GÜHRING

Tool solutions for the oil and gas industry

GÜHRING – YOUR WORLDWIDE PARTNER

EB 80

Single-fluted gun drills EB 80

with brazed carbide head

all standard inch dimensions for the oil and gas industry can be delivered within 2 weeks

STOP

All gun drills must have a pilot hole as support.
Gun drills must never operate at full speed without support in the machine shop.

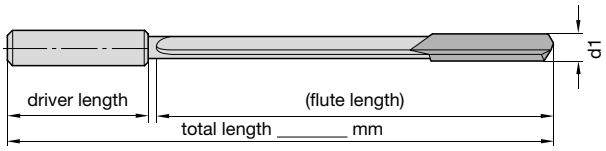
Brazed single-fluted gun drills EB 80 - special tool

NEW | EB 80 | WN | R | h5

Tool material	Carbide
Carbide grade	DK460UF
Surface	◯
Shank form	T 1 - T17

Head form: G up to 0.625000
C from 0.640625

- for almost all materials
- manufactured within 10 working days
- all carbide heads are in stock, ensuring great flexibility for customer-specific manufactured lengths



GÜHRINGNAVIGATOR

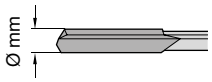
Cutting data page 18

d1 inch	d1 inch size	d1 mm
3/32	0.093750	2.381
7/64	0.109375	2.778
1/8	0.125000	3.175
	0.126000	3.200
9/64	0.140625	3.572
5/32	0.156250	3.969
11/64	0.171875	4.366
3/16	0.187500	4.763
	0.190000	4.826
	0.201000	5.105
	0.202000	5.131
13/64	0.203125	5.159
7/32	0.218750	5.556
15/64	0.234375	5.953
	0.248000	6.299
	0.249000	6.325
1/4	0.250000	6.350
	0.263000	6.680
	0.264000	6.706
17/64	0.265625	6.747
9/32	0.281250	7.144
	0.295000	7.493
	0.296000	7.518
19/64	0.296875	7.541
	0.310000	7.874
	0.311000	7.899
	0.312000	7.925
5/16	0.312500	7.938
21/64	0.328125	8.334
	0.331000	8.407
11/32	0.343750	8.731
23/64	0.359375	9.128
	0.371000	9.423
	0.372000	9.449
	0.373000	9.474
	0.374000	9.500
3/8	0.375000	9.525
25/64	0.390625	9.922
13/32	0.406250	10.319
27/64	0.421875	10.716
	0.435500	11.062
	0.436500	11.087
7/16	0.437500	11.113
29/64	0.453125	11.509
15/32	0.468750	11.906
31/64	0.484375	12.303
	0.496000	12.598
	0.497000	12.624
	0.498000	12.649
	0.499000	12.675
1/2	0.500000	12.700
33/64	0.515625	13.097
	0.529000	13.437
	0.530000	13.462

d1 inch	d1 inch size	d1 mm
17/32	0.531250	13.494
35/64	0.546875	13.891
	0.560500	14.237
	0.561500	14.262
9/16	0.562500	14.288
37/64	0.578125	14.684
19/32	0.593750	15.081
39/64	0.609375	15.478
	0.623000	15.824
	0.624000	15.850
5/8	0.625000	15.875
41/64	0.640625	16.272
21/32	0.656250	16.669
43/64	0.671875	17.066
11/16	0.687500	17.463
45/64	0.703125	17.859
	0.711000	18.059
	0.718000	18.237
23/32	0.718750	18.256
47/64	0.734375	18.653
	0.749000	19.025
3/4	0.750000	19.050
49/64	0.765625	19.447
25/32	0.781250	19.844
51/64	0.796875	20.241
13/16	0.812500	20.638
	0.815000	20.701
53/64	0.828125	21.034
27/32	0.843750	21.431
55/64	0.859375	21.828
	0.874000	22.200
7/8	0.875000	22.225
57/64	0.890625	22.622
29/32	0.906250	23.019
59/64	0.921875	23.416
15/16	0.937500	23.813
61/64	0.953125	24.209
31/32	0.968750	24.606
63/64	0.984375	25.003
	0.998000	25.349
	0.999000	25.375
1	1.000000	25.400
1 1/16	1.062500	26.988
1 1/8	1.125000	28.575
1 3/16	1.187500	30.163
1 1/4	1.250000	31.750
1 5/16	1.312500	33.338
1 3/8	1.375000	34.925
1 7/16	1.437500	36.513
1 1/2	1.500000	38.100

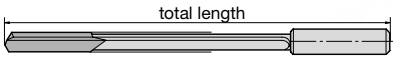
In only four steps to the correct tool:

1



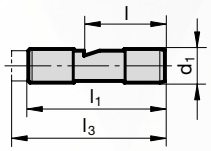
Nom.-Ø
Please choose
2.0–13.9 mm increasing by 0.1 mm
14.0–22.0 mm increasing by 0.5 mm
Other dimensions available on request!

2



Total length
Please choose
a total length up to max. 2,000 mm
(length determination see below)

3



Driver
Please choose
a valid driver*

4

Surface		Material	
S TiN	→	P	Steel
A SuperA	→	M	Stainless steel
Y Signum	→	K	Cast iron
bright	→	N	Aluminium
a nanoA	→	S	Special alloy
F FIRE	→	H	Hardened steel

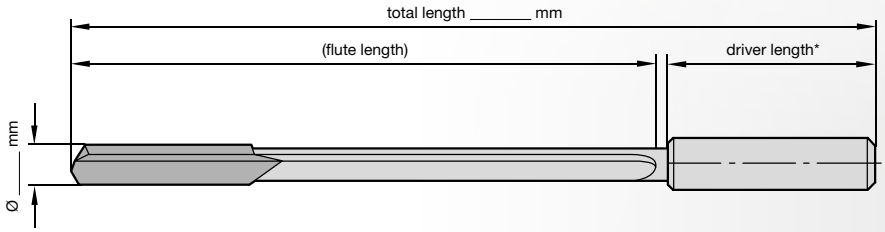
Surface
Please choose
one surface finish

The EB 80 gun drill quick service promotion only applies to gun drills that
- fit in the described grid. The head length, head form, flute length and other technical details are determined in line with our Guhring standard.
- have one of the surface finishes listed below. Other coating options (i. e. TiCN) have a minimum 4 weeks delivery time.

Single-fluted gun drills EB 80 manufacture in max. 10 working days!

Enquiry/order returned to us by fax or e-mail.

○ Enquiry ○ Order Items _____



Driver
○ no ○ Code no.: _____

Geometry
○ lateral chip breaker

Head form
○ C ○ G

Surface
○ bright ○ Endurum ○ FIRE ○ nanoFIRE ○ Signum ○ TiAlN ○ TiAlN-nanoA ○ TiAlN-SuperA ○ TiN

*** Detailed information on our driver programme can be found on the next page.**

Company/customer no.

Telephone

Company

Email

Department

Date/signature

Gühring KG
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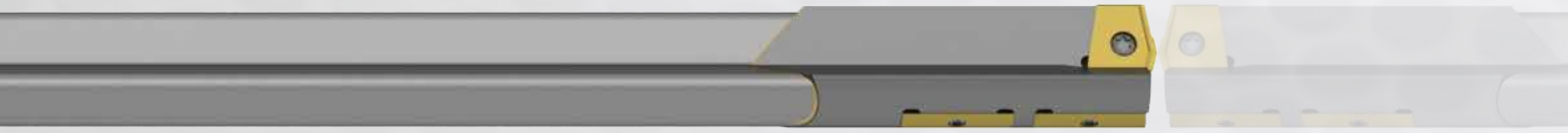
Single-fluted gun drills EB 800

with inserts and interchangeable guide pads



All gun drills must have a pilot hole as support.
Gun drills must never operate at full speed without support in the machine shop.

EB 800 single-fluted gun drills with indexable inserts

30xD | EB 800 | WN | R | h8

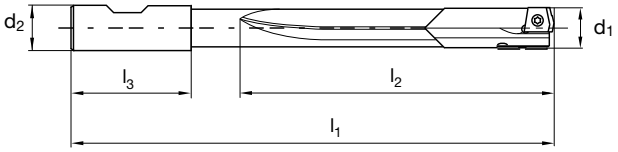
Tool material	Carbide tipped
Surface	S
Shank form	T1 - T17

P	•
M	○
K	○
N	•
S	○
H	

- with interchangeable inserts
- with interchangeable guide pads
- with screw driver
- with screws
- for universal application
- order torque wrench set art. no. 4966 separately

GÜHRINGNAVIGATOR

Cutting data page 18



Article no. **5644**

d1 h8		Ø-range	d2	l1	l2	l3	Code no.
mm	inch		mm	mm	mm	mm	
12.000		12.000-12.499	20.000	446.00	384.00	50.00	12.000
12.100		12.000-12.499	20.000	446.00	384.00	50.00	12.100
12.200		12.000-12.499	20.000	446.00	384.00	50.00	12.200
12.300	31/64	12.000-12.499	20.000	446.00	384.00	50.00	12.300
12.400		12.000-12.499	20.000	446.00	384.00	50.00	12.400
12.500		12.500-12.999	20.000	468.00	406.00	50.00	12.500
12.600		12.500-12.999	20.000	468.00	406.00	50.00	12.600
12.700	1/2	12.500-12.999	20.000	468.00	406.00	50.00	12.700
12.800		12.500-12.999	20.000	468.00	406.00	50.00	12.800
12.900		12.500-12.999	20.000	468.00	406.00	50.00	12.900
14.000		14.000-14.499	20.000	510.00	448.00	50.00	14.000
14.100		14.000-14.499	20.000	510.00	448.00	50.00	14.100
14.200		14.000-14.499	20.000	510.00	448.00	50.00	14.200
14.300		14.000-14.499	20.000	510.00	448.00	50.00	14.300
14.400		14.000-14.499	20.000	510.00	448.00	50.00	14.400
15.000		15.000-15.499	25.000	548.00	480.00	56.00	15.000
15.100		15.000-15.499	25.000	548.00	480.00	56.00	15.100
15.200		15.000-15.499	25.000	548.00	480.00	56.00	15.200
15.300		15.000-15.499	25.000	548.00	480.00	56.00	15.300
15.400		15.000-15.499	25.000	548.00	480.00	56.00	15.400
15.500		15.500-15.999	25.000	580.00	515.00	56.00	15.500
15.600		15.500-15.999	25.000	580.00	515.00	56.00	15.600
15.700		15.500-15.999	25.000	580.00	515.00	56.00	15.700
15.800		15.500-15.999	25.000	580.00	515.00	56.00	15.800
15.900		15.500-15.999	25.000	580.00	515.00	56.00	15.900
16.000		16.000-16.499	25.000	580.00	512.00	56.00	16.000
16.100		16.000-16.499	25.000	580.00	512.00	56.00	16.100
16.200		16.000-16.499	25.000	580.00	512.00	56.00	16.200
16.300		16.000-16.499	25.000	580.00	512.00	56.00	16.300
16.400		16.000-16.499	25.000	580.00	512.00	56.00	16.400
18.000		18.000-18.499	25.000	644.00	576.00	56.00	18.000
18.100		18.000-18.499	25.000	644.00	576.00	56.00	18.100
18.200		18.000-18.499	25.000	644.00	576.00	56.00	18.200
18.300		18.000-18.499	25.000	644.00	576.00	56.00	18.300
18.400		18.000-18.499	25.000	644.00	576.00	56.00	18.400
19.000		19.000-19.499	25.000	695.00	635.00	56.00	19.000
19.050	3/4	19.000-19.499	25.000	695.00	635.00	56.00	19.050
19.100		19.000-19.499	25.000	695.00	635.00	56.00	19.100
19.200		19.000-19.499	25.000	695.00	635.00	56.00	19.200
19.300		19.000-19.499	25.000	695.00	635.00	56.00	19.300
19.400		19.000-19.499	25.000	695.00	635.00	56.00	19.400
20.000		20.000-20.499	32.000	712.00	640.00	60.00	20.000

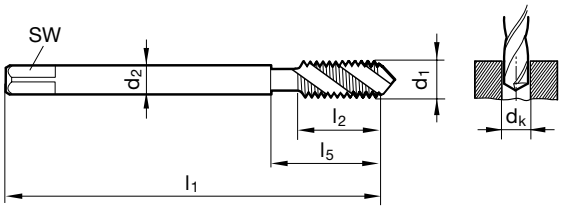
d1 h8		Ø-range	d2	l1	l2	l3	Code no.
mm	inch		mm	mm	mm	mm	
20.100		20.000-20.499	32.000	712.00	640.00	60.00	20.100
20.200		20.000-20.499	32.000	712.00	640.00	60.00	20.200
20.300		20.000-20.499	32.000	712.00	640.00	60.00	20.300
20.400		20.000-20.499	32.000	712.00	640.00	60.00	20.400
24.000		24.000-24.499	32.000	840.00	768.00	60.00	24.000
24.100		24.000-24.499	32.000	840.00	768.00	60.00	24.100
24.200		24.000-24.499	32.000	840.00	768.00	60.00	24.200
24.300		24.000-24.499	32.000	840.00	768.00	60.00	24.300
24.400		24.000-24.499	32.000	840.00	768.00	60.00	24.400
25.000	63/64	25.000-25.499	32.000	875.00	810.00	60.00	25.000
25.100		25.000-25.499	32.000	875.00	810.00	60.00	25.100
25.200		25.000-25.499	32.000	875.00	810.00	60.00	25.200
25.300		25.000-25.499	32.000	875.00	810.00	60.00	25.300
25.400	1	25.000-25.499	32.000	875.00	810.00	60.00	25.400
31.500		31.500-31.999	40.000	1080.00	1005.00	70.00	31.500
31.600		31.500-31.999	40.000	1080.00	1005.00	70.00	31.600
31.700		31.500-31.999	40.000	1080.00	1005.00	70.00	31.700
31.800		31.500-31.999	40.000	1080.00	1005.00	70.00	31.800
31.900		31.500-31.999	40.000	1080.00	1005.00	70.00	31.900

Machine taps for the oil and gas industry

P	≤ 1000
M	○
K	○
N	
S	
H	

- 8-Pitch Taps
- outstanding performance for oil and gas materials such as AISI 4130/4140 and steels up to HRC 35
- longer service life and higher cutting performance
- new type of flute allows faster chip removal, improved productivity and a longer service life

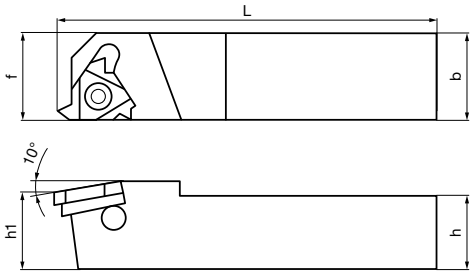
Tool material	HSS-E
Tolerance on Ø	2B
Surface	S
Type	N R40
Form	C
Internal cooling	✕



Gühring Standard

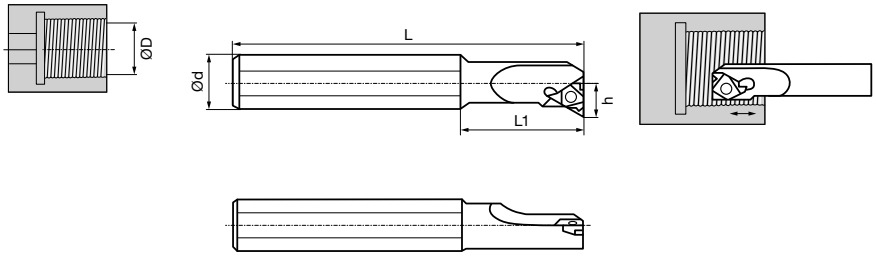
d1	Tolerance	d2	SW	dk	l1	l2	l5	Code no.
		mm	mm	mm	mm	mm	mm	
1 - 8	2B	20.320	15.240	25.50	160	32	73	4289 25.400
1 - 8	2B	18.000	14.500	25.50	160	32	73	303489223
1 1/8 - 8	2B	22.758	17.070	28.50	180	32	85	4289 28.575
1 1/8 - 8	2B	22.000	18.000	28.50	180	32	85	303489226
1 1/4 - 8	2B	25.933	19.460	31.75	180	32	85	4289 31.750
1 1/4 - 8	2B	22.000	18.000	31.75	180	32	85	303489263
1 3/8 - 8	2B	28.143	21.110	35.00	200	32	102	4289 34.925
1 3/8 - 8	2B	28.000	22.000	35.00	200	32	102	303489264
1 1/2 - 8	2B	31.318	23.500	38.25	200	32	102	4289 38.100
1 1/2 - 8	2B	28.000	22.000	38.25	200	32	102	303489265
1 5/8 - 8	2B	33.147	24.870	41.25	200	32	102	4289 41.275
1 5/8 - 8	2B	32.000	24.000	41.25	200	32	102	303489266
1 3/4 - 8	2B	36.322	27.230	44.50	220	32	102	4289 44.450
1 3/4 - 8	2B	36.000	29.000	44.50	220	32	102	303489278
1 7/8 - 8	2B	36.000	29.000	44.50	220	32	120	303489279
2 - 8	2B	41.758	31.320	50.75	225	32	125	4289 50.800
2 - 8	2B	40.000	32.000	50.75	225	32	125	303489225
2 1/4 - 8	2B	48.108	36.068	57.25	250	32	150	4289 57.150
2 1/4 - 8	2B	45.000	35.000	57.25	250	32	150	303489262

Clamping holder for turning, external machining



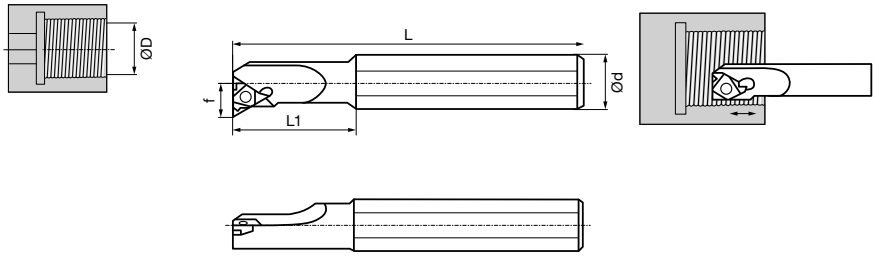
L	f	h=h1	b	Thread-turning insert size	**Material no.**
mm	mm	mm	mm		
100.000	11.000	10.000	10.000	GEL 11	**333231417**
80.000	16.000	12.000	12.000	GEL 16	**333231418**
100.000	16.000	16.000	16.000	GEL 16	**333231419**
125.000	20.000	20.000	20.000	GEL 16	**333231420**
150.000	25.000	25.000	25.000	GEL 16	**333231421**
170.000	32.000	32.000	32.000	GEL 16	**333231422**
150.000	25.000	25.000	25.000	GEL 22	**333231423**
170.000	32.000	32.000	32.000	GEL 22	**333231424**
150.000	25.000	25.000	25.000	GEL 27	**333231426**
170.000	32.000	32.000	32.000	GEL 27	**333231427**
100.000	11.000	8.000	8.000	GER 11	**333231428**
100.000	11.000	10.000	10.000	GER 11	**333231429**
80.000	16.000	12.000	12.000	GER 16	**333231430**
100.000	16.000	16.000	16.000	GER 16	**333231431**
125.000	20.000	20.000	20.000	GER 16	**333231432**
150.000	25.000	25.000	25.000	GER 16	**333231433**
170.000	32.000	32.000	32.000	GER 16	**333231434**
150.000	25.000	25.000	25.000	GER 22	**333231435**
170.000	32.000	32.000	32.000	GER 22	**333231436**
150.000	25.000	25.000	25.000	GER 27	**333231438**
170.000	32.000	32.000	32.000	GER 27	**333231439**
200.000	40.000	40.000	40.000	GER 27	**333231440**

Boring bars, internal machining, left hand



L	L1	f	D min.	Ø d	Thread-turning insert size	**Material no.**
mm		mm	mm	mm		
100.000	12.000	4.300	6.400	12.000	GIL 06	**333231611**
125.000	18.000	5.300	7.800	16.000	GIL 08	**333231627**
100.000		7.400	12.000	10.000	GIL 11	**333231628**
125.000	25.000	6.500	12.000	16.000	GIL 11	**333231629**
140.000	32.000	8.000	15.000	16.000	GIL 11	**333231630**
150.000	32.000	10.000	16.000	16.000	GIL 16	**333231631**
170.000	40.000	11.400	19.000	20.000	GIL 16	**333231632**
170.000		13.400	24.000	20.000	GIL 16	**333231633**
200.000		16.300	29.000	25.000	GIL 16	**333231634**
250.000		19.600	36.000	32.000	GIL 16	**333231635**
300.000		23.800	44.000	40.000	GIL 16	**333231636**
170.000		13.000	24.000	20.000	GIL 22	**333231637**
200.000		17.200	29.000	25.000	GIL 22	**333231638**
250.000		21.500	38.000	32.000	GIL 22	**333231639**
300.000		25.800	46.000	40.000	GIL 22	**333231640**
250.000		22.400	40.000	32.000	GIL 27	**333231641**
300.000		26.400	48.000	40.000	GIL 27	**333231642**
350.000		31.400	58.000	50.000	GIL 27	**333231643**
400.000		36.400	68.000	60.000	GIL 27	**333231644**

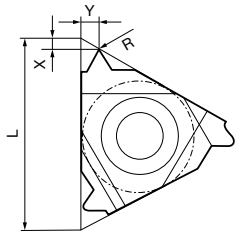
Boring bars, internal machining, right hand



L	L1	f	D min.	Ø d	Thread-turning insert size	Material no.
mm		mm	mm	mm		
100.000	12.000	4.300	6.400	12.000	GIR 06	**333231645**
125.000	18.000	5.300	7.800	16.000	GIR 08	**333231646**
100.000		7.400	12.000	10.000	GIR 11	**333231647**
125.000	25.000	6.500	12.000	16.000	GIR 11	**333231648**
140.000	32.000	8.000	15.000	16.000	GIR 11	**333231649**
150.000	32.000	10.000	16.000	16.000	GIR 16	**333231650**
170.000	40.000	11.400	19.000	20.000	GIR 16	**333231651**
170.000		13.400	24.000	20.000	GIR 16	**333231652**
200.000		16.300	29.000	25.000	GIR 16	**333231653**
250.000		19.600	36.000	32.000	GIR 16	**333231654**
300.000		23.800	44.000	40.000	GIR 16	**333231655**
170.000		13.000	24.000	20.000	GIR 22	**333231656**
200.000		17.200	29.000	25.000	GIR 22	**333231657**
250.000		21.500	38.000	32.000	GIR 22	**333231658**
300.000		25.800	46.000	40.000	GIR 22	**333231659**
250.000		22.400	40.000	32.000	GIR 27	**333231660**
300.000		26.400	48.000	40.000	GIR 27	**333231661**
350.000		31.400	58.000	50.000	GIR 27	**333231662**
400.000		36.400	68.000	60.000	GIR 27	**333231663**

Insert for threading

- best surface quality
- ideally suited for deep holes when used with corresponding boring bar
- with one insert it is possible to turn different thread profiles



UN full profile (UN, UNC, UNF, UNEF)

R	L	X	Y	TPI min.	Description	**Material no.**
mm	mm	mm	mm			
0.110	16.000	0.700	0.800	24	GER 16	**333231441**
0.140	16.000	0.800	0.900	20	GER 16	**333231442**
0.150	16.000	0.800	1.000	18	GER 16	**333231443**
0.190	16.000	0.900	1.100	16	GER 16	**333231444**
0.220	16.000	1.000	1.200	14	GER 16	**333231445**
0.250	16.000	1.100	1.400	12	GER 16	**333231446**
0.410	16.000	1.200	1.600	8	GER 16	**333231447**

Withworth full profile (BSW, BSF, BSP), external thread

R	L	X	Y	TPI min.	Description	**Material no.**
mm	mm	mm	mm			
0.080	16.000	0.800	1.000	19	GER 16	**333231448**
0.200	16.000	0.900	1.100	16	GER 16	**333231449**
0.230	16.000	1.000	1.200	14	GER 16	**333231450**
0.300	16.000	1.100	1.500	11	GER 16	**333231451**

Withworth full profile (BSW, BSF, BSP), internal thread

R	L	X	Y	TPI min.	Description	**Material no.**
mm	mm	mm	mm			
0.080	16.000	0.800	1.000	19	GIR 16	**333231452**
0.200	16.000	0.900	1.100	16	GIR 16	**333231453**
0.230	16.000	1.000	1.200	14	GIR 16	**333231454**
0.300	11.000	1.100	1.500	11	GIR 16	**333231455**

NPT (pipe thread), full profile, external

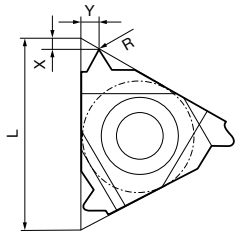
R	L	X	Y	TPI min.	Description	**Material no.**
mm	mm	mm	mm			
0.050	16.000	0.800	1.000	18	GER 16	**333231456**
0.050	16.000	0.900	1.200	14	GER 16	**333231457**
0.090	16.000	1.100	1.500	11.5	GER 16	**333231458**
0.150	16.000	1.200	1.800	8	GER 16	**333231459**

NPT (pipe thread), full profile, internal

R	L	X	Y	TPI min.	Description	**Material no.**
mm	mm	mm	mm			
0.050	16.000	0.900	1.200	14	GJR 16	**333231460**
0.090	16.000	1.100	1.500	11.5	GJR 16	**333231461**
0.150	16.000	1.200	1.800	8	GJR 16	**333231462**

Insert for threading

- best surface quality
- ideally suited for deep holes when used with corresponding boring bar
- with one insert it is possible to turn different thread profiles



UNJ, external thread

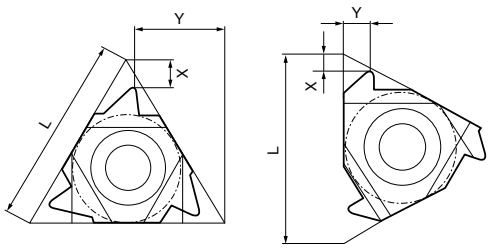
R	L	X	Y	TPI min.	Description	Material no.
mm	mm	mm	mm			
0.200	11.000	0.800	0.900	20	GEL 11	**333231534**
0.220	11.000	0.800	1.000	18	GEL 11	**333231535**
0.260	16.000	0.900	1.100	16	GEL 16	**333231536**
0.310	16.000	1.000	1.300	13	GEL 16	**333231582**
0.340	16.000	1.100	1.300	12	GEL 16	**333231583**
0.200	11.000	0.800	0.900	20	GER 11	**333231584**
0.110	16.000	0.600	0.600	36	GER 16	**333231585**
0.120	16.000	0.600	0.700	32	GER 16	**333231586**
0.140	16.000	0.700	0.700	28	GER 16	**333231587**
0.170	16.000	0.700	0.800	24	GER 16	**333231588**
0.200	16.000	0.800	0.900	20	GER 16	**333231589**
0.220	16.000	0.800	1.000	18	GER 16	**333231590**
0.260	16.000	0.900	1.100	16	GER 16	**333231591**
0.290	16.000	1.000	1.200	14	GER 16	**333231592**
0.310	16.000	1.000	1.300	13	GER 16	**333231593**
0.340	16.000	1.100	1.300	12	GER 16	**333231594**
0.510	16.000	1.200	1.600	8	GER 16	**333231595**

UNJ, internal thread

R	L	X	Y	TPI min.	Description	Material no.
mm	mm	mm	mm			
0.170	11.000	0.700	0.800	24	GIR 11	**333231596**
0.200	11.000	0.800	0.900	20	GIR 11	**333231597**
0.220	11.000	0.800	1.000	18	GIR 11	**333231598**
0.260	11.000	0.900	1.100	16	GIR 11	**333231599**
0.260	16.000	0.900	1.100	16	GIR 16	**333231600**
0.290	16.000	1.000	1.200	14	GIR 16	**333231601**
0.410	16.000	1.200	1.500	10	GIR 16	**333231602**
0.510	16.000	1.200	1.600	8	GIR 16	**333231603**

Insert for threading

- best surface quality
- ideally suited for deep holes when used with corresponding boring bar
- with one insert it is possible to turn different thread profiles



American buttress, external thread

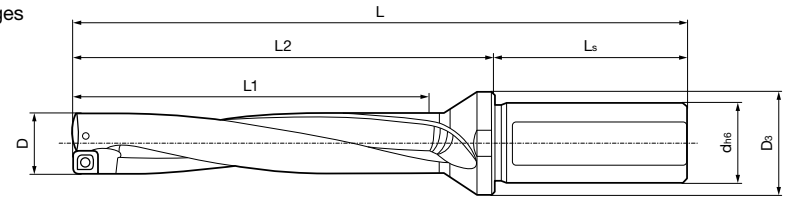
L	X	Y	TPI min.	Description	**Material no.**
mm	mm	mm			
27.000	3.100	12.100	3	GEL 27	**333231604**
22.000	2.400	9.800	4	GER 22	**333231605**
27.000	3.100	12.100	3	GER 27	**333231606**

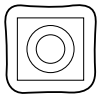
American buttress, internal thread

L	X	Y	TPI min.	Description	**Material no.**
mm	mm	mm			
27.000	3.100	12.100	3	GIL 27	**333231607**
22.000	2.400	9.800	4	GIR 22	**333231608**
27.000	3.100	12.100	3	GIR 27	**333231609**

Drilling and internal turning, 5xD

- drill body with internal cooling
- indexable inserts with 4 cutting edges
- for general applications





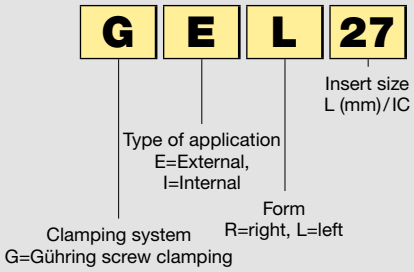
D	d (h6)	D3	L1 (5xD	Material no.	Insert	Material no.
mm	mm	mm	mm	Holder		Insert
12.700	20.000	25.000	65.000	**333221340**	SOMT040204	**333234078**
13.490	20.000	25.000	70.000	**333221341**	SOMT040204	**333234078**
14.000	20.000	25.000	70.000	**333238036**	SOMT050204	**333221493**
14.290	20.000	25.000	75.000	**333221482**	SOMT050204	**333221493**
15.000	20.000	25.000	75.000	**333238117**	SOMT050204	**333221493**
15.080	20.000	25.000	75.000	**333221483**	SOMT050204	**333221493**
15.870	20.000	25.000	80.000	**333221484**	SOMT050204	**333221493**
16.000	20.000	25.000	80.000	**333238118**	SOMT050204	**333221493**
16.670	25.000	32.000	85.000	**333221485**	SOMT060204	**333221494**
17.000	25.000	32.000	85.000	**333226561**	SOMT060204	**333221494**
17.460	25.000	32.000	90.000	**333221486**	SOMT060204	**333221494**
17.860	25.000	32.000	90.000	**333221487**	SOMT060204	**333221494**
18.000	25.000	32.000	90.000	**333238119**	SOMT060204	**333221494**
18.650	25.000	32.000	95.000	**333221488**	SOMT060204	**333221494**
19.000	25.000	32.000	95.000	**333238120**	SOMT060204	**333221494**
19.050	25.000	32.000	95.000	**333221489**	SOMT070306	**333221495**
20.000	25.000	32.000	100.000	**333238121**	SOMT070306	**333221495**
21.000	25.000	32.000	105.000	**333238122**	SOMT070306	**333221495**
22.000	25.000	32.000	110.000	**333238123**	SOMT070306	**333221495**
22.220	25.000	45.000	110.000	**333221490**	SOMT08T306	**333221497**
23.000	25.000	32.000	115.000	**333238124**	SOMT08T306	**333221497**
24.000	25.000	32.000	120.000	**333238125**	SOMT08T306	**333221497**
25.000	25.000	32.000	125.000	**333238126**	SOMT08T306	**333221497**
25.400	25.000	45.000	130.000	**333221491**	SOMT08T306	**333221497**
26.000	25.000	32.000	130.000	**333238127**	SOMT08T306	**333221497**
27.000	25.000	40.000	135.000	**333238128**	SOMT09T308	**333223314**
28.000	25.000	40.000	140.000	**333238129**	SOMT09T308	**333223314**
29.000	32.000	40.000	145.000	**333238130**	SOMT09T308	**333223314**
30.000	32.000	40.000	150.000	**333238131**	SOMT09T308	**333223314**
31.000	32.000	40.000	155.000	**333238132**	SOMT09T308	**333223314**
32.000	32.000	40.000	160.000	**333238133**	SOMT11T308	**333223818**
33.000	32.000	40.000	165.000	**333238134**	SOMT11T308	**333223818**
34.000	32.000	40.000	170.000	**333238135**	SOMT11T308	**333223818**
35.000	32.000	40.000	175.000	**333238136**	SOMT11T308	**333223818**
36.000	32.000	40.000	180.000	**333238137**	SOMT11T308	**333223818**
37.000	32.000	50.000	185.000	**333238138**	SOMT130408	**333223820**
38.000	32.000	50.000	190.000	**333238139**	SOMT130408	**333223820**
39.000	32.000	50.000	195.000	**333238140**	SOMT130408	**333223820**
40.000	32.000	50.000	200.000	**333236058**	SOMT130408	**333223820**
41.000	40.000	50.000	205.000	**333238141**	SOMT130408	**333223820**
42.000	40.000	50.000	210.000	**333238142**	SOMT130408	**333223820**
43.000	40.000	50.000	215.000	**333238145**	SOMT130408	**333223820**
44.000	40.000	60.000	220.000	**333238144**	SOMT150508	**333238162**
45.000	40.000	60.000	225.000	**333238146**	SOMT150508	**333238162**
46.000	40.000	60.000	230.000	**333238147**	SOMT150508	**333238162**
47.000	40.000	60.000	235.000	**333238148**	SOMT150508	**333238162**
48.000	40.000	60.000	240.000	**333238149**	SOMT150508	**333238162**
49.000	40.000	60.000	245.000	**333238150**	SOMT150508	**333238162**
50.000	40.000	60.000	250.000	**333238151**	SOMT150508	**333238162**

- Also available with drilling lengths 2xD, 3xD and 4xD on request.
- 2.5xD and 3.5xD from Ø 51 mm to Ø 80 mm also available on request.
- Indexable inserts made of other types of carbide can also be ordered as a special solution.

GÜHRINGNAVIGATOR

Insert Threading

Explanation of insert description



General formulas

Cutting speed (v_c)

$$v_c = \frac{d_1 \cdot \pi \cdot n}{1000} \text{ [m/min]}$$

Revolutions per minute (n)

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \text{ [U/min]}$$

Feed rate (v_f)

$$v_f = f \cdot n \text{ [mm/min]}$$

ISO	Material		Material examples/ material number	Tensile strength (N/mm²)	Brinell hardness (HB)	Cutting speed v_c (m/min) Ⓢ
P	Carbon steel	C < = 0.15 %	11SMn30+C / 1.0715 C15 / 1.0401	500 600	150 180	180
		C ≥ 0.15 - 0.45 %	S235JR (ST37-2) / 1.0037 Ck22 / 1.1151	400 600	120 180	
		C > 0.45 %	S355JO (St52-3) / 1.0553 C60 / 1.0601	600 900	180 270	160
	Low-alloyed steel (alloy content ≤ 5%)	annealed	16MnCr5 / 1.7131 18CrNi8 / 1.5920	650 650	200 200	80
		heat-treatable	25CrMoV4 / 1.7218 42CrMo4V / 1.7225	900 1100	270 320	130
	High-alloyed steel (alloy content > 5%)	annealed	X37CrMoV5-1 / 1.2343 X153CrMoV12 / 1.2379	750 850	220 250	120
		heat-treatable	55NiCrMoV7 / 1.2714	1200	350	100
	Cast steel	un-alloyed, low-alloyed	GS52 / 1.0552	600	180	80
		high-alloyed	GX40CrNiSi22-10 / 1.4826	750	220	60
M	Stainless steel	martensitic, ferritic, tempered	X14CrMoS17 / 1.4104 X4CrNiMo16-5-1 / 1.4418	800 1000	240 300	110
		austenitic, Ni > 8%	X5CrNi18-10 / 1.4301 X2CrNiMo17-12-2 / 1.4404	650	200	160
		austenitic, ferritic (Duplex)	X2CrNiMoCuN25-6-3 / 1.4507 X2CrNiMoN25-7-4 / 1.4410	850	250	80
K	Grey cast iron	low tensile strength	EN-GJL-200 (GG20) / 0.6020		180	120
		high tensile strength	EN-GJL-400 (GG40) / 0.6040		260	130
	Spheroidal graphite iron	low tensile strength	EN-GJS-400-15 (GGG40) / 0.7040		160	130
		high tensile strength	EN-GJS-700-2 (GGG70) / 0.7070		260	100
	Malleable cast iron	low tensile strength	EN-GJMW-350-4 (GTW35) / 0.8035		125	130
		high tensile strength	EN-GJMB-550-4 (GTS55) / 0.8155		250	100
N	Al-alloys	non-heat-treatable <12% Si	EN-AW-2017 (AlCuMg1) / 3.1325		60	1400
		heat-treatable <12% Si	EN-AW-6082 (AlMgSi1) / 3.2315		100	500
	Al-cast-alloys	non-heat-treatable <12% Si	AlSi9Cu3 / 3.2163		80	700
		heat-treatable <12% Si	AlSi10Mg / 3.2383		100	420
	Copper alloys	brass, lead alloy	CuZn39Pb2 (MS58) / 2.0380	400	120	400
		bronze	CuSn6 / 2.1020	500	150	-
S	Heat resistant alloys, super alloys	NiFe-base, annealed	NiCr15Fe (Alloy600) / 2.4816	700		60
		NiFe-Basis, hardened		950		50
		NiCo-Basis, annealed	NiMo16Cr15W (Alloy C-276) / 2.4819	800		30
		NiCo-Basis, cast		1100		20
		NiCo-Basis, hardened	NiCr19NbMo (Alloy718) / 2.4668	1200		20
	Titanium-alloys	annealed	Ti6Al4V / 3.7164	900		140
		hardened		1200		50
H	Hardened steels		Heat-treatable steel		> 52 HRC	40
			Heat-treatable steel, case hardened steel		> 59 HRC	30
			Heat-treatable steel, case hardened steel		> 62 HRC	30

The specified values must be adapted to the machine and machining conditions.

GÜHRINGNAVIGATOR

To select the optimal tool and the recommended machining parameters for your application, please also use the electronic version of the GuhringNavigator on the internet: www.guehring.com.

Drill Ø mm	Feed column no.									
	20	19	18	17	16	15	14	13	12	11
	f (mm/rev.)									
1.0	0.050	0.030	0.022	0.015	0.010	0.006	0.004	0.003	0.002	0.001
1.5	0.075	0.050	0.045	0.032	0.020	0.012	0.008	0.006	0.004	0.002
2.0	0.100	0.060	0.055	0.046	0.028	0.016	0.010	0.007	0.005	0.003
2.5	0.125	0.075	0.070	0.054	0.030	0.018	0.012	0.008	0.006	0.004
4.0	0.240	0.120	0.085	0.065	0.043	0.025	0.016	0.010	0.007	0.005
6.0	0.360	0.180	0.120	0.085	0.061	0.035	0.024	0.013	0.009	0.007
8.0	0.480	0.240	0.150	0.100	0.068	0.045	0.032	0.022	0.014	0.010
10.0	0.600	0.300	0.160	0.120	0.075	0.055	0.040	0.028	0.016	0.012
14.0	0.700	0.350	0.180	0.130	0.085	0.065	0.050	0.035	0.025	0.020
20.0	0.800	0.400	0.250	0.180	0.110	0.080	0.060	0.045	0.035	0.026
24.0	0.900	0.450	0.300	0.185	0.130	0.085	0.065	0.047	0.036	0.027
30.0	1.050	0.500	0.400	0.200	0.150	0.100	0.070	0.050	0.040	0.030
35.0	1.100	0.600	0.450	0.250	0.180	0.120	0.075	0.055	0.045	0.035
40.0	1.200	0.700	0.500	0.300	0.200	0.150	0.080	0.060	0.050	0.040
52.0	1.300	0.800	0.550	0.350	0.230	0.180	0.100	0.070	0.060	0.050

* The feed rates always relate to tools with the recommended coating.
In some cases the successful application of un-coated tools cannot be guaranteed.

Coolant:
○ Air
● Neat oil
◍ Soluble oil

STOP

All gun drills must have a pilot hole as support.
Gun drills must never operate at full speed without support in the machine shop.

Cutting direction:
Ⓡ right-hand cutting

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength N/mm²	Hardness	Coolant
Common structural steels	**1.0035** S185(St33), **1.0486** P275N(StE285), **1.0345**	≤500		● ◍
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937**	≤1000		● ◍
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37	≤850		● ◍
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb2	≤1000		● ◍
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		● ◍
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		● ◍
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		● ◍
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		● ◍
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		● ◍
Unalloyed case hard. steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		● ◍
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		● ◍
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		● ◍
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105**	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122**	≤1500		●
Cast iron	**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	◍ ○
Spheroidal graphite iron and malleable cast iron	**0.7050** EN-GJS-500-7 (GGG50), **0.8035**		≤240 HB	◍
	0.7070 EN-GJS-700-2 (GGG70), **0.8170** EN-GJMB-700-2		≤350 HB	◍
Chilled cast iron	–		≤350 HB	◍
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	◍
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	◍
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		◍
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		◍
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5	≤1400		●
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		◍
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si	≤650		◍
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		◍
≤ 24 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		◍
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05**	≤400		◍
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		◍
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410**	≤600		◍ ○
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		◍
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176**	≤600		◍ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Bakelit, Resopal, Pertinax, Moltopren	≤150		◍
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		◍
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

Please observe the following for pilot holes

- The pilot hole diameter tolerance should be G8 and the nominal tools tolerance always Ø m7.
- If the single-fluted gun drill has a guide diameter, the pilot hole should be at least deep enough to support both head forms when drilling the pilot hole.
- Depending on the application, it may be advantageous if the pilot hole has an entry chamfer.
- If there are strict requirements regarding the position and path of the deep drilled hole, then the pilot hole should be chamfered or be drilled on a lathe.

EB 80/EB 80 XXL

Single-fluted gun drill
Solid carbide head
2.000 ... 40.000

recom. coating	≤35xD v_c m/min	≤35xD Feed col. no.	>35xD v_c m/min	>35xD Feed col. no.
○	100	14	95	13
	85	14	80	13
S	90	14	85	13
	80	14	75	13
S	90	13	85	12
	80	13	75	12
	75	13	70	12
S	75	13	70	12
	65	13	60	12
S	80	14	75	13
S	75	13	70	12
	65	13	60	12
C	75	13	70	12
	65	13	60	12
C	75	12	70	11
	65	12	60	11
C	55	11	50	11
C	65	12	60	12
C	30	12	25	11
	25	11	20	11
C	55	13	50	12
	45	13	40	12
	35	13	35	12
S	85	15	80	14
	80	15	75	14
S	80	14	75	13
	70	14	65	13
S	55	13	50	12
S	60	13	60	12
	50	13	50	12
S	60	13	60	12
	50	13	50	12
C	20	11	20	11
○	35	11	30	11
	30	11	25	11
C	150	16	140	15
○	120	15	115	14
○	150	16	140	15
	130	16	120	15
○	110	16	100	15
C	75	14	70	13
○	120	17	115	16
	90	17	85	16
○	95	16	90	15
	75	16	70	15
○	70	16	65	15
	60	16	55	15
○	75	14	70	13
	70	14	65	13
○	60	13	55	12
	50	13	45	12

EB 800

Single-fluted gun drill
with interchangeable inserts
12.000 ... 52.000

recom. coating	≤35xD v_c m/min	≤35xD Feed col. no.	>35xD v_c m/min	>35xD Feed col. no.
S	90	15	85	15
	80	15	75	15
S	85	16	80	16
	75	16	70	16
S	85	15	80	15
	80	15	75	15
	75	15	70	15
F	75	15	70	15
	65	15	60	15
F	80	15	75	15
Y	75	15	70	15
	70	15	65	15
F	70	15	65	15
	60	15	55	15
F	65	14	60	14
	60	14	55	14
Y	55	14	50	14
Y	65	15	60	15
Y	30	13	25	13
	25	12	20	12
a	50	14	45	14
	45	14	40	14
	40	14	35	14
Y	85	16	80	16
	80	16	75	16
Y	75	16	70	16
	70	16	65	16
Y	55	15	50	15
Y	60	14	60	14
	50	14	50	14
Y	60	14	60	14
	50	14	50	14
a	25	13	20	13
a	35	13	30	13
	30	12	25	12
S	140	16	135	16
S	125	16	120	16
S	170	17	165	17
	140	17	135	17
S	115	16	110	16
S	75	15	70	15
S	120	17	115	17
	90	17	85	17
S	95	17	90	17
	75	17	70	17
S	70	17	65	17
	60	17	55	17
S	75	16	70	16
	70	16	65	16
S	60	15	55	15
	50	15	45	15

GÜHRINGNAVIGATOR

Insert drilling system

All the values stated are guideline values. The actual achievable cutting speeds and feed rates depend on the machining conditions.
We recommend carrying out drilling trials.

Coolant:
○ Air
● Neat oil
◍ Soluble oil

Material group	Material examples Figures in bold = material no. to DIN EN 10 027	Tensile strength N/mm²	Hardness	Coolant
Common structural steels	**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		◍
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		◍
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	≤1000		◍
Unalloyed heat-treatable steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤700		◍
	1.0503 C45, **1.1191** C45E (Ck45)	≤850		◍
	1.0601 C60, **1.1221** C60E (Ck60)	≤1000		◍
Alloyed heat-treatable steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	≤1000		◍
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	≤1400		◍
Unalloyed case hard. steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤850		◍
Alloyed case hardened steels	**1.7276** 10CrMo11, **1.5125** 11MnSi6	≤1000		●
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	≤1400		●
Nitriding steels	**1.8504** 34CrAl6	≤1000		◍
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	≤1400		●
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		◍
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	≤1400		●
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤1400		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤350 HB	●
Hardened steels	–		≤48 HRC	●
			≤66 HRC	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤900		●
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤1100		●
martensitic	**1.4057** X20CrNi172 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤1500		●
Cast iron	**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	◍ ○
Spheroidal graphite iron and malleable cast iron	**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	◍
Chilled cast iron	–		≤350 HB	◍
New cast materials GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)		≤220 HB	◍ ○
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo 6		≤300 HB	◍ ○
New cast materials ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	≤1000		◍ ○
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	≤1400		◍ ○
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤2000		●
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤1400		●
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		◍
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤650		◍
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		◍
≤ 24 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		◍
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤400		○
Copper, low-alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤500		◍
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		◍
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		◍
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		◍ ●
	2.0790 CuNi18Zn19Pb	≤850		●
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	≤1000		●
Duroplastics	Epoxy resin, Resopal, Pertinax, Moltopren	≤150		○
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon	≤100		◍ ○
Kevlar	Kevlar	≤1000		○
Glass, carbon concentr. plastics	GFK/CFK	≤1000		○

SOMT05
SOMT06

v_c m/min	f (mm/z)
180-350	0,04-0,1
180-350	0,04-0,1
180-350	0,04-0,1
180-350	0,04-0,1
180-350	0,04-0,1
180-350	0,04-0,1
180-350	0,04-0,1
100-180	0,06-0,16
100-180	0,06-0,16
100-180	0,06-0,16
100-240	0,06-0,16
100-180	0,06-0,16
100-180	0,06-0,16
100-180	0,06-0,16
100-180	0,06-0,16
100-180	0,06-0,16
100-180	0,06-0,16
100-180	0,06-0,16
30-50	0,05-0,09
30-50	0,05-0,09
160-240	0,06-0,12
160-240	0,06-0,12
160-240	0,06-0,12

SOMT07
SOMT08

v_c m/min	VR-Code
180-350	0,04-0,12
180-350	0,04-0,12
180-350	0,04-0,12
180-350	0,04-0,12
180-350	0,04-0,12
180-350	0,04-0,12
180-350	0,04-0,12
100-180	0,08-0,2
100-180	0,08-0,2
100-180	0,08-0,2
100-240	0,08-0,2
100-180	0,08-0,2
100-180	0,08-0,2
100-180	0,08-0,2
100-180	0,08-0,2
100-180	0,08-0,2
100-180	0,08-0,2
100-180	0,08-0,2
30-50	0,06-0,1
30-50	0,06-0,1
160-240	0,08-0,16
160-240	0,08-0,16
160-240	0,08-0,16

SOMT09
SOMT11

v_c m/min	VR-Code
180-350	0,06-0,14
180-350	0,06-0,14
180-350	0,06-0,14
180-350	0,06-0,14
180-350	0,06-0,14
180-350	0,06-0,14
180-350	0,06-0,14
100-180	0,1-0,2
100-180	0,1-0,2
100-180	0,1-0,2
100-240	0,1-0,2
100-180	0,1-0,2
100-180	0,1-0,2
100-180	0,1-0,2
100-180	0,1-0,2
100-180	0,1-0,2
100-180	0,1-0,2
100-180	0,1-0,2
30-50	0,06-0,11
30-50	0,06-0,11
160-240	0,08-0,18
160-240	0,08-0,18
160-240	0,08-0,18

SOMT13
SOMT15

v_c m/min	VR-Code
180-350	0,08-0,16
180-350	0,08-0,16
180-350	0,08-0,16
180-350	0,08-0,16
180-350	0,08-0,16
180-350	0,08-0,16
180-350	0,08-0,16
100-180	0,1-0,22
100-180	0,1-0,22
100-180	0,1-0,22
100-240	0,12-0,22
100-180	0,12-0,22
100-180	0,12-0,22
100-180	0,12-0,22
100-180	0,12-0,22
100-180	0,12-0,22
100-180	0,12-0,22
100-180	0,12-0,22
30-50	0,07-0,12
30-50	0,07-0,12
160-240	0,1-0,2
160-240	0,1-0,2
160-240	0,1-0,2

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