TBT TIEFBOHRTECHNIK

THE DEFINITION OF PRECISION



DEEP HOLE DRILLING TOOLS AND ACCESSORIES

TBT TIEFBOHRTECHNIK

TOOLS AND ACCESSORIES

RELIABILITY, QUALITY, PRECISION AND CUSTOMER PROXIMITY - FOR OVER 60 YEARS



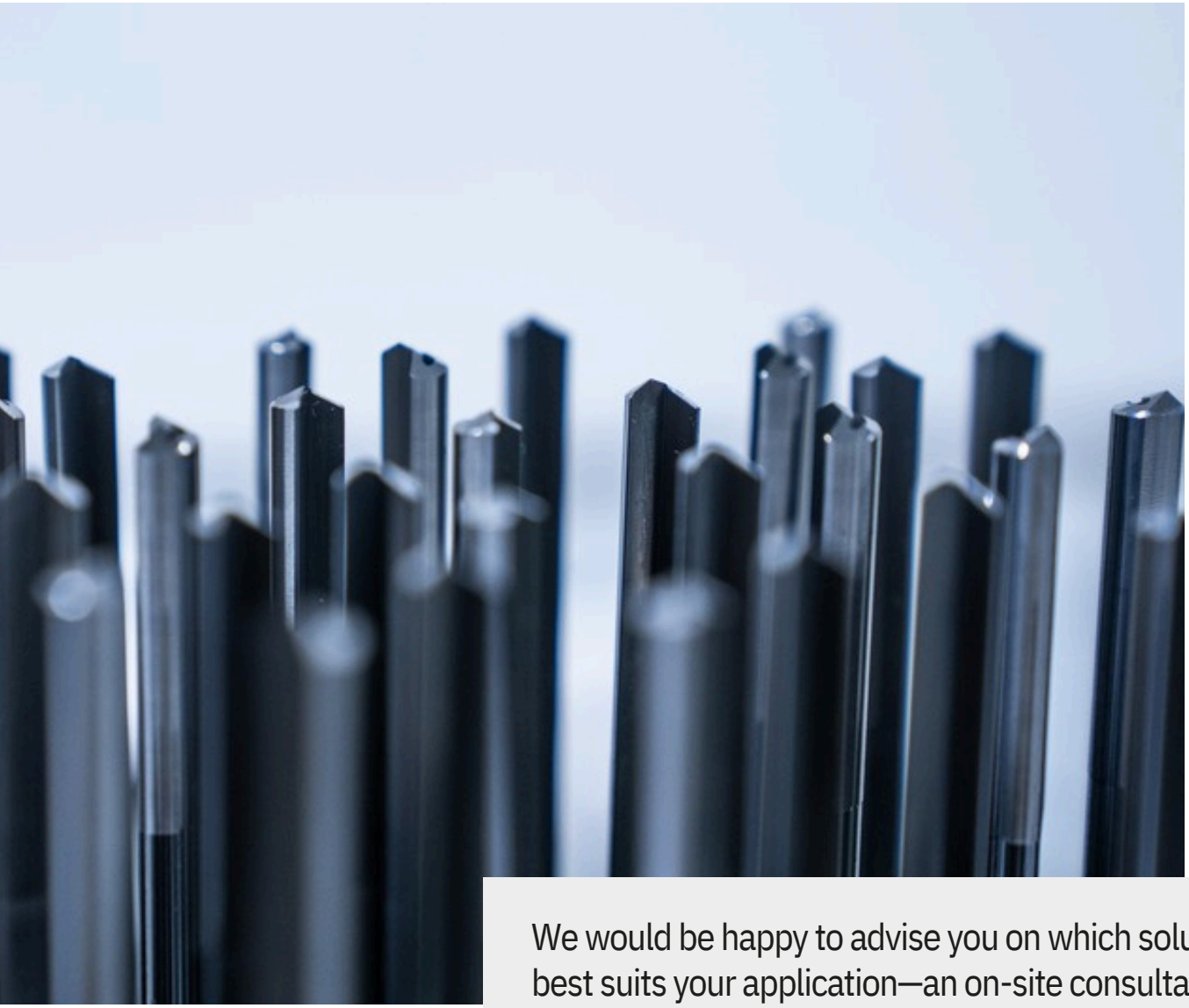
From the very beginning, TBT Tiefbohrtechnik specialized in deep-hole drilling manufacturing technology—always with the aim of competently offering machines, tools, and services from a single source.

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

TBT combines the flexibility, commitment, and customer orientation of a lean, medium-sized enterprise with a global presence. There is no region of the world where we are not represented by subsidiaries or experienced representatives. With our highly qualified and dedicated employees, your deep-hole drilling project is in the very best hands.

ISO 9001 CERTIFIED

ISO 14001 CERTIFIED



We would be happy to advise you on which solution best suits your application—an on-site consultation is available upon request.
+49 7123 976-352 | tbttools@tbt.de

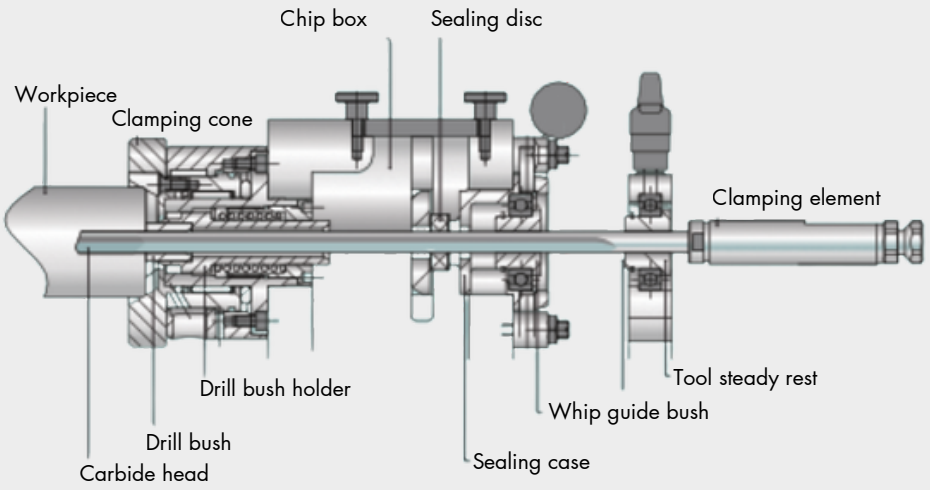
An Insight into our Production

TBT TIEFBOHRTECHNIK

PROCESSING METHODS

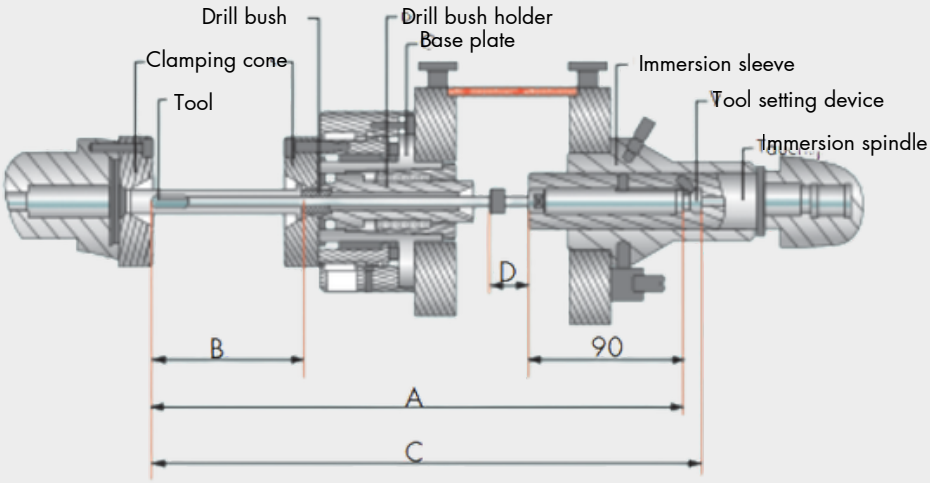
SEALING CASE PROCEDURE

In the sealing case method, single-lip deep-hole drilling tools with diameters ranging from 1.9 mm to 50 mm and lengths of up to 6,000 mm are employed; in this context, L/D ratios well in excess of 120xD are commonplace. The tools are guided by steady rests, the spacing of which should not exceed 40 to 50 times the tool diameter. Sealing against the machine spindle is achieved via a sealed housing equipped with a sealing disk.



IMMERSION PROCEDURE

Single-lip solid drilling tools with diameters ranging from 0.7 to 50 mm are used without steady rests, which limits the drilling depth in the plunge method to approximately 160 mm. This method is particularly suitable for short and smaller bores. Sealing is achieved via the immersion sleeve or immersion spindle.



A Tool length
B Drill depth
C Reference dimension
D Adjustment distance depending on drill diameter

The cutting fluid is supplied under high pressure through bores in the tool, while the mixture of cutting fluid and chips is evacuated via a longitudinal groove on the shank. The cutting edge covers the entire bore radius. The tool consists of a drill head, a fluted shank, and a clamping element. The tool possesses self-guiding properties thanks to its specially designed cutting edge and guide pads.

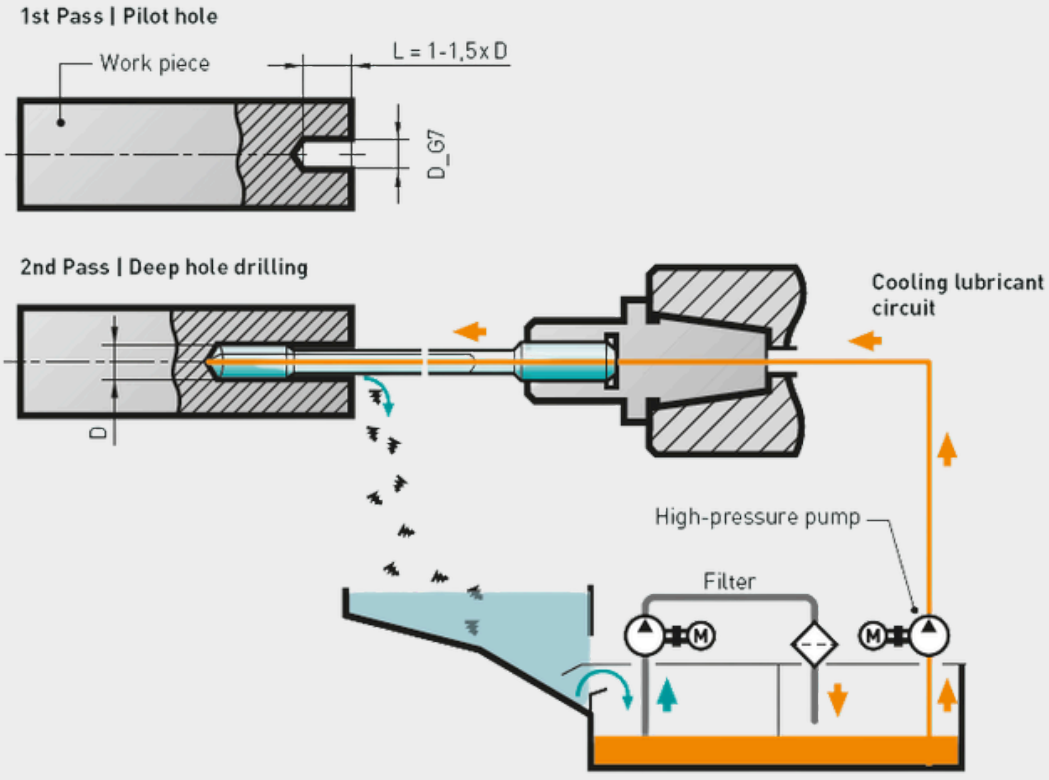
Drilling guide for
Machining centres

DEEP HOLE DRILLING ON MACHINING CENTRES

The trend towards multi-station machining has resulted in single-lip drills being used increasingly on conventional machine tools, for example on machining centres. With its combination of precision and superior drilling performance, the single-lip drill is also used for short and intricate holes.

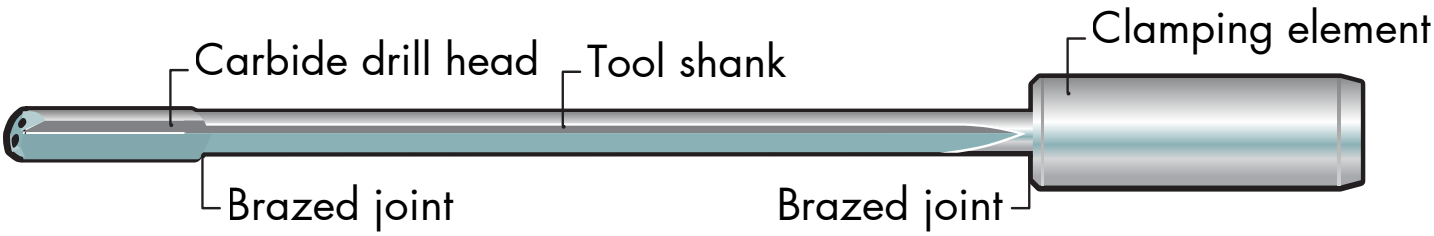
Unlike deep hole drilling machines, drill bushes are only very seldom used in conventional machine tools. As a result, a pilot hole has to be drilled in the work piece first if a single-lip drill is to be used.

This hole has to meet specific requirements, for example, regarding diameter tolerance or guide length. Our expert team at TBT will be happy to advise you on the appropriate tools from the TBT range, for example single-lip drill, step drill or solid carbide drill, from the TBT range, for example single-lip drill, step drill, solid carbide drill and with indexable inserts.



TBT TIEFBOHRTECHNIK

TOOLS
SINGLE-LIP DRILL, BRAZED



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

Diameter range:	1.9 – 50.0 mm
Length:	up to 6000 mm
Effective tool length:	40 – 50 x D

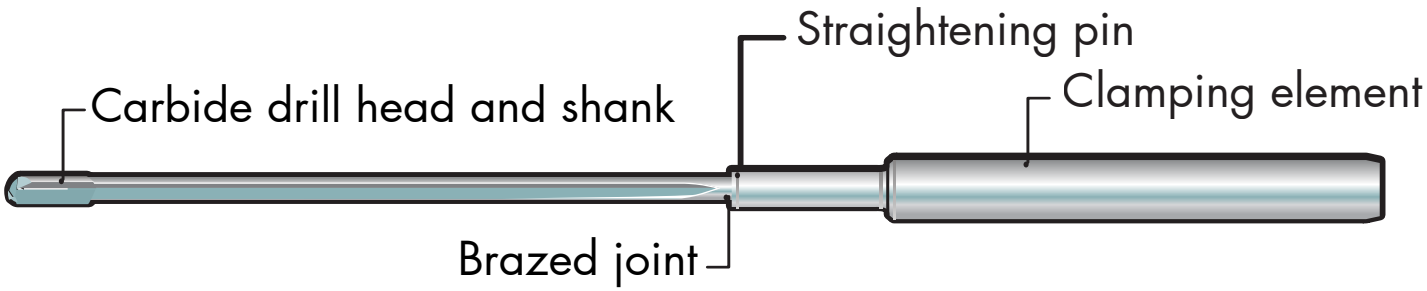
Cooling lubricant required - deep hole drilling oil preferred

Filter resolution:	10 – 20 µm
Viscosity:	Ø 1.9 – 50 mm = 10 – 20 mm^2 /S



Insight to our solid carbide tool production

SOLID CARBIDE SINGLE-LIP DRILLS



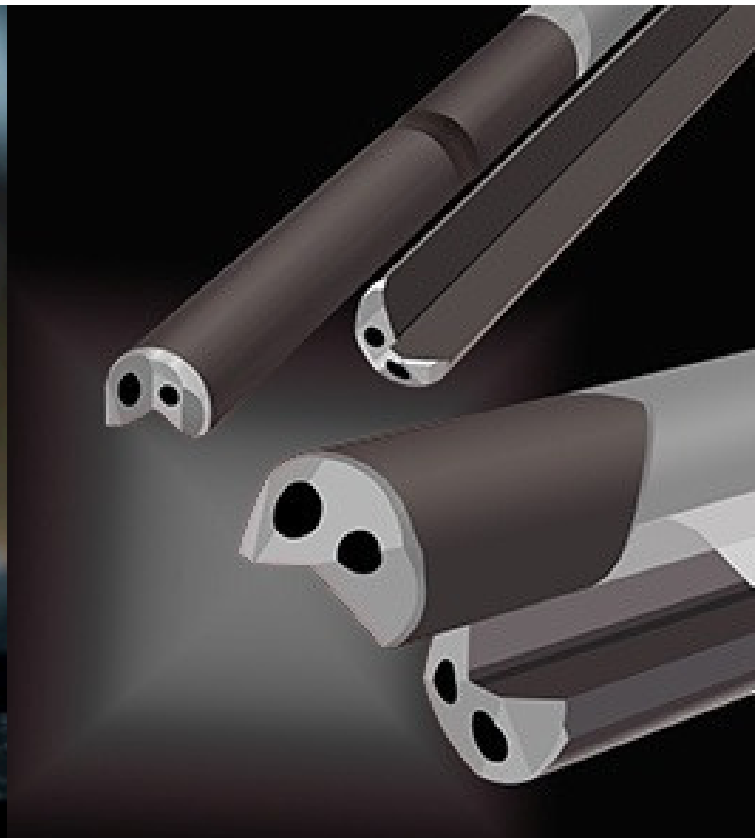
In terms of tool construction, the drill head and shank are manufactured from a single carbide blank. This tool offers exceptional process reliability and high performance. Extended tool life is achieved due to minimal torsional vibration. This type of tool is designed either as a solid (monoblock) unit or with an additional steel clamping element.

Diameter range:	0.7 – 12.0 mm
Length:	up to 600 mm
Effective tool length:	80 – 100 x D

Cooling lubricant required - deep hole drilling oil preferred

Filter resolution:	5 – 10 µm
Viscosity:	Ø 0.7 – 2.0 mm = 7 – 10 mm^2 /S
	Ø 2.0 – 12 mm = 10 – 20 mm^2 /S





TBT TIEFBOHRTECHNIK

Replacement of wear parts

SINGLE LIP DRILLS WITH INDEXABLE INSERTS

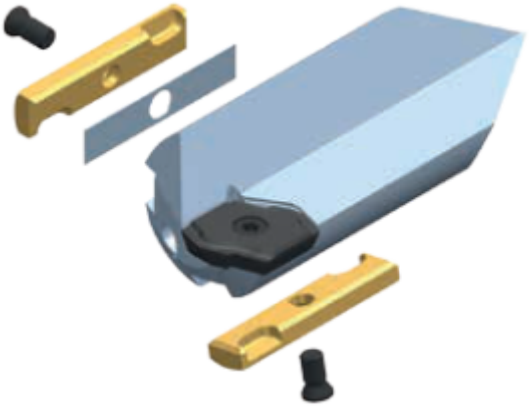


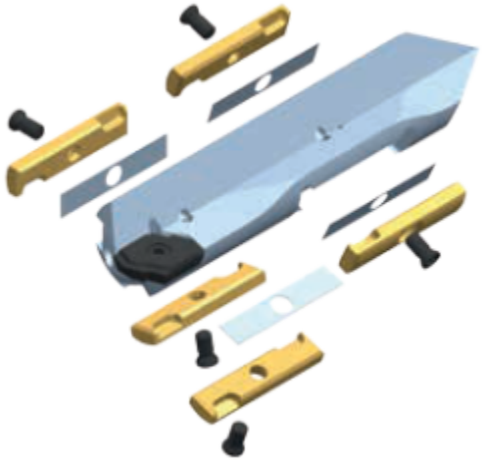


Highlights

1. High cost-efficiency due to a specially developed cutting edge geometry for optimal chip formation.
2. Short downtime due to rapid replacement of wear parts on the clamped tool.
3. Easy handling, no regrinding, no length adjustment, simple inventory management for wear parts.
4. Long tool life due to full coating and cutting edge preparation.
5. Rapid availability due to wear parts held in stock.

Material	cutting speed	feed rate mm / rev		
	Vc m/min	Ø 11,50 - 17,99 mm	Ø 18,00 - 24,99 mm	Ø 25,00 - 28,00 mm
Construction steel	80 - 100	0,055 - 0,100	0,080 - 0,110	0,100 - 0,140
Case hardened steel	80 - 100	0,055 - 0,100	0,080 - 0,110	0,100 - 0,140
Case hardened steel	70 - 80	0,070 - 0,100	0,080 - 0,110	0,100 - 0,130
Heat treaded steel	70 - 90	0,070 - 0,100	0,080 - 0,110	0,100 - 0,140
Heat treaded steel	55 - 75	0,070 - 0,100	0,080 - 0,110	0,100 - 0,130
Nitriding steel	55 - 75	0,070 - 0,090	0,080 - 0,100	0,090 - 0,120
Ferritic steel	60 - 80	0,070 - 0,100	0,080 - 0,110	0,100 - 0,140
Austenitic steel	60 - 80	0,070 - 0,090	0,080 - 0,100	0,100 - 0,120
Heat resisting steel, Tool steel	50 - 70	0,070 - 0,090	0,080 - 0,100	0,100 - 0,120
Steel castings	60 - 80	0,070 - 0,100	0,080 - 0,110	0,100 - 0,140
Nodular cast iron	65 - 80	0,090 - 0,120	0,100 - 0,130	0,120 - 0,150
Cast iron	70 - 100	0,090 - 0,120	0,100 - 0,130	0,120 - 0,150
Aluminium	100 - 200	0,080 - 0,110	0,090 - 0,120	0,100 - 0,140
Copper	120 - 300	0,050 - 0,090	0,060 - 0,100	0,080 - 0,120





» Current diameter range: Ø 11.50 – 28.00 mm (will be expanded in the future)
» Cutting blade & guide pads fully coated
» Covering the whole diameter range with only 6 sizes of cutting blades
» Adjusting shim in steps of 0.01mm to fine tune diameter tolerance

Select your wear parts in the following table:

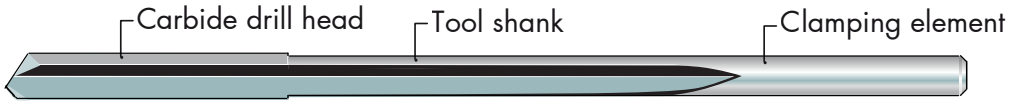
Drill Ø		Cutting insert	Screw	Guide pad	Screw	Adjusting shim
from	to					
11,50	13,99	TSTS-CB2-00 TSTS000199	M2,2x4 TSTS000613	TSTS-GC04A-P TSTS000326	M2,2x4 TSTS000613	TSTS-S04-0.14 TSTS000004
14,00	15,09	TSTS-CB2-01 TSTS000094	M2,2x4,6 TSTS000614			
15,10	17,39	TSTS-CB2-02 TSTS000095	M2,5x5 TSTS000615	TSTS-GC05A-P TSTS000091	M2,5x5 TSTS000615	TSTS-S05-0.20 TSTS000117
17,40	19,79	TSTS-CB2-05 TSTS000098				
19,80	23,89	TSTS-CB2-07 TSTS000100	M3x6 TSTS000616	TSTS-GC06-P TSTS000016	M3x6 TSTS000616	TSTS-S06-0.20 TSTS000127
23,90	28,00	TSTS-CB2-08 TSTS000181				

TBT TIEFBOHRTECHNIK

SPECIAL TOOLS

HIGH-SPEED SINGLE-LIP DRILL

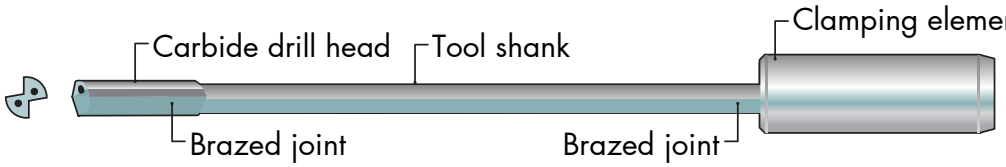




Innovative TBT high-speed cutting edge geometry, precision-ground tool surface and ultra smooth coating due to own top finishing allows for feed speeds of up to factor 5 compared with conventional carbide single-lip drills. We will be happy to provide further information on request.

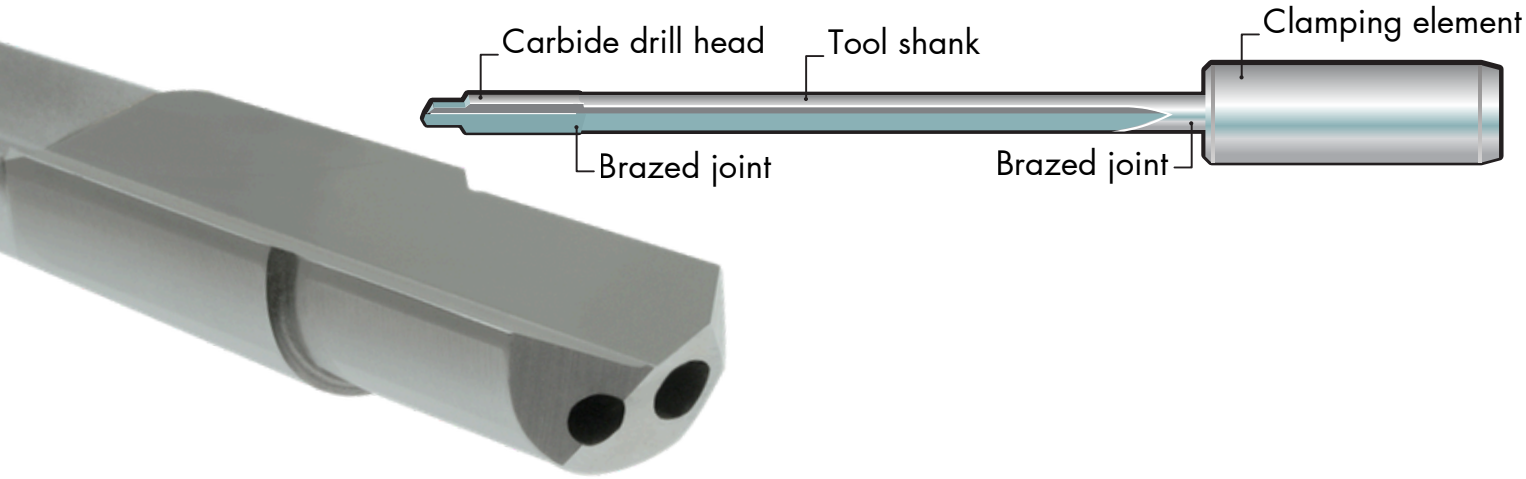
DOUBLE-LIP DRILL





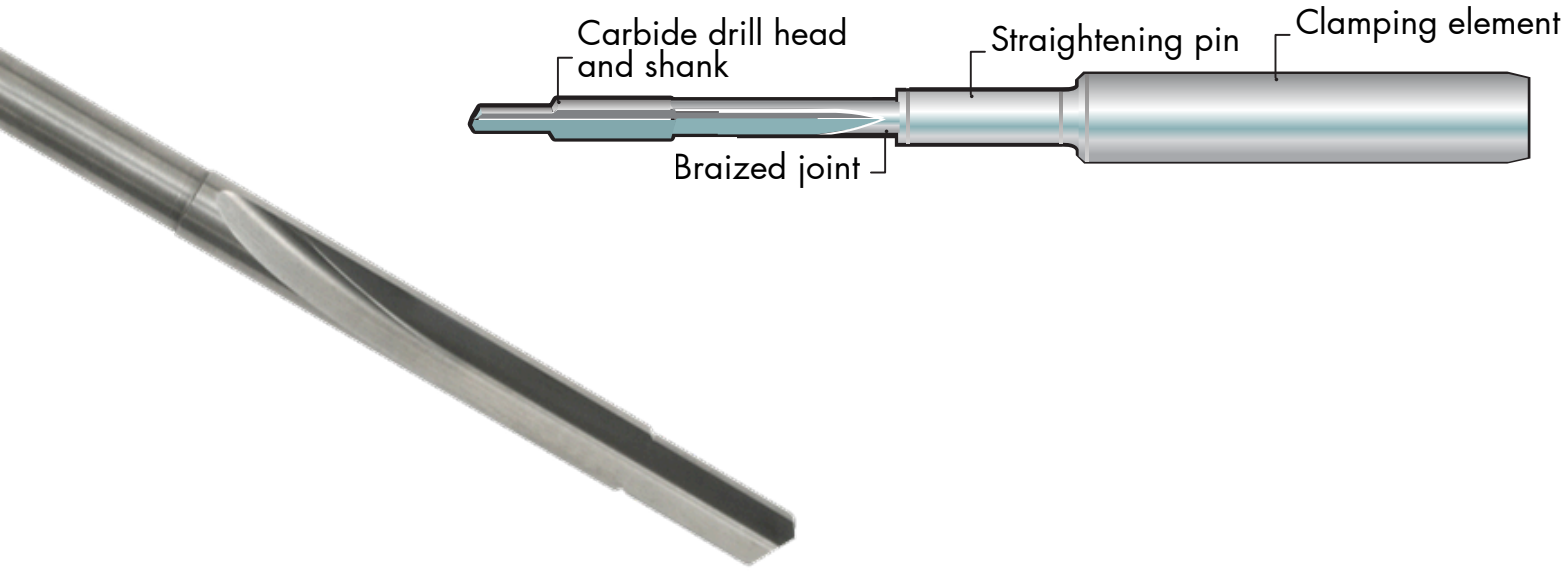
Double-lip drilling—a process related to deep-hole drilling—is used in the 6 to 25 mm diameter range. The tools feature two cutting edges and, in addition to the two burnishing lands, typically have two guide pads. These tools are manufactured either from solid carbide or as an assembly comprising a solid carbide drill head and a steel tube or solid steel shank. Due to the smaller chip space, these tools are best suited for materials that produce short chips.

STEP DRILL



Step drills are used to produce multiple hole diameters in a single operation or for specialized drilling tasks. They meet the highest standards regarding coaxiality, surface quality, and concentricity.

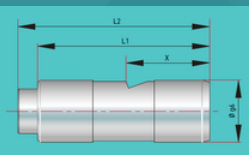
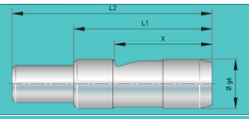
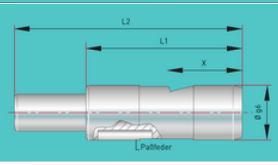
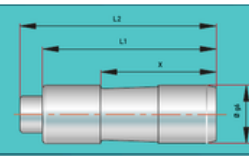
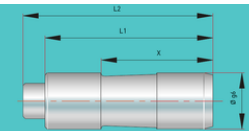
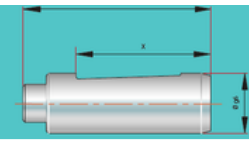
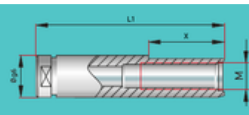
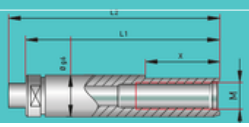
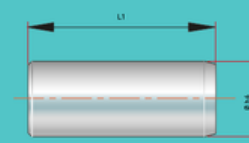
SOLID CARBIDE SINGLE-LIP STEP DRILL

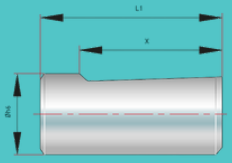
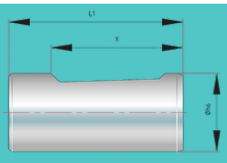
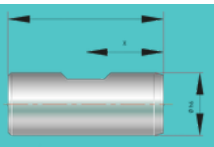
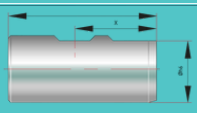


TBT TIEFBOHRTECHNIK

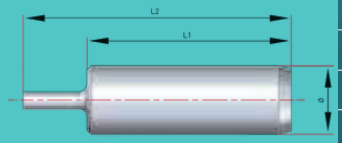
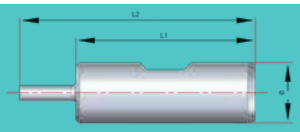
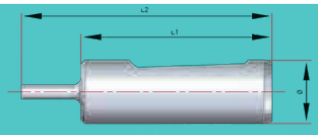
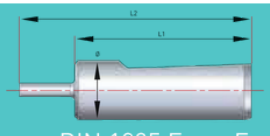
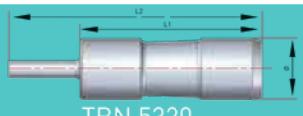
OVERVIEW - CLAMPING ELEMENTS

Clamping sleeves
In addition to a wide range of standard clamping sleeves, TBT also manufactures bespoke clamping sleeves in accordance with your specifications (drawing or sample).

Name	Diagram	L1	L2	X	M	Drill range	Article number
ø 10 x 40		40	46	24,3		1,900 - 7,099	5009000
ø 16 x 45		45	53	31		1,900 - 12,099	5006872
ø 16 x 50		50	58	47,5		1,900 - 12,099	5008000
ø 25 x 70		70	78	34		1,900 - 19,799	5007000
ø 10 x 40		42	55	24,3		7,100 - 9,999	5005026
ø 16 x 45		45	65	31		11,400 - 14,949	5005519
ø 16 x 50		52	75	47,5		11,400 - 14,949	5005004
ø 25 x 70		72	105	34		19,800 - 23,799	5005003
ø 25,4 x 69,8		69,8		57,1		1,900 - 19,799	5005011
ø 31,75 x 69,8		69,8		57,1		1,900 - 25,999	5005022
ø 38,1 x 69,8		69,8		57,1		1,900 - 30,999	5005024
ø 12,7 x 38,1		38,1	58	25,4		8,300 - 12,499	5005962
ø 19,05 x 69,8		69,8	100	44,4		14,95 - 18,799	5005529
ø 25,4 x 69,8		69,8	105	57,1		19,8 - 24,799	5005339
ø 31,75 x 69,8		69,8	100	57,1		26,0 - 30,999	5005193
ø 38,1 x 69,8		69,8	100	57,1		33,0 - 40,0	5006386
ø 10 x 68		68		35	M6 x 0,5	1,9 - 6,799	5006093
ø 16 x 90		90		37	M10 x 1	1,9 - 12,099	5006094
ø 25 x 112		112		45	M16 x 1,5	1,9 - 19,799	5006095
ø 10 x 68		68	81	35	M6 x 0,5	6,8 - 9,999	5006196
ø 16 x 90		90	110	37	M10 x 1	11,4 - 14,949	5006197
ø 25 x 112		112	142	45	M16 x 1,5	19,8 - 24,799	5006198
ø 10 x 40	 DIN 6535 Form HA	40				1,9 - 6,499	5006914
ø 12 x 45		45				1,9 - 7,999	5006719
ø 16 x 48		48				1,9 - 11,399	5005802
ø 20 x 50		50				1,9 - 14,949	5006518
ø 25 x 56		56				1,9 - 19,799	5006519
ø 32 x 60		60				1,9 - 25,999	5006960

Name	Diagram	L1	L2	X	M	Drill range	Articel number
ø 10 x 40	 DIN 1835 Form E	40	28			1,9 - 7,099	5006158
ø 12 x 45		45	33			1,9 - 7,999	5005822
ø 16 x 48		48	36			1,9 - 11,399	5005872
ø 20 x 50		50	38			1,9 - 14,949	5005821
ø 25 x 56		56	44			1,9 - 19,799	5005583
ø 32 x 60		60	48			1,9 - 25,999	5005861
ø 10 x 40	 DIN 6535 Form HE	40	28			1,9 - 6,499	5006487
ø 12 x 45		45	33			1,9 - 7,999	5006458
ø 16 x 48		48	36			1,9 - 11,399	5006501
ø 20 x 50		50	38			1,9 - 14,949	5006505
ø 25 x 56		56	44			1,9 - 19,799	5006491
ø 10 x 40	 DIN 6535 Form HB	40	20			1,9 - 7,099	5005914
ø 12 x 45		45	22,5			1,9 - 7,999	5006061
ø 16 x 48		48	24			1,9 - 11,399	5005911
ø 20 x 50		50	25			1,9 - 14,949	5005886
ø 25 x 56	 DIN 6535 Form HB	56	32			1,9 - 19,799	5005887
ø 32 x 60		60	36			1,9 - 25,999	5006234
ø 40 x 70		70	40			1,9 - 29,999	5006239

Clamping elements for solid carbide tools

4 x 34 x 46	 DIN 6535-HA	34	46			0,500 - 5,800	5006878
6 x 36 x 51		36	51			0,500 - 5,800	5008255
10 x 40 x 55		40	55			0,500 - 7,000	5008126
12 x 45 x 60		45	60			0,500 - 8,300	5007374
16 x 48 x 63		48	63			0,500 - 10,000	5008018
6 x 36 x 51	 DIN 6535 Form HB	36	51			0,500 – 5,800	5008827
10 x 40 x 55		40	55			0,500 – 7,000	5007159
12 x 45 x 60		45	60			0,500 – 8,300	5007726
16 x 48 x 63		48	63			0,500 – 10,000	5007260
6 x 36 x 51	 DIN 6535 Form HE	36	51			0,500 – 5,800	5008450
10 x 40 x 55		40	55			0,500 – 7,000	5007156
12 x 45 x 60		45	60			0,500 – 8,300	5008462
16 x 48 x 63		48	63			0,500 – 10,000	5007808
6 x 36 x 51	 DIN 1835 Form E	36	51			0,500 – 5,800	5008828
10 x 40 x 55		40	55			0,500 – 7,000	5007328
12 x 45 x 60		45	60			0,500 – 8,300	5008829
16 x 48 x 63		48	63			0,500 – 10,000	5008471
12,7 x 38,1 x 53	 TBN 5320	38,1	53			0,500 – 8,300	5007536

TBT TIEFBOHRTECHNIK

TECHNICAL SPECIFICATIONS

		>			> >			> > >			> > > >		
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 mean roughness **Ra**	µm	50	25	12.5	6.30	3.20	1.60	0.80	0.40	0.20	0.10	0.05	0.02

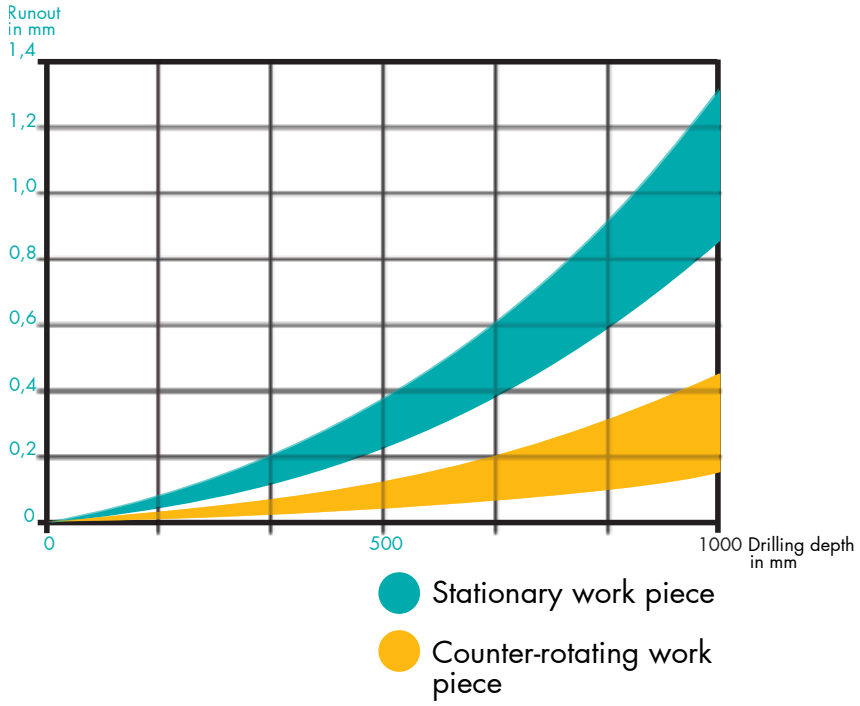
Surface quality (reference values)

SURFACE QUALITY

The radial energy generated during drilling is transferred to the bore wall through the guide pads, resulting in the surface being pressed smooth.

This effect can be increased even more by adjusting the design of the guide pads, giving an outstanding surface quality.

Diameter tolerance
Diameter tolerances of up to IT 7 can be achieved in production with TBT single-lip drills.



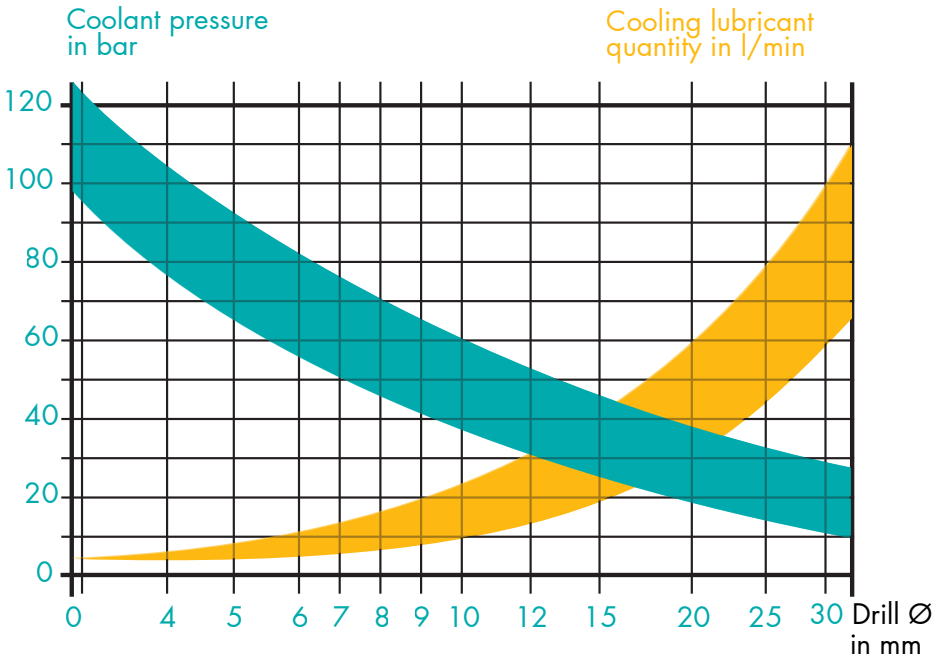
Runout (reference values)

RUNOUT

As a result of the drill bush or the pilot bore on the work piece together with the bore itself, the single-lip drill achieves precision, restricted guidance, and the drift is, therefore, kept to a minimum.

COOLING LUBRICANTS

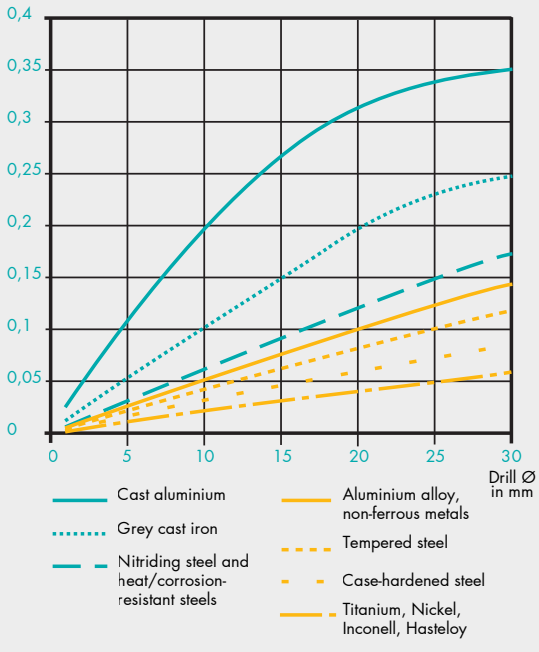
An efficient and correctly dimensioned coolant system and filter are required in order to ensure the economic viability and process reliability of deep hole drilling. A further consideration is the requirement to adhere to a minimum level of fat content (depending on the material) when using emulsion. We recommend the use of deep hole drilling oil for small drill diameters and highalloy steels.



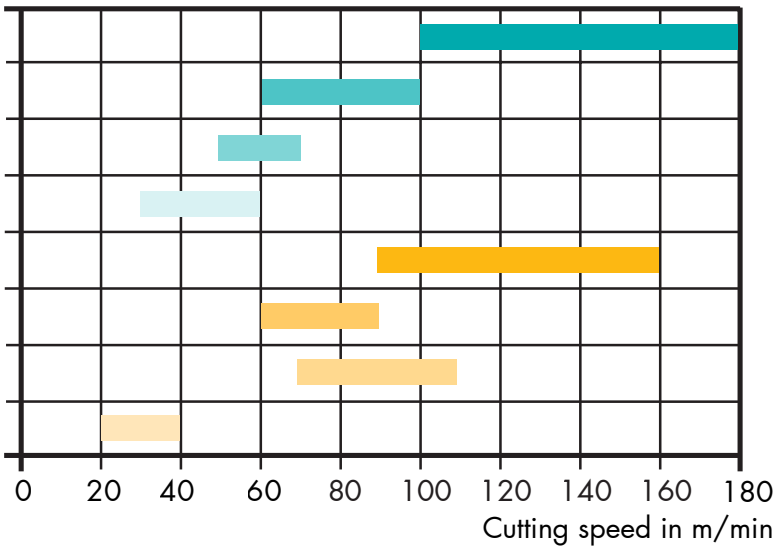
Cooling lubricants (reference values)

CUTTING SPEED

Please see the tables on pages 22 – 25. for details of the various cutting speeds and feed values.



Feed (reference values)



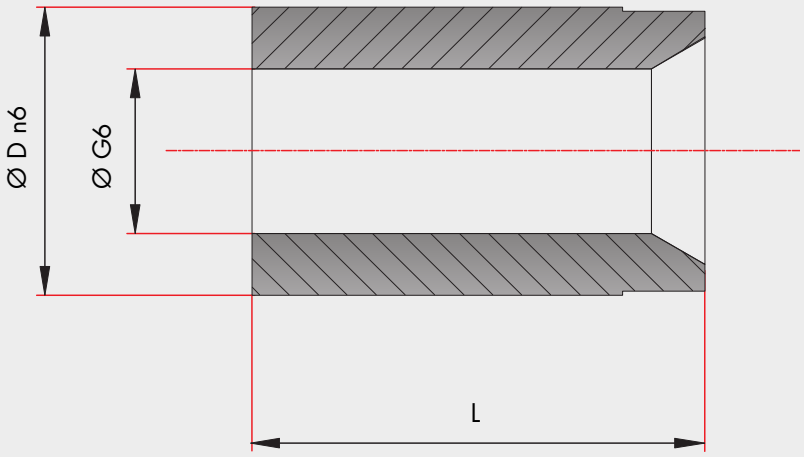
Cutting speed (reference values)

TBT TIEFBOHRTECHNIK

DRILL BUSHES

Centring guide at the start of drilling until the tool centres itself in the hole.
Available in steel or carbide.
Drill Bushes according to TBT standard ensure a safe and smooth chip evacuation.





DRILL BUSHES STEEL / CARBIDE VERSION

TBT standard steel / carbide	Tool-ø		D n6	L	ø 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 2302/2310	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	

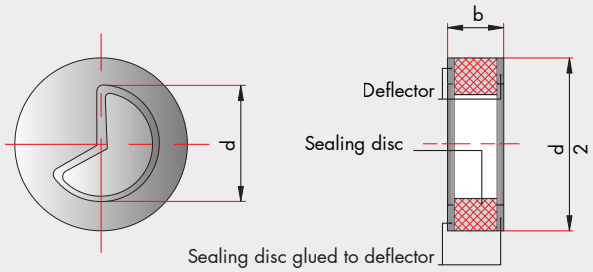
Please note when ordering:
Example of order: drill bush Ø 5.0 steel
Order text: drill bush as per TBN 2302 5.0 x 8 x11

Setting up a TBT machine

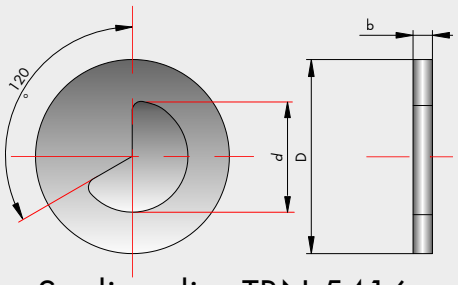
SEALING DISCS

Forms a seal between the chip box and the spindle





Sealing disc TBN 5404



Sealing disc TBN 5416

COMPOSITE 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 - 16,399	32	11	
TBN 5404	16,400 - 25,999	40	12	
TBN 5404	14,550 - 40,999	90	12	

VULKOLLAN SEALING DISC TBN 5416

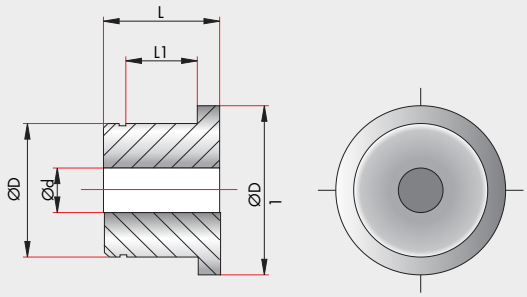
TBT standard	Tool-ø	D	b	d
TBN 5416	2,000 - 6,499	20	4	Please state tool Ø when ordering.
TBN 5416	4,800 - 20,799	32	4	
TBN 5416	6,500 - 25,999	40	4	
TBN 5416	26,000 - 41,000	90	4	

TBT TIEFBOHRTECHNIK

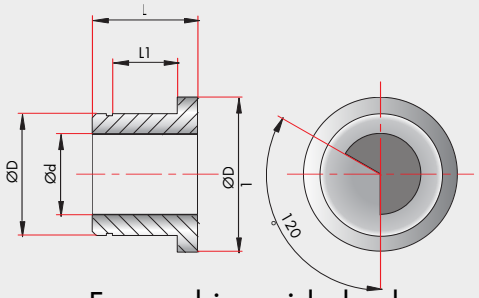
WHIP GUIDE BUSCHES

For guiding and stabilising the tool.
Made from high-quality, oil-resistant polyurethane.





Whip guide bush



Form whip guide bush

WHIP GUIDE BUSHES

TBT standard	Tool-ø	D	D1	L	L1	d
TBN 5406	1,900 - 16,399	20	26	20	12	Please state
TBN 5407	1,900 - 25,999	30	38	26	16	tool Ø
TBN 5412	1,900 - 35,999	45	50	26	16	when ordering.

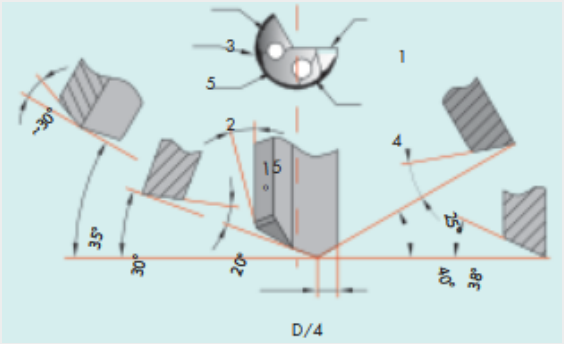
FORM WHIP GUIDE BUSHES

TBT standard	Tool-ø	D	D1	L	L1	d
TBN 5420	2,000 - 12,449	20	26	20	12	Please state
TBN 5421	4,000 - 23,799	30	38	26	16	tool Ø
TBN 5422	5,650 - 33,699	45	50	26	16	when ordering.

CUTTING EDGE GEOMETRY

Symbol	Axis A	Axis B	Axis C	Measure	Comment
1	-30°	+12°	+5°	>D/4	Set Axis C such that the chamfer during the second pass is parallel to the chip face. The width of the chamfer is the same as that of the circular grinding chamfer.
2	-30°	+20°	+6,5°	Fase 0,3...0,5	
3	+20°	+12°	-5°	D/4	
4	+30°	+12°	+55°		
5	0°	+25°	-5°		
6					Twist the single-lip drill lightly around the circumference without damaging the guide chamfer!

[There may be slight deviation in measurement due to angle distortion]



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

Changes to the cutting edge geometry of the single-lip drill could affect the drilled surface, the chip shape, drilling tolerance, drill centring, chip removal, surface quality or useful life.

Virtually all drilling tasks can be executed successfully with TBT standard grind facets. Generally speaking, special grind facets, sometimes with a chip separator / chip breaker are required when deep drilling particularly long-chipping materials or materials that are difficult to machine. We already manufacture and develop a wide range of grind sections or manufacture them to customer specifications. The standard grind facets for TBT single-lip drills depend on the drill diameter and the material to be drilled. We recommend TBT universal and tandem grinding machines for regrinding tools.

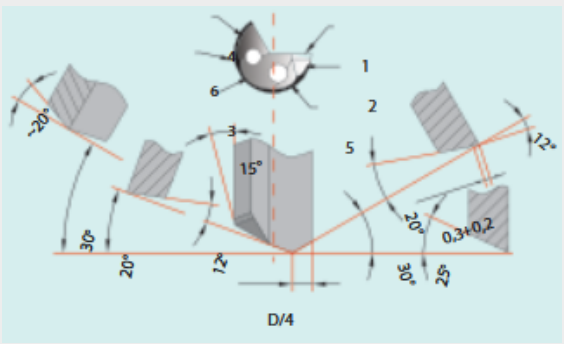
TBT cutting geometries are the result of over 60 years of research and development across our machine manufacturing, tool design, and machining service divisions.

Our cutting geometries enable you to successfully execute even challenging drilling tasks.

Leverage our experience for your applications.

Symbol	Axis A	Axis B	Axis C	Measure	Comment
1	-40°	+25°	+12°	>D/4	
2	+30°	+20°	-7°	D/4	
3	+35°	+20°	+55°		
4	0°	+38°	0°		
5					Twist the single-lip drill lightly around the circumference without damaging the guide chamfer!

[There may be slight deviation in measurement due to angle distortion]



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

TBT TIEFBOHRTECHNIK

GRINDING MACHINES

Regrinding deep hole drilling tools





Grinding machine

Our wide variety of re-sharpening devices enables you to regrind your single-lip drills yourself. Our many years of experience in this field have informed the design and manufacture of our grinding machines, devices and associated accessories.

Tandem grinding machine

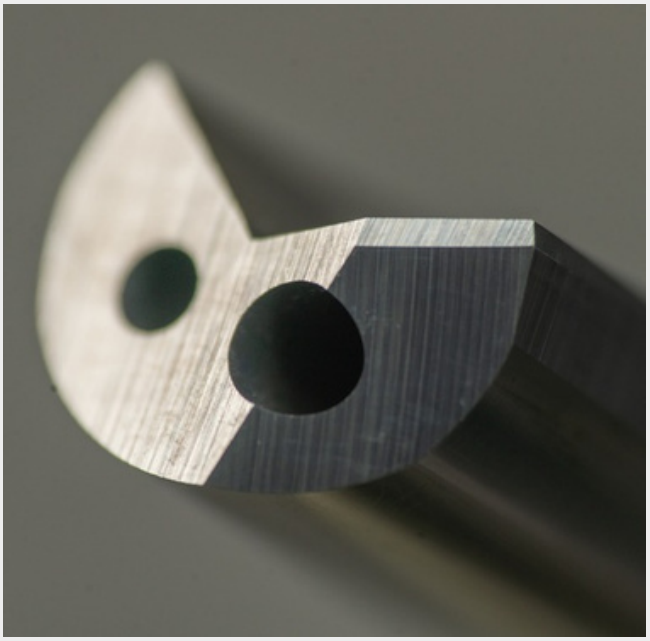
A high-precision, double-spindle grinding machine designed for precision resharpening of largerseries single-lip drills with the same cutting edge geometry and a diameter range of 2.0 mm to approx. 20 mm. Up to five different tool positions allow for all angles required for five-facet grinding to be reset, making grinding even simpler. The lateral oscillation of the spindle unit is electromechanical.

» Cutting edge geometry only has to be set once
» Fully replaceable adaptor for different geometries and for setting the geometries
» Eight different tool holder cassettes cover the entire range of tool diameters

A further accessory available is the dry dust extractor for efficient removal of any grinding dust in the work area.

GRINDING MACHINES







TBT universal grinding machine

A ready-to-operate machine for your specific requirements: the grinding spindle unit and our tried-and-tested TBT universal clamping device are mounted together on a solid plate, allowing for optimum regrinding quality for excellent drill results. A matching base and extraction unit are also available.

TBT Universal clamping device

Our universal clamping device can be used on all conventional tool grinding machines. The benefits of the clamping device used on our TBT universal grinding machine speak for themselves:

» Compact device, adjustable in three axes for grinding of all standard geometries for single-lip drills
» Device for supporting particularly long single-lip drills
» Two different clamping ranges [2.5 – 32 mm and 5.0 – 45 mm] cover a broad spectrum of tool diameters

In addition, our TBT universal clamping device can be fitted with a grinder holder with integrated lighting and 20x measurement microscope, for optimum re-sharpening of your very small single-lip drills (1.0 –3.5 mm).

TBT TIEFBOHRTECHNIK

CUTTING DATA

Reference values for deep hole drilling of 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, titanium, titanium alloys		Stainless, acid-resistant steel + cast steel, austenitic 18 – 25% Cr, Ni > 8%		Stainless steel + cast steel, martensitic / ferritic 13 – 25% (sulphurated) "good machinability"		Alloyed tempered steels, case-hardened steels, nitriding steels, tool steels, (> 900N/mm²)	
Cutting speed in m/min	25 – 60		30 – 60		40 – 70		60 – 80	
	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	0,0007	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

Cutting speed and feed levels depend on: tool length, cooling lubricant, material and the stability of the machine elements and work piece clamping. All values are reference values.

CUTTING DATA

Reference values for deep hole drilling of various materials for **solid carbide** single-lip drills

Material groups	Cast iron, grey cast iron (> 300 N/mm²), ductile cast iron (> 400 N/mm²), general steel casting		Cast iron, grey cast iron (< 300 N/mm²), ductile cast iron (< 400 N/mm²), malleable cast iron, white-heart malleable iron, blackheart malleable iron, "good machinability"		Non-alloy and low-alloy structural steel, machining steel, tempered steel, case hardened steel, tool steel (< 900N/mm²), "good machinability"		Copper, bronze, brass, plastics		Aluminium + cast aluminium Si content > 5%, "good machinability"		Aluminium + aluminium alloy Si content < 5%, "not hardened"	
Cutting speed in m/min	60 – 90		70 – 100		70 – 100		80 – 150		80 – 160		100 – 300	
	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

Cutting speed and feed levels depend on: tool length, cooling lubricant, material and the stability of the machine elements and work piece clamping. All values are reference values.

TBT TIEFBOHRTECHNIK

CUTTING DATA

Reference values for deep hole drilling of 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, titanium, titanium alloys		Stainless, acid-resistant steel + cast steel, austenitic 18 – 25% Cr, Ni > 8%		Stainless steel + cast steel, martensitic / ferritic 13 – 25% (sulphurated) "easily machinable"		Alloyed tempered steels, case-hardened steels, nitriding steels, tool steels, (> 900N / mm²)	
Cutting speed in m/min	25 – 60		30 – 60		40 – 70		60 – 80	
	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

Cutting speed and feed levels depend on: tool length, cooling lubricant, material and the stability of the machine elements and work piece clamping. All values are reference values.

CUTTING DATA

Reference values for deep hole drilling of various materials for single-lip drills **with brazed-on carbide head**

Material groups	Cast iron, grey cast iron (> 300 N/mm²), ductile cast iron (> 400N/mm²), general steel casting		Cast iron, grey cast iron (<300 N/mm²), ductile cast iron (< 400 N/mm²), malleable cast iron, whiteheart malleable iron, blackheart malleable iron, "good machinability"		Non-alloy and low-alloy structural steel, machining steel, tempered steel, case hardened steel, tool steel (< 900N/mm²), "good machinability"		Copper, bronze, brass, plastics		Aluminium + cast aluminium Si content > 5%, "good machinability"		Aluminium + aluminium alloy Si content < 5%, "not hardened"	
Cutting speed in m/min	60 – 90		70 – 100		70 – 100		80 – 150		80 – 160		100 – 300	
	von	bis	von	bis	von	bis	von	bis	von	bis	von	bis
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

Cutting speed and feed levels depend on: tool length, cooling lubricant, material and the stability of the machine elements and work piece clamping. All values are reference values.

TBT TIEFBOHRTECHNIK

For more than 60 years, we have stood for the highest quality, precision, and customer proximity in deep hole drilling technology.

We manufacture deep hole drilling machines and tools and carry out contract work. As a market leader in our industry, one thing drives us above all: providing our customers with absolute expertise and reliability across all areas of our business.

Machines

- **ML Series** | A true all-rounder in gun and STS/BTA drilling
- **B Series** | Our precision giants with inclined bed
- **BW Series** | Deep hole drilling, milling, and thread cutting
- **Dies** | For flat or ring dies
- **Special Solutions** | Challenge us!

Tools

- **Single-Lip Drills** | Diameter range: 0.7 mm up to well over 50 mm
- **Insert Single-Lip Drills** | Diameter range: 12 mm to 28 mm
- **Two-Lip Drills** | Diameter range: 6 mm to 25 mm
- **STS/BTA Drills** | Diameter range: 25 mm to 170 mm
- **Special Solutions** | Step drills, reaming tools, and much more

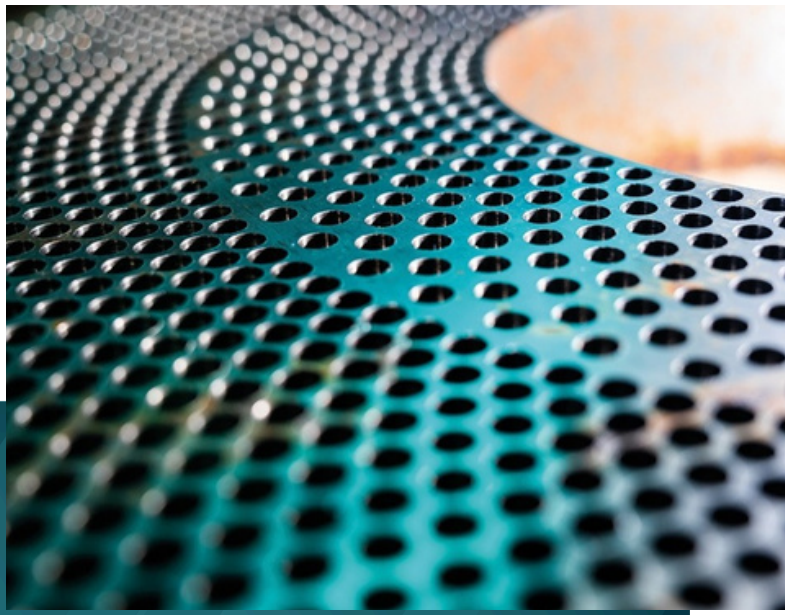
Service

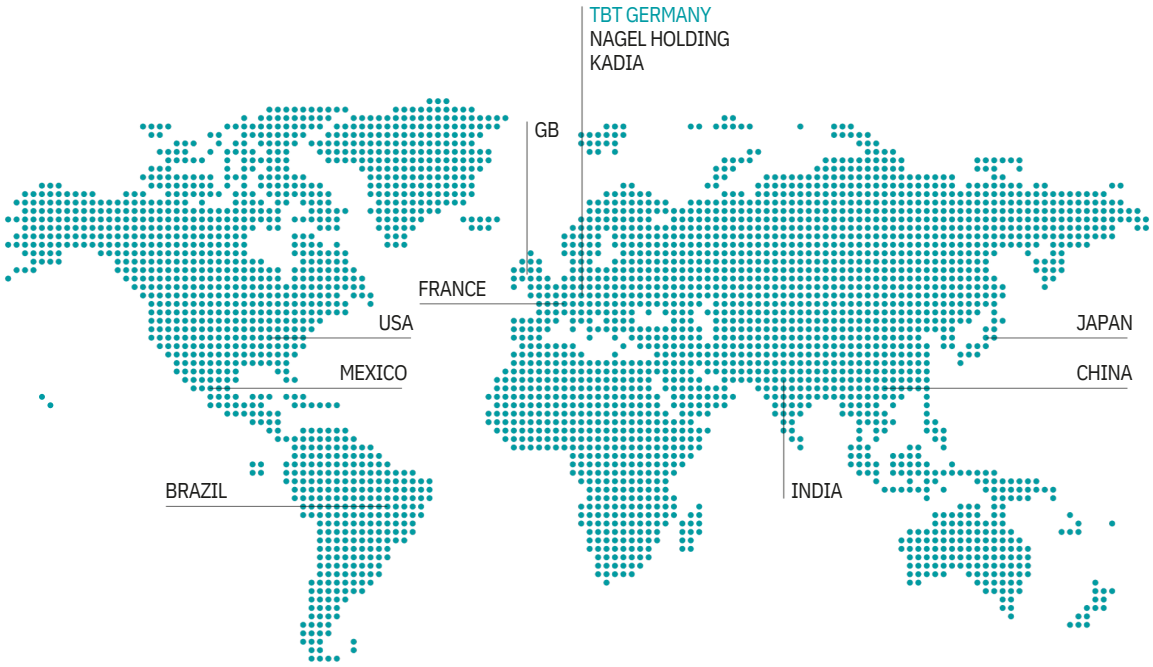
- **Remote Maintenance** | For fast analysis of your machine
- **Spare Parts** | For TBT machines and other brands
- **Used Machines** | Some available immediately from stock
- **Retrofit** | Sustainable upgrades for your old machine

Contract Drilling

- Extensive machine park
- Prototype production
- Series production
- Machines and tools from our own manufacturing
- 3D measuring room







At TBT, we combine the flexibility, commitment, and customer focus of a lean, medium-sized company with a global presence.

TBT Tiefbohrtechnik GmbH + Co
Siemensstraße 1
72581 Dettingen/Erms
Germany
info@tbt.de
www.tbt.de

TBT S.à.r.l.
Z.I. Gutenberg - 7 rue Joseph Cugnot
57200 Sarreguemines
France
contact@tbt.fr
www.tbt.fr

TBT USA Inc.
288 Dino Drive
48103 Ann Arbor, MI
USA
info@tbtgundrilling.com
tbtgundrilling.com

Nagel do Brasil
Máquinas e Ferramentas Ltd.
Av. Brasilia, 125, 13.327.900 Salto-SP
Brazil
nagel@nagel.com.br
www.nagel.com.br

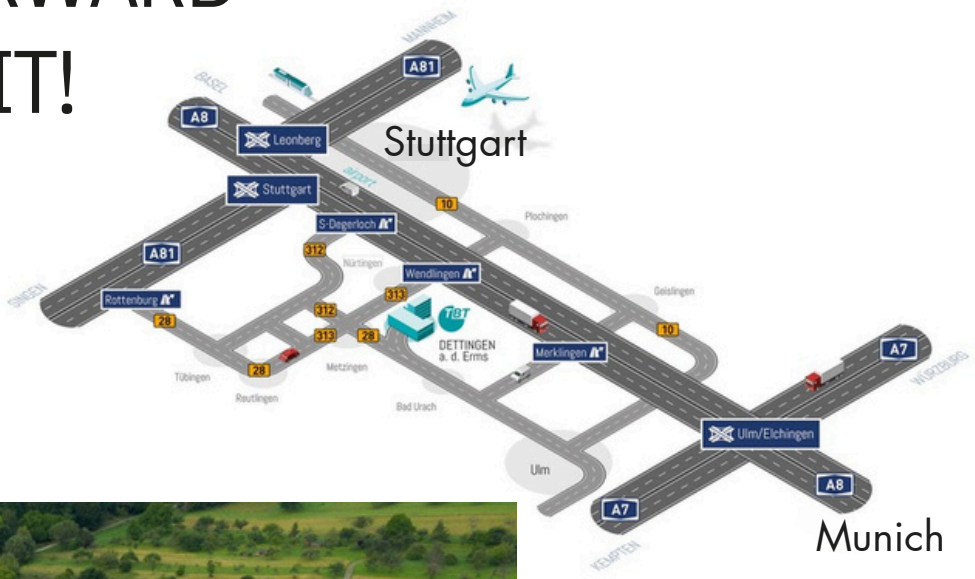
TBT U.K. Ltd.
Gorsey Lane, Coleshill
Birmingham, B46 1JU
Great Britain
info@tbtuk.com
www.tbtuk.com

TBT Tiefbohrtechnik Pvt. Ltd.
41 a/5 Mathura Enclave,
Second floor, 1st cross,
opposite to ABB,
Peenya industrial area 2nd phase,
Chok Kasandra,
Bengaluru 560 058
India
w.kiefer@tbt.de

NAGEL Machinery Trading Co. Ltd.
Room 1106; Yulin Building;
No.5 second Alley Xiangjunnanli Chao yang District
Beijing China
jiangang@nagel-tbt.com.cn
www.nagel-tbt.com.cn

We are represented in many parts of the world by subsidiaries or experienced representatives. You can find all contact details on our website.

WE LOOK FORWARD TO YOUR VISIT!





TBT TIEFBOHRTECHNIK

TBT Tiefbohrtechnik GmbH + Co
Siemensstraße 1
72581 Dettingen/Erms
Germany
T: +49 7123 976-0
F: +49 7123 976-200
info@tbt.de
www.tbt.de

Visit us online!

Website | LinkedIn | YouTube | Facebook | Instagram

As of June 2026 – Technical data subject to change