



■ Made  
■ in  
■ Germany



# BasicDrill

**EMUGE** ★

Solid Carbide Twist Drills

### Main area of application

The twist drill BasicDrill is universally applicable and available in the diameter range from 3.00 to 18.00 mm.

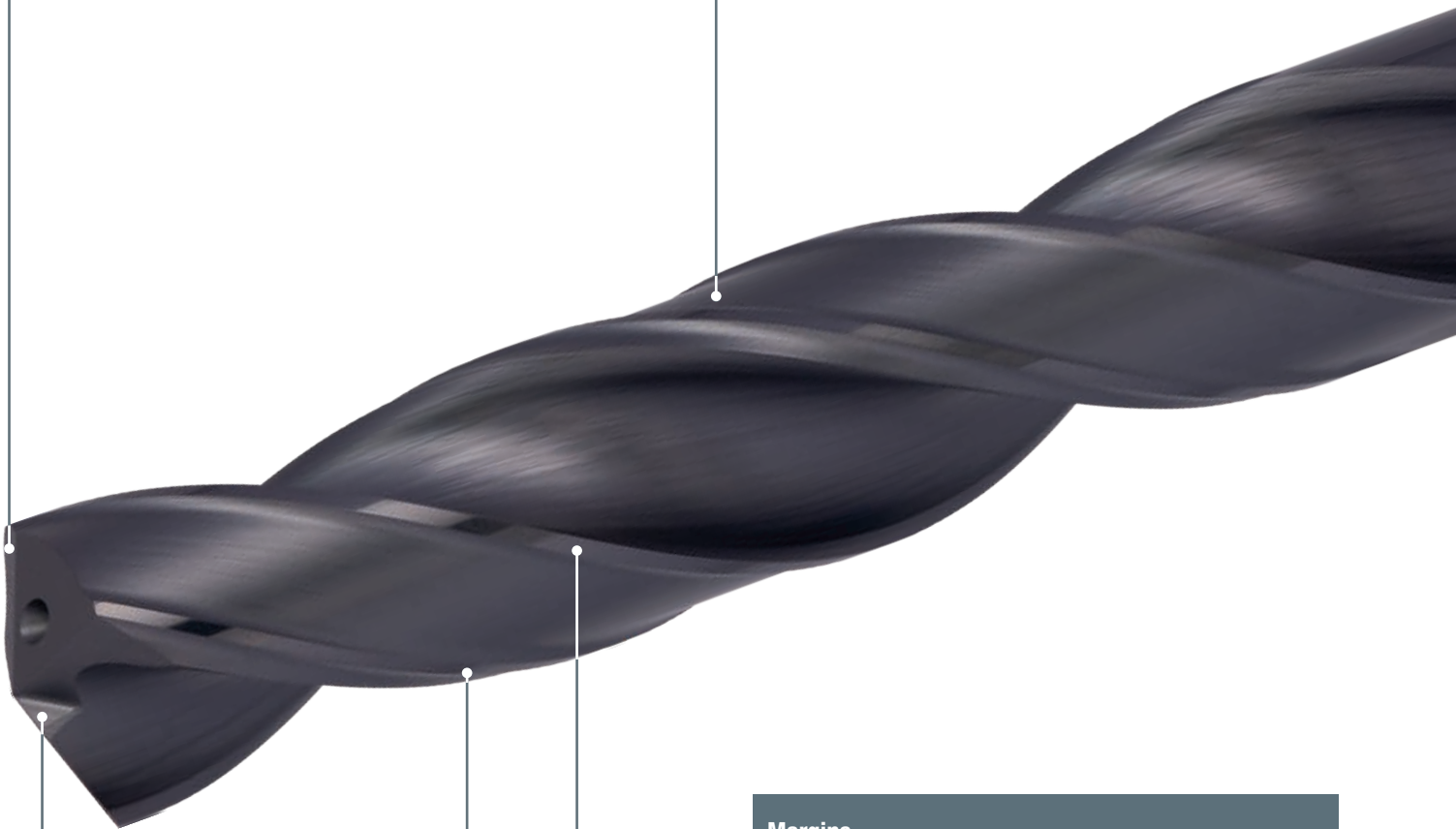
The application area of the BasicDrill covers the material groups steel materials, stainless steel materials, cast materials and non-ferrous materials. Its application focus is the steel area.

#### Cutting edge shape and edge preparation

The concave main cutting edge combined with an optimised edge preparation enables the best cutting behaviour in the steel and cast iron area with excellent tool life.

#### Cutting material and coating

The combination of carbide and a high-performance coating enables higher cutting speeds and feed rates.



#### Point geometry

An optimised point design allows sufficient space for chip forming and coolant distribution.

#### Margins

The design with four margins ensures optimum guidance of the twist drill in the bore. The third and fourth margin are arranged in such a way that they engage at an early stage. The special design prevents jamming even in stainless steel materials.

**Shank end**

The shank end has been designed in such a way that the drilling tool can be used with emulsion as well as with minimum quantity lubrication (MQL).

**Flutes**

The open shape of the flute facilitates smooth chip evacuation.



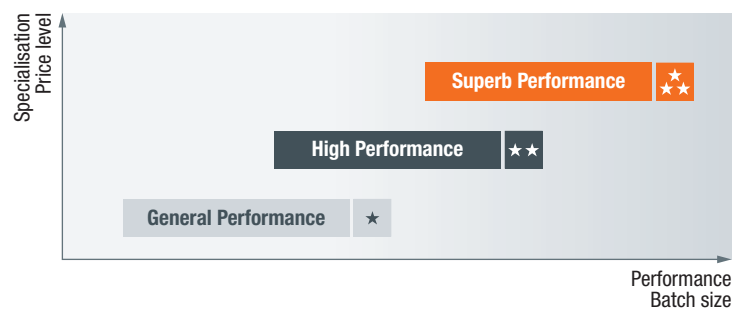
**The EMUGE-FRANKEN performance classes of twist drills**

The performance classes indicated by stars make it easier to find the right tool for the specific performance requirements and the batch size to be produced.

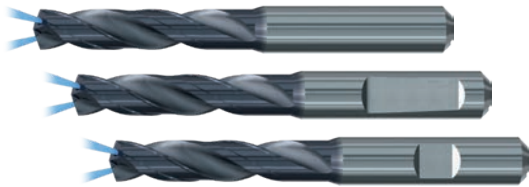
Tools for standard requirements and versatile use are assigned to the category “General Performance”.

Tools designed for special materials or applications are marked “High Performance”.

Specialists with the highest performance values and the best possible technology are classified as “Superb Performance”.



**BasicDrill BD101-3xD** new

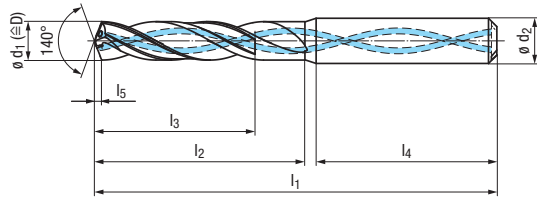


Solid carbide twist drill, 3xD, in Basic geometry for universal application.

**Product features and benefits:**

Four margins for better guidance and hole quality.  
Internal cooling channels and high-performance coating for high process reliability.  
Use in various materials with steel as the main application area.

Applications – material	
<b>P</b>	1.1-5.1
<b>M</b>	1.1-3.1
<b>K</b>	1.1-4.2
<b>N</b>	1.1-2.3
<b>S</b>	1.2-1.3, 2.2-2.3
<b>H</b>	1.1-1.3



**Short design**

Information about this product is also available on the web



ø d <sub>1</sub> m7	Taps		Cold-forming taps					ø d <sub>2</sub> h6	DIN 6535 HA	DIN 6535 HE	DIN 6535 HB	
			l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>					
3.00	M3.5x0.5, MJ3.5x0.6		62	20	14	36	0.6	6	TA201344.0300	TA501344.0300	TA601344.0300	●
3.10			62	20	14	36	0.6	6	TA201344.0310	TA501344.0310	TA601344.0310	●
3.20			62	20	14	36	0.6	6	TA201344.0320	TA501344.0320	TA601344.0320	●
3.30	M4	M3.5x0.5	62	20	14	36	0.6	6	TA201344.0330	TA501344.0330	TA601344.0330	●
3.40	MJ4x0.7		62	20	14	36	0.6	6	TA201344.0340	TA501344.0340	TA601344.0340	●
3.50	M4x0.5		62	20	14	36	0.6	6	TA201344.0350	TA501344.0350	TA601344.0350	●
3.60	MJ4x0.5		62	20	14	36	0.7	6	TA201344.0360	TA501344.0360	TA601344.0360	●
3.70	M4.5	M4, MJ4x0.7	62	20	14	36	0.7	6	TA201344.0370	TA501344.0370	TA601344.0370	●
3.80		M4x0.5	66	24	17	36	0.7	6	TA201344.0380	TA501344.0380	TA601344.0380	●
3.90			66	24	17	36	0.7	6	TA201344.0390	TA501344.0390	TA601344.0390	●
4.00	M4.5x0.5		66	24	17	36	0.7	6	TA201344.0400	TA501344.0400	TA601344.0400	●
4.10			66	24	17	36	0.8	6	TA201344.0410	TA501344.0410	TA601344.0410	●
4.20	M5	M4.5	66	24	17	36	0.8	6	TA201344.0420	TA501344.0420	TA601344.0420	●
4.30	MJ5x0.8	M4.5x0.5	66	24	17	36	0.8	6	TA201344.0430	TA501344.0430	TA601344.0430	●
4.40	M5x0.75		66	24	17	36	0.8	6	TA201344.0440	TA501344.0440	TA601344.0440	●
4.50	M5x0.5		66	24	17	36	0.8	6	TA201344.0450	TA501344.0450	TA601344.0450	●
4.60	M 5.5		66	24	17	36	0.8	6	TA201344.0460	TA501344.0460	TA601344.0460	●
4.65		M5, MJ5x0.8	66	24	17	36	0.9	6	TA201344.0465	TA501344.0465	TA601344.0465	●
4.70		M5x0.75	66	24	17	36	0.9	6	TA201344.0470	TA501344.0470	TA601344.0470	●
4.80		M5x0.5	66	28	20	36	0.9	6	TA201344.0480	TA501344.0480	TA601344.0480	●
4.90			66	28	20	36	0.9	6	TA201344.0490	TA501344.0490	TA601344.0490	●
5.00	M6		66	28	20	36	0.9	6	TA201344.0500	TA501344.0500	TA601344.0500	●
5.10	MJ6x1	M5.5	66	28	20	36	0.9	6	TA201344.0510	TA501344.0510	TA601344.0510	●
5.20	M6x0.75		66	28	20	36	1.0	6	TA201344.0520	TA501344.0520	TA601344.0520	●
5.30		M5.5x0.5	66	28	20	36	1.0	6	TA201344.0530	TA501344.0530	TA601344.0530	●
5.40			66	28	20	36	1.0	6	TA201344.0540	TA501344.0540	TA601344.0540	●
5.50	M6x0.5		66	28	20	36	1.0	6	TA201344.0550	TA501344.0550	TA601344.0550	●
5.55		MJ6x1	66	28	20	36	1.0	6	TA201344.0555	TA501344.0555	TA601344.0555	●
5.60	MJ6x0.5	M6	66	28	20	36	1.0	6	TA201344.0560	TA501344.0560	TA601344.0560	●
5.70		M6x0.75	66	28	20	36	1.0	6	TA201344.0570	TA501344.0570	TA601344.0570	●
5.80		M6x0.5	66	28	20	36	1.1	6	TA201344.0580	TA501344.0580	TA601344.0580	●
5.90			66	28	20	36	1.1	6	TA201344.0590	TA501344.0590	TA601344.0590	●
6.00	M7		66	28	20	36	1.1	6	TA201344.0600	TA501344.0600	TA601344.0600	●
6.20	M7x0.75		79	34	24	36	1.1	8	TA201344.0620	TA501344.0620	TA601344.0620	●
6.30			79	34	24	36	1.2	8	TA201344.0630	TA501344.0630	TA601344.0630	●
6.35	MJ7x0.75		79	34	24	36	1.2	8	TA201344.0635	TA501344.0635	TA601344.0635	●
6.40			79	34	24	36	1.2	8	TA201344.0640	TA501344.0640	TA601344.0640	●
6.50	M7x0.5		79	34	24	36	1.2	8	TA201344.0650	TA501344.0650	TA601344.0650	●
6.60		M7	79	34	24	36	1.2	8	TA201344.0660	TA501344.0660	TA601344.0660	●
6.70		M7x0.75	79	34	24	36	1.2	8	TA201344.0670	TA501344.0670	TA601344.0670	●
6.80	M8, G1/16	M7x0.5	79	34	24	36	1.2	8	TA201344.0680	TA501344.0680	TA601344.0680	●
6.90	MJ8x1.25		79	34	24	36	1.3	8	TA201344.0690	TA501344.0690	TA601344.0690	●

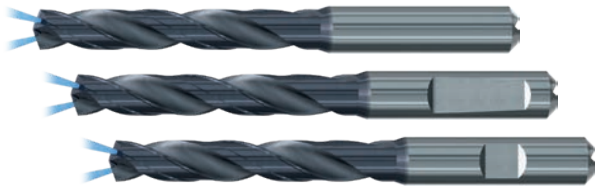
ø d <sub>1</sub> m7	Taps		Cold-forming taps					ø d <sub>2</sub> h6	DIN 6535 HA	DIN 6535 HE	DIN 6535 HB	
			l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>					
7.00	M8x1		79	34	24	36	1.3	8	TA201344.0700	TA501344.0700	TA601344.0700	●
7.20	M8x0.75		79	41	29	36	1.3	8	TA201344.0720	TA501344.0720	TA601344.0720	●
7.40			79	41	29	36	1.4	8	TA201344.0740	TA501344.0740	TA601344.0740	●
7.45		M8	79	41	29	36	1.4	8	TA201344.0745	TA501344.0745	TA601344.0745	●
7.50	M8x0.5		79	41	29	36	1.4	8	TA201344.0750	TA501344.0750	TA601344.0750	●
7.60		M8x1	79	41	29	36	1.4	8	TA201344.0760	TA501344.0760	TA601344.0760	●
7.70		M8x0.75	79	41	29	36	1.4	8	TA201344.0770	TA501344.0770	TA601344.0770	●
7.80	M9	M8x0.5	79	41	29	36	1.4	8	TA201344.0780	TA501344.0780	TA601344.0780	●
7.90	MJ9x1.25		79	41	29	36	1.4	8	TA201344.0790	TA501344.0790	TA601344.0790	●
8.00	M9x1		79	41	29	36	1.5	8	TA201344.0800	TA501344.0800	TA601344.0800	●
8.10	MJ9x1		89	47	35	40	1.5	10	TA201344.0810	TA501344.0810	TA601344.0810	●
8.20	M9x0.75		89	47	35	40	1.5	10	TA201344.0820	TA501344.0820	TA601344.0820	●
8.30			89	47	35	40	1.5	10	TA201344.0830	TA501344.0830	TA601344.0830	●
8.40			89	47	35	40	1.5	10	TA201344.0840	TA501344.0840	TA601344.0840	●
8.50	M10, M9x0.5		89	47	35	40	1.6	10	TA201344.0850	TA501344.0850	TA601344.0850	●
8.60	MJ10x1.5	M9x1	89	47	35	40	1.6	10	TA201344.0860	TA501344.0860	TA601344.0860	●
8.70		M9x0.75	89	47	35	40	1.6	10	TA201344.0870	TA501344.0870	TA601344.0870	●
8.80	M10x1.25, G1/8	M9x0.5	89	47	35	40	1.6	10	TA201344.0880	TA501344.0880	TA601344.0880	●
9.00	M10x1		89	47	35	40	1.6	10	TA201344.0900	TA501344.0900	TA601344.0900	●
9.20	M10x0.75	MJ10x1.75	89	47	35	40	1.7	10	TA201344.0920	TA501344.0920	TA601344.0920	●
9.30			89	47	35	40	1.7	10	TA201344.0930	TA501344.0930	TA601344.0930	●
9.35	MJ10x0.75	M10, MJ10x1.5	89	47	35	40	1.7	10	TA201344.0935	TA501344.0935	TA601344.0935	●
9.40			89	47	35	40	1.7	10	TA201344.0940	TA501344.0940	TA601344.0940	●
9.50	M10x0.5, M11		89	47	35	40	1.7	10	TA201344.0950	TA501344.0950	TA601344.0950	●
9.60	MJ10x0.5, MJ11x1.5	M10x1	89	47	35	40	1.8	10	TA201344.0960	TA501344.0960	TA601344.0960	●
9.80		M10x0.5	89	47	35	40	1.8	10	TA201344.0980	TA501344.0980	TA601344.0980	●
9.90	MJ11x1.25		89	47	35	40	1.8	10	TA201344.0990	TA501344.0990	TA601344.0990	●
10.00	M11x1		89	47	35	40	1.8	10	TA201344.1000	TA501344.1000	TA601344.1000	●
10.10	MJ11x1		102	55	40	45	1.8	12	TA201344.1010	TA501344.1010	TA601344.1010	●
10.20	M11x0.75, M12		102	55	40	45	1.9	12	TA201344.1020	TA501344.1020	TA601344.1020	●
10.30			102	55	40	45	1.9	12	TA201344.1030	TA501344.1030	TA601344.1030	●
10.40			102	55	40	45	1.9	12	TA201344.1040	TA501344.1040	TA601344.1040	●
10.50	M12x1.5		102	55	40	45	1.9	12	TA201344.1050	TA501344.1050	TA601344.1050	●
10.80	M12x1.25		102	55	40	45	2.0	12	TA201344.1080	TA501344.1080	TA601344.1080	●
11.00	M12x1		102	55	40	45	2.0	12	TA201344.1100	TA501344.1100	TA601344.1100	●
11.20		MJ12x1.75	102	55	40	45	2.0	12	TA201344.1120	TA501344.1120	TA601344.1120	●
11.25	M12x0.75	M12	102	55	40	45	2.1	12	TA201344.1125	TA501344.1125	TA601344.1125	●
11.30		M12x1.5 (GAL)	102	55	40	45	2.1	12	TA201344.1135	TA501344.1135	TA601344.1135	●
11.35		M12x1.5, MJ12x1.5	102	55	40	45	2.1	12	TA201344.1135	TA501344.1135	TA601344.1135	●
11.50			102	55	40	45	2.1	12	TA201344.1150	TA501344.1150	TA601344.1150	●
11.60		M12x1	102	55	40	45	2.1	12	TA201344.1160	TA501344.1160	TA601344.1160	●
11.80	G1/4		102	55	40	45	2.2	12	TA201344.1180	TA501344.1180	TA601344.1180	●
12.00	M13x1, M14		102	55	40	45	2.2	12	TA201344.1200	TA501344.1200	TA601344.1200	●
12.10	MJ13x1		107	60	43	45	2.2	14	TA201344.1210	TA501344.1210	TA601344.1210	●
12.20			107	60	43	45	2.2	14	TA201344.1220	TA501344.1220	TA601344.1220	●
12.50	M14x1.5		107	60	43	45	2.3	14	TA201344.1250	TA501344.1250	TA601344.1250	●
12.70		MJ13x0.75	107	60	43	45	2.3	14	TA201344.1270	TA501344.1270	TA601344.1270	●
12.90	MJ14x1.25		107	60	43	45	2.4	14	TA201344.1290	TA501344.1290	TA601344.1290	●
13.00	M14x1		107	60	43	45	2.4	14	TA201344.1300	TA501344.1300	TA601344.1300	●
13.10	MJ14x1	M14, MJ14x2	107	60	43	45	2.4	14	TA201344.1310	TA501344.1310	TA601344.1310	●
13.30			107	60	43	45	2.4	14	TA201344.1330	TA501344.1330	TA601344.1330	●
13.35		M14x1.5, MJ14x1.5	107	60	43	45	2.4	14	TA201344.1335	TA501344.1335	TA601344.1335	●
13.50			107	60	43	45	2.5	14	TA201344.1350	TA501344.1350	TA601344.1350	●
14.00	M15x1, M16		107	60	43	45	2.6	14	TA201344.1400	TA501344.1400	TA601344.1400	●
14.10	MJ15x1		115	65	45	48	2.6	16	TA201344.1410	TA501344.1410	TA601344.1410	●
14.20	M15x0.75		115	65	45	48	2.6	16	TA201344.1420	TA501344.1420	TA601344.1420	●
14.50	M16x1.5		115	65	45	48	2.6	16	TA201344.1450	TA501344.1450	TA601344.1450	●
14.70		M15x0.75	115	65	45	48	2.7	16	TA201344.1470	TA501344.1470	TA601344.1470	●
15.00	M16x1		115	65	45	48	2.7	16	TA201344.1500	TA501344.1500	TA601344.1500	●
15.10	MJ16x1	M16	115	65	45	48	2.8	16	TA201344.1510	TA501344.1510	TA601344.1510	●
15.20	M 16x0.75		115	65	45	48	2.8	16	TA201344.1520	TA501344.1520	TA601344.1520	●
15.25	G3/8		115	65	45	48	2.8	16	TA201344.1525	TA501344.1525	TA601344.1525	●
15.35		M16x1.5	115	65	45	48	2.8	16	TA201344.1535	TA501344.1535	TA601344.1535	●
15.50	M18		115	65	45	48	2.8	16	TA201344.1550	TA501344.1550	TA601344.1550	●
15.80	MJ18x2.5		115	65	45	48	2.9	16	TA201344.1580	TA501344.1580	TA601344.1580	●
16.00	M18x2		115	65	45	48	2.9	16	TA201344.1600	TA501344.1600	TA601344.1600	●
16.50	M18x1.5		123	73	51	48	3.0	18	TA201344.1650	TA501344.1650	TA601344.1650	●
17.00	M18x1		123	73	51	48	3.1	18	TA201344.1700	TA501344.1700	TA601344.1700	●
17.50	M20		123	73	51	48	3.2	18	TA201344.1750	TA501344.1750	TA601344.1750	●
18.00	M20x2		123	73	51	48	3.3	18	TA201344.1800	TA501344.1800	TA601344.1800	●



### BasicDrill BD101-5xD



5xD

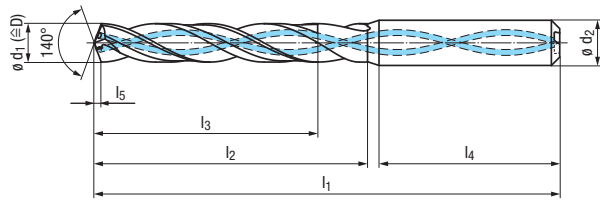


Solid carbide twist drill, 5xD, in Basic geometry for universal application.

#### Product features and benefits:

Four margins for better guidance and hole quality.  
Internal cooling channels and high-performance coating for high process reliability.  
Use in various materials with steel as the main application area.

Applications – material	
P	1.1-5.1
M	1.1-3.1
K	1.1-4.2
N	1.1-2.3
S	1.2-1.3, 2.2-2.3
H	1.1-1.3



#### Long design

Information about this product is also available on the web



	Taps		Cold-forming taps					$\phi d_2$ h6	DIN 6535 HA	DIN 6535 HE	DIN 6535 HB	
	$\phi d_1$ m7			$l_1$	$l_2$	$l_3$	$l_4$					
3.00	M3.5x0.5, MJ3.5x0.6		66	28	23	36	0.6	6	TA211344.0300	TA511344.0300	TA611344.0300	●
3.10			66	28	23	36	0.6	6	TA211344.0310	TA511344.0310	TA611344.0310	●
3.20			66	28	23	36	0.6	6	TA211344.0320	TA511344.0320	TA611344.0320	●
3.30	M4	M3.5x0.5	66	28	23	36	0.6	6	TA211344.0330	TA511344.0330	TA611344.0330	●
3.40	MJ4x0.7		66	28	23	36	0.6	6	TA211344.0340	TA511344.0340	TA611344.0340	●
3.50	M4x0.5		66	28	23	36	0.6	6	TA211344.0350	TA511344.0350	TA611344.0350	●
<b>new</b> 3.60	MJ4x0.5		66	28	23	36	0.7	6	TA211344.0360	TA511344.0360	TA611344.0360	●
3.70	M4.5	M4, MJ4x0.7	66	28	23	36	0.7	6	TA211344.0370	TA511344.0370	TA611344.0370	●
3.80		M4x0.5	74	36	29	36	0.7	6	TA211344.0380	TA511344.0380	TA611344.0380	●
3.90			74	36	29	36	0.7	6	TA211344.0390	TA511344.0390	TA611344.0390	●
4.00	M4.5x0.5		74	36	29	36	0.7	6	TA211344.0400	TA511344.0400	TA611344.0400	●
4.10			74	36	29	36	0.8	6	TA211344.0410	TA511344.0410	TA611344.0410	●
4.20	M5	M4.5	74	36	29	36	0.8	6	TA211344.0420	TA511344.0420	TA611344.0420	●
4.30	MJ5x0.8	M4.5x0.5	74	36	29	36	0.8	6	TA211344.0430	TA511344.0430	TA611344.0430	●
<b>new</b> 4.40	M5x0.75		74	36	29	36	0.8	6	TA211344.0440	TA511344.0440	TA611344.0440	●
4.50	M5x0.5		74	36	29	36	0.8	6	TA211344.0450	TA511344.0450	TA611344.0450	●
4.60	M 5.5		74	36	29	36	0.8	6	TA211344.0460	TA511344.0460	TA611344.0460	●
4.65		M5, MJ5x0.8	74	36	29	36	0.9	6	TA211344.0465	TA511344.0465	TA611344.0465	●
4.70		M5x0.75	74	36	29	36	0.9	6	TA211344.0470	TA511344.0470	TA611344.0470	●
4.80		M5x0.5	82	44	35	36	0.9	6	TA211344.0480	TA511344.0480	TA611344.0480	●
4.90			82	44	35	36	0.9	6	TA211344.0490	TA511344.0490	TA611344.0490	●
5.00	M6		82	44	35	36	0.9	6	TA211344.0500	TA511344.0500	TA611344.0500	●
5.10	MJ6x1	M5.5	82	44	35	36	0.9	6	TA211344.0510	TA511344.0510	TA611344.0510	●
5.20	M6x0.75		82	44	35	36	1.0	6	TA211344.0520	TA511344.0520	TA611344.0520	●
5.30		M5.5x0.5	82	44	35	36	1.0	6	TA211344.0530	TA511344.0530	TA611344.0530	●
<b>new</b> 5.40			82	44	35	36	1.0	6	TA211344.0540	TA511344.0540	TA611344.0540	●
5.50	M6x0.5		82	44	35	36	1.0	6	TA211344.0550	TA511344.0550	TA611344.0550	●
5.55		MJ6x1	82	44	35	36	1.0	6	TA211344.0555	TA511344.0555	TA611344.0555	●
5.60	MJ6x0.5	M6	82	44	35	36	1.0	6	TA211344.0560	TA511344.0560	TA611344.0560	●
5.70		M6x0.75	82	44	35	36	1.0	6	TA211344.0570	TA511344.0570	TA611344.0570	●
5.80		M6x0.5	82	44	35	36	1.1	6	TA211344.0580	TA511344.0580	TA611344.0580	●
5.90			82	44	35	36	1.1	6	TA211344.0590	TA511344.0590	TA611344.0590	●
6.00	M7		82	44	35	36	1.1	6	TA211344.0600	TA511344.0600	TA611344.0600	●
6.20	M7x0.75		91	53	43	36	1.1	8	TA211344.0620	TA511344.0620	TA611344.0620	●
6.30			91	53	43	36	1.2	8	TA211344.0630	TA511344.0630	TA611344.0630	●
6.35	MJ7x0.75		91	53	43	36	1.2	8	TA211344.0635	TA511344.0635	TA611344.0635	●
6.40			91	53	43	36	1.2	8	TA211344.0640	TA511344.0640	TA611344.0640	●
6.50	M7x0.5		91	53	43	36	1.2	8	TA211344.0650	TA511344.0650	TA611344.0650	●
6.60		M7	91	53	43	36	1.2	8	TA211344.0660	TA511344.0660	TA611344.0660	●
<b>new</b> 6.70		M7x0.75	91	53	43	36	1.2	8	TA211344.0670	TA511344.0670	TA611344.0670	●
6.80	M8, G1/16	M7x0.5	91	53	43	36	1.2	8	TA211344.0680	TA511344.0680	TA611344.0680	●
6.90	MJ8x1.25		91	53	43	36	1.3	8	TA211344.0690	TA511344.0690	TA611344.0690	●

	Taps		Cold-forming taps					Ø d <sub>2</sub> h <sub>6</sub>	DIN 6535 HA	DIN 6535 HE	DIN 6535 HB	
	Ø d <sub>1</sub> m <sub>7</sub>			l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>					
7.00	M8x1		91	53	43	36	1.3	8	TA211344.0700	TA511344.0700	TA611344.0700	●
7.20	M8x0.75		91	53	43	36	1.3	8	TA211344.0720	TA511344.0720	TA611344.0720	●
7.40			91	53	43	36	1.4	8	TA211344.0740	TA511344.0740	TA611344.0740	●
7.45		M8	91	53	43	36	1.4	8	TA211344.0745	TA511344.0745	TA611344.0745	●
<b>new</b> 7.50	M8x0.5		91	53	43	36	1.4	8	TA211344.0750	TA511344.0750	TA611344.0750	●
7.60		M8x1	91	53	43	36	1.4	8	TA211344.0760	TA511344.0760	TA611344.0760	●
<b>new</b> 7.70		M8x0.75	91	53	43	36	1.4	8	TA211344.0770	TA511344.0770	TA611344.0770	●
7.80	M9	M8x0.5	91	53	43	36	1.4	8	TA211344.0780	TA511344.0780	TA611344.0780	●
<b>new</b> 7.90	MJ9x1.25		91	53	43	36	1.4	8	TA211344.0790	TA511344.0790	TA611344.0790	●
8.00	M9x1		91	53	43	36	1.5	8	TA211344.0800	TA511344.0800	TA611344.0800	●
8.10	MJ9x1		103	61	49	40	1.5	10	TA211344.0810	TA511344.0810	TA611344.0810	●
8.20	M9x0.75		103	61	49	40	1.5	10	TA211344.0820	TA511344.0820	TA611344.0820	●
8.30			103	61	49	40	1.5	10	TA211344.0830	TA511344.0830	TA611344.0830	●
8.40			103	61	49	40	1.5	10	TA211344.0840	TA511344.0840	TA611344.0840	●
8.50	M10, M9x0.5		103	61	49	40	1.6	10	TA211344.0850	TA511344.0850	TA611344.0850	●
8.60	MJ10x1.5	M9x1	103	61	49	40	1.6	10	TA211344.0860	TA511344.0860	TA611344.0860	●
<b>new</b> 8.70		M9x0.75	103	61	49	40	1.6	10	TA211344.0870	TA511344.0870	TA611344.0870	●
8.80	M10x1.25, G1/8	M9x0.5	103	61	49	40	1.6	10	TA211344.0880	TA511344.0880	TA611344.0880	●
9.00	M10x1		103	61	49	40	1.6	10	TA211344.0900	TA511344.0900	TA611344.0900	●
<b>new</b> 9.20	M10x0.75	MJ10x1.75	103	61	49	40	1.7	10	TA211344.0920	TA511344.0920	TA611344.0920	●
9.30			103	61	49	40	1.7	10	TA211344.0930	TA511344.0930	TA611344.0930	●
9.35	MJ10x0.75	M10, MJ10x1.5	103	61	49	40	1.7	10	TA211344.0935	TA511344.0935	TA611344.0935	●
9.40			103	61	49	40	1.7	10	TA211344.0940	TA511344.0940	TA611344.0940	●
9.50	M10x0.5, M11		103	61	49	40	1.7	10	TA211344.0950	TA511344.0950	TA611344.0950	●
9.60	MJ10x0.5, MJ11x1.5	M10x1	103	61	49	40	1.8	10	TA211344.0960	TA511344.0960	TA611344.0960	●
9.80		M10x0.5	103	61	49	40	1.8	10	TA211344.0980	TA511344.0980	TA611344.0980	●
9.90	MJ11x1.25		103	61	49	40	1.8	10	TA211344.0990	TA511344.0990	TA611344.0990	●
<b>new</b> 10.00	M11x1		103	61	49	40	1.8	10	TA211344.1000	TA511344.1000	TA611344.1000	●
10.10	MJ11x1		118	71	56	45	1.8	12	TA211344.1010	TA511344.1010	TA611344.1010	●
10.20	M11x0.75, M12		118	71	56	45	1.9	12	TA211344.1020	TA511344.1020	TA611344.1020	●
10.30			118	71	56	45	1.9	12	TA211344.1030	TA511344.1030	TA611344.1030	●
10.40			118	71	56	45	1.9	12	TA211344.1040	TA511344.1040	TA611344.1040	●
10.50	M12x1.5		118	71	56	45	1.9	12	TA211344.1050	TA511344.1050	TA611344.1050	●
10.80	M12x1.25		118	71	56	45	2.0	12	TA211344.1080	TA511344.1080	TA611344.1080	●
11.00	M12x1		118	71	56	45	2.0	12	TA211344.1100	TA511344.1100	TA611344.1100	●
11.20		MJ12x1.75	118	71	56	45	2.0	12	TA211344.1120	TA511344.1120	TA611344.1120	●
11.25	M12x0.75	M12	118	71	56	45	2.1	12	TA211344.1125	TA511344.1125	TA611344.1125	●
<b>new</b> 11.30		M12x1.5 (GAL)	118	71	56	45	2.1	12	TA211344.1135	TA511344.1135	TA611344.1135	●
11.35		M12x1.5, MJ12x1.5	118	71	56	45	2.1	12	TA211344.1135	TA511344.1135	TA611344.1135	●
11.50			118	71	56	45	2.1	12	TA211344.1150	TA511344.1150	TA611344.1150	●
11.60		M12x1	118	71	56	45	2.1	12	TA211344.1160	TA511344.1160	TA611344.1160	●
11.80	G1/4		118	71	56	45	2.2	12	TA211344.1180	TA511344.1180	TA611344.1180	●
12.00	M13x1, M14		118	71	56	45	2.2	12	TA211344.1200	TA511344.1200	TA611344.1200	●
<b>new</b> 12.10	MJ13x1		124	77	60	45	2.2	14	TA211344.1210	TA511344.1210	TA611344.1210	●
12.20			124	77	60	45	2.2	14	TA211344.1220	TA511344.1220	TA611344.1220	●
12.50	M14x1.5		124	77	60	45	2.3	14	TA211344.1250	TA511344.1250	TA611344.1250	●
12.70		MJ13x0.75	124	77	60	45	2.3	14	TA211344.1270	TA511344.1270	TA611344.1270	●
12.90	MJ14x1.25		124	77	60	45	2.4	14	TA211344.1290	TA511344.1290	TA611344.1290	●
13.00	M14x1		124	77	60	45	2.4	14	TA211344.1300	TA511344.1300	TA611344.1300	●
13.10	MJ14x1	M14, MJ14x2	124	77	60	45	2.4	14	TA211344.1310	TA511344.1310	TA611344.1310	●
<b>new</b> 13.30			124	77	60	45	2.4	14	TA211344.1330	TA511344.1330	TA611344.1330	●
13.35		M14x1.5, MJ14x1.5	124	77	60	45	2.4	14	TA211344.1335	TA511344.1335	TA611344.1335	●
13.50			124	77	60	45	2.5	14	TA211344.1350	TA511344.1350	TA611344.1350	●
14.00	M15x1, M16		124	77	60	45	2.6	14	TA211344.1400	TA511344.1400	TA611344.1400	●
<b>new</b> 14.10	MJ15x1		133	83	63	48	2.6	16	TA211344.1410	TA511344.1410	TA611344.1410	●
<b>new</b> 14.20	M15x0.75		133	83	63	48	2.6	16	TA211344.1420	TA511344.1420	TA611344.1420	●
14.50	M16x1.5		133	83	63	48	2.6	16	TA211344.1450	TA511344.1450	TA611344.1450	●
<b>new</b> 14.70		M15x0.75	133	83	63	48	2.7	16	TA211344.1470	TA511344.1470	TA611344.1470	●
15.00	M16x1		133	83	63	48	2.7	16	TA211344.1500	TA511344.1500	TA611344.1500	●
15.10	MJ16x1	M16	133	83	63	48	2.8	16	TA211344.1510	TA511344.1510	TA611344.1510	●
<b>new</b> 15.20	M 16x0.75		133	83	63	48	2.8	16	TA211344.1520	TA511344.1520	TA611344.1520	●
15.25	G3/8		133	83	63	48	2.8	16	TA211344.1525	TA511344.1525	TA611344.1525	●
15.35		M16x1.5	133	83	63	48	2.8	16	TA211344.1535	TA511344.1535	TA611344.1535	●
15.50	M18		133	83	63	48	2.8	16	TA211344.1550	TA511344.1550	TA611344.1550	●
<b>new</b> 15.80	MJ18x2.5		133	83	63	48	2.9	16	TA211344.1580	TA511344.1580	TA611344.1580	●
16.00	M18x2		133	83	63	48	2.9	16	TA211344.1600	TA511344.1600	TA611344.1600	●
<b>new</b> 16.50	M18x1.5		143	93	71	48	3.0	18	TA211344.1650	TA511344.1650	TA611344.1650	●
<b>new</b> 17.00	M18x1		143	93	71	48	3.1	18	TA211344.1700	TA511344.1700	TA611344.1700	●
<b>new</b> 17.50	M20		143	93	71	48	3.2	18	TA211344.1750	TA511344.1750	TA611344.1750	●
<b>new</b> 18.00	M20x2		143	93	71	48	3.3	18	TA211344.1800	TA511344.1800	TA611344.1800	●

# Application recommendation and cutting data

**Please note:**

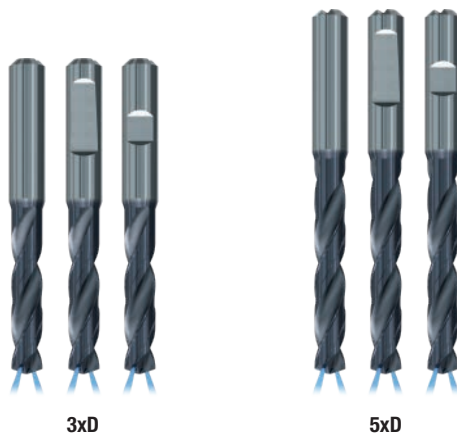
The cutting values listed in the respective columns are standard values which have to be adjusted to individual work conditions (material, lubrication, machine etc.).

$v_c$  = Cutting speed [m/min]

$f$  = Feed per revolution [mm/rev.]

Applications – material				Material examples	Material numbers	Coolant-lubricant recommendation			
						Emulsion	Oil	Minimum quantity lubrication (MQL)	Dry / Pressurised air
P	<b>Steel materials</b>								
	1.1	Cold-extrusion steels, Construction steels, Free-cutting steels, etc.	≤ 600 N/mm <sup>2</sup>	Cq15	1.1132	■	■	■	
				S235JR (St37-2)	1.0037				
				10SPb20	1.0722				
	2.1	Construction steels, Cementation steels, Steel castings, etc.	≤ 800 N/mm <sup>2</sup>	E360 (St70-2)	1.0070	■	■	■	
				16MnCr5	1.7131				
				GS-25CrMo4	1.7218				
	3.1	Cementation steels, Heat-treatable steels, Cold work steels, etc.	≤ 1000 N/mm <sup>2</sup>	20MoCr3	1.7320	■	■	■	
				42CrMo4	1.7225				
				102Cr6	1.2067				
				50CrMo4	1.7228				
	4.1	Heat-treatable steels, Cold work steels, Nitriding steels, etc.	≤ 1200 N/mm <sup>2</sup>	X45NiCrMo4	1.2767	■	■	■	
				31CrMo12	1.8515				
	5.1	High-alloyed steels, Cold work steels, Hot work steels, etc.	≤ 1400 N/mm <sup>2</sup>	X38CrMoV5-3	1.2367	■	■	■	
				X100CrMoV8-1-1	1.2990				
			X40CrMoV5-1	1.2344					
M	<b>Stainless steel materials</b>								
	1.1	Ferritic, martensitic	≤ 950 N/mm <sup>2</sup>	X2CrTi12	1.4512	■	■	■	
	2.1	Austenitic	≤ 950 N/mm <sup>2</sup>	X6CrNiMoTi17-12-2	1.4571	■	■	■	
	3.1	Austenitic-ferritic (Duplex)	≤ 1100 N/mm <sup>2</sup>	X2CrNiMoN22-5-3	1.4462	■	■	■	
	4.1	Austenitic-ferritic heat-resistant (Super Duplex)	≤ 1250 N/mm <sup>2</sup>	X2CrNiMoN25-7-4	1.4410	■	■	■	
K	<b>Cast materials</b>								
	1.1	Cast iron with lamellar graphite (GJL)	100-250 N/mm <sup>2</sup>	EN-GJL-200 (GG20)	EN-JL-1030	■	■	■	■
	1.2		250-450 N/mm <sup>2</sup>	EN-GJL-300 (GG30)	EN-JL-1050	■	■	■	■
	2.1	Cast iron with nodular graphite (GJS)	350-500 N/mm <sup>2</sup>	EN-GJS-400-15 (GGG40)	EN-JS-1030	■	■	■	■
	2.2		500-900 N/mm <sup>2</sup>	EN-GJS-700-2 (GGG70)	EN-JS-1070	■	■	■	■
	3.1	Cast iron with vermicular graphite (GJV)	300-400 N/mm <sup>2</sup>	GJV 300		■	■	■	■
	3.2		400-500 N/mm <sup>2</sup>	GJV 450		■	■	■	■
	4.1	Malleable cast iron (GTMW, GTMB)	250-500 N/mm <sup>2</sup>	EN-GJMW-350-4 (GTW-35)	EN-JM-1010	■	■	■	■
	4.2		500-800 N/mm <sup>2</sup>	EN-GJMB-450-6 (GTS-45)	EN-JM-1140	■	■	■	■
N	<b>Non ferrous materials</b>								
	<b>Aluminium alloys</b>								
	1.1	Aluminium wrought alloys	≤ 200 N/mm <sup>2</sup>	EN AW-AlMn1	EN AW-3103	■	■	■	■
	1.2		≤ 350 N/mm <sup>2</sup>	EN AW-AlMgSi	EN AW-6060	■	■	■	■
	1.3		≤ 550 N/mm <sup>2</sup>	EN AW-AlZn5Mg3Cu	EN AW-7022	■	■	■	■
	1.4		Si ≤ 7%	EN AC-AlMg5	EN AC-51300	■	■	■	■
	1.5	Aluminium cast alloys	7% < Si ≤ 12%	EN AC-ALSi9Cu3	EN AC-46500	■	■	■	■
	1.6		12% < Si ≤ 17%	GD-ALSi17Cu4FeMg		■	■	■	■
	<b>Copper alloys</b>								
	2.1	Pure copper, low-alloyed copper	≤ 400 N/mm <sup>2</sup>	E-Cu 57	EN CW 004 A	■	■	■	■
	2.2	Copper-zinc alloys (brass, long-chipping)	≤ 550 N/mm <sup>2</sup>	CuZn37 (Ms63)	EN CW 508 L	■	■	■	■
	2.3	Copper-zinc alloys (brass, short-chipping)	≤ 550 N/mm <sup>2</sup>	CuZn36Pb3 (Ms58)	EN CW 603 N	■	■	■	■
	2.4	Copper-aluminium alloys (alu bronze, long-chipping)	≤ 800 N/mm <sup>2</sup>	CuAl10Ni5Fe4	EN CW 307 G	■	■	■	■
	2.5	Copper-tin alloys (tin bronze, long-chipping)	≤ 700 N/mm <sup>2</sup>	CuSn8P	EN CW 459 K	■	■	■	■
	2.6	Copper-tin alloys (tin bronze, short-chipping)	≤ 400 N/mm <sup>2</sup>	CuSn7 ZnPb (Rg7)	2.1090	■	■	■	■
	2.7	Special copper alloys	≤ 600 N/mm <sup>2</sup>	(AMPCO® 8)		■	■	■	■
	2.8		≤ 1400 N/mm <sup>2</sup>	(AMPCO® 45)		■	■	■	■
	<b>Magnesium alloys</b>								
	3.1	Magnesium wrought alloys	≤ 500 N/mm <sup>2</sup>	MgAl6Zn	3.5612	■	■	■	■
	3.2	Magnesium cast alloys	≤ 500 N/mm <sup>2</sup>	EN-MCMgAl9Zn1	EN-MC21120	■	■	■	■
	<b>Synthetics</b>								
	4.1	Duroplastics (short-chipping)		Bakelit, Pertinax					
	4.2	Thermoplastics (long-chipping)		PMMA, POM, PVC					
	4.3	Fibre-reinforced synthetics (fibre content ≤ 30%)		GFK, CFK, AFK					
4.4	Fibre-reinforced synthetics (fibre content > 30%)		GFK, CFK, AFK						
<b>Special materials</b>									
5.1	Graphite		C 8000						
5.2	Tungsten-copper alloys		W-Cu 80/20						
5.3	Composite materials		Hylite, Alucobond						
S	<b>Special materials</b>								
	<b>Titanium alloys</b>								
	1.1	Pure titanium	≤ 450 N/mm <sup>2</sup>	Ti1	3.7025	■	■	■	■
	1.2	Titanium alloys	≤ 900 N/mm <sup>2</sup>	TiAl6V4	3.7165	■	■	■	■
	1.3		≤ 1250 N/mm <sup>2</sup>	TiAl4Mo4Sn2	3.7185	■	■	■	■
	<b>Nickel alloys, cobalt alloys and iron alloys</b>								
	2.1	Pure nickel	≤ 600 N/mm <sup>2</sup>	Ni 99.6	2.4060	■	■	■	■
	2.2	Nickel-base alloys	≤ 1000 N/mm <sup>2</sup>	Monel 400	2.4360	■	■	■	■
	2.3		≤ 1600 N/mm <sup>2</sup>	Inconel 718	2.4668	■	■	■	■
	2.4	Cobalt-base alloys	≤ 1000 N/mm <sup>2</sup>	Udimet 605		■	■	■	■
	2.5		≤ 1600 N/mm <sup>2</sup>	Haynes 25	2.4964	■	■	■	■
	2.6	Iron-base alloys	≤ 1500 N/mm <sup>2</sup>	Incoloy 800	1.4958	■	■	■	■
H	<b>Hard materials</b>								
	1.1	High strength steels, hardened steels, hard castings	44 - 50 HRC	Weldox 1100		■	■	■	■
	1.2		50 - 55 HRC	Hardox 550		■	■	■	■
	1.3		55 - 60 HRC	Armox 600T		■	■	■	■
	1.4		60 - 63 HRC	Ferro-Titanit		■	■	■	■
	1.5		63 - 66 HRC	HSSE		■	■	■	■

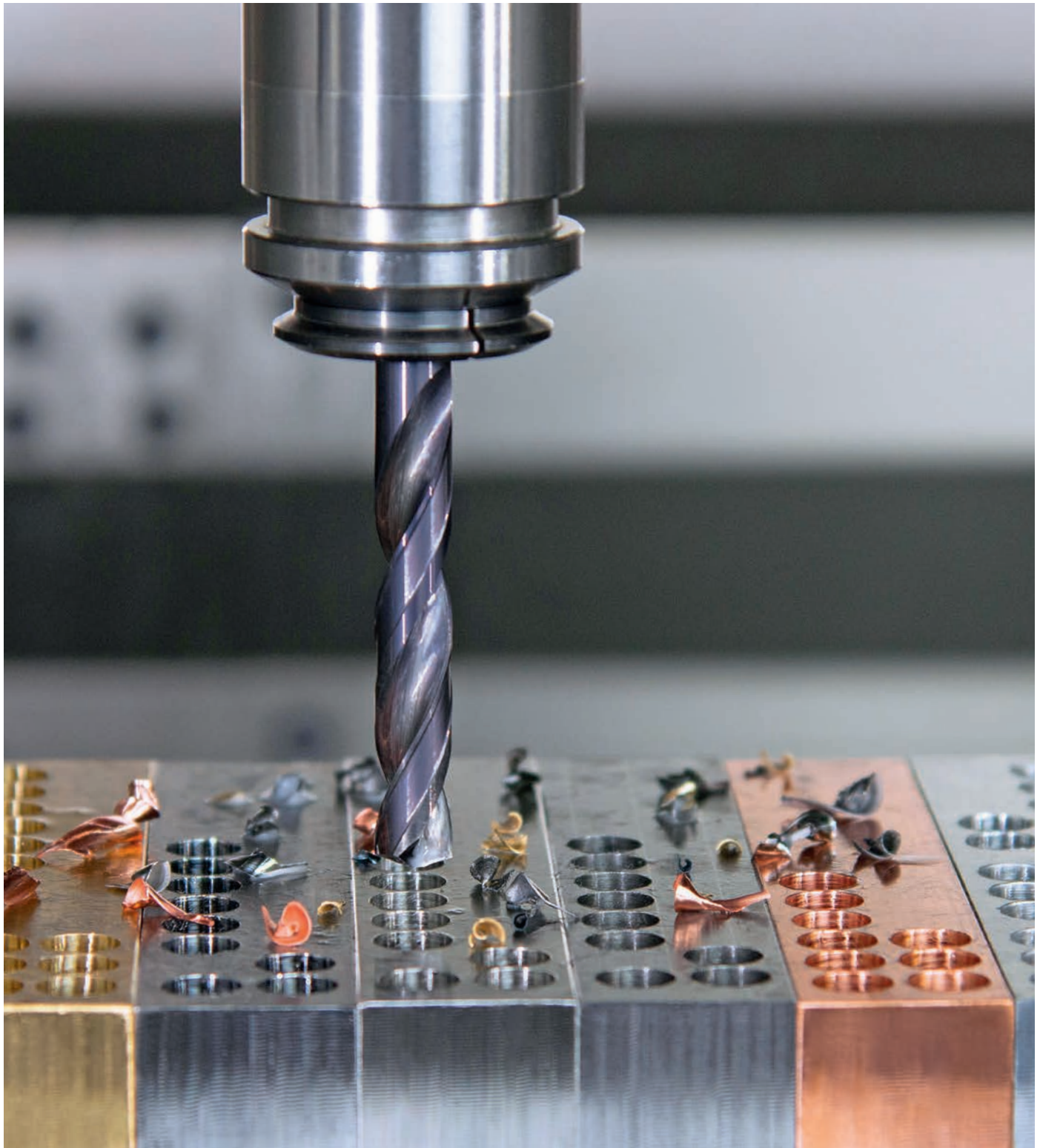




3xD

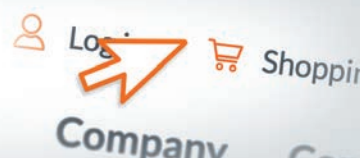
5xD

v <sub>c</sub> [m/min]			D = 3 mm			D = 5 mm			D = 8 mm			D = 10 mm			D = 12 mm			D = 16 mm			D = 18 mm			
			f [mm/rev.]			f [mm/rev.]			f [mm/rev.]			f [mm/rev.]			f [mm/rev.]			f [mm/rev.]			f [mm/rev.]			
min.	rec.	max.	min.	rec.	max.	min.	rec.	max.	min.	rec.	max.	min.	rec.	max.	min.	rec.	max.	min.	rec.	max.	min.	rec.	max.	
100	140	180	0.11	0.16	0.25	0.16	0.20	0.28	0.20	0.25	0.35	0.23	0.28	0.40	0.25	0.31	0.43	0.27	0.34	0.47	0.29	0.35	0.49	1.1
80	120	160	0.11	0.16	0.25	0.16	0.20	0.28	0.20	0.25	0.35	0.23	0.28	0.40	0.25	0.31	0.43	0.27	0.34	0.47	0.29	0.35	0.49	2.1
80	100	120	0.11	0.15	0.24	0.16	0.18	0.24	0.20	0.24	0.30	0.23	0.26	0.34	0.25	0.29	0.37	0.27	0.32	0.41	0.29	0.33	0.43	3.1
50	70	100	0.11	0.15	0.24	0.16	0.18	0.24	0.20	0.24	0.30	0.23	0.26	0.34	0.25	0.29	0.37	0.27	0.32	0.41	0.29	0.33	0.43	4.1
50	65	90	0.10	0.13	0.21	0.13	0.17	0.24	0.17	0.21	0.30	0.19	0.24	0.34	0.21	0.26	0.37	0.22	0.28	0.39	0.23	0.29	0.40	5.1
40	60	80	0.04	0.06	0.09	0.09	0.12	0.19	0.11	0.17	0.26	0.14	0.19	0.30	0.15	0.21	0.33	0.16	0.23	0.36	0.17	0.24	0.37	1.1
40	55	75	0.04	0.05	0.08	0.08	0.11	0.16	0.10	0.15	0.20	0.14	0.18	0.27	0.15	0.20	0.30	0.16	0.22	0.32	0.17	0.23	0.34	2.1
40	50	70	0.04	0.05	0.08	0.08	0.11	0.16	0.10	0.15	0.20	0.14	0.18	0.27	0.15	0.20	0.30	0.16	0.22	0.32	0.17	0.23	0.34	3.1
120	140	160	0.11	0.16	0.25	0.16	0.20	0.28	0.20	0.25	0.35	0.23	0.28	0.40	0.25	0.31	0.43	0.27	0.34	0.47	0.29	0.35	0.50	1.1
110	130	150	0.11	0.16	0.25	0.16	0.20	0.28	0.20	0.25	0.35	0.23	0.28	0.40	0.25	0.31	0.43	0.27	0.34	0.47	0.29	0.35	0.50	1.2
140	160	180	0.11	0.16	0.25	0.16	0.20	0.28	0.20	0.25	0.35	0.23	0.28	0.40	0.25	0.31	0.43	0.27	0.34	0.47	0.29	0.35	0.50	2.1
100	120	140	0.11	0.15	0.24	0.16	0.18	0.24	0.20	0.24	0.30	0.23	0.26	0.34	0.25	0.29	0.37	0.27	0.32	0.41	0.29	0.33	0.43	2.2
80	100	120	0.11	0.16	0.25	0.16	0.20	0.28	0.20	0.25	0.35	0.23	0.28	0.40	0.25	0.31	0.43	0.27	0.34	0.47	0.29	0.35	0.50	3.1
60	80	100	0.10	0.14	0.22	0.14	0.18	0.25	0.18	0.23	0.32	0.20	0.25	0.36	0.22	0.28	0.39	0.24	0.30	0.43	0.26	0.32	0.45	3.2
100	120	140	0.11	0.16	0.25	0.16	0.20	0.28	0.20	0.25	0.35	0.23	0.28	0.40	0.25	0.31	0.43	0.27	0.34	0.47	0.29	0.35	0.50	4.1
90	110	130	0.11	0.15	0.24	0.16	0.18	0.24	0.20	0.24	0.30	0.23	0.26	0.34	0.25	0.29	0.37	0.27	0.32	0.41	0.29	0.33	0.43	4.2
160	180	240	0.14	0.19	0.31	0.19	0.28	0.38	0.24	0.33	0.42	0.27	0.37	0.47	0.30	0.41	0.52	0.32	0.45	0.57	0.33	0.46	0.58	1.1
160	180	240	0.14	0.19	0.31	0.19	0.28	0.38	0.24	0.33	0.42	0.27	0.37	0.47	0.30	0.41	0.52	0.32	0.45	0.57	0.33	0.46	0.58	1.2
160	180	240	0.14	0.19	0.31	0.19	0.28	0.38	0.24	0.33	0.42	0.27	0.37	0.47	0.30	0.41	0.52	0.32	0.45	0.57	0.33	0.46	0.58	1.3
160	180	240	0.14	0.19	0.31	0.19	0.28	0.38	0.24	0.33	0.42	0.27	0.37	0.47	0.30	0.41	0.52	0.32	0.45	0.57	0.33	0.46	0.58	1.4
160	180	240	0.14	0.19	0.31	0.19	0.28	0.38	0.24	0.33	0.42	0.27	0.37	0.47	0.30	0.41	0.52	0.32	0.45	0.57	0.33	0.46	0.58	1.5
160	180	240	0.14	0.19	0.31	0.19	0.28	0.38	0.24	0.33	0.42	0.27	0.37	0.47	0.30	0.41	0.52	0.32	0.45	0.57	0.33	0.46	0.58	1.6
120	140	180	0.03	0.05	0.07	0.04	0.06	0.08	0.05	0.10	0.13	0.06	0.12	0.14	0.06	0.14	0.16	0.07	0.15	0.17	0.07	0.16	0.17	2.1
120	140	180	0.03	0.05	0.07	0.04	0.06	0.08	0.05	0.10	0.13	0.06	0.12	0.14	0.06	0.14	0.16	0.07	0.15	0.17	0.07	0.16	0.17	2.2
120	140	180	0.11	0.14	0.19	0.17	0.22	0.30	0.22	0.28	0.39	0.25	0.31	0.42	0.27	0.33	0.44	0.30	0.36	0.48	0.31	0.37	0.50	2.3
																								2.4
																								2.5
																								2.6
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																								3.1
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																								4.3
																								4.4
																								5.1
																								5.2
																								5.3
40	50	60	0.04	0.05	0.06	0.06	0.08	0.10	0.10	0.12	0.15	0.11	0.13	0.17	0.12	0.14	0.19	0.14	0.16	0.20	0.15	0.17	0.21	1.1
30	40	50	0.04	0.05	0.06	0.06	0.08	0.10	0.10	0.12	0.15	0.11	0.13	0.17	0.12	0.14	0.19	0.14	0.16	0.20	0.15	0.17	0.21	1.2
																								1.3
																								2.1
20	40	60	0.04	0.05	0.07	0.06	0.08	0.11	0.10	0.13	0.20	0.11	0.15	0.23	0.12	0.17	0.25	0.14	0.18	0.27	0.15	0.19	0.28	2.2
10	25	40	0.04	0.05	0.07	0.06	0.08	0.10	0.10	0.12	0.15	0.11	0.13	0.17	0.12	0.14	0.19	0.14	0.16	0.20	0.15	0.17	0.21	2.3
																								2.4
																								2.5
																								2.6
20	40	50	0.05	0.06	0.11	0.08	0.11	0.16	0.10	0.16	0.25	0.11	0.18	0.28	0.12	0.19	0.31	0.14	0.20	0.34	0.15	0.21	0.35	1.1
20	30	50	0.05	0.06	0.11	0.08	0.11	0.16	0.10	0.16	0.25	0.11	0.18	0.28	0.12	0.19	0.31	0.14	0.20	0.34	0.15	0.21	0.35	1.2
20	30	50	0.05	0.06	0.11	0.08	0.11	0.16	0.10	0.16	0.25	0.11	0.18	0.28	0.12	0.19	0.31	0.14	0.20	0.34	0.15	0.21	0.35	1.3
																								1.4
																								1.5



**24/7**

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Registration provides you with additional product data and functions. These include standardised tool data (2D / 3D / characteristics), an order or quotation history and individual watch lists as well as other useful functions.

**Regrinding and recoating service**

Regrinding and recoating form an essential contribution to the economically efficient use of drilling tools.

The EMUGE regrinding and recoating service guarantees the restoration of the original geometry and the original coating of the tool.

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**Customer****Transport**

The tools can be sent either to EMUGE directly, or picked up by your local EMUGE sales contact. Our special TOOL BOX is available for that if you need it.

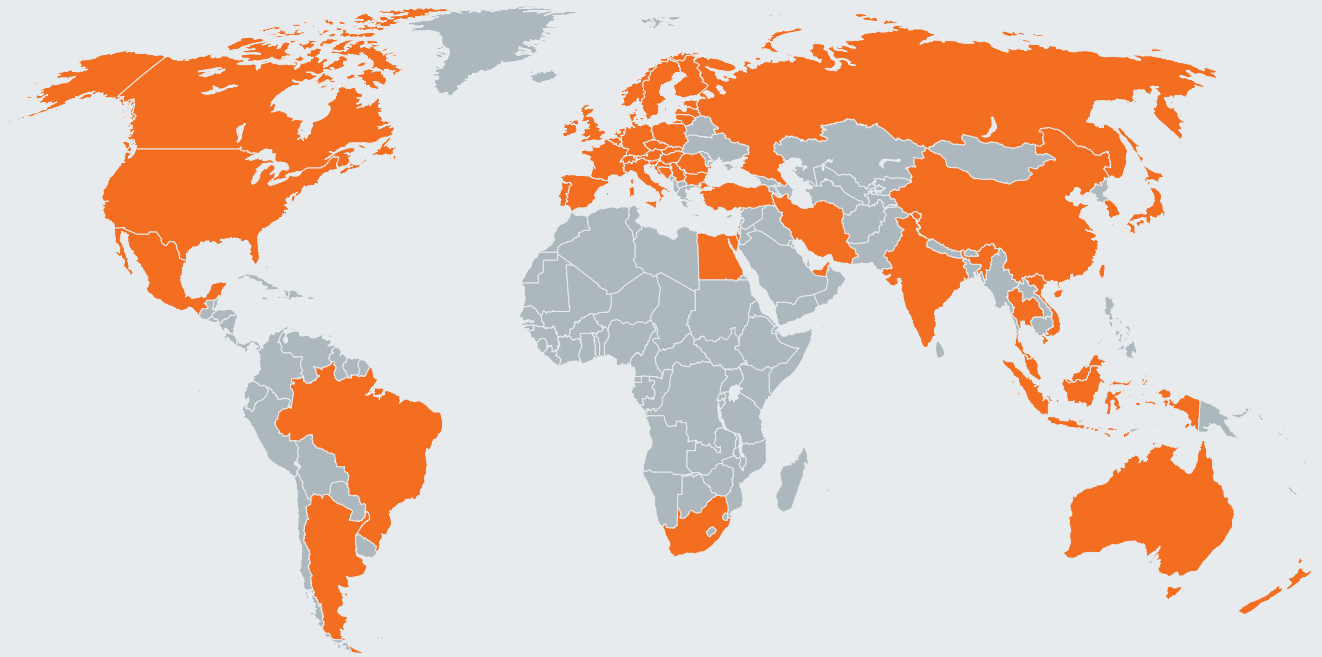
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Before the actual refitting, the tools are checked carefully for their condition. If found suitable, the twist drills are resharpened on production machines, and subject to the same quality inspection as new tools.

**Shipping**

The reground and recoated drilling tools are returned after 2-3 weeks to the address specified by you, safely packed.

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