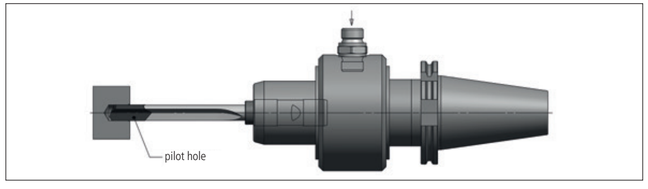
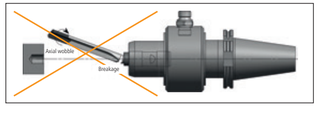
Safety information:

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 pilot hole.



4. Tools support: unsupported drill length should never exceed the dimensions as shown on table (previous page). If the unsupported drill length is exceeded the drill might cause injury. Do not exceed 40 times diameter unsupported!
5. The gundrill is fed into 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 rotated 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 botek 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 botek deep hole drilling tools, operations errors, unsuitable machinery or misuse while using our tools!

Do you have any further queries? **Please contact us via our technical hotline ELB: P +49 7123 3808-300.** We will be pleased to offer you advice.

Guide values:

The values specified in this catalogue are guide values only and can vary depending on your application.

botek®
DEEP HOLE DRILLING SYSTEMS
SOLID CARBIDE TOOLS

botek
Präzisionsbohrtechnik GmbH

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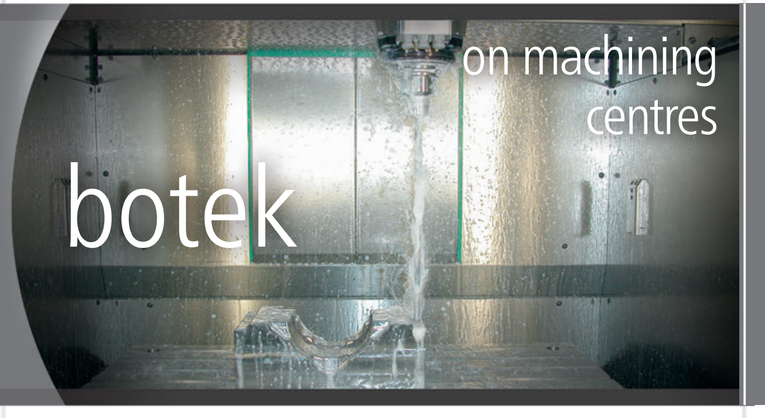
- Our General Standard Terms and Conditions, which we assume as known, apply.
- We reserve the right to make modifications in the interests of technical improvement.
- Such modifications cannot, in principle, be accepted as justifiable grounds for complaint.
- Subject to change. The manufacturer accepts no responsibility for misprints and other errors.

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Deep hole drilling on machining centres



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The single flute gundrilling process and its application requirements

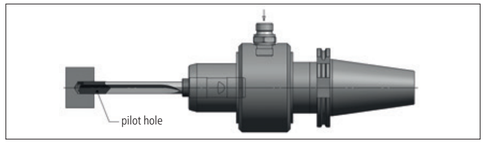
In the past years deep hole drilling tools have been used exclusively on special deep hole drilling machines or special purpose machines with integrated deep hole drilling units. The economic pressure is for machining the workpiece fully; including deep holes up to 40 x diameter, and even deeper on modern CNC machining centres.

The single flute gundrilling process with inner cooling supply and chips removal in the V-shaped groove (flute) on the drill tube is the most commonly used deep hole drilling system.

It allows cost effective and precise holemaking and is synonymous with high cutting performance, outstanding drilling quality regarding diametric tolerances, surface quality, centreline deviation, hole straightness and roundness. A high process stability due to continuous and trouble free chip removal (no packing cycle) allows also processing not easily machinable materials. Deep hole drilling tools can be used both horizontally and vertically, with rotating tool, or with rotating workpiece, which makes them particularly suitable for use on machining centers.

Conditions for successful deep hole drilling on machining centres:

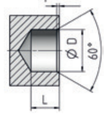
1. An efficient coolant and filtration system.
   The smaller the diameter, the better the coolant and filtration system should be.
2. Suitable coolant, i.e. deep hole drilling oil or emulsion (min. 10-12% concentration, with additives) has to be provided in sufficient quantity and pressure. Minimum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



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 pilot hole affects the drilling performance (tool life, centerline deviation, etc.)

Guide values for guide hole: (pilot hole)

	Drilling range (mm)	Dimensions for the guide hole (pilot hole)	
		L (mm)	**D (mm)** (ISO tolerance F7)
	to 3.000	approx. 2.0 x D	+ 0.006 to 0.016
	3.001 - 6.000	approx. 1.5 x D	+ 0.010 to 0.022
	6.001 - 10.000	approx. 1.5 x D	+ 0.013 to 0.028
	10.001 - 18.000	approx. 1.5 x D	+ 0.016 to 0.034
	18.001 - 30.000	approx. 1.5 x D	+ 0.020 to 0.041
	30.001 - 50.000	approx. 1.25 x D	+ 0.025 to 0.050
	50.001 - 80.000	approx. 1.0 x D	+ 0.030 to 0.060

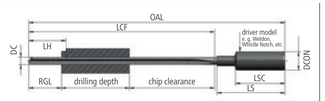
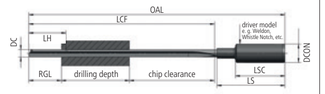
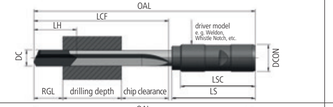
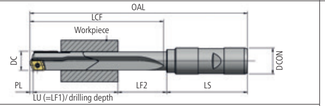
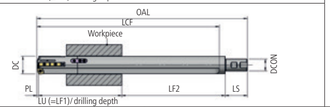
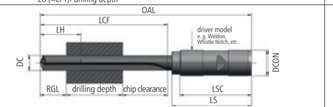
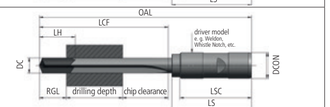
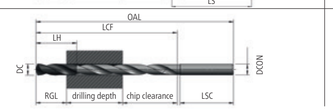
For precise holes we recommend to use the ISO tolerance G6. The dimensions specified in the table are guide values. ISO tolerance F8 is possible under specific conditions. To avoid chipping of the cutting edge, a chamfered pilot hole (F) is recommended depending on machining requirements.

Pilot drill Type 153 / 158

Two flute spiral tool, coolant fed or not coolant fed
Drill diameter range 0.800 - 26.000 mm



Along with the deep hole drilling tools botek is offering special solid carbide tools.
These tools are aligned optimally in diameter and nose grind geometry especially to the nose grind of a botek deep hole drilling tool. This allows a precise, efficient and therefore reasonable deep hole drilling process.

Deep hole drilling tools			Deep hole drilling tools		
Type of tool	**Tool diameter** in mm	**Maximum unsupported length of tool** **Drill-Ø** from - to in mm	**Schematic diagram**	**Catalog**	**Stock program**
Type 113 **Single flute gundrill** solid carbide gundrill	0.500 - 12.000	up to approx. 80 x D		**Single fluted drills** **Type 110, 113, 113-HP**	see Website **www.botek.de** (Print-PDF)
Type 113-HP **Solid carbide gundrill** High performance	0.700 - 12.000	up to approx. 80 x D			
Type 110 **Single flute gundrill** with brazed solid carbide tip	1.850 - 51.200	1.850 - 20.999 approx. 40 x D 21.000 - 30.999 approx. 35 x D 31.000 - 40.999 approx. 30 x D 41.000 - 51.200 approx. 25 x D			
Type 01 / Type 01T **Single flute gundrill** with indexable inserts and guide pads	9.90 - 43.99	9.90 - 20.99 approx. 40 x D 21.00 - 30.99 approx. 35 x D 31.00 - 40.99 approx. 30 x D 41.00 - 43.99 approx. 25 x D		**Deep hole drilling tools** **Type 01, 02**	see Website **www.botek.de** (Print-PDF)
Type 02 **Deep hole drilling tool** with indexable inserts and guide pads	37.00 - 74.99	37.00 - 44.99 approx. 40 x D 45.00 - 59.99 approx. 30 x D 60.00 - 74.99 approx. 25 x D			
Type 123 **Twin fluted drill** Solid carbide 2-fluted drill	2.800 - 32.000	2.800 - 6.999 approx. 80 x D 7.000 - 12.000 approx. 55 x D 12.001 - 20.000 approx. 50 x D 20.001 - 32.000 approx. 45 x D		**Twin fluted drills** **Type 120, 123**	see Website **www.botek.de** (Print-PDF)
Type 120 **Twin fluted drill** with brazed solid carbide tip	5.000 - 43.009	4.000 - 9.999 approx. 60 x D 10.000 - 19.999 approx. 55 x D 20.000 - 43.009 approx. 50 x D			
Type 158-00 **Solid carbide twist drill**	3.000 - 14.000	up to approx. 35 x D			

botek ejector tools are also suited for usage on machining centres. For more detailed information and accessories please contact our applications engineers. Please see also our brochure 'product line'

Other dimensions on request

Drilling sequence:

1. Drilling pilot hole (dimensions see table on left hand side)
2. Feed gundrill into pilot hole while non rotating or rotating slowly (< 50 rev./min)
3. Switch on the coolant
4. Switch on spindle rotation and feed.
5. After reaching the drilling depth switch off coolant and spindle rotation
6. Switch off coolant
7. Retract tool (maximum rotation not exceeding 200 rev./min. without support). Take care for safety information (see backside).

Technical hotline:
Tools with exchangeable cutting inserts – **P: +49 7123 3808-200**
Single flute gundrills / Twin fluted drills, Solid carbide twist drills, Milling cutters, Reaming tools – **P: +49 7123 3808-300**

Tool support:
The unsupported drill length should never exceed the dimensions as shown on table.
This means, drilling depths, that exceed the maximum diameter-/length proportion (see table above), must be made in different lengths of drills with each drill being longer than the previous drill. The tools will be supported by the previously drilled hole.

Drivers:
botek manufactures a variety of standard drivers from stock as well as customers specific configurations.
For more information please see our other catalogues.

Coating:
All tools, as well as inserts and guide pads can be supplied with various coatings.
The type of coating is aligned due to processed material, coolant and drilling situation.