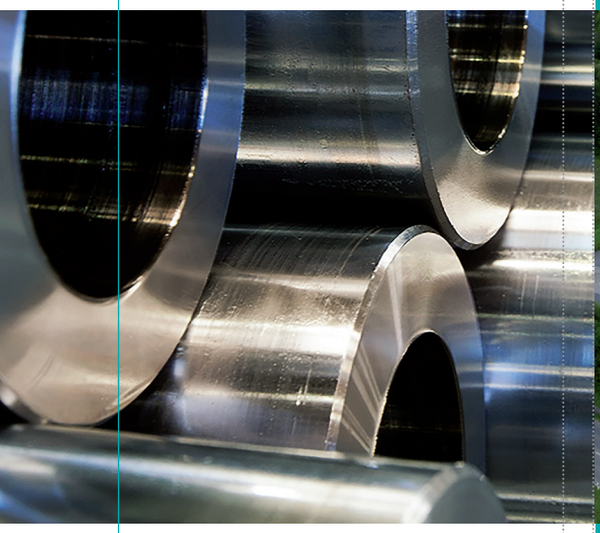
TBT TIEFBOHRTECHNIK

TBT Single Tube and Ejector tools



COMPANY HISTORY

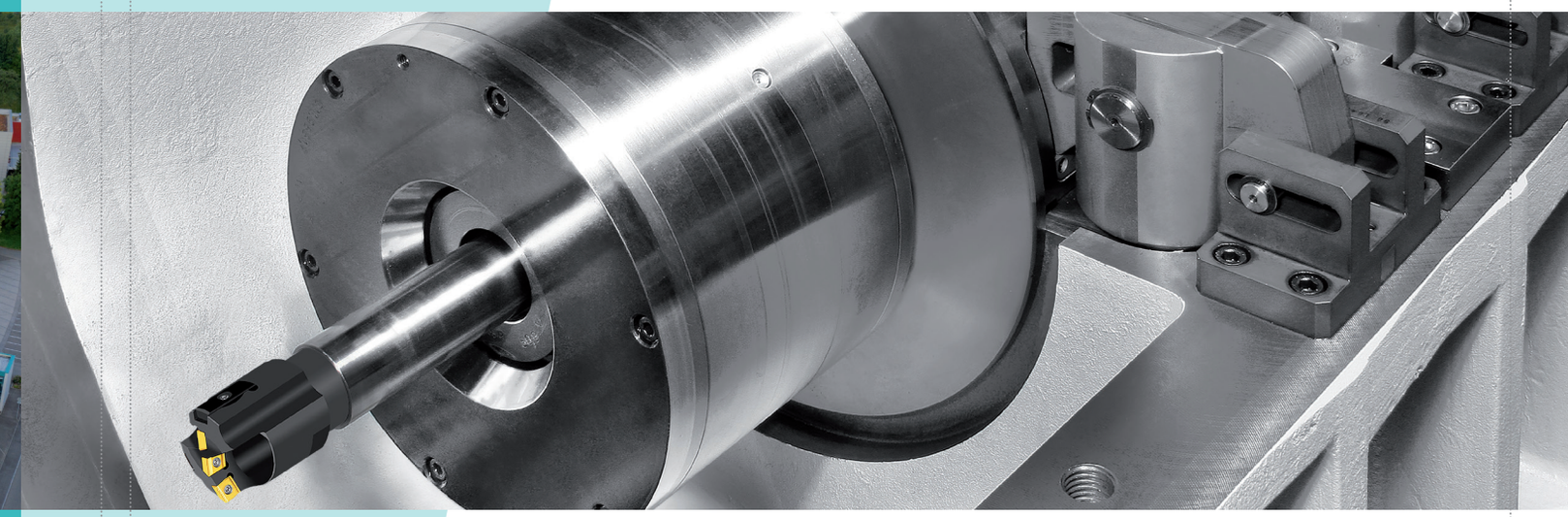
All over the world customers associate TBT Tiefbohrtechnik with reliability, quality, precision and customer proximity. And that for over 50 years.

Founded 1966 in Dettingen, Erms, the company specialized in deep drilling production technology right from the start. Always with the aim of offering machines, tools and services competently from a single source.

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

The company TBT combines flexibility, commitment and customer orientation of a lean, medium-sized company with a global presence. There is hardly any country in the world in which we are not represented by subsidiaries or experienced representatives. With our highly qualified and committed employees, your deep drilling task is in the best of hands.

CONTENTS



QUALITY

ZERTIFIZIERT
zertifiziertes
ISO 9001
Qualitätsmanagement
ZERTIFIZIERT

ZERTIFIZIERT
zertifiziertes
VDA 6.4
Qualitätsmanagement
ZERTIFIZIERT

ZERTIFIZIERT
zertifiziertes
ISO 14001
Qualitätsmanagement
ZERTIFIZIERT

Quality is the cornerstone of our corporate philosophy, shaping both our services and our products. Our stated aim is to manufacture our products to the highest standard in line with your specific requirements. Just as the market so rightly expects!

Being a certified company in compliance with DIN EN ISO 9001 and VDA 6.4 is proof that our operational processes are properly structured and that our quality management system is implemented and practised at all levels of the company. With the certificate ISO 14001 we prove our resource-efficient way of working and our responsibility towards our environment.

We see ourselves as your partner. Therefore, we aspire to a long-term working relationship with you. We seek an open and frank dialogue that will allow us to merge the expertise and experience present in both our companies, resulting in integrated and practical solutions.

Thanks to our dedicated staff, we are able to guarantee that your order will be carried out on time and exactly as required.

HIGH-PERFORMANCE PRECISISION DRILLING

TBT has been instrumental in shaping and developing deep hole technology.

In high-performance precision drilling, in addition to the single-lip drill, the so-called STS or BTA process and a modification of it, the ejector process, has proven itself in practice due to the diameter tolerances and surface qualities that are achieved, as well as the minimal deviation.

This is why the deep drilling procedure replaces drilling and reaming with a single operation in a large number of applications - and this with extremely high process reliability.

Deep drilling tools are single-edged, asymmetrical tools, i.e. only one cutting edge is engaged in each diameter to be machined. This also applies if the entire cutting width is divided into a peripheral, an intermediate and a center cutting edge, for example. During the drilling phase, the tools must therefore be guided through a drill bushing or a pilot hole.

The drills can be used not only on deep drilling machines, but also, for example, on machining centres, lathes and boring mills. Large drilling depths of up to 250 times the drilling diameter are possible, whereby the method is economical even with short drilling depths.

The cooling lubricant passes from the machine to the cutting edge of the tool through the annular space between the tool and the bore. In addition to cooling and lubricating the drill head, the pressurized cooling lubricant flushes the chips out of the bore through the inside of the tool. Due to the internal chip evacuation, there is no impairment of the generated surface.

TBT manufactures STS and ejector tools for every drilling diameter from Ø 25.00 mm to 183.90 mm.

Depending on the material to be drilled, the machine used by the customer and the specific drilling situation, we develop and manufacture the optimal tools for your task. Whether in the standard design for solid drilling or for counter drilling, we deliver solutions for the highest demands.

TBT advises you and implements your requirements for the drill head, wear parts and drill pipes quickly and consistently with the latest design and manufacturing processes.

At TBT, all wear parts required for a continuous supply of tools are always in stock.

SINGLE TUBE SYSTEM

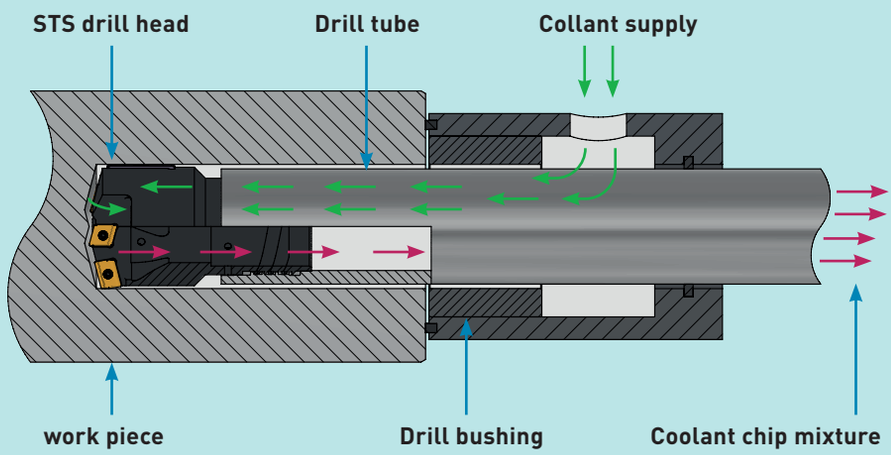
The single tube system, also known as STS or BTA deep drilling, is used for holes in the diameter range from 25.00 - 400 mm, in exceptional cases up to 1000 mm.

The cooling lubricant streams from the outside between the bore wall and the drill pipe with the aid of a pressure head or also known as BOZA. The cooling lubricant and chips flush through the inside of the drill pipe.

This prevents chips from coming into contact with the wall of the bore and thus deteriorating the quality of the bore.

The BOZA introduces the cooling lubricant into the work piece, seals the tool and the drill tube and serves as a carrier for the drill bushing. In many cases, the work piece is also supported by the BOZA.

The coolant / chip mixture streams into the inside of the tool through the chip mouth of the drill head and thus discharged from the bore.

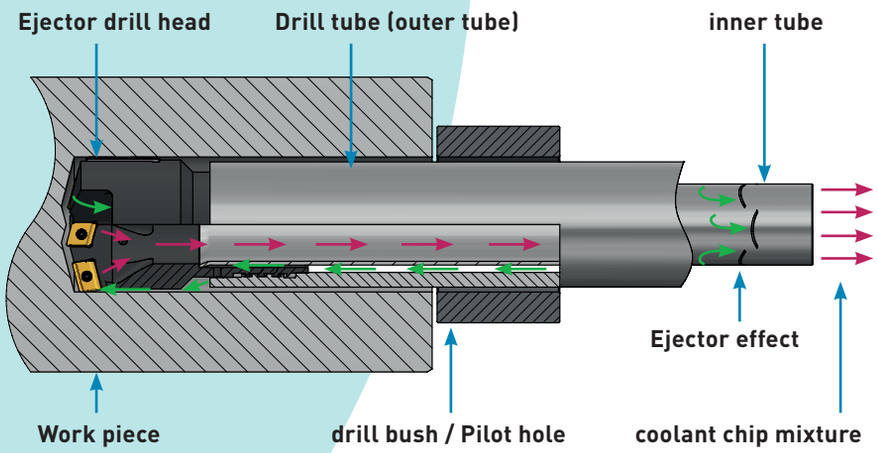


EJECTOR SYSTEM

The ejector deep drilling process is a modification of the STS process and, in contrast to this, used on universal machines such as lathes, milling machines and boring mills, since no pressure head (BOZA) is required.

In the ejector system, the drilling oil is fed in through an annular space between the drill pipe and an inner tube (double tube system). At the rear end of the inner tube and, in the case of larger diameters, also just behind the drill head, there is an annular nozzle through which a precisely measured portion of the oil volume flow reaches the inside and flows off through the inner tube. This draining oil creates a negative pressure in the front area of the drill head and in the jaws, based on the principle of a jet pump.

The remaining part of the drilling oil emerges radially outwards in front of the drill head thread, washes around the guide pads and the cutting edges and takes the chips out of the bore through the inner tube. The negative pressure ensures that the oil is sucked out of the drill head area and therefore enables to work with considerably lower pressures and volume flows than with STS drilling. A seal between work piece and tool or drill tube is not required.



TOOL: SERIES 25

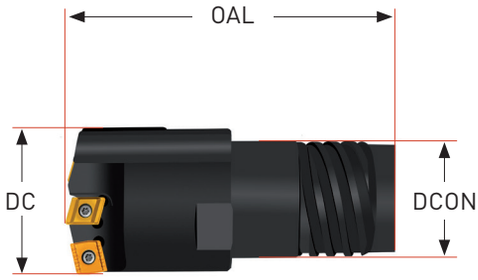
SERIES 25 SOLID DRILLING TOOLS Ø 25,00 - 65,00 MM

When deep drilling in all materials, our Series 25 tool offers a safe drilling process. An excellent surface quality and good concentricity make the tool the most productive choice for the diameter range 25.00 - 65.00 mm. The few spare parts guarantee easy handling. Already established cutting inserts and tool bodies ensure the process reliability.

Diameter range:	STS:	25.00 - 65.00 mm
	Ejector:	25.00 - 65.00 mm
Diameter increments:	0.01 mm	
Drilling depths:	150 X diameter	
Hole tolerance:	IT 10	
Surface quality:	Ra 1.6 - 3.2 µm	
Cooling lubricant:	deep drilling oil or emulsion	
Insert geometry:	G & L geometry	
Carbide coating variant:	25 & 35	

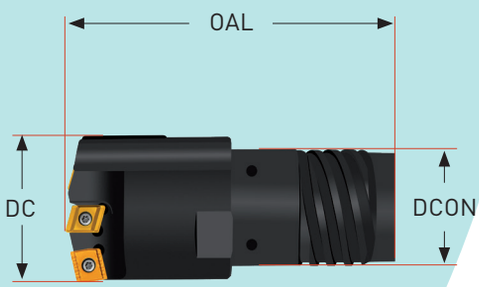
SINGLE TUBE SYSTEM

Diameter range DC		drill tube Ø	DCON	OAL
25,00	26,40	22,00	19,50	75
26,41	28,70	24,00	21,00	78
28,71	31,00	26,00	23,50	80
31,01	33,30	28,00	25,50	80
33,31	36,20	30,00	28,00	90
36,21	39,60	33,00	30,00	90
39,61	43,00	36,00	33,00	95
43,01	47,00	39,00	36,00	100
47,01	51,70	43,00	39,00	110
51,71	56,20	47,00	43,00	115
56,21	60,60	51,00	47,00	125
60,61	65,00	56,00	51,00	125

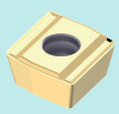
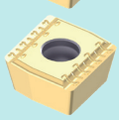
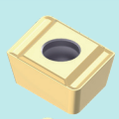
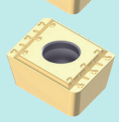
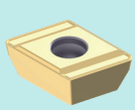
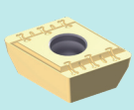
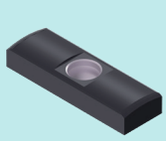


EJECTOR SYSTEM

Diameter range DC		drill tube Ø	DCON	OAL
25,00	26,40	23,50	21,00	75
26,41	28,70	26,00	23,50	78
28,71	31,00	28,00	25,50	80
31,01	33,30	30,50	28,00	80
33,31	36,20	33,00	30,00	90
36,21	39,60	35,50	33,00	90
39,61	43,00	39,00	36,00	95
43,01	47,00	42,50	39,00	100
47,01	51,70	46,50	43,00	110
51,71	56,20	51,00	47,00	115
56,21	65,00	55,50	51,00	125



TOOLS: WEAR PARTS SERIES 25

Diameter range DC		Peripheral insert	Article number	Screw	Article number
25,00	31,00		TSTS000756 [IN-P-060308-G-25] TSTS000836 [IN-P-060308-L-25]		TSTS000024 [SC-M2,2x6,5 7IP]
31,01	38,99		TSTS000753 [IN-P-08T308-G-25] TSTS000837 [IN-P-08T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
39,00	49,99		TSTS000732 [IN-P-09T308-G-25] TSTS000838 [IN-P-09T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
50,00	65,00		TSTS000759 [IN-P-11T308-G-25] TSTS000839 [IN-P-11T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
Diameter range DC		Intermediate insert	Article number	Screw	Article number
25,00	31,00		TSTS000757 [IN-I-050308-G-25] TSTS000840 [IN-I-050308-L-25]		TSTS000034[SC-M2,5x7,2 7IP]
31,01	34,99		TSTS000754 [IN-I-06T308-G-25] TSTS000841 [IN-I-06T308-L-25]		TSTS000034[SC-M2,5x7,2 7IP]
35,00	54,99		TSTS000733 [IN-I-08T308-G-25] TSTS000842 [IN-I-08T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
55,00	65,00		TSTS000760 [IN-I-12T308-G-25] TSTS000843 [IN-I-12T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
Diameter range DC		Centre insert	Article number	Screw	Article number
25,00	28,70		TSTS000758 [IN-C-050308-G-25] TSTS000844 [IN-C-050308-L-25]		TSTS000024 [SC-M2,2x6,5 7IP]
28,71	33,99		TSTS000755 [IN-C-06T308-G-25] TSTS000845 [IN-C-06T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
34,00	43,00		TSTS000734 [IN-C-08T308-G-25] TSTS000846 [IN-C-08T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
43,01	47,00		TSTS000761 [IN-C-10T308-G-25] TSTS000847 [IN-C-10T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
47,01	49,99		TSTS000762 [IN-C-12T308-G-25] TSTS000848 [IN-C-12T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
50,00	57,99		TSTS000761 [IN-C-10T308-G-25] TSTS000847 [IN-C-10T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
58,00	65,00		TSTS000762 [IN-C-12T308-G-25] TSTS000848 [IN-C-12T308-L-25]		TSTS000034 [SC-M2,5x7,2 7IP]
Diameter range DC		Guide pad	Article number	Screw	Article number
25,00	31,00		TSTS000763 [GC-061830024-20]		TSTS000034 [SC-M2,5x7,2 7IP]
31,01	39,60		TSTS000764 [GC-0702035028-20]		TSTS000740 [SC-M3,0x8,5 9IP]
39,61	47,00		TSTS000765 [GC-082545033-20]		TSTS000775 [SC-M3,5x9,4 10IP]
47,01	54,99		TSTS000766 [GC-103045040-20]		TSTS000775 [SC-M3,5x9,4 10IP]
55,00	65,00		TSTS000767 [GC-123555050-20]		TSTS000775 [SC-M3,5x9,4 10IP]

Geometry G:

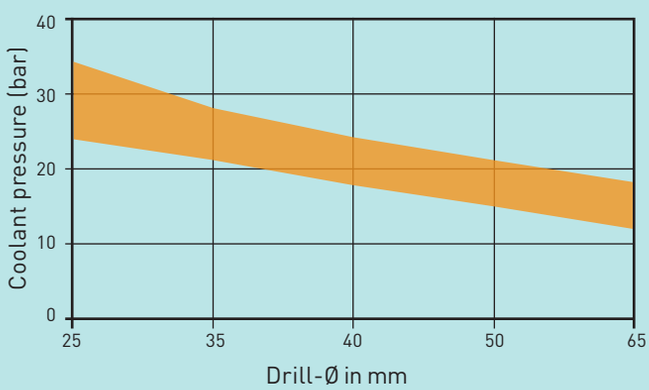
» Versatile
» High feed rates and cutting speeds possible
» Good chip control and reliable chip breaking in most materials

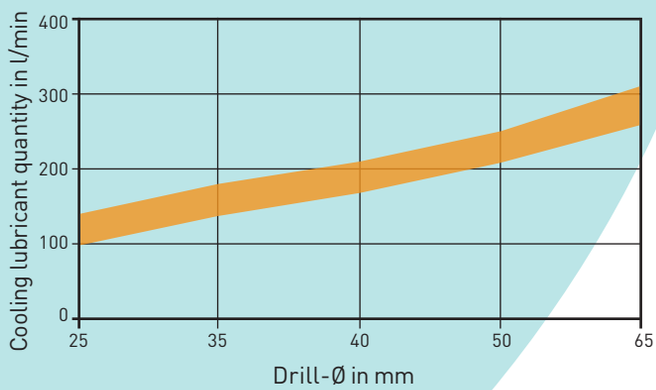
Geometry L:

» With the help of specially developed chip breakers, the geometry guarantees a safe process in materials with poor chip breaking properties

» Better chip control in deeper holes of long-chipping materials with poor chip breaking properties.

Werkstoffe	Feed f in mm / rev Cutting speed	Vc in m / min Tool diameter		
		Ø 25,00 - 30,00 mm	Ø 30,00 - 45,00 mm	Ø 45,00 - 65,00 mm
Construction and free cutting steel ≤ 700 N/mm2	75-130	0,11-0,30	0,12-0,40	0,14-0,45
Tempered steel ≤ 900 N/mm2	65-120	0,15-0,30	0,18-0,40	0,20-0,45
Tempered steel ≤ 1100 N/mm2	60-110	0,15-0,30	0,18-0,40	0,20-0,45
Case-hardened steel ≤ 700 N/mm2	70-120	0,11-0,35	0,15-0,40	0,20-0,45
Case-hardened steel ≤ 1100 N/mm2	55-110	0,11-0,35	0,15-0,38	0,20-0,40
Nitriding steel ≤ 1100 N/mm2	55-110	0,11-0,35	0,15-0,38	0,20-0,40
Heat-resistant steel tool steel	55-80	0,10-0,20	0,12-0,22	0,14-0,25
Ferritic alloy steel (Heat-resistant)	40-100	0,15-0,25	0,20-0,30	0,20-0,40
Austenitic alloy steel (stainless)	40-100	0,20-0,30	0,22-0,35	0,22-0,40
General steel casting ≤ 700 N/mm2	55-90	0,11-0,25	0,15-0,30	0,20-0,35
Compacted graphite iron ≤ 1000 N/mm2	50-110	0,11-0,35	0,15-0,40	0,20-0,40
Grey cast iron	70-110	0,11-0,35	0,15-0,40	0,20-0,40
Non-ferrous metal (Aluminium, Aluminium alloy, Copper)	70-150	0,10-0,30	0,15-0,35	0,20-0,40





Important note:

All stated values are only guidelines and may differ from the stated values depending on the application.

Please get in touch with your TBT contact person for special applications.

TBT is not liable for improper use of the deep drilling tools or for any inadequate machine requirements and operating errors!

Improper use of tools can cause breakage and hazards for equipment and operators.

SERIES 63 SOLID BORING TOOL Ø 63,50 - 135,99 MM

The Series 63 adjustable boring heads impress with their easy radial adjustment and short setting time.

Permanent precision is guaranteed by the flexible setting options. The combination of large chip evacuation channels and modern wear parts make machining extremely economical. Stable and secure mounting cartridges protect the drill head from damage and enable quick replacement.

Four indexable insert types cover the entire diameter range and are available in different grades and geometries.

Diameter range:	STS:	63.50 - 135.99 mm
	Ejector:	63.50 - 135.99 mm
Diameter increments:	0.01 mm	
Drilling depths:	100 X diameter	
Hole tolerance:	IT 10	
Surface quality:	Ra 1.6 - 3.2 µm	
Cooling lubricant:	deep drilling oil or emulsion	
Insert geometry:	G & L geometry	
Carbide coating variant:	25 & 35	

Tool body available on request.

Security notice
We are not liable for damage resulting from improper handling of our deep drilling tools, operating errors, inadequate machine requirements or improper use of our tools.

The relevant application, emission and safety regulations must be observed.

We are happy to help!

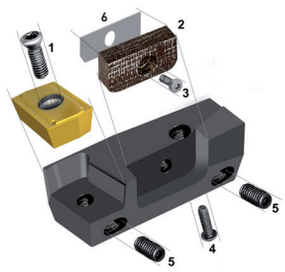
Diameter range		Drill tube Ø	radial adjust-ment	Cartridge						Guide pad	pcs
				Peripheral cutting insert	pcs	Center cutting insert	pcs	Intermediate cutting insert	pcs		
63,50	64,99	51	+1	TSTS002000	1	TSTS002002	1	TSTS002004	1	TSTS000801	2
65,00	66,99	56	+1,5	TSTS002000	1	TSTS002002	1	TSTS002004	1	TSTS000801	2
67,00	69,84	62	+1,5	TSTS002000	1	TSTS002002	1	TSTS002004	1	TSTS000801	2
69,85	71,44	62	+1	TSTS002000	1	TSTS002002	1	TSTS002004	1	TSTS000801	2
71,45	72,99	62	+0,75	TSTS002000	1	TSTS002002	1	TSTS002004	1	TSTS000801	2
73,00	74,99	68	+0,75	TSTS002000	1	TSTS002002	1	TSTS002004	1	TSTS000801	2
75,00	79,99	68	+2	TSTS002001	1	TSTS002002	1	TSTS002004	1	TSTS000802	2
80,00	82,54	75	+1,25	TSTS002001	1	TSTS002002	1	TSTS002004	1	TSTS000802	2
82,55	84,99	75	+0,75	TSTS002001	1	TSTS002002	1	TSTS002004	1	TSTS000802	2
85,00	86,99	75	+1,75	TSTS002001	1	TSTS002003	1	TSTS002004	1	TSTS000803	2
87,00	88,89	82	+1,75	TSTS002001	1	TSTS002003	1	TSTS002004	1	TSTS000803	2
88,90	94,99	82	+1,75	TSTS002001	1	TSTS002003	1	TSTS002004	1	TSTS000803	2
95,00	95,24	82	+2	TSTS002001	1	TSTS002003	1	TSTS002005	1	TSTS000803	2
95,25	99,99	82	+2	TSTS002001	1	TSTS002003	1	TSTS002005	1	TSTS000803	2
100,00	101,59	94	+1	TSTS002001	1	TSTS002003	1	TSTS002005	1	TSTS000804	2
101,60	104,99	94	+1,25	TSTS002001	1	TSTS002003	1	TSTS002005	1	TSTS000804	2
105,00	107,94	94	+0,5	TSTS002001	1	TSTS002003	1	TSTS002005	1	TSTS000804	2
107,95	109,99	94	+2	TSTS002000	1	TSTS002002	1	TSTS002004	1	TSTS000804	2
110,00	111,99	94	+1,5	TSTS002000	1	TSTS002002	1	TSTS002004	1	TSTS000805	2
112,00	114,29	106	+1,5	TSTS002000	1	TSTS002002	3	TSTS002004	1	TSTS000805	2
114,30	114,99	106	+1,75	TSTS002000	1	TSTS002002	3	TSTS002004	1	TSTS000805	2
115,00	119,99	106	+1,5	TSTS002000	1	TSTS002002	3	TSTS002004	1	TSTS000805	2
120,00	123,99	106	+1,5	TSTS002000	1	TSTS002002	3	TSTS002004	1	TSTS000806	2
124,00	124,99	118	+1,5	TSTS002000	1	TSTS002002	3	TSTS002004	1	TSTS000806	2
125,00	126,99	118	+1,75	TSTS002001	1	TSTS002002	3	TSTS002004	1	TSTS000806	2
127,00	129,99	118	+1,25	TSTS002001	1	TSTS002002	3	TSTS002004	1	TSTS000806	2
130,00	135,99	118	+0,5	TSTS002001	1	TSTS002002	3	TSTS002004	1	TSTS000807	2
136,00	183,90	Upon request									

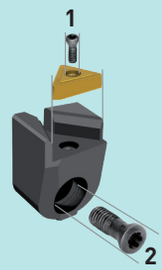
GUIDE PADS AND ADJUSTING SHIMS

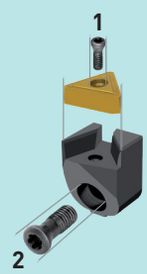
Guide pad	adjusting shim	Guide pad	adjusting shim
TSTS000801 TSTS000802 TSTS000803 TSTS000804	TSTS002025 (0,10) TSTS002026 (0,20) TSTS002027 (0,30)	TSTS000805 TSTS000806 TSTS000807	TSTS002022 (0,10) TSTS002023 (0,20) TSTS002024 (0,30)

INDEXABLE INSERTS

Peripheral cartridge	Peripheral cutting insert		Centre cartridge	Centre cutting insert		Interme-diate cartridge	Intermediate cutting insert	
TSTS 002000	TSTS000808 IN-P-13T308-G-25	TSTS000884 IN-P-13T308-L-25	TSTS 002002	TSTS000864 IN-T-16T312-G-25	TSTS000886 IN-T-16T312-L-25	TSTS 002004	TSTS000864 IN-T-16T312-G-25	TSTS000886 IN-T-16T312-L-25
TSTS 002001	TSTS000809 IN-P-180608-G-25	TSTS000885 IN-P-180608-L-25	TSTS 002003	TSTS000865 IN-T-220612-G-25	TSTS000887 IN-T-220612-L-25	TSTS 002005	TSTS000865 IN-T-220612-G-25	TSTS000887 IN-T-220612-L-25

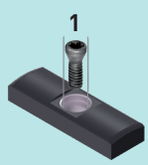






Peripheral cartridge			adjusting shim		Centre & intermediate cartridge		
TSTS002000 CA-P-1516-16	1	TSTS002006	6	TSTS002014 (0,1) TSTS002015 (0,2) TSTS002016 (0,4) TSTS002017 (0,8)	TSTS002004 / CA-I-1216-16 & TSTS002002 /CA-C-1216-16	1	TSTS000019 SC-M3,0x7,2 9IP
	2	TSTS002011				2	TSTS002009 SC-M5,0x17,25 20IP
	3	TSTS002008					
	4	TSTS002012					
	5	825450					
TSTS002001 CA-P-1822-22	1	TSTS002007	6	TSTS002018 (0,1) TSTS002019 (0,2) TSTS002020 (0,4) TSTS002021 (0,8)	TSTS002005 / CA-I-1522-22 & TSTS002003 / CA-C-1522-22	3	TSTS002007 SC-M4,0x12 15IP
	2	TSTS002013				4	TSTS002009 SC-M5,0x17,25 20IP
	3	TSTS002008					
	4	TSTS002012					
	5	825450					

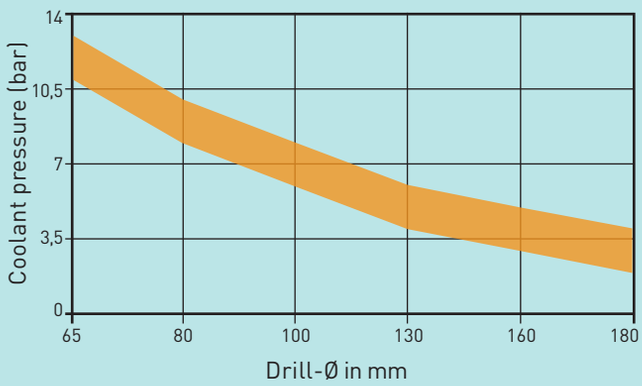
Guide pad		screw	
TSTS000801 TSTS000802	TSTS000803	1	TSTS002010
TSTS000804 TSTS000805	TSTS000806 TSTS000807	1	TSTS002009

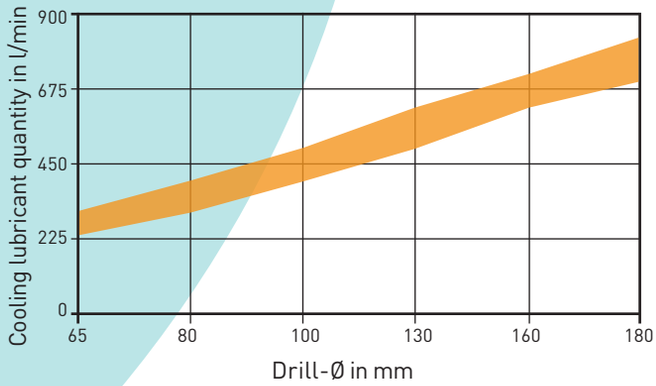


DIAMETER ADJUSTMENT SERIES 63

1. Remove the two guide pads
2. Clean and check the two guide pad seats to make sure they are free of burrs and dirt.
3. Select the adjusting shim for the corresponding guide pad. The adjustment shims are available for each guide pad size in thicknesses of 0.1, 0.2 and 0.3 mm.
4. Insert the adjusting shim under the guide pad opposite to the peripheral insert.
5. Mount the guide pad in the upper position in order to be able to measure the tool diameter.
6. For fine adjustment, the position of the peripheral insert can be adjusted radially with the adjustment screw of the cartridge.
7. Measure the tool diameter with a micrometer screw gauge.
8. Fasten the guide pad opposite to the peripheral insert in the lower position. Mount the second guide pad below the intermediate insert.

Materials	Feed f in mm / rev Cutting speed	Vc f in mm/U Tool diameter 63,50-135,99 mm
Construction and free cutting steel ≤ 700 N/mm2	80-100	0,18-0,35
Tempered steel ≤ 900 N/mm2	70-100	0,18-0,30
Tempered steel ≤ 1100 N/mm2	60-100	0,16-0,30
Case-hardened steel ≤ 700 N/mm2	80-100	0,18-0,35
Case-hardened steel ≤ 1100 N/mm2	60-90	0,18-0,30
Nitriding steel ≤ 1100 N/mm2	60-90	0,15-0,28
Heat-resistant steel tool steel	55-75	0,15-0,28
Ferritic alloy steel (Heat-resistant)	60-90	0,10-0,20
Austenitic alloy steel (stainless)	60-90	0,10-0,20
General steel casting ≤ 700 N/mm2	50-100	0,15-0,30
Compacted graphite iron ≤ 1000 N/mm2	50-100	0,16-0,35
Grey cast iron	60-100	0,16-0,35
Non-ferrous metal (Aluminium, Aluminium alloy, Copper)	65-150	0,10-0,30





Important note:

All stated values are only guidelines and may differ from the stated values depending on the application.

Please get in touch with your TBT contact person for special applications.

TBT is not liable for improper use of the deep drilling tools or for any inadequate machine requirements and operating errors!

Improper use of tools can cause breakage and hazards for equipment and operators.

SERIES 65 SOLID BORING TOOL Ø 65,00 - 165,10 MM

The Series 65 adjustable boring heads impress with their easy radial adjustment and short setting time.

Permanent precision is guaranteed by the flexible setting options. The combination of large chip evacuation channels and modern wear parts make machining extremely economical. Stable and secure mounting cartridges protect the drill head from damage and enable quick replacement.

Four indexable insert types cover the entire diameter range and are available in different grades and geometries.

Diameter range:	STS: from Ø 65.00 mm Ejector: on request
Diameter increments:	0.01 mm
Drilling depths:	100 X diameter
Hole tolerance:	IT 10
Surface quality:	Ra 1.6 - 3.2 µm
Cooling lubricant:	deep drilling oil or emulsion
Insert geometry:	G & L geometry
Carbide coating variant:	25 & 35

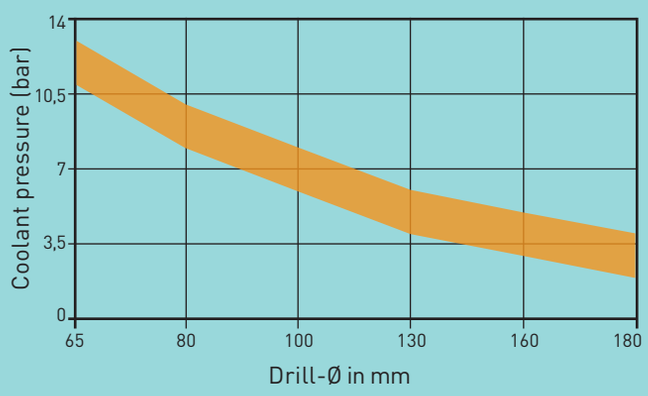
Tool body available on request.

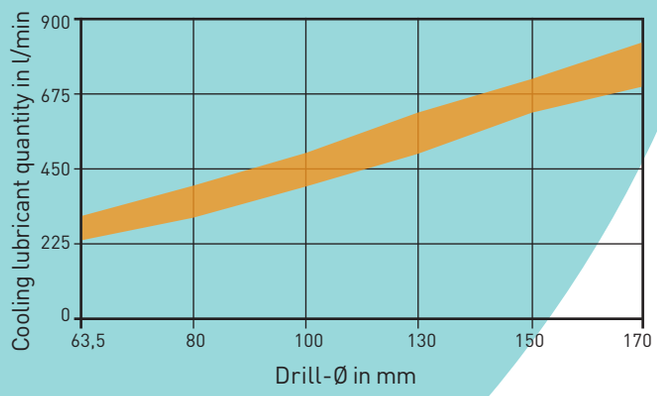
Security notice
We are not liable for damage resulting from improper handling of our deep drilling tools, operating errors, inadequate machine requirements or improper use of our tools.

The relevant application, emission and safety regulations must be observed.

We are happy to help!

Materials	Feed f in mm / rev Cutting speed	Vc f in mm/U
		Tool diameter 63,50 - 135,99 mm
Construction and free cutting steel ≤ 700 N/mm2	80-100	0,18-0,35
Tempered steel ≤ 900 N/mm2	70-100	0,18-0,30
Tempered steel ≤ 1100 N/mm2	60-100	0,16-0,30
Case-hardened steel ≤ 700 N/mm2	80-100	0,18-0,35
Case-hardened steel ≤ 1100 N/mm2	60-90	0,18-0,30
Nitriding steel ≤ 1100 N/mm2	60-90	0,15-0,28
Heat-resistant steel tool steel	55-75	0,15-0,28
Ferritic alloy steel (Heat-resistant)	60-90	0,10-0,20
Austenitic alloy steel (stainless)	60-90	0,10-0,20
General steel casting ≤ 700 N/mm2	50-100	0,15-0,30
Compacted graphite iron ≤ 1000 N/mm2	50-100	0,16-0,35
Grey cast iron	60-100	0,16-0,35
Non-ferrous metal (Aluminium, Aluminium alloy, Copper)	65-150	0,10-0,30





Important note:

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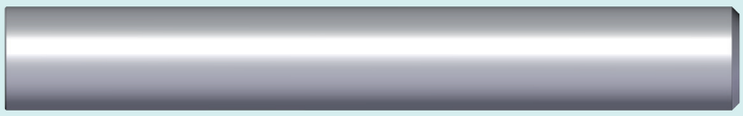
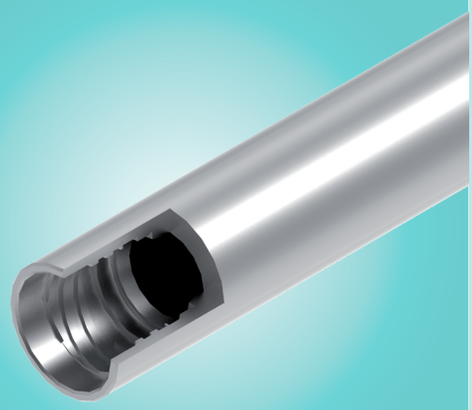
Improper use of tools can cause breakage and hazards for equipment and operators.





SINGLE TUBE SYSTEM DRILL TUBES

The STS drill tubes serve as a carrier for the drill head and as a connection between the tool and the deep drilling spindle.

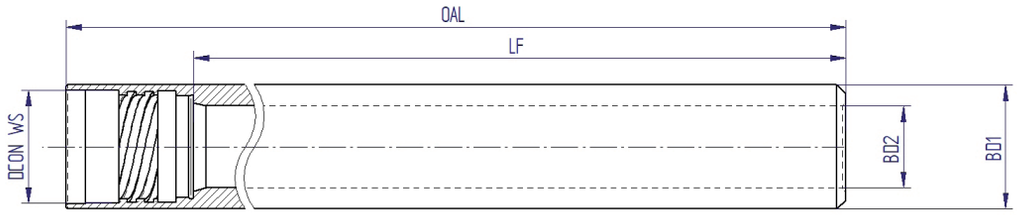
The tools are friction-locked to the drill tube by means of a thread. The drill tubes are standardized and each cover a defined drill diameter range.

The 4-turn thread connection enables the simple assembly of the STS tools:

4-thread connection:

The 4-turn thread is chosen very often because of its stability and easy-to-release connection. The 4-turn thread enable the use of thinner-walled pipes with a reduced thread depth.

The drill tubes are provided with a 4-start internal thread at one end. Other thread designs are possible on request. The maximum length for the TBT drill tubes is 6 meters.

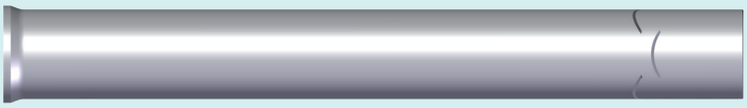


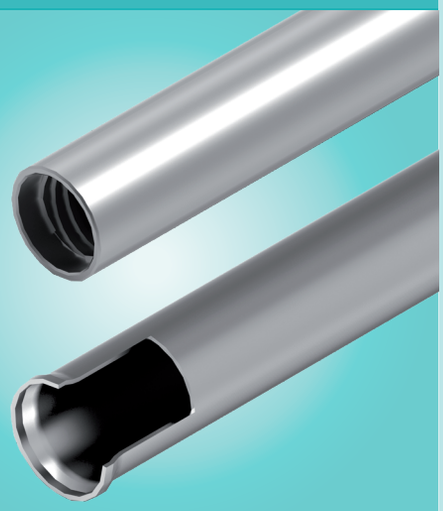
Tool Diameter range DC		BD1	BD2	DCON WS	LF	Standard OAL in mm
25,00	26,40	22,0	14	19,5	2574	2600
26,41	28,70	24,0	15,5	21,0	2574	2600
28,71	31,00	26,0	17	23,5	2571	2600
31,01	33,30	28,0	18,5	25,5	2571	2600
33,31	36,20	30,0	20	28,0	2571	2600
36,21	39,60	33,0	23	30,0	2564	2600
39,61	43,00	36,0	25,5	33,0	2564	2600
43,01	47,00	39,0	28	36,0	2564	2600
47,01	51,70	43,0	31	39,0	2564	2600
51,71	56,20	47,0	35	43,0	2560	2600
56,21	65,00	51,0	39	47,0	2560	2600
65,00	66,99	56,0	43	52,0	-	-
67,00	72,99	62,0	48	58,0	-	-
73,00	79,99	68,0	53	63,0	-	-
80,00	86,89	75,0	59	70,0	-	-
87,00	99,99	82,0	66	77,0	-	-
100,00	111,99	94,0	78	89,0	-	-
112,00	123,99	106,0	90	101,0	-	-
124,00	135,99	118,0	92	113,0	-	-
136,00	147,99	130,0	104	125,0	-	-
148,00	159,99	142,0	116	137,0	-	-
160,00	171,99	156,0	128	149,0	-	-
172,00	183,90	166,0	140	161,0	-	-

Alternative drill tube lengths on request

Outer tube

Inner tube



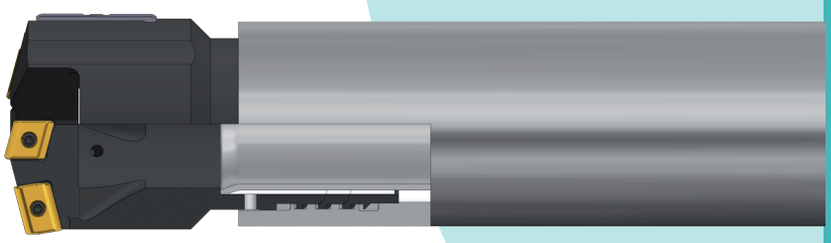


EJECTOR TUBE

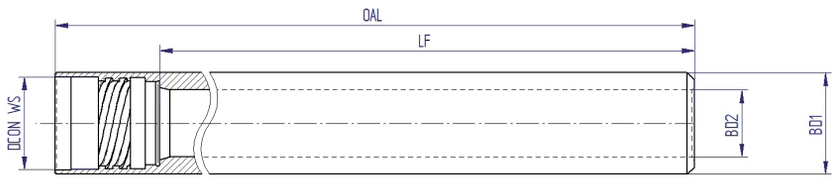
In the case of ejector drill pipes, there are outer tubes and inner tubes.

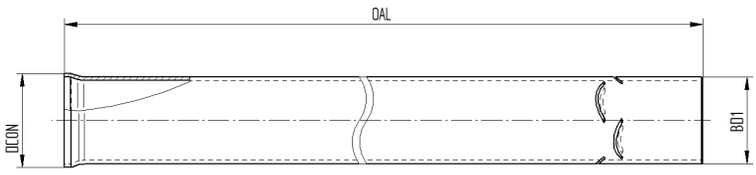
The drilling oil is supplied through an annular space between the outer pipe and the inner pipe.

At the rear end of the inner tube and, in the case of larger diameters, also just behind the drill head, there is a ring nozzle through which the oil streams inside.



Tool diameter	Inner tube
≤ 65.00 mm	30 mm longer than the outer tube
65.01-123.90 mm	190 mm longer than the outer tube
124.00-183.90 mm	220 mm longer than the outer tube

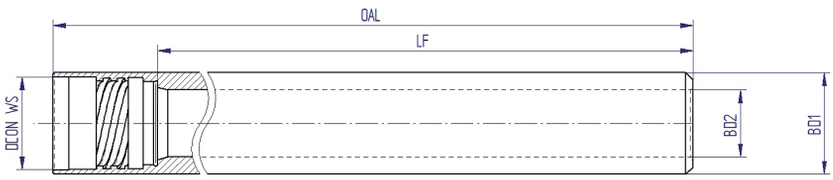


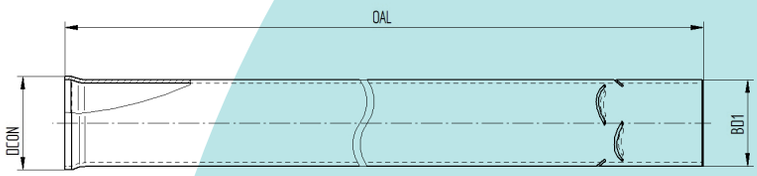


Tool Diameter range DC		Outer Tube					Inner Tube		
		BD1	DCON ws	LF	BD2	Standard OAL in mm	DCON	BD1	Standard OAL in mm
18,40	20,00	18	16	372,5	12	400	12	10	430
		20,01	16	602,5	12	630	12	10	660
		21,81	16	1042,5	12	1070	12	10	1100
20,01	21,80	19,5	18	370,0	14	400	14	12	430
		26,41	18	600,0	14	630	14	12	660
		28,71	18	1040,0	14	1070	14	12	1100
21,81	24,10	21,5	19	370,0	15	400	15	13	430
		33,31	19	600,0	15	630	15	13	660
		21,5	19	1040,0	15	1070	15	13	1100
24,11	26,40	23,5	21	370,0	16	400	16	14	430
		23,5	21	600,0	16	630	16	14	660
		23,5	21	1040,0	16	1070	16	14	1100
26,41	28,70	26	23,5	367,0	18	400	18	16	430
		26	23,5	597,0	18	630	18	16	660
		26	23,5	1037,0	18	1070	18	16	1100
28,71	31,00	28	25,5	367,0	20	400	20	18	430
		28	25,5	597,0	20	630	20	18	660
		28	25,5	1037,0	20	1070	20	18	1100
31,01	33,30	30,5	28	367,0	22	400	22	20	430
		30,5	28	597,0	22	630	22	20	660
		30,5	28	1037,0	22	1070	22	20	1100
33,31	36,20	33	30	360,0	24	400	24	22	430
		33	30	590,0	24	630	24	22	660
		33	30	1030,0	24	1070	24	22	1100

Alternative drill tube lengths on request

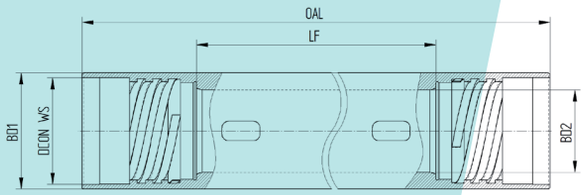
DRILLING TUBES: EJECTOR SYSTEM

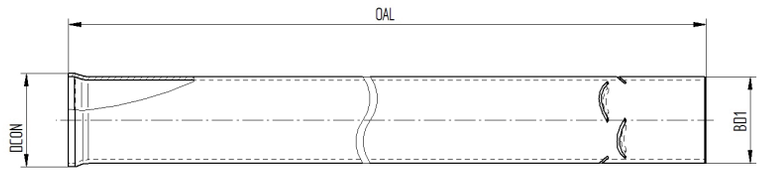




Tool-Diameter range DC		Outer Tube					Inner Tube		
		BD1	DCON ws	LF	BD2	Standard OAL in mm	DCON	BD1	Standard OAL in mm
36,21	39,60	35,5	33	360,0	26	430	26	24	430
		35,5	33	590,0	26	660	26	24	660
		35,5	33	1030,0	26	1100	26	24	1100
39,61	43,00	39	36	360,0	29	400	29	27	430
		39	36	590,0	29	630	29	27	660
		39	36	1030,0	29	1070	29	27	1100
43,01	47,00	42,5	39	360,0	32	400	32	30	430
		42,5	39	590,0	32	630	32	30	660
		42,5	39	1030,0	32	1070	32	30	1100
47,0	51,70	46,5	43	356,0	35	400	35	32	430
		46,5	43	586,0	35	630	35	32	660
		46,5	43	1026,0	35	1070	35	32	1100
51,71	56,20	51	47	356,0	39	400	39	36	430
		51	47	586,0	39	630	39	36	660
		51	47	1026,0	39	1070	39	36	1100
56,21	64,99	55,5	51	356,0	43	400	43	40	430
		55,5	51	586,0	43	630	43	40	660
		55,5	51	1026,0	43	1070	43	40	1100

Alternative drill tube lengths on request

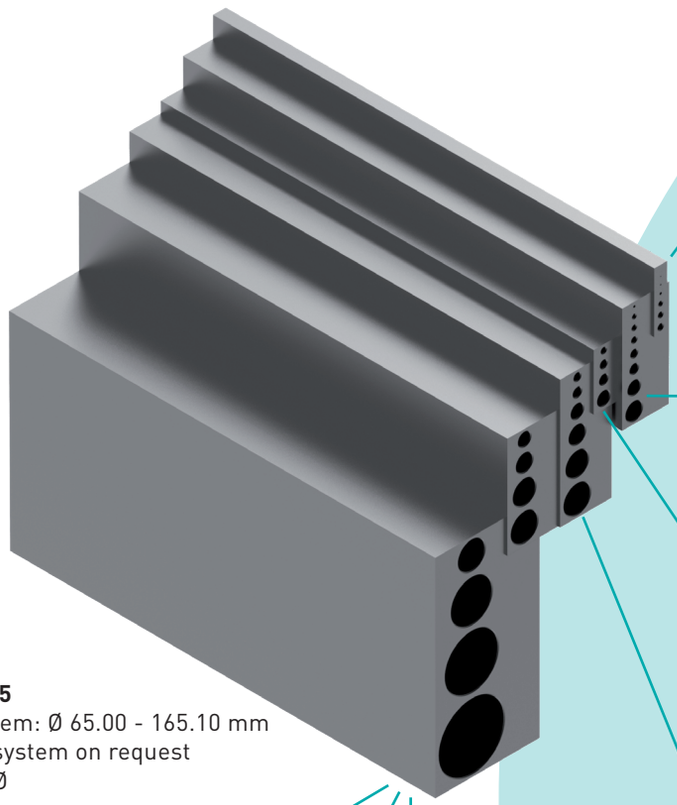




The outer tubes feature an internal thread at one or both ends.

Tool Diameter range DC		Outer Tube				Inner Tube
		BD1	DCON ws	LF	BD2	BD1
65,00	69,84	56	52	75	43	40
69,85	74,99	62	58	75	48	44
75,00	79,99	68	63	75	53	48
80,00	88,89	75	70	97	59	54
88,90	99,99	82	77	97	66	60
100,00	114,29	94	89	97	78	70
114,30	124,99	106	101	118	90	80
125,00	135,99	118	113	118	92	80
136,00	147,90	130	125	118	104	95
148,00	159,99	142	137	139	116	100
160,00	171,99	154	149	139	128	120
172,00	183,90	166	161	139	140	130

Alternative drill tube lengths on request



Solid carbide single-lip drills
Ø 0.70 - 12.00 mm
» Tool length up to 700 mm
» IT 7
» Ra 0.1 - 0.8 µm

Single-lip drill with brazed-on drill head
Ø 1.90 - 50.00 mm
» Tool length up to 6000 mm
» IT 7
» Ra 0.1 - 0.8 µm

Double lip drill
Ø 5.50 - 25.00 mm
» Tool length up to 2800 mm
» IT 10 - IT11
» Ra 0.1 - 0.8 µm

Single-lip drill with indexable inserts
Ø 12.00 - 55.00 mm
» Tool length up to 6000 mm
» IT 10 - IT11
» Ra 0.1 - 0.8 µm

Series 65
STS system: Ø 65.00 - 165.10 mm
Ejector system on request
» 100 X Ø
» IT 10
» Ra 1.6 - 3.2 µm

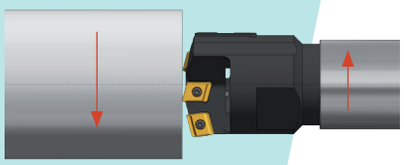
Series 63
STS system: Ø 63.50 - 135.99 mm
Ejector system: Ø 63.50 - 135.99 mm
» 100 X Ø
» IT 10
» Ra 1.6 - 3.2 µm

Series 25
STS system: Ø 25.00 - 65.00 mm
Ejector system: Ø 25.00 - 65.00 mm
» 150 X Ø
» IT 10
» Ra 1.6 - 3.2 µm

BORE CENTRE DEVIATION

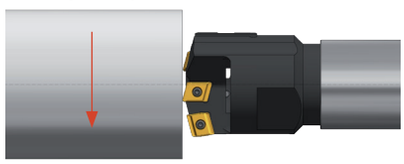
Due to the drill bushing or the pilot hole resting on the work piece and the hole itself, the tool receives a precise forced guidance, whereby the course of deviation moves within minimal limits.

Double rotation: work piece and drill



The most precise straightness in deep drilling is achieved with counter-rotation, i.e. both the drill and the work piece rotate in opposite directions. The centreline deviation per meter of drilling depth is approx. 0.25 - 0.60 mm.

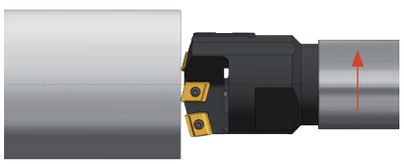
Rotating work piece



A deviation between 0.3 - 1.0 mm per meter is typical for a rotating work-piece process.

The tool stands still during this operation.

Rotating drill

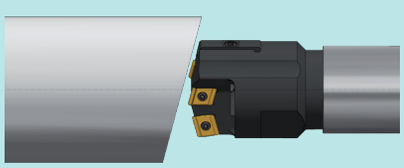


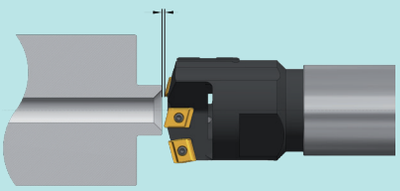
During this process, the work piece stands still and the tool rotates.

There can be a deviation between 0.3 - 1.0 mm per meter.

WORKPIECE PREPARATION

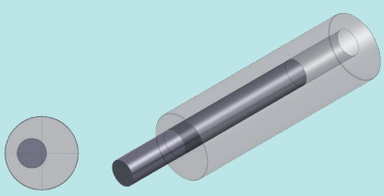
The condition of the contact surface on the work piece is a prerequisite for an optimal drilling process. A plain and clean surface is essential for machining.



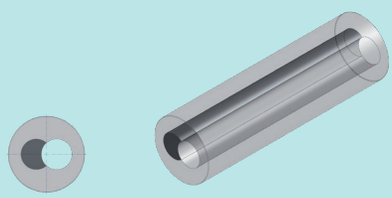


The intermediate cutting inserts enters the work piece first instead of the central cutting insert.
The centering presses the drill in the wrong direction where there is no support bar.

OVERLAPPING HOLES



So that the hole can be made without an interrupted cut, the first hole must be filled with round material.



The overlapping hole can be produced through the closed, already existing hole.

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