1,230	3,000	38,000	10,000
1,240	3,000	38,000	10,000
1,260	3,000	38,000	10,000
1,270	3,000	38,000	10,000
1,280	3,000	38,000	10,000
1,300	3,000	38,000	10,000
1,370	3,000	38,000	10,000
1,400	3,000	38,000	10,000
1,420	3,000	38,000	10,000
1,450	3,000	38,000	10,000



Brocas helicoidais
com haste cilíndrica

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,490	3,000	38,000	10,000
1,500	3,000	38,000	10,000
1,510	3,000	38,000	10,000
1,520	3,000	38,000	10,000
1,550	3,000	38,000	10,000
1,560	3,000	38,000	10,000
1,580	3,000	38,000	10,000
1,590	3,000	38,000	10,000
1,600	3,000	38,000	12,000
1,630	3,000	38,000	12,000
1,650	3,000	38,000	12,000
1,700	3,000	38,000	12,000
1,750	3,000	38,000	12,000
1,800	3,000	38,000	12,000
1,810	3,000	38,000	12,000
1,820	3,000	38,000	12,000
1,830	3,000	38,000	12,000
1,840	3,000	38,000	12,000
1,850	3,000	38,000	12,000
1,860	3,000	38,000	12,000
1,900	3,000	38,000	12,000
1,920	3,000	38,000	12,000
1,950	3,000	38,000	12,000
1,980	3,000	38,000	12,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,000	3,000	38,000	12,000
2,050	3,000	38,000	12,000
2,100	3,000	38,000	12,000
2,150	3,000	38,000	12,000
2,200	3,000	38,000	12,000
2,400	3,000	38,000	12,000
2,500	3,000	38,000	12,000
2,550	3,000	38,000	12,000
2,600	3,000	38,000	12,000
2,750	3,000	38,000	12,000
2,800	3,000	38,000	12,000
2,950	3,000	38,000	12,000
3,000	3,000	38,000	12,000



Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração

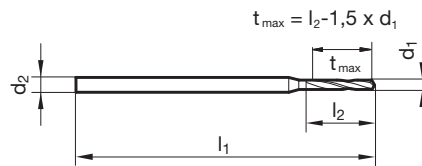


- P** • Redução da aresta transversal $\geq \varnothing 0,500$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado
- M** •
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos
- S** ○
- H**

Material de corte	MD int.
Superfície	A
Sentido de corte	R

GÜHRINGNAVIGATOR

Página de dados de corte 796



Brocas helicoidais com haste cilíndrica

Nr. do artigo **6400**

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	3,000
0,550	3,000	47,000	3,300
0,600	3,000	47,000	3,600
0,650	3,000	47,000	3,900
0,700	3,000	47,000	4,200
0,750	3,000	47,000	4,500
0,800	3,000	47,000	4,800
0,850	3,000	47,000	5,100
0,900	3,000	47,000	5,400
0,950	3,000	47,000	5,700
1,000	3,000	47,000	6,000
1,050	3,000	47,000	6,300
1,100	3,000	47,000	6,600
1,150	3,000	47,000	6,900
1,200	3,000	47,000	7,200
1,250	3,000	47,000	7,500
1,300	3,000	47,000	7,800
1,350	3,000	47,000	8,100
1,400	3,000	47,000	8,400
1,450	3,000	47,000	8,700
1,500	3,000	47,000	9,000
1,550	3,000	47,000	9,300
1,590	3,000	47,000	9,600
1,600	3,000	47,000	9,600
1,650	3,000	47,000	9,900
1,700	3,000	47,000	10,200
1,750	3,000	47,000	10,500
1,800	3,000	52,000	10,800
1,850	3,000	52,000	11,100
1,900	3,000	52,000	11,400

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	11,700
1,980	4,000	59,000	12,000
2,000	4,000	59,000	12,000
2,050	4,000	59,000	12,300
2,100	4,000	59,000	12,600
2,150	4,000	59,000	12,900
2,200	4,000	59,000	13,200
2,250	4,000	59,000	13,500
2,300	4,000	59,000	13,800
2,350	4,000	59,000	14,100
2,380	4,000	59,000	14,400
2,400	4,000	59,000	14,400
2,450	4,000	59,000	14,700
2,500	4,000	59,000	15,000
2,550	4,000	59,000	15,300
2,600	4,000	59,000	15,600
2,650	4,000	59,000	15,900
2,700	4,000	59,000	16,200
2,750	4,000	59,000	16,500
2,780	4,000	59,000	16,800
2,800	4,000	59,000	16,800
2,850	4,000	59,000	17,100
2,900	4,000	59,000	17,400
2,950	4,000	59,000	17,700
3,000	4,000	59,000	18,000



Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração



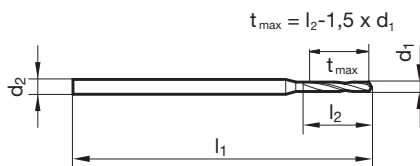
- P** • Redução da aresta transversal $\geq \varnothing 0,500$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado
- M** •
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos
- S** ○
- H**

Material de corte	MD int.
Superfície	A
Sentido de corte	R

Brocas helicoidais com haste cilíndrica

GÜHRINGNAVIGATOR

Página de dados de corte 796



Nr. do artigo **6401**

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	4,000
0,550	3,000	47,000	4,400
0,600	3,000	47,000	4,800
0,650	3,000	47,000	5,200
0,700	3,000	47,000	5,600
0,750	3,000	47,000	6,000
0,800	3,000	47,000	6,400
0,850	3,000	47,000	6,800
0,900	3,000	47,000	7,200
0,950	3,000	47,000	7,600
1,000	3,000	47,000	8,000
1,050	3,000	47,000	8,400
1,100	3,000	47,000	8,800
1,150	3,000	47,000	9,200
1,200	3,000	52,000	10,800
1,250	3,000	52,000	11,300
1,300	3,000	52,000	11,700
1,350	3,000	52,000	12,200
1,400	3,000	52,000	12,600
1,450	3,000	52,000	13,100
1,500	3,000	52,000	13,500
1,550	3,000	52,000	14,000
1,590	3,000	52,000	14,400
1,600	3,000	52,000	14,400
1,650	3,000	52,000	14,900
1,700	3,000	52,000	15,300
1,750	3,000	52,000	15,800
1,800	3,000	52,000	16,200
1,850	3,000	52,000	16,700
1,900	3,000	52,000	17,100

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	17,600
1,980	4,000	63,000	18,000
2,000	4,000	63,000	18,000
2,050	4,000	63,000	18,500
2,100	4,000	63,000	18,900
2,150	4,000	63,000	19,400
2,200	4,000	63,000	19,800
2,250	4,000	63,000	20,300
2,300	4,000	63,000	20,700
2,350	4,000	63,000	21,200
2,380	4,000	63,000	21,600
2,400	4,000	63,000	21,600
2,450	4,000	63,000	22,100
2,500	4,000	63,000	22,500
2,550	4,000	63,000	23,000
2,600	4,000	67,000	23,400
2,650	4,000	67,000	23,900
2,700	4,000	67,000	24,300
2,750	4,000	67,000	24,800
2,780	4,000	67,000	25,200
2,800	4,000	67,000	25,200
2,850	4,000	67,000	25,700
2,900	4,000	67,000	26,100
2,950	4,000	67,000	26,600
3,000	4,000	67,000	27,000



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração



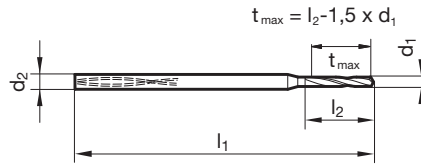
- P** • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado
- M** •
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos
- S** ○
- H** □

Material de corte	MD int.
Superfície	A
Sentido de corte	R



GÜHRING NAVIGATOR

Página de dados de corte 796



Brocas helicoidais com haste cilíndrica

Nr. do artigo **6405**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	11,000
1,450	4,000	52,000	12,000
1,500	4,000	52,000	12,000
1,550	4,000	52,000	12,000
1,590	4,000	52,000	13,000
1,600	4,000	52,000	13,000
1,650	4,000	52,000	13,000
1,700	4,000	56,000	14,000
1,750	4,000	56,000	14,000
1,800	4,000	56,000	14,000
1,850	4,000	56,000	15,000
1,900	4,000	56,000	15,000
1,950	4,000	56,000	16,000
1,980	4,000	56,000	16,000
2,000	4,000	56,000	16,000
2,050	4,000	56,000	16,000
2,100	4,000	62,000	17,000
2,150	4,000	62,000	17,000
2,200	4,000	62,000	18,000
2,250	4,000	62,000	18,000
2,300	4,000	62,000	18,000
2,350	4,000	62,000	19,000
2,380	4,000	62,000	19,000
2,400	4,000	62,000	19,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,450	4,000	62,000	20,000
2,500	4,000	62,000	20,000
2,550	4,000	62,000	20,000
2,600	4,000	66,000	21,000
2,650	4,000	66,000	21,000
2,700	4,000	66,000	22,000
2,750	4,000	66,000	22,000
2,780	4,000	66,000	22,000
2,800	4,000	66,000	22,000
2,850	4,000	66,000	23,000
2,900	4,000	66,000	23,000
2,950	4,000	66,000	24,000
3,000	4,000	66,000	24,000



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração



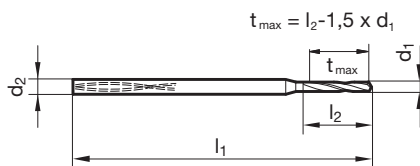
Material de corte	MD int.
Superfície	A
Sentido de corte	R

- P** • Redução da aresta transversal ≥ Ø 1,400 • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado
- M** •
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos
- S** ○
- H**

Brocas helicoidais com haste cilíndrica

GÜHRINGNAVIGATOR

Página de dados de corte 796



Nr. do artigo **6408**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	15,000
1,450	4,000	52,000	16,000
1,500	4,000	52,000	17,000
1,550	4,000	52,000	17,000
1,590	4,000	52,000	18,000
1,600	4,000	52,000	18,000
1,650	4,000	52,000	18,000
1,700	4,000	56,000	19,000
1,750	4,000	56,000	19,000
1,800	4,000	56,000	20,000
1,850	4,000	56,000	20,000
1,900	4,000	56,000	21,000
1,950	4,000	56,000	21,000
1,980	4,000	56,000	22,000
2,000	4,000	56,000	22,000
2,050	4,000	56,000	23,000
2,100	4,000	62,000	23,000
2,150	4,000	62,000	24,000
2,200	4,000	62,000	24,000
2,250	4,000	62,000	25,000
2,300	4,000	62,000	25,000
2,320	4,000	62,000	26,000
2,350	4,000	62,000	26,000
2,380	4,000	62,000	26,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,400	4,000	62,000	26,000
2,450	4,000	62,000	27,000
2,500	4,000	62,000	28,000
2,550	4,000	62,000	28,000
2,600	4,000	66,000	29,000
2,650	4,000	66,000	29,000
2,700	4,000	66,000	30,000
2,750	4,000	66,000	30,000
2,780	4,000	66,000	31,000
2,800	4,000	66,000	31,000
2,850	4,000	66,000	31,000
2,900	4,000	66,000	32,000
2,950	4,000	66,000	32,000
3,000	4,000	66,000	33,000



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração



Material de corte **MD int.**

Superfície **A**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado

M •

K •

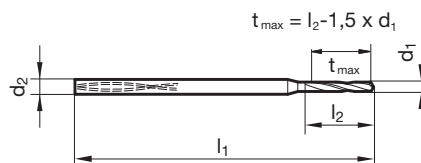
N ○ aços para construção e cementação • aços para máquinas automáticas,

S ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos

H

GÜHRING NAVIGATOR

Página de dados de corte 796



Brocas helicoidais com haste cilíndrica

Nr. do artigo **6412**

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	62,000	25,000
1,500	4,000	62,000	27,000
1,590	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,700	4,000	70,000	31,000
1,800	4,000	70,000	32,000
1,900	4,000	70,000	34,000
1,980	4,000	70,000	36,000
2,000	4,000	70,000	36,000
2,100	4,000	78,000	38,000
2,200	4,000	78,000	40,000
2,300	4,000	78,000	42,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,380	4,000	78,000	44,000
2,400	4,000	78,000	44,000
2,500	4,000	78,000	45,000
2,600	4,000	87,000	47,000
2,700	4,000	87,000	48,000
2,780	4,000	87,000	50,000
2,800	4,000	87,000	50,000
2,900	4,000	87,000	52,000
3,000	4,000	87,000	54,000



Brocas helicoidais curtas, haste-Ø 12,7 mm



Material de corte **HSS**

Superfície

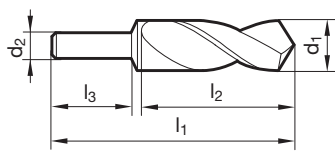
Sentido de corte

- P** • Redução da aresta transversal $\geq \text{Ø } 14,290$ • afiação de superfície cônica
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 778



Nr. do artigo **268**

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
13,000	12,700	156,000	82,000	57,000
13,490	12,700	156,000	82,000	57,000
13,500	12,700	156,000	82,000	57,000
14,000	12,700	156,000	82,000	57,000
14,290	12,700	157,000	83,000	57,000
14,500	12,700	157,000	83,000	57,000
15,000	12,700	157,000	83,000	57,000
15,500	12,700	157,000	83,000	57,000
15,870	12,700	157,000	83,000	57,000
16,000	12,700	157,000	83,000	57,000
16,500	12,700	158,000	84,000	57,000
16,670	12,700	158,000	84,000	57,000
17,000	12,700	158,000	84,000	57,000
17,460	12,700	158,000	84,000	57,000
17,500	12,700	158,000	84,000	57,000
18,000	12,700	158,000	84,000	57,000
19,000	12,700	158,000	84,000	57,000
19,050	12,700	159,000	85,000	57,000

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
19,840	12,700	159,000	85,000	57,000
20,000	12,700	159,000	85,000	57,000
21,000	12,700	159,000	85,000	57,000
21,430	12,700	159,000	85,000	57,000
22,000	12,700	159,000	85,000	57,000
22,220	12,700	159,000	85,000	57,000
23,000	12,700	159,000	85,000	57,000
23,020	12,700	159,000	85,000	57,000
23,810	12,700	160,000	86,000	57,000
24,000	12,700	160,000	86,000	57,000
25,000	12,700	160,000	86,000	57,000
25,400	12,700	160,000	86,000	57,000
28,570	12,700	160,000	86,000	57,000



Brocas helicoidais curtas, haste-Ø 16,0 mm



- P** • sem afiação da ponta • aço-HSS ligado com Co • resistência ao desgaste ampliada • com haste universal • mandrils semi-elaborados
- M** • com centragem em ambos os lados • para retrabalhos como p. ex. correções de diâmetros, retificação de escalões, retificação de formas
- K** ○
- N** ○ materiais de difícil usinabilidade • aços resistentes a corrosão e ácidos
- S** ○ • aços para molas • aços austeníticos
- H**

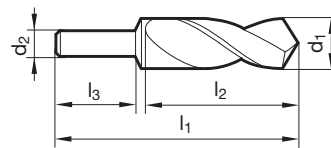
Material de corte **HSCO**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 772



Brocas helicoidais com haste cilíndrica

Nr. do artigo **128**

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
16,000	16,000	130,000	88,000	42,000
16,500	16,000	130,000	88,000	40,000
17,000	16,000	130,000	88,000	40,000
17,500	16,000	130,000	88,000	40,000
18,000	16,000	130,000	88,000	40,000
19,000	16,000	130,000	88,000	40,000
20,000	16,000	130,000	88,000	40,000
20,500	16,000	130,000	88,000	40,000
21,000	16,000	130,000	88,000	40,000
21,500	16,000	130,000	88,000	40,000
22,000	16,000	130,000	88,000	40,000
22,500	16,000	130,000	88,000	40,000
23,000	16,000	130,000	88,000	40,000
23,500	16,000	130,000	88,000	40,000
24,000	16,000	130,000	88,000	40,000
24,500	16,000	130,000	88,000	40,000
25,000	16,000	130,000	88,000	40,000
25,500	16,000	140,000	98,000	40,000

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
26,000	16,000	140,000	98,000	40,000
27,000	16,000	140,000	98,000	40,000
28,000	16,000	140,000	98,000	40,000
28,500	16,000	140,000	98,000	40,000
30,000	16,000	140,000	98,000	40,000
31,000	16,000	140,000	98,000	40,000
32,000	16,000	140,000	98,000	40,000
35,000	16,000	140,000	98,000	40,000
38,000	16,000	140,000	98,000	40,000
40,000	16,000	140,000	98,000	40,000



Brocas helicoidais curtas, haste-Ø 25,4 mm



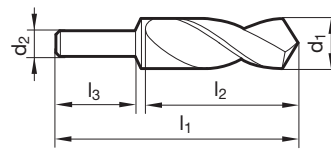
- P** • sem afiação da ponta • aço-HSS ligado com Co • resistência ao desgaste ampliada • com haste universal • mandrils semi-elaborados
- M** • com centragem em ambos os lados • para retrabalhos como p. ex. correções de diâmetros, retificação de escalões, retificação de formas
- K** ○
- N** ○ aços resistentes a corrosão e ácidos • materiais de difícil usinabilidade
- S** ○ • aços para molas • aços austeníticos
- H**

Material de corte	HSCO
Superfície	○
Sentido de corte	Ⓜ

Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 772



Nr. do artigo **129**

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
25,000	25,400	140,000	93,000	45,000
26,000	25,400	140,000	93,000	45,000
28,000	25,400	140,000	93,000	45,000
29,500	25,400	140,000	93,000	45,000
30,000	25,400	140,000	93,000	45,000
32,000	25,400	140,000	93,000	45,000
33,000	25,400	140,000	93,000	45,000
34,000	25,400	140,000	93,000	45,000
35,000	25,400	140,000	93,000	45,000
36,000	25,400	140,000	93,000	45,000
37,000	25,400	140,000	93,000	45,000
38,000	25,400	140,000	93,000	45,000

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
40,000	25,400	140,000	93,000	45,000



Brocas helicoidais curtas, haste-Ø 25,4 mm



Material de corte **HSCO**

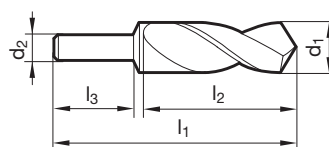
Superfície

Sentido de corte

- P** • sem afiação da ponta • aço-HSS ligado com Co • alta resistência ao desgaste • com haste universal • mandrils semi-elaborados com
- M** • centragem em ambos os lados • para retrabalhos como p. ex. correções de diâmetros, retificação de escalões, retificação de formas
- K** ○
- N** ○ materiais de difícil usinabilidade • aços resistentes a corrosão e ácidos (aços-VA) • aços para molas • aços austeníticos
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 772



Brocas helicoidais com haste cilíndrica

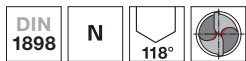
Nr. do artigo **136**

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
25,000	25,400	140,000	93,000	45,000
25,500	25,400	140,000	93,000	45,000
26,000	25,400	140,000	93,000	45,000
26,500	25,400	140,000	93,000	45,000
27,500	25,400	140,000	93,000	45,000
29,500	25,400	140,000	93,000	45,000

d1	d2	l1	l2	l3
mm	mm	mm	mm	mm
36,000	25,400	140,000	93,000	45,000
38,000	25,400	140,000	93,000	45,000
39,000	25,400	140,000	93,000	45,000



Brocas para furos de pinos



Material de corte **HSS**

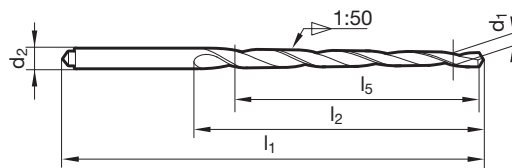
Superfície $\text{Ra} \leq 2,36$

Sentido de corte

P • Redução da aresta transversal $\geq \text{Ø } 1,000$ • afiação de superfície cônica
 • para furos cônicos, pinos cônicos conforme DIN 1 (novo: DIN EN 22339) e DIN 7978 (novo: DIN EN 28736) • com arraste

- M** ○
- K** •
- N** ○
- S** ○
- H** ○

Brocas helicoidais com haste cilíndrica



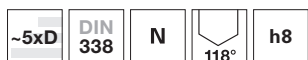
Nr. do artigo **531**

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
2,000	3,150	86,000	52,000	48,000
2,500	3,150	86,000	52,000	48,000
3,000	4,000	100,000	63,000	58,000
3,500	5,000	112,000	74,000	68,000
4,000	5,000	112,000	74,000	68,000
4,500	6,300	122,000	81,000	73,000

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
5,000	6,300	122,000	81,000	73,000
5,500	8,000	160,000	114,000	105,000
6,000	8,000	160,000	114,000	105,000
8,000	10,000	207,000	157,000	145,000
10,000	12,500	245,000	190,000	175,000
12,000	16,000	290,000	228,000	210,000



Jogos de brocas helicoidais

Material de corte **HSS**Superfície $\sqrt{2,36}$

Sentido de corte (R)

P • afiação de superfície cônica • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada. Outras composições de kits sob encomenda.

M	•
K	•
N	○
S	
H	



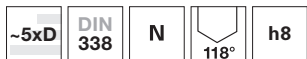
Brocas helicoidais com haste cilíndrica

Nr. do artigo **201**

d1	aumentando em	Peças/jogo	Nº de cód.
mm	mm		
1,0-5,0	0,1	41	0,011
5,1-10,0	0,1	50	0,012
1,0-10,0	0,5	19	0,013
1,0-13,0	0,5	25	0,014
1,0-5,9	0,1	50	0,015
6,0-10,0	0,1	41	0,016
1,0-10,5	0,5	24	0,018
1,0-10,5	0,5	32	0,019
1/16 - 1/2	1/64	29	0,021
1,02-5,79	1/64	60	0,026



Jogo de brocas, a granel



Material de corte	HSS
Superfície	
Sentido de corte	

P • afiação de superfície cônica • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada. Outras composições de kits sob encomenda.

M	•
K	•
N	○
S	
H	

Brocas helicoidais com haste cilíndrica

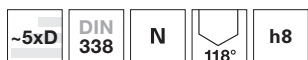


Nr. do artigo **200**

d1	aumentando em	Peças/jogo	Nº de cód.
mm	mm		
1,0-5,0	0,1	41	0,011
5,1-10,0	0,1	50	0,012
1,0-10,0	0,5	19	0,013
1,0-13,0	0,5	25	0,014
1,0-5,9	0,1	50	0,015
6,0-10,0	0,1	41	0,016
1,0-10,5	0,5	24	0,018



Jogos de brocas helicoidais

Material de corte **HSS**Superfície **S**Sentido de corte **R**

P • afiação de superfície cônic • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada. Outras composições de kits sob encomenda.

M	•
K	•
N	○
S	
H	



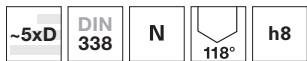
Brocas helicoidais com haste cilíndrica

Nr. do artigo **17**

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-10,0	0,5	19	6,013
1,0-13,0	0,5	25	6,014
1,0-5,9	0,1	50	6,015
6,0-10,0	0,1	41	6,016
1/16 - 1/2	1/64	29	6,021



Jogos de brocas helicoidais



P	•	afiação de superfície cônica • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada. Outras composições de kits sob encomenda.
M	○	
K	•	
N	○	
S	○	
H	○	

Brocas helicoidais com haste cilíndrica

Material de corte	HSCO
Superfície	●
Sentido de corte	Ⓜ

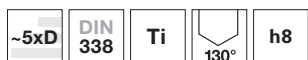


Nr. do artigo **16**

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-10,0	0,5	19	3,013
1,0-13,0	0,5	25	3,014
1,0-5,9	0,1	50	3,015
6,0-10,0	0,1	41	3,016
1/16 - 1/2	1/64	29	3,021



Jogos de brocas helicoidais

Material de corte **HSCO**

Superfície ○

Sentido de corte (R)

P ○ afiação de superfície cônica • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada. Outras composições de kits sob encomenda.



Brocas helicoidais com haste cilíndrica

Nr. do artigo **18**

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-10,0	0,5	19	8,013
1,0-13,0	0,5	25	8,014
1,0-5,9	0,1	50	8,015
6,0-10,0	0,1	41	8,016
1,0-10,5	0,5	24	8,018



Jogos de brocas helicoidais



P ○ afiação de superfície cônica • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada. Outras composições de kits sob encomenda.

- M** ●
- K** ○
- N** ○
- S** ○
- H** ○

Brocas helicoidais com haste cilíndrica

Material de corte	HSCO
Superfície	○
Sentido de corte	Ⓜ



Nr. do artigo **195**

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-13,0	0,5	25	8,014
1,0-10,5	0,5	24	8,018



Jogos de brocas helicoidais

Material de corte **HSCO**

Superfície

Sentido de corte

P ● afiação de superfície cônica • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada. Outras composições de kits sob encomenda.

M	○
K	○
N	○
S	○
H	○



Brocas helicoidais com haste cilíndrica

Nr. do artigo **2049**

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-13,0	0,5	25	0,014
1,0-10,0	0,5	19	0,013
1,0-10,5	0,5	24	0,018
1,0-5,0	0,1	41	0,011
5,1-10,0	0,1	50	0,012



Jogos de brocas helicoidais



P • afiação de superfície cônica • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada. Outras composições de kits sob encomenda.

- M** ○
- K** ○
- N** ○
- S** ○
- H** ○

Brocas helicoidais com haste cilíndrica

Material de corte	HSCO
Superfície	M
Sentido de corte	R



Nr. do artigo **2050**

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-10,0	0,5	19	0,013
5,1-10,0	0,1	50	0,012



Jogo de brocas AeroX



P	•	afiação em cruz otimizada • liga de aço rápido HSCO com 8% de cobalto • As Brocas estão disponíveis nos kits de dimensões populares como mostrado. Para uso em bancadas os kits podem ser fornecidos em bakelite. Para mais composições portáteis, a caixa é recomendada.
M	•	
K	•	Outras composições de kits sob encomenda.
N	•	aço não ligado e de alta liga • materiais fundidos • metais não ferrosos
S	•	• Titânio e ligas de titânio
H	○	

Material de corte **M42**

Superfície

Sentido de corte



Brocas helicoidais com haste cilíndrica

Nr. do artigo **1083**

d1	aumentando em	Peças/jogo	Nº de cód.
mm	mm		
1,0-13,0	0,5	25	0,014
1,0-10,0	0,5	19	0,013



Jogos de brocas helicoidais



Estojo vazio

Brocas helicoidais
com haste cilíndrica



Nr. do artigo 36

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-13,0			0,214
1,0-10,0			0,213
1,0-5,9			0,215
6,0-10,0			0,216
1,0-10,5			0,218


Jogos de brocas helicoidais


Estojo vazio


 Brocas helicoidais
com haste cilíndrica

 Nr. do artigo **73**

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-13,0			0,614



Jogos de brocas helicoidais



Suporte de bakelite

Brocas helicoidais
com haste cilíndrica



Nr. do artigo 11

d1 mm	aumentando em mm	Peças/jogo	Nº de cód.
1,0-13,0			0,114
5,1-10,0			0,112
1,0-5,0			0,111
1,0-5,9			0,115
1,0-10,0			0,113
1/16 - 1/2			0,121
1/16 - 1/2			0,122



Brocas especiais com cortes de metal duro



Material de corte	Metal duro
Superfície	○
Sentido de corte	Ⓜ

P ○ Redução da aresta transversal ≥ Ø 1,700 • afiação facetada • providas com metal duro

M

K ○

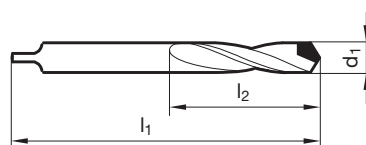
N aço para molas • fundição dura acima de 300 HB • molibdênio puro • bronzes duros e tenazes

S

H ○

GÜHRING NAVIGATOR

Página de dados de corte 776



Brocas helicoidais com haste cilíndrica

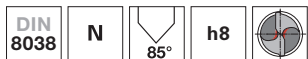
Nr. do artigo **703**

d1	l1	l2
mm	mm	mm
1,700	45,000	18,000
2,600	50,000	20,000
2,700	50,000	20,000
2,900	50,000	20,000
3,000	50,000	20,000
3,100	56,000	25,000
3,200	56,000	25,000
3,250	56,000	25,000
3,300	56,000	25,000
3,500	56,000	25,000
3,700	56,000	25,000
3,800	56,000	25,000
3,900	56,000	25,000
4,000	56,000	25,000
4,100	63,000	28,000
4,200	63,000	28,000
4,300	63,000	28,000
4,500	63,000	28,000
4,800	63,000	28,000
4,900	63,000	28,000
5,000	63,000	28,000
5,100	71,000	32,000
5,200	71,000	32,000
5,300	71,000	32,000
5,400	71,000	32,000
5,500	71,000	32,000
5,800	71,000	32,000
6,000	71,000	32,000
6,200	71,000	32,000
6,300	71,000	32,000
6,350	71,000	32,000
6,400	71,000	32,000
6,500	71,000	32,000
6,700	80,000	40,000
6,800	80,000	40,000
7,000	80,000	40,000

d1	l1	l2
mm	mm	mm
7,200	80,000	40,000
7,500	80,000	40,000
7,800	80,000	40,000
8,000	80,000	40,000
8,200	90,000	50,000
8,400	90,000	50,000
8,500	90,000	50,000
9,000	90,000	50,000
9,500	90,000	50,000
9,800	100,000	56,000
10,000	100,000	56,000
10,200	100,000	56,000
10,400	100,000	56,000
10,500	100,000	56,000
11,000	100,000	56,000
11,500	112,000	63,000
12,000	112,000	63,000
12,500	112,000	63,000
12,700	112,000	63,000
13,000	112,000	63,000
13,500	125,000	71,000
14,000	125,000	71,000
14,500	125,000	71,000
15,000	125,000	71,000
15,500	140,000	80,000
16,000	140,000	80,000
16,500	140,000	80,000
17,000	140,000	80,000
17,500	160,000	90,000
18,000	160,000	90,000
19,000	160,000	90,000
19,500	160,000	90,000
20,000	160,000	90,000
21,000	160,000	90,000
22,000	160,000	90,000
24,000	170,000	100,000



Brocas especiais com cortes de metal duro



P Redução da aresta transversal $\geq \varnothing 1,500$ • afiação facetada • providas com metal duro

- M**
- K**
- N**
- S**
- H**

plásticos reforçados com fibras de vidro • duroplásticos com ação abrasiva nos cortes e guias

Material de corte **Metal duro**

Superfície



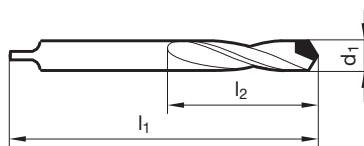
Sentido de corte



Brocas helicoidais com haste cilíndrica

GÜHRING NAVIGATOR

Página de dados de corte 776



Nr. do artigo **704**

d1	l1	l2
mm	mm	mm
1,900	45,000	18,000
2,200	45,000	18,000
3,100	56,000	25,000
3,200	56,000	25,000
3,500	56,000	25,000
4,200	63,000	28,000

d1	l1	l2
mm	mm	mm
5,000	63,000	28,000
6,000	71,000	32,000
8,000	80,000	40,000
24,000	170,000	100,000



Brocas helicoidais FK



P Redução da aresta transversal $\geq \varnothing 2,380$ • afiação especial

- M**
- K**
- N** plásticos reforçados com fibra
- S**
- H**

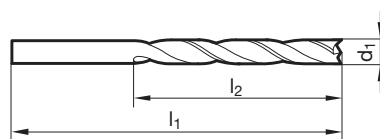
Material de corte **MD int.**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 776



Brocas helicoidais com haste cilíndrica

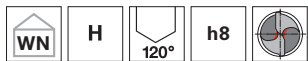
Nr. do artigo **1149**

d1		l1	l2
mm	inch		
2,500		43,000	14,000
3,200		49,000	18,000
3,570	9/64	52,000	20,000
4,000		55,000	22,000
4,760	3/16	62,000	26,000
5,000		62,000	26,000

d1		l1	l2
mm	inch		
6,000		66,000	28,000
8,000		79,000	37,000
10,000		89,000	43,000



Brocas ponta de lança



Material de corte **Metal duro**

Superfície ○

Sentido de corte (R)

P ○ Redução da aresta transversal $\geq \varnothing 3,000$ • afiação facetada • broca especial • utilização sob condições pesadas

M

K ○

N fundição dura • aço duro

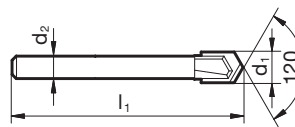
S

H ○

GÜHRING NAVIGATOR

Página de dados de corte 776

Brocas helicoidais com haste cilíndrica



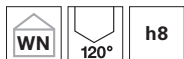
Nr. do artigo **707**

d1	l1	l2
mm	mm	mm
3,000	50,000	
5,000	63,000	
5,500	70,000	
6,000	70,000	
8,000	80,000	
9,000	90,000	

d1	l1	l2
mm	mm	mm
12,000	112,000	



Brocas para pedras



Material de corte **Metal duro**

Superfície

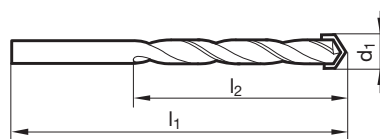
Sentido de corte

P afiação facetada • providas com metal duro • para furadeiras e furadeiras de impacto • para furar ladrilhos e azulejos sem a função de impacto!

K alvenaria, concreto, ladrilhos

S

H



Brocas helicoidais com haste cilíndrica

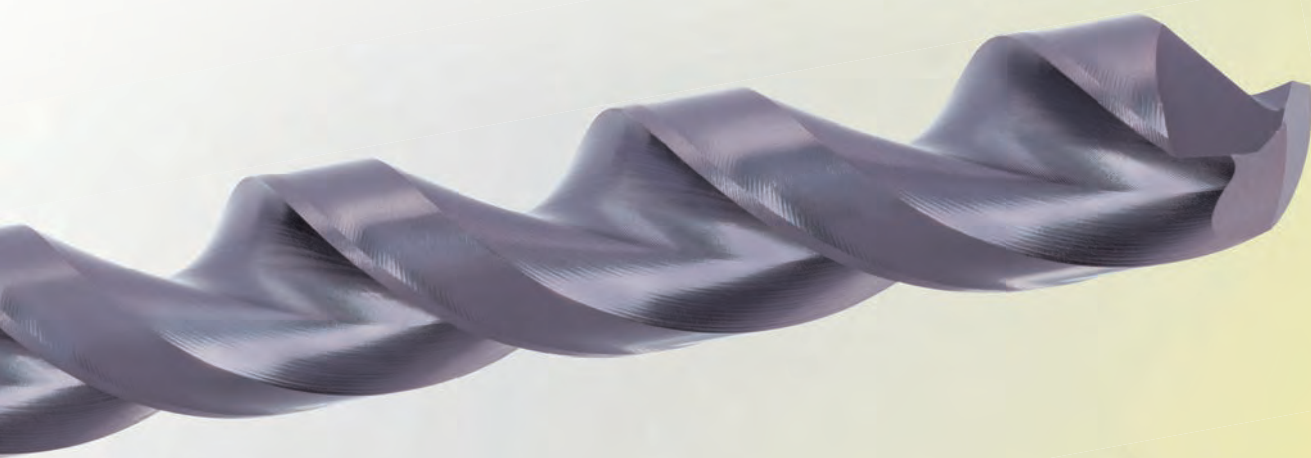
Nr. do artigo **716**

d1	l1	l2
mm	mm	mm
4,000	75,000	40,000
5,000	85,000	50,000
6,000	100,000	60,000
8,000	120,000	80,000
10,000	120,000	80,000
12,000	150,000	90,000

d1	l1	l2
mm	mm	mm



BROCAS HELICOIDAIS COM CONE MORSE





P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Brocas espirais curtas

•	•	•	•	•	•		~3xD	WN	GV 120	R	HSCO	○	8,100 - 38,000	363	772 448
•	•	•	•	•	•		~3xD	WN	GV 120	R	HSCO	Ⓢ	10,500 - 31,000	663	774 449

Brocas helicoidais

•	•	•	•	•	•		~5xD	DIN 345	N	R	HSS	○ _{2,36}	2,380 - 96,000	245	778 450
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSS	○ _{16,0}	10,000 - 28,000	592	778 454
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSS	Ⓢ	3,000 - 31,000	654	780 455
•	•	•	•	•	•		~5xD	DIN 345	N	L	HSS	○	6,000 - 60,000	248	778 457
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSS	○	8,500 - 59,000	229	778 458
•	•	•	•	•	•		~5xD	DIN 345	H	R	HSS	○	6,700 - 25,250	246	778 459
•	•	•	•	•	•		~5xD	DIN 345	W	R	HSS	○	3,200 - 32,000	247	778 460
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSS	○ _{16,0}	7,940 - 31,750	558	778 461
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSS	Ⓢ	7,940 - 31,500	606	780 462
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSCO	○	4,000 - 50,000	345	780 463
•	•	•	•	•	•		~5xD	DIN 345	N	R	HSCO	Ⓢ	8,000 - 30,000	661	782 465
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSCO	○ _{16,0}	10,000 - 39,000	645	780 466
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSCO	Ⓢ	10,000 - 23,810	662	782 467
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSCO	Ⓒ	10,000 - 30,160	1222	782 468
•	•	•	•	•	•		~5xD	DIN 345	GT 100	R	HSCO	Ⓐ	10,400 - 30,160	1224	782 469
•	•	•	•	•	•		~5xD	DIN 345	VA	R	HSCO	○	10,000 - 34,000	1262	780 470
•	•	•	•	•	•		~5xD	DIN 346	N	R	HSS	○	10,000 - 73,000	251	778 471
•	•	•	•	•	•		~5xD	DIN 346	N	R	HSCO	○	12,000 - 31,500	351	780 472

Brocas para furar através de buchas

•	•	•	•	•	•		~10xD	DIN 341	N	R	HSS	○	2,900 - 50,000	257	786 473
•	•	•	•	•	•		~10xD	DIN 341	N	R	HSS	Ⓢ	5,500 - 22,000	655	786 475
•	•	•	•	•	•		~10xD	DIN 341	GT 100	R	HSS	○ _{16,0}	5,500 - 32,000	551	786 476

Brocas helicoidais com cone Morse



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Brocas para furar através de buchas

•	•	•					~10xD	DIN 341	GT 100		HSS		7,000 - 23,000	656	786 478
○		•					~10xD	DIN 341	GT 50		HSS		5,500 - 29,500	505	786 479
•	○	•	•	○			~10xD	DIN 341	N		HSCO		4,750 - 40,000	357	792 480
•	•	•	•	○			~10xD	DIN 341	GT 100		HSCO		10,000 - 26,000	623	792 481
•	•	○					~10xD	WN	N		HSS		10,000 - 29,000	523	786 482

Brocas helicoidais extra longas, série 1

•	•	○					~15xD	DIN 1870	N		HSS		8,000 - 50,000	266	788 483
•	•	•					~15xD	DIN 1870	GT 100		HSS		8,000 - 30,000	526	790 484
○		•					~15xD	DIN 1870	GT 50		HSS		8,500 - 33,000	525	788 485
•	•	•	•	○			~15xD	DIN 1870	GT 100		HSCO		9,520 - 30,000	620	794 486

Brocas helicoidais extra longas, série 2

•	•	○					~20xD	DIN 1870	N		HSS		8,000 - 45,000	267	788 487
•	•	•					~20xD	DIN 1870	GT 100		HSS		8,000 - 30,000	527	790 488
○		•					~20xD	DIN 1870	GT 50		HSS		8,500 - 31,000	542	788 489
•	•	•	•	○			~20xD	DIN 1870	GT 100		HSCO		9,520 - 23,420	621	794 490

Brocas helicoidais extra longas

•	•	•					>20xD	WN	GT 100		HSS		6,000 - 7,500	563	790 491
•	•	•					>20xD	WN	GT 100		HSS		6,000 - 10,000	564	790 492
•	•	•					>20xD	WN	GT 100		HSS		6,000 - 17,000	565	790 493
•	•	•					>20xD	WN	GT 100		HSS		8,000 - 40,000	566	790 494
•	•	•					>20xD	WN	GT 100		HSS		14,000 - 40,000	293	790 495
•	•	•					>20xD	WN	GT 100		HSS		14,000 - 18,000	298	790 496
•	•	•					>20xD	WN	GT 100		HSS		14,000 - 18,000	299	790 497

Brocas com canais de refrigeração curtas

•	○	•	•				~7xD	WN	N		HSS		9,920 - 23,020	269	788 498
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Brocas helicoidais com cone Morse



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Brocas com canais de refrig., compr. canais conf.e norma da empr.

•	○	•	•	•				WN	N	R	HSS	●	8,000 - 50,000	254	788 499
•	○	•	•	•				WN	N	R	HSS	●	8,000 - 42,000	255	788 500

Brocas com canais de refrigeração, comprimento canais DIN 341

•	○	•	•	•			~10xD	WN	N	R	HSS	●	10,000 - 32,000	1101	788 501
•	○	•	•	•			~10xD	WN	N	R	HSS	●	10,000 - 40,000	270	788 502
•	○	•	•	•			~10xD	WN	N	R	HSS	●	10,000 - 44,450	271	788 503
•	○	•	•	•			~10xD	WN	N	R	HSS	●	10,000 - 44,450	272	788 504
•	•	•	•	•	○		~10xD	WN	GT 100	R	HSCO	●	11,000 - 34,920	370	794 505
•	•	•	•	•	○		~10xD	WN	GT 100	R	HSCO	●	11,000 - 34,920	371	794 506
•	•	•	•	•	○		~10xD	WN	GT 100	R	HSCO	●	12,500 - 34,000	372	794 507

Brocas com canais de refrigeração, comprimento canais DIN 1870

•	•	•	•	•	○		~15xD	WN	GT 100	R	HSCO	●	11,000 - 34,000	374	794 508
•	•	•	•	•	○		~15xD	WN	GT 100	R	HSCO	●	11,000 - 34,000	375	794 509
•	•	•	•	•	○		~15xD	WN	GT 100	R	HSCO	●	11,000 - 29,000	376	794 510

Brocas para furos de pinos

•	○	•	○	○				DIN 1898	N	R	HSS	●	5,000 - 25,000	532	511
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Brocas especiais com cortes de metal duro

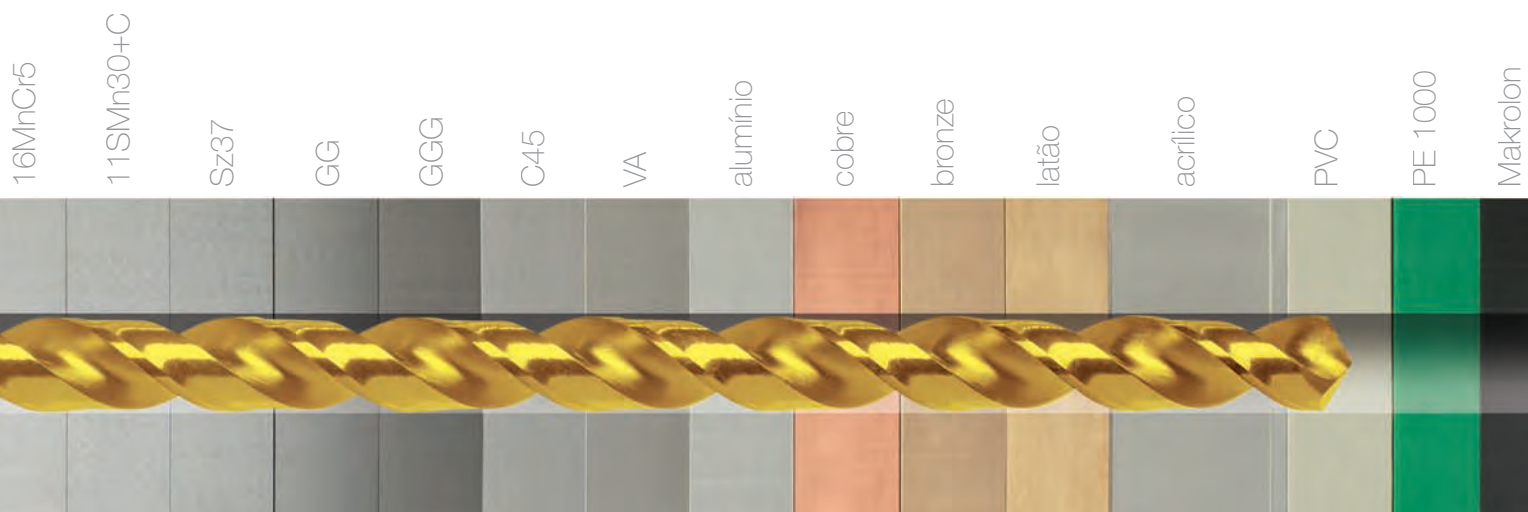
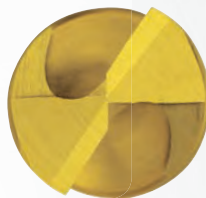
○	○	○	○	○				DIN 8041	N	R	HM	○	8,000 - 40,000	705	776 512
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Brocas helicoidais com cone Morse

GU 500

Broca HSCO universal

- de uso universal em quase todos tipos de materiais
- afiação com 4 facetas para excelente auto centragem e furos com especial exatidão
- baixas forças de avanço e momentos de torção graças a afiação de precisão
- ótima expulsão dos cavacos devido ao perfil arredondado dos canais de saída da broca



GU 500 - de uso universal em quase todos tipos de materiais

Para a usinagem de aços de construção · e carbono · aços de alta liga até 850 N/mm² · aços inoxidáveis
materiais fundidos · metais não ferrosos · alumínio · ligas de magnésio · plásticos



P AÇO



~ 3xD
Norma de empr.

~ 5xD
DIN 345



~ 10xD
DIN 341


~ 15xD
DIN 1870
R1



No 1


Ø 3,00 - 31,00 mm
Nr. do artigo 654
a partir d. pág. 455
 




No 1




Ø 5,50 - 22,00 mm
Nr. do artigo 655
a partir d. pág. 475
 


Ø 8,00 - 50,00 mm
Nr. do artigo 266
a partir d. pág. 483






Ø 8,00 - 30,00 mm
Nr. do artigo 661
a partir d. pág. 465
 


Ø 4,75 - 40,00 mm
Nr. do artigo 357
a partir d. pág. 480



Ø 7,94 - 31,50 mm
Nr. do artigo 606
a partir d. pág. 462
  

Ø 7,00 - 23,00 mm
Nr. do artigo 656
a partir d. pág. 478
  



Ø 8,00 - 30,00 mm
Nr. do artigo 526
a partir d. pág. 484


Ø 10,00 - 23,81 mm
Nr. do artigo 662
a partir d. pág. 467
   

Ø 10,00 - 26,00 mm
Nr. do artigo 623
a partir d. pág. 481


No 1
Ø 9,52 - 30,00 mm
Nr. do artigo 620
a partir d. pág. 486



No 1


Ø 10,50 - 31,00 mm
Nr. do artigo 663
a partir d. pág. 449
 

~ 10xD
comprimento de canal
DIN 341


~ 15xD
comprimento de canal
DIN 1870 R1

No 1

Ø 10,00 - 32,00 mm
Nr. do artigo 1101
a partir d. pág. 501


Ø 11,00 - 34,92 mm
Nr. do artigo 370
a partir d. pág. 505


No 1

Ø 11,00 - 34,00 mm
Nr. do artigo 374
a partir d. pág. 508


Brocas helicoidais
com cone Morse

sem refrigeração interna

com refrigeração interna



QUICKFINDER

~20xD
DIN 1870
R2

>20xD
Norma de empr.
extra curto

No 1 Ferramenta ideal

Ø 8,00 - 45,00 mm
Nr. do artigo 267
a partir d. pág. 487



Tipo N, HSS



Tipo N, HSCO

Ø 8,00 - 30,00 mm
Nr. do artigo 527
a partir d. pág. 488



No 1

Ø 8,00 - 40,00 mm
Nr. do artigo 566
a partir d. pág. 494



GT100, HSS

No 1

Ø 9,52 - 23,42 mm
Nr. do artigo 621
a partir d. pág. 490



GT100, HSCO



GV120, HSCO



Tipo N, HSS



GT100, HSCO

Brocas helicoidais
com cone Morse



AÇOS RESISTENTES A CORROSÃO



TITÂNIO, SUAS LIGAS ESPECIAIS

~ 3xD
Norma de empr.

~ 5xD
DIN 345

~ 10xD
DIN 341

~ 15xD
DIN 1870
R1

No 1 No 1

Ø 10,00 - 34,00 mm
Nr. do artigo 1262
a partir d. pág. 470



No 1 No 1

Ø 10,00 - 26,00 mm
Nr. do artigo 623
a partir d. pág. 481



No 1 No 1

Ø 9,52 - 30,00 mm
Nr. do artigo 620
a partir d. pág. 486



No 1 No 1

Ø 10,50 - 31,00 mm
Nr. do artigo 663
ab S.449



Ø 8,00 - 30,00 mm
Nr. do artigo 661
a partir d. pág. 465



Ø 4,75 - 40,00 mm
Nr. do artigo 357
a partir d. pág. 480



~ 10xD
comprimento de canal
DIN 341

~ 15xD
comprimento de canal
DIN 1870 R1

No 1 No 1

Ø 11,00 - 34,92 mm
Nr. do artigo 370
a partir d. pág. 505



No 1 No 1

Ø 11,00 - 34,00 mm
Nr. do artigo 374
a partir d. pág. 508



Brocas helicoidais com cone Morse

sem refrigeração interna

com refrigeração interna



QUICKFINDER

~20xD
DIN 1870
R2

>20xD
Norma de empr.
extra curto

No 1 Ferramenta ideal
para aço inox

No 1 Ferramenta ideal
para Titânio e suas ligas especiais



Tipo VA, HSCO

No 1 **No 1**

Ø 9,52 - 23,42 mm
Nr. do artigo 621
a partir d. pág. 490



GT100, HSCO



GV120, HSCO



Tipo N, HSCO



GT100, HSCO



K FUNDIDOS



~ 3xD
Norma de empr.

~ 5xD
DIN 345



~ 10xD
DIN 341


~ 15xD
DIN 1870
R1



No 1


Ø 3,00 - 31,00 mm
Nr. do artigo 654
a partir d. pág. 455
 




No 1




Ø 5,50 - 22,00 mm
Nr. do artigo 655
a partir d. pág. 475
 


Ø 8,00 - 50,00 mm
Nr. do artigo 266
a partir d. pág. 483






Ø 8,00 - 30,00 mm
Nr. do artigo 661
a partir d. pág. 465
 


Ø 4,75 - 40,00 mm
Nr. do artigo 357
a partir d. pág. 480


Ø 7,94 - 31,50 mm
Nr. do artigo 606
a partir d. pág. 462
  


Ø 7,00 - 23,00 mm
Nr. do artigo 656
a partir d. pág. 478
  

Ø 8,00 - 30,00 mm
Nr. do artigo 526
a partir d. pág. 484




Ø 10,00 - 23,81 mm
Nr. do artigo 662
a partir d. pág. 467
   

Ø 10,00 - 26,00 mm
Nr. do artigo 623
a partir d. pág. 481


No 1

Ø 9,52 - 30,00 mm
Nr. do artigo 620
a partir d. pág. 486



No 1

Ø 10,50 - 31,00 mm
Nr. do artigo 663
a partir d. pág. 449
 


~ 10xD
comprimento de canal
DIN 341


~ 15xD
comprimento de canal
DIN 1870 R1

No 1

Ø 10,00 - 32,00 mm
Nr. do artigo 1101
a partir d. pág. 501


No 1

Ø 11,00 - 34,92 mm
Nr. do artigo 370
a partir d. pág. 505


Ø 11,00 - 34,00 mm
Nr. do artigo 374
a partir d. pág. 508


Brocas helicoidais
com cone Morse

sem refrigeração interna

com refrigeração interna



QUICKFINDER

~20xD
DIN 1870
R2

>20xD
Norma de empr.
extra curto

No 1 Ferramenta ideal

Ø 8,00 - 45,00 mm
Nr. do artigo 267
a partir d. pág. 487



Tipo N, HSS



Tipo N, HSCO

Ø 8,00 - 30,00 mm
Nr. do artigo 527
a partir d. pág. 488



No 1

Ø 8,00 - 40,00 mm
Nr. do artigo 566
a partir d. pág. 494



GT100, HSS

No 1

Ø 9,52 - 23,42 mm
Nr. do artigo 621
a partir d. pág. 490



GT100, HSCO



GV120, HSCO



Tipo N, HSS



GT100, HSCO

Brocas helicoidais
com cone Morse



N ALUMÍNIO, NE, PLÁSTICOS

~ 3xD Norma de empr.	~ 5xD DIN 345	~ 10xD DIN 341	~ 15xD DIN 1870 R1
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	No 1 Ø 3,20 - 32,00 mm Nr. do artigo 247 a partir d. pág. 460 	Tipo W para materiais de baixa liga e de cavacos longos	
	No 1 Ø 6,70 - 25,25 mm Nr. do artigo 246 a partir d. pág. 459 	Tipo H para materiais duros e quebradiços	
	Tipo GT50 para materiais de baixa liga e de cavacos longos	No 1 Ø 5,50 - 29,50 mm Nr. do artigo 505 a partir d. pág. 479 	No 1 Ø 8,50 - 33,00 mm Nr. do artigo 525 a partir d. pág. 485
	Ø 7,94 - 31,75 mm Nr. do artigo 558 a partir d. pág. 461 S	Ø 5,50 - 32,00 mm Nr. do artigo 551 a partir d. pág. 476 S	Ø 8,00 - 30,00 mm Nr. do artigo 526 a partir d. pág. 484 S
	Ø 10,00 - 39,00 mm Nr. do artigo 645 a partir d. pág. 466 S C A	Ø 10,00 - 26,00 mm Nr. do artigo 623 a partir d. pág. 481 S	Ø 9,52 - 30,00 mm Nr. do artigo 620 a partir d. pág. 486 S

	~ 10xD comprimento de canal DIN 341	~ 15xD comprimento de canal DIN 1870 R1
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	No 1 Ø 10,00 - 32,00 mm Nr. do artigo 1101 a partir d. pág. 501 	
	Ø 11,00 - 34,92 mm Nr. do artigo 370 a partir d. pág. 505 	No 1 Ø 11,00 - 34,00 mm Nr. do artigo 374 a partir d. pág. 508

Brocas helicoidais com cone Morse

sem refrigeração interna

com refrigeração interna



QUICKFINDER

~20xD
DIN 1870
R2

>20xD
Norma de empr.
extra curto

No 1 Ferramenta ideal



Tipo W, HSS



Tipo H, HSS

No 1

Ø 8,50 - 31,00 mm
Nr. do artigo 542
a partir d. pág. 489



GT50, HSS

No 1

Ø 8,00 - 30,00 mm
Nr. do artigo 527
a partir d. pág. 488



Ø 8,00 - 40,00 mm
Nr. do artigo 566
a partir d. pág. 494



GT100, HSS

Ø 9,52 - 23,42 mm
Nr. do artigo 621
a partir d. pág. 490



GT100, HSCO



Tipo N, HSS

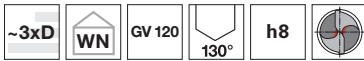


GT100, HSCO

Brocas helicoidais
com cone Morse



Brocas espirais curtas



- P** • Redução da aresta transversal $\geq \varnothing 7,000$ • afiação de superfície cônica
 - M** •
 - K** •
 - N** ○ materiais de difícil usinabilidade • aços resistentes a corrosão e ácidos
 - S** •
 - H** ○
- aço-HSS ligado com Co • resistência ao desgaste ampliada
- aços para molas e austeníticos

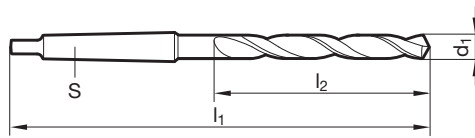
Material de corte **HSCO**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 772



Nr. do artigo **363**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,100		MK-1	130,000	49,000
8,200		MK-1	130,000	49,000
8,300		MK-1	130,000	49,000
8,500		MK-1	130,000	49,000
8,600		MK-1	134,000	53,000
8,730	11/32	MK-1	134,000	53,000
9,000		MK-1	134,000	53,000
9,520	3/8	MK-1	138,000	57,000
9,920	25/64	MK-1	138,000	57,000
10,000		MK-1	138,000	57,000
10,100		MK-1	138,000	57,000
10,200		MK-1	138,000	57,000
10,500		MK-1	138,000	57,000
11,000		MK-1	142,000	61,000
11,750		MK-1	142,000	61,000
12,000		MK-1	147,000	66,000
12,500		MK-1	147,000	66,000
12,700	1/2	MK-1	147,000	66,000
13,000		MK-1	147,000	66,000
13,490	17/32	MK-2	168,000	70,000
13,500		MK-2	168,000	70,000
14,000		MK-2	168,000	70,000
14,500		MK-2	172,000	74,000
15,000		MK-2	172,000	74,000
15,500		MK-2	176,000	78,000
16,000		MK-2	176,000	78,000
16,500		MK-2	179,000	81,000
17,000		MK-2	179,000	81,000
17,500		MK-2	183,000	85,000
18,000		MK-2	183,000	85,000

d1		S	l1	l2
mm	inch		mm	mm
18,500		MK-2	186,000	88,000
19,000		MK-2	186,000	88,000
19,450	49/64	MK-3	212,000	91,000
20,000		MK-3	212,000	91,000
20,500		MK-3	216,000	95,000
20,900		MK-3	216,000	95,000
21,000		MK-3	216,000	95,000
21,500		MK-3	219,000	98,000
22,000		MK-3	219,000	98,000
22,220	7/8	MK-3	219,000	98,000
23,000		MK-3	222,000	101,000
23,020	29/32	MK-3	222,000	101,000
24,000		MK-3	225,000	104,000
24,500		MK-3	225,000	104,000
25,000	63/64	MK-3	225,000	104,000
26,000		MK-4	256,000	107,000
26,500		MK-4	256,000	107,000
27,000		MK-4	259,000	110,000
27,500		MK-4	259,000	110,000
28,000		MK-4	259,000	110,000
29,000		MK-4	263,000	114,000
29,370	1 5/32	MK-4	263,000	114,000
30,000		MK-4	263,000	114,000
32,000		MK-4	269,000	120,000
33,000		MK-4	269,000	120,000
37,000		MK-4	276,000	127,000
38,000		MK-5	317,000	130,000



Brocas espirais curtas



Material de corte **HSCO**

Superfície **S**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 9,000$ • afiação de superfície cônica
• aço-HSS ligado com Co • alta resistência ao desgaste

M •

K •

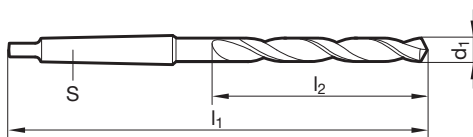
N ○ materiais de difícil usinabilidade • aços resistentes a corrosão e ácidos (aços-VA) • aços para molas e austeníticos

S •

H ○

GÜHRING NAVIGATOR

Página de dados de corte 774



Nr. do artigo **663**

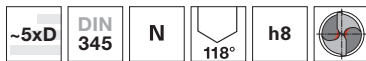
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,500		MK-1	138,000	57,000
10,750		MK-1	142,000	61,000
11,500		MK-1	142,000	61,000
12,500		MK-1	147,000	66,000
13,500		MK-2	168,000	70,000
14,000		MK-2	168,000	70,000
14,250		MK-2	172,000	74,000
15,000		MK-2	172,000	74,000
16,000		MK-2	176,000	78,000
16,500		MK-2	179,000	81,000
17,000		MK-2	179,000	81,000
17,500		MK-2	183,000	85,000

d1		S	l1	l2
mm	inch		mm	mm
18,000		MK-2	183,000	85,000
19,000		MK-2	186,000	88,000
20,000		MK-3	212,000	91,000
21,000		MK-3	216,000	95,000
22,000		MK-3	219,000	98,000
23,000		MK-3	222,000	101,000
25,000	63/64	MK-3	225,000	104,000
27,000		MK-4	259,000	110,000
29,000		MK-4	263,000	114,000
30,000		MK-4	263,000	114,000
31,000		MK-4	266,000	117,000



Brocas helicoidais



Material de corte **HSS**

Superfície

Sentido de corte

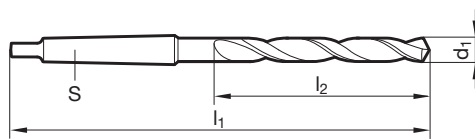
P • Redução da aresta transversal $\geq \varnothing 14,050$ • afiação de superfície cônica

M	
K	•
N	o
S	
H	

aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

GÜHRINGNAVIGATOR

Página de dados de corte 778



Nr. do artigo **245**

Brocas helicoidais com cone Morse

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
2,380	3/32	MK-1	111,000	30,000	5,950	15/64	MK-1	138,000	57,000
2,400		MK-1	111,000	30,000	6,000		MK-1	138,000	57,000
2,450		MK-1	111,000	30,000	6,050		MK-1	144,000	63,000
2,500		MK-1	111,000	30,000	6,100		MK-1	144,000	63,000
2,650		MK-1	111,000	30,000	6,200		MK-1	144,000	63,000
2,780	7/64	MK-1	114,000	33,000	6,300		MK-1	144,000	63,000
2,900		MK-1	114,000	33,000	6,350	1/4	MK-1	144,000	63,000
3,000		MK-1	114,000	33,000	6,400		MK-1	144,000	63,000
3,050		MK-1	117,000	36,000	6,500		MK-1	144,000	63,000
3,170	1/8	MK-1	117,000	36,000	6,600		MK-1	144,000	63,000
3,200		MK-1	117,000	36,000	6,700		MK-1	144,000	63,000
3,250		MK-1	117,000	36,000	6,750	17/64	MK-1	150,000	69,000
3,300		MK-1	117,000	36,000	6,800		MK-1	150,000	69,000
3,450		MK-1	120,000	39,000	6,900		MK-1	150,000	69,000
3,500		MK-1	120,000	39,000	7,000		MK-1	150,000	69,000
3,570	9/64	MK-1	120,000	39,000	7,140	9/32	MK-1	150,000	69,000
3,600		MK-1	120,000	39,000	7,200		MK-1	150,000	69,000
3,970	5/32	MK-1	124,000	43,000	7,250		MK-1	150,000	69,000
4,000		MK-1	124,000	43,000	7,300		MK-1	150,000	69,000
4,200		MK-1	124,000	43,000	7,400		MK-1	150,000	69,000
4,250		MK-1	124,000	43,000	7,500		MK-1	150,000	69,000
4,300		MK-1	128,000	47,000	7,540	19/64	MK-1	156,000	75,000
4,370	11/64	MK-1	128,000	47,000	7,600		MK-1	156,000	75,000
4,400		MK-1	128,000	47,000	7,700		MK-1	156,000	75,000
4,500		MK-1	128,000	47,000	7,750		MK-1	156,000	75,000
4,600		MK-1	128,000	47,000	7,800		MK-1	156,000	75,000
4,750		MK-1	128,000	47,000	7,900		MK-1	156,000	75,000
4,760	3/16	MK-1	133,000	52,000	7,940	5/16	MK-1	156,000	75,000
4,800		MK-1	133,000	52,000	8,000		MK-1	156,000	75,000
5,000		MK-1	133,000	52,000	8,050		MK-1	156,000	75,000
5,100		MK-1	133,000	52,000	8,100		MK-1	156,000	75,000
5,160	13/64	MK-1	133,000	52,000	8,200		MK-1	156,000	75,000
5,200		MK-1	133,000	52,000	8,250		MK-1	156,000	75,000
5,250		MK-1	133,000	52,000	8,300		MK-1	156,000	75,000
5,300		MK-1	133,000	52,000	8,330	21/64	MK-1	156,000	75,000
5,500		MK-1	138,000	57,000	8,400		MK-1	156,000	75,000
5,560	7/32	MK-1	138,000	57,000	8,500		MK-1	156,000	75,000
5,600		MK-1	138,000	57,000	8,600		MK-1	162,000	81,000
5,700		MK-1	138,000	57,000	8,700		MK-1	162,000	81,000
5,750		MK-1	138,000	57,000	8,730	11/32	MK-1	162,000	81,000
5,800		MK-1	138,000	57,000	8,750		MK-1	162,000	81,000
5,900		MK-1	138,000	57,000	8,800		MK-1	162,000	81,000



d1		S	l1	l2
mm	inch		mm	mm
8,900		MK-1	162,000	81,000
9,000		MK-1	162,000	81,000
9,050		MK-1	162,000	81,000
9,100		MK-1	162,000	81,000
9,130	23/64	MK-1	162,000	81,000
9,200		MK-1	162,000	81,000
9,250		MK-1	162,000	81,000
9,300		MK-1	162,000	81,000
9,500		MK-1	162,000	81,000
9,520	3/8	MK-1	168,000	87,000
9,750		MK-1	168,000	87,000
9,800		MK-1	168,000	87,000
9,900		MK-1	168,000	87,000
9,920	25/64	MK-1	168,000	87,000
10,000		MK-1	168,000	87,000
10,100		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
10,250		MK-1	168,000	87,000
10,300		MK-1	168,000	87,000
10,320	13/32	MK-1	168,000	87,000
10,400		MK-1	168,000	87,000
10,500		MK-1	168,000	87,000
10,520		MK-1	168,000	87,000
10,600		MK-1	168,000	87,000
10,700		MK-1	175,000	94,000
10,720	27/64	MK-1	175,000	94,000
10,750		MK-1	175,000	94,000
10,800		MK-1	175,000	94,000
10,900		MK-1	175,000	94,000
11,000		MK-1	175,000	94,000
11,100		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
11,200		MK-1	175,000	94,000
11,250		MK-1	175,000	94,000
11,300		MK-1	175,000	94,000
11,500		MK-1	175,000	94,000
11,600		MK-1	175,000	94,000
11,700		MK-1	175,000	94,000
11,750		MK-1	175,000	94,000
11,800		MK-1	175,000	94,000
11,900		MK-1	182,000	101,000
11,910	15/32	MK-1	182,000	101,000
12,000		MK-1	182,000	101,000
12,100		MK-1	182,000	101,000
12,200		MK-1	182,000	101,000
12,250		MK-1	182,000	101,000
12,300	31/64	MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
12,550		MK-1	182,000	101,000
12,600		MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
12,750		MK-1	182,000	101,000
12,800		MK-1	182,000	101,000
12,900		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,100	33/64	MK-1	182,000	101,000
13,200		MK-1	182,000	101,000
13,250		MK-1	189,000	108,000
13,300		MK-1	189,000	108,000
13,490	17/32	MK-1	189,000	108,000
13,500		MK-1	189,000	108,000
13,600		MK-1	189,000	108,000
13,700		MK-1	189,000	108,000
13,750		MK-1	189,000	108,000
13,800		MK-1	189,000	108,000
13,890	35/64	MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,050		MK-2	212,000	114,000
14,100		MK-2	212,000	114,000
14,200		MK-2	212,000	114,000
14,250		MK-2	212,000	114,000
14,290	9/16	MK-2	212,000	114,000

d1		S	l1	l2
mm	inch		mm	mm
14,300		MK-2	212,000	114,000
14,400		MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
14,600		MK-2	212,000	114,000
14,680	37/64	MK-2	212,000	114,000
14,700		MK-2	212,000	114,000
14,750		MK-2	212,000	114,000
14,800		MK-2	212,000	114,000
14,900		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,080	19/32	MK-2	218,000	120,000
15,100		MK-2	218,000	120,000
15,200		MK-2	218,000	120,000
15,250		MK-2	218,000	120,000
15,300		MK-2	218,000	120,000
15,400		MK-2	218,000	120,000
15,500		MK-2	218,000	120,000
15,600		MK-2	218,000	120,000
15,700		MK-2	218,000	120,000
15,750		MK-2	218,000	120,000
15,800		MK-2	218,000	120,000
15,870	5/8	MK-2	218,000	120,000
15,900		MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,100		MK-2	223,000	125,000
16,200		MK-2	223,000	125,000
16,250		MK-2	223,000	125,000
16,270	41/64	MK-2	223,000	125,000
16,300		MK-2	223,000	125,000
16,400		MK-2	223,000	125,000
16,500		MK-2	223,000	125,000
16,670	21/32	MK-2	223,000	125,000
16,700		MK-2	223,000	125,000
16,750		MK-2	223,000	125,000
16,800		MK-2	223,000	125,000
17,000		MK-2	223,000	125,000
17,070	43/64	MK-2	228,000	130,000
17,100		MK-2	228,000	130,000
17,250		MK-2	228,000	130,000
17,300		MK-2	228,000	130,000
17,400		MK-2	228,000	130,000
17,460	11/16	MK-2	228,000	130,000
17,500		MK-2	228,000	130,000
17,600		MK-2	228,000	130,000
17,700		MK-2	228,000	130,000
17,750		MK-2	228,000	130,000
17,800		MK-2	228,000	130,000
17,860	45/64	MK-2	228,000	130,000
17,900		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
18,100		MK-2	233,000	135,000
18,200		MK-2	233,000	135,000
18,250		MK-2	233,000	135,000
18,260	23/32	MK-2	233,000	135,000
18,300		MK-2	233,000	135,000
18,500		MK-2	233,000	135,000
18,650	47/64	MK-2	233,000	135,000
18,750		MK-2	233,000	135,000
18,800		MK-2	233,000	135,000
18,900		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
19,050	3/4	MK-2	238,000	140,000
19,100		MK-2	238,000	140,000
19,200		MK-2	238,000	140,000
19,250		MK-2	238,000	140,000
19,450	49/64	MK-2	238,000	140,000
19,500		MK-2	238,000	140,000
19,700		MK-2	238,000	140,000
19,750		MK-2	238,000	140,000
19,800		MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000



d1		S	l1	l2
mm	inch		mm	mm
20,100		MK-2	243,000	145,000
20,200		MK-2	243,000	145,000
20,250		MK-2	243,000	145,000
20,300		MK-2	243,000	145,000
20,400		MK-2	243,000	145,000
20,500		MK-2	243,000	145,000
20,640	13/16	MK-2	243,000	145,000
20,750		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,030	53/64	MK-2	243,000	145,000
21,100		MK-2	243,000	145,000
21,200		MK-2	243,000	145,000
21,250		MK-2	248,000	150,000
21,430	27/32	MK-2	248,000	150,000
21,500		MK-2	248,000	150,000
21,750		MK-2	248,000	150,000
21,830	55/64	MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
22,100		MK-2	248,000	150,000
22,200		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
22,250		MK-2	248,000	150,000
22,400		MK-2	248,000	150,000
22,500		MK-2	253,000	155,000
22,620	57/64	MK-2	253,000	155,000
22,750		MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
23,020	29/32	MK-2	253,000	155,000
23,250		MK-3	276,000	155,000
23,420	59/64	MK-3	276,000	155,000
23,500		MK-3	276,000	155,000
23,750		MK-3	281,000	160,000
23,810	15/16	MK-3	281,000	160,000
23,900		MK-3	281,000	160,000
24,000		MK-3	281,000	160,000
24,100		MK-3	281,000	160,000
24,210	61/64	MK-3	281,000	160,000
24,250		MK-3	281,000	160,000
24,500		MK-3	281,000	160,000
24,610	31/32	MK-3	281,000	160,000
24,750		MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,100		MK-3	286,000	165,000
25,200		MK-3	286,000	165,000
25,250		MK-3	286,000	165,000
25,400	1	MK-3	286,000	165,000
25,500		MK-3	286,000	165,000
25,750		MK-3	286,000	165,000
25,800	1 1/64	MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,190	1 1/32	MK-3	286,000	165,000
26,250		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
26,590	1 3/64	MK-3	291,000	170,000
26,750		MK-3	291,000	170,000
26,990	1 1/16	MK-3	291,000	170,000
27,000		MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
27,750		MK-3	291,000	170,000
27,780	1 3/32	MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,250		MK-3	296,000	175,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
28,750		MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
29,250		MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
29,750		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
30,100		MK-3	301,000	180,000
30,160	1 3/16	MK-3	301,000	180,000

d1		S	l1	l2
mm	inch		mm	mm
30,250		MK-3	301,000	180,000
30,500		MK-3	301,000	180,000
30,560	1 13/64	MK-3	301,000	180,000
30,750		MK-3	301,000	180,000
31,000		MK-3	301,000	180,000
31,250		MK-3	301,000	180,000
31,500		MK-3	301,000	180,000
31,750	1 1/4	MK-3	306,000	185,000
32,000		MK-4	334,000	185,000
32,150	1 17/64	MK-4	334,000	185,000
32,250		MK-4	334,000	185,000
32,500		MK-4	334,000	185,000
32,750		MK-4	334,000	185,000
33,000		MK-4	334,000	185,000
33,340	1 5/16	MK-4	334,000	185,000
33,500		MK-4	334,000	185,000
34,000		MK-4	339,000	190,000
34,500		MK-4	339,000	190,000
34,750		MK-4	339,000	190,000
34,920	1 3/8	MK-4	339,000	190,000
35,000		MK-4	339,000	190,000
35,500		MK-4	339,000	190,000
36,000		MK-4	344,000	195,000
36,500		MK-4	344,000	195,000
36,750		MK-4	344,000	195,000
37,000		MK-4	344,000	195,000
37,310	1 15/32	MK-4	344,000	195,000
37,500		MK-4	344,000	195,000
37,700	1 31/64	MK-4	349,000	200,000
38,000		MK-4	349,000	200,000
38,100	1 1/2	MK-4	349,000	200,000
38,500	1 33/64	MK-4	349,000	200,000
39,000		MK-4	349,000	200,000
39,500		MK-4	349,000	200,000
39,690	1 9/16	MK-4	349,000	200,000
40,000		MK-4	349,000	200,000
40,500		MK-4	354,000	205,000
40,750		MK-4	354,000	205,000
40,800		MK-4	354,000	205,000
41,000		MK-4	354,000	205,000
41,270	1 5/8	MK-4	354,000	205,000
41,500		MK-4	354,000	205,000
42,000		MK-4	354,000	205,000
42,500		MK-4	354,000	205,000
43,000		MK-4	359,000	210,000
43,500		MK-4	359,000	210,000
44,000		MK-4	359,000	210,000
44,450	1 3/4	MK-4	359,000	210,000
44,500		MK-4	359,000	210,000
45,000		MK-4	359,000	210,000
45,500		MK-4	364,000	215,000
46,000		MK-4	364,000	215,000
46,430	1 53/64	MK-4	364,000	215,000
46,500		MK-4	364,000	215,000
47,000		MK-4	364,000	215,000
47,230	1 55/64	MK-4	364,000	215,000
47,500		MK-4	364,000	215,000
47,620	1 7/8	MK-4	369,000	220,000
48,000		MK-4	369,000	220,000
48,020	1 57/64	MK-4	369,000	220,000
48,500		MK-4	369,000	220,000
48,820	1 59/64	MK-4	369,000	220,000
49,000		MK-4	369,000	220,000
49,500		MK-4	369,000	220,000
49,610	1 61/64	MK-4	369,000	220,000
50,000		MK-4	369,000	220,000
50,500		MK-4	374,000	225,000
50,800	2	MK-4	374,000	225,000
51,000		MK-5	412,000	225,000
52,000		MK-5	412,000	225,000
53,000		MK-5	412,000	225,000
53,390		MK-5	417,000	230,000



d1		S	l1	l2
mm	inch		mm	mm
53,400		MK-5	417,000	230,000
54,000		MK-5	417,000	230,000
55,000		MK-5	417,000	230,000
56,000		MK-5	417,000	230,000
57,000		MK-5	422,000	235,000
58,000		MK-5	422,000	235,000
59,000		MK-5	422,000	235,000
60,000		MK-5	422,000	235,000
61,000		MK-5	427,000	240,000
62,000		MK-5	427,000	240,000
63,000		MK-5	427,000	240,000
63,500	2 1/2	MK-5	432,000	245,000
65,000		MK-5	432,000	245,000
66,670	2 5/8	MK-5	432,000	245,000
67,500		MK-5	437,000	250,000
68,000		MK-5	437,000	250,000
69,850	2 3/4	MK-5	437,000	250,000
70,000		MK-5	437,000	250,000

d1		S	l1	l2
mm	inch		mm	mm
71,500		MK-5	442,000	255,000
72,000		MK-5	442,000	255,000
75,000		MK-5	442,000	255,000
76,990	3 1/32	MK-6	514,000	260,000
77,000		MK-6	514,000	260,000
77,790	3 1/16	MK-6	514,000	260,000
78,580	3 3/32	MK-6	514,000	260,000
79,500		MK-6	514,000	260,000
87,310	3 7/16	MK-6	524,000	270,000
89,000		MK-6	524,000	270,000
92,500		MK-6	529,000	275,000
93,000		MK-6	529,000	275,000
94,000		MK-6	529,000	275,000
94,500		MK-6	529,000	275,000
95,250	3 3/4	MK-6	534,000	280,000
95,500		MK-6	534,000	280,000
96,000		MK-6	534,000	280,000



Brocas helicoidais



Material de corte **HSS**

Superfície

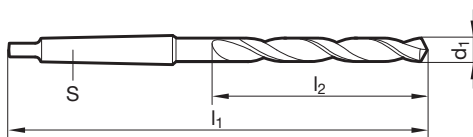
Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
• para operações pesadas em construções metálicas

- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga)
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 778



Nr. do artigo **592**

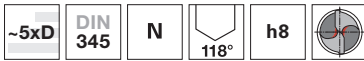
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,320	13/32	MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
11,500		MK-1	175,000	94,000
11,910	15/32	MK-1	182,000	101,000
12,000		MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,490	17/32	MK-1	189,000	108,000
13,500		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000

d1		S	l1	l2
mm	inch		mm	mm
14,290	9/16	MK-2	212,000	114,000
15,080	19/32	MK-2	218,000	120,000
17,000		MK-2	223,000	125,000
18,000		MK-2	228,000	130,000
19,050	3/4	MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
21,430	27/32	MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
28,000		MK-3	291,000	170,000



Brocas helicoidais



Material de corte **HSS**

Superfície **S**

Sentido de corte **R**

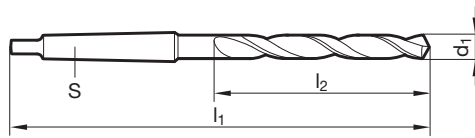
P • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica

P	•
M	
K	•
N	o
S	
H	

aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

GÜHRINGNAVIGATOR

Página de dados de corte 780



Nr. do artigo **654**

Brocas helicoidais com cone Morse

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
3,000		MK-1	114,000	33,000	11,110	7/16	MK-1	175,000	94,000
3,170	1/8	MK-1	117,000	36,000	11,200		MK-1	175,000	94,000
3,500		MK-1	120,000	39,000	11,250		MK-1	175,000	94,000
3,970	5/32	MK-1	124,000	43,000	11,500		MK-1	175,000	94,000
4,000		MK-1	124,000	43,000	11,510	29/64	MK-1	175,000	94,000
4,100		MK-1	124,000	43,000	11,750		MK-1	175,000	94,000
4,370	11/64	MK-1	128,000	47,000	11,910	15/32	MK-1	182,000	101,000
4,500		MK-1	128,000	47,000	12,000		MK-1	182,000	101,000
4,760	3/16	MK-1	133,000	52,000	12,200		MK-1	182,000	101,000
5,000		MK-1	133,000	52,000	12,400		MK-1	182,000	101,000
5,160	13/64	MK-1	133,000	52,000	12,500		MK-1	182,000	101,000
5,560	7/32	MK-1	138,000	57,000	12,700	1/2	MK-1	182,000	101,000
6,000		MK-1	138,000	57,000	12,750		MK-1	182,000	101,000
6,500		MK-1	144,000	63,000	13,000		MK-1	182,000	101,000
6,750	17/64	MK-1	150,000	69,000	13,250		MK-1	189,000	108,000
6,800		MK-1	150,000	69,000	13,490	17/32	MK-1	189,000	108,000
7,000		MK-1	150,000	69,000	13,500		MK-1	189,000	108,000
7,100		MK-1	150,000	69,000	13,890	35/64	MK-1	189,000	108,000
7,140	9/32	MK-1	150,000	69,000	14,000		MK-1	189,000	108,000
7,400		MK-1	150,000	69,000	14,200		MK-2	212,000	114,000
7,700		MK-1	156,000	75,000	14,250		MK-2	212,000	114,000
8,000		MK-1	156,000	75,000	14,290	9/16	MK-2	212,000	114,000
8,500		MK-1	156,000	75,000	14,500		MK-2	212,000	114,000
8,730	11/32	MK-1	162,000	81,000	14,680	37/64	MK-2	212,000	114,000
8,800		MK-1	162,000	81,000	14,750		MK-2	212,000	114,000
9,000		MK-1	162,000	81,000	14,900		MK-2	212,000	114,000
9,400		MK-1	162,000	81,000	15,000		MK-2	212,000	114,000
9,520	3/8	MK-1	168,000	87,000	15,250		MK-2	218,000	120,000
9,600		MK-1	168,000	87,000	15,500		MK-2	218,000	120,000
9,750		MK-1	168,000	87,000	15,750		MK-2	218,000	120,000
9,800		MK-1	168,000	87,000	15,870	5/8	MK-2	218,000	120,000
10,000		MK-1	168,000	87,000	16,000		MK-2	218,000	120,000
10,200		MK-1	168,000	87,000	16,200		MK-2	223,000	125,000
10,250		MK-1	168,000	87,000	16,500		MK-2	223,000	125,000
10,300		MK-1	168,000	87,000	17,000		MK-2	223,000	125,000
10,320	13/32	MK-1	168,000	87,000	17,070	43/64	MK-2	228,000	130,000
10,400		MK-1	168,000	87,000	17,250		MK-2	228,000	130,000
10,500		MK-1	168,000	87,000	17,500		MK-2	228,000	130,000
10,720	27/64	MK-1	175,000	94,000	17,750		MK-2	228,000	130,000
10,750		MK-1	175,000	94,000	18,000		MK-2	228,000	130,000
10,800		MK-1	175,000	94,000	18,250		MK-2	233,000	135,000
11,000		MK-1	175,000	94,000	18,260	23/32	MK-2	233,000	135,000



d1		S	l1	l2
mm	inch		mm	mm
18,500		MK-2	233,000	135,000
18,650	47/64	MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
19,050	3/4	MK-2	238,000	140,000
19,450	49/64	MK-2	238,000	140,000
19,500		MK-2	238,000	140,000
19,750		MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
20,250		MK-2	243,000	145,000
20,500		MK-2	243,000	145,000
20,640	13/16	MK-2	243,000	145,000
20,750		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,250		MK-2	248,000	150,000
21,500		MK-2	248,000	150,000
21,750		MK-2	248,000	150,000
21,830	55/64	MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
22,500		MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
23,500		MK-3	276,000	155,000
23,750		MK-3	281,000	160,000

d1		S	l1	l2
mm	inch		mm	mm
24,000		MK-3	281,000	160,000
24,500		MK-3	281,000	160,000
24,750		MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,400	1	MK-3	286,000	165,000
25,500		MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
27,000		MK-3	291,000	170,000
27,380	1 5/64	MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
29,750		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
30,500		MK-3	301,000	180,000
31,000		MK-3	301,000	180,000

Brocas helicoidais com cone Morse



Brocas helicoidais



Material de corte **HSS**

Superfície

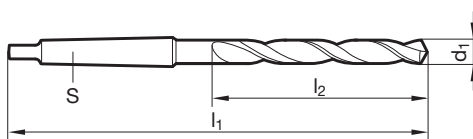
Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 14,750$ • afiação de superfície cônica

- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 778



Nr. do artigo **248**

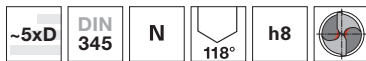
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
6,000		MK-1	138,000	57,000
8,000		MK-1	156,000	75,000
8,100		MK-1	156,000	75,000
8,400		MK-1	156,000	75,000
8,500		MK-1	156,000	75,000
9,000		MK-1	162,000	81,000
10,500		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,500		MK-1	175,000	94,000
13,000		MK-1	182,000	101,000
14,000		MK-1	189,000	108,000
15,000		MK-2	212,000	114,000
17,200		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
25,500		MK-3	286,000	165,000
28,000		MK-3	291,000	170,000

d1		S	l1	l2
mm	inch		mm	mm
29,000		MK-3	296,000	175,000
30,500		MK-3	301,000	180,000
32,500		MK-4	334,000	185,000
33,000		MK-4	334,000	185,000
34,000		MK-4	339,000	190,000
38,000		MK-4	349,000	200,000
40,000		MK-4	349,000	200,000
60,000		MK-5	422,000	235,000



Brocas helicoidais



- P** • Redução da aresta transversal $\geq \varnothing 8,500$ • afiação de superfície cônica
- M** • melhor quebra de cavacos • Adequado especialmente para máquinas transfer
- K** •
- N** ○ materiais com cavacos longos
- S**
- H**

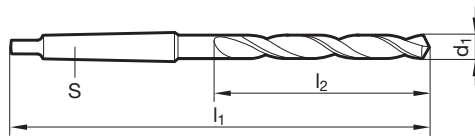
Material de corte **HSS**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 778



Nr. do artigo **229**

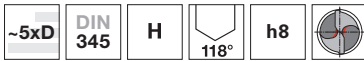
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	156,000	75,000
8,730	11/32	MK-1	162,000	81,000
9,000		MK-1	162,000	81,000
9,500		MK-1	162,000	81,000
9,520	3/8	MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,910	15/32	MK-1	182,000	101,000
12,250		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,250		MK-1	189,000	108,000
13,490	17/32	MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,290	9/16	MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,080	19/32	MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
18,000		MK-2	228,000	130,000
18,250		MK-2	233,000	135,000
19,500		MK-2	238,000	140,000
19,840	25/32	MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
20,640	13/16	MK-2	243,000	145,000

d1		S	l1	l2
mm	inch		mm	mm
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
23,810	15/16	MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,400	1	MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,190	1 1/32	MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
35,000		MK-4	339,000	190,000
39,500		MK-4	349,000	200,000
42,500		MK-4	354,000	205,000
43,500		MK-4	359,000	210,000
46,040	1 13/16	MK-4	364,000	215,000
46,500		MK-4	364,000	215,000
47,500		MK-4	364,000	215,000
56,000		MK-5	417,000	230,000
57,000		MK-5	422,000	235,000
58,000		MK-5	422,000	235,000
59,000		MK-5	422,000	235,000



Brocas helicoidais



Material de corte **HSS**

Superfície

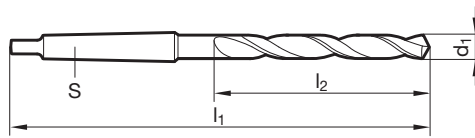
Sentido de corte

P Redução da aresta transversal $\geq \varnothing 14,500$ • afiação de superfície cônica

- M**
- K**
- N** • materiais duros e quebradiços • latão e ligas de magnésio • bronze e bronze fosforoso • ardósia, mica, pertinax
- S**
- H**

GÜHRING NAVIGATOR

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Nr. do artigo **246**

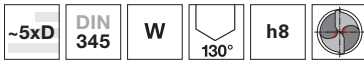
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
6,700		MK-1	144,000	63,000
8,200		MK-1	156,000	75,000
11,000		MK-1	175,000	94,000
11,750		MK-1	175,000	94,000
12,600		MK-1	182,000	101,000
12,800		MK-1	182,000	101,000
13,750		MK-1	189,000	108,000
14,500		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,500		MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,500		MK-2	223,000	125,000

d1		S	l1	l2
mm	inch		mm	mm
17,000		MK-2	223,000	125,000
20,500		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
22,250		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
25,000	63/64	MK-3	281,000	160,000
25,250		MK-3	286,000	165,000



Brocas helicoidais



Material de corte **HSS**

Superfície ○

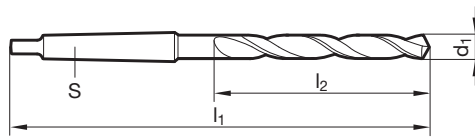
Sentido de corte (R)

P Redução da aresta transversal ≥ Ø 14,100 • afiação de superfície cônica

- M**
- K**
- N** • materiais moles com cavacos longos • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 778



Nr. do artigo **247**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
3,200		MK-1	117,000	36,000
3,300		MK-1	117,000	36,000
3,800		MK-1	124,000	43,000
4,000		MK-1	124,000	43,000
5,000		MK-1	133,000	52,000
5,400		MK-1	138,000	57,000
5,500		MK-1	138,000	57,000
6,000		MK-1	138,000	57,000
6,300		MK-1	144,000	63,000
6,500		MK-1	144,000	63,000
6,600		MK-1	144,000	63,000
6,750	17/64	MK-1	150,000	69,000
6,800		MK-1	150,000	69,000
7,000		MK-1	150,000	69,000
7,500		MK-1	150,000	69,000
7,750		MK-1	156,000	75,000
8,000		MK-1	156,000	75,000
9,200		MK-1	162,000	81,000
9,500		MK-1	162,000	81,000
9,750		MK-1	168,000	87,000
9,800		MK-1	168,000	87,000
12,000		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000

d1		S	l1	l2
mm	inch		mm	mm
13,200		MK-1	182,000	101,000
14,000		MK-1	189,000	108,000
16,000		MK-2	218,000	120,000
17,000		MK-2	223,000	125,000
18,000		MK-2	228,000	130,000
18,500		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
20,000		MK-2	238,000	140,000
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
27,000		MK-3	291,000	170,000
27,200		MK-3	291,000	170,000
27,250		MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
30,300		MK-3	301,000	180,000
30,500		MK-3	301,000	180,000
31,000		MK-3	301,000	180,000
31,500		MK-3	301,000	180,000
32,000		MK-4	334,000	185,000



Brocas helicoidais

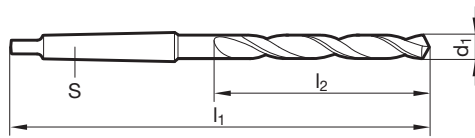


- P** • Redução da aresta transversal $\geq \varnothing 7,940$ • afiação de superfície cônica
- M**
- K** • canais largos • especialmente para profundidades acima de 3xD
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

Material de corte	HSS
Superfície	$\frac{0,016}{16,0}$
Sentido de corte	

GÜHRINGNAVIGATOR

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Nr. do artigo **558**

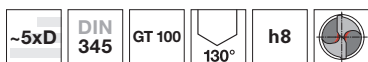
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
7,940	5/16	MK-1	156,000	75,000
8,000		MK-1	156,000	75,000
8,250		MK-1	156,000	75,000
9,500		MK-1	162,000	81,000
10,000		MK-1	168,000	87,000
10,250		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
12,700	1/2	MK-1	182,000	101,000
12,750		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,250		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,290	9/16	MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
19,500		MK-2	238,000	140,000

d1		S	l1	l2
mm	inch		mm	mm
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,250		MK-2	248,000	150,000
27,500		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
30,160	1 3/16	MK-3	301,000	180,000
30,500		MK-3	301,000	180,000
31,500		MK-3	301,000	180,000
31,750	1 1/4	MK-3	306,000	185,000



Brocas helicoidais



Material de corte **HSS**

Superfície **S**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 7,940$ • afiação de superfície cônica
• canais largos • especialmente para profundidades acima de 3xD

M

K •

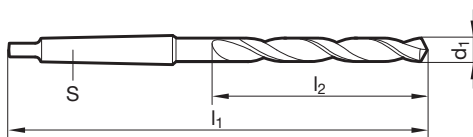
N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

GÜHRING NAVIGATOR

Página de dados de corte 780



Nr. do artigo **606**

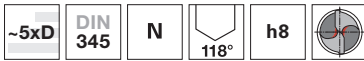
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
7,940	5/16	MK-1	156,000	75,000
8,750		MK-1	162,000	81,000
9,000		MK-1	162,000	81,000
9,520	3/8	MK-1	168,000	87,000
10,000		MK-1	168,000	87,000
11,110	7/16	MK-1	175,000	94,000
12,250		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
12,750		MK-1	182,000	101,000
14,000		MK-1	189,000	108,000
14,500		MK-2	212,000	114,000
15,750		MK-2	218,000	120,000

d1		S	l1	l2
mm	inch		mm	mm
15,870	5/8	MK-2	218,000	120,000
17,500		MK-2	228,000	130,000
23,500		MK-3	276,000	155,000
23,810	15/16	MK-3	281,000	160,000
25,400	1	MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
28,570	1 1/8	MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
31,500		MK-3	301,000	180,000



Brocas helicoidais



Material de corte **HSCO**

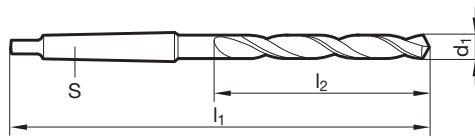
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • resistência ao desgaste ampliada
- K** •
- N** ○ aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 780



Nr. do artigo **345**

Brocas helicoidais com cone Morse

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
4,000		MK-1	124,000	43,000	12,700	1/2	MK-1	182,000	101,000
5,000		MK-1	133,000	52,000	12,750		MK-1	182,000	101,000
5,200		MK-1	133,000	52,000	13,000		MK-1	182,000	101,000
5,500		MK-1	138,000	57,000	13,100	33/64	MK-1	182,000	101,000
6,000		MK-1	138,000	57,000	13,200		MK-1	182,000	101,000
6,500		MK-1	144,000	63,000	13,250		MK-1	189,000	108,000
6,700		MK-1	144,000	63,000	13,490	17/32	MK-1	189,000	108,000
6,750	17/64	MK-1	150,000	69,000	13,500		MK-1	189,000	108,000
6,800		MK-1	150,000	69,000	13,700		MK-1	189,000	108,000
7,000		MK-1	150,000	69,000	13,750		MK-1	189,000	108,000
7,500		MK-1	150,000	69,000	13,800		MK-1	189,000	108,000
8,000		MK-1	156,000	75,000	13,900		MK-1	189,000	108,000
8,200		MK-1	156,000	75,000	14,000		MK-1	189,000	108,000
8,500		MK-1	156,000	75,000	14,100		MK-2	212,000	114,000
8,700		MK-1	162,000	81,000	14,200		MK-2	212,000	114,000
9,000		MK-1	162,000	81,000	14,250		MK-2	212,000	114,000
9,500		MK-1	162,000	81,000	14,290	9/16	MK-2	212,000	114,000
9,520	3/8	MK-1	168,000	87,000	14,500		MK-2	212,000	114,000
10,000		MK-1	168,000	87,000	14,750		MK-2	212,000	114,000
10,100		MK-1	168,000	87,000	15,000		MK-2	212,000	114,000
10,150		MK-1	168,000	87,000	15,080	19/32	MK-2	218,000	120,000
10,200		MK-1	168,000	87,000	15,250		MK-2	218,000	120,000
10,250		MK-1	168,000	87,000	15,500		MK-2	218,000	120,000
10,320	13/32	MK-1	168,000	87,000	15,750		MK-2	218,000	120,000
10,500		MK-1	168,000	87,000	15,870	5/8	MK-2	218,000	120,000
10,700		MK-1	175,000	94,000	16,000		MK-2	218,000	120,000
10,720	27/64	MK-1	175,000	94,000	16,100		MK-2	223,000	125,000
10,750		MK-1	175,000	94,000	16,250		MK-2	223,000	125,000
10,800		MK-1	175,000	94,000	16,270	41/64	MK-2	223,000	125,000
11,000		MK-1	175,000	94,000	16,500		MK-2	223,000	125,000
11,110	7/16	MK-1	175,000	94,000	16,670	21/32	MK-2	223,000	125,000
11,200		MK-1	175,000	94,000	16,750		MK-2	223,000	125,000
11,500		MK-1	175,000	94,000	17,000		MK-2	223,000	125,000
11,600		MK-1	175,000	94,000	17,460	11/16	MK-2	228,000	130,000
11,750		MK-1	175,000	94,000	17,500		MK-2	228,000	130,000
11,800		MK-1	175,000	94,000	17,750		MK-2	228,000	130,000
11,900		MK-1	182,000	101,000	17,860	45/64	MK-2	228,000	130,000
12,000		MK-1	182,000	101,000	18,000		MK-2	228,000	130,000
12,100		MK-1	182,000	101,000	18,200		MK-2	233,000	135,000
12,200		MK-1	182,000	101,000	18,250		MK-2	233,000	135,000
12,250		MK-1	182,000	101,000	18,260	23/32	MK-2	233,000	135,000
12,500		MK-1	182,000	101,000	18,500		MK-2	233,000	135,000



Brocas helicoidais com cone Morse

d1		S	l1	l2	
mm	inch		mm	mm	
18,650	47/64	MK-2	233,000	135,000	
18,750		MK-2	233,000	135,000	
19,000		MK-2	233,000	135,000	
19,050	3/4	MK-2	238,000	140,000	
19,250		MK-2	238,000	140,000	
19,500		MK-2	238,000	140,000	
19,750		MK-2	238,000	140,000	
19,840	25/32	MK-2	238,000	140,000	
20,000		MK-2	238,000	140,000	
20,250		MK-2	243,000	145,000	
20,500	13/16	MK-2	243,000	145,000	
20,640		MK-2	243,000	145,000	
20,750		MK-2	243,000	145,000	
21,000		MK-2	243,000	145,000	
21,250		MK-2	248,000	150,000	
21,500	7/8	MK-2	248,000	150,000	
22,000		MK-2	248,000	150,000	
22,220		MK-2	248,000	150,000	
22,250		MK-2	248,000	150,000	
22,500		MK-2	253,000	155,000	
22,620		57/64	MK-2	253,000	155,000
23,000	MK-2		253,000	155,000	
23,020	29/32	MK-2	253,000	155,000	
23,500		MK-3	276,000	155,000	
24,000	61/64	MK-3	281,000	160,000	
24,210		MK-3	281,000	160,000	
24,500		MK-3	281,000	160,000	
25,000		63/64	MK-3	281,000	160,000
25,250	MK-3		286,000	165,000	
25,400	1		MK-3	286,000	165,000
			MK-3	286,000	165,000

d1		S	l1	l2
mm	inch		mm	mm
25,500		MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
27,000		MK-3	291,000	170,000
27,500	1 1/8	MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
28,570		MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
30,000	1 1/4	MK-3	296,000	175,000
30,500		MK-3	301,000	180,000
31,000		MK-3	301,000	180,000
31,500		MK-3	301,000	180,000
31,750		MK-3	306,000	185,000
32,000	7/8	MK-4	334,000	185,000
32,500		MK-4	334,000	185,000
33,000		MK-4	334,000	185,000
34,000		MK-4	339,000	190,000
35,000		MK-4	339,000	190,000
36,000		MK-4	344,000	195,000
37,000		MK-4	344,000	195,000
38,000		MK-4	349,000	200,000
39,000		MK-4	349,000	200,000
40,000		1 21/32	MK-4	349,000
42,000	MK-4		354,000	205,000
42,070	MK-4		354,000	205,000
43,000	MK-4		359,000	210,000
45,000	MK-4		359,000	210,000
50,000	MK-4		369,000	220,000



Brocas helicoidais



Material de corte **HSCO**

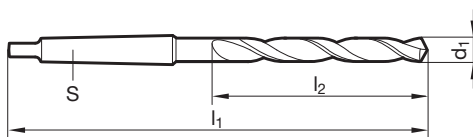
Superfície **S**

Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 7,940$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • alta resistência ao desgaste
- K** •
- N** ○ aços com, sem liga e fundidos acima de 800-N/mm^2 • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 782



Nr. do artigo **661**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	156,000	75,000
8,500		MK-1	156,000	75,000
9,000		MK-1	162,000	81,000
9,500		MK-1	162,000	81,000
9,520	3/8	MK-1	168,000	87,000
10,000		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
12,000		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,500		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,500		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
16,000		MK-2	218,000	120,000
17,000		MK-2	223,000	125,000
17,070	43/64	MK-2	228,000	130,000

d1		S	l1	l2
mm	inch		mm	mm
17,460	11/16	MK-2	228,000	130,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
19,000		MK-2	233,000	135,000
19,500		MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
23,810	15/16	MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
29,000		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000



Brocas helicoidais

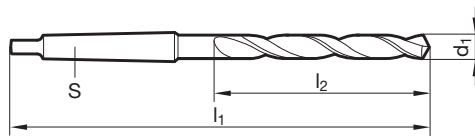


- P** • Redução da aresta transversal $\geq \varnothing 9,520$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • canais largos • alta resistência ao desgaste
- K** • especialmente para profundidades acima de 3xD
- N** ○ aços com, sem liga e fundidos acima de 1000·N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** ○
- H** ○

Material de corte	HSCO
Superfície	$\frac{>0}{16,0}$
Sentido de corte	

GÜHRING NAVIGATOR

Página de dados de corte 780



Nr. do artigo **645**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,100		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
10,500		MK-1	168,000	87,000
10,720	27/64	MK-1	175,000	94,000
10,800		MK-1	175,000	94,000
11,000		MK-1	175,000	94,000
11,500		MK-1	175,000	94,000
11,510	29/64	MK-1	175,000	94,000
12,000		MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,300		MK-1	189,000	108,000
13,500		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,250		MK-2	212,000	114,000
14,290	9/16	MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,250		MK-2	218,000	120,000
15,500		MK-2	218,000	120,000
15,750		MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,500		MK-2	223,000	125,000
16,670	21/32	MK-2	223,000	125,000
17,000		MK-2	223,000	125,000
17,250		MK-2	228,000	130,000
17,460	11/16	MK-2	228,000	130,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000

d1		S	l1	l2
mm	inch		mm	mm
18,250		MK-2	233,000	135,000
18,500		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
22,220	7/8	MK-2	248,000	150,000
22,620	57/64	MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
24,000		MK-3	281,000	160,000
24,210	61/64	MK-3	281,000	160,000
24,610	31/32	MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
27,780	1 3/32	MK-3	291,000	170,000
28,570	1 1/8	MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
31,000		MK-3	301,000	180,000
33,000		MK-4	334,000	185,000
35,000		MK-4	339,000	190,000
37,000		MK-4	344,000	195,000
38,000		MK-4	349,000	200,000
39,000		MK-4	349,000	200,000



Brocas helicoidais



Material de corte **HSCO**

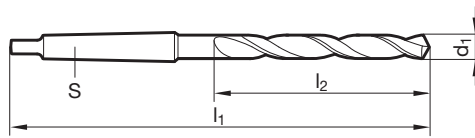
Superfície **S**

Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • canais largos • alta resistência ao desgaste
- K** • especialmente para profundidades acima de 3xD
- N** ○ aços com, sem liga e fundidos acima de 1000·N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** ○
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 782



Nr. do artigo **662**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
11,400		MK-1	175,000	94,000
12,200		MK-1	182,000	101,000
12,300	31/64	MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
14,000		MK-1	189,000	108,000
14,290	9/16	MK-2	212,000	114,000
15,000		MK-2	212,000	114,000

d1		S	l1	l2
mm	inch		mm	mm
16,000		MK-2	218,000	120,000
17,460	11/16	MK-2	228,000	130,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
22,000		MK-2	248,000	150,000
23,000		MK-2	253,000	155,000
23,500		MK-3	276,000	155,000
23,810	15/16	MK-3	281,000	160,000



Brocas helicoidais



Material de corte **HSCO**

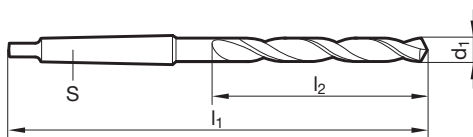
Superfície **G**

Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • alta resistência ao desgaste
- K** ○ especialmente para profundidades acima de 3xD
- N** aços com, sem liga e fundidos acima de 1000·N/mm² • aços para
- S** trabalhos a quente e a frio • aços para mancais de laminadoras • aços
- H** de liga alta • aços para beneficiamento e cementação

GÜHRINGNAVIGATOR

Página de dados de corte 782



Nr. do artigo **1222**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
11,000		MK-1	175,000	94,000
11,110	7/16	MK-1	175,000	94,000
12,500		MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
14,200		MK-2	212,000	114,000
15,870	5/8	MK-2	218,000	120,000
16,500		MK-2	223,000	125,000
16,670	21/32	MK-2	223,000	125,000
17,460	11/16	MK-2	228,000	130,000
19,500		MK-2	238,000	140,000

d1		S	l1	l2
mm	inch		mm	mm
23,500		MK-3	276,000	155,000
23,810	15/16	MK-3	281,000	160,000
25,500		MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
29,500		MK-3	296,000	175,000
30,160	1 3/16	MK-3	301,000	180,000



Brocas helicoidais



Material de corte **HSCO**

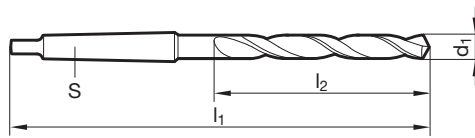
Superfície **A**

Sentido de corte **R**

- P** ○ Redução da aresta transversal $\geq \varnothing 10,400$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • canais largos • alta resistência ao desgaste
- K** • especialmente para profundidades acima de 3xD
- N** ○ aços com, sem liga e fundidos acima de 1000·N/mm² • aços para
- S** ○ trabalhos a quente e a frio • aços para mancais de laminadoras • aços
- H** ○ de liga alta • aços para beneficiamento e cementação

GÜHRINGNAVIGATOR

Página de dados de corte 782



Nr. do artigo **1224**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,400		MK-1	168,000	87,000
11,110	7/16	MK-1	175,000	94,000
12,300	31/64	MK-1	182,000	101,000
12,700	1/2	MK-1	182,000	101,000
14,200		MK-2	212,000	114,000
14,290	9/16	MK-2	212,000	114,000
15,870	5/8	MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,500		MK-2	223,000	125,000
19,000		MK-2	233,000	135,000
19,500		MK-2	238,000	140,000
23,810	15/16	MK-3	281,000	160,000

d1		S	l1	l2
mm	inch		mm	mm
25,500		MK-3	286,000	165,000
26,990	1 1/16	MK-3	291,000	170,000
27,000		MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
29,500		MK-3	296,000	175,000
30,160	1 3/16	MK-3	301,000	180,000



Brocas helicoidais



Material de corte **HSCO**

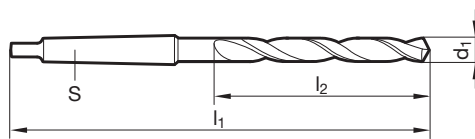
Superfície

Sentido de corte

- P** ○ afiação de superfície cônica • aço-HSS ligado com Co • resistência ao desgaste ampliada
- M** ●
- K** ●
- N** ○ aços austeníticos resistentes a corrosão-/ácidos-/calor (V2A e V4A)
- S** ○
- H** ●

GÜHRINGNAVIGATOR

Página de dados de corte 780



Nr. do artigo **1262**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	168,000	87,000
10,200		MK-1	168,000	87,000
10,500		MK-1	168,000	87,000
10,800		MK-1	175,000	94,000
11,000		MK-1	175,000	94,000
11,200		MK-1	175,000	94,000
11,800		MK-1	175,000	94,000
12,000		MK-1	182,000	101,000
12,300	31/64	MK-1	182,000	101,000
12,500		MK-1	182,000	101,000
13,000		MK-1	182,000	101,000
13,490	17/32	MK-1	189,000	108,000
13,500		MK-1	189,000	108,000
13,800		MK-1	189,000	108,000
14,000		MK-1	189,000	108,000
14,250		MK-2	212,000	114,000
14,500		MK-2	212,000	114,000
14,750		MK-2	212,000	114,000
15,000		MK-2	212,000	114,000
15,250		MK-2	218,000	120,000
15,480	39/64	MK-2	218,000	120,000
15,500		MK-2	218,000	120,000
16,000		MK-2	218,000	120,000
16,250		MK-2	223,000	125,000
16,500		MK-2	223,000	125,000
17,000		MK-2	223,000	125,000
17,500		MK-2	228,000	130,000
18,000		MK-2	228,000	130,000
18,500		MK-2	233,000	135,000
19,000		MK-2	233,000	135,000

d1		S	l1	l2
mm	inch		mm	mm
19,500		MK-2	238,000	140,000
20,000		MK-2	238,000	140,000
20,500		MK-2	243,000	145,000
21,000		MK-2	243,000	145,000
21,500		MK-2	248,000	150,000
21,750		MK-2	248,000	150,000
22,000		MK-2	248,000	150,000
22,500		MK-2	253,000	155,000
23,000		MK-2	253,000	155,000
23,420	59/64	MK-3	276,000	155,000
24,000		MK-3	281,000	160,000
24,500		MK-3	281,000	160,000
25,000	63/64	MK-3	281,000	160,000
25,500		MK-3	286,000	165,000
26,000		MK-3	286,000	165,000
26,500		MK-3	286,000	165,000
27,000		MK-3	291,000	170,000
27,500		MK-3	291,000	170,000
28,000		MK-3	291,000	170,000
28,500		MK-3	296,000	175,000
29,000		MK-3	296,000	175,000
30,000		MK-3	296,000	175,000
32,000		MK-4	334,000	185,000
34,000		MK-4	339,000	190,000



Brocas helicoidais



Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 14,200$ • afiação de superfície cônica
• com cone Morse maior

M

K •

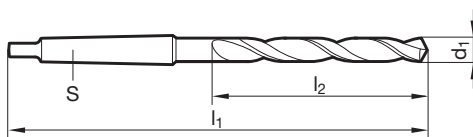
N ○ aço com e sem liga e aço fundido • ferro fundido, fundição maleável,
fundição nodular • ferro sinterizado, prata nova, grafite

S

H

GÜHRINGNAVIGATOR

Página de dados de corte 778



Nr. do artigo **251**

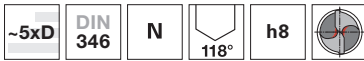
Brocas helicoidais
com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	185,000	87,000
10,500		MK-2	185,000	87,000
11,000		MK-2	192,000	94,000
11,910	15/32	MK-2	199,000	101,000
12,000		MK-2	199,000	101,000
12,250		MK-2	199,000	101,000
12,500		MK-2	199,000	101,000
13,000		MK-2	199,000	101,000
13,100	33/64	MK-2	199,000	101,000
13,250		MK-2	206,000	108,000
13,490	17/32	MK-2	206,000	108,000
13,500		MK-2	206,000	108,000
13,890	35/64	MK-2	206,000	108,000
14,000		MK-2	206,000	108,000
16,700		MK-3	246,000	125,000
17,000		MK-3	246,000	125,000
17,250		MK-3	251,000	130,000
18,250		MK-3	256,000	135,000
18,260	23/32	MK-3	256,000	135,000
18,650	47/64	MK-3	256,000	135,000
18,750		MK-3	256,000	135,000
19,000		MK-3	256,000	135,000
19,050	3/4	MK-3	261,000	140,000
19,450	49/64	MK-3	261,000	140,000
19,840	25/32	MK-3	261,000	140,000
20,000		MK-3	261,000	140,000
20,250		MK-3	266,000	145,000
20,640	13/16	MK-3	266,000	145,000
21,000		MK-3	266,000	145,000
21,030	53/64	MK-3	266,000	145,000

d1		S	l1	l2
mm	inch		mm	mm
21,430	27/32	MK-3	271,000	150,000
21,500		MK-3	271,000	150,000
22,000		MK-3	271,000	150,000
22,220	7/8	MK-3	271,000	150,000
23,000		MK-3	276,000	155,000
23,020	29/32	MK-3	276,000	155,000
27,500		MK-4	319,000	170,000
27,750		MK-4	319,000	170,000
27,780	1 3/32	MK-4	319,000	170,000
28,000		MK-4	319,000	170,000
28,180	1 7/64	MK-4	324,000	175,000
28,500		MK-4	324,000	175,000
28,570	1 1/8	MK-4	324,000	175,000
28,970	1 9/64	MK-4	324,000	175,000
29,770	1 11/64	MK-4	324,000	175,000
31,500		MK-4	329,000	180,000
32,000		MK-5	372,000	185,000
36,000		MK-5	382,000	195,000
40,080	1 37/64	MK-5	392,000	205,000
41,000		MK-5	392,000	205,000
41,500		MK-5	392,000	205,000
42,070	1 21/32	MK-5	392,000	205,000
44,050	1 47/64	MK-5	397,000	210,000
45,000		MK-5	397,000	210,000
46,040	1 13/16	MK-5	402,000	215,000
47,000		MK-5	402,000	215,000
49,000		MK-5	407,000	220,000
49,500		MK-5	407,000	220,000
73,000		MK-6	509,000	255,000



Brocas helicoidais



Material de corte **HSCO**

Superfície



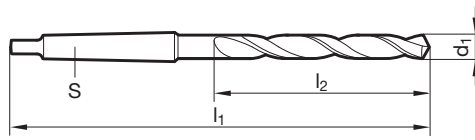
Sentido de corte



- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
- aço-HSS ligado com Co • alta resistência ao desgaste • com cone Morse maior
- M** ○
- K** •
- N** • aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 780



Nr. do artigo **351**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
12,000		MK-2	199,000	101,000
13,000		MK-2	199,000	101,000
14,000		MK-2	206,000	108,000
17,500		MK-3	251,000	130,000
18,500		MK-3	256,000	135,000
20,000		MK-3	261,000	140,000
21,000		MK-3	266,000	145,000
21,500		MK-3	271,000	150,000
22,750		MK-3	276,000	155,000
23,000		MK-3	276,000	155,000
29,000		MK-4	324,000	175,000
30,000		MK-4	324,000	175,000

d1		S	l1	l2
mm	inch		mm	mm
31,000		MK-4	329,000	180,000
31,500		MK-4	329,000	180,000



Brocas para furar através de buchas



Material de corte **HSS**

Superfície



Sentido de corte

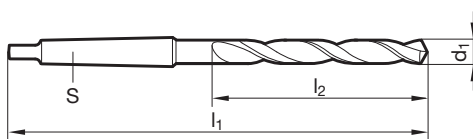


P • Redução da aresta transversal $\geq \varnothing 14,100$ • afiação de superfície cônica
• para furar através de buchas

- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **257**

Brocas helicoidais com cone Morse

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
2,900		MK-1	132,000	51,000	9,900		MK-1	197,000	116,000
3,900		MK-1	145,000	64,000	10,000		MK-1	197,000	116,000
4,000		MK-1	145,000	64,000	10,050		MK-1	197,000	116,000
4,100		MK-1	145,000	64,000	10,100		MK-1	197,000	116,000
4,200		MK-1	145,000	64,000	10,200		MK-1	197,000	116,000
4,500		MK-1	150,000	69,000	10,250		MK-1	197,000	116,000
4,700		MK-1	150,000	69,000	10,300		MK-1	197,000	116,000
5,000		MK-1	155,000	74,000	10,400		MK-1	197,000	116,000
5,100		MK-1	155,000	74,000	10,500		MK-1	197,000	116,000
5,200		MK-1	155,000	74,000	10,600		MK-1	197,000	116,000
5,250		MK-1	155,000	74,000	10,700		MK-1	206,000	125,000
5,500		MK-1	161,000	80,000	10,750		MK-1	206,000	125,000
5,800		MK-1	161,000	80,000	10,800		MK-1	206,000	125,000
6,000		MK-1	161,000	80,000	10,900		MK-1	206,000	125,000
6,500		MK-1	167,000	86,000	11,000		MK-1	206,000	125,000
6,700		MK-1	167,000	86,000	11,250		MK-1	206,000	125,000
6,800		MK-1	174,000	93,000	11,400		MK-1	206,000	125,000
7,000		MK-1	174,000	93,000	11,500		MK-1	206,000	125,000
7,100		MK-1	174,000	93,000	11,750		MK-1	206,000	125,000
7,200		MK-1	174,000	93,000	11,800		MK-1	206,000	125,000
7,300		MK-1	174,000	93,000	12,000		MK-1	215,000	134,000
7,400		MK-1	174,000	93,000	12,100		MK-1	215,000	134,000
7,500		MK-1	174,000	93,000	12,200		MK-1	215,000	134,000
7,600		MK-1	181,000	100,000	12,250		MK-1	215,000	134,000
7,800		MK-1	181,000	100,000	12,300	31/64	MK-1	215,000	134,000
8,000		MK-1	181,000	100,000	12,400		MK-1	215,000	134,000
8,050		MK-1	181,000	100,000	12,500		MK-1	215,000	134,000
8,200		MK-1	181,000	100,000	12,600		MK-1	215,000	134,000
8,250		MK-1	181,000	100,000	13,000		MK-1	215,000	134,000
8,500		MK-1	181,000	100,000	13,100	33/64	MK-1	215,000	134,000
8,600		MK-1	188,000	107,000	13,200		MK-1	215,000	134,000
8,750		MK-1	188,000	107,000	13,490	17/32	MK-1	223,000	142,000
8,800		MK-1	188,000	107,000	13,500		MK-1	223,000	142,000
8,900		MK-1	188,000	107,000	13,750		MK-1	223,000	142,000
9,000		MK-1	188,000	107,000	13,900		MK-1	223,000	142,000
9,100		MK-1	188,000	107,000	14,000		MK-1	223,000	142,000
9,300		MK-1	188,000	107,000	14,100		MK-2	245,000	147,000
9,400		MK-1	188,000	107,000	14,250		MK-2	245,000	147,000
9,500		MK-1	188,000	107,000	14,290	9/16	MK-2	245,000	147,000
9,600		MK-1	197,000	116,000	14,300		MK-2	245,000	147,000
9,700		MK-1	197,000	116,000	14,400		MK-2	245,000	147,000
9,800		MK-1	197,000	116,000	14,500		MK-2	245,000	147,000



Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
14,750		MK-2	245,000	147,000
14,900		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000
15,200		MK-2	251,000	153,000
15,250		MK-2	251,000	153,000
15,500		MK-2	251,000	153,000
15,600		MK-2	251,000	153,000
15,750		MK-2	251,000	153,000
16,000		MK-2	251,000	153,000
16,100		MK-2	257,000	159,000
16,200		MK-2	257,000	159,000
16,250		MK-2	257,000	159,000
16,500		MK-2	257,000	159,000
16,670	21/32	MK-2	257,000	159,000
16,750		MK-2	257,000	159,000
17,000		MK-2	257,000	159,000
17,250		MK-2	263,000	165,000
17,460	11/16	MK-2	263,000	165,000
17,500		MK-2	263,000	165,000
17,750		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
18,250		MK-2	269,000	171,000
18,500		MK-2	269,000	171,000
18,750		MK-2	269,000	171,000
19,000		MK-2	269,000	171,000
19,500		MK-2	275,000	177,000
19,750		MK-2	275,000	177,000
19,840	25/32	MK-2	275,000	177,000
20,000		MK-2	275,000	177,000
20,250		MK-2	282,000	184,000
20,500		MK-2	282,000	184,000
20,640	13/16	MK-2	282,000	184,000
21,000		MK-2	282,000	184,000
21,500		MK-2	289,000	191,000
21,750		MK-2	289,000	191,000
21,830	55/64	MK-2	289,000	191,000
22,000		MK-2	289,000	191,000
22,220	7/8	MK-2	289,000	191,000
22,250		MK-2	289,000	191,000
22,500		MK-2	296,000	198,000
23,000		MK-2	296,000	198,000
23,500		MK-3	319,000	198,000
23,750		MK-3	327,000	206,000
23,810	15/16	MK-3	327,000	206,000
24,000		MK-3	327,000	206,000
24,250		MK-3	327,000	206,000
24,500		MK-3	327,000	206,000
25,000	63/64	MK-3	327,000	206,000

d1		S	l1	l2
mm	inch		mm	mm
25,250		MK-3	335,000	214,000
25,500		MK-3	335,000	214,000
26,000		MK-3	335,000	214,000
26,500		MK-3	335,000	214,000
26,590	1 3/64	MK-3	343,000	222,000
26,990	1 1/16	MK-3	343,000	222,000
27,000		MK-3	343,000	222,000
27,380	1 5/64	MK-3	343,000	222,000
27,500		MK-3	343,000	222,000
28,000		MK-3	343,000	222,000
28,500		MK-3	351,000	230,000
29,000		MK-3	351,000	230,000
29,500		MK-3	351,000	230,000
30,000		MK-3	351,000	230,000
30,500		MK-3	360,000	239,000
31,000		MK-3	360,000	239,000
32,000		MK-4	397,000	248,000
33,000		MK-4	397,000	248,000
33,500		MK-4	397,000	248,000
34,000		MK-4	406,000	257,000
35,000		MK-4	406,000	257,000
36,000		MK-4	416,000	267,000
36,120	1 27/64	MK-4	416,000	267,000
36,910	1 29/64	MK-4	416,000	267,000
37,000		MK-4	416,000	267,000
37,500		MK-4	416,000	267,000
38,000		MK-4	426,000	277,000
39,000		MK-4	426,000	277,000
39,500		MK-4	426,000	277,000
40,000		MK-4	426,000	277,000
40,080	1 37/64	MK-4	436,000	287,000
40,880	1 39/64	MK-4	436,000	287,000
41,000		MK-4	436,000	287,000
41,670	1 41/64	MK-4	436,000	287,000
42,000		MK-4	436,000	287,000
43,000		MK-4	447,000	298,000
43,660	1 23/32	MK-4	447,000	298,000
44,000		MK-4	447,000	298,000
45,000		MK-4	447,000	298,000
46,830	1 27/32	MK-4	459,000	310,000
48,000		MK-4	470,000	321,000
49,000		MK-4	470,000	321,000
50,000		MK-4	470,000	321,000



Brocas espirais curtas



Material de corte **HSS**

Superfície **S**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 4,000$ • afiação de superfície cônica
• para furar através de buchas

M

K •

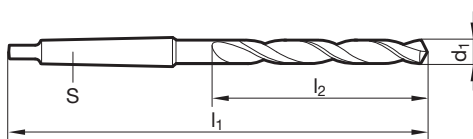
N ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

S

H

GÜHRING NAVIGATOR

Página de dados de corte 786



Nr. do artigo **655**

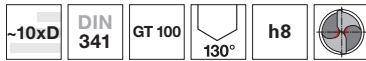
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
5,500		MK-1	161,000	80,000
6,000		MK-1	161,000	80,000
6,800		MK-1	174,000	93,000
7,000		MK-1	174,000	93,000
7,300		MK-1	174,000	93,000
8,000		MK-1	181,000	100,000
8,200		MK-1	181,000	100,000
8,400		MK-1	181,000	100,000
8,500		MK-1	181,000	100,000
8,600		MK-1	188,000	107,000
8,700		MK-1	188,000	107,000
8,800		MK-1	188,000	107,000
9,000		MK-1	188,000	107,000
9,500		MK-1	188,000	107,000
10,000		MK-1	197,000	116,000
10,050		MK-1	197,000	116,000
10,100		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,400		MK-1	197,000	116,000
10,500		MK-1	197,000	116,000
11,000		MK-1	206,000	125,000
11,400		MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
11,750		MK-1	206,000	125,000

d1		S	l1	l2
mm	inch		mm	mm
12,000		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
13,000		MK-1	215,000	134,000
13,500		MK-1	223,000	142,000
14,000		MK-1	223,000	142,000
14,250		MK-2	245,000	147,000
14,500		MK-2	245,000	147,000
14,750		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000
15,250		MK-2	251,000	153,000
15,870	5/8	MK-2	251,000	153,000
17,000		MK-2	257,000	159,000
17,500		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
21,000		MK-2	282,000	184,000
22,000		MK-2	289,000	191,000



Brocas para furar através de buchas

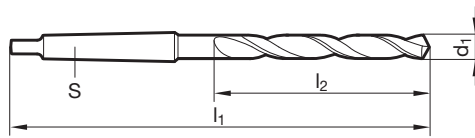


- P** • Redução da aresta transversal $\geq \varnothing 5,500$ • afiação de superfície cônica
- M** • canais largos • na expulsão difícil dos cavacos
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786

Material de corte	HSS
Superfície	$\frac{0}{16,0}$
Sentido de corte	



Nr. do artigo **551**

Brocas helicoidais com cone Morse

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
5,500		MK-1	161,000	80,000	13,100	33/64	MK-1	215,000	134,000
5,550		MK-1	161,000	80,000	13,490	17/32	MK-1	223,000	142,000
6,350	1/4	MK-1	167,000	86,000	13,500		MK-1	223,000	142,000
6,500		MK-1	167,000	86,000	13,800		MK-1	223,000	142,000
6,750	17/64	MK-1	174,000	93,000	13,890	35/64	MK-1	223,000	142,000
6,800		MK-1	174,000	93,000	14,000		MK-1	223,000	142,000
7,000		MK-1	174,000	93,000	14,200		MK-2	245,000	147,000
7,500		MK-1	174,000	93,000	14,250		MK-2	245,000	147,000
7,940	5/16	MK-1	181,000	100,000	14,290	9/16	MK-2	245,000	147,000
8,000		MK-1	181,000	100,000	14,500		MK-2	245,000	147,000
8,100		MK-1	181,000	100,000	14,750		MK-2	245,000	147,000
8,200		MK-1	181,000	100,000	15,000		MK-2	245,000	147,000
8,300		MK-1	181,000	100,000	15,250		MK-2	251,000	153,000
8,330	21/64	MK-1	181,000	100,000	15,480	39/64	MK-2	251,000	153,000
8,500		MK-1	181,000	100,000	15,750		MK-2	251,000	153,000
8,600		MK-1	188,000	107,000	16,000		MK-2	251,000	153,000
8,700		MK-1	188,000	107,000	16,500		MK-2	257,000	159,000
8,750		MK-1	188,000	107,000	16,670	21/32	MK-2	257,000	159,000
9,000		MK-1	188,000	107,000	17,000		MK-2	257,000	159,000
9,500		MK-1	188,000	107,000	17,460	11/16	MK-2	263,000	165,000
9,520	3/8	MK-1	197,000	116,000	17,500		MK-2	263,000	165,000
9,800		MK-1	197,000	116,000	18,000		MK-2	263,000	165,000
9,900		MK-1	197,000	116,000	18,260	23/32	MK-2	269,000	171,000
9,920	25/64	MK-1	197,000	116,000	19,000		MK-2	269,000	171,000
10,000		MK-1	197,000	116,000	19,500		MK-2	275,000	177,000
10,200		MK-1	197,000	116,000	19,840	25/32	MK-2	275,000	177,000
10,250		MK-1	197,000	116,000	20,000		MK-2	275,000	177,000
10,320	13/32	MK-1	197,000	116,000	21,000		MK-2	282,000	184,000
10,500		MK-1	197,000	116,000	22,000		MK-2	289,000	191,000
10,750		MK-1	206,000	125,000	23,000		MK-2	296,000	198,000
11,000		MK-1	206,000	125,000	23,020	29/32	MK-2	296,000	198,000
11,110	7/16	MK-1	206,000	125,000	23,500		MK-3	319,000	198,000
11,500		MK-1	206,000	125,000	24,000		MK-3	327,000	206,000
11,510	29/64	MK-1	206,000	125,000	25,000	63/64	MK-3	327,000	206,000
11,750		MK-1	206,000	125,000	26,000		MK-3	335,000	214,000
11,800		MK-1	206,000	125,000	26,590	1 3/64	MK-3	343,000	222,000
12,000		MK-1	215,000	134,000	28,570	1 1/8	MK-3	351,000	230,000
12,300	31/64	MK-1	215,000	134,000	28,900		MK-3	351,000	230,000
12,500		MK-1	215,000	134,000	28,970	1 9/64	MK-3	351,000	230,000
12,700	1/2	MK-1	215,000	134,000	29,000		MK-3	351,000	230,000
12,800		MK-1	215,000	134,000	30,000		MK-3	351,000	230,000
13,000		MK-1	215,000	134,000	30,500		MK-3	360,000	239,000

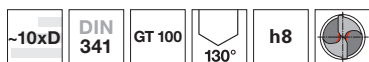


d1		S	l1	l2
mm	inch		mm	mm
30,560	1 13/64	MK-3	360,000	239,000
30,960	1 7/32	MK-3	360,000	239,000
31,000		MK-3	360,000	239,000
31,500		MK-3	360,000	239,000
32,000		MK-4	397,000	248,000

d1		S	l1	l2
mm	inch		mm	mm



Brocas para furar através de buchas



Material de corte **HSS**

Superfície **S**

Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 5,600$ • afiação de superfície cônica
• canais largos • na expulsão difícil dos cavacos

M

K •

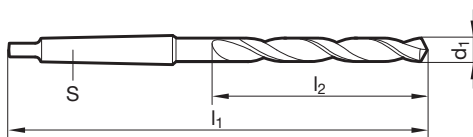
N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

GÜHRING NAVIGATOR

Página de dados de corte 786



Nr. do artigo **656**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
7,000		MK-1	174,000	93,000
9,000		MK-1	188,000	107,000
9,500		MK-1	188,000	107,000
9,920	25/64	MK-1	197,000	116,000
10,000		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,320	13/32	MK-1	197,000	116,000
10,500		MK-1	197,000	116,000
11,000		MK-1	206,000	125,000
11,110	7/16	MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
12,000		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
13,000		MK-1	215,000	134,000
13,800		MK-1	223,000	142,000
14,000		MK-1	223,000	142,000
14,500		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000

d1		S	l1	l2
mm	inch		mm	mm
16,000		MK-2	251,000	153,000
16,670	21/32	MK-2	257,000	159,000
17,460	11/16	MK-2	263,000	165,000
17,500		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
19,050	3/4	MK-2	275,000	177,000
20,500		MK-2	282,000	184,000
20,640	13/16	MK-2	282,000	184,000
21,500		MK-2	289,000	191,000
23,000		MK-2	296,000	198,000



Brocas para furar através de buchas



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P ○ Redução da aresta transversal ≥ Ø 4,200 • afiação de superfície cônica
• canal especialmente longo

M

K

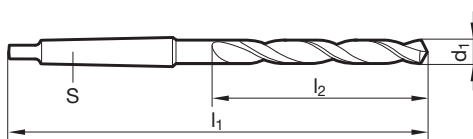
N • materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira

S

H

GÜHRING NAVIGATOR

Página de dados de corte 786



Nr. do artigo **505**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
5,500		MK-1	161,000	80,000
5,600		MK-1	161,000	80,000
5,800		MK-1	161,000	80,000
6,000		MK-1	161,000	80,000
6,100		MK-1	167,000	86,000
6,300		MK-1	167,000	86,000
6,500		MK-1	167,000	86,000
6,700		MK-1	167,000	86,000
6,800		MK-1	174,000	93,000
7,000		MK-1	174,000	93,000
7,200		MK-1	174,000	93,000
7,300		MK-1	174,000	93,000
7,500		MK-1	174,000	93,000
7,700		MK-1	181,000	100,000
7,950		MK-1	181,000	100,000
8,000		MK-1	181,000	100,000
8,200		MK-1	181,000	100,000
8,300		MK-1	181,000	100,000
8,400		MK-1	181,000	100,000
8,500		MK-1	181,000	100,000
8,600		MK-1	188,000	107,000
9,050		MK-1	188,000	107,000
9,300		MK-1	188,000	107,000
9,500		MK-1	188,000	107,000
9,600		MK-1	197,000	116,000
9,700		MK-1	197,000	116,000
9,800		MK-1	197,000	116,000
10,000		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,250		MK-1	197,000	116,000

d1		S	l1	l2
mm	inch		mm	mm
10,700		MK-1	206,000	125,000
10,750		MK-1	206,000	125,000
10,800		MK-1	206,000	125,000
11,200		MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
11,800		MK-1	206,000	125,000
12,000		MK-1	215,000	134,000
12,200		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
12,700	1/2	MK-1	215,000	134,000
12,800		MK-1	215,000	134,000
13,250		MK-1	223,000	142,000
13,750		MK-1	223,000	142,000
13,800		MK-1	223,000	142,000
14,200		MK-2	245,000	147,000
14,250		MK-2	245,000	147,000
14,300		MK-2	245,000	147,000
14,500		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000
16,000		MK-2	251,000	153,000
16,500		MK-2	257,000	159,000
16,800		MK-2	257,000	159,000
18,500		MK-2	269,000	171,000
19,250		MK-2	275,000	177,000
21,000		MK-2	282,000	184,000
23,500		MK-3	319,000	198,000
24,000		MK-3	327,000	206,000
29,000		MK-3	351,000	230,000
29,500		MK-3	351,000	230,000



Brocas para furar através de buchas



Material de corte **HSCO**

Superfície

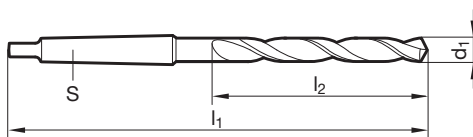
Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 4,750$ • afiação de superfície cônica
 • aço-HSS ligado com Co • resistência ao desgaste ampliada • para furar através de buchas

M ○
K •
N • aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
S ○
H

GÜHRINGNAVIGATOR

Página de dados de corte 792



Nr. do artigo **357**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
4,750		MK-1	150,000	69,000
5,000		MK-1	155,000	74,000
5,400		MK-1	161,000	80,000
6,000		MK-1	161,000	80,000
6,750	17/64	MK-1	174,000	93,000
6,800		MK-1	174,000	93,000
7,000		MK-1	174,000	93,000
8,000		MK-1	181,000	100,000
8,200		MK-1	181,000	100,000
8,500		MK-1	181,000	100,000
8,800		MK-1	188,000	107,000
9,000		MK-1	188,000	107,000
9,500		MK-1	188,000	107,000
9,800		MK-1	197,000	116,000
10,000		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,250		MK-1	197,000	116,000
10,500		MK-1	197,000	116,000
11,000		MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
12,000		MK-1	215,000	134,000
12,250		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
13,000		MK-1	215,000	134,000

d1		S	l1	l2
mm	inch		mm	mm
13,500		MK-1	223,000	142,000
14,000		MK-1	223,000	142,000
14,500		MK-2	245,000	147,000
14,750		MK-2	245,000	147,000
15,000		MK-2	245,000	147,000
15,500		MK-2	251,000	153,000
16,000		MK-2	251,000	153,000
16,750		MK-2	257,000	159,000
17,000		MK-2	257,000	159,000
17,500		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
20,000		MK-2	275,000	177,000
21,000		MK-2	282,000	184,000
22,000		MK-2	289,000	191,000
23,000		MK-2	296,000	198,000
24,000		MK-3	327,000	206,000
25,000	63/64	MK-3	327,000	206,000
26,000		MK-3	335,000	214,000
26,500		MK-3	335,000	214,000
27,000		MK-3	343,000	222,000
28,000		MK-3	343,000	222,000
30,000		MK-3	351,000	230,000
33,000		MK-4	397,000	248,000
40,000		MK-4	426,000	277,000



Brocas para furar através de buchas

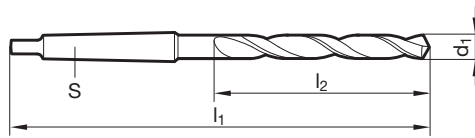


Material de corte	HSCO
Superfície	$>0,16,0$
Sentido de corte	(R)

- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • na expulsão difícil dos cavacos
- K** •
- N** • aços com, sem liga e fundidos acima de 800-N/mm^2 • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** •
- H** •

GÜHRINGNAVIGATOR

Página de dados de corte 792



Nr. do artigo **623**

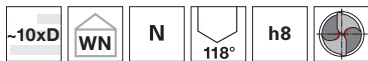
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	197,000	116,000
10,200		MK-1	197,000	116,000
10,320	13/32	MK-1	197,000	116,000
10,500		MK-1	197,000	116,000
10,800		MK-1	206,000	125,000
11,000		MK-1	206,000	125,000
11,200		MK-1	206,000	125,000
11,500		MK-1	206,000	125,000
11,510	29/64	MK-1	206,000	125,000
11,800		MK-1	206,000	125,000
12,000		MK-1	215,000	134,000
12,200		MK-1	215,000	134,000
12,400		MK-1	215,000	134,000
12,500		MK-1	215,000	134,000
13,000		MK-1	215,000	134,000
13,490	17/32	MK-1	223,000	142,000
13,500		MK-1	223,000	142,000
13,890	35/64	MK-1	223,000	142,000
14,000		MK-1	223,000	142,000
14,200		MK-2	245,000	147,000
14,290	9/16	MK-2	245,000	147,000
14,500		MK-2	245,000	147,000
14,680	37/64	MK-2	245,000	147,000
15,000		MK-2	245,000	147,000

d1		S	l1	l2
mm	inch		mm	mm
15,500		MK-2	251,000	153,000
16,000		MK-2	251,000	153,000
16,500		MK-2	257,000	159,000
17,000		MK-2	257,000	159,000
17,460	11/16	MK-2	263,000	165,000
17,500		MK-2	263,000	165,000
18,000		MK-2	263,000	165,000
18,500		MK-2	269,000	171,000
19,000		MK-2	269,000	171,000
19,500		MK-2	275,000	177,000
20,000		MK-2	275,000	177,000
20,500		MK-2	282,000	184,000
21,000		MK-2	282,000	184,000
22,000		MK-2	289,000	191,000
22,500		MK-2	296,000	198,000
24,000		MK-3	327,000	206,000
25,000	63/64	MK-3	327,000	206,000
26,000		MK-3	335,000	214,000



Brocas para furar através de buchas



Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 16,500$ • afiação de superfície cônica
• com cone Morse maior • para furar através de buchas

M

K •

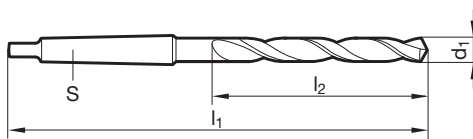
N ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

S

H

GÜHRING NAVIGATOR

Página de dados de corte 786



Nr. do artigo **523**

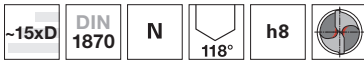
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	214,000	116,000
11,000		MK-2	223,000	125,000
12,300	31/64	MK-2	232,000	134,000
12,500		MK-2	232,000	134,000
14,000		MK-2	240,000	142,000
21,000		MK-3	305,000	184,000

d1		S	l1	l2
mm	inch		mm	mm
23,000		MK-3	319,000	198,000
29,000		MK-4	379,000	230,000



Brocas helicoidais extra longas, série1



Material de corte **HSS**

Superfície

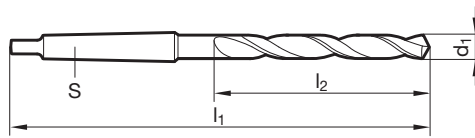
Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 7,800$ • afiação de superfície cônica
• para furos extremamente profundos

- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **266**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	265,000	165,000
8,500		MK-1	265,000	165,000
9,000		MK-1	275,000	175,000
9,500		MK-1	275,000	175,000
10,000		MK-1	285,000	185,000
10,200		MK-1	285,000	185,000
10,250		MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
11,000		MK-1	300,000	195,000
11,400		MK-1	300,000	195,000
11,500		MK-1	300,000	195,000
11,750		MK-1	300,000	195,000
11,800		MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,200		MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
12,700	1/2	MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,500		MK-1	325,000	220,000
13,750		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
14,290	9/16	MK-2	340,000	220,000
14,500		MK-2	340,000	220,000
15,000		MK-2	340,000	220,000
15,250		MK-2	355,000	230,000
15,500		MK-2	355,000	230,000
15,750		MK-2	355,000	230,000
15,800		MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
16,250		MK-2	355,000	230,000
16,500		MK-2	355,000	230,000
16,670	21/32	MK-2	355,000	230,000
17,000		MK-2	355,000	230,000
17,500		MK-2	370,000	245,000
17,750		MK-2	370,000	245,000
18,000		MK-2	370,000	245,000
18,500		MK-2	370,000	245,000
18,650	47/64	MK-2	370,000	245,000
19,000		MK-2	370,000	245,000
19,500		MK-2	385,000	260,000
19,750		MK-2	385,000	260,000
20,000		MK-2	385,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
20,500		MK-2	385,000	260,000
20,640	13/16	MK-2	385,000	260,000
21,000		MK-2	385,000	260,000
21,430	27/32	MK-2	405,000	270,000
21,500		MK-2	405,000	270,000
22,000		MK-2	405,000	270,000
22,500		MK-2	405,000	270,000
23,000		MK-2	405,000	270,000
23,020	29/32	MK-2	405,000	270,000
23,500		MK-3	425,000	270,000
24,000		MK-3	440,000	290,000
24,500		MK-3	440,000	290,000
25,000	63/64	MK-3	440,000	290,000
26,000		MK-3	440,000	290,000
26,500		MK-3	440,000	290,000
27,000		MK-3	460,000	305,000
28,000		MK-3	460,000	305,000
30,000		MK-3	460,000	305,000
30,500		MK-3	480,000	320,000
31,000		MK-3	480,000	320,000
32,000		MK-4	505,000	320,000
33,000		MK-4	505,000	320,000
34,000		MK-4	530,000	340,000
35,000		MK-4	530,000	340,000
36,000		MK-4	530,000	340,000
38,000		MK-4	555,000	360,000
39,000		MK-4	555,000	360,000
40,000		MK-4	555,000	360,000
42,000		MK-4	555,000	360,000
45,000		MK-4	585,000	385,000
45,240	1 25/32	MK-4	585,000	385,000
48,000		MK-4	605,000	405,000
50,000		MK-4	605,000	405,000



Brocas helicoidais extra longas, série1



Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 5,800$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos

M

K •

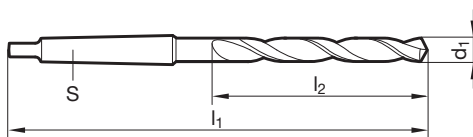
N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

GÜHRINGNAVIGATOR

Página de dados de corte 790



Nr. do artigo **526**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	265,000	165,000
8,500		MK-1	265,000	165,000
8,600		MK-1	275,000	175,000
8,700		MK-1	275,000	175,000
9,000		MK-1	275,000	175,000
9,500		MK-1	275,000	175,000
9,520	3/8	MK-1	285,000	185,000
9,800		MK-1	285,000	185,000
10,000		MK-1	285,000	185,000
10,200		MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
10,720	27/64	MK-1	300,000	195,000
11,000		MK-1	300,000	195,000
11,110	7/16	MK-1	300,000	195,000
11,500		MK-1	300,000	195,000
11,510	29/64	MK-1	300,000	195,000
11,750		MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
12,700	1/2	MK-1	310,000	205,000
12,800		MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,490	17/32	MK-1	325,000	220,000
13,500		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
14,200		MK-2	340,000	220,000
14,290	9/16	MK-2	340,000	220,000
14,500		MK-2	340,000	220,000
15,000		MK-2	340,000	220,000
15,500		MK-2	355,000	230,000

d1		S	l1	l2
mm	inch		mm	mm
15,870	5/8	MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
16,500		MK-2	355,000	230,000
17,000		MK-2	355,000	230,000
17,460	11/16	MK-2	370,000	245,000
17,500		MK-2	370,000	245,000
18,000		MK-2	370,000	245,000
18,500		MK-2	370,000	245,000
19,000		MK-2	370,000	245,000
19,500		MK-2	385,000	260,000
20,000		MK-2	385,000	260,000
20,500		MK-2	385,000	260,000
21,000		MK-2	385,000	260,000
21,500		MK-2	405,000	270,000
22,000		MK-2	405,000	270,000
23,000		MK-2	405,000	270,000
24,000		MK-3	440,000	290,000
25,000	63/64	MK-3	440,000	290,000
26,000		MK-3	440,000	290,000
26,500		MK-3	440,000	290,000
28,000		MK-3	460,000	305,000
28,500		MK-3	460,000	305,000
29,000		MK-3	460,000	305,000
30,000		MK-3	460,000	305,000



Brocas helicoidais extra longas, série1



- P** ○ Redução da aresta transversal $\geq \varnothing 7,900$ • afiação de superfície cônica
• para furos extremamente profundos • para materiais moles e com cavacos longos
- M** □
- K** □
- N** ● materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira
- S** □
- H** □

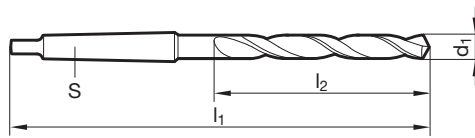
Material de corte **HSS**

Superfície ○

Sentido de corte **R**

GÜHRINGNAVIGATOR

Página de dados de corte 788



Nr. do artigo **525**

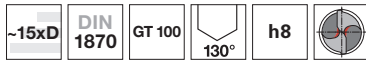
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	265,000	165,000
8,700		MK-1	275,000	175,000
9,000		MK-1	275,000	175,000
9,500		MK-1	275,000	175,000
10,000		MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
11,000		MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,500		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
15,000		MK-2	340,000	220,000
15,500		MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
18,000		MK-2	370,000	245,000
19,500		MK-2	385,000	260,000
21,000		MK-2	385,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
23,000		MK-2	405,000	270,000
24,000		MK-3	440,000	290,000
24,300		MK-3	440,000	290,000
24,380		MK-3	440,000	290,000
24,500		MK-3	440,000	290,000
25,500		MK-3	440,000	290,000
26,500		MK-3	440,000	290,000
27,500		MK-3	460,000	305,000
28,000		MK-3	460,000	305,000
29,000		MK-3	460,000	305,000
31,000		MK-3	480,000	320,000
33,000		MK-4	505,000	320,000



Brocas helicoidais extra longas, série1

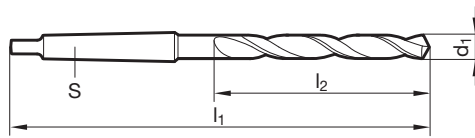


Material de corte	HSCO
Superfície	$\geq \frac{0}{16,0}$
Sentido de corte	(R)

- P** • Redução da aresta transversal $\geq \varnothing 9,520$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • para furos extremamente profundos • na expulsão difícil dos cavacos
- K** •
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** •

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **620**

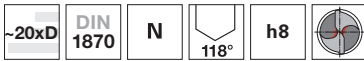
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
9,520	3/8	MK-1	285,000	185,000
10,000		MK-1	285,000	185,000
10,200		MK-1	285,000	185,000
10,320	13/32	MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
11,000		MK-1	300,000	195,000
11,110	7/16	MK-1	300,000	195,000
11,500		MK-1	300,000	195,000
11,510	29/64	MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,300	31/64	MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
12,700	1/2	MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,500		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
14,290	9/16	MK-2	340,000	220,000
14,500		MK-2	340,000	220,000
15,000		MK-2	340,000	220,000
15,080	19/32	MK-2	355,000	230,000
15,500		MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
16,500		MK-2	355,000	230,000
17,000		MK-2	355,000	230,000

d1		S	l1	l2
mm	inch		mm	mm
17,500		MK-2	370,000	245,000
18,000		MK-2	370,000	245,000
18,500		MK-2	370,000	245,000
19,000		MK-2	370,000	245,000
20,000		MK-2	385,000	260,000
21,000		MK-2	385,000	260,000
21,830		MK-2	405,000	270,000
22,000		MK-2	405,000	270,000
22,620		MK-2	405,000	270,000
23,000		MK-2	405,000	270,000
25,500		MK-3	440,000	290,000
26,000		MK-3	440,000	290,000
27,180		MK-3	460,000	305,000
29,370	1 5/32	MK-3	460,000	305,000
30,000		MK-3	460,000	305,000



Brocas helicoidais extra longas, série 2



- P** • Redução da aresta transversal $\geq \varnothing 7,700$ • afiação de superfície cônica
• para furos extremamente profundos
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

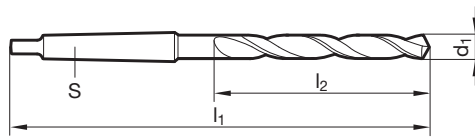
Material de corte **HSS**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **267**

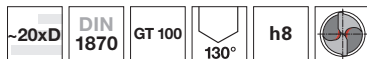
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	330,000	210,000
8,500		MK-1	330,000	210,000
9,000		MK-1	345,000	220,000
10,000		MK-1	360,000	235,000
10,200		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,750		MK-1	375,000	250,000
11,800		MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,490	17/32	MK-1	410,000	275,000
13,500		MK-1	410,000	275,000
14,000		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
15,480	39/64	MK-2	445,000	295,000
15,500		MK-2	445,000	295,000
16,000		MK-2	445,000	295,000
16,500		MK-2	445,000	295,000
17,000		MK-2	445,000	295,000
17,070	43/64	MK-2	465,000	310,000
17,500		MK-2	465,000	310,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
19,050	3/4	MK-2	490,000	325,000
19,500		MK-2	490,000	325,000
20,000		MK-2	490,000	325,000

d1		S	l1	l2
mm	inch		mm	mm
20,640	13/16	MK-2	490,000	325,000
21,000		MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
21,500		MK-2	515,000	345,000
21,830	55/64	MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
22,800		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
23,020	29/32	MK-2	515,000	345,000
23,750		MK-3	555,000	365,000
23,810	15/16	MK-3	555,000	365,000
24,000		MK-3	555,000	365,000
24,500		MK-3	555,000	365,000
25,000	63/64	MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
28,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000
31,000		MK-3	610,000	410,000
32,000		MK-4	635,000	410,000
34,000		MK-4	665,000	430,000
40,000		MK-4	695,000	460,000
45,000		MK-4	735,000	490,000



Brocas helicoidais extra longas, série 2

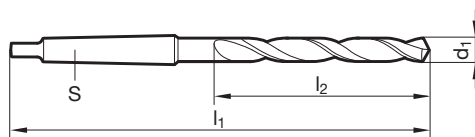


Material de corte	HSS
Superfície	$\geq \frac{0}{16,0}$
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 7,800$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **527**

Brocas helicoidais com cone Morse

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-1	330,000	210,000	17,500		MK-2	465,000	310,000
8,400		MK-1	330,000	210,000	17,800		MK-2	465,000	310,000
8,500		MK-1	330,000	210,000	18,000		MK-2	465,000	310,000
9,000		MK-1	345,000	220,000	18,500		MK-2	465,000	310,000
9,500		MK-1	345,000	220,000	19,000		MK-2	465,000	310,000
10,000		MK-1	360,000	235,000	19,450	49/64	MK-2	490,000	325,000
10,500		MK-1	360,000	235,000	19,500		MK-2	490,000	325,000
11,000		MK-1	375,000	250,000	20,000		MK-2	490,000	325,000
11,110	7/16	MK-1	375,000	250,000	20,500		MK-2	490,000	325,000
11,500		MK-1	375,000	250,000	21,000		MK-2	490,000	325,000
11,510	29/64	MK-1	375,000	250,000	21,030	53/64	MK-2	490,000	325,000
11,800		MK-1	375,000	250,000	21,430	27/32	MK-2	515,000	345,000
11,910	15/32	MK-1	395,000	260,000	22,000		MK-2	515,000	345,000
12,000		MK-1	395,000	260,000	23,000		MK-2	515,000	345,000
12,500		MK-1	395,000	260,000	23,020	29/32	MK-2	515,000	345,000
12,700	1/2	MK-1	395,000	260,000	23,810	15/16	MK-3	555,000	365,000
13,000		MK-1	395,000	260,000	24,000		MK-3	555,000	365,000
13,500		MK-1	410,000	275,000	24,210	61/64	MK-3	555,000	365,000
13,700		MK-1	410,000	275,000	25,000	63/64	MK-3	555,000	365,000
13,800		MK-1	410,000	275,000	26,000		MK-3	555,000	365,000
13,890	35/64	MK-1	410,000	275,000	26,190	1 1/32	MK-3	555,000	365,000
14,000		MK-1	410,000	275,000	26,500		MK-3	555,000	365,000
14,290	9/16	MK-2	425,000	275,000	27,000		MK-3	580,000	385,000
14,500		MK-2	425,000	275,000	28,000		MK-3	580,000	385,000
15,000		MK-2	425,000	275,000	28,750		MK-3	580,000	385,000
15,500		MK-2	445,000	295,000	29,000		MK-3	580,000	385,000
16,000		MK-2	445,000	295,000	29,500		MK-3	580,000	385,000
16,500		MK-2	445,000	295,000	30,000		MK-3	580,000	385,000
17,000		MK-2	445,000	295,000					
17,070	43/64	MK-2	465,000	310,000					



Brocas helicoidais extra longas, série 2



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P ○ Redução da aresta transversal $\geq \varnothing 8,000$ • afiação de superfície cônica
• para furos extremamente profundos

M

K

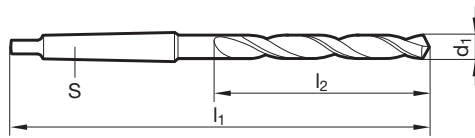
N • materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira

S

H

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **542**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	330,000	210,000
8,600		MK-1	345,000	220,000
8,800		MK-1	345,000	220,000
9,000		MK-1	345,000	220,000
9,500		MK-1	345,000	220,000
10,500		MK-1	360,000	235,000
10,700		MK-1	375,000	250,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
17,000		MK-2	445,000	295,000
17,500		MK-2	465,000	310,000
20,500		MK-2	490,000	325,000

d1		S	l1	l2
mm	inch		mm	mm
21,000		MK-2	490,000	325,000
21,500		MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
24,000		MK-3	555,000	365,000
24,500		MK-3	555,000	365,000
25,500		MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
26,500		MK-3	555,000	365,000
27,500		MK-3	580,000	385,000
28,000		MK-3	580,000	385,000
29,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000
31,000		MK-3	610,000	410,000



Brocas helicoidais extra longas, série 2



Material de corte **HSCO**

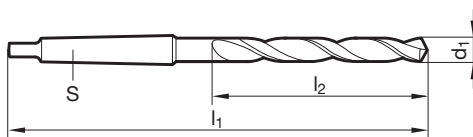
Superfície $\geq \frac{0}{16,0}$

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 9,520$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • alta resistência ao desgaste
- K** • na expulsão difícil dos cavacos • para furos extremamente profundos
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** •

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **621**

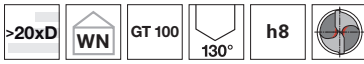
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
9,520	3/8	MK-1	360,000	235,000
10,000		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
10,720	27/64	MK-1	375,000	250,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,510	29/64	MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
12,700	1/2	MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
16,000		MK-2	445,000	295,000
16,270		MK-2	445,000	295,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
20,000		MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
23,420	59/64	MK-3	535,000	345,000



Brocas helicoidais extra longas



P • Redução da aresta transversal $\geq \varnothing 6,000$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

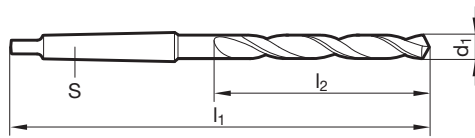
Material de corte **HSS**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **563**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
6,000		MK-1	200,000	120,000
6,500		MK-1	200,000	120,000
7,000		MK-1	200,000	120,000
7,500		MK-1	200,000	120,000

d1		S	l1	l2
mm	inch		mm	mm



Brocas helicoidais extra longas



P • Redução da aresta transversal $\geq \varnothing 6,000$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

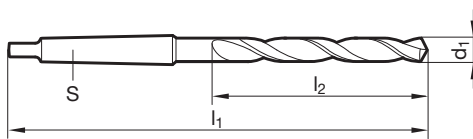
GÜHRING NAVIGATOR

Página de dados de corte 790

Material de corte **HSS**

Superfície

Sentido de corte



Nr. do artigo **564**

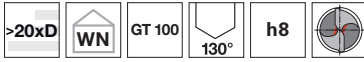
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
6,000		MK-1	300,000	220,000
6,500		MK-1	300,000	220,000
7,000		MK-1	300,000	220,000
8,000		MK-1	350,000	270,000
8,500		MK-1	350,000	270,000
9,000		MK-1	350,000	270,000

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-1	350,000	270,000



Brocas helicoidais extra longas



P • Redução da aresta transversal $\geq \varnothing 6,000$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

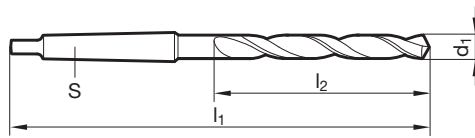
Material de corte **HSS**

Superfície $\frac{16,0}{\sqrt{R}}$

Sentido de corte **R**

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **565**

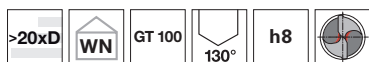
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
6,000		MK-1	425,000	345,000
6,500		MK-1	425,000	345,000
7,000		MK-1	425,000	345,000
7,500		MK-1	425,000	345,000
8,000		MK-1	425,000	345,000
8,500		MK-1	425,000	345,000
9,000		MK-1	425,000	345,000
10,000		MK-1	425,000	345,000
11,000		MK-1	425,000	345,000
12,000		MK-1	425,000	345,000
13,000		MK-1	425,000	345,000
14,000		MK-1	425,000	345,000

d1		S	l1	l2
mm	inch		mm	mm
15,000		MK-2	425,000	325,000
16,000		MK-2	425,000	325,000
17,000		MK-2	425,000	325,000



Brocas helicoidais extra longas

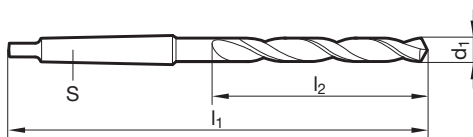


Material de corte	HSS
Superfície	$\frac{0,16}{R}$
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 8,000$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **566**

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	500,000	420,000
8,500		MK-1	500,000	420,000
9,000		MK-1	500,000	420,000
9,500		MK-1	500,000	420,000
10,000		MK-1	500,000	420,000
11,000		MK-1	500,000	420,000
12,000		MK-1	500,000	420,000
13,000		MK-1	500,000	420,000
14,000		MK-1	500,000	420,000
15,000		MK-2	500,000	400,000
16,000		MK-2	500,000	400,000
17,000		MK-2	500,000	400,000

d1		S	l1	l2
mm	inch		mm	mm
18,000		MK-2	500,000	400,000
19,000		MK-2	500,000	400,000
20,000		MK-2	500,000	400,000
21,000		MK-2	500,000	400,000
22,000		MK-2	500,000	400,000
35,000		MK-4	500,000	350,000
40,000		MK-4	500,000	350,000

Brocas helicoidais com cone Morse



Brocas helicoidais extra longas



P • Redução da aresta transversal $\geq \varnothing 14,000$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

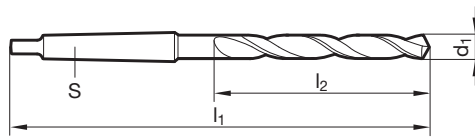
Material de corte **HSS**

Superfície $\frac{16,0}{\sqrt{R}}$

Sentido de corte **R**

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **293**

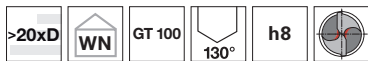
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	600,000	500,000
15,000		MK-2	600,000	500,000
16,000		MK-2	600,000	500,000
17,000		MK-2	600,000	500,000
18,000		MK-2	600,000	500,000
19,000		MK-2	600,000	500,000
20,000		MK-2	600,000	500,000
21,000		MK-2	600,000	500,000
22,000		MK-2	600,000	500,000
23,000		MK-2	600,000	500,000
24,000		MK-3	600,000	475,000
25,000	63/64	MK-3	600,000	475,000

d1		S	l1	l2
mm	inch		mm	mm
26,000		MK-3	600,000	475,000
28,000		MK-3	600,000	475,000
30,000		MK-3	600,000	475,000
32,000		MK-4	600,000	450,000
35,000		MK-4	600,000	450,000
38,000		MK-4	600,000	450,000
40,000		MK-4	600,000	450,000



Brocas helicoidais extra longas

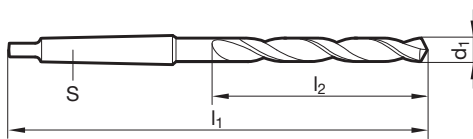


- P** • Redução da aresta transversal $\geq \varnothing 14,000$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ



Nr. do artigo **298**

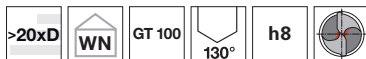
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	750,000	650,000
15,000		MK-2	750,000	650,000
16,000		MK-2	750,000	650,000
18,000		MK-2	750,000	650,000

d1		S	l1	l2
mm	inch		mm	mm



Brocas helicoidais extra longas



P • Redução da aresta transversal $\geq \varnothing 14,000$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

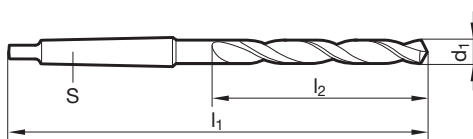
Material de corte **HSS**

Superfície ○

Sentido de corte (R)

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **299**

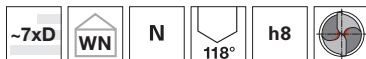
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	1000,000	850,000
15,000		MK-2	1000,000	850,000
16,000		MK-2	1000,000	850,000
18,000		MK-2	1000,000	850,000

d1		S	l1	l2
mm	inch		mm	mm



Brocas com canais de refrigeração curtas

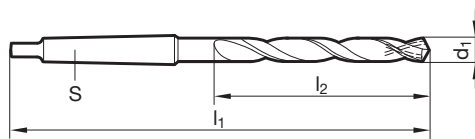


- P** • Redução da aresta transversal $\geq \varnothing 9,520$ • afiação de superfície cônica
- M** ○ para furar através de buchas • fornecimento de refrigerante radial através de anéis de refrigeração Guhring
- K** •
- N** • pacotes de chapas • aço e aço fundido, ferro fundido • aços austeníticos até 800 N/mm²
- S**
- H**

Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ

GÜHRINGNAVIGATOR

Página de dados de corte 788



Nr. do artigo **269**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
9,920	25/64	MK-1	197,000	101,000
10,320	13/32	MK-1	197,000	101,000
10,500		MK-1	197,000	101,000
11,000		MK-1	206,000	110,000
11,110	7/16	MK-1	206,000	110,000
11,500		MK-1	206,000	110,000
12,500		MK-1	215,000	119,000
12,700	1/2	MK-1	215,000	119,000
12,800		MK-1	215,000	119,000
13,000		MK-1	215,000	119,000
13,200		MK-1	215,000	119,000
13,490	17/32	MK-1	223,000	127,000
13,500		MK-1	223,000	127,000
13,800		MK-1	223,000	127,000
14,000		MK-1	223,000	127,000
14,250		MK-2	245,000	133,000
14,290	9/16	MK-2	245,000	133,000
14,500		MK-2	245,000	133,000
15,000		MK-2	245,000	133,000
15,080	19/32	MK-2	251,000	139,000
15,150		MK-2	251,000	139,000
15,180		MK-2	251,000	139,000
15,250		MK-2	251,000	139,000
15,870	5/8	MK-2	251,000	139,000
16,000		MK-2	251,000	139,000
16,500		MK-2	257,000	145,000
16,670	21/32	MK-2	257,000	145,000
16,750		MK-2	257,000	145,000
17,000		MK-2	257,000	145,000
17,100		MK-2	263,000	151,000

d1		S	l1	l2
mm	inch		mm	mm
17,460	11/16	MK-2	263,000	151,000
17,500		MK-2	263,000	151,000
17,750		MK-2	263,000	151,000
18,000		MK-2	263,000	151,000
18,260	23/32	MK-2	269,000	157,000
18,500		MK-2	269,000	157,000
19,000		MK-2	269,000	157,000
19,050	3/4	MK-2	275,000	163,000
19,200		MK-2	275,000	163,000
19,250		MK-2	275,000	163,000
19,500		MK-2	275,000	163,000
19,750		MK-2	275,000	163,000
19,840	25/32	MK-2	275,000	163,000
20,250		MK-2	282,000	170,000
20,640	13/16	MK-2	282,000	170,000
20,750		MK-2	282,000	170,000
21,000		MK-2	282,000	170,000
21,430	27/32	MK-2	289,000	177,000
21,500		MK-2	289,000	177,000
22,220	7/8	MK-2	289,000	177,000
23,020	29/32	MK-2	296,000	184,000



Brocas com canais de refrig., compr. canais conf.e norma da empr.



- P** • Redução da aresta transversal $\geq \varnothing 8,000$ • afiação de superfície cônica
- M** ○ • refrig. axial e radial através da haste cone-morse (similar a DIN 228 forma BK) • possibilid. de abrir e fechar o fluxo de refrig. através do parafuso de alimentação
- K** •
- N** • otimizado para perfuração de vigas de aço em linhas de furo-corte
- S** • pacotes de chapas • aço e aço fundido, ferro fundido • aços austeníticos até 800 N/mm²
- H**

Material de corte **HSS**

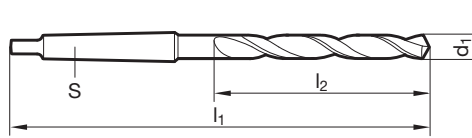
Superfície

Sentido de corte



GÜHRINGNAVIGATOR

#R01#



Nr. do artigo **254**

Brocas helicoidais com cone Morse

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-2	268,000	116,000	29,000		MK-4	410,000	225,000
9,000		MK-2	268,000	116,000	30,000		MK-4	410,000	225,000
10,000		MK-3	268,000	116,000	31,000		MK-4	410,000	225,000
10,500		MK-3	268,000	116,000	32,000		MK-4	410,000	225,000
11,000		MK-3	278,000	125,000	33,000		MK-4	410,000	225,000
12,000		MK-3	287,000	134,000	34,000		MK-4	410,000	225,000
13,000		MK-3	287,000	134,000	35,000		MK-4	410,000	225,000
13,500		MK-3	285,000	142,000	36,000		MK-4	410,000	225,000
14,000		MK-3	285,000	142,000	37,000		MK-4	410,000	225,000
15,000		MK-3	300,000	147,000	38,000		MK-4	410,000	225,000
16,000		MK-3	306,000	153,000	39,000		MK-4	410,000	225,000
17,000		MK-3	311,000	159,000	40,000		MK-4	410,000	225,000
17,500		MK-3	318,000	165,000	41,000		MK-4	410,000	225,000
18,000		MK-3	318,000	165,000	42,000		MK-4	410,000	225,000
19,000		MK-3	324,000	171,000	43,000		MK-4	410,000	225,000
20,000		MK-3	330,000	177,000	44,000		MK-4	410,000	225,000
21,000		MK-3	343,000	184,000	45,000		MK-4	410,000	225,000
22,000		MK-3	350,000	191,000	46,000		MK-4	410,000	225,000
23,000		MK-3	357,000	198,000	47,000		MK-4	410,000	225,000
24,000		MK-3	365,000	206,000	48,000		MK-4	410,000	225,000
25,000	63/64	MK-3	365,000	206,000	49,000		MK-4	410,000	225,000
26,000		MK-3	373,000	214,000	50,000		MK-4	410,000	225,000
27,000		MK-4	407,000	222,000					
28,000		MK-4	407,000	222,000					



Brocas com canais de refrig., compr. canais conf.e norma da empr.



- P** • Redução da aresta transversal $\geq \varnothing 8,000$ • afiação de superfície cônica
- M** ○ geometria espec. com 170° de ângulo de ponta e 90° de ponta de centro
- K** • muito boa característica auto-centrante • refrig. axial e radial através da haste cone-morse (similar a DIN 228 forma BK) • possibiild. de abrir e fechar o fluxo de refrig. através do parafuso de alimentação
- N** • otimizado para perfuração de vigas de aço em linhas de furo-corte • aço
- S** e aço fundido, ferro fundido • aços austeníticos até 800 N/mm^2
- H**

Material de corte **HSS**

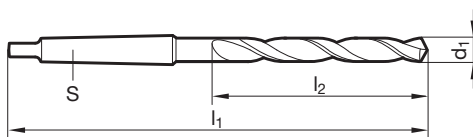
Superfície

Sentido de corte



GÜHRINGNAVIGATOR

#R01#



Nr. do artigo **255**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-2	268,000	116,000
9,000		MK-2	268,000	116,000
10,000		MK-3	268,000	116,000
10,500		MK-3	268,000	116,000
11,000		MK-3	278,000	125,000
12,000		MK-3	287,000	134,000
13,000		MK-3	287,000	134,000
13,500		MK-3	285,000	142,000
14,000		MK-3	285,000	142,000
15,000		MK-3	300,000	147,000
16,000		MK-3	306,000	153,000
17,000		MK-3	311,000	159,000
17,500		MK-3	318,000	165,000
18,000		MK-3	318,000	165,000
19,000		MK-3	324,000	171,000
20,000		MK-3	330,000	177,000
21,000		MK-3	343,000	184,000
22,000		MK-3	350,000	191,000
23,000		MK-3	357,000	198,000
24,000		MK-3	365,000	206,000
25,000	63/64	MK-3	365,000	206,000
26,000		MK-3	373,000	214,000
27,000		MK-4	375,000	193,000
28,000		MK-4	375,000	193,000

d1		S	l1	l2
mm	inch		mm	mm
29,000		MK-4	375,000	193,000
30,000		MK-4	375,000	193,000
31,000		MK-4	375,000	193,000
32,000		MK-4	375,000	193,000
33,000		MK-4	375,000	193,000
34,000		MK-4	375,000	193,000
35,000		MK-4	375,000	193,000
36,000		MK-4	375,000	193,000
37,000		MK-4	375,000	193,000
38,000		MK-4	375,000	193,000
39,000		MK-4	375,000	193,000
40,000		MK-4	375,000	193,000
41,000		MK-4	375,000	193,000
42,000		MK-4	375,000	193,000



Brocas com canais de refrigeração, comprimento canais DIN 341



Material de corte **HSS**

Superfície

Sentido de corte

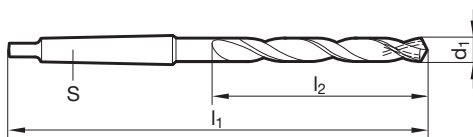
P • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
 • Para furação utilizando buchas. Alimentação da refrigeração de acordo com DIN 228 BK.

M ○
K •
N • pacotes de chapas • aço e aço fundido, ferro fundido • aços austeníticos até 800 N/mm²

S
H

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **1101**

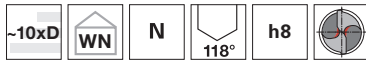
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	223,000	116,000
10,500		MK-2	223,000	116,000
11,000		MK-2	232,000	125,000
11,500		MK-2	232,000	125,000
12,000		MK-2	241,000	134,000
12,500		MK-2	241,000	134,000
13,000		MK-2	241,000	134,000
13,500		MK-2	249,000	142,000
14,000		MK-2	249,000	142,000
14,750		MK-2	254,000	147,000
15,000		MK-2	254,000	147,000
16,000		MK-2	260,000	153,000
16,250		MK-2	266,000	159,000
17,000		MK-2	266,000	159,000
17,500		MK-2	272,000	165,000
18,000		MK-2	272,000	165,000
19,000		MK-2	278,000	171,000
20,000		MK-2	284,000	177,000

d1		S	l1	l2
mm	inch		mm	mm
21,000		MK-2	291,000	184,000
22,000		MK-2	298,000	191,000
24,000		MK-3	332,000	206,000
25,000	63/64	MK-3	332,000	206,000
26,000		MK-3	340,000	214,000
28,000		MK-3	348,000	222,000
29,000		MK-3	356,000	230,000
30,000		MK-3	356,000	230,000
32,000		MK-4	409,000	248,000



Brocas com canais de refrigeração, comprimento canais DIN 341



Material de corte **HSS**

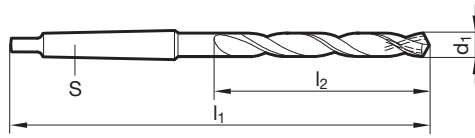
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
- M** ○ para furar através de buchas • fornecimento de refrigeração axial através do cone morse
- K** •
- N** • pacotes de chapas • aço e aço fundido, ferro fundido • aços austeníticos até 800 N/mm²
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **270**

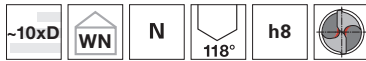
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	233,000	116,000
11,000		MK-2	242,000	125,000
12,000		MK-2	251,000	134,000
13,000		MK-2	251,000	134,000
13,200		MK-2	251,000	134,000
13,500		MK-2	259,000	142,000
14,000		MK-2	259,000	142,000
14,290	9/16	MK-2	264,000	147,000
15,000		MK-2	264,000	147,000
15,500		MK-2	270,000	153,000
16,000		MK-2	270,000	153,000
16,500		MK-2	276,000	159,000
17,000		MK-2	276,000	159,000
17,460	11/16	MK-2	282,000	165,000
17,500		MK-2	282,000	165,000
18,000		MK-2	282,000	165,000
18,500		MK-3	307,000	171,000
19,000		MK-3	307,000	171,000
19,500		MK-3	313,000	177,000
20,000		MK-3	313,000	177,000
20,500		MK-3	320,000	184,000
21,000		MK-3	320,000	184,000
22,000		MK-3	327,000	191,000
23,000		MK-3	334,000	198,000

d1		S	l1	l2
mm	inch		mm	mm
23,020	29/32	MK-3	334,000	198,000
24,000		MK-3	342,000	206,000
25,000	63/64	MK-3	342,000	206,000
26,000		MK-3	350,000	214,000
26,500		MK-3	350,000	214,000
27,000		MK-4	385,000	222,000
28,000		MK-4	385,000	222,000
29,000		MK-4	393,000	230,000
29,500		MK-4	393,000	230,000
30,000		MK-4	393,000	230,000
32,000		MK-4	421,000	248,000
33,000		MK-4	421,000	248,000
34,000		MK-4	430,000	257,000
35,000		MK-4	430,000	257,000
40,000		MK-4	450,000	277,000



Brocas com canais de refrigeração, comprimento canais DIN 341



Material de corte **HSS**

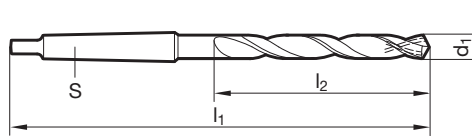
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
- M** ○ para furar através de buchas • fornecimento de refrigerante radial através de anéis de refrigeração Guhring
- K** •
- N** • pacotes de chapas • aço e aço fundido, ferro fundido • aços austeníticos até 800 N/mm²
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **271**

Brocas helicoidais com cone Morse

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
10,000		MK-2	233,000	116,000	19,500		MK-3	313,000	177,000
10,500		MK-2	233,000	116,000	19,840	25/32	MK-3	313,000	177,000
10,720	27/64	MK-2	242,000	125,000	20,000		MK-3	313,000	177,000
11,000		MK-2	242,000	125,000	20,250		MK-3	320,000	184,000
11,510	29/64	MK-2	242,000	125,000	22,500		MK-3	334,000	198,000
11,910	15/32	MK-2	251,000	134,000	23,000		MK-3	334,000	198,000
12,300	31/64	MK-2	251,000	134,000	23,750		MK-3	342,000	206,000
13,000		MK-2	251,000	134,000	24,250		MK-3	342,000	206,000
13,800		MK-2	259,000	142,000	24,610	31/32	MK-3	342,000	206,000
14,000		MK-2	259,000	142,000	25,400	1	MK-3	350,000	214,000
14,250		MK-2	264,000	147,000	26,000		MK-3	350,000	214,000
14,290	9/16	MK-2	264,000	147,000	26,990	1 1/16	MK-4	385,000	222,000
14,500		MK-2	264,000	147,000	27,780	1 3/32	MK-4	385,000	222,000
15,000		MK-2	264,000	147,000	28,570	1 1/8	MK-4	393,000	230,000
15,080	19/32	MK-2	270,000	153,000	28,750		MK-4	393,000	230,000
15,500		MK-2	270,000	153,000	29,000		MK-4	393,000	230,000
16,000		MK-2	270,000	153,000	29,500		MK-4	393,000	230,000
16,500		MK-2	276,000	159,000	30,000		MK-4	393,000	230,000
17,000		MK-2	276,000	159,000	30,500		MK-4	402,000	239,000
17,250		MK-2	282,000	165,000	34,000		MK-4	430,000	257,000
17,500		MK-2	282,000	165,000	44,450		MK-4	471,000	298,000
18,250		MK-3	307,000	171,000					
18,500		MK-3	307,000	171,000					
19,050	3/4	MK-3	313,000	177,000					



Brocas com canais de refrigeração, comprimento canais DIN 341



Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica
• para furar através de buchas • fornecimento de refrigerante radial no cone Morse

M ○

K •

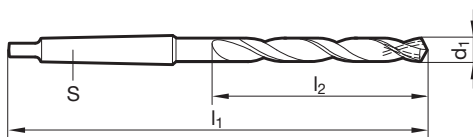
N • pacotes de chapas • aço e aço fundido, ferro fundido • aços austeníticos até 800 N/mm²

S

H

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **272**

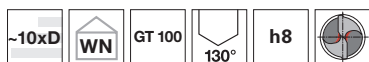
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
10,000		MK-2	233,000	116,000
12,500		MK-2	251,000	134,000
13,200		MK-2	251,000	134,000
13,500		MK-2	259,000	142,000
14,750		MK-2	264,000	147,000
15,500		MK-2	270,000	153,000
15,870	5/8	MK-2	270,000	153,000
16,500		MK-2	276,000	159,000
16,670	21/32	MK-2	276,000	159,000
17,000		MK-2	276,000	159,000
18,000		MK-2	282,000	165,000
18,500		MK-3	307,000	171,000

d1		S	l1	l2
mm	inch		mm	mm
20,000		MK-3	313,000	177,000
22,000		MK-3	327,000	191,000
22,500		MK-3	334,000	198,000
24,000		MK-3	342,000	206,000
26,000		MK-3	350,000	214,000
26,990	1 1/16	MK-4	385,000	222,000
29,500		MK-4	393,000	230,000
32,000		MK-4	421,000	248,000
44,450	1 3/4	MK-4	471,000	298,000



Brocas com canais de refrigeração, comprimento canais DIN 341



Material de corte **HSCO**

Superfície



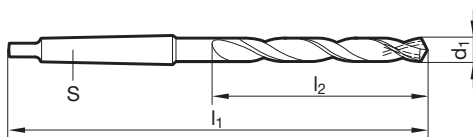
Sentido de corte



- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica
- M** • fornecimento de refrigeração axial através do cone morse • aço-HSS ligado com Co • resistência ao desgaste ampliada • para furar através de buchas
- K** •
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm²
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **370**

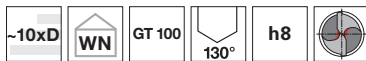
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	242,000	125,000
12,000		MK-2	251,000	134,000
12,500		MK-2	251,000	134,000
13,000		MK-2	251,000	134,000
13,500		MK-2	259,000	142,000
14,000		MK-2	259,000	142,000
15,000		MK-2	264,000	147,000
15,080	19/32	MK-2	270,000	153,000
16,000		MK-2	270,000	153,000
17,000		MK-2	276,000	159,000
17,500		MK-2	282,000	165,000
18,000		MK-2	282,000	165,000
18,500		MK-3	307,000	171,000
19,000		MK-3	307,000	171,000
20,000		MK-3	313,000	177,000
21,000		MK-3	320,000	184,000
21,500		MK-3	327,000	191,000
22,000		MK-3	327,000	191,000

d1		S	l1	l2
mm	inch		mm	mm
24,000		MK-3	342,000	206,000
24,610	31/32	MK-3	342,000	206,000
29,370	1 5/32	MK-4	393,000	230,000
29,500		MK-4	393,000	230,000
30,000		MK-4	393,000	230,000
30,960	1 7/32	MK-4	402,000	239,000
31,000		MK-4	402,000	239,000
32,000		MK-4	421,000	248,000
32,250		MK-4	421,000	248,000
32,500		MK-4	421,000	248,000
32,540	1 9/32	MK-4	421,000	248,000
33,000		MK-4	421,000	248,000
34,130	1 11/32	MK-4	430,000	257,000
34,920	1 3/8	MK-4	430,000	257,000



Brocas com canais de refrigeração, comprimento canais DIN 341



Material de corte **HSCO**

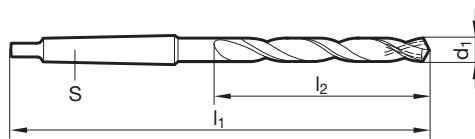
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica
- M** • fornecimento de refrigerante radial através de anéis de refrigeração
- K** • Guhring • aço-HSS ligado com Co • alta resistência ao desgaste • para furar através de buchas
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm²
- S** •
- H** •

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **371**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	242,000	125,000
11,110	7/16	MK-2	242,000	125,000
11,500		MK-2	242,000	125,000
12,300	31/64	MK-2	251,000	134,000
12,500		MK-2	251,000	134,000
12,800		MK-2	251,000	134,000
13,000		MK-2	251,000	134,000
13,490	17/32	MK-2	259,000	142,000
13,500		MK-2	259,000	142,000
14,000		MK-2	259,000	142,000
14,290	9/16	MK-2	264,000	147,000
14,500		MK-2	264,000	147,000
15,000		MK-2	264,000	147,000
16,000		MK-2	270,000	153,000
16,500		MK-2	276,000	159,000
16,670	21/32	MK-2	276,000	159,000
17,000		MK-2	276,000	159,000
17,460	11/16	MK-2	282,000	165,000
18,260	23/32	MK-3	307,000	171,000
19,500		MK-3	313,000	177,000
19,840	25/32	MK-3	313,000	177,000
20,500		MK-3	320,000	184,000
20,640	13/16	MK-3	320,000	184,000
21,000		MK-3	320,000	184,000

d1		S	l1	l2
mm	inch		mm	mm
21,500		MK-3	327,000	191,000
22,220	7/8	MK-3	327,000	191,000
22,500		MK-3	334,000	198,000
23,020	29/32	MK-3	334,000	198,000
23,810	15/16	MK-3	342,000	206,000
28,570	1 1/8	MK-4	393,000	230,000
29,000		MK-4	393,000	230,000
30,000		MK-4	393,000	230,000
30,960	1 7/32	MK-4	402,000	239,000
31,750	1 1/4	MK-4	411,000	248,000
32,000		MK-4	421,000	248,000
32,540	1 9/32	MK-4	421,000	248,000
33,340	1 5/16	MK-4	421,000	248,000
34,000		MK-4	430,000	257,000
34,920	1 3/8	MK-4	430,000	257,000



Brocas com canais de refrigeração, comprimento canais DIN 341



Material de corte **HSCO**

Superfície



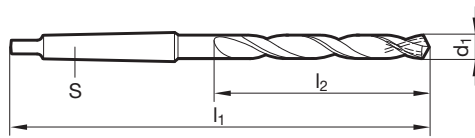
Sentido de corte



- P** • Redução da aresta transversal $\geq \varnothing 11,500$ • afiação de superfície cônica
- M** • fornecimento de refrigerante radial no cone Morse • aço-HSS ligado com Co • alta resistência ao desgaste • para furar através de buchas
- K** •
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm²
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **372**

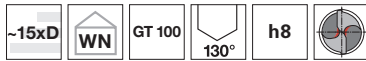
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
12,500		MK-2	251,000	134,000
12,700	1/2	MK-2	251,000	134,000
14,000		MK-2	259,000	142,000
16,000		MK-2	270,000	153,000
17,000		MK-2	276,000	159,000
18,500		MK-3	307,000	171,000

d1		S	l1	l2
mm	inch		mm	mm
21,500		MK-3	327,000	191,000
23,810	15/16	MK-3	342,000	206,000
27,000		MK-4	385,000	222,000
30,000		MK-4	393,000	230,000
34,000		MK-4	430,000	257,000



Brocas com canais de refrigeração, comprimento canais DIN 1870



Material de corte **HSCO**

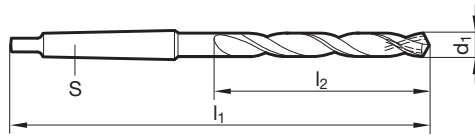
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \text{Ø } 11,000$ • afiação de superfície cônica
- M** • fornecimento de refrigeração axial através do cone morse • aço-HSS ligado com Co • resistência ao desgaste ampliada • para furar através de buchas
- K** •
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm^2
- S** •
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 794



Nr. do artigo **374**

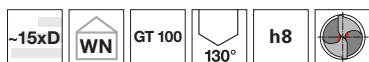
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
12,000		MK-2	322,000	205,000
12,300	31/64	MK-2	322,000	205,000
12,500		MK-2	322,000	205,000
13,000		MK-2	322,000	205,000
14,000		MK-2	337,000	220,000
15,000		MK-2	337,000	220,000
16,000		MK-2	347,000	230,000
16,500		MK-2	347,000	230,000
17,500		MK-2	362,000	245,000
18,000		MK-2	362,000	245,000
18,500		MK-3	381,000	245,000
19,840	25/32	MK-3	396,000	260,000
20,000		MK-3	396,000	260,000
21,000		MK-3	396,000	260,000
21,430	27/32	MK-3	406,000	270,000
21,500		MK-3	406,000	270,000
24,610	31/32	MK-3	426,000	290,000

d1		S	l1	l2
mm	inch		mm	mm
28,570	1 1/8	MK-4	468,000	305,000
28,750		MK-4	468,000	305,000
29,370	1 5/32	MK-4	468,000	305,000
30,960	1 7/32	MK-4	483,000	320,000
32,250		MK-4	493,000	320,000
32,540	1 9/32	MK-4	493,000	320,000
34,000		MK-4	513,000	340,000



Brocas com canais de refrigeração, comprimento canais DIN 1870



Material de corte **HSCO**

Superfície



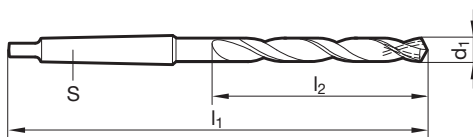
Sentido de corte



- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica • fornecimento de refrigerante radial através de anéis de refrigeração
- M** • Guhring • aço-HSS ligado com Co • alta resistência ao desgaste • para furar através de buchas
- K** •
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm²
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **375**

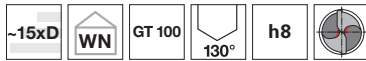
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
11,110	7/16	MK-2	312,000	195,000
11,510	29/64	MK-2	312,000	195,000
12,800		MK-2	322,000	205,000
13,500		MK-2	337,000	220,000
18,260	23/32	MK-3	381,000	245,000
19,000		MK-3	381,000	245,000
21,000		MK-3	396,000	260,000
21,430	27/32	MK-3	406,000	270,000
24,500		MK-3	426,000	290,000
25,000	63/64	MK-3	426,000	290,000
25,400	1	MK-3	426,000	290,000

d1		S	l1	l2
mm	inch		mm	mm
26,500		MK-3	426,000	290,000
28,570	1 1/8	MK-4	468,000	305,000
30,960	1 7/32	MK-4	483,000	320,000
32,540	1 9/32	MK-4	493,000	320,000
33,340	1 5/16	MK-4	493,000	320,000
34,000		MK-4	513,000	340,000



Brocas com canais de refrigeração, comprimento canais DIN 1870

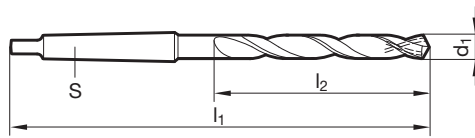


- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica
- M** • fornecimento de refrigerante radial no cone Morse • aço-HSS ligado com Co • alta resistência ao desgaste • para furar através de buchas
- K** •
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm²
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 794

Material de corte	HSCO
Superfície	●
Sentido de corte	Ⓜ



Nr. do artigo **376**

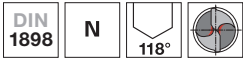
Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
13,000		MK-2	322,000	205,000
14,000		MK-2	337,000	220,000
16,500		MK-2	347,000	230,000
18,000		MK-2	362,000	245,000
19,840	25/32	MK-3	396,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
21,500		MK-3	406,000	270,000
27,780	1 3/32	MK-4	468,000	305,000
29,000		MK-4	468,000	305,000



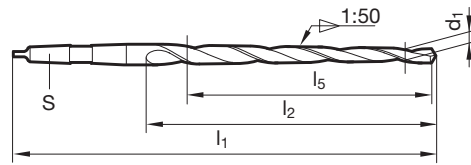
Brocas para furos de pinos



P • Redução da aresta transversal $\geq \varnothing 5,000$ • afiação de superfície cônica
 • para furos cônicos para recepção de pinos cônicos conforme DIN 1
 (nova: DIN EN 22339), DIN 7978 (nova DIN EN 28736), DIN 7977 (nova
 DIN EN 28737) e DIN 258

- M** ○
- K** •
- N** ○
- S** ○
- H** ○

Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ



Nr. do artigo **532**

d1	S	l1	l2	l5
mm		mm	mm	mm
5,000	MK-1	155,000	81,000	73,000
6,000	MK-1	187,000	108,000	105,000
8,000	MK-1	227,000	149,000	145,000
10,000	MK-1	257,000	180,000	175,000
12,000	MK-2	315,000	219,000	210,000
13,000	MK-2	325,000	229,000	220,000

d1	S	l1	l2	l5
mm		mm	mm	mm
14,000	MK-2	325,000	229,000	220,000
16,000	MK-2	335,000	239,000	230,000
20,000	MK-3	377,000	263,000	250,000
25,000	MK-3	427,000	311,000	300,000

Brocas helicoidais com cone Morse



Brocas especiais com cortes de metal duro

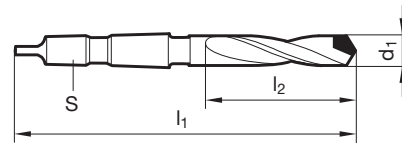


- P** ○ Redução da aresta transversal $\geq \varnothing 8,000$ • afiação facetada • providas com metal duro
- M** ○
- K** ○
- N** ○ aço para molas • fundição dura acima de 300 HB • molibdênio puro
- S** ○ • bronzes duros e tenazes
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 776

Material de corte	Metal duro
Superfície	○
Sentido de corte	Ⓜ



Nr. do artigo **705**

Brocas helicoidais com cone Morse

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	130,000	40,000
8,500		MK-1	135,000	45,000
10,000		MK-1	140,000	50,000
10,200		MK-1	140,000	50,000
10,500		MK-1	140,000	50,000
11,000		MK-1	140,000	50,000
11,500		MK-1	146,000	56,000
12,000		MK-1	146,000	56,000
13,000		MK-1	146,000	56,000
13,500		MK-2	168,000	63,000
14,000		MK-2	168,000	63,000
14,500		MK-2	168,000	63,000
15,000		MK-2	168,000	63,000
15,500		MK-2	175,000	70,000
16,000		MK-2	175,000	70,000
16,500		MK-2	175,000	70,000
17,000		MK-2	175,000	70,000
17,500		MK-2	185,000	80,000
18,000		MK-2	185,000	80,000
19,000		MK-2	185,000	80,000
19,500		MK-3	215,000	90,000
20,000		MK-3	215,000	90,000
21,000		MK-3	215,000	90,000
21,500		MK-3	215,000	90,000

d1		S	l1	l2
mm	inch		mm	mm
22,000		MK-3	215,000	90,000
23,000		MK-3	225,000	100,000
24,000		MK-3	225,000	100,000
24,500		MK-3	225,000	100,000
25,000	63/64	MK-3	225,000	100,000
26,000		MK-4	260,000	110,000
26,500		MK-4	260,000	110,000
27,000		MK-4	260,000	110,000
28,000		MK-4	260,000	110,000
30,000		MK-4	275,000	125,000
32,000		MK-4	275,000	125,000
33,000		MK-4	290,000	140,000
38,000		MK-4	310,000	160,000
40,000		MK-4	310,000	160,000

HSK-A para Cone Morse

Para fixação Cone Morse
com espiga

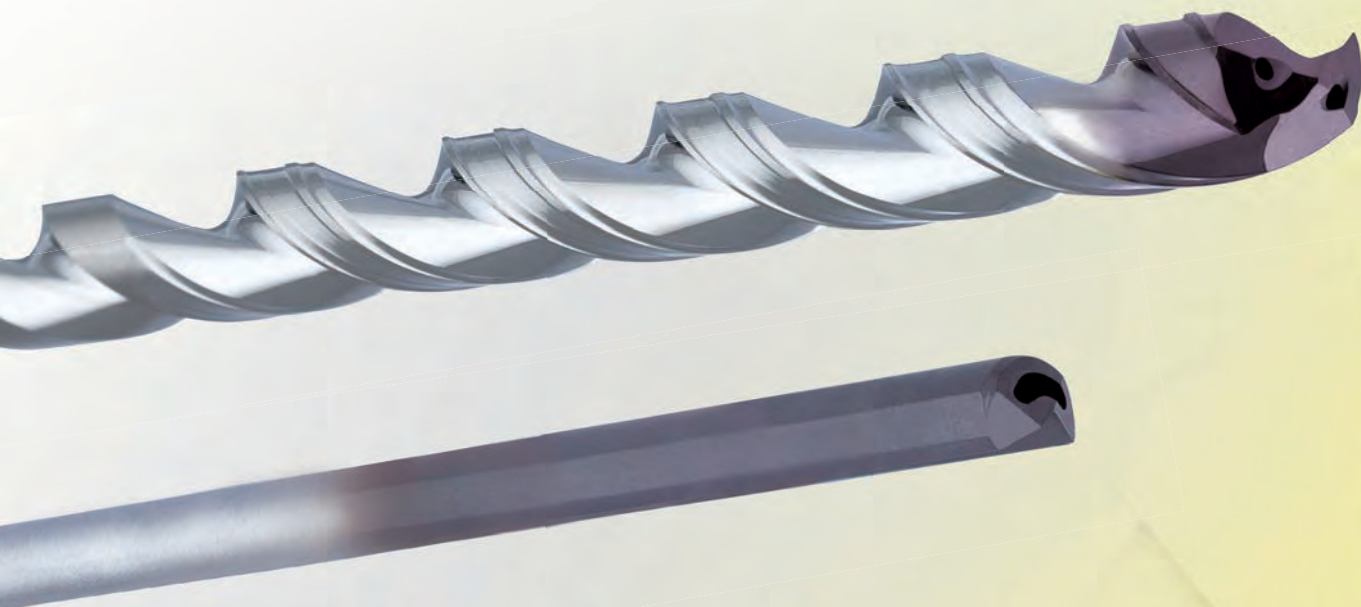


Mais informações podem ser
encontradas no nosso catálogo GM 300.





BROCAS CANHÃO PARA FURAÇÃO PROFUNDA





BROCAS DE METAL DURO
HELICOISAIS PARA FURAÇÃO
PROFUNDA



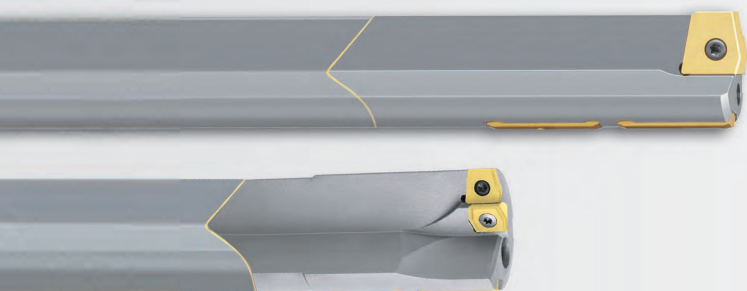
BROCAS CANHÃO DE METAL DURO
COM UM CORTE
EB 100



BROCAS CANHÃO SOLDADA
COM UM CORTE
EB 80



BROCAS CANHÃO SOLDADAS
COM DOIS CORTES
ZB 80



BROCAS CANHÃO MODULARES
COM UM CORTE
EB 800



BROCAS HSS/HSCO HELICOISAIS
PARA FURAÇÃO PROFUNDA



- brocas MDI para furos profundos para as mais elevadas velocidades de corte e avanços
- profundidades de furos de 15xD até 40xD
- Ø nominais de 3,00 – 14,00 mm
- ótima estabilidade e refrigeração da ferramenta
- elevadas vidas úteis com reduzidos tempos de usinagem
- adequadas para quase todos os tipos de materiais

à partir da página 523

- brocas para furos profundos com um corte para tolerâncias especialmente apertadas
- fabricadas acima de 0,9 mm Ø nominais
- Ø nominais até 16,00 mm
- comprimento dos canais de saída até 500,00 mm; porém no máx. 100xD
- até 80xD com somente uma ferramenta
- adequadas para quase todos materiais

à partir da página 529

- brocas para furos profundos com um corte com cabeça MD
- comprimento total até 3000,00 mm
- Ø nominal 2,00 – 40,00 mm
- grande variedade de execuções, por exemplo com raio completo ou como broca escalonada
- adequadas para quase todos os materiais

à partir da página 540

Brocas canhão para
furação profunda

- brocas para furos profundos com dois cortes com cabeça MD
- Ø nominal 6,00 – 30,00 mm
- ideais para GG25, GGG40, GGV
- canais de refrigeração extremamente grandes
- geometria da ponta otimizada

à partir da página 551

- brocas para furos profundos com um corte com pastilhas e lâminas de guia intercambiáveis
- Ø nominal 12,00 – 52,00 mm
- cada gama de haste básica modificável em 0,5 mm
- é possível toda combinação de classes de metal duro e revestimentos

à partir da página 553

- brocas para furos profundos espiralizadas HSS-/HSCO para processos de usinagem assegurados
- gama de diâmetros 0,40 mm – 50,00 mm
- comprimento dos canais de saída até 850,00 mm
- disponíveis com haste cilíndrica ou cônica
- adequada para muitos materiais

à partir da página 580



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	MATERIAL de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página	
•	•	•	•	•	•		15xD	WN	RT 100 T	R	VHM	A	3,000 - 14,000	6509	760 523	
•	•	•	•	•	•		20xD	WN	RT 100 T	R	VHM	A	3,000 - 14,000	6511	760 524	
•	•	•	•	•	•		25xD	WN	RT 100 T	R	VHM	A	3,000 - 12,000	6512	760 525	
•	•	•	•	•	•		30xD	WN	RT 100 T	R	VHM	A	3,000 - 10,000	6513	760 526	
•	•	•	•	•	•		40xD	WN	RT 100 T	R	VHM	A	3,000 - 8,000	6514	760 527	
Broca canhão com um corte EB 100																
•	•	•	•	•	•		25xD	WN	EB 100	R	VHM	a	2,380 - 12,000	5646	808 529	
•	•	•	•	•	•		50xD	WN	EB 100	R	VHM	a	2,380 - 8,000	5647	808 530	
•	•	•	•	•	•		75xD	WN	EB 100	R	VHM	a	2,380 - 6,000	5648	808 531	
•	•	•	•	•	•		45,00	WN	EB 100	R	VHM	○	1,200 - 3,200	5024	808 532	
•	•	•	•	•	•		45,00	WN	EB 100	R	VHM	A	1,200 - 3,200	5632	808 533	
•	•	•	•	•	•		80,00	WN	EB 100	R	VHM	○	1,200 - 5,000	5020	808 534	
•	•	•	•	•	•		80,00	WN	EB 100	R	VHM	A	1,200 - 5,000	5633	808 535	
•	•	•	•	•	•		120,00	WN	EB 100	R	VHM	○	1,500 - 5,000	5026	808 536	
•	•	•	•	•	•		120,00	WN	EB 100	R	VHM	A	1,500 - 5,000	5637	808 537	
•	•	•	•	•	•		160,00	WN	EB 100	R	VHM	○	1,500 - 8,000	5021	808 538	
•	•	•	•	•	•		160,00	WN	EB 100	R	VHM	A	1,500 - 8,000	5638	808 539	
Broca canhão com um corte EB 80																
•	•	•	•	•	•		20xD	WN	EB 80	R	HM	S	4,000 - 12,000	5018	808 540	
•	•	•	•	•	•		20xD	WN	EB 80	R	HM	C	3,970 - 12,700	5639	808 541	
•	•	•	•	•	•		30xD	WN	EB 80	R	HM	S	4,000 - 12,000	5460	808 542	
•	•	•	•	•	•		30xD	WN	EB 80	R	HM	C	3,970 - 12,700	5640	808 543	
•	•	•	•	•	•		40xD	WN	EB 80	R	HM	○	4,000 - 12,000	5689	808 544	
•	•	•	•	•	•		40xD	WN	EB 80	R	HM	S	4,000 - 12,000	5022	808 545	
•	•	•	•	•	•		40xD	WN	EB 80	R	HM	C	3,970 - 12,700	5641	808 546	

Brocas canhão para furação profunda



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página		
Broca canhão com um corte EB 80																	
•	○	•	○	○	○		80xD	WN	EB 80	R	HM	○	3,970 - 11,950	5690	808 547		
•	○	•	○	○	○		80xD	WN	EB 80	R	HM	Ⓢ	4,950 - 11,950	5023	808 548		
○	•	○	•	○	○		80xD	WN	EB 80	R	HM	Ⓢ	4,950 - 12,650	5642	808 549		
•	○	•	•	○	○		1100,00	WN	EB 80	R	HM	Ⓢ	6,000 - 22,000	5164	808 550		
Broca canhão com dois cortes ZB 80																	
•	•	•	•	•	•		30xD	WN	ZB 80	R	HM	○	8,000 - 12,000	5019	808 551		
•	•	•	•	•	•		30xD	WN	ZB 80	R	HM	○	8,000 - 12,000	5643	808 552		
Broca canhão com um corte EB 800 com pastilhas intercambiáveis																	
•	○	○	•	○	○		30xD	WN	EB 800	R	HM	Ⓢ	12,000 - 24,000	5644	808 555		
Chave Torx																	
						WN										1612	558
Torquímetro																	
						WN										4915	559
Pontas intercambiáveis Torx																	
						WN										4917	560
Parafusos de fixação																	
						WN										4071	561
Através de buchas																	
						WN					VHM					5748	565
						WN					HSS					5747	566
Discos de vedação para broca canhão com um corte																	
						WN										5752	569
Buchas de guia para lunetas, para brocas canhão com um corte																	
						WN										5750	571
Buchas para lunetas para brocas com um e dois cortes																	
						WN										5749	573

Brocas canhão para furação profunda



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	MATERIAL de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Discos de vedação para broca canhão com dois cortes

														5753	575
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Buchas de guia para lunetas, para brocas canhão com dois cortes

														5751	576
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Parafuso de ajuste

														5754	577
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														5755	578
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Brocas helicoidais longas

•	•	•	•	•	•		~10xD	DIN 340	N	(R)	HSS		0,400 - 36,510	217	786	580
•	•	•	•	•	•		~10xD	DIN 340	N	(R)	HSS		0,500 - 22,220	667	786	583
•	•	•	•	•	•		~10xD	DIN 340	N	(L)	HSS		0,450 - 29,000	220	786	585
•	•	•	•	•	•		~10xD	DIN 340	N	(R)	HSS		2,950 - 25,250	204	786	587
•	•	•	•	•	•		~10xD	DIN 340	H	(R)	HSS		0,500 - 16,000	218	786	588
•	•	•	•	•	•		~10xD	DIN 340	H	(L)	HSS		0,450 - 15,000	221	786	590
•	•	•	•	•	•		~10xD	DIN 340	W	(R)	HSS		0,500 - 20,640	219	786	591
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSS		1,000 - 14,000	535	786	593
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSS		1,000 - 14,000	668	786	596
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSS		1,000 - 10,000	2462	786	598
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(L)	HSS		1,400 - 13,000	506	786	599
•	•	•	•	•	•		~10xD	DIN 340	GT 50	(R)	HSS		1,000 - 32,600	501	786	600
•	•	•	•	•	•		~10xD	DIN 340	N	(R)	HSCO		0,500 - 22,000	317	792	602
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSCO		1,000 - 16,000	336	792	604
•	•	•	•	•	•		~10xD	DIN 340	GT 100	(R)	HSCO		1,000 - 12,000	396	792	606
•	•	•	•	•	•		~10xD	DIN 340	Ti	(R)	HSCO		1,000 - 15,000	617	792	607
•	•	•	•	•	•		~10xD	DIN 340	Ti	(R)	HSCO		1,000 - 10,200	669	792	609
•	•	•	•	•	•		~10xD	WN	N	(R)	VHM		0,500 - 1,450	706	792	611

Brocas canhão para furação profunda



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página	
•	•	•	•	•	•		~15xD	DIN 1869	N	(R)	HSS		1,600 - 13,000	235	788 612	
•	•	•	•	•	•		~15xD	DIN 1869	GT 100	(R)	HSS		1,950 - 13,000	502	790 614	
•	•	•	•	•	•		~15xD	DIN 1869	GT 100	(R)	HSS		2,000 - 12,700	670	790 616	
•	•	•	•	•	•		~15xD	DIN 1869	GT 50	(R)	HSS		2,000 - 12,700	524	788 617	
•	•	•	•	•	•		~15xD	DIN 1869	GT 100	(R)	HSCO		2,700 - 10,000	618	794 619	
Brocas helicoidais extra longas, série 2																
•	•	•	•	•	•		~20xD	DIN 1869	N	(R)	HSS		2,700 - 13,000	236	788 620	
•	•	•	•	•	•		~20xD	DIN 1869	GT 100	(R)	HSS		2,000 - 13,000	503	790 621	
•	•	•	•	•	•		~20xD	DIN 1869	GT 100	(R)	HSS		2,700 - 8,500	671	790 623	
•	•	•	•	•	•		~20xD	DIN 1869	GT 50	(R)	HSS		3,000 - 13,000	528	788 624	
•	•	•	•	•	•		~20xD	DIN 1869	GT 100	(R)	HSCO		3,000 - 10,000	619	794 625	
Brocas helicoidais extra longas, série 3																
•	•	•	•	•	•		~25xD	DIN 1869	N	(R)	HSS		3,500 - 13,000	237	788 626	
•	•	•	•	•	•		~25xD	DIN 1869	GT 100	(R)	HSS		2,500 - 13,000	504	790 627	
•	•	•	•	•	•		~25xD	DIN 1869	GT 50	(R)	HSS		2,500 - 10,000	529	788 628	
•	•	•	•	•	•		~25xD	DIN 1869	GT 100	(R)	HSCO		2,500 - 13,000	571	794 629	
Brocas helicoidais extra longas																
•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS		6,000 - 12,000	242	790 630	
•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS		8,000 - 12,000	243	790 631	
•	•	•	•	•	•		>25xD	WN	GT 100	(R)	HSS		10,000 - 12,000	244	790 632	
Brocas helicoidais extra longas, série 1																
•	•	•	•	•	•		~15xD	DIN 1870	N	(R)	HSS		8,000 - 50,000	266	788 633	
•	•	•	•	•	•		~15xD	DIN 1870	GT 100	(R)	HSS		8,000 - 30,000	526	790 634	
•	•	•	•	•	•		~15xD	DIN 1870	GT 50	(R)	HSS		8,500 - 33,000	525	788 635	
•	•	•	•	•	•		~15xD	DIN 1870	GT 100	(R)	HSCO		9,520 - 30,000	620	794 636	

Brocas canhão para furação profunda



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Brocas helicoidais extra longas, série 2

•	•	•	•	•	•		~20xD	DIN 1870	N		HSS	●	8,000 - 45,000	267	788 637
•	•	•	•	•	•		~20xD	DIN 1870	GT 100		HSS	● ≥0/16,0	8,000 - 30,000	527	790 638
○	•	•	•	•	•		~20xD	DIN 1870	GT 50		HSS	○	8,500 - 31,000	542	788 639
•	•	•	•	•	•		~20xD	DIN 1870	GT 100		HSCO	● ≥0/16,0	9,520 - 23,420	621	794 640

Brocas com canais de refrigeração, comprimento canais DIN 1870

•	•	•	•	•	•		~15xD	WN	GT 100		HSCO	●	11,000 - 34,000	374	794 641
•	•	•	•	•	•		~15xD	WN	GT 100		HSCO	●	11,000 - 34,000	375	794 642
•	•	•	•	•	•		~15xD	WN	GT 100		HSCO	●	11,000 - 29,000	376	794 643

Brocas canhão para furação profunda



Brocas Ratio com canais de refrigeração

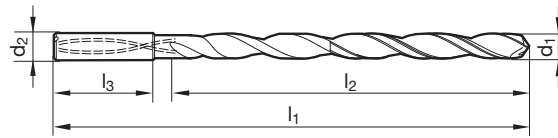


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • • formato côncavo da aresta de corte principal • seção de canal otimizada
- K** • • máxima seção de canal de refrigeração • observar pressão de refrigeração
- N** ○ aços para construção e cementação • aços para máquinas automáticas,
- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços
- H** ○ inoxidáveis • materiais fundidos

Material de corte	MD int.
Superfície	A
Forma da haste	HA

GÜHRING NAVIGATOR

Página de dados de corte 760



Nr. do artigo **6509**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	95,000	55,000	36,000	7,940	5/16	8,000	183,000	143,000	36,000
3,170	1/8	6,000	106,000	67,000	36,000	8,000		8,000	183,000	143,000	36,000
3,500		6,000	116,000	76,000	36,000	8,330	21/64	10,000	204,000	160,000	40,000
3,570	9/64	6,000	116,000	76,000	36,000	8,500		10,000	204,000	160,000	40,000
3,970	5/32	6,000	116,000	76,000	36,000	8,730	11/32	10,000	204,000	160,000	40,000
4,000		6,000	116,000	76,000	36,000	9,000		10,000	204,000	160,000	40,000
4,370	11/64	6,000	133,000	93,000	36,000	9,130	23/64	10,000	221,000	177,000	40,000
4,500		6,000	133,000	93,000	36,000	9,520	3/8	10,000	221,000	177,000	40,000
4,760	3/16	6,000	133,000	93,000	36,000	9,920	25/64	10,000	221,000	177,000	40,000
5,000		6,000	133,000	93,000	36,000	10,000		10,000	221,000	177,000	40,000
5,100		6,000	150,000	110,000	36,000	10,320	13/32	12,000	247,000	198,000	45,000
5,160	13/64	6,000	150,000	110,000	36,000	10,720	27/64	12,000	247,000	198,000	45,000
5,410		6,000	150,000	110,000	36,000	11,000		12,000	247,000	198,000	45,000
5,500		6,000	150,000	110,000	36,000	11,110	7/16	12,000	263,000	214,000	45,000
5,560	7/32	6,000	150,000	110,000	36,000	11,510	29/64	12,000	263,000	214,000	45,000
5,950	15/64	6,000	150,000	110,000	36,000	11,910	15/32	12,000	263,000	214,000	45,000
6,000		6,000	150,000	110,000	36,000	12,000		12,000	263,000	214,000	45,000
6,350	1/4	8,000	167,000	127,000	36,000	12,300	31/64	14,000	297,000	248,000	45,000
6,500		8,000	167,000	127,000	36,000	12,700	1/2	14,000	297,000	248,000	45,000
6,750	17/64	8,000	167,000	127,000	36,000	13,100	33/64	14,000	297,000	248,000	45,000
7,000		8,000	167,000	127,000	36,000	13,490	17/32	14,000	297,000	248,000	45,000
7,140	9/32	8,000	183,000	143,000	36,000	13,890	35/64	14,000	297,000	248,000	45,000
7,500		8,000	183,000	143,000	36,000	14,000		14,000	297,000	248,000	45,000
7,540	19/64	8,000	183,000	143,000	36,000						

Brocas canhão para furação profunda



Brocas Ratio com canais de refrigeração

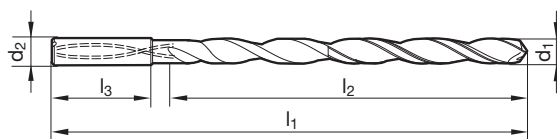


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
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- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços
- H** ○ inoxidáveis • materiais fundidos

GÜHRING NAVIGATOR

Página de dados de corte 760

Material de corte	MD int.
Superfície	A
Forma da haste	HA



Nr. do artigo **6511**

Brocas canhão para furação profunda

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	110,000	70,000	36,000	8,730	11/32	10,000	249,000	205,000	40,000
3,100		6,000	123,000	83,000	36,000	9,000		10,000	249,000	205,000	40,000
3,170	1/8	6,000	123,000	83,000	36,000	9,130	23/64	10,000	271,000	227,000	40,000
3,500		6,000	136,000	96,000	36,000	9,520	3/8	10,000	271,000	227,000	40,000
3,570	9/64	6,000	136,000	96,000	36,000	9,920	25/64	10,000	271,000	227,000	40,000
3,970	5/32	6,000	136,000	96,000	36,000	10,000		10,000	271,000	227,000	40,000
4,000		6,000	136,000	96,000	36,000	10,320	13/32	12,000	302,000	253,000	45,000
4,200		6,000	158,000	118,000	36,000	10,720	27/64	12,000	302,000	253,000	45,000
4,370	11/64	6,000	158,000	118,000	36,000	11,000		12,000	302,000	253,000	45,000
4,500		6,000	158,000	118,000	36,000	11,110	7/16	12,000	323,000	274,000	45,000
4,760	3/16	6,000	158,000	118,000	36,000	11,510	29/64	12,000	323,000	274,000	45,000
5,000		6,000	158,000	118,000	36,000	11,910	15/32	12,000	323,000	274,000	45,000
5,100		6,000	180,000	140,000	36,000	12,000		12,000	323,000	274,000	45,000
5,160	13/64	6,000	180,000	140,000	36,000	12,300	31/64	14,000	367,000	318,000	45,000
5,410		6,000	180,000	140,000	36,000	12,700	1/2	14,000	367,000	318,000	45,000
5,500		6,000	180,000	140,000	36,000	13,100	33/64	14,000	367,000	318,000	45,000
5,560	7/32	6,000	180,000	140,000	36,000	13,490	17/32	14,000	367,000	318,000	45,000
5,950	15/64	6,000	180,000	140,000	36,000	13,890	35/64	14,000	367,000	318,000	45,000
6,000		6,000	180,000	140,000	36,000	14,000		14,000	367,000	318,000	45,000
6,350	1/4	8,000	202,000	162,000	36,000						
6,500		8,000	202,000	162,000	36,000						
6,750	17/64	8,000	202,000	162,000	36,000						
7,000		8,000	202,000	162,000	36,000						
7,140	9/32	8,000	223,000	183,000	36,000						
7,500		8,000	223,000	183,000	36,000						
7,540	19/64	8,000	223,000	183,000	36,000						
7,940	5/16	8,000	223,000	183,000	36,000						
8,000		8,000	223,000	183,000	36,000						
8,330	21/64	10,000	249,000	205,000	40,000						
8,500		10,000	249,000	205,000	40,000						



Brocas Ratio com canais de refrigeração

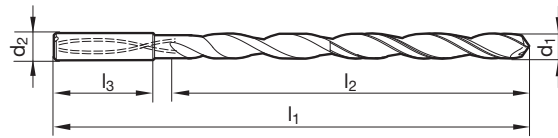


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • formato côncavo da aresta de corte principal • seção de canal otimizada
- K** • máxima seção de canal de refrigeração • observar pressão de refrigeração
- N** ○ aços para construção e cementação • aços para máquinas automáticas,
- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos
- H** ○

Material de corte	MD int.
Superfície	A
Forma da haste	HA

GÜHRING NAVIGATOR

Página de dados de corte 760



Nr. do artigo **6512**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	125,000	85,000	36,000	7,000		8,000	237,000	197,000	36,000
3,100		6,000	141,000	101,000	36,000	7,140	9/32	8,000	263,000	223,000	36,000
3,170	1/8	6,000	141,000	101,000	36,000	7,500		8,000	263,000	223,000	36,000
3,500		6,000	156,000	116,000	36,000	7,540	19/64	8,000	263,000	223,000	36,000
3,570	9/64	6,000	156,000	116,000	36,000	7,940	5/16	8,000	263,000	223,000	36,000
3,800		6,000	156,000	116,000	36,000	8,000		8,000	263,000	223,000	36,000
3,970	5/32	6,000	156,000	116,000	36,000	8,330	21/64	10,000	294,000	250,000	40,000
4,000		6,000	156,000	116,000	36,000	8,500		10,000	294,000	250,000	40,000
4,200		6,000	183,000	143,000	36,000	8,730	11/32	10,000	294,000	250,000	40,000
4,370	11/64	6,000	183,000	143,000	36,000	8,800		10,000	294,000	250,000	40,000
4,500		6,000	183,000	143,000	36,000	9,000		10,000	294,000	250,000	40,000
4,760	3/16	6,000	183,000	143,000	36,000	9,130	23/64	10,000	321,000	277,000	40,000
5,000		6,000	183,000	143,000	36,000	9,520	3/8	10,000	321,000	277,000	40,000
5,100		6,000	210,000	170,000	36,000	9,920	25/64	10,000	321,000	277,000	40,000
5,160	13/64	6,000	210,000	170,000	36,000	10,000		10,000	321,000	277,000	40,000
5,410		6,000	210,000	170,000	36,000	10,320	13/32	12,000	359,000	310,000	45,000
5,500		6,000	210,000	170,000	36,000	10,720	27/64	12,000	359,000	310,000	45,000
5,560	7/32	6,000	210,000	170,000	36,000	11,000		12,000	359,000	310,000	45,000
5,950	15/64	6,000	210,000	170,000	36,000	11,110	7/16	12,000	386,000	337,000	45,000
6,000		6,000	210,000	170,000	36,000	11,510	29/64	12,000	386,000	337,000	45,000
6,300		8,000	237,000	197,000	36,000	11,910	15/32	12,000	386,000	337,000	45,000
6,350	1/4	8,000	237,000	197,000	36,000	12,000		12,000	386,000	337,000	45,000
6,500		8,000	237,000	197,000	36,000						
6,750	17/64	8,000	237,000	197,000	36,000						

Brocas canhão para furação profunda



Brocas Ratio com canais de refrigeração

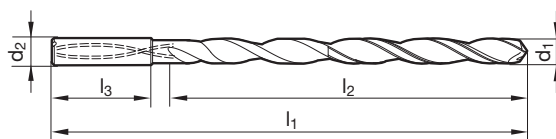


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • • formato côncavo da aresta de corte principal • seção de canal otimizada
- K** • • máxima seção de canal de refrigeração • observar pressão de refrigeração
- N** ○ aços para construção e cementação • aços para máquinas automáticas,
- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços
- H** ○ inoxidáveis • materiais fundidos

GÜHRING NAVIGATOR

Página de dados de corte 760

Material de corte	MD int.
Superfície	A
Forma da haste	HA



Nr. do artigo **6513**

Brocas canhão para furação profunda

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	140,000	100,000	36,000	7,000		8,000	272,000	232,000	36,000
3,100		6,000	158,000	118,000	36,000	7,140	9/32	8,000	303,000	263,000	36,000
3,170	1/8	6,000	158,000	118,000	36,000	7,500		8,000	303,000	263,000	36,000
3,500		6,000	176,000	136,000	36,000	7,540	19/64	8,000	303,000	263,000	36,000
3,570	9/64	6,000	176,000	136,000	36,000	7,940	5/16	8,000	303,000	263,000	36,000
3,800		6,000	176,000	136,000	36,000	8,000		8,000	303,000	263,000	36,000
3,970	5/32	6,000	176,000	136,000	36,000	8,330	21/64	10,000	339,000	295,000	40,000
4,000		6,000	176,000	136,000	36,000	8,500		10,000	339,000	295,000	40,000
4,200		6,000	208,000	168,000	36,000	8,730	11/32	10,000	339,000	295,000	40,000
4,370	11/64	6,000	208,000	168,000	36,000	8,800		10,000	339,000	295,000	40,000
4,500		6,000	208,000	168,000	36,000	9,000		10,000	339,000	295,000	40,000
4,760	3/16	6,000	208,000	168,000	36,000	9,130	23/64	10,000	371,000	327,000	40,000
5,000		6,000	208,000	168,000	36,000	9,520	3/8	10,000	371,000	327,000	40,000
5,100		6,000	240,000	200,000	36,000	9,920	25/64	10,000	371,000	327,000	40,000
5,160	13/64	6,000	240,000	200,000	36,000	10,000		10,000	371,000	327,000	40,000
5,410		6,000	240,000	200,000	36,000						
5,500		6,000	240,000	200,000	36,000						
5,560	7/32	6,000	240,000	200,000	36,000						
5,950	15/64	6,000	240,000	200,000	36,000						
6,000		6,000	240,000	200,000	36,000						
6,300		8,000	272,000	232,000	36,000						
6,350	1/4	8,000	272,000	232,000	36,000						
6,500		8,000	272,000	232,000	36,000						
6,750	17/64	8,000	272,000	232,000	36,000						



Brocas Ratio com canais de refrigeração

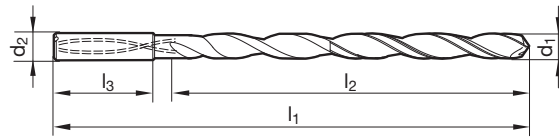


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • • formato côncavo da aresta de corte principal • seção de canal otimizada
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- N** ○ aços para construção e cementação • aços para máquinas automáticas,
- S** ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços
- H** ○ inoxidáveis • materiais fundidos

GÜHRING NAVIGATOR

Página de dados de corte 760

Material de corte	MD int.
Superfície	A
Forma da haste	HA



Nr. do artigo **6514**

d1		d2 h6	l1	l2	l3	d1		d2 h6	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	170,000	130,000	36,000	5,950	15/64	6,000	300,000	260,000	36,000
3,100		6,000	193,000	153,000	36,000	6,000		6,000	300,000	260,000	36,000
3,170	1/8	6,000	193,000	153,000	36,000	6,300		8,000	322,000	282,000	36,000
3,500		6,000	193,000	153,000	36,000	6,350	1/4	8,000	322,000	282,000	36,000
3,570	9/64	6,000	216,000	176,000	36,000	6,500		8,000	322,000	282,000	36,000
3,800		6,000	216,000	176,000	36,000	6,750	17/64	8,000	342,000	302,000	36,000
3,970	5/32	6,000	216,000	176,000	36,000	7,000		8,000	342,000	302,000	36,000
4,000		6,000	216,000	176,000	36,000	7,140	9/32	8,000	363,000	323,000	36,000
4,200		6,000	238,000	198,000	36,000	7,500		8,000	363,000	323,000	36,000
4,370	11/64	6,000	238,000	198,000	36,000	7,540	19/64	8,000	383,000	343,000	36,000
4,500		6,000	238,000	198,000	36,000	7,940	5/16	8,000	383,000	343,000	36,000
4,760	3/16	6,000	258,000	218,000	36,000	8,000		8,000	383,000	343,000	36,000
5,000		6,000	258,000	218,000	36,000						
5,100		6,000	280,000	240,000	36,000						
5,160	13/64	6,000	280,000	240,000	36,000						
5,410		6,000	280,000	240,000	36,000						
5,500		6,000	280,000	240,000	36,000						
5,560	7/32	6,000	300,000	260,000	36,000						

Brocas canhão para furação profunda



Ação de serviço rápido para brocas para furos profundos

fornecimento de brocas para furos profundos sobre medida dentro de poucos dias úteis:
A ação de serviço super rápido da Gühring torna isso possível

EB 100

As possibilidades de execução:

- comprimentos de canais de saída:

45 mm Ø 1,2 / 1,5 / 1,59 / 1,6 / 1,98 / 2,0 / 2,5 / 2,7 / 3,0 / 3,2

80 mm Ø 1,5 / 1,59 / 1,6 / 1,98 / 2,0 / 2,5 / 2,7 / 3,0 / 3,2 / 3,5 / 4,0 / 4,2 / 4,5 / 5,0

120 mm Ø 1,5 / 1,59 / 1,6 / 1,98 / 2,0 / 2,5 / 2,7 / 3,0 / 3,2 / 3,5 / 4,0 / 4,2 / 4,5 / 5,0

160 mm Ø 1,5 / 1,59 / 1,6 / 1,98 / 2,0 / 2,5 / 2,7 / 3,0 / 3,2 / 3,5 / 4,0 / 4,2 / 4,5 / 5,0 /
6,0 / 8,0

- solução especial: diâmetro nominal 0,9 – 16,0 mm, comprimento do canal de saída máx. 500 mm
- classe de MD; K30/K40
- forma de circunferência G
- brilhante ou revestida
- em combinação com pinças de fixação usuais

Fornecimento de ferramentas especiais dentro de 15 dias úteis

EB 80

As possibilidades de execução:

- diâmetro nominal 2,0 - 13,9 mm crescente em 0,1 mm
- diâmetro nominal 14,0 – 22,0 mm crescente em 0,5 mm
- comprimento total até 1.200 mm, comprimento do canal de saída mín. 20xD
- forma da circunferência G
- pinças de fixação usuais
- classe de MD K15
- brilhante com afiação padrão para materiais de fundição e alumínio
- revestimento S (TiN) com quebra cavacos para cavacos longos
- em combinação com revestimentos usuais

Fornecimento de ferramentas especiais dentro de 10 dias úteis



Broca canhão com um corte EB 100



Material de corte **MD int.**

Superfície **Ⓜ**

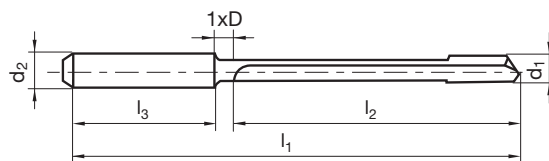
Forma da haste HA

P • forma da circunferência G • haste integral VDI com extremidade cônica MQL a partir de d1 = 3 mm respectivamente d2 = 6 mm

P	•
M	•
K	○
N	
S	○
H	○

GÜHRINGNAVIGATOR

Página de dados de corte 808



Nr. do artigo **5646**

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
2,380	3/32	4,000	100,000	70,000	28,000	2,380	
2,500		4,000	115,000	85,000	28,000	2,500	
2,780	7/64	4,000	115,000	85,000	28,000	2,780	
3,000		6,000	145,000	105,000	36,000	3,000	
3,170	1/8	6,000	145,000	105,000	36,000	3,170	
3,500		6,000	145,000	105,000	36,000	3,500	
3,570	9/64	6,000	160,000	120,000	36,000	3,570	
3,970	5/32	6,000	160,000	120,000	36,000	3,970	
4,000		6,000	160,000	120,000	36,000	4,000	
4,370	11/64	6,000	220,000	180,000	36,000	4,370	
4,760	3/16	6,000	220,000	180,000	36,000	4,760	
5,000		6,000	220,000	180,000	36,000	5,000	
5,160	13/64	6,000	220,000	180,000	36,000	5,160	
5,560	7/32	6,000	220,000	180,000	36,000	5,560	
5,950	15/64	6,000	220,000	180,000	36,000	5,950	
6,000		6,000	220,000	180,000	36,000	6,000	
6,350	1/4	8,000	260,000	210,000	36,000	6,350	
6,750	17/64	8,000	260,000	210,000	36,000	6,750	
7,000		8,000	260,000	210,000	36,000	7,000	
7,140	9/32	8,000	285,000	240,000	36,000	7,140	
7,540	19/64	8,000	285,000	240,000	36,000	7,540	
7,940	5/16	8,000	285,000	240,000	36,000	7,940	
8,000		8,000	285,000	240,000	36,000	8,000	
9,000		10,000	350,000	300,000	40,000	9,000	
10,000		10,000	350,000	300,000	40,000	10,000	
11,000		12,000	420,000	360,000	45,000	11,000	
12,000		12,000	420,000	360,000	45,000	12,000	

Brocas canhão para furação profunda



Broca canhão com um corte EB 100



Material de corte **MD int.**

Superfície **Ⓜ**

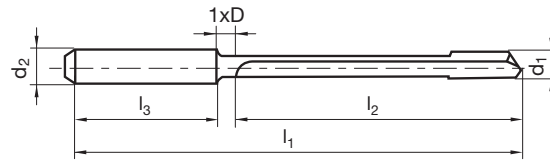
Forma da haste HA

P • forma da circunferência G • haste integral VDI com extremidade cônica MQL a partir de d1 = 3 mm respectivamente d2 = 6 mm

P	•
M	•
K	○
N	
S	○
H	○

GÜHRINGNAVIGATOR

Página de dados de corte 808



Nr. do artigo **5647**

Brocas canhão para furação profunda

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
2,380	3/32	4,000	160,000	130,000	28,000	2,380	
2,500		4,000	185,000	155,000	28,000	2,500	
2,780	7/64	4,000	185,000	155,000	28,000	2,780	
3,000		6,000	230,000	190,000	36,000	3,000	
3,170	1/8	6,000	230,000	190,000	36,000	3,170	
3,500		6,000	230,000	190,000	36,000	3,500	
3,570	9/64	6,000	260,000	220,000	36,000	3,570	
3,970	5/32	6,000	260,000	220,000	36,000	3,970	
4,000		6,000	260,000	220,000	36,000	4,000	
4,370	11/64	6,000	370,000	330,000	36,000	4,370	
4,760	3/16	6,000	370,000	330,000	36,000	4,760	
5,000		6,000	370,000	330,000	36,000	5,000	
5,160	13/64	6,000	370,000	330,000	36,000	5,160	
5,560	7/32	6,000	370,000	330,000	36,000	5,560	
5,950	15/64	6,000	370,000	330,000	36,000	5,950	
6,000		6,000	370,000	330,000	36,000	6,000	
6,350	1/4	8,000	430,000	385,000	36,000	6,350	
6,750	17/64	8,000	430,000	385,000	36,000	6,750	
7,000		8,000	430,000	385,000	36,000	7,000	
7,140	9/32	8,000	485,000	440,000	36,000	7,140	
7,540	19/64	8,000	485,000	440,000	36,000	7,540	
7,940	5/16	8,000	485,000	440,000	36,000	7,940	
8,000		8,000	485,000	440,000	36,000	8,000	



Broca canhão com um corte EB 100



Material de corte **MD int.**

Superfície **⊕**

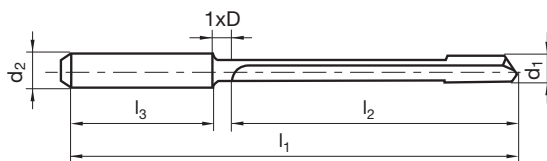
Forma da haste HA

P • forma da circunferência G • haste integral VDI com extremidade cônica
MQL a partir de d1 = 3 mm respectivamente d2 = 6 mm

P	•
M	•
K	○
N	
S	○
H	○

GÜHRINGNAVIGATOR

Página de dados de corte 808



Nr. do artigo **5648**

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
2,380	3/32	4,000	220,000	190,000	28,000	2,380	
2,500		4,000	255,000	220,000	28,000	2,500	
2,780	7/64	4,000	255,000	220,000	28,000	2,780	
3,000		6,000	320,000	280,000	36,000	3,000	
3,170	1/8	6,000	320,000	280,000	36,000	3,170	
3,500		6,000	320,000	280,000	36,000	3,500	
3,570	9/64	6,000	360,000	320,000	36,000	3,570	
3,970	5/32	6,000	360,000	320,000	36,000	3,970	
4,000		6,000	360,000	320,000	36,000	4,000	
4,370	11/64	6,000	525,000	485,000	36,000	4,370	
4,760	3/16	6,000	525,000	485,000	36,000	4,760	
5,000		6,000	525,000	485,000	36,000	5,000	
5,160	13/64	6,000	525,000	485,000	36,000	5,160	
5,560	7/32	6,000	525,000	485,000	36,000	5,560	
5,950	15/64	6,000	525,000	485,000	36,000	5,950	
6,000		6,000	525,000	485,000	36,000	6,000	

Brocas canhão para furação profunda



Broca canhão com um corte EB 100

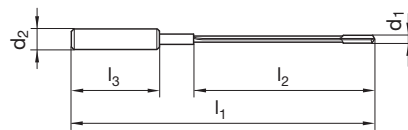


P	○	comprimento do canal 45 mm • forma da circunferência G
M	○	
K	○	
N	●	
S	●	
H	○	

GÜHRINGNAVIGATOR

Página de dados de corte 808

Material de corte	MD int.
Superfície	○
Forma da haste	HA



Nr. do artigo **5024**

Brocas canhão para furação profunda

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
1,200		4,000	90,000	45,000	28,000	1,200	
1,500		4,000	90,000	45,000	28,000	1,500	
1,590	1/16	4,000	90,000	45,000	28,000	1,590	
1,600		4,000	90,000	45,000	28,000	1,600	
1,980	5/64	4,000	90,000	45,000	28,000	1,980	
2,000		4,000	90,000	45,000	28,000	2,000	
2,500		10,000	100,000	45,000	40,000	2,500	
2,700		10,000	100,000	45,000	40,000	2,700	
3,000		10,000	100,000	45,000	40,000	3,000	
3,200		10,000	100,000	45,000	40,000	3,200	



Broca canhão com um corte EB 100



Material de corte **MD int.**

Superfície **A**

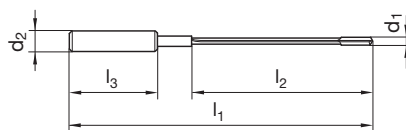
Forma da haste HA

P • comprimento do canal 45 mm • forma da circunferência G

P	•
M	○
K	•
N	○
S	○
H	○

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5632**

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
1,200		4,000	90,000	45,000	28,000	1,200
1,500		4,000	90,000	45,000	28,000	1,500
1,590	1/16	4,000	90,000	45,000	28,000	1,590
1,600		4,000	90,000	45,000	28,000	1,600
1,980	5/64	4,000	90,000	45,000	28,000	1,980
2,000		4,000	90,000	45,000	28,000	2,000
2,500		10,000	100,000	45,000	40,000	2,500
2,700		10,000	100,000	45,000	40,000	2,700
3,000		10,000	100,000	45,000	40,000	3,000
3,200		10,000	100,000	45,000	40,000	3,200

Brocas canhão para furação profunda



Broca canhão com um corte EB 100

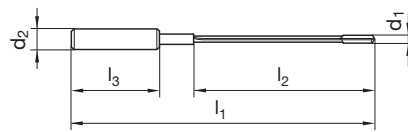


P	○	comprimento do canal 80 mm • forma da circunferência G
M	○	
K	○	
N	●	
S	●	
H	○	

GÜHRING NAVIGATOR

Página de dados de corte 808

Material de corte	MD int.
Superfície	○
Forma da haste	HA



Nr. do artigo **5020**

Brocas canhão para furação profunda

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
1,200		4,000	125,000	80,000	28,000	1,200	
1,500		4,000	125,000	80,000	28,000	1,500	
1,590	1/16	4,000	125,000	80,000	28,000	1,590	
1,600		4,000	125,000	80,000	28,000	1,600	
1,980	5/64	4,000	125,000	80,000	28,000	1,980	
2,000		4,000	125,000	80,000	28,000	2,000	
2,500		10,000	135,000	80,000	40,000	2,500	
2,700		10,000	135,000	80,000	40,000	2,700	
3,000		10,000	135,000	80,000	40,000	3,000	
3,200		10,000	135,000	80,000	40,000	3,200	
3,500		10,000	135,000	80,000	40,000	3,500	
4,000		10,000	135,000	80,000	40,000	4,000	
4,200		10,000	135,000	80,000	40,000	4,200	
4,500		10,000	135,000	80,000	40,000	4,500	
5,000		10,000	135,000	80,000	40,000	5,000	



Broca canhão com um corte EB 100



Material de corte **MD int.**

Superfície **A**

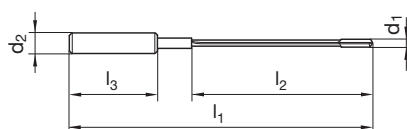
Forma da haste **HA**

P • comprimento do canal 80 mm • forma da circunferência G

P	•
M	○
K	•
N	○
S	○
H	○

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5633**

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
1,200		4,000	125,000	80,000	28,000	1,200	
1,500		4,000	125,000	80,000	28,000	1,500	
1,590	1/16	4,000	125,000	80,000	28,000	1,590	
1,600		4,000	125,000	80,000	28,000	1,600	
1,980	5/64	4,000	125,000	80,000	28,000	1,980	
2,000		4,000	125,000	80,000	28,000	2,000	
2,500		10,000	135,000	80,000	40,000	2,500	
2,700		10,000	135,000	80,000	40,000	2,700	
3,000		10,000	135,000	80,000	40,000	3,000	
3,200		10,000	135,000	80,000	40,000	3,200	
3,500		10,000	135,000	80,000	40,000	3,500	
4,000		10,000	135,000	80,000	40,000	4,000	
4,200		10,000	135,000	80,000	40,000	4,200	
4,500		10,000	135,000	80,000	40,000	4,500	
5,000		10,000	135,000	80,000	40,000	5,000	

Brocas canhão para
furação profunda



Broca canhão com um corte EB 100

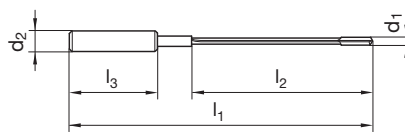


P	○	comprimento do canal 120 mm • forma da circunferência G
M	○	
K	○	
N	●	
S	●	
H	○	

GÜHRING NAVIGATOR

Página de dados de corte 808

Material de corte	MD int.
Superfície	○
Forma da haste	HA



Nr. do artigo **5026**

Brocas canhão para furação profunda

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
1,500		4,000	165,000	120,000	28,000	1,500	
1,590	1/16	4,000	165,000	120,000	28,000	1,590	
1,600		4,000	165,000	120,000	28,000	1,600	
1,980	5/64	4,000	165,000	120,000	28,000	1,980	
2,000		4,000	165,000	120,000	28,000	2,000	
2,500		10,000	175,000	120,000	40,000	2,500	
2,700		10,000	175,000	120,000	40,000	2,700	
3,000		10,000	175,000	120,000	40,000	3,000	
3,200		10,000	175,000	120,000	40,000	3,200	
3,500		10,000	175,000	120,000	40,000	3,500	
4,000		10,000	175,000	120,000	40,000	4,000	
4,200		10,000	175,000	120,000	40,000	4,200	
4,500		10,000	175,000	120,000	40,000	4,500	
5,000		10,000	175,000	120,000	40,000	5,000	



Broca canhão com um corte EB 100



Material de corte **MD int.**

Superfície **A**

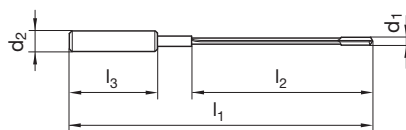
Forma da haste **HA**

P • comprimento do canal 120 mm • forma da circunferência G

P	•
M	○
K	•
N	○
S	○
H	○

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5637**

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
1,500		4,000	165,000	120,000	28,000	1,500	
1,590	1/16	4,000	165,000	120,000	28,000	1,590	
1,600		4,000	165,000	120,000	28,000	1,600	
1,980	5/64	4,000	165,000	120,000	28,000	1,980	
2,000		4,000	165,000	120,000	28,000	2,000	
2,500		10,000	175,000	120,000	40,000	2,500	
2,700		10,000	175,000	120,000	40,000	2,700	
3,000		10,000	175,000	120,000	40,000	3,000	
3,200		10,000	175,000	120,000	40,000	3,200	
3,500		10,000	175,000	120,000	40,000	3,500	
4,000		10,000	175,000	120,000	40,000	4,000	
4,200		10,000	175,000	120,000	40,000	4,200	
4,500		10,000	175,000	120,000	40,000	4,500	
5,000		10,000	175,000	120,000	40,000	5,000	

Brocas canhão para
furação profunda



Broca canhão com um corte EB 100

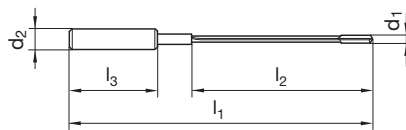


P	○	comprimento do canal 160 mm • forma da circunferência G
M	○	
K	○	
N	●	
S	●	
H	○	

GÜHRINGNAVIGATOR

Página de dados de corte 808

Material de corte	MD int.
Superfície	○
Forma da haste	HA



Nr. do artigo **5021**

Brocas canhão para furação profunda

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
1,500		4,000	205,000	160,000	28,000	1,500	
1,590	1/16	4,000	205,000	160,000	28,000	1,590	
1,600		4,000	205,000	160,000	28,000	1,600	
1,980	5/64	4,000	205,000	160,000	28,000	1,980	
2,000		4,000	205,000	160,000	28,000	2,000	
2,500		10,000	215,000	160,000	40,000	2,500	
2,700		10,000	215,000	160,000	40,000	2,700	
3,000		10,000	215,000	160,000	40,000	3,000	
3,200		10,000	215,000	160,000	40,000	3,200	
3,500		10,000	215,000	160,000	40,000	3,500	
4,000		10,000	215,000	160,000	40,000	4,000	
4,200		10,000	215,000	160,000	40,000	4,200	
4,500		10,000	215,000	160,000	40,000	4,500	
5,000		10,000	215,000	160,000	40,000	5,000	
6,000		16,000	225,000	160,000	48,000	6,000	
8,000		16,000	225,000	160,000	48,000	8,000	



Broca canhão com um corte EB 100



Material de corte **MD int.**

Superfície **A**

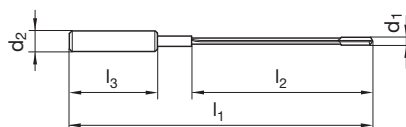
Forma da haste **HA**

P • comprimento do canal 160 mm • forma da circunferência G

P	•
M	○
K	•
N	○
S	○
H	○

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5638**

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
1,500		4,000	205,000	160,000	28,000	1,500
1,590	1/16	4,000	205,000	160,000	28,000	1,590
1,600		4,000	205,000	160,000	28,000	1,600
1,980	5/64	4,000	205,000	160,000	28,000	1,980
2,000		4,000	205,000	160,000	28,000	2,000
2,500		10,000	215,000	160,000	40,000	2,500
2,700		10,000	215,000	160,000	40,000	2,700
3,000		10,000	215,000	160,000	40,000	3,000
3,200		10,000	215,000	160,000	40,000	3,200
3,500		10,000	215,000	160,000	40,000	3,500
4,000		10,000	215,000	160,000	40,000	4,000
4,200		10,000	215,000	160,000	40,000	4,200
4,500		10,000	215,000	160,000	40,000	4,500
5,000		10,000	215,000	160,000	40,000	5,000
6,000		16,000	225,000	160,000	48,000	6,000
8,000		16,000	225,000	160,000	48,000	8,000

Brocas canhão para
furação profunda



Broca canhão com um corte EB 80

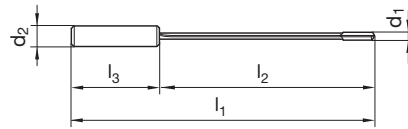


P	•	com câmara de cavacos ampliada • forma da circunferência G • com quebra cavacos longitudinal
M	○	
K	•	
N	○	
S	○	
H	○	

GÜHRINGNAVIGATOR

Página de dados de corte 808

Material de corte	Metal duro
Superfície	S
Forma da haste	HA



Nr. do artigo **5018**

Brocas canhão para furação profunda

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
4,000		12,000	150,000	100,000	45,000	4,000
4,200		12,000	160,000	110,000	45,000	4,200
4,500		12,000	170,000	120,000	45,000	4,500
5,000		16,000	180,000	130,000	48,000	5,000
5,500		16,000	190,000	140,000	48,000	5,500
6,000		16,000	210,000	160,000	48,000	6,000
6,500		16,000	220,000	170,000	48,000	6,500
7,000		16,000	235,000	185,000	48,000	7,000
8,000		16,000	260,000	210,000	48,000	8,000
9,000		16,000	280,000	230,000	48,000	9,000
10,000		20,000	320,000	260,000	50,000	10,000
12,000		20,000	370,000	310,000	50,000	12,000



Broca canhão com um corte EB 80



Material de corte **Metal duro**

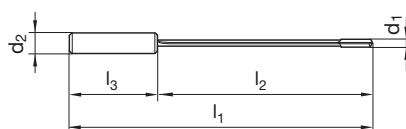
Superfície **Ⓢ**

Forma da haste **HA**

P	○	forma da circunferência G
M	●	
K	○	
N	○	
S	●	
H	○	

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5639**

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
3,970	5/32	10,000	150,000	100,000	40,000	3,970	
4,000		12,000	150,000	100,000	45,000	4,000	
5,000		16,000	180,000	130,000	48,000	5,000	
5,156	13/64	16,000	180,000	130,000	48,000	5,156	
6,000		16,000	210,000	160,000	48,000	6,000	
6,350	1/4	16,000	220,000	170,000	48,000	6,350	
7,000		16,000	235,000	185,000	48,000	7,000	
7,938	5/16	16,000	260,000	210,000	48,000	7,938	
8,000		16,000	260,000	210,000	48,000	8,000	
9,000		16,000	280,000	230,000	48,000	9,000	
9,525	3/8	16,000	290,000	240,000	48,000	9,525	
10,000		20,000	320,000	260,000	50,000	10,000	
11,000		20,000	340,000	290,000	50,000	11,000	
11,113	7/16	20,000	340,000	290,000	50,000	11,113	
12,000		20,000	370,000	310,000	50,000	12,000	
12,700	1/2	20,000	385,000	330,000	50,000	12,700	

Brocas canhão para furação profunda



Broca canhão com um corte EB 80

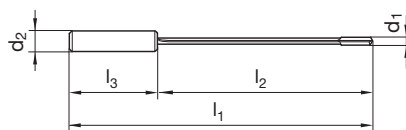


P	•	com câmara de cavacos ampliada • forma da circunferência G • com quebra cavacos longitudinal
M	○	
K	•	
N	○	
S	○	
H	○	

GÜHRINGNAVIGATOR

Página de dados de corte 808

Material de corte	Metal duro
Superfície	S
Forma da haste	HA



Nr. do artigo **5460**

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
4,000		12,000	200,000	155,000	45,000	4,000
4,200		12,000	210,000	165,000	45,000	4,200
4,500		12,000	220,000	175,000	45,000	4,500
5,000		16,000	230,000	182,000	48,000	5,000
5,500		16,000	245,000	197,000	48,000	5,500
6,000		16,000	260,000	212,000	48,000	6,000
6,500		16,000	275,000	227,000	48,000	6,500
7,000		16,000	290,000	242,000	48,000	7,000
8,000		16,000	320,000	272,000	48,000	8,000
9,000		16,000	350,000	302,000	48,000	9,000
10,000		20,000	400,000	350,000	50,000	10,000
12,000		20,000	450,000	400,000	50,000	12,000

Brocas canhão para furação profunda



Broca canhão com um corte EB 80



Material de corte **Metal duro**

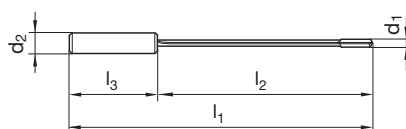
Superfície **Ⓢ**

Forma da haste **HA**

P	○	forma da circunferência G
M	●	
K	○	
N	○	
S	●	
H	○	

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5640**

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
3,970	5/32	10,000	200,000	155,000	40,000	3,970	
4,000		12,000	200,000	155,000	45,000	4,000	
5,000		16,000	230,000	182,000	48,000	5,000	
5,156	13/64	16,000	230,000	182,000	48,000	5,156	
6,000		16,000	260,000	212,000	48,000	6,000	
6,350	1/4	16,000	275,000	227,000	48,000	6,350	
7,000		16,000	290,000	242,000	48,000	7,000	
7,938	5/16	16,000	320,000	272,000	48,000	7,938	
8,000		16,000	320,000	272,000	48,000	8,000	
9,000		16,000	350,000	302,000	48,000	9,000	
9,525	3/8	16,000	380,000	330,000	48,000	9,525	
10,000		20,000	400,000	350,000	50,000	10,000	
11,000		20,000	430,000	380,000	50,000	11,000	
11,113	7/16	20,000	430,000	380,000	50,000	11,113	
12,000		20,000	450,000	400,000	50,000	12,000	
12,700	1/2	20,000	500,000	450,000	50,000	12,700	

Brocas canhão para
furação profunda



Broca canhão com um corte EB 80

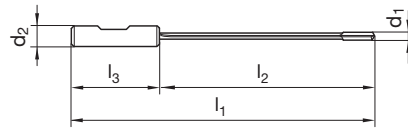


P	•	com câmara de cavacos ampliada • forma da circunferência G • com quebra cavacos longitudinal
M	○	
K	•	
N	○	
S	○	
H	○	

GÜHRING NAVIGATOR

Página de dados de corte 808

Material de corte	Metal duro
Superfície	○
Forma da haste	HB



Nr. do artigo **5689**

Brocas canhão para furação profunda

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
4,000		12,000	230,000	185,000	45,000	4,000
5,000		16,000	280,000	232,000	48,000	5,000
6,000		16,000	320,000	272,000	48,000	6,000
8,000		16,000	420,000	372,000	48,000	8,000
10,000		20,000	510,000	460,000	50,000	10,000
12,000		20,000	600,000	550,000	50,000	12,000



Broca canhão com um corte EB 80



Material de corte **Metal duro**

Superfície **S**

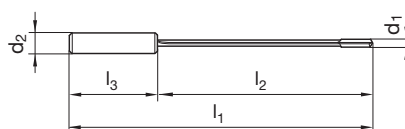
Forma da haste HA

P • com câmara de cavacos ampliada • forma da circunferência G • com quebra cavacos longitudinal

P	•
M	○
K	•
N	○
S	○
H	○

GÜHRINGNAVIGATOR

Página de dados de corte 808



Nr. do artigo **5022**

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
4,000		12,000	230,000	185,000	45,000	4,000
4,200		12,000	240,000	195,000	45,000	4,200
4,500		12,000	250,000	205,000	45,000	4,500
5,000		16,000	280,000	232,000	48,000	5,000
5,500		16,000	300,000	252,000	48,000	5,500
6,000		16,000	320,000	272,000	48,000	6,000
6,500		16,000	340,000	292,000	48,000	6,500
7,000		16,000	370,000	322,000	48,000	7,000
8,000		16,000	420,000	372,000	48,000	8,000
9,000		16,000	450,000	402,000	48,000	9,000
10,000		20,000	510,000	460,000	50,000	10,000
12,000		20,000	600,000	550,000	50,000	12,000

Brocas canhão para furação profunda



Broca canhão com um corte EB 80

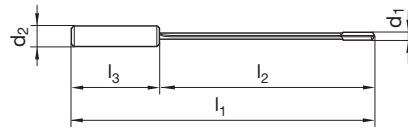


P	○	forma da circunferência G
M	●	
K	○	
N		
S	●	
H	○	

GÜHRINGNAVIGATOR

Página de dados de corte 808

Material de corte	Metal duro
Superfície	Ⓢ
Forma da haste	HA



Nr. do artigo **5641**

Brocas canhão para
furação profunda

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
3,970	5/32	10,000	230,000	185,000	40,000	3,970
4,000		12,000	230,000	185,000	45,000	4,000
5,000		16,000	280,000	232,000	48,000	5,000
5,156	13/64	16,000	280,000	232,000	48,000	5,156
6,000		16,000	320,000	272,000	48,000	6,000
6,350	1/4	16,000	340,000	292,000	48,000	6,350
7,000		16,000	370,000	322,000	48,000	7,000
7,938	5/16	16,000	420,000	372,000	48,000	7,938
8,000		16,000	420,000	372,000	48,000	8,000
9,000		16,000	450,000	402,000	48,000	9,000
9,525	3/8	16,000	480,000	432,000	48,000	9,525
10,000		20,000	510,000	460,000	50,000	10,000
11,000		20,000	550,000	500,000	50,000	11,000
11,113	7/16	20,000	550,000	500,000	50,000	11,113
12,000		20,000	600,000	550,000	50,000	12,000
12,700	1/2	20,000	635,000	585,000	50,000	12,700



Broca canhão com um corte EB 80



Material de corte **Metal duro**

Superfície ○

Forma da haste HB



P ● com câmara de cavacos ampliada • forma da circunferência G • com quebra cavacos longitudinal

M ○

K ●

N ○

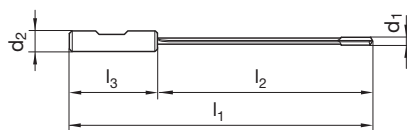
S ○

H ○

comprimento máximo por ferramenta 40 x D, para maiores profundidades de furação utilizar Art. Nr. 5689 como primeira ferramenta

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5690**

d1 h5		d2 h6		l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	mm	
3,970	5/32	10,000	390,000	350,000	40,000	3,970	
4,950		16,000	480,000	432,000	48,000	4,950	
5,950	15/64	16,000	560,000	512,000	48,000	5,950	
7,950		16,000	740,000	692,000	48,000	7,950	
9,950		20,000	910,000	860,000	50,000	9,950	
11,950		20,000	1080,000	1030,000	50,000	11,950	

Brocas canhão para furação profunda



Broca canhão com um corte EB 80



Material de corte **Metal duro**

Superfície **S**

Forma da haste HA

P • com câmara de cavacos ampliada • forma da circunferência G • com quebra cavacos longitudinal

M ○

K •

N ○

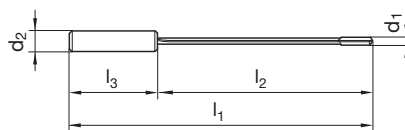
S ○

H ○

comprimento máximo do canal para cavacos por ferramenta 40xD, para profundidades maiores utilizar preferencialmente broca art. Nr. 5022!

GÜHRINGNAVIGATOR

Página de dados de corte 808



Nr. do artigo **5023**

Brocas canhão para furação profunda

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
4,950		16,000	480,000	432,000	48,000	4,950
5,950	15/64	16,000	560,000	512,000	48,000	5,950
7,950		16,000	740,000	692,000	48,000	7,950
9,950		20,000	910,000	860,000	50,000	9,950
11,950		20,000	1080,000	1030,000	50,000	11,950



Broca canhão com um corte EB 80



Material de corte **Metal duro**

Superfície **C**

Forma da haste **HA**

P ○ forma da circunferência G

M ●

K ○

N □

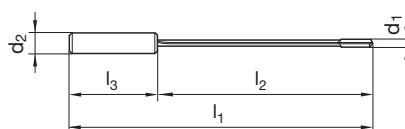
S ●

H ○

comprimento máximo por ferramenta 40 x D, para maiores profundidades de furação utilizar Art. Nr. 5641 como primeira ferramenta

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5642**

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
4,950		16,000	480,000	432,000	48,000	4,950
5,106		16,000	480,000	432,000	48,000	5,106
5,950	15/64	16,000	560,000	512,000	48,000	5,950
6,300		16,000	590,000	542,000	48,000	6,300
6,950		16,000	650,000	602,000	48,000	6,950
7,888		16,000	740,000	692,000	48,000	7,888
7,950		16,000	740,000	692,000	48,000	7,950
8,950		16,000	820,000	772,000	48,000	8,950
9,475		16,000	870,000	822,000	48,000	9,475
9,950		20,000	910,000	860,000	50,000	9,950
10,950		20,000	995,000	945,000	50,000	10,950
11,063		20,000	995,000	945,000	50,000	11,063
11,950		20,000	1080,000	1030,000	50,000	11,950
12,650		20,000	1140,000	1090,000	50,000	12,650

Brocas canhão para furação profunda



Broca canhão com um corte EB 80



Material de corte **Metal duro**

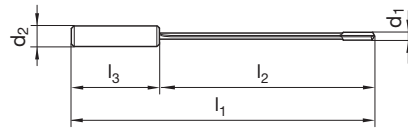
Superfície **S**

Forma da haste Cilíndrica

P	•	comprimento total = 1100.00 mm • forma da circunferência G • haste de fixação para máquinas de furação profunda(T3.1)
M	○	
K	•	
N	•	
S	○	
H	○	

GÜHRINGNAVIGATOR

Página de dados de corte 808



Nr. do artigo **5164**

Brocas canhão para furação profunda

d1 h5		d2 h6	l1	l2	l3	Nº de cód.
mm	inch					
6,000		25,000	1100,000	1010,000	70,000	6,000
7,000		25,000	1100,000	1010,000	70,000	7,000
8,000		25,000	1100,000	1010,000	70,000	8,000
10,000		25,000	1100,000	1010,000	70,000	10,000
12,000		25,000	1100,000	1010,000	70,000	12,000
16,000		25,000	1100,000	1010,000	70,000	16,000
20,000		25,000	1100,000	1010,000	70,000	20,000
22,000		25,000	1100,000	1000,000	70,000	22,000



Broca canhão com dois cortes ZB 80



Material de corte **Metal duro**

Superfície ○

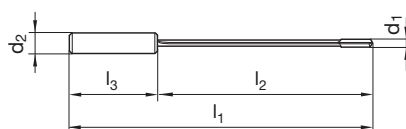
Forma da haste HA

P brocas canhão com 4 facetas • para alumínio

P	
M	
K	
N	•
S	
H	

GÜHRING NAVIGATOR

Página de dados de corte 808



Nr. do artigo **5019**

d1 h5	d2	l1	l2	l3	Nº de cód.
mm	mm	mm	mm	mm	
8,000	16,000	330,000	280,000	48,000	8,000
10,000	20,000	390,000	340,000	50,000	10,000
12,000	20,000	450,000	400,000	50,000	12,000

Brocas canhão para furação profunda

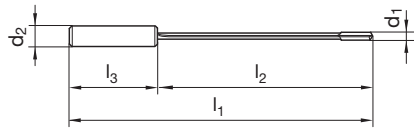
Broca canhão com dois cortes ZB 80



P	brocas canhão com 4 facetas • para ferros fundidos
M	
K	•
N	
S	
H	

GÜHRING NAVIGATOR
 Página de dados de corte 808

Material de corte	Metal duro
Superfície	○
Forma da haste	HA



Nr. do artigo **5643**

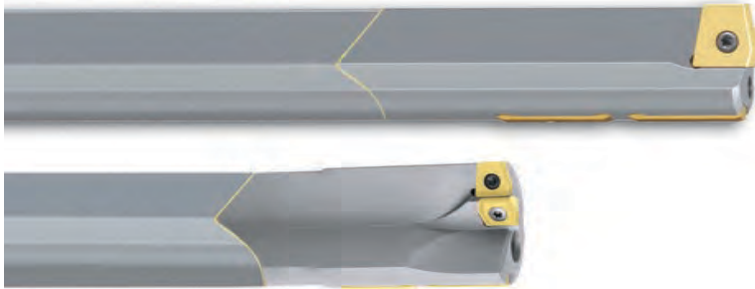
d1 h5	d2	l1	l2	l3	Nº de cód.
mm	mm	mm	mm	mm	
8,000	16,000	330,000	280,000	48,000	8,000
10,000	20,000	390,000	340,000	50,000	10,000
12,000	20,000	450,000	400,000	50,000	12,000

Brocas canhão para furação profunda



EB 800

- Soluções especiais até Ø 52,00 mm
- insertos e guias com incremento de 0,1 mm no diâmetro como standard, e incrementos de 0,01mm como especial



Nós executamos brocas canhão de um corte com pastilhas e réguas de guia intercambiáveis exclusivamente como ferramentas especiais para aplicações específicas dos clientes. Elas são utilizadas para a usinagem de quase todos os materiais e estão à disposição na gama de Ø 16,0 até 40,0 mm e com comprimento total de até 3000 mm.

Suas vantagens especiais são:

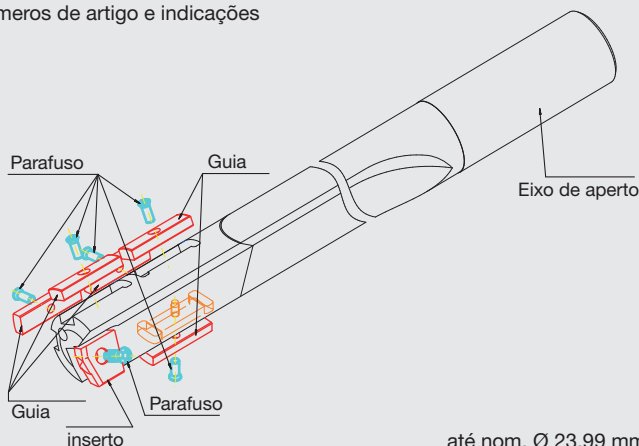
- Com a técnica de trocas de peças para pastilhas e réguas de guia é possível toda combinação de classes de metal duro e revestimentos
- Graças às pastilhas e réguas de guia de precisão não são necessárias regulagens complicadas.
- Nós executamos as réguas de guia de metal duro especial individualmente para a sua tarefa de furação profunda. Elas podem ser montadas sobre giro, assim são possíveis duas operações completas. Adicionalmente todos os revestimentos podem ser colocados.
- Os assentos das pastilhas e as pastilhas de precisão levam a uma pequena quantidade de componentes. Desta maneira a construção é extremamente sólida.
- Tempos de parada de alto custo para a produção são evitados porque que a troca das peças de desgaste podem ser feitas na própria máquina.
- Graças à técnica de pastilhas intercambiáveis são evitados altos custos de reafiação
- A seleção de insertos mais apropriados sempre leva a uma ótima quebra de cavacos mesmo nos materiais mais problemáticos.
- Os insertos intercambiáveis de metal duro especial, são especialmente adaptados à sua tarefa individual de furação profunda. Adicionalmente todos os revestimentos Gühring podem ser colocados.
- Dentro de sua gama de diâmetros todos os diâmetros nominais podem ser modificados a qualquer momento com a troca das peças intercambiáveis
- Nós executamos o elemento de fixação em aço para beneficiamento conforme

- DIN 6535 HA	- DIN 6535 HB
- DIN 6535 HE	- DIN 1835 E

 Também são possíveis todas as formas usuais para máquinas de furação profunda

**Atenção: - comprimento do canal de saída mais curto 15xD
- tolerância Ø alcançável IT9/IT10**

Com todo orçamento recebe-se um desenho com todos os números de artigo e indicações



até nom. Ø 23.99 mm 4 guias
à partir nom. Ø 24.00 mm 5 guias

Brocas canhão para
furação profunda

Torque de aperto - Valores de referência

WSP Inserto externo

Dimensão	Diâmetro em mm	Rosca Métrica ISO em mm	Torx - dimensão	Torque de aperto - Nm
0.	12,00 – 15,99	M2,5 x 5,2	T8	1,00
1.	16,00 – 19,99	M3,0 x 6,4	T9	1,40
2.	20,00 – 25,99	M4,0 x 7,7	T15	2,50
3.	26,00 – 29,99	M4,0 x 10,6	T15	2,50
4.	30,00 – 33,99	M4,0 x 10,6	T15	2,50
5.	34,00 – 37,99	M5,0 x 14,2	T20	5,00
6.	38,00 – 40,00	M5,0 x 14,2	T20	5,00
7.	40,01 – 43,99	M3,0 x 6,4	T9	1,40
8.	44,00 – 47,99	M4,0 x 7,7	T15	2,50
9.	48,00 – 52,00	M4,0 x 10,6	T15	2,50

WSP Inserto interno

Dimensão	Diâmetro em mm	Rosca Métrica ISO em mm	Torx - dimensão	Torque de aperto - Nm
7. – 9.	40,01 – 52,00	M4,5 x 11,8	T15	3,00

Guias

Dimensão	Diâmetro em mm	Rosca Métrica ISO em mm	Torx - dimensão	Torque de aperto - Nm
0.	12,00 – 15,99	M1,6 x 4,4	T5	0,40
1.	16,00 – 17,99	M2,2 x 4,6	T7	0,60
1.	18,00 – 19,99	M2,2 x 5,6	T7	0,60
2.	20,00 – 22,49	M2,5 x 5,2	T8	1,00
2.	22,50 – 25,99	M2,5 x 6,4	T8	1,00
3.	26,00 – 29,99	M2,5 x 6,4	T8	1,00
4. – 9.	30,00 – 52,00	M3,0 x 8,0	T9	1,40



Broca canhão com um corte EB 800 com pastilhas intercambiáveis

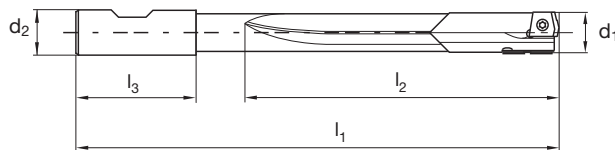


P	•	com pastilhas intercambiáveis • com réguas de guia intercambiáveis
M	○	• com chave de aperto • com parafusos • uso universal • chave de Torque No. 4915 pedidos separadamente
K	○	
N	•	
S	○	
H		

GÜHRINGNAVIGATOR

Página de dados de corte 808

Material de corte	Metal duro
Superfície	S
Forma da haste	HB











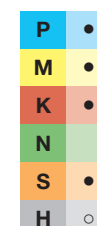





Nr. do artigo **5644**

d1 h8		d2	l1	l2	l3	Nº de cód.
mm	inch	mm	mm	mm	mm	
12,000		20,000	446,000	384,000	50,000	12,000
12,700	1/2	20,000	468,000	406,000	50,000	12,700
14,000		20,000	510,000	448,000	50,000	14,000
15,000		25,000	548,000	480,000	56,000	15,000
16,000		25,000	580,000	512,000	56,000	16,000
18,000		25,000	644,000	576,000	56,000	18,000
20,000		32,000	712,000	640,000	60,000	20,000
24,000		32,000	840,000	768,000	60,000	24,000

Brocas canhão para furação profunda












Soluções especiais gama Ø 12.0 à Ø 52.0 mm, comprimento total máx. 3000 mm

Dimensão do porta ferramenta	Gama de diâmetros do porta ferramenta	Corpo / Porta ferramenta	inserto					
			Insertos (externo)				Parafusos	Chave de fenda
								
Revestimento-TiN	Revestimento-FIRE	Revestimento-Signum	Revestimento-TiAlN nanoA					
0.	Ø12.00 - Ø12.49 Ø12.50 - Ø12.99 Ø13.00 - Ø13.49 Ø13.50 - Ø13.99 Ø14.00 - Ø14.49 Ø14.50 - Ø14.99 Ø15.00 - Ø15.49 Ø15.50 - Ø15.99	Haste básica/ Suporte individual sobre consulta do cliente comprimento total até 3000 mm comprimento do canal de saída acima de 10xD alternativa: Programa padrão Nr. do artigo 5644 do diâmetro 12,00 mm até 24,00 mm em dimensões preferenciais completo com pastilhas e lâminas intercambiáveis TiN					Nr. do artigo 4071 2.502 T8 M2.5x 5.2	Nr. do artigo 1612 8.001
	1.		Ø16.00 - Ø16.49 Ø16.50 - Ø16.99 Ø17.00 - Ø17.49 Ø17.50 - Ø17.99 Ø18.00 - Ø18.49 Ø18.50 - Ø18.99 Ø19.00 - Ø19.49 Ø19.50 - Ø19.99					Nr. do artigo 4071 3.002 T9 M3x6.4
2.			Ø20.00 - Ø20.49 Ø20.50 - Ø20.99 Ø21.00 - Ø21.49 Ø21.50 - Ø21.99 Ø22.00 - Ø22.49 Ø22.50 - Ø22.99 Ø23.00 - Ø23.49 Ø23.50 - Ø23.99 Ø24.00 - Ø24.49 Ø24.50 - Ø24.99 Ø25.00 - Ø25.49 Ø25.50 - Ø25.99	Nr. do artigo 5029 + nom.-Ø = Pedido no.	Nr. do artigo 5704 + nom.-Ø = Pedido no.	Nr. do artigo 5702 + nom.-Ø = Pedido no.	Nr. do artigo 5706 + nom.-Ø = Pedido no.	Nr. do artigo 4071 4.001 T15 M4x7.7
	3.		Ø26.00 - Ø26.49 Ø26.50 - Ø26.99 Ø27.00 - Ø27.49 Ø27.50 - Ø27.99 Ø28.00 - Ø28.49 Ø28.50 - Ø28.99 Ø29.00 - Ø29.49 Ø29.50 - Ø29.99					Nr. do artigo 4071 4.002 T15 M4x10.6
4.			Ø30.00 - Ø30.49 Ø30.50 - Ø30.99 Ø31.00 - Ø31.49 Ø31.50 - Ø31.99 Ø32.00 - Ø32.49 Ø32.50 - Ø32.99 Ø33.00 - Ø33.49 Ø33.50 - Ø33.99	Nr. do artigo 4071 5.002 T20 M5x14.2				
	5.		Ø34.00 - Ø34.49 Ø34.50 - Ø34.99 Ø35.00 - Ø35.49 Ø35.50 - Ø35.99 Ø36.00 - Ø36.49 Ø36.50 - Ø36.99 Ø37.00 - Ø37.49 Ø37.50 - Ø37.99		Nr. do artigo 4071 3.002 TX9 M3x6.4			
6.			Ø38.00 - Ø38.49 Ø38.50 - Ø38.99 Ø39.00 - Ø39.49 Ø39.50 - Ø40.00	Nr. do artigo 4071 4.001 TX15 M4x7.7				
	7.		Ø40.01 - Ø40.49 Ø40.50 - Ø40.99 Ø41.00 - Ø41.49 Ø41.50 - Ø41.99 Ø42.00 - Ø42.49 Ø42.50 - Ø42.99 Ø43.00 - Ø43.49 Ø43.50 - Ø43.99		Nr. do artigo 4071 4.002 TX15 M4x10.6			
8.			Ø44.00 - Ø44.49 Ø44.50 - Ø44.99 Ø45.00 - Ø45.49 Ø45.50 - Ø45.99 Ø46.00 - Ø46.49 Ø46.50 - Ø46.99 Ø47.00 - Ø47.49 Ø47.50 - Ø47.99					
	9.	Ø48.00 - Ø48.49 Ø48.50 - Ø48.99 Ø49.00 - Ø49.49 Ø49.50 - Ø49.99 Ø50.00 - Ø50.49 Ø50.50 - Ø50.99 Ø51.00 - Ø51.49 Ø51.50 - Ø52.00						

Brocas canhão para furção profunda

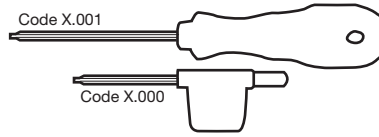


Inserto (interno)	Parafusos	Chave de fenda	Réguas de guia				Parafusos	Chave de fenda																																																
			Réguas de guia																																																					
																																																								
			Revestimento-TiN	Revestimento-FIRE	Revestimento-Signum	Revestimento-TiAlN nanoA																																																		
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			Nr. do artigo 5030 + nom.-Ø = Pedido no.	Nr. do artigo 5705 + nom.-Ø = Pedido no.	Nr. do artigo 5703 + nom.-Ø = Pedido no.	Nr. do artigo 5707 + nom.-Ø = Pedido no.	Nr. do artigo 4071 2.502 T8 M2.5x 5.2 Nr. do artigo 4071 2.501 T8 M2.5x6.4	Nr. do artigo 1612 8.001																																																
polido Broca especial TiN Broca especial FIRE Broca especial	Nr. do artigo 4071 4.501 T15 M4.5x11.8	Nr. do artigo 1612 15.001	Broca especial	Broca especial	Broca especial	Broca especial	Nr. do artigo 4071 3.003 T9 M3x8	Nr. do artigo 1612 9.001																																																

Brocas canhão para furação profunda



Chave Torx



Nr. do artigo **1612**

Tamanho	Nº de cód.
T5	5,001
T7	7,001
T8	8,001
T9	9,001
T15	15,001
T20	20,001

Brocas canhão para furação profunda



Torquímetro



Nr. do artigo

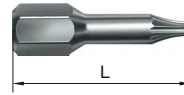
4915

Acionamento		Nm	Tipo	Nº de cód.
1/4"	hexágono	0,4-1	A	1,001
1/4"	hexágono	1-5	A	5,001

Brocas canhão para
furação profunda



Pontas intercambiáveis Torx



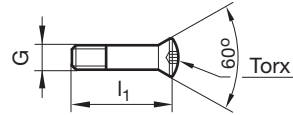
Nr. do artigo **4917**

Acionamento		Torx	L mm	Nº de cód.
1/4	hexágono	T5	25,000	5,000
1/4	hexágono	T7	25,000	7,000
1/4	hexágono	T8	25,000	8,000
1/4	hexágono	T9	25,000	9,000
1/4	hexágono	T15	25,000	15,000
1/4	hexágono	T20	25,000	20,000

Brocas canhão para
furação profunda



Parafusos de fixação



Nr. do artigo

4071

G	l1 mm	Torx	Nº de cód.
M1,6	4,400	T5	1,601
M2,2	5,600	T7	2,202
M2,2	4,600	T7	2,203
M2,5	6,400	T8	2,501
M2,5	5,200	T8	2,502
M3	6,400	T9	3,002
M3	8,000	T9	3,003
M4	7,700	T15	4,001
M4	10,600	T15	4,002
M5	14,200	T20	5,002

Brocas canhão para
furação profunda



Brocas canhão para
furação profunda

EQUIPAMENTOS PARA AFIAR BROCAS CANHÃO PARA FUROS PROFUNDOS

Afiadora para brocas canhão TBM 116

A TBM 116 é uma afiadora manual universal. Ela é especialmente compacta e forma junto com o dispositivo de afiação de brocas canhão Guhring e o rebolo duplo Guhring uma perfeita unidade. Ela é especialmente apropriada para reafiar pequenas e médias quantidades, diversos diâmetros e comprimentos. Além disto ela possibilita, entre outras coisas, de modo simples a execução de um quebra cavacos transversal em brocas canhão com um corte.

Acessórios:

Uma afiadora e duas valiosas luminárias como também duas tomadas 220 V anexas (Dispositivo de afiação e rebolos devem ser pedidos adicionalmente).

Dados da máquina:

Tensão de trabalho 380 V/50Hz, rotação do rebolo 2850 rpm, diâmetro máx. do rebolo 150 mm

Número do material: 600 127 170





Dispositivo para afiar brocas canhão TBV 116 para Ø 3 até 30mm

O dispositivo foi projetado para reafiar brocas canhão com um corte numa gama de diâmetros de 3 mm até 30 mm. Ele realiza afiações standard e especiais. Graças a sua pinola curta não é necessário considerar se um comprimento mínimo de canal. Além disto no fornecimento está prevista uma barra para apoio de ferramentas longas. Com isto o TBV 116 é universal e também pode ser adaptado em qualquer afiadora manual. **Para o TBV 116 nós recomendamos nossos rebolos duplos DSS 125.**

Atenção:

Brocas canhão com um corte tem uma câmara de cavacos com uma abertura de 120° e por isto não podem ser fixadas com pinça em um divisor. E com isto a ferramenta pode eventualmente ser danificada.

Número do material: 600 127 171



Dispositivo para afiar brocas canhão TBV 216 para Ø 1 até 6 mm

O novo dispositivo universal TBV 216 especial para afiar brocas canhão com um corte de pequenos diâmetros na gama de 1,0 até 6,0 mm e com um comprimento máximo de 350 mm possibilita a reafiação e a modificação da afiação com poucos e simples toques em somente quatro operações. A afiação acontece com um dispositivo basculante de 3 eixos que permite os mais diversos ângulos de afiação. Todos ângulos podem ser regulados individualmente a cada instante e eventualmente corrigidos.

Para isto recomendamos nosso rebole simples ESS 125.

Acessórios:

- Um jogo de buchas de guia com os diâmetros 1,0 / 1,5 / 2,0 / 2,5 / 3,0 / 3,0 / 3,5 mm
- diversas peças intermediárias
- microscópio de centragem
- luminária de fibra ótica e lupa de medição.

Número do material: 600 132 346





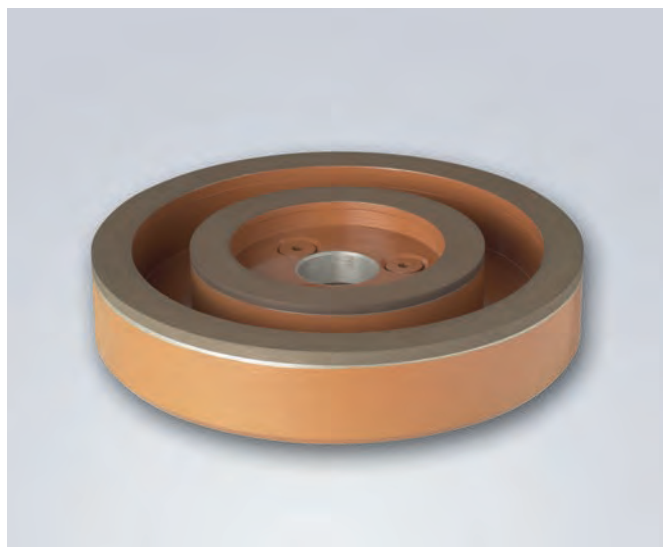
Rebolo duplo DSS 125

O rebolo duplo DSS 125 é um jogo de rebolos firmemente aparafusados e ajustados. Trata-se aqui de um rebolo diamantado externo de desbaste, com o qual é retirada a maior parte do desgaste, e um rebolo diamantado interno de acabamento, com o qual após os cortes obtém-se um acabamento fino. É aconselhável que de tempo em tempo os rebolos sejam liberados do pó da retificação com uma pedra de limpeza, senão eventualmente origina-se muito calor e o corte do metal duro é danificado.

O rebolo DSS 125 consiste de:

- um rebolo externo Ø 125 mm, largura da camada 10 mm, espessura da camada 2 mm, furo Ø 20 mm, grana D126,
- um rebolo interno Ø 75 mm, largura da camada 10 mm, espessura da camada 2 mm, furo Ø 20 mm, grana D 46

Número do material: 400 110 098



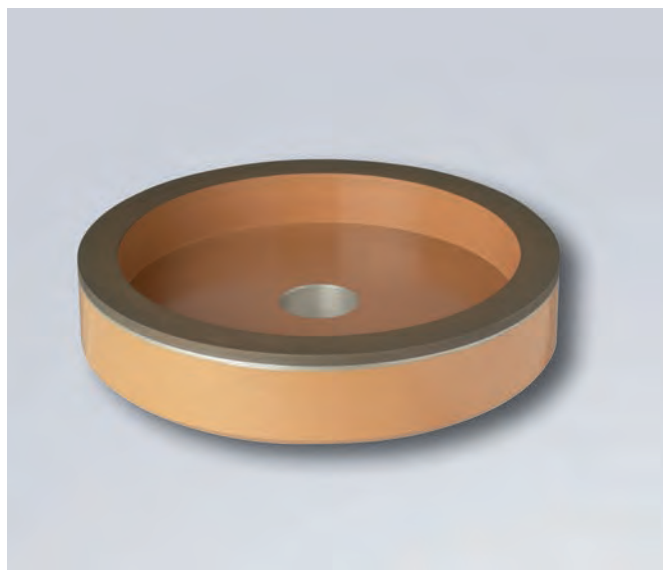
Rebolo simples ESS 125

O rebolo ESS 125 é um rebolo de diamante fino, com o qual as arestas de corte obtêm um bom acabamento fino. É aconselhável que de tempo em tempo os rebolos sejam liberados do pó da retificação com uma pedra de limpeza, senão eventualmente origina-se muito calor e o corte do metal duro é danificado.

O rebolo ESS 125 consiste de:

- um rebolo Ø 125 mm, largura da camada 10 mm, espessura da camada 3 mm, furo Ø 20 mm, grana D25

Número do material: 400 119 203





Através de buchas

Material de corte

MD int.



Nr. do artigo

5748

d2	d1	l1	Nº de cód.
mm	mm	mm	
0,900	3,000	9,000	0,900
1,590	4,000	9,000	1,590
1,600	4,000	9,000	1,600
1,605	4,000	9,000	1,605
2,000	5,000	9,000	2,000
2,030	5,000	9,000	2,030
2,040	5,000	9,000	2,040
2,500	5,000	9,000	2,500
3,000	6,000	12,000	3,000
3,500	7,000	12,000	3,500
3,750	7,000	12,000	3,750
4,000	7,000	12,000	4,000
4,500	8,000	12,000	4,500
5,000	8,000	12,000	5,000
5,200	10,000	16,000	5,200
5,500	10,000	16,000	5,500
5,515	10,000	16,000	5,515
5,525	10,000	16,000	5,525
6,000	10,000	16,000	6,000
6,100	12,000	16,000	6,100
6,900	12,000	16,000	6,900
7,100	12,000	16,000	7,100
8,000	12,000	16,000	8,000
8,015	12,000	16,000	8,015
8,510	15,000	20,000	8,510
10,000	15,000	20,000	10,000
10,920	18,000	20,000	10,920
11,000	18,000	20,000	11,000
12,000	18,000	20,000	12,000
12,030	18,000	20,000	12,030

d2	d1	l1	Nº de cód.
mm	mm	mm	
12,600	22,000	28,000	12,600
14,000	22,000	28,000	14,000
14,030	22,000	28,000	14,030
14,400	22,000	28,000	14,400
16,000	26,000	28,000	16,000
16,030	26,000	28,000	16,030
16,200	26,000	28,000	16,200
18,000	26,000	28,000	18,000
18,030	26,000	28,000	18,030
18,050	26,000	28,000	18,050
20,000	30,000	36,000	20,000
20,030	30,000	36,000	20,030
22,000	30,000	36,000	22,000
22,030	30,000	36,000	22,030
22,120	35,000	36,000	22,120
23,500	35,000	36,000	23,500
24,000	35,000	36,000	24,000
24,030	35,000	36,000	24,030
25,000	35,000	36,000	25,000
26,000	35,000	36,000	26,000
30,000	42,000	45,000	30,000
34,000	48,000	45,000	34,000
40,000	55,000	55,000	40,000

Brocas canhão para furação profunda

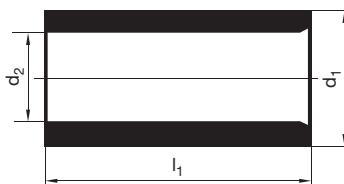


Através de buchas



Material de corte

HSS



Nr. do artigo

5747

Brocas canhão para furação profunda

d2	d1	l1	Nº de cód.
mm	mm	mm	
0,900	3,000	9,000	0,900
1,600	4,000	9,000	1,600
2,000	5,000	9,000	2,000
2,200	5,000	9,000	2,200
2,340	5,000	9,000	2,340
2,700	6,000	12,000	2,700
3,000	6,000	12,000	3,000
3,100	6,000	12,000	3,100
3,255	6,000	12,000	3,255
3,300	6,000	12,000	3,300
3,400	7,000	12,000	3,400
3,500	7,000	12,000	3,500
3,650	7,000	12,000	3,650
3,700	7,000	12,000	3,700
3,800	7,000	12,000	3,800
4,000	7,000	12,000	4,000
4,100	8,000	12,000	4,100
4,300	8,000	12,000	4,300
4,500	8,000	12,000	4,500
4,600	8,000	12,000	4,600
4,760	8,000	12,000	4,760
4,763	8,000	12,000	4,763
4,800	8,000	12,000	4,800
5,000	8,000	12,000	5,000
5,020	8,000	12,000	5,020
5,100	10,000	16,000	5,100
5,200	10,000	16,000	5,200
5,300	10,000	16,000	5,300
5,500	10,000	16,000	5,500
5,600	10,000	16,000	5,600
5,800	10,000	16,000	5,800
6,000	10,000	16,000	6,000
6,050	10,000	16,000	6,050
6,100	12,000	16,000	6,100
6,300	12,000	16,000	6,300
6,350	12,000	16,000	6,350
6,370	12,000	16,000	6,370
6,502	12,000	16,000	6,502
6,600	12,000	16,000	6,600
6,730	12,000	16,000	6,730
6,731	12,000	16,000	6,731
6,750	12,000	16,000	6,750

d2	d1	l1	Nº de cód.
mm	mm	mm	
6,800	12,000	16,000	6,800
7,000	12,000	16,000	7,000
7,100	12,000	16,000	7,100
7,400	12,000	16,000	7,400
7,500	12,000	16,000	7,500
7,600	12,000	16,000	7,600
7,800	12,000	16,000	7,800
7,830	12,000	16,000	7,830
7,938	12,000	16,000	7,938
8,000	12,000	16,000	8,000
8,020	12,000	16,000	8,020
8,050	12,000	16,000	8,050
8,100	15,000	20,000	8,100
8,500	15,000	20,000	8,500
8,530	15,000	20,000	8,530
8,800	15,000	20,000	8,800
9,000	15,000	20,000	9,000
9,100	15,000	20,000	9,100
9,200	15,000	20,000	9,200
9,300	15,000	20,000	9,300
9,500	15,000	20,000	9,500
9,525	15,000	20,000	9,525
9,530	15,000	20,000	9,530
9,570	15,000	20,000	9,570
9,652	15,000	20,000	9,652
9,800	15,000	20,000	9,800
10,000	15,000	20,000	10,000
10,100	18,000	20,000	10,100
10,600	18,000	20,000	10,600
11,080	18,000	20,000	11,080
11,100	18,000	20,000	11,100
11,113	18,000	20,000	11,113
11,500	18,000	20,000	11,500
11,600	18,000	20,000	11,600
12,000	18,000	20,000	12,000
12,020	18,000	20,000	12,020
12,100	22,000	28,000	12,100
12,530	22,000	28,000	12,530
12,600	22,000	28,000	12,600
12,700	22,000	28,000	12,700
12,800	22,000	28,000	12,800
12,954	22,000	28,000	12,954



d2	d1	l1	Nº de cód.
mm	mm	mm	
13,000	22,000	28,000	13,000
13,400	22,000	28,000	13,400
13,500	22,000	28,000	13,500
13,700	22,000	28,000	13,700
13,800	22,000	28,000	13,800
14,000	22,000	28,000	14,000
14,310	22,000	28,000	14,310
14,620	22,000	28,000	14,620
14,770	22,000	28,000	14,770
15,000	22,000	28,000	15,000
15,875	26,000	28,000	15,875
16,000	26,000	28,000	16,000
16,330	26,000	28,000	16,330
17,040	26,000	28,000	17,040
17,080	26,000	28,000	17,080
18,000	26,000	28,000	18,000
18,255	30,000	36,000	18,255
18,450	30,000	36,000	18,450
19,000	30,000	36,000	19,000
19,050	30,000	36,000	19,050
19,300	30,000	36,000	19,300
19,700	30,000	36,000	19,700
20,000	30,000	36,000	20,000
21,050	30,000	36,000	21,050

d2	d1	l1	Nº de cód.
mm	mm	mm	
22,000	30,000	36,000	22,000
22,100	35,000	36,000	22,100
22,120	35,000	36,000	22,120
22,225	35,000	36,000	22,225
23,500	35,000	36,000	23,500
24,000	35,000	36,000	24,000
24,500	35,000	36,000	24,500
25,000	35,000	36,000	25,000
25,250	35,000	36,000	25,250
25,400	35,000	36,000	25,400
26,000	35,000	36,000	26,000
28,000	42,000	45,000	28,000
28,169	42,000	45,000	28,169
30,000	42,000	45,000	30,000
30,100	48,000	45,000	30,100
34,000	48,000	45,000	34,000
38,100	55,000	55,000	38,100
40,000	55,000	55,000	40,000

Brocas canhão para
furação profunda



Acessórios p. máquinas de furação profunda

Ao contrário das máquinas convencionais, as máquinas para furação profunda tem determinado acessórios como standard por exemplo buchas de guia para furação, anéis de vedação, buchas de guia para lunetas etc. Você encontra uma seleção destes produtos on the following pages.



A ilustração pode ser diferente do original

Acessórios

Anéis de vedação e buchas de guia das lunetas, artigos números 5749, 5750, 5751, 5752 e 5753, cobrem sempre uma gama de diâmetros nominais das brocas para furação profunda a serem guiadas. Para o pedido devem sempre ser indicados o número do artigo mais o número do código das tabelas abaixo!

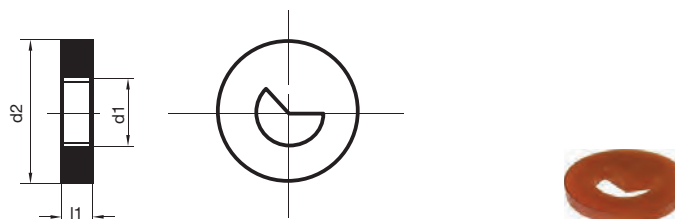
Tabela de atribuição de código nº / Diâmetro de acessórios para furação profunda

Código Nr.	p. broca canhão c. diâmetro nominal d1	
	de mm	até mm
1,900	2,000	2,099
2,000	2,100	2,199
2,100	2,200	2,299
2,200	2,300	2,399
2,300	2,400	2,499
2,400	2,500	2,599
2,500	2,600	2,699
2,600	2,700	2,799
2,700	2,800	2,899
2,800	2,900	3,099
3,000	3,100	3,359
3,200	3,360	3,459
3,300	3,460	3,559
3,400	3,560	3,799
3,600	3,800	3,959
3,700	3,960	4,259
4,000	4,260	4,499
4,200	4,500	4,749
4,500	4,750	4,999
4,700	5,000	5,249
5,000	5,250	5,499
5,200	5,500	5,749
5,500	5,750	5,999
5,700	6,000	6,249
6,000	6,250	6,449
6,200	6,450	6,749
6,500	6,750	6,999
6,700	7,000	7,299
7,000	7,300	7,599
7,300	7,600	7,799
7,500	7,800	7,999
7,700	8,000	8,299
8,000	8,300	8,699
8,400	8,700	8,999
8,700	9,000	9,299
9,000	9,300	9,699

Código Nr.	p. broca canhão c. diâmetro nominal d1	
	de mm	até mm
9,400	9,700	9,999
9,700	10,000	10,299
10,000	10,300	10,799
10,500	10,800	11,299
11,000	11,300	11,799
11,500	11,800	12,399
12,000	12,400	12,899
12,500	12,900	13,399
13,000	13,400	13,899
13,500	13,900	14,399
14,000	14,400	14,899
14,500	14,900	15,399
15,000	15,400	15,899
15,500	15,900	16,399
16,000	16,400	16,899
16,500	16,900	17,399
17,000	17,400	17,899
17,500	17,900	18,399
18,000	18,400	19,509
19,000	19,510	20,509
20,000	20,510	21,509
21,000	21,510	22,609
22,000	22,610	23,609
23,000	23,610	24,609
24,000	24,610	25,609
25,000	25,610	26,609
26,000	26,610	27,609
27,000	27,610	28,609
28,000	28,610	29,609
29,000	29,610	30,609
30,000	30,610	32,609
32,000	32,610	34,699
34,000	34,700	36,699
36,000	36,700	38,699
38,000	38,700	40,000



Discos de vedação para broca canhão com um corte



Nr. do artigo **5752**

d1 mm	Gama de diâmetros	d2 mm	l1 mm	Nº de cód.
2,100	2,200-2,299	20,000	4,000	2,100
2,200	2,300-2,399	20,000	4,000	2,200
2,600	2,700-2,799	20,000	4,000	2,600
2,800	2,900-3,099	20,000	4,000	2,800
3,000	3,100-3,359	20,000	4,000	3,000
3,300	3,460-3,559	20,000	4,000	3,300
3,400	3,560-3,799	20,000	4,000	3,400
3,600	3,800-3,959	20,000	4,000	3,600
3,700	3,960-4,259	20,000	4,000	3,700
4,000	4,260-4,499	20,000	4,000	4,000
4,200	4,500-4,749	20,000	4,000	4,200
4,500	4,750-4,999	20,000	4,000	4,500
4,700	5,000-5,249	20,000	4,000	4,700
5,000	5,250-5,499	32,000	4,000	5,000
5,200	5,500-5,749	32,000	4,000	5,200
5,500	5,750-5,999	32,000	4,000	5,500
5,700	6,000-6,249	32,000	4,000	5,700
6,000	6,250-6,449	32,000	4,000	6,000
6,200	6,450-6,749	32,000	4,000	6,200
6,500	6,750-6,999	32,000	4,000	6,500
6,700	7,000-7,299	32,000	4,000	6,700
7,000	7,300-7,599	32,000	4,000	7,000
7,300	7,600-7,799	32,000	4,000	7,300
7,500	7,800-7,999	32,000	4,000	7,500
7,700	8,000-8,299	32,000	4,000	7,700
8,000	8,300-8,699	32,000	4,000	8,000
8,400	8,700-8,999	32,000	4,000	8,400
8,700	9,000-9,299	32,000	4,000	8,700
9,000	9,300-9,699	32,000	4,000	9,000
9,400	9,700-9,999	32,000	4,000	9,400
9,700	10,000-10,299	32,000	4,000	9,700
10,000	11,300-11,799	32,000	4,000	10,000
10,500	10,800-11,299	32,000	4,000	10,500
11,000	11,300-11,799	32,000	4,000	11,000
11,500	11,800-12,399	32,000	4,000	11,500
12,000	12,400-12,899	32,000	4,000	12,000
12,500	12,900-13,399	32,000	4,000	12,500
13,500	13,900-14,399	32,000	4,000	13,500
14,000	14,400-14,899	32,000	4,000	14,000
14,500	14,900-15,399	32,000	4,000	14,500
15,000	15,400-15,899	32,000	4,000	15,000
15,500	15,900-16,399	40,000	4,000	15,500
16,500	16,900-17,399	40,000	4,000	16,500
17,000	17,400-17,899	40,000	4,000	17,000
17,500	17,900-18,399	40,000	4,000	17,500
18,000	18,400-19,509	40,000	4,000	18,000
19,000	19,510-20,509	40,000	4,000	19,000
20,000	20,510-21,509	40,000	4,000	20,000

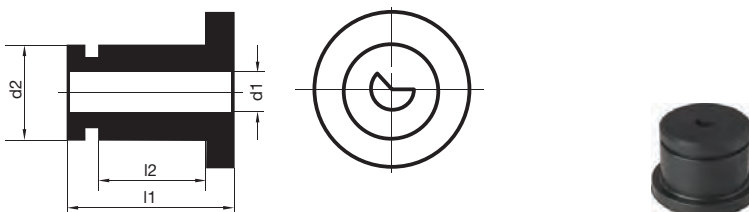
Brocas canhão para
furação profunda



d1	Gama de diâmetros	d2	l1	Nº de cód.
mm		mm	mm	
21,000	21,510-22,609	40,000	4,000	21,000
22,000	22,610-23,609	40,000	4,000	22,000
23,000	23,610-24,609	40,000	4,000	23,000
24,000	24,610-25,609	40,000	4,000	24,000
25,000	25,610-26,609	40,000	4,000	25,000
27,000	27,610-28,609	90,000	4,000	27,000
29,000	29,610-30,609	90,000	4,000	29,000
30,000	30,610-32,609	90,000	4,000	30,000
32,000	32,610-34,699	90,000	4,000	32,000
36,000	36,700-38,699	90,000	4,000	36,000
38,000	38,700-40,000	90,000	4,000	38,000



Buchas de guia para lunetas, para brocas canhão com um corte



Nr. do artigo **5750**

d1	Gama de diâmetros	d2	l1	l2	Nº de cód.
mm		mm	mm	mm	
2,100	2,200-2,299	20,000	20,000	12,000	202,100
2,600	2,700-2,799	20,000	20,000	12,000	202,600
2,800	2,900-3,099	20,000	20,000	12,000	202,800
3,000	3,100-3,359	20,000	20,000	12,000	203,000
3,300	3,460-3,559	20,000	20,000	12,000	203,300
3,700	3,960-4,259	20,000	20,000	12,000	203,700
4,700	5,000-5,249	20,000	20,000	12,000	204,700
5,700	6,000-6,249	20,000	20,000	12,000	205,700
6,700	7,000-7,299	20,000	20,000	12,000	206,700
7,700	8,000-8,299	20,000	20,000	12,000	207,700
8,000	8,300-8,699	20,000	20,000	12,000	208,000
8,700	9,000-9,299	20,000	20,000	12,000	208,700
9,700	10,000-10,299	20,000	20,000	12,000	209,700
11,500	11,800-12,399	20,000	20,000	12,000	211,500
3,700	3,960-4,259	30,000	26,000	13,000	303,700
4,000	4,260-4,499	30,000	26,000	13,000	304,000
4,200	4,500-4,749	30,000	26,000	13,000	304,200
4,500	4,750-4,999	30,000	26,000	13,000	304,500
4,700	5,000-5,249	30,000	26,000	13,000	304,700
5,000	5,250-5,499	30,000	26,000	13,000	305,000
5,200	5,500-5,749	30,000	26,000	13,000	305,200
5,500	5,750-5,999	30,000	26,000	13,000	305,500
5,700	6,000-6,249	30,000	26,000	13,000	305,700
6,000	6,250-6,449	30,000	26,000	13,000	306,000
6,200	6,450-6,749	30,000	26,000	13,000	306,200
6,500	6,750-6,999	30,000	26,000	13,000	306,500
6,700	7,000-7,299	30,000	26,000	13,000	306,700
7,000	7,300-7,599	30,000	26,000	13,000	307,000
7,300	7,600-7,799	30,000	26,000	13,000	307,300
7,500	7,800-7,999	30,000	26,000	13,000	307,500
7,700	8,000-8,299	30,000	26,000	13,000	307,700
8,000	8,300-8,699	30,000	26,000	13,000	308,000
8,400	8,700-8,999	30,000	26,000	13,000	308,400
8,700	9,000-9,299	30,000	26,000	13,000	308,700
9,000	9,300-9,699	30,000	26,000	13,000	309,000
9,400	9,700-9,999	30,000	26,000	13,000	309,400
9,700	10,000-10,299	30,000	26,000	13,000	309,700
10,000	10,300-10,799	30,000	26,000	13,000	310,000
10,500	10,800-11,299	30,000	26,000	13,000	310,500
11,000	11,300-11,799	30,000	26,000	13,000	311,000
11,500	11,800-12,399	30,000	26,000	13,000	311,500
12,000	12,400-12,899	30,000	26,000	13,000	312,000
12,500	12,900-13,399	30,000	26,000	13,000	312,500
13,500	13,900-14,399	30,000	26,000	13,000	313,500
14,000	14,400-14,899	30,000	26,000	13,000	314,000
14,500	14,900-15,399	30,000	26,000	13,000	314,500
15,000	15,400-15,899	30,000	26,000	13,000	315,000
15,500	15,900-16,399	30,000	26,000	13,000	315,500

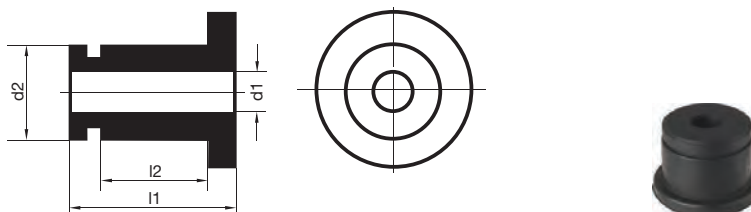
Brocas canhão para
furação profunda



d1	Gama de diâmetros	d2	l1	l2	Nº de cód.
mm		mm	mm	mm	
16,500	16,900-17,399	30,000	26,000	13,000	316,500
17,000	17,400-17,899	30,000	26,000	13,000	317,000
17,500	17,900-18,399	30,000	26,000	13,000	317,500
18,000	18,400-19,509	30,000	26,000	13,000	318,000
19,000	19,510-20,509	30,000	26,000	13,000	319,000
21,000	21,510-22,609	30,000	26,000	13,000	321,000
20,000	20,510-21,509	45,000	26,000	16,000	420,000
21,000	21,510-22,609	45,000	26,000	16,000	421,000
22,000	22,610-23,609	45,000	26,000	16,000	422,000
23,000	23,610-24,609	45,000	26,000	16,000	423,000
24,000	24,610-25,609	45,000	26,000	16,000	424,000
25,000	25,610-26,609	45,000	26,000	16,000	425,000
27,000	27,610-28,609	45,000	26,000	16,000	427,000
28,000	28,610-29,609	45,000	26,000	16,000	428,000
29,000	29,610-30,609	45,000	26,000	16,000	429,000
30,000	30,610-32,609	45,000	26,000	16,000	430,000
32,000	32,610-34,699	45,000	26,000	16,000	432,000
34,000	34,700-36,699	45,000	26,000	16,000	434,000



Buchas para lunetas para brocas com um e dois cortes



Nr. do artigo **5749**

d1	Gama de diâmetros	d2	l1	l2	Nº de cód.
mm		mm	mm	mm	
3,000	3,100-3,359	20,000	22,000	12,000	203,000
3,700	3,960-4,259	20,000	22,000	12,000	203,700
4,500	4,750-4,999	20,000	22,000	12,000	204,500
4,700	5,000-5,249	20,000	22,000	12,000	204,700
5,700	6,000-6,249	20,000	22,000	12,000	205,700
8,000	8,300-8,699	20,000	22,000	12,000	208,000
9,700	10,000-10,299	20,000	22,000	12,000	209,700
2,200	2,300-2,399	30,000	26,000	13,000	302,200
3,000	3,100-3,359	30,000	26,000	13,000	303,000
3,300	3,460-3,559	30,000	26,000	13,000	303,300
3,400	3,560-3,799	30,000	26,000	13,000	303,400
3,600	3,800-3,959	30,000	26,000	13,000	303,600
3,700	3,960-4,259	30,000	26,000	13,000	303,700
4,000	4,260-4,499	30,000	26,000	13,000	304,000
4,200	4,500-4,749	30,000	26,000	13,000	304,200
4,500	4,750-4,999	30,000	26,000	13,000	304,500
4,700	5,000-5,249	30,000	26,000	13,000	304,700
5,000	5,250-5,499	30,000	26,000	13,000	305,000
5,200	5,500-5,749	30,000	26,000	13,000	305,200
5,500	5,750-5,999	30,000	26,000	13,000	305,500
5,700	6,000-6,249	30,000	26,000	13,000	305,700
6,000	6,250-6,449	30,000	26,000	13,000	306,000
6,200	6,450-6,749	30,000	26,000	13,000	306,200
6,700	7,000-7,299	30,000	26,000	13,000	306,700
7,500	7,800-7,999	30,000	26,000	13,000	307,500
7,700	8,000-8,299	30,000	26,000	13,000	307,700
8,700	9,000-9,299	30,000	26,000	13,000	308,700
9,000	9,300-9,699	30,000	26,000	13,000	309,000
9,700	10,000-10,299	30,000	26,000	13,000	309,700
10,000	10,300-10,799	30,000	26,000	13,000	310,000
10,500	10,800-11,299	30,000	26,000	13,000	310,500
11,000	11,300-11,799	30,000	26,000	13,000	311,000
11,500	11,800-12,399	30,000	26,000	13,000	311,500
12,000	12,400-12,899	30,000	26,000	13,000	312,000
12,500	12,900-13,399	30,000	26,000	13,000	312,500
13,500	13,900-14,399	30,000	26,000	13,000	313,500
14,000	14,400-14,899	30,000	26,000	13,000	314,000
14,500	14,900-15,399	30,000	26,000	13,000	314,500
15,000	15,400-15,899	30,000	26,000	13,000	315,000
15,500	15,900-16,399	30,000	26,000	13,000	315,500
16,600	17,900-18,399	30,000	26,000	13,000	316,600
17,000	17,400-17,899	30,000	26,000	13,000	317,000
17,500	17,900-18,399	30,000	26,000	13,000	317,500
18,000	18,400-19,509	30,000	26,000	13,000	318,000
19,000	19,510-20,509	30,000	26,000	13,000	319,000
20,000	20,510-21,509	30,000	26,000	13,000	320,000
21,000	21,510-22,609	30,000	26,000	13,000	321,000
22,000	22,610-23,609	30,000	26,000	13,000	322,000

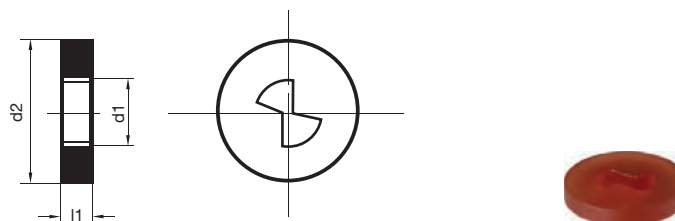
Brocas canhão para
furação profunda



d1	Gama de diâmetros	d2	l1	l2	Nº de cód.
mm		mm	mm	mm	
23,000	23,610-24,609	30,000	26,000	13,000	323,000
24,000	24,610-25,609	30,000	26,000	13,000	324,000
4,700	5,000-5,249	45,000	26,000	16,000	404,700
6,200	6,450-6,749	45,000	26,000	16,000	406,200
7,500	7,800-7,999	45,000	26,000	16,000	407,500
7,700	8,000-8,299	45,000	26,000	16,000	407,700
9,000	9,300-9,699	45,000	26,000	16,000	409,000
9,400	9,700-9,999	45,000	26,000	16,000	409,400
9,700	10,000-10,299	45,000	26,000	16,000	409,700
11,500	11,800-12,399	45,000	26,000	16,000	411,500
14,000	14,400-14,899	45,000	26,000	16,000	414,000
15,000	15,400-15,899	45,000	26,000	16,000	415,000
15,500	15,900-16,399	45,000	26,000	16,000	415,500
17,500	17,900-18,399	45,000	26,000	16,000	417,500
18,000	18,400-19,509	45,000	26,000	16,000	418,000
19,000	19,510-20,509	45,000	26,000	16,000	419,000
21,000	21,510-22,609	45,000	26,000	16,000	421,000
24,000	24,610-25,609	45,000	26,000	16,000	424,000
25,000	25,610-26,609	45,000	26,000	16,000	425,000
26,000	26,610-27,609	45,000	26,000	16,000	426,000
27,000	27,610-28,609	45,000	26,000	16,000	427,000
29,000	29,610-30,609	45,000	26,000	16,000	429,000
32,000	32,610-34,699	45,000	26,000	16,000	432,000



Discos de vedação para broca canhão com dois cortes



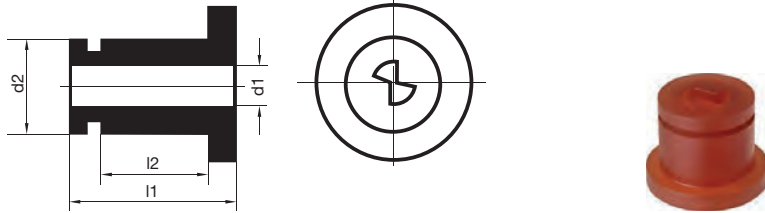
Nr. do artigo **5753**

d1 mm	Gama de diâmetros	d2 mm	l1 mm	Nº de cód.
5,700	6,000-6,249	32,000	4,000	5,700
7,700	8,000-8,299	32,000	4,000	7,700
8,700	9,000-9,299	32,000	4,000	8,700
9,000	9,300-9,699	32,000	4,000	9,000
9,700	10,000-10,299	32,000	4,000	9,700
11,500	11,800-12,399	32,000	4,000	11,500
13,500	13,900-14,399	32,000	4,000	13,500
15,500	15,900-16,399	40,000	4,000	15,500
19,000	19,510-20,509	40,000	4,000	19,000
23,000	23,610-24,609	40,000	4,000	23,000
25,000	25,610-26,609	40,000	4,000	25,000

Brocas canhão para
furação profunda



Buchas de guia para lunetas, para brocas canhão com dois cortes



Nr. do artigo **5751**

d1	Gama de diâmetros	d2	l1	l2	Nº de cód.
mm		mm	mm	mm	
5,700	6,000-6,249	20,000	20,000	12,000	205,700
9,700	10,000-10,299	20,000	20,000	12,000	209,700
6,500	6,750-6,999	30,000	26,000	13,000	306,500
6,700	7,000-7,299	30,000	26,000	13,000	306,700
7,700	8,000-8,299	30,000	26,000	13,000	307,700
9,400	9,700-9,999	30,000	26,000	13,000	309,400
9,700	10,000-10,299	30,000	26,000	13,000	309,700
11,500	11,800-12,399	30,000	26,000	13,000	311,500
15,000	15,400-15,899	30,000	26,000	13,000	315,000
15,500	15,900-16,399	30,000	26,000	13,000	315,500
16,600	17,900-18,399	30,000	26,000	13,000	316,600
17,000	17,400-17,899	30,000	26,000	13,000	317,000
17,500	17,900-18,399	30,000	26,000	13,000	317,500
8,700	9,000-9,299	45,000	26,000	16,000	408,700
13,500	13,900-14,399	45,000	26,000	16,000	413,500
19,000	19,510-20,509	45,000	26,000	16,000	419,000
23,000	23,610-24,609	45,000	26,000	16,000	423,000
24,000	24,610-25,609	45,000	26,000	16,000	424,000
25,000	25,610-26,609	45,000	26,000	16,000	425,000
26,000	26,610-27,609	45,000	26,000	16,000	426,000
27,000	27,610-28,609	45,000	26,000	16,000	427,000

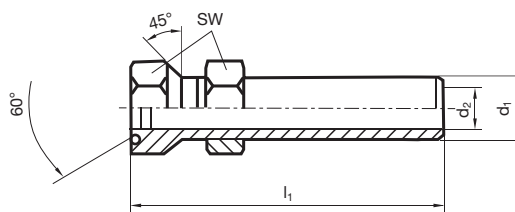
Brocas canhão para furação profunda



Parafuso de ajuste



Parafusos de regulagem sem elemento de vedação



Nr. do artigo **5754**

d1	d2	l1	SW	Nº de cód.
	mm	mm	mm	
M6 x 0,5	3,500	26,000	9,000	6,000
M10 x 1	6,000	38,000	13,000	10,000
M16 x 1,5	10,000	57,000	22,000	16,000

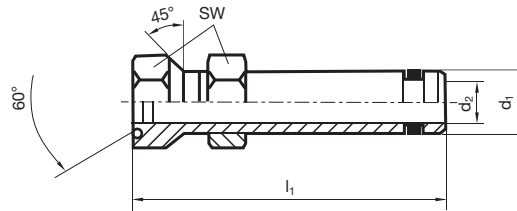
Brocas canhão para
furação profunda



Parafuso de ajuste



Parafusos de ajuste com elemento de vedação



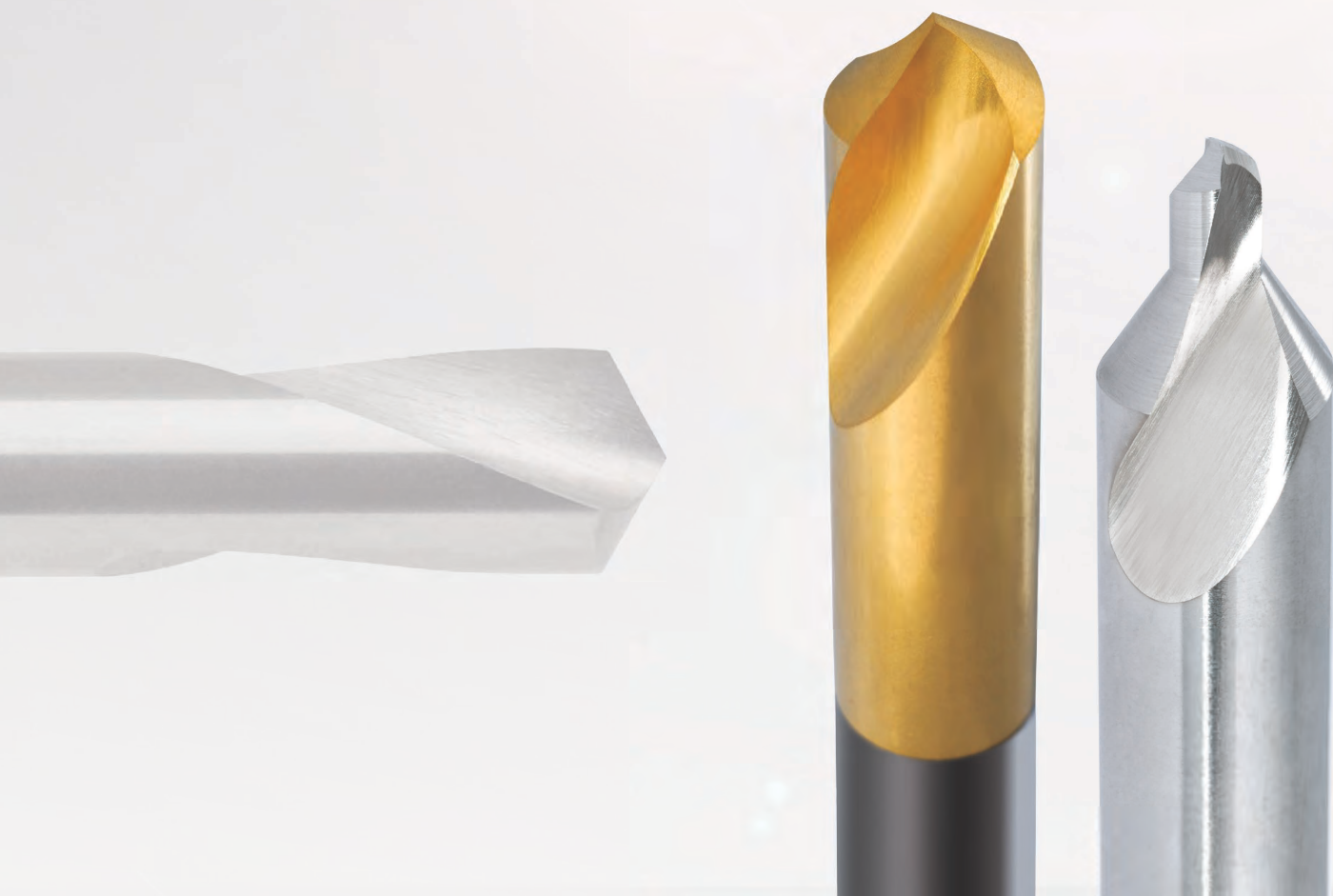
Nr. do artigo **5755**

d1	d2	l1	SW	Nº de cód.
	mm	mm	mm	
M6 x 0,5	3,500	45,000	9,000	6,000
M10 x 1	6,000	50,000	13,000	10,000
M16 x 1,5	10,000	65,000	22,000	16,000
M24X1,5	16,000	90,000	30,000	24,000

Brocas canhão para furação profunda

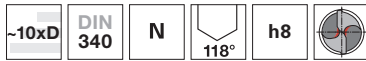
Centradores NC e brocas de centro

Ao aplicar brocas longas recomendamos pilotá-las. Nossos centradores NC são perfeitamente indicados para isso. Para a produção de furos formados nós recomendamos a nossas brocas de centro.





Brocas helicoidais longas

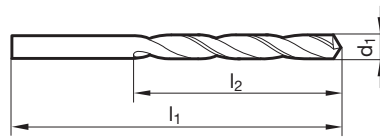


Material de corte	HSS
Superfície	$\geq 0,2,36$
Sentido de corte	(R)

- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica • para furos profundos
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **217**

Brocas canhão para furação profunda

				Nr. do artigo 217			
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,400	1/64	30,000	10,000	1,500		70,000	45,000
0,440		30,000	10,000	1,510		76,000	50,000
0,450		30,000	10,000	1,550		76,000	50,000
0,470		30,000	10,000	1,590	1/16	76,000	50,000
0,500		32,000	12,000	1,600		76,000	50,000
0,520		32,000	12,000	1,610		76,000	50,000
0,550		35,000	15,000	1,650		76,000	50,000
0,570		35,000	15,000	1,700		76,000	50,000
0,600		35,000	15,000	1,750		80,000	53,000
0,620		38,000	18,000	1,780		80,000	53,000
0,650		38,000	18,000	1,800		80,000	53,000
0,700		42,000	21,000	1,850		80,000	53,000
0,730		42,000	21,000	1,900		80,000	53,000
0,750		42,000	21,000	1,930		85,000	56,000
0,760		46,000	25,000	1,950		85,000	56,000
0,790	1/32	46,000	25,000	1,980	5/64	85,000	56,000
0,800		46,000	25,000	2,000		85,000	56,000
0,820		46,000	25,000	2,030		85,000	56,000
0,850		46,000	25,000	2,050		85,000	56,000
0,900		51,000	29,000	2,060		85,000	56,000
0,910		51,000	29,000	2,080		85,000	56,000
0,920		51,000	29,000	2,100		85,000	56,000
0,950		51,000	29,000	2,150		90,000	59,000
0,970		56,000	33,000	2,200		90,000	59,000
1,000		56,000	33,000	2,250		90,000	59,000
1,040		56,000	33,000	2,260		90,000	59,000
1,050		56,000	33,000	2,300		90,000	59,000
1,080		60,000	37,000	2,350		90,000	59,000
1,090		60,000	37,000	2,370		95,000	62,000
1,100		60,000	37,000	2,380	3/32	95,000	62,000
1,120		60,000	37,000	2,400		95,000	62,000
1,130		60,000	37,000	2,420		95,000	62,000
1,150		60,000	37,000	2,440		95,000	62,000
1,180		60,000	37,000	2,450		95,000	62,000
1,190	3/64	65,000	41,000	2,490		95,000	62,000
1,200		65,000	41,000	2,500		95,000	62,000
1,250		65,000	41,000	2,550		95,000	62,000
1,300		65,000	41,000	2,580		95,000	62,000
1,350		70,000	45,000	2,600		95,000	62,000
1,400		70,000	45,000	2,620		95,000	62,000
1,450		70,000	45,000	2,640		95,000	62,000
1,490		70,000	45,000	2,650		95,000	62,000



d1		l1	l2
mm	inch	mm	mm
2,700		100,000	66,000
2,710		100,000	66,000
2,750		100,000	66,000
2,780	7/64	100,000	66,000
2,790		100,000	66,000
2,800		100,000	66,000
2,820		100,000	66,000
2,850		100,000	66,000
2,870		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,030		106,000	69,000
3,050		106,000	69,000
3,100		106,000	69,000
3,150		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,260		106,000	69,000
3,300		106,000	69,000
3,350		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,650		112,000	73,000
3,660		112,000	73,000
3,700		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,850		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,950		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,030		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,450		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,650		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,950		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,030		132,000	87,000
5,050		132,000	87,000

d1		l1	l2
mm	inch	mm	mm
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,150		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,350		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,450		139,000	91,000
5,500		139,000	91,000
5,550		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,750		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,060		148,000	97,000
6,100		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,700		165,000	109,000
7,750		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000

Brocas canhão para furação profunda



Brocas canhão para
furação profunda

d1		l1	l2
mm	inch	mm	mm
9,200		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,600		184,000	121,000
9,700		184,000	121,000
9,750		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,250		184,000	121,000
10,300		184,000	121,000
10,320	13/32	184,000	121,000
10,400		184,000	121,000
10,500		184,000	121,000
10,700		195,000	128,000
10,720	27/64	195,000	128,000
10,750		195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,600		195,000	128,000
11,700		195,000	128,000
11,750		195,000	128,000
11,800		195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,100		205,000	134,000
12,200		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
12,800		205,000	134,000
13,000		205,000	134,000
13,200		205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,800		214,000	140,000
13,890	35/64	214,000	140,000
14,000		214,000	140,000
14,200		220,000	144,000
14,250		220,000	144,000
14,290	9/16	220,000	144,000
14,490		220,000	144,000
14,500		220,000	144,000
14,900		220,000	144,000

d1		l1	l2
mm	inch	mm	mm
15,000		220,000	144,000
15,080	19/32	227,000	149,000
15,200		227,000	149,000
15,250		227,000	149,000
15,400		227,000	149,000
15,480	39/64	227,000	149,000
15,500		227,000	149,000
15,600		227,000	149,000
15,870	5/8	227,000	149,000
16,000		227,000	149,000
16,270	41/64	235,000	154,000
16,500		235,000	154,000
16,670	21/32	235,000	154,000
17,000		235,000	154,000
17,070	43/64	241,000	158,000
17,460	11/16	241,000	158,000
17,500		241,000	158,000
18,000		241,000	158,000
18,500		247,000	162,000
18,650	47/64	247,000	162,000
19,000		247,000	162,000
19,050	3/4	254,000	166,000
19,500		254,000	166,000
20,000		254,000	166,000
20,500		261,000	171,000
20,640	13/16	261,000	171,000
21,000		261,000	171,000
21,500		268,000	176,000
22,000		268,000	176,000
23,300		275,000	180,000
23,810	15/16	282,000	185,000
24,000		282,000	185,000
25,000	63/64	282,000	185,000
26,190	1 1/32	290,000	190,000
26,500		290,000	190,000
26,990	1 1/16	298,000	195,000
28,570	1 1/8	307,000	201,000
29,000		307,000	201,000
29,370	1 5/32	307,000	201,000
29,500		307,000	201,000
30,160	1 3/16	316,000	207,000
30,960	1 7/32	316,000	207,000
31,000		316,000	207,000
36,510	1 7/16	345,000	225,000



Brocas helicoidais longas



Material de corte **HSS**

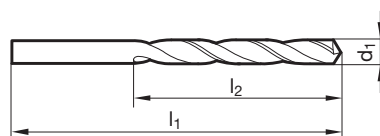
Superfície **S**

Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • para furos profundos • para furar através de buchas
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **667**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,800		100,000	66,000
0,600		35,000	15,000	2,850		100,000	66,000
0,700		42,000	21,000	2,870		100,000	66,000
0,750		42,000	21,000	2,900		100,000	66,000
0,800		46,000	25,000	3,000		100,000	66,000
0,900		51,000	29,000	3,030		106,000	69,000
0,950		51,000	29,000	3,050		106,000	69,000
1,000		56,000	33,000	3,100		106,000	69,000
1,100		60,000	37,000	3,170	1/8	106,000	69,000
1,150		60,000	37,000	3,200		106,000	69,000
1,200		65,000	41,000	3,250		106,000	69,000
1,250		65,000	41,000	3,260		106,000	69,000
1,300		65,000	41,000	3,300		106,000	69,000
1,350		70,000	45,000	3,350		106,000	69,000
1,400		70,000	45,000	3,400		112,000	73,000
1,450		70,000	45,000	3,500		112,000	73,000
1,500		70,000	45,000	3,570	9/64	112,000	73,000
1,550		76,000	50,000	3,600		112,000	73,000
1,590	1/16	76,000	50,000	3,650		112,000	73,000
1,600		76,000	50,000	3,700		112,000	73,000
1,650		76,000	50,000	3,730		112,000	73,000
1,700		76,000	50,000	3,750		112,000	73,000
1,800		80,000	53,000	3,800		119,000	78,000
1,850		80,000	53,000	3,850		119,000	78,000
1,900		80,000	53,000	3,850		119,000	78,000
1,950		85,000	56,000	3,900		119,000	78,000
1,980	5/64	85,000	56,000	3,950		119,000	78,000
2,000		85,000	56,000	3,970	5/32	119,000	78,000
2,100		85,000	56,000	4,000		119,000	78,000
2,200		90,000	59,000	4,050		119,000	78,000
2,300		90,000	59,000	4,100		119,000	78,000
2,350		90,000	59,000	4,200		119,000	78,000
2,370		95,000	62,000	4,250		119,000	78,000
2,380	3/32	95,000	62,000	4,300		126,000	82,000
2,440		95,000	62,000	4,370	11/64	126,000	82,000
2,450		95,000	62,000	4,400		126,000	82,000
2,500		95,000	62,000	4,500		126,000	82,000
2,530		95,000	62,000	4,570		126,000	82,000
2,650		95,000	62,000	4,600		126,000	82,000
2,700		100,000	66,000	4,620		126,000	82,000
2,750		100,000	66,000	4,650		126,000	82,000
2,780	7/64	100,000	66,000	4,700		126,000	82,000
				4,750		126,000	82,000

Brocas canhão para furação profunda



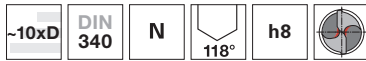
Brocas canhão para
furação profunda

d1		l1	l2
mm	inch	mm	mm
4,760	3/16	132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
5,000	13/64	132,000	87,000
5,100		132,000	87,000
5,160		132,000	87,000
5,200		132,000	87,000
5,250		132,000	87,000
5,300	7/32	132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560		139,000	91,000
5,600		139,000	91,000
5,610	1/4	139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,350		148,000	97,000
6,400		17/64	148,000
6,500	148,000		97,000
6,600	148,000		97,000
6,750	156,000		102,000
6,800	156,000		102,000
7,000	9/32	156,000	102,000
7,100		156,000	102,000
7,140		156,000	102,000
7,200		156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400	19/64	156,000	102,000
7,500		156,000	102,000
7,540		165,000	109,000
7,700		165,000	109,000
7,940		165,000	109,000
8,000		165,000	109,000
8,050		165,000	109,000
8,100	5/16	165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,500	11/32	165,000	109,000
8,700		175,000	115,000
8,730		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000

d1		l1	l2
mm	inch	mm	mm
9,100		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,900	25/64	184,000	121,000
9,920		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000	7/16	195,000	128,000
11,110		195,000	128,000
11,500		195,000	128,000
11,750		195,000	128,000
11,910		205,000	134,000
12,000	15/32	205,000	134,000
12,500		205,000	134,000
12,700		205,000	134,000
13,000		205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,800	35/64	214,000	140,000
13,890		214,000	140,000
14,000		214,000	140,000
14,290		220,000	144,000
14,500	9/16	220,000	144,000
14,750		220,000	144,000
14,800		220,000	144,000
14,900	19/32	220,000	144,000
15,000		220,000	144,000
15,080		227,000	149,000
16,000		227,000	149,000
16,500		235,000	154,000
16,670		235,000	154,000
16,750	21/32	235,000	154,000
17,000		235,000	154,000
17,460		241,000	158,000
18,000	11/16	241,000	158,000
18,250		247,000	162,000
22,220		268,000	176,000



Brocas helicoidais longas

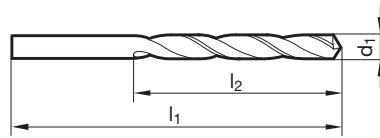


Material de corte	HSS
Superfície	$\geq 6,00$
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 14,750$ • afiação de superfície cônica
- para furos profundos • para furar através de buchas
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **220**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,450		30,000	10,000	4,500		126,000	82,000
0,470		30,000	10,000	4,600		126,000	82,000
0,900		51,000	29,000	4,780		132,000	87,000
0,950		51,000	29,000	4,800		132,000	87,000
1,100		60,000	37,000	4,950		132,000	87,000
1,150		60,000	37,000	5,000		132,000	87,000
1,200		65,000	41,000	5,100		132,000	87,000
1,250		65,000	41,000	5,200		132,000	87,000
1,400		70,000	45,000	5,600		139,000	91,000
1,450		70,000	45,000	5,700		139,000	91,000
1,500		70,000	45,000	6,000		139,000	91,000
1,600		76,000	50,000	6,050		148,000	97,000
1,630		76,000	50,000	6,100		148,000	97,000
1,660		76,000	50,000	6,400		148,000	97,000
1,730		80,000	53,000	6,500		148,000	97,000
1,800		80,000	53,000	6,600		148,000	97,000
1,850		80,000	53,000	6,800		156,000	102,000
1,900		80,000	53,000	7,200		156,000	102,000
2,000		85,000	56,000	7,500		156,000	102,000
2,300		90,000	59,000	7,800		165,000	109,000
2,500		95,000	62,000	8,000		165,000	109,000
2,700		100,000	66,000	8,100		165,000	109,000
2,750		100,000	66,000	8,250		165,000	109,000
2,900		100,000	66,000	8,400		165,000	109,000
2,950		100,000	66,000	8,800		175,000	115,000
3,000		100,000	66,000	9,000		175,000	115,000
3,050		106,000	69,000	9,520	3/8	184,000	121,000
3,070		106,000	69,000	9,700		184,000	121,000
3,100		106,000	69,000	9,800		184,000	121,000
3,250		106,000	69,000	9,900		184,000	121,000
3,300		106,000	69,000	10,000		184,000	121,000
3,350		106,000	69,000	10,100		184,000	121,000
3,400		112,000	73,000	10,500		184,000	121,000
3,500		112,000	73,000	11,000		195,000	128,000
3,550		112,000	73,000	11,500		195,000	128,000
3,600		112,000	73,000	11,900		205,000	134,000
3,700		112,000	73,000	12,000		205,000	134,000
3,800		119,000	78,000	12,200		205,000	134,000
4,000		119,000	78,000	12,500		205,000	134,000
4,050		119,000	78,000	13,000		205,000	134,000
4,250		119,000	78,000	13,500		214,000	140,000
4,300		126,000	82,000	14,750		220,000	144,000

Brocas canhão para furação profunda



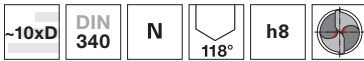
d1		l1	l2
mm	inch	mm	mm
19,000		247,000	162,000
20,000		254,000	166,000
22,000		268,000	176,000
25,000	63/64	282,000	185,000
25,500		290,000	190,000
29,000		307,000	201,000

d1		l1	l2
mm	inch	mm	mm

Brocas carvão para
furação profunda



Brocas helicoidais longas

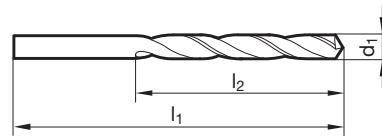


- P** • Redução da aresta transversal $\geq \varnothing 2,950$ • afiação de superfície cônica • com arraste
- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

Material de corte **HSS**

Superfície

Sentido de corte



Nr. do artigo **204**

d1		l1	l2
mm	inch	mm	mm
2,950		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,600		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
4,000		119,000	78,000
4,050		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
5,000		132,000	87,000
5,080		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,500		139,000	91,000
5,600		139,000	91,000
5,800		139,000	91,000
5,850		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
7,000		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,400		165,000	109,000
8,450		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
9,000		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,300		184,000	121,000
10,400		184,000	121,000
10,500		184,000	121,000
10,800		195,000	128,000
11,600		195,000	128,000
12,000		205,000	134,000
13,000		205,000	134,000
25,250		290,000	190,000

Brocas canhão para furação profunda



Brocas helicoidais longas



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P Redução da aresta transversal ≥ Ø 15,000 • afiação de superfície cônica
• para furos profundos

M

K

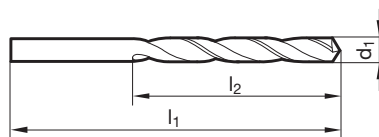
N • materiais duros e quebradiços • latão e ligas de magnésio • bronze e
bronze fosforoso • ardósia, mica, pertinax

S

H

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **218**

Brocas canhão para furação profunda

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
0,500		32,000	12,000	2,300		90,000	59,000
0,520		32,000	12,000	2,350		90,000	59,000
0,550		35,000	15,000	2,400		95,000	62,000
0,600		35,000	15,000	2,500		95,000	62,000
0,650		38,000	18,000	2,550		95,000	62,000
0,700		42,000	21,000	2,600		95,000	62,000
0,750		42,000	21,000	2,650		95,000	62,000
0,800		46,000	25,000	2,700		100,000	66,000
0,820		46,000	25,000	2,800		100,000	66,000
0,840		46,000	25,000	2,830		100,000	66,000
0,850		46,000	25,000	2,870		100,000	66,000
0,900		51,000	29,000	2,900		100,000	66,000
0,950		51,000	29,000	2,940		100,000	66,000
0,970		56,000	33,000	3,000		100,000	66,000
1,000		56,000	33,000	3,020		106,000	69,000
1,050		56,000	33,000	3,050		106,000	69,000
1,100		60,000	37,000	3,060		106,000	69,000
1,150		60,000	37,000	3,100		106,000	69,000
1,200		65,000	41,000	3,150		106,000	69,000
1,250		65,000	41,000	3,180		106,000	69,000
1,300		65,000	41,000	3,200		106,000	69,000
1,400		70,000	45,000	3,250		106,000	69,000
1,500		70,000	45,000	3,270		106,000	69,000
1,550		76,000	50,000	3,300		106,000	69,000
1,560		76,000	50,000	3,400		112,000	73,000
1,570		76,000	50,000	3,500		112,000	73,000
1,580		76,000	50,000	3,550		112,000	73,000
1,600		76,000	50,000	3,600		112,000	73,000
1,650		76,000	50,000	3,800		119,000	78,000
1,700		76,000	50,000	3,900		119,000	78,000
1,750		80,000	53,000	4,000		119,000	78,000
1,800		80,000	53,000	4,030		119,000	78,000
1,820		80,000	53,000	4,100		119,000	78,000
1,850		80,000	53,000	4,200		119,000	78,000
1,900		80,000	53,000	4,300		126,000	82,000
1,950		85,000	56,000	4,400		126,000	82,000
2,000		85,000	56,000	4,500		126,000	82,000
2,050		85,000	56,000	4,600		126,000	82,000
2,100		85,000	56,000	4,700		126,000	82,000
2,180		90,000	59,000	4,760	3/16	132,000	87,000
2,200		90,000	59,000	4,800		132,000	87,000
2,250		90,000	59,000	4,900		132,000	87,000



Brocas helicoidais longas



Material de corte **HSS**

Superfície

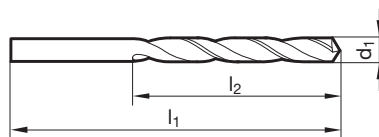
Sentido de corte

P Redução da aresta transversal $\geq \varnothing 15,000$ • afiação de superfície cônica
• para furos profundos

- M**
- K**
- N** • materiais duros e quebradiços • latão e ligas de magnésio • bronze e bronze fosforoso • ardósia, mica, pertinax
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **221**

Brocas canhão para furação profunda

d1		l1	l2
mm	inch	mm	mm
0,450		30,000	10,000
0,600		35,000	15,000
0,650		38,000	18,000
0,900		51,000	29,000
1,100		60,000	37,000
1,240		65,000	41,000
1,300		65,000	41,000
1,320		65,000	41,000
1,370		70,000	45,000
1,400		70,000	45,000
1,500		70,000	45,000
1,550		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
2,000		85,000	56,000
2,160		90,000	59,000
2,180		90,000	59,000
2,200		90,000	59,000
2,270		90,000	59,000
2,350		90,000	59,000
2,850		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,170	1/8	106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000

d1		l1	l2
mm	inch	mm	mm
3,510		112,000	73,000
3,700		112,000	73,000
4,100		119,000	78,000
4,200		119,000	78,000
4,400		126,000	82,000
4,500		126,000	82,000
4,900		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,100		132,000	87,000
5,400		139,000	91,000
5,600		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,800		156,000	102,000
8,000		165,000	109,000
9,000		175,000	115,000
12,800		205,000	134,000
15,000		220,000	144,000



Brocas helicoidais longas



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P Redução da aresta transversal ≥ Ø 14,500 • afiação de superfície cônica
• para furos profundos

M

K

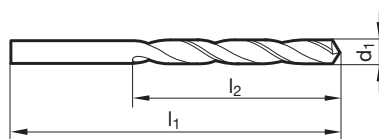
N • materiais moles com cavacos longos • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • plásticos moles, madeira

S

H

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **219**

d1		l1	l2
mm	inch	mm	mm
0,500		32,000	12,000
0,600		35,000	15,000
0,650		38,000	18,000
0,700		42,000	21,000
0,740		42,000	21,000
0,750		42,000	21,000
0,800		46,000	25,000
0,850		46,000	25,000
0,900		51,000	29,000
0,950		51,000	29,000
0,970		56,000	33,000
0,980		56,000	33,000
1,000		56,000	33,000
1,100		60,000	37,000
1,180		60,000	37,000
1,190	3/64	65,000	41,000
1,200		65,000	41,000
1,220		65,000	41,000
1,250		65,000	41,000
1,300		65,000	41,000
1,350		70,000	45,000
1,370		70,000	45,000
1,400		70,000	45,000
1,440		70,000	45,000
1,500		70,000	45,000
1,520		76,000	50,000
1,600		76,000	50,000
1,610		76,000	50,000
1,650		76,000	50,000
1,700		76,000	50,000
1,750		80,000	53,000
1,760		80,000	53,000
1,770		80,000	53,000
1,780		80,000	53,000
1,800		80,000	53,000
1,850		80,000	53,000
1,900		80,000	53,000
1,950		85,000	56,000
1,970		85,000	56,000
2,000		85,000	56,000
2,050		85,000	56,000
2,070		85,000	56,000

d1		l1	l2
mm	inch	mm	mm
2,100		85,000	56,000
2,150		90,000	59,000
2,200		90,000	59,000
2,250		90,000	59,000
2,300		90,000	59,000
2,350		90,000	59,000
2,380	3/32	95,000	62,000
2,400		95,000	62,000
2,430		95,000	62,000
2,450		95,000	62,000
2,490		95,000	62,000
2,500		95,000	62,000
2,550		95,000	62,000
2,600		95,000	62,000
2,650		95,000	62,000
2,700		100,000	66,000
2,710		100,000	66,000
2,750		100,000	66,000
2,800		100,000	66,000
2,850		100,000	66,000
2,880		100,000	66,000
2,900		100,000	66,000
2,950		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,170	1/8	106,000	69,000
3,180		106,000	69,000
3,200		106,000	69,000
3,250		106,000	69,000
3,260		106,000	69,000
3,300		106,000	69,000
3,350		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,600		112,000	73,000
3,650		112,000	73,000
3,700		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,830		119,000	78,000
3,900		119,000	78,000

Brocas canhão para furação profunda



Brocas canhão para
furação profunda

d1		l1	l2
mm	inch	mm	mm
3,920		119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,100		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,700		126,000	82,000
4,800		132,000	87,000
4,830		132,000	87,000
4,870		132,000	87,000
4,900		132,000	87,000
4,950		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,430		139,000	91,000
5,500		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,980		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,450		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,550		165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000

d1		l1	l2
mm	inch	mm	mm
7,850		165,000	109,000
7,900		165,000	109,000
7,950		165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,500		165,000	109,000
8,550		175,000	115,000
8,600		175,000	115,000
8,700		175,000	115,000
8,750		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,500		175,000	115,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,300		184,000	121,000
10,700		195,000	128,000
10,750		195,000	128,000
11,000		195,000	128,000
11,300		195,000	128,000
11,400		195,000	128,000
12,000		205,000	134,000
13,100	33/64	205,000	134,000
13,500		214,000	140,000
13,750		214,000	140,000
14,000		214,000	140,000
14,500		220,000	144,000
15,000		220,000	144,000
15,500		227,000	149,000
17,000		235,000	154,000
18,000		241,000	158,000
18,250		247,000	162,000
19,000		247,000	162,000
19,840	25/32	254,000	166,000
20,000		254,000	166,000
20,640	13/16	261,000	171,000

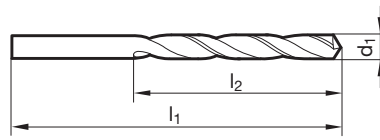


Brocas helicoidais longas



- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

Material de corte	HSS
Superfície	
Sentido de corte	



GÜHRINGNAVIGATOR

Página de dados de corte 786

Nr. do artigo **535**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,200		90,000	59,000
1,020		56,000	33,000	2,250		90,000	59,000
1,040		56,000	33,000	2,260		90,000	59,000
1,050		56,000	33,000	2,300		90,000	59,000
1,070		60,000	37,000	2,350		90,000	59,000
1,090		60,000	37,000	2,370		95,000	62,000
1,100		60,000	37,000	2,380	3/32	95,000	62,000
1,150		60,000	37,000	2,400		95,000	62,000
1,180		60,000	37,000	2,440		95,000	62,000
1,190	3/64	65,000	41,000	2,450		95,000	62,000
1,200		65,000	41,000	2,480		95,000	62,000
1,250		65,000	41,000	2,490		95,000	62,000
1,300		65,000	41,000	2,500		95,000	62,000
1,320		65,000	41,000	2,530		95,000	62,000
1,350		70,000	45,000	2,550		95,000	62,000
1,400		70,000	45,000	2,580		95,000	62,000
1,450		70,000	45,000	2,600		95,000	62,000
1,500		70,000	45,000	2,640		95,000	62,000
1,510		76,000	50,000	2,650		95,000	62,000
1,520		76,000	50,000	2,700		100,000	66,000
1,550		76,000	50,000	2,710		100,000	66,000
1,590	1/16	76,000	50,000	2,750		100,000	66,000
1,600		76,000	50,000	2,780	7/64	100,000	66,000
1,650		76,000	50,000	2,790		100,000	66,000
1,670		76,000	50,000	2,800		100,000	66,000
1,700		76,000	50,000	2,820		100,000	66,000
1,750		80,000	53,000	2,830		100,000	66,000
1,780		80,000	53,000	2,850		100,000	66,000
1,800		80,000	53,000	2,870		100,000	66,000
1,850		80,000	53,000	2,900		100,000	66,000
1,900		80,000	53,000	2,940		100,000	66,000
1,930		85,000	56,000	2,950		100,000	66,000
1,950		85,000	56,000	3,000		100,000	66,000
1,980	5/64	85,000	56,000	3,050		106,000	69,000
1,990		85,000	56,000	3,100		106,000	69,000
2,000		85,000	56,000	3,150		106,000	69,000
2,050		85,000	56,000	3,170	1/8	106,000	69,000
2,060		85,000	56,000	3,200		106,000	69,000
2,080		85,000	56,000	3,250		106,000	69,000
2,100		85,000	56,000	3,260		106,000	69,000
2,150		90,000	59,000	3,270		106,000	69,000
2,180		90,000	59,000	3,300		106,000	69,000

Brocas canhão para furação profunda



Brocas canhão para furação profunda

d1		l1	l2
mm	inch	mm	mm
3,400		112,000	73,000
3,450		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,570	9/64	112,000	73,000
3,600		112,000	73,000
3,660		112,000	73,000
3,700		112,000	73,000
3,730		112,000	73,000
3,750		112,000	73,000
3,800		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,130		119,000	78,000
4,150		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,050		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,250		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,750		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,050		148,000	97,000
6,100		148,000	97,000

d1		l1	l2
mm	inch	mm	mm
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
6,910		156,000	102,000
7,000		156,000	102,000
7,030		156,000	102,000
7,040		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000
7,750		165,000	109,000
7,800		165,000	109,000
7,850		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,250		165,000	109,000
8,300		165,000	109,000
8,330	21/64	165,000	109,000
8,400		165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,840		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,340		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,600		184,000	121,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,080		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000

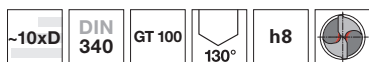


d1		l1	l2
mm	inch	mm	mm
10,300		184,000	121,000
10,320	13/32	184,000	121,000
10,400		184,000	121,000
10,490		184,000	121,000
10,500		184,000	121,000
10,600		184,000	121,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,100		195,000	128,000
11,110	7/16	195,000	128,000
11,300		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,800		195,000	128,000
11,900		205,000	134,000
11,910	15/32	205,000	134,000

d1		l1	l2
mm	inch	mm	mm
12,000		205,000	134,000
12,150		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,600		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,490	17/32	214,000	140,000
13,500		214,000	140,000
13,700		214,000	140,000
13,890	35/64	214,000	140,000
13,900		214,000	140,000
14,000		214,000	140,000



Brocas helicoidais longas



Material de corte **HSS**

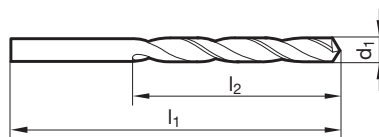
Superfície **S**

Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • canais largos • na expulsão difícil dos cavacos
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **668**

Brocas canhão para furação profunda

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,800		100,000	66,000
1,090		60,000	37,000	2,820		100,000	66,000
1,100		60,000	37,000	2,850		100,000	66,000
1,180		60,000	37,000	2,870		100,000	66,000
1,190	3/64	65,000	41,000	2,900		100,000	66,000
1,200		65,000	41,000	2,950		100,000	66,000
1,300		65,000	41,000	3,000		100,000	66,000
1,320		65,000	41,000	3,050		106,000	69,000
1,400		70,000	45,000	3,100		106,000	69,000
1,500		70,000	45,000	3,170	1/8	106,000	69,000
1,510		76,000	50,000	3,200		106,000	69,000
1,590	1/16	76,000	50,000	3,250		106,000	69,000
1,600		76,000	50,000	3,260		106,000	69,000
1,650		76,000	50,000	3,300		106,000	69,000
1,700		76,000	50,000	3,400		112,000	73,000
1,800		80,000	53,000	3,450		112,000	73,000
1,850		80,000	53,000	3,500		112,000	73,000
1,900		80,000	53,000	3,570	9/64	112,000	73,000
1,930		85,000	56,000	3,600		112,000	73,000
1,950		85,000	56,000	3,700		112,000	73,000
1,980	5/64	85,000	56,000	3,730		112,000	73,000
1,990		85,000	56,000	3,750		112,000	73,000
2,000		85,000	56,000	3,800		119,000	78,000
2,060		85,000	56,000	3,860		119,000	78,000
2,080		85,000	56,000	3,870		119,000	78,000
2,100		85,000	56,000	3,900		119,000	78,000
2,180		90,000	59,000	3,910		119,000	78,000
2,200		90,000	59,000	3,970	5/32	119,000	78,000
2,260		90,000	59,000	4,000		119,000	78,000
2,300		90,000	59,000	4,040		119,000	78,000
2,380	3/32	95,000	62,000	4,090		119,000	78,000
2,400		95,000	62,000	4,100		119,000	78,000
2,490		95,000	62,000	4,200		119,000	78,000
2,500		95,000	62,000	4,220		119,000	78,000
2,530		95,000	62,000	4,300		126,000	82,000
2,550		95,000	62,000	4,370	11/64	126,000	82,000
2,580		95,000	62,000	4,400		126,000	82,000
2,600		95,000	62,000	4,500		126,000	82,000
2,640		95,000	62,000	4,600		126,000	82,000
2,700		100,000	66,000	4,700		126,000	82,000
2,710		100,000	66,000	4,760	3/16	132,000	87,000
2,780	7/64	100,000	66,000	4,800		132,000	87,000



d1		l1	l2
mm	inch	mm	mm
4,850		132,000	87,000
4,900		132,000	87,000
4,910		132,000	87,000
4,920		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,100		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,760		156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,250		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000

d1		l1	l2
mm	inch	mm	mm
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,340		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,300	31/64	205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
14,000		214,000	140,000

Brocas canhão para furação profunda



Brocas helicoidais longas



Material de corte **HSS**

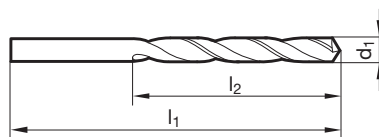
Superfície **F**

Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • canais largos • na expulsão difícil dos cavacos
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 786



Nr. do artigo **2462**

Brocas canhão para furação profunda

d1		l1	l2
mm	inch	mm	mm
1,000		56,000	33,000
1,100		60,000	37,000
1,200		65,000	41,000
1,300		65,000	41,000
1,500		70,000	45,000
1,600		76,000	50,000
1,700		76,000	50,000
1,800		80,000	53,000
1,900		80,000	53,000
2,000		85,000	56,000
2,100		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,400		95,000	62,000
2,500		95,000	62,000
2,600		95,000	62,000
2,800		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000

d1		l1	l2
mm	inch	mm	mm
3,800		119,000	78,000
4,000		119,000	78,000
4,200		119,000	78,000
4,300		126,000	82,000
4,500		126,000	82,000
4,800		132,000	87,000
5,000		132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,800		156,000	102,000
7,000		156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,600		165,000	109,000
8,000		165,000	109,000
9,000		175,000	115,000
10,000		184,000	121,000



Brocas helicoidais longas



Material de corte **HSS**

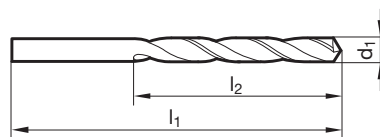
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação de superfície cônica
- M** • canais largos • na expulsão difícil dos cavacos
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **506**

d1		l1	l2
mm	inch	mm	mm
1,400		70,000	45,000
1,500		70,000	45,000
1,600		76,000	50,000
1,680		76,000	50,000
1,800		80,000	53,000
1,850		80,000	53,000
2,000		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,350		90,000	59,000
2,500		95,000	62,000
2,800		100,000	66,000
3,000		100,000	66,000
3,050		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,550		112,000	73,000
3,800		119,000	78,000
3,950		119,000	78,000
4,000		119,000	78,000
4,400		126,000	82,000
4,500		126,000	82,000

d1		l1	l2
mm	inch	mm	mm
4,600		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,950		132,000	87,000
5,160	13/64	132,000	87,000
5,200		132,000	87,000
5,400		139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
7,400		156,000	102,000
7,800		165,000	109,000
8,500		165,000	109,000
9,000		175,000	115,000
9,900		184,000	121,000
10,320	13/32	184,000	121,000
11,000		195,000	128,000
11,500		195,000	128,000
11,600		195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000

Brocas canhão para furação profunda



Brocas helicoidais longas



P ○ Redução da aresta transversal ≥ Ø 2,370 • afiação de superfície cônica
• canal especialmente longo

M
K
N ●
S
H

● materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira

Material de corte **HSS**

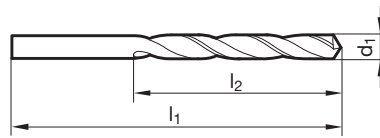
Superfície ○

Sentido de corte



GÜHRINGNAVIGATOR

Página de dados de corte 786



Nr. do artigo **501**

Brocas canhão para furação profunda

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,350		90,000	59,000
1,020		56,000	33,000	2,370		95,000	62,000
1,030		56,000	33,000	2,380	3/32	95,000	62,000
1,040		56,000	33,000	2,400		95,000	62,000
1,070		60,000	37,000	2,440		95,000	62,000
1,090		60,000	37,000	2,450		95,000	62,000
1,100		60,000	37,000	2,490		95,000	62,000
1,180		60,000	37,000	2,500		95,000	62,000
1,190	3/64	65,000	41,000	2,520		95,000	62,000
1,200		65,000	41,000	2,530		95,000	62,000
1,250		65,000	41,000	2,550		95,000	62,000
1,300		65,000	41,000	2,580		95,000	62,000
1,320		65,000	41,000	2,600		95,000	62,000
1,400		70,000	45,000	2,640		95,000	62,000
1,450		70,000	45,000	2,650		95,000	62,000
1,480		70,000	45,000	2,700		100,000	66,000
1,500		70,000	45,000	2,710		100,000	66,000
1,510		76,000	50,000	2,750		100,000	66,000
1,550		76,000	50,000	2,780	7/64	100,000	66,000
1,590	1/16	76,000	50,000	2,790		100,000	66,000
1,600		76,000	50,000	2,800		100,000	66,000
1,610		76,000	50,000	2,820		100,000	66,000
1,700		76,000	50,000	2,850		100,000	66,000
1,750		80,000	53,000	2,870		100,000	66,000
1,780		80,000	53,000	2,900		100,000	66,000
1,800		80,000	53,000	2,950		100,000	66,000
1,850		80,000	53,000	3,000		100,000	66,000
1,900		80,000	53,000	3,050		106,000	69,000
1,930		85,000	56,000	3,100		106,000	69,000
1,950		85,000	56,000	3,170	1/8	106,000	69,000
1,980	5/64	85,000	56,000	3,200		106,000	69,000
1,990		85,000	56,000	3,250		106,000	69,000
2,000		85,000	56,000	3,260		106,000	69,000
2,050		85,000	56,000	3,300		106,000	69,000
2,060		85,000	56,000	3,350		106,000	69,000
2,080		85,000	56,000	3,400		112,000	73,000
2,100		85,000	56,000	3,450		112,000	73,000
2,180		90,000	59,000	3,500		112,000	73,000
2,200		90,000	59,000	3,570	9/64	112,000	73,000
2,250		90,000	59,000	3,600		112,000	73,000
2,260		90,000	59,000	3,650		112,000	73,000
2,300		90,000	59,000	3,660		112,000	73,000



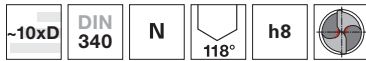
d1		l1	l2
mm	inch	mm	mm
3,700		112,000	73,000
3,800		119,000	78,000
3,860		119,000	78,000
3,900		119,000	78,000
3,910		119,000	78,000
3,970	5/32	119,000	78,000
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,050		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,250		119,000	78,000
4,300		126,000	82,000
4,350		126,000	82,000
4,370	11/64	126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,750		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,650		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,030		148,000	97,000
6,040		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,040		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,670		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,025		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,330	21/64	165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,750		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,130	23/64	175,000	115,000
9,300		175,000	115,000
9,340		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,580		184,000	121,000
9,600		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,080		184,000	121,000
10,200		184,000	121,000
10,260		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,600		184,000	121,000
10,700		195,000	128,000
10,720	27/64	195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,400		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,750		195,000	128,000
11,800		195,000	128,000
11,900		205,000	134,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,200		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,490	17/32	214,000	140,000
14,000		214,000	140,000
32,600		325,000	213,000

Brocas canhão para furação profunda



Brocas helicoidais longas



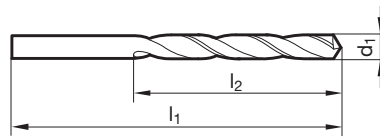
- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** ○ aço-HSS ligado com Co • resistência ao desgaste ampliada
- K** •
- N** • aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** ○
- H**

Material de corte	HSCO
Superfície	$\geq \frac{0}{2,36}$
Sentido de corte	



GÜHRING NAVIGATOR

Página de dados de corte 792



Nr. do artigo **317**

Brocas canhão para furação profunda

d1				l1				l2			
mm		inch		mm		mm		mm		mm	
0,500				32,000				12,000			
0,600				35,000				15,000			
0,700				42,000				21,000			
0,750				42,000				21,000			
0,800				46,000				25,000			
0,850				46,000				25,000			
0,900				51,000				29,000			
0,950				51,000				29,000			
0,960				56,000				33,000			
1,000				56,000				33,000			
1,020				56,000				33,000			
1,050				56,000				33,000			
1,100				60,000				37,000			
1,150				60,000				37,000			
1,190		3/64		65,000				41,000			
1,200				65,000				41,000			
1,250				65,000				41,000			
1,300				65,000				41,000			
1,350				70,000				45,000			
1,400				70,000				45,000			
1,450				70,000				45,000			
1,500				70,000				45,000			
1,510				76,000				50,000			
1,550				76,000				50,000			
1,590		1/16		76,000				50,000			
1,600				76,000				50,000			
1,650				76,000				50,000			
1,700				76,000				50,000			
1,780				80,000				53,000			
1,800				80,000				53,000			
1,850				80,000				53,000			
1,900				80,000				53,000			
1,950				85,000				56,000			
1,980		5/64		85,000				56,000			
2,000				85,000				56,000			
2,050				85,000				56,000			
2,060				85,000				56,000			
2,100				85,000				56,000			
2,200				90,000				59,000			
2,300				90,000				59,000			
2,380		3/32		95,000				62,000			
2,400				95,000				62,000			
2,500								95,000			62,000
2,600								95,000			62,000
2,700								100,000			66,000
2,780		7/64						100,000			66,000
2,800								100,000			66,000
2,900								100,000			66,000
3,000								100,000			66,000
3,050								106,000			69,000
3,100								106,000			69,000
3,170		1/8						106,000			69,000
3,200								106,000			69,000
3,250								106,000			69,000
3,300								106,000			69,000
3,400								112,000			73,000
3,500								112,000			73,000
3,550								112,000			73,000
3,570		9/64						112,000			73,000
3,600								112,000			73,000
3,700								112,000			73,000
3,800								119,000			78,000
3,900								119,000			78,000
3,970		5/32						119,000			78,000
4,000								119,000			78,000
4,040								119,000			78,000
4,100								119,000			78,000
4,200								119,000			78,000
4,300								126,000			82,000
4,370		11/64						126,000			82,000
4,400								126,000			82,000
4,500								126,000			82,000
4,600								126,000			82,000
4,700								126,000			82,000
4,760		3/16						132,000			87,000
4,800								132,000			87,000
4,850								132,000			87,000
4,900								132,000			87,000
5,000								132,000			87,000
5,050								132,000			87,000
5,100								132,000			87,000
5,160		13/64						132,000			87,000
5,200								132,000			87,000
5,300								132,000			87,000



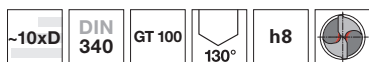
d1		l1	l2
mm	inch	mm	mm
5,400		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,200		165,000	109,000
8,330	21/64	165,000	109,000
8,430		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
9,000		175,000	115,000
9,130	23/64	175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,500		175,000	115,000

d1		l1	l2
mm	inch	mm	mm
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,920	25/64	184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,320	13/32	184,000	121,000
10,500		184,000	121,000
10,720	27/64	195,000	128,000
10,750		195,000	128,000
10,800		195,000	128,000
11,000		195,000	128,000
11,110	7/16	195,000	128,000
11,200		195,000	128,000
11,500		195,000	128,000
11,510	29/64	195,000	128,000
11,910	15/32	205,000	134,000
12,000		205,000	134,000
12,300	31/64	205,000	134,000
12,500		205,000	134,000
12,700	1/2	205,000	134,000
13,000		205,000	134,000
13,100	33/64	205,000	134,000
13,500		214,000	140,000
13,700		214,000	140,000
13,890	35/64	214,000	140,000
13,900		214,000	140,000
14,000		214,000	140,000
14,290	9/16	220,000	144,000
14,400		220,000	144,000
14,600		220,000	144,000
14,680	37/64	220,000	144,000
14,700		220,000	144,000
14,750		220,000	144,000
14,900		220,000	144,000
15,000		220,000	144,000
15,080	19/32	227,000	149,000
15,480	39/64	227,000	149,000
15,800		227,000	149,000
15,870	5/8	227,000	149,000
16,000		227,000	149,000
22,000		268,000	176,000

Brocas canhão para
furação profunda



Brocas helicoidais longas

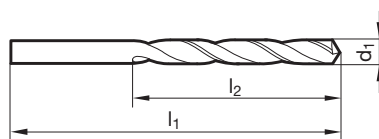


Material de corte	HSCO
Superfície	
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • na expulsão difícil dos cavacos
- K** •
- N** • aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** •
- H** •

GÜHRING NAVIGATOR

Página de dados de corte 792



Nr. do artigo **336**

Brocas canhão para furação profunda

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	2,440		95,000	62,000
1,020		56,000	33,000	2,450		95,000	62,000
1,040		56,000	33,000	2,490		95,000	62,000
1,070		60,000	37,000	2,500		95,000	62,000
1,090		60,000	37,000	2,530		95,000	62,000
1,100		60,000	37,000	2,550		95,000	62,000
1,180		60,000	37,000	2,580		95,000	62,000
1,190	3/64	65,000	41,000	2,600		95,000	62,000
1,200		65,000	41,000	2,640		95,000	62,000
1,250		65,000	41,000	2,700		100,000	66,000
1,300		65,000	41,000	2,710		100,000	66,000
1,320		65,000	41,000	2,750		100,000	66,000
1,400		70,000	45,000	2,780	7/64	100,000	66,000
1,500		70,000	45,000	2,790		100,000	66,000
1,510		76,000	50,000	2,800		100,000	66,000
1,550		76,000	50,000	2,820		100,000	66,000
1,590	1/16	76,000	50,000	2,850		100,000	66,000
1,600		76,000	50,000	2,870		100,000	66,000
1,610		76,000	50,000	2,900		100,000	66,000
1,700		76,000	50,000	2,950		100,000	66,000
1,750		80,000	53,000	3,000		100,000	66,000
1,780		80,000	53,000	3,050		106,000	69,000
1,800		80,000	53,000	3,100		106,000	69,000
1,850		80,000	53,000	3,170	1/8	106,000	69,000
1,900		80,000	53,000	3,200		106,000	69,000
1,930		85,000	56,000	3,260		106,000	69,000
1,980	5/64	85,000	56,000	3,300		106,000	69,000
1,990		85,000	56,000	3,400		112,000	73,000
2,000		85,000	56,000	3,440		112,000	73,000
2,050		85,000	56,000	3,450		112,000	73,000
2,060		85,000	56,000	3,500		112,000	73,000
2,080		85,000	56,000	3,570	9/64	112,000	73,000
2,100		85,000	56,000	3,600		112,000	73,000
2,180		90,000	59,000	3,660		112,000	73,000
2,200		90,000	59,000	3,700		112,000	73,000
2,250		90,000	59,000	3,730		112,000	73,000
2,260		90,000	59,000	3,750		112,000	73,000
2,300		90,000	59,000	3,800		119,000	78,000
2,350		90,000	59,000	3,860		119,000	78,000
2,370		95,000	62,000	3,900		119,000	78,000
2,380	3/32	95,000	62,000	3,910		119,000	78,000
2,400		95,000	62,000	3,970	5/32	119,000	78,000



d1		l1	l2
mm	inch	mm	mm
3,990		119,000	78,000
4,000		119,000	78,000
4,040		119,000	78,000
4,090		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,220		119,000	78,000
4,300		126,000	82,000
4,370	11/64	126,000	82,000
4,390		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,570		126,000	82,000
4,600		126,000	82,000
4,620		126,000	82,000
4,700		126,000	82,000
4,760	3/16	132,000	87,000
4,800		132,000	87,000
4,850		132,000	87,000
4,900		132,000	87,000
4,920		132,000	87,000
4,980		132,000	87,000
5,000		132,000	87,000
5,060		132,000	87,000
5,100		132,000	87,000
5,110		132,000	87,000
5,160	13/64	132,000	87,000
5,180		132,000	87,000
5,200		132,000	87,000
5,220		132,000	87,000
5,300		132,000	87,000
5,310		139,000	91,000
5,400		139,000	91,000
5,410		139,000	91,000
5,500		139,000	91,000
5,560	7/32	139,000	91,000
5,600		139,000	91,000
5,610		139,000	91,000
5,700		139,000	91,000
5,790		139,000	91,000
5,800		139,000	91,000
5,900		139,000	91,000
5,940		139,000	91,000
5,950	15/64	139,000	91,000
6,000		139,000	91,000
6,040		148,000	97,000
6,100		148,000	97,000
6,150		148,000	97,000
6,200		148,000	97,000
6,250		148,000	97,000
6,300		148,000	97,000
6,350	1/4	148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,530		148,000	97,000
6,600		148,000	97,000
6,630		148,000	97,000
6,700		148,000	97,000
6,750	17/64	156,000	102,000
6,800		156,000	102,000

d1		l1	l2
mm	inch	mm	mm
6,900		156,000	102,000
7,000		156,000	102,000
7,030		156,000	102,000
7,100		156,000	102,000
7,140	9/32	156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,370		156,000	102,000
7,400		156,000	102,000
7,490		156,000	102,000
7,500		156,000	102,000
7,540	19/64	165,000	109,000
7,670		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
7,940	5/16	165,000	109,000
8,000		165,000	109,000
8,030		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,610		175,000	115,000
8,700		175,000	115,000
8,730	11/32	175,000	115,000
8,800		175,000	115,000
8,840		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,090		175,000	115,000
9,100		175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,350		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
9,700		184,000	121,000
9,750		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
10,750		195,000	128,000
10,800		195,000	128,000
10,900		195,000	128,000
11,000		195,000	128,000
11,500		195,000	128,000
11,800		195,000	128,000
12,000		205,000	134,000
12,500		205,000	134,000
13,000		205,000	134,000
15,500		227,000	149,000
16,000		227,000	149,000

Brocas canhão para furação profunda



Brocas helicoidais longas

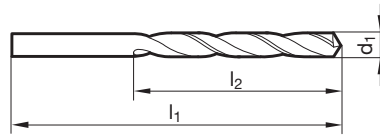


- P** • Redução da aresta transversal $\geq \varnothing 1,000$ • afiação de superfície cônica • aço-HSS ligado com Co • canais largos • especialmente alta resistência ao desgaste • na expulsão difícil dos cavacos
- M** •
- K** •
- N** • aços com, sem liga e fundidos acima de 800-N/mm² • aços para trabalhos a quente e a frio • aços para mancais de laminadoras • aços de liga alta • aços para beneficiamento e cementação
- S** •
- H** •

GÜHRINGNAVIGATOR

Página de dados de corte 792

Material de corte	HSCO
Superfície	F
Sentido de corte	R



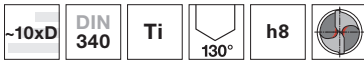
Nr. do artigo **396**

Brocas canhão para furação profunda

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	5,800		139,000	91,000
1,100		60,000	37,000	5,900		139,000	91,000
1,200		65,000	41,000	6,000		139,000	91,000
1,300		65,000	41,000	6,200		148,000	97,000
1,500		70,000	45,000	6,500		148,000	97,000
1,600		76,000	50,000	6,700		148,000	97,000
1,800		80,000	53,000	6,800		156,000	102,000
1,900		80,000	53,000	7,000		156,000	102,000
2,000		85,000	56,000	7,200		156,000	102,000
2,100		85,000	56,000	7,400		156,000	102,000
2,200		90,000	59,000	7,500		156,000	102,000
2,300		90,000	59,000	7,600		165,000	109,000
2,400		95,000	62,000	7,700		165,000	109,000
2,500		95,000	62,000	7,800		165,000	109,000
2,700		100,000	66,000	7,900		165,000	109,000
2,800		100,000	66,000	8,000		165,000	109,000
2,900		100,000	66,000	8,200		165,000	109,000
3,000		100,000	66,000	8,300		165,000	109,000
3,100		106,000	69,000	8,500		165,000	109,000
3,200		106,000	69,000	8,600		175,000	115,000
3,300		106,000	69,000	8,800		175,000	115,000
3,400		112,000	73,000	8,900		175,000	115,000
3,500		112,000	73,000	9,000		175,000	115,000
3,600		112,000	73,000	9,100		175,000	115,000
3,800		119,000	78,000	9,200		175,000	115,000
3,900		119,000	78,000	9,300		175,000	115,000
4,000		119,000	78,000	9,500		175,000	115,000
4,100		119,000	78,000	9,600		184,000	121,000
4,200		119,000	78,000	9,700		184,000	121,000
4,500		126,000	82,000	10,000		184,000	121,000
4,800		132,000	87,000	10,200		184,000	121,000
5,000		132,000	87,000	10,500		184,000	121,000
5,100		132,000	87,000	11,000		195,000	128,000
5,200		132,000	87,000	11,500		195,000	128,000
5,400		139,000	91,000	12,000		205,000	134,000
5,500		139,000	91,000				



Brocas helicoidais longas

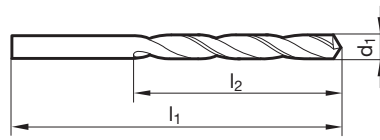


- P** ○ Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
- M** ● aço-HSS ligado com Co • resistência ao desgaste ampliada
- K** ●
- N** ● Titânio e ligas de titânio • aços austeníticos resistentes a corrosão-/ácidos-/calor • aços de alta resistência de cavacos curtos acima de 900 N/mm² • aços para mancais de laminadoras • Hastelloy, Inconel, Nimonic
- S** ●
- H** ●

Material de corte **HSCO**

Superfície ○

Sentido de corte



GÜHRING NAVIGATOR

Página de dados de corte 792

Nr. do artigo **617**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	3,300		106,000	69,000
1,100		60,000	37,000	3,400		112,000	73,000
1,200		65,000	41,000	3,450		112,000	73,000
1,300		65,000	41,000	3,500		112,000	73,000
1,400		70,000	45,000	3,570	9/64	112,000	73,000
1,450		70,000	45,000	3,600		112,000	73,000
1,500		70,000	45,000	3,700		112,000	73,000
1,590	1/16	76,000	50,000	3,800		119,000	78,000
1,600		76,000	50,000	3,900		119,000	78,000
1,610		76,000	50,000	3,970	5/32	119,000	78,000
1,650		76,000	50,000	4,000		119,000	78,000
1,700		76,000	50,000	4,050		119,000	78,000
1,750		80,000	53,000	4,100		119,000	78,000
1,800		80,000	53,000	4,200		119,000	78,000
1,850		80,000	53,000	4,300		126,000	82,000
1,900		80,000	53,000	4,400		126,000	82,000
1,930		85,000	56,000	4,500		126,000	82,000
1,950		85,000	56,000	4,600		126,000	82,000
1,980	5/64	85,000	56,000	4,700		126,000	82,000
2,000		85,000	56,000	4,760	3/16	132,000	87,000
2,050		85,000	56,000	4,800		132,000	87,000
2,100		85,000	56,000	4,900		132,000	87,000
2,150		90,000	59,000	4,950		132,000	87,000
2,200		90,000	59,000	5,000		132,000	87,000
2,260		90,000	59,000	5,100		132,000	87,000
2,300		90,000	59,000	5,160	13/64	132,000	87,000
2,380	3/32	95,000	62,000	5,200		132,000	87,000
2,400		95,000	62,000	5,300		132,000	87,000
2,450		95,000	62,000	5,400		139,000	91,000
2,500		95,000	62,000	5,500		139,000	91,000
2,550		95,000	62,000	5,600		139,000	91,000
2,600		95,000	62,000	5,700		139,000	91,000
2,700		100,000	66,000	5,800		139,000	91,000
2,780	7/64	100,000	66,000	6,000		139,000	91,000
2,800		100,000	66,000	6,100		148,000	97,000
2,900		100,000	66,000	6,200		148,000	97,000
3,000		100,000	66,000	6,300		148,000	97,000
3,050		106,000	69,000	6,350	1/4	148,000	97,000
3,100		106,000	69,000	6,400		148,000	97,000
3,170	1/8	106,000	69,000	6,500		148,000	97,000
3,200		106,000	69,000	6,600		148,000	97,000
3,250		106,000	69,000	6,700		148,000	97,000

Brocas canhão para furação profunda



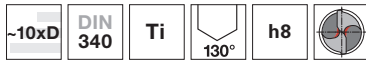
d1		l1	l2
mm	inch	mm	mm
6,750	17/64	156,000	102,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000	9/32	156,000	102,000
7,100		156,000	102,000
7,140		156,000	102,000
7,250		156,000	102,000
7,400		156,000	102,000
7,500	19/64	156,000	102,000
7,540		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,940		165,000	109,000
8,000	5/16	165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300	21/64	165,000	109,000
8,330		165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700	11/32	175,000	115,000
8,730		175,000	115,000
8,800		175,000	115,000

d1		l1	l2	
mm	inch	mm	mm	
9,000		175,000	115,000	
9,100		175,000	115,000	
9,500		175,000	115,000	
9,520	3/8	184,000	121,000	
9,800		184,000	121,000	
10,000		184,000	121,000	
10,200		184,000	121,000	
10,500		184,000	121,000	
11,000		195,000	128,000	
11,110		7/16	195,000	128,000
11,510		29/64	195,000	128,000
12,000		205,000	134,000	
12,500		205,000	134,000	
13,000		205,000	134,000	
15,000		220,000	144,000	

Brocas carvão para
furação profunda



Brocas helicoidais longas

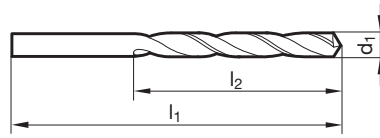


- P** ○ Redução da aresta transversal ≥ Ø 1,000 • afiação de superfície cônica
- M** ● aço-HSS ligado com Co • resistência ao desgaste ampliada
- K** ●
- N** ● Titânio e ligas de titânio • aços austeníticos resistentes a corrosão-/ácidos-/calor • aços de alta resistência de cavacos curtos acima de 900 N/mm² • aços para mancais de laminadoras • Hastelloy, Inconel, Nimonic
- S** ●
- H** ●

Material de corte **HSCO**

Superfície **S**

Sentido de corte **R**



Nr. do artigo **669**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,000		56,000	33,000	4,300		126,000	82,000
1,200		65,000	41,000	4,370	11/64	126,000	82,000
1,300		65,000	41,000	4,400		126,000	82,000
1,400		70,000	45,000	4,500		126,000	82,000
1,500		70,000	45,000	4,700		126,000	82,000
1,590	1/16	76,000	50,000	4,760	3/16	132,000	87,000
1,600		76,000	50,000	4,800		132,000	87,000
1,700		76,000	50,000	5,000		132,000	87,000
1,800		80,000	53,000	5,100		132,000	87,000
1,900		80,000	53,000	5,160	13/64	132,000	87,000
1,980	5/64	85,000	56,000	5,200		132,000	87,000
2,000		85,000	56,000	5,300		132,000	87,000
2,050		85,000	56,000	5,500		139,000	91,000
2,100		85,000	56,000	5,600		139,000	91,000
2,200		90,000	59,000	5,700		139,000	91,000
2,300		90,000	59,000	5,800		139,000	91,000
2,380	3/32	95,000	62,000	6,000		139,000	91,000
2,400		95,000	62,000	6,100		148,000	97,000
2,500		95,000	62,000	6,200		148,000	97,000
2,600		95,000	62,000	6,300		148,000	97,000
2,700		100,000	66,000	6,350	1/4	148,000	97,000
2,750		100,000	66,000	6,400		148,000	97,000
2,780	7/64	100,000	66,000	6,500		148,000	97,000
2,800		100,000	66,000	6,700		148,000	97,000
2,900		100,000	66,000	6,750	17/64	156,000	102,000
3,000		100,000	66,000	6,800		156,000	102,000
3,100		106,000	69,000	7,000		156,000	102,000
3,170	1/8	106,000	69,000	7,100		156,000	102,000
3,200		106,000	69,000	7,140	9/32	156,000	102,000
3,250		106,000	69,000	7,200		156,000	102,000
3,300		106,000	69,000	7,400		156,000	102,000
3,400		112,000	73,000	7,500		156,000	102,000
3,500		112,000	73,000	7,540	19/64	165,000	109,000
3,570	9/64	112,000	73,000	7,800		165,000	109,000
3,600		112,000	73,000	7,900		165,000	109,000
3,700		112,000	73,000	7,940	5/16	165,000	109,000
3,800		119,000	78,000	8,000		165,000	109,000
3,900		119,000	78,000	8,200		165,000	109,000
3,970	5/32	119,000	78,000	8,500		165,000	109,000
4,000		119,000	78,000	8,730	11/32	175,000	115,000
4,100		119,000	78,000	9,000		175,000	115,000
4,200		119,000	78,000	9,130	23/64	175,000	115,000

Brocas canhão para furação profunda



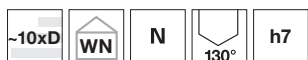
d1		l1	l2
mm	inch	mm	mm
9,300		175,000	115,000
9,500		175,000	115,000
9,520	3/8	184,000	121,000
10,000		184,000	121,000
10,200		184,000	121,000

d1		l1	l2
mm	inch	mm	mm

Brocas carvão para
furação profunda



Brocas helicoidais longas



Material de corte **MD int.**

Superfície ○

Sentido de corte (R)

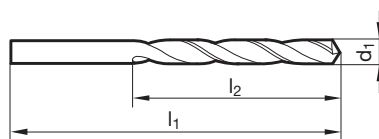
P afiação facetada • formato reto da aresta de corte principal

- M**
- K**
- N**
- S**
- H**

plásticos reforçados com fibras de vidro • duroplásticos com ação abrasiva nos cortes e guias

GÜHRINGNAVIGATOR

Página de dados de corte 792



Nr. do artigo **706**

d1		l1	l2
mm	inch	mm	mm
0,500		38,000	8,500
0,600		38,000	9,500
0,650		38,000	10,500
0,700		38,000	10,500
0,750		38,000	12,500
0,800		38,000	12,500
0,850		38,000	14,500
0,900		38,000	14,500
1,000		38,000	17,000
1,050		38,000	17,000
1,100		38,000	17,000
1,400		38,000	17,000

d1		l1	l2
mm	inch	mm	mm
1,450		38,000	17,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série1



P • Redução da aresta transversal $\geq \varnothing 2,380$ • afiação de superfície cônica
• para furos extremamente profundos

M
K •
N ○
S
H

aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

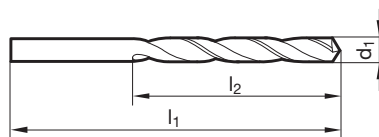
Material de corte **HSS**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **235**

Brocas canhão para furação profunda

d1				l1				l2				
mm		inch		mm		mm		mm		mm		
1,600				115,000			75,000	4,600			185,000	125,000
1,700				115,000			75,000	4,700			185,000	125,000
1,800				120,000			80,000	4,760	3/16		195,000	135,000
1,900				120,000			80,000	4,800			195,000	135,000
1,930				125,000			85,000	4,900			195,000	135,000
1,950				125,000			85,000	5,000			195,000	135,000
2,000				125,000			85,000	5,100			195,000	135,000
2,050				125,000			85,000	5,200			195,000	135,000
2,100				125,000			85,000	5,300			195,000	135,000
2,200				135,000			90,000	5,340			205,000	140,000
2,300				135,000			90,000	5,400			205,000	140,000
2,350				135,000			90,000	5,500			205,000	140,000
2,380	3/32			140,000			95,000	5,560	7/32		205,000	140,000
2,400				140,000			95,000	5,600			205,000	140,000
2,500				140,000			95,000	5,700			205,000	140,000
2,600				140,000			95,000	5,800			205,000	140,000
2,700				150,000			100,000	5,900			205,000	140,000
2,800				150,000			100,000	6,000			205,000	140,000
2,900				150,000			100,000	6,100			215,000	150,000
3,000				150,000			100,000	6,200			215,000	150,000
3,100				155,000			105,000	6,250			215,000	150,000
3,170	1/8			155,000			105,000	6,300			215,000	150,000
3,200				155,000			105,000	6,350	1/4		215,000	150,000
3,250				155,000			105,000	6,400			215,000	150,000
3,300				155,000			105,000	6,500			215,000	150,000
3,400				165,000			115,000	6,600			215,000	150,000
3,500				165,000			115,000	6,700			215,000	150,000
3,570	9/64			165,000			115,000	6,750	17/64		225,000	155,000
3,600				165,000			115,000	6,800			225,000	155,000
3,650				165,000			115,000	7,000			225,000	155,000
3,700				165,000			115,000	7,200			225,000	155,000
3,750				165,000			115,000	7,400			225,000	155,000
3,800				175,000			120,000	7,500			225,000	155,000
3,900				175,000			120,000	7,700			240,000	165,000
3,970	5/32			175,000			120,000	7,800			240,000	165,000
4,000				175,000			120,000	7,900			240,000	165,000
4,100				175,000			120,000	7,940	5/16		240,000	165,000
4,200				175,000			120,000	8,000			240,000	165,000
4,300				185,000			125,000	8,100			240,000	165,000
4,370	11/64			185,000			125,000	8,200			240,000	165,000
4,400				185,000			125,000	8,330	21/64		240,000	165,000
4,500				185,000			125,000	8,400			240,000	165,000



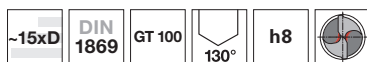
d1		l1	l2
mm	inch	mm	mm
8,500		240,000	165,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
8,900		250,000	175,000
9,000		250,000	175,000
9,130	23/64	250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000
9,700		265,000	185,000
9,800		265,000	185,000
9,900		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,100		265,000	185,000
10,200		265,000	185,000
10,250		265,000	185,000

d1		l1	l2
mm	inch	mm	mm
10,320	13/32	265,000	185,000
10,500		265,000	185,000
11,000		280,000	195,000
11,500		280,000	195,000
11,510	29/64	280,000	195,000
11,800		280,000	195,000
12,000		295,000	205,000
12,100		295,000	205,000
12,250		295,000	205,000
12,300	31/64	295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000
13,000		295,000	205,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série1

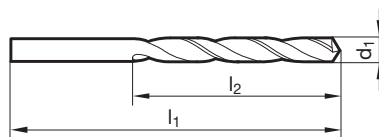


Material de corte	HSS
Superfície	
Sentido de corte	

- P** • Redução da aresta transversal ≥ Ø 1,950 • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 790



Nr. do artigo **502**

Brocas canhão para furação profunda

				Nr. do artigo 502			
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,950		125,000	85,000	4,400		185,000	125,000
2,000		125,000	85,000	4,500		185,000	125,000
2,050		125,000	85,000	4,570		185,000	125,000
2,100		125,000	85,000	4,600		185,000	125,000
2,200		135,000	90,000	4,700		185,000	125,000
2,300		135,000	90,000	4,760	3/16	195,000	135,000
2,370		140,000	95,000	4,800		195,000	135,000
2,380	3/32	140,000	95,000	4,900		195,000	135,000
2,400		140,000	95,000	5,000		195,000	135,000
2,500		140,000	95,000	5,100		195,000	135,000
2,550		140,000	95,000	5,110		195,000	135,000
2,580		140,000	95,000	5,160	13/64	195,000	135,000
2,600		140,000	95,000	5,200		195,000	135,000
2,700		150,000	100,000	5,300		195,000	135,000
2,780	7/64	150,000	100,000	5,400		205,000	140,000
2,800		150,000	100,000	5,500		205,000	140,000
2,850		150,000	100,000	5,560	7/32	205,000	140,000
2,870		150,000	100,000	5,600		205,000	140,000
2,900		150,000	100,000	5,700		205,000	140,000
2,950		150,000	100,000	5,750		205,000	140,000
3,000		150,000	100,000	5,800		205,000	140,000
3,030		155,000	105,000	5,900		205,000	140,000
3,100		155,000	105,000	5,950	15/64	205,000	140,000
3,170	1/8	155,000	105,000	6,000		205,000	140,000
3,200		155,000	105,000	6,100		215,000	150,000
3,250		155,000	105,000	6,200		215,000	150,000
3,300		155,000	105,000	6,250		215,000	150,000
3,400		165,000	115,000	6,300		215,000	150,000
3,500		165,000	115,000	6,350	1/4	215,000	150,000
3,570	9/64	165,000	115,000	6,400		215,000	150,000
3,600		165,000	115,000	6,500		215,000	150,000
3,700		165,000	115,000	6,600		215,000	150,000
3,750		165,000	115,000	6,700		215,000	150,000
3,800		175,000	120,000	6,750	17/64	225,000	155,000
3,860		175,000	120,000	6,800		225,000	155,000
3,900		175,000	120,000	6,900		225,000	155,000
3,970	5/32	175,000	120,000	7,000		225,000	155,000
4,000		175,000	120,000	7,100		225,000	155,000
4,100		175,000	120,000	7,200		225,000	155,000
4,200		175,000	120,000	7,300		225,000	155,000
4,300		185,000	125,000	7,500		225,000	155,000
4,370	11/64	185,000	125,000	7,540	19/64	240,000	165,000



d1		l1	l2
mm	inch	mm	mm
7,700		240,000	165,000
7,750		240,000	165,000
7,800		240,000	165,000
7,900		240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,100		240,000	165,000
8,200		240,000	165,000
8,300		240,000	165,000
8,330	21/64	240,000	165,000
8,400		240,000	165,000
8,430		240,000	165,000
8,500		240,000	165,000
8,600		250,000	175,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
9,000		250,000	175,000
9,200		250,000	175,000
9,300		250,000	175,000
9,400		250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000

d1		l1	l2
mm	inch	mm	mm
9,700		265,000	185,000
9,800		265,000	185,000
9,900		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,200		265,000	185,000
10,320	13/32	265,000	185,000
10,500		265,000	185,000
10,720	27/64	280,000	195,000
11,000		280,000	195,000
11,110	7/16	280,000	195,000
11,200		280,000	195,000
11,500		280,000	195,000
11,510	29/64	280,000	195,000
11,750		280,000	195,000
11,800		280,000	195,000
12,000		295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000
13,000		295,000	205,000



Brocas helicoidais extra longas, série1



P • Redução da aresta transversal $\geq \varnothing 1,980$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S ○

H

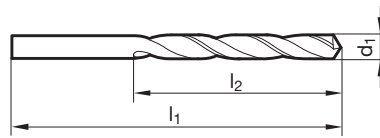
GÜHRINGNAVIGATOR

Página de dados de corte 790

Material de corte **HSS**

Superfície **S**

Sentido de corte **R**



Nr. do artigo **670**

Brocas canhão para furação profunda

d1		l1	l2
mm	inch	mm	mm
2,000		125,000	85,000
2,100		125,000	85,000
2,200		135,000	90,000
2,300		135,000	90,000
2,380	3/32	140,000	95,000
2,400		140,000	95,000
2,500		140,000	95,000
2,780	7/64	150,000	100,000
2,800		150,000	100,000
2,950		150,000	100,000
3,000		150,000	100,000
3,100		155,000	105,000
3,170	1/8	155,000	105,000
3,200		155,000	105,000
3,300		155,000	105,000
3,500		165,000	115,000
3,570	9/64	165,000	115,000
3,600		165,000	115,000
3,800		175,000	120,000
3,970	5/32	175,000	120,000
4,000		175,000	120,000
4,200		175,000	120,000
4,370	11/64	185,000	125,000
4,500		185,000	125,000
4,600		185,000	125,000
4,760	3/16	195,000	135,000
4,800		195,000	135,000
5,000		195,000	135,000
5,100		195,000	135,000
5,160	13/64	195,000	135,000
5,200		195,000	135,000
5,500		205,000	140,000
5,560	7/32	205,000	140,000
6,000		205,000	140,000
6,100		215,000	150,000
6,200		215,000	150,000

d1		l1	l2
mm	inch	mm	mm
6,350	1/4	215,000	150,000
6,500		215,000	150,000
6,600		215,000	150,000
6,800		225,000	155,000
7,000		225,000	155,000
7,140	9/32	225,000	155,000
7,500		225,000	155,000
7,540	19/64	240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,200		240,000	165,000
8,500		240,000	165,000
8,730	11/32	250,000	175,000
9,000		250,000	175,000
9,520	3/8	265,000	185,000
9,600		265,000	185,000
9,920	25/64	265,000	185,000
10,000		265,000	185,000
10,900		280,000	195,000
11,000		280,000	195,000
11,900		295,000	205,000
11,910	15/32	295,000	205,000
12,000		295,000	205,000
12,500		295,000	205,000
12,700	1/2	295,000	205,000



Brocas helicoidais extra longas, série1



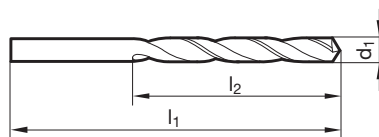
Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

P ○ Redução da aresta transversal ≥ Ø 2,380 • afiação de superfície cônica
• para furos extremamente profundos

- M**
- K**
- N** • materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **524**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		125,000	85,000	5,200		195,000	135,000
2,100		125,000	85,000	5,400		205,000	140,000
2,200		135,000	90,000	5,600		205,000	140,000
2,300		135,000	90,000	5,700		205,000	140,000
2,350		135,000	90,000	5,800		205,000	140,000
2,380	3/32	140,000	95,000	5,900		205,000	140,000
2,400		140,000	95,000	5,950	15/64	205,000	140,000
2,450		140,000	95,000	6,000		205,000	140,000
2,500		140,000	95,000	6,100		215,000	150,000
2,600		140,000	95,000	6,350	1/4	215,000	150,000
2,780	7/64	150,000	100,000	6,400		215,000	150,000
2,800		150,000	100,000	6,500		215,000	150,000
2,900		150,000	100,000	6,600		215,000	150,000
2,950		150,000	100,000	6,750	17/64	225,000	155,000
3,000		150,000	100,000	6,800		225,000	155,000
3,100		155,000	105,000	7,000		225,000	155,000
3,170	1/8	155,000	105,000	7,100		225,000	155,000
3,200		155,000	105,000	7,140	9/32	225,000	155,000
3,300		155,000	105,000	7,300		225,000	155,000
3,350		155,000	105,000	7,400		225,000	155,000
3,400		165,000	115,000	7,500		225,000	155,000
3,450		165,000	115,000	7,540	19/64	240,000	165,000
3,500		165,000	115,000	7,800		240,000	165,000
3,530		165,000	115,000	7,800		240,000	165,000
3,570	9/64	165,000	115,000	7,900		240,000	165,000
3,600		165,000	115,000	7,940	5/16	240,000	165,000
3,800		175,000	120,000	8,000		240,000	165,000
3,900		175,000	120,000	8,100		240,000	165,000
3,970	5/32	175,000	120,000	8,330	21/64	240,000	165,000
4,000		175,000	120,000	8,600		250,000	175,000
4,100		175,000	120,000	8,730	11/32	250,000	175,000
4,200		175,000	120,000	8,900		250,000	175,000
4,250		175,000	120,000	9,000		250,000	175,000
4,300		185,000	125,000	9,130	23/64	250,000	175,000
4,370	11/64	185,000	125,000	9,200		250,000	175,000
4,400		185,000	125,000	9,500		250,000	175,000
4,500		185,000	125,000	9,520	3/8	265,000	185,000
4,760	3/16	195,000	135,000	9,920	25/64	265,000	185,000
4,900		195,000	135,000	10,000		265,000	185,000
5,000		195,000	135,000	10,320	13/32	265,000	185,000
5,100		195,000	135,000	10,500		265,000	185,000
5,160	13/64	195,000	135,000	11,000		280,000	195,000
				11,110	7/16	280,000	195,000

Brocas canhão para furação profunda



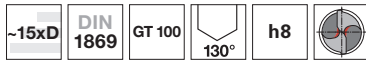
d1		l1	l2
mm	inch	mm	mm
11,500		280,000	195,000
11,910	15/32	295,000	205,000
12,000		295,000	205,000
12,700	1/2	295,000	205,000

d1		l1	l2
mm	inch	mm	mm

Brocas carvão para
furação profunda



Brocas helicoidais extra longas, série1

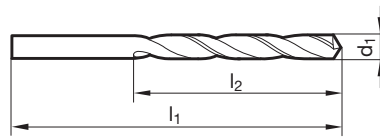


- P** • Redução da aresta transversal $\geq \varnothing 2,700$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • para furos extremamente profundos • na expulsão difícil dos cavacos
- K** •
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** •

Material de corte **HSCO**

Superfície

Sentido de corte



Nr. do artigo **618**

d1		l1	l2
mm	inch	mm	mm
2,700		150,000	100,000
2,900		150,000	100,000
3,000		150,000	100,000
3,100		155,000	105,000
3,170	1/8	155,000	105,000
3,200		155,000	105,000
3,300		155,000	105,000
3,400		165,000	115,000
3,500		165,000	115,000
3,570	9/64	165,000	115,000
3,600		165,000	115,000
3,700		165,000	115,000
3,750		165,000	115,000
3,800		175,000	120,000
3,970	5/32	175,000	120,000
4,000		175,000	120,000
4,100		175,000	120,000
4,200		175,000	120,000
4,300		185,000	125,000
4,370	11/64	185,000	125,000
4,400		185,000	125,000
4,500		185,000	125,000
4,600		185,000	125,000
4,760	3/16	195,000	135,000
4,800		195,000	135,000
4,850		195,000	135,000
5,000		195,000	135,000
5,100		195,000	135,000
5,160	13/64	195,000	135,000
5,200		195,000	135,000
5,300		195,000	135,000
5,400		205,000	140,000
5,500		205,000	140,000
5,560	7/32	205,000	140,000
5,600		205,000	140,000
5,700		205,000	140,000

d1		l1	l2
mm	inch	mm	mm
5,800		205,000	140,000
6,000		205,000	140,000
6,100		215,000	150,000
6,200		215,000	150,000
6,300		215,000	150,000
6,350	1/4	215,000	150,000
6,400		215,000	150,000
6,500		215,000	150,000
6,600		215,000	150,000
6,700		215,000	150,000
6,750	17/64	225,000	155,000
6,800		225,000	155,000
7,000		225,000	155,000
7,140	9/32	225,000	155,000
7,400		225,000	155,000
7,500		225,000	155,000
7,540	19/64	240,000	165,000
7,700		240,000	165,000
7,800		240,000	165,000
7,940	5/16	240,000	165,000
8,000		240,000	165,000
8,200		240,000	165,000
8,330	21/64	240,000	165,000
8,500		240,000	165,000
8,700		250,000	175,000
8,730	11/32	250,000	175,000
8,800		250,000	175,000
9,000		250,000	175,000
9,130	23/64	250,000	175,000
9,400		250,000	175,000
9,500		250,000	175,000
9,520	3/8	265,000	185,000
9,700		265,000	185,000
10,000		265,000	185,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série 2

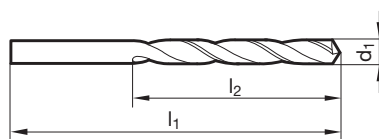


Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ

- P** ● Redução da aresta transversal ≥ Ø 2,700 • afiação de superfície cônica
• para furos extremamente profundos
- M** ●
- K** ●
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S** ●
- H** ●

GÜHRING NAVIGATOR

Página de dados de corte 788



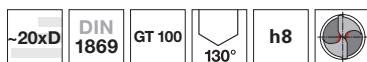
Nr. do artigo **236**

Brocas canhão para furação profunda

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,700		190,000	130,000	6,500		275,000	190,000
2,800		190,000	130,000	6,700		275,000	190,000
2,900		190,000	130,000	6,800		290,000	200,000
3,000		190,000	130,000	7,000		290,000	200,000
3,100		200,000	135,000	7,140	9/32	290,000	200,000
3,170	1/8	200,000	135,000	7,500		290,000	200,000
3,200		200,000	135,000	7,540	19/64	305,000	210,000
3,300		200,000	135,000	7,800		305,000	210,000
3,500		210,000	145,000	7,940	5/16	305,000	210,000
3,570	9/64	210,000	145,000	8,000		305,000	210,000
3,600		210,000	145,000	8,100		305,000	210,000
3,800		220,000	150,000	8,500		305,000	210,000
3,970	5/32	220,000	150,000	8,700		320,000	220,000
4,000		220,000	150,000	8,730	11/32	320,000	220,000
4,100		220,000	150,000	8,800		320,000	220,000
4,200		220,000	150,000	8,900		320,000	220,000
4,500		235,000	160,000	9,000		320,000	220,000
4,760	3/16	245,000	170,000	9,130	23/64	320,000	220,000
4,800		245,000	170,000	9,500		320,000	220,000
4,900		245,000	170,000	9,800		340,000	235,000
5,000		245,000	170,000	10,000		340,000	235,000
5,200		245,000	170,000	10,200		340,000	235,000
5,500		260,000	180,000	10,500		340,000	235,000
5,560	7/32	260,000	180,000	11,000		365,000	250,000
5,800		260,000	180,000	11,110	7/16	365,000	250,000
5,900		260,000	180,000	11,500		365,000	250,000
5,950	15/64	260,000	180,000	11,510	29/64	365,000	250,000
6,000		260,000	180,000	11,750		365,000	250,000
6,200		275,000	190,000	12,000		375,000	260,000
6,350	1/4	275,000	190,000	13,000		375,000	260,000



Brocas helicoidais extra longas, série 2

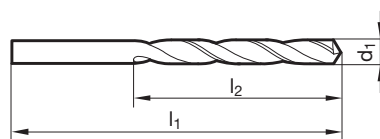


Material de corte	HSS
Superfície	$\geq 0,236$
Sentido de corte	R

- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 790



Nr. do artigo **503**

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
2,000		160,000	110,000	6,100		275,000	190,000
2,200		170,000	115,000	6,150		275,000	190,000
2,300		170,000	115,000	6,200		275,000	190,000
2,500		180,000	120,000	6,350	1/4	275,000	190,000
2,800		190,000	130,000	6,400		275,000	190,000
3,000		190,000	130,000	6,500		275,000	190,000
3,030		200,000	135,000	6,600		275,000	190,000
3,100		200,000	135,000	6,700		275,000	190,000
3,170	1/8	200,000	135,000	6,750	17/64	290,000	200,000
3,200		200,000	135,000	6,800		290,000	200,000
3,300		200,000	135,000	6,900		290,000	200,000
3,400		210,000	145,000	7,000		290,000	200,000
3,500		210,000	145,000	7,140	9/32	290,000	200,000
3,570	9/64	210,000	145,000	7,500		290,000	200,000
3,600		210,000	145,000	7,540	19/64	305,000	210,000
3,700		210,000	145,000	7,800		305,000	210,000
3,800		220,000	150,000	7,940	5/16	305,000	210,000
3,900		220,000	150,000	8,000		305,000	210,000
3,970	5/32	220,000	150,000	8,200		305,000	210,000
4,000		220,000	150,000	8,330	21/64	305,000	210,000
4,100		220,000	150,000	8,500		305,000	210,000
4,200		220,000	150,000	8,600		320,000	220,000
4,300		235,000	160,000	8,730	11/32	320,000	220,000
4,370	11/64	235,000	160,000	8,800		320,000	220,000
4,400		235,000	160,000	9,000		320,000	220,000
4,500		235,000	160,000	9,100		320,000	220,000
4,760	3/16	245,000	170,000	9,130	23/64	320,000	220,000
4,800		245,000	170,000	9,500		320,000	220,000
4,900		245,000	170,000	9,520	3/8	340,000	235,000
5,000		245,000	170,000	9,700		340,000	235,000
5,100		245,000	170,000	9,800		340,000	235,000
5,160	13/64	245,000	170,000	9,920	25/64	340,000	235,000
5,200		245,000	170,000	10,000		340,000	235,000
5,300		245,000	170,000	10,200		340,000	235,000
5,400		260,000	180,000	10,500		340,000	235,000
5,500		260,000	180,000	10,720	27/64	365,000	250,000
5,560	7/32	260,000	180,000	11,000		365,000	250,000
5,700		260,000	180,000	11,110	7/16	365,000	250,000
5,800		260,000	180,000	11,500		365,000	250,000
5,900		260,000	180,000	11,510	29/64	365,000	250,000
5,950	15/64	260,000	180,000	11,750		365,000	250,000
6,000		260,000	180,000	11,910	15/32	375,000	260,000

Brocas canhão para furação profunda



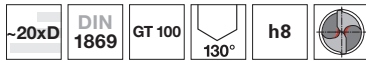
d1		l1	l2
mm	inch	mm	mm
12,000		375,000	260,000
12,300	31/64	375,000	260,000
12,500		375,000	260,000
12,700	1/2	375,000	260,000
13,000		375,000	260,000

d1		l1	l2
mm	inch	mm	mm

Brocas carvão para
furação profunda



Brocas helicoidais extra longas, série 2



- P** • Redução da aresta transversal $\geq \varnothing 2,300$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S** ○
- H**

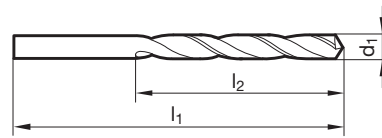
Material de corte **HSS**

Superfície **S**

Sentido de corte **R**

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **671**

d1		l1	l2
mm	inch	mm	mm
2,700		190,000	130,000
2,800		190,000	130,000
3,000		190,000	130,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,090		220,000	150,000
4,370	11/64	235,000	160,000
4,400		235,000	160,000
4,500		235,000	160,000
4,600		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
5,000		245,000	170,000

d1		l1	l2
mm	inch	mm	mm
5,300		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
6,000		260,000	180,000
6,350	1/4	275,000	190,000
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,500		290,000	200,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,500		305,000	210,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série 2



P ○ Redução da aresta transversal $\geq \varnothing 2,800$ • afiação de superfície cônica
• para furos extremamente profundos

M
K
N ●
S
H

● materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira

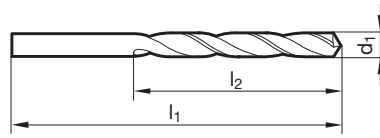
Material de corte **HSS**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **528**

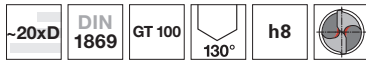
Brocas canhão para furação profunda

d1		l1	l2
mm	inch	mm	mm
3,000		190,000	130,000
3,030		200,000	135,000
3,100		200,000	135,000
3,170	1/8	200,000	135,000
3,500		210,000	145,000
3,650		210,000	145,000
3,800		220,000	150,000
4,000		220,000	150,000
4,200		220,000	150,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
5,000		245,000	170,000
5,110		245,000	170,000
5,500		260,000	180,000
5,800		260,000	180,000
6,000		260,000	180,000
7,000		290,000	200,000

d1		l1	l2
mm	inch	mm	mm
7,500		290,000	200,000
8,000		305,000	210,000
8,500		305,000	210,000
9,000		320,000	220,000
10,000		340,000	235,000
10,500		340,000	235,000
11,500		365,000	250,000
13,000		375,000	260,000



Brocas helicoidais extra longas, série 2

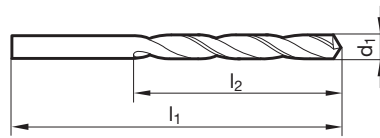


- P** • Redução da aresta transversal $\geq \varnothing 3,000$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • para furos extremamente profundos • na expulsão difícil dos cavacos
- K** •
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** ○

Material de corte **HSCO**

Superfície

Sentido de corte



Nr. do artigo **619**

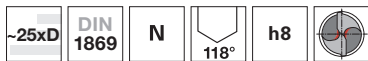
d1		l1	l2
mm	inch	mm	mm
3,000		190,000	130,000
3,170	1/8	200,000	135,000
3,200		200,000	135,000
3,300		200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,100		220,000	150,000
4,200		220,000	150,000
4,370	11/64	235,000	160,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
4,800		245,000	170,000
4,900		245,000	170,000
5,000		245,000	170,000
5,200		245,000	170,000
5,500		260,000	180,000
5,560	7/32	260,000	180,000
5,950	15/64	260,000	180,000
6,000		260,000	180,000
6,100		275,000	190,000
6,200		275,000	190,000
6,350	1/4	275,000	190,000

d1		l1	l2
mm	inch	mm	mm
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,140	9/32	290,000	200,000
7,400		290,000	200,000
7,500		290,000	200,000
7,540	19/64	305,000	210,000
7,600		305,000	210,000
7,940	5/16	305,000	210,000
8,000		305,000	210,000
8,200		305,000	210,000
8,500		305,000	210,000
8,730	11/32	320,000	220,000
9,000		320,000	220,000
9,130	23/64	320,000	220,000
9,500		320,000	220,000
9,520	3/8	340,000	235,000
9,600		340,000	235,000
9,900		340,000	235,000
10,000		340,000	235,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série 3



Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 3,500$ • afiação de superfície cônica
• para furos extremamente profundos

M

K •

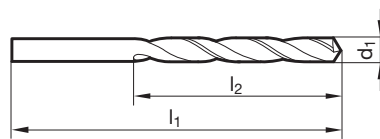
N ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

S

H

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **237**

Brocas canhão para furação profunda

d1		l1	l2
mm	inch	mm	mm
3,500		265,000	180,000
3,800		280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,800		330,000	225,000
5,900		330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000
6,800		370,000	250,000
7,000		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
7,500		370,000	250,000
7,800		390,000	265,000
8,000		390,000	265,000
8,500		390,000	265,000
9,000		410,000	280,000
9,500		410,000	280,000
9,800		430,000	295,000
10,000		430,000	295,000
10,300		430,000	295,000
10,500		430,000	295,000
11,000		455,000	310,000
11,500		455,000	310,000
11,750		455,000	310,000
12,000		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000



Brocas helicoidais extra longas, série 3

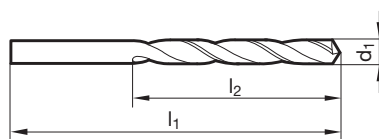


Material de corte	HSS
Superfície	
Sentido de corte	

- P** • Redução da aresta transversal $\geq \varnothing 2,500$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **504**

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,100		250,000	170,000
3,170	1/8	250,000	170,000
3,200		250,000	170,000
3,300		250,000	170,000
3,400		265,000	180,000
3,500		265,000	180,000
3,570	9/64	265,000	180,000
3,600		265,000	180,000
3,700		265,000	180,000
3,800		280,000	190,000
3,900		280,000	190,000
3,970	5/32	280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,300		295,000	200,000
4,370	11/64	295,000	200,000
4,400		295,000	200,000
4,500		295,000	200,000
4,600		295,000	200,000
4,760	3/16	315,000	210,000
4,800		315,000	210,000
4,900		315,000	210,000
5,000		315,000	210,000
5,100		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,560	7/32	330,000	225,000
5,800		330,000	225,000
5,950	15/64	330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,300		350,000	235,000
6,350	1/4	350,000	235,000
6,400		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000
6,750	17/64	370,000	250,000
6,800		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
7,000		370,000	250,000
7,140	9/32	370,000	250,000
7,200		370,000	250,000
7,500		370,000	250,000
7,540	19/64	390,000	265,000
7,750		390,000	265,000
7,800		390,000	265,000
7,940	5/16	390,000	265,000
8,000		390,000	265,000
8,200		390,000	265,000
8,330	21/64	390,000	265,000
8,500		390,000	265,000
8,600		410,000	280,000
8,730	11/32	410,000	280,000
8,800		410,000	280,000
8,900		410,000	280,000
9,000		410,000	280,000
9,200		410,000	280,000
9,500		410,000	280,000
9,520	3/8	430,000	295,000
9,530		430,000	295,000
9,920	25/64	430,000	295,000
10,000		430,000	295,000
10,320	13/32	430,000	295,000
10,500		430,000	295,000
10,720	27/64	455,000	310,000
11,000		455,000	310,000
11,110	7/16	455,000	310,000
11,500		455,000	310,000
12,000		480,000	330,000
12,200		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série 3

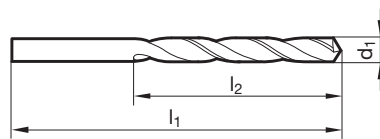


Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

- P** ○ Redução da aresta transversal $\geq \varnothing 2,500$ • afiação de superfície cônica • para furos extremamente profundos
- M** □
- K** □
- N** ● materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira
- S** □
- H** □

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **529**

Brocas canhão para furação profunda

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,500		265,000	180,000
3,800		280,000	190,000
4,000		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
6,000		330,000	225,000
6,500		350,000	235,000
6,700		350,000	235,000
6,800		370,000	250,000
7,500		370,000	250,000

d1		l1	l2
mm	inch	mm	mm
8,000		390,000	265,000
9,500		410,000	280,000
10,000		430,000	295,000



Brocas helicoidais extra longas, série 3

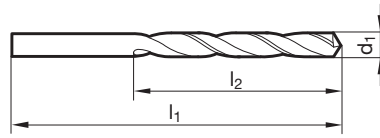


- P** • Redução da aresta transversal $\geq \varnothing 2,500$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • alta resistência ao desgaste
- K** • para furos extremamente profundos • na expulsão difícil dos cavacos
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** •

Material de corte **HSCO**

Superfície

Sentido de corte



Nr. do artigo **571**

d1		l1	l2
mm	inch	mm	mm
2,500		225,000	150,000
3,000		240,000	160,000
3,100		250,000	170,000
3,170	1/8	250,000	170,000
3,200		250,000	170,000
3,300		250,000	170,000
3,400		265,000	180,000
3,500		265,000	180,000
3,700		265,000	180,000
3,800		280,000	190,000
3,900		280,000	190,000
3,970	5/32	280,000	190,000
4,000		280,000	190,000
4,100		280,000	190,000
4,200		280,000	190,000
4,300		295,000	200,000
4,500		295,000	200,000
4,600		295,000	200,000
4,760	3/16	315,000	210,000
4,800		315,000	210,000
4,900		315,000	210,000
5,000		315,000	210,000
5,100		315,000	210,000
5,200		315,000	210,000
5,500		330,000	225,000
5,560	7/32	330,000	225,000
5,800		330,000	225,000
5,950	15/64	330,000	225,000
6,000		330,000	225,000
6,100		350,000	235,000
6,200		350,000	235,000
6,300		350,000	235,000
6,350	1/4	350,000	235,000
6,400		350,000	235,000
6,500		350,000	235,000
6,700		350,000	235,000

d1		l1	l2
mm	inch	mm	mm
6,750	17/64	370,000	250,000
6,800		370,000	250,000
7,000		370,000	250,000
7,140	9/32	370,000	250,000
7,200		370,000	250,000
7,500		370,000	250,000
7,750		390,000	265,000
7,800		390,000	265,000
7,940	5/16	390,000	265,000
8,000		390,000	265,000
8,200		390,000	265,000
8,500		390,000	265,000
8,600		410,000	280,000
8,730	11/32	410,000	280,000
8,800		410,000	280,000
9,000		410,000	280,000
9,500		410,000	280,000
9,520	3/8	430,000	295,000
10,000		430,000	295,000
10,320	13/32	430,000	295,000
10,500		430,000	295,000
10,720	27/64	455,000	310,000
11,000		455,000	310,000
11,110	7/16	455,000	310,000
11,500		455,000	310,000
12,000		480,000	330,000
12,200		480,000	330,000
12,500		480,000	330,000
13,000		480,000	330,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas

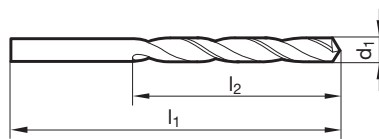


- P** • Redução da aresta transversal $\geq \varnothing 6,000$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790

Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ



Nr. do artigo **242**

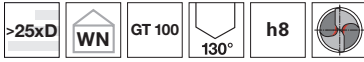
Brocas canhão para furação profunda

d1		l1	l2
mm	inch		
6,000		500,000	400,000
8,000		500,000	400,000
10,000		600,000	500,000
11,000		600,000	500,000
12,000		600,000	500,000

d1		l1	l2
mm	inch		



Brocas helicoidais extra longas



P • Redução da aresta transversal $\geq \varnothing 8,000$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos

M

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

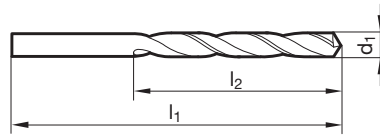
Material de corte **HSS**

Superfície ○

Sentido de corte (R)

GÜHRING NAVIGATOR

Página de dados de corte 790



Nr. do artigo **243**

d1		l1	l2
mm	inch		
8,000		750,000	650,000
10,000		750,000	650,000
11,000		750,000	650,000
12,000		750,000	650,000

d1		l1	l2
mm	inch		

Brocas canhão para furação profunda



Brocas helicoidais extra longas

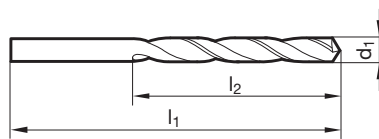


- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos
- M**
- K** •
- N** • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 790

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ



Nr. do artigo **244**

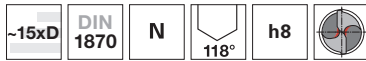
Brocas canhão para furação profunda

d1		l1	l2
mm	inch		
10,000		1000,000	850,000
11,000		1000,000	850,000
12,000		1000,000	850,000

d1		l1	l2
mm	inch		



Brocas helicoidais extra longas, série1



Material de corte **HSS**

Superfície

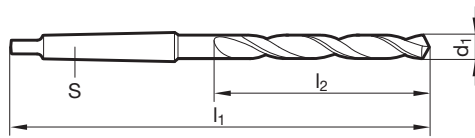
Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 7,800$ • afiação de superfície cônica
• para furos extremamente profundos

- M**
- K** •
- N** ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **266**

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-1	265,000	165,000	20,500		MK-2	385,000	260,000
8,500		MK-1	265,000	165,000	20,640	13/16	MK-2	385,000	260,000
9,000		MK-1	275,000	175,000	21,000		MK-2	385,000	260,000
9,500		MK-1	275,000	175,000	21,430	27/32	MK-2	405,000	270,000
10,000		MK-1	285,000	185,000	21,500		MK-2	405,000	270,000
10,200		MK-1	285,000	185,000	22,000		MK-2	405,000	270,000
10,250		MK-1	285,000	185,000	22,500		MK-2	405,000	270,000
10,500		MK-1	285,000	185,000	23,000		MK-2	405,000	270,000
11,000		MK-1	300,000	195,000	23,020	29/32	MK-2	405,000	270,000
11,400		MK-1	300,000	195,000	23,500		MK-3	425,000	270,000
11,500		MK-1	300,000	195,000	24,000		MK-3	440,000	290,000
11,750		MK-1	300,000	195,000	24,500		MK-3	440,000	290,000
11,800		MK-1	300,000	195,000	25,000	63/64	MK-3	440,000	290,000
12,000		MK-1	310,000	205,000	26,000		MK-3	440,000	290,000
12,200		MK-1	310,000	205,000	26,500		MK-3	440,000	290,000
12,500		MK-1	310,000	205,000	27,000		MK-3	460,000	305,000
12,700	1/2	MK-1	310,000	205,000	28,000		MK-3	460,000	305,000
13,000		MK-1	310,000	205,000	30,000		MK-3	460,000	305,000
13,500		MK-1	325,000	220,000	30,500		MK-3	480,000	320,000
13,750		MK-1	325,000	220,000	31,000		MK-3	480,000	320,000
14,000		MK-1	325,000	220,000	32,000		MK-4	505,000	320,000
14,290	9/16	MK-2	340,000	220,000	33,000		MK-4	505,000	320,000
14,500		MK-2	340,000	220,000	34,000		MK-4	530,000	340,000
15,000		MK-2	340,000	220,000	35,000		MK-4	530,000	340,000
15,250		MK-2	355,000	230,000	36,000		MK-4	530,000	340,000
15,500		MK-2	355,000	230,000	38,000		MK-4	555,000	360,000
15,750		MK-2	355,000	230,000	39,000		MK-4	555,000	360,000
15,800		MK-2	355,000	230,000	40,000		MK-4	555,000	360,000
16,000		MK-2	355,000	230,000	42,000		MK-4	555,000	360,000
16,250		MK-2	355,000	230,000	45,000		MK-4	585,000	385,000
16,500		MK-2	355,000	230,000	45,240	1 25/32	MK-4	585,000	385,000
16,670	21/32	MK-2	355,000	230,000	48,000		MK-4	605,000	405,000
17,000		MK-2	355,000	230,000	50,000		MK-4	605,000	405,000
17,500		MK-2	370,000	245,000					
17,750		MK-2	370,000	245,000					
18,000		MK-2	370,000	245,000					
18,500		MK-2	370,000	245,000					
18,650	47/64	MK-2	370,000	245,000					
19,000		MK-2	370,000	245,000					
19,500		MK-2	385,000	260,000					
19,750		MK-2	385,000	260,000					
20,000		MK-2	385,000	260,000					

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série1



P • Redução da aresta transversal $\geq \varnothing 5,800$ • afiação de superfície cônica • canais largos • para furos extremamente profundos • na expulsão difícil dos cavacos

K •

N • ferro fundido e aços até 1000 N/mm² • Exceções: aços-CrNi, aços-VA e outros

S

H

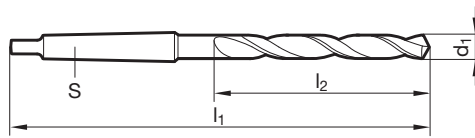
Material de corte **HSS**

Superfície

Sentido de corte

GÜHRINGNAVIGATOR

Página de dados de corte 790



Nr. do artigo **526**

Brocas canhão para furação profunda

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-1	265,000	165,000	15,870	5/8	MK-2	355,000	230,000
8,500		MK-1	265,000	165,000	16,000		MK-2	355,000	230,000
8,600		MK-1	275,000	175,000	16,500		MK-2	355,000	230,000
8,700		MK-1	275,000	175,000	17,000		MK-2	355,000	230,000
9,000		MK-1	275,000	175,000	17,460	11/16	MK-2	370,000	245,000
9,500		MK-1	275,000	175,000	17,500		MK-2	370,000	245,000
9,520	3/8	MK-1	285,000	185,000	18,000		MK-2	370,000	245,000
9,800		MK-1	285,000	185,000	18,500		MK-2	370,000	245,000
10,000		MK-1	285,000	185,000	19,000		MK-2	370,000	245,000
10,200		MK-1	285,000	185,000	19,500		MK-2	385,000	260,000
10,500		MK-1	285,000	185,000	20,000		MK-2	385,000	260,000
10,720	27/64	MK-1	300,000	195,000	20,500		MK-2	385,000	260,000
11,000		MK-1	300,000	195,000	21,000		MK-2	385,000	260,000
11,110	7/16	MK-1	300,000	195,000	21,500		MK-2	405,000	270,000
11,500		MK-1	300,000	195,000	22,000		MK-2	405,000	270,000
11,510	29/64	MK-1	300,000	195,000	23,000		MK-2	405,000	270,000
11,750		MK-1	300,000	195,000	24,000		MK-3	440,000	290,000
12,000		MK-1	310,000	205,000	25,000	63/64	MK-3	440,000	290,000
12,500		MK-1	310,000	205,000	26,000		MK-3	440,000	290,000
12,700	1/2	MK-1	310,000	205,000	26,500		MK-3	440,000	290,000
12,800		MK-1	310,000	205,000	28,000		MK-3	460,000	305,000
13,000		MK-1	310,000	205,000	28,500		MK-3	460,000	305,000
13,490	17/32	MK-1	325,000	220,000	29,000		MK-3	460,000	305,000
13,500		MK-1	325,000	220,000	30,000		MK-3	460,000	305,000
14,000		MK-1	325,000	220,000					
14,200		MK-2	340,000	220,000					
14,290	9/16	MK-2	340,000	220,000					
14,500		MK-2	340,000	220,000					
15,000		MK-2	340,000	220,000					
15,500		MK-2	355,000	230,000					



Brocas helicoidais extra longas, série1

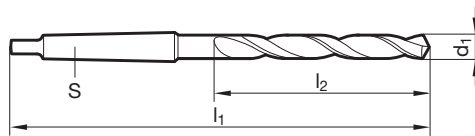


- P** ○ Redução da aresta transversal $\geq \varnothing 7,900$ • afiação de superfície cônica
• para furos extremamente profundos • para materiais moles e com cavacos longos
- M** □
- K** □
- N** ● materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira
- S** □
- H** □

Material de corte **HSS**

Superfície ○

Sentido de corte (R)



Nr. do artigo **525**

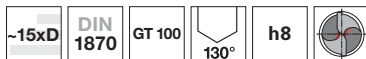
d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	265,000	165,000
8,700		MK-1	275,000	175,000
9,000		MK-1	275,000	175,000
9,500		MK-1	275,000	175,000
10,000		MK-1	285,000	185,000
10,500		MK-1	285,000	185,000
11,000		MK-1	300,000	195,000
12,000		MK-1	310,000	205,000
12,500		MK-1	310,000	205,000
13,000		MK-1	310,000	205,000
13,500		MK-1	325,000	220,000
14,000		MK-1	325,000	220,000
15,000		MK-2	340,000	220,000
15,500		MK-2	355,000	230,000
16,000		MK-2	355,000	230,000
18,000		MK-2	370,000	245,000
19,500		MK-2	385,000	260,000
21,000		MK-2	385,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
23,000		MK-2	405,000	270,000
24,000		MK-3	440,000	290,000
24,300		MK-3	440,000	290,000
24,380		MK-3	440,000	290,000
24,500		MK-3	440,000	290,000
25,500		MK-3	440,000	290,000
26,500		MK-3	440,000	290,000
27,500		MK-3	460,000	305,000
28,000		MK-3	460,000	305,000
29,000		MK-3	460,000	305,000
31,000		MK-3	480,000	320,000
33,000		MK-4	505,000	320,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série1

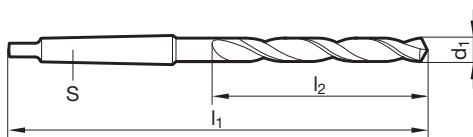


Material de corte	HSCO
Superfície	$\geq \frac{0}{16,0}$
Sentido de corte	(R)

- P** • Redução da aresta transversal $\geq \varnothing 9,520$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • resistência ao desgaste ampliada • para furos extremamente profundos • na expulsão difícil dos cavacos
- K** •
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** •

GÜHRINGNAVIGATOR

Página de dados de corte 794



Nr. do artigo **620**

Brocas canhão para furação profunda

d1					S					l1					l2				
mm		inch			mm		inch			mm		inch			mm		inch		
9,520	3/8			MK-1	285,000	185,000				17,500	370,000	245,000							
10,000				MK-1	285,000	185,000				18,000	370,000	245,000							
10,200				MK-1	285,000	185,000				18,500	370,000	245,000							
10,320	13/32			MK-1	285,000	185,000				19,000	370,000	245,000							
10,500				MK-1	285,000	185,000				20,000	385,000	260,000							
11,000				MK-1	300,000	195,000				21,000	385,000	260,000							
11,110	7/16			MK-1	300,000	195,000				21,830	405,000	270,000							
11,500				MK-1	300,000	195,000				22,000	405,000	270,000							
11,510	29/64			MK-1	300,000	195,000				22,620	405,000	270,000							
12,000				MK-1	310,000	205,000				23,000	405,000	270,000							
12,300	31/64			MK-1	310,000	205,000				25,500	440,000	290,000							
12,500				MK-1	310,000	205,000				26,000	440,000	290,000							
12,700	1/2			MK-1	310,000	205,000				27,180	460,000	305,000							
13,000				MK-1	310,000	205,000				29,370	460,000	305,000							
13,500				MK-1	325,000	220,000				30,000	460,000	305,000							
14,000				MK-1	325,000	220,000													
14,290	9/16			MK-2	340,000	220,000													
14,500				MK-2	340,000	220,000													
15,000				MK-2	340,000	220,000													
15,080	19/32			MK-2	355,000	230,000													
15,500				MK-2	355,000	230,000													
16,000				MK-2	355,000	230,000													
16,500				MK-2	355,000	230,000													
17,000				MK-2	355,000	230,000													



Brocas helicoidais extra longas, série 2



Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 7,700$ • afiação de superfície cônica
• para furos extremamente profundos

M

K •

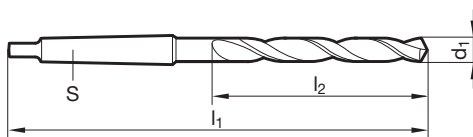
N ○ aço e aço fundido (com liga e sem liga) • ferro fundido, fundição maleável, fundição nodular • ferro sinterizado, prata nova, grafite

S

H

GÜHRINGNAVIGATOR

Página de dados de corte 788



Nr. do artigo **267**

d1		S	l1	l2
mm	inch		mm	mm
8,000		MK-1	330,000	210,000
8,500		MK-1	330,000	210,000
9,000		MK-1	345,000	220,000
10,000		MK-1	360,000	235,000
10,200		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,750		MK-1	375,000	250,000
11,800		MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,490	17/32	MK-1	410,000	275,000
13,500		MK-1	410,000	275,000
14,000		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
15,480	39/64	MK-2	445,000	295,000
15,500		MK-2	445,000	295,000
16,000		MK-2	445,000	295,000
16,500		MK-2	445,000	295,000
17,000		MK-2	445,000	295,000
17,070	43/64	MK-2	465,000	310,000
17,500		MK-2	465,000	310,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
19,050	3/4	MK-2	490,000	325,000
19,500		MK-2	490,000	325,000
20,000		MK-2	490,000	325,000

d1		S	l1	l2
mm	inch		mm	mm
20,640	13/16	MK-2	490,000	325,000
21,000		MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
21,500		MK-2	515,000	345,000
21,830	55/64	MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
22,800		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
23,020	29/32	MK-2	515,000	345,000
23,750		MK-3	555,000	365,000
23,810	15/16	MK-3	555,000	365,000
24,000		MK-3	555,000	365,000
24,500		MK-3	555,000	365,000
25,000	63/64	MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
28,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000
31,000		MK-3	610,000	410,000
32,000		MK-4	635,000	410,000
34,000		MK-4	665,000	430,000
40,000		MK-4	695,000	460,000
45,000		MK-4	735,000	490,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série 2



P • Redução da aresta transversal $\geq \text{Ø } 7,800$ • afiação de superfície cônica • canais largos • na expulsão difícil dos cavacos • para furos extremamente profundos

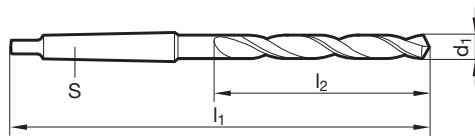
K •
N • ferro fundido e aços até 1000 N/mm^2 • Exceções: aços-CrNi, aços-VA e outros

S
H

GÜHRINGNAVIGATOR

Página de dados de corte 790

Material de corte	HSS
Superfície	$\geq \frac{\text{Ø}}{16,0}$
Sentido de corte	



Nr. do artigo **527**

Brocas canhão para furação profunda

d1		S	l1	l2	d1		S	l1	l2
mm	inch		mm	mm	mm	inch		mm	mm
8,000		MK-1	330,000	210,000	17,500		MK-2	465,000	310,000
8,400		MK-1	330,000	210,000	17,800		MK-2	465,000	310,000
8,500		MK-1	330,000	210,000	18,000		MK-2	465,000	310,000
9,000		MK-1	345,000	220,000	18,500		MK-2	465,000	310,000
9,500		MK-1	345,000	220,000	19,000		MK-2	465,000	310,000
10,000		MK-1	360,000	235,000	19,450	49/64	MK-2	490,000	325,000
10,500		MK-1	360,000	235,000	19,500		MK-2	490,000	325,000
11,000		MK-1	375,000	250,000	20,000		MK-2	490,000	325,000
11,110	7/16	MK-1	375,000	250,000	20,500		MK-2	490,000	325,000
11,500		MK-1	375,000	250,000	21,000		MK-2	490,000	325,000
11,510	29/64	MK-1	375,000	250,000	21,030	53/64	MK-2	490,000	325,000
11,800		MK-1	375,000	250,000	21,430	27/32	MK-2	515,000	345,000
11,910	15/32	MK-1	395,000	260,000	22,000		MK-2	515,000	345,000
12,000		MK-1	395,000	260,000	23,000		MK-2	515,000	345,000
12,500		MK-1	395,000	260,000	23,020	29/32	MK-2	515,000	345,000
12,700	1/2	MK-1	395,000	260,000	23,810	15/16	MK-3	555,000	365,000
13,000		MK-1	395,000	260,000	24,000		MK-3	555,000	365,000
13,500		MK-1	410,000	275,000	24,210	61/64	MK-3	555,000	365,000
13,700		MK-1	410,000	275,000	25,000	63/64	MK-3	555,000	365,000
13,800		MK-1	410,000	275,000	26,000		MK-3	555,000	365,000
13,890	35/64	MK-1	410,000	275,000	26,190	1 1/32	MK-3	555,000	365,000
14,000		MK-1	410,000	275,000	26,500		MK-3	555,000	365,000
14,290	9/16	MK-2	425,000	275,000	27,000		MK-3	580,000	385,000
14,500		MK-2	425,000	275,000	28,000		MK-3	580,000	385,000
15,000		MK-2	425,000	275,000	28,750		MK-3	580,000	385,000
15,500		MK-2	445,000	295,000	29,000		MK-3	580,000	385,000
16,000		MK-2	445,000	295,000	29,500		MK-3	580,000	385,000
16,500		MK-2	445,000	295,000	30,000		MK-3	580,000	385,000
17,000		MK-2	445,000	295,000					
17,070	43/64	MK-2	465,000	310,000					



Brocas helicoidais extra longas, série 2



Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P ○ Redução da aresta transversal $\geq \varnothing 8,000$ • afiação de superfície cônica
• para furos extremamente profundos

M

K

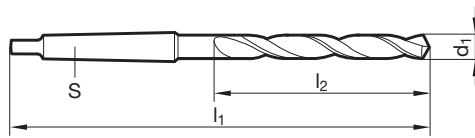
N • materiais moles e com cavacos longos até 500 N/mm² • aços moles para máquinas automáticas • alumínio, ligas de Al (cavacos longos) • zinco, cobre fino, Silumin, eletrodos • Zamak, Argalium, plásticos moles, madeira

S

H

GÜHRING NAVIGATOR

Página de dados de corte 788



Nr. do artigo **542**

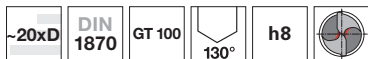
d1		S	l1	l2
mm	inch		mm	mm
8,500		MK-1	330,000	210,000
8,600		MK-1	345,000	220,000
8,800		MK-1	345,000	220,000
9,000		MK-1	345,000	220,000
9,500		MK-1	345,000	220,000
10,500		MK-1	360,000	235,000
10,700		MK-1	375,000	250,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
17,000		MK-2	445,000	295,000
17,500		MK-2	465,000	310,000
20,500		MK-2	490,000	325,000

d1		S	l1	l2
mm	inch		mm	mm
21,000		MK-2	490,000	325,000
21,500		MK-2	515,000	345,000
22,000		MK-2	515,000	345,000
23,000		MK-2	515,000	345,000
24,000		MK-3	555,000	365,000
24,500		MK-3	555,000	365,000
25,500		MK-3	555,000	365,000
26,000		MK-3	555,000	365,000
26,500		MK-3	555,000	365,000
27,500		MK-3	580,000	385,000
28,000		MK-3	580,000	385,000
29,000		MK-3	580,000	385,000
29,500		MK-3	580,000	385,000
30,000		MK-3	580,000	385,000
31,000		MK-3	610,000	410,000

Brocas canhão para furação profunda



Brocas helicoidais extra longas, série 2

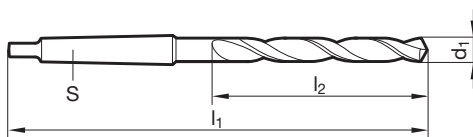


Material de corte	HSCO
Superfície	$\geq \frac{0}{16,0}$
Sentido de corte	(R)

- P** • Redução da aresta transversal $\geq \varnothing 9,520$ • afiação de superfície cônica
- M** • aço-HSS ligado com Co • canais largos • alta resistência ao desgaste
- K** • na expulsão difícil dos cavacos • para furos extremamente profundos
- N** • aços e aços fundidos de alta resistência • ferro fundido, fundição maleável, fundição nodular
- S** •
- H** •

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **621**

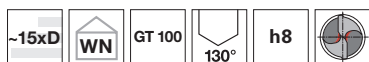
Brocas canhão para furação profunda

d1		S	l1	l2
mm	inch		mm	mm
9,520	3/8	MK-1	360,000	235,000
10,000		MK-1	360,000	235,000
10,500		MK-1	360,000	235,000
10,720	27/64	MK-1	375,000	250,000
11,000		MK-1	375,000	250,000
11,500		MK-1	375,000	250,000
11,510	29/64	MK-1	375,000	250,000
12,000		MK-1	395,000	260,000
12,500		MK-1	395,000	260,000
12,700	1/2	MK-1	395,000	260,000
13,000		MK-1	395,000	260,000
13,500		MK-1	410,000	275,000

d1		S	l1	l2
mm	inch		mm	mm
14,000		MK-1	410,000	275,000
14,500		MK-2	425,000	275,000
15,000		MK-2	425,000	275,000
16,000		MK-2	445,000	295,000
16,270		MK-2	445,000	295,000
18,000		MK-2	465,000	310,000
18,500		MK-2	465,000	310,000
19,000		MK-2	465,000	310,000
20,000		MK-2	490,000	325,000
21,430	27/32	MK-2	515,000	345,000
23,420	59/64	MK-3	535,000	345,000



Brocas com canais de refrigeração, comprimento canais DIN 1870



Material de corte **HSCO**

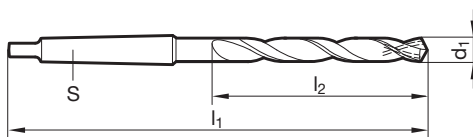
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica
- M** • fornecimento de refrigeração axial através do cone morse • aço-HSS ligado com Co • resistência ao desgaste ampliada • para furar através de buchas
- K** •
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm²
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **374**

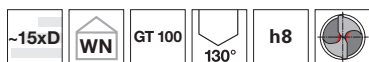
d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
12,000		MK-2	322,000	205,000
12,300	31/64	MK-2	322,000	205,000
12,500		MK-2	322,000	205,000
13,000		MK-2	322,000	205,000
14,000		MK-2	337,000	220,000
15,000		MK-2	337,000	220,000
16,000		MK-2	347,000	230,000
16,500		MK-2	347,000	230,000
17,500		MK-2	362,000	245,000
18,000		MK-2	362,000	245,000
18,500		MK-3	381,000	245,000
19,840	25/32	MK-3	396,000	260,000
20,000		MK-3	396,000	260,000
21,000		MK-3	396,000	260,000
21,430	27/32	MK-3	406,000	270,000
21,500		MK-3	406,000	270,000
24,610	31/32	MK-3	426,000	290,000

d1		S	l1	l2
mm	inch		mm	mm
28,570	1 1/8	MK-4	468,000	305,000
28,750		MK-4	468,000	305,000
29,370	1 5/32	MK-4	468,000	305,000
30,960	1 7/32	MK-4	483,000	320,000
32,250		MK-4	493,000	320,000
32,540	1 9/32	MK-4	493,000	320,000
34,000		MK-4	513,000	340,000

Brocas canhão para furação profunda



Brocas com canais de refrigeração, comprimento canais DIN 1870



Material de corte **HSCO**

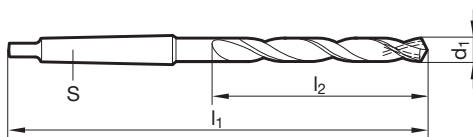
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica
- M** • fornecimento de refrigerante radial através de anéis de refrigeração
- K** • Guhring • aço-HSS ligado com Co • alta resistência ao desgaste • para furar através de buchas
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm²
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **375**

Brocas canhão para furação profunda

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
11,110	7/16	MK-2	312,000	195,000
11,510	29/64	MK-2	312,000	195,000
12,800		MK-2	322,000	205,000
13,500		MK-2	337,000	220,000
18,260	23/32	MK-3	381,000	245,000
19,000		MK-3	381,000	245,000
21,000		MK-3	396,000	260,000
21,430	27/32	MK-3	406,000	270,000
24,500		MK-3	426,000	290,000
25,000	63/64	MK-3	426,000	290,000
25,400	1	MK-3	426,000	290,000

d1		S	l1	l2
mm	inch		mm	mm
26,500		MK-3	426,000	290,000
28,570	1 1/8	MK-4	468,000	305,000
30,960	1 7/32	MK-4	483,000	320,000
32,540	1 9/32	MK-4	493,000	320,000
33,340	1 5/16	MK-4	493,000	320,000
34,000		MK-4	513,000	340,000



Brocas com canais de refrigeração, comprimento canais DIN 1870



Material de corte **HSCO**

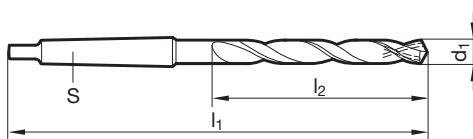
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • afiação de superfície cônica
- M** • fornecimento de refrigerante radial no cone Morse • aço-HSS ligado com Co • alta resistência ao desgaste • para furar através de buchas
- K** •
- N** • aços de alta resistência • aço fundido, ferro fundido • aços resistentes a corrosão-/ácidos-/calor • resistências até 1300 N/mm²
- S** •
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 794



Nr. do artigo **376**

d1		S	l1	l2
mm	inch		mm	mm
11,000		MK-2	312,000	195,000
13,000		MK-2	322,000	205,000
14,000		MK-2	337,000	220,000
16,500		MK-2	347,000	230,000
18,000		MK-2	362,000	245,000
19,840	25/32	MK-3	396,000	260,000

d1		S	l1	l2
mm	inch		mm	mm
21,500		MK-3	406,000	270,000
27,780	1 3/32	MK-4	468,000	305,000
29,000		MK-4	468,000	305,000

Brocas canhão para furação profunda



MICRO BROCCAS



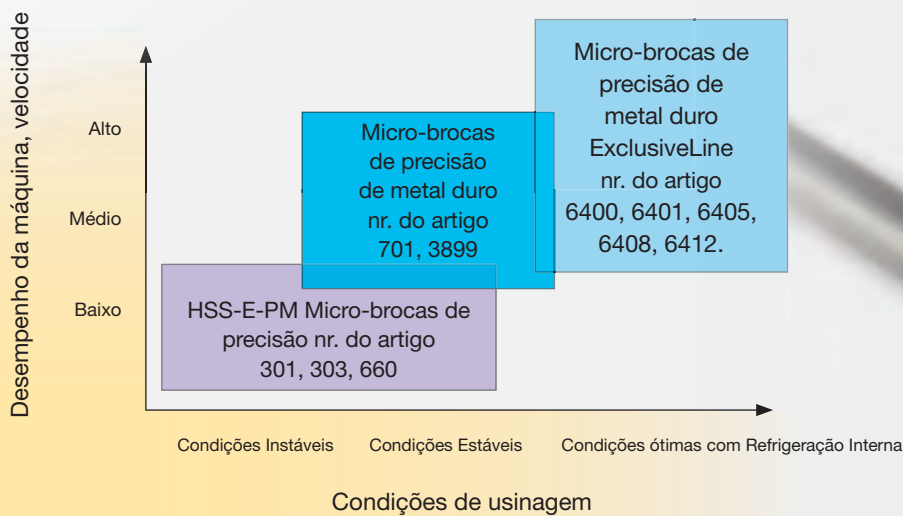


Tipos de micro-brocas de precisão

VANTAGENS E FAIXA DE APLICAÇÃO

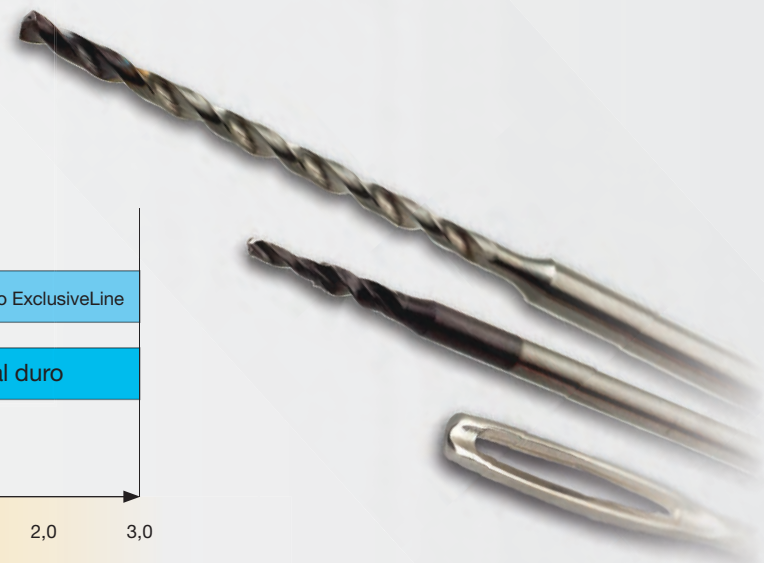
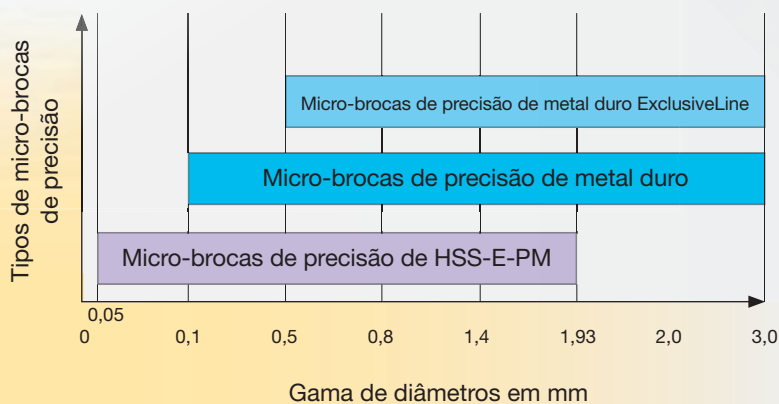
A Gühring oferece a solução ideal tanto para a produção seriada de grandes lotes em máquinas com condições do mais elevado rendimento e refrigeração interna, como

também, para tarefas de usinagem para a produção de lotes menores ou em máquinas de baixo rendimento e condições difíceis de usinagem.



GAMA DO PROGRAMA

O volumoso programa de micro brocas de MDI e HSS-E-PM da Gühring cobre a gama completa de diâmetros de 0,05 mm até 3,0 mm.



O programa de micro brocas da Gühring com ferramentas de metal duro integral e aço rápido sinterizado HSS-E-PM é idealmente adequado para a execução dos menores furos em todas as áreas de utilização.

A produção de furos menores de alta precisão requer a maior qualidade e é uma das usinagens de furos que mais exigem. Para esses casos e para todos usuários a Gühring oferece a partir de seu volumoso programa padrão a micro broca ideal.



MICRO BROCAS HSS-E-PM

As micro brocas de aço sinterizado de alto rendimento HSS-E se destacam por uma muito alta resistência ao desgaste e uma elevada tenacidade e estabilidade dos cantos de corte, o que é especialmente importante em condições de usinagem difíceis e pouco estáveis. Nisso o aço HSS-E apresenta uma estrutura muito homogênea, o que repercute positivamente como uma alta e constante capacidade de rendimento nas micro brocas.



Por isso as micro brocas são adequadas, por exemplo, para a utilização em furadeiras multifusos, em máquinas com rotações limitadas ou na produção de lotes pequenos e médios, pois aí oferecem alta qualidade com uma ótima relação custo benefício.

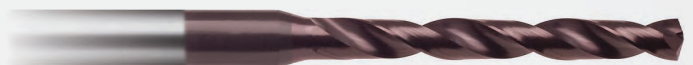
Para exigências maiores de vida útil e de parâmetros de corte a Gühring oferece também em seu programa padrão micro brocas HSS-E-PM com revestimento TiN.

A Gühring oferece também brocas com corte à esquerda para utilizações especiais.

Para utilizações especiais que requerem brocas com corte à esquerda a Gühring oferece também uma solução padrão.

MICRO BROCAS DE PRECISÃO EM MDI

As micro brocas MDI sem canais de refrigeração da Gühring cobrem a volumosa gama de diâmetros de 0,1 mm até 3,0 mm. Em comparação com as micro brocas HSS-E-PM as micro brocas MDI, em condições de usinagem mais estáveis e rendimento de máquinas mais elevados, realizam parâmetros de corte e vidas úteis mais altos.



O motivo para isso é a utilização de metal duro ultrafino, o qual apresenta uma dureza muito alta, resistência ao calor e ao desgaste e com isso possibilita a enorme capacidade de rendimento das micro brocas MDI.

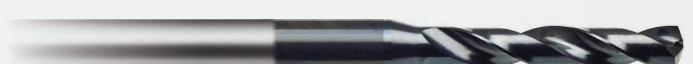
MICRO BROCAS DE PRECISÃO EM MDI EXCLUSIVELINE TAMBÉM COM REFRIGERAÇÃO INTERNA

As micro brocas MDI Exclusiveline, que estão disponíveis tanto sem canais como com canais de refrigeração, possibilitam a usinagem de alto rendimento de quase todos os materiais.

Com condições de usinagem mais estáveis e rendimento de máquinas e rotações da árvore mais elevados, estas micro brocas apresentam sua plena capacidade na produção em série de grandes lotes.

Nisso a afiação de 2 facetas por corte com honeamento retificado dos cantos de corte permite elevados valores de corte como também uma ótima quebra dos cavacos.

As câmaras de cavacos com perfil de canal especial transportam os cavacos com segurança para fora do furo.



Para profundidades de furos até 4xD e 7xD estão disponíveis micro brocas sem refrigeração na gama de diâmetros de 0,5 até 3,0 mm.

As micro brocas MDI 5xD, 8xD e 15xD com refrigeração interna põem a prova a sua plena capacidade na usinagem de aços inoxidáveis e de ligas especiais, como também, na execução de furos profundos. Graças a sua geometria de ferramenta otimizada as micro brocas MDI até 15xD da Gühring não necessitam de retirada forçada dos cavacos.

As ferramentas são projetadas, de modo que, as micro brocas até 4xD sem refrigeração e até 5xD com refrigeração são idealmente adequadas como brocas piloto para as micro brocas 15xD.

SOLUÇÕES ESPECIAIS CONFORME NECESSIDADE DO CLIENTE

Ao lado das micro brocas padrão a Gühring oferece também, sobre pedidos dos clientes, micro brocas especiais tanto de HSS-E-PM quanto de MDI. Fazem parte:



- medidas intermediárias fora do programa padrão
- brocas escalonadas para furos escalonados ou furos com escareamento
- comprimentos especiais até 30xD de profundidade de furo
- diversas variações de haste
- revestimentos alternativos



P	M	K	N	S	H	Representação da ferramenta	Prof. do furo	Norma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Micro brocas de precisão HSS-E-PM sem dutos de refrigeração

•	•	•	•	○			~5xD	DIN 1899	N	R	HSS-E-PM	○	0,050 - 1,920	301	796 649
•	•	•	•	○			~5xD	DIN 1899	N	R	HSS-E-PM	Ⓢ	0,160 - 1,900	660	796 652
•	•	•	•	○			~5xD	DIN 1899	N	L	HSS-E-PM	○	0,130 - 1,850	303	796 654

Micro brocas de precisão Metal duro sem dutos de refrigeração

•	○	○	○	○	○		~5xD	WN	N	R	VHM	○	0,200 - 1,400	701	796 656
•	•							WN	N	R	VHM	ⓐ	0,100 - 3,000	3899	796 657

Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração

•	•	•	○	○			4xD	WN	N	R	VHM	ⓐ	0,500 - 3,000	6400	796 659
•	•	•	○	○			7xD	WN	N	R	VHM	ⓐ	0,500 - 3,000	6401	796 660

Micro Brocas de precisão ExclusiveLine com dutos de refrigeração

•	•	•	○	○			5xD	WN	N	R	VHM	ⓐ	1,400 - 3,000	6405	796 661
•	•	•	○	○			8xD	WN	N	R	VHM	ⓐ	1,400 - 3,000	6408	796 662
•	•	•	○	○			15xD	WN	N	R	VHM	ⓐ	1,400 - 3,000	6412	796 663

Micro brocas



Micro brocas de precisão HSS-E-PM sem dutos de refrigeração

Material de corte **HSS-E-PM**

Superfície



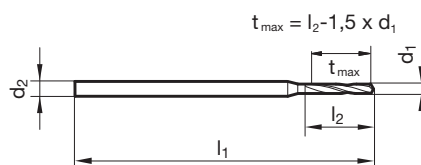
Sentido de corte



P • afiação facetada • com haste reforçada • $\varnothing 0,15\text{ mm}$ aço-HSS ligado com Co

M •**K** •**N** • aços de liga alta**S** ○**H****GÜHRING**NAVIGATOR

Página de dados de corte 796



Nr. do artigo

301

d1	d2	l1	l2	d1	d2	l1	l2
mm	mm	mm	mm	mm	mm	mm	mm
0,050	1,000	25,000	0,400	0,275	1,000	25,000	1,900
0,060	1,000	25,000	0,400	0,280	1,000	25,000	1,900
0,070	1,000	25,000	0,500	0,285	1,000	25,000	1,900
0,075	1,000	25,000	0,500	0,290	1,000	25,000	1,900
0,080	1,000	25,000	0,500	0,295	1,000	25,000	1,900
0,090	1,000	25,000	0,500	0,300	1,000	25,000	1,900
0,100	1,000	25,000	0,500	0,305	1,000	25,000	2,400
0,105	1,000	25,000	0,500	0,310	1,000	25,000	2,400
0,110	1,000	25,000	0,500	0,315	1,000	25,000	2,400
0,115	1,000	25,000	0,500	0,320	1,000	25,000	2,400
0,120	1,000	25,000	0,500	0,325	1,000	25,000	2,400
0,121	1,000	25,000	0,800	0,330	1,000	25,000	2,400
0,125	1,000	25,000	0,800	0,335	1,000	25,000	2,400
0,128	1,000	25,000	0,800	0,340	1,000	25,000	2,400
0,130	1,000	25,000	0,800	0,345	1,000	25,000	2,400
0,140	1,000	25,000	0,800	0,350	1,000	25,000	2,400
0,143	1,000	25,000	0,800	0,355	1,000	25,000	2,400
0,145	1,000	25,000	0,800	0,360	1,000	25,000	2,400
0,147	1,000	25,000	0,800	0,365	1,000	25,000	2,400
0,150	1,000	25,000	0,800	0,370	1,000	25,000	2,400
0,155	1,000	25,000	1,100	0,375	1,000	25,000	2,400
0,160	1,000	25,000	1,100	0,380	1,000	25,000	2,400
0,170	1,000	25,000	1,100	0,385	1,000	25,000	3,000
0,175	1,000	25,000	1,100	0,390	1,000	25,000	3,000
0,180	1,000	25,000	1,100	0,400	1,000	25,000	3,000
0,190	1,000	25,000	1,100	0,405	1,000	25,000	3,000
0,195	1,000	25,000	1,500	0,410	1,000	25,000	3,000
0,200	1,000	25,000	1,500	0,415	1,000	25,000	3,000
0,205	1,000	25,000	1,500	0,420	1,000	25,000	3,000
0,210	1,000	25,000	1,500	0,425	1,000	25,000	3,000
0,215	1,000	25,000	1,500	0,430	1,000	25,000	3,000
0,220	1,000	25,000	1,500	0,432	1,000	25,000	3,000
0,225	1,000	25,000	1,500	0,435	1,000	25,000	3,000
0,230	1,000	25,000	1,500	0,440	1,000	25,000	3,000
0,235	1,000	25,000	1,500	0,445	1,000	25,000	3,000
0,240	1,000	25,000	1,500	0,450	1,000	25,000	3,000
0,245	1,000	25,000	1,900	0,455	1,000	25,000	3,000
0,250	1,000	25,000	1,900	0,460	1,000	25,000	3,000
0,255	1,000	25,000	1,900	0,470	1,000	25,000	3,000
0,260	1,000	25,000	1,900	0,475	1,000	25,000	3,000
0,265	1,000	25,000	1,900	0,480	1,000	25,000	3,000
0,270	1,000	25,000	1,900	0,485	1,000	25,000	3,400



d1	d2	l1	l2
mm	mm	mm	mm
0,490	1,000	25,000	3,400
0,495	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,505	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,515	1,000	25,000	3,400
0,520	1,000	25,000	3,400
0,525	1,000	25,000	3,400
0,530	1,000	25,000	3,400
0,535	1,000	25,000	3,900
0,540	1,000	25,000	3,900
0,545	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,560	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,585	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,595	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,605	1,000	25,000	4,200
0,610	1,000	25,000	4,200
0,615	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,625	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,632	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,655	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,665	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,675	1,000	25,000	4,800
0,680	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,695	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,705	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800
0,725	1,000	25,000	4,800
0,730	1,000	25,000	4,800
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,795	1,500	25,000	5,300
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,825	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,845	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,925	1,500	25,000	6,000
0,930	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800

d1	d2	l1	l2
mm	mm	mm	mm
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,010	1,500	25,000	6,800
1,020	1,500	25,000	6,800
1,030	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,055	1,500	25,000	6,800
1,060	1,500	25,000	6,800
1,070	1,500	25,000	7,600
1,080	1,500	25,000	7,600
1,090	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,110	1,500	25,000	7,600
1,120	1,500	25,000	7,600
1,130	1,500	25,000	7,600
1,140	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,160	1,500	25,000	7,600
1,170	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,190	1,500	25,000	8,500
1,200	1,500	25,000	8,500
1,210	1,500	25,000	8,500
1,220	1,500	25,000	8,500
1,230	1,500	25,000	8,500
1,240	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,260	1,500	25,000	8,500
1,265	1,500	25,000	8,500
1,270	1,500	25,000	8,500
1,280	1,500	25,000	8,500
1,290	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,310	1,500	25,000	8,500
1,320	1,500	25,000	8,500
1,325	1,500	25,000	9,500
1,330	1,500	25,000	9,500
1,340	1,500	25,000	9,500
1,350	1,500	25,000	9,500
1,370	1,500	25,000	9,500
1,380	1,500	25,000	9,500
1,390	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,410	1,500	25,000	9,500
1,420	1,500	25,000	9,500
1,430	1,500	25,000	9,500
1,440	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,460	2,000	30,000	9,500
1,470	2,000	30,000	9,500
1,500	2,000	30,000	9,500
1,520	2,000	30,000	10,600
1,530	2,000	30,000	10,600
1,540	2,000	30,000	10,600
1,550	2,000	30,000	10,600
1,590	2,000	30,000	10,600
1,600	2,000	30,000	10,600
1,610	2,000	30,000	10,600
1,630	2,000	30,000	10,600
1,640	2,000	30,000	10,600
1,650	2,000	30,000	10,600
1,660	2,000	30,000	10,600
1,690	2,000	30,000	10,600
1,700	2,000	30,000	10,600
1,710	2,000	30,000	11,800
1,715	2,000	30,000	11,800
1,730	2,000	30,000	11,800
1,745	2,000	30,000	11,800
1,750	2,000	30,000	11,800
1,775	2,000	30,000	11,800
1,800	2,000	30,000	11,800

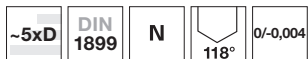


d1	d2	l1	l2
mm	mm	mm	mm
1,830	2,000	30,000	11,800
1,840	2,000	30,000	11,800
1,850	2,000	30,000	11,800
1,860	2,000	30,000	11,800
1,900	2,000	30,000	11,800
1,920	2,000	30,000	13,200

d1	d2	l1	l2
mm	mm	mm	mm



Micro brocas de precisão HSS-E-PM sem dutos de refrigeração



Material de corte **HSS-E-PM**

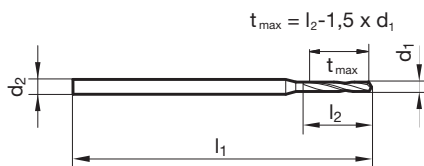
Superfície **S**

Sentido de corte **R**

- P** • afiação facetada • com haste reforçada • resistência ao desgaste ampliada
- M** •
- K** •
- N** • aços de liga alta
- S** ○
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 796



Nr. do artigo **660**

Micro brocas

d1	d2	l1	l2
mm	mm	mm	mm
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,200	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,250	1,000	25,000	1,900
0,255	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,265	1,000	25,000	1,900
0,270	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,295	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,305	1,000	25,000	2,400
0,310	1,000	25,000	2,400
0,320	1,000	25,000	2,400
0,325	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000
0,410	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,490	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,520	1,000	25,000	3,400

d1	d2	l1	l2
mm	mm	mm	mm
0,530	1,000	25,000	3,400
0,540	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,560	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,610	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,680	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800
0,730	1,000	25,000	4,800
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800



d1	d2	l1	l2
mm	mm	mm	mm
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,020	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,070	1,500	25,000	7,600
1,080	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,190	1,500	25,000	8,500

d1	d2	l1	l2
mm	mm	mm	mm
1,200	1,500	25,000	8,500
1,220	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,300	1,500	25,000	8,500
1,350	1,500	25,000	9,500
1,390	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,420	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,500	2,000	30,000	9,500
1,800	2,000	30,000	11,800
1,900	2,000	30,000	11,800



Micro brocas de precisão HSS-E-PM sem dutos de refrigeração



Material de corte **HSS-E-PM**

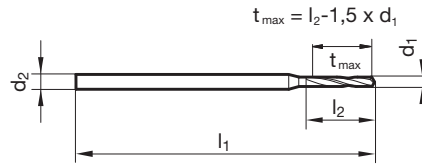
Superfície

Sentido de corte

- P** • afiação facetada • com haste reforçada • $\varnothing 0,15\text{ mm}$ aço-HSS ligado com Co
- M** •
- K** •
- N** • aços de liga alta
- S** ○
- H**

GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo **303**

Micro brocas

d1	d2	l1	l2	d1	d2	l1	l2
mm	mm	mm	mm	mm	mm	mm	mm
0,130	1,000	25,000	0,800	0,410	1,000	25,000	3,000
0,140	1,000	25,000	0,800	0,415	1,000	25,000	3,000
0,150	1,000	25,000	0,800	0,420	1,000	25,000	3,000
0,155	1,000	25,000	1,100	0,430	1,000	25,000	3,000
0,160	1,000	25,000	1,100	0,435	1,000	25,000	3,000
0,170	1,000	25,000	1,100	0,440	1,000	25,000	3,000
0,175	1,000	25,000	1,100	0,450	1,000	25,000	3,000
0,180	1,000	25,000	1,100	0,460	1,000	25,000	3,000
0,185	1,000	25,000	1,100	0,465	1,000	25,000	3,000
0,190	1,000	25,000	1,100	0,470	1,000	25,000	3,000
0,195	1,000	25,000	1,500	0,480	1,000	25,000	3,000
0,200	1,000	25,000	1,500	0,485	1,000	25,000	3,400
0,210	1,000	25,000	1,500	0,490	1,000	25,000	3,400
0,215	1,000	25,000	1,500	0,495	1,000	25,000	3,400
0,220	1,000	25,000	1,500	0,500	1,000	25,000	3,400
0,225	1,000	25,000	1,500	0,510	1,000	25,000	3,400
0,230	1,000	25,000	1,500	0,520	1,000	25,000	3,400
0,235	1,000	25,000	1,500	0,525	1,000	25,000	3,400
0,240	1,000	25,000	1,500	0,540	1,000	25,000	3,900
0,245	1,000	25,000	1,900	0,545	1,000	25,000	3,900
0,250	1,000	25,000	1,900	0,550	1,000	25,000	3,900
0,255	1,000	25,000	1,900	0,555	1,000	25,000	3,900
0,260	1,000	25,000	1,900	0,565	1,000	25,000	3,900
0,265	1,000	25,000	1,900	0,570	1,000	25,000	3,900
0,270	1,000	25,000	1,900	0,580	1,000	25,000	3,900
0,275	1,000	25,000	1,900	0,590	1,000	25,000	3,900
0,280	1,000	25,000	1,900	0,600	1,000	25,000	3,900
0,290	1,000	25,000	1,900	0,615	1,000	25,000	4,200
0,295	1,000	25,000	1,900	0,620	1,000	25,000	4,200
0,300	1,000	25,000	1,900	0,630	1,000	25,000	4,200
0,310	1,000	25,000	2,400	0,640	1,000	25,000	4,200
0,315	1,000	25,000	2,400	0,650	1,000	25,000	4,200
0,330	1,000	25,000	2,400	0,660	1,000	25,000	4,200
0,340	1,000	25,000	2,400	0,670	1,000	25,000	4,200
0,345	1,000	25,000	2,400	0,675	1,000	25,000	4,800
0,350	1,000	25,000	2,400	0,680	1,000	25,000	4,800
0,355	1,000	25,000	2,400	0,685	1,000	25,000	4,800
0,360	1,000	25,000	2,400	0,690	1,000	25,000	4,800
0,370	1,000	25,000	2,400	0,695	1,000	25,000	4,800
0,380	1,000	25,000	2,400	0,700	1,000	25,000	4,800
0,390	1,000	25,000	3,000	0,710	1,000	25,000	4,800
0,400	1,000	25,000	3,000	0,720	1,000	25,000	4,800

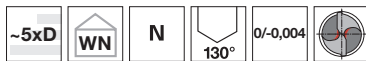


d1	d2	l1	l2
mm	mm	mm	mm
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,800	1,500	25,000	5,300
0,805	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,855	1,500	25,000	6,000
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,885	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,915	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,925	1,500	25,000	6,000
0,935	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,975	1,500	25,000	6,800
0,980	1,500	25,000	6,800
0,985	1,500	25,000	6,800
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800
1,005	1,500	25,000	6,800
1,020	1,500	25,000	6,800

d1	d2	l1	l2
mm	mm	mm	mm
1,030	1,500	25,000	6,800
1,040	1,500	25,000	6,800
1,050	1,500	25,000	6,800
1,060	1,500	25,000	6,800
1,080	1,500	25,000	7,600
1,085	1,500	25,000	7,600
1,090	1,500	25,000	7,600
1,100	1,500	25,000	7,600
1,110	1,500	25,000	7,600
1,120	1,500	25,000	7,600
1,125	1,500	25,000	7,600
1,150	1,500	25,000	7,600
1,160	1,500	25,000	7,600
1,170	1,500	25,000	7,600
1,180	1,500	25,000	7,600
1,200	1,500	25,000	8,500
1,250	1,500	25,000	8,500
1,270	1,500	25,000	8,500
1,280	1,500	25,000	8,500
1,285	1,500	25,000	8,500
1,290	1,500	25,000	8,500
1,310	1,500	25,000	8,500
1,330	1,500	25,000	9,500
1,350	1,500	25,000	9,500
1,360	1,500	25,000	9,500
1,375	1,500	25,000	9,500
1,400	1,500	25,000	9,500
1,405	1,500	25,000	9,500
1,425	1,500	25,000	9,500
1,450	1,500	25,000	9,500
1,460	2,000	30,000	9,500
1,500	2,000	30,000	9,500
1,600	2,000	30,000	10,600
1,615	2,000	30,000	10,600
1,800	2,000	30,000	11,800
1,850	2,000	30,000	11,800



Micro brocas de precisão Metal duro sem dutos de refrigeração

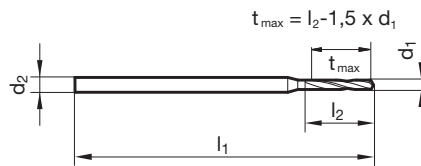


Material de corte	MD int.
Superfície	○
Sentido de corte	Ⓜ

- P** ● Redução da aresta transversal ≥ Ø 0,800 • afiação facetada • formato reto da aresta de corte principal
- M** ○
- K** ●
- N** ○ aços para construção e cementação • materiais fundidos • bronze, latão
- S** ○ alumínio e ligas de alumínio • magnésio e ligas de magnésio • plásticos e plásticos reforçados com fibra
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo **701**

Micro brocas

d1	d2	l1	l2	d1	d2	l1	l2
mm	mm	mm	mm	mm	mm	mm	mm
0,200	1,000	25,000	1,500	0,850	1,500	25,000	5,300
0,220	1,000	25,000	1,500	0,900	1,500	25,000	6,000
0,250	1,000	25,000	1,900	1,000	1,500	25,000	6,800
0,260	1,000	25,000	1,900	1,050	1,500	25,000	6,800
0,280	1,000	25,000	1,900	1,100	1,500	25,000	7,600
0,300	1,000	25,000	1,900	1,150	1,500	25,000	7,600
0,330	1,000	25,000	2,400	1,200	1,500	25,000	8,500
0,350	1,000	25,000	2,400	1,250	1,500	25,000	8,500
0,400	1,000	25,000	3,000	1,300	1,500	25,000	8,500
0,450	1,000	25,000	3,000	1,350	1,500	25,000	9,500
0,500	1,000	25,000	3,400	1,400	1,500	25,000	9,500
0,600	1,000	25,000	3,900				
0,650	1,000	25,000	4,200				
0,700	1,000	25,000	4,800				
0,750	1,000	25,000	4,800				
0,800	1,500	25,000	5,300				
0,810	1,500	25,000	5,300				
0,830	1,500	25,000	5,300				



Micro brocas de precisão Metal duro sem dutos de refrigeração

Material de corte **MD int.**Superfície **A**Sentido de corte **R**

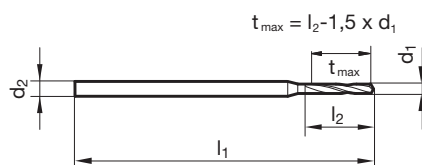
P • Redução da aresta transversal $\geq \varnothing 0,800$ • afiação facetada

M**K** •**N**

aços para construção e cementação • aços para máquinas automáticas,
aços para beneficiamento • aços com liga até 1200 N/mm² • materiais fundidos

S**H****GÜHRING**NAVIGATOR

Página de dados de corte 796



Nr. do artigo

3899

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,100	3,000	38,000	1,200
0,150	3,000	38,000	2,000
0,200	3,000	38,000	2,500
0,250	3,000	38,000	3,000
0,260	3,000	38,000	3,000
0,270	3,000	38,000	3,000
0,280	3,000	38,000	3,000
0,300	3,000	38,000	5,000
0,310	3,000	38,000	5,000
0,330	3,000	38,000	5,000
0,350	3,000	38,000	6,000
0,360	3,000	38,000	6,000
0,370	3,000	38,000	6,000
0,380	3,000	38,000	6,000
0,400	3,000	38,000	7,000
0,410	3,000	38,000	7,000
0,430	3,000	38,000	7,000
0,440	3,000	38,000	7,000
0,450	3,000	38,000	7,000
0,480	3,000	38,000	7,000
0,500	3,000	38,000	7,000
0,510	3,000	38,000	7,000
0,530	3,000	38,000	7,000
0,550	3,000	38,000	7,000
0,570	3,000	38,000	7,000
0,600	3,000	38,000	7,000
0,640	3,000	38,000	7,000
0,650	3,000	38,000	7,000
0,660	3,000	38,000	7,000
0,680	3,000	38,000	7,000
0,700	3,000	38,000	8,000
0,710	3,000	38,000	8,000
0,720	3,000	38,000	8,000
0,740	3,000	38,000	8,000
0,750	3,000	38,000	8,000
0,760	3,000	38,000	8,000
0,770	3,000	38,000	8,000
0,780	3,000	38,000	8,000
0,790	3,000	38,000	8,000
0,800	3,000	38,000	10,000
0,810	3,000	38,000	10,000
0,820	3,000	38,000	10,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,830	3,000	38,000	10,000
0,840	3,000	38,000	10,000
0,850	3,000	38,000	10,000
0,860	3,000	38,000	10,000
0,870	3,000	38,000	10,000
0,880	3,000	38,000	10,000
0,890	3,000	38,000	10,000
0,900	3,000	38,000	10,000
0,910	3,000	38,000	10,000
0,920	3,000	38,000	10,000
0,930	3,000	38,000	10,000
0,940	3,000	38,000	10,000
0,950	3,000	38,000	10,000
0,960	3,000	38,000	10,000
0,970	3,000	38,000	10,000
0,980	3,000	38,000	10,000
0,990	3,000	38,000	10,000
1,000	3,000	38,000	10,000
1,010	3,000	38,000	10,000
1,020	3,000	38,000	10,000
1,050	3,000	38,000	10,000
1,060	3,000	38,000	10,000
1,070	3,000	38,000	10,000
1,090	3,000	38,000	10,000
1,100	3,000	38,000	10,000
1,110	3,000	38,000	10,000
1,150	3,000	38,000	10,000
1,170	3,000	38,000	10,000
1,190	3,000	38,000	10,000
1,200	3,000	38,000	10,000
1,210	3,000	38,000	10,000
1,220	3,000	38,000	10,000
1,230	3,000	38,000	10,000
1,240	3,000	38,000	10,000
1,260	3,000	38,000	10,000
1,270	3,000	38,000	10,000
1,280	3,000	38,000	10,000
1,300	3,000	38,000	10,000
1,370	3,000	38,000	10,000
1,400	3,000	38,000	10,000
1,420	3,000	38,000	10,000
1,450	3,000	38,000	10,000



d1	d2 h6	l1	l2
mm	mm	mm	mm
1,490	3,000	38,000	10,000
1,500	3,000	38,000	10,000
1,510	3,000	38,000	10,000
1,520	3,000	38,000	10,000
1,550	3,000	38,000	10,000
1,560	3,000	38,000	10,000
1,580	3,000	38,000	10,000
1,590	3,000	38,000	10,000
1,600	3,000	38,000	12,000
1,630	3,000	38,000	12,000
1,650	3,000	38,000	12,000
1,700	3,000	38,000	12,000
1,750	3,000	38,000	12,000
1,800	3,000	38,000	12,000
1,810	3,000	38,000	12,000
1,820	3,000	38,000	12,000
1,830	3,000	38,000	12,000
1,840	3,000	38,000	12,000
1,850	3,000	38,000	12,000
1,860	3,000	38,000	12,000
1,900	3,000	38,000	12,000
1,920	3,000	38,000	12,000
1,950	3,000	38,000	12,000
1,980	3,000	38,000	12,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,000	3,000	38,000	12,000
2,050	3,000	38,000	12,000
2,100	3,000	38,000	12,000
2,150	3,000	38,000	12,000
2,200	3,000	38,000	12,000
2,400	3,000	38,000	12,000
2,500	3,000	38,000	12,000
2,550	3,000	38,000	12,000
2,600	3,000	38,000	12,000
2,750	3,000	38,000	12,000
2,800	3,000	38,000	12,000
2,950	3,000	38,000	12,000
3,000	3,000	38,000	12,000



Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração



Material de corte **MD int.**

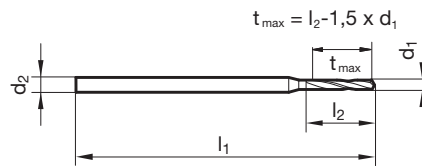
Superfície **A**

Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 0,500$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado
- M** •
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos
- S** ○
- H**

GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo **6400**

d1	d2 h6	l1	l2
mm	mm	mm	mm
0,500	3,000	47,000	3,000
0,550	3,000	47,000	3,300
0,600	3,000	47,000	3,600
0,650	3,000	47,000	3,900
0,700	3,000	47,000	4,200
0,750	3,000	47,000	4,500
0,800	3,000	47,000	4,800
0,850	3,000	47,000	5,100
0,900	3,000	47,000	5,400
0,950	3,000	47,000	5,700
1,000	3,000	47,000	6,000
1,050	3,000	47,000	6,300
1,100	3,000	47,000	6,600
1,150	3,000	47,000	6,900
1,200	3,000	47,000	7,200
1,250	3,000	47,000	7,500
1,300	3,000	47,000	7,800
1,350	3,000	47,000	8,100
1,400	3,000	47,000	8,400
1,450	3,000	47,000	8,700
1,500	3,000	47,000	9,000
1,550	3,000	47,000	9,300
1,590	3,000	47,000	9,600
1,600	3,000	47,000	9,600
1,650	3,000	47,000	9,900
1,700	3,000	47,000	10,200
1,750	3,000	47,000	10,500
1,800	3,000	52,000	10,800
1,850	3,000	52,000	11,100
1,900	3,000	52,000	11,400

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,950	3,000	52,000	11,700
1,980	4,000	59,000	12,000
2,000	4,000	59,000	12,000
2,050	4,000	59,000	12,300
2,100	4,000	59,000	12,600
2,150	4,000	59,000	12,900
2,200	4,000	59,000	13,200
2,250	4,000	59,000	13,500
2,300	4,000	59,000	13,800
2,350	4,000	59,000	14,100
2,380	4,000	59,000	14,400
2,400	4,000	59,000	14,400
2,450	4,000	59,000	14,700
2,500	4,000	59,000	15,000
2,550	4,000	59,000	15,300
2,600	4,000	59,000	15,600
2,650	4,000	59,000	15,900
2,700	4,000	59,000	16,200
2,750	4,000	59,000	16,500
2,780	4,000	59,000	16,800
2,800	4,000	59,000	16,800
2,850	4,000	59,000	17,100
2,900	4,000	59,000	17,400
2,950	4,000	59,000	17,700
3,000	4,000	59,000	18,000

Micro brocas



Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração

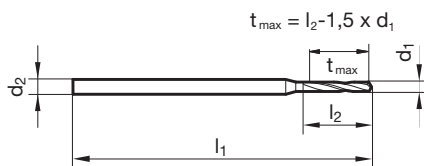


Material de corte	MD int.
Superfície	A
Sentido de corte	R

- P** • Redução da aresta transversal $\geq \varnothing 0,500$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado
- M** •
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos
- S** ○
- H**

GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo **6401**

Micro brocas

d1	d2 h6	l1	l2	d1	d2 h6	l1	l2
mm	mm	mm	mm	mm	mm	mm	mm
0,500	3,000	47,000	4,000	1,950	3,000	52,000	17,600
0,550	3,000	47,000	4,400	1,980	4,000	63,000	18,000
0,600	3,000	47,000	4,800	2,000	4,000	63,000	18,000
0,650	3,000	47,000	5,200	2,050	4,000	63,000	18,500
0,700	3,000	47,000	5,600	2,100	4,000	63,000	18,900
0,750	3,000	47,000	6,000	2,150	4,000	63,000	19,400
0,800	3,000	47,000	6,400	2,200	4,000	63,000	19,800
0,850	3,000	47,000	6,800	2,250	4,000	63,000	20,300
0,900	3,000	47,000	7,200	2,300	4,000	63,000	20,700
0,950	3,000	47,000	7,600	2,350	4,000	63,000	21,200
1,000	3,000	47,000	8,000	2,380	4,000	63,000	21,600
1,050	3,000	47,000	8,400	2,400	4,000	63,000	21,600
1,100	3,000	47,000	8,800	2,450	4,000	63,000	22,100
1,150	3,000	47,000	9,200	2,500	4,000	63,000	22,500
1,200	3,000	52,000	10,800	2,550	4,000	63,000	23,000
1,250	3,000	52,000	11,300	2,600	4,000	67,000	23,400
1,300	3,000	52,000	11,700	2,650	4,000	67,000	23,900
1,350	3,000	52,000	12,200	2,700	4,000	67,000	24,300
1,400	3,000	52,000	12,600	2,750	4,000	67,000	24,800
1,450	3,000	52,000	13,100	2,780	4,000	67,000	25,200
1,500	3,000	52,000	13,500	2,800	4,000	67,000	25,200
1,550	3,000	52,000	14,000	2,850	4,000	67,000	25,700
1,590	3,000	52,000	14,400	2,900	4,000	67,000	26,100
1,600	3,000	52,000	14,400	2,950	4,000	67,000	26,600
1,650	3,000	52,000	14,900	3,000	4,000	67,000	27,000
1,700	3,000	52,000	15,300				
1,750	3,000	52,000	15,800				
1,800	3,000	52,000	16,200				
1,850	3,000	52,000	16,700				
1,900	3,000	52,000	17,100				


Micro Brocas de precisão ExclusiveLine com dutos de refrigeração
Material de corte **MD int.**Superfície **A**Sentido de corte **R****NEW**

P • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado

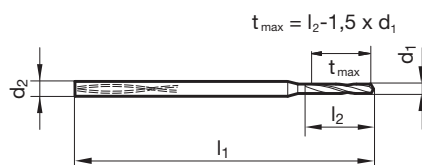
M •**K** •

N ○ aços para construção e cementação • aços para máquinas automáticas,

S ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos

H
GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo

6405

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	52,000	11,000
1,450	4,000	52,000	12,000
1,500	4,000	52,000	12,000
1,550	4,000	52,000	12,000
1,590	4,000	52,000	13,000
1,600	4,000	52,000	13,000
1,650	4,000	52,000	13,000
1,700	4,000	56,000	14,000
1,750	4,000	56,000	14,000
1,800	4,000	56,000	14,000
1,850	4,000	56,000	15,000
1,900	4,000	56,000	15,000
1,950	4,000	56,000	16,000
1,980	4,000	56,000	16,000
2,000	4,000	56,000	16,000
2,050	4,000	56,000	16,000
2,100	4,000	62,000	17,000
2,150	4,000	62,000	17,000
2,200	4,000	62,000	18,000
2,250	4,000	62,000	18,000
2,300	4,000	62,000	18,000
2,350	4,000	62,000	19,000
2,380	4,000	62,000	19,000
2,400	4,000	62,000	19,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,450	4,000	62,000	20,000
2,500	4,000	62,000	20,000
2,550	4,000	62,000	20,000
2,600	4,000	66,000	21,000
2,650	4,000	66,000	21,000
2,700	4,000	66,000	22,000
2,750	4,000	66,000	22,000
2,780	4,000	66,000	22,000
2,800	4,000	66,000	22,000
2,850	4,000	66,000	23,000
2,900	4,000	66,000	23,000
2,950	4,000	66,000	24,000
3,000	4,000	66,000	24,000



Micro Brocas de precisão ExclusiveLine com dutos de refrigeração

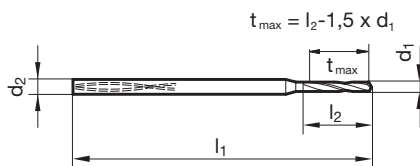


Material de corte	MD int.
Superfície	A
Sentido de corte	R

- P** • Redução da aresta transversal ≥ Ø 1,400 • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado
- M** •
- K** •
- N** ○ aços para construção e cementação • aços para máquinas automáticas, aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos
- S** ○
- H**

GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo **6408**

Micro brocas

d1	d2 h6	l1	l2	d1	d2 h6	l1	l2
mm	mm	mm	mm	mm	mm	mm	mm
1,400	4,000	52,000	15,000	2,400	4,000	62,000	26,000
1,450	4,000	52,000	16,000	2,450	4,000	62,000	27,000
1,500	4,000	52,000	17,000	2,500	4,000	62,000	28,000
1,550	4,000	52,000	17,000	2,550	4,000	62,000	28,000
1,590	4,000	52,000	18,000	2,600	4,000	66,000	29,000
1,600	4,000	52,000	18,000	2,650	4,000	66,000	29,000
1,650	4,000	52,000	18,000	2,700	4,000	66,000	30,000
1,700	4,000	56,000	19,000	2,750	4,000	66,000	30,000
1,750	4,000	56,000	19,000	2,780	4,000	66,000	31,000
1,800	4,000	56,000	20,000	2,800	4,000	66,000	31,000
1,850	4,000	56,000	20,000	2,850	4,000	66,000	31,000
1,900	4,000	56,000	21,000	2,900	4,000	66,000	32,000
1,950	4,000	56,000	21,000	2,950	4,000	66,000	32,000
1,980	4,000	56,000	22,000	3,000	4,000	66,000	33,000
2,000	4,000	56,000	22,000				
2,050	4,000	56,000	23,000				
2,100	4,000	62,000	23,000				
2,150	4,000	62,000	24,000				
2,200	4,000	62,000	24,000				
2,250	4,000	62,000	25,000				
2,300	4,000	62,000	25,000				
2,320	4,000	62,000	26,000				
2,350	4,000	62,000	26,000				
2,380	4,000	62,000	26,000				


Micro Brocas de precisão ExclusiveLine com dutos de refrigeração
Material de corte **MD int.**Superfície **A**Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 1,400$ • afiação facetada • formato reto da aresta de corte principal • honning das arestas retificado

M •

K •

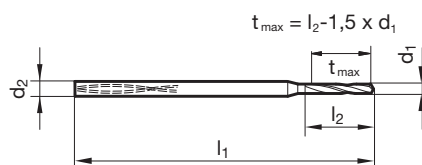
N ○ aços para construção e cementação • aços para máquinas automáticas,

S ○ aços para beneficiamento • aços com liga até 1200 N/mm² • aços inoxidáveis • materiais fundidos

H

GÜHRING NAVIGATOR

Página de dados de corte 796



Nr. do artigo

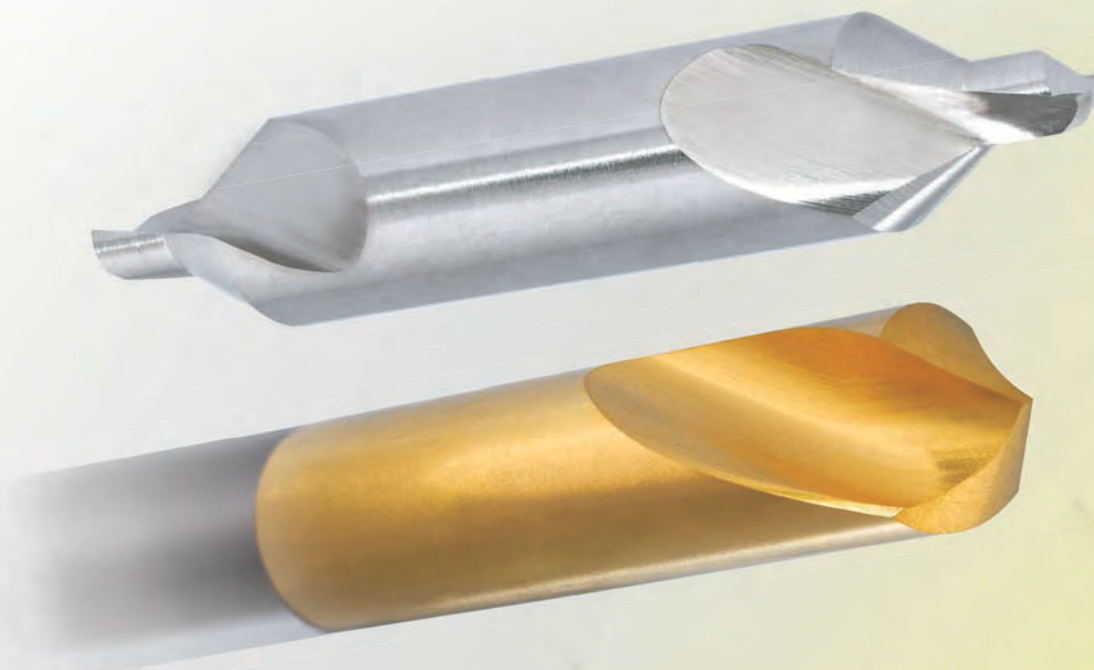
6412

d1	d2 h6	l1	l2
mm	mm	mm	mm
1,400	4,000	62,000	25,000
1,500	4,000	62,000	27,000
1,590	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,600	4,000	62,000	29,000
1,700	4,000	70,000	31,000
1,800	4,000	70,000	32,000
1,900	4,000	70,000	34,000
1,980	4,000	70,000	36,000
2,000	4,000	70,000	36,000
2,100	4,000	78,000	38,000
2,200	4,000	78,000	40,000
2,300	4,000	78,000	42,000

d1	d2 h6	l1	l2
mm	mm	mm	mm
2,380	4,000	78,000	44,000
2,400	4,000	78,000	44,000
2,500	4,000	78,000	45,000
2,600	4,000	87,000	47,000
2,700	4,000	87,000	48,000
2,780	4,000	87,000	50,000
2,800	4,000	87,000	50,000
2,900	4,000	87,000	52,000
3,000	4,000	87,000	54,000



BROCAS PARA CENTRAGEM / BROCAS PARA CENTRAR





P	M	K	N	S	H	Representação da ferramenta	Forma da haste	Norma	Forma	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Brocas de centragem sem plano

•	○	•	•	○			Cyl	DIN 333	A	R	HSS	○	0,500 - 12,500	581	802 668
•	○	•	•	○			Cyl	DIN 333	A	R	HSS	Ⓢ	0,500 - 8,000	613	802 669
•	○	•	•	○			Cyl	DIN 333	A	L	HSS	○	0,500 - 12,500	582	670
•	○	•	•	○			Cyl	DIN 333	A	R	HSS	○	1,000 - 12,500	590	671
•	○	•	•	○			Cyl	DIN 333	R	R	HSS	○	0,500 - 12,500	583	802 672
•	○	•	•	○			Cyl	DIN 333	R	R	HSS	Ⓢ	0,800 - 8,000	614	802 673
•	○	•	•	○			Cyl	DIN 333	R	L	HSS	○	0,800 - 5,000	584	674
•	○	•	•	○			Cyl	DIN 333	B	R	HSS	○	1,000 - 10,000	585	802 675
•	○	•	•	○			Cyl	DIN 333	B	L	HSS	○	1,000 - 10,000	586	676
•	○	•	•	○			Cyl	DIN 333	B	R	HSS	○	1,000 - 6,300	591	677
•	○	•	•	○			Cyl	ASME B94.11 M	A	R	HSS	○	1,190 - 7,940	594	678
•	○	•	•	○			Cyl	ASME B94.11 M	B	R	HSS	○	1,190 - 6,350	595	679
•	○	•	•	○			Cyl	BS 328	A	R	HSS	○	1,190 - 7,940	292	802 680
•	○	•	•	○			Cyl	BS 328	A	L	HSS	○	1,190 - 7,940	294	681
•	•	•	•	○			Cyl	DIN 333	A	R	HSCO	○	1,000 - 4,000	381	802 682
○	○	○	○	○	○		Cyl	WN	A	R	VHM	○	0,500 - 6,300	736	683
•	○	•	•	○			Cyl	WN	A	R	HSS	○	0,500 - 10,000	281	684
•	○	•	•	○			Cyl	WN	A	L	HSS	○	0,800 - 5,000	282	685
•	○	•	•	○			Cyl	WN	R	R	HSS	○	0,500 - 10,000	283	686
•	○	•	•	○			Cyl	WN	R	L	HSS	○	1,600 - 4,000	284	687
•	○	•	•	○			Cyl	WN	B	R	HSS	○	1,000 - 6,300	285	688
•	○	•	•	○			Cyl	WN	A	R	HSS	○	1,000 - 3,150	280	802 689

Brocas de centragem com plano

•	○	•	•	○			Cyl	DIN 333	A	R	HSS	○	1,600 - 10,000	587	802 690
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Brocas para centragem/brocas para centrar



P	M	K	N	S	H	Representação da ferramenta	Forma da haste	Norma	Forma	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
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Brocas de centragem com plano

•	○	•	•	○			Cyl	DIN 333	R		HSS	○	1,000 - 10,000	588	802 691
•	○	•	•	○			Cyl	DIN 333	B		HSS	○	1,600 - 8,000	589	692
•	○	•	•	○			Cyl	DIN 333	A		HSS	○	1,600 - 10,000	287	693
•	○	•	•	○			Cyl	DIN 333	R		HSS	○	2,000 - 8,000	288	694
•	○	•	•	○			Cyl	WN	B		HSS	○	1,600 - 5,000	289	695

Brocas de centragem NC 90°

•	○	•	•	○			Cyl	WN			HSS	○	3,000 - 25,400	557	798 696
•	○	•	•	○			Cyl	WN			HSS		3,000 - 25,400	568	798 697
•	•	•	•	○			B	WN			HSCO	○	3,000 - 20,000	1136	798 698
•	•	•	•	○			B	WN			HSCO		3,000 - 20,000	1133	798 699
•	○	•	•	○			Cyl	WN			HSS	○	6,350 - 25,400	559	798 700
○	○	○	○	○	○		Cyl	WN			VHM	○	4,000 - 20,000	723	701

Brocas de centragem NC 120°

•	○	•	•	○			Cyl	WN			HSS	○	3,000 - 25,400	556	798 702
•	○	•	•	○			Cyl	WN			HSS		3,000 - 25,000	567	798 703
•	•	•	•	○			B	WN			HSCO	○	3,000 - 20,000	1134	798 704
•	•	•	•	○			B	WN			HSCO		3,000 - 20,000	1135	798 705
○	○	○	○	○	○		HA	WN			VHM	○	5,000 - 20,000	724	706

Brocas de centragem NC 142°

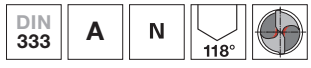
○	○	○	○	○	○		HB	WN			VHM	○	4,000 - 20,000	546	707
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Brocas para carroceria

•	○	•	•	○			Cyl	WN			HSS		1,500 - 10,000	554	708
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Brocas para centragem/brocas para centrar

Brocas de centragem sem plano

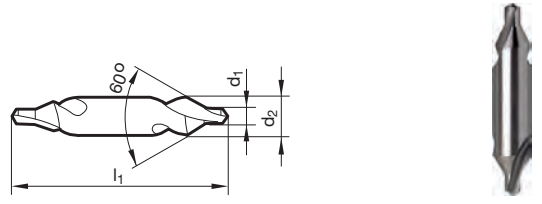


- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ sem escareado de proteção • para furos de centro conforme DIN 332, folha 1, forma A • $d1 \leq 0,8$ mm: um lado com ponta
- K** •
- N** •
- S** ○
- H** •

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

GÜHRING NAVIGATOR

Página de dados de corte 802



Nr. do artigo **581**

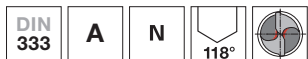
d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

d1	d2	l1
mm	mm	mm
10,000	25,000	100,000
12,500	31,500	125,000

Brocas para centragem/brocas para centrar



Brocas de centragem sem plano



Material de corte **HSS**

Superfície **S**

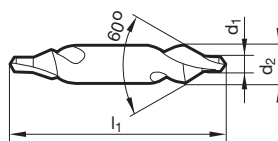
Sentido de corte **R**

P • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
 • sem escareado de proteção • para furos de centro conforme DIN 332,
M ◦ folha 1, forma A • $d1 \leq 0,8$ mm: um lado com ponta • resistência ao
 desgaste ampliada

- K** •
- N** •
- S** ◦
- H**

GÜHRING NAVIGATOR

Página de dados de corte 802



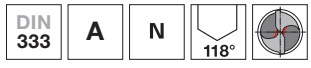
Nr. do artigo **613**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000

d1	d2	l1
mm	mm	mm
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

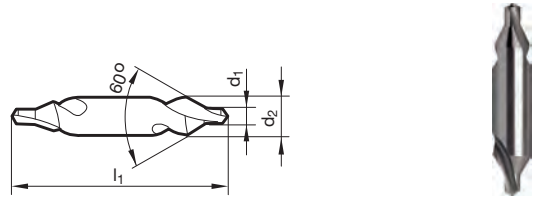
Brocas para centragem/brocas para centrar

Brocas de centragem sem plano



- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ sem escareado de proteção • para furos de centro conforme DIN 332, folha 1, forma A • $d1 \leq 0,8$ mm: um lado com ponta
- K** •
- N** •
- S** ○
- H** ○

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓛ



Nr. do artigo **582**

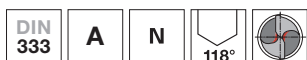
d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

d1	d2	l1
mm	mm	mm
10,000	25,000	100,000
12,500	31,500	125,000

Brocas para centragem/brocas para centrar



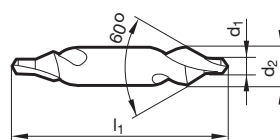
Brocas de centragem sem plano

Material de corte **HSS**

Superfície

Sentido de corte

P	•	Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
M	○	• com o pescoço reforçado para proporcionar alta resistência à fratura
K	•	• sem escareado de proteção • recesso entre rebaixo e furo para espaço de lubrificação adicional • para furos de centro conforme DIN 332, folha 1, forma A
N	•	
S	○	
H		

Nr. do artigo **590**

d1	d2	l1
mm	mm	mm
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000

d1	d2	l1
mm	mm	mm
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000
10,000	25,000	100,000
12,500	31,500	125,000

Brocas de centragem sem plano

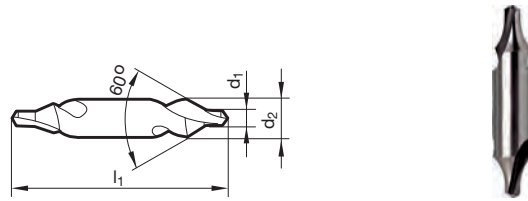


- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ • alinhamento correto entre pontas • para furos de centragem conforme DIN 332 parte 1, forma R • $d1 \leq 0,8$ mm: um lado com ponta
- K** •
- N** •
- S** ○
- H** •

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

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Nr. do artigo **583**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

d1	d2	l1
mm	mm	mm
10,000	25,000	100,000
12,500	31,500	125,000

Brocas para centragem/brocas para centrar



Brocas de centragem sem plano



Material de corte **HSS**

Superfície **S**

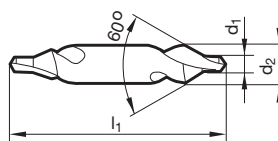
Sentido de corte **R**

- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ • resistência ao desgaste ampliada • alinhamento correto entre pontas
- K** •
- N** •
- S** ○
- H**

• para furos de centragem conforme DIN 332 parte 1, forma R • $d1 \leq 0,8$ mm: um lado com ponta

GÜHRING NAVIGATOR

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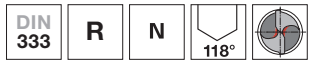
Nr. do artigo **614**

d1	d2	l1
mm	mm	mm
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000

d1	d2	l1
mm	mm	mm
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

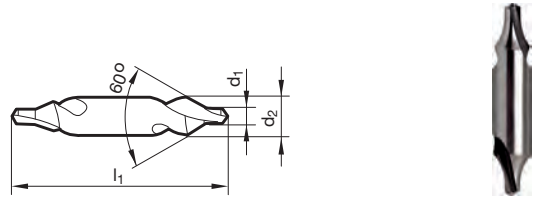
Brocas para centragem/brocas para centrar

Brocas de centragem sem plano



- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ • alinhamento correto entre pontas • para furos de centragem conforme DIN 332 parte 1, forma R • $d1 \leq 0,8$ mm: um lado com ponta
- K** •
- N** •
- S** ○
- H** •

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓛ



Nr. do artigo **584**

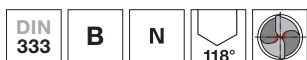
d1	d2	l1
mm	mm	mm
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000

d1	d2	l1
mm	mm	mm
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000

Brocas para centragem/brocas para centrar



Brocas de centragem sem plano

Material de corte **HSS**

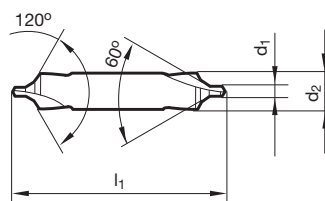
Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
• conforme DIN 332, folha 1, forma B • com escareado de proteção 120°

M ○**K** •**N** •**S** ○**H****GÜHRING**NAVIGATOR

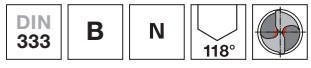
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Nr. do artigo **585**

d1	d2	l1
mm	mm	mm
1,000	4,000	35,500
1,250	5,000	40,000
1,600	6,300	45,000
2,000	8,000	50,000
2,500	10,000	56,000
3,150	11,200	60,000

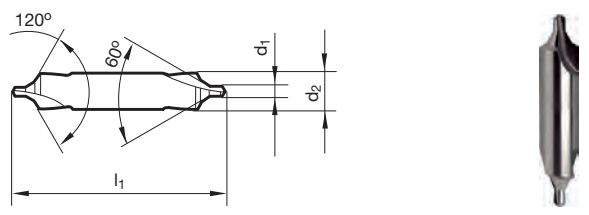
d1	d2	l1
mm	mm	mm
4,000	14,000	67,000
5,000	18,000	75,000
6,300	20,000	80,000
8,000	25,000	100,000
10,000	31,500	125,000

Brocas de centragem sem plano



Material de corte	HSS
Superfície	○
Sentido de corte	Ⓛ

- P** ● Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ • conforme DIN 332, folha 1, forma B • com escareado de proteção 120°
- K** ●
- N** ●
- S** ○
- H** ●



Nr. do artigo **586**

d1	d2	l1
mm	mm	mm
1,000	4,000	35,500
1,250	5,000	40,000
1,600	6,300	45,000
2,000	8,000	50,000
2,500	10,000	56,000
3,150	11,200	60,000

d1	d2	l1
mm	mm	mm
4,000	14,000	67,000
5,000	18,000	75,000
6,300	20,000	80,000
8,000	25,000	100,000
10,000	31,500	125,000

Brocas para centragem/brocas para centrar



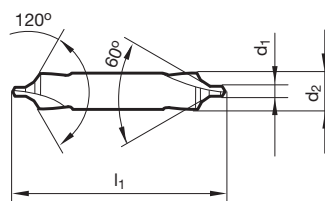
Brocas de centragem sem plano

Material de corte **HSS**

Superfície ○

Sentido de corte


- P** ● Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
 • com o pescoço reforçado para proporcionar alta resistência à fratura
M ○ • recesso entre rebaixo e furo para espaço de lubrificação adicional
K ● • conforme DIN 332, folha 1, forma B • com escareado de proteção 120°

N ●**S** ○**H** ○Nr. do artigo **591**

d1	d2	l1
mm	mm	mm
1,000	4,000	35,500
1,600	6,300	45,000
2,000	8,000	50,000
2,500	10,000	56,000
3,150	11,200	60,000
4,000	14,000	67,000

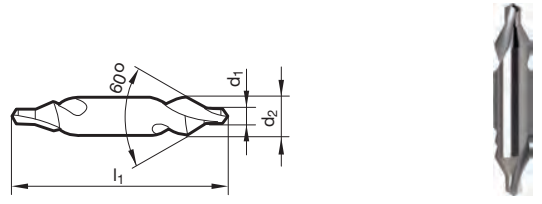
d1	d2	l1
mm	mm	mm
5,000	18,000	75,000
6,300	20,000	80,000

Brocas de centragem sem plano

ASME B94.11 M	A	N	118°	
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Material de corte	HSS
Superfície	○
Sentido de corte	

- P** ● Redução da aresta transversal $\geq \varnothing 1,980$ • afiação de superfície cônica
- M** ○ • forma A conforme norma americana
- K** ●
- N** ●
- S** ○
- H** ●



Nr. do artigo **594**

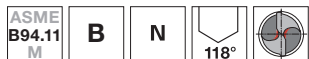
Tamanho	d1		d2	l1	Nº de cód.
	mm	inch	mm	mm	
1	1,190	3/64	3,170	32,000	1,190
2	1,980	5/64	4,760	48,000	1,980
3	2,780	7/64	6,350	51,000	2,780
4	3,170	1/8	7,940	54,000	3,170
5	4,760	3/16	11,110	70,000	4,760
6	5,560	7/32	12,700	76,000	5,560

Tamanho	d1		d2	l1	Nº de cód.
	mm	inch	mm	mm	
7	6,350	1/4	15,870	83,000	6,350
8	7,940	5/16	19,050	89,000	7,940

Brocas para centragem/brocas para centrar



Brocas de centragem sem plano



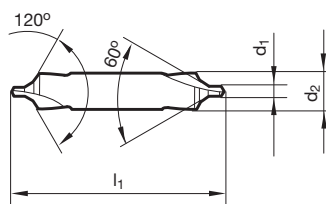
Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P ● Redução da aresta transversal $\geq \varnothing 2,380$ • afiação de superfície cônica
 • forma B conforme norma americana

- M** ○
- K** ●
- N** ●
- S** ○
- H** ○



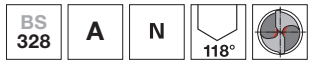
Nr. do artigo **595**

Tamanho	d1		d2	l1	Nº de cód.
	mm	inch	mm	mm	
11	1,190	3/64	3,170	32,000	1,190
12	1,590	1/16	4,760	48,000	1,590
13	2,380	3/32	6,350	51,000	2,380
14	2,780	7/64	7,940	54,000	2,780
15	3,970	5/32	11,110	70,000	3,970
16	4,760	3/16	12,700	76,000	4,760

Tamanho	d1		d2	l1	Nº de cód.
	mm	inch	mm	mm	
17	5,560	7/32	15,870	83,000	5,560
18	6,350	1/4	19,050	89,000	6,350

Brocas para centragem/brocas para centrar

Brocas de centragem sem plano

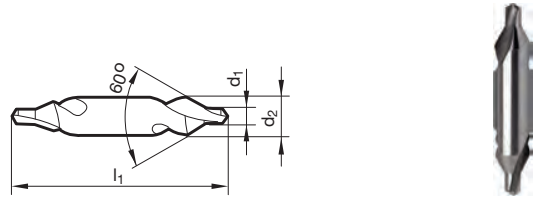


- P** • Redução da aresta transversal $\geq \varnothing 1,190$ • afiação de superfície cônica
- M** ○ • forma A conforme norma britânica
- K** •
- N** •
- S** ○
- H** ○

Material de corte	HSS
Superfície	○
Sentido de corte	

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Nr. do artigo **292**

Tamanho	d1		d2	l1	Nº de cód.
	mm	inch			
1	1,190	3/64	3,170	38,000	1,190
2	1,590	1/16	4,760	44,000	1,590
3	2,380	3/32	6,350	51,000	2,380
4	3,170	1/8	7,940	57,000	3,170
5	4,760	3/16	11,110	63,000	4,760
6	6,350	1/4	15,870	76,000	6,350

Tamanho	d1		d2	l1	Nº de cód.
	mm	inch			
7	7,940	5/16	19,050	89,000	7,940

Brocas para centragem/brocas para centrar



Brocas de centragem sem plano



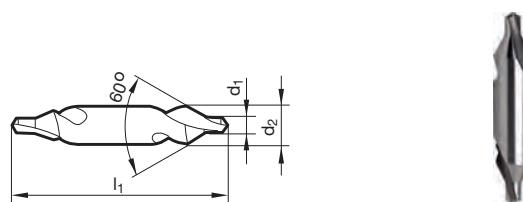
Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 1,190$ • afiação de superfície cônica
• forma A conforme norma britânica

P	•
M	○
K	•
N	•
S	○
H	



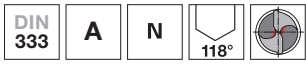
Nr. do artigo **294**

Tamanho	d1		d2	l1	Nº de cód.
	mm	inch	mm	mm	
1	1,190	3/64	3,170	38,000	1,190
2	1,590	1/16	4,760	44,000	1,590
3	2,380	3/32	6,350	51,000	2,380
4	3,170	1/8	7,940	57,000	3,170
5	4,760	3/16	11,110	63,000	4,760
6	6,350	1/4	15,870	76,000	6,350

Tamanho	d1		d2	l1	Nº de cód.
	mm	inch	mm	mm	
7	7,940	5/16	19,050	89,000	7,940

Brocas para centragem/brocas para centrar

Brocas de centragem sem plano



- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** • sem escareado de proteção • resistência ao desgaste ampliada • para furos de centro conforme DIN 332, folha 1, forma A
- K** •
- N** • materiais acima de 800 N/mm² • aços-CrNi resistentes a corrosão-/ácidos-/calor
- S** ○
- H**

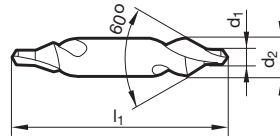
Material de corte **HSCO**

Superfície ○

Sentido de corte 

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Nr. do artigo **381**

d1	d2	l1
mm	mm	mm
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000

d1	d2	l1
mm	mm	mm
4,000	10,000	56,000

Brocas para centragem/brocas para centrar



Brocas de centragem sem plano



Material de corte **MD int.**

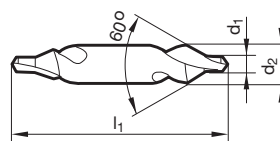
Superfície

Sentido de corte

P ○ Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
 • sem escareado de proteção • para furos de centro conforme DIN 332,
 folha 1, forma A • $d1 \leq 0,8$ mm: um lado com ponta

K ○
N ○ adequação de material universal

S ○
H ○



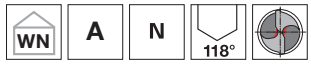
Nr. do artigo **736**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000

d1	d2	l1
mm	mm	mm
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000

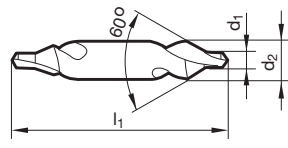
Brocas para centragem/brocas para centrar

Brocas de centragem sem plano



- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ sem escareado de proteção • para furos de centro DIN 332 folha 1 (edição 09.1960x cancelada), Forma A • $d1 \leq 0,8$ mm: um lado com ponta
- K** •
- N** •
- S** ○
- H** ○

Material de corte	HSS
Superfície	○
Sentido de corte	(R)



Nr. do artigo **281**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
1,000	3,150	31,500
1,250	4,000	35,500
1,600	5,000	40,000
2,000	6,300	45,000
2,500	8,000	50,000

d1	d2	l1
mm	mm	mm
3,150	10,000	56,000
4,000	12,500	63,000
5,000	16,000	71,000
6,300	20,000	80,000
8,000	25,000	100,000
10,000	31,500	125,000

Brocas para centragem/brocas para centrar



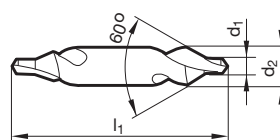
Brocas de centragem sem plano

Material de corte **HSS**

Superfície ○

Sentido de corte (L)

P ● Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
 • sem escareado de proteção • para furos de centro DIN 332 folha 1
 (edição 09.1960x cancelada), Forma A • $d1 \leq 0,8$ mm: um lado com
 ponta

M ○**K** ●**N** ●**S** ○**H** ○Nr. do artigo **282**

d1	d2	l1
mm	mm	mm
0,800	3,150	25,000
1,250	4,000	35,500
1,600	5,000	40,000
2,000	6,300	45,000
2,500	8,000	50,000
3,150	10,000	56,000

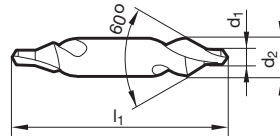
d1	d2	l1
mm	mm	mm
4,000	12,500	63,000
5,000	16,000	71,000

Brocas de centragem sem plano



- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ • alinhamento correto entre pontas • para furos de centro conforme DIN 332, folha 1, forma R (emissão 09.1960x revisado) • $d1 \leq 0,8$ mm: um lado com ponta
- K** •
- N** •
- S** ○
- H** ○

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ



Nr. do artigo **283**

d1	d2	l1
mm	mm	mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	4,000	35,500
1,600	5,000	40,000
2,000	6,300	45,000
2,500	8,000	50,000
3,150	10,000	56,000
4,000	12,500	63,000
5,000	16,000	71,000
6,300	20,000	80,000
8,000	25,000	100,000

d1	d2	l1
mm	mm	mm
10,000	31,500	125,000

Brocas para centragem/brocas para centrar



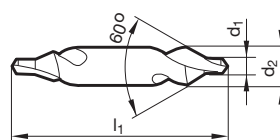
Brocas de centragem sem plano

Material de corte **HSS**

Superfície ○

Sentido de corte (L)

P • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
 • alinhamento correto entre pontas • para furos de centro conforme DIN 332, folha 1, forma R (emissão 09.1960x revisado)

M ○**K** •**N** •**S** ○**H**Nr. do artigo **284**

d1	d2	l1
mm	mm	mm
1,600	5,000	40,000
2,000	6,300	45,000
2,500	8,000	50,000
3,150	10,000	56,000
4,000	12,500	63,000

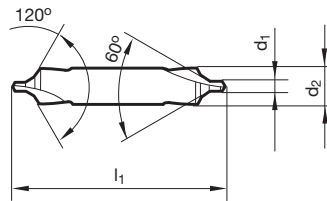
d1	d2	l1
mm	mm	mm

Brocas de centragem sem plano



- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ para furos de centro DIN 332 folha 1 (edição 09.1960x cancelada),
- K** • Forma B • com escareado de proteção 120°
- N** •
- S** ○
- H** •

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ



Nr. do artigo **285**

d1	d2	l1
mm	mm	mm
1,000	6,300	40,000
1,600	8,000	50,000
2,000	10,000	56,000
2,500	11,200	63,000
3,150	14,000	71,000
4,000	16,000	80,000

d1	d2	l1
mm	mm	mm
5,000	20,000	90,000
6,300	25,000	100,000

Brocas para centragem/brocas para centrar



Brocas de centragem sem plano



Material de corte **HSS**

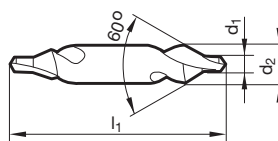
Superfície ○

Sentido de corte (R)

- P** ● Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ • broca para centragem extra longa • sem escareado de proteção • para furos de centragem semelhante DIN 332 parte 1, forma A • para locais de centragem aprofundados
- K** ●
- N** ●
- S** ○
- H** ●

GÜHRING NAVIGATOR

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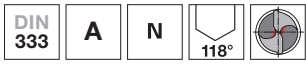
Nr. do artigo **280**

d1	d2	l1
mm	mm	mm
1,000	4,000	120,000
1,600	5,000	120,000
2,000	6,000	120,000
2,500	8,000	120,000
3,150	10,000	120,000

d1	d2	l1
mm	mm	mm

Brocas para centragem/brocas para centrar

Brocas de centragem com plano

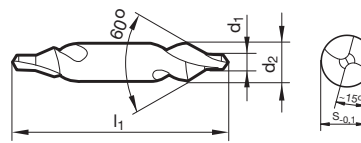


- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ para furos de centro conforme DIN 332, folha 1, forma A • sem
- K** • escareado de proteção
- N** •
- S** ○
- H** •

Material de corte	HSS
Superfície	○
Sentido de corte	

GÜHRING NAVIGATOR

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Nr. do artigo **587**

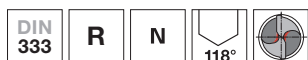
d1	d2	l1	S
mm	mm	mm	mm
1,600	4,000	35,500	3,250
2,000	5,000	40,000	4,200
2,500	6,300	45,000	5,350
3,150	8,000	50,000	6,950
4,000	10,000	56,000	8,400
5,000	12,500	63,000	10,950

d1	d2	l1	S
mm	mm	mm	mm
6,300	16,000	71,000	14,000
8,000	20,000	80,000	17,900
10,000	25,000	100,000	22,500

Brocas para centragem/brocas para centrar



Brocas de centragem com plano

Material de corte **HSS**

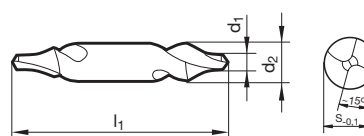
Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
 • alinhamento correto entre pontas • para furos de centragem conforme
M ○ DIN 332 parte 1, forma R

K •**N** •**S** ○**H****GÜHRING** NAVIGATOR

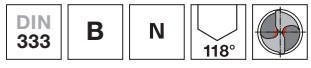
Página de dados de corte 802

Nr. do artigo **588**

d1	d2	l1	S
mm	mm	mm	mm
1,000	3,150	31,500	2,350
2,000	5,000	40,000	4,200
2,500	6,300	45,000	5,350
3,150	8,000	50,000	6,950
4,000	10,000	56,000	8,400
5,000	12,500	63,000	10,950

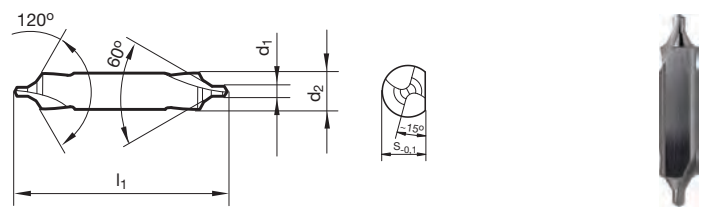
d1	d2	l1	S
mm	mm	mm	mm
6,300	16,000	71,000	14,000
8,000	20,000	80,000	17,900
10,000	25,000	100,000	22,500

Brocas de centragem com plano



Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

- P** ● Redução da aresta transversal ≥ Ø 2,000 • afiação de superfície cônica
- M** ○ • conforme DIN 332, folha 1, forma B • com escareado de proteção 120°
- K** ●
- N** ●
- S** ○
- H** ●



Nr. do artigo **589**

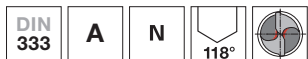
d1	d2	l1	S
mm	mm	mm	mm
1,600	6,300	45,000	5,350
2,000	8,000	50,000	6,950
2,500	10,000	56,000	8,400
3,150	11,200	60,000	10,000
4,000	14,000	67,000	12,650
5,000	18,000	75,000	16,400

d1	d2	l1	S
mm	mm	mm	mm
6,300	20,000	80,000	17,900
8,000	25,000	100,000	22,500

Brocas para centragem/brocas para centrar



Brocas de centragem com plano



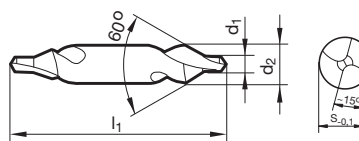
Material de corte **HSS**

Superfície ○

Sentido de corte (R)

P ● Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
 • sem escareado de proteção • para furos de centro DIN 332 folha 1
 (edição 09.1960x cancelada), Forma A

- M** ○
- K** ●
- N** ●
- S** ○
- H** ○



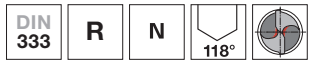
Nr. do artigo **287**

d1	d2	l1	S
mm	mm	mm	mm
1,600	5,000	40,000	4,200
2,000	6,300	45,000	5,350
2,500	8,000	50,000	6,850
3,150	10,000	56,000	8,400
4,000	12,500	63,000	10,650
5,000	16,000	71,000	13,650

d1	d2	l1	S
mm	mm	mm	mm
6,300	20,000	80,000	17,400
8,000	25,000	100,000	21,900
10,000	31,500	125,000	27,100

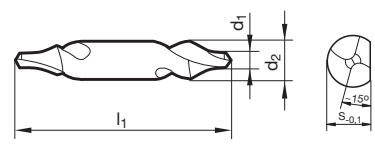
Brocas para centragem/brocas para centrar

Brocas de centragem com plano



- P** • Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ • alinhamento correto entre pontas • para furos de centro conforme DIN 332, folha 1, forma R (emissão 09.1960x revisado)
- K** •
- N** •
- S** ○
- H** •

Material de corte	HSS
Superfície	○
Sentido de corte	



Nr. do artigo **288**

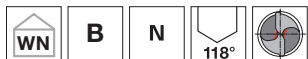
d1	d2	l1	S
mm	mm	mm	mm
2,000	6,300	45,000	5,350
2,500	8,000	50,000	6,850
3,150	10,000	56,000	8,400
4,000	12,500	63,000	10,650
5,000	16,000	71,000	13,650
6,300	20,000	80,000	17,400

d1	d2	l1	S
mm	mm	mm	mm
8,000	25,000	100,000	21,900

Brocas para centragem/brocas para centrar



Brocas de centragem com plano

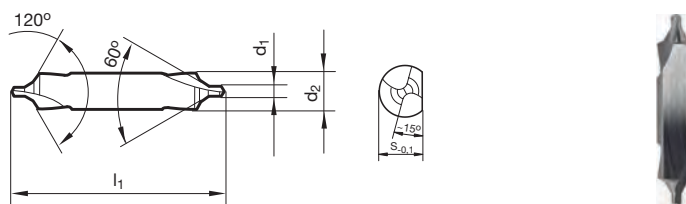


Material de corte **HSS**

Superfície ○

Sentido de corte (R)

- P** ● Redução da aresta transversal $\geq \varnothing 2,000$ • afiação de superfície cônica
- M** ○ • para furos de centro DIN 332 folha 1 (edição 09.1960x cancelada),
- K** ● Forma B • com escareado de proteção 120°
- N** ●
- S** ○
- H** ●



Nr. do artigo **289**

d1	d2	l1	S
mm	mm	mm	mm
1,600	8,000	50,000	6,500
2,000	10,000	56,000	7,950
2,500	11,200	63,000	9,500
3,150	14,000	71,000	12,000
4,000	16,000	80,000	14,400
5,000	20,000	90,000	18,400

d1	d2	l1	S
mm	mm	mm	mm

Brocas para centragem/brocas para centrar

Brocas de centragem NC 90°

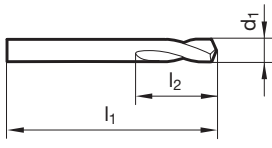


- P** • afiação de superfície cônica • apropriadas somente para centrar
- M** ○
- K** •
- N** •
- S** ○
- H** ○

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

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Nr. do artigo **557**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,000		84,000	22,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
12,000		102,000	30,000
12,700	1/2	102,000	30,000
13,000		102,000	30,000

d1		l1	l2
mm	inch	mm	mm
14,000		107,000	33,500
15,870	5/8	115,000	37,500
16,000		115,000	37,500
19,050	3/4	131,000	45,000
20,000		131,000	45,000
25,000	63/64	151,000	53,000
25,400	1	156,000	53,000

Brocas para centragem/brocas para centrar



Brocas de centragem NC 90°



Material de corte **HSS**

Superfície **S**

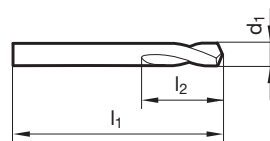
Sentido de corte **R**

P • afiação de superfície cônica • apropriadas somente para centrar

P	•
M	○
K	•
N	•
S	○
H	

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Nr. do artigo **568**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
12,000		102,000	30,000
12,700	1/2	102,000	30,000
15,870	5/8	115,000	37,500
16,000		115,000	37,500

d1		l1	l2
mm	inch	mm	mm
19,050	3/4	131,000	45,000
20,000		131,000	45,000
25,000	63/64	151,000	53,000
25,400	1	156,000	53,000

Brocas para centragem/brocas para centrar

Brocas de centragem NC 90°



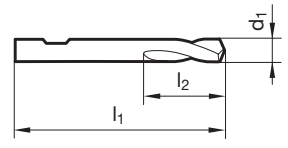
- P** • afiação de superfície cônica • apropriadas somente para centrar • ≥ Ø 6,0 mm com um plano de arraste conforme DIN 1835-B • aço-HSS
- M** • ligado com Co • resistência ao desgaste ampliada
- K** •
- N** •
- S** ○
- H**

Material de corte	HSCO
Superfície	○
Sentido de corte	Ⓜ



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Nr. do artigo **1136**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
16,000		115,000	37,500
20,000		131,000	45,000

Brocas para centragem/brocas para centrar



Brocas de centragem NC 90°



P • afiação de superfície cônica • apropriadas somente para centrar • $\geq \varnothing 6,0$ mm com um plano de arraste conforme DIN 1835-B • aço-HSS
M • ligado com Co • resistência ao desgaste ampliada

- K** •
- N** •
- S** ○
- H**

Material de corte **HSCO**

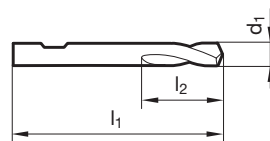
Superfície **F**

Sentido de corte **R**



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Nr. do artigo **1133**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
16,000		115,000	37,500
20,000		131,000	45,000

Brocas para centragem/brocas para centrar

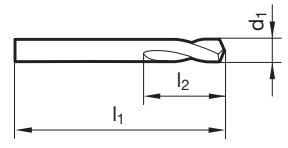
Brocas de centragem NC 90°



- P** • afiação de superfície cônica • apropriadas somente para centrar
- M** ○
- K** •
- N** •
- S** ○
- H**

Material de corte	HSS
Superfície	○
Sentido de corte	

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Nr. do artigo **559**

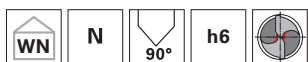
d1		l1	l2
mm	inch	mm	mm
6,350	1/4	105,000	17,000
8,000		118,000	21,000
9,520	3/8	132,000	25,000
12,700	1/2	159,000	30,000
15,870	5/8	186,000	37,500
19,050	3/4	213,000	45,000

d1		l1	l2
mm	inch	mm	mm
25,400	1	216,000	53,000

Brocas para centragem/brocas para centrar

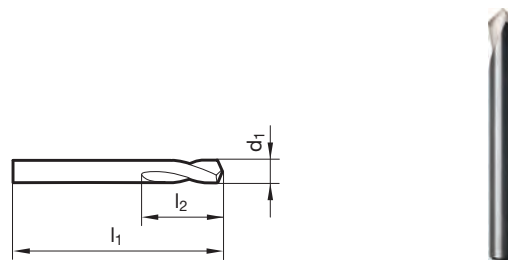


Brocas de centragem NC 90°



- P** ○ Redução da aresta transversal $\geq \varnothing 6,000$ • afiação facetada • apropriadas somente para centrar
- M** ○
- K** ○
- N** ○ adequação de material universal
- S** ○
- H** ○

Material de corte	MD int.
Superfície	○
Sentido de corte	Ⓜ



Nr. do artigo **723**

d1		l1	l2
mm	inch	mm	mm
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
12,000		102,000	30,000
12,700	1/2	102,000	30,000
15,870	5/8	115,000	37,500
16,000		115,000	37,500
19,050	3/4	131,000	45,000

d1		l1	l2
mm	inch	mm	mm
20,000		131,000	45,000

Brocas para centragem/brocas para centrar

Brocas de centragem NC 120°

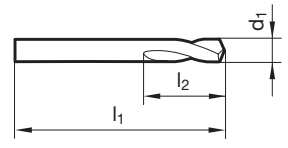


Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

- P** ● afiação de superfície cônica • apropriadas somente para centrar
- M** ○
 - K** ●
 - N** ●
 - S** ○
 - H** ○

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Nr. do artigo **556**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
5,600		66,000	16,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
6,500		70,000	17,000
7,000		74,000	19,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
11,550		95,000	28,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
12,700	1/2	102,000	30,000
14,000		107,000	33,500
15,000		111,000	33,500
15,870	5/8	115,000	37,500
16,000		115,000	37,500
19,000		127,000	40,000
19,050	3/4	131,000	45,000
20,000		131,000	45,000
25,000	63/64	151,000	53,000
25,400	1	156,000	53,000

Brocas para centragem/brocas para centrar



Brocas de centragem NC 120°



Material de corte **HSS**

Superfície **S**

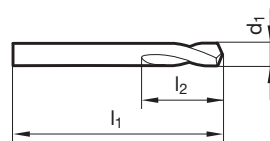
Sentido de corte **R**

P • afiação de superfície cônica • apropriadas somente para centrar

P	•
M	○
K	•
N	•
S	○
H	

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Nr. do artigo **567**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000
12,000		102,000	30,000
12,700	1/2	102,000	30,000
15,870	5/8	115,000	37,500
16,000		115,000	37,500

d1		l1	l2
mm	inch	mm	mm
19,050	3/4	131,000	45,000
20,000		131,000	45,000
25,000	63/64	151,000	53,000

Brocas para centragem/brocas para centrar

Brocas de centragem NC 120°



P • afiação de superfície cônica • apropriadas somente para centrar • $\geq \varnothing 6,0$ mm com um plano de arraste conforme DIN 1835-B • aço-HSS
M • ligado com Co • resistência ao desgaste ampliada

- K** •
- N** •
- S** ○
- H**

Material de corte **HSCO**

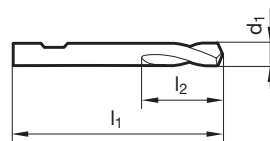
Superfície ○

Sentido de corte



GÜHRINGNAVIGATOR

Página de dados de corte 798



Nr. do artigo **1134**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
16,000		115,000	37,500
20,000		131,000	45,000

Brocas para centragem/brocas para centrar



Brocas de centragem NC 120°



P • afiação de superfície cônica • apropriadas somente para centrar • $\geq \varnothing 6,0$ mm com um plano de arraste conforme DIN 1835-B • aço-HSS
M • ligado com Co • resistência ao desgaste ampliada

- K** •
- N** •
- S** ○
- H**

Material de corte **HSCO**

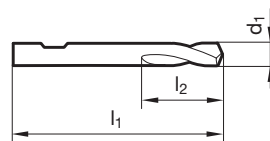
Superfície **F**

Sentido de corte **R**



GÜHRING NAVIGATOR

Página de dados de corte 798



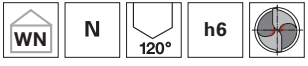
Nr. do artigo **1135**

d1		l1	l2
mm	inch	mm	mm
3,000		46,000	12,000
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
16,000		115,000	37,500
20,000		131,000	45,000

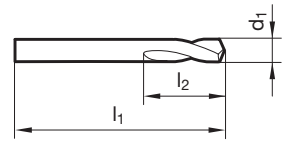
Brocas para centragem/brocas para centrar

Brocas de centragem NC 120°



- P** ○ Redução da aresta transversal ≥ Ø 13,500 • afiação facetada
• apropriadas somente para centrar
- M** ○
- K** ○
- N** ○ adequação de material universal
- S** ○
- H** ○

Material de corte	MD int.
Superfície	○
Sentido de corte	Ⓜ



Nr. do artigo **724**

d1		l1	l2
mm	inch	mm	mm
5,000		62,000	14,000
6,000		66,000	16,000
6,350	1/4	70,000	17,000
8,000		79,000	21,000
9,520	3/8	89,000	25,000
10,000		89,000	25,000

d1		l1	l2
mm	inch	mm	mm
12,000		102,000	30,000
12,700	1/2	102,000	30,000
15,870	5/8	115,000	37,500
16,000		115,000	37,500
19,050	3/4	131,000	45,000
20,000		131,000	45,000

Brocas para centragem/brocas para centrar



Brocas de centragem NC 142°



Material de corte **MD int.**

Superfície ○

Sentido de corte (R)

P ○ afiação facetada • apropriadas somente para centrar • $\varnothing \geq 6,0$ mm, haste de fixação forma HB

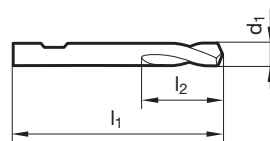
M ○

K ○

N ○ adequação de material universal

S ○

H ○



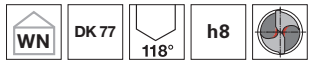
Nr. do artigo **546**

d1		l1	l2
mm	inch	mm	mm
4,000		55,000	12,000
5,000		62,000	14,000
6,000		66,000	16,000
8,000		79,000	21,000
10,000		89,000	25,000
12,000		102,000	30,000

d1		l1	l2
mm	inch	mm	mm
16,000		115,000	37,500
20,000		131,000	45,000

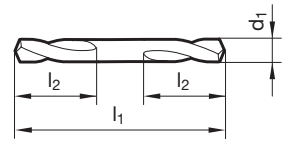
Brocas para centragem/brocas para centrar

Brocas para carroceria



- P** • Redução da aresta transversal $\geq \varnothing 1,450$ • afiação de superfície cônica • para utilização em ambos lados • para furações manuais em carrocerias
- M** ○
- K** •
- N** • materiais de paredes finas
- S** ○
- H** ○

Material de corte	HSS
Superfície	$\geq 0,2,36$
Sentido de corte	(R)



Nr. do artigo **554**

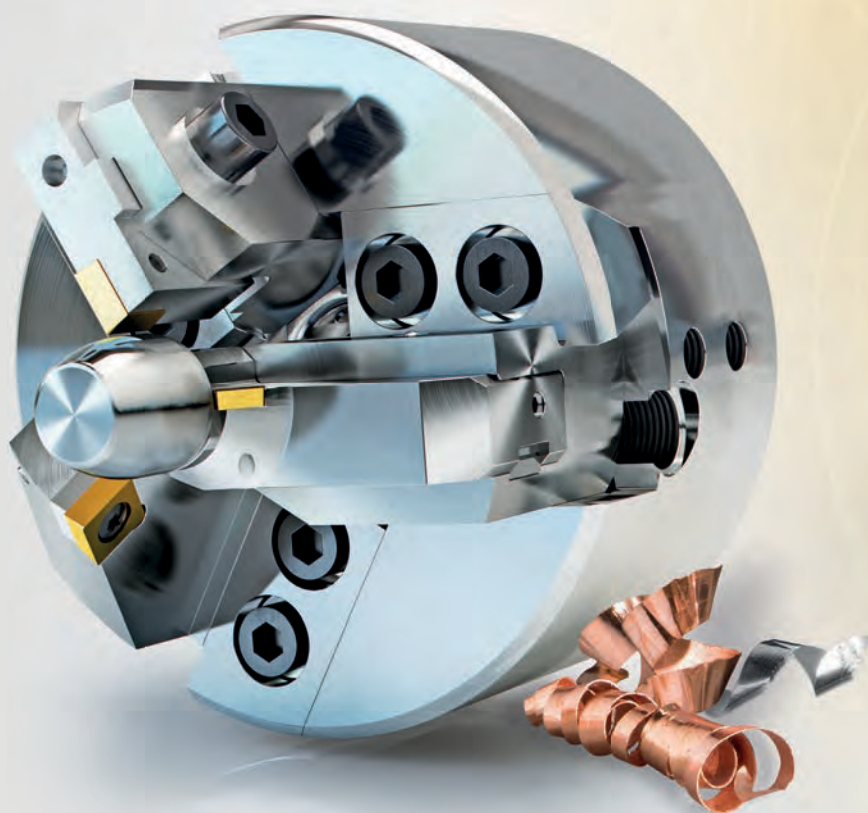
d1	l1	l2
mm	mm	mm
1,500	32,000	6,000
1,900	36,000	7,100
2,000	38,000	7,500
2,100	38,000	7,500
2,200	40,000	8,500
2,300	40,000	8,500
2,400	43,000	9,500
2,450	43,000	9,500
2,500	43,000	9,500
2,600	43,000	9,500
2,700	46,000	10,600
2,780	46,000	10,600
2,800	46,000	10,600
2,900	46,000	10,600
3,000	46,000	10,600
3,050	49,000	11,200
3,100	49,000	11,200
3,170	49,000	11,200
3,200	49,000	11,200
3,260	49,000	11,200
3,300	49,000	11,200
3,500	52,000	12,500
3,570	52,000	12,500
3,600	52,000	12,500
3,650	52,000	12,500
3,700	52,000	12,500
3,800	55,000	14,000
3,970	55,000	14,000
4,000	55,000	14,000
4,100	55,000	14,000
4,200	55,000	14,000
4,300	58,000	15,500
4,500	58,000	15,500
4,600	58,000	15,500
4,760	62,000	17,000
4,800	62,000	17,000

d1	l1	l2
mm	mm	mm
4,900	62,000	17,000
5,000	62,000	17,000
5,100	62,000	17,000
5,200	62,000	17,000
5,300	62,000	17,000
5,400	66,000	19,000
5,500	66,000	19,000
5,560	66,000	19,000
5,600	66,000	19,000
5,800	66,000	19,000
5,900	66,000	19,000
5,950	66,000	19,000
6,000	66,000	19,000
6,100	70,000	21,200
6,350	70,000	21,200
6,500	70,000	21,200
6,800	74,000	23,600
7,000	74,000	23,600
7,100	74,000	23,600
7,500	74,000	23,600
7,940	79,000	25,000
8,000	79,000	25,000
8,500	79,000	25,000
8,600	84,000	25,000
9,000	84,000	25,000
9,500	84,000	25,000
9,520	89,000	25,000
10,000	89,000	25,000

Brocas para centragem/brocas para centrar

GE 100

Sistemas de ferramentas multi-funcionais para a usinagem final. Combinando até 5 etapas de operação com apenas uma ferramenta!



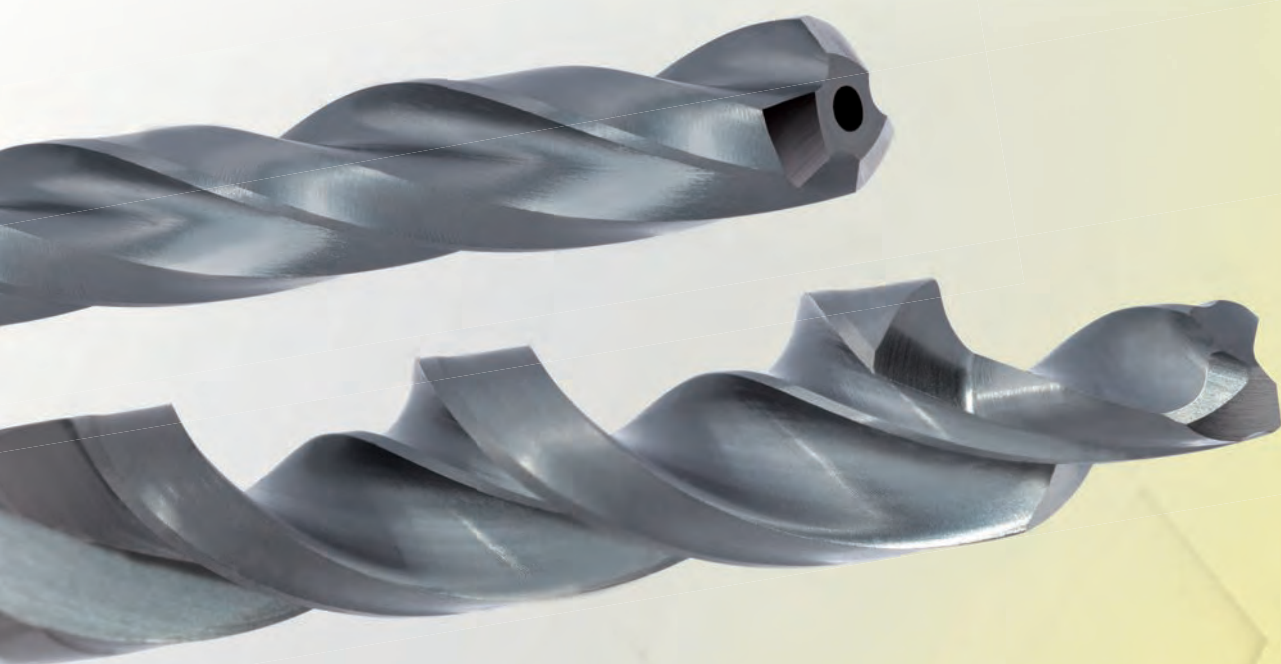
Dois a quatro suportes de fixação ajustáveis em combinação com uma broca de centro ou broca escalonada para reduzir a usinagem completa de uma peça a questão de segundos.



Mais informações podem ser encontradas no nosso catálogo GE 100.



BROCAS ESCALONADAS / BROCAS CALIBRADORAS





P	M	K	N	S	H	Representação da ferramenta	Norma	Forma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página
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Brocas escalonadas para centrages DIN 332

•	○	•	•	○			WN	D	N	R	HSS	●	8,000 - 40,000	274	804	714
•	○	•	•	○			WN	DR	N	R	HSS	●	8,000 - 40,000	574	804	715
•	○	•	•	○			WN	D	N	R	HSS	●	8,000 - 20,000	575	804	716
•	○	•	•	○			WN	D	N	R	HSS	●	14,000 - 40,000	576	804	717

Brocas escalonadas curtas com haste cilíndrica

•	○	•	•	○			WN		N	R	HSS	○	6,000 - 19,000	378	804	718
•	○	•	•	○			WN		N	R	HSS	○	6,600 - 21,500	1147	804	719
•	○	•	•	○			WN		N	R	HSS	○	6,000 - 18,000	379	804	720
•	○	•	•	○			WN		N	R	HSS	○	3,400 - 13,500	380	804	721

Brocas Subland com haste cilíndrica

•	○	•	•	○			DIN 8374	A	N	R	HSS	●	6,000 - 15,000	536	806	722
•	○	•	•	○			DIN 8374	B	N	R	HSS	●	7,500 - 19,000	569	806	723
•	○	•	•	○			WN		N	R	HSS	●	6,600 - 17,200	636	806	724
•	○	•	•	○			WN		N	R	HSS	●	6,000 - 8,000	638	806	725
•	○	•	•	○			DIN 8376		N	R	HSS	●	6,000 - 18,000	538	806	726
○	○	○	○	○	○		WN		N	R	VHM	○	6,000 - 15,000	738		727
•	○	•	•	○			WN		N	R	HSS	●	5,900 - 17,500	514	806	728
•	○	•	•	○			DIN 8378		N	R	HSS	●	3,400 - 13,500	540	806	729
○	○	○	○	○	○		WN		N	R	VHM	○	4,500 - 11,000	739		730

Brocas escalonadas/
brocas calibradoras

Brocas Subland com cone Morse

•	○	•	•	○			WN		N	R	HSS	●	11,500 - 23,000	637	806	731
•	○	•	•	○			WN		N	R	HSS	●	11,000 - 29,000	537	806	732
•	○	•	•	○			WN		N	R	HSS	●	18,000 - 26,000	639	806	733
•	○	•	•	○			DIN 8377		N	R	HSS	●	10,000 - 33,000	539	806	734
•	○	•	•	○			WN		N	R	HSS	●	9,400 - 33,000	520	806	735

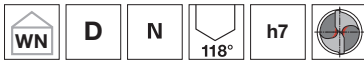


P	M	K	N	S	H	Representação da ferramenta	Norma	Forma	Tipo	Sentido de corte	Material de corte	Superfície	d1/mm	Artigo Nr.	Dados de corte, Página página
<p>Brocas Subland com cone Morse</p>								DIN 8379	N	R	HSS	●	9,000 - 22,000	541	806 736
<p>Brocas calibradoras com haste cilíndrica</p>								DIN 344	N	R	HSS	●	3,800 - 20,000	533	800 737
							WN	N	R	HM	○	3,800 - 15,000	750	739	
<p>Brocas calibradoras com cone Morse</p>								DIN 343	N	R	HSS	●	7,800 - 50,000	534	800 740
							DIN 343	N	R	HSCO	●	8,500 - 26,000	634	800 742	
							DIN 1864	N	R	HSS	●	5,000 - 30,000	555	800 743	
							DIN 1864	N	R	HSCO	●	8,000 - 15,000	635	800 744	
							WN	N	R	HM	○	28,700 - 39,600	729	745	
<p>Brocas para furos de pinos</p>								DIN 1898	N	R	HSS	● _{2,36} ⁰	2,000 - 12,000	531	746
							DIN 1898	N	R	HSS	●	5,000 - 25,000	532	747	

Brocas escalonadas/
brocas calibradoras



Brocas escalonadas para centragens DIN 332



Material de corte **HSS**

Superfície



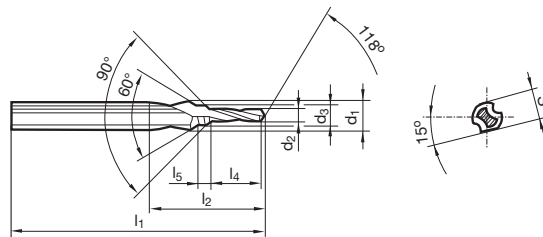
Sentido de corte



- P** • Redução da aresta transversal $\geq \varnothing 8,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • com plano de fixação • escareado 60° • para furos de rosca com centralização conforme DIN 332, folha 2, forma D • utilização em máquinas de centrar e facear
- M** ○
- K** •
- N** •
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 804

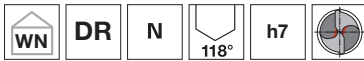


Nr. do artigo **274**

d1 h7	d2 h8	d3	l1	l2	l4	l5	S	para roscas
mm	mm	mm	mm	mm	mm	mm	mm	
8,000	3,300	4,300	63,000	23,000	11,000	1,600	6,750	M 4
10,000	4,200	5,300	67,000	27,000	13,000	2,150	8,450	M 5
12,500	5,000	6,400	71,000	33,000	16,000	2,900	10,450	M 6
14,000	6,800	8,400	88,000	41,000	19,500	3,500	12,500	M 8
16,000	8,500	10,500	94,000	47,000	23,000	4,700	14,850	M10
20,000	10,200	13,000	105,000	59,000	28,000	6,500	18,450	M12
25,000	14,000	17,000	132,000	67,000	33,000	8,300	23,400	M16
31,500	17,500	21,000	145,000	76,500	38,000	10,350	29,350	M20
40,000	21,000	25,000	160,000	90,000	45,000	12,000	36,500	M24



Brocas escalonadas para centragens DIN 332



- P** • Redução da aresta transversal $\geq \varnothing 8,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • com plano de fixação • escareado 60° • conforme DIN 332, folha , 2 forma DR
- M** ○
- K** •
- N** •
- S** ○
- H** ○



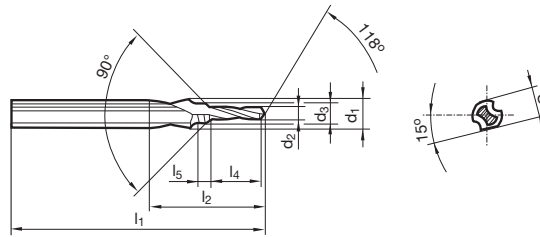
Material de corte **HSS**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 804



Nr. do artigo **574**

d1 h7	d2 h8	d3	l1	l2	l4	l5	S	para roscas
mm	mm	mm	mm	mm	mm	mm	mm	
8,000	3,300	4,300	63,000	23,000	11,000	1,600	6,750	M 4
10,000	4,200	5,300	67,000	27,000	13,000	2,150	8,450	M 5
12,500	5,000	6,400	71,000	33,000	16,000	2,900	10,450	M 6
14,000	6,800	8,400	88,000	41,000	19,500	3,500	12,500	M 8
16,000	8,500	10,500	94,000	47,000	23,000	4,700	14,850	M10
20,000	10,200	13,000	105,000	59,000	28,000	6,500	18,450	M12
25,000	14,000	17,000	132,000	67,000	33,000	8,300	23,400	M16
31,500	17,500	21,000	145,000	76,500	38,000	10,350	29,350	M20
40,000	21,000	25,000	160,000	90,000	45,000	12,000	36,500	M24



Brocas escalonadas para centragens DIN 332



Material de corte **HSS**

Superfície

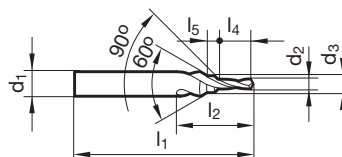
Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 8,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • escareado 60° • para furos de rosca com centralização conforme DIN 332, folha 2, forma D

- K** •
- N** •
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 804



Nr. do artigo **575**

d1 h7	d2 h8	d3	l1	l2	l4	l5	para roscas
mm	mm	mm	mm	mm	mm	mm	
8,000	3,300	4,300	63,000	23,000	11,000	1,600	M 4
10,000	4,200	5,300	67,000	27,000	13,000	2,150	M 5
12,500	5,000	6,400	71,000	33,000	16,000	2,900	M 6
14,000	6,800	8,400	88,000	41,000	19,500	3,500	M 8
16,000	8,500	10,500	94,000	47,000	23,000	4,700	M10
20,000	10,200	13,000	105,000	59,000	28,000	6,500	M12



Brocas escalonadas para centragens DIN 332



Material de corte **HSS**

Superfície



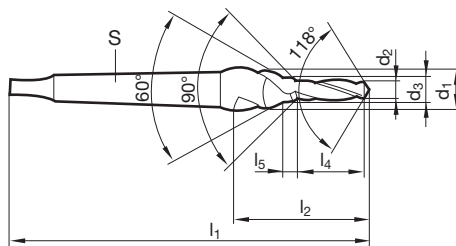
Sentido de corte



P • Redução da aresta transversal $\geq \varnothing 14,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • escareado
M ○ 60° • para furos de rosca com centralização conforme DIN 332, folha 2, forma D
K •
N •
S ○
H

GÜHRING NAVIGATOR

Página de dados de corte 804



Nr. do artigo **576**

d1 h7	d2 h8	d3	l1	l2	l4	l5	para roscas
mm	mm	mm	mm	mm	mm	mm	
14,000	6,800	8,400	110,000	41,000	19,500	3,500	M 8
16,000	8,500	10,500	131,000	47,000	23,000	4,700	M10
20,000	10,200	13,000	145,000	59,000	28,000	6,500	M12
25,000	14,000	17,000	172,000	67,000	33,000	8,300	M16
31,500	17,500	21,000	184,000	76,500	38,000	10,350	M20
40,000	21,000	25,000	222,000	90,000	45,000	12,000	M24

Brocas escalonadas/
brocas calibradoras



Brocas escalonadas curtas com haste cilíndrica



Material de corte **HSS**

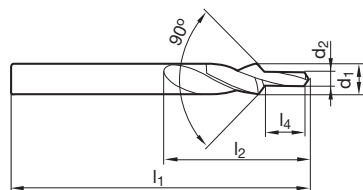
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 6,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • bastante estáveis à torção • para máquinas CNC e NC • para furos passantes conforme DIN EN 20273, série fino • para rebaixos de cabeças de parafusos 90° conforme DIN 74 forma A, • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- M** ○
- K** •
- N** •
- S** ○
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 804



Nr. do artigo **378**

d1	d2 h6	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
6,000	3,200	66,000	28,000	9,000	M 3
8,000	4,300	79,000	37,000	11,000	M 4
10,000	5,300	89,000	43,000	13,000	M 5
11,500	6,400	95,000	47,000	15,000	M 6
15,000	8,400	111,000	56,000	19,000	M 8
19,000	10,500	127,000	64,000	23,000	M 10



Brocas escalonadas curtas com haste cilíndrica

Material de corte **HSS**

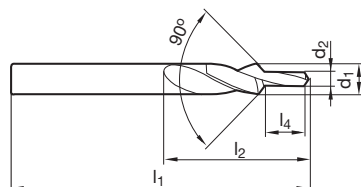
Superfície ○

Sentido de corte

P ● Redução da aresta transversal $\geq \varnothing 6,600$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • bastante estáveis à torção • para máquinas CNC e NC • p. furos passantes conf. DIN EN 20273, série média • para rebaixos de cabeças de parafusos 90° conforme DIN 74 forma A, • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes

M ○**K** ●**N** ●**S** ○**H** ○**GÜHRING**NAVIGATOR

Página de dados de corte 804



Nr. do artigo

1147

d1	d2 h6	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
6,600	3,400	70,000	31,000	9,000	M 3
9,000	4,500	84,000	40,000	11,000	M 4
11,000	5,500	95,000	47,000	13,000	M 5
13,000	6,600	102,000	51,000	15,000	M 6
17,200	9,000	123,000	62,000	19,000	M 8
21,500	11,000	141,000	70,000	23,000	M 10

Brocas escalonadas curtas com haste cilíndrica

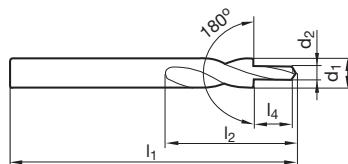


- P** • Redução da aresta transversal $\geq \varnothing 6,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • bastante estáveis à torção • para máquinas CNC e NC • p. furos passantes conf. DIN EN 20273, série média • p. escareado de cabeças de parafusos de 180° conf. DIN 974-1, séries 1 • p. parafusos conf. DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- M** ○
- K** •
- N** •
- S** ○
- H** ○

Material de corte	HSS
Superfície	○
Sentido de corte	Ⓜ

GÜHRINGNAVIGATOR

Página de dados de corte 804



Nr. do artigo **379**

d1	d2 h6	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
6,000	3,400	66,000	28,000	9,000	M 3
8,000	4,500	79,000	37,000	11,000	M 4
10,000	5,500	89,000	43,000	13,000	M 5
11,000	6,600	95,000	47,000	15,000	M 6
15,000	9,000	111,000	56,000	19,000	M 8
18,000	11,000	123,000	62,000	23,000	M 10



Brocas escalonadas curtas com haste cilíndrica

Material de corte **HSS**

Superfície ○

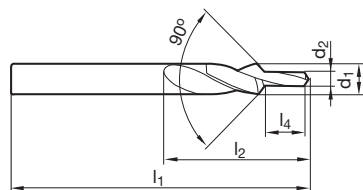
Sentido de corte (R)

P • Redução da aresta transversal $\geq \varnothing 3,400$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • bastante estáveis à torção • para máquinas CNC e NC • para rosqueamento DIN 336 • para escareados 90° em furos passantes conforme DIN EN 20273, série média • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes

M ○
K •
N •
S ○
H ○

GÜHRING NAVIGATOR

Página de dados de corte 804

Nr. do artigo **380**

d1	d2 h6	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
3,400	2,500	52,000	20,000	8,800	M 3
4,500	3,300	58,000	24,000	11,400	M 4
5,500	4,200	66,000	28,000	13,600	M 5
6,600	5,000	70,000	31,000	16,500	M 6
9,000	6,800	84,000	40,000	21,000	M 8
11,000	8,500	95,000	47,000	25,500	M 10
13,500	10,200	107,000	54,000	30,000	M 12



Brocas Subland com haste cilíndrica



Material de corte **HSS**

Superfície

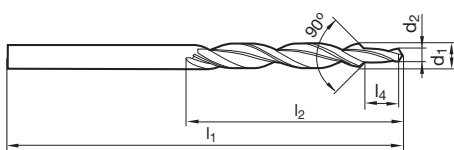
Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 6,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • para furos passantes conforme DIN EN 20273, série fino • para escareados de cabeças de parafusos 90° • f orienta-se segundo os diâmetros pequenos

- K** • vc orienta-se segundo os diâmetros grandes
- N** ○
- S** ○
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 806



Nr. do artigo **536**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
6,000	3,200	93,000	57,000	9,000	M 3
8,000	4,300	117,000	75,000	11,000	M 4
10,000	5,300	133,000	87,000	13,000	M 5
11,500	6,400	142,000	94,000	15,000	M 6
15,000	8,400	169,000	114,000	19,000	M 8



Brocas Subland com haste cilíndrica



P • Redução da aresta transversal $\geq \varnothing 7,500$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • p. furos
M ○ passantes conf. DIN EN 20273, série média • para rebaixos de cabeças de parafusos 90° conforme DIN 74, forma A e F • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
K •
N ○
S ○
H ○

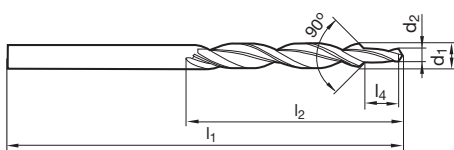
Material de corte **HSS**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **569**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
7,500	3,400	109,000	69,000	9,000	M 3
9,700	4,500	133,000	87,000	11,000	M 4
12,000	5,500	151,000	101,000	13,000	M 5
14,500	6,600	169,000	114,000	15,000	M 6
19,000	9,000	198,000	135,000	19,000	M 8

Brocas escalonadas/
brocas calibradoras



Brocas Subland com haste cilíndrica



Material de corte **HSS**

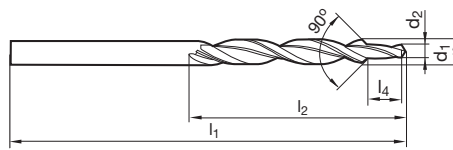
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 6,600$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • p. furos
- M** ○ passantes conf. DIN EN 20273, série média • para rebaiços de cabeças de parafusos 90° conforme DIN 74 parte 1 (edição 12.1980 revogada),
- K** • forma A e B, execução média • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- N** ○
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **636**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
6,600	3,400	101,000	63,000	9,000	M 3
9,000	4,500	125,000	81,000	11,000	M 4
11,000	5,500	142,000	94,000	13,000	M 5
13,000	6,600	151,000	101,000	15,000	M 6
17,200	9,000	191,000	130,000	19,000	M 8



Brocas Subland com haste cilíndrica



- P** • Redução da aresta transversal $\geq \varnothing 6,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • para furos passantes conforme DIN EN 20273, série fino • p. escareado de cabeças de parafusos de 180° conf. DIN 974-1, séries 1 • Para parafusos conforme DIN 6912, 7513, 7984 • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- M** ○
- K** •
- N** ○
- S** ○
- H** ○

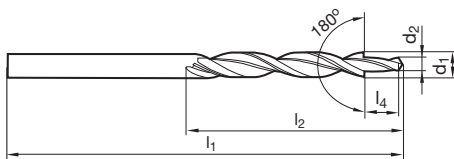
Material de corte **HSS**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **638**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
6,000	3,200	93,000	57,000	9,000	M 3
8,000	4,300	117,000	75,000	11,000	M 4

Brocas escalonadas/
brocas calibradoras



Brocas Subland com haste cilíndrica



Material de corte **HSS**

Superfície

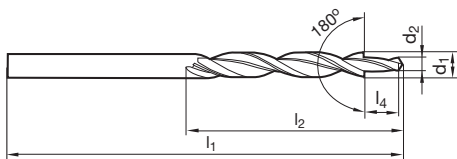
Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 6,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • p. furos passantes conf. DIN EN 20273, série média • p. escareado de cabeças de parafusos de 180° conf. DIN 974-1, séries 1 • para parafusos conforme DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 e DIN 7513, 7516, 7500-1 • f orienta-se segundo os diâmetros pequenos
- N** ○ • vc orienta-se segundo os diâmetros grandes

- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **538**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
6,000	3,400	93,000	57,000	9,000	M 3
8,000	4,500	117,000	75,000	11,000	M 4
10,000	5,500	133,000	87,000	13,000	M 5
11,000	6,600	142,000	94,000	15,000	M 6
15,000	9,000	169,000	114,000	19,000	M 8
18,000	11,000	191,000	130,000	23,000	M 10



Brocas Subland com haste cilíndrica

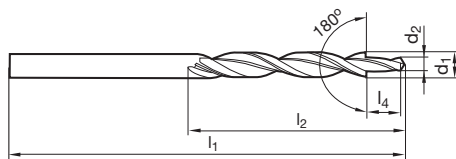


Material de corte **MD int.**

Superfície

Sentido de corte

- P** ○ Redução da aresta transversal $\geq \varnothing 6,000$ • afiação de superfície cônica
- M** ○ • p. furos passantes conf. DIN EN 20273, série média • p. escareado de cabeças de parafusos de 180° conf. DIN 974-1, séries 1
- K** ○ • Para parafusos conforme DIN 6912, 7513, 7984 • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- N** ○
- S** ○ adequação de material universal
- H** ○



Nr. do artigo **738**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
6,000	3,400	93,000	57,000	9,000	M 3
8,000	4,500	117,000	75,000	11,000	M 4
10,000	5,500	133,000	87,000	13,000	M 5
11,000	6,600	142,000	94,000	15,000	M 6
15,000	9,000	169,000	114,000	19,000	M 8

Brocas escalonadas/
brocas calibradoras



Brocas Subland com haste cilíndrica



Material de corte **HSS**

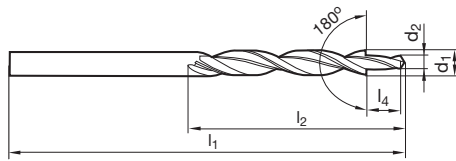
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 5,900$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • para furos passantes com escareados forma H, J, K conforme Din 75 parte 2 (edição 04. 1968 revogada). Execução média e fina • para parafusos conforme DIN 84, 912, 6912 • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- M** ○
- K** •
- N** ○
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **514**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
5,900	3,200	93,000	57,000	11,000	M 3
7,400	4,300	109,000	69,000	13,000	M 4
8,000	4,800	117,000	75,000	13,000	M 4
9,400	5,300	125,000	81,000	16,000	M 5
10,000	5,800	133,000	87,000	16,000	M 5
10,400	6,400	133,000	87,000	19,000	M 6
11,000	7,000	142,000	94,000	19,000	M 6
13,500	8,400	160,000	108,000	22,000	M 8
16,500	10,500	184,000	125,000	25,000	M 10
17,500	11,500	191,000	130,000	25,000	M 10



Brocas Subland com haste cilíndrica



Material de corte **HSS**

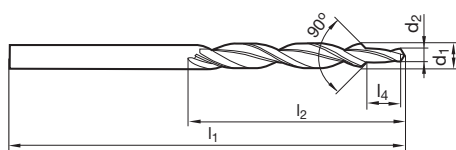
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 3,400$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • para
- M** ○ rosqueamento DIN 336 • para escareados 90° em furos passantes conforme DIN EN 20273, série média • f orienta-se segundo os
- K** • diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- N** ○
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **540**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
3,400	2,500	70,000	39,000	8,800	M 3
4,500	3,300	80,000	47,000	11,400	M 4
5,500	4,200	93,000	57,000	13,600	M 5
6,600	5,000	101,000	63,000	16,500	M 6
9,000	6,800	125,000	81,000	21,000	M 8
11,000	8,500	142,000	94,000	25,500	M 10
13,500	10,200	160,000	108,000	30,000	M 12

Brocas escalonadas/
brocas calibradoras



Brocas Subland com haste cilíndrica

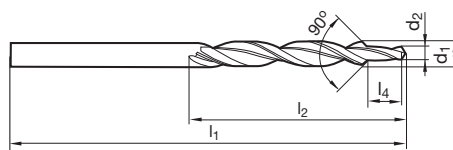


Material de corte **MD int.**

Superfície

Sentido de corte

- P** ○ Redução da aresta transversal $\geq \varnothing 4,500$ • afiação de superfície cônica
- M** ○ • para rosqueamento DIN 336 • para escareados 90° em furos passantes
- K** ○ conforme DIN EN 20273, série média • f orienta-se segundo os
- N** ○ diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- S** ○ adequação de material universal
- H** ○



Nr. do artigo **739**

d1 h8	d2 h9	l1	l2	l4	para roscas
mm	mm	mm	mm	mm	
4,500	3,300	80,000	47,000	11,400	M 4
5,500	4,200	93,000	57,000	13,600	M 5
6,600	5,000	101,000	63,000	16,500	M 6
9,000	6,800	125,000	81,000	21,000	M 8
11,000	8,500	142,000	94,000	25,500	M 10



Brocas Subland com cone Morse



Material de corte **HSS**

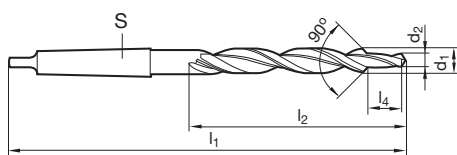
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 11,500$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • para furos
- M** ○ passantes conforme DIN EN 20273, série fino • para rebaiços de
- K** • cabeças de parafusos 90° conforme DIN 74 parte 1 (edição 12.1980 revogada), forma A, execução fina • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- N** ○
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **637**

d1 h8	d2 h9	S	l1	l2	l4	para roscas
mm	mm		mm	mm	mm	
11,500	6,400	MK-1	175,000	94,000	15,000	M 6
15,000	8,400	MK-2	212,000	114,000	19,000	M 8
19,000	10,500	MK-2	233,000	135,000	23,000	M 10
23,000	13,000	MK-2	253,000	155,000	27,000	M 12

Brocas escalonadas/
brocas calibradoras



Brocas Subland com cone Morse

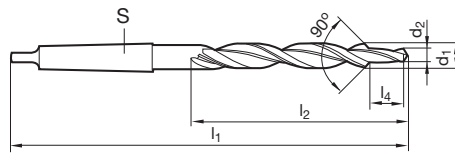


- P** • Redução da aresta transversal $\geq \varnothing 11,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • p. furos
- M** ○ passantes conf. DIN EN 20273, série média • para rebaiços de cabeças de parafusos 90° conforme DIN 74 parte 1 (edição 12.1980 revogada),
- K** • forma A e B, execução média • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- N** ○
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 806

Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ



Nr. do artigo **537**

d1 h8	d2 h9	S	l1	l2	l4	para roscas
mm	mm		mm	mm	mm	
11,000	5,500	MK-1	175,000	94,000	13,000	M 5
17,200	9,000	MK-2	228,000	130,000	19,000	M 8
21,500	11,000	MK-2	248,000	150,000	23,000	M 10
26,000	14,000	MK-3	286,000	165,000	27,000	M 12
29,000	16,000	MK-3	296,000	175,000	31,000	M 14



Brocas Subland com cone Morse



- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • para furos
- M** ○ passantes conforme DIN EN 20273, série fino • p. escareado de cabeças de parafusos de 180° conf. DIN 974-1, séries 1 • p. parafusos conf. DIN
- K** • 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- N** ○
- S** ○
- H** ○

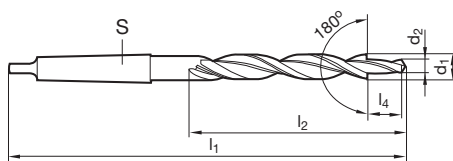
Material de corte **HSS**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **639**

d1 h8	d2 h9	S	l1	l2	l4	para roscas
mm	mm		mm	mm	mm	
18,000	10,500	MK-2	228,000	130,000	23,000	M 10
20,000	13,000	MK-2	238,000	140,000	27,000	M 12
26,000	17,000	MK-3	286,000	165,000	35,000	M 16

Brocas escalonadas/
brocas calibradoras



Brocas Subland com cone Morse

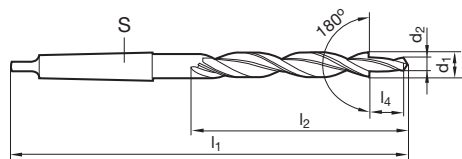


- P** • Redução da aresta transversal $\geq \varnothing 10,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • p. furos
- M** ○ passantes conf. DIN EN 20273, série média • p. escareado de cabeças de parafusos de 180° conf. DIN 974-1, séries 1 • para parafusos
- K** • conforme DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 e DIN 7513, 7516, 7500-1 • f orienta-se segundo os diâmetros pequenos
- N** ○ • vc orienta-se segundo os diâmetros grandes
- S**
- H**

GÜHRING NAVIGATOR

Página de dados de corte 806

Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ



Nr. do artigo **539**

d1 h8	d2 h9	S	l1	l2	l4	para roscas
mm	mm		mm	mm	mm	
10,000	5,500	MK-1	168,000	87,000	13,000	M 5
11,000	6,600	MK-1	175,000	94,000	15,000	M 6
15,000	9,000	MK-2	212,000	114,000	19,000	M 8
18,000	11,000	MK-2	228,000	130,000	23,000	M 10
20,000	13,500	MK-2	238,000	140,000	27,000	M 12
26,000	17,500	MK-3	286,000	165,000	35,000	M 16
30,000	20,000	MK-3	296,000	175,000	39,000	M 18
33,000	22,000	MK-4	334,000	185,000	43,000	M 20

Brocas escalonadas/
brocas calibradoras



Brocas Subland com cone Morse



- P** • Redução da aresta transversal $\geq \varnothing 9,400$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • com
- M** ◦ escareados antigos forma H, J, K cnforme DIN 75 folha 2 (emissão 04.1968 revisado), projeto médio e fino • para parafusos conforme
- K** • DIN 84, 912, 6912 • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- N** ◦
- S** ◦
- H** ◦

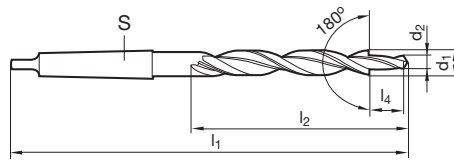
Material de corte **HSS**

Superfície

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **520**

d1 h8	d2 h9	S	l1	l2	l4	para roscas
mm	mm		mm	mm	mm	
9,400	5,300	MK-1	162,000	81,000	16,000	M 5
10,000	5,800	MK-1	168,000	87,000	16,000	M 5
11,000	7,000	MK-1	175,000	94,000	19,000	M 6
13,500	8,400	MK-1	189,000	108,000	22,000	M 8
16,500	10,500	MK-2	223,000	125,000	25,000	M 10
17,500	11,500	MK-2	228,000	130,000	25,000	M 10
19,000	13,000	MK-2	233,000	135,000	28,000	M 12
20,000	14,000	MK-2	238,000	140,000	28,000	M 12
23,000	15,000	MK-2	253,000	155,000	30,000	M 14
24,000	16,000	MK-3	281,000	160,000	30,000	M 14
25,000	17,000	MK-3	281,000	160,000	33,000	M 16
26,000	18,000	MK-3	286,000	165,000	33,000	M 16
28,000	19,000	MK-3	291,000	170,000	36,000	M 18
29,000	20,000	MK-3	296,000	175,000	36,000	M 18
31,000	21,000	MK-3	301,000	180,000	39,000	M 20
33,000	23,000	MK-4	334,000	185,000	39,000	M 20

Brocas escalonadas/
brocas calibradoras



Brocas Subland com cone Morse



Material de corte **HSS**

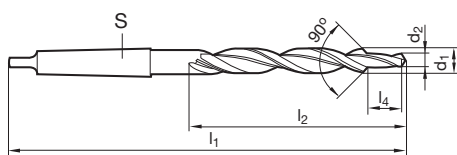
Superfície

Sentido de corte

- P** • Redução da aresta transversal $\geq \varnothing 9,000$ • valores do núcleo corrigido referem-se ao \varnothing nom. d1 • afiação de superfície cônica • para rosqueamento DIN 336 • para escareados 90° em furos passantes conforme DIN EN 20273, série média • f orienta-se segundo os diâmetros pequenos • vc orienta-se segundo os diâmetros grandes
- M** ○
- K** •
- N** ○
- S** ○
- H** ○

GÜHRING NAVIGATOR

Página de dados de corte 806



Nr. do artigo **541**

d1 h8	d2 h9	S	l1	l2	l4	para roscas
mm	mm		mm	mm	mm	
9,000	6,800	MK-1	162,000	81,000	21,000	M 8
11,000	8,500	MK-1	175,000	94,000	25,500	M 10
13,500	10,200	MK-1	189,000	108,000	30,000	M 12
15,500	12,000	MK-2	218,000	120,000	34,500	M 14
17,500	14,000	MK-2	228,000	130,000	38,500	M 16
20,000	15,500	MK-2	238,000	140,000	43,500	M 18
22,000	17,500	MK-2	248,000	150,000	47,500	M 20



Brocas calibradoras com haste cilíndrica

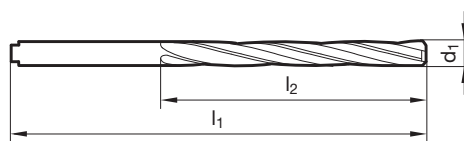


Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ

- P** ● afiação de superfície cônica • especialmente com alta estabilidade
- para furos pré furados/fundidos/estampados • com arraste conforme
- M** ○ DIN 1809 • corrige o alinhamento com exatidão • corrige erros de cilíndricidade • melhora o acabamento da superfície de furos • entrada-Ø
- K** ● < furo a ser calibrado • observar os menores Ø “d0” dos furos pré-furados • alargar cuidadosamente após a calibração
- N** ○
- S** ○
- H** ○

GÜHRINGNAVIGATOR

Página de dados de corte 800



Nr. do artigo **533**

d1	l1	l2	d0 ≥	d1	l1	l2	d0 ≥
mm	mm	mm	mm	mm	mm	mm	mm
3,800	96,000	64,000	2,80	8,200	142,000	100,000	5,60
4,000	96,000	64,000	2,80	8,250	142,000	100,000	5,60
4,100	96,000	64,000	2,80	8,300	142,000	100,000	5,60
4,400	102,000	69,000	3,20	8,400	142,000	100,000	5,60
4,500	102,000	69,000	3,20	8,500	142,000	100,000	5,60
4,600	102,000	69,000	3,20	8,600	151,000	107,000	6,30
4,750	102,000	69,000	3,20	8,700	151,000	107,000	6,30
4,800	108,000	74,000	3,50	8,800	151,000	107,000	6,30
4,900	108,000	74,000	3,50	8,850	151,000	107,000	6,30
5,000	108,000	74,000	3,50	9,000	151,000	107,000	6,30
5,050	108,000	74,000	3,50	9,100	151,000	107,000	6,30
5,100	108,000	74,000	3,50	9,200	151,000	107,000	6,30
5,300	108,000	74,000	3,50	9,300	151,000	107,000	6,30
5,400	116,000	80,000	4,20	9,400	151,000	107,000	6,30
5,500	116,000	80,000	4,20	9,500	151,000	107,000	6,30
5,550	116,000	80,000	4,20	9,650	162,000	116,000	7,00
5,750	116,000	80,000	4,20	9,800	162,000	116,000	7,00
5,800	116,000	80,000	4,20	10,000	162,000	116,000	7,00
5,850	116,000	80,000	4,20	10,100	162,000	116,000	7,00
5,900	116,000	80,000	4,20	10,200	162,000	116,000	7,00
6,000	116,000	80,000	4,20	10,300	162,000	116,000	7,00
6,100	124,000	86,000	4,20	10,500	162,000	116,000	7,00
6,200	124,000	86,000	4,20	10,600	162,000	116,000	7,00
6,250	124,000	86,000	4,20	10,700	173,000	125,000	7,70
6,300	124,000	86,000	4,20	10,750	173,000	125,000	7,70
6,400	124,000	86,000	4,20	11,000	173,000	125,000	7,70
6,500	124,000	86,000	4,20	11,250	173,000	125,000	7,70
6,700	124,000	86,000	4,20	11,300	173,000	125,000	7,70
6,800	133,000	93,000	4,90	11,750	184,000	134,000	8,40
7,000	133,000	93,000	4,90	11,800	184,000	134,000	8,40
7,150	133,000	93,000	4,90	12,000	184,000	134,000	8,40
7,200	133,000	93,000	4,90	12,200	184,000	134,000	8,40
7,250	133,000	93,000	4,90	12,500	184,000	134,000	8,40
7,500	133,000	93,000	4,90	12,750	184,000	134,000	9,10
7,600	142,000	100,000	5,60	13,000	184,000	134,000	9,10
7,700	142,000	100,000	5,60	13,500	194,000	142,000	9,80
7,750	142,000	100,000	5,60	13,750	194,000	142,000	9,80
7,800	142,000	100,000	5,60	14,000	194,000	142,000	9,80
7,950	142,000	100,000	5,60	15,000	202,000	147,000	10,50
8,000	142,000	100,000	5,60	15,750	211,000	153,000	11,20
8,050	142,000	100,000	5,60	16,000	211,000	153,000	11,20
8,100	142,000	100,000	5,60	17,000	218,000	159,000	11,90

Brocas escalonadas/
brocas calibradoras

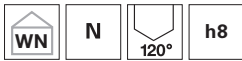


d1	l1	l2	d0 ≥
mm	mm	mm	mm
18,000	226,000	165,000	12,60
20,000	242,000	177,000	14,00

d1	l1	l2	d0 ≥
mm	mm	mm	mm



Brocas calibradoras com haste cilíndrica

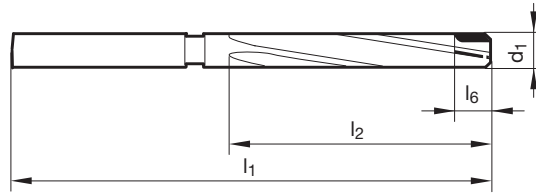


Material de corte **Metal duro**

Superfície ○

Sentido de corte (R)

- P** ○ afiação de superfície cônica • providas com metal duro • para furos pré furados/fundidos/estampados • corrige o alinhamento com exatidão
- M** ○ • corrige erros de cilíndricidade • melhora o acabamento da superfície de furos • entrada-Ø < furo a ser calibrado • observar os menores Ø
- K** ○ “d0” dos furos pré-furados
- N** ○
- S** ○ adequação de material universal
- H** ○



Nr. do artigo **750**

d1	l1	l2	l6	d0 ≥
mm	mm	mm	mm	mm
3,800	96,000	64,000		2,800
4,800	108,000	74,000		3,500
5,000	108,000	74,000		3,500
5,800	116,000	80,000		4,200
6,000	116,000	80,000		4,200
7,000	133,000	93,000		4,900

d1	l1	l2	l6	d0 ≥
mm	mm	mm	mm	mm
7,800	142,000	100,000		5,600
8,000	142,000	100,000		5,600
14,000	194,000	142,000	19,000	9,800
15,000	202,000	147,000	19,000	10,500

Brocas calibradoras com cone Morse

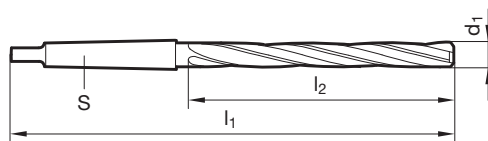


Material de corte	HSS
Superfície	●
Sentido de corte	Ⓜ

- P** ● afiação de superfície cônica • especialmente com alta estabilidade
- M** ○ para furos pré furados/fundidos/estampados • corrige o alinhamento com exatidão • corrige erros de cilindricidade • melhora o acabamento da superfície de furos • entrada-Ø < furo a ser calibrado • observar os menores Ø "d0" dos furos pré-furados • alargar cuidadosamente após a calibração
- K** ●
- N** ○
- S**
- H**

GÜHRINGNAVIGATOR

Página de dados de corte 800



Nr. do artigo **534**

d1	S	l1	l2	d0 ≥	d1	S	l1	l2	d0 ≥
mm		mm	mm	mm	mm		mm	mm	mm
7,800	MK-1	156,000	75,000	5,60	16,200	MK-2	223,000	125,000	11,90
8,000	MK-1	156,000	75,000	5,60	16,250	MK-2	223,000	125,000	11,90
8,100	MK-1	156,000	75,000	5,60	16,500	MK-2	223,000	125,000	11,90
8,800	MK-1	162,000	81,000	6,30	16,750	MK-2	223,000	125,000	11,90
9,000	MK-1	162,000	81,000	6,30	17,000	MK-2	223,000	125,000	11,90
9,200	MK-1	162,000	81,000	6,30	17,500	MK-2	228,000	130,000	12,60
9,700	MK-1	168,000	87,000	7,00	17,750	MK-2	228,000	130,000	12,60
9,800	MK-1	168,000	87,000	7,00	18,000	MK-2	228,000	130,000	12,60
9,900	MK-1	168,000	87,000	7,00	18,100	MK-2	233,000	135,000	13,30
10,000	MK-1	168,000	87,000	7,00	18,250	MK-2	233,000	135,000	13,30
10,100	MK-1	168,000	87,000	7,00	18,500	MK-2	233,000	135,000	13,30
10,200	MK-1	168,000	87,000	7,00	18,700	MK-2	233,000	135,000	13,30
10,750	MK-1	175,000	94,000	7,70	18,750	MK-2	233,000	135,000	13,30
11,000	MK-1	175,000	94,000	7,70	18,800	MK-2	233,000	135,000	13,30
11,100	MK-1	175,000	94,000	7,70	19,000	MK-2	233,000	135,000	13,30
11,250	MK-1	175,000	94,000	7,70	19,250	MK-2	238,000	140,000	14,00
11,500	MK-1	175,000	94,000	7,70	19,500	MK-2	238,000	140,000	14,00
11,750	MK-1	182,000	101,000	8,40	19,700	MK-2	238,000	140,000	14,00
11,800	MK-1	182,000	101,000	8,40	19,750	MK-2	238,000	140,000	14,00
12,000	MK-1	182,000	101,000	8,40	20,000	MK-2	238,000	140,000	14,00
12,200	MK-1	182,000	101,000	8,40	20,200	MK-2	243,000	145,000	14,60
12,300	MK-1	182,000	101,000	8,40	20,250	MK-2	243,000	145,000	14,60
12,500	MK-1	182,000	101,000	8,40	20,500	MK-2	243,000	145,000	14,60
12,700	MK-1	182,000	101,000	9,10	20,700	MK-2	243,000	145,000	14,60
12,750	MK-1	182,000	101,000	9,10	21,000	MK-2	243,000	145,000	14,60
13,000	MK-1	182,000	101,000	9,10	21,500	MK-2	248,000	150,000	15,30
13,250	MK-1	189,000	108,000	9,80	21,700	MK-2	248,000	150,000	15,30
13,500	MK-1	189,000	108,000	9,80	21,750	MK-2	248,000	150,000	15,30
13,750	MK-1	189,000	108,000	9,80	22,000	MK-2	248,000	150,000	15,30
13,800	MK-1	189,000	108,000	9,80	22,250	MK-2	248,000	150,000	15,30
14,000	MK-1	189,000	108,000	9,80	22,400	MK-2	248,000	150,000	15,30
14,100	MK-2	212,000	114,000	10,50	22,500	MK-2	253,000	155,000	16,00
14,200	MK-2	212,000	114,000	10,50	22,700	MK-2	253,000	155,000	16,00
14,450	MK-2	212,000	114,000	10,50	23,000	MK-2	253,000	155,000	16,00
14,500	MK-2	212,000	114,000	10,50	23,500	MK-2	253,000	155,000	16,00
14,750	MK-2	212,000	114,000	10,50	23,700	MK-3	281,000	160,000	16,60
15,000	MK-2	212,000	114,000	10,50	24,000	MK-3	281,000	160,000	16,60
15,250	MK-2	218,000	120,000	11,20	24,200	MK-3	281,000	160,000	16,60
15,500	MK-2	218,000	120,000	11,20	24,500	MK-3	281,000	160,000	17,30
15,750	MK-2	218,000	120,000	11,20	24,700	MK-3	281,000	160,000	17,30
16,000	MK-2	218,000	120,000	11,20	24,750	MK-3	281,000	160,000	17,30
16,150	MK-2	223,000	125,000	11,90	25,000	MK-3	281,000	160,000	17,30

Brocas escalonadas/
brocas calibradoras



d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
25,250	MK-3	286,000	165,000	18,00
25,500	MK-3	286,000	165,000	18,00
25,600	MK-3	286,000	165,000	18,00
25,700	MK-3	286,000	165,000	18,00
26,000	MK-3	286,000	165,000	18,00
26,500	MK-3	286,000	165,000	18,00
26,700	MK-3	291,000	170,000	18,60
27,000	MK-3	291,000	170,000	18,60
27,500	MK-3	291,000	170,000	18,60
27,700	MK-3	291,000	170,000	19,30
28,000	MK-3	291,000	170,000	19,30
28,700	MK-3	296,000	175,000	20,00
29,000	MK-3	296,000	175,000	20,00
29,500	MK-3	296,000	175,000	20,50
29,700	MK-3	296,000	175,000	20,50
29,750	MK-3	296,000	175,000	20,50
30,000	MK-3	296,000	175,000	20,50
30,500	MK-3	301,000	180,000	21,00
30,600	MK-3	301,000	180,000	21,00
31,000	MK-3	301,000	180,000	21,00
31,600	MK-4	334,000	185,000	22,00
32,000	MK-4	334,000	185,000	22,00
32,600	MK-4	334,000	185,000	23,00
33,000	MK-4	334,000	185,000	23,00

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
33,600	MK-4	339,000	190,000	24,00
34,000	MK-4	339,000	190,000	24,00
34,600	MK-4	339,000	190,000	25,00
35,000	MK-4	339,000	190,000	25,00
35,600	MK-4	344,000	195,000	25,50
36,000	MK-4	344,000	195,000	25,50
36,600	MK-4	344,000	195,000	26,00
37,600	MK-4	349,000	200,000	26,50
38,000	MK-4	349,000	200,000	26,50
39,000	MK-4	349,000	200,000	27,00
39,600	MK-4	349,000	200,000	28,00
40,000	MK-4	349,000	200,000	28,00
44,000	MK-4	359,000	210,000	30,50
44,600	MK-4	359,000	210,000	31,00
45,000	MK-4	359,000	210,000	31,00
50,000	MK-4	369,000	220,000	34,50



Brocas calibradoras com cone Morse

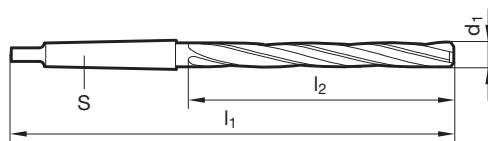
DIN 343	N	120°	h8
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P	•	afiação de superfície cônica • especialmente com alta estabilidade
M	○	para furos pré furados/fundidos/estampados • corrige o alinhamento com exatidão • corrige erros de cilíndricidade • melhora o acabamento da superfície de furos • entrada-Ø < furo a ser calibrado • observar os menores Ø "d0" dos furos pré-furados • alargar cuidadosamente após a calibração
K	•	
N	•	
S	○	
H		

GÜHRINGNAVIGATOR

Página de dados de corte 800

Material de corte	HSCO
Superfície	●
Sentido de corte	Ⓜ



Nr. do artigo **634**

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
8,500	MK-1	156,000	75,000	5,60
9,000	MK-1	162,000	81,000	6,30
9,800	MK-1	168,000	87,000	7,00
10,750	MK-1	175,000	94,000	7,70
11,750	MK-1	182,000	101,000	8,40
12,000	MK-1	182,000	101,000	8,40
12,500	MK-1	182,000	101,000	8,40
12,750	MK-1	182,000	101,000	9,10
13,000	MK-1	182,000	101,000	9,10
14,000	MK-1	189,000	108,000	9,80
14,750	MK-2	212,000	114,000	10,50
15,750	MK-2	218,000	120,000	11,20

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
16,000	MK-2	218,000	120,000	11,20
16,500	MK-2	223,000	125,000	11,90
17,000	MK-2	223,000	125,000	11,90
18,000	MK-2	228,000	130,000	12,60
19,700	MK-2	238,000	140,000	14,00
20,000	MK-2	238,000	140,000	14,00
21,000	MK-2	243,000	145,000	14,60
22,000	MK-2	248,000	150,000	15,30
23,000	MK-2	253,000	155,000	16,00
24,000	MK-3	281,000	160,000	16,60
25,000	MK-3	281,000	160,000	17,30
26,000	MK-3	286,000	165,000	18,00



Brocas calibradoras com cone Morse



- P** • afiação de superfície cônica • especialmente com alta estabilidade
- para furos pré furados/fundidos/estampados • corrige o alinhamento com exatidão • corrige erros de cilíndricidade • melhora o acabamento da superfície de furos • entrada-Ø < furo a ser calibrado • observar os menores Ø "d0" dos furos pré-furados • alargar cuidadosamente após a calibração
- M** ○
- K** •
- N** ○
- S** ○
- H** ○

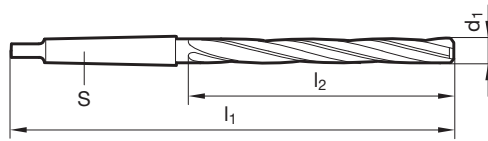
Material de corte **HSS**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 800



Nr. do artigo **555**

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
5,000	MK-1	155,000	74,000	3,50
8,000	MK-1	181,000	100,000	5,60
8,800	MK-1	188,000	107,000	6,30
9,000	MK-1	188,000	107,000	6,30
9,700	MK-1	197,000	116,000	7,00
9,800	MK-1	197,000	116,000	7,00
10,000	MK-1	197,000	116,000	7,00
10,100	MK-1	197,000	116,000	7,00
10,500	MK-1	197,000	116,000	7,00
11,100	MK-1	206,000	125,000	7,70
11,750	MK-1	215,000	134,000	8,40
12,000	MK-1	215,000	134,000	8,40
12,750	MK-1	215,000	134,000	9,10
13,000	MK-1	215,000	134,000	9,10
13,750	MK-1	223,000	142,000	9,80
14,000	MK-1	223,000	142,000	9,80
15,000	MK-2	245,000	147,000	10,50
15,750	MK-2	251,000	153,000	11,20

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
16,000	MK-2	251,000	153,000	11,20
17,750	MK-2	263,000	165,000	12,60
19,000	MK-2	269,000	171,000	13,30
19,700	MK-2	275,000	177,000	14,00
20,000	MK-2	275,000	177,000	14,00
20,700	MK-2	282,000	184,000	14,60
21,000	MK-2	282,000	184,000	14,60
21,700	MK-2	289,000	191,000	15,30
22,000	MK-2	289,000	191,000	15,30
22,700	MK-2	296,000	198,000	16,00
23,000	MK-2	296,000	198,000	16,00
24,000	MK-3	327,000	206,000	16,60
25,000	MK-3	327,000	206,000	17,30
25,700	MK-3	335,000	214,000	18,00
30,000	MK-3	351,000	230,000	20,50

Brocas escalonadas/
brocas calibradoras



Brocas calibradoras com cone Morse

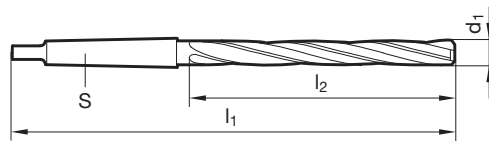
DIN 1864	N	120°	h8
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P	•	afiação de superfície cônica • especialmente com alta estabilidade
M	○	• para furos pré furados/fundidos/estampados • corrige o alinhamento com exatidão • corrige erros de cilindricidade • melhora o acabamento da superfície de furos • entrada-Ø < furo a ser calibrado • observar os menores Ø "d0" dos furos pré-furados • alargar cuidadosamente após a calibração
K	•	
N	•	
S	○	
H		

GÜHRING NAVIGATOR

Página de dados de corte 800

Material de corte	HSCO
Superfície	●
Sentido de corte	Ⓜ



Nr. do artigo **635**

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm
8,000	MK-1	181,000	100,000	5,60
10,000	MK-1	197,000	116,000	7,00
14,000	MK-1	223,000	142,000	9,80
15,000	MK-2	245,000	147,000	10,50

d1	S	l1	l2	d0 ≥
mm		mm	mm	mm



Brocas calibradoras com cone Morse



- P** ○ afiação de superfície cônica • providas com metal duro • para furos pré furados/fundidos/estampados • corrige o alinhamento com exatidão
- M** ○ • corrige erros de cilindricidade • melhora o acabamento da superfície de furos • entrada-Ø < furo a ser calibrado • observar os menores Ø “d0” dos furos pré-furados
- K** ○
- N** ○
- S** ○ adequação de material universal
- H** ○

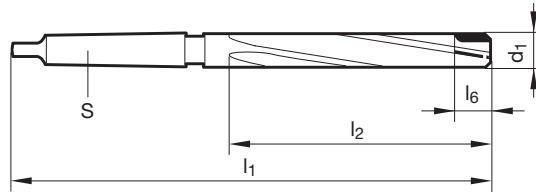
Material de corte **Metal duro**

Superfície ○

Sentido de corte

GÜHRING NAVIGATOR

Página de dados de corte 800



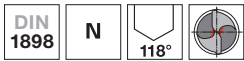
Nr. do artigo **729**

d1	S	l1	l2	l6	d0 ≥
mm		mm	mm	mm	mm
28,700	MK-3	296,000	175,000	25,000	21,0
29,700	MK-3	296,000	175,000	25,000	22,0
30,600	MK-3	301,000	180,000	25,000	23,0
31,600	MK-4	334,000	185,000	25,000	24,0
33,000	MK-4	334,000	185,000	25,000	25,0
33,600	MK-4	339,000	190,000	25,000	26,0

d1	S	l1	l2	l6	d0 ≥
mm		mm	mm	mm	mm
34,000	MK-4	339,000	190,000	25,000	26,0
36,000	MK-4	344,000	195,000	25,000	28,0
37,600	MK-4	349,000	200,000	25,000	30,0
38,600	MK-4	349,000	200,000	25,000	31,0
39,000	MK-4	349,000	200,000	25,000	31,0
39,600	MK-4	349,000	200,000	25,000	32,0



Brocas para furos de pinos

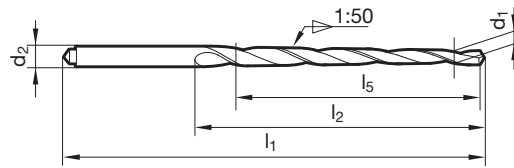


Material de corte **HSS**

Superfície $\text{Ra} \leq 2,36$

Sentido de corte

- P** • Redução da aresta transversal $\geq \text{Ø } 1,000$ • afiação de superfície cônica
- M** ○ para furos cônicos, pinos cônicos conforme DIN 1 (novo: DIN EN 22339) e DIN 7978 (novo: DIN EN 28736) • com arraste
- K** •
- N** ○
- S**
- H**



Nr. do artigo **531**

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
2,000	3,150	86,000	52,000	48,000
2,500	3,150	86,000	52,000	48,000
3,000	4,000	100,000	63,000	58,000
3,500	5,000	112,000	74,000	68,000
4,000	5,000	112,000	74,000	68,000
4,500	6,300	122,000	81,000	73,000

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
5,000	6,300	122,000	81,000	73,000
5,500	8,000	160,000	114,000	105,000
6,000	8,000	160,000	114,000	105,000
8,000	10,000	207,000	157,000	145,000
10,000	12,500	245,000	190,000	175,000
12,000	16,000	290,000	228,000	210,000



Brocas para furos de pinos



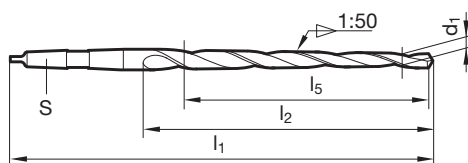
Material de corte **HSS**

Superfície

Sentido de corte

P • Redução da aresta transversal $\geq \varnothing 5,000$ • afiação de superfície cônica
 • para furos cônicos para recepção de pinos cônicos conforme DIN 1
 (nova: DIN EN 22339), DIN 7978 (nova DIN EN 28736), DIN 7977 (nova
 DIN EN 28737) e DIN 258

- M** ○
- K** •
- N** ○
- S** ○
- H** ○



Nr. do artigo **532**

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
5,000		155,000	81,000	73,000
6,000		187,000	108,000	105,000
8,000		227,000	149,000	145,000
10,000		257,000	180,000	175,000
12,000		315,000	219,000	210,000
13,000		325,000	229,000	220,000

d1	d2	l1	l2	l5
mm	mm	mm	mm	mm
14,000		325,000	229,000	220,000
16,000		335,000	239,000	230,000
20,000		377,000	263,000	250,000
25,000		427,000	311,000	300,000

GUANZHU

NANMIO

BRING

GÜHRING NAVIGATOR

GATOR



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Tipo
- Superfície
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○

Navegador



≤3xD Prof. do furo

1171	1660	1180	1181	2468	2477	2469	8510	8610	8520	8620
6538K	6537K	6537K	6537K	6537K	6537K	6537K	6537K	6537K	6537K	6537K
M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro
P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P
RT 80 U	RT 100 F RT 100 F RT 100 U			RT 100 F RT 100 U RT 100 U			RT 100 VA		RT 100 HF	
S	S	S	S	F	F	F	a	a	Y	Y
axial	axial	axial	axial	axial	axial	axial	axial	axial	axial	axial
55	53	54	43	52	39	41	48	50	44	46



Vc m/min	Código VR	Vc m/min	Código VR			Vc m/min	Código VR			Vc m/min	Código VR			Vc m/min	Código VR		
95	6	110	6	6	6	145	7	7	7				145	7	7		
80	5	90	5	5	5	120	6	6	6				120	6	6		
95	7	130	7	7	7	170	8	8	8				170	8	8		
75	6	110	7	7	7	145	8	8	8				145	8	8		
80	6	100	7	7	7	130	8	8	8				130	8	8		
75	6	95	6	6	6	125	7	7	7				125	7	7		
70	6	90	6	6	6	120	7	7	7				120	7	7		
75	6	90	6	6	6	120	7	7	7				120	7	7		
60	5	80	6	6	6	105	7	7	7				105	7	7		
90	7	110	7	7	7	145	8	8	8				145	8	8		
75	6	90	6	6	6	120	7	7	7				120	7	7		
60	5	80	6	6	6	105	7	7	7				105	7	7		
75	6	85	6	6	6	110	7	7	7				110	7	7		
60	5	80	4	4	5	105	5	5	5				105	5	5		
45	5	60	5	5	5	80	6	6	6				80	6	6		
35	5	50	4	4	4	65	5	5	5				65	5	5		
40	4	45	3	3	3	60	4	4	4				60	4	4		
		45	2	2	2	60	3	3	3				60	3	3		
		40	2	2	2	55	3	3	3				55	3	3		
		20	1	1	1	35	2	2	2				35	2	2		
40	2	45	4	4	4	60	5	5	5	80	5	5					
35	2	40	2	2	2	55	2	2	2	60	2-3	2-3					
35	2	35	4	4	4	45	5	5	5	80	5	5					
150	7	160	8	8	8	210	9	9	9								
110	7	120	8	8	8	160	9	9	9								
110	7	100	8	8	8	140	9	9	9								
90	6	95	7	7	7	130	8	8	8								
		30	2	2	2	40	3	3	3								
		25	3	3	3	35	4	4	4	30	4	4	35	4	4		
		35	3	3	3	45	4	4	4	45	4	4	45	4	4		
		30	2	2	2	40	3	3	3	40	3	3	40	3	3		
200	8	240	8	8	8	310	9	9	9								
200	8	240	8	8	8	310	9	9	9								
170	8	200	8	8	8	260	9	9	9								
140	7	170	8	8	8	220	9	9	9								
		230	7	7	7	280	8	8	8								
		95	6	6	6	125	7	7	7								
		250	7	7	7	325	8	8	8								
		170	6	6	6	220	7	7	7								
		95	6	6	6	125	7	7	7								
		80	5	5	5	105	6	6	6								
		70	5	5	5	90	6	6	6								
		60	5	5	5	80	6	6	6								

Navegador



GÜHRING NAVIGATOR

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- Nr. do artigo
Norma/DIN
Mat. de corte
Grupo de apl. MD
Tipo
Superfície
Refrigeração
Progr. na página

Table with columns: Ø da broca mm, Código das séries de avanço (1-9), f (mm/rotação). Rows include drill bit sizes from 0.50 to 80.00 mm.

- AI Preferencialmente para a usinagem de alumínio
G Preferencialmente para a usinagem de fundidos
Refrigerante conforme o material: Ar, Óleo, Emulsão
Sentido de corte: Direita, Esquerda

Main material selection table with columns: Grupo de materiais, Exemplos de materiais, Res. à tração, Dureza, Refrig. Rows include various material groups like Aços de construção, Aços para máquinas automáticas, etc.

Navegador



≤3xD Prof. do furo

1702	1184	1242
6539	6537K	6539
Metal duro Metal duro Metal duro		
K/P	K/P	K/P
RT 100 F	RT 100 U	RT 100 U
S	S	S
28	21	23

2475	2480	2472	2473
6537K	6537K	6537K	6539
Metal duro Metal duro Metal duro Metal duro			
K/P	K/P	K/P	K/P
RT 100 F	RT 100 U	RT 100 U	RT 100 U
F	F	F	F
27	16	18	20

8524	
6537K	
Metal duro	
K/P	
RT 100 HF	
Y	
25	

≤4xD

768	6068
WN	WN
Metal duro Metal duro	
K	K
RT 150 GG	RT 150 GG
○	○
axial	axial
56	58
Al	G



Vc m/min	Código VR		
100	6	6	6
85	5	5	5
110	7	7	7
85	6	6	6
90	6	6	6
85	6	6	6
80	6	6	6
80	6	6	6
75	5	5	5
100	7	7	7
90	6	6	6
65	4	4	4
75	5	5	5
70	4	4	4
50	5	5	5
40	4	4	4
40	3		
35	2	2	2
35	1	1	1
20	1	1	1
40	2	2	2
15	2	1	1
35	2	2	2
160	7	7	7
120	7	7	7
120	7	6	6
95	7	6	6
25	2	2	2
20	3	3	3
15	1	1	1
15	1	1	1
200	8	8	8
200	8	8	8
170	8	8	8
140	7	7	7
200	7	7	7
80	6	6	6
210	7	7	7
140	6	6	6
80	5	5	5
65	5	5	5
60	4	4	4
45	4	4	4

Vc m/min	Código VR			
130	7	7	7	7
110	6	6	6	6
145	8	8	8	8
110	7	7	7	7
120	7	7	7	7
110	7	7	7	7
105	7	7	7	7
105	7	7	7	7
100	6	6	6	6
130	8	8	8	8
120	7	7	7	7
85	5	5	5	5
100	6	6	6	6
90	5	5	5	5
65	6	6	6	6
55	5	5	5	5
55	4			
45	3	3	3	3
40	1	1	1	1
20	1	1	1	1
40	2	2	2	2
15	1	1	1	1
35	2	2	2	2
210	8	8	8	8
155	8	8	8	8
155	8	7	7	7
125	8	7	7	7
35	3	3	3	3
25	4	4	4	4
15	1	1	1	1
15	1	1	1	1
260	9	9	9	9
260	9	9	9	9
220	9	8	8	8
180	8	8	8	8
260	8	8	8	8
105	7	7	7	7
270	8	8	8	8
180	7	7	7	7
105	6	6	6	6
85	6	6	6	6
80	5	5	5	5
60	5	5	5	5

Vc m/min	Código VR
130	7
110	6
145	8
110	7
120	7
110	7
105	7
105	7
100	6
130	8
120	7
85	5
100	6
90	5
65	6
55	5
55	4
45	3
40	1
20	1
40	2
15	1
35	2
25	4
15	1
15	1

Vc m/min	Código VR	
120	7	7
100	7	7
90	7	7
80	7	7
40	2	2
410	9	7
410	9	7
380	9	7
330	9	7
280	9	9
110	6	6
80	5	5

Navegador



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Tipo
- Superfície
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓡ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Número em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		○
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		○
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



≤5xD Prof. do furo

1172	6501	1662	1182	1663	1183	2478	2470	2479	2471	5759
6538M	6537L	6537L	6537L	6537L	6537L	6537L	6537L	6537L	6537L	6537L
M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro
P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K/P
RT 80 U	RT 100 R	RT 100 F	RT 100 F	RT 100 U	RT 100 U	RT 100 F	RT 100 F	RT 100 U	RT 100 U	RT 100 S
S	F	S	S	S	S	F	F	F	F	F
axial	axial	axial	axial	axial	axial	axial	axial	axial	axial	axial
84	82	78	80	65	66	76	77	61	63	59



Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR				Vc m/min	Código VR				Vc m/min	Código VR
95	5			110	6	6	6	6	145	7	7	7	7	145-230	8
80	4			90	5	5	5	5	120	6	6	6	6	120-220	7
95	6			130	7	7	7	7	170	8	8	8	8	170-260	8
75	5			110	7	7	7	7	145	8	8	8	8	145-230	8
80	5			100	7	7	7	7	130	8	8	8	8	130-220	8
75	5			95	6	6	6	6	125	7	7	7	7	125-210	7
75	5			90	6	6	6	6	120	7	7	7	7	120-200	7
75	5			90	6	6	6	6	120	7	7	7	7	120-210	7
55	4			80	6	6	6	6	105	7	7	7	7	105-200	7
90	6			110	7	7	7	7	145	8	8	8	8	145-230	8
75	5			90	6	6	6	6	120	7	7	7	7	120-210	7
55	4			65	4	4	4	4	85	5	5	5	5	105-200	6
70	5			85	6	6	6	6	105	7	7	7	7	110-150	7
55	4			80	4	4	5	5	100	5	5	5	5	100-150	5
40	4			60	5	5	5	5	70	6	6	6	6	70-120	6
35	4			50	4	4	4	4	55	5	5	5	5	55-100	5
40	3			45	3	3	4	4	60	4	4	5	5	60-100	5
				45	2	2	2	2	60	3	3	3	3	60-100	5
				40	2	2	2	2	55	3	3	3	3		
				25	1	1	1	1	35	2	2	2	2		
40	2			45	4	4	4	4	60	5	5	5	5		
35	2			40	2	2	2	2	55	2	2	2	2		
35	2			35	4	4	4	4	50	5	5	5	5		
150	6	210	9	160	8	8	8	8	195	9	9	9	9		
110	6	160	9	120	8	8	8	8	160	9	9	9	9		
110	6	160	9	100	8	8	8	8	140	9	9	9	9		
90	5	130	8	95	7	7	7	7	130	8	8	8	8		
				30	2	2	2	2	40	3	3	3	3		
		130	8												
		100	8												
		80	8												
		60	8												
				25	3	3	3	3	35	4	4	4	4		
				35	3	3	3	3	45	4	4	4	4		
				30	2	2	2	2	40	3	3	3	3		
200	7			240	8	8	8	8	310	9	9	9	9		
200	7			240	8	8	8	8	310	9	9	9	9		
170	7			200	8	8	8	8	260	9	9	9	9		
140	6			170	8	8	8	8	220	9	9	9	9		
				230	7	7	7	7	280	8	8	8	8		
				95	6	6	6	6	125	7	7	7	7		
				250	7	7	7	7	325	8	8	8	8		
				170	6	6	6	6	220	7	7	7	7		
				95	6	6	6	6	125	7	7	7	7		
				80	5	5	5	5	105	6	6	6	6		
				70	5	5	5	5	90	6	6	6	6		
				60	5	5	5	5	80	6	6	6	6		



GÜHRING NAVIGATOR

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- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Tipo
- Superfície
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		●
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



≤5xD Prof. do furo

8511	8611
6537L	6537L
Metal duro Metal duro	
K/P	K/P
RT 100 VA	RT 100 VA
a	a
axial	axial
72	74

8521	8621
6537L	6537L
Metal duro Metal duro	
K/P	K/P
RT 100 HF	RT 100 HF
Y	Y
axial	axial
68	70

1243	2717
WN	6537L
Metal duro Metal duro	
K/P	K/P
RT 100 U	RT 100 U
S	S
36	35

2712	2474	2996	2719
6537L	WN	6537L	6537L
Metal duro Metal duro Metal duro Metal duro			
K/P	K/P	K/P	K/P
RT 100 F	RT 100 U	RT 100 U	RT 100 U
F	F	F	F
38	34	30	32



Vc m/min	Código VR		Vc m/min	Código VR		Vc m/min	Código VR		Vc m/min	Código VR	
			145	7	7	100	6	6	130	7	7
			120	6	6	85	5	5	110	6	6
			170	8	8	110	7	7	145	8	8
			145	8	8	85	6	6	110	7	7
			130	8	8	90	6	6	120	7	7
			125	7	7	85	6	6	110	7	7
			120	7	7	80	6	6	105	7	7
			120	7	7	80	6	6	105	7	7
			105	7	7	75	5	5	100	6	6
			145	8	8	100	7	7	130	8	8
			120	7	7	90	6	6	120	7	7
			85	5	5	65	4	4	85	5	5
			110	7	7	75	5	5	100	6	6
			105	5	5	70	4	4	90	5	5
			80	6	6	50	5	5	65	6	6
			65	5	5	40	4	4	55	5	5
			60	4	4				55	4	
			60	3	3	35	2	2	45	3	3
			55	3	3	35	1	1	35	1	1
			35	2	2	20	1	1	20	1	1
80	5	5				40	2	2	45	2	2
60	2-3	2-3				15	1	1	15	1	1
80	5	5				35	2	2	35	2	2
						160	7	7	210	8	8
						120	7	7	155	8	8
						120	6	6	145	8	7
						95	6	6	125	8	7
						25	2	2	35	3	3
30	4	4	35	4	4	20	3	3	25	4	4
45	4	4	45	4	4	15	1	1	15	1	1
40	3	3	40	3	3	15	1	1	15	1	1
						200	8	8	260	9	9
						200	8	8	260	9	9
						170	8	8	235	9	9
						140	7	7	170	8	8
						200	7	7	260	8	8
						80	6	6	105	7	7
						210	7	7	270	8	8
						140	6	6	180	7	7
						80	5	5	105	6	6
						65	5	5	85	6	6
						60	4	4	80	5	5
						45	4	4	60	5	5

Navegador



≤7xD Prof. do furo

1173
6538L
M. duro
P
RT80U
S
axial
95

769	6069
WN	WN
Metal duro	
K	K
RT 150 GG	
○	○
axial	axial
93	94
Al	G

2711
WN
M. duro
K/P
RT100U
S
axial
89

4044	4045
WN	WN
Metal duro	
K/P	K/P
RT 100 U	
F	F
axial	axial
85	87

6502
WN
M. duro
K/P
RT100R
F
axial
91

8522
WN
M. duro
K/P
RT100HF
Y
axial
90

≤8xD

5760
6537L
M. duro
K/P
RT100S
F
axial
96

≤10xD

770	6070
WN	WN
Metal duro	
K	K
RT 150 GG	
○	○
axial	axial
98	99
Al	G

≤12xD

5525
WN
M. duro
K/P
RT100U
F
axial
100



V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR
95	4			110	5	145	6 6			145-230	7			110	6
75	3			90	4	120	5 5			120-220	6			110	5
90	5			130	6	170	7 7			170-260	7			110	7
75	4			110	6	145	7 7			145-230	7			100	7
80	4			100	6	130	7 7			130-220	7			110	7
75	4			95	5	125	6 6			125-210	6			110	6
60	4			90	5	120	6 6			120-200	6			100	6
75	4			90	5	120	6 6			120-210	6			110	6
60	3			80	5	105	6 6			105-200	6			105	6
90	5			110	6	145	7 7			145-230	7			110	7
75	4			90	5	120	6 6			120-210	6			110	6
55	3			65	3	85	4 4			105-200	5			85	4
75	4			80	5	110	6 6			110-150	6			100	6
55	3			75	4	105	4 4			100-150	4			80	4
40	3			55	4	80	5 5			70-120	5			80	5
35	3			40	3	65	4 4			65-100	4			65	4
40	2			45	2	60	4 4			60-100	4			50	4
				45	1	60	2 2			60-100	4			50	2
				40	1	55	2 2								
				25	1	35	1 1			55	2				
										35	1				
35	1			45	3	60	4 4							60	4
33	1			40	2	55	2 2							55	2
25	1			35	3	45	4 4							45	4
150	5	120	6 7	150	7	195	8 8	210	8			120	6 6	120	8
110	5	100	6 7	120	7	160	8 8	160	8			100	6 6	120	8
110	5	90	6 7	100	7	140	8 8	160	8			90	6 6	100	8
90	4	80	6 7	95	6	130	7 7	130	7			80	6 6	90	7
		40	2 2	30	1	40	2 2					40	1 2		
								130	7						
								100	7						
								80	7						
								60	7						
				25	2	35	3 3			35	3				
				35	1	40	3 3			45	3				
				30	1	40	2 2			40	4				
180	6	410	8 7	240	7	310	8 8					410	8 6	150	8
180	6	410	8 7	240	7	310	8 8					410	8 6	150	8
160	6	380	8 8	200	7	260	8 8					380	8 6	150	8
130	5	330	8 8	170	7	220	8 8					330	8 6	120	8
				230	6	280	7 7							150	7
				95	6	125	6 6							80	6
				250	7	325	7 7					280	7 7	120	7
				170	6	220	6 6							120	6
				110	6 6	95	6 6					110	6 6	40	6
				80	5 5	80	5 5					80	5 5		
				70	5	90	5 5								
				60	5	80	5 5							40	5

Navegador



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Tipo
- Superfície
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Número em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		●
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



≤15xD

773
WN
Metal duro
K
RT 150 GN
○
axial
103

≤15xD

6509
WN
Metal duro
K/P
RT 100 T
Ⓐ
40 bar MQL
102

≤20xD

6511
WN
Metal duro
K/P
RT 100 T
Ⓐ
40 bar MQL
104

≤25xD

6512
WN
Metal duro
K/P
RT 100 T
Ⓐ
40 bar MQL
105

≤30xD

6513
WN
Metal duro
K/P
RT 100 T
Ⓐ
40 bar MQL
106

≤40xD

6514
WN
Metal duro
K/P
RT 100 T
Ⓐ
40 bar
107



Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR
		110	8			110	8			100	8			80	7
		110	8			110	8			100	8			80	7
		120	8			120	8			120	8			100	8
		120	8			120	8			100	8			100	8
		110	6			110	6			110	6			110	6
		110	8			110	8			100	8			80	7
		100	7			100	7			100	7			80	7
		110	7	80	7	110	7	80	7	100	7	70	7	80	7
		110	6	80	7	110	6	80	7	100	6	70	7	80	6
		110	8			110	8			100	8			80	7
		110	7	80	6-7	110	7	80	6-7	100	7	70	6-7	80	6
		110	6	80	6-7	110	6	80	6-7	100	6	70	6-7	80	6
		100	5			100	5			80	5			80	5
		80	5			80	5			60	5			60	5
		100	6-7			100	6			90	6			80	6
		80	5			80	5			70	4			70	4
		50	5			50	5			50	4			50	4
		50	5			50	5			50	4			50	4
		50	4			50	4			50	4			50	4
		100	5			100	5			100	5			80	5
		70	2-3			60	3			60	3			70	2-3
		100	5			100	5			100	5			80	5
120	5	140	8			140	8			130	8			120	8
100	5	100	8			100	8			90	8			80	8
90	5	140	8			140	8			130	8			120	8
80	5	100	8			100	8			90	8			80	8
40	1														
		100	6			100	6			90	6			80	6
		100	6			100	6			90	6			80	6
		90	8	90	8	90	8	90	8	80	8	80	8	70	8
		30	2			30	2			30	2			30	2
410	6														
410	6														
380	7														
330	7														
		120	1			120	1			120	1			120	1
280	6	120	8			120	8			110	8			100	8
110	5														
80	4														



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Tipo
- Superfície
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Número em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		●
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



GUHRING NAVIGATOR

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- Nr. do artigo**
- Norma/DIN**
- Mat. de corte**
- Grupo de apl. MD**
- Prof. do furo**
- Superfície**
- Aplicação**
- Progr. na página**

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		<input type="radio"/>
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		<input type="radio"/>
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		<input type="radio"/>
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		<input type="radio"/>
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		<input type="radio"/>
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		<input type="radio"/>
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		<input type="radio"/>
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		<input type="radio"/>
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		<input type="radio"/>
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		<input type="radio"/>
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		<input checked="" type="radio"/>
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		<input checked="" type="radio"/>
Aços para nitretação	1.8504 34CrAl6	≤1000		<input type="radio"/>
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		<input checked="" type="radio"/>
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		<input type="radio"/>
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		<input checked="" type="radio"/>
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		<input checked="" type="radio"/>
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	<input checked="" type="radio"/>
Aços temperados	-		≤48 HRC	<input checked="" type="radio"/>
			≤66 HRC	<input checked="" type="radio"/>
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		<input checked="" type="radio"/>
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		<input checked="" type="radio"/>
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		<input checked="" type="radio"/>
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	<input type="radio"/>
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	<input type="radio"/>
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	<input type="radio"/>
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	<input type="radio"/>
Fundição dura	-		≤350 HB	<input type="radio"/>
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	<input type="radio"/>
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	<input type="radio"/>
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		<input type="radio"/>
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		<input type="radio"/>
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		<input checked="" type="radio"/>
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		<input checked="" type="radio"/>
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		<input checked="" type="radio"/>
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input type="radio"/>
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		<input type="radio"/>
Ligas de Al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		<input type="radio"/>
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input type="radio"/>
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		<input type="radio"/>
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		<input type="radio"/>
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		<input type="radio"/>
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		<input type="radio"/>
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		<input checked="" type="radio"/>
	2.0790 CuNi18Zn19Pb	≤850		<input checked="" type="radio"/>
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		<input checked="" type="radio"/>
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		<input checked="" type="radio"/>
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		<input type="radio"/>
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		<input type="radio"/>
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		<input type="radio"/>
Vidros reforç. com fibr. de carb.	GFK/CFK	≤1000		<input type="radio"/>



HT 800 WP $\leq 1,5 \times D$

$\leq 3 \times D$

4112
WN
M. duro
K/P
1,5xD
F
aços
139

4115
WN
M. duro
K/P
1,5xD
a
aços res.
145

4113
WN
M. duro
K/P
1,5xD
F
mat. fund.
142

4114
WN
M. duro
K/P
1,5xD
○
Al e liga
148

4112
WN
M. duro
K/P
3xD
F
aços
139

4115
WN
M. duro
K/P
3xD
a
aços res.
145

4113
WN
M. duro
K/P
3xD
F
mat. fund.
142

4114
WN
M. duro
K/P
3xD
○
Al e liga
148



V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR
130	6							130	6				
110	5							110	5				
130	7							130	7				
110	6							110	6				
130	6							130	6				
125	6							125	6				
110	5							110	5				
110	6							110	6				
90	5							90	5				
130	7							130	7				
110	6							110	6				
70	4							70	4				
105	5							105	5				
70	4							70	4				
60	5							60	5				
55	4							55	4				
55	3							55	3				
50	2							50	2				
		25	2							25	2		
		55	3							55	3		
		40	3							40	3		
		35	3							35	3		
				100	6							100	6
				90	6							90	6
				120	7							120	7
				100	6							100	6
		90	6							90	6		
				80	5							80	5
				80	5							80	5
				80	5							80	5
				80	5							80	5
		25	2							25	2		
		40	3							40	3		
		35	2							35	2		
						200	7					200	7
						180	7					180	7
						150	7					150	7
						120	7					120	7
						180	7					180	7
						70	6					70	6
						180	7					180	7
						120	6					120	6
						70	6					70	6
						50	6					50	6
						45	6					45	6
						35	5					35	5

Navegador



GUHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

Nr. do artigo
Norma/DIN
Mat. de corte
Grupo de apl. MD
Prof. do furo
Superfície
Aplicação
Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
Aços para nitretação	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC ≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos martensíticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos de cavacos longos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
Plásticos,duroplásticos termoplástico	Resina epóxi, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon	≤150 ≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vidros reforç. com fibr. de carb.	GFK/CFK	≤1000		○



HT 800 WP ≤5xD

≤7xD

4112
WN
M. duro
K/P
5xD
F
aços
139

4115
WN
M. duro
K/P
5xD
a
aços res.
145

4113
WN
M. duro
K/P
5xD
F
mat. fund.
142

4114
WN
M. duro
K/P
5xD
○
Al e liga
148

4112
WN
M. duro
K/P
7xD
F
aços
139

4115
WN
M. duro
K/P
7xD
a
aços res.
145

4113
WN
M. duro
K/P
7xD
F
mat. fund.
142

4114
WN
M. duro
K/P
7xD
○
Al e liga
148



Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR
125	6												
105	5												
125	7												
105	6												
125	6												
120	6												
105	5												
105	6												
85	5												
125	7												
105	6												
70	4												
105	5												
70	4												
55	5												
50	4												
55	3												
50	2												
		25	2							25	1		
		55	3							55	2		
		40	3							40	2		
		35	3							35	2		
				100	6							80	6
				90	6							70	6
				120	7							100	7
				100	6							80	6
		90	6							70	6		
				80	5							60	5
				80	5							60	5
				80	5							60	5
				80	5							60	5
		25	2							25	1		
		40	3							40	2		
		35	2							35	1		
						180	7					180	6
						180	7					180	6
						140	7					140	6
						110	7					110	6
						180	7					180	6
						70	6					70	5
						180	7					180	6
						120	6					120	5
						70	6					70	5
						50	6					50	5
						45	6					45	5
						35	5					35	4

Navegador



GUHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Prof. do furo
- Superfície
- Aplicação
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
Aços para nitretação	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC ≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos martensíticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤900 ≤1100 ≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos de cavacos longos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
Plásticos,duroplásticos termoplástico	Resina epóxi, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon	≤150 ≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vidros reforç. com fibr. de carb.	GFK/CFK	≤1000		○

Navegador



HT 800 WP ≤10xD

4112
WN
M. duro
K/P
10xD
F
aços
139

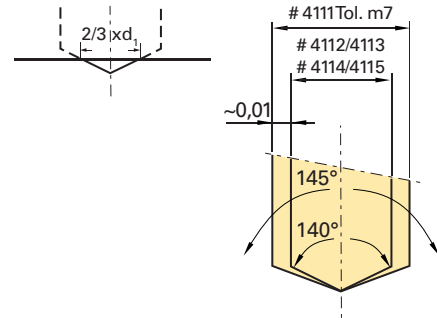
4115
WN
M. duro
K/P
10xD
a
aços res.
145

4113
WN
M. duro
K/P
10xD
F
mat. fund.
142

4114
WN
M. duro
K/P
10xD
○
Al e liga
148

4111
WN
M. duro
K/P
1xD
a
Pilot/Abaix
151

≤1xD Pilotar/Abaixar



- Em furos passantes deverá ser observado, que as guias das pastilhas fiquem em operação. Além disto recomendamos que o avanço seja reduzido antes da saída do furo.
- para profundidades de furação acima de 5xD geralmente recomendamos a centragem ou a execução de um furo piloto com o suporte Art. Nr. 4101 e pastilha Art. Nr. 4111. Dependendo do material a ser usinado poderão ser utilizadas alternativamente brocas RT 100 U ou RT 100 VA.
- Ao furar sem centragem recomendamos uma redução do avanço ao iniciar-se a furação.
- A broca não deverá ser utilizada em cortes interrompidos (chavetas, furos transversais) antes de se executar um teste. No caso de cortes interrompidos (máx. 0,2xD) recomendamos reduzir o avanço conforme a possibilidade.
- Contrariamente as brocas com inserts intercambiáveis clássicas as brocas HT 800 são adequadas também, para furar pacotes de chapas.
- Em tornos (ferramenta para furar parada) deve ser observado, que a ferramenta esteja exatamente no centro.
- Uma subministração suficiente de refrigeração, através de emulsão ou óleo, é condição básica para uma ótima usinagem.
- A ferramenta é só condicionalmente adequada para usinagem a seco ou MQL. Na utilização de MQL nós recomendamos o emprego de haste com extremidade cônica MQL, como também, de peças MQL da Gühring. Nossa assistência técnica lhes aconselhará com prazer.



Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR
100	5							130	6
95	4							110	5
100	6							130	7
95	5							110	6
100	5							130	6
95	5							125	6
90	4							110	5
90	5							110	6
85	4							90	5
100	6							130	7
90	5							110	6
70	4							70	4
95	4							105	5
70	3							70	4
55	4							60	5
50	3							55	4
55	2							55	3
50	2							50	2
		25	1					25	2
		55	2					55	3
		40	2					40	3
		35	2					35	3
				80	6			100	6
				70	6			90	6
				100	7			120	7
				80	6			100	6
		70	6					90	6
				60	5			80	5
				60	5			80	5
				60	5			80	5
				60	5			80	5
		25	1					25	2
		40	2					40	3
		35	1					35	2
						150	6	200	7
						150	6	180	7
						130	6	150	7
						105	6	120	7
						150	6	180	7
						70	5	70	6
						150	6	180	7
						110	5	120	6
						70	5	70	6
						50	5	50	6
						45	5	45	6
						35	4	35	5



GUHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito.

Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

- Nr. do artigo
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- Prof. do furo
- Superfície
- Aplicação
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
Aços para nitretação	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC ≤66 HRC	●
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		○
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 ≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vidros reforç. com fibr. de carb.	GFK/CFK	≤1000		○



GÜHRINGNAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito.
 Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

- Nr. do artigo
- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Superfície
- Tipo
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão





Sentido de corte:


- Direita
- Esquerda


Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		
Aços para nitretação	1.8504 34CrAl6	≤1000		
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	
Aços temperados	-		≤48 HRC	
			≤66 HRC	
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	
Fundição dura	-		≤350 HB	
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		
	2.0790 CuNi18Zn19Pb	≤850		
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		









≤3xD Prof. do furo

223	224	225	552
226	227	228	553
1897	1897	1897	1897
HSS	HSS	HSS	HSS
			
N	H	W	GT 80
192/200	204/206	208/210	212/215

653
672
1897
HSS

N
196/203

2460
1897
HSS

N
199

329	363	1261	129	1259
330			136	
1897	WN	1897	WN	1897
HSCO	HSCO	HSCO	HSCO	M42
				
GV 120	GV 120	VA	N	N
218/225	448	230	414/415	235

128
WN
HSCO

N
413



Vc m/min	Código VR				Vc m/min	Código VR	Vc m/min	Código VR				Vc m/min	Código VR	
27	6			6	30	6	32	7	35	5	5	5	5	
22	5			5	24	5	26	6	30	5	5	5	5	
30	6			6	33	6	36	7	40	5	5	5	5	
30	5			5	33	5	36	6	40	5	5	5	5	50
25	5			5	28	5	31	6	40	5	5	5	5	
25	5			5	28	5	31	6	40	5	5	5	5	
					25	4	28	5	35	4	4		4	4
					22	4	24	5	20	4	4		4	4
									16	3	3		3	3
									36	6	6	6	6	
30	6			6	33	6	36	7	20	4	4		4	4
					20	4	22	5	15	3	3		3	3
									16	4	4		4	4
					14	4	16	5	12	3	3		3	3
16	4			4	18	4	20	5	12	3	3		3	3
									15	4	4		4	4
									12	3	3		3	3
									15	3	3		3	3
									12	3	3		3	3
									15	3	3		3	3
									8	2	2		2	2
									4	1	1		1	1
									18	1	1	4	4	3
									14	3	3	3	3	3
									16	3	3	3	3	3
30	6			6	33	6	36	7	35	6	6		6	5
30	6			6	33	6	36	7	30	6	6		6	5
25	6			6	28	6	31	7	30	6	6		6	5
20	6			6	22	6	24	7	25	6	6		6	5
									10	3	3		3	3
70				7	7				8	1	1		1	1
70				7	7				10	2	2		2	2
50	7			7	7				6	2	2		2	2
50	6			6	6				90			7	7	
70	6			6	6				90			7	7	
60	5			5	5	80	6		80			7	7	
70				6	6	75	5		70			6	6	
40	5			5	5	45	5		70			6	6	
30	4			4	4	65	5		40			5	5	
25	4			4	4	75	5		60			5	5	
15	4			4	4	45	5		40			5	5	
						33	4		35	4	4		4	4
						27	4		30	4	4		4	4
						16	4		20	4	4		4	4
						15	4		15	4	4		4	4
18	4			4	4	22	4		20	4	4		4	4
28	5			5	5	36	5		30	4	4		4	4

Navegador



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

Nr. do artigo
Norma/DIN
Mat. de corte
Superfície
Tipo
Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		●
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



≤3xD Prof. do furo

572
1897
HSCO
S
VA
231

2048
1897
HSCO
M
P2000
233

1228
1897
HSCO
S
GT 80
227

2498
1897
HSCO
F
GT 80
229

659	663
1897	WN
HSCO	HSCO
S	S
GV 120	GV 120
222	449

2461
1897
HSCO
F
GV 120
224

512
WN
HSCO
S
GU 500
384

515
1897
HSS-E-PM
F
GT 500
237



Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	
38	6	35	6	38	6	42	6	38	5	5	42	6	45	6	42	6
33	5	30	5	33	5	36	5	33	4	4	36	5	35	5	37	5
44	6	40	6	44	6	48	7	44	5	5	48	6	50	6	47	7
42	5	40	5	38	5	42	6	38	5	5	42	6	40	6	44	6
44	5	40	5	44	6	48	6	44	5	5	48	6	44	6	47	6
44	5	40	5	44	5	48	6	44	5	5	48	6	44	6	47	6
		35	4	38	4	42	5	38	4	4	42	5	40	5	44	5
		25	4	27	4	30	5	27	4	4	30	5	27	4	30	4
		20	3	22	3	24	4	22	3	3	24	4	22	3	25	3
40	6	40	6	44	4	48	4	44	4	4	48	5	44	6	47	4
		20	4	22	4	24	5	22	4	4	24	5	22	4	25	5
		15	3	18	3	20	4	18	3	3	20	4	18	3	20	4
		20	4	22	4	24	5	22	4	4	24	5	22	4	25	5
		15	3	18	3	20	4	18	3	3	20	4	16	3	18	4
		18	4	19	4	21	5	19	4	4	21	5	20	4	22	5
		12	3	14	3	16	4	14	3	3	16	4	15	3	17	4
		12	3	14	3	17	4	14	3	3	17	4	13	3	17	4
		8	2	9	2	11	3	9	2	2	11	3	9	2	12	2
								4	1	1	5	2				
20	4	14	4	15	4	17	4	20	4	4	22	5	20	4	22	4
15	3	10	3	10	3	12	3	15	3	3	17	4	16	4	18	3
18	3	12	3	12	3	14	3	18	3	3	20	4	18	4	20	3
30	6	38	6	45	6	50	7	40	6	6	45	7	45	6	50	7
30	6	30	6	40	6	45	7	35	6	6	40	7	40	6	44	7
		30	6	33	6	36	7	33	6	6	36	7	40	6	45	7
		25	6	27	6	29	7	27	6	6	29	7	30	6	33	7
		10	3	8	3	10	4	12	3	3	14	4			16	4
8	1	5	2					6	2	2	7	2			6	2
12	2							11	2	2	12	3				
8	2							7	2	2	8	3				
90	7	90	7										70	7		
90	7	90	7										70	7		
80	7	80	7										85	7		
70	6	70	6										70	6		
70	6	85	6										80	6		
70	5	80	5	88	5	96	6						80	5	80	5
60	5	70	5	77	5	84	6						77	5		
40	5	40	5	44	5	48	6						44	5	60	5
35	4	40	4	45	5	50	5	45	5	5	50	6	50	4	50	5
33	4	30	4	40	4	45	5	40	4	4	45	5	40	4	44	5
20	4	25	4	22	4	25	5	23	4	4	26	5	32	4	33	5
15	4	15	4	17	4	20	5	17	4	4	20	5	28	4	28	5
		20	4	22	4	24	5						25	4	25	5
30	4	25	5	27	5	30	5						27	4		

Navegador



GÜHRINGNAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Superfície
- Tipo
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓡ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



≤3xD Prof. do furo

730	702	1149	710	703	705	704	707
6539	WN	WN	WN	8037	8041	8038	WN
M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro	M. duro
K10/K20							
○	○	○	○	○	○	○	○
N	N	N	Duro 150	N	N	N	H
239	243	431	323	429	512	430	432

2463	1946
6539	6537K
M. duro	M. duro
K/P	K/P
F	A
N	H
241	389



Vc m/min	Código VR							Vc m/min	Código VR	Vc m/min	Código VR
80	4							104	5		
70	4							91	5		
80	5		4	4	4			104	6		
70	4		3	3	3			91	5		
80	4							104	5		
70	4							91	5		
60	4							78	5		
60	4							78	5		
80	5							104	6	80	6
60	4							78	5		
50	4							65	5	65	4
50	3							65	4	80	4
25	2		2	2	2		2	32	3		
20	2		3	3	3			26	4	40	2
10			2	2	2					30	1
25	2							32	2		
15	1							20	1		
25	2							32	2		
90	4		4	4	4			117	5	90	8
80	4		4	4	4			104	5	80	8
80	4		4	4	4			91	5	80	8
70	4		4	4	4			104	5	70	7
10			1	1	1		1			30	2
15	2							20	2		
15	1							15	1		
15	1							15	1		
200	7							260	8		
200	7							260	8		
150	6							195	7		
120	6							156	7		
180	6							234	6		
80	5							104	6		
180	5		5	5	5			234	6		
180	5		5	5	5			234	6		
120	5							156	6		
120	5							156	6		
70	4							91	5		
50	3							65	4		
50	4	4						65	5		
40	3	3					3	52	4		
150			1								
80	3	3					2	104	4		

Navegador



GÜHRING NAVIGATOR

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- Nr. do artigo
- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Superfície
- Tipo
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Direita
- Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Número em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		
Aços para nitretação	1.8504 34CrAl6	≤1000		
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	
Aços temperados	-		≤48 HRC	
			≤66 HRC	
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		
	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	
Fundição dura	-		≤350 HB	
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		
	2.0790 CuNi18Zn19Pb	≤850		
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		



≤5xD Prof. do furo

560	205	240	268	229	245	592	251	206	246	207	247	549	558
	208			248				209		210		550	
338	338	338	WN	345	345	345	346	338	345	338	345	338	345
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
○	○ ⁺⁰ / _{2,36}	○	○	○	○ ⁺⁰ / _{2,36}	○ ⁺⁰ / _{16,0}	○	○	○	○	○	○ ⁺⁰ / _{2,36}	○ ⁺⁰ / _{16,0}
N	N	N	N	N	N	N	N	H	H	W	W	GT 100	GT 100
256	244/258	257	412	458/457	450	454	471	263/266	459	269/272	460	274/281	461



Vc m/min	Código VR												
27	6	6	6	6	6	6	6	6				6	6
22	5	5	5	5	5	5	5	5				5	5
30	6	6	6	6	6	6	6	6				6	6
30	5	5	5	5	5	5	5	5				5	5
25	5	5	5	5	5	5	5	5				5	5
25	5	5	5	5	5	5	5	5				5	5
30	6	6	6	6	6	6	6	6				6	6
16		4	4	4	4	4	4	4				4	4
80											7	7	
80											7	7	
70	7	7	7	7	7	7	7	7			7	7	7
70	6	6	6	6	6	6	6	6				6	6
50	6	6	6	6	6	6	6	6	6	6		6	6
50	5	5	5	5	5	5	5	5			5	5	5
70									6	6			
40	5	5	5	5	5	5	5	5				5	5
30	4	4	4	4	4	4	4	4	4	4			
25	4	4	4	4	4	4	4	4					
15	4	4	4	4	4	4	4	4				4	4
18	4	4	4	4	4	4	4	4	4	4		4	4
28	5	5	5	5	5	5	5	5	5	5	5		



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

- Nr. do artigo
- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Superfície
- Tipo
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Direita
- Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		
Aços para nitretação	1.8504 34CrAl6	≤1000		
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	
Aços temperados	-		≤48 HRC	
			≤66 HRC	
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		
	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	
Fundição dura	-		≤350 HB	
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		
	2.0790 CuNi18Zn19Pb	≤850		
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		



≤5xD Prof. do furo

651	654	652	606
664		665	
338	345	338	345
HSS	HSS	HSS	HSS
S	S	S	S
N	N	GT 100	GT 100
250/261	455	277/283	462

2456	2457
338	338
HSS	HSS
F	F
N	GT 100
254	280

305	345	351	622	645	605	1260	1262	1146
308					608			
338	345	346	338	345	338	338	345	338
HSCO	HSCO	HSCO	HSCO	HSCO	HSCO	HSCO	HSCO	M42
N	N	N	GT 100	GT 100	Ti	VA	VA	N
284/289	463	472	291	466	301/308	309	470	315



Vc m/min	Código VR			
30	6	6	6	6
24	5	5	5	5
33	6	6	6	6
33	5	5	5	5
28	5	5	5	5
28	5	5	5	5
25	4	4	4	4
22	4	4	4	4
33	6	6	6	6
20	4	4	4	4
14	4	4	4	4
18	4	4	4	4
33	6	6	6	6
33	6	6	6	6
28	6	6	6	6
22	6	6	6	6
80	6	6		
65	5	5	5	5
75	5	5	5	5
45	5	5	5	5
33	4	4		
27	4	4		
16	4	4	4	4
15	4	4	4	4
22	4	4	4	4
36	5	5		

Vc m/min	Código VR	
32	7	7
26	6	6
36	7	7
36	6	6
31	6	6
31	6	6
28	5	5
24	5	5
36	7	7
22	5	5
16	5	5
20	5	5
36	7	7
36	7	7
31	7	7
24	7	7
85	8	8
85	8	8
60	8	8
60	8	7
90	7	7
70	6	6
80	6	6
50	6	6
36	5	5
33	5	5
18	5	5
18	5	5
29	5	5

Vc m/min	Código VR									
35	5	5	5	5	5			5	5	5
30	5	5	5	5	5			5	5	5
40	5	5	5	5	5			5	5	5
40	5	5	5	5	5			5	5	5
40	5	5	5	5	5			5	5	5
35	4	4	4	4	4					5
20	4	4	4	4	4					4
16	3	3	3	3	3		3			3
36	6	6	6	6	6	6	6	6	6	6
20	4	4	4	4	4					3
15	3	3	3	3	3		3			3
16	4	4	4	4	4					3
12	3	3	3	3	3		3			3
15	4	4	4	4	4					3
12	3	3	3	3	3		3			3
15	3	3	3	3	3		3			3
8	2	2	2	2			2			2
4										1
18	4	4	4	4	4	4	4	4	4	3
14	3	3	3	2	2	3	3	3	3	3
16	3	3	3	3	3	3	3	3	3	3
35	6	6	6	6	6	6	6	6	6	5
30	6	6	6	6	6	6	6	6	6	5
30	6	6	6	6	6	6	6	6	6	5
28	6	6	6	6	6	6	6	6	6	5
10	3	3	3	3	3	3	3			3
8										1
10							2	2	2	2
6							2	2	2	2
90							7	7	7	7
90							7	7	7	7
80				7	7		7	7	7	7
70				6	6		6	6	6	6
70							6	6	6	6
40	5	5	5	5	5		5	5	5	5
60							5	5	5	5
40	5	5	5	4	4		5	5	5	5
35	4	4	4				4	4	4	4
33	4	4	4				4	4	4	4
20	4	4	4	4	4		4	4	4	4
15	4	4	4	4	4		1	1	1	4
20	4	4	4	4	4					

Navegador



GÜHRINGNAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito.
 Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

Nr. do artigo
Norma/DIN
Mat. de corte
Superfície
Tipo
Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○

Navegador



≤5xD Prof. do furo

2997	661	658	662	657
338	345	338	345	338
HSCO	HSCO	HSCO	HSCO	HSCO
S	S	S	S	S
N	N	GT 100	GT 100	Ti
288	465	294	467	304

2459	2458
338	338
HSCO	HSCO
F	F
GT 100	Ti
296	306

1223	1224	1221	1222
338	345	338	345
HSCO	HSCO	HSCO	HSCO
A	A	C	C
GT 100	GT 100	GT 100	GT 100
299	469	298	468



Vc m/min	Código VR				
38	6	6	6	6	
33	5	5	5	5	
44	5	5	5	5	
38	5	5	5	5	
44	5	5	5	5	
38	4	4	4	4	
27	4	4	4	4	
22	3	3	3	3	3
44	4	4	4	4	
22	4	4	4	4	
18	3	3	3	3	
22	4	4	4	4	
18	3	3	3	3	
19	4	4	4	4	
14	3	3	3	3	
14	3	3	3	3	3
9	2	2			2
20	4	4	4	4	4
15	3	3			3
18			3	3	3
40	6	6	6	6	
35	6	6	6	6	
33	6	6	6	6	
27	6	6	6	6	
12					3
6					2
11					2
7					2
88	5	5	5	5	
40	4	4			
22	4	4	4	4	
17	4	4	4	4	4
22	4	4	4	4	

Vc m/min	Código VR	
42	6	
36	5	
48	6	
42	6	
48	6	
42	5	
30	5	
34	4	4
48	6	
24	5	
20	4	
24	5	
20	4	
20	4	
21	5	
16	4	
17	4	4
11	3	2
6	1	
22	5	5
17	4	3
20	4	4
45	7	
40	7	
36	7	
29	7	
14	4	3
7		2
12		2
8		2
85	8	
72	7	
96	6	
40		
25	5	
20	5	4
24	5	

Vc m/min	Código VR			
42			6	6
36			6	6
48			6	6
42	5	5	6	6
42			5	5
30			5	5
34			4	4
48			7	7
24			5	5
20			4	4
20			5	5
15			4	4
21			5	5
16			4	4
17			4	4
11			3	3
22			5	5
18			4	4
45	7	7		
40	7	7		
36	7	7		
29	7	7		
85	7	7		
96	6	6		
25	5	5		
20	5	5		
24	5	5		



GÜHRINGNAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Superfície
- Tipo
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓜ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



≤5xD Prof. do furo

1199	1018	2047	511	513	1131	1132	732	2464
338	338	338	WN	WN	WN	WN	WN	WN
M42	M42	HSCO	HSCO	HSS-E-PM	HSCO	HSCO	M. duro	M. duro
F nano			S	F		S		F
N	AeroX	P2000	GU 500	GT 500	GT 80 IK	GT 80 IK	N	N
sem	sem	sem	sem	sem	com	com	sem	sem
317	313	311	386	388	395	396	319	321



V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	V _c m/min	Código VR	
42	6	35	6	35	6	45	6	42	6	48	7	60	7	80	4	100	5			
36	5	30	5	30	5	35	5	37	5	38	6	48	6	70	4	90	5			
48	6	40	6	40	6	50	6	47	6	48	7	60	7	80	5	100	6			
42	5	40	5	40	5	40	5	44	6	38	6	48	6	70	4	90	4			
44	6	40	5	40	5	44	6	47	6	48	6	60	6	80	4	100	5			
44	5	40	5	40	5	44	6	47	6	48	6	60	6	70	4	90	5			
42	5	35	4	35	4	40	5	44	5	38	5	50	5	60	4	80	5			
30	4	20	4	25	4	27	4	30	4	28	5	33	5	60	4	80	5			
25	3	16	3	20	3	22	3	25	3	26	4	31	4							
40	6	36	6	40	6	44	6	47	3	43	7	55	7	80	5	100	6			
25	3	20	3	20	4	22	4	25	4	25	5	31	5	60	4	80	5			
20	3	15	3	15	3	18	3	20	3	24	4	31	4							
20	3	16	4	20	4	22	4	25	4	25	5	30	5	50	4	65	5			
18	3	12	3	15	3	16	3	18	4	20	4	24	4							
21	4	15	3	18	4	20	4	22	5	24	5	30	5	50	3	65	3			
16	3	12	3	12	3	15	3	17	4	16	4	20	4							
17	3	15	3	12	3	13	3	14	4	14	4	18	4							
11	2	8	2	8	2	9	2	12	2	12	3	15	3	25	2	30	3			
6	1	4	1							4	3	5	3	20	2	20	2			
20	4	18	3	14	4	20	4	22	4	20	5	25	5	25	2	30	2			
15	3	14	3	10	3	16	4	18	3	14	4	18	4	15	1	20	1			
18	3	16	3	12	3	18	4	20	3	16	4	20	4	25	2	30	2			
45	6	35	6	38	6	45	6	50	7	48	7	60	7	90	4	115	5			
40	6	30	6	30	6	40	6	40	7	38	7	48	7	80	4	100	5			
36	6	30	6	30	6	40	6	44	7	42	7	52	7	70	4	90	5			
29	6	28	6	25	6	30	6	33	7	32	7	40	7	80	4	80	5			
14	3	10	3	10	3			16	4	12	4	15	4							
9	1	8	1	5	2			6	2	10	2	12	2	15	2	20	3			
12	2	10	2							14	3	18	3	15	1	15	1			
8	2	6	2							10	3	12	3	15	1	15	1			
		90	7	90	7	70	7							200	7	260	8			
		90	7	90	7	70	7							200	7	260	8			
80	7	80	7	80	7	85	7			95	7	120	7	150	6	195	7			
70	6	70	6	70	6	70	6			75	8	95	8	120	6	155	7			
80	6	70	6	85	6	80	6							180	5	235	6			
70	5	70	5	80	5	80	5	50	5	90	6	100	6	80	5	100	6			
60	5	60	5	70	5	77	5							180	5	235	6			
40	5	40	5	40	5	44	5	60	5	45	6	55	6	180	5	235	6			
35	4	35	4	40	4	50	4	50	5					120	5	155	6			
33	4	33	4	30	4	40	4	44	5	48	5	60	5	120	5	155	6			
20	4	20	4	25	4	32	4	33	5	45	5	55	5	70	4	90	5			
15	4	15	4	15	4	28	4	28	5	38	5	45	5	50	3	65	4			
		20	4	20	4	25	4	25	4					50	4	50	5			
		30	5	25	5	27	4			38	6	48	6	40	3	65	4			
														80	3	100	4			

Navegador



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

- Nr. do artigo
- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Superfície
- Tipo
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Direita
- Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Número em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		
Aços para nitretação	1.8504 34CrAl6	≤1000		
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	
Aços temperados	-		≤48 HRC	
			≤66 HRC	
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		
	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	
Fundição dura	-		≤350 HB	
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		
	2.0790 CuNi18Zn19Pb	≤850		
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		



≤10xD Prof. do furo

561	211	204	217	257	523
			220		
339	339	340	340	341	WN
HSS	HSS	HSS	HSS	HSS	HSS
N	N	N	N	N	N
sem	sem	sem	sem	sem	sem
327	325	338	331/336	473	482

218	219	501	505	535	551
221				506	
340	340	340	341	340	341
HSS	HSS	HSS	HSS	HSS	HSS
H	W	GT50	GT50	GT100	GT100
sem	sem	sem	sem	sem	sem
339/341	342	351	479	344/350	476

666	667	655	668	656	2462
339	340	341	340	341	340
HSS	HSS	HSS	HSS	HSS	HSS
N	N	N	GT100	GT100	GT100
sem	sem	sem	sem	sem	sem
328	334	475	347	478	349



V _c m/min	Código VR					
24	6	6	6	6	6	6
20	5	5	5	5	5	5
27	6	6	6	6	6	6
27	5	5	5	5	5	5
22	5	5	5	5	5	5
22	5	5	5	5	5	5
27	6	6	6	6	6	6
14	4	4	4	4	4	4
27	6	6	6	6	6	6
27	6	6	6	6	6	6
22	6	6	6	6	6	6
18	6	6	6	6	6	6
45	7	7	7	7	7	7
45	6	6	6	6	6	6
63	6	6	6	6	6	6
54	5	5	5	5	5	5
36	5	5	5	5	5	5
28	4	4	4	4	4	4
22	4	4	4	4	4	4
22	4	4	4	4	4	4
14	4	4	4	4	4	4
22	5	5	5	5	5	5

V _c m/min	Código VR					
24				6	6	
20				5	5	
27				6	6	
27				5	5	
22				5	5	
22				5	5	
27				6	6	
14				4	4	
27				6	6	
27				6	6	
22				6	6	
18				6	6	
65	7	7	7			
65	7	7	7			
45	7			6	6	
63	6		6	6		
54		5		5	5	
63	6					
36				5	5	
28	4					
22				4	4	
14	4			4	4	
22	5	5	5	5		

V _c m/min	Código VR						V _c m/min	Código VR
28	6	6	6	6	6	6	30	7
22	5	5	5	5	5	5	24	6
30	6	6	6	6	6	6	33	7
30	5	5	5	5	5	5	33	6
25	5	5	5	5	5	5	28	6
25	5	5	5	5	5	5	28	6
22	4	4	4	4	4	4	24	5
18	4	4	4	4	4	4	23	5
30	6	6	6	6	6	6	33	7
14	4	4	4	4	4	4	18	5
12	4	4	4	4	4	4	15	5
16	4	4	4	4	4	4	19	5
10	3	3	3	3	3	3	13	4
30	6	6	6	6	6	6	33	7
30	6	6	6	6	6	6	33	7
24	6	6	6	6	6	6	26	7
20	6	6	6	6	6	6	22	7
50	7	7	7	7	7	7	55	8
50	6	6	6	6	6	6	55	7
70	6	6	6	6	6	6	70	
60	5	5	5	5	5	5	65	6
40	5	5	5	5	5	5	44	6
30	4	4	4	4	4	4	30	
25	4	4	4	4	4	4	25	
14	4	4	4	4	4	4	16	5
12	4	4	4	4	4	4	14	5
18	4	4	4	4	4	4	23	5
32	5	5	5	5	5	5	32	

Navegador



GÜHRING NAVIGATOR

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- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Superfície
- Tipo
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○

Navegador



≤10xD Prof. do furo

390	254	255	269	270	271	272	1101
WN	WN	WN	WN	WN	WN	WN	WN
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
N	N	N	N	N	N	N	N
com	com	com	com	com	com	com	com
394	499	500	498	502	503	504	501



>10xD Prof. do furo

235	236	237	266	267	524	528	529	525	542
1869 R1	1869 R2	1869 R3	1870 R1	1870 R2	1869 R1	1869 R2	1869 R3	1870 R1	1870 R2
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
N	N	N	N	N	GT 50	GT 50	GT 50	GT 50	GT 50
sem	sem	sem	sem	sem	sem	sem	sem	sem	sem
363	371	377	483	487	368	375	379	485	489



Vc m/min	Código VR							
26	6	6	6	6	6	6	6	6
22	5	5	5	5	5	5	5	5
30	6	6	6	6	6	6	6	6
30	5	5	5	5	5	5	5	5
24	5	5	5	5	5	5	5	5
24	5	5	5	5	5	5	5	5
22	4	4	4	4	4	4	4	4
20	4	4	4	4	4	4	4	4
14	3	3	3	3	3	3	3	3
30	6	6	6	6	6	6	6	6
17	4	4	4	4	4	4	4	4
12	3	3	3	3	3	3	3	3
14	4	4	4	4	4	4	4	4
10	3	3	3	3	3	3	3	3
15	4	4	4	4	4	4	4	4
10	3	3	3	3	3	3	3	3
10	3	3	3	3	3	3	3	3
7	2	2	2	2	2	2	2	2

30	6	6	6	6	6	6	6	6
30	6	6	6	6	6	6	6	6
24	6	6	6	6	6	6	6	6
20	6	6	6	6	6	6	6	6
7	3	3	3	3	3	3	3	3

80	6							
50	7	7	7	7	7	7	7	7
50	6	6	6	6	6	6	6	6
60	5	5	5	5	5	5	5	5
40	5	5	5	5	5	5	5	5
24	4	4	4	4	4	4	4	4
24	4	4	4	4	4	4	4	4
22	4	4	4	4	4	4	4	4
24	5	5	5	5	5	5	5	5

Vc m/min	Código VR									
22	5	5	5	5	5					
18	4	4	4	4	4					
20	5	5	5	5	5					
20	4	4	4	4	4					
25	4	4	4	4	4					
25	4	4	4	4	4					
12	3	3	3	3	3					
22	5	5	5	5	5					
10	3	3	3	3	3					
8	3	3	3	3	3					
12	3	3	3	3	3					
6	2	2	2	2	2					
6	2	2	2	2	2					

22	5	5	5	5	5					
18	5	5	5	5	5					
20	5	5	5	5	5					
14	5	5	5	5	5					

55						6	6	6	6	6
55						6	6	6	6	6
45	6	6	6	6	6					
36	5	5	5	5	5					
55	5	5	5	5	5	5	5	5	5	5
22	4	4	4	4	4					
45	4	4	4	4	4					
28	4	4	4	4	4					
22	3	3	3	3	3					
20	3	3	3	3	3					
18	3	3	3	3	3					
12	3	3	3	3	3					
18	4	4	4	4	4	4	4	4	4	4



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

Nr. do artigo
Norma/DIN
Mat. de corte
Superfície
Tipo
Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓡ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		●
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn1Pb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7Zn1Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○

Navegador



>10xD Prof. do furo

502	503	504	242	243	244	526	527	563	564	565	566	293	298	299
1869 R1	1869 R2	1869 R3	WN	WN	WN	1870 R1	1870 R2	WN	WN	WN	WN	WN	WN	WN
HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100	GT 100
365	372	378	381	382	383	484	488	491	492	493	494	495	496	497

670	671
1869 R1	1869 R2
HSS	HSS
GT 100	GT 100
367	374



Vc m/min	Código VR														
22	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
12	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
20	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
14	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
28	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
20	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
12	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Vc m/min	Código VR	
28	5	5
22	4	4
28	5	5
22	4	4
28	4	4
22	4	4
16	3	3
28	5	5
12	3	3
8	2	2
28	5	5
22	5	5
25	5	5
18	5	5
6	1	1
70	6	6
70	6	6
55	6	6
45	5	5
70	5	5
28	4	4
36	4	4
28	3	3
25	3	3
22	3	3
18	3	3
15	3	3
22	4	4

Navegador



GÜHRINGNAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Superfície
- Tipo
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		●
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



≤10xD Prof. do furo

311	317	357	336	623	617
339	340	341	340	341	340
HSCO	HSCO	HSCO	HSCO	HSCO	HSCO

N	N	N	GT 100	GT 100	Ti
330	353	480	355	481	358

669
340
HSCO

Ti
360

396
340
HSCO

GT 100
357

706
WN
M. duro
K10/K20

N
362



Vc m/min	Código VR						Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR
33	5	5	5	5	5			36	5			
27	5	5	5	5	5			30	4			
36	5	5	5	5	5			40	5			
32	5	5	5	5	5			36	5			
36	5	5	5	5	5			40	5			
36	5	5	5	5	5			40	5			
22	4	4	4	4	4			26	4			
18	4	4	4	4	4			18	4			
14	3	3	3	3	3	3		15	3			
32	5	5	5	5	5		15	3	32	5		
18	4	4	4	4	4			20	4			
13	3	3	3	3	3		13	3	18	3		
14	4	4	4	4	4			18	4			
10	3	3	3	3	3		10	3	12	3		
13	4	4	4	4	4			15	4			
10	3	3	3	3	3		10	3	12	3		
12	3	3	3	3	3		10	3	14	3		
6	2	2	2	2	2		8	2	9	3		
4				1	1			5	1			
12	4	4	4	4	4	4	15	4	14	4		
8	3	3	3	2	2	3	10	3	10	3		
10	3	3	3	3	3	3	13	3	12	3		
32	6	6	6	6	6			35	6			
27	6	6	6	6	6			30	6			
26	6	6	6	6	6			30	6			
24	6	6	6	6	6			26	6			
6	3	3	3	3	3	3	6	3	12	3		
5	1	1	1				6	1				
8							10	2				
5							6	2				
70				7	7			77	7			
60				6	6			66	6			
60						5						
36	5	5	5	5	5			40	6			
54				5	5							
36	5	5	5	5	5			40	6			
30	4	4	4	5	5							
24	4	4	4	5	5							
18	4	4	4	4	4			21	5			
13	4	4	4	4	4	4	25	4	15	5		
16	4	4	4	4	4			30	5	50	4	
26						4				40	3	
										80	3	

Navegador



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

Nr. do artigo
Norma/DIN
Mat. de corte
Superfície
Tipo
Refrigeração
Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/rotação)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓔ Direita
- Ⓕ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		●
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		●
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		●
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		●
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		●
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		●
Aços para nitretação	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		●
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC ≤66 HRC	●
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	●
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	●
Fundição dura	-		≤350 HB	●
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	●
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		●
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		●
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		●
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		●
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		●
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		●
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		●
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5Zn2Pb	≤500		●
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		●
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		●
Bronzes, de cavacos curtos	2.1090 CuSn7Zn2Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		●
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○

Navegador



>10xD Prof. do furo

618	619	620	621
1869 R1	1869 R2	1870 R1	1870 R2
HSCO	HSCO	HSCO	HSCO
GT 100	GT 100	GT 100	GT 100
sem	sem	sem	sem
370	376	486	490

571
1869 R3
HSCO
GT 100
sem
380

370	371	372
WN	WN	WN
HSCO	HSCO	HSCO
GT 100	GT 100	GT 100
com	com	com
505	506	507

374	375	376
WN	WN	WN
HSCO	HSCO	HSCO
GT 100	GT 100	GT 100
com	com	com
508	509	510



Vc m/min	Código VR			
30	4	4	4	4
25	4	4	4	4
33	4	4	4	4
30	4	4	4	4
33	4	4	4	4
33	4	4	4	4
20	3	3	3	3
14	3	3	3	3
10	2	2	2	2
29	4	4	4	4
14	3	3	3	3
10	2	2	2	2
10	3	3	3	3
8	2	2	2	2
11	3	3	3	3
8	2	2	2	2
8	2	2	2	2
5	1	1	1	1
3	1	1	1	1
10	3	3	3	3
8	2	2	2	2
10	2	2	2	2
20	5	5	5	5
16	5	5	5	5
5	2	2	2	2
5	1	1	1	1
6	1	1	1	1
5	1	1	1	1
50	6	6	6	6
40	5	5	5	5
30	4	4	4	4
45	4	4	4	4
30	4	4	4	4
25	4	4	4	4
20	4	4	4	4
16	3	3	3	3
10	3	3	3	3
14	3	3	3	3
20	3	3	3	3

Vc m/min	Código VR
30	4
25	4
33	4
30	4
33	4
33	4
20	3
14	3
10	2
29	4
14	3
10	2
10	3
8	2
11	3
8	2
8	2
5	1
3	1
10	3
8	2
10	2
20	5
16	5
5	2
5	1
6	1
5	1
50	6
40	5
30	4
45	4
30	4
25	4
20	4
16	3
10	3
14	3
20	3

Vc m/min	Código VR		
35	6	6	6
30	5	5	5
30	6	6	6
30	5	5	5
35	5	5	5
29	5	5	5
22	4	4	4
18	4	4	4
14	3	3	3
35	6	6	6
18	4	4	4
14	3	3	3
14	4	4	4
12	3	3	3
15	4	4	4
11	3	3	3
11	3	3	3
8	2	2	2
4	2	2	2
14	4	4	4
10	3	3	3
12	3	3	3
30	6	6	6
24	6	6	6
24	6	6	6
20	6	6	6
8	3	3	3
8	1	1	1
10	2	2	2
8	2	2	2
60	7	7	7
50	6	6	6
38	5	5	5
55	5	5	5
36	5	5	5
24	4	4	4
20	4	4	4
14	4	4	4
25	5	5	5

Vc m/min	Código VR		
30	5	5	5
25	4	4	4
30	5	5	5
25	4	4	4
30	4	4	4
25	4	4	4
18	3	3	3
16	3	3	3
12	2	2	2
30	5	5	5
16	3	3	3
12	2	2	2
12	3	3	3
10	2	2	2
13	3	3	3
9	2	2	2
9	2	2	2
6	2	2	2
4	1	1	1
12	3	3	3
8	2	2	2
12	2	2	2
28	5	5	5
22	5	5	5
22	5	5	5
18	5	5	5
6	2	2	2
6	1	1	1
8	2	2	2
6	2	2	2
55	6	6	6
44	5	5	5
35	4	4	4
50	4	4	4
33	4	4	4
22	4	4	4
18	4	4	4
12	4	4	4
25	4	4	4

Navegador



GÜHRING NAVIGATOR

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

- Nr. do artigo
- Nr. do artigo
- Norma/DIN
- Mat. de corte
- Grupo de apl. MD
- Superfície
- Tipo
- Refrigeração
- Progr. na página

Ø da broca mm	Código das séries de avanço								
	101	102	103	104	105	106	107	108	109
	f (mm/rotação)								
0,10	0,002	0,003	0,003	0,004	0,006	0,007	0,010	0,013	0,016
0,16	0,002	0,003	0,004	0,005	0,007	0,009	0,012	0,016	0,022
0,25	0,003	0,004	0,005	0,007	0,009	0,011	0,014	0,019	0,024
0,30	0,004	0,005	0,007	0,009	0,011	0,015	0,019	0,025	0,033
0,50	0,005	0,007	0,008	0,011	0,014	0,019	0,024	0,031	0,041
0,63	0,007	0,009	0,012	0,015	0,020	0,026	0,034	0,044	0,057
0,80	0,010	0,013	0,016	0,020	0,024	0,031	0,038	0,048	0,060
1,00	0,020	0,024	0,029	0,035	0,041	0,050	0,060	0,072	0,086
1,50	0,030	0,035	0,040	0,046	0,052	0,060	0,069	0,080	0,092
2,00	0,040	0,046	0,053	0,061	0,070	0,080	0,093	0,106	0,122

Ø da broca mm	Código das séries de avanço nr. do art. 6400/6401/6408/6412												
	56	57	58	59	60	61	62	63	64	65	66	67	68
	f (mm/rotação)												
0,50	0,006	0,012	0,018	0,022	0,030	0,035	0,040	0,045	0,050	0,050	0,055	0,060	0,060
0,80	0,008	0,016	0,024	0,032	0,040	0,050	0,060	0,070	0,080	0,080	0,080	0,090	0,090
1,00	0,012	0,022	0,032	0,042	0,060	0,070	0,080	0,090	0,100	0,100	0,110	0,110	0,120
1,50	0,021	0,036	0,051	0,066	0,090	0,100	0,120	0,130	0,150	0,150	0,160	0,170	0,180
2,00	0,032	0,052	0,072	0,092	0,120	0,140	0,160	0,180	0,200	0,210	0,220	0,230	0,240
2,50	0,045	0,070	0,095	0,120	0,150	0,170	0,200	0,220	0,250	0,260	0,270	0,280	0,300
3,00	0,060	0,090	0,120	0,150	0,180	0,210	0,240	0,270	0,300	0,310	0,330	0,340	0,360

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Direita
- Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Número em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 ≤1000		
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 ≤1000		
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000		
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400		
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400		
Aços para nitretação	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400		
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 ≤1400		
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	
Aços temperados	-		≤48 HRC ≤66 HRC	
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤240 HB ≤350 HB	
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB ≤350 HB	
Fundição dura	-		≤350 HB	
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤220 HB ≤300 HB	
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400		
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 ≤1400		
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		
	2.0790 CuNi18Zn19Pb	≤850		
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 ≤1000		
Plásticos,duroplásticos	Resina epóxi, Resopal, Pertinax, Moltopren	≤150		
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		



301
303
1899
HSS-E-PM
○
N
sem
649/654

660
1899
HSS-E-PM
Ⓢ
N
sem
652

701
WN
M. duro
K10/K20
○
N
sem
656

3899
WN
M. duro
K/P
Ⓐ
N
sem
657

≤4xD ≤7xD

6400	6401
WN	WN
M. duro	M. duro
K/P	K/P
Ⓐ	Ⓐ
N	N
sem	sem
108/659	109/660

≤5xD ≤8xD ≤15xD

6405	6408	6412
WN	WN	WN
M. duro	M. duro	M. duro
K/P	K/P	K/P
Ⓐ	Ⓐ	Ⓐ
N	N	N
com	com	com
110/661	111/662	112/663



Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR	Vc m/min	Código VR			
21	106	27	106	50	105	100	62	100	64	62	105	62	58	58
18	105	23	105	35	104	100	62	100	64	62	100	62	58	58
18	106	23	106	50	105	100	62	100	64	62	105	62	59	59
16	105	21	105	45	104	90	61	90	63	61	90	61	59	59
20	105	26	105	45	104	90	62	90	64	62	95	62	58	58
18	105	23	105	35	104	90	62	90	64	62	95	62	58	58
14	104	18	104	30	103	90	61	90	63	61	90	61	58	58
14	104	18	104	30	103	90	61	90	63	61	90	61	58	58
12	103	16	103	70	60	70	60	70	62	60	70	60	58	58
18	106	23	106	50	103	100	61	100	63	61	100	61	57	57
14	104	18	104	40	103	85	61	85	63	61	85	61	58	58
12	103	16	103	70	60	70	60	70	62	60	70	60	58	58
14	104	18	104	25	103	70	60	70	62	60	70	60	57	57
12	103	16	103	60	60	60	60	60	62	60	60	60	57	57
16	104	20	104	50	60	50	60	50	62	60	50	60	58	58
14	103	18	103	60	60	60	60	60	62	60	50	60	58	58
14	103	18	103					60	57	57	50	57	57	57
8	102	10	102	20	102			60	57	57	50	57	57	57
				15	104									
18	104	20	104	25	103			30	57	57	70	57	57	57
14	103	16	103	25	102			15	56	56	60	56	56	56
16	103	18	103	25	102			30	57	57	70	57	57	57
26	106	33	106	80	105	130	66	130	68	66	150	60	60	60
22	106	28	106	60	105	130	66	130	68	66	140	60	60	60
18	106	23	106	60	105	130	66	130	68	66	140	60	60	60
22	106	28	106	50	105	120	65	120	67	65	130	60	60	60
				15	103			10	56	56	25	56	56	56
				45	104			15	56	56	35	56	56	56
				25	104			15	56	56	35	56	56	56
				160	107			70	68	68	70	68	68	68
				150	106			70	68	68	70	68	68	68
26	107			100	106			135	59	59	135	59	59	59
18	106			60	106			135	59	59	135	59	59	59
75	106	80	106	150	105									
42	105	53	105	50	105									
				67	106									
22	105	28	105	44	104									
22	104	28	104	68	103									
18	104	23	104	49	103									
13	104	16	104	53	103									
		14	104	36	103									
16	104	20	104	50	103									
18	104	23	104	36	103									
				60	104									

Navegador



GÜHRING NAVIGATOR Brocas para centrar

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

Nr. do artigo
Norma/DIN
Mat. de corte
Superfície
Tipo
Angulo da ponta °
Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		●
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



557	556	559
WN		
HSS		
○	○	○
N	N	N
90	120	90
696	702	700

568	567
WN	
HSS	
Ⓢ	Ⓢ
N	N
90	120
697	703

1136	1134
WN	
HSCO	
○	○
N	N
90	120
698	704

1133	1135
WN	
HSCO	
Ⓢ	Ⓢ
N	N
90	120
699	705



Vc m/min	Código VR		
30	6	6	6
25	5	5	5
32	6	6	6
30	5	5	5
25	5	5	5
25	5	5	5
20	4	4	4
15	4	4	4
12	3	3	3
30	6	6	6
15	4	4	4
8	3	3	3
16	4	4	4
10	3	3	3
6	3	3	3
8	3	3	3
30	6	6	6
30	6	6	6
25	6	6	6
20	6	6	6
70	7	7	7
70	7	7	7
50	7	7	7
50	6	6	6
70	6	6	6
60	5	5	5
60	5	5	5
40	5	5	5
30	4	4	4
25	4	4	4
15	4	4	4
12	4	4	4
18	4	4	4
28	5	5	5

Vc m/min	Código VR	
32	6	6
26	5	5
35	6	6
33	5	5
28	5	5
28	5	5
25	4	4
22	4	4
17	3	3
33	6	6
20	4	4
12	3	3
14	4	4
18	4	4
12	3	3
8	3	3
10	3	3
10	3	3
33	6	6
33	6	6
28	6	6
22	6	6
60	6	6
80	6	6
65	5	5
70	5	5
45	5	5
33	4	4
27	4	4
16	4	4
15	4	4
22	4	4
36	5	5

Vc m/min	Código VR	
35	6	6
30	5	5
40	5	5
40	5	5
35	5	5
35	5	5
30	4	4
22	4	4
17	3	3
33	6	6
20	4	4
15	3	3
14	4	4
12	3	3
18	4	4
12	3	3
8	3	3
8	2	2
12	3	3
10	3	3
10	3	3
33	6	6
33	6	6
30	6	6
25	6	6
6	1	1
8	2	2
6	2	2
80	7	7
80	7	7
60	7	7
60	6	6
70	6	6
65	5	5
70	5	5
45	5	5
35	4	4
33	4	4
20	4	4
15	4	4
22	4	4
36	5	5

Vc m/min	Código VR	
42	6	6
36	5	5
48	6	6
42	6	6
44	6	6
44	6	6
40	5	5
27	4	4
22	3	3
37	6	6
22	4	4
18	3	3
19	4	4
15	3	3
21	4	4
16	3	3
12	3	3
10	2	2
18	3	3
15	3	3
12	3	3
38	6	6
35	6	6
33	6	6
28	6	6
7	1	1
10	2	2
8	2	2
85	7	7
65	7	7
65	6	6
80	6	6
70	5	5
75	5	5
50	5	5
45	5	5
40	4	4
25	4	4
20	4	4
25	4	4
40	4	4

Navegador



GÜHRING NAVIGATOR Brocas calibradoras

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

Nr. do artigo
 Norma/DIN
 Mat. de corte
 Superfície
 Tipo
 Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓡ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos, duroplásticos	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



533	534	555
DIN 344	DIN 343	DIN 1864
HSS		
N	N	N
737	740	743

634	635
DIN 343	DIN 1864
HSCO	
N	N
742	744



Vc m/min	Código VR		
27	4	4	4
20	4	4	4
28	4	4	4
25	4	4	4
22	4	4	4
20	4	4	4
18	3	3	3
15	4	4	4
8	3	3	3
23	5	5	5
15	4	4	4
8	3	3	3
10	4	4	4
8	3	3	3
10	3	3	3
6	3	3	3
6	3	3	3
5	2	2	2
8	2	2	2
6	2	2	2
5	2	2	2
20	6	6	6
20	5	5	5
18	6	6	6
16	5	5	5
3	1	1	1
5	2	2	2
4	2	2	2
60	7	7	7
60	7	7	7
36	6	6	6
36	6	6	6
40	6	6	6
50	5	5	5
50	5	5	5
30	5	5	5
30	4	4	4
25	4	4	4
15	4	4	4
15	4	4	4
15	4	4	4
25	5	5	5

Vc m/min	Código VR	
30	4	4
25	4	4
32	4	4
30	4	4
25	4	4
22	4	4
20	3	3
17	4	4
10	3	3
25	5	5
17	4	4
10	3	3
13	4	4
10	3	3
13	3	3
8	3	3
8	3	3
6	2	2
10	2	2
8	2	2
6	2	2
25	6	6
25	5	5
20	6	6
18	5	5
4	1	1
6	2	2
5	2	2
70	7	7
70	7	7
40	6	6
40	6	6
50	6	6
55	5	5
55	5	5
35	5	5
35	4	4
30	4	4
20	4	4
18	4	4
20	4	4
30	5	5

Navegador



GÜHRING NAVIGATOR Brocas para centragem

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito. Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

Nr. do artigo

Norma/DIN

Mat. de corte

Superfície

Tipo

Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓡ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos austeníticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○



581	583	585	280	292	587	588
DIN 333			WN	BS 328	DIN 333	
HSS						
○	○	○	○	○	○	○
A	R	B	B	A	A	R
668	672	675	689	680	690	691

613	614
DIN 333	
HSS	
Ⓢ	Ⓢ
A	R
669	673

381
DIN 333
HSCO
○
A
682



Vc m/min	Código VR						
30	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4
30	4	4	4	4	4	4	4
30	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4
20	4	4	4	4	4	4	4
20	3	3	3	3	3	3	3
15	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3
25	5	5	5	5	5	5	5
15	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3
10	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3
10	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3
5	2	2	2	2	2	2	2
10	3	3	3	3	3	3	3
8	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3
20	6	6	6	6	6	6	6
20	5	5	5	5	5	5	5
25	6	6	6	6	6	6	6
20	5	5	5	5	5	5	5
3	1	1	1	1	1	1	1
5	2	2	2	2	2	2	2
4	2	2	2	2	2	2	2
70	7	7	7	7	7	7	7
70	7	7	7	7	7	7	7
40	6	6	6	6	6	6	6
40	6	6	6	6	6	6	6
60	6	6	6	6	6	6	6
50	5	5	5	5	5	5	5
60	5	5	5	5	5	5	5
40	5	5	5	5	5	5	5
30	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4
25	5	5	5	5	5	5	5

Vc m/min	Código VR		Vc m/min	Código VR
35	4	4	35	4
30	4	4	30	4
35	4	4	35	4
35	4	4	35	4
30	4	4	30	4
25	4	4	25	4
22	3	3	22	3
17	4	4	17	4
10	3	3	10	3
30	5	5	30	5
18	4	4	18	4
10	3	3	10	3
13	4	4	13	4
10	3	3	10	3
13	3	3	13	3
8	3	3	8	3
8	3	3	8	3
8	2	2	8	2
15	3	3	15	3
10	3	3	10	3
8	3	3	8	3
25	6	6	25	6
25	5	5	25	5
30	6	6	30	6
25	5	5	25	5
6	1	1	6	1
6	2	2	6	2
5	2	2	5	2
50	6	6	50	6
70	6	6	70	6
60	5	5	60	5
70	5	5	70	5
45	5	5	45	5
35	4	4	35	4
30	4	4	30	4
20	4	4	20	4
18	4	4	18	4
20	4	4	20	4
30	5	5	30	5

Navegador



GÜHRING NAVIGATOR Brocas escalonadas/Brocas escalonadas cilíndrica

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito.
 Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Guhring sob www.guehring.de.

Nr. do artigo
 Norma/DIN
 Mat. de corte
 Superfície
 Tipo
 Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Ⓜ Direita
- Ⓛ Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		○
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		○
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		○
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		○
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		○
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		○
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		○
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		○
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		○
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		○
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		●
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		●
Aços para nitretação	1.8504 34CrAl6	≤1000		○
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		●
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		○
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		○
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		●
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	●
Aços temperados	-		≤48 HRC	●
			≤66 HRC	●
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		●
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		●
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	○
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	○
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	○
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	○
Fundição dura	-		≤350 HB	○
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	○
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	○
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		○
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		○
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		●
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		○
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		○
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		○
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		○
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		○
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		○
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		○
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		○
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		○
	2.0790 CuNi18Zn19Pb	≤850		○
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		○
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		○
Plásticos,duroplásticos	Bakelit, Resopal, Pertinax, Moltopren	≤150		○
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		○
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		○
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		○

Navegador



274	574	575	576
WN			
HSS			
●	●	●	●
N	N	N	N
714	715	716	717

378	1147	379	380
WN			
HSS			
○	○	○	○
N	N	N	N
718	719	720	721



Vc m/min	Código VR			
30	4	4	4	4
25	4	4	4	4
30	4	4	4	4
30	4	4	4	4
25	4	4	4	4
20	4	4	4	4
20	3	3	3	3
15	4	4	4	4
8	3	3	3	3
25	5	5	5	5
15	4	4	4	4
8	3	3	3	3
10	4	4	4	4
8	3	3	3	3
10	3	3	3	3
6	3	3	3	3
6	3	3	3	3
5	2	2	2	2
8	2	2	2	2
6	2	2	2	2
5	2	2	2	2
20	6	6	6	6
20	5	5	5	5
25	6	6	6	6
20	5	5	5	5
3	1	1	1	1
5	2	2	2	2
4	2	2	2	2
60	7	7	7	7
60	7	7	7	7
40	6	6	6	6
40	6	6	6	6
40	6	6	6	6
50	5	5	5	5
60	5	5	5	5
40	5	5	5	5
30	4	4	4	4
25	4	4	4	4
15	4	4	4	4
15	4	4	4	4
15	4	4	4	4
25	5	5	5	5

Vc m/min	Código VR			
30	4	4	4	4
25	4	4	4	4
30	4	4	4	4
30	4	4	4	4
25	4	4	4	4
20	4	4	4	4
20	3	3	3	3
15	4	4	4	4
8	3	3	3	3
25	5	5	5	5
15	4	4	4	4
8	3	3	3	3
10	4	4	4	4
8	3	3	3	3
10	3	3	3	3
6	3	3	3	3
6	3	3	3	3
5	2	2	2	2
8	2	2	2	2
6	2	2	2	2
5	2	2	2	2
20	6	6	6	6
20	5	5	5	5
25	6	6	6	6
20	5	5	5	5
3	1	1	1	1
5	2	2	2	2
4	2	2	2	2
60	7	7	7	7
60	7	7	7	7
40	6	6	6	6
40	6	6	6	6
40	6	6	6	6
50	5	5	5	5
60	5	5	5	5
40	5	5	5	5
30	4	4	4	4
25	4	4	4	4
15	4	4	4	4
15	4	4	4	4
15	4	4	4	4
25	5	5	5	5

Navegador



GÜHRING NAVIGATOR Brocas escalonadas

Deve-se dar preferência a ferramentas com o Nr. de código das séries de avanço impresso em negrito.

Para a seleção da ferramenta ideal e dos dados de corte recomendados para a sua aplicação você tem também a sua disposição uma versão eletrônica do navegador Gühring sob www.guehring.de.

Nr. do artigo

Norma/DIN

Mat. de corte

Superfície

Tipo

Progr. na página

Ø da broca mm	Código das séries de avanço								
	1	2	3	4	5	6	7	8	9
	f (mm/U)								
0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250
50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000

Refrigerante conforme o material:

- Ar
- Óleo
- Emulsão

Sentido de corte:

- Direita
- Esquerda

Grupo de materiais	Exemplos de materiais, nova denominação (denominação antiga entre parênteses) Números em negrito = Nr. do material conforme DIN EN	Res. à tração N/mm ²	Dureza	Refrig.
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2)	≤500		
	1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤1000		
Aços para máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36)	≤850		
	1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤1000		
Aços para beneficiam. sem liga	1.0402 C22, 1.1178 C30E (Ck30)	≤700		
	1.0503 C45, 1.1191 C45E (Ck45)	≤850		
	1.0601 C60, 1.1221 C60E (Ck60)	≤1000		
Aços para beneficiam. com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4	≤1000		
	1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1400		
Aços para cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850		
Aços para cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6	≤1000		
	1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1400		
Aços para nitretação	1.8504 34CrAl6	≤1000		
	1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1400		
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9	≤850		
	1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤1400		
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400		
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤350 HB	
Aços temperados	-		≤48 HRC	
			≤66 HRC	
Aços inoxidáveis, sulfurosos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤900		
austeníticos	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤1100		
martensíticos	1.4057 X20CrNi172 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤1500		
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20)		≤240 HB	
	0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)		≤350 HB	
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35)		≤240 HB	
	0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤350 HB	
Fundição dura	-		≤350 HB	
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35)		≤220 HB	
	EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6		≤300 HB	
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000)	≤1000		
	EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1400		
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000		
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2	≤850		
	3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤650		
Ligas de al fundido ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤400		
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500		
Latão, de cavacos curtos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		
de cavacos longos	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		
	2.0790 CuNi18Zn19Pb	≤850		
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	≤850		
	2.0980 CuAl11Ni, 2.1247 CuBe2	≤1000		
Plásticos, duroplásticos	Bakelit, Resopal, Pertinax, Moltopren	≤150		
termoplástico	Plexiglas, Hostalen, Novodur, Makralon	≤100		
Plást. reforç. com fibr. de aramid	Kevlar	≤1000		
Vídeos reforç. com fibr. de carb.	GFK/CFK	≤1000		

Navegador



536	569	636	638	538	514	540	637	537	639	539	520	541		
DIN 8374		WN		DIN 8376		WN		DIN 8378		WN		DIN 8377	WN	DIN 8379
HSS														
●	●	●	●	●	●	●	●	●	●	●	●	●		
N	N	N	N	N	N	N	N	N	N	N	N	N		
722	723	724	725	726	728	729	731	732	733	734	735	736		



Vc m/min	Código VR												
30	4	4	4	4	4	4	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4	4	4	4	4	4	4
30	4	4	4	4	4	4	4	4	4	4	4	4	4
30	4	4	4	4	4	4	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4	4	4	4	4	4	4
20	4	4	4	4	4	4	4	4	4	4	4	4	4
20	3	3	3	3	3	3	3	3	3	3	3	3	3
15	4	4	4	4	4	4	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3	3	3	3	3	3	3
25	5	5	5	5	5	5	5	5	5	5	5	5	5
15	4	4	4	4	4	4	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3	3	3	3	3	3	3
10	4	4	4	4	4	4	4	4	4	4	4	4	4
8	3	3	3	3	3	3	3	3	3	3	3	3	3
10	3	3	3	3	3	3	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3	3	3	3	3	3	3
6	3	3	3	3	3	3	3	3	3	3	3	3	3
5	2	2	2	2	2	2	2	2	2	2	2	2	2
8	2	2	2	2	2	2	2	2	2	2	2	2	2
6	2	2	2	2	2	2	2	2	2	2	2	2	2
5	2	2	2	2	2	2	2	2	2	2	2	2	2
20	6	6	6	6	6	6	6	6	6	6	6	6	6
20	5	5	5	5	5	5	5	5	5	5	5	5	5
25	6	6	6	6	6	6	6	6	6	6	6	6	6
20	5	5	5	5	5	5	5	5	5	5	5	5	5
3	1	1	1	1	1	1	1	1	1	1	1	1	1
5	2	2	2	2	2	2	2	2	2	2	2	2	2
4	2	2	2	2	2	2	2	2	2	2	2	2	2
60	7	7	7	7	7	7	7	7	7	7	7	7	7
60	7	7	7	7	7	7	7	7	7	7	7	7	7
40	6	6	6	6	6	6	6	6	6	6	6	6	6
40	6	6	6	6	6	6	6	6	6	6	6	6	6
40	6	6	6	6	6	6	6	6	6	6	6	6	6
50	5	5	5	5	5	5	5	5	5	5	5	5	5
60	5	5	5	5	5	5	5	5	5	5	5	5	5
40	5	5	5	5	5	5	5	5	5	5	5	5	5
30	4	4	4	4	4	4	4	4	4	4	4	4	4
25	4	4	4	4	4	4	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4	4	4	4	4	4	4
25	5	5	5	5	5	5	5	5	5	5	5	5	5

Navegador



Brocas-Ø mm a partir de	Código das séries de avanços							
	11	12	13	14	15	16	17	18
	f (mm/rotação)							
1,50	0,002	0,004	0,006	0,008	0,012	0,020	0,032	0,045
2,00	0,003	0,005	0,007	0,010	0,016	0,028	0,046	0,055
2,50	0,004	0,006	0,008	0,012	0,018	0,030	0,054	0,070
4,00	0,005	0,007	0,010	0,016	0,025	0,043	0,065	0,085
6,00	0,007	0,009	0,013	0,024	0,035	0,061	0,085	0,120
8,00	0,010	0,014	0,022	0,032	0,045	0,068	0,100	0,150
10,00	0,012	0,016	0,028	0,040	0,055	0,075	0,120	0,160
14,00	0,020	0,025	0,035	0,050	0,065	0,085	0,130	0,180
18,00	0,025	0,030	0,040	0,055	0,070	0,095	0,145	0,200
20,00	0,026	0,035	0,045	0,060	0,080	0,110	0,180	0,250
24,00	0,027	0,036	0,047	0,065	0,085	0,130	0,185	0,300
28,00	0,028	0,038	0,049	0,068	0,090	0,140	0,195	0,350
30,00	0,030	0,040	0,050	0,070	0,100	0,150	0,200	0,400
35,00	0,035	0,045	0,055	0,075	0,120	0,180	0,250	0,450
40,00	0,040	0,050	0,060	0,080	0,150	0,200	0,300	0,500

* Os valores de avanços referem-se a ferramentas com o revestimento recomendado. Em alguns casos a função da ferramenta não pode ser exercida sem revestimento.



Todas brocas canhão deverão ser guiadas ao iniciar o furo. Brocas canhão nunca devem ser movimentadas livremente com rotação plena dentro do espaço da máquina.

Dicas e truques

- Para profundidades de furos acima de 40 x D nós recomendamos a utilização de duas ou mais brocas canhão, p. ex. ø 10 x 400 mm e ø 9,95 x 800 mm.
- Brocas canhão para profundidades de furo acima de 40 x D deveriam ser introduzidas no furo piloto com giro à esquerda.
- Para a troca de ferramentas acima de 40 x D a ferramenta pode ser aquietada por ca. de 1 segundo através do desligamento da refrigeração de alta pressão.
- Para a usinagem de materiais com cavacos longos nós recomendamos a utilização de brocas canhão com canais para a saída de cavacos, polidos.
- Geralmente nós recomendamos que a emulsão contenha um teor de gordura de pelo menos 10%.
- Brocas canhão com um corte, para alumínio com cavacos longos, deveriam ser encomendadas com uma afiação de ponta com 180° e com um ressalto na câmara de óleo.
- Ao iniciar-se a furação em alumínio com menos de 1% de Si, isto é em velocidade de corte recomendada $v_c > 160$ m/min, nós recomendamos, para elevar a rotação em vários passos até atingir a rotação final. Além disso deveria executar-se um furo piloto mais profundo com ca. de 3 x D.

Os passos para furar furos profundos

- Executar um furo piloto (L = 1,5 x D, tolerância G9)
- Introduzir com rotação de 200 rpm, avanço de 500 mm/min
- Regular a pressão da refrigeração e a rotação
- Furar continuamente sem pica-pau.
- Na utilização de brocas canhão com uma grande relação comprimento-diâmetro nós recomendamos furar até uma profundidade de 25 mm com parâmetros de corte reduzidos (75% da velocidade ideal).
- Desligar o abastecimento da refrigeração após alcançar a profundidade do furo
- Voltar com avanço rápido e o fuso desligado

Refrigeração:

- Emulsão
- Óleo
- Ar

EB100

Broca canhão com um corte

MDI

0,9 ... 12,0



≤35xD

>35xD

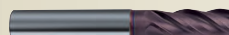
Grupo de materiais	Exemplos de material Nr. em negrito = Nr. do mat. conf. norma DIN EN	Resist. à Dureza tração N/mm²	Meios p.refr.	Revest.* recom.	≤35xD		>35xD	
					Vc m/min	Avanço Código	Vc m/min	Avanço Código
Aços de construção	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937	≤500 ≤1000	○	○	100 85	15 15	100 85	15 15
Aços p. máquinas automáticas	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb2	≤850 ≤1000	○	○	90 80	15 15	90 80	15 15
Aços p. beneficiamento sem liga	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤700 ≤850 ≤1000	○	○	80 75 75	14 14 14	80 75 75	14 14 14
Aços p. beneficiamento com liga	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	≤1000 ≤1400	○	○	75 65	14 14	75 65	14 14
Aços p. cementação sem liga	1.0301 (C10), 1.1121 C10E (Ck10)	≤850	○	○	80	15	80	15
Aços p. cementação com liga	1.7276 10CrMo11, 1.5125 11MnSi6 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5	≤1000 ≤1400	●	○	75 65	14 14	75 65	14 14
Aços para nitretação	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≤1000 ≤1400	○	○	75 65	14 14	75 65	14 14
Aços para ferramentas	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6	≤850 ≤1400	●	○	75 65	13 13	75 65	13 13
Aços rápidos	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≤1400	●	○	55	12	55	12
Aços para molas	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)	≤350 HB	●	○	65	13	65	13
Aços temperados	-	≤48 HRC ≤66 HRC	●	○	30 25	13 10	30 25	13 14
Aços inoxidáveis, sulfurosos austeníticos martensíticos	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10 1.4057 X20CrNi172 (X17CrNi16-2), 1.4122	≤900 ≤1100 ≤1500	●	○	40 35 35	14 14 14	40 35 35	14 14 14
Ferro fundido	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)	≤240 HB ≤350 HB	○	○	85 80	16 16	85 85	16 16
Fundição nodular e fundição maleável	0.7050 EN-GJS-500-7 (GGG50), 0.8035 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2	≤240 HB ≤350 HB	○	○	80 70	15 15	80 70	15 15
Fundição dura	-	≤350 HB	○	○	55	14	55	14
Novos materiais fundidos GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo 6	≤220 HB ≤300 HB	○	○				
Novos materiais fundidos ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	≤1000 ≤1400	○	○				
Ligas especiais	Nimonic, Inconel, Monel, Hastelloy	≤2000	○	○	20	12	20	12
Titânio e ligas de titânio	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	≤850 ≤1400	○	○	35 30	12 12	35 30	12 12
Alumínio e ligas de alumínio	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400	○	○	150	17	150	17
Ligas de alumínio forjáveis	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si	≤650	○	○	120	19	120	19
Ligas de Al fundido ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600	○	○	120 130	20 18	120 130	20 18
Ligas de magnésio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05	≤400	○	○	110	17	110	17
Cobre, de liga baixa	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤500	○	○	75	15	75	15
Latão, de cavacos curtos de cavacos longos	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600	○	○	120 90	18 18	120 90	18 18
Bronzes, de cavacos curtos	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 2.0790 CuNi18Zn19Pb	≤600 ≤850	○	○	95 75	17 17	95 75	17 17
Bronzes, de cavacos longos	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl1Ni, 2.1247 CuBe2	≤850 ≤1000	○	○	70 60	17 17	70 60	17 17
Plásticos, duroplásticos termoplástico	Bakelit, Resopal, Pertinax, Moltopren Plexiglas, Hostalen, Novodur, Makralon	≤150 ≤100	○	○	75 70	15 15	75 70	15 15
com fibras de aramid	Kevlar	≤1000	○	○	60	14	60	14
com fibras de carbono	GFK/CFK	≤1000	○	○	50	14	50	14



Procedimento

Para obter-se resultados ideais na usinagem de furos profundos principalmente ao iniciar-se os furos sobre raios ou superfícies irregulares nós recomendamos os seguintes passos:

1. Fresar uma superfície, p. ex. com uma fresa Gühring Ratio RF 100 U inclusive com corte central. A superfície deverá ser executada com um ângulo reto em relação ao ângulo de entrada da furação.
2. Executar um furo piloto cilíndrico (tolerância G9) com uma profundidade de pelo menos 1 x D. Para isso recomendamos a nossa broca Ratio RT 100 U ou respectivamente a broca RT 100 F. Graças a seu ângulo da ponta de 140° e sua tolerância de diâmetro m7 estas brocas Ratio são as mais adequadas para esta usinagem.
3. Introduzir a broca no furo piloto com ca. 300 rpm com um avanço de ca. 500 mm/min.
4. Regular a pressão de refrigeração e as rpm.
5. Furar continuamente até a profundidade final sem ciclo de expulsão dos cavacos (picapau).
6. Em furos passantes com saída reta, isto é 90°, reduzir a velocidade de avanço para 50% ca. de 1 mm antes da saída.
7. Em furos passantes com saída inclinada, reduzir a velocidade de avanço para 40% ca. de 1 mm antes da saída.
8. Ao atingir a profundidade do furo desligar as rotações e a refrigeração, e sair em velocidade de avanço rápida.



Fresa Ratio RF 100 U, Gühring artigo Nr. 3736

Graças a seus ângulos de hélice desiguais a fresa Ratio RT 100 U com revestimento Fire oferece elevados avanços e vida útil nas usinagens de acabamento e desbaste em aço e materiais fundidos, como também, em Ti e ligas Ni.



Broca Ratio RT 100 U, artigo Nr. 2477

Broca Ratio RT 100 F, artigo Nr. 1660

Graças a sua geometria de corte especial as brocas Ratio Gühring distinguem-se por uma muito boa autocentragem e exato alinhamento dos furos. O tipo U é especialmente adequado para a usinagem de aços de construção e AISi altamente ligado, o tipo F para aços altamente ligados, inoxidáveis e resistentes a ácidos e ao calor, como também, para Al e ligas de Al, Mg e ligas de Mg, Ti e ligas de Ti.

EB80

Broca canhão com um corte
Cabeça-metal duro integral

2,0 ... 40,0



ZB80

Broca canhão com dois cortes
Cabeça-metal duro integral

6,0 ... 27,0



EB800

Broca canhão com um corte
Com pastilhas intercambiáveis

12,0 ... 40,0



Revest.* recom.	≤35xD		>35xD		Revest.* recom.	≤35xD		>35xD		Revest.* recom.	≤35xD		>35xD		
	Vc m/min	Avanço Código	Vc m/min	Avanço Código		Vc m/min	Avanço Código	Vc m/min	Avanço Código		Vc m/min	Avanço Código	Vc m/min	Avanço Código	
T	100	14	95	13							T	90	15	85	15
T	85	14	80	13							T	80	15	75	15
T	90	14	85	13							T	85	16	80	16
T	80	14	75	13							T	75	16	70	16
T	90	13	85	12							T	85	15	80	15
T	80	13	75	12							T	80	15	75	15
T	75	13	70	12							T	75	15	70	15
T	75	13	70	12							T	75	15	70	15
T	65	13	60	12							T	65	15	60	15
T	80	14	75	13							T	80	15	75	15
T	75	13	70	12							T	75	15	70	15
T	65	13	60	12							T	70	15	65	15
C	75	13	70	12							T	70	15	65	15
C	65	13	60	12							T	60	15	55	15
C	75	12	70	11							T	65	14	60	14
C	65	12	60	11							T	60	14	55	14
C	55	11	50	11							T	55	14	50	14
C	65	12	60	12							T	65	15	60	15
C	30	12	25	11							T	30	13	25	13
C	25	11	20	11							T	25	12	20	12
C	55	13	50	12							T	50	14	45	14
C	45	13	40	12							F	45	14	40	14
C	35	13	35	12							F	40	14	35	14
	85	15	80	14		85	18	80	17		F	85	16	80	16
	80	15	75	14		80	18	75	17		F	80	16	75	16
	80	14	75	13		75	17	70	16		F	75	16	70	16
	70	14	65	13		70	17	65	16		T	70	16	65	16
	55	13	50	12		65	16	60	15		F	55	15	50	15
C	20	11	20	11							F	25	13	20	13
C	35	11	30	11							F	35	13	30	13
C	30	11	25	11							F	30	12	25	12
C	150	16	140	15		120	18	115	17		F	140	16	135	16
C	120	15	115	14		110	18	105	17		F	125	16	120	16
C	150	16	140	15		135	18	130	17		F	170	17	165	17
C	130	16	120	15		120	17	115	16		F	140	17	135	17
C	110	16	100	15							F	115	16	110	16
C	75	14	70	13							F	75	15	70	15
C	120	17	115	16		130	18	125	17		F	120	17	115	17
C	90	17	85	16		120	18	115	17		F	90	17	85	17
C	95	16	90	15		110	17	105	16		F	95	17	90	17
C	75	16	70	15		110	17	105	16		F	75	17	70	17
C	70	16	65	15		95	17	90	16		F	70	17	65	17
C	60	16	55	15		95	17	90	16		F	60	17	55	17
C	75	14	70	13							F	75	16	70	16
C	70	14	65	13							F	70	16	65	16
C	60	13	55	12							F	60	15	55	15
C	50	13	45	12							F	50	15	45	15





l3

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RT 100 TRIGON®

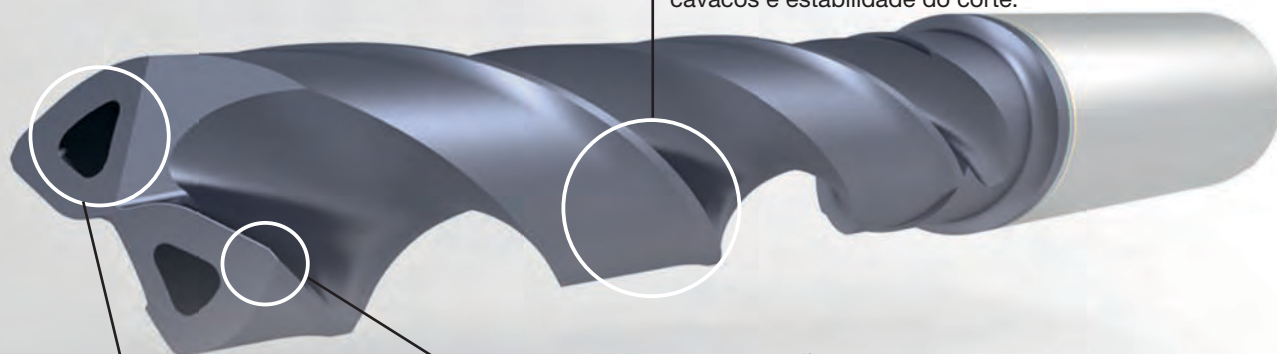
Design de canal de refrigeração inovador para refrigeração eficiente

Altas taxas de cromo e níquel levam os aços inoxidáveis a uma elevada resistência, inclusive a corrosão. Mas com isso porém piora a usabilidade do material e as temperaturas do processo se elevam.

A inovadora geometria do canal de refrigeração da broca RT 100 TRIGON possibilita altas velocidades de corte e altas taxas de avanço.

Forma do canal

Uma forma de canal especialmente desenvolvida com a máxima qualidade superficial, como também a afiação de 4 arestas, garantem ótimas formação de cavacos e estabilidade do corte.



Preparação dos cantos de corte

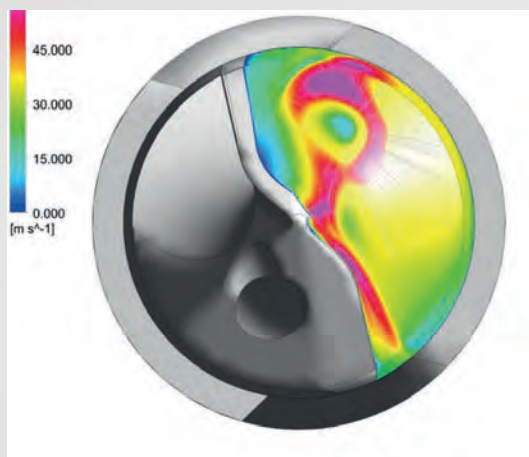
O revestimento a base de TiAlN e a preparação especial dos cantos de corte levam a uma alta resistência ao desgaste ao já fortemente solicitado corte da ferramenta.



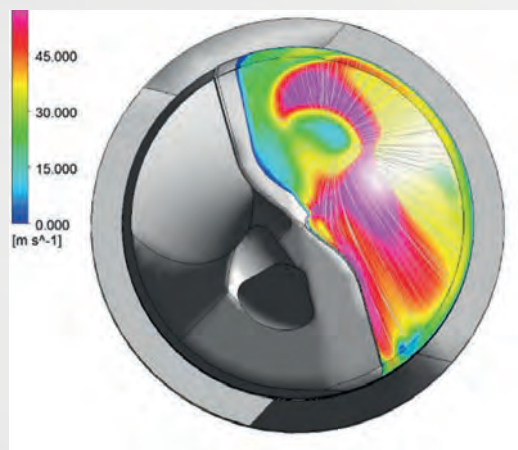
Através da nova forma dos canais de refrigeração, o volume de refrigeração, a velocidade e o sentido do fluxo serão otimizados, e as extremas temperaturas do processo serão idealmente eliminadas. Em comparação aos canais de

refrigeração redondos clássicos o fluido de refrigeração será direcionado exatamente às áreas mais solicitadas, a aresta principal de corte e as pontas de corte.

Canal de refrigeração clássico



Canal de refrigeração com design TRIGON®



Comparação do comportamento do fluxo



RT 100 C

A broca Ratio para a usinagem de aços com cavacos longos

Geometria de cortes

As arestas principais de formato concavo levam a perfeitos cortes e penetração na usinagem de materiais com cavacos longos. As forças e as temperaturas do processo são nitidamente reduzidas.

Forma do canal

Uma forma de canais com perfil estreito especialmente orientada para aços com cavacos longos garante um ótimo desempenho na formação dos cavacos inclusive em velocidades de corte baixas.

Altas qualidades de superfície e um novo tipo de revestimento com superfície muito lisa levam a um ótimo transporte dos cavacos. As altas temperaturas do processo são eliminadas com segurança

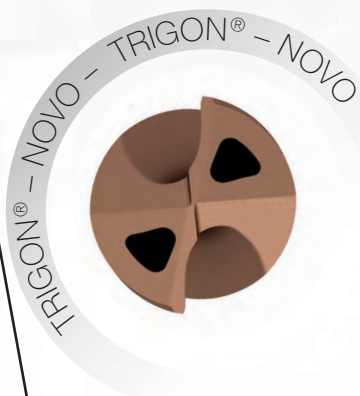
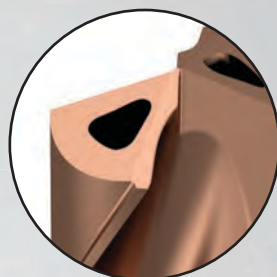
- Ferramenta especial
- Ø 3-20 mm
- Profundidade de furação até 7xD
- a partir de Ø 6,0 mm com novo design de canal de refrigeração TRIGON®

Novo design do canal de refrigeração

Através da nova forma dos canais de refrigeração, o volume de refrigeração, a velocidade e o sentido do fluxo serão otimizados, e as extremas temperaturas do processo serão idealmente eliminadas. Em comparação aos canais de refrigeração redondos clássicos o fluido de refrigeração será direcionado exatamente às áreas mais solicitadas, a aresta principal de corte e as pontas de corte.

Preparação dos cantos de corte

Através de uma preparação especial dos cantos de corte, complementada com uma geometria especial dos cantos e uma excepcional qualidade de superfície, as vidas das ferramentas podem ser nitidamente elevadas. Adicionalmente age se contra a formação de de micro lascas e de arestas postiças





RT 100 AL

A nova broca MDI para a usinagem de materiais de alumínio

Nas ferramentas para furação de alumínio, além da formação dos cavacos, também o transporte destes é de extrema importância. Com a broca RT 100 AL é atingida uma ótima formação de cavacos em toda a gama de materiais - desde as ligas de alumínio forjáveis moles tenazes até as ligas de alumínio fundidas com alto teor de silício.

Qualidade de superfície extremamente alta nas áreas de redução das arestas, superfícies de saída e de folga.

- Redução das temperaturas do processo
- Evita as arestas postiças

geometria de ponta aberta e forma dos cantos de corte

- ótimo desempenho na formação dos cavacos

A broca RT 100 AL destaca-se através da alta qualidade superficial na redução das arestas, superfícies de saída e de folga. Os cantos e ponta de corte com micro tratamento completam a geometria da ponta e levam a um desempenho perfeito de corte, baixas temperaturas de processo evitam a formação de arestas postiças na usinagem de alumínio.

Cantos de corte agudos com micro tratamento

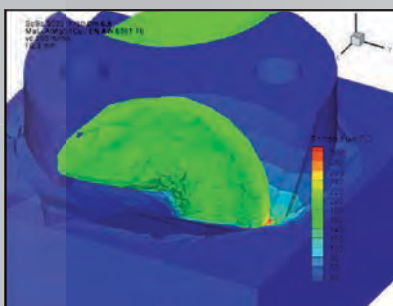
- desempenho perfeito do corte, também em ligas-ALSi térmicamente tratadas
- rompimento curto dos cavacos também em ligas de alumínio forjáveis

Perfil do canal

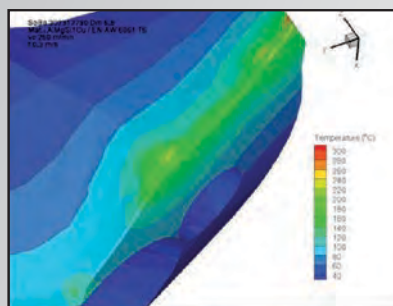
- canal polido para ótimo escoamento dos cavacos
- redução do atrito
- Eliminação da formação de arestas postiças



Formação dos cavacos



Distribuição da temperatura no corte



As ferramentas são executadas na forma brilhante, para alúminios fortemente abrasivos é possível a aplicação de um revestimento adicional na cabeça da ferramenta para o aumento de sua vida útil.

Dimensões especiais como também escalonamentos simples ou múltiplos são igualmente possíveis de serem fornecidos sob consulta.



Plásticos reforçados com fibras (FRP)

Devido a eficiência, redução do peso, resistência ou da dinâmica os plásticos ligados com fibras (FRP) modernos tem dado entrada numa grande massa de aplicação industriais. Com suas qualidades específicas eles ampliam o grupo dos clássicos materiais leves como ligas de alumínio e de titânio. Os FRP ou também sistemas multi materiais, uma mistura de FRP e materiais metálicos, não se tornam exclusivamente reservados as aplicações aeronáuticas e espaciais, esportes a motor e outras aplicações de ponta.

Deve ser destacado especialmente o grande crescimento na técnica de energia e de meios de transporte, no setor de energia eólica como também na construção de máquinas em geral. FRP são empregados em toda parte, onde se procura alta resistência específica com pouco peso, altos processos dinâmicos ou processos eficientes de energia.

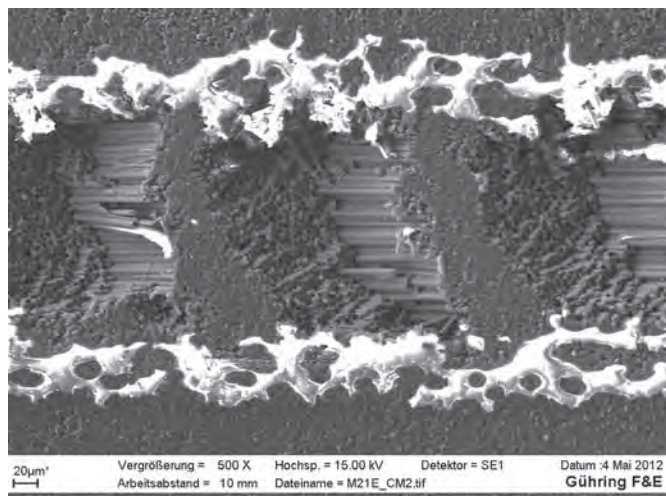
Desde meados dos anos 1980 a Guhring oferece soluções de ferramentas nas áreas standard e especiais para a usinagem de FRP. Esta experiência de longos anos levou ao desenvolvimento das mais diversas ferramentas especiais de alto rendimento, adaptadas a diversas condições e casos de utilização como furação guiada manualmente, furação com unidades de avanço, usinagem através de robôs ou usinagem em centros de usinagem convencional

As ferramentas Guhring para a usinagem de FRP preenchem as exigências fundamentais na usinagem de modernos materiais leves.

- Peças sem fibras salientes
- superfícies de peças livres de delaminação
- nenhum dano na peça através de „Peelup“ ou „Pushout“
- impedir rupturas das fibras „Pullouts“ nas peças
- minimizar a formação de rebarbas
- impedir danos térmicos

Para a usinagem de materiais FRP sem danos nas peças a qualidade dos cantos de corte e a resistência ao desgaste do material de corte são de decisiva importância. Condição para um processo de separação seguro na forte ação abrasiva

das fibras, especialmente em materiais com participação do volume de fibras de mais de 55 por cento, é um canto de corte bem agudo.



Superfície de corte CFK ampliada 500 vezes

Com o microscópio reticulado eletrônico pode se reconhecer após a usinagem com ferramentas da Guhring, que a estrutura e a direção das fibras na peça permanecem preservadas. As fibras não são prensadas na matriz, nem são arrancadas da liga.

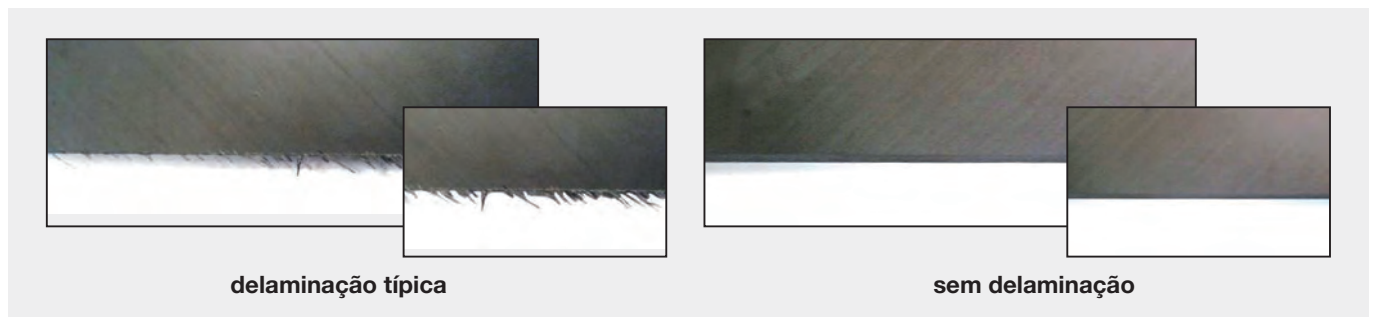


GFK / CFK

Plásticos reforçados com fibras de vidro (GFK) são empregados industrialmente em grandes quantidades em energia eólica, como também nas áreas de transporte e de construção. GFK geralmente são utilizados em peças que sofrem cargas moderadas, geralmente peças concavas com grande superfície. As peças GFK que suportam menos carga nisto em muitos casos são preferidas até em relação às peças mais leves (CFK) plástico reforçado com fibras de carbono, porque são produzidas a menor custo e mais facilmente usáveis.

O plástico reforçado com fibras de carbono (CFK), na forma de uma peça, muitas vezes chamado de carbono, destaca-se em relação ao GFK através de sua resistência nitidamente mais elevada. As fibras de carbono puras de acordo com o processo de fabricação e diâmetro da fibra ultrapassam em muitas vezes a resistência de materiais de aço e ao mesmo tempo com peso bem menor. Devido a isto o CFK é quase exclusivamente utilizado em peças de estruturas que sofrem altas cargas.

Para a formatação da peça, introdução das forças e proteção das fibras, estas no caso de CFK e GFK, são embutidas numa matriz. A proporção das fibras em relação à matriz determina a assim chamada participação do volume de fibras e no caso de peças CFK submetidas a altas cargas fica em até 65 por cento. Para a usinagem de acabamento destas peças, ao lado do tipo de fibra também deverá ser observado o alinhamento das fibras. O alinhamento das fibras em materiais CFK é um fator determinante para a tendência do material para a delaminação e arrancamento das fibras. Assim posições unidirecionais tendem a uma acentuada delaminação especialmente na saída dos furos. Esta tendência à delaminação deverá ser evitada mediante a geometria da ferramenta.



A usinagem de materiais CFK e GFK exige, especialmente nas fibras fortemente sujeitas a abrasão, soluções adaptadas de ferramentas. Para evitar os danos típicos na peça de FRP

a Guhring oferece ferramentas específicas de alto rendimento que direcionam as forças de corte durante a usinagem.





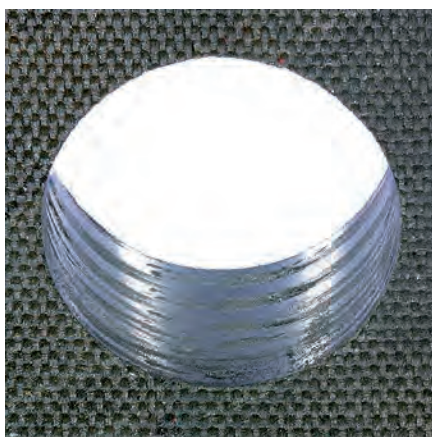
Furação de FRP

Na furação são utilizadas ferramentas para furar específicas para o material com diversas geometrias de ponta. Através de ferramentas adaptadas as fibras podem ser separadas tanto

em posição unidirecional quanto em camadas e a delaminação pode ser evitada na superfície da peça na entrada- e na saída („Peel up“) / „Push out“) da ferramenta como também na peça.



Furo D = 6,35 mm
com fibras salientes na camada superior e delaminações



Furo D = 6,35 mm
CFK com tramas na posição correta
ótima qualidade da usinagem



Furo D = 6,35 mm
CFK unidirecional
com ótima qualidade de usinagem

Materiais-Stack

Como materiais Stack, abreviadamente Stacks, designa-se a combinação de pelo menos dois materiais diversos com diferentes características. Combinações frequentes de materiais utilizadas em construções leves são CFK/Titânio como também CFK/alumínio. Também porém são possíveis combinações dos materiais CFK, titânio, aços nobres e alumínio em diferentes composições. Para juntar elementos de ligação estes diversos materiais deverão ser trabalhados conjuntamente em um processo. O desafio para as ferramentas de corte durante a usinagem decorre das muito diferentes características dos materiais e estratégias de usinagem dos materiais combinados. Na usinagem de Stacks de CFK/Titânio o CFK atua abrasivamente e leva rapidamente a um arredondamento dos cortes da ferramenta. Por outro lado o titânio é muito tenaz e provoca por sua baixa condutividade de calor altas temperaturas na usinagem. Na usinagem surgem rapidamente muitos danos no CFK devido as altas forças e temperaturas na usinagem. Apesar das diferentes características dos materiais deverá ser garantida a manutenção das dimensões durante uma longa vida útil da ferramenta.

A Guhring oferece também para este grupo de materiais soluções especiais de ferramentas de metal duro integral (MDI), metal duro revestido e cortes providos de PCD. Estas são especialmente adaptadas ao respectivo material e garantem o transporte dos cavacos como também a uniformidade no diâmetro dos furos para todos materiais.





Superfícies de folga estruturadas com laser

Otimização da vida da ferramenta graças ao fluido refrigerante ser guiado diretamente para o local de destino

Na usinagem de furos uma grande quantidade do fluido de refrigeração não alcança sempre o efeito desejado, já que sua subministração também deve ser dirigida. Para isso a usinagem a laser de ferramentas oferece novas possibilidades de desenvolvimento. Importantes parafusos de regulação para influenciar a refrigeração ao furar apresentam a seção dos canais de refrigeração e sua localização dentro da superfície de folga. Além disso estruturas dentro das superfícies de folga como também das superfícies ao lado podem influenciar o comportamento do fluxo do fluido de refrigeração. Essas

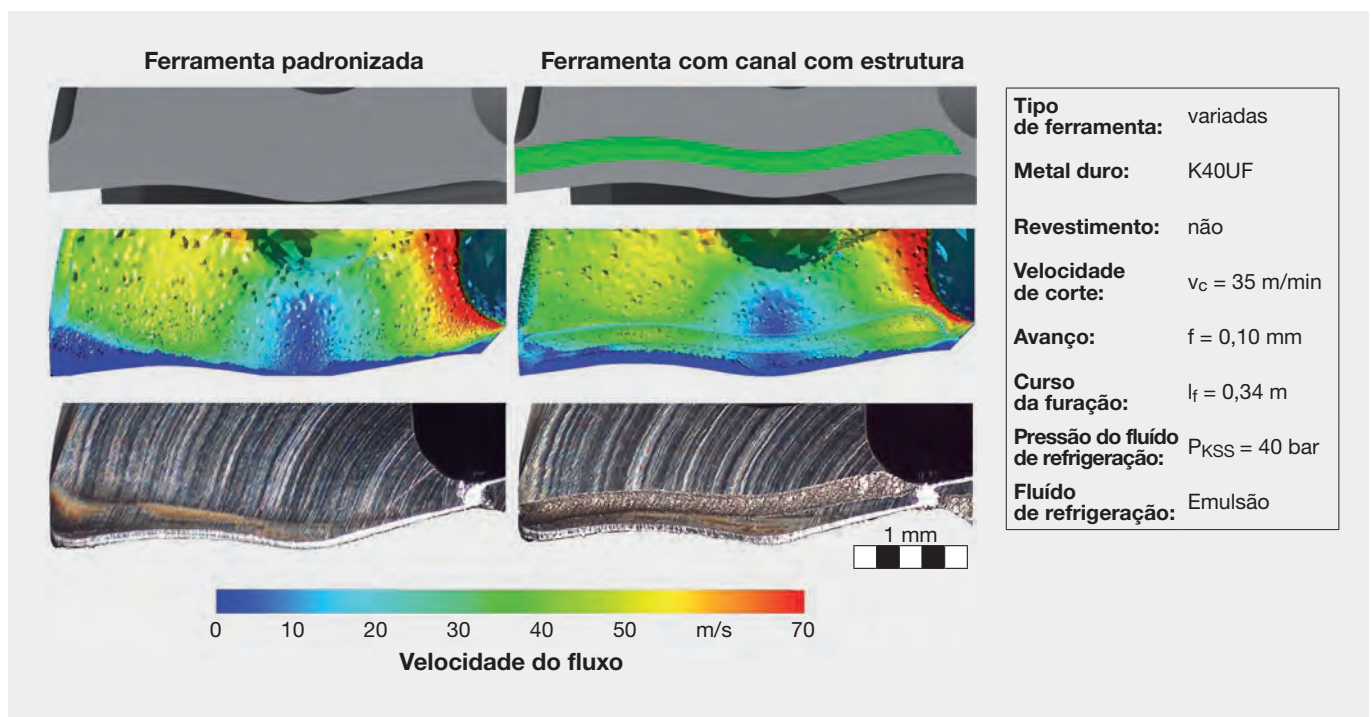
Simulação com Computational Fluid Dynamics (CFD)

Através do emprego de uma simulação-CFD a influência, do diâmetro do canal de refrigeração como também das estruturas introduzidas, sobre o fluxo da refrigeração pode ser analisada detalhadamente. As primeiras análises foram efetuadas numa estrutura de canal simples, que estavam a uma distância constante de aproximadamente 150 μm do corte. Esse canal apresentou uma profundidade de aproximadamente 50 μm . Simulações-CFD executadas comprovam uma influência vantajosa do fluxo do refrigerante e uma refrigeração melhor em áreas térmicamente altamente carregadas. Áreas maiores próximas ao canto de corte, que anteriormente quase não foram alcançadas pelo fluido de refrigeração devido as reduzidas dimensões entre a superfície de folga e fundo do furo, recebem uma refrigeração maior através do direcionamento

estruturas são introduzidas através de usinagem a laser. A meta é conduzir o fluido de refrigeração dentro das zonas altamente carregadas da ferramenta, especialmente as que são submetidas a altas cargas térmicas. A isso pertence por exemplo o chanfro de guia ou o canto de corte. A carga reduzida deve reduzir o desgaste e adicionalmente elevar a vida útil da ferramenta. Casos de utilização são todas operações de furação, nas quais as ferramentas são submetidas a elevadas cargas térmicas. Através da melhor refrigeração acompanhada de temperaturas menores aperfeiçoa-se a qualidade dos furos

do fluxo, como também, do derramamento na área.

Os depósitos marrons sobre as superfícies de folga nas ferramentas utilizadas na usinagem de níquel com base de Inconel 718 comprovam o maior rendimento da refrigeração nessas áreas. Tanto a dilatação da área quanto a intensidade dos depósitos formados pelo fluido de refrigeração queimado, reduz o canal nas áreas entre o canto de corte e a estrutura a laser. Assim a carga térmica reduzida eleva as vidas úteis almeçadas e aperfeiçoa a qualidade realizável do furo na usinagem de Inconel 418.

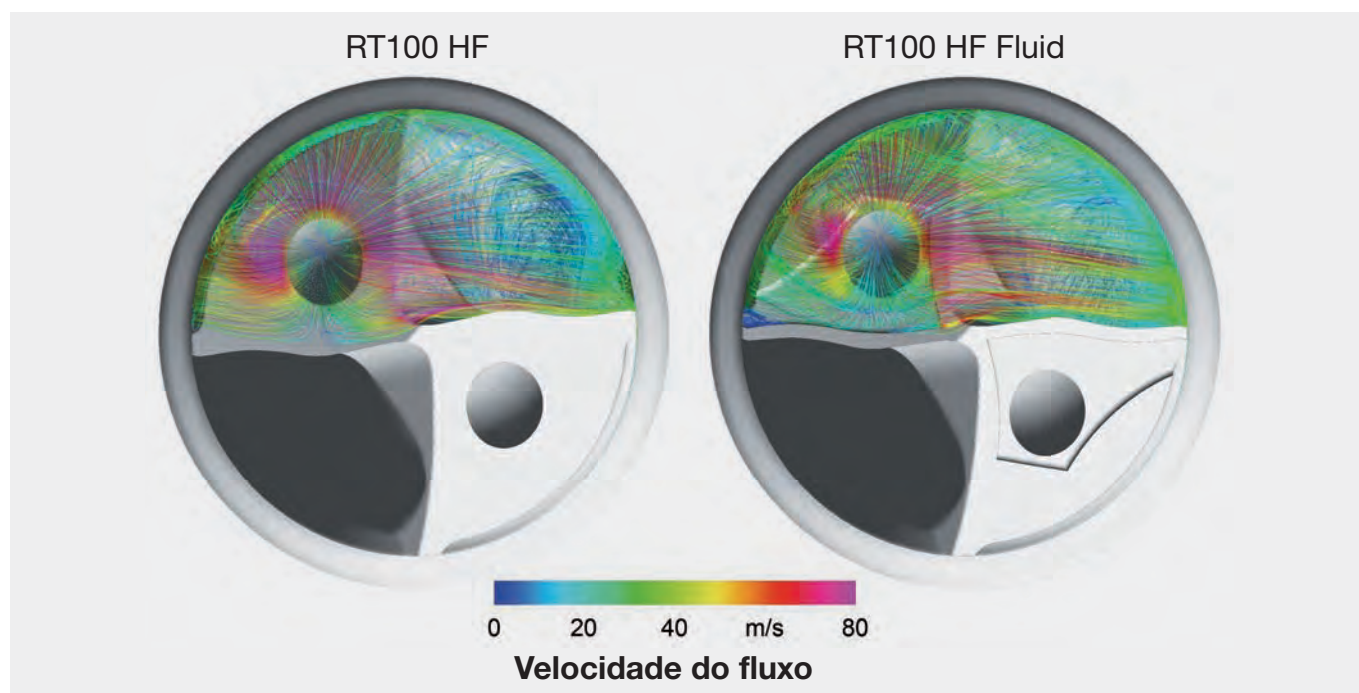




Observação sobre estruturas complexas

Baseados nos resultados das estruturas simples partiu-se para o desenvolvimento de formas mais complexas, para aperfeiçoar-se o direcionamento do fluxo de refrigeração. Já que a usinagem a laser oferece uma ampla liberdade de criação, foram implementadas significativas e mais dispendiosas formas que não poderiam ser criadas com essas características por outros processos de usinagem. As adaptações das estruturas a laser englobam tanto forma quanto localização e profundidade de remoção de material, para garantir uma ótima refrigeração. Também aqui foi utilizada a simulação CFD, para analisar detalhadamente as influências das diversas formas sobre o comportamento do fluxo de refrigeração como a formação de turbilhonamento na área do canto de corte, que amplia adicionalmente a ação da refrigeração.

Com a estrutura para o direcionamento da refrigeração, a partir da estrutura simples foram possíveis consideráveis aperfeiçoamentos com respeito ao comportamento do desgaste das ferramentas para furar. Paralelamente ao desenvolvimento da estrutura sucederam-se estudos sobre a usinagem a laser mesmo, para evitar danos periféricos como superfícies muito ásperas, que poderiam influenciar desfavoravelmente o fluxo. A atual usinagem a laser independentemente do metal duro a ser usinado procura obter qualidades superficiais de $Rz < 5 \mu\text{m}$, sem causar danos periféricos que possam limitar o rendimento. Também a aderência de revestimentos de ferramentas não está sujeita a nenhuma influência relevante através da estrutura da superfície de folga.



Área de utilização

Deverão ser utilizadas ferramentas modificadas especialmente em materiais, cuja usinagem está sujeita a uma elevada carga térmica. Esse é o caso em aços inoxidáveis, ligas de titânio como também ligas a base de níquel entre outros. Os desenvolvimentos atuais são levados adiante baseados na usinagem de Inconel 718.

Suas características exigem extremas cargas termomecânicas e limitam com isso consideravelmente a vida útil das ferramentas como também a produtividade. Uma influência objetiva do fluxo de refrigeração oferece considerável potencial, para otimizar essa usinagem.



Otimização de processos através de usinagem com sobreposição de movimento

A usinagem de novos materiais, começando com materiais reforçados com fibra, através de materiais muito tenazes como titânio ou ligas de cobre até materiais friáveis como materiais cerâmicos, com extremo desgaste e formação de cavacos apresenta um desafio para a usinagem convencional. Novas abordagens para a otimização de processos através

Observação fundamental

Na sobreposição de movimentos axiais sobre o avanço contínuo, conforme o caso, são utilizadas diversas gamas de frequência com poucos Hertz até milhares de Hertz. Adicionalmente ocorrem uma modificação definida do ângulo do sentido da ação e um aumento na velocidade do corte da ferramenta em relação a peça. Dependendo do caso de utilização e do tipo de ferramenta serão alcançados diversos efeitos através de um cisalhamento com vibrações sustentadas.

- formação mais favorável de cavacos / quebra de cavacos melhorada
- melhor transporte de cavacos
- gerar pontos definidos de quebra dos cavacos
- diminuição da formação de arestas postiças
- prolongamento da vida útil da ferramenta
- menores forças de trabalho
- temperaturas mais baixas

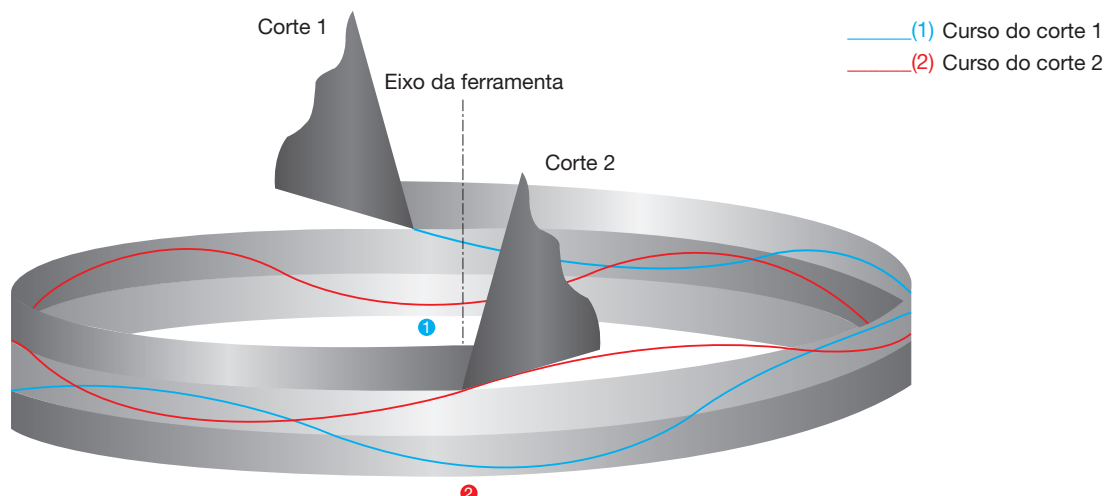
1.) Impulso de baixa frequência

No impulso de baixa frequência serão utilizadas frequências até 1 kHz e amplitudes até 0,5 mm. A essa categoria contam também contam o esvaziamento programado dos cavacos através do afastamento da ferramenta e de tempos de espera devido a uma interrupção do movimento de avanço. Centros de usinagem convencionais não permitem elevar arbitrariamente esse movimento descontínuo de avanço devido a limitação da dinâmica dos movimentos dos eixos. Para alcançar movimentos sobrepostos com frequências, que correspondem

de sobreposição de movimentos no sentido do avanço abrem novas possibilidades para o aperfeiçoamento da formação de cavacos, forças de processos reduzidas e qualidade mais elevada nas superfícies produzidas como também maximizar as vidas úteis visadas.

Atualmente a usinagem com sobreposição de movimento é utilizado no corte de materiais difíceis de cisalhar como superalloys, materiais reforçados com fibra e materiais Stack, mas também ligas com cavacos longos como por exemplo ligas de cobre sem chumbo. Na vibração sobreposta deverá ser distinguido entre vibrações de baixa frequência e de alta frequência.

a muitas vezes a rotação da árvore, são utilizados caixas de velocidades especiais. Essas caixas de velocidades podem ser integradas diretamente a máquina ou de uma execução como cabeçote sobre a árvore. O avanço é feito através de uma caixa de engrenagens no eixo de avanço ou por meio de curvas. Diferentemente do corte com seção de cavaco constante ao furar com avanço constante, obtém-se com sobreposição de um movimento axial uma seção de cavaco variável.





As frequências axiais baixas dos movimentos sobrepostos possibilitam também a formação de cavacos com comprimento e seção definidos em materiais muito dúteis. A amplitude do movimento axial sobreposto controla assim a espessura máxima do cavaco. A regulagem da espessura pode, ser variada desde o estrangulamentos na seção do cavaco até o

afastamento do corte da superfície superior da peça e com isso interromper a formação do cavaco. Assim a frequência acoplada com as rotações, geralmente mecânica, decide sobre a distância entre os estrangulamentos e eventualmente quantidade dos processos de afastamento por rotação da ferramenta.

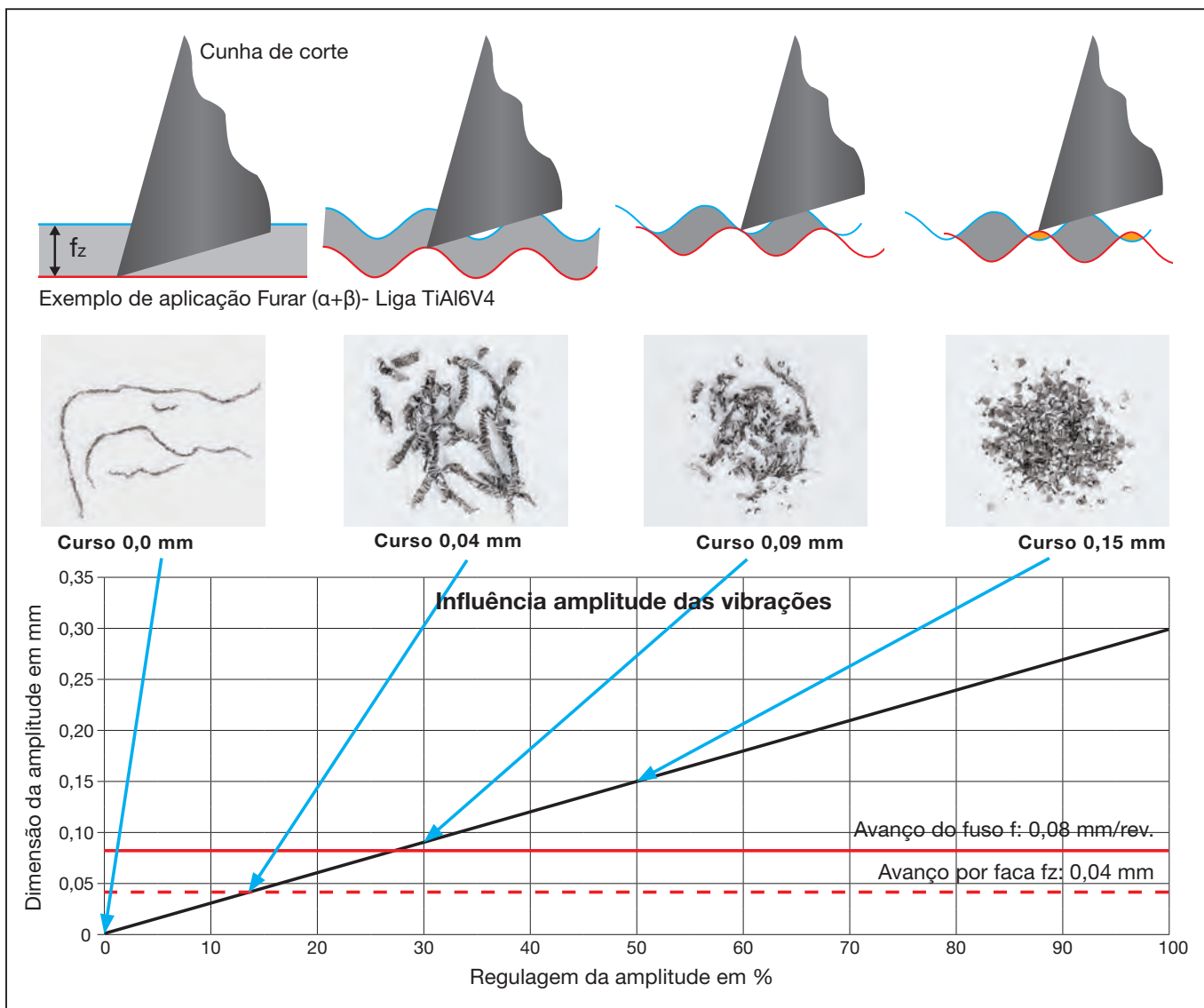
Influência da sobreposição de vibrações sobre a formação dos cavacos

Em um teste foram feitos furos em uma liga usual de titânio (TiAl6V4), onde foi variada a amplitude da vibração. Todos os testes foram efetuados com ferramentas para furar idênticas com diâmetro $d = 6,35$ mm completamente a seco. Os valores de corte foram $vc = 30$ m/min e $f = 0,08$ mm/R.

A observação dos cavacos mostra claramente a influência da amplitude sobre a formação do cavaco. Já em uma amplitude igual a espessura do cavaco o comprimento do cavaco foi nitidamente encurtado. Para se produzir, sem exceção, cavacos muito curtos em materiais dúcteis deve-se eleger uma

amplitude claramente maior que o avanço dos cortes. Com isso o corte se afasta completamente da face superior da peça e o processo de formação de cavacos é proposadamente interrompido.

Na usinagem de combinações de materiais híbridos, assim chamados sanduíches ou materiais-Stack a usinagem com sobreposição de vibrações já se estabeleceu. Aqui evita-se especialmente com a garantia do rompimento do cavaco enxaguamentos nas camadas das fibras das ligas e reduz-se globalmente as temperaturas.

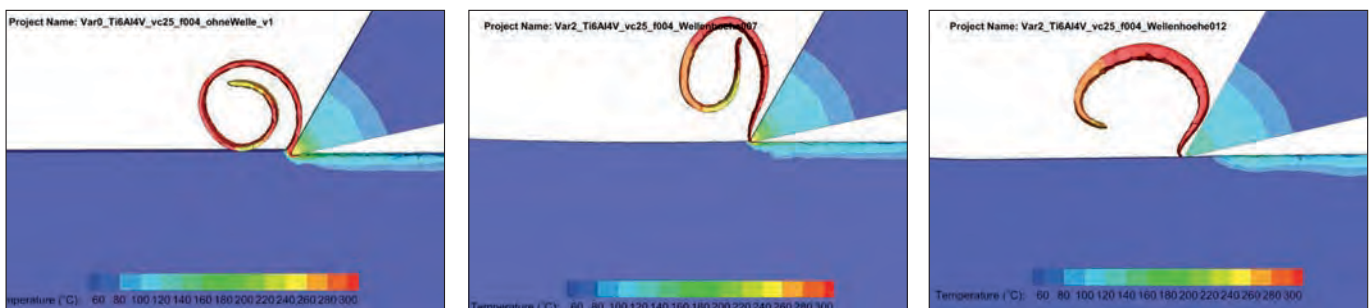




Influência da sobreposição de vibrações sobre a temperatura de processo

Com a ajuda do método de elementos finitos (FEM) é simulada a formação dos cavacos no canto de corte para diversas condições de utilização. As seguintes figuras mostram a formação de cavacos em uma simulação-FEM. As conclusões da simulação mostram a elevação da espessura dos cavacos

e o encurtamento dos cavacos com a amplitude da vibração. Além disso mostra-se que com um corte contínuo sem curso é alcançado um nível de temperatura mais alto no canto de corte

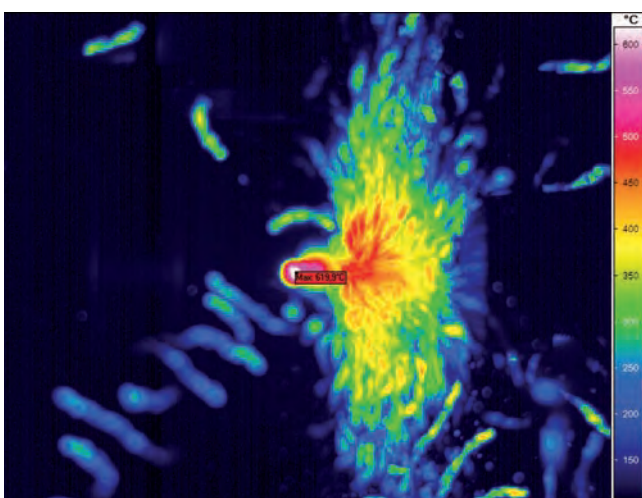


Isso fica especialmente claro na comparação das temperaturas no cisalhamento de combinações de CFK/titânio. No teste foram utilizadas ferramentas para furar idênticas com diâmetro $d = 6,35$ mm a seco. Os valores de corte $vc = 30$ m/min e $f = 0,08$ mm/R.

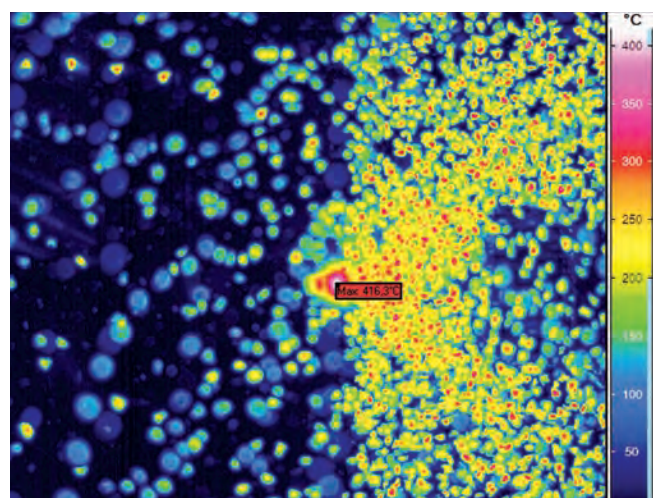
Por meio de uma câmara termográfica o calor gerado na usinagem de material Stack-CFK/titânio foi tirado em tempo real. A placa de teste tinha uma espessura total de 20 mm, 6 mm CFK e 14 mm titânio (TiAl6V4). Essa foi furada de tal modo que a parede restante tinha 1,5 mm em relação a superfície lateral da placa. A comparação da temperatura dos cortes da broca diretamente na saída da parte inferior

do material como também a temperatura do cavaco por meio da apresentação acumulada mostram a diferença entre a usinagem convencional e a usinagem com sobreposição de vibração. Sem sobreposição de vibração foi medida no teste uma temperatura máxima acima de 600°C no corte. Na usinagem com sobreposição de vibração sob condições idênticas a temperatura máxima reduziu-se em cerca de um terço a abaixo de 450°C . Além disso pela melhor quebra do cavaco foi obtida uma claramente melhor qualidade no furo e um aumento da vida útil da ferramenta.

Fotografia usinagem Stack CFK/ ($\alpha+\beta$)- liga TiAl6V4



Convencional a seco
 ϑ_{max} : 619°C



Com auxílio de vibrações a seco
 ϑ_{max} : 416°C



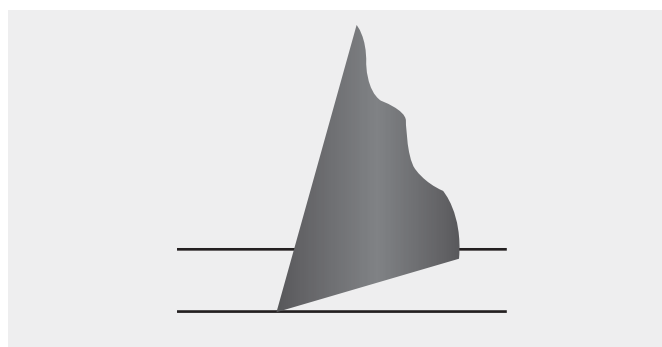
2.) Impulso com alta frequência (com apoio de ultrassom))

No processo de usinagem impulsionado com alta frequência - também chamado de ultrassom suportado- há uma sobreposição do processo convencional cinemático com uma movimentação oscilante da ferramenta no sentido radial, que frente ao impulso de baixa frequência com $> 16...55$ kHz mostra uma frequência claramente mais alta. A amplitude máxima alcançável na ponta da ferramenta, que fica entre $2...30$ μm , é fortemente dependente da combinação da ferramenta, sistema de impulso e rendimento introduzido, já que a oscilação resulta do impulso da ferramenta com sua frequência de ressonância.

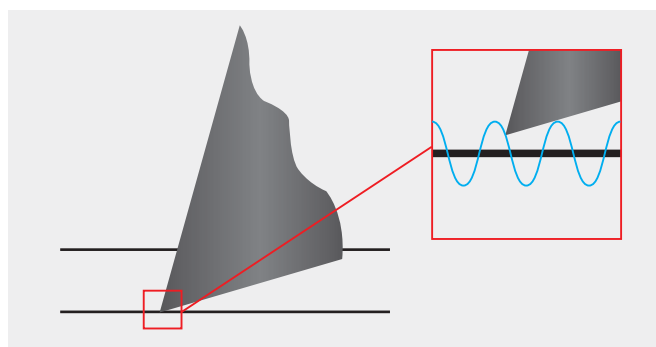
O impulso acontece por meio de um atuador, composto de gerador, conversor, booster e da combinação de ferramenta e adaptador, o assim chamado sonotrode. O gerador transforma energia elétrica em uma oscilação senoidal de alta frequência, que é transportada ao conversor. O booster transforma a amplitude de oscilação vinda do conversor e a encaminha ampliada ao sonotrode, no qual a energia elétrica é transformada em energia mecânica através de piezatores.

A combinação do movimento de avanço e um movimento oscilante linear possibilita entre outros a usinagem econômica de materiais de alta resistência como ligas de materiais cerâmicos. Até agora o cisalhamento auxiliado por ultrassom era principalmente utilizado na usinagem dos assim chamados Advanced Materials, como vidros, cerâmica e metais duros, por meio de ferramentas com corte de geometria indefinida. Com a usinagem de furação e fresamento de Composite Materials, como plásticos reforçados com fibras, estruturas sanduíches e espuma, o cisalhamento impulsionado por alta frequência encontra também cada vez mais aplicação na usinagem com corte definido. Na usinagem com cortes definidos uma microdesorganização auxilia o cisalhamento do material, o que em parte resulta visivelmente na qualidade superficial e leva a uma redução das forças do processo.

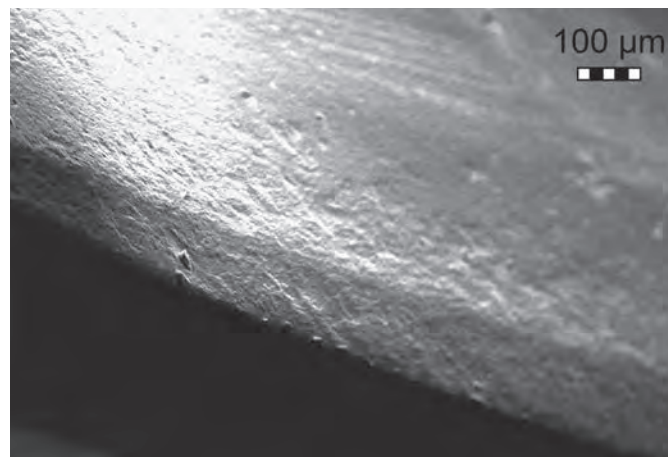
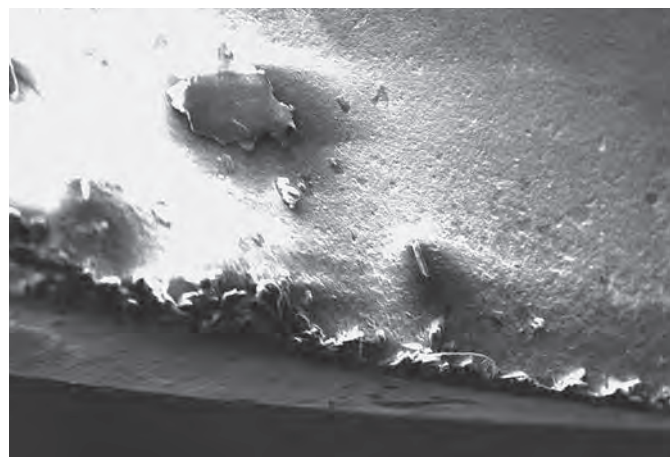
Ao lado de uma influência positiva do processo de desgaste na usinagem de materiais de aço, pode se verificar uma redução na formação de arestas postizas na furação de ligas a base de níquel.



Sem auxílio do ultrassom



Com auxílio do ultrassom



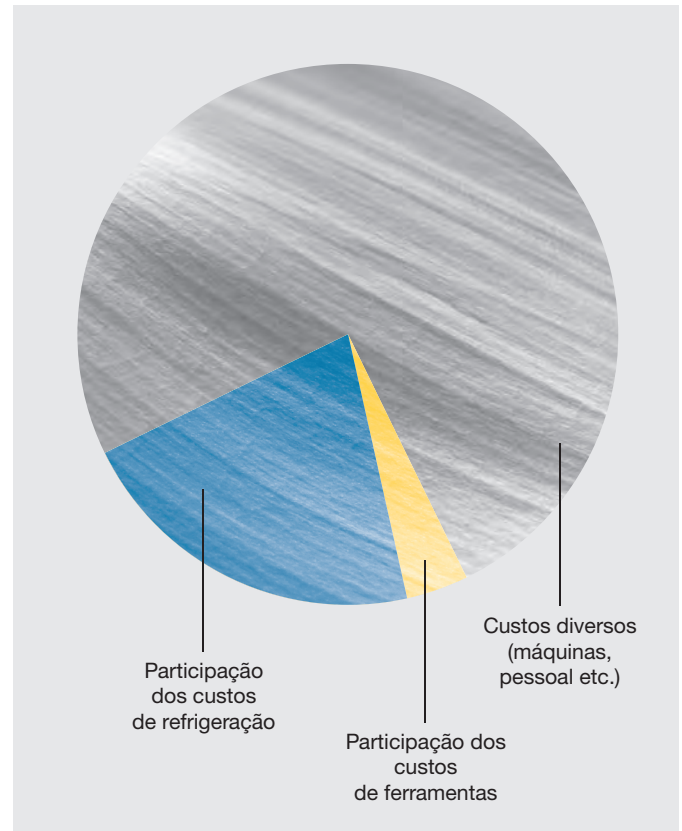


Tecnologia - MQL

Critérios

Ao lado dos custos de máquinas e ferramentas, os custos ao redor da refrigeração, constituem uma considerável parte dos custos da usinagem. Por isso a redução da necessidade de refrigeração oferece um variável potencial de economia.

A economia de meios de refrigeração não só traz vantagens de custos como também auxilia a proteção do meio ambiente e da saúde. Em meados dos anos 1990 iniciaram-se as pesquisas e desenvolvimento na área de MQL, das quais a Gühring foi uma das pioneiras.

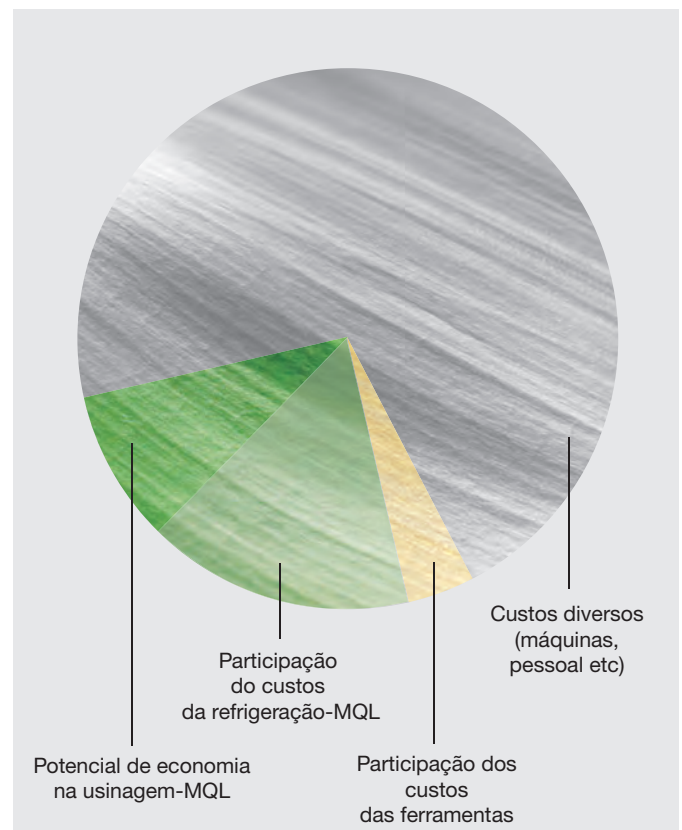


Metas da usinagem com MQL

A aquisição de uma nova instalação de refrigeração-MQL é nitidamente mais vantajosa do que uma refrigeração convencional!

!

- Redução da carga de temperatura nas pontas das ferramentas
- Diminuição do desgaste de ferramentas
- Escoamento efetivo dos cavacos em furos profundos
- Redução da necessidade de refrigeração
- Alto efeito de refrigeração especialmente em furos profundos
- Redução dos custos como:
 - custos de limpeza das peças
 - custos para o descarte de meios de refrigeração
 - custos para o descarte de meios de refrigeração com cavacos
- Proteção ao meio ambiente e a saúde





O desenvolvimento de modernos sistemas-MQL

Pela sua pesquisa dos critérios para a usinagem-MQL a Guhring criou a condição para uma tecnologia-MQL próxima a prática. Do jogo de fixação até o corte da ferramenta todos os componentes foram incluídos - o resultado foi o primeiro sistema de fornecimento de refrigeração MQL.

Características:

- Sistema modular e padronizado
- O conjunto de fixação MQL e o convencional são intercambiáveis sem problemas graças ao idêntico contorno do fuso (spindle contour)
- Os mandrís hidráulicos, de fixação térmica e synchro são todos desenvolvidos para o conjunto de fixação-MQL



O atual sistema-MQL da Guhring

Através da integração de um parafuso de regulagem de comprimento MQL ao primeiro sistema de fornecimento MQL da Gühring as obstruções e perdas de óleo são evitadas com segurança. Com isso hoje o cliente tem a disposição um sistema de fornecimento MQL, que corresponde otimamente as exigências de modernos processos de usinagem.

Características do primeiro sistema de fornecimento-MQL da Gühring:

- Fornecedor do fluido de refrigeração livre de obstruções
- Unidade de fornecimento-MQL especial
- Extremidade de haste da ferramenta correta para MQL
- Parafuso de regulagem de comprimento cônico

O usuário lucra devido ser um sistema padronizado e proporciona a redução de estoque graças aos componentes serem compatíveis





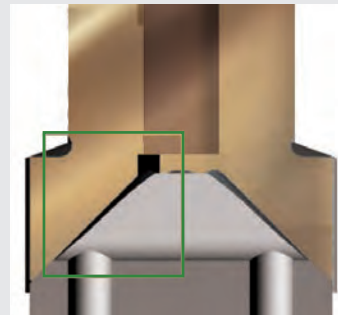
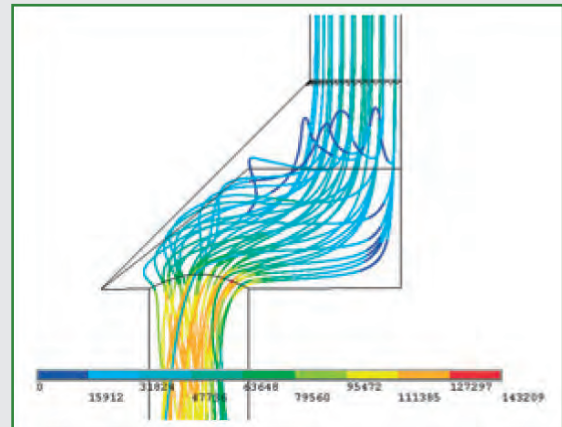
Forma perfeita da extremidade da haste! Para um seguro fornecimento-MQL

É importante, conduzir a extremamente pequena quantidade de óleo diretamente até ao ponto de atuação! Aqui a forma geométrica da extremidade da haste é de suma importância. A extremidade de haste cônica da Guhring cria ótimas condições para a utilização de MQL.

Vantagens da extremidade cônica:

- Nenhuma obstrução do óleo
- Mínimos espaços mortos
- Manuseio simples
- Fabricação favorável

Perfil da corrente com pequena formação de remoinho

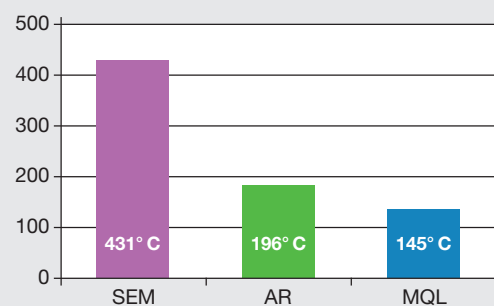
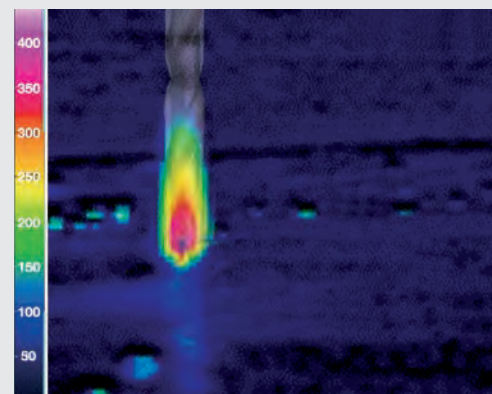


Condições da corrente do fluxo na fenda de ligação do canal de refrigeração do ponto da passagem cônica

Mantém a ponta fria

Com MQL a temperatura de processo pode ser reduzida consideravelmente em comparação com a usinagem a seco. Com isso consegue-se vidas úteis mais longas e uma segurança maior no processo

Análise termográfica na Guhring:
Comparação das temperaturas da ferramenta





A melhor forma para MQL!!

Melhores resultados mediante geometria otimizada de ferramentas para a usinagem-MQL no exemplo RT 100 T!



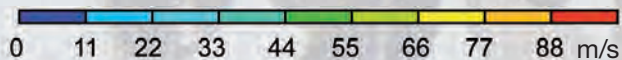
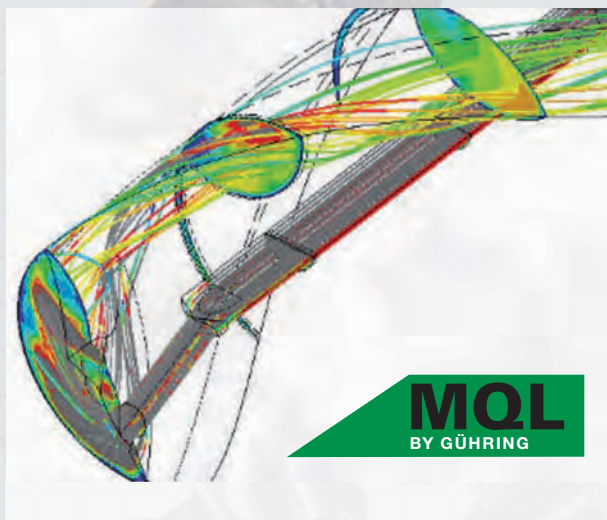
1. Seção do canal:

A geometria do canal de ferramentas-MQL Guhring gera cavacos curtos, que são ótimamente transportados para fora de furos profundos.

2. Máxima seção para canal de refrigeração:

Tanto o fornecimento de refrigeração quanto o transporte de cavacos foram aperfeiçoados através da seção máxima dos canais de refrigeração das ferramentas.

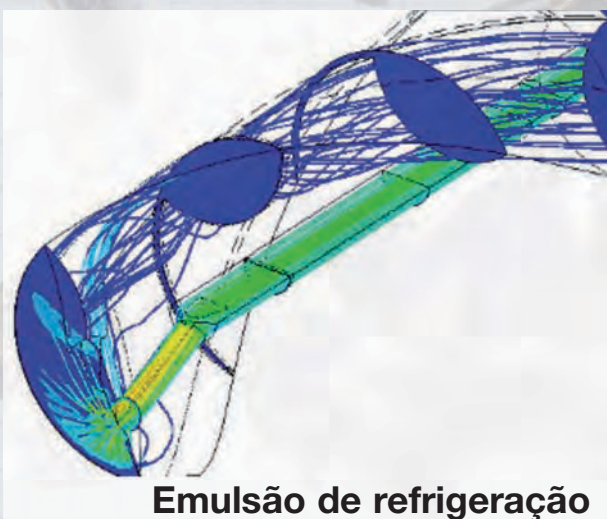
Comparação de velocidades de escoamento



A velocidade de escoamento
no canal, com MQL é de 30,4 m/s

O volume na MQL
é de 6,960 l/h (norma-litros ar/h)

Ferramenta-D = 11,7 mm
Pressão na bomba = 6 bar
pressão na ferramenta = 4 bar



A velocidade de escoamento
no canal com emulsão é de 3,5 m/s

O volume com emulsão
é de 600l/h (norma-litros ar/h)

Ferramenta-D = 11,7 mm
Pressão na bomba = 60 bar
Pressão na ferramenta = 31 bar

Emulsão de refrigeração



Variantes do sistema-MQL

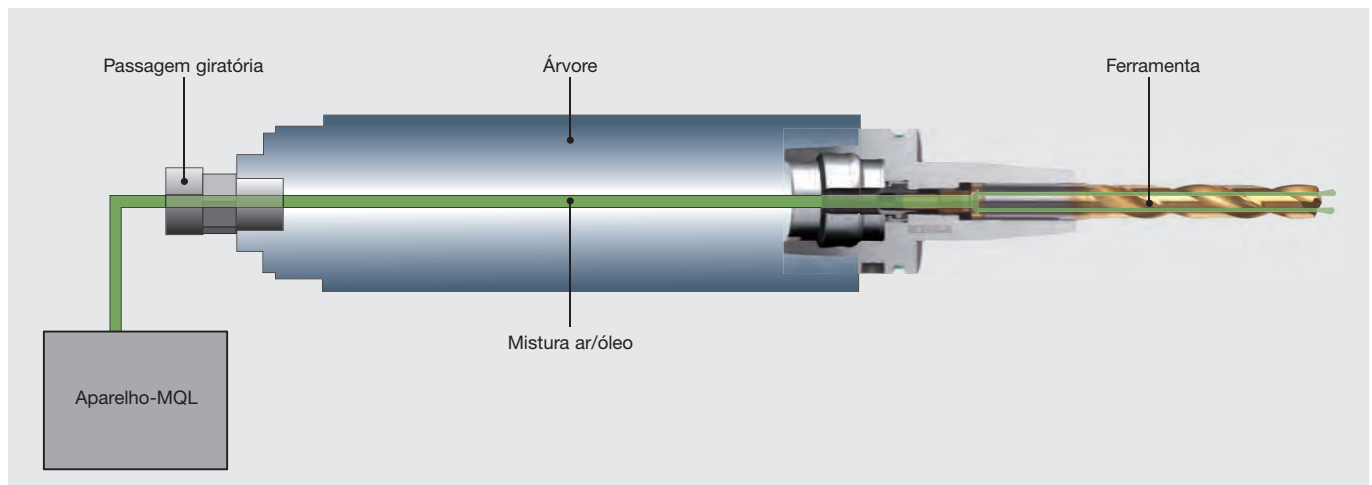
A preparação do meio da refrigeração-MQL na ferramenta pode ser efetuada por dois caminhos distintos: a mistura de aerosol que pode ser preparada fora da máquina e dirigida ao ponto de usinagem (sistema com 1 canal) ou o ar comprimido e o meio de refrigeração-MQL são encaminhados separadamente para uma câmara misturadora e somente aí

serão misturados (sistema com 2 canais). O envio do aerosol ao ponto de usinagem é efetuado através de uma passagem axial giratória, a árvore, o sistema de fixação e finalmente a ferramenta de corte, apropriados para lubrificação de mínima quantidade. Alterações de seção inevitáveis devem ser efetuadas de modo favorável ao fluxo.

O sistema-MQL de 1 canal

No sistema-MQL de 1 canal a produção de um aerosol apropriado para lubrificação é efetuada em um aparelho-MQL colocado separadamente na máquina. Sistemas especiais de injetores dentro de um reservatório sob pressão produzem

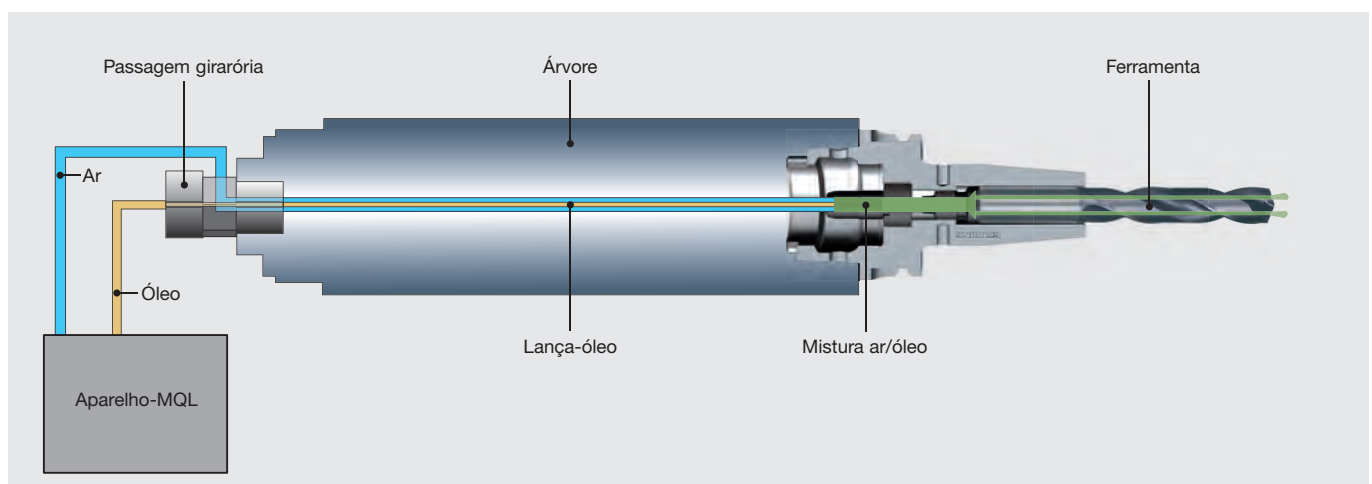
por meio de ar comprimido dosado um aerosol apropriado para lubrificação, cujas partes de óleo podem ser reguladas, e daí asseguradas dentro dos limites físicos através de um comando-MQL



O sistema-MQL de 2 canais

No sistema de 2 canais o óleo vai do conjunto através de 1 guia giratória e uma guia curta até a passagem giratória. Nesta está integrada uma válvula rápida a qual dosa o óleo em mínimas quantidades. Através de uma lança montada na árvore o óleo é transportado ao porta ferramentas. O segundo canal da passagem giratória serve para levar o ar até o porta ferramentas. Somente neste ponto o ar é misturado

ao óleo. Além disso o porta ferramentas dispõe de um injetor prensado, no qual se encontra a câmara de mistura. Nesse sistema o óleo e o ar podem ser misturados em qualquer quantidade. O caminho da câmara de mistura até o ponto de ação ainda é somente mínimo, o que causa um tempo de reação muito rápido e permite uma muito rápida modificação na quantidade de óleo.





Superfície brilhante



Brocas sem revestimento tem muito bom rendimento especialmente na usinagem de alumínio fundido como também em ligas de alumínio forjáveis com moderado teor de silício. Para fazer frente ao aqui dominante desgaste por adesão (formação de arestas postiças), estas ferramentas são adaptadas a esse campo de utilização por meio de uma geometria especial, conjuntamente com altas qualidades superficiais na área de redução da aresta transversal, canal e superfícies de folga.

Superfícies vaporizadas/nitretadas



Superfícies vaporizadas demonstram através de uma oxidação intencional na área da margem (cerca de 3 até 10 μm) uma melhor proteção a corrosão da superfície como também um melhor comportamento tribológico das ferramentas. Para utilizações abrasivas recomenda-se a nitretação da superfície, pela qual a dureza da margem é aumentada e com isso a resistência ao desgaste da ferramenta é melhorada.

Revestimento TiN



Temperatura máxima de utilização; < 600°C
Cor: amarela dourada
Execução: uma camada

O revestimento TiN introduzido nos anos 1980 pela Guhring encontra utilização a baixo custo e em larga escala em HSS como também em metal duro na furação.

Revestimento FIRE/nanoFIRE



Temperatura máxima de utilização; < 800°C
Cor: violeta
Execução: multicamadas
Dureza: 3300 HV0,05

Os revestimentos FIRE e nanoFIRE contém ao lado de titânio e gás carbônico também alumínio. Esses revestimentos foram introduzidos já no final dos anos 1990 e constituem uma continuação do desenvolvimento dos revestimentos TiN. Eles se destacam através de uma dureza mais elevada como também de uma boa estabilidade termoquímica e são adequadas tanto para HSS quanto metal duro



Revestimento Raptor



Temperatura máxima de utilização; < 800°C
 Cor: dourada descorada
 Execução: multicamadas
 Dureza: 3300 HV0,05

A estrutura multicamadas TiN/TiAlN do Raptor é responsável pela boa performance na usinagem de aços. Mediante uma camada adicional, baseada em zircônio, a capacidade de rendimento pode também ser desenvolvida para aços com ação adesiva (por exemplo aços ferríticos, austeníticos e duplex).

Revestimento TiAlN



Temperatura máxima de utilização; < 800°C
 Cor: violeta
 Execução: multicamadas
 Dureza: 3300 HV0,05

O revestimento TiAlN mostra características semelhantes como FIRE e nanoFIRE e com sua execução de uma camada encontra geralmente utilização na área de micro brocas.

Revestimento nanoA



Temperatura máxima de utilização; < 900°C
 Cor: azul violeta
 Execução: multicamadas nano estruturado
 Dureza: 3300 HV0,05

O revestimento nanoA igualmente baseado no TiAlN comprovou-se especialmente na usinagem de aços inoxidáveis, mas encontra também em parte aplicação na furação de fundição, titânio, material a base de níquel e ligas cobalto-cromo. Por sua constituição nanológica o crescimento de rupturas é protelado. Além disso em função de sua composição adequada ele dispõe de uma mais elevada estabilidade química do que por exemplo TiAlN com silício.

Revestimento Sirius



Temperatura máxima de utilização; < 900°C
 Cor: Dourada descorada
 Execução: multicamadas nano estruturada
 Dureza: 3400 HV0,05

O revestimento Sirius essencialmente baseado no revestimento AlTiN é adequado especialmente para a usinagem de aços inoxidáveis. Por sua estrutura nanológica ele demonstra boa dureza e tenacidade. A camada de cobertura com zircônio deve impedir amplamente reações químicas com o material e com isso promover o fluxo dos cavacos.



Revestimento Signum



Temperatura máxima de utilização; < 800°C
Cor: bronze
Execução: multicamadas nanocomposta
Dureza: 5500 HV0,05

O revestimento Signum faz parte do grupo chamado de nano compósito. A microestrutura destaca-se por extremamente finos nano cristais, que estão embutidos numa matriz vítrea de nitreto de silício altamente resistente a temperatura. Disso resulta uma elevada dureza, o que faz o revestimento Signum ser a primeira escolha para aços temperados e materiais fundidos.

Revestimento Endurum



Temperatura máxima de utilização; < 800°C
Cor: cobre
Execução: multicamadas nanocomposta
Dureza: 4000 HV0,05

O revestimento Endurum que também faz parte da família dos nano compósitos, que através da adaptação do processo de revestimento foi especificamente desenvolvido para usinagem de aço carbono, aço para máquinas automáticas, e aços ligados com manganês.

Revestimento Zenit



Temperatura máxima de utilização; < 700°C
Cor: dourada descorada
Execução: multicamadas nanoestruturada
Dureza: 2500 HV0,05

O revestimento Zenit foi otimizado especialmente para usinagem de ligas de titânio. A execução especial como também a composição, trazem uma significativa redução ao desgaste tribotécnico e com isso o tornam um autêntico especialista em sua área de atuação. Paralelamente ele oferece bons resultados na furação de ligas de alumínio fundido com moderado teor de silício.

Revestimento Ice



Temperatura máxima de utilização; < 1000°C
Cor: cinza metálica
Execução: multicamadas
Dureza: 3500 HV0,05

O revestimento Ice baseado em titânio, alumínio e cromo é especializado na usinagem de metais não ferrosos, como por exemplo ligas de cobre e também bronze e latão



Revestimento Carbo

Temperatura máxima de utilização; < 500°C
Cor: cinza negra
Execução: uma camada
Dureza: 5000 HV0,05



O revestimento Carbo pertence ao grupo DLC (DLC - diamond-like carbon). Estes revestimentos de carbono possuem características do diamante. O revestimento Carbo demonstra por sua composição, a saber, 100% carbono, e estrutura (ta-C) uma dureza muito alta. Desta maneira explica-se a sua excelente performance ao furar metais não ferrosos como por exemplo ligas de alumínio forjáveis e de alumínio fundido (< 12% Si), cobre, latão, latão e bronze. Adicionalmente ele também é um parceiro confiável na usinagem de plásticos não reforçados e madeira.

Revestimento Cristall

Temperatura máxima de utilização; < 600°C
Cor: cinza-negra
Execução: uma camada
Dureza: 8000 HV0,05



O revestimento Cristall, como pura camada de diamante, não fica nada atrás ao diamante natural. Ao lado de muitas características físicas interessantes ele se destaca por sua extraordinária dureza. Com isso o micro cristalino revestimento Cristall adequa-se excelentemente para usinagem de materiais altamente abrasivos como por exemplo materiais reforçados com fibras, cerâmica, grafite e ligas de alumínio fundido com alto teor de silício (12%). Por motivos técnicos de processos, esse revestimento é exclusivamente aplicado a tipos especiais de metal duro.



	Furação		
	Metal duro		HSS
	Convencional	MQL	
Aço carbono; Aço máquina, Aço manganês	Endurum	Endurum	Fire
	Raptor	Raptor	-
	Fire	Fire	-
Aço, baixa liga	Fire	Fire	Fire
	Endurum	Endurum	TiN
	Raptor	Raptor	
Aço, ligado	Fire	Fire	Fire
	Signum	Signum	TiN
	nanoA	nanoA	
Aço, endurecido <55 HRC	Signum	Signum	-
	Fire	Fire	-
	TiAIN	TiAIN	-
Aço, endurecido 55 - 65 HRC	Signum	Signum	-
	Fire	Fire	-
	TiAIN	TiAIN	-
Aços resistentes a corrosão e ácidos	nanoA	nanoA	Sirius
	Sirius	Sirius	Fire
	Endurum	Endurum	TiN
Ferro fundido	Signum	Signum	Fire
	Fire	Fire	-
	nanoA	nanoA	-
Alumínio forjado	brilhante	brilhante	brilhante
	Carbo	Carbo	Carbo
	Cristall	Cristall	-
Alumínio fundido (<12% Silício)	brilhante	brilhante	brilhante
	Zenit	Zenit	Zenit
	Carbo	Carbo	Carbo
Alumínio fundido (>12% Silício)	Cristall	Cristall	-
	-	-	-
	-	-	-
Ligas à base de Níquel (ex. Inconel)	nanoA	nanoA	Fire
	Signum	Signum	-
	Fire	Fire	-
Titânio e ligas de titânio	Zenit	Zenit	Fire
	nanoA	nanoA	-
Cobre/Bronze/Latão	ICE	ICE	TiN
	Carbo	Carbo	-
Ligas Cobalto-Cromo	nanoA	nanoA	-
	Signum	Signum	-
	Fire	Fire	-
Metais preciosos	nanoA	nanoA	-
Cerâmicos	Cristall	Cristall	-
Plásticos não reforçados	Carbo	-	-
Plásticos Fibro-reforçados	Cristall	Cristall	-
	Signum	Signum	-

Nota:

A tabela mostra as recomendações gerais de aplicação dos revestimentos-Gühring.
Prioridade do revestimento adequado de cima para baixo.



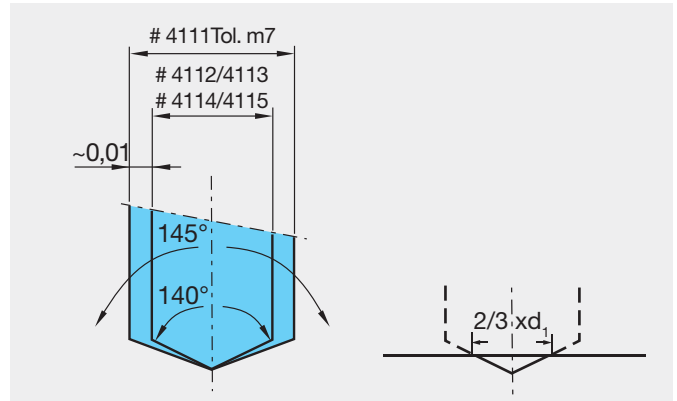
Centrar e executar furos piloto

Centrar e executar furos piloto com o Sistema HT 800

Para profundidades de furação maiores que $5xD$ geralmente nós recomendamos para centrar e eventualmente executar os furos piloto com o sistema HT 800.

Ao pilotar com broca para centragem o diâmetro da furação deve ser aproximadamente de $2/3$ do furo a ser executado. Ao executar o furo piloto nós recomendamos uma profundidade de $1xD$. Além disso o ângulo da ponta como também o diâmetro da ferramenta para o furo piloto deveriam ser maiores do que o ângulo da ponta da broca seguinte.

Para garantir isso nós recomendamos a utilização da pastilha para furos piloto especialmente adaptada Art. Nr. 4111 com ângulo de ponta de 145° e diâmetro com tolerância m7 com o mandril rígido extra curto Art.Nr. 4105.



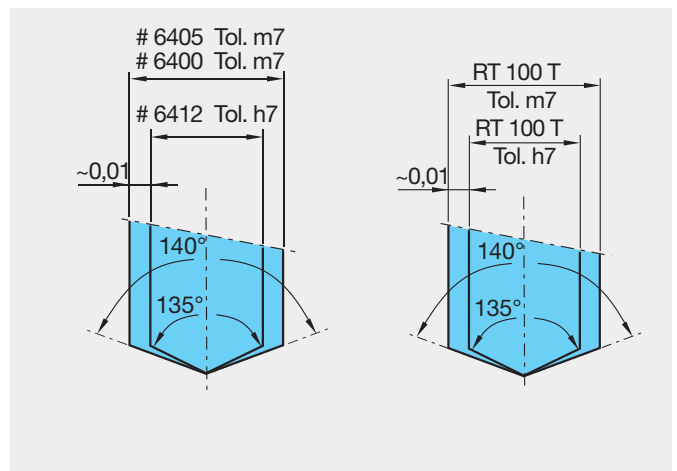
Centrar e executar o furo piloto com brocas MDI

Na utilização de brocas MDI para profundidades de $7xD$ até $12xD$ nós recomendamos centrar ou a execução de um furo piloto com $1xD$ até $2xD$ de profundidade.

Em profundidades de furos maiores que $12xD$ é indispensável e necessário um furo piloto com $1xD$ até $2xD$ de profundidade.

Para executar o furo piloto para a micro broca ExclusiveLine com $15xD$ (Artigo Nr. 6412) nós recomendamos a utilização da micro broca ExclusiveLine $4xD$ sem refrigeração (Artigo Nr. 6400) ou $5xD$ com refrigeração (Artigo Nr. 6405), já que elas são especialmente adequadas em relação ao ângulo da ponta como também da tolerância do diâmetro.

Para executar o furo piloto para a broca helicoidal para furos profundos RT 100 T pode ser utilizada por exemplo a broca RT 100 U com refrigeração interna, $3xD$ (Artigo Nr. 2477), já que elas são especialmente adequadas em relação ao ângulo da ponta como também da tolerância do diâmetro.



Centrar executar furos piloto com brocas HSS

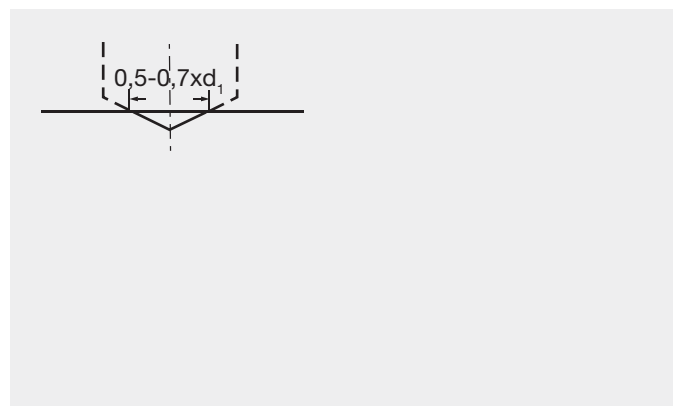
Centrar com comprimentos de brocas conforme DIN 340

Na utilização de brocas HSS/HSCO conforme DIN 340 nós recomendamos centrar com um diâmetro de centro com $0,5-0,7$ vezes do diâmetro da broca. As brocas-HSS/HSCO-NC são especialmente adequadas para esses furos de centro. Informações detalhadas encontram-se no capítulo brocas NC

Executar furos pilotos com comprimentos de brocas conforme DIN 1869

Na utilização de brocas longas e extra longas HSS/HSCO conforme DIN 1869 nós recomendamos a execução de um furo piloto com $1xD$ até $2xD$ de profundidade.

As brocas extra curtas, tipo GV 120, conforme DIN 1897 são especialmente adequadas para isso.





Brocas NC

Brocas NC

Para a execução de furos com posição especialmente exata, furos com diâmetros com tolerâncias apertadas, furos profundos ou geralmente no caso de peças com formas desfavoráveis (redondas, asperas) recomenda-se, de antes do processo de furação executar-se um centro com uma broca NC. Isso garante que a broca seguinte fure com posição exata e que um eventual desvio da broca seja evitado.

Também para a execução de escareados ou eventualmente chanfros ou centragem em um mesmo passo, poderão ser utilizadas brocas NC, quando o diâmetro da centragem da broca NC for maior que o diâmetro da broca.

Brocas NC são executadas com comprimento de canal de saída muito curto e sem detalonamento na guia, para garantir uma execução muito estável e uma posição muito exata do furo de centro. Com essa execução as brocas NC são adequadas somente para centragem e não para a produção de profundidades que sejam maiores do que o comprimento de afiação da ponta.

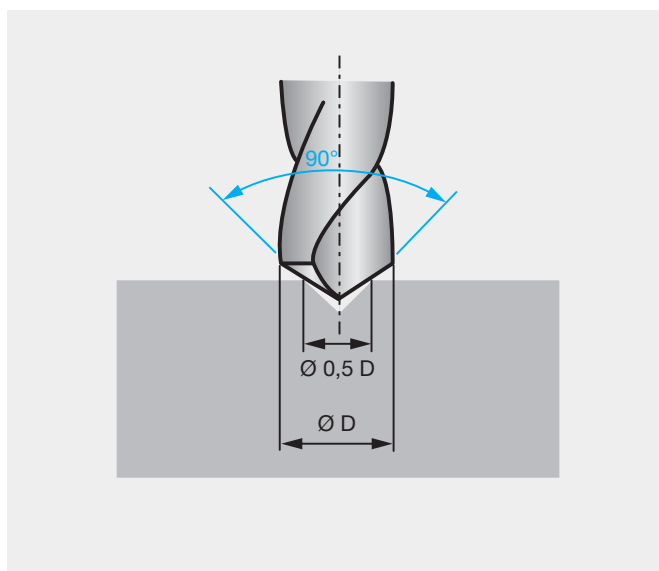
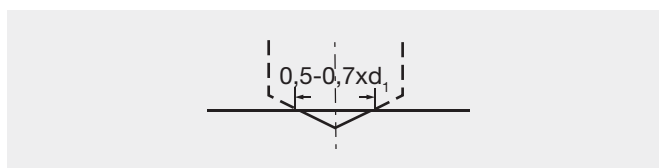
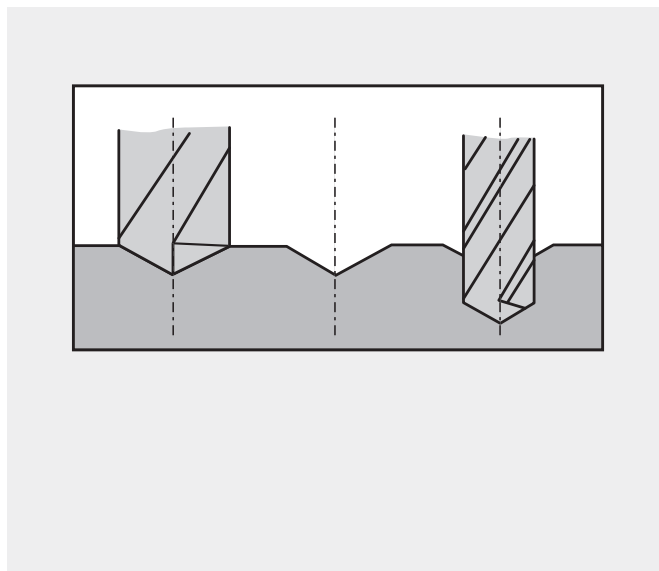
Seleção da broca NC

Idealmente o diâmetro do centro deveria ser selecionado com 0,5-0,7 vezes do diâmetro da broca

Brocas NC 90°

Brocas NC com ângulo de ponta 90° são adequadas especialmente para centragem, quando em seguida serão executados furos com brocas HSS/HSCO, que tenham uma aresta transversal relativamente grande. Com isso é garantido que a broca HSS/HSCO seguinte fure primeiro com os cortes principais e que seja guiada nos pontos mais sólidos dos cantos de corte.

Além disso as brocas NC com ângulo de ponta 90° são adequadas para a execução da centragem e um escareado de 90° num mesmo passo, quando o diâmetro de centragem da broca NC é maior que o do furo.

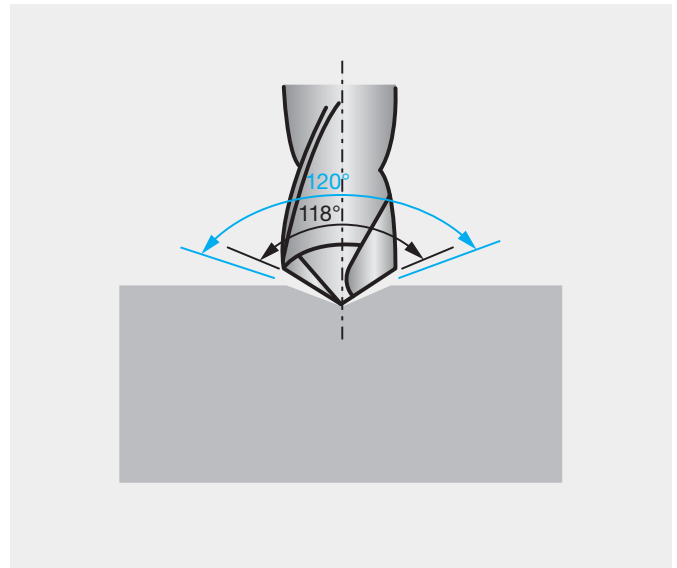




Brocas NC

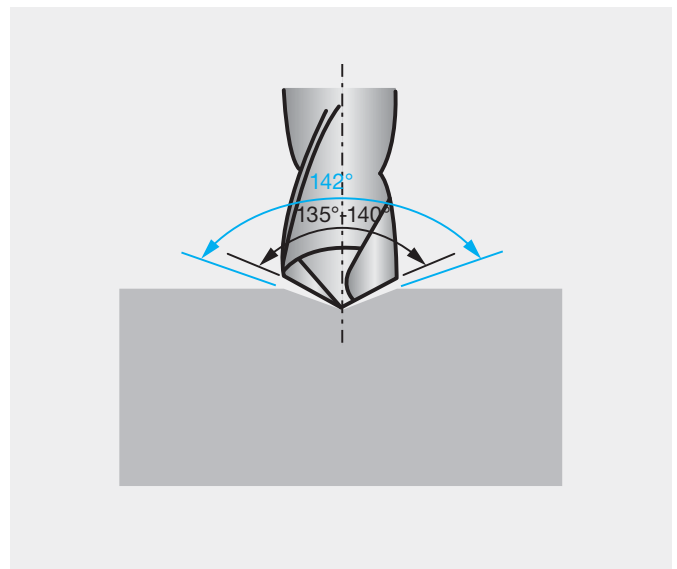
Brocas NC 120°

Brocas NC com ângulo de ponta 120° são adequadas especialmente para centragem, quando em seguida serão executados furos com brocas HSS/HSCO com ângulo de ponta 118°. Com isso garante-se que a broca HSS/HSCO seguinte fure primeiro com os cortes principais e que seja bem guiada.






Brocas NC 142°

Brocas NC com ângulo de ponta 142° são adequadas especialmente para centragem, quando em seguida serão executados furos com brocas de metal duro com ângulo de ponta com 135°-140°. Com isso garante-se que a broca de metal duro seguinte inicie o furo com a ponta, centre e seja guiada. Se os cantos de corte da broca de metal duro encostarem na peça antes da ponta corre-se o risco de que os cantos de corte se trinquem e a broca desvie no furo.



Brocas NC

90°	120°	142°
		



Pressão e volumes de refrigeração Brocas Ratio

Os volumes de refrigeração ótimos, bons e mínimos representados no diagrama somente valem para brocas Ratio helicoidais tipo RT 100 e independem das máquinas. Mas por outro lado as pressões dependem das máquinas, já que cada máquina tem outros sistemas de refrigeração e por causa disto outras condições de vazão (Fig.1). Por isto os valores de pressão representados somente servem como informação, para estimar a ordem de grandeza.

Para as brocas Ratio tipo RT 80 com canal de refrigeração central devem ser adotados outros parâmetros (Fig. 2).

Os diagramas foram determinados experimentalmente para o campo de usinagem mais importante para as brocas Ratio, a usinagem de aço. Mas eles também são utilizáveis como valores de referência para outros materiais, mas em primeira linha por isto, porque para a usinagem de aço sempre são necessárias as máximas pressões de refrigeração. A que

ponto a refrigeração também depende do material a ser usinado, é demonstrado pelas especialmente sensíveis brocas Ratio de canais retos tipo Rt 150. Assim por exemplo as perdas de vida útil por pressões muito baixas na usinagem de fundição cinzenta são muito maiores do que na furação de ligas de alumínio com silício. Mas isto só quando a liga AISi for de cavacos curtos! A imprescindivelmente necessária mínima ou boa pressão para a usinagem de fundição deve basicamente ser selecionada algo mais alta do que para a usinagem de AISi (Fig. 3 e 4).

Os valores recomendados somente devem ser utilizados para profundidades até ca. 5 x D. Para furos mais profundos devem ser aplicadas brocas com refrigeração interna, especialmente a RT 150 GT, já que senão a usinagem (dependendo do material) se tornaria anti-econômica.

Pressões de refrig. necessárias
 — pressão ótima
 — pressão boa
 — pressão mínima

Volumes de refrig. necessários
 — volume ótimo
 — volume bom
 — volume médio

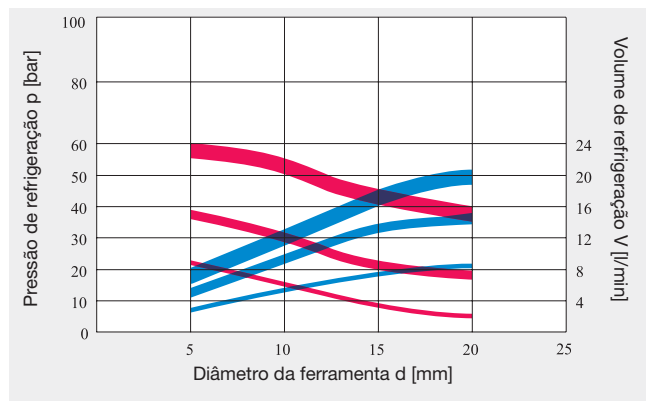


Fig. 1: Pressões e volumes de refrigeração necessários para brocas Ratio tipo RT 100 com canais helicoidais internos para refrigeração.

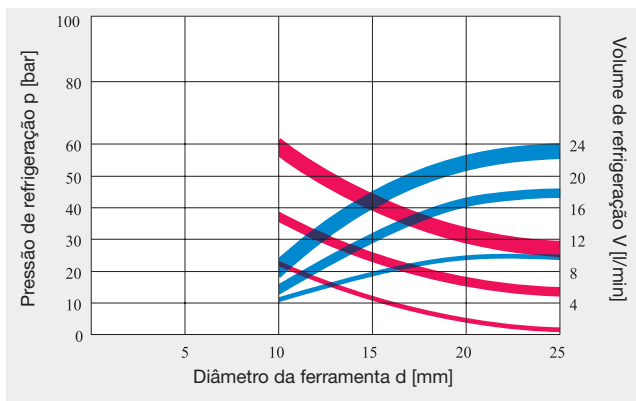


Fig. 2: Pressões e volumes de refrigeração necessários para brocas Ratio tipo RT 80 com canal central para refrigeração interna

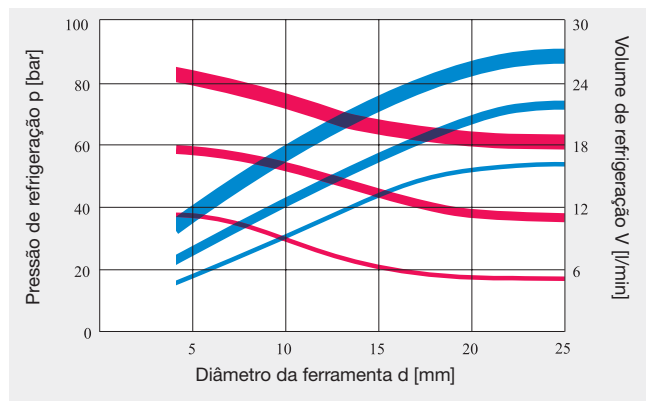


Fig. 3: Pressões e volumes de refrigeração necessários para a usinagem de GG 25 com brocas Ratio com canais retos tipo RT 150 GG.

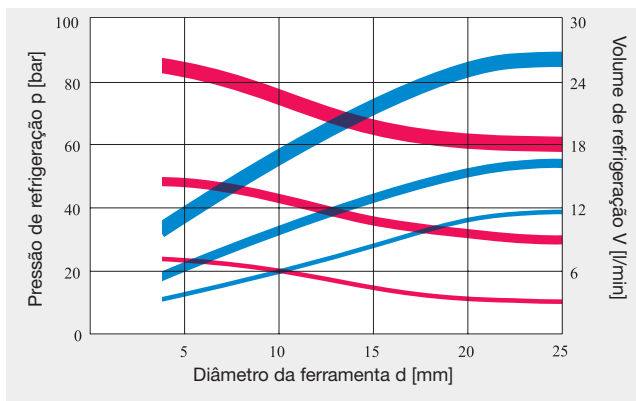


Fig. 4: Pressões e volumes de refrigeração necessários para a usinagem de AISi7 com brocas Ratio com canais retos tipo RT 150 GG.

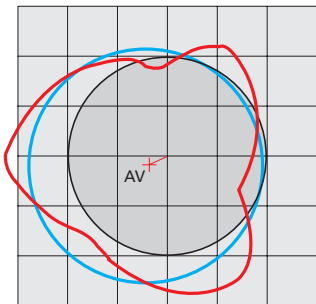


Qualidades de furos típicos, selecionados

1. em 42CrMo4V, Ø 14,5 mm

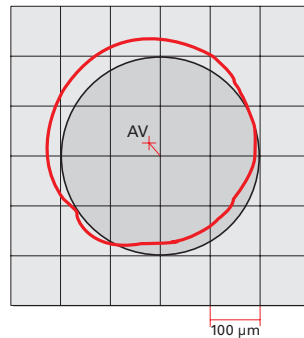
Broca HSS, tipo N
Nr. do artigo 651

vc = 25 m/min
 f = 0,25 mm/rotação
 +Rmax = 131,8 µm
 -Rmax = -49,1 µm
 D-real = 14,566 mm
 dRmax = 103,5 µm
 AV = 49,2 µm
 Ra = 2,6 µm, Rz = 6,8 µm **IT12**



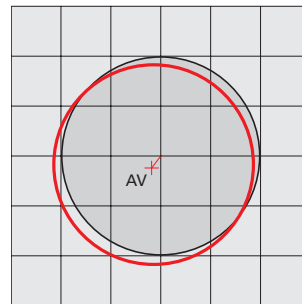
Broca Ratio, tipo RT 80
Nr. do artigo 1171

vc = 70 m/min
 f = 0,25 mm/rotação
 +Rmax = 42,7 µm
 -Rmax = -29,6 µm
 D-real = 14,515 mm
 dRmax = 12,9 µm
 AV = 35,3 µm
 Ra = 1,4 µm, Rz = 4,31 µm **IT9**



Broca Ratio, tipo RT 100
Nr. do artigo 1181

vc = 70 m/min
 f = 0,25 mm/rotação
 +Rmax = 26,7 µm
 -Rmax = -17,2 µm
 D-real = 14,509 mm
 dRmax = 5,2 µm
 AV = 22,8 µm
 Ra = 1,04 µm, Rz = 3,2 µm **IT8**



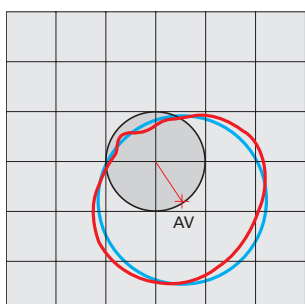
A diferença máxima de circularidade ($d_{m\acute{a}x}$) é formada como soma absoluta das maiores e menores diferenças do contorno real sobre o círculo médio. O deslocamento do eixo (AV) indica ao usuário quantos µm a broca desviou para o lado. O parâmetro que está com o desvio máximo determina em dependência do diâmetro da ferramenta a classe de qualidade-IT do furo.

O círculo preto representa o diâmetro teórico do furo que a ferramenta deveria usinar no caso ideal. O círculo vermelho representa o contorno real da forma do furo, que é obtido com o respectivo tipo de broca. O círculo envolvente (azul) é a média matemática do círculo real, portanto o diâmetro médio (nas brocas Ratio o círculo envolvente é praticamente igual ao Ø-real).

2. em GGG40, Ø 10,0 mm

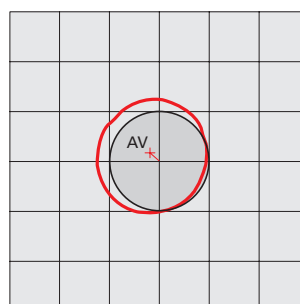
Broca HSS, tipo N
Nr. do artigo 651

vc = 30 m/min
 f = 0,2 mm/rotação
 D-real = 10,077 mm
 +Rmax = 106 µm
 -Rmax = -28 µm
 dRmax = 42 µm
 AV = 68,5 µm
 Ra = 3,7 µm, Rz = 17,2 µm **IT12**



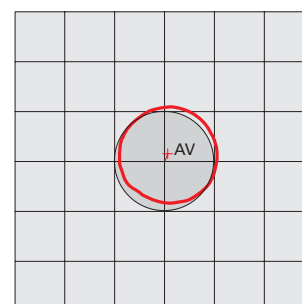
Broca Ratio, tipo RT 100
Nr. do artigo 1181

vc = 90 m/min
 f = 0,3 mm/rotação
 D-real = 10,027 mm
 +Rmax = 34 µm
 -Rmax = -9,2 µm
 dRmax = 6,5 µm
 AV = 22,5 µm
 Ra = 2,2 µm, Rz = 11,5 µm **IT9**



Broca Ratio, tipo RT 150 GG
Nr. do artigo 768

vc = 130 m/min
 f = 0,2 mm/rotação
 D-real = 9,994 mm
 +Rmax = 11,5 µm
 -Rmax = -18 µm
 dRmax = 5 µm
 AV = 14 µm
 Ra = 1,99 µm, Rz = 11,2 µm **IT8**





Pequena introdução ao tema furação profunda

Nas técnicas de usinagem a partir de uma profundidade de $15xD$ ou mais, denominada furação profunda, os furos menos profundos também podem ser produzidos com brocas canhão. Com isto utilizamos as características positivas que surgem no furo como boa superfície, pequena variação nos diâmetros e retilíneidade otimizada.

Alta pressão de refrigeração - neste meio tempo uma realidade

Como nos últimos anos a refrigeração interna se afirmou em todas as ferramentas de furar, o meio de refrigeração justifica o nome e é levado através de canais de refrigeração até onde é urgentemente necessário. Com estas providências conseguiu-se também expressivas melhoras na vida útil e nas quebras de brocas helicoidais, de ferramentas de roscar, etc. Toda máquina convencional hoje é oferecida com refrigeração de alta pressão e com isto é apropriada também para furação profunda. A participação das brocas para furação profunda em centros de usinagem, tornos, etc, ganha cada vez mais em importância. Com isto o processo se torna cada vez mais popular nas técnicas de usinagem.



Todas as brocas canhão deverão estar guiadas por furo piloto.
Brocas canhão nunca deverão girar na velocidade total em vazio sem estarem apoiadas dentro do furo piloto.

Atenção!

astes de aço para fixação da broca canhão na sua grande maioria não são adequadas para fixação Shrink Fit! (Exceção T16 ver página seguinte)

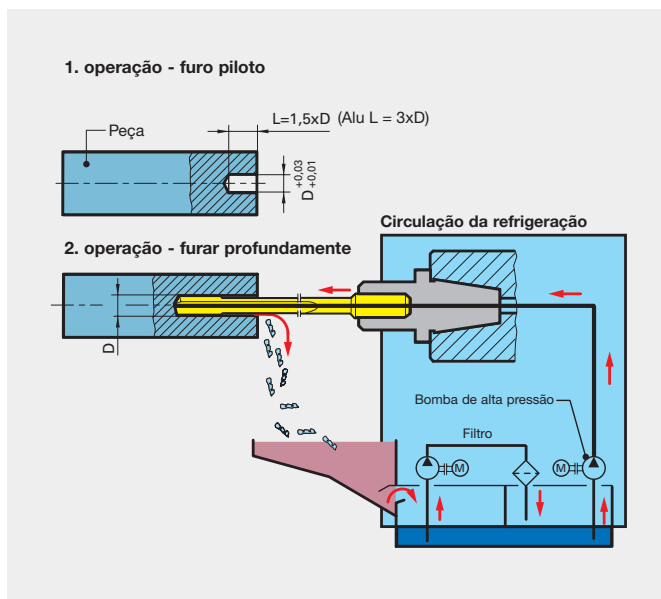
Procedimento em máquinas convencionais:

- Executar um furo piloto (tolerância H 8).
- Introduzir com rotação de 200 rpm, avanço de 500 mm/min. Em ferramentas acima de $40 \times D$ introduzir com sentido de rotação à esquerda.
- Regular a pressão da refrigeração e a rotação
- Furar continuamente sem extrair os cavacos. Na utilização de brocas canhão com uma grande relação comprimento-diâmetro (p. ex. EB 100 com comprimento de canal a partir de 160 mm) nós recomendamos furar até uma profundidade de 25 mm com parâmetros de corte reduzidos (75% da velocidade ideal).
- Desligar o abastecimento da refrigeração após atingir a profundidade do furo.
- Retirar em avanço rápido com o fuso parado.

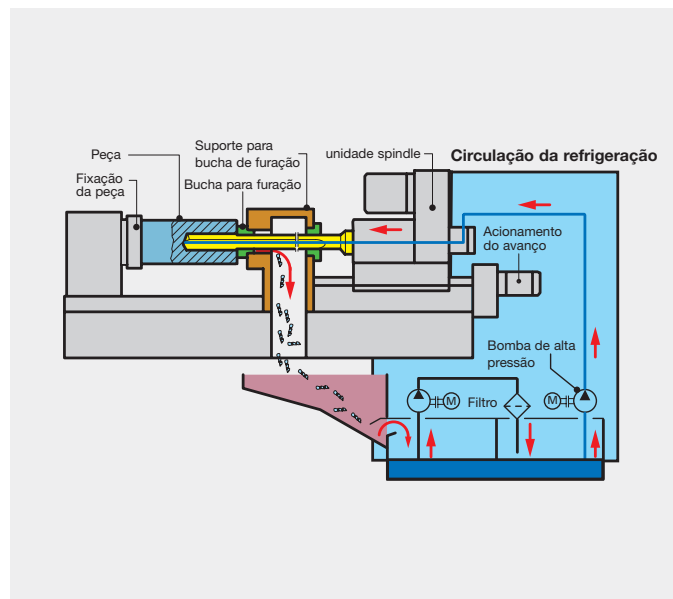
Dicas e truques

- Para profundidades acima de $40xD$ recomendamos a utilização de duas ou mais brocas canhão, p. ex. $\varnothing 10 \times 400$ mm e $\varnothing 9,95 \times 800$ mm.
- Brocas canhão para profundidades de furo acima de $40xD$ deveriam ser introduzidas no furo piloto com giro à esquerda.
- Para usinagem de materiais com cavacos longos recomendamos a utilização de brocas canhão com canais polidos.
- Brocas canhão com um corte, para alumínio de cavacos longos deveriam ser encomendadas com afiação da ponta com 180° e com ressalto na câmara de óleo.
- Ao se iniciar-se a furação em alumínio com menos de 1% de Si, isto é em velocidade de corte recomendada $vc > 160$ m/min, nós recomendamos, para elevar a rotação em vários passos até atingir a rotação final. Além disso deveria executar-se um furo piloto mais profundo com ca. de $3xD$.

Furação profunda em máquinas convencionais



Máquinas para furação profunda



Nós mantemos em estoque o programa de hastes de fixação apresentado aqui, porém ele representa somente uma seleção de hastes de fixação. Nós naturalmente também fabricamos hastes de fixação individualmente conforme desenhos

do cliente com a mais alta precisão. Atenção! Nas brocas EB 100 são necessárias hastes de fixação com pinos de guia. Informações sobre consulta.

Haste de fixação para máquinas de furação profunda

1

Índice	d ₁	l ₁	l ₂	l ₃
1.1	10	40	24	-
1.2	10	40	24	45
1.3	10	40	24	55
1.4	16	45	31,2	-
1.5	25	70	34	-
1.6	25	70	34	78

5

Índice	d ₁	l ₁	l ₂
5.1	10	60	20
5.2	16	80	28
5.3	25	100	50
5.4	10	100	-
5.5	10	110	-

2

Índice	d ₁	l ₁	l ₂	l ₃
2.1	16	50	47	-
2.2	16	50	47	55
2.3	16	50	47	70

6

Índice	d ₁	l ₁
6.1	12,7	38
6.2	19,05	70
6.3	38,1	70

3

Índice	d ₁	l ₁	l ₂	l ₃
3.1	25	70	34	100

7

Índice	d ₁	l ₁	l ₂
7.1	16	112	73
7.2	20	126	82

4

Índice	d ₁	l ₁
4.1	19,05	70
4.2	12,70	70
4.3	25,40	70
4.4	31,75	-
4.5	36,10	70

Haste de fixação conforme DIN 1835

Forma E

9

Índice	d ₁	l ₁
9.1	8	36
9.2	10	40
9.3	12	45
9.4	16	48
9.5	20	50
9.6	25	56
9.7	32	60
9.8	31,75	70
9.9	38,1	70
9.10	40	70

Haste de fixação conforme DIN 6535

Forma HA

10

Índice	d ₁	l ₁
10.1	8	36
10.2	10	40
10.3	12	45
10.4	16	48
10.5	20	50
10.6	25	56
10.7	32	60
10.8	25	70
10.9	40	70

Haste de fixação conforme esboço VDI

12

Índice	d ₁	l ₁
12.1	10	68
12.2	16	90
12.3	25	112

pode ser utilizada também, em máquinas de furação profunda

Forma HB com índices 8.6, 8.7, 8.8

8

Índice	d ₁	l ₁
8.1	8	36
8.2	10	40
8.3	12	45
8.4	16	48
8.5	20	50
8.6	25	56
8.7	32	60
8.8	40	70

Hastes de fixação conforme Speed-Bit-System

13

Índice	d ₁	l ₁	l ₂
13.1	16	40	16
13.2	25	50	25
13.2	35,6	60	-

pode ser utilizada também, em máquinas de furação profunda

Forma HE

11

Índice	d ₁	l ₁
11.1	8	36
11.2	10	40
11.3	12	45
11.4	16	48
11.5	20	50
11.6	25,4	70
11.7	25	56
11.8	32	60
11.9	40	70

Variações de execução das hastes de fixação de brocas canhão com haste tubular

Modo de proceder para Ø-nominal < Ø-haste (a diferença deve ser ca. de 6 mm) a haste do tubo assenta na haste de fixação

Modo de proceder para Ø-nominal diferente do Ø haste (no máximo até a igualdade): a haste do tubo assenta sobre o pino

Modo de proceder para Ø-nominal > Ø-haste: a haste do tubo assenta sobre o pino, cujo Ø-interno > Ø-haste, encostando no ressalto

similar. Forma HA (pode ser fixado por interferência térmica)

16

Índice	d ₁	l ₁
16.1	10	50
16.2	16	64
16.3	20	70
16.4	25	81
16.5	32	92

similar. Forma HE

17

Índice	d ₁	l ₁
17.1	19,05	70
17.2	25,40	70
17.3	31,75	70
17.4	38,1	70

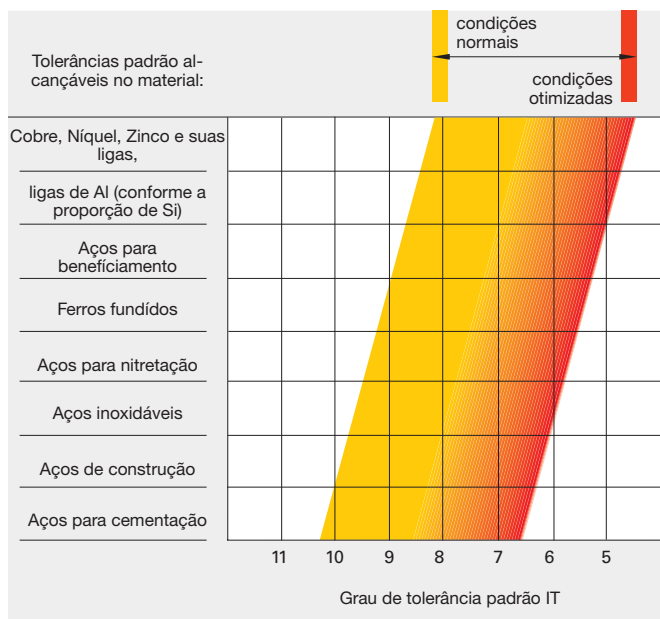
pode ser utilizada também, em máquinas de furação profunda



Precisão em brocas canhão com um corte

Tolerâncias padrão*

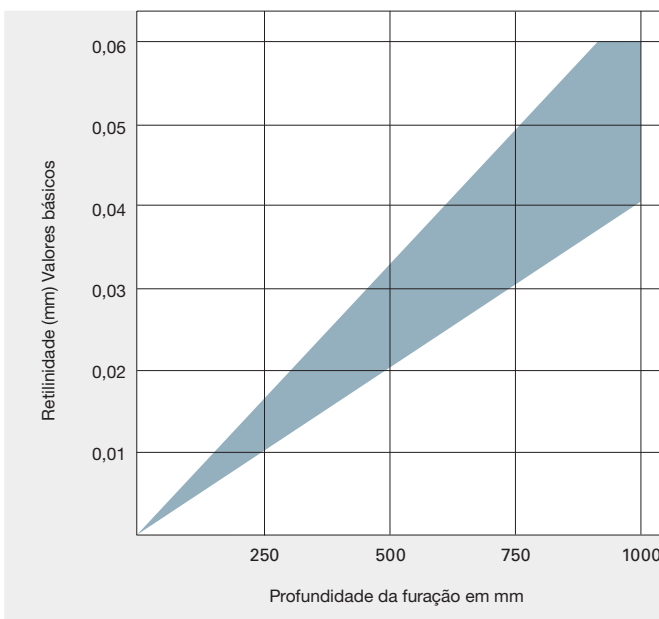
Com brocas canhão de um corte podem se alcançar tolerâncias padrão menores, já que as forças de corte são assimiladas pelas guias e não se formam furos maiores, devidos a pequenos desvios como ocorre p. ex. com brocas helicoidais.



Retilidade do furo*

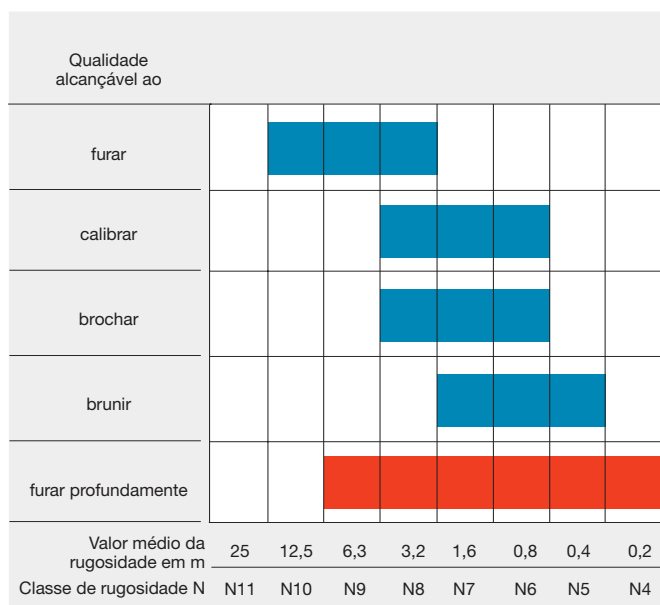
Como em brocas canhão com um corte a cabeça de precisão de metal duro é diretamente soldada em uma haste flexível a ferramenta isenta de eventuais batimentos gera um furo muito reto.

Porém variações extremas de materiais e outros fatores de influência podem afetar a retilidade do furo.



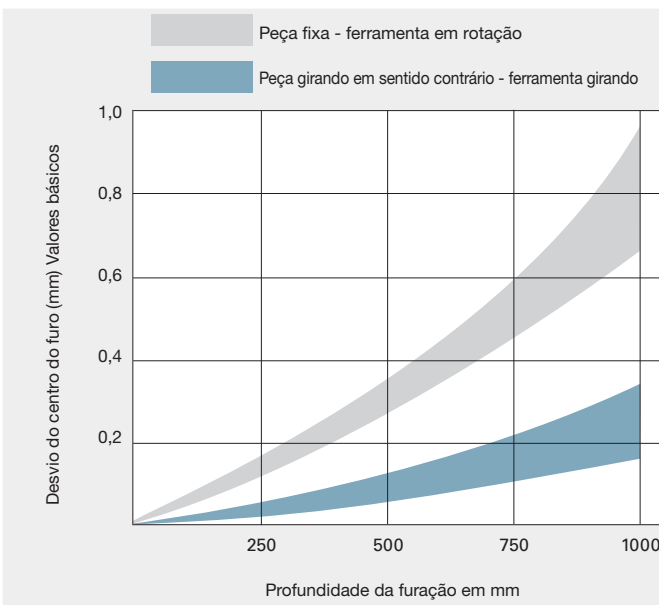
Qualidade superficial*

As forças no corte são assimiladas pelas réguas de guias as quais por sua vez alisam a superfície. Por isto o filme de óleo entre as guias e a superfície do furo tem um papel muito importante. Quanto melhor é a qualidade do meio de refrigeração, tanto melhor é a superfície.



Desvio do centro do furo*

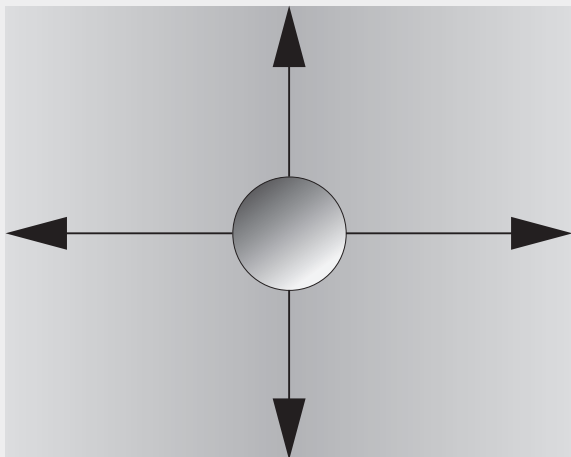
Se um furo, por exemplo é feito com uma broca helicoidal comum, a qualidade da afiação da ponta influencia entre outros o desvio do centro do furo. Acontece uma diferença de equilíbrio das forças nos cortes. Ao furar com brocas canhão, réguas de guias assimilam as forças de corte, o que resulta num bom desvio do centro do furo.



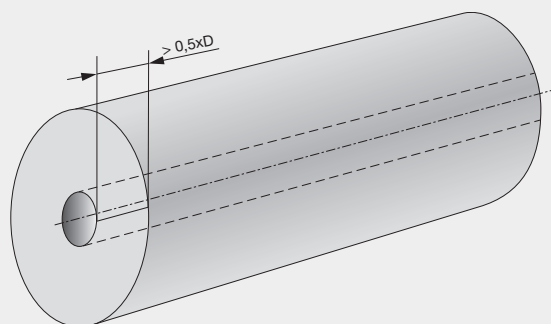
* Brocas para furos profundos com dois cortes - tanto com canais retos quanto com canais helicoidais - atingem ca. de 50% dos valores aqui indicados.



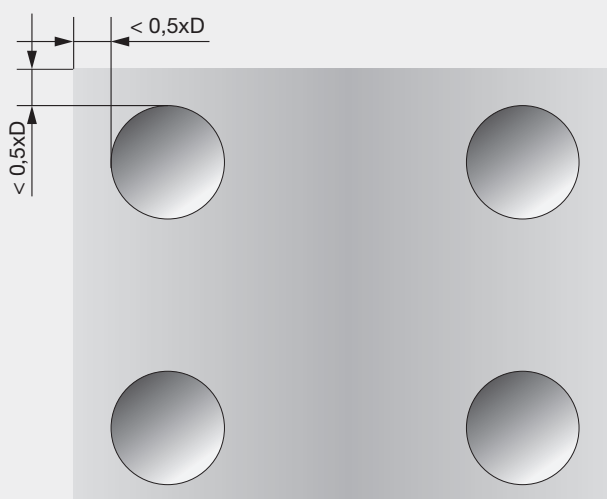
Retilidade do furo/desvio do centro



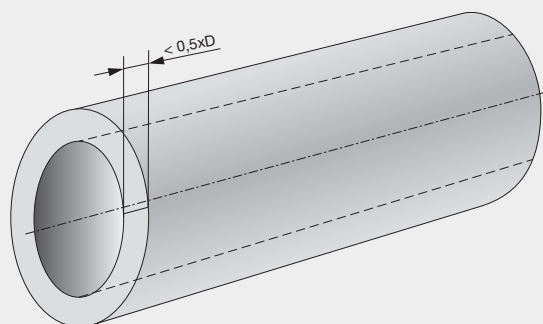
Distância do furo à borda $> 0,5xD$



distância à borda suficiente
($> 0,5xD$) → ótimo



Distância do furo à borda $< 0,5xD$



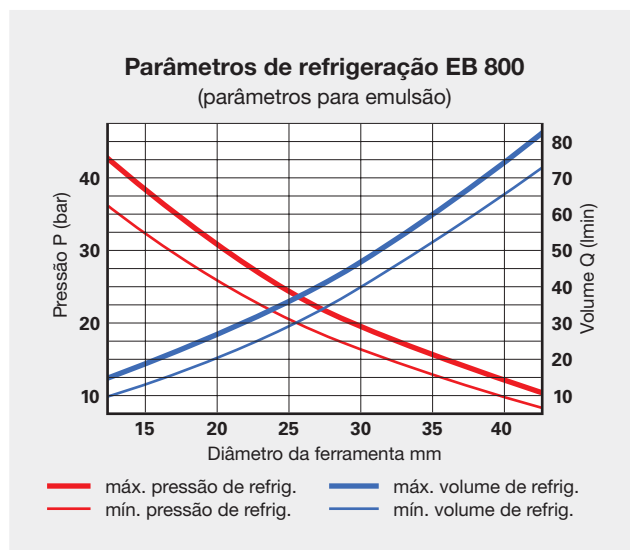
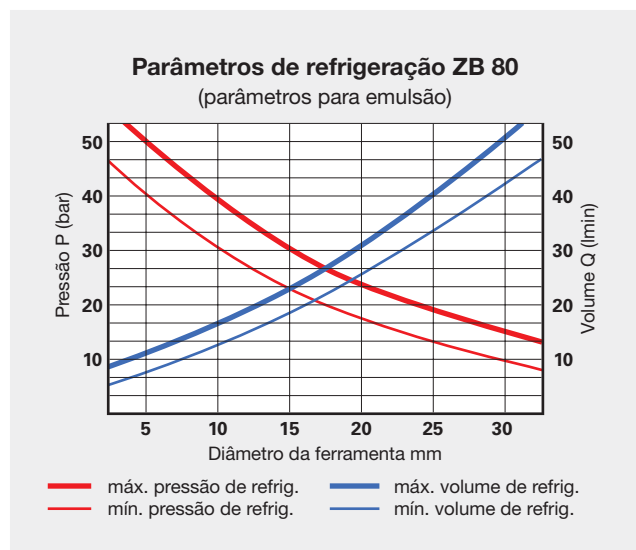
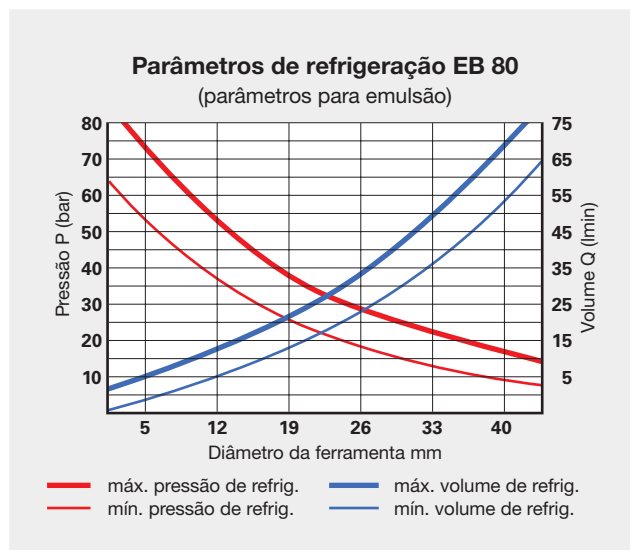
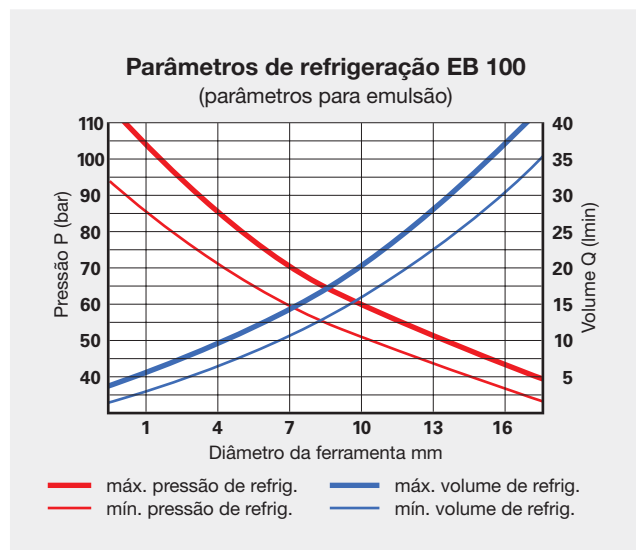
distância mínima ($0,5xD$)
está abaixo → pode levar a perda da
retilidade do furo



Valores de refrigeração

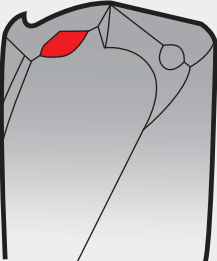
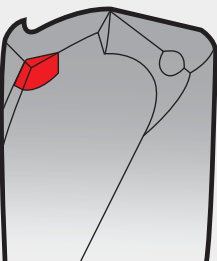
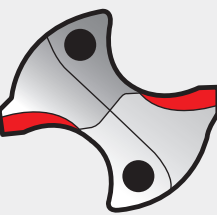
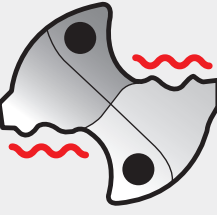
Favor observarem:

- Todas as brocas canhão somente poderão ser utilizadas com refrigeração interna, tanto faz que seja com ar, emulsão ou óleo. Sem refrigeração interna os cavacos não podem ser transportados para fora do furo.
- Todas as brocas canhão poderão também utilizar óleo como meio para a refrigeração interna. Mas então porém é necessária uma pressão 30% mais elevada, para obter o mesmo volume do meio de refrigeração.
- Se as brocas canhão forem utilizar MQL, no caso de diâmetros nominais menores poderá ser necessário o aumento da pressão, conforme a pressão do sistema MQL.
- Caso os valores de refrigeração não sejam suficientes pode-se trabalhar com parâmetros de corte reduzidos. Também é possível a utilização de sistemas de elevação de pressão.
- Para brocas canhão com grandes comprimentos, deve atentar-se, com a pressão do fluido de refrigeração para que este, atenda o volume requerido de fluido nos canais de refrigeração.



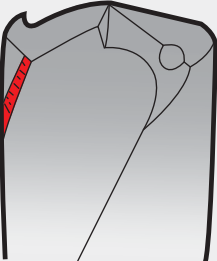

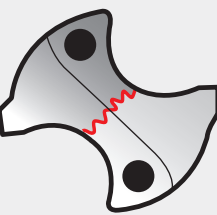
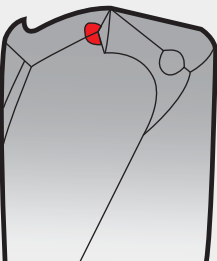


Referências de aplicação/Resolução de problemas

Problemas	Causas	Ações Corretivas
1. Aresta postiça 	<ul style="list-style-type: none"> ■ Velocidade de corte muito baixa ■ Honeamento do corte principal muito grande ■ Corte principal brilhante 	<ul style="list-style-type: none"> ■ Aumentar a velocidade de corte ■ Diminuir o honeamento do corte principal ■ Revestir a ferramenta
2. Rupturas nos cantos 	<ul style="list-style-type: none"> ■ Condições instáveis, fixação da ferramenta insuficiente ■ Erro de circularidade muito grande ■ Corte interrompido 	<ul style="list-style-type: none"> ■ Fixar melhor a peça ■ Controlar a circularidade, corrigir se possível ■ Reduzir o avanço
3. Forte desgaste na superfície de folga 	<ul style="list-style-type: none"> ■ Velocidade de corte muito alta ■ Avanço muito baixo ■ Ângulo de folga muito pequeno 	<ul style="list-style-type: none"> ■ Reduzir a velocidade de corte ■ Aumentar o avanço ■ Aumentar o ângulo de folga
4. Rupturas no corte principal 	<ul style="list-style-type: none"> ■ Condições instáveis, fixação da peça insuficiente ■ Corte interrompido ■ Largura máxima da marca do desgaste ultrapassada ■ Tipo de ferramenta errado 	<ul style="list-style-type: none"> ■ Fixar melhor a peça ■ Fixar melhor a peça ■ Reduzir os intervalos das ferramentas ■ Utilizar uma ferramenta adequada (veja o auxílio de selecionamento)

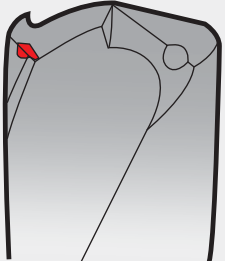
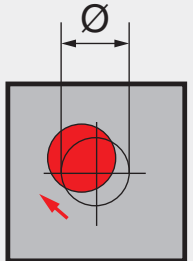
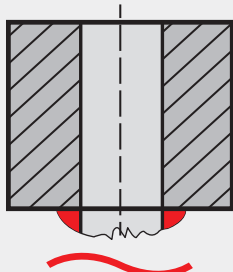
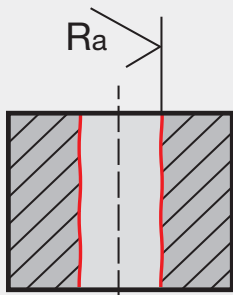


Referências de aplicação/Resolução de problemas

Problemas	Causas	Ações Corretivas
5. Desgastes das guias 	<ul style="list-style-type: none"> ■ Condições instáveis, fixação da peça insuficiente ■ Erro de circularidade muito grande ■ Redução dos diâmetros muito pequena ■ Meio de refrigeração errado (óleo). emulsão muito rala 	<ul style="list-style-type: none"> ■ Fixar melhor a peça ■ Controlar a circularidade, corrigir se possível ■ Aumentar a redução dos diâmetros ■ Aumentar a concentração de óleo ou utilizar óleo integral
6. Dorso arranhado 	<ul style="list-style-type: none"> ■ Condições instáveis, Fixação da peça insuficiente ■ Erro de circularidade muito grande ■ Corte interrompido ■ Material abrasivo 	<ul style="list-style-type: none"> ■ Fixar melhor a peça ■ Controlar a circularidade, corrigir se possível ■ Reduzir o avanço ■ Aumentar a concentração de óleo ou utilizar óleo integral
7. Forte desgaste na aresta transversal 	<ul style="list-style-type: none"> ■ Velocidade de corte muito baixa ■ Avanço muito grande ■ Honeamento do corte principal muito grande 	<ul style="list-style-type: none"> ■ Aumentar a velocidade de corte ■ Reduzir o avanço ■ Diminuir o honeamento do corte principal
8. Rupturas na transição, redução de arestas, corte principal 	<ul style="list-style-type: none"> ■ Ângulo de folga muito pequeno ■ Honeamento do corte principal muito grande ■ Tipo de ferramenta errada 	<ul style="list-style-type: none"> ■ Aumentar o ângulo de folga ■ Diminuir o honeamento do corte principal ■ Utilizar ferramenta adequada (veja auxílio de selecionamento)



Referências de aplicação/Resolução de problemas

Problemas	Causas	Ações Corretivas
9. Deformação plástica do canto de corte 	<ul style="list-style-type: none"> ■ Velocidade de corte muito alta ■ A quantidade de refrigeração não é suficiente ■ Honeamento do canto errado ou faltante 	<ul style="list-style-type: none"> ■ Reduzir a velocidade de corte ■ Aumentar a quantidade de refrigeração (volume, pressão) ■ Corrigir o honeamento do canto
10. Desvio do centro 	<ul style="list-style-type: none"> ■ Condições instáveis, Fixação da peça insuficiente ■ Erro de circularidade muito grande ■ Iniciar o furo em superfície inclinada ■ Aresta transversal muito grande 	<ul style="list-style-type: none"> ■ Melhorar a fixação da peça ■ Controlar a circularidade, corrigir se possível ■ Fazer uma base com fresa ou broca piloto RT100-P. ■ Reduzir a aresta transversal
11. Rebarba forte na saída do furo 	<ul style="list-style-type: none"> ■ Avanço muito grande ■ Largura máxima da marca do desgaste ultrapassada ■ Honeamento do corte principal muito grande 	<ul style="list-style-type: none"> ■ Diminuir o avanço ■ Reduzir os intervalos de troca de ferramentas ■ Diminuir o honeamento do corte principal
12. Superfície ruim 	<ul style="list-style-type: none"> ■ Condições instáveis, fixação da peça insuficiente ■ Erro de circularidade muito grande ■ A quantidade de refrigeração não é suficiente 	<ul style="list-style-type: none"> ■ Melhorar a fixação da peça ■ Controlar a circularidade, corrigir se possível ■ Aumentar a quantidade de refrigeração (volume, pressão)



Aços rápidos

Nós somente produzimos nossas ferramentas de aço rápido a partir de tipos de aços de alto valor, cuidadosamente selecionados. Conforme os seus componentes de liga as ferramentas obtém características específicas para o caso de aplicação:

Tungstênio, Molibdênio: aumenta a resistência do revenimento, e a resistência ao desgaste.

Vanádio: aumenta a resistência ao desgaste

Cobalto: aumenta a resistência ao desgaste, amplia a resistência térmica

Denominação Guhring	Tipo	Área de aplicação Características
HSS	Aço rápido convencional	Material de corte standard para utilização universal
HSCO / HSS-E	Aço rápido com liga de cobalto	Material de corte com alta resistência a dureza para muito altas solicitações. Especialmente adequado para altas temperaturas de corte ou refrigeração deficiente
M42	Aço rápido com 8% de cobalto	Material de corte com elevada resistência a temperatura e dureza, Adequado para usinar materiais difíceis de cisalhar
HSS-E		
HSS-E-PM	Aço rápido sinterizado	Material de corte com estrutura muito densa e uniforme. Alta dureza e resistência térmica, grande resistência ao desgaste e estabilidade dos cantos de corte



As classes mais importantes de metal duro para ferramentas Gühring.

A tabela a seguir contém as classes de metal duro mais importantes disponíveis no estoque da Gühring para aplicações em geral. Outras classes de metal duro disponíveis à pedido. Mais informações podem ser encontradas em www.guehring-carbide.de.

Em mais de 80% das aplicações conhecidas pela Gühring, os resultados da classe DK460UF de metal duro, combinado com revestimento selecionado, não foram superados por nenhuma outra classe de metal duro, incluindo ferramentas revestidas. Este fato combinado com a disponibilidade de matéria prima nos estoques da Gühring simplificam imensamente a escolha da ferramenta. Para mais informações a respeito das aplicações de classes de metal duro, favor contactar nossos engenheiros.

Classe	Teor de cobalto [M-%]	WC-grão utilizado [µm]	Dureza [HV]	Classificação-ISO [ISO 513]	Caracterização
DK460UF K40UF	10	0,6	1620	K20-K40	Classe de ampla aplicação, que, geralmente revestida, usina aços, ligas moles de alumínio, ferro fundido, e também super ligas como Inconel 718. Esta classe representa a espinha dorsal de nossa produção.
DK500UF K44UF	12	0,5	1690	K20-K30	Esta classe foi desenvolvida especialmente para usinagem dura. Defronte a DK 460 UF ela se sobressai devido a sua dureza mais elevada e maior tolerância a deformações. Devido ao seu alto teor de cobalto é recomendada a utilização de um revestimento.
DK255F	8	0,7	1720	K20	Esta classe é recomendada para usinagem dura, para fundição cinzenta de alta resistência e ligas duras de AlSi. A usinagem a seco é possível. É recomendada a utilização de um revestimento.
DK120	6	1,3	1620	K15-K20	Esta classe é especialmente adequada para utilização com revestimento de diamante.
DK120UF	7	0,7	1850	K05-K10	Classe com granulação ultra fina com elevadíssima resistência ao desgaste, adequada em máquinas absolutamente estáveis, preferencialmente para alargadores.
K55SF	9	0,2-0,4	1920	K05-K10	Para a utilização em materiais altamente resistentes ao desgaste, aços inoxidáveis, materiais compósitos como Kevlar e fibras de vidro, usinagem a alta velocidade e a seco.
DK400N	10	0,7	1580	K20-K40	Classe altamente tenaz para a usinagem de metais de alta resistência a temperaturas.
DK256EH	10	0,6	1750	K20	Esta variação é indicada principalmente para usinagem de ligas a base de níquel.
K6UF	6	0,6	1870	K05-K10	Grão ultrafino com alta resistência ao desgaste, indicado para usinagem de materiais altamente resistentes, materiais compósitos, fibra de carbono e kevlar.
K5UF	5	0,5	2010	K05-K10	Recentemente desenvolvido com alta dureza para furação e alargamento.



Materiais de corte super duros

Não é somente por sua altíssima dureza, mas também por sua alta resistência térmica que os materiais de corte superduros possibilitam os mais altos parâmetros de corte, e com isto a mais alta produtividade. PCD (Poly-Crystalline Diamond) tem altíssima resistência ao desgaste. O principal campo de

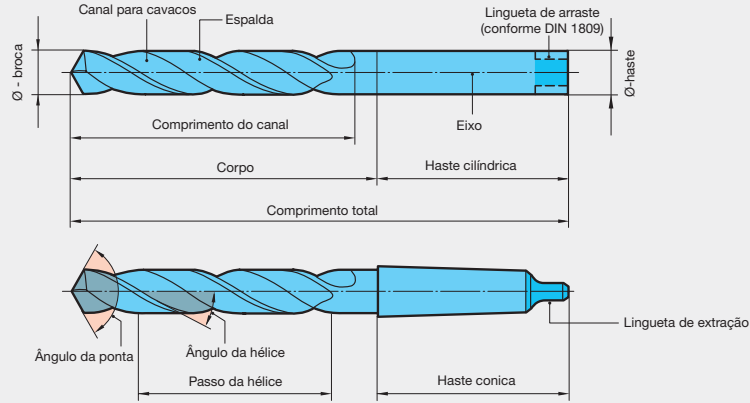
aplicação do PCD é a usinagem de alumínio e compósitos fibrosos. PcBN (Poly-Crystalline cubic Boron Nitrite) tem aplicações em materiais ferrosos. Para se beneficiar de todo potencial destes materiais, deve-se utilizar-se de máquinas-ferramenta estáveis.

Denominação Gühring	Classificação	Área de aplicação Características	Tamanho dos grãos médio	Área de aplicação características
PCD	Grão fino	Alumínio e ligas de alumínio <10% Si, ligas de magnésio, latão, cobre, bronze. Excelente qualidade de arestas de corte, alta resistência a abrasão, excelente acabamento superficial.	2-4 µm	> 90% PCD
	Grão médio	Classe universal (para acabamentos em geral) Ligas AISi <14% Si, ligas de cobre, grafite e materiais compósitos de grafite, compósitos plásticos fibrosos, cerâmicas não sinterizadas e metal duro (<15% de liga metálica) Excelente resistência a abrasão, bom acabamento superficial.	5-10 µm	ca. 92% PCD
	Grão grosso	Aplicações de desbaste Ligas AISi >14% Si e outras aplicações abrasivas, MQL, cerâmica sinterizada e metal duro (<15% de liga metálica). Extrema resistência a abrasão, alta resistência a impactos, vida útil elevada em aceitáveis e boas qualidades superficiais.	>25 µm	ca. 94% PCD
	Grãos mistos	Nas aplicações mais abrasivas de usinagem (p. ex. ligas AISi >14% Si, MQL, materiais compósitos). Elevada resistência ao desgaste, excelente resistência a impactos, extrema resistência a abrasão com boa resistência a fissuras, vida útil elevada com ótimas qualidades superficiais.	4 µm+ 25 µm	ca. 95% PCD
PcBN 10..	Proporção baixa de CBN com base de metal duro	Para usinagem em acabamento de aços endurecidos, aços temperados, e aços ferramenta, indicado para corte contínuo e interropido com ap<0,3mm. Alta resistência ao desgaste, resistência ao impacto, resistência a altas temperaturas, tenacidade.	<1-4 µm	40-65% CBN
PcBN 20..	Elevada proporção de CBN com base de metal duro	Para usinagem, entre outros, de fundidos nodulares (>45HRC), aço sinterizado, Alta resistência ao desgaste, resistência ao impacto.	2-3 µm	70-90% CBN
PcBN 30..	Elevada proporção de CBN sem base de metal duro	Ferramentas de PcBN indicadas para operações de desbaste. Fundidos cinzentos, fundição dura, aços endurecidos. Para aplicação em porta-ferramentas, ferramentas de furação e mandrilamento, cabeçotes de fresar com castanhas de fixação. Alta resistência ao desgaste, resistência ao impacto	2-20 µm	70-87% CBN

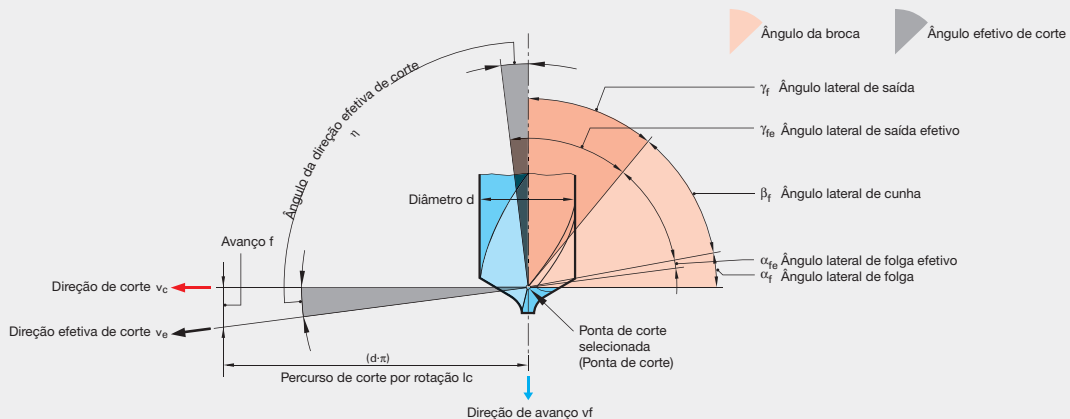
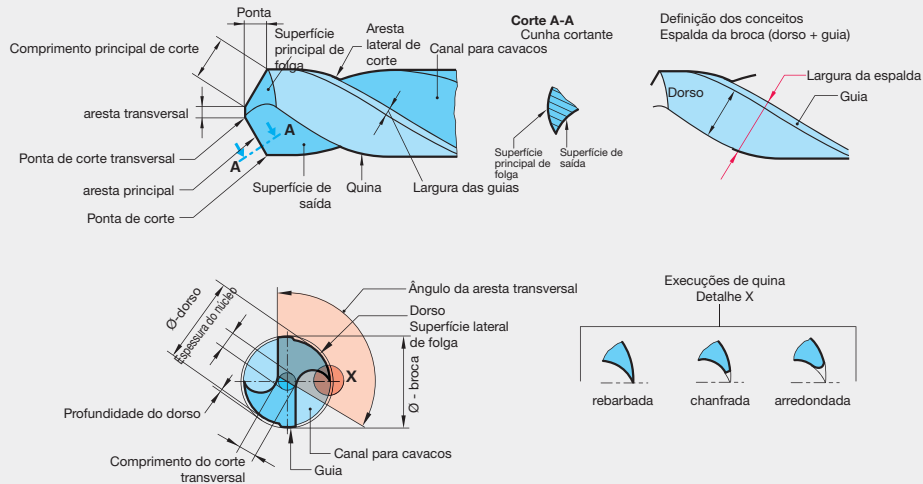


Conceitos, dimensões e ângulos DIN ISO 5419 (Extrato; edição 06/98)

Brocas helicoidais com haste cilíndrica/haste cônica



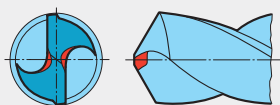
Parte cortante



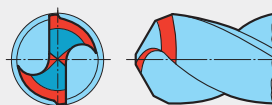


Formas de afiação e precisão de fabricação

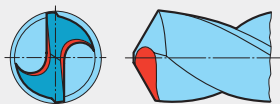
Formas de afiação DIN 1412 (extrato: edição 03/01)



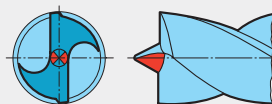
Forma A
Redução da
aresta transversal



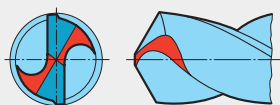
Forma D
Afição para
ferro fundido cinzento



Forma B
Redução da
aresta transversal com
correção da
aresta principal



Forma E
Ponta para centrar



Forma C
Afição em cruz

Precisão de fabricação de brocas helicoidais conforme DIN ISO 286, parte 2

Diâmetro (Dimensão nominal) até inclusive mm	Afastamentos μm	
	h8	h7
0,38 ... 0,60	10	7
0,95	12	8
3,00	14	10
6,00	18	12
10,00	22	15
18,00	27	18
30,00	33	21
50,00	39	25
80,00	46	30
120,00	54	35

* Se a nossa tolerância de fabricação normal h8 não atende as suas necessidades comunique-nos por favor. Veja os preços adicionais para tolerâncias mais apertadas nas listas no final do capítulo ferramentas para furar.

Referência sobre outras normas

DIN 228 folha 1 Cones para ferramentas;
cone Morse e cone métrico, hastes cónicas

DIN 1414 - 1 Condições técnicas para fornecimento de
brocas helicoidais de aço rápido

DIN 6580 conceitos da técnica da formação de cavacos;
movimentos e geometria do processo da formação do cavaco

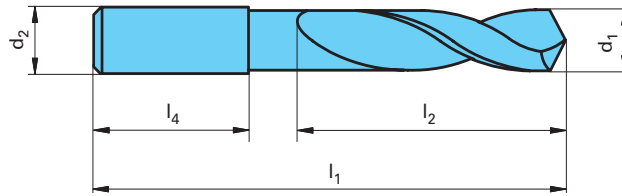
DIN 6581 Conceitos da técnica da formação do cavaco; sistemas
de referências e ângulos na parte cortante da ferramenta

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Brocas helicoidais de metal duro (brocas Ratio)

Brocas helicoidais de metal duro (brocas Ratio) DIN 6537

Válida para brocas helicoidais de metal duro integral com 2 ou 3 cortes, e haste cilíndrica rebaixada conforme DIN 6535

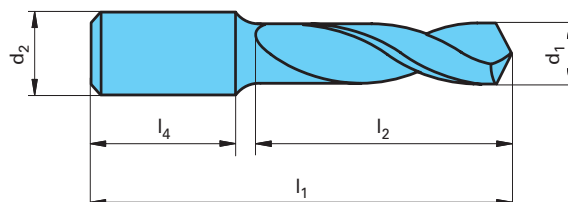


Dimensões em mm

Ø-nominal Gama até d1m7	Ø-haste d2h6	Broca Ratio para 3 x D		Broca Ratio para 5 x D		Comprimento da haste l4
		Comprimento total l1	Comprimento do canal máx. l2	Comprimento total l1	Comprimento do canal máx. l2	
2,9...3,75	6	62	20	66	28	36
4,75	6	66	24	74	36	36
6,00	6	66	28	82	44	36
7,00	8	79	34	91	53	36
8,00	8	79	41	91	53	36
10,00	10	89	47	103	61	40
12,00	12	102	55	118	71	45
14,00	14	107	60	124	77	45
16,00	16	115	65	133	83	48
18,00	18	123	73	143	93	48
20,00	20	131	79	153	101	50

Brocas helicoidais de metal duro (brocas Ratio) DIN 6538

Válida para brocas com pastilha soldada ou cabeça de metal duro soldada com haste reforçada de aço conforme DIN 6535. A cabeça soldada pode ser uma parte ou a parte cortante completa.



Dimensões em mm

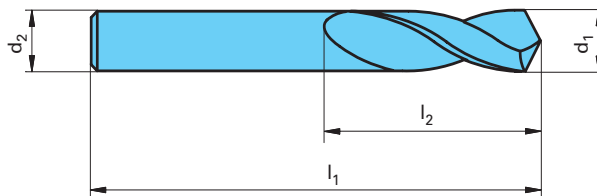
Ø-nominal Gama até d1h7	Ø-haste d2h6	Broca Ratio para 3 x D		Broca Ratio para 5 x D		Broca Ratio para 7 x D		Comprimento da haste l4
		Comprimento total l1	Comprimento do canal máx. l2	Comprimento total l1	Comprimento do canal máx. l2	Comprimento total l1	Comprimento do canal máx. l2	
9,5...12,0	16	103	51	127	75	151	99	48
14,0	16	111	59	139	87	167	115	48
16,0	20	122	68	154	100	186	132	50
18,0	20	130	76	166	112	202	148	50
20,0	25	144	84	184	124	224	164	56
22,0	25	153	93	197	137	241	181	56
24,0	25	161	101	209	149	257	197	56
26,0	32	174	110	226	162	278	214	60
28,0	32	182	118	238	174	294	230	60
30,0	32	190	126	250	186	310	246	60



Brocas helicoidais de metal duro (brocas Ratio)

Brocas helicoidais de metal duro (brocas Ratio) DIN 6539

Válida para brocas helicoidais de metal duro integral com haste cilíndrica passante, isto é com mesmo diâmetro nos cortes e na haste



Dimensões em mm

Gama -Ø- nominais até (= haste-Ø d2) d1	Comprimento total l1	Comprimento do canal l2
1,90...2,12	38	12
2,36	40	13
2,65	43	14
3,00	46	16
3,35	49	18
3,75	52	20
4,25	55	22
4,75	58	24
5,30	62	26
6,00	66	28
6,70	70	31
7,50	74	34
8,00	79	37
8,50	79	37
9,50	84	40

Gama -Ø- nominais até (= haste-Ø d2) d1	Comprimento total l1	Comprimento do canal l2
10,00	89	43
10,60	89	43
11,80	95	47
12,00	102	51
13,20	102	51
14,00	107	54
15,00	111	56
16,00	115	58
17,00	119	60
18,00	123	62
19,00	127	64
20,00	131	66

Brocas helicoidais com haste cilíndrica

Diâmetro até (inclusive) mm	DIN 338		DIN 339		DIN 340		DIN 1897		DIN 1869 Brocas helicoidais super longas					
	Comprimento total mm	Comprimento do canal	Comprimento total mm	Comprimento do canal	Comprimento total mm	Comprimento do canal	Comprimento total mm	Comprimento do canal	Série 1		Série 2		Série 3	
									Comprimento total mm	Comprimento do canal	Comprimento total mm	Comprimento do canal	Comprimento total mm	Comprimento do canal
≤ 0,24	19	2,5					19	1,5						
0,30	19	3					19	1,5						
0,38	19	4					19	2						
0,48	20	5			30*	10*	19	2,5						
0,53	22	6			32*	12*	20	3						
0,60	24	7	32*	15*	35*	15*	21	3,5						
0,67	26	8	36*	18*	38*	18*	22	4						
0,75	28	9	39*	20*	42*	21*	23	4,5						
0,85	30	10	42*	22*	46*	25*	24	5						
0,95	32	11	45*	24*	51*	29*	25	5,5						
1,06	34	12	48	26	56	33	26	6						
1,18	36	14	50	28	60	37	28	7						
1,32	38	16	52	30	65	41	30	8						
1,50	40	18	55	33	70	45	32	9						
1,70	43	20	58	35	76	50	34	10	115*	75*				
1,90	46	22	62	38	80	53	36	11	120*	80*				
2,12	49	24	66	41	85	56	38	12	125	85	160*	110*	205*	135*
2,36	53	27	70	44	90	59	40	13	135	90	170*	115*	215*	145*
2,65	57	30	74	47	95	62	43	14	140	95	180*	120*	225*	150*
3,00	61	33	79	51	100	66	46	16	150	100	190	130	240*	160*
3,35	65	36	84	55	106	69	49	18	155	105	200	135	250*	170*
3,75	70	39	91	60	112	73	52	20	165	115	210	145	265	180
4,25	75	43	96	64	119	78	55	22	175	120	220	150	280	190
4,75	80	47	102	69	126	82	58	24	185	125	235	160	295	200
5,30	86	52	108	74	132	87	62	26	195	135	245	170	315	210
6,00	93	57	116	80	139	91	66	28	205	140	260	180	330	225
6,70	101	63	124	86	148	97	70	31	215	150	275	190	350	235
7,50	109	69	133	93	156	102	74	34	225	155	290	200	370	250
8,50	117	75	142	100	165	109	79	37	240	165	305	210	390	265
9,50	125	81	151	107	175	115	84	40	250	175	320	220	410	280
10,60	133	87	162	116	184	121	89	43	265	185	340	235	430	295
11,80	142	94	173	125	195	128	95	47	280*	195*	365*	250*	455*	310*
13,20	151	101	184	134	205	134	102	51	295*	205*	375*	260*	480*	330*
14,00	160	108	194	142	214	140	107	54						
15,00	169	114	202	147	220	144	111	56						
16,00	178	120	211	153	227	149	115	58						
17,00	184	125	218	159	235	154	119	60						
18,00	191	130	226	165	241	158	123	62						
19,00	198	135	234	171	247	162	127	64						
20,00	205	140	242	177	254	166	131	66						
21,20					261	171	136	68						
22,40					268	176	141	70						
23,60					275	180	146	72						
25,00					282	185	151	75						
26,50					290	190	156	78						
28,00					298	195	162	81						
30,00					307	201	168	84						
31,50					316	207	174	87						
33,50							180	90						
35,50							186	93						
37,50							193	96						
40,00							200	100						
42,50							207	104						
45,00							214	108						
47,50							221	112						
50,00							228	116						

Nós fornecemos brocas helicoidais até 1000 mm de comprimento total conforme norma da Guhring. Art. Nr. 242, 243, 244

* Norma Guhring



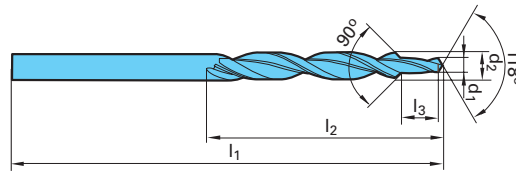
Brocas helicoidais com cone Morse

Diâmetro até (inclusive) mm	DIN 345			DIN 346			DIN 341			Brocas para furar através de buchas com cone Morse grande*			Brocas-GV/VA* para materiais de difícil usinabilidade			DIN 1870 Brocas helicoidais super longas					
	Comprimento total mm	Comprimento do canal mm	Cone Morse	Comprimento total mm	Comprimento do canal mm	Cone Morse	Comprimento total mm	Comprimento do canal mm	Cone Morse	Comprimento total mm	Comprimento do canal mm	Cone Morse	Comprimento total mm	Comprimento do canal mm	Cone Morse	Série 1			Série 2		
																Comprimento total mm	Comprimento do canal mm	Cone Morse	Comprimento total mm	Comprimento do canal mm	Cone Morse
2,65	111*	30*	1*																		
3,00	114	33	1																		
3,35	117	36	1																		
3,75	120	39	1																		
4,25	124	43	1				145*	64*	1*												
4,75	128	47	1				150*	69*	1*												
5,30	133	52	1				155	74	1												
6,00	138	57	1				161	80	1												
6,70	144	63	1				167	86	1												
7,50	150	69	1				174	93	1												
8,50	156	75	1				181	100	1			130	49	1	265	165	1	330	210	1	
9,50	162	81	1				188	107	1			134	53	1	275	175	1	345	220	1	
10,60	168	87	1	185*	87*	2*	197	116	1	214	116	2	138	57	1	285	185	1	360	235	1
11,80	175	94	1	192*	94*	2*	206	125	1	223	125	2	142	61	1	300	195	1	375	250	1
13,20	182	101	1	199	101	2	215	134	1	232	134	2	147	66	1	310	205	1	395	260	1
14,00	189	108	1	206	108	2	223	142	1	240	142	2	168	70	2	325	220	1	410	275	1
15,00	212	114	2	235*	114*	3*	245	147	2	268	147	3	172	74	2	340	220	2	425	275	2
16,00	218	120	2	241*	120*	3*	251	153	2	274	153	3	176	78	2	355	230	2	445	295	2
17,00	223	125	2	246*	125*	3*	257	159	2	280	159	3	179	81	2	355	230	2	445	295	2
18,00	228	130	2	251*	130*	3*	263	165	2	286	165	3	183	85	2	370	245	2	465	310	2
19,00	233	135	2	256	135	3	269	171	2	292	171	3	186	88	2	370	245	2	465	310	2
20,00	238	140	2	261	140	3	275	177	2	298	177	3	212	91	3	385	260	2	490	325	2
21,20	243	145	2	266	145	3	282	184	2	305	184	3	216	95	3	385	260	3	490	325	3
22,40	248	150	2	271	150	3	289	191	2	312	191	3	219	98	3	405	270	3	515	345	3
23,02	253	155	2	276	155	3	296	198	2	319	198	3	222	101	3	405	270	3	515	345	3
23,60	276	155	3	304*	155*	4*	319	198	3	347	198	4	222	101	3	425	270	3	535	345	3
25,00	281	160	3	309*	160*	4*	327	206	3	355	206	4	225	104	3	440	290	3	555	365	3
26,50	286	165	3	314*	165*	4*	335	214	3	363	214	4	256	107	4	440	290	3	555	365	3
28,00	291	170	3	319	170	4	343	222	3	371	222	4	259	110	4	460	305	3	580	385	3
30,00	296	175	3	324	175	4	351	230	3	379	230	4	263	114	4	460	305	3	580	385	3
31,50	301	180	3	329	180	4	360	239	3	388	239	4	266	117	4	480	320	3	610	410	3
31,75	306	185	3	334	185	4	369	248	3	397	248	4	269	120	4	480	320	3	610	410	3
33,50	334	185	4	372*	185*	5*	397	248	4	435	248	5	269	120	4	505	320	4	635	410	4
35,50	339	190	4	377*	190*	5*	406	257	4				272	123	4	530	340	4	665	430	4
37,50	344	195	4	382*	195*	5*	416	267	4				276	127	4	530	340	4	665	430	4
40,00	349	200	4	387*	200*	5*	426	277	4				317	130	5	555	360	4	695	460	4
42,50	354	205	4	392	205	5	436	287	4				320	133	5	555	360	4	695	460	4
45,00	359	210	4	397	210	5	447	298	4				323	136	5	585	385	4	735	490	4
47,50	364	215	4	402	215	5	459	310	4							585	385	4	735	490	4
50,00	369	220	4	407	220	5	470	321	4							605	405	4	765	510	4
50,80	374	225	4	412	225	5	475*	326*	4*												
53,00	412	225	5	479*	225*	6*	513*	326*	5*												
56,00	417	230	5	484*	230*	6*	518*	331*	5*												
60,00	422	235	5	489*	235*	6*	523*	336*	5*												
63,00	427	240	5	494*	240*	6*															
67,00	432	245	5	499	245	6															
71,00	437	250	5	504	250	6															
75,00	442	255	5	509	255	6															
76,50	447	260	5	514	260	6															
80,00	514	260	6																		
85,00	519	265	6																		
90,00	524	270	6																		
95,00	529	275	6																		
100,00	534	280	6																		
106,00	539*	285*	6*																		

Nós fornecemos brocas helicoidais até 1000 mm de comprimento total conforme norma da Guhring. Art. Nr. 293, 298, 299, 563, 564, 565, 566

* Norma Guhring

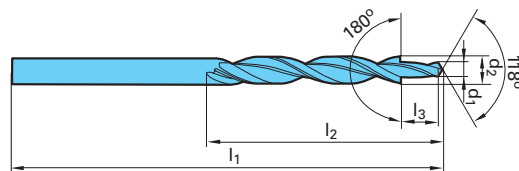
Brocas Subland com haste cilíndrica, escareado 90°



Ø- rebaixador d2 h8 mm	Ø- escalão d1 h9 mm	Comprimento total l1 mm	Comprimento do canal l2 mm	Comprimento do escalonado l3 mm	para rosca	Campo de aplicação
			HSS DIN 8378/	MD	Norma Gühring	
3,4	2,5	70	39	8,8	M 3	Para furos de núcleo de rosca conforme DIN 336 e escareados correspondentes aos furos passantes conforme DIN 273 (antiga) e DIN EN 20273 fileira: »médio«
4,5	3,3	80	47	11,4	M 4	
5,5	4,2	93	57	13,6	M 5	
6,6	5,0	101	63	16,5	M 6	
9,0	6,8	125	81	21,0	M 8	
11,0	8,5	142	94	25,5	M10	
13,5	10,2	160	108	30,0	M12	
DIN 8374 para escareados, fileira fino						
6,0	3,2	93	57	9,0	M 3	Para furos passantes conforme DIN ISO 273 (antiga), DIN EN 20273 fileira: »fino«, escareados para cabeça de parafuso forma A e B conforme DIN 74 parte 1 (antiga) fileira: »fino« e escareados para cabeça de parafuso conforme DIN 74 forma F. Para parafusos DIN 963 (antiga) e DIN 964 (antiga).
8,0	4,3	117	75	11,0	M 4	
10,0	5,3	133	87	13,0	M 5	
11,5	6,4	142	94	15,0	M 6	
15,0	8,4	169	114	19,0	M 8	
19,0	10,5	198	135	23,0	M10	
Norma Gühring para escareados, fileira médio						
6,6	3,4	101	63	9,0	M 3	Para furos passantes conforme DIN ISO 273 (antiga) e escareados para cabeça de parafuso forma A e B conforme DIN 74 parte 1 (antiga) fileira: »médio«. Para parafusos DIN 963 (antiga) e DIN 964 (antiga).
9,0	4,5	125	81	11,0	M 4	
11,0	5,5	142	94	13,0	M 5	
13,0	6,6	151	101	15,0	M 6	
17,2	9,0	191	130	19,0	M 8	
DIN 8374 para escareados, fileira médio						
7,5	3,4	109	69	9,0	M 3	Para furos passantes conforme DIN ISO 273 (antiga) e escareados para cabeça de parafuso forma A e B conforme DIN 74 parte 1 (antiga) fileira: »médio«. Para parafusos DIN 963 (antiga) e DIN 964 (antiga).
9,7	4,5	133	87	11,0	M 4	
12,0	5,5	151	101	13,0	M 5	
14,5	6,6	169	114	15,0	M 6	
19,9	9,0	198	135	19,0	M 8	



Brocas Subland com haste cilíndrica, ângulo do rebaixo 180°

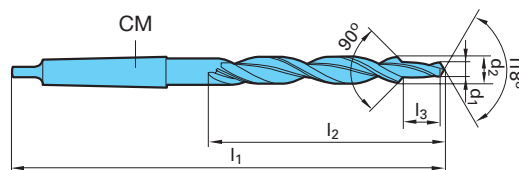


Ø- escareador d2 h8 mm	Ø- escalão d1 h9 mm	Comprimento total l1 mm	Comprimento do canal l2 mm	Comprimento do escalonado l3 mm	para rosca	Campo de aplicação
			HSS DIN 8376/	MD	Norma Guhring	
6,0**	3,4	93**	57**	9,0	M 3	Para furos passantes conforme DIN-ISO 273 (antiga), DIN EN 20273 fileira: »médio«, rebaixos para cabeça de parafuso conforme DIN 974 - 1 e rebaixos para cabeça de parafuso forma H, J e K conforme DIN 74 parte 2 (antiga) fileira »médio«. Para parafusos DIN 84 (antiga), 912 (antiga), 6912, 7513 e DIN 7984.
6,5	3,4	101	63	9,0	M 3	
8,0	4,5	117	75	11,0	M 4	
10,0	5,5	133	87	13,0	M 5	
11,0	6,6	142	94	15,0	M 6	
15,0	9,0	169	114	19,0	M 8	
18,0	11,0	191	130	23,0	M10	
Norma Guhring						
6,0	3,2	93	57	9,0	M 3	Para furos passantes conforme DIN-ISO 273 (antiga) e rebaixos para cabeça de parafuso forma H, J e K conforme DIN 74 parte 2 (antiga) fileira: »fino«. Para parafusos DIN 84 (antiga), 912 (antiga), 6912, 7513 e DIN 7984.
8,0	4,3	117	75	11,0	M 4	
Norma Guhring para rebaixos, fileira fino (antiga*)						
5,9	3,2	93	57	11,0	M 3	Para parafusos DIN 84 (antiga) DIN 912 (antiga) e DIN 6912. Para rebaixos antigos forma H, J e K conforme DIN 75 parte 2 fileira: »fino«.
7,4	4,3	109	69	13,0	M 4	
9,4	5,3	125	81	16,0	M 5	
10,4	6,4	133	87	19,0	M 6	
13,5	8,4	160	108	22,0	M 8	
16,5	10,5	184	125	25,0	M10	
Norma Guhring para rebaixos, fileira médio (antiga*)						
8,0	4,8	117	75	13,0	M 3	Para parafusos DIN 84 (antiga), DIN 912 (antiga) e DIN 6912. Para rebaixos antigos forma H, J e K conforme DIN 75 parte 2 fileira: »médio«.
10,0	5,8	133	87	16,0	M 4	
11,0	7,0	142	94	19,0	M 5	
14,5	9,5	169	114	22,0	M 6	
17,5	11,5	191	130	25,0	M 8	

* DIN 75, parte 2; ** Norma Guhring



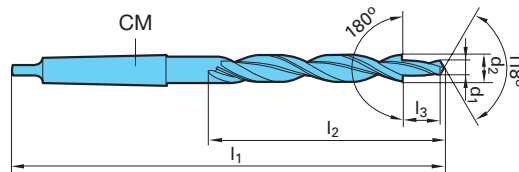
Brocas Subland com cone Morse, escareado 90°



Rebaixador d2 h8 mm	Ø- escalão d1 h9 mm	Comprimento total l1 mm	Comprimento do canal l2 mm	Cone Morse CM	Comprimento do escalonado l3 mm	para rosca	Campo de aplicação
Norma Guhring							
11,0	5,5	175	94	1	13,0	M 5	Para furos passantes conforme DIN-ISO 273 (antiga), DIN EN 20273 fileira: »médio«, escareados para cabeça de parafuso conforme DIN 74 forma F e escareados para cabeça de parafuso forma A e B conforme DIN 74 parte 1 (antiga) execução:»médio«. Para parafusos DIN 963 (antiga) e DIN 964 (antiga).
13,0	6,6	182	101	1	15,0	M 6	
17,2	9,0	228	130	2	19,0	M 8	
21,5	11,0	248	150	2	23,0	M10	
26,0	14,0	286	165	3	27,0	M12	
29,0	16,0	296	175	3	31,0	M14	
DIN 8375							
12,0	5,5	182	101	1	13,0	M 5	Para furos passantes conforme DIN-ISO 273 (antiga), DIN EN 20273 fileira: »médio«, escareados para cabeça de parafuso conforme DIN 74 forma F e escareados para cabeça de parafuso forma A e B conforme DIN 74 parte 1 (antiga) execução:»médio«. Para parafusos DIN 963 (antiga) e DIN 964 (antiga).
14,5	6,6	---	108	1	15,0	M 6	
19,0	9,0	253	135	2	19,0	M 8	
23,0	11,0	248	155	2	23,0	M10	
Norma Guhring							
11,5	6,4	175	94	1	15,0	M 6	Para furos passantes conforme DIN-ISO 273 (antiga) e escareados para cabeça de parafuso forma A e B conforme DIN 74 parte 1 (antiga) execução: »fino«. Para parafusos DIN 963 (antiga) e DIN 964 (antiga).
15,0	8,4	212	114	2	19,0	M 8	
19,0	10,5	233	135	2	23,0	M10	
23,0	13,0	253	155	2	27,0	M12	
26,0	15,0	286	165	3	31,0	M14	
30,0	17,0	296	175	3	35,0	M16	
DIN 8379							
9,0	6,8	162	81	1	21,0	M 8	Para furos de núcleo de rosca conforme DIN 336, DIN EN 20273 fileira:»médio« e escareados correspondentes aos furos passantes conforme DIN ISO 273 (antiga).
11,0	8,5	175	94	1	25,5	M10	
13,5	10,2	189	108	1	30,0	M12	
15,5	12,0	218	120	2	34,5	M14	
17,5	14,0	228	130	2	38,5	M16	
20,0	15,5	238	140	2	43,5	M18	
22,0	17,5	248	150	2	47,5	M20	



Brocas Subland com cone Morse, rebaixo 180°



Ø- rebaixador d2 h8 mm	Ø- escalão d1 h9 mm	Comprimento total l1 mm	Comprimento do canal l2 mm	Cone Morse CM	Comprimento do escalonado l3 mm	para rosca	Campo de aplicação					
HSS DIN 8377/				MD Norma Guhring								
10,0	5,5	168	87	1	13,0	M 5	Para furos passantes conforme DIN-ISO 273 (antiga), DIN EN 20273 fileira: »médio«, rebaixo para cabeças de parafuso conforme DIN 974-1 e rebaiços para cabeça de parafuso forma H, J e K conforme DIN 74 parte 2 (antiga) execução: »médio«. Para parafusos DIN 84 (antiga), 912 (antiga), 6912, 7513 e DIN 7984.					
11,0	6,6	175	94	1	15,0	M 6						
15,0	9,0	212	114	2	19,0	M 8						
18,0	11,0	228	130	2	23,0	M10						
20,0	13,5	238	140	2	27,0	M12						
24,0	15,5	281	160	3	31,0	M14						
26,0	17,5	286	165	3	35,0	M16						
30,0	20,0	296	175	3	39,0	M18						
33,0	22,0	334	185	4	43,0	M20						
Norma Guhring												
10,0	5,3	168	87	1	13,0	M 5	Para furos passantes conforme DIN-ISO 273 (antiga) e rebaiços para cabeça de parafuso forma H, J e K conforme DIN 74 parte 2 (antiga) execução »fino«. Para parafusos DIN 84 (antiga), 912 (antiga), 6912, 7513 e DIN 7984.					
11,0	6,4	175	94	1	15,0	M 6						
15,0	8,4	212	114	2	19,0	M 8						
18,0	10,5	228	130	2	23,0	M10						
20,0	13,0	238	140	2	27,0	M12						
24,0	15,0	281	160	3	31,0	M14						
26,0	17,0	286	165	3	35,0	M16						
Norma Guhring para rebaiços, execução fino (antiga*)												
9,4	5,3	162	81	1	16,0	M 5	Para parafusos DIN 84 (antiga), DIN 912 (antiga) e DIN 6912. Para rebaiços antigos forma H, J e K conforme DIN 75 parte 2 execução: »fino«.					
10,4	6,4	168	87	1	19,0	M 6						
13,5	8,4	189	108	1	22,0	M 8						
16,5	10,5	223	125	2	25,0	M10						
19,0	13,0	233	135	2	28,0	M12						
23,0	15,0	253	155	2	30,0	M14						
25,0	17,0	281	160	3	33,0	M16						
28,0	19,0	291	170	3	36,0	M18						
31,0	21,0	301	180	3	39,0	M 20						
Norma Guhring para rebaiços, execução médio (antiga*)												
10,0	5,8	168	87	1	16,0	M 5	Para parafusos DIN 84 (antiga), DIN 6912. Para rebaiços antigos forma H, J e K conforme DIN 75 parte 2 execução: »médio«.					
11,0	7,0	175	94	1	19,0	M 6						
14,5	9,5	212	114	2	22,0	M 8						
17,5	11,5	228	130	2	25,0	M10						
20,0	14,0	238	140	2	28,0	M12						
24,0	16,0	281	160	3	30,0	M14						
26,0	18,0	286	165	3	33,0	M16						
29,0	20,0	296	175	3	36,0	M18						
33,0	23,0	334	185	4	39,0	M20						
British Standard												
19/32	15,08	25/64	9,92	8 5/8	219	4 3/4	121	2	3/4	19,05	3/8 polegada	Para parafusos de cabeça cilíndrica conforme norma britânica
21/32	16,67	29/64	11,51	8 3/4	222	4 7/8	124	2	7/8	22,22	7/16 polegada	
25/32	19,84	33/64	13,10	9 3/8	238	5 1/2	140	2	1	25,40	1/2 polegada	

* DIN 75, parte 2



Broca calibradora com haste cilíndrica

Brocas calibradoras de encaixe

Diâmetro até inclusive mm	DIN 344					DIN 222		
	Comprimento total mm	Comprimento do canal para cavacos mm	Diâmetro até inclusive mm	Comprimento total mm	Comprimento do canal para cavacos mm	Ø nominal até inclusive mm	Comprimento total mm	Ø nominal do furo mm
4,25	96*	64*	11,70	173	125	35,5	45	13
4,75	102*	69*	13,20	184	134	45,0	50	16
5,30	108	74	14,00	194	142	53,0	56	19
6,00	116	80	15,00	202	147	63,0	63	22
6,70	124	86	16,00	211	153	75,0	71	27
7,50	133	93	17,00	218	159	90,0	80	32
8,50	142	100	18,00	226	165	101,6	90	40
9,50	151	107	19,00	234	171			
10,60	162	116	20,00	242	177			

Brocas calibradoras com cone Morse

Diâmetro até inclusive mm	DIN 343			DIN 1864		
	Comprimento total mm	Comprimento do canal para cavacos mm	Cone Morse	Comprimento total mm	Comprimento do canal para cavacos mm	Cone Morse
7,50	150*	69*	1*	174*	93*	1*
8,50	156*	75*	1*	181*	100*	1*
9,50	162	81	1	188	107	1
10,60	168	87	1	197	116	1
11,70	175	94	1	206	125	1
13,20	182	101	1	215	134	1
14,00	189	108	1	223	142	1
15,00	212	114	2	245	147	2
16,00	218	120	2	251	153	2
17,00	223	125	2	257	159	2
18,00	228	130	2	263	165	2
19,00	233	135	2	269	171	2
20,00	238	140	2	275	177	2
21,20	243	145	2	282	184	2
22,40	248	150	2	289	191	2
23,60	253	155	2	296	198	2
25,00	281	160	3	327	206	3
26,50	286	165	3	335	214	3
28,00	291	170	3	343	222	3
30,00	296	175	3	351	230	3
31,50	301	180	3	360	239	3
33,50	334	185	4			
35,50	339	190	4			
37,50	344	195	4			
40,00	349	200	4			
42,50	354	205	4			
45,00	359	210	4			
47,50	364	215	4			
50,00	369	220	4			

*Norma Guhring

Minibrocas (comprimento total 25 mm)

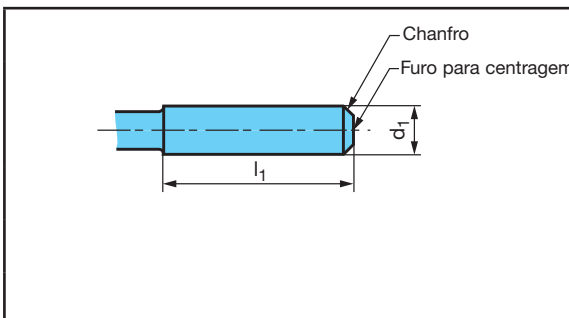
DIN 1899					
Diâmetro até inclusive mm	Ø-haste mm	Comprimento do canal para cavacos mm	Diâmetro até inclusive mm	Ø-haste mm	Comprimento do canal para cavacos mm
de 0,1 . . . 0,12	1,0	0,5	0,67	1,0	4,2
0,15	1,0	0,8	0,75	1,0	4,8
0,19	1,0	1,1	0,79	1,0	5,3
0,24	1,0	1,5	0,85	1,5	5,3
0,30	1,0	1,9	0,95	1,5	6,0
0,38	1,0	2,4	1,06	1,5	6,8
0,48	1,0	3,0	1,18	1,5	7,6
0,53	1,0	3,4	1,32	1,5	8,5
0,60	1,0	3,9	1,45	1,5	9,5



Hastes cilíndricas para ferramentas de aço rápido, DIN 1835-1 (extrato)

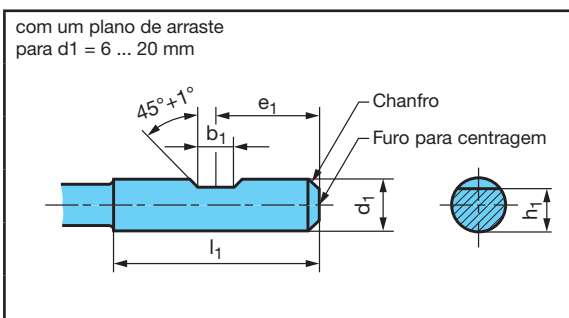
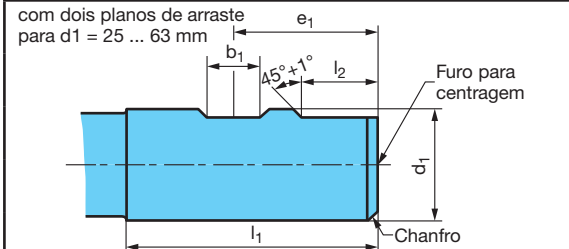
Forma A, lisa

Dimensões em mm

	d ₁	h ₁	d ₁	h ₁	d ₁	h ₁
	h8	+2 0	h8	+2 0	h8	+2 0
	3	28	12	45	50	80
	4	28	16	48	63	90
	5	28	20	50		
	6	36	25	56		
	8	36	32	60		
	10	40	40	70		

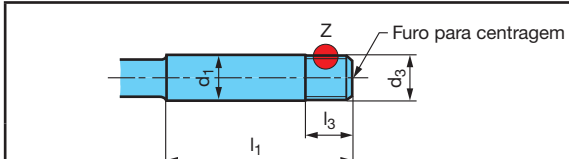
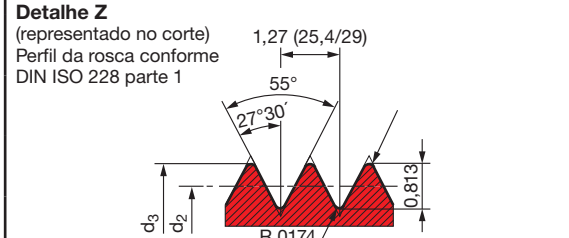
Forma B, com plano de arraste lateral

Dimensões em mm

	com um plano de arraste para d ₁ = 6 ... 20 mm	d ₁	b ₁	e ₁	h ₁	l ₁	l ₂	Furo para centragem Forma R DIN 332 parte 1
		h6	+0,05 0	0 -1	h13	+2 0	+1 0	
	com dois planos de arraste para d ₁ = 25 ... 63 mm	6	4,2	18	4,8	36	-	1,6x2,5
		8	5,5	18	6,6	36	-	1,6x3,35
		10	7	20	8,4	40	-	1,6x3,35
		12	8	22,5	10,4	45	-	1,6x3,35
		16	10	24	14,2	48	-	2,0x4,25
		20	11	25	18,2	50	-	2,5x5,3
		25	12	32	23	56	17	2,5x5,3
		32	14	36	30	60	19	3,15x6,7
		40	14	40	38	70	19	3,15x6,7
		50	18	45	47,8	80	23	3,15x6,7
		63	18	50	60,8	90	23	3,15x6,7

Forma D, com rosca de fixação

Dimensões em mm

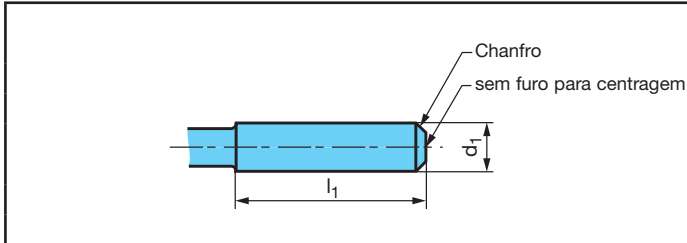
	d ₁	d ₃	Dim. limite	d ₂	Dim. limite	l ₁	l ₃	Furo para centragem Forma R DIN 332 parte 1
	h8					+2 0	+2 0	
	6	5,9	0 -0,1	5,087	0 -0,1	36	10	1,6 x 2,5
	10	9,9	0 -0,1	9,087	0 -0,1	40	10	1,6 x 3,35
	12	11,9	0 -0,1	11,087	0 -0,1	45	10	1,6 x 3,35
	16	15,9	0 -0,1	15,087	0 -0,1	48	10	2,0 x 4,25
	20	19,9	0 -0,15	19,087	0 -0,15	50	15	2,5 x 5,3
	25	24,9	0 -0,15	24,087	0 -0,15	56	15	2,5 x 5,3
	32	31,9	0 -0,15	31,087	0 -0,15	60	15	3,15 x 6,7



Hastes cilíndricas para brocas helicoidais e fresas de topo de metal duro DIN 6535

Forma HA, lisa

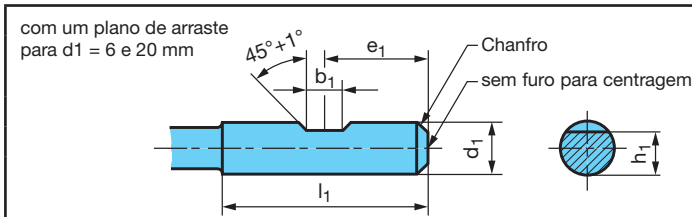
Dimensões em mm



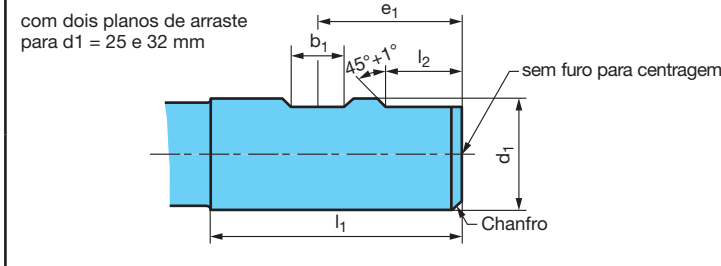
d ₁	l ₁	d ₁	l ₁
h6	+2 0	h6	+2 0
2	28	14	45
3	28	16	48
4	28	18	48
5	28	20	50
6	36	25	56
8	36	32	60
10	40		
12	45		

Forma HB, com plano de arraste lateral

Dimensões em mm



d ₁	b ₁	e ₁	h ₁	l ₁	l ₂
h6	+0,05 0	0 -1	h11	+2 0	+1 0
6	4,2	18	5,1	36	-
8	5,5	18	6,9	36	-
10	7	20	8,5	40	-
12	8	22,5	10,4	45	-
14	8	22,5	12,7	45	-
16	10	24	14,2	48	-
18	10	24	16,2	48	-
20	11	25	18,2	50	-

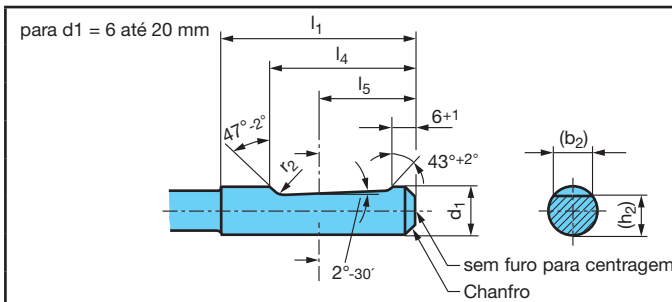


25	12	32	23	56	17
32	14	36	30	60	19

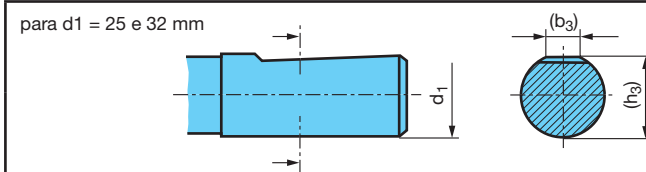
Forma HE, com plano de fixação inclinado sem canais de refrigeração*

* Execução: hastes cilíndricas conforme DIN 6535 são produzidas sem ou com canais de refrigeração. A aplicação da execução para ferramentas diferentes como também dimensões e determinação da posição dos canais de refrigeração estão contidas nas respectivas normas de dimensões.

Dimensões em mm



d ₁	(b ₂)	(b ₃)	h ₂	(h ₃)	l ₁	l ₄	l ₅	r ₂
h6	≈	(b ₃)	h11	(h ₃)	+2 0	0 -1	Dimensão nominal	min.
6	4,3	-	5,1	-	36	25	18	1,2
8	5,5	-	6,9	-	36	25	18	1,2
10	7,1	-	8,5	-	40	28	20	1,2
12	8,2	-	10,4	-	45	33	22,5	1,2
14	8,1	-	12,7	-	45	33	22,5	1,2
16	10,1	-	14,2	-	48	36	24	1,6
18	10,8	-	16,2	-	48	36	24	1,6
20	11,4	-	18,2	-	50	38	25	1,6

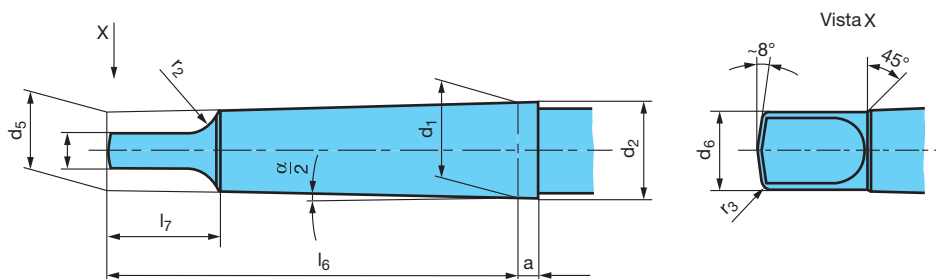


25	13,6	9,3	23,0	24,1	56	44	32	1,6
32	15,5	9,9	30,0	31,2	60	48	35	1,6



Cones Morse DIN 228 parte 1 (extrato)

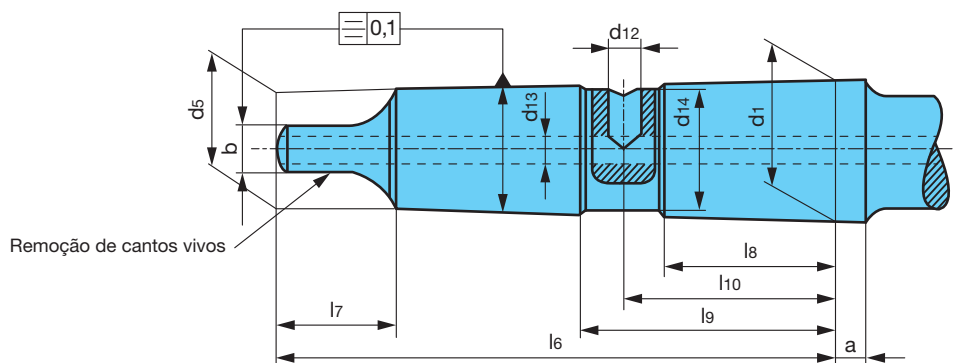
Forma B, cone Morse com lingueta de arraste



Dimensões em mm

Haste conforme DIN 228 Forma B Tamanho	a	Dimensões limite	b	d ₁	d ₂ ≈	d ₅ ≈	d ₆ max.	l ₆ -1	l ₇ max.	r ₂ max.	r ₃ ≈	$\frac{\alpha}{2}$
CM 1	3,5	+1,4 0	5,2	12,065	12,2	9,0	8,7	62	13,5	5	1,2	1°25'43"
CM 2	5,0	+1,4 0	6,3	17,780	18,0	14,0	13,5	75	16	6	1,6	1°25'50"
CM 3	5,0	+1,7 0	7,9	23,825	24,1	19,1	18,5	94	20	7	2	1°26'16"
CM 4	6,5	+1,9 0	11,9	31,267	31,6	25,2	24,5	117,5	24	8	2,5	1°29'15"
CM 5	6,5	+1,9 0	15,9	44,399	44,7	36,5	35,7	149,5	29	10	3	1°30'26"

Forma BK, cone-morse com pino e canais de refrigeração



Dimensões em mm

Haste conforme DIN 228 Forma BK Tamanho	a	Dimensões limite	b	d ₁	d ₅ ≈	d ₁₂	d ₁₃	d ₁₄ 0 -0,01	l ₆ 0 -1	l ₇ max.	l ₈	l ₉	l ₁₀
CM 1	3,5	+1,4 0	5,2	12,065	9,0	-	-	-	62	13,5	-	-	-
CM 2	5	+1,4 0	6,3	17,780	14,0	4,2	4,2	15,0	75	16	20	34	27
CM 3	5	+1,7 0	7,9	23,825	19,1	5,0	5,0	21,0	94	20	29	43	36
CM 4	6,5	+1,9 0	11,9	31,267	25,2	6,8	6,8	28,0	117,5	24	39	55	47
CM 5	6,5	+1,9 0	15,9	44,399	36,5	8,5	8,5	40,0	149,5	29	51	69	60



Tolerâncias brocas para centrar

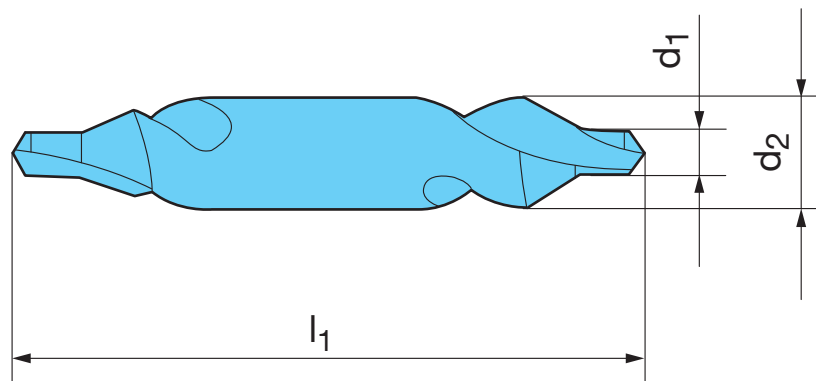
DIN 333	
Gama de diâmetros d1 mm	Afastamentos limites d1 mm
0,50 – 2,50	0 +0,14
3,15 – 5,00	0 +0,18
6,30 – 10,00	0 +0,22
12,50	0 +0,27

para Art.-Nr. 285/286	
Gama de diâmetros d1 mm	Afastamentos limites d1 mm
1,00 – 1,25	0 +0,10
1,60 – 3,15	0 +0,15
3,15 – 10,00	0 +0,20

conforme B.S. 328	
Gama de diâmetros d1 mm	Afastamentos limites d1 mm
1,19 – 1,59	0 ±0,05
2,38 – 3,17	0 ±0,07
4,76	0 ±0,07
6,35 – 7,94	0 ±0,12

conforme B.S. 328	
Gama-Ø-haste d1 mm	Afastamentos limites d1 mm
3,17 – 4,76	-0,020
6,35	-0,025
7,94 – 11,11	-0,050
15,87 – 19,05	-0,050

conforme ASA	
Gama de diâmetros d1 mm	Afastamentos limites d1 mm
todos	0 + 0,07 mm





Diâmetro de núcleo para roscas cortadas

Rosca métrica ISO DIN 13					Rosca métrica fina ISO DIN 13					Rosca UNC ASME B1.1				
Ø nom.	Passo P	Diâmetro do furo Ø	Ø do núcleo rosca interna 6H*		Ø nom.	Passo P	Diâmetro do furo Ø	Ø do núcleo rosca interna 6H		Ø nom.	Fio	Diâmetro do furo Ø	Ø do núcleo rosca interna 2B	
		DIN 336	min.	max.			DIN 336	min.	max.		por pleg.	DIN 336	min.	max.
	mm	mm	mm	mm			mm	mm	mm			mm	mm	mm
M 1	0,25	0,75	0,729	0,785	M 2,5 x	0,35	2,15	2,121	2,221	M 22 x	1,00	21,00	20,917	21,153
M 1,1	0,25	0,85	0,829	0,885	M 3,0 x	0,35	2,65	2,621	2,721	M 22 x	1,50	20,50	20,376	20,676
M 1,2	0,25	0,95	0,929	0,985	M 3,5 x	0,35	3,15	3,121	3,221	M 22 x	2,00	20,00	19,835	20,210
M 1,4	0,30	1,10	1,075	1,142	M 4,0 x	0,50	3,50	3,459	3,599	M 24 x	1,00	23,00	22,917	23,153
M 1,6	0,35	1,25	1,221	1,321	M 4,5 x	0,50	4,00	3,959	4,099	M 24 x	1,50	22,50	22,376	22,676
M 1,8	0,35	1,45	1,421	1,521	M 5,0 x	0,50	4,50	4,459	4,599	M 24 x	2,00	22,00	21,835	22,210
M 2	0,40	1,60	1,567	1,679	M 5,5 x	0,50	5,00	4,959	5,099	M 25 x	1,00	24,00	23,917	24,153
M 2,2	0,45	1,75	1,713	1,838	M 6,0 x	0,75	5,20	5,188	5,378	M 25 x	1,50	23,50	23,376	23,676
M 2,5	0,45	2,05	2,013	2,138	M 7,0 x	0,75	6,20	6,188	6,378	M 25 x	2,00	23,00	22,835	23,210
M 3	0,50	2,50	2,459	2,599	M 8,0 x	0,50	7,50	7,459	7,599	M 27 x	1,00	26,00	25,917	26,153
M 3,5	0,60	2,90	2,850	3,010	M 8,0 x	0,75	7,20	7,188	7,378	M 27 x	1,50	25,50	25,376	25,676
M 4	0,70	3,30	3,242	3,422	M 8,0 x	1,00	7,00	6,917	7,153	M 27 x	2,00	25,00	24,835	25,210
M 4,5	0,75	3,70	3,688	3,878	M 9,0 x	0,75	8,20	8,188	8,378	M 28 x	1,00	27,00	26,917	27,153
M 5	0,80	4,20	4,134	4,334	M 9,0 x	1,00	8,00	7,917	8,153	M 28 x	1,50	26,50	26,376	26,676
M 6	1,00	5,00	4,917	5,153	M 10 x	0,75	9,20	9,188	9,378	M 28 x	2,00	26,00	25,835	26,210
M 7	1,00	6,00	5,917	6,153	M 10 x	1,00	9,00	8,917	9,153	M 30 x	1,00	29,00	28,917	29,153
M 8	1,25	6,80	6,647	6,912	M 10 x	1,25	8,80	8,647	8,912	M 30 x	1,50	28,50	28,376	28,676
M 9	1,25	7,80	7,647	7,912	M 11 x	0,75	10,20	10,188	10,378	M 30 x	2,00	28,00	27,835	28,210
M 10	1,50	8,50	8,376	8,676	M 11 x	1,00	10,00	9,917	10,153	M 30 x	3,00	27,00	26,752	27,252
M 11	1,50	9,50	9,376	9,676	M 12 x	1,00	11,00	10,917	11,153	M 32 x	1,50	30,50	30,376	30,676
M 12	1,75	10,20	10,106	10,441	M 12 x	1,25	10,80	10,647	10,912	M 32 x	2,00	30,00	29,835	30,210
M 14	2,00	12,00	11,835	12,210	M 12 x	1,50	10,50	10,376	10,676	M 33 x	1,50	31,50	31,376	31,676
M 16	2,00	14,00	13,835	14,210	M 14 x	1,00	13,00	12,917	13,153	M 33 x	2,00	31,00	30,835	31,210
M 18	2,50	15,50	15,294	15,744	M 14 x	1,25	12,80	12,647	12,912	M 33 x	3,00	30,00	29,752	30,252
M 20	2,50	17,50	17,294	17,744	M 14 x	1,50	12,50	12,376	12,676	M 35 x	1,50	33,50	33,376	33,676
M 22	2,50	19,50	19,294	19,744	M 15 x	1,00	14,00	13,917	14,153	M 36 x	1,50	34,50	34,376	34,676
M 24	3,00	21,00	20,752	21,252	M 15 x	1,50	13,50	13,376	13,676					
M 27	3,00	24,00	23,752	24,252	M 16 x	1,00	15,00	14,917	15,153					
M 30	3,50	26,50	26,211	26,771	M 16 x	1,25	14,80	14,647	14,912					
M 33	3,50	29,50	29,211	29,771	M 16 x	1,50	14,50	14,376	14,676					
M 36	4,00	32,00	31,670	32,270	M 17 x	1,00	16,00	15,917	16,153					
M 39	4,00	35,00	34,670	35,270	M 17 x	1,50	15,50	15,376	15,676					
M 42	4,50	37,50	37,129	37,799	M 18 x	1,00	17,00	16,917	17,153					
M 45	4,50	40,50	40,129	40,799	M 18 x	1,50	16,50	16,376	16,676					
M 48	5,00	43,00	42,587	43,297	M 20 x	1,00	19,00	18,917	19,153					
M 52	5,00	47,00	46,587	47,297	M 20 x	1,50	18,50	18,376	18,676					
M 56	5,50	50,50	50,046	50,796	M 20 x	2,00	18,00	17,835	18,210					

* M 1,1 até M 1,4 Ø-núcleo rosca interna 5H

Rosca MJ DIN ISO 5855					Rosca UNJC ISO 3161				Rosca UNJF ISO 3161					
Ø nom.	x Passo P	Diâmetro do furo Ø	Ø do núcleo rosca interna 5H*		Ø nom.	Fio	Diâmetro do furo Ø	Ø do núcleo rosca interna 3B		Ø nom.	Fio	Diâmetro do furo Ø	Ø do núcleo rosca interna 3B	
		DIN 336	min.	max.		por pleg.	DIN 336	min.	max.		por pleg.	DIN 336	min.	max.
	mm	mm	mm	mm			mm	mm	mm			mm	mm	mm
MJ 3	x 0,50	2,60	2,513	2,653	Nr. 6	- 32	2,85	2,733	2,939	Nr. 6	- 40	3,00	2,888	3,053
MJ 4	x 0,70	3,40	3,318	3,498	Nr. 8	- 32	3,55	3,393	3,599	Nr. 8	- 36	3,60	3,480	3,663
MJ 5	x 0,80	4,30	4,221	4,421	Nr. 10	- 24	4,00	3,795	4,064	Nr. 10	- 32	4,20	4,054	4,255
MJ 6	x 0,50	5,55	5,513	5,625	Nr. 12	- 24	4,60	4,455	4,704	Nr. 12	- 28	4,75	4,602	4,816
MJ 6	x 0,75	5,35	5,269	5,419	1/4	- 20	5,30	5,113	5,387	1/4	- 28	5,60	5,466	5,662
MJ 6	x 1,00	5,10	5,026	5,216	5/16	- 18	6,75	6,563	6,833	5/16	- 24	7,00	6,906	7,109
MJ 8	x 0,50	7,55	7,513	7,625	3/8	- 16	8,20	7,978	8,255	3/8	- 24	8,60	8,494	8,679
MJ 8	x 0,75	7,35	7,269	7,419	7/16	- 14	9,60	9,346	9,639	7/16	- 20	10,00	9,876	10,084
MJ 8	x 1,00	7,10	7,026	7,216	1/2	- 13	11,00	10,798	11,095	1/2	- 20	11,60	11,463	11,661
MJ 8	x 1,25	6,90	6,782	6,994	9/16	- 12	12,40	12,228	12,482	9/16	- 18	13,00	12,913	13,122
MJ 10	x 1,00	9,10	9,026	9,216	5/8	- 11	13,80	13,627	13,904	5/8	- 18	14,60	14,501	14,702
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 UNF ASME B1.1					Rosca BS-W (Whitworth) BS84				Rosca gás (Whitworth) (conforme DIN-ISO 228-1)					Rosca blindada para aço conforme DIN 40430					
Ø nom.	Fio por poleg.	Diâmetro do furo Ø		Ø do núcleo rosca interna 2B	Ø nom.	Fio por poleg.	Diâmetro do furo Ø		Ø do núcleo rosca interna 2B	Ø nom.	Fio por poleg.	Diâmetro do furo Ø		Ø do núcleo rosca interna	Ø nom.	Fio por poleg.	Diâmetro do furo Ø		Ø do núcleo rosca interna
		DIN 336 mm	min. mm				max. mm	DIN 336 mm				min. mm	max. mm				DIN 336 mm	min. mm	
Nr. 1 - 72		1,55	1,473	1,610	W 1/16	60	1,20	1,045	1,230	G 1/16	28	6,80	6,561	6,843	Pg 7	20	11,40	11,280	11,430
Nr. 2 - 64		1,85	1,755	1,910	W 3/32	48	1,80	1,704	1,912	G 1/8	28	8,80	8,566	8,848	Pg 9	18	14,00	13,860	14,010
Nr. 3 - 56		2,15	2,024	2,197	W 1/8	40	2,50	2,362	2,591	G 1/4	19	11,80	11,445	11,890	Pg 11	18	17,30	17,260	17,410
Nr. 4 - 48		2,40	2,271	2,459	W 5/32	32	3,20	2,952	3,214	G 3/8	19	15,25	14,950	15,395	Pg 13,5	18	19,00	19,060	19,210
Nr. 5 - 44		2,70	2,550	2,741	W 3/16	24	3,60	3,407	3,745	G 1/2	14	19,00	18,631	19,172	Pg 16	18	21,30	21,160	21,310
Nr. 6 - 40		2,95	2,819	3,023	W 7/32	24	4,50	4,201	4,539	G 5/8	14	21,00	20,587	21,128	Pg 21	16	26,90	26,780	27,030
Nr. 8 - 36		3,50	3,404	3,607	W 1/4	20	5,10	4,724	5,156	G 3/4	14	24,50	24,117	24,658	Pg 29	16	35,50	35,480	35,730
Nr. 10 - 32		4,10	3,962	4,166	W 5/16	18	6,50	6,130	6,590	G 7/8	14	28,25	27,877	28,418	Pg 36	16	45,50	45,480	45,730
Nr. 12 - 28		4,60	4,496	4,724	W 3/8	16	7,90	7,492	7,987	G 1	11	30,75	30,291	30,931	Pg 42	16	52,50	52,480	52,730
1/4 - 28		5,50	5,359	5,588	W 7/16	14	9,20	8,789	9,330	G 1 1/8	11	35,50	34,939	35,579	Pg 48	16	57,80	57,780	58,030
5/16 - 24		6,90	6,782	7,036	W 1/2	12	10,50	9,989	10,591	G 1 1/4	11	39,50	38,952	39,592					
3/8 - 24		8,50	8,382	8,636	W 9/16	12	12,00	11,577	12,179	G 1 1/2	11	45,25	44,845	45,485					
7/16 - 20		9,90	9,728	10,033	W 5/8	11	13,50	12,918	13,558	G 1 3/4	11	51,00	50,788	51,428					
1/2 - 20		11,50	11,328	11,608	W 3/4	10	16,25	15,797	16,483	G 2	11	57,00	56,656	57,296					
9/16 - 18		12,90	12,751	13,081	W 7/8	9	19,25	18,611	19,353										
5/8 - 18		14,50	14,351	14,681	W 1	8	22,00	21,334	22,147										
3/4 - 16		17,50	17,323	17,678	W 1 1/8	7	24,50	23,928	24,832										
7/8 - 14		20,40	20,269	20,650	W 1 1/4	7	27,75	27,103	28,007										
1 - 12		23,25	23,114	23,571	W 1 3/8	6	30,50	29,504	30,528										
1 1/8 - 12		26,50	26,289	26,746	W 1 1/2	6	33,50	32,679	33,703										
1 1/4 - 12		29,50	29,464	29,921	W 1 5/8	5	35,50	34,769	35,963										
1 3/8 - 12		32,75	32,639	33,096	W 1 3/4	5	39,00	37,944	39,138										
1 1/2 - 12		36,00	35,814	36,271	W 2	4,5	44,50	43,571	44,877										

NPT ANSI B 2.1
Rosca conica americana para tubos cone 1:16

Execução A (evitar se possível)		Execução B		Ø nom.	Fio por puled.	Ø do furo do núcleo cilindr. (A) d ₁	Ø do furo do núcleo conico (B) D ₁	Profundidade da rosca ET mm	Profund. 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 rosca postiças DIN 8140				Rosca EG UNC (UNC-STI) para rosca postiças ASME B18.29.1				Rosca EG UNF (UNF-STI) para rosca postiças ASME B18.29.1				
Ø nom.	x Passo P mm	Diâmetro do furo Ø		Ø nom.	Fio por poleg.	Diâmetro do furo Ø		Ø nom.	Fio por poleg.	Diâmetro do furo Ø		
		DIN 336 mm	min. mm			max. mm	DIN 336 mm			min. mm	max. mm	DIN 336 mm
EG M 4 x 0,70		4,20	4,152	4,292	EG Nr. 6 - 32	3,80	3,678	3,879	EG Nr. 6 - 40	3,70	3,644	3,818
EG M 5 x 0,80		5,25	5,174	5,334	EG Nr. 8 - 32	4,40	4,338	4,524	EG Nr. 8 - 36	4,40	4,321	4,498
EG M 6 x 1,00		6,30	6,217	6,407	EG Nr. 10 - 24	5,20	5,055	5,283	EG Nr. 10 - 32	5,10	4,999	5,184
EG M 8 x 1,25		8,40	8,271	8,483	EG Nr. 12 - 24	5,80	5,715	5,944	EG Nr. 12 - 28	5,70	5,682	5,809
EG M10 x 1,50		10,50	10,324	10,560	EG 1/4 - 20	6,70	6,624	6,868	EG 1/4 - 28	6,60	6,546	6,721
EG M12 x 1,75		12,50	12,379	12,644	EG 5/16 - 18	8,40	8,242	8,489	EG 5/16 - 24	8,25	8,166	8,352
EG M14 x 1,25		14,40	14,271	14,483	EG 3/8 - 16	10,00	9,868	10,127	EG 3/8 - 24	9,80	9,754	9,931
EG M16 x 2,00		16,50	16,433	16,733	EG 7/16 - 14	11,60	11,506	11,783	EG 7/16 - 20	11,50	11,389	11,585
					EG 1/2 - 13	13,30	13,122	13,393	EG 1/2 - 20	13,10	12,974	13,172
					EG 9/16 - 12	14,90	14,747	15,032	EG 9/16 - 18	14,70	14,592	14,798
					EG 5/8 - 11	16,50	16,375	16,673	EG 5/8 - 18	16,25	16,180	16,386

Informações técnicas



Diâmetros de brocas recomendados para a laminação de roscas

Rosca métrica ISO DIN 13						Rosca métrica fina ISO DIN 13												
Ø nom.	Passo P	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 7H*		Ø nom.	Passo P	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 7H*						
			min.	max.	min.	max.				min.	max.	min.	max.					
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm					
M 2	0,40	1,85	1,84	1,88	1,567	1,679	M 2,5 x 0,35	2,35	2,35	2,38	2,121	2,221	M 17 x 1,50	16,30	16,26	16,38	15,376	15,751
M 2,2	0,45	2,00	2,01	2,05	1,713	1,838	M 3 x 0,35	2,85	2,85	2,88	2,621	2,721	M 18 x 1,00	17,55	17,52	17,62	16,917	17,217
M 2,5	0,45	2,30	2,28	2,32	2,013	2,138	M 4 x 0,35	3,85	3,85	3,88	3,621	3,721	M 18 x 1,50	17,30	17,26	17,38	16,376	16,751
M 3	0,50	2,80	2,78	2,85	2,459	2,639	M 4 x 0,50	3,80	3,78	3,83	3,459	3,639	M 18 x 2,00	17,10	17,05	17,20	15,835	16,310
M 3,5	0,60	3,25	3,23	3,30	2,850	3,050	M 5 x 0,50	4,80	4,78	4,83	4,459	4,639	M 20 x 1,00	19,55	19,52	19,62	18,917	19,217
M 4	0,70	3,70	3,68	3,76	3,242	3,466	M 5,5 x 0,50	5,30	5,28	5,33	4,959	5,139	M 20 x 1,50	19,30	19,26	19,38	18,376	19,751
M 4,5	0,75	4,20					M 6 x 0,75	5,65	5,62	5,70	5,188	5,424	M 24 x 1,00	23,55	23,52	23,62	22,917	23,217
M 5	0,80	4,65	4,62	4,71	4,134	4,384	M 7 x 0,75	6,65	6,62	6,70	6,188	6,424	M 24 x 1,50	23,30	23,26	23,38	22,376	22,751
M 6	1,00	5,55	5,52	5,62	4,917	5,217	M 8 x 0,75	7,65	7,62	7,70	7,188	7,424	M 24 x 2,00	23,10	23,05	23,20	21,835	22,310
M 7	1,00	6,55	6,52	6,62	5,917	6,217	M 8 x 1,00	7,55	7,52	7,62	6,917	7,217	M 27 x 1,50	26,30	26,26	26,38	25,376	25,751
M 8	1,25	7,40	7,36	7,47	6,647	6,982	M 9 x 0,75	8,65	8,62	8,70	8,188	8,424	M 30 x 1,50	29,30	29,26	29,38	28,376	28,751
M 9	1,25	8,40	8,36	8,47	7,647	7,982	M 9 x 1,00	8,55	8,52	8,62	7,917	8,217	M 33 x 1,50	32,30	32,26	32,38	31,376	31,751
M 10	1,50	9,30	9,26	9,38	8,376	8,751	M 10 x 0,75	9,65	9,62	9,70	9,188	9,424	M 36 x 1,50	35,30	35,26	35,38	34,376	34,751
M 11	1,50	10,30	10,26	10,38	9,376	9,751	M 10 x 1,00	9,55	9,52	9,62	8,917	9,217	M 39 x 1,50	38,30	38,26	38,38	37,376	37,751
M 12	1,75	11,20	11,15	11,29	10,106	10,531	M 10 x 1,25	9,40	9,36	9,47	8,647	8,982	M 42 x 1,50	41,30	41,26	41,38	42,376	42,751
M 14	2,00	13,10	13,05	13,20	11,835	12,310	M 11 x 0,75	10,65	10,62	10,70	10,188	10,424						
M 16	2,00	15,10	15,05	15,20	13,835	14,310	M 11 x 1,00	10,55	10,52	10,62	9,917	10,217						
M 18	2,50	16,90	16,83	17,02	15,294	15,854	M 12 x 1,00	11,55	11,52	11,62	10,917	11,217						
M 20	2,50	18,90	18,83	19,02	17,294	17,854	M 12 x 1,25	11,40	11,36	11,47	10,647	10,982						
M 22	2,50	20,90	20,83	21,02	19,294	19,854	M 12 x 1,50	11,30	11,26	11,38	10,376	10,751						
M 24	3,00	22,70	22,62	22,80	20,752	21,382	M 14 x 1,00	13,55	13,52	13,62	12,917	13,217						
M 27	3,00	25,70	25,62	25,80	23,752	24,382	M 14 x 1,25	13,40	13,36	13,47	12,647	12,982						
M 30	3,50	28,50	28,40	28,60	26,211	26,921	M 14 x 1,50	13,30	13,26	13,38	12,376	12,751						
M 33	3,50	31,50	31,40	31,60	29,211	29,921	M 15 x 1,00	14,55	14,52	14,62	13,917	14,217						
M 36	4,00	34,30	34,17	34,40	31,670	32,420	M 15 x 1,50	14,30	14,26	14,38	13,376	13,751						
M 39	4,00	37,30	37,17	37,40	34,670	35,420	M 16 x 1,00	15,55	15,52	15,62	14,917	15,217						
M 42	4,50	40,10	39,95	40,20	37,129	37,979	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 até M 2,5 Ø-núcleo rosca interna 6H

* M 2,5 x 0,35 até M 4 x 0,35 Ø-núcleo rosca interna 6H

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 recalçadas a frio, tem em regra uma maior resistência do que as roscas cortadas.

Rosca UNC ASME B1.1						Rosca UNF ASME B1.1						Rosca gás (Whitworth) DIN EN ISO 228-1								
Ø nom.	Fio por poleg.	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 2B		Ø nom.	Fio por poleg.	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 2B		Ø nom.	Fio por poleg.	Ø do furo	Ø do furo		Ø do núcleo Rosca interna 2B	
			min.	max.	min.	max.				min.	max.	min.	max.				min.	max.	min.	max.
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
Nr. 1 - 64	1,68	1,67	1,70	1,425	1,580	Nr. 1 - 72	1,70	1,69	1,72	1,473	1,610	G 1/16	28	7,30	7,28	7,35	6,561	6,843		
Nr. 2 - 56	1,98	1,97	2,01	1,694	1,872	Nr. 2 - 64	2,00	1,99	2,03	1,755	1,910	G 1/8	28	9,30	9,28	9,35	8,566	8,848		
Nr. 3 - 48	2,28	2,27	2,32	1,941	2,146	Nr. 3 - 56	2,30	2,29	2,34	2,024	2,197	G 1/4	19	12,50	12,48	12,55	11,445	11,890		
Nr. 4 - 40	2,55	2,54	2,59	2,157	2,385	Nr. 4 - 48	2,60	2,59	2,63	2,271	2,459	G 3/8	19	16,00	15,98	16,05	14,950	15,395		
Nr. 5 - 40	2,90	2,89	2,94	2,487	2,698	Nr. 5 - 44	2,90	2,89	2,93	2,550	2,741	G 1/2	14	20,00	19,98	20,12	18,631	19,172		
Nr. 6 - 32	3,15	3,14	3,19	2,642	2,896	Nr. 6 - 40	3,20	3,19	3,24	2,819	3,023	G 5/8	14	22,00	21,98	22,12	20,587	21,128		
Nr. 8 - 32	3,80	3,78	3,82	3,302	3,531	Nr. 8 - 36	3,85	3,83	3,88	3,404	3,607	G 3/4	14	25,50	25,48	25,62	24,177	24,658		
Nr. 10 - 24	4,35	4,33	4,39	3,683	3,937	Nr. 10 - 32	4,45	4,43	4,49	3,962	4,166	G 7/8	14	29,25	29,23	29,37	27,817	28,418		
Nr. 12 - 24	5,00	4,97	5,03	4,343	4,597	Nr. 12 - 28	5,10	5,07	5,13	4,496	4,724	G 1	11	32,00	31,98	32,15	30,291	30,931		
1/4 - 20	5,75	5,72	5,80	4,978	5,258	1/4 - 28	5,95	5,92	5,99	5,359	5,588	G 1 1/4	11	40,75	40,70	40,85	38,952	39,592		
5/16 - 18	7,30	7,26	7,37	6,401	6,731	5/16 - 24	7,45	7,42	7,50	6,782	7,036									
3/8 - 16	8,80	8,77	8,88	7,798	8,153	3/8 - 24	9,05	9,02	9,10	8,838	8,636									
7/16 - 14	10,30	10,27	10,37	9,144	9,550	7/16 - 20	10,55	10,48	10,58	9,728	10,033									
1/2 - 13	11,80	11,77	11,88	10,592	11,024	1/2 - 20	12,10	12,08	12,18	11,328	11,608									
9/16 - 12	13,30	13,28	13,39	11,989	12,446	9/16 - 18	13,65	13,61	13,72	12,751	13,081									
5/8 - 11	14,80	14,78	14,90	13,386	13,868	5/8 - 18	15,25	15,21	15,32	14,351	14,681									
3/4 - 10	17,90	17,85	17,97	16,307	16,840	3/4 - 16	18,35	18,30	18,41	17,323	17,678									
7/8 - 9	21,00	20,95	21,10	19,177	19,761	7/8 - 14	21,40	21,35	21,49	20,269	20,650									
1 - 8	24,00	23,95	24,12	21,971	22,606	1 - 12	24,45	24,40	24,54	23,114	23,571									



De 1/64 até 11 63/64

Tamanho (Polegadas)	mm	Partes da polegada (Decimal)	Tamanho (Polegadas)	mm	Partes da polegada (Decimal)	Tamanho (Polegadas)	mm	Partes da polegada (Decimal)	Tamanho (Polegadas)	mm	Partes da polegada (Decimal)
-	0,10	0,0039	51	1,70	0,0670	4	5,31	0,2090	-	14,00	0,5512
97	0,15	0,0059		1,75	0,0689	3	5,41	0,213	9/16	14,29	0,5625
96	0,16	0,0063	50	1,78	0,0700		5,50	0,2165		14,50	0,5709
95	0,17	0,0067		1,80	0,0709	7/32	5,56	0,2188	37/64	14,68	0,5781
94	0,18	0,0071	49	1,85	0,0730	2	5,61	0,221	-	15,00	0,5906
93	0,19	0,0075		1,90	0,0748	1	5,79	0,228	19/32	15,08	0,5938
92	0,20	0,0079	48	1,93	0,0760	A	5,94	0,234	39/64	15,48	0,6094
91	0,21	0,0083		1,95	0,0768	15/64	5,95	0,2344		15,50	0,6102
90	0,22	0,0087	5/64	1,98	0,0781	-	6,00	0,2362	5/8	15,88	0,625
89	0,23	0,0091	47	1,99	0,0785	B	6,05	0,238	-	16,00	0,6299
88	0,24	0,0095	-	2,00	0,0787	C	6,15	0,242	41/64	16,27	0,6406
-	0,25	0,0098		2,05	0,0807	D	6,25	0,246		16,50	0,6496
87	0,25	0,0100	46	2,06	0,0810	1/4	6,35	0,25	21/32	16,67	0,6562
	0,26	0,0102	45	2,08	0,0820	E	6,35	0,25	-	17,00	0,6693
86	0,27	0,0105		2,15	0,0846		6,50	0,2559	43/64	17,07	0,6719
	0,27	0,0106	44	2,18	0,0860	F	6,53	0,257	11/16	17,46	0,6875
85	0,28	0,0110	43	2,26	0,0890	G	6,63	0,261		17,50	0,689
	0,29	0,0114	42	2,37	0,0935	17/64	6,75	0,2656	45/64	17,86	0,7031
84	0,29	0,0115	3/32	2,38	0,0938		6,75	0,2657	-	18,00	0,7087
-	0,30	0,0118	41	2,44	0,0960	H	6,76	0,266	23/32	18,26	0,7188
83	0,30	0,0120	40	2,50	0,0980	I	6,91	0,272		18,50	0,7283
82	0,32	0,0125	39	2,53	0,0995	-	7,00	0,2756	47/64	18,65	0,7344
	0,32	0,0126	38	2,58	0,1015	J	7,04	0,2772	-	19,00	0,748
81	0,33	0,0130	37	2,64	0,1040	K	7,14	0,281	3/4	19,05	0,75
80	0,34	0,0135	36	2,71	0,1065	9/32	7,14	0,2812	49/64	19,45	0,7656
79	0,37	0,0145	7/64	2,78	0,1094	L	7,37	0,29		19,50	0,7677
1/64	0,40	0,0156	35	2,79	0,11	M	7,49	0,2949	25/32	19,84	0,7812
78	0,41	0,0160	34	2,82	0,111		7,50	0,2953	-	20,00	0,7874
77	0,46	0,0180	33	2,87	0,113	19/64	7,54	0,2969	51/64	20,24	0,7969
-	0,50	0,0197		2,90	0,1142	N	7,67	0,3020		20,50	0,8071
76	0,51	0,0200	32	2,95	0,116		7,75	0,3051	13/16	20,64	0,8125
75	0,53	0,0210	-	3,00	0,1181	5/16	7,94	0,3125	-	21,00	0,8268
74	0,57	0,0225	31	3,05	0,12	-	8,00	0,315	53/64	21,03	0,8281
-	0,60	0,0236	1/8	3,18	0,125	O	8,03	0,316	27/32	21,43	0,8438
73	0,61	0,0240	30	3,26	0,1285	P	8,20	0,323		21,50	0,8465
72	0,64	0,0250		3,30	0,1299	21/64	8,33	0,3281	55/64	21,84	0,8594
71	0,66	0,0260	29	3,45	0,136	Q	8,43	0,332	-	22,00	0,8661
-	0,70	0,0276		3,50	0,1378		8,50	0,3346	7/8	22,23	0,875
70	0,71	0,0280	28	3,57	0,1405	R	8,61	0,339		22,50	0,8858
69	0,74	0,0292	9/64	3,57	0,1406	11/32	8,73	0,3438	57/64	22,62	0,8906
-	0,75	0,0295	27	3,66	0,144		8,75	0,3445	-	23,00	0,9055
68	0,79	0,0310	26	3,73	0,147	S	8,84	0,348	29/32	23,02	0,9062
1/32	0,79	0,0313		3,75	0,1476	-	9,00	0,3543	59/64	23,42	0,9219
-	0,80	0,0315	25	3,80	0,1495	T	9,09	0,358		23,50	0,9252
67	0,81	0,0320	24	3,86	0,152	23/64	9,13	0,3594	15/16	23,81	0,9375
66	0,84	0,0330	23	3,91	0,154	U	9,35	0,368	-	24,00	0,9449
65	0,89	0,0350	5/32	3,97	0,1562		9,50	0,374	61/64	24,21	0,9531
-	0,90	0,0354	22	3,99	0,157	3/8	9,53	0,375		24,50	0,9646
64	0,91	0,0360	-	4,00	0,1575	V	9,56	0,377	31/32	24,61	0,9688
63	0,94	0,0370	21	4,04	0,159	W	9,80	0,386	-	25,00	0,9843
62	0,97	0,0380	20	4,09	0,161	25/64	9,92	0,3906	63/64	25,00	0,9844
61	0,99	0,0390		4,20	0,1654	-	10,00	0,3937	1	25,40	1,00
-	1,00	0,0394	19	4,22	0,166	X	10,08	0,397			
60	1,02	0,0400	18	4,31	0,1695	Y	10,26	0,4040			
59	1,04	0,0410	11/64	4,37	0,1719	13/32	10,32	0,4062			
58	1,07	0,0420	17	4,39	0,173	Z	10,49	0,413			
57	1,09	0,0430	16	4,50	0,177		10,50	0,4134			
56	1,18	0,0465	15	4,57	0,18	27/64	10,72	0,4219			
3/64	1,19	0,0469	14	4,62	0,182	-	11,00	0,4331			
	1,20	0,0472	13	4,70	0,185	7/16	11,11	0,4375			
	1,25	0,0492	3/16	4,76	0,1875		11,50	0,4528			
	1,30	0,0512	12	4,80	0,189	29/64	11,51	0,4531			
55	1,32	0,0520	11	4,85	0,191	15/32	11,91	0,4688			
54	1,40	0,0550	10	4,91	0,1935	-	12,00	0,4724			
	1,45	0,0571	9	4,98	0,196	31/64	12,30	0,4844			
	1,50	0,0591	-	5,00	0,1968		12,50	0,4921			
53	1,51	0,0595	8	5,05	0,199	1/2	12,70	0,50			
	1,55	0,0610	7	5,11	0,2010	-	13,00	0,5118			
1/16	1,59	0,0625	13/64	5,16	0,2031	33/64	13,10	0,5156			
	1,60	0,0630	6	5,18	0,2040	17/32	13,49	0,5312			
52	1,61	0,0635	5	5,22	0,2055		13,50	0,5315			
	1,65	0,0650		5,25	0,2067	35/64	13,89	0,5469			

1 polegada = 25,400 mm, veja DIN 4890 (edição 2/75)



As novas abreviaturas de materiais (seleção)

Nr. do material	Abreviatura antiga	Abreviatura nova	Nr. do material	Abreviatura antiga	Abreviatura nova	Nr. do material	Abreviatura antiga	Abreviatura nova	Nr. do material	Abreviatura antiga	Abreviatura nova
0.6010	GG10	EN-GJL-100	1.0728	60 S 20	-	1.4436	X5CrNiMo17 133	X3CrNiMo17-13-3	1.7043	-	38Cr4
0.6020	GG20	EN-GJL-200	1.0736	9 SMn 36	11SMn37	1.4438	X2CrNiMo 18 16 4	X2CrNiMo18-15-4	1.7147	20 MnCr 5	20MnCr5
0.6025	GG25	EN-GJL-250	1.0737	9 SMnPb 36	11SMnPb37	1.4460	X4CrNiMo 27 5 2	X3CrNiMoN27-5-2	1.7149	20 MnCrS 5	20MnCrS5
0.6035	GG35	EN-GJL-350	1.0756	35 SPb 20	35SPb20	1.4462	X2CrNiMoN2253	X2CrNiMoN22-5-3	1.7176	55 Cr 3	55Cr3
0.7050	GGG50	EN-GJS-500-7	1.0757	45 SPb 20	46SPb20	1.4509	X6CrTiNb 18	X2CrTiNb18	1.7182	27 MnCrB 5 2	27MnCrB5-2
0.7070	GGG70	EN-GJS-700-2	1.0760	-	38SMn26	1.4510	X6CrTi 17	X3CrTi17	1.7185	33 MnCrB 5 2	33MnCrB5-2
0.8035	GTW35	EN-GJMW-350-4	1.0761	-	38SMnPb26	1.4511	X6CrNb 17	X3CrNb17	1.7189	39 MnCrB 6 2	39MnCrB6-2
0.8155	GTS55	EN-GJMB-550-4	1.0762	-	44SMn28	1.4512	X6CrTi 12	X2CrTi12	1.7213	25 CrMo 4	25CrMoS4
0.8170	GTS70	EN-GJMB-700-2	1.0763	-	44SMnPb28	1.4520	X1CrTi 15	X2CrTi17	1.7218	25 CrMo 4	25CrMo4
1.0022	St 01Z	-	1.0873	-	DC06 [Fe P06]	1.4521	X2CrMoTi 18 2	X2CrMoTi18-2	1.7219	-	26CrMo4-2
1.0035	St 33	S185	1.1103	ESTe 255	S255NL1	1.4522	X2CrMoNb 18 2	X2CrMoNb18-2	1.7220	34 CrMo 4	34CrMo4
1.0039	St 37 -2	S235JRH	1.1105	ESTe 315	S315NL1	1.4532	X7CrNiMoAl 15 7	X8CrNiMoAl15-7-2	1.7225	42 CrMo 4	42CrMo4
1.0044	St 44 -2	S275JR	1.1121	Ck 10	C10E	1.4541	X6CrNiTi18 10	X6CrNiTi18-10	1.7226	34 CrMo 4	34CrMoS4
1.0050	St 50 -2	E295	1.1141	Ck15	C15E	1.4542	X5CrNiCuNb 17 4	X5CrNiCuNb16-4	1.7227	42 CrMoS 4	42CrMoS4
1.0060	St 60 -2	E335	1.1151	Ck 22	C22E	1.4550	X6CrNiNb 18 10	X6CrNiNb18-10	1.7228	50 CrMo 4	50CrMo4
1.0070	St 70 -2	E360	1.1158	Ck 25	C25E	1.4558	X2NiCrAlTi 32 20	X2NiCrAlTi32-20	1.7264	20 CrMo 5	20CrMo5
1.0114	St 37 -3U	S235J0	1.1170	28 Mn 6	28Mn6	1.4567	X3CrNiCu 18 9 X	X3CrNiCu18-9-4	1.7261	20 CrMo 4	20CrMo4
1.0226	St 02Z	DX51D	1.1178	Ck 30	C30E	1.4568	X7CrNiAl 17 7	X7CrNiAl17-7	1.7323	20 MoCrS 4	20MoCrS4
1.0242	StE 250 -2Z	S250GD	1.1181	Ck 35	C35E	1.4571	-	X6CrNiMoTi17-12-2	1.7333	22 CrMoS 3 5	22CrMoS3-5
1.0244	StE 280 -2Z	S280GD	1.1186	Ck 40	C40E	1.4577	X3CrNiMoTi 25 25	X3CrNiMoTi25-25	1.7335	13 CrMo 4 4	13CrMo4-5
1.0250	StE 320 -3Z	S320GD	1.1191	Ck 45	C45E	1.4592	X1CrMoTi 29 4	X2CrMoTi29-4	1.7362	12 CrMo 19 5	12CrMo19-5
1.0301	C 10	-	1.1203	Ck 55	C55E	1.4713	X10CrAl 7	X10CrAlSi7	1.7380	10 CrMo 9 10	10CrMo9-10
1.0302	C 10 Pb	-	1.1206	Ck 50	C50E	1.4724	X10CrAl 13	X10CrAlSi13	1.7383	-	11CrMo9-10
1.0306	St 06 Z	DX54D	1.1221	Ck 60	C60E	1.4742	X10CrAl 18	X10CrAlSi18	1.7779	-	20CrMoV13-5-5
1.0312	St 15	DC05 [Fe P05]	1.1241	Cm 50	C50R	1.4762	X10CrAl 24	X10CrAlSi25	1.8159	50 CrV 4	51CrV4
1.0319	RRStE 210.7	L210GA	1.1750	C 75 W	C75W	1.4821	X20CrNiSi 25 4	X20CrNiSi25-4	1.8504	34 CrAl 6	34CrAl6
1.0322	-	DX56D	1.2067	102 Cr 6	102Cr6	1.4828	X15CrNiSi 20 12	X15CrNiSi20-12	1.8519	31 CrMoV 9	31CrMoV9
1.0330	St 12 [St 2]	DC01 [Fe P01]	1.2080	-	X210Cr12	1.4833	X7CrNi 23 14	X7CrNi23-12	1.8550	34 CrAlNi 7	34CrAlNi7
1.0333	USt 13	-	1.2083	-	X42Cr13	1.4841	X15CrNiSi 25 20	X15CrNiSi25-21	1.8807	13 MnNiMoV 5 4	13MnNiMoV5-4
1.0338	St 14 [St 4]	DC04 [Fe P04]	1.2419	-	105WCr6	1.4845	X12CrNi 25 21	X12CrNi25-21	1.8812	18 MnMoV 5 2	18MnMoV5-2
1.0345	H I	P235GH	1.2767	-	X45NiCrMo4	1.4864	X12NiCrSi 36 16	X12NiCrSi35-16	1.8815	18 MnMoV 6 3	18MnMoV6-3
1.0347	RRSt 13 [RRSt 3]	DC03 [Fe P03]	1.3243	S6-5-2-5	S 6-5-2-5	1.4878	X12CrNiTi18 9	X10CrNiTi18-10	1.8821	StE 355 TM	P355M
1.0348	UH I	P195GH	1.3343	S6-5-2	S 6-5-2	1.4903	-	X10CrMoVNb9-1	1.8824	StE 420 TM	P420M
1.0350	St 03Z	DX52D	1.3344	S6-5-3	S 6-5-3	1.5026	55 Si 7	55Si7	1.8826	StE 460 TM	P460M
1.0355	St 05Z	DX53D	1.4000	X6Cr 13	X6Cr13	1.5131	50 MnSi 4	50MnSi4	1.8828	ESTe 420 TM	P420ML2
1.0356	TTSt 35 N	P215NL	1.4002	X6CrAl 13	X6CrAl13	1.5415	15 Mo 3	16Mo3	1.8831	ESTe 460 TM	P460ML2
1.0358	St 05 Z	-	1.4003	X2Cr 11	X2CrNi12	1.5530	21 MnB 5	20MnB5	1.8832	TStE 355 TM	P355ML1
1.0401	C 15	-	1.4005	-	X12CrS13	1.5531	30 MnB 5	30MnB5	1.8835	TStE 420 TM	P420ML1
1.0402	C 22	C22	1.4006	X10Cr 13	X12Cr13	1.5532	38 MnB 5	38MnB5	1.8837	ESTe 460 TM	P460ML1
1.0403	C 15 Pb	-	1.4016	X6Cr 17	X6Cr17	1.5637	10 Ni 14	12Ni14	1.8879	StE ...	P690Q
1.0406	C 25	C25	1.4021	X20Cr 13	X20Cr13	1.5662	-	X11CrMo5+I	1.8880	WStE ...	P690QH
1.0419	St 52.0	L355	1.4028	X30Cr 13	X30Cr13	1.5680	-	X12Ni5	1.8881	TStE ...	P690QL1
1.0424	St 45.8 (ersetzt)	P265	1.4031	X38Cr 13	X38Cr13	1.5710	36 NiCr 6	36NiCr6	1.8882	10 MnTi 3	10MnTi3
1.0424	St 42.8 (ersetzt)	P265	1.4034	X46Cr 13	X46Cr13	1.5715	-	16NiCrS4	1.8888	ESTe ...	P690QL2
1.0425	H2	P265GH	1.4037	X65Cr13	X65Cr13	1.5752	14 NiCr 14	15NiCr13	1.8900	StE 380	S380N
1.0429	StE 290.7 TM	L290MB	1.4057	X20CrNi 17 2	X17CrNi16-2	1.6210	15 MnNi 6 3	15MnNi6-3	1.8901	StE 460	S460N
1.0457	StE 240.7	L245NB	1.4104	X12CrMoS 17	X14CrMoS17	1.6211	16 MnNi 6 3	16MnNi6-3	1.8902	StE 420	S420N
1.0459	RRStE 240.7	L245GA	1.4105	X4CrMoS 18	X6CrMoS17	1.6310	20 MnMoNi 5 5	20MnMoNi5-5	1.8903	TStE 460	S460NL
1.0461	StE 255	S255N	1.4109	X65CrMo 14	X70CrMo15	1.6311	20 MnMoNi 4 5	20MnMoNi4-5	1.8905	StE 460	P460N
1.0473	19 Mn 6	P355GH	1.4110	X55CrMo 14	X55CrMo14	1.6341	11 NiMoV 5 3	11NiMoV5-3	1.8907	StE 500	S500N
1.0481	17 Mn 4	P295GH	1.4112	X90CrMoV 18	X90CrMoV18	1.6368	15 NiCuMoNb 5	15NiCuMoNb5	1.8910	TStE 380	S380NL
1.0484	StE 290.7	L290NB	1.4113	X6CrMo 17 1	X6CrMo17-1	1.6511	36 CrNiMo 4	36CrNiMo4	1.8911	ESTe 380	S380NL1
1.0486	StE 285	P275N	1.4116	X45CrMoV 15	X50CrMoV15	1.6523	21 NiCrMo 2	21NiCrMo2-2	1.8912	TStE 420	S420NL
1.0501	C 35	C35	1.4120	X20CrMo 13	X20CrMo13	1.6526	21 NiCrMoS 2	21NiCrMoS2-2	1.8913	ESTe 420	S420NL1
1.0503	C 45	C45	1.4122	X35CrMo 17	X39CrMo17-1	1.6580	30 CrNiMo 8	30CrNiMo8	1.8915	TStE 460	P460NL1
1.0505	StE 315	P315N	1.4125	X105CrMo 17	X105CrMo17	1.6582	34 CrNiMo 6	34CrNiMo6	1.8917	WStE 500	S500NL
1.0511	C 40	C40	1.4301	X5CrNi 18 10	X5CrNi18-10	1.6587	17 CrNiMo 6	18CrNiMo7-6	1.8918	ESTe 460	P460NL2
1.0528	C 30	C30	1.4303	X5CrNi 18 12	X4CrNi18-12	1.7003	38 Cr 2	38Cr2	1.8919	ESTe 500	S500NL1
1.0529	StE 350 -3Z	S350GD	1.4305	X10CrNiS 18 9	X8CrNiS18-9	1.7006	46 Cr 2	46Cr2	1.8930	WStE 380	P380NH
1.0535	C 55	C55	1.4306	X2CrNi 19 11	X2CrNi19-11	1.7016	17 Cr 3	17Cr3	1.8932	WStE 420	P420NH
1.0539	StE 355N	S355NH	1.4310	X12CrNi 17 7	X10CrNi18-8	1.7023	38 CrS 2	38CrS2	1.8935	WStE 460	P460NH
1.0540	C 50	C50	1.4311	X2CrNiN 18 10	X2CrNiN18-10	1.7025	46 CrS 2	46CrS2	1.8937	TStE 500	P500NH
1.0547	St 52 -3U	S355J0H	1.4313	X4CrNi 13 4	X3CrNiMo13-4	1.7030	28 Cr 4	28Cr4	1.8972	StE 415.7	L415NB
1.0582	StE 360.7	L360NB	1.4318	X2CrNiN 18 7	X2CrNiN18-7	1.7033	34 Cr 4	34Cr4	1.8973	StE 415.7 TM	L415MB
1.0601	C 60	C60	1.4335	X1CrNi 25 21	X1CrNi25-21	1.7034	37 Cr 4	37Cr4	1.8975	StE 445.7 TM	L450MB
1.0710	15 S 10	-	1.4361	X1CrNiSi 18 15	X1CrNiSi18-15-4	1.7035	41 Cr 4	41Cr4	1.8977	StE 480.7 TM	L485MB
1.0715	9 SMn 28	11SMn30	1.4362	X2CrNiN 23 4	X2CrNiN23-4	1.7036	28 CrS 4	28CrS4	1.8978	StE 550.7 TM	L555MB
1.0718	9 SMnPb 28	11SMnPb30	1.4401	X5CrNiMo17 122	X5CrNiMo17-12-2	1.7037	34 CrS 4	34CrS4			
1.0721	10 S 20	10S20	1.4404	X2CrNiMo17 132	X2CrNiMo17-12-2	1.7038	37 CrS 4	37CrS4			
1.0722	10 S Pb 20	10SPb20	1.4410	X10CrNiMo 18 9	X2CrNiMoN25-7-4	1.7039	41 CrS 4	41CrS4			
1.0726	35 S 20	35S20	1.4418	X4CrNiMo 16 5	X4CrNiMo16-5-1	1.7131	16 MnCr 5	16MnCr5			
1.0727	45 S 20	46S20	1.4435	X2CrNiMo 18 143	X2CrNiMo18-14-3	1.7139	16 MnCrS 5	16MnCrS5			

ÍNDICE DE ARTIGOS

BRINCA
GÜJH



Nr. do artigo	Página	Profundidade do furo	Norma	Denominação	Material de corte	Tipo	Forma
11	428		Norma de empr.	Jogos de brocas helicoidais			
16	420	~5xD	DIN 338	Jogos de brocas helicoidais	HSCO	N	
17	419	~5xD	DIN 338	Jogos de brocas helicoidais	HSS	N	
18	421	~5xD	DIN 338	Jogos de brocas helicoidais	HSCO	Ti	
36	426		Norma de empr.	Jogos de brocas helicoidais			
73	427		Norma de empr.	Jogos de brocas helicoidais			
128	413		Norma de empr.	Brocas helicoidais curtas, haste-Ø 16,0 mm	HSCO	V72	
129	414		Norma de empr.	Brocas helicoidais curtas, haste-Ø 25,4 mm	HSCO	V72	
136	415		Norma de empr.	Brocas helicoidais curtas, haste-Ø 25,4 mm	HSCO	V72	
195	422	~5xD	DIN 338	Jogos de brocas helicoidais	HSCO	VA	
200	418	~5xD	DIN 338	Jogo de brocas, a granel	HSS	N	
201	417	~5xD	DIN 338	Jogos de brocas helicoidais	HSS	N	
204	338, 587	~10xD	DIN 340	Brocas helicoidais longas	HSS	N	
205	244	~5xD	DIN 338	Brocas espirais curtas	HSS	N	
206	263	~5xD	DIN 338	Brocas espirais curtas	HSS	H	
207	269	~5xD	DIN 338	Brocas espirais curtas	HSS	W	
208	258	~5xD	DIN 338	Brocas espirais curtas	HSS	N	
209	266	~5xD	DIN 338	Brocas espirais curtas	HSS	H	
210	272	~5xD	DIN 338	Brocas espirais curtas	HSS	W	
211	325	~10xD	DIN 339	Brocas para furar através de buchas	HSS	N	
217	331, 580	~10xD	DIN 340	Brocas helicoidais longas	HSS	N	
218	339, 588	~10xD	DIN 340	Brocas helicoidais longas	HSS	H	
219	342, 591	~10xD	DIN 340	Brocas helicoidais longas	HSS	W	
220	336, 585	~10xD	DIN 340	Brocas helicoidais longas	HSS	N	
221	341, 590	~10xD	DIN 340	Brocas helicoidais longas	HSS	H	
223	192	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	N	
224	204	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	H	
225	208	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	W	
226	200	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	N	
227	206	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	H	
228	210	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	W	
229	468	~5xD	DIN 345	Brocas helicoidais	HSS	N	
235	363, 612	~15xD	DIN 1869	Brocas helicoidais extra longas, série 1	HSS	N	
236	371, 620	~20xD	DIN 1869	Brocas helicoidais extra longas, série 2	HSS	N	
237	377, 626	~25xD	DIN 1869	Brocas helicoidais extra longas, série 3	HSS	N	
240	257	~5xD	DIN 338	Brocas espirais curtas	HSS	N	
242	381, 630	>25xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
243	382, 631	>25xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
244	383, 632	>25xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
245	450	~5xD	DIN 345	Brocas helicoidais	HSS	N	
246	459	~5xD	DIN 345	Brocas helicoidais	HSS	H	
247	460	~5xD	DIN 345	Brocas helicoidais	HSS	W	
248	457	~5xD	DIN 345	Brocas helicoidais	HSS	N	
251	471	~5xD	DIN 346	Brocas helicoidais	HSS	N	
254	499		Norma de empr.	Brocas com canais de refrig., compr. canais conf.e norma da empr.	HSS	N	
255	500		Norma de empr.	Brocas com canais de refrig., compr. canais conf.e norma da empr.	HSS	N	
257	473	~10xD	DIN 341	Brocas para furar através de buchas	HSS	N	
266	483, 633	~15xD	DIN 1870	Brocas helicoidais extra longas, série 1	HSS	N	
267	487, 637	~20xD	DIN 1870	Brocas helicoidais extra longas, série 2	HSS	N	
268	412		Norma de empr.	Brocas helicoidais curtas, haste-Ø 12,7 mm	HSS	N	
269	498	~7xD	Norma de empr.	Brocas com canais de refrigeração curtas	HSS	N	
270	502	~10xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 341	HSS	N	
271	503	~10xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 341	HSS	N	
272	504	~10xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 341	HSS	N	
274	714		Norma de empr.	Brocas escalonadas para centragens DIN 332	HSS	N	D
280	689		Norma de empr.	Brocas de centragem sem plano	HSS	N	A
281	684		Norma de empr.	Brocas de centragem sem plano	HSS	N	A
282	685		Norma de empr.	Brocas de centragem sem plano	HSS	N	A
283	686		Norma de empr.	Brocas de centragem sem plano	HSS	N	R
284	687		Norma de empr.	Brocas de centragem sem plano	HSS	N	R
285	688		Norma de empr.	Brocas de centragem sem plano	HSS	N	B
287	693		DIN 333	Brocas de centragem com plano	HSS	N	A
288	694		DIN 333	Brocas de centragem com plano	HSS	N	R
289	695		Norma de empr.	Brocas de centragem com plano	HSS	N	B
292	680		BS 328	Brocas de centragem sem plano	HSS	N	A
293	495	>20xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
294	681		BS 328	Brocas de centragem sem plano	HSS	N	A
298	496	>20xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
299	497	>20xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
301	397, 649	~5xD	DIN 1899	Micro brocas de precisão HSS-E-PM sem dutos de refrigeração	HSS-E-PM	N	
303	402, 654	~5xD	DIN 1899	Micro brocas de precisão HSS-E-PM sem dutos de refrigeração	HSS-E-PM	N	
305	284	~5xD	DIN 338	Brocas espirais curtas	HSCO	N	



Nr. do artigo	Página	Profundidade do furo	Norma	Denominação	Material de corte	Tipo	Forma
308	289	~5xD	DIN 338	Brocas espirais curtas	HSCO	N	
311	330	~10xD	DIN 339	Brocas para furar através de buchas	HSCO	N	
317	353, 602	~10xD	DIN 340	Brocas helicoidais longas	HSCO	N	
329	218	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	GV 120	
330	225	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	GV 120	
336	355, 604	~10xD	DIN 340	Brocas helicoidais longas	HSCO	GT 100	
345	463	~5xD	DIN 345	Brocas helicoidais	HSCO	N	
351	472	~5xD	DIN 346	Brocas helicoidais	HSCO	N	
357	480	~10xD	DIN 341	Brocas para furar através de buchas	HSCO	N	
363	448	~3xD	Norma de empr.	Brocas espirais curtas	HSCO	GV 120	
370	505	~10xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 341	HSCO	GT 100	
371	506	~10xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 341	HSCO	GT 100	
372	507	~10xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 341	HSCO	GT 100	
374	508, 641	~15xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 1870	HSCO	GT 100	
375	509, 642	~15xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 1870	HSCO	GT 100	
376	510, 643	~15xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 1870	HSCO	GT 100	
378	718		Norma de empr.	Brocas escalonadas curtas com haste cilíndrica	HSS	N	
379	720		Norma de empr.	Brocas escalonadas curtas com haste cilíndrica	HSS	N	
380	721		Norma de empr.	Brocas escalonadas curtas com haste cilíndrica	HSS	N	
381	682		DIN 333	Brocas de centragem sem plano	HSCO	N	A
390	394	~10xD	Norma de empr.	Brocas com canais de refrigeração	HSS	N	
396	357, 606	~10xD	DIN 340	Brocas helicoidais longas	HSCO	GT 100	
501	351, 600	~10xD	DIN 340	Brocas helicoidais longas	HSS	GT 50	
502	365, 614	~15xD	DIN 1869	Brocas helicoidais extra longas, série 1	HSS	GT 100	
503	372, 621	~20xD	DIN 1869	Brocas helicoidais extra longas, série 2	HSS	GT 100	
504	378, 627	~25xD	DIN 1869	Brocas helicoidais extra longas, série 3	HSS	GT 100	
505	479	~10xD	DIN 341	Brocas para furar através de buchas	HSS	GT 50	
506	350, 599	~10xD	DIN 340	Brocas helicoidais longas	HSS	GT 100	
511	386	~5xD	Norma de empr.	Brocas helicoidais com haste reforçada	HSCO	GU 500	
512	384	~3xD	Norma de empr.	Brocas helicoidais com haste reforçada	HSCO	GU 500	
513	388	~5xD	Norma de empr.	Brocas helicoidais com haste reforçada	HSS-E-PM	GT 500	
514	728		Norma de empr.	Brocas Subland com haste cilíndrica	HSS	N	
515	237	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS-E-PM	GT 500	
520	735		Norma de empr.	Brocas Subland com cone Morse	HSS	N	
523	482	~10xD	Norma de empr.	Brocas para furar através de buchas	HSS	N	
524	368, 617	~15xD	DIN 1869	Brocas helicoidais extra longas, série 1	HSS	GT 50	
525	485, 635	~15xD	DIN 1870	Brocas helicoidais extra longas, série 1	HSS	GT 50	
526	484, 634	~15xD	DIN 1870	Brocas helicoidais extra longas, série 1	HSS	GT 100	
527	488, 638	~20xD	DIN 1870	Brocas helicoidais extra longas, série 2	HSS	GT 100	
528	375, 624	~20xD	DIN 1869	Brocas helicoidais extra longas, série 2	HSS	GT 50	
529	379, 628	~25xD	DIN 1869	Brocas helicoidais extra longas, série 3	HSS	GT 50	
531	416, 746		DIN 1898	Brocas para furos de pinos	HSS	N	
532	511, 747		DIN 1898	Brocas para furos de pinos	HSS	N	
533	737		DIN 344	Brocas calibradoras com haste cilíndrica	HSS	N	
534	740		DIN 343	Brocas calibradoras com cone Morse	HSS	N	
535	344, 593	~10xD	DIN 340	Brocas helicoidais longas	HSS	GT 100	
536	722		DIN 8374	Brocas Subland com haste cilíndrica	HSS	N	A
537	732		Norma de empr.	Brocas Subland com cone Morse	HSS	N	
538	726		DIN 8376	Brocas Subland com haste cilíndrica	HSS	N	
539	734		DIN 8377	Brocas Subland com cone Morse	HSS	N	
540	729		DIN 8378	Brocas Subland com haste cilíndrica	HSS	N	
541	736		DIN 8379	Brocas Subland com cone Morse	HSS	N	
542	489, 639	~20xD	DIN 1870	Brocas helicoidais extra longas, série 2	HSS	GT 50	
546	707		Norma de empr.	Brocas de centragem NC 142°	Metal duro	N	
549	274	~5xD	DIN 338	Brocas espirais curtas	HSS	GT 100	
550	281	~5xD	DIN 338	Brocas espirais curtas	HSS	GT 100	
551	476	~10xD	DIN 341	Brocas para furar através de buchas	HSS	GT 100	
552	212	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	GT 80	
553	215	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	GT 80	
554	708		Norma de empr.	Brocas para carroceria	HSS	DK 77	
555	743		DIN 1864	Brocas calibradoras com cone Morse	HSS	N	
556	702		Norma de empr.	Brocas de centragem NC 120°	HSS	N	
557	696		Norma de empr.	Brocas de centragem NC 90°	HSS	N	
558	461	~5xD	DIN 345	Brocas helicoidais	HSS	GT 100	
559	700		Norma de empr.	Brocas de centragem NC 90°	HSS	N	
560	256	~5xD	DIN 338	Brocas espirais curtas	HSS	N	
561	327	~10xD	DIN 339	Brocas para furar através de buchas	HSS	N	
563	491	>20xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
564	492	>20xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
565	493	>20xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
566	494	>20xD	Norma de empr.	Brocas helicoidais extra longas	HSS	GT 100	
567	703		Norma de empr.	Brocas de centragem NC 120°	HSS	N	



Nr. do artigo	Página	Profundidade do furo	Norma	Denominação	Material de corte	Tipo	Forma
568	697		Norma de empr.	Brocas de centragem NC 90°	HSS	N	
569	723		DIN 8374	Brocas Subland com haste cilíndrica	HSS	N	B
571	380, 629	~25xD	DIN 1869	Brocas helicoidais extra longas, série 3	HSCO	GT 100	
572	231	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	VA	
574	715		Norma de empr.	Brocas escalonadas para centragens DIN 332	HSS	N	DR
575	716		Norma de empr.	Brocas escalonadas para centragens DIN 332	HSS	N	D
576	717		Norma de empr.	Brocas escalonadas para centragens DIN 332	HSS	N	D
577	390		NAS 907	Brocas extra-longas, compr. 6 polegadas	HSS	N	
578	392		NAS 907	Brocas extra-longas, compr. 12 polegadas	HSS	N	
579	391		NAS 907	Brocas extra-longas, compr. 6 polegadas	HSS	N	
580	393		NAS 907	Brocas extra-longas, compr. 12 polegadas	HSS	N	
581	668		DIN 333	Brocas de centragem sem plano	HSS	N	A
582	670		DIN 333	Brocas de centragem sem plano	HSS	N	A
583	672		DIN 333	Brocas de centragem sem plano	HSS	N	R
584	674		DIN 333	Brocas de centragem sem plano	HSS	N	R
585	675		DIN 333	Brocas de centragem sem plano	HSS	N	B
586	676		DIN 333	Brocas de centragem sem plano	HSS	N	B
587	690		DIN 333	Brocas de centragem com plano	HSS	N	A
588	691		DIN 333	Brocas de centragem com plano	HSS	N	R
589	692		DIN 333	Brocas de centragem com plano	HSS	N	B
590	671		DIN 333	Brocas de centragem sem plano	HSS	N	A
591	677		DIN 333	Brocas de centragem sem plano	HSS	N	B
592	454	~5xD	DIN 345	Brocas helicoidais	HSS	N	
594	678		ASME B94.11 M	Brocas de centragem sem plano	HSS	N	A
596	679		ASME B94.11 M	Brocas de centragem sem plano	HSS	N	B
605	301	~5xD	DIN 338	Brocas espirais curtas	HSCO	Ti	
606	462	~5xD	DIN 345	Brocas helicoidais	HSS	GT 100	
608	308	~5xD	DIN 338	Brocas espirais curtas	HSCO	Ti	
611	114	5xD	DIN 6539	Brocas Ratio, 3 cortes	Metal duro	GS 200 U	
613	669		DIN 333	Brocas de centragem sem plano	HSS	N	A
614	673		DIN 333	Brocas de centragem sem plano	HSS	N	R
617	358, 607	~10xD	DIN 340	Brocas helicoidais longas	HSCO	Ti	
618	370, 619	~15xD	DIN 1869	Brocas helicoidais extra longas, série 1	HSCO	GT 100	
619	376, 625	~20xD	DIN 1869	Brocas helicoidais extra longas, série 2	HSCO	GT 100	
620	486, 636	~15xD	DIN 1870	Brocas helicoidais extra longas, série 1	HSCO	GT 100	
621	490, 640	~20xD	DIN 1870	Brocas helicoidais extra longas, série 2	HSCO	GT 100	
622	291	~5xD	DIN 338	Brocas espirais curtas	HSCO	GT 100	
623	481	~10xD	DIN 341	Brocas para furar através de buchas	HSCO	GT 100	
634	742		DIN 343	Brocas calibradoras com cone Morse	HSCO	N	
635	744		DIN 1864	Brocas calibradoras com cone Morse	HSCO	N	
636	724		Norma de empr.	Brocas Subland com haste cilíndrica	HSS	N	
637	731		Norma de empr.	Brocas Subland com cone Morse	HSS	N	
638	725		Norma de empr.	Brocas Subland com haste cilíndrica	HSS	N	
639	733		Norma de empr.	Brocas Subland com cone Morse	HSS	N	
645	466	~5xD	DIN 345	Brocas helicoidais	HSCO	GT 100	
651	250	~5xD	DIN 338	Brocas espirais curtas	HSS	N	
652	277	~5xD	DIN 338	Brocas espirais curtas	HSS	GT 100	
653	196	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	N	
654	455	~5xD	DIN 345	Brocas helicoidais	HSS	N	
655	475	~10xD	DIN 341	Brocas espirais curtas	HSS	N	
656	478	~10xD	DIN 341	Brocas para furar através de buchas	HSS	GT 100	
657	304	~5xD	DIN 338	Brocas espirais curtas	HSCO	Ti	
658	294	~5xD	DIN 338	Brocas espirais curtas	HSCO	GT 100	
659	222	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	GV 120	
660	400, 652	~5xD	DIN 1899	Micro brocas de precisão HSS-E-PM sem dutos de refrigeração	HSS-E-PM	N	
661	465	~5xD	DIN 345	Brocas helicoidais	HSCO	N	
662	467	~5xD	DIN 345	Brocas helicoidais	HSCO	GT 100	
663	449	~3xD	Norma de empr.	Brocas espirais curtas	HSCO	GV 120	
664	261	~5xD	DIN 338	Brocas espirais curtas	HSS	N	
665	283	~5xD	DIN 338	Brocas espirais curtas	HSS	GT 100	
666	328	~10xD	DIN 339	Brocas para furar através de buchas	HSS	N	
667	334, 583	~10xD	DIN 340	Brocas helicoidais longas	HSS	N	
668	347, 596	~10xD	DIN 340	Brocas helicoidais longas	HSS	GT 100	
669	360, 609	~10xD	DIN 340	Brocas helicoidais longas	HSCO	Ti	
670	367, 616	~15xD	DIN 1869	Brocas helicoidais extra longas, série 1	HSS	GT 100	
671	374, 623	~20xD	DIN 1869	Brocas helicoidais extra longas, série 2	HSS	GT 100	
672	203	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	N	
701	404, 656	~5xD	Norma de empr.	Micro brocas de precisão Metal duro sem dutos de refrigeração	Metal duro	N	
702	243	~3xD	Norma de empr.	Brocas helicoidais extras curtas	Metal duro	N	
703	429		DIN 8037	Brocas especiais com cortes de metal duro	Metal duro	N	
704	430		DIN 8038	Brocas especiais com cortes de metal duro	Metal duro	N	
705	512		DIN 8041	Brocas especiais com cortes de metal duro	Metal duro	N	



Nr. do artigo	Página	Profundidade do furo	Norma	Denominação	Material de corte	Tipo	Forma
706	362, 611	~10xD	Norma de empr.	Brocas helicoidais longas	Metal duro	N	
707	432		Norma de empr.	Brocas ponta de lança	Metal duro	H	
710	323	~5xD	Norma de empr.	Brocas espirais curtas	Metal duro	Duro 150	
716	433		Norma de empr.	Brocas para pedras	Metal duro	N	
723	701		Norma de empr.	Brocas de centragem NC 90°	Metal duro	N	
724	706		Norma de empr.	Brocas de centragem NC 120°	Metal duro	N	
729	745		Norma de empr.	Brocas calibradoras com cone Morse	Metal duro	N	
730	239	3xD	DIN 6539	Brocas helicoidais extras curtas	Metal duro	N	
731	115	5xD	DIN 6539	Brocas Ratio, 3 cortes	Metal duro	GS 200 U	
732	319	~5xD	Norma de empr.	Brocas espirais curtas	Metal duro	N	
736	683		Norma de empr.	Brocas de centragem sem plano	Metal duro	N	A
738	727		Norma de empr.	Brocas Subland com haste cilíndrica	Metal duro	N	
739	730		Norma de empr.	Brocas Subland com haste cilíndrica	Metal duro	N	
745	116	5xD	DIN 6539	Brocas Ratio, 3 cortes	Metal duro	GS 200 G	
750	739		Norma de empr.	Brocas calibradoras com haste cilíndrica	Metal duro	N	
768	56	4xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 150 GG	
769	93	7xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 150 GG	
770	98	10xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 150 GG	
773	103	15xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 150 GN	
1018	313	~5xD	DIN 338	Broca helicoidal AeroX afiação em cruz	M42	AeroX	
1025	117	5xD	DIN 6539	Brocas Ratio, 3 cortes	Metal duro	GS 200 G	
1027	119	5xD	DIN 6539	Brocas Ratio, 3 cortes	Metal duro	GS 200 F	
1032	120	3xD	Norma de empr.	Brocas Ratio escalonadas, 3 cortes	Metal duro	GS 200 G	
1047	162		Norma de empr.	Pastilhas intercambiáveis RT 800	Metal duro	RT 800 WP	
1071	168		Norma de empr.	Parafusos de fixação RT 800			
1083	425	~5xD	DIN 338	Jogo de brocas AeroX	M42	AeroX	
1101	501	~10xD	Norma de empr.	Brocas com canais de refrigeração, comprimento canais DIN 341	HSS	N	
1131	395	~5xD	Norma de empr.	Brocas com canais de refrigeração	HSCO	GT 80 IK	
1132	396	~5xD	Norma de empr.	Brocas com canais de refrigeração	HSCO	GT 80 IK	
1133	699		Norma de empr.	Brocas de centragem NC 90°	HSCO	N	
1134	704		Norma de empr.	Brocas de centragem NC 120°	HSCO	N	
1135	705		Norma de empr.	Brocas de centragem NC 120°	HSCO	N	
1136	698		Norma de empr.	Brocas de centragem NC 90°	HSCO	N	
1146	315	~5xD	DIN 338	Brocas espirais curtas	M42	N	
1147	719		Norma de empr.	Brocas escalonadas curtas com haste cilíndrica	HSS	N	
1149	431		Norma de empr.	Brocas helicoidais FK	Metal duro	FK	
1171	55	3xD	DIN 6538K	Brocas Ratio com canais de refrigeração	Metal duro	RT 80 U	
1172	84	5xD	DIN 6538M	Brocas Ratio com canais de refrigeração	Metal duro	RT 80 U	
1173	95	7xD	DIN 6538L	Brocas Ratio com canais de refrigeração	Metal duro	RT 80 U	
1180	54	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 F	
1181	43	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
1182	80	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 F	
1183	66	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
1184	21	3xD	DIN 6537K	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
1199	317	~5xD	DIN 338	Brocas espirais curtas	M42	N	
1221	298	~5xD	DIN 338	Brocas espirais curtas	HSCO	GT 100	
1222	468	~5xD	DIN 345	Brocas helicoidais	HSCO	GT 100	
1223	299	~5xD	DIN 338	Brocas espirais curtas	HSCO	GT 100	
1224	469	~5xD	DIN 345	Brocas helicoidais	HSCO	GT 100	
1228	227	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	GT 80	
1242	23	3xD	DIN 6539	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
1243	36	5xD	Norma de empr.	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
1259	235	~3xD	DIN 1897	Brocas helicoidais extras curtas	M42	N	
1260	309	~5xD	DIN 338	Brocas espirais curtas	HSCO	VA	
1261	230	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	VA	
1262	470	~5xD	DIN 345	Brocas helicoidais	HSCO	VA	
1612	171, 558		Norma de empr.	Chave Torx			
1660	53	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 F	
1662	78	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 F	
1663	65	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
1702	28	3xD	DIN 6539	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 F	
1946	389	~3xD	DIN 6537K	Brocas helicoidais com haste reforçada	Metal duro	H	
2047	311	~5xD	DIN 338	Brocas espirais curtas	HSCO	P2000	
2048	233	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	P2000	
2049	423	~5xD	DIN 338	Jogos de brocas helicoidais	HSCO	P2000	
2050	424	~3xD	DIN 1897	Jogos de brocas helicoidais	HSCO	P2000	
2456	254	~5xD	DIN 338	Brocas espirais curtas	HSS	N	
2457	280	~5xD	DIN 338	Brocas espirais curtas	HSS	GT 100	
2458	306	~5xD	DIN 338	Brocas espirais curtas	HSCO	Ti	
2459	296	~5xD	DIN 338	Brocas espirais curtas	HSCO	GT 100	
2460	199	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSS	N	
2461	224	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	GV 120	



Nr. do artigo	Página	Profundida- de do furo	Norma	Denominação	Material de corte	Tipo	Forma
2462	349, 598	~10xD	DIN 340	Brocas helicoidais longas	HSS	GT 100	
2463	241	~3xD	DIN 6539	Brocas helicoidais extras curtas	Metal duro	N	
2464	321	~5xD	Norma de empr.	Brocas espirais curtas	Metal duro	N	
2468	52	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 F	
2469	41	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
2470	77	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 F	
2471	63	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
2472	18	3xD	DIN 6537K	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
2473	20	3xD	DIN 6539	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
2474	34	5xD	Norma de empr.	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
2475	27	3xD	DIN 6537K	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 F	
2477	39	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
2478	76	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 F	
2479	61	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
2480	16	3xD	DIN 6537K	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
2485	164		Norma de empr.	Pastilhas intercambiáveis RT 800	Metal duro	RT 800 WP	
2498	229	~3xD	DIN 1897	Brocas helicoidais extras curtas	HSCO	GT 80	
2711	89	7xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
2712	38	5xD	DIN 6537L	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 F	
2713	113	5xD	DIN 6537L	Brocas Ratio, 3 cortes	Metal duro	FT 200 G	
2717	35	5xD	DIN 6537L	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
2719	32	5xD	DIN 6537L	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
2747	166		Norma de empr.	Pastilhas intercambiáveis RT 800	Metal duro	RT 800 WP	
2996	30	5xD	DIN 6537L	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 U	
2997	288	~5xD	DIN 338	Brocas espirais curtas	HSCO	N	
3899	405, 657		Norma de empr.	Micro brocas de precisão Metal duro sem dutos de refrigeração	Metal duro	N	
4044	85	7xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
4045	87	7xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
4071	158, 561		Norma de empr.	Parafusos de fixação			
4105	138	1xD	Norma de empr.	Suporte para pastilhas intercambiáveis HT 800		HT 800 WP	
4106	128	1,5xD	Norma de empr.	Suporte para pastilhas intercambiáveis HT 800		HT 800 WP	
4107	130	3xD	Norma de empr.	Suporte para pastilhas intercambiáveis HT 800		HT 800 WP	
4108	132	5xD	Norma de empr.	Suporte para pastilhas intercambiáveis HT 800		HT 800 WP	
4109	134	7xD	Norma de empr.	Suporte para pastilhas intercambiáveis HT 800		HT 800 WP	
4110	136	10xD	Norma de empr.	Suporte para pastilhas intercambiáveis HT 800		HT 800 WP	
4111	151		Norma de empr.	Pastilhas intercambiáveis HT 800	Metal duro	HT 800 WP	
4112	139		Norma de empr.	Pastilhas intercambiáveis HT 800	Metal duro	HT 800 WP	
4113	142		Norma de empr.	Pastilhas intercambiáveis HT 800	Metal duro	HT 800 WP	
4114	148		Norma de empr.	Pastilhas intercambiáveis HT 800	Metal duro	HT 800 WP	
4115	145		Norma de empr.	Pastilhas intercambiáveis HT 800	Metal duro	HT 800 WP	
4915	169, 559		Norma de empr.	Torquímetro			
4917	170, 560		Norma de empr.	Pontas intercambiáveis Torx			
5018	540	20xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5019	551	30xD	Norma de empr.	Broca canhão com dois cortes ZB 80	Metal duro	ZB 80	
5020	534	80.000	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5021	538	160.000	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5022	545	40xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5023	548	80xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5024	532	45.000	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5026	536	120.000	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5164	550	1100.000	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5242	159	3xD	Norma de empr.	Suporte para pastilhas intercambiáveis RT 800		RT 800 WP	
5243	160	5xD	Norma de empr.	Suporte para pastilhas intercambiáveis RT 800		RT 800 WP	
5248	161	7xD	Norma de empr.	Suporte para pastilhas intercambiáveis RT 800		RT 800 WP	
5460	542	30xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5525	100	12xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 U	
5632	533	45.000	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5633	535	80.000	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5637	537	120.000	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5638	539	160.000	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5639	541	20xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5640	543	30xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5641	546	40xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5642	549	80xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5643	552	30xD	Norma de empr.	Broca canhão com dois cortes ZB 80	Metal duro	ZB 80	
5644	555	30xD	Norma de empr.	Broca canhão com um corte EB 800 com pastilhas intercambiáveis	Metal duro	EB 800	
5646	529	25xD	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5647	530	50xD	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5648	531	75xD	Norma de empr.	Broca canhão com um corte EB 100	Metal duro	EB 100	
5689	544	40xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5690	547	80xD	Norma de empr.	Broca canhão com um corte EB 80	Metal duro	EB 80	
5747	566		Norma de empr.	Através de buchas	HSS		



Nr. do artigo	Página	Profundidade do furo	Norma	Denominação	Material de corte	Tipo	Forma
5748	565		Norma de empr.	Através de buchas	Metal duro		
5749	573		Norma de empr.	Buchas para lunetas para brocas com um e dois cortes			
5750	571		Norma de empr.	Buchas de guia para lunetas, para brocas canhão com um corte			
5751	576		Norma de empr.	Buchas de guia para lunetas, para brocas canhão com dois cortes			
5752	569		Norma de empr.	Discos de vedação para broca canhão com um corte			
5753	575		Norma de empr.	Discos de vedação para broca canhão com dois cortes			
5754	577		Norma de empr.	Parafuso de ajuste			
5755	578		Norma de empr.	Parafuso de ajuste			
5759	59	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 S	
5760	96	8xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 S	
6068	58	4xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 150 GG	
6069	94	7xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 150 GG	
6070	99	10xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 150 GG	
6128	157		Norma de empr.	Parafusos de fixação			
6400	108, 407, 659	4xD	Norma de empr.	Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração	Metal duro	N	
6401	109, 408, 660	7xD	Norma de empr.	Micro Brocas de precisão ExclusiveLine sem dutos de refrigeração	Metal duro	N	
6405	110, 409, 661	5xD	Norma de empr.	Micro Brocas de precisão ExclusiveLine com dutos de refrigeração	Metal duro	N	
6408	111, 410, 662	8xD	Norma de empr.	Micro Brocas de precisão ExclusiveLine com dutos de refrigeração	Metal duro	N	
6412	112, 411, 663	15xD	Norma de empr.	Micro Brocas de precisão ExclusiveLine com dutos de refrigeração	Metal duro	N	
6501	82	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 R	
6502	91	7xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 R	
6509	102, 523	15xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 T	
6511	104, 524	20xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 T	
6512	105, 525	25xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 T	
6513	106, 526	30xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 T	
6514	107, 527	40xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 T	
7632	155		Norma de empr.	Pastilhas para escarear HT 800	Metal duro		
7635	156		Norma de empr.	Pastilhas para escarear HT 800	Metal duro		
7645	154		Norma de empr.	Pastilhas para escarear HT 800	Metal duro		
8510	48	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 VA	
8511	72	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 VA	
8520	44	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 HF	
8521	68	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 HF	
8522	90	7xD	Norma de empr.	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 HF	
8524	25	3xD	DIN 6537K	Brocas Ratio sem canais de refrigeração	Metal duro	RT 100 HF	
8610	50	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 VA	
8611	74	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 VA	
8620	46	3xD	DIN 6537K	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 HF	
8621	70	5xD	DIN 6537L	Brocas Ratio com canais de refrigeração	Metal duro	RT 100 HF	









Perfeição em operações de furação



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Furação

Rosqueamento/Fresamento de rosca/Laminação

Fresamento

Escareamento

Alargamento

PCD

Ferramentas especiais

Sistema Modular de fixação

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