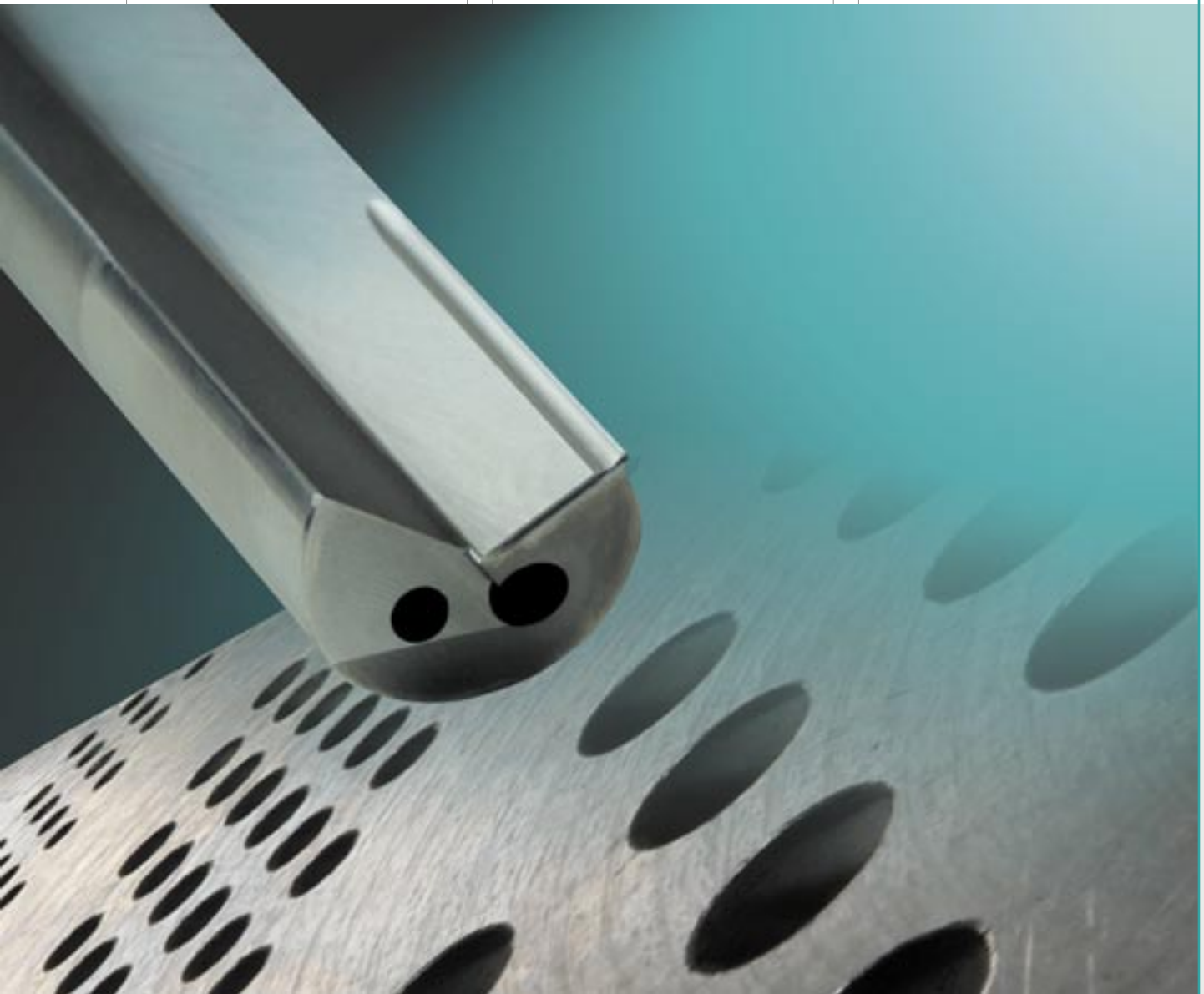


TBT Deep Hole Drilling Tools, Accessories and Grinding Machines





Customers all over the world associate the company TBT Tiefbohrtechnik with reliability, quality, precision and customer service. Indeed, this has been the case for over 35 years.

Founded in 1966 in Dettingen a. d. Erms, the company specialised right from the start in the manufacturing technology of deep hole drilling. The company's aim has always been to supply machines, tools and services from one source with professional expertise.

The company's rise to market leader confirms that our customers appreciate this corporate policy.

TBT combines the flexibility, dedication and customer-oriented approach of a streamlined medium-sized company with global presence. We have subsidiaries or experienced representatives in virtually every major country in the world. Entrusted to our highly-qualified and dedicated staff, your deep hole drilling tasks are in safe hands.



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Quality is a foundation of our corporate philosophy, shaping both our services and our products. It is our stated aim to customise the product to your specific requirements and to meet the highest standards in terms of quality - as the market justifiably expects.

Our company's certification conforming to DIN EN ISO 9001:2000 and VDA 6:4 demonstrates that the sequences of operation are clearly structured and that our quality management system is practised and fostered at all levels of the company.

We see ourselves as your partners, always aspiring to a long-term working relationship with you. In seeking open and frank dialogue with you, we believe that our professional expertise and experience will merge with yours to become one unit. The result - integrated, pragmatic solutions. Thanks to our dedicated staff we can guarantee precision and punctuality.



5



High-performance precision drilling

TBT has made a decisive impact in shaping and developing deep hole drilling technology. In the field of high-performance precision drilling the single-lip drill has proved its practical value thanks to the diameter tolerances it can achieve, the quality of the surface finish and the minimal level of drift. In many applications, therefore, the deep drilling principle replaces drilling and reaming with one pass – and does so with extremely high process reliability.

Some applications, however, require more than just deep drilling. On account of its combination of precision and high drilling capacity, the single-lip drill is also admirably suited to short and medium depth holes.

Single-lip drills are one-edged tools which are guided through a jig bush as they bore. Not only can these drills be used on deep hole drill machines, but also on machining centres or automatic lathes, for example. The cooling lubricant (coolant) travels from the machine through the inside of the tool to its cutting edge.

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In addition to cooling and lubricating the drill head, the pressurised cooling lubricant also flushes the chips from the hole.

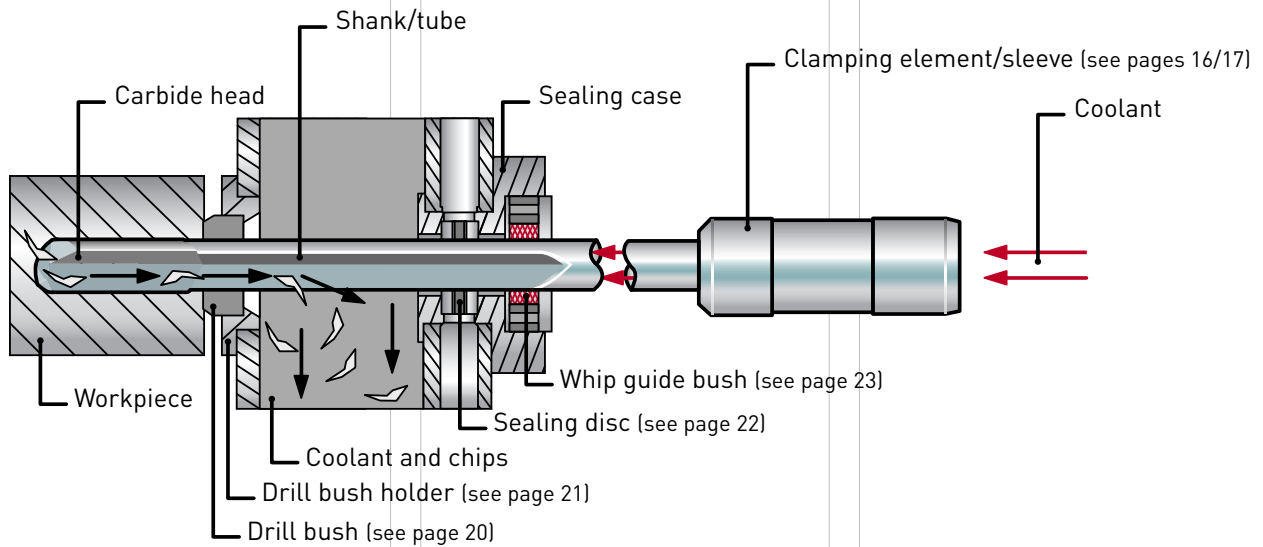
As such, deep hole drilling is a logical and efficient process for achieving precise drilling results.

TBT single-lip drills are made for every drill diameter (1/1,000mm graduations) from 0.6 mm to well over 50 mm and in total lengths of up to approx. 6,000 mm.

After assessing the material requiring drilling, the machine used by the customer and the specific drilling situation, we develop and optimise the tools you require for the task. It may be the standard version; it may be for widening existing bores; a step tool for making accurate stepped bores with minimal centre offset or a special tool for drilling a specific surface; without coating or a version with coating and, for the most exacting demands, with a PCD-tipped tool cutting edge.

TBT will advise you and then turn your requirements for the head and shank into reality using ultra-modern design and manufacturing processes. The tool head and shank are brazed with the correct clamping element to fit your machine.

TBT has several hundred different kinds of clamping element in stock. We also offer a 48-hour delivery service.



Sealing case procedure

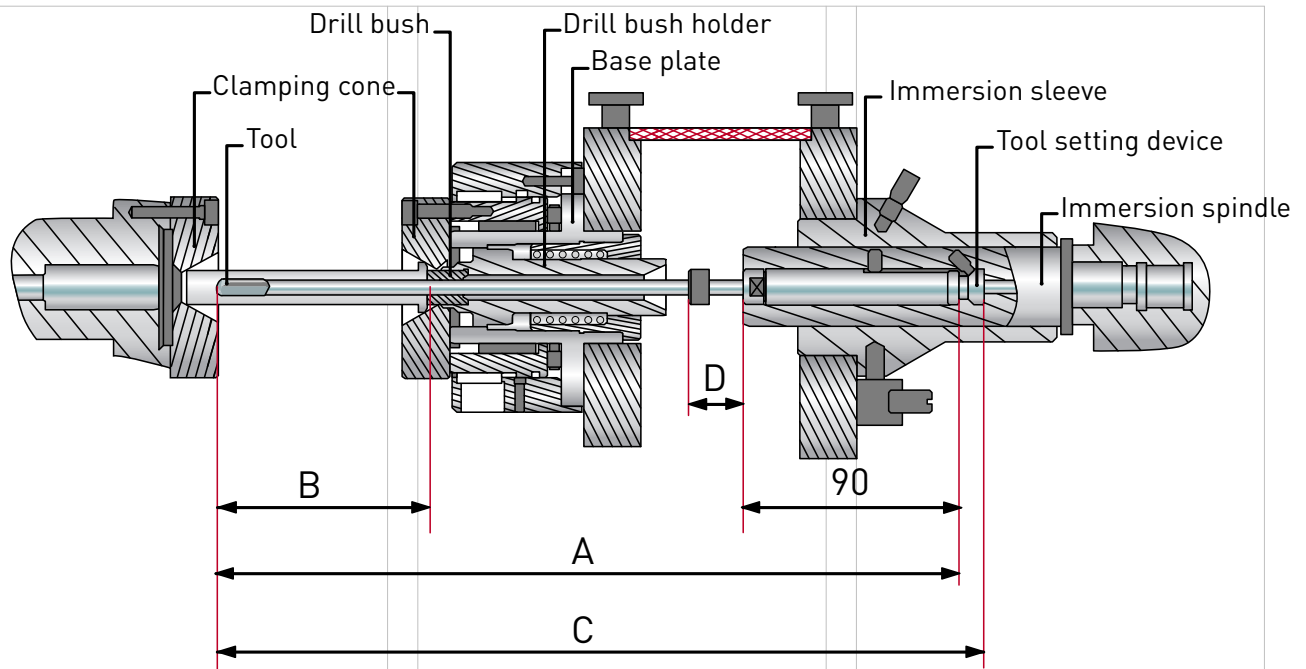
The sealing case procedure uses solid single-lip boring tools with diameters ranging from 1.9 mm to approx. 50 mm. The tool lengths can reach approx. 6,000 mm. Consequently the tools are guided through stays. The distance of the steady rests should not exceed $40 - 50 \times \text{tool } \varnothing$.

The machine spindle is sealed via the sealing case or the sealing disc located inside it.

The cooling lubricant (coolant) is supplied through one or more holes (or kidney shaped oil hole) inside the tool. The (coolant) and chip mixture is discharged through a longitudinal slot (bead) on the outside of the tool shank.

The cutting edge spans the radius of the hole to be drilled. The tool tool is comprised of the drill head, beaded shank and clamping element (driver/sleeve). The "classic" single-lip drill has a solid carbide head with cutting edge and guide pads.

Immersion procedure



8

Immersion procedure for shallow drilling depths

Solid single-lip drilling tools are used for diameters ranging from 0.6 mm – 50 mm. Since steady rests are not used, the drilling depth in the immersion procedure is limited to a maximum depth of 160 mm.

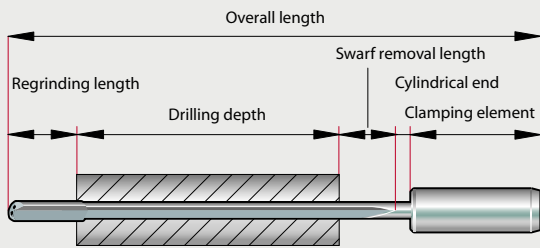
The procedure is mainly suitable for making short holes. Tools less than $\varnothing 2$ mm are made entirely from carbide. Solid carbide tools are increasingly being used for diameters ranging from 2 to 12 mm and relatively shallow drilling depths.

The machine spindle is sealed by the immersion sleeve, or immersion spindle.

The cooling lubricant (coolant) is fed inside the tool through one or more holes (or nodules). The KSS and chip mixture is discharged through a longitudinal slot (bead) on the outside of the tool shank.

The cutting edge spans the radius of the hole to be drilled. The tool is comprised of the drill head, beaded shank and clamping element (sleeve). The "classic" single-lip drill has a solid carbide head with cutting edge and guide pad.

- A Tool length (oal)
- B Drilling depth
- C Reference dimension
- D Adjustment distance depending on drill diameter

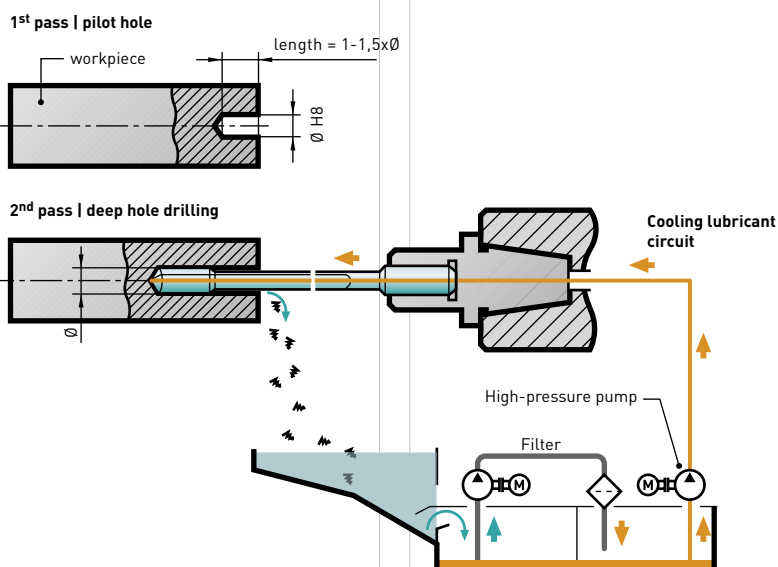


Length calculation

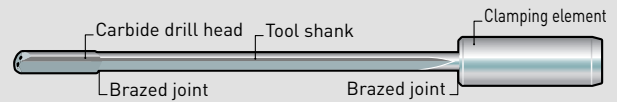
The trend for multistation machining has led to increasing use of single-lip drills on conventional machine tools, e. g. machining centres. On account of its combination of precision and high drilling capacity, the single-lip drill is also used for short and medium depth or stepped holes.

Unlike deep hole drilling machines, drill bushes are very rarely used in conventional machine tools; for this reason a pilot hole has to be drilled in the workpiece beforehand in order to use a single-lip drill.

This hole has to meet specific requirements in terms of, e. g. diameter tolerance and guide length. Our experts at TBT can advise you in selecting suitable tools from the range we produce, e. g. single-lip drill, step drill or solid carbide drill.



Tools: Single-lip drill, brazed



10 Single-lip drill with brazed-on drill head

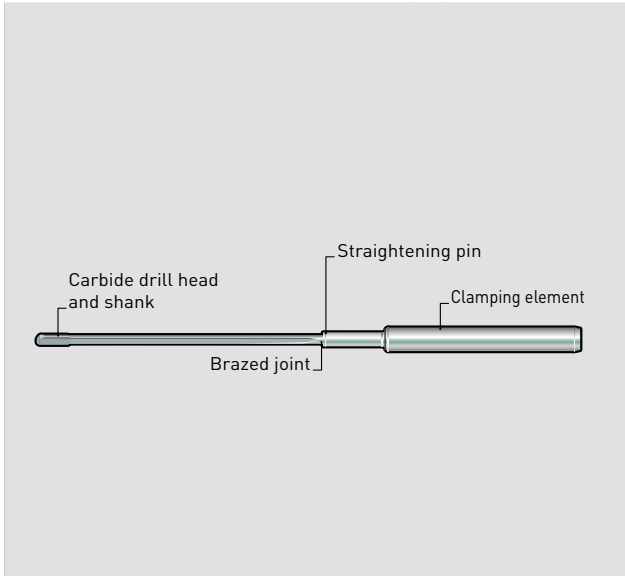
Single-lip drills with brazed-on drill heads comprise a solid carbide drill head or a steel drill head with carbide inserts, drill shank made from hardened and tempered steel and clamping sleeve made from steel. The drill head and clamping sleeve are brazed to the tool shank.

Diameter range	1.9 – 50.0 mm
Length	Up to 6,000 mm
Effective tool length	40 – 50 x Ø
Cooling lubricant (coolant) required	
Deep hole drilling oil preferred	
Filter resolution	10 – 20 µm
Viscosity	Ø 1.9 – 50 mm = 10 – 20 mm ² /S

Safety information

We do not accept liability for damage resulting from improper handling of our deep hole drilling tools, operating errors, deficient machine conditions or improper use of our tools. The relevant instructions for use, emission and safety regulations must be observed.

We will be happy to advise you!



Solid carbide single-lip drill

The drill head and shank are made from one carbide slug. This tool is particularly process-reliable and efficient. Longer tool life is achieved on account of less torsional vibration.

The clamping element (steel) is made with a straightening pin on this type of tool. The clamping element (sleeves) and drill shank are brazed together.

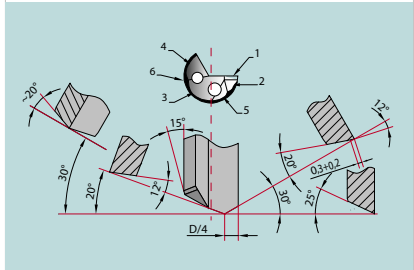
Diameter range	0.6 – 12.0 mm
Length	Up to 350 mm
Effective tool length	80 – 100 x Ø
Cooling lubricant (coolant) required	Deep hole drilling oil preferred
Filter resolution	5 – 10 µm
Viscosity	Ø 0.6 – 2.0 mm = 7 – 10 mm ² /S Ø 2.0 – 12 mm = 10 – 20 mm ² /S

Safety information

We do not accept liability for damage resulting from improper handling of our deep hole drilling tools, operating errors, deficient machine conditions or improper use of our tools. The relevant instructions for use, emission and safety regulations must be observed.

We will be happy to advise you!

Symbol	Axis A	Axis B	Axis C	measure	comment
	-30°	+12°	+5°	>D/4	twist the drill at the circumference without damaging the cutting edges
	-30°	+20°	+6,5°	Fase 0,3...0,5	
	+20°	+12°	-5°	D/4	
	+30°	+12°	+55°		
	0°	+25°	-5°		



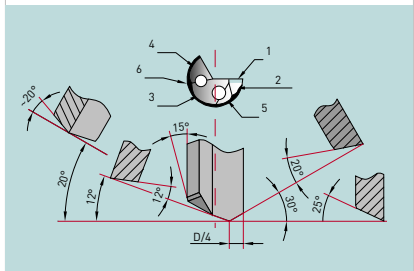
Standard grind section for single-lip drills with Ø 5 to 30 mm

Changes to the cutting edge geometry have a direct impact on bore quality and process reliability.

TBT cutting edge geometries are the result of over 40 years' development and research work by our mechanical engineering, tool design and machining service departments.

Our cutting edge geometries also enable difficult drilling jobs to be carried out.

Apply our experience to your applications.



Standard grind section for single-lip drills up to Ø 5 mm

12 Cutting edge geometry

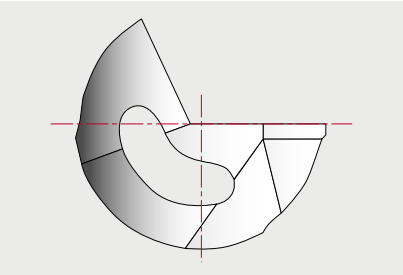
Changes to the cutting edge geometry of the single-lip drill can affect the drilled surface, the chip shape, bore tolerance, drill centring, chip removal, surface quality and tool life.

With TBT standard grind facets virtually any drilling tasks can be executed successfully. When drilling deep holes in particularly longchipping materials and in materials that are difficult to machine it is generally necessary to use special grind facets, in some cases with chip separators/chip breakers. We are already making, redesigning or customising a number of different grind sections. The standard grind sections for TBT single-lip drills depend on the drill diameter and the material being drilled. TBT universal and tandem grinding machines are recommended for regrinding tools.

Symbol	Axis A	Axis B	Axis C	measure	comment
	-40°	+25°	+12°	>D/4	twist the drill at the circumference without damaging the cutting edges
	+30°	+20°	-7°	D/4	
	+35°	+20°	+55°		
	0°	+38°	0°		

Standard circumferential forms

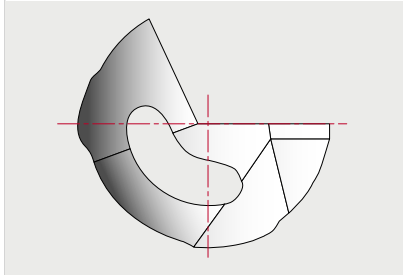
The circumferential shapes developed by TBT are specially tailored to the respective application.



Circumferential form G60

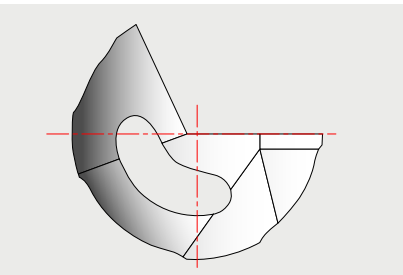
Standard form suitable for most materials and drilling jobs. With this shape the tool diameter can no longer be measured after manufacture.

The standard starting point of the guide pad is 60°, but can range from 45° to 80°.



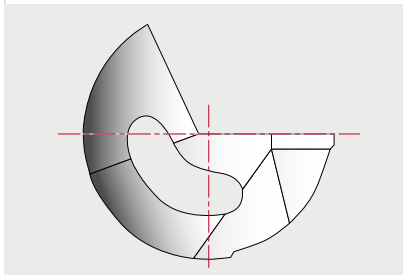
Circumferential form C

This form is the preferred choice for narrow tolerances in terms of the bore diameter and finish. Some of the guide pads are convex ground. The spherical grinding heel can protrude over the guide pads.



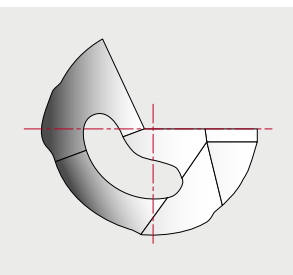
Circumferential form A

form for awkward approaches to drilling work or cross drilling, machining of soft materials and poor performance of cooling lubricant. Often used on the cyl. guide part (long drill head).

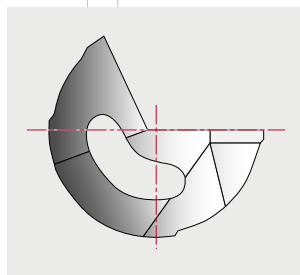


Circumferential form D45

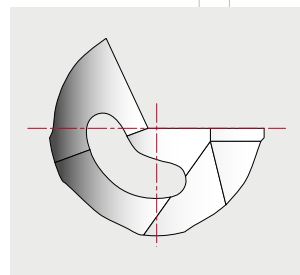
The form is almost exclusively used for soft materials, such as grey cast iron, graphite, ... , especially in conjunction with narrow bore tolerances.



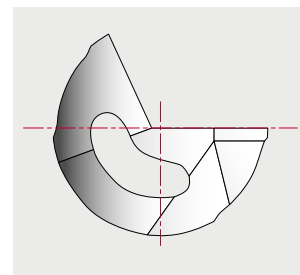
Circumferential form S



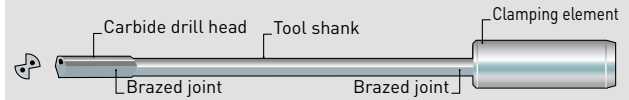
Circumferential form E185



Circumferential form F



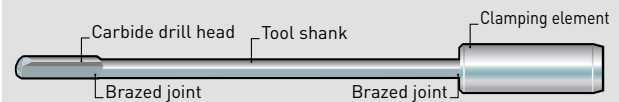
Circumferential form GA80



14 Double-lip drill

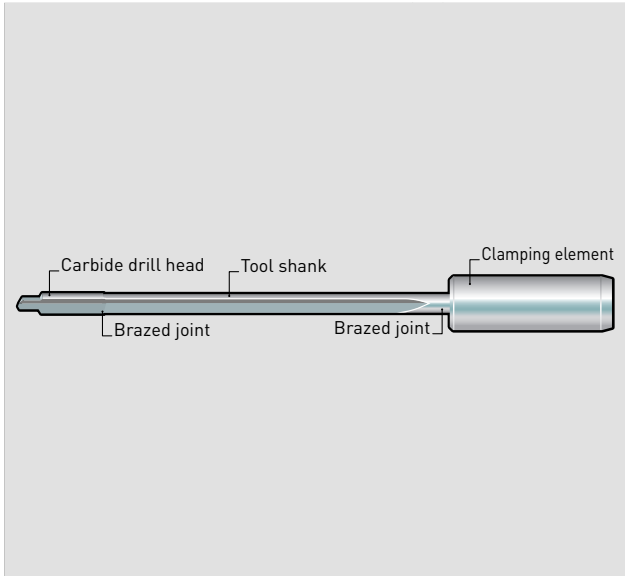
Double-lip drilling – a procedure related to deep hole drilling – is used for diameters ranging from approx. 4 to 25 mm and with length/dia. Ratios of up to max. 30 to 40. The tools are two-edged and normally have two guide pads in addition to the two spherical grinding heels. These tools are either solid carbide or they have a solid carbide drill head and steel tube or solid steel shank. Its similarity to single-lip drilling (deep hole drilling) is derived

primarily from the fact that they have the same cooling lubricant circuit. The cooling lubricant (coolant) is fed inside the tool through two cooling channels (holes). The coolant and chip mixture is discharged through two longitudinal slots (beads) on the outside of the tool shank. On account of the relatively limited amount of space in the swarf chamber, these tools should preferably be used for short-chipping materials.



Counterbore tool

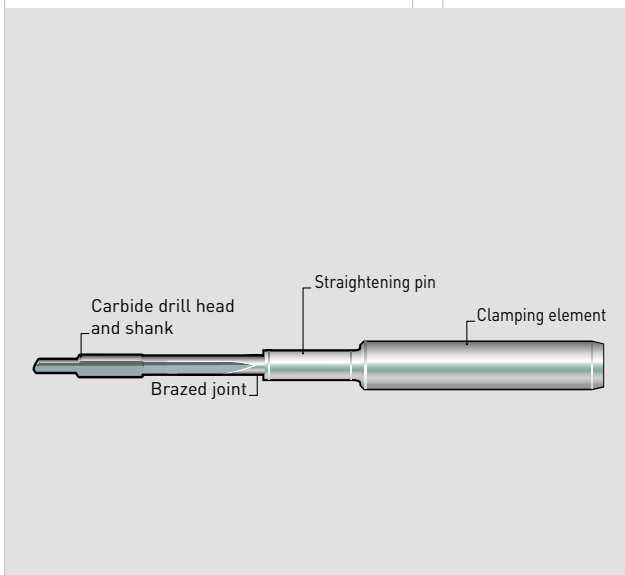
Special tool for finishing existing through-holes. The chips are removed in the feed direction.



Single-lip step drill

Used to include several bore diameters in one pass. Meets the highest demands in concentricity and coaxial applications.

15



Solid carbide single-lip step drill

Used to include several bore diameters in one pass. Meets the highest demands in concentricity and coaxial applications. Maximum tool length 350 mm.

Clamping sleeves

Clamping element overview

Clamping sleeves

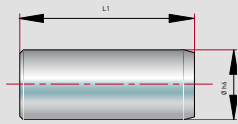
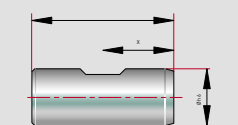
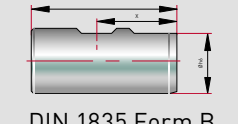
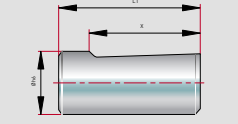
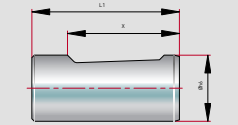
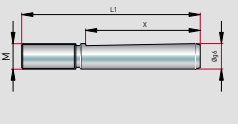
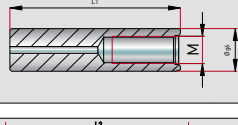
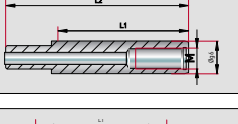
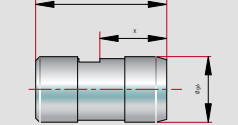
In addition to manufacturing a large selection of standard clamping sleeves, TBT also customises clamping sleeves to your special requirements (from a diagram or sample).

Name	Diagram	L1	L2	X	M	Drill range	Article no.
∅ 10 x40		40	46	24.3		1.900-7.099	5009000
∅ 16 x45		45	53	31		1.900-12.099	5006872
∅ 16 x50		50	58	47.5		1.900-12.099	5008000
∅ 25 x70		70	78	34		1.900-19.799	5007000
∅ 10 x40		42	55	24.3		7.100-9.999	5005026
∅ 16 x45		45	65	31		11.400-14.949	5005519
∅ 16 x50		52	75	47.5		11.400-14.949	5005004
∅ 25 x70		72	105	34		19.800-24.799	5005003
16 ∅ 16 x50		50	58	47.5		1.900-8.699	5006049
∅ 12.7 x38.1		38.1		25.4		1.900-8.299	5005009
∅ 19.05 x69.8		69.8		44.4		1.900-14.949	5005007
∅ 25.4 x69.8		69.8		57.1		1.900-19.799	5005011
∅ 31.75 x69.8		69.8		57.1		1.900-25.999	5005022
∅ 38.1 x69.8		69.8		57.1		1.900-32.999	5005024
∅ 12.7 x38.1		38.1	58	25.4		8.300-12.499	5005962
∅ 19.05 x69.8		69.8	100	44.4		14.95-18.799	5005529
∅ 25.4 x69.8		69.8	105	57.1		19.8-24.799	5005339
∅ 31.75 x69.8		69.8	100	57.1		26.0-30.999	5005193
∅ 38.1 x69.8		69.8	100	57.1		33.0-40.0	5006386
∅ 10 x68		68		35	M6x0.5	1.9-6.799	5006093
∅ 16 x90		90		37	M10x1	1.9-12.099	5006094
∅ 25 x112		112		45	M16x1.5	1.9-19.799	5006095
∅ 10 x68		68	81	35	M6x0.5	6.8-9.999	5006196
∅ 16 x90		90	110	37	M10x1	11.4-14.949	5006197
∅ 25 x112		112	142	45	M16x1.5	19.8-24.799	5006198

Clamping element overview

Clamping sleeves

In addition to manufacturing a large selection of standard clamping sleeves, TBT also customises clamping sleeves to your special requirements (from a diagram or sample).

Name	Diagram	L1	L2	X	M	Drill range	Article no.
∅ 10 x40	 <p>DIN 1835 Form A</p>	40				1.9-6.499	5006914
∅ 12 x45		45				1.9-7.999	5006719
∅ 16 x48		48				1.9-11.399	5005802
∅ 20 x50		50				1.9-14.949	5006518
∅ 25 x56		56				1.9-19.799	5006519
∅ 32 x60		60				1.9-25.999	5006960
∅ 10 x40	 <p>DIN 1835 Form B</p>	40	20			1.9-7.099	5005914
∅ 12 x45		45	22.5			1.9-7.999	5006061
∅ 16 x48		48	24			1.9-12.099	5005911
∅ 20 x50	 <p>DIN 1835 Form B</p>	50	25			1.9-14.949	5005886
∅ 25 x56		56	32			1.9-19.799	5005887
∅ 32 x60		60	36			1.9-25.999	5006234
∅ 40 x70		70	40			1.9-29.999	5006239
∅ 10 x40	 <p>DIN 1835 Form E</p>	40	28			1.9-7.099	5006158
∅ 12 x45		45	33			1.9-7.999	5005822
∅ 16 x48		48	36			1.9-11.399	5005872
∅ 20 x50		50	38			1.9-14.949	5005821
∅ 25 x56		56	44			1.9-19.799	5005583
∅ 32 x60		60	48			1.9-25.999	5005861
∅ 10 x40	 <p>DIN 6535 Form HE</p>	40	28			1.9-6.499	5006487
∅ 12 x45		45	33			1.9-7.999	5006458
∅ 16 x48		48	36			1.9-11.399	5006501
∅ 20 x50		50	38			1.9-14.949	5006505
∅ 25 x 56		56	44			1.9-19.799	5006491
∅ 16 x112		112	72		TR16x1.5	1.9-11.399	5005211
∅ 20 x126		126	81.0		TR20x2	1.9-14.949	5005334
∅ 28 x126		126	24		TR28x2	1.9-23.799	5005460
∅ 36 x 162		162	25		TR36x2	1.9-26.999	5006302
∅ 10 x60		60			M6x0.5	1.9-6.499	5005835
∅ 16 x80		80			M10x1	1.9-12.099	5005837
∅ 25 x100		100			M16x1.5	1.9-19.799	5005839
∅ 16 x80		80	100		M10x1	12.1-14.949	5005836
∅ 25 x100		100	140		M16x1.5	19.8-24.799	5005838
∅ 16 x40		40		15.5		1.9-11.399	5005595
∅ 25 x50		50		25.5		1.9-19.799	5005592
∅ 35 x60		60		29.5		1.9-28.999	5005881

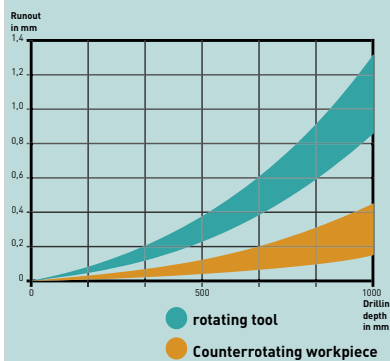
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Title		N12	N11	N10	N9	N8	N7	N6	N5	N4	N3	N2	N1
Twist drilling				X	X	X							
Reaming						X	X	X	X	X			
Broaching						X	X	X	X				
Honing							X	X	X	X	X	X	
Deep hole drilling								X	X	X	X		
Arithmetical centre line average Ra	µm	50	25	12,5	6,30	3,20	1,60	0,80	0,40	0,20	0,10	0,05	0,025

Surface quality (standard values)

Surface quality

The radial energy produced during drilling presses the tool Guide pads against the inner wall of the bore, thereby smoothing the surface of the wall. This effect can be increased by the design of the guide pads. The result is an excellent surface finish.

This smoothing process can be enhanced even more by adjusting the design of the guide pads, giving an outstanding quality to the surface finish.



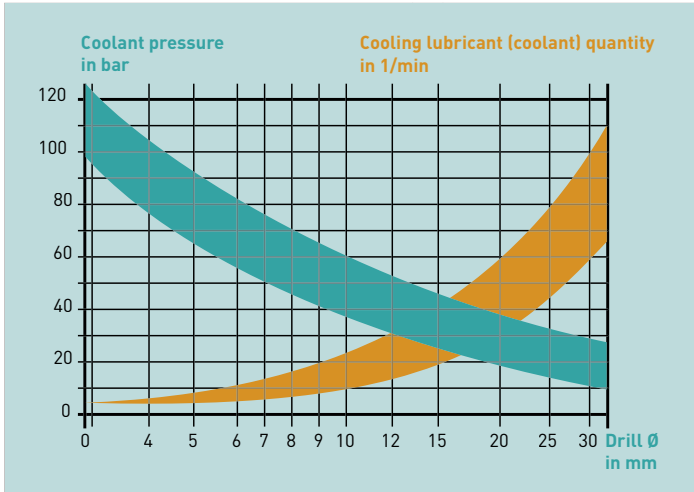
Runout (standard values)

Diameter tolerance

Diameter tolerances of up to IT 7 are achievable in production with TBT single-lip drills.

Bore runout

The drill bush on the workpiece, or the pilot hole and the hole itself, dictate precisely restricted guidance for the single-lip drill thus limiting the drift to a minimum.



Cooling lubricants (coolant) (approx. values)

Cooling lubricants (Coolant)

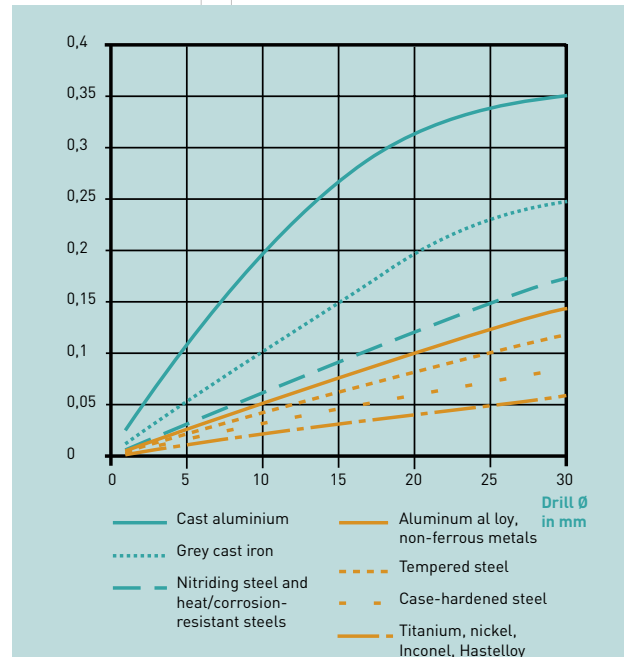
An efficient and correctly dimensioned coolant system with filtering is required to guarantee the economic viability and process reliability of deep hole drilling. Another consideration is the requirement to adhere to a minimum fat content (depends on the material) when using emulsion. It is advisable to use deep hole drilling oil for small drill diameters and high-alloy steels.



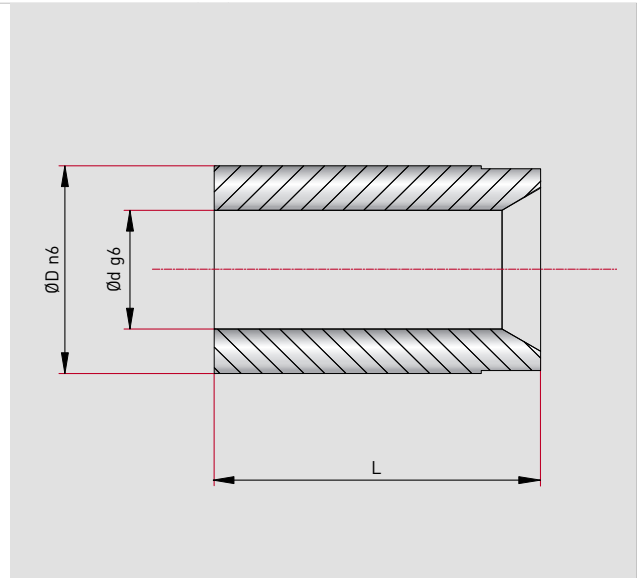
Cutting speed (approx. values)

Cutting speed

An exact table showing the different cutting speeds and feed values can be found on pages 28 – 31 (see also virtual feed and speed calculator at www.tbt.de).



Feed (approx. values)



20

Machining accessories, drill bush

Centering guide for start of drilling until the tool can centre itself in the hole. Available in steel or carbide.

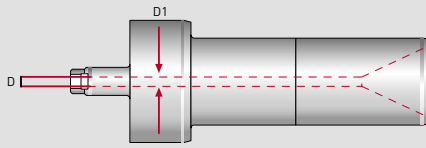
Steel/carbide drill bushes

TBT standard Steel/Carbide	Tool Ø		D n6	L	d g6
TBN 2302 / 2310	0.900	0.999	3	8	Please state tool Ø when ordering
TBN 2302 / 2310	1.000	1.899	4		
TBN 2302 / 2310	1.900	2.699	5		
TBN 2302 / 2310	2.700	3.399	6	11	
TBN 2302 / 2310	3.400	4.099	7		
TBN 2302 / 2310	4.100	5.099	8		
TBN 2302 / 2310	5.100	6.099	10	14	
TBN 2302 / 2310	6.100	8.099	12		
TBN 2302 / 2310	8.100	10.099	15	18	
TBN 2302 / 2310	10.100	12.099	18		
TBN 2302 / 2310	12.100	15.099	22	26	
TBN 2 302 / 2310	15.100	18.099	26		
TBN 2302 / 2310	18.100	22.099	30	33	
TBN 2302 / 2310	22.100	26.099	35		
TBN 2302 / 2310	26.100	30.099	42		
TBN 2302 / 2310	30.100	35.099	48	42	
TBN 2302 / 2310	35.100	42.099	55		
TBN 2302 / 2310	42.100	48.099	62	52	
TBN 2302 / 2310	48.100	55.099	70		
TBN 2302 / 2310	55.100	63.000	78	67	

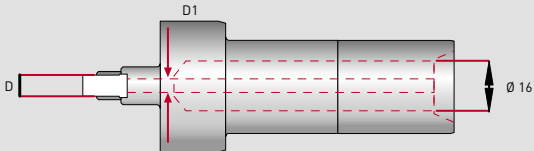
Order note:

Example order: drill bush Ø 5.0 Steel

Order text: drill bush as per TBN 2302 5.0 x 8 x11



drill bush holder 190005-7111-01



drill bush holder 190005-7111-15



Machining accessories, drill bush holder

Holds the Drill bush in place for positioning on the workpiece.

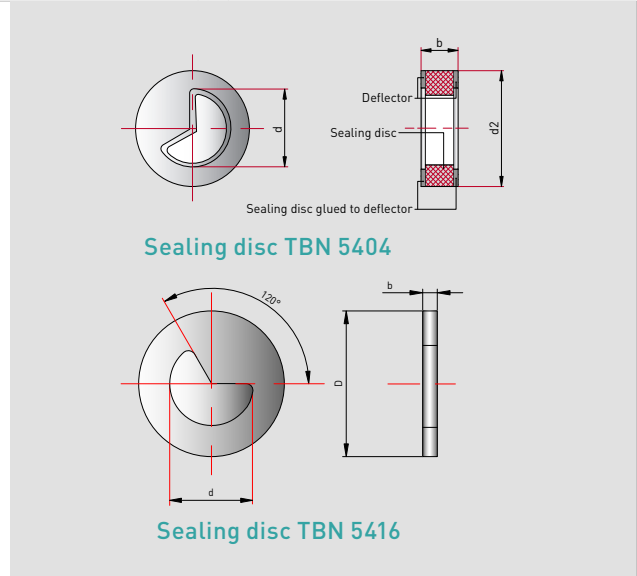
drill bush holder

Drill range		ØD
From	To	
1.000	1.899	4
1.900	2.699	5
2.700	3.399	6
3.400	4.099	7
4.100	5.099	8
5.100	6.099	10
6.100	8.099	12
8.100	10.099	15
10.100	12.099	18
12.100	15.099	22
15.100	18.099	26
18.100	22.099	30
22.100	26.099	35
26.100	30.099	42
30.100	35.099	48
35.100	42.099	55
42.100	48.099	62
48.100	55.099	70
55.100	63.000	78

Order note:

Please state machine no. and drill diameter when ordering

Accessories: Sealing discs



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Machining accessories, sealing disc

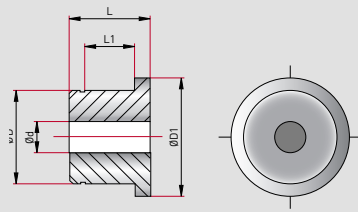
Forms a seal between the swarf chamber and spindle.

sealing disc TBN 5404

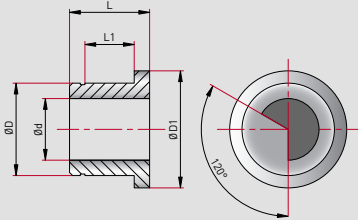
TBT standard	Tool Ø		d2	b	d
TBN 5404	2.900	5.249	20	7	Please state tool Ø when ordering
TBN 5404	5.250	14.449	32	11	
TBN 5404	14.450	25.999	40	12	
TBN 5404	26.000	40.999	90	12	

Vulkollan sealing disc TBN 5416

TBT standard	Tool Ø	D	b	d
TBN 5416	3.100-15.599	32	4	Please state tool Ø when ordering
TBN 5416	15.600-25.999	40	4	
TBN 5416	26.000 +	90	4	



Whip guide bush



Form whip guide bush



Machining accessories, whip guide bush

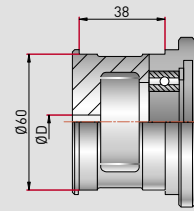
Used to guide and stabilize the tool.

Whip guide bushes

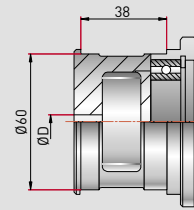
TBT standard	Tool Ø	D	D1	L	L1	d
TBN 5406	1.900-16.399	20	26	20	12	Please state tool Ø when ordering
TBN 5407	1.900-25.999	30	38	26	16	
TBN 5408	1.900-34.000	45	50	26	16	

Form whip guide bushes

TBT standard	Tool Ø	D	D1	L	L1	d
TBN 5420	1.900-16.399	20	26	20	12	Please state tool Ø when ordering
TBN 5421	1.900-23.799	30	38	26	16	



Sealing case 302200-7101-01



Sealing case 100700-7101-01

Machining accessories, sealing case

Houses the sealing disc and whip guide bush.

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302200-7101-01

Sealing case for Ø 20 whip guide bushes without bearing

Article no.	Drill range		ØD
	From	To	
302200-7101-01	1.900	5.249	6.5
302200-7102-01	5.250	11.399	12.5
302200-7103-01	11.400	16.399	18.5

Sealing case for Ø 20 whip guide bushes with bearing

Article no.	Drill range		ØD
	From	To	
302200-7101-00	1.900	5.249	6.5
302200-7102-00	5.250	11.399	12.5
302200-7103-00	11.400	16.399	18.5

100700-7101-01

Sealing case for Ø 30 whip guide bushes without bearing

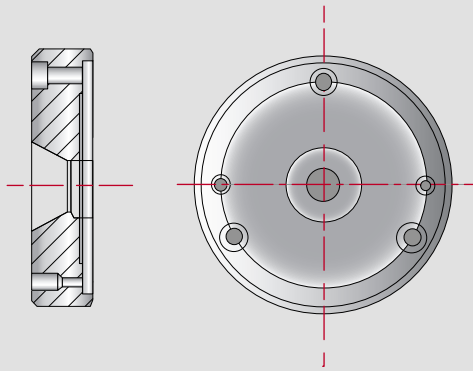
Article no.	Drill range		ØD
	From	To	
100700-7101-01	1.900	5.249	6.5
100700-7102-01	5.250	11.399	12.5
100700-7103-01	11.400	16.399	18.5
100700-7104-01	16.400	25.999	27

Sealing case for Ø 30 whip guide bushes with bearing

Article no.	Drill range		ØD
	From	To	
100700-7101-00	1.900	5.249	6.5
100700-7102-00	5.250	11.399	12.5
100700-7103-00	11.400	16.399	18.5
100700-7104-00	16.400	25.999	27

Order note:

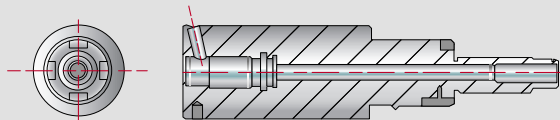
Please state machine no. and drill diameter when ordering



Clamping cone

Machining accessories, clamping cone

Used to clamp and centre rotationally symmetrical workpieces.

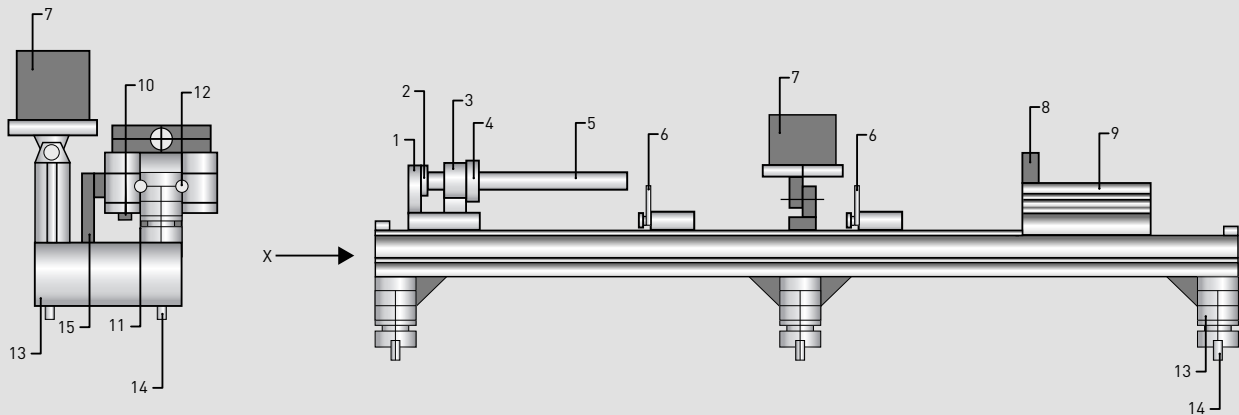


Tool Holder

Machining accessories, tool holder

Clamping/anchoring the tools.





General view of length measuring system

26 Machining accessories, tool setting device

The length measuring system is a precision system for setting the length of drills. The above diagram shows the length measuring system and its components.

The adapter (4) holds the plug gauge and the drill being measured. In the case of relatively long lengths, the drills are supported by the sliding V-blocks (6) which are also height-adjustable and lockable.

The moving carrier plate (9) with the mounted magnetic sensor determines the zero point and measures the length. The measurement is displayed on the positioning indicator (7). The angle of incline of the positioning indicator is adjustable and can therefore be adapted to the lighting conditions and the size of the operator.

The cable connecting the magnetic sensor to the positioning indicator is routed and enclosed in a cable drag chain (15).

The measuring length can be extended by moving the stop plate (8) to the end of the moving carrier plate (9).

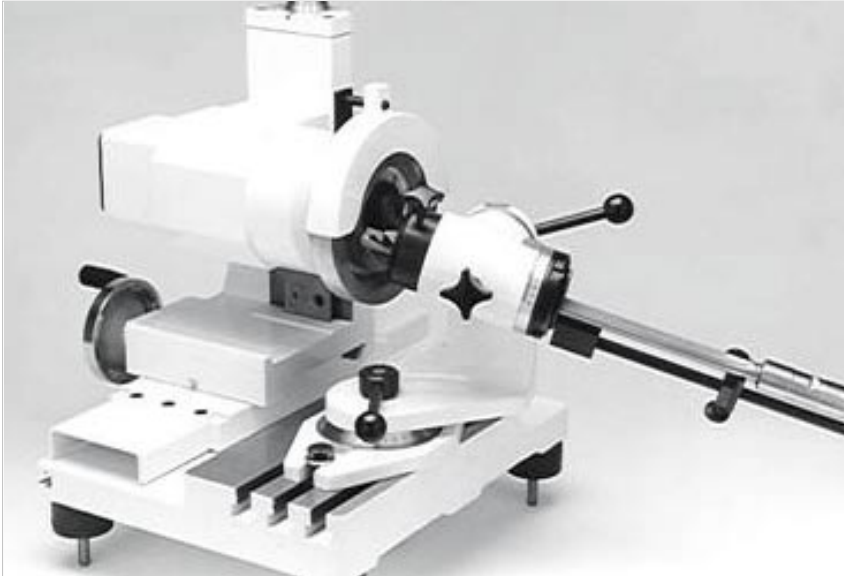
Different versions of the length measuring system can be supplied but the description and operation are essentially the same.

- Table-top version
- Stand-alone version with base, drill support and plastic boxes for small parts.

- 1 Base holder
- 2 Support bolt
- 3 Holder for adaptor
- 4 Adaptor
- 5 Plug gauge
- 6 V-blocks

- 7 Positioning indicator
- 8 Stop plate
- 9 Moving carrier plate
- 10 Magnetic sensor
- 11 Magnetic tape
- 12 Linear guide
- 13 Supports
- 14 Fastening screws
- 15 Cable drag chain





Universal grinding machine

Grinding machine

Various regrinding devices allow you to regrind your single-lip drill yourself. Our many years of experience in this area have been positively invested in the design and production of our grinding machines, jigs and associated accessories.

Tandem grinding machine

A high-precision, double-spindle grinding machine, designed for accurate resharpener of relatively large single-lip drills with the same cutting edge geometry and diameters ranging from 2.0 to approx. 20 mm.

Up to five different tool positions enable presetting of all angles required for five facet grinding, making grinding simpler. The lateral oscillation of the spindle unit is electromechanical.

- Cutting edge geometry need only be set once
- Fully exchangeable adaptor plate for different geometries and for setting the geometries
- Eight different tool holder cassettes provide coverage of the whole range of tool diameters

Another accessory available is a dry dust extractor for efficient removal of the wheel swarf from the work area.

TBT universal grinding fixture

Our universal grinding fixture can be used on conventional tool grinders. The advantages of the chucking fixture, which we also use on our TBT universal grinder, are obvious:

- Compact fixture adjustable in three axes for grinding all standard geometries for single-lip drills



Tandem grinding machine

- Fixture supports extra-long single-lip drills
- Two different clamping ranges (2.5 - 32 mm and 5.0 - 45 mm) cover a wide range of tool diameters

For optimum resharpener of your really small single-lip drills (1.0 - 3.5 mm) the TBT universal grinding fixture can also be fitted with a grinder holder with integrated lighting and 20x measuring microscope.

TBT universal grinding machine

A fully operable device for your specific requirements - the grinding spindle unit and our tried-and-tested TBT universal chucking fixture are mounted together on a solid board, thus allowing optimum regrinding quality for excellent drilling results. Matching base and extraction equipment are also available.

Standard values for deep hole drilling in various materials for solid carbide single-lip drills

Material groups	Spring steels; hardened steels; high-temperature steels; cast steel/chilled cast iron; special alloys: e.g. Nimonic; Inconel etc.; titanium; titanium alloys		Stainless acid-proof steel+cast steel, austenitic 18-25% Cr, Ni>8%		Stainless steel+cast steel, martensitic/ferritic 13-25% Cr (sulphurated) "easily machinable"		Alloyed tempered steels case-hardened steels nitriding steels tool steels (>900 N/mm ²)	
	25 – 60		30 – 60		40 – 70		60 – 80	
Cutting speed m/min								
Drill Ø mm	Feed mm/rev.							
	From	To	From	To	From	To	From	To
0.7 – 0.79	0.0004	0.0012	0.0005	0.0012	0.0007	0.0012	0.0005	0.0012
0.8 – 0.89	0.0006	0.0016	0.0070	0.0014	0.0011	0.0014	0.0006	0.0015
0.9 – 0.99	0.0009	0.0020	0.0011	0.0019	0.0014	0.0017	0.0009	0.0019
1.0 – 1.09	0.0013	0.0024	0.0014	0.0022	0.0019	0.0022	0.0010	0.0023
1.1 – 1.19	0.0017	0.0028	0.0017	0.0025	0.0022	0.0026	0.0013	0.0029
1.2 – 1.29	0.0020	0.0033	0.0020	0.0027	0.0024	0.0028	0.0015	0.0035
1.3 – 1.39	0.0023	0.0036	0.0022	0.0029	0.0031	0.0035	0.0020	0.0041
1.4 – 1.49	0.0026	0.0038	0.0023	0.0031	0.0034	0.0037	0.0021	0.0047
1.5 – 1.59	0.0029	0.0042	0.0024	0.0035	0.0035	0.0042	0.0021	0.0051
1.6 – 1.79	0.0035	0.0054	0.0036	0.0049	0.0040	0.0051	0.0024	0.0066
1.8 – 1.99	0.0040	0.0065	0.0040	0.0065	0.0050	0.0065	0.0030	0.0075
2.0 – 2.49	0.0050	0.0075	0.0050	0.0075	0.0050	0.0075	0.0030	0.0095
2.5 – 2.99	0.0060	0.0095	0.0060	0.0095	0.0060	0.0110	0.0040	0.0110
3.0 – 3.49	0.0080	0.0110	0.0080	0.0110	0.0080	0.0130	0.0050	0.0140
3.5 – 3.99	0.0090	0.0125	0.0100	0.0160	0.0090	0.0160	0.0070	0.0160
4.0 – 4.49	0.0100	0.0135	0.0110	0.0180	0.0100	0.0190	0.0080	0.0190
4.5 – 4.99	0.0110	0.0160	0.0140	0.0220	0.0110	0.0220	0.0110	0.0210
5.0 – 5.99	0.0130	0.0220	0.0150	0.0240	0.0130	0.0250	0.0120	0.0250
6.0 – 7.99	0.0150	0.0290	0.0180	0.0290	0.0150	0.0370	0.0150	0.0330
8.0 – 12.0	0.0170	0.0360	0.0210	0.0330	0.0170	0.0410	0.0180	0.0380

The cutting speed and feed settings depend on the following: tool length, cooling lubricant, material, stability of the machine parts and workpiece clamping. All the entries are standard values.

Standard values for deep hole drilling in various materials for solid carbide single-lip drills

Material groups	Cast iron grey cast iron (>300 N/mm ²) ductile cast iron (>400 N/mm ²) general steel casting		Cast iron; grey cast iron (<300 N/mm ²) ductile cast iron (<400 N/mm ²); malleable cast iron; whiteheart malleable iron; blackheart cast iron "easily machinable"		Structural steel; high-carbon and low-alloy machining steel; tempered steel; case-hardened steel; tool steel (<900 N/mm ²) "easily machinable"		Copper, bronze; brass; plastics		Aluminium+cast aluminium, Si content >5% easily machinable		Aluminium+cast aluminium, Si content <5% not hardened	
	Cutting speed m/min	60 – 90	70 – 100	70 – 100	80 – 150	80 – 160	100 – 300					
Drill Ø mm	Feed mm/rev.											
	From	To	From	To	From	To	From	To	From	To	From	To
0.7 – 0.79	0.0009	0.0014	0.0007	0.0018	0.0004	0.0018	0.0005	0.0012	0.0007	0.0012	0.0005	0.0009
0.8 – 0.89	0.0012	0.0018	0.0010	0.0023	0.0004	0.0022	0.0008	0.0015	0.0012	0.0014	0.0008	0.0012
0.9 – 0.99	0.0015	0.0024	0.0014	0.0028	0.0007	0.0026	0.0011	0.0019	0.0017	0.0020	0.0011	0.0017
1.0 – 1.09	0.0019	0.0029	0.0018	0.0032	0.0010	0.0032	0.0015	0.0024	0.0020	0.0024	0.0015	0.0024
1.1 – 1.19	0.0025	0.0035	0.0022	0.0038	0.0014	0.0038	0.0019	0.0029	0.0022	0.0029	0.0019	0.0034
1.2 – 1.29	0.0031	0.0041	0.0030	0.0048	0.0018	0.0041	0.0024	0.0034	0.0024	0.0034	0.0024	0.0041
1.3 – 1.39	0.0040	0.0051	0.0039	0.0060	0.0020	0.0050	0.0028	0.0039	0.0026	0.0045	0.0026	0.0044
1.4 – 1.49	0.0047	0.0060	0.0049	0.0079	0.0021	0.0054	0.0031	0.0047	0.0028	0.0055	0.0032	0.0048
1.5 – 1.59	0.0053	0.0068	0.0056	0.0100	0.0021	0.0067	0.0032	0.0053	0.0035	0.0066	0.0038	0.0059
1.6 – 1.79	0.0064	0.0095	0.0064	0.0150	0.0028	0.0075	0.0035	0.0095	0.0040	0.0085	0.0040	0.0075
1.8 – 1.99	0.0070	0.0130	0.0070	0.0220	0.0030	0.0095	0.0040	0.0130	0.0050	0.0110	0.0050	0.0110
2.0 – 2.49	0.0100	0.0220	0.0090	0.0330	0.0040	0.0120	0.0040	0.0180	0.0050	0.0200	0.0070	0.0130
2.5 – 2.99	0.0130	0.0320	0.0110	0.0430	0.0050	0.0160	0.0050	0.0250	0.0060	0.0360	0.0080	0.0170
3.0 – 3.49	0.0150	0.0390	0.0140	0.0530	0.0080	0.0180	0.0060	0.0370	0.0080	0.0540	0.0100	0.0200
3.5 – 3.99	0.0180	0.0480	0.0180	0.0620	0.0090	0.0230	0.0070	0.0490	0.0110	0.0750	0.0100	0.0250
4.0 – 4.49	0.0200	0.0560	0.0200	0.0690	0.0120	0.0260	0.0080	0.0600	0.0120	0.0950	0.0130	0.0300
4.5 – 4.99	0.0230	0.0640	0.0230	0.0780	0.0140	0.0280	0.0090	0.0690	0.0140	0.1300	0.0160	0.0360
5.0 – 5.99	0.0250	0.0760	0.0250	0.0950	0.0150	0.0380	0.0100	0.0800	0.0150	0.1550	0.0200	0.0470
6.0 – 7.99	0.0300	0.1100	0.0300	0.1250	0.0180	0.0490	0.0120	0.0960	0.0180	0.2050	0.0260	0.0660
8.0 – 12.0	0.0330	0.1190	0.0350	0.1360	0.0210	0.0570	0.0140	0.1100	0.0210	0.2080	0.0290	0.0780

The cutting speed and feed settings depend on the following: tool length, cooling lubricant, material, stability of the machine parts and workpiece clamping. All the entries are standard values.

Standard values for deep hole drilling in various materials for single-lip drills with brazed-on carbide head

Material groups	Spring steels; hardened steels; high-temperature steels; cast steel/chilled cast iron; special alloys: e.g. Nimonic; Inconel etc.; titanium; titanium alloys		Stainless acid-proof steel+cast steel, austenitic 18–25% Cr, Ni>8%		Stainless steel+cast steel, martensitic/ferritic 13–25%Cr (sulphurated) "easily machinable"		Alloyed tempered steels case-hardened steels nitriding steels tool steels (>900 N/mm ²)	
	25 – 60		30 – 60		40 – 70		60 – 80	
Cutting speed m/min	25 – 60		30 – 60		40 – 70		60 – 80	
Drill Ø mm	Feed mm/rev.							
	From	To	From	To	From	To	From	To
1.9 – 2.49	0.001	0.002	0.002	0.005	0.002	0.006	0.002	0.005
2.5 – 2.99	0.001	0.005	0.004	0.007	0.004	0.007	0.004	0.006
3.0 – 3.49	0.002	0.007	0.006	0.008	0.005	0.009	0.005	0.007
3.5 – 3.99	0.004	0.008	0.008	0.009	0.007	0.011	0.007	0.010
4.0 – 4.49	0.006	0.009	0.009	0.010	0.008	0.013	0.008	0.012
4.5 – 4.99	0.008	0.011	0.010	0.013	0.009	0.017	0.011	0.015
5.0 – 5.99	0.010	0.014	0.012	0.015	0.013	0.019	0.013	0.018
6.0 – 6.99	0.012	0.016	0.014	0.017	0.015	0.023	0.015	0.022
7.0 – 7.99	0.015	0.018	0.016	0.019	0.018	0.026	0.018	0.025
8.0 – 8.99	0.018	0.021	0.018	0.021	0.020	0.031	0.020	0.027
9.0 – 9.99	0.021	0.025	0.020	0.028	0.023	0.034	0.023	0.030
10.0 – 11.99	0.024	0.030	0.025	0.033	0.025	0.041	0.025	0.038
12.0 – 13.99	0.027	0.033	0.030	0.038	0.030	0.045	0.029	0.044
14.0 – 15.99	0.029	0.040	0.035	0.044	0.035	0.052	0.035	0.050
16.0 – 17.99	0.033	0.044	0.041	0.050	0.042	0.060	0.039	0.053
18.0 – 19.99	0.037	0.049	0.045	0.062	0.045	0.067	0.044	0.060
20.0 – 23.99	0.041	0.054	0.049	0.071	0.050	0.079	0.049	0.069
24.0 – 27.99	0.045	0.057	0.052	0.083	0.054	0.090	0.054	0.077
28.0 – 31.99	0.049	0.062	0.057	0.091	0.059	0.098	0.059	0.085
32 – 39.99	0.052	0.065	0.063	0.098	0.065	0.107	0.063	0.098
40 – 50	0.055	0.069	0.068	0.105	0.071	0.113	0.068	0.105

The cutting speed and feed settings depend on the following: tool length, cooling lubricant, material, stability of the machine parts and workpiece clamping. All the entries are standard values.

Standard values for deep hole drilling in various materials for single-lip drills with brazed-on carbide head

Material groups	Cast iron grey cast iron (>300 N/mm ²) ductile cast iron (>400 N/mm ²) general steel casting		Cast iron; grey cast iron (<300 N/mm ²) ductile cast iron (<400 N/mm ²); malleable cast iron; whiteheart malleable iron; blackheart cast iron "easily machinable"		Structural steel; high-carbon and low-alloy machining steel; tempered steel; case-hardened steel; tool steel (<900 N/mm ²) "easily machinable"		Copper, bronze; brass; plastics		Aluminium+cast aluminium, Si content >5% easily machinable		Aluminium+cast aluminium, Si content <5% not hardened	
	Cutting speed m/min	60 – 90		70 – 100		70 – 100		80 – 150		80 – 160		100 – 300
Drill Ø mm	Feed mm/rev.											
	From	To	From	To	From	To	From	To	From	To	From	To
1.9 – 2.49	0.005	0.018	0.005	0.019	0.003	0.007	0.003	0.015	0.002	0.012	0.002	0.005
2.5 – 2.99	0.008	0.028	0.008	0.026	0.005	0.010	0.005	0.020	0.004	0.026	0.004	0.008
3.0 – 3.49	0.009	0.038	0.009	0.038	0.007	0.013	0.006	0.030	0.006	0.037	0.006	0.012
3.5 – 3.99	0.011	0.042	0.011	0.046	0.009	0.015	0.007	0.045	0.007	0.055	0.007	0.025
4.0 – 4.49	0.012	0.047	0.012	0.050	0.012	0.019	0.008	0.050	0.008	0.071	0.008	0.026
4.5 – 4.99	0.016	0.052	0.016	0.057	0.014	0.020	0.009	0.057	0.009	0.094	0.009	0.028
5.0 – 5.99	0.018	0.065	0.018	0.068	0.016	0.026	0.010	0.069	0.010	0.109	0.010	0.036
6.0 – 6.99	0.024	0.071	0.024	0.074	0.018	0.028	0.012	0.079	0.012	0.125	0.012	0.045
7.0 – 7.99	0.028	0.084	0.028	0.085	0.021	0.035	0.014	0.092	0.018	0.130	0.014	0.049
8.0 – 8.99	0.032	0.092	0.032	0.096	0.024	0.036	0.016	0.101	0.020	0.144	0.016	0.056
9.0 – 9.99	0.036	0.110	0.036	0.114	0.027	0.040	0.018	0.113	0.023	0.158	0.018	0.064
10.0 – 11.99	0.045	0.116	0.050	0.120	0.030	0.049	0.020	0.139	0.025	0.174	0.020	0.074
12.0 – 13.99	0.051	0.126	0.060	0.138	0.036	0.060	0.024	0.156	0.030	0.182	0.024	0.087
14.0 – 15.99	0.057	0.138	0.070	0.154	0.042	0.071	0.028	0.179	0.035	0.194	0.028	0.099
16.0 – 17.99	0.062	0.158	0.079	0.170	0.048	0.079	0.033	0.199	0.050	0.209	0.033	0.108
18.0 – 19.99	0.066	0.173	0.090	0.191	0.054	0.091	0.036	0.224	0.054	0.228	0.036	0.130
20.0 – 23.99	0.069	0.189	0.106	0.207	0.060	0.107	0.040	0.249	0.060	0.254	0.040	0.146
24.0 – 27.99	0.076	0.210	0.120	0.221	0.069	0.117	0.048	0.291	0.072	0.295	0.048	0.169
28.0 – 31.99	0.079	0.212	0.140	0.237	0.079	0.134	0.056	0.327	0.084	0.360	0.056	0.194
32 – 39.99	0.086	0.228	0.160	0.245	0.085	0.154	0.064	0.380	0.096	0.455	0.064	0.221
40 – 50	0.089	0.239	0.180	0.254	0.091	0.169	0.072	0.399	0.105	0.488	0.072	0.239

The cutting speed and feed settings depend on the following: tool length, cooling lubricant, material, stability of the machine parts and workpiece clamping. All the entries are standard values.

Repair service for tools helps you save on resources and costs.

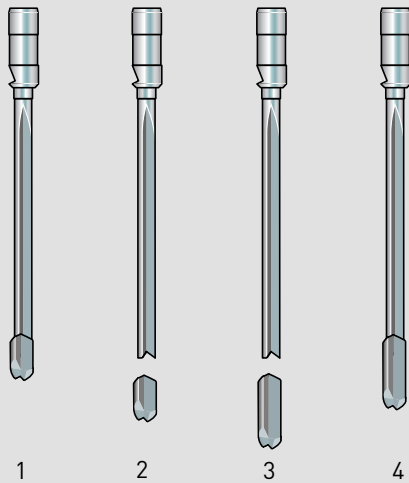
The following alternatives are available:

Resharpener tools

All deep hole drilling tools sharpened, including to customer specifications, on ultra-modern grinding machines.

Retipping carbide head

Possible if clamping element and shank are usable

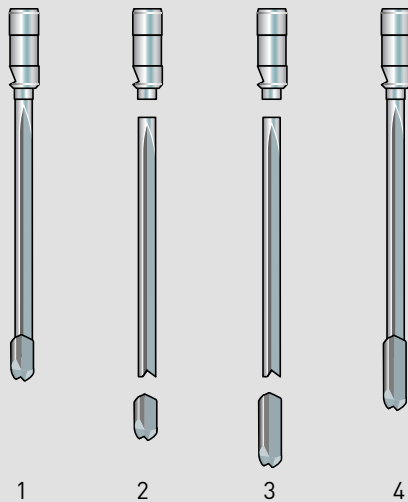


1. Condition upon delivery
2. Remove used carbide head
3. Fit new head
4. Reconditioned tool

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Retipping carbide head and (steel) shank

Possible if clamping element usable



1. Condition upon delivery
2. Remove used carbide head and shank
3. Fit new carbide head and shank
4. Reconditioned tool

Recoating

Recoating deep hole drilling tools with any standard type of coating (by arrangement).



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