

botek[®]

DEEP HOLE DRILLING SYSTEMS
SOLID CARBIDE TOOLS

Deep hole drilling tools

Type 01, 02, 07



botek

New:
from dia. 12.000 mm insert
with serration



System single flute gundrills



The botek company

Manufacturing deep and precise holes is a technical challenge when processing metal. Accordingly specialising in deep hole drilling technology was the founding idea in 1974 of botek Präzisionsbohrtechnik GmbH in Riederich.

botek grew to be an international supplier of deep hole drilling tools. Over 450 employees in the main company develop and manufacture single and two fluted drills, deep hole drilling tools BTA and Ejector systems as well as special tools.

A complete product program, regarding all deep hole drilling aspects and a team of highly qualified and dedicated cutting specialists make botek a competent partner for the automobile industry and their suppliers, shipbuilding industry, hydraulic industry as well as motor, gear and machine building companies.



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- We reserve the right to make modifications in the interests of technical improvement. Such modifications cannot, in principle, be accepted as justifiable reasons for complaint.
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Express Order Line / Stock program

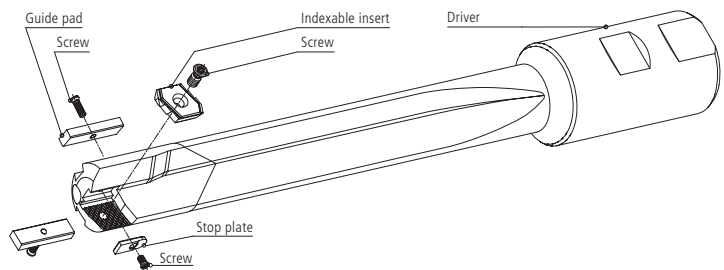
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Advantages / Overview

Type 01

Advantages

1. New, high-performance deep hole drilling tool with a modern, user-friendly design.
2. Very high operational efficiency combined with optimum cutting capacity.
3. Ideally suited to CNC machines with a coolant system. Drilling depths up to $40 \times D$ are possible in a single drilling cycle. Tools also produce excellent results when used on deep hole drilling machines.
4. No regrinding needed.
5. Various indexable insert chip breakers are available according to material to be processed. Coated indexable inserts and guide pads are also available.
6. Easy exchange of indexable inserts and guide pads. No need to adjust setting within ± 0.01 mm diameter.
7. When using matching interchangeable parts, the drill head diameter may, however, be adjusted within a range of 0.5 mm.
8. The model with extended guide pads (Type 01-010) is also suitable for crosshole drilling.
9. Drilling grades up to IT 8 are possible.
10. Retipping is possible.



Overview

Type	Drilling range	
Type 01-001 Gundrill for solid drilling	Standard version with 2 guide pads Drilling range: Ø 12.00 - 17.99 mm	
Type 01-000 Gundrill for solid drilling	Standard version with 2 guide pads Drilling range: Ø 18.00 - 43.99 mm	
Type 01-011 Gundrill for solid drilling	Version with extended guide pads (4 or 5 pcs respectively) Drilling range: Ø 13.50 - 17.99 mm	
Type 01-010 Gundrill for solid drilling	Version with extended guide pads (4 or 5 pcs respectively) Drilling range: Ø 18.00 - 43.99 mm	
Type 01-020 Gundrill for solid drilling	Milled shank with 2 guide pads Drilling range: Ø 18.00 - 43.99 mm Standard length: $5 \times D$ and $10 \times D$	

Chip breaker

1. The chip breaker has a decisive part to play with the chip formation.
2. To obtain trouble-free chip flow along with optimum tool life, it is essential to aim for the most ideal chip formation possible.
3. The chips should be broken just short enough to ensure that there is no chip congestion in the flute of the drill.
4. Excessively short, crushed chips place strain on the cutting edges and lead to premature wear and will destroy the cutting edge.
5. For processing commonly used materials, indexable inserts are available from stock with chip breakers in accordance with model SP 1 or model SP 2.

Chip breaker SP 1

- Unalloyed steels
 $C > 0.2 \%$
- Alloyed steels
- Toughened steels
- Case hardened steels
- Tool steels
- Stainless and acid-proof steels

Chip breaker SP 2 (from Ø 18.00)



- Unalloyed steels
 $C < 0.2 \%$
- Long chip-forming special steels
- Stainless and acid-proof steels

Chip breaker SP 3

- According to b, t, r or drawing

Ordering data Type 01









Diameter range: 12.00 to 17.99

Diameter range	Drilling tool	
	Type 01-001 Standard version with 2 guide pads	Type 01-011 Version with extended guide pads (4 pcs)
Ø (mm)		
12.00 - 12.49	01-121* -001	-
12.50 - 12.99	01-122* -001	-
13.00 - 13.49	01-131* -001	-
13.50 - 13.99	01-132* -001	01-132* -011
14.00 - 14.49	01-141* -001	01-141* -011
14.50 - 14.99	01-142* -001	01-142* -011
15.00 - 15.49	01-151* -001	01-151* -011
15.50 - 15.99	01-152* -001	01-152* -011
16.00 - 16.49	01-161* -001	01-161* -011
16.50 - 16.99	01-162* -001	01-162* -011
17.00 - 17.49	01-171* -001	01-171* -011
17.50 - 17.99	01-172* -001	01-172* -011

The tools are available in steps of 0.05 mm in diameter.
Dimensions in between can be achieved in steps of 0.025 mm by using smaller guide pad only.
The tool diameter tolerance is ± 0.01 mm.

Length (mm) up to							
500	800	1,250	1,600	2,000	2,500	3,200	4,500
1	2	3	4	5	6	7	8

* Length groups

Drill diameter					Replaceable insert			Indexable guide pads			Guide pad end stop	
Ø (mm)												
					1x	1x (alternative)	1x	2x (Type 01-000) 4x (Type 01-010)	2x (Typ 01-000) 4x (Typ 01-010)	2x	2x	
12.00	12.50	13.00	-	-	01-0675-321	-	Screw 21-0200-860 (M2.5 x 4.7)	Key 22-0600-925	01-0500-410/12	Screw 01-1300-840 (M2.2 x 4)	Key 01-1300-945	
12.05	12.55	13.05	-	-	01-0677-321	-			01-0501-410/12			
12.10	12.60	13.10	-	-	01-0680-321	-			01-0502-410/12			
12.15	12.65	13.15	-	-	01-0682-321	-			01-0503-410/12			
12.20	12.70	13.20	-	-	01-0685-321	-			01-0504-410/12			
12.25	12.75	13.25	-	-	01-0687-321	-			01-0505-410/12			
12.30	12.80	13.30	-	-	01-0690-321	-			01-0506-410/12			
12.35	12.85	13.35	-	-	01-0692-321	-			01-0507-410/12			
12.40	12.90	13.40	-	-	01-0695-321	-			01-0508-410/12			
12.45	12.95	13.45	-	-	01-0697-321	-			01-0509-410/12			
12.49	12.99	13.49	-	-	01-0699-321	-	01-0510-410/12					
13.50	14.00	14.50	15.00	-	01-0775-321	01-0775-311	Screw 22-0610-840 (M2.5 x 5.9)	Key 22-0600-925	01-0500-410/13	Screw 01-1300-840 (M2.2 x 4)	Key 01-1300-945	
13.55	14.05	14.55	15.05	-	01-0777-321	01-0777-311			01-0501-410/13			
13.60	14.10	14.60	15.10	-	01-0780-321	01-0780-311			01-0502-410/13			
13.65	14.15	14.65	15.15	-	01-0782-321	01-0782-311			01-0503-410/13			
13.70	14.20	14.70	15.20	-	01-0785-321	01-0785-311			01-0504-410/13			
13.75	14.25	14.75	15.25	-	01-0787-321	01-0787-311			01-0505-410/13			
13.80	14.30	14.80	15.30	-	01-0790-321	01-0790-311			01-0506-410/13			
13.85	14.35	14.85	15.35	-	01-0792-321	01-0792-311			01-0507-410/13			
13.90	14.40	14.90	15.40	-	01-0795-321	01-0795-311			01-0508-410/13			
13.95	14.45	14.95	15.45	-	01-0797-321	01-0797-311			01-0509-410/13			
13.99	14.49	14.99	15.49	-	01-0799-321	01-0799-311			01-0510-410/13			
15.50	16.00	16.50	17.00	17.50	01-0905-321	01-0905-311			01-0500-410/15			
15.55	16.05	16.55	17.05	17.55	01-0907-321	01-0907-311			01-0501-410/15			
15.60	16.10	16.60	17.10	17.60	01-0910-321	01-0910-311			01-0502-410/15			
15.65	16.15	16.65	17.15	17.65	01-0912-321	01-0912-311			01-0503-410/15			
15.70	16.20	16.70	17.20	17.70	01-0915-321	01-0915-311			01-0504-410/15			
15.75	16.25	16.75	17.25	17.75	01-0917-321	01-0917-311			01-0505-410/15			
15.80	16.30	16.80	17.30	17.80	01-0920-321	01-0920-311			01-0506-410/15			
15.85	16.35	16.85	17.35	17.85	01-0922-321	01-0922-311			01-0507-410/15			
15.90	16.40	16.90	17.40	17.90	01-0925-321	01-0925-311			01-0508-410/15			
15.95	16.45	16.95	17.45	17.95	01-0927-321	01-0927-311	01-0509-410/15					
15.99	16.49	16.99	17.49	17.99	01-0929-321	01-0929-311	01-0510-410/15					

Ordering data Type 01

Diameter range: 18.00 to 43.99

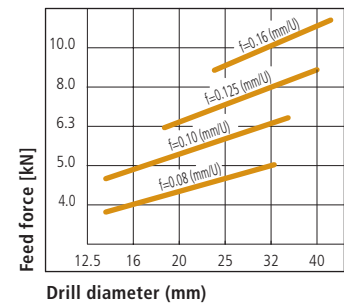
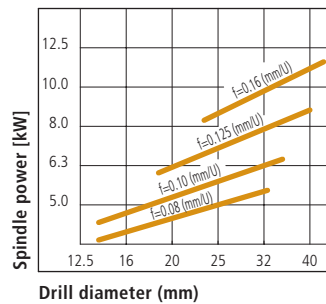
Drilling range from - up to	Drilling tool		Indexable insert			Stop plate		Guide pads					
	Standard version with 2 guide pads	Version with extended guide pads (5 pcs)	Indexable insert	Screw	Key	Stop plate	Screw / Key	Guide pads	Screw / Key				
Ø (mm)													
			1x	1x		1x	1x	2x / 5x	2x / 5x				
18.00 - 18.49	01-181* -000	01-181* -010	01-1810-310	21-0100-830	22-0600-935 T9	Order no. depends on drill diameter. Please specify when ordering. 01-2050-610-S... Stop plates are available in increments of 0.01 mm thickness.	Screw: 01-0200-860 (M 2.5 x 4.3) Key: 22-0600-925 T8	01-1800-410	Screw: 21-0200-860 (M 2.5 x 4.7) Key: 22-0600-925 T8				
18.50 - 18.99	01-182* -000	01-182* -010	01-1820-310	(M 3 x 6.9)									
19.00 - 19.49	01-191* -000	01-191* -010	01-1910-310										
19.50 - 19.99	01-192* -000	01-192* -010	01-1920-310										
20.00 - 20.49	01-201* -000	01-201* -010	01-2010-310										
20.50 - 20.99	01-202* -000	01-202* -010	01-2020-310										
21.00 - 21.49	01-211* -000	01-211* -010	01-2110-310										
21.50 - 21.99	01-212* -000	01-212* -010	01-2120-310										
22.00 - 22.49	01-221* -000	01-221* -010	01-2210-310										
22.50 - 22.99	01-222* -000	01-222* -010	01-2220-310										
23.00 - 23.49	01-231* -000	01-231* -010	01-2310-310										
23.50 - 23.99	01-232* -000	01-232* -010	01-2320-310										
24.00 - 24.49	01-241* -000	01-241* -010	01-2410-310										
24.50 - 24.99	01-242* -000	01-242* -010	01-2420-310	21-0400-830 (M 4 x 9)	22-0900-935 T15	Order no. depends on drill diameter. Please specify when ordering. 01-2400-610-S... Stop plates are available in increments of 0.01 mm thickness.	Screw: 21-0200-860 (M 2.5 x 4.7) Key: 22-0600-925 T8	01-2400-410	Screw: 22-0600-820 (M 2.5 x 8.2) Key: 22-0600-925 T8				
25.00 - 25.49	01-251* -000	01-251* -010	01-2510-310										
25.50 - 25.99	01-252* -000	01-252* -010	01-2520-310										
26.00 - 26.49	01-261* -000	01-261* -010	01-2610-310										
26.50 - 26.99	01-262* -000	01-262* -010	01-2620-310										
27.00 - 27.49	01-271* -000	01-271* -010	01-2710-310										
27.50 - 27.99	01-272* -000	01-272* -010	01-2720-310	22-0900-830 (M 4 x 11)									
28.00 - 28.49	01-281* -000	01-281* -010	01-2810-310										
28.50 - 28.99	01-282* -000	01-282* -010	01-2820-310										
29.00 - 29.49	01-291* -000	01-291* -010	01-2910-310										
29.50 - 29.99	01-292* -000	01-292* -010	01-2920-310										
30.00 - 30.49	01-301* -000	01-301* -010	01-3010-310										
30.50 - 30.99	01-302* -000	01-302* -010	01-3020-310										
31.00 - 31.49	01-311* -000	01-311* -010	01-3110-310										
31.50 - 31.99	01-312* -000	01-312* -010	01-3120-310										
32.00 - 32.49	01-321* -000	01-321* -010	01-3210-310										
32.50 - 32.99	01-322* -000	01-322* -010	01-3220-310										
33.00 - 33.49	01-331* -000	01-331* -010	01-3310-310	22-1200-830 (M 5 x 12.5)	22-1200-935 T20	Order no. depends on drill diameter. Please specify when ordering. 01-3750-610-S... Stop plates are available in increments of 0.01 mm thickness.	Screw: 21-0600-860 (M 3 x 6.7) Key: 22-0600-935 T9	01-3000-410	Screw: 22-0800-840 (M 3 x 8.2) Key: 22-0600-935 T9				
33.50 - 33.99	01-332* -000	01-332* -010	01-3320-310										
34.00 - 34.49	01-341* -000	01-341* -010	01-3410-310										
34.50 - 34.99	01-342* -000	01-342* -010	01-3420-310										
35.00 - 35.49	01-351* -000	01-351* -010	01-3510-310										
35.50 - 35.99	01-352* -000	01-352* -010	01-3520-310										
36.00 - 36.49	01-361* -000	01-361* -010	01-3610-310										
36.50 - 36.99	01-362* -000	01-362* -010	01-3620-310										
37.00 - 37.49	01-371* -000	01-371* -010	01-3710-310										
37.50 - 37.99	01-372* -000	01-372* -010	01-3720-310										
38.00 - 38.49	01-381* -000	01-381* -010	01-3810-310										
38.50 - 38.99	01-382* -000	01-382* -010	01-3820-310										
39.00 - 39.49	01-391* -000	01-391* -010	01-3910-310										
39.50 - 39.99	01-392* -000	01-392* -010	01-3920-310										
40.00 - 40.49	01-401* -000	01-401* -010	01-4010-310	22-1500-830 (M 6 x 14)	22-1500-935 T25	Order no. depends on drill diameter. Please specify when ordering. 01-4100-610-S... Stop plates are available in increments of 0.01 mm thickness.	Screw: 21-0600-860 (M 3 x 6.7) Key: 22-0600-935 T9	01-3700-410	Screw: 22-1200-840 (M 3.5 x 11.4) Key: 22-0900-935 T15				
40.50 - 40.99	01-402* -000	01-402* -010	01-4020-310										
41.00 - 41.49	01-411* -000	01-411* -010	01-4110-310										
41.50 - 41.99	01-412* -000	01-412* -010	01-4120-310										
42.00 - 42.49	01-421* -000	01-421* -010	01-4210-310										
42.50 - 42.99	01-422* -000	01-422* -010	01-4220-310										
43.00 - 43.49	01-431* -000	01-431* -010	01-4310-310										
43.50 - 43.99	01-432* -000	01-432* -010	01-4320-310										
Drilling range from - up to	Standard version with 2 guide pads	Version with extended guide pads (5 pcs)	Indexable insert	Screw				Key		Stop plate	Screw / Key	Guide pads	Screw / Key
	Drilling tool		Indexable insert					Stop plate		Guide pads			

For identification and determination of price, the deep hole drilling tools under Type 01 are subdivided into length groups in the order number:

Length (mm) up to								
500	800	1,250	1,600	2,000	2,500	3,200	4,500	
1	2	3	4	5	6	7	8	
* Length groups								

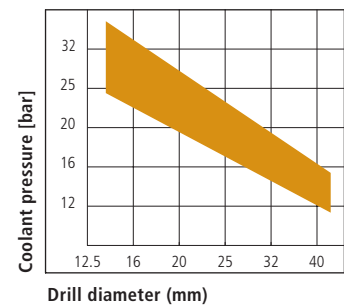
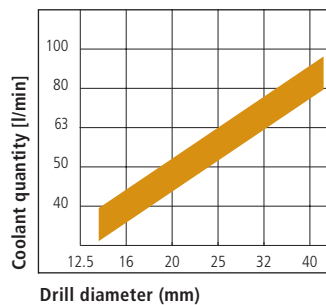
Performance diagrams

These values are guide values for toughened steel rated ~ 800 N/mm² and may deviate depending on workpiece material and characteristics, as well as tool condition.



Coolant information

Proper chip removal is only assured if the coolant is supplied to the tool in sufficient quantity and under sufficient pressure.



Guide values for deep hole drilling of different materials:

Guide values for cutting speed and feed rate are shown in the table below.

As there are many factors that can affect the results of deep-hole drilling, these values must be adjusted if necessary.

Material / Mechanical strength properties	Cutting speed (m/min)	Feed (mm/rev) for drill diameter (mm)				Carbide grades				
		12.00 - 18.00	18.00 - 25.00	25.00 - 32.00	32.00 - ...	Indexable insert up to Ø 17.99	from Ø 18.00	Guide pad		
Construction steel ≤ 700 N/mm ²	80 - 100	0.06 - 0.10	0.08 - 0.11	0.10 - 0.14	0.13 - 0.16	K 30B-1	P 25B-1	P 20		
Case hardened steel ≤ 700 N/mm ²										
Case hardened steel ≤ 1,100 N/mm ²	70 - 80	0.06 - 0.10	0.08 - 0.11	0.10 - 0.13	0.12 - 0.15				P 25B-1*	P 20
Heat treated steel ≤ 700 N/mm ²	70 - 90	0.06 - 0.10	0.08 - 0.11	0.10 - 0.14	0.13 - 0.16				P 25B-1	
Heat treated steel ≤ 1,100 N/mm ²	55 - 75	0.06 - 0.10	0.08 - 0.11	0.10 - 0.13	0.12 - 0.15				P 25B-1*	P 20B
Nitriding steel ≤ 1,100 N/mm ²	55 - 75	0.06 - 0.09	0.08 - 0.10	0.09 - 0.12	0.11 - 0.14				P 40B-1	
Ferritic steel ≤ 900 N/mm ²	60 - 80	0.06 - 0.10	0.08 - 0.11	0.10 - 0.14	0.13 - 0.16				P 25B-1	P 20
Austenitic steel (stainless)	60 - 80	0.06 - 0.09	0.08 - 0.10	0.10 - 0.12	0.12 - 0.14	K 10-1	P 25-1			
Heat resisting steel (stainless), Tool steel	50 - 70	0.06 - 0.09	0.08 - 0.10	0.10 - 0.12	0.12 - 0.14	K 30B-1	P 25B-1*	P 20		
Steel castings ≤ 700 N/mm ²	60 - 80	0.06 - 0.10	0.08 - 0.11	0.10 - 0.14	0.13 - 0.16					
Nodular cast iron ≤ 1,100 N/mm ²	65 - 80	0.08 - 0.12	0.10 - 0.13	0.12 - 0.15	0.14 - 0.18					
Cast iron, alloyed and unalloyed	70 - 100	0.08 - 0.12	0.10 - 0.13	0.12 - 0.15	0.14 - 0.18	K 10-1	K 10-1			
Aluminium and Aluminium alloys	100 - 200	0.07 - 0.11	0.09 - 0.12	0.10 - 0.14	0.12 - 0.18					
Copper Cu-content < 99%	120 - ...	0.04 - 0.09	0.06 - 0.10	0.08 - 0.12	0.10 - 0.14					

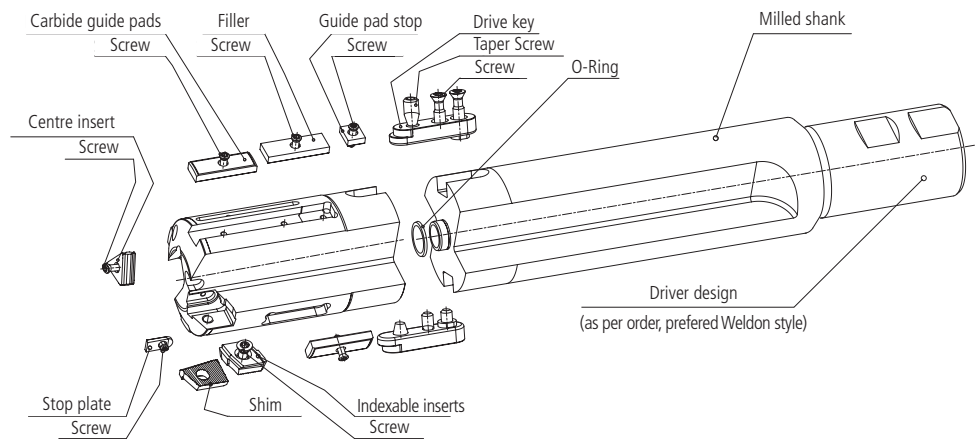
*first recommendation

Advantages / Overview

Type 02

Advantages

1. New, high-performance deep hole drilling tool with a modern, user-friendly design.
2. Very high operational efficiency combined with optimum cutting capacity.
3. Ideally suited to CNC machines with a coolant system. Drilling depths up to $40 \times D$ are possible in a single drilling cycle. Tools also produce excellent results when used on deep hole drilling machines.
4. No regrinding needed.
5. Various indexable insert chip breakers are available according to material to be processed. Coated indexable inserts and guide pads are also available.
6. Easy exchange of indexable inserts and guide pads. No need to adjust setting within $\varnothing \pm 0.01$ mm diameter.
7. When using matching interchangeable parts, the drill head diameter may, however, be adjusted within a range of 0.5 mm.
8. The model with extended guide pads (Type 02-010) is also suitable for crosshole drilling.
9. Drilling grades up to IT 8 are possible.
10. Centre insert with 6 cutting edges.



Overview

Type	Drilling range	
Type 02-000 Solid drilling tool	Standard version with 3 guide pads Drilling range: \varnothing 37.00 - 74.99 mm (larger diameters on request)	
Type 02-010 Solid drilling tool	Version with extended guide pads (7 pcs) Drilling range: \varnothing 37.00 - 74.99 mm (larger diameters on request)	

Chip breaker

1. The chip breaker has a decisive part to play with the chip formation.
2. To obtain trouble-free chip flow along with optimum tool life, it is essential to aim for the most ideal chip formation possible.
3. The chips should be broken just short enough to ensure that there is no chip congestion in the flute of the drill.
4. Excessively short, crushed chips place strain on the cutting edges and lead to premature wear and will destroy the cutting edge.
5. For processing commonly used materials, indexable inserts are available from stock with chip breakers in accordance with model SP 1 or model SP 2.

Chip breaker SP 1

- Unalloyed steels $C > 0.2 \%$
- Alloyed steels
- Toughened steels
- Case hardened steels
- Tool steels
- Stainless and acid-proof steels

Chip breaker SP 3

- According to b, t, r or drawing

Chip breaker SP 2

- Unalloyed steels $C < 0.2 \%$
- Long chip-forming special steels
- stainless and acid-proof steels

Chip breaker SP 5

- New universal chip breaker design
- High feed rates and high productivity

Ordering data

Type 02

Drilling range from - up to	Drill head complete	Milled shank	Shank spares		Peripheral insert			Stop plate		Centre inserts		Guide pads		
			Drive Key	Taper screw / Screw	Shim	Indexable inserts	Screw / Key	Stop plate	Screw / Key	Centre inserts	Screw / Key	Guide pads	Guide pad end stop	Screw / Key
\emptyset (mm)														
37.00-37.49	02-3701-...	99-023720...	99-023713-100	Taper screw: 99-024414-047 Screw: 22-1200-830	22-0910-710	02-1200-310	Screw: 22-0900-831 (M4x12) Key: 22-0900-935	01-2050-6105...	When re-ordering please state dimension S (thickness).	22-0800-211	Screw: 22-0800-860 (M2.5x4.4) Key: 22-0600-925	3x (7x)	10-0800-410/36	Screw: 22-0800-840 (M3x8.2) Key: 22-0600-935
37.50-37.99	02-3703-...													
38.00-38.49	02-3801-...													
38.50-38.99	02-3803-...													
39.00-39.49	02-3901-...													
39.50-39.99	02-3903-...													
40.00-40.49	02-4001-...													
40.50-40.99	02-4003-...													
41.00-41.49	02-4101-...													
41.50-41.99	02-4103-...													
42.00-42.49	02-4201-...	99-024020...	99-024013-090	Taper screw: 99-024014-090 Screw: 22-1500-830	22-1030-710	02-1350-310	Screw: 22-0900-831 (M4x12) Key: 22-0900-935	01-2050-6105...	When re-ordering please state dimension S (thickness).	22-1000-211	Screw: 22-0800-820 (M3x10.3) Key: 22-0600-935	3x (7x)	10-0800-410/40	Guide pad end stop: 10-0800-4195... S = 0.025; S = 0.05; S = 0.10 When re-ordering please state dimension S. End stop: 10-0800-625
42.50-42.99	02-4203-...													
43.00-43.49	02-4301-...													
43.50-43.99	02-4303-...													
44.00-44.49	02-4401-...													
44.50-44.99	02-4403-...													
45.00-45.49	02-4501-...													
45.50-45.99	02-4503-...													
46.00-46.49	02-4601-...													
46.50-46.99	02-4603-...													
47.00-47.49	02-4701-...	99-024620...	99-024013-076	Taper screw: 99-025214-059 Screw: 22-1500-831	22-1230-710	02-1550-310	Screw: 22-1200-831 (M5x14.2) Key: 22-1200-935	01-2400-6105...	When re-ordering please state dimension S (thickness).	22-1100-211	Screw: 21-0200-860 (M2.5x4.7) Key: 22-0600-925	3x (7x)	10-0800-410/42	Guide pad end stop: 10-1000-4195... S = 0.025; S = 0.05; S = 0.10 When re-ordering please state dimension S. End stop: 10-1000-625
47.50-47.99	02-4703-...													
48.00-48.49	02-4801-...													
48.50-48.99	02-4803-...													
49.00-49.49	02-4901-...													
49.50-49.99	02-4903-...													
50.00-50.49	02-5001-...													
50.50-50.99	02-5003-...													
51.00-51.49	02-5101-...													
51.50-51.99	02-5103-...													
52.00-52.49	02-5201-...	99-025020...	99-025013-076	Taper screw: 99-025214-059 Screw: 22-1500-831	22-1240-710	02-1650-310	Screw: 22-1200-831 (M5x14.2) Key: 22-1200-935	01-2400-6105...	When re-ordering please state dimension S (thickness).	22-1300-211	Screw: 22-1200-840 (M3.5x11.4) Key: 22-0900-935	3x (7x)	10-1000-410/44	Guide pad end stop: 10-1000-4195... S = 0.025; S = 0.05; S = 0.10 When re-ordering please state dimension S. End stop: 10-1000-625
52.50-52.99	02-5203-...													
53.00-53.49	02-5301-...													
53.50-53.99	02-5303-...													
54.00-54.49	02-5401-...													
54.50-54.99	02-5403-...													
55.00-55.49	02-5501-...													
55.50-55.99	02-5503-...													
56.00-56.49	02-5601-...													
56.50-56.99	02-5603-...													
57.00-57.49	02-5701-...	99-025620...	99-025013-076	Taper screw: 99-025214-059 Screw: 22-1500-831	22-1340-710	02-1800-310	Screw: 22-1200-831 (M5x14.2) Key: 22-1200-935	01-2400-6105...	When re-ordering please state dimension S (thickness).	22-1300-211	Screw: 22-1200-840 (M3.5x11.4) Key: 22-0900-935	3x (7x)	10-1000-410/46	Guide pad end stop: 10-1000-4195... S = 0.025; S = 0.05; S = 0.10 When re-ordering please state dimension S. End stop: 10-1000-625
57.50-57.99	02-5703-...													
58.00-58.49	02-5801-...													
58.50-58.99	02-5803-...													
59.00-59.49	02-5901-...													
59.50-59.99	02-5903-...													
60.00-60.49	02-6001-...													
60.50-60.99	02-6003-...													
61.00-61.49	02-6101-...													
61.50-61.99	02-6103-...													
62.00-62.49	02-6201-...	99-026120...	99-025013-076	Taper screw: 99-025214-059 Screw: 22-1500-831	22-1500-710	02-1900-310	Screw: 22-1500-831 (M6x17.5) Key: 22-1500-935	01-3750-6105...	When re-ordering please state dimension S (thickness).	22-1500-211	Screw: 21-0600-860 (M3x6.7) Key: 22-0600-935	3x (7x)	10-1000-410/47	Guide pad end stop: 10-1000-4195... S = 0.025; S = 0.05; S = 0.10 When re-ordering please state dimension S. End stop: 10-1000-625
62.50-62.99	02-6203-...													
63.00-63.49	02-6301-...													
63.50-63.99	02-6303-...													
64.00-64.49	02-6401-...													
64.50-64.99	02-6403-...													
65.00-65.49	02-6501-...													
65.50-65.99	02-6503-...													
66.00-66.49	02-6601-...													
66.50-66.99	02-6603-...													
67.00-67.49	02-6701-...	99-026620...	99-027013-078	Taper screw: 99-027014-078 Screw: 99-027008-078	22-1630-710	02-2150-310	Screw: 22-1500-831 (M6x17.5) Key: 22-1500-935	01-3750-6105...	When re-ordering please state dimension S (thickness).	22-1500-211	Screw: 22-1500-820 (M3.5x14) Key: 22-0900-935	3x (7x)	10-1200-410/45	Guide pad end stop: 10-1200-4195... S = 0.025; S = 0.05; S = 0.10 When re-ordering please state dimension S. End stop: 10-1200-625
67.50-67.99	02-6703-...													
68.00-68.49	02-6801-...													
68.50-68.99	02-6803-...													
69.00-69.49	02-6901-...													
69.50-69.99	02-6903-...													
70.00-70.49	02-7001-...													
70.50-70.99	02-7003-...													
71.00-71.49	02-7101-...													
71.50-71.99	02-7103-...													
72.00-72.49	02-7201-...	99-027220...	99-027013-078	Taper screw: 99-027014-078 Screw: 99-027008-078	22-1630-710	02-2370-310	Screw: 22-1500-831 (M6x17.5) Key: 22-1500-935	01-3750-6105...	When re-ordering please state dimension S (thickness).	22-1500-211	Screw: 22-1500-820 (M3.5x14) Key: 22-0900-935	3x (7x)	10-1200-410/55	Guide pad end stop: 10-1200-4195... S = 0.025; S = 0.05; S = 0.10 When re-ordering please state dimension S. End stop: 10-1200-625
72.50-72.99	02-7203-...													
73.00-73.49	02-7301-...													
73.50-73.99	02-7303-...													
74.00-74.49	02-7401-...													
74.50-74.99	02-7403-...													

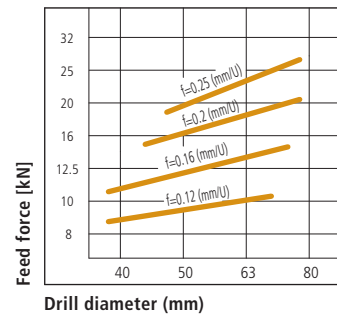
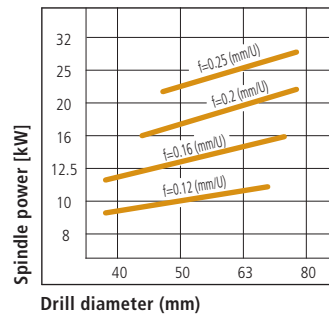
Larger diameters on request.

Technical information

Type 02

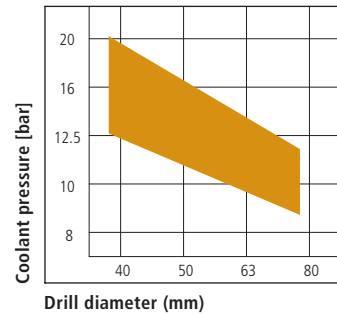
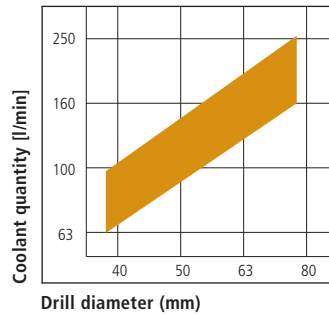
Performance diagrams

These guide values are for drilling alloyed steel (800 - 1,000 N/mm²) and can vary for other workpiece materials and tool conditions (wear).



Coolant information

Sufficient coolant must be supplied to the tool for troublefree chip removal.



Guide values for deep hole drilling of different materials:

Guide values for cutting speed and feed rate are shown in the table below.

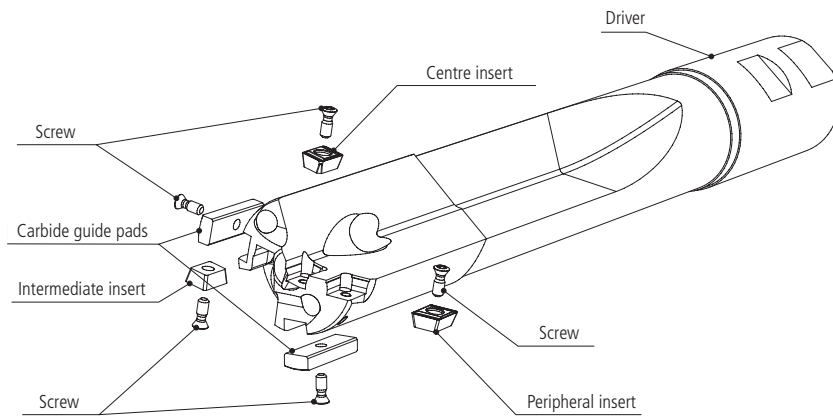
As there are many factors that can affect the results of deep-hole drilling, these values must be adjusted if necessary.

Material / Hardness	Cutting speed (m/min)	Feed (mm/rev) for drill diameter (mm)			Carbide grades		
		37.00 - 51.99	52.00 - 67.99	68.00 - 74.99	Indexable insert	Centre insert	Guide pads
Free machining steel ≤ 700 N/mm ²	80 - 100	0.14 - 0.20	0.16 - 0.22	0.18 - 0.25	P 25B - 5* P 25B - 2 P 40B - 2	P 40B - 1	P 20
Case hardening steel ≤ 700 N/mm ²							
Case hardening steel ≤ 1,100 N/mm ²	70 - 80	0.12 - 0.18	0.14 - 0.20	0.16 - 0.22	P 25B - 5* P 25B - 1 P 40B - 1		
Heat treatable steel ≤ 700 N/mm ²	70 - 90	0.14 - 0.20	0.16 - 0.22	0.18 - 0.25			
Heat treatable steel ≤ 1,100 N/mm ²	55 - 75	0.12 - 0.18	0.14 - 0.20	0.16 - 0.22	P 25B - 5* P 25B - 2 P 40B - 2		
Nitriding steel ≤ 1,100 N/mm ²	55 - 75	0.12 - 0.18	0.14 - 0.20	0.16 - 0.22			
Ferritic steel ≤ 900 N/mm ²	60 - 80	0.12 - 0.18	0.14 - 0.20	0.16 - 0.22	P 25B - 1 P 40B - 1		
Austenitic steel (stainless)	60 - 80	0.12 - 0.16	0.14 - 0.18	0.16 - 0.20			
Heat resisting steel (stainless), Tool steel	50 - 70	0.12 - 0.18	0.14 - 0.20	0.16 - 0.22	P 25B - 2* P 40B - 2		
Steel castings ≤ 700 N/mm ²	60 - 80	0.14 - 0.20	0.16 - 0.22	0.18 - 0.25			
Nodular cast iron ≤ 1,100 N/mm ²	65 - 80	0.16 - 0.20	0.18 - 0.25	0.20 - 0.25	P 25B - 5* P 25B - 1 P 40B - 1		
Cast iron, alloyed and unalloyed	70 - 100	0.16 - 0.20	0.18 - 0.25	0.20 - 0.25			
Aluminium and Aluminium alloys	100 - 200	0.12 - 0.16	0.14 - 0.18	0.16 - 0.20	K 10 - 1	K 10 - 1	
Copper Cu-Content < 99%	120 - ...	0.10 - 0.14	0.12 - 0.16	0.14 - 0.18			

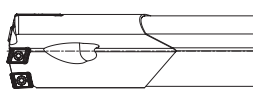
*first recommendation

Advantages

1. Newly developed high performance drilling tool.
2. Few exchangeable spare parts for the whole drilling range.
3. Minimal universal chip breaker design for high feed rates and high productivity.
4. Simple handling through fixed insert pockets.
5. Suitable for almost all machines with inner coolant supply.
6. Retipping is possible.



Overview

Type	Drilling range	
Type 07-000 Solid drilling tool	Version with 2 guide pads Drilling range: Ø 25.00 - 50.99 mm (larger diameters on request)	

Chip breaker SP5

- new universal chip breaker design
- high feed rates and high productivity

Chip breaker SP 2

- Unalloyed steels C < 0.2 %
- Long chip-forming special steels
- Stainless and acid-proof steels









Ordering data

Type 07

Order no. drilling tool complete:

07 - 3570 3 - 000

07	3570	3	000
Type	Drill diameter [mm] (Ø 35.70 mm)	Length group see table below	Guide pad style

Drilling range	Peripheral insert		Intermediate insert		Centre insert		Carbide guide pads	
Ø (mm)								
	1x	1x	1x	1x	1x	1x	2x	2x
25.00 - 28.99	70-0550-310	Screw 22-0610-840 M 2.5 x 5.9 Key 22-0600-925	70-0550-310	Screw 22-0610-840 M 2.5 x 5.9 Key 22-0600-925	70-0550-210	Screw 22-0610-840 M 2.5 x 5.9 Key 22-0600-925	70-0600-410/24	Screw 22-0610-840 M 2.5 x 5.9 Key 22-0600-925
29.00 - 29.99					70-0650-210			
30.00 - 31.99								
32.00 - 34.99	70-0650-310							
35.00 - 38.99	70-0800-310	Screw 22-0600-830 M 3 x 8.4 Key 22-0600-935	70-0800-310	Screw 22-0600-830 M 3 x 8.4 Key 22-0600-935	70-0800-210	Screw 22-0600-830 M 3 x 8.4 Key 22-0600-935	10-0800-410/38	Screw 22-0600-830 M 3 x 8.4 Key 22-0600-935
39.00 - 41.99					70-0950-210			
42.00 - 44.99								
45.00 - 47.99	70-0950-310						10-1000-410/45	Screw 22-1200-840 M 3.5 x 11.4 Key 22-0600-935
48.00 - 50.99								

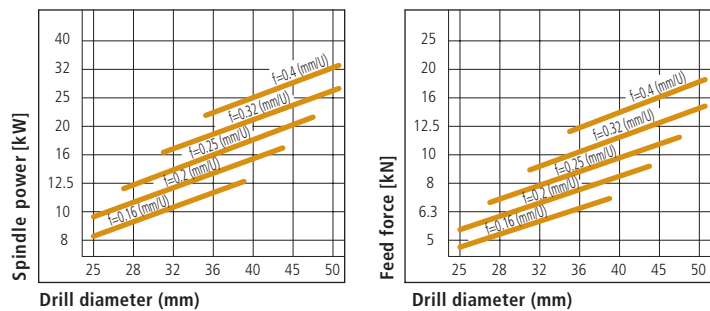
Drilling range	Peripheral insert	Intermediate insert	Centre insert	Carbide guide pads
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Length groups

Length (mm) up to							
500	800	1,250	1,600	2,000	2,500	3,200	4,500
1	2	3	4	5	6	7	8
Length groups							

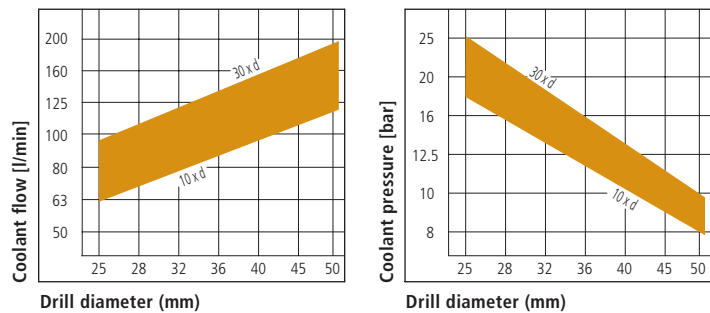
Performance diagrams

These guide values are for drilling alloyed steel (800 - 1,000 N/mm²) and can vary for other workpiece materials and tool conditions (wear).



Coolant information

Sufficient coolant must be supplied to the tool for troublefree chip removal.



Guide values for deep hole drilling of different materials:

Guide values for cutting speed and feed rate are shown in the table below.

As there are many factors that can affect the results of deep-hole drilling, these values must be adjusted if necessary.

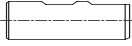
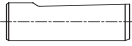
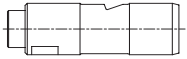

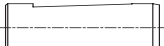

Material / Hardness	Cutting speed (m/min)	Feed (mm/rev) for drill diameter (mm)			Carbide grades		
		25.00 - 29.99	30.00 - 44.99	45.00 - 50.99	Outer + Interm. insert	Centre insert	Guide pad
Construction steel < 700 N/mm ²	80 - 100	0.10 - 0.20	0.10 - 0.30	0.10 - 0.30	U225BX-2	U225BX-2	P 20
Case hardening steel < 750 N/mm ²	80 - 100	0.10 - 0.20	0.10 - 0.30	0.10 - 0.30	U225BX-2		
Case hardening steel < 1,100 N/mm ²	70 - 80	0.20 - 0.25	0.20 - 0.30	0.20 - 0.35	U225BX-5	U440BX-5	
Heat treatable steel < 700 N/mm ²	70 - 90	0.20 - 0.25	0.25 - 0.30	0.25 - 0.40	U225BX-5		
Heat treatable steel < 1,100 N/mm ²	55 - 75	0.20 - 0.25	0.25 - 0.30	0.25 - 0.30	U225BX-5		
Nitriding steel < 1,100 N/mm ²	55 - 75	0.15 - 0.20	0.15 - 0.20	0.15 - 0.25	U225BX-2		P 20/B
Ferritic steel < 900 N/mm ²	60 - 80	0.15 - 0.25	0.25 - 0.30	0.25 - 0.30	U225BX-5		P 20
Austenitic steel	60 - 80	0.10 - 0.20	0.10 - 0.20	0.10 - 0.20	U225BX-2	U225BX-2	
Heat resisting steel (stainless), Tool steel	50 - 70	0.15 - 0.20	0.15 - 0.20	0.15 - 0.25	U225BX-2		
Steel castings < 700 N/mm ²	60 - 80	0.20 - 0.25	0.25 - 0.30	0.20 - 0.35	U225BX-5	U440BX-5	P 20
Nodular cast iron < 1,100 N/mm ²	65 - 80	0.20 - 0.35	0.25 - 0.40	0.30 - 0.40	U225BX-5		
Cast iron, alloyed and unalloyed	70 - 100	0.20 - 0.35	0.30 - 0.40	0.30 - 0.40	U225BX-5		
Aluminium and Aluminium alloys	100 - 200	0.10 - 0.25	0.15 - 0.30	0.15 - 0.45	U225BX-5		P 20
Copper Cu-content < 99%	120 - ...	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	U225BX-2	U225BX-2	P 20

Driver / Service

Type 01 / Type 02 / Type 07

Driver

Drivers normally are supplied in compliance with DIN 1835 B or DIN 6535 HA, HB and HE, but they can also be made to order.

Driver (mm)	Type	Picture	botek order no.	For tool setup	
				For drill dia. (mm) from - up to	L Driver (mm)
25	DIN 1835 - B 25		ZH25-22	12.00 - 19.50	56
32	DIN 1835 - B 32		ZH32-10	12.00 - 25.60	60
40	DIN 1835 - B 40		ZH40-13	12.00 - 32.60	70
50	DIN 1835 - B 50		ZH50-05	12.00 - 43.99	80
25	DIN 1835 - E 25		ZH25-36	12.00 - 19.50	56
32	DIN 1835 - E 32		ZH32-12	12.00 - 25.60	60
25			ZH25-00	12.00 - 19.50	70/78
25.4	inch		ZH25.4-00	12.00 - 19.50	70
31.7	inch		ZH31.7-00	12.00 - 25.60	70
38.1	inch		ZH38.1-00	12.00 - 32.60	70

Service

botek stock program

Certain sizes of Type 01 are available ex stock.

Retipping (Type 01 / Type 07)

Retipping of brazed tools is possible.

Accessories

Accessories for our deep hole drilling tools Type 01, 02, 07 are also available.

More information can be found at www.botek.de

Technical appendix

Requirements for application / Dimensions for the guide hole

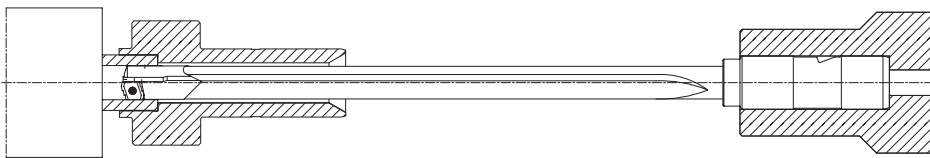
The characteristic of the single flute gundrilling process is that coolant is fed through the coolant hole in the tool and exits along with the chips in the V-shaped groove (flute) on the drill tube from the drilled hole. The coolant also provides lubrication to the drill periphery.

The gundrill is a single-edged tool without self-centering. When positioning the drill, the tool must be guided through a drill bush or a pilot hole.

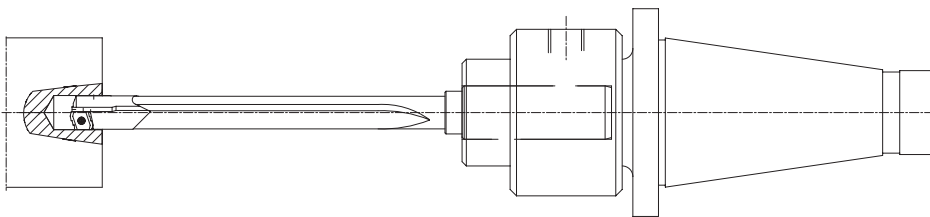
The quality of the guide hole affects the drilling performance.

1. An efficient coolant and filtration system with a coolant filtration of 20 μm to 30 μm (the smaller the drill diameter, the better the coolant and filtration system should be).
2. **Suitable coolant**, i.e. deep hole drilling oil or emulsion (min. 10-12% concentration, with additives) has to be provided in sufficient quantity and pressure. Minimum quantity lubrication (MQL) may be used under certain conditions.
3. **Guidance** with a drill bush (deep hole drilling machine) or a pilot hole (machining centre).

with drill bush



In application with deep hole drilling machine we recommend to use drill bush with F7 hole tolerance.



Dimensions for the guide hole

	Drill diameter (mm)	Dimensions for guide hole (pilot hole/drill bush)	
		L (mm)	D (mm) to tool- \emptyset
	12.00 - 17.99	approx. 1.50 x D	+ 0.016 to 0.034
	18.00 - 29.99	approx. 1.50 x D	+ 0.020 to 0.041
	30.00 - 49.99	approx. 1.25 x D	+ 0.025 to 0.050
	50.00 - ...	approx. 1.00 x D	+ 0.030 to 0.060

The dimensions specified in the table are guide values and comply with ISO tolerance field F7. ISO tolerance F8 is possible under specific conditions. To avoid chipping of the cutting edge, a chamfered pilot hole (F) is recommended depending on machining requirements.

Technical appendix

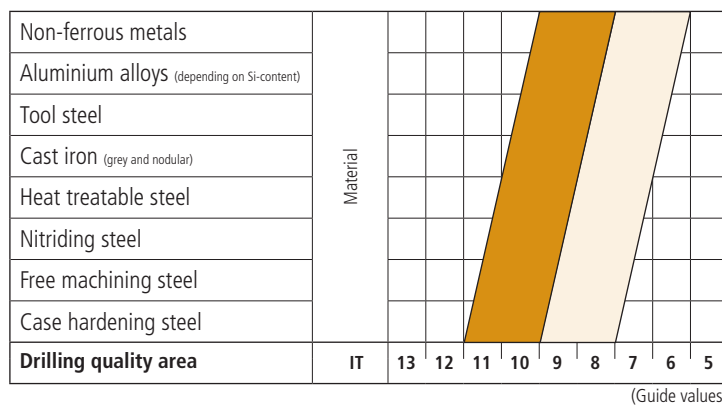
Drilling quality

To achieve optimum drilling results when using **deep hole drilling tools** with indexable inserts and guide pads, various criteria must be applied. In addition to tool design, key factors are machine design and construction, process techniques, pressurised and filtered deep hole drilling coolant. Selection of proper cutting parameters is also a significant factor.

The key factors botek considers when designing gundrills:

1. Material type
2. Diameter, tolerance and surface finish
3. Carbide grade and coating
4. Nose grind geometry

Achievable drilling tolerances



under normal conditions
 under favourable conditions

Surface quality

Roughness class		N8	N7	N6	N5	N4	N3
Quality area							
Surface roughness	Rt μm	21	11.5	6.2	3.4	1.9	1.0
	Ra μm	3.2	1.6	0.8	0.4	0.2	0.1
	Rz μm	14	7.6	4.5	2.2	1.2	0.65

(Guide values)

under normal conditions
 under favourable conditions

Centerline deviation (drift)

Counter-rotation: The optimum results are achieved with a rotating tool and simultaneous workpiece counter-rotation: See „Z”.

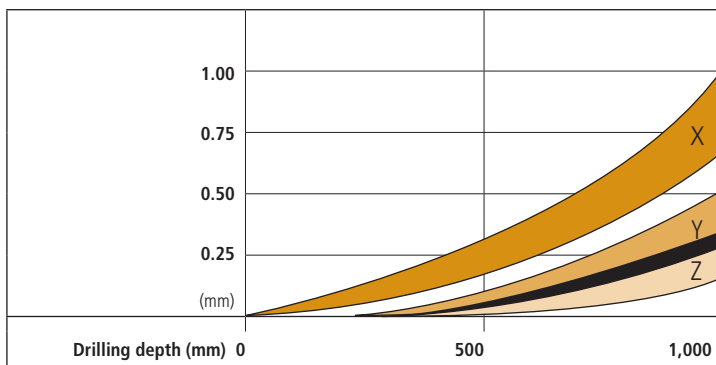
Workpiece rotating: The next best technique involves the workpiece rotating with the gundrill non-rotating: See „Y”.

Tool rotating: See „X”.

In all applications tool drift is minimised by using a close fitting pilot bore or guide bushing during gundrilling.

Angular alignment of pilot bore with desired gundrill bore is imperative.

With a guide bushing, alignment and distance from the workpiece are also important.

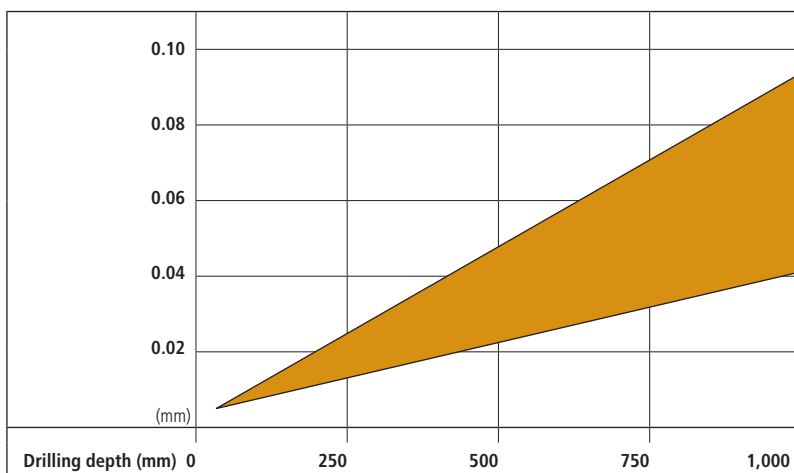


Hole straightness

Whipping or deflection of the gundrill flute plays a decisive role in hole straightness and run out in the workpiece.

Carbide tipped gundrills must be supported by a steady rest or whip guide every 40 diameters.

For further information, refer to page 18.



Roundness

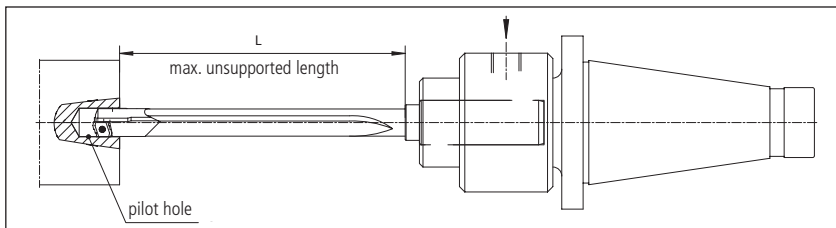
Hole roundness is a primary advantage of gundrilling over conventional twist drilling.

Hole roundness measurements as low as 10 μm are possible.

Technical appendix

Application notes

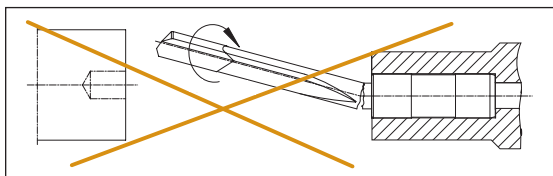
1. **Before using the drills make sure the machine has the necessary equipment to do proper deep hole drilling. The machine should have suitable safety guarding for protection from cutting chips and coolant for operator.** Check with machine builder!
2. **Improper use or handling of deep hole drilling tools can cause serious injuries**, e.g. skin cuts from the cutting edge.
3. Deep hole drilling tools are not self centering and can be unbalanced. Therefore the drills must be guided **during the start of the drilling cycle** by means of a sufficiently long drill bush or pilot hole (see detail „Z“ on below illustration). For information on the guide hole (pilot hole) see page 15.



4. **Tool support: Unsupported drill length** should never exceed the dimensions as shown on table. If the unsupported drill length is exceeded the drill might cause injury.

Type	Max. unsupported length of the tool	
	Drill diameter D	Max. unsupported length L
Type 01 / Typ 07	12.00 - 20.99	approx. 40 x D
	21.00 - 30.99	approx. 35 x D
	31.00 - 40.99	approx. 30 x D
	41.00 - ...	approx. 25 x D
Type 02	37.00 - 44.99	approx. 40 x D
	45.00 - 59.99	approx. 30 x D
	60.00 - 74.99	approx. 25 x D

5. The gundrill is fed into the drill bush or pilot hole **while non rotating** or rotated slowly at < 50 RPM. Then the coolant and the machine spindle should be started.
6. **After reaching the drilling depth** switch off the coolant and retract with the spindle stopped or slowly rotating at < 50 RPM.
7. Grinding of carbide produces dust (cobalt, etc.) that may be potentially hazardous. Use adequate ventilation and safety glasses during grinding.
8. **Consequences of not following** our application notes No. 1 - 7.



Using botok gundrills other than directed may cause personal injury.

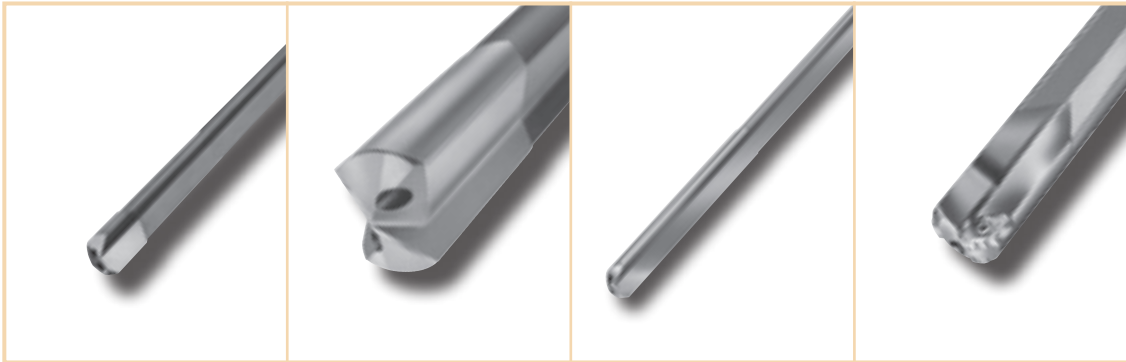
Tool breakage and unsupported gundrills can be extremely dangerous. **Please use with caution and care!**

Please note that all application notes and values contained herein are intended as guidelines only. We do not accept any liability for damages caused by improper handling of botok deep hole drilling tools, operating errors, unsuitable machinery or misuse while using our tools!

Do you have any further queries? Please call up at +49 7123 38 08-0. We will be pleased to offer you advice.

Express order line:

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Product range:

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- Single flute gundrill with indexable inserts and guide pads **Type 01**

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