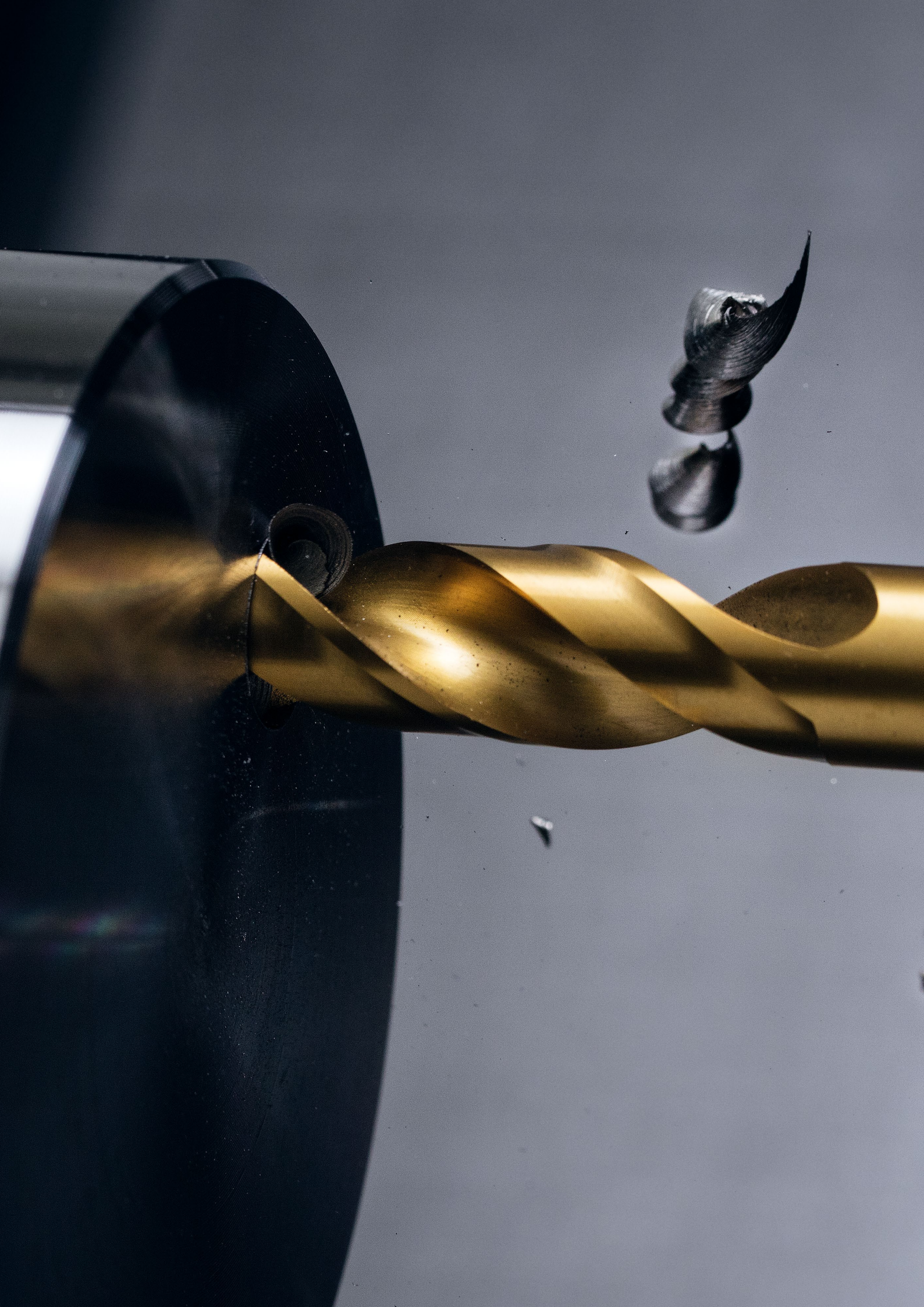


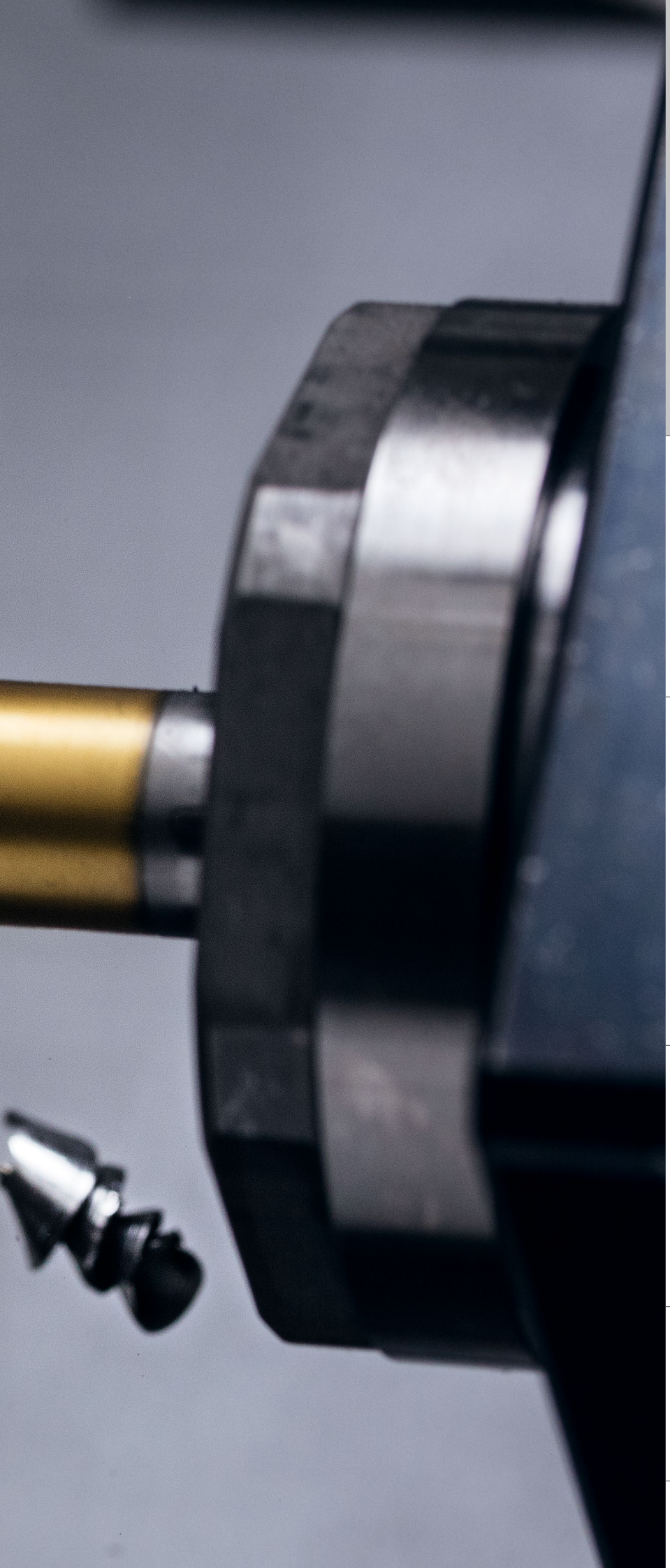


Table of contents

WNT \ Performance

Premium quality tools for high performance.

The premium quality tools from the **WNT Performance** product line have been designed for specific applications and are distinguished by their outstanding performance. If you make high demands on the performance of your production and want to achieve the very best results, we recommend the Premium tools in this product line.

Symbol explanation

Shank

Version

Int. coolant supply

self-centering

● = **Main Application**

○ = Extended application

Toolfinder

	Tool type	Material/ Coating	Description	DIN 1897	DIN 338	DIN 340	Series 1	Series 2	Series 3
				3xD	5xD	10xD	> 10xD		
Steel – Universal	**VX**	HSS-E TiN	▲ universal high-performance drill ▲ shank DIN 1835A ▲ self centering	8	16				
	UNI	HSS-E PM TiN	▲ wear-resistant due to HSS-E-PM and TiN coating ▲ universal high-performance drill	9–14	17–22				
	UNI	HSS-E TiN	▲ as for type VX ▲ without standard shank to DIN 1835 A ▲ available as a set	9–14	17–22	26–28			
	N	HSS vap.	▲ stable twist drill ▲ also suitable for portable drills ▲ available in set	9–14	17–22				
	WT	HSS-E vap.	▲ for high alloy steel and special alloys (Hastelloy, Inconel, Nimonic)	9–14					
	WT	HSS-E TiN	▲ as type WT HSS-E vap. ▲ higher wear resistance due to coating	9–14					
	WTL-L	HSS F.-nit	▲ left-hand cutting ▲ nitrided cutting edge giving increased wear protection to cutting corners and guide lands	15	23				
	WNXi	HSS-E	▲ very good chip evacuation with thro' coolant ▲ for long chipping materials to 1000 N/mm²		25				
	WNXi	HSS-E TiN	▲ as type WNXi HSS-E ▲ higher wear resistance due to coating		25				
	WTL	HSS-E F.-nit	▲ special flute profile with large chip gullet ▲ nitrided cutting edge giving increased wear protection to cutting corners and guide lands		17–22	26–28			
	WTL	HSS-E TiN	▲ as WTL HSS-E, but higher v_c and wear resistance due to coating ▲ suitable for steel and cast iron		17–22				
	WTL	HSS-E TiCN	▲ as WTL TiN, but higher v_c and wear resistance possible with high alloy steels		23				
	WTL	HSS F.-nit	▲ special flute profile with large chip gullet ▲ nitrided cutting edge giving increased wear protection to cutting corners and guide lands			26–28	29	30	30
	WTL	HSS TiN	▲ as WTL HSS, but higher v_c and wear resistance due to coating			26–28			
	WNX	HSS-E	▲ wide chip flutes for long-chipping materials ▲ self-centring	9–14					
	NC	HSS	▲ suitable for use with drill bushes ▲ very good chip evacuation with thro' coolant			25			
	NC	HSS TiAlN	▲ as NC, but higher v_c and wear resistance due to coating			25			
Stainless steel	**VA**	HSS-E	▲ specialist for stainless and acid-resistant materials ▲ special geometry	9–14	17–22				
Non-ferrous metals	**W**	HSS	▲ specialist for non-ferrous metals		17–22				
	WTW	HSS	▲ for non-ferrous metals to 500 N/mm² ▲ for deep holes			26–28			

HSS Drills Overview

3xD without thro‘ coolant

	Tool type	Material | Coating	Point angle	Diameter in mm DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Hardened materials		coated	uncoated	WNT \ Performance
	VX	HSS-E TiN	118°	2–20	●	●	●	●	○			■		8
	UNI	HSS-E PM TiN	130°	1–14	●	○	●	○	○			■		9–14
	UNI	HSS-E TiN	118°	1–14	●	●	●	●	○	○		■		9–14
	N	HSS vap.	118°	0,4–20	●		●	○				■		9–14
	VA	HSS-E	130°	1–12	○	●	○	○	○				□	9–14
	WNX	HSS-E	130°	1–20	●	○	○	●	○				□	9–14
	WT	HSS-E vap.	130°	0,4–25	●	○	○	○	○	○		■		9–14
	WT	HSS-E TiN	130°	1–20	●	○	○	○	○	○		■		9–14
	WTL-L	HSS F-nit	130°	1–19	●	○	○	●		○	left-hand cutting	■		15

5xD without thro‘ coolant

	Tool type	Material | Coating	Point angle	Diameter in mm DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Hardened materials		coated	uncoated	WNT \ Performance
	VX	HSS-E TiN	118°	2–20	●	●	●	●	○			■		16
	UNI	HSS-E PM TiN	130°	1–14	●	○	●	○	○			■		17–22
	UNI	HSS-E TiN	118°	0,9–14	●	●	●	●	○			■		17–22
	N	HSS vap.	118°	0,2–20	●		●	○				■		17–22
	VA	HSS-E	130°	1–12	○	●	○	○	○				□	17–22
	WTL	HSS-E F-nit.	130°	1–16	●	○	○	○				■		17–22
	WTL	HSS-E TiN	130°	1–16	●	○	○	○				■		17–22
	WTL	HSS-E TiCN	130°	3–12	●	○						■		23
	W	HSS	130°	0,20–20				●					□	17–22
	WTL-L	HSS F-nit.	130°	1–16	●		○	○			left-hand cutting	■		23

HSS Drills Overview

	Tool type	Material | Coating	Point angle	Diameter in mm DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Hardened materials	coated	uncoated	WNT \ Performance
5xD with thro' coolant													
	WNXi	HSS-E	130°	5–20	●	●	●	○	○	E		□	25
	WNXi	HSS-E TiN	130°	5–20	●	●	●	○	○	E	■		25
up to 10xD without thro' coolant													
	UNI	HSS-E TiN	118°	1–14	●	○	●	○		A	■		26–28
	WTL	HSS TiN	130°	1–14	●		●	●		A	■		26–28
	WTL	HSS-E F-nit.	130°	1–12	●	●	●	●		A	■		26–28
	WTL	HSS F-nit.	130°	1–14	●		●	●		A	■		26–28
	WTW	HSS	130°	1–14				●		A		□	26–28
up to 10xD with thro' coolant													
	NC	HSS	130°	3–13	●	○	●	○	○	A		□	25
	NC	HSS TiAlN	130°	3–13	●	○	●	○	○	A	■		25
over 10xD without thro' coolant													
	WTL	HSS Series 1	130°	2–13	●	○	●	●		A	■		29
	WTL	HSS Series 2	130°	2–13	●	○	●	●		A	■		30
	WTL	HSS Series 3	130°	2,5–13	●	○	●	●		A	■		30
Mini-drill													
	N	HSS-E PM	118°	0,15–1,45	●	●	●	●	○	A		□	31
Twist Drill Sets													
	N	HSS vap.	118°	1–10	●		●			A	■		24
	UNI	HSS-E TiN	118°	1–10	●	●	●	●	○	A	■		24

HSS Drills Overview

	Tool type	Material | Coating	Point angle	Diameter in mm DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Hardened materials		coated	uncoated	WNT \ Performance
NC Spot Drill														
	NC-A	HSS	90°	3–20	●	○	●	○			A ~B		□	35–37
	NC-A	HSS TiN	90°	3–20	●	○	●	○			A ~B	■		35+36
	NC-A	HSS	120°	3–20	●	○	●	○			A ~B		□	35+36
	NC-A	HSS TiN	120°	3–20	●	○	●	○			A ~B	■		35+36
Centre drills														
	ZB	HSS	118°	0,5–6,3	●	○	●	○				DIN 333 – Form A/B/R	□	37–39
	ZB	HSS TiN	118°	0,5–6,3	●	○	●	○				DIN 333 – Form A	■	38
	ZB	HSS-E	118°	0,5–6,3	●	○	●	○				DIN 333 – Form A	□	38
Core drills														
	N	HSS	120°	3,8–12	●	○	●	●	○		A	3 flute	□	40
Stepped drills														
	SB	HSS vap.	118°	2,5–10,2	●	○	●	○			A	Countersinking angle 90°	■	41
	SB	HSS	118°	2,5–10,2	●	○	●	○			A	Countersinking angle 90°	□	41
	SB	HSS vap.	118°	3,2–10,5	●	○	●	○			A	Countersinking angle 90°	■	41
	SB	HSS	118°	3,2–10,5	●	○	●	○			A	Countersinking angle 90°	□	41
	SB	HSS vap.	118°	3,4–11	●	○	●	○			A	Countersinking angle 180°	■	42
	SB	HSS	118°	3,4–11	●	○	●	○			A	Countersinking angle 180°	□	42
	SB	HSS vap.	118°	3,3–21	●	○	●	○				Countersinking angle 60°	■	44

HSS Drills Overview

	Tool type	Material | Coating	Point angle	Diameter in mm DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Hardened materials		coated ■ uncoated □	WNT \ Performance
Drills with Morse taper													
3xD													
	WT	HSS-E vap.	**130°**	10–30	●	○	○	○	○		MK	■	31
5xD													
	N	HSS vap.	**118°**	10–60	●		●	○			MK	■	32
	WTL	HSS-E F.-nit	**130°**	10–27	●	○	○	○			MK	■	32
10xD													
	N	HSS vap.	**118°**	10–50	●		●	○			MK	■	33
	WTL	HSS-E F.-nit	**130°**	10–26	●	●	●	●			MK	■	33
above 10xD													
	WTL	HSS Series 1	**130°**	10–30	●	○	●	●			MK	■	34
	WTL	HSS Series 2	**130°**	10–30	●	○	●	●			MK	■	34
Core drills													
	N	HSS vap.	**120°**	10–30	●	○	●	●	○		MK	3 flute ■	40
Stepped drills													
	SB	HSS vap.	**118°**	5,5–22	●	○	●	○			MK	Countersinking angle 180° ■	43

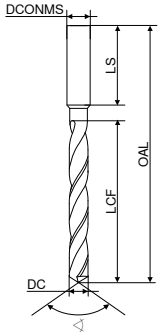
High-performance twist drills similar to DIN 1897, extra-short

- shank to DIN 1835 A
- special point thinning
- very good centering behaviour
- 4 facet
- highest Performance

≤ 3xD

VX

TiN



HSS-E

DC h8	OAL	LCF	DCONMS h6	LS	Article no. 10 122 ...
mm	mm	mm	mm	mm	
2,00	44	12	3	28	020
2,10	44	12	3	28	021
2,20	45	13	3	28	022
2,30	45	13	3	28	023
2,40	46	14	3	28	024
2,50	46	14	3	28	025
2,60	46	14	3	28	026
2,70	48	16	3	28	027
2,80	48	16	3	28	028
2,90	48	16	3	28	029
3,00	48	16	3	28	030
3,10	50	18	4	28	031
3,20	50	18	4	28	032
3,30	50	18	4	28	033
3,40	52	20	4	28	034
3,50	52	20	4	28	035
3,60	52	20	4	28	036
3,70	52	20	4	28	037
3,80	54	22	4	28	038
3,90	54	22	4	28	039
4,00	54	22	4	28	040
4,10	66	22	6	36	041
4,20	66	22	6	36	042
4,30	68	24	6	36	043
4,40	68	24	6	36	044
4,50	68	24	6	36	045
4,60	68	24	6	36	046
4,70	68	24	6	36	047
4,80	70	26	6	36	048
4,90	70	26	6	36	049
5,00	70	26	6	36	050
5,10	70	26	6	36	051
5,20	70	26	6	36	052
5,30	70	26	6	36	053
5,40	72	28	6	36	054
5,50	72	28	6	36	055
5,55	72	28	6	36	555
5,60	72	28	6	36	056
5,70	72	28	6	36	057
5,80	72	28	6	36	058
5,90	72	28	6	36	059
6,00	72	28	6	36	060
6,10	75	31	8	36	061
6,20	75	31	8	36	062
6,30	75	31	8	36	063
6,40	75	31	8	36	064
6,50	75	31	8	36	065
6,60	75	31	8	36	066
6,70	75	31	8	36	067
6,80	78	34	8	36	068
6,90	78	34	8	36	069
7,00	78	34	8	36	070

DC h8	OAL	LCF	DCONMS h6	LS	Article no. 10 122 ...
mm	mm	mm	mm	mm	
7,10	78	34	8	36	071
7,20	78	34	8	36	072
7,30	78	34	8	36	073
7,40	78	34	8	36	074
7,45	78	34	8	36	745
7,50	78	34	8	36	075
7,60	81	37	8	36	076
7,70	81	37	8	36	077
7,80	81	37	8	36	078
7,90	81	37	8	36	079
8,00	81	37	8	36	080
8,10	87	37	10	40	081
8,20	87	37	10	40	082
8,30	87	37	10	40	083
8,40	87	37	10	40	084
8,50	87	37	10	40	085
8,60	91	40	10	40	086
8,70	91	40	10	40	087
8,80	91	40	10	40	088
8,90	91	40	10	40	089
9,00	91	40	10	40	090
9,10	91	40	10	40	091
9,20	91	40	10	40	092
9,30	91	40	10	40	093
9,35	91	40	10	40	935
9,40	91	40	10	40	094
9,50	91	40	10	40	095
9,60	93	43	10	40	096
9,70	93	43	10	40	097
9,80	93	43	10	40	098
9,90	93	43	10	40	099
10,00	93	43	10	40	100
10,10	100	43	12	45	101
10,20	100	43	12	45	102
10,30	100	43	12	45	103
10,40	100	43	12	45	104
10,50	100	43	12	45	105
10,60	100	43	12	45	106
10,70	104	47	12	45	107
10,80	104	47	12	45	108
10,90	104	47	12	45	109
11,00	104	47	12	45	110
11,10	104	47	12	45	111
11,50	104	47	12	45	115
11,70	104	47	12	45	117
11,80	104	47	12	45	118
11,90	108	51	12	45	119
12,00	108	51	12	45	120
12,10	111	51	16	48	121
12,20	111	51	16	48	122
12,30	111	51	16	48	123
12,40	111	51	16	48	124
12,50	111	51	16	48	125
12,60	111	51	16	48	126
12,70	111	51	16	48	127
12,80	111	51	16	48	128
12,90	111	51	16	48	129
13,00	111	51	16	48	130
13,50	114	54	16	48	135
14,00	114	54	16	48	140
14,50	116	56	16	48	145
15,00	116	56	16	48	150
15,50	118	58	16	48	155
16,00	118	58	16	48	160
16,50	126	60	20	50	165
17,00	126	60	20	50	170
17,50	128	62	20	50	175
18,00	128	62	20	50	180
18,50	130	64	20	50	185
19,00	130	64	20	50	190
19,50	132	66	20	50	195
20,00	132	66	20	50	200

Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○

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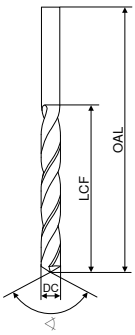
High-performance twist drills similar to DIN 1897, extra-short

≤ 3xD



UNI	UNI	N	VA	WNX	WT	WT
TiN	TiN	vap.			vap.	TiN

◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 113 ...	Article no. 10 107 ...	Article no. 10 105 ...	Article no. 10 130 ...	Article no. 10 106 ...	Article no. 10 109 ...	Article no. 10 110 ...
mm	inch	mm	mm							
0,40		19	2,5			004 [1]			00400 [1]	
0,50		20	3,0			005 [1]			00500 [1]	
0,55		21	3,5						00550 [1]	
0,60		21	3,5			006 [1]			00600 [1]	
0,65		22	4,0						00650 [1]	
0,70		23	4,5			007 [1]			00700 [1]	
0,75		23	4,5						00750 [1]	
0,80		24	5,0			008 [1]			00800 [1]	
0,85		24	5,0						00850 [1]	
0,90		25	5,5			009 [1]			00900 [1]	
0,95		25	5,5						00950 [1]	
1,00		26	6,0	010 [2]	010	010 [1]	010	010	01000 [1]	010
1,05		26	6,0						01050 [1]	
1,10		28	7,0	011 [2]	011	011 [1]	011	011	01100 [1]	011
1,15		28	7,0						01150 [1]	
1,20		30	8,0	012 [2]	012	012 [1]	012	012	01200 [1]	012
1,25		30	8,0						01250 [1]	
1,30		30	8,0	013 [2]	013	013 [1]	013	013	01300 [1]	013
1,35		32	9,0						01350 [1]	
1,40		32	9,0	014 [2]	014	014 [1]	014	014	01400 [1]	014
1,45		32	9,0						01450 [1]	
1,50		32	9,0	015 [2]	015	015 [1]	015	015	01500 [1]	015
1,55		34	10,0						01550 [1]	
1,60		34	10,0	016 [2]	016	016 [1]	016	016	01600 [1]	016
1,65		34	10,0						01650 [1]	
1,70		34	10,0	017 [2]	017	017 [1]	017	017	01700 [1]	017
1,75		36	11,0						01750 [1]	
1,80		36	11,0	018 [2]	018	018 [1]	018	018	01800 [1]	018
1,83		36	11,0						01830 [1]	
1,85		36	11,0						01850 [1]	
1,90		36	11,0	019 [2]	019	019 [1]	019	019	01900 [1]	019
1,95		38	12,0						01950 [1]	
2,00		38	12,0	020 [2]	020	020 [1]	020	020	02000 [1]	020
2,05		38	12,0						02050 [1]	
2,10		38	12,0	021 [2]	021	021 [1]	021	021	02100 [1]	021
2,15		40	13,0						02150 [1]	
2,20		40	13,0	022 [2]	022	022 [1]	022	022	02200 [1]	022
2,25		40	13,0						02250 [1]	
2,30		40	13,0	023 [2]	023	023 [1]	023	023	02300 [1]	023
2,35		40	13,0						02350 [1]	
2,38	3/32	43	14,0	238 [2]	238					
2,40		43	14,0	024 [2]	024	024	024	024	02400	024
2,45		43	14,0						02450	

Steel	●	●	●	○	●	●	●
Stainless steel	○	●		●	○	○	○
Cast iron	●	●	●	○	○	○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○	○	○	○
Hardened materials		○				○	○

1) uncoated
2) self-centering

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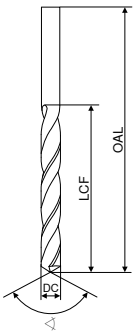
Continued on next page

High-performance twist drills similar to DIN 1897, extra-short

≤ 3xD



UNI	UNI	N	VA	WNX	WT	WT
TiN	TiN	vap.			vap.	TiN

◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 113 ...	Article no. 10 107 ...	Article no. 10 105 ...	Article no. 10 130 ...	Article no. 10 106 ...	Article no. 10 109 ...	Article no. 10 110 ...
mm	inch	mm	mm							
2,50		43	14,0	025 [2]	025	025	025	025	02500	025
2,55		43	14,0						02550	
2,60		43	14,0	026 [2]	026	026	026	026	02600	026
2,65		43	14,0						02650	
2,70		46	16,0	027 [2]	027	027	027	027	02700	027
2,75		46	16,0						02750	
2,78	7/64	46	16,0	278 [2]	278					
2,80		46	16,0	028 [2]	028	028	028	028	02800	028
2,85		46	16,0						02850	
2,90		46	16,0	029 [2]	029	029	029	029	02900	029
2,95		46	16,0						02950	
3,00		46	16,0	030 [2]	030	030	030	030	03000	030
3,05		49	18,0						03050	
3,10		49	18,0	031 [2]	031	031	031	031	03100	031
3,15		49	18,0						03150	
3,17	1/8	49	18,0	317 [2]	317					
3,20		49	18,0	032 [2]	032	032	032	032	03200	032
3,25		49	18,0						03250	
3,30		49	18,0	033 [2]	033	033	033	033	03300	033
3,35		49	18,0						03350	
3,40		52	20,0	034 [2]	034	034	034	034	03400	034
3,45		52	20,0						03450	
3,50		52	20,0	035 [2]	035	035	035	035	03500	035
3,55		52	20,0						03550	
3,57	9/64	52	20,0	357 [2]	357					
3,60		52	20,0	036 [2]	036	036	036	036	03600	036
3,70		52	20,0	037 [2]	037	037	037	037	03700	037
3,75		52	20,0						03750	
3,80		55	22,0	038 [2]	038	038	038	038	03800	038
3,85		55	22,0						03850	
3,90		55	22,0	039 [2]	039	039		039	03900	039
3,95		55	22,0						03950	
3,97	5/32	55	22,0	397 [2]	397					
4,00		55	22,0	040 [2]	040	040	040	040	04000	040
4,05		55	22,0						04050	
4,10		55	22,0	041 [2]	041	041	041	041	04100	041
4,15		55	22,0						04150	
4,20		55	22,0	042 [2]	042	042	042	042	04200	042
4,25		55	22,0						04250	
4,30		58	24,0	043 [2]	043	043	043	043	04300	043
4,35		58	24,0						04350	
4,37	11/64	58	24,0	437 [2]	437					
4,40		58	24,0	044 [2]	044	044		044	04400	044

Steel	●	●	●	○	●	●	●
Stainless steel	○	●		●	○	○	○
Cast iron	●	●	●	○	○	○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○	○	○	○
Hardened materials		○				○	○

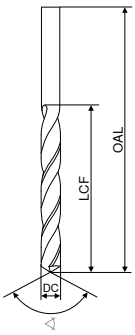
1) uncoated
2) self-centering

→ v_c Page 46+47

Continued on next page

High-performance twist drills similar to DIN 1897, extra-short

≤ 3xD



UNI	UNI	N	VA	WNX	WT	WT
TiN	TiN	vap.			vap.	TiN

◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E

DC h8	DC	OAL	LCF	Article no. 10 113 ...	Article no. 10 107 ...	Article no. 10 105 ...	Article no. 10 130 ...	Article no. 10 106 ...	Article no. 10 109 ...	Article no. 10 110 ...
mm	inch	mm	mm							
4,45		58	24,0						04450	
4,50		58	24,0	045 2)	045	045	045	045	04500	045
4,55		58	24,0						04550	
4,60		58	24,0	046 2)	046	046	046	046	04600	046
4,65		58	24,0						04650	465
4,70		58	24,0	047 2)	047	047	047	047	04700	047
4,75		58	24,0						04750	
4,76	3/16	62	26,0	476 2)	476					
4,80		62	26,0	048 2)	048	048	048	048	04800	048
4,85		62	26,0						04850	
4,90		62	26,0	049 2)	049	049	049	049	04900	049
4,95		62	26,0						04950	
5,00		62	26,0	050 2)	050	050	050	050	05000	050
5,05		62	26,0						05050	
5,10		62	26,0	051 2)	051	051	051	051	05100	051
5,15		62	26,0						05150	
5,16	13/64	62	26,0	516 2)	516					
5,20		62	26,0	052 2)	052	052	052	052	05200	052
5,25		62	26,0						05250	
5,30		62	26,0	053 2)	053	053	053	053	05300	053
5,35		66	28,0						05350	
5,40		66	28,0	054 2)	054	054		054	05400	054
5,45		66	28,0						05450	
5,50		66	28,0	055 2)	055	055	055	055	05500	055
5,55		66	28,0						05550	555
5,56	7/32	66	28,0	556 2)	556					
5,60		66	28,0	056 2)	056	056	056	056	05600	056
5,70		66	28,0	057 2)	057	057	057	057	05700	057
5,75		66	28,0						05750	
5,80		66	28,0	058 2)	058	058	058	058	05800	058
5,85		66	28,0						05850	
5,90		66	28,0	059 2)	059	059	059	059	05900	059
5,95	15/64	66	28,0	595 2)	595				05950	
6,00		66	28,0	060 2)	060	060	060	060	06000	060
6,05		70	31,0						06050	
6,10		70	31,0	061 2)	061	061	061	061	06100	061
6,15		70	31,0						06150	
6,20		70	31,0	062 2)	062	062	062	062	06200	062
6,25		70	31,0						06250	
6,30		70	31,0	063 2)	063	063	063	063	06300	063
6,35	1/4	70	31,0	635 2)	635				06350	
6,40		70	31,0	064 2)	064	064	064	064	06400	064
6,45		70	31,0						06450	

Steel	●	●	●	○	●	●	●
Stainless steel	○	●		●	○	○	○
Cast iron	●	●	●	○	○	○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○	○	○	○
Hardened materials		○				○	○

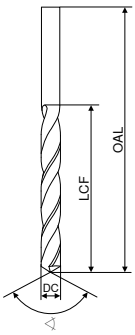
1) uncoated
2) self-centering

→ v_c Page 46+47

Continued on next page

High-performance twist drills similar to DIN 1897, extra-short

≤ 3xD



UNI	UNI	N	VA	WNX	WT	WT
TiN	TiN	vap.			vap.	TiN

◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 113 ...	Article no. 10 107 ...	Article no. 10 105 ...	Article no. 10 130 ...	Article no. 10 106 ...	Article no. 10 109 ...	Article no. 10 110 ...
mm	inch	mm	mm							
6,50		70	31,0	065 2)	065	065	065	065	06500	065
6,55		70	31,0						06550	
6,60		70	31,0	066 2)	066	066	066	066	06600	066
6,65		70	31,0						06650	
6,70		70	31,0	067 2)	067	067	067	067	06700	067
6,75		74	34,0	675 2)	675				06750	
6,80		74	34,0	068 2)	068	068	068	068	06800	068
6,85		74	34,0						06850	
6,90		74	34,0	069 2)	069	069	069	069	06900	069
7,00		74	34,0	070 2)	070	070	070	070	07000	070
7,05		74	34,0						07050	
7,10		74	34,0	071 2)	071	071	071	071	07100	071
7,14	9/32	74	34,0	714 2)	714					
7,20		74	34,0	072 2)	072	072	072	072	07200	072
7,25		74	34,0						07250	
7,30		74	34,0	073 2)	073	073		073	07300	073
7,35		74	34,0						07350	
7,40		74	34,0	074 2)	074	074		074	07400	074
7,50		74	34,0	075 2)	075	075	075	075	07500	075
7,60		79	37,0	076 2)	076	076		076	07600	076
7,70		79	37,0	077 2)	077	077	077	077	07700	077
7,75		79	37,0						07750	
7,80		79	37,0	078 2)	078	078		078	07800	078
7,90		79	37,0	079 2)	079	079	079	079	07900	079
7,94	5/16	79	37,0	794 2)	794					
8,00		79	37,0	080 2)	080	080	080	080	08000	080
8,05		79	37,0						08050	
8,10		79	37,0	081 2)	081	081	081	081	08100	081
8,15		79	37,0						08150	
8,20		79	37,0	082 2)	082	082	082	082	08200	082
8,25		79	37,0						08250	
8,30		79	37,0	083 2)	083	083	083	083	08300	083
8,40		79	37,0	084 2)	084	084	084	084	08400	084
8,50		79	37,0	085 2)	085	085	085	085	08500	085
8,55		84	40,0						08550	
8,60		84	40,0		086	086	086	086	08600	086
8,70		84	40,0		087	087	087	087	08700	087
8,73	11/32	84	40,0	873 2)	873					
8,75		84	40,0						08750	
8,80		84	40,0	088 2)	088	088		088	08800	088
8,90		84	40,0		089	089		089	08900	089
8,95		84	40,0						08950	
9,00		84	40,0	090 2)	090	090	090	090	09000	090

Steel	●	●	●	○	●	●	●
Stainless steel	○	●		●	○	○	○
Cast iron	●	●	●	○	○	○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○	○	○	○
Hardened materials		○				○	○

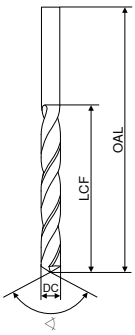
1) uncoated
2) self-centering

→ v_c Page 46+47

Continued on next page

High-performance twist drills similar to DIN 1897, extra-short

≤ 3xD



UNI	UNI	N	VA	WNX	WT	WT
TiN	TiN	vap.			vap.	TiN

◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E

DC h8	DC	OAL	LCF	Article no. 10 113 ...	Article no. 10 107 ...	Article no. 10 105 ...	Article no. 10 130 ...	Article no. 10 106 ...	Article no. 10 109 ...	Article no. 10 110 ...
mm	inch	mm	mm							
9,05		84	40,0						09050	
9,10		84	40,0		091	091		091	09100	091
9,20		84	40,0		092	092	092	092	09200	092
9,25		84	40,0						09250	
9,30		84	40,0	093 2)	093	093	093	093	09300	093
9,40		84	40,0		094	094		094	09400	094
9,50		84	40,0	095 2)	095	095	095	095	09500	095
9,60		89	43,0		096	096		096	09600	096
9,65		89	43,0						09650	
9,70		89	43,0		097	097		097	09700	097
9,75		89	43,0						09750	
9,80		89	43,0	098 2)	098	098	098	098	09800	098
9,90		89	43,0		099	099		099	09900	099
10,00		89	43,0	100 2)	100	100	100	100	10000	100
10,05		89	43,0						10050	
10,10		89	43,0		101	101			10100	
10,20		89	43,0	102 2)	102	102	102	102	10200	102
10,25		89	43,0						10250	
10,30		89	43,0		103	103			10300	
10,40		89	43,0		104	104			10400	
10,50		89	43,0	105 2)	105	105	105	105	10500	105
10,60		95	47,0			106			10600	
10,70		95	47,0			107			10700	
10,75		95	47,0						10750	
10,80		95	47,0			108		108	10800	108
10,90		95	47,0			109			10900	
11,00		95	47,0	110 2)	110	110	110	110	11000	110
11,10		95	47,0			111			11100	
11,11	7/16	95	47,0	111 2)	111					
11,20		95	47,0			112			11200	
11,30		95	47,0			113			11300	
11,40		95	47,0			114			11400	
11,50		95	47,0	115 2)	115	115	115	115	11500	115
11,60		95	47,0			116				
11,70		95	47,0			117	117		11700	
11,75		95	47,0						11750	
11,80		95	47,0			118		118	11800	118
11,90		102	51,0			119				
12,00		102	51,0	120 2)	120	120	120	120	12000	120
12,10		102	51,0			121			12100	
12,20		102	51,0			122			12200	
12,25		102	51,0						12250	
12,30		102	51,0	123 2)	123	123		123	12300	123

Steel	●	●	●	○	●	●	●
Stainless steel	○	●		●	○	○	○
Cast iron	●	●	●	○	○	○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○	○	○	○
Hardened materials		○				○	○

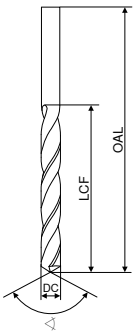
1) uncoated
2) self-centering

→ v_c Page 46+47

Continued on next page

High-performance twist drills similar to DIN 1897, extra-short

≤ 3xD



UNI	UNI	N	VA	WNX	WT	WT
TiN	TiN	vap.			vap.	TiN

◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 113 ...	Article no. 10 107 ...	Article no. 10 105 ...	Article no. 10 130 ...	Article no. 10 106 ...	Article no. 10 109 ...	Article no. 10 110 ...
mm	inch	mm	mm							
12,40		102	51,0			124			12400	
12,50		102	51,0	125 [2]	125	125		125	12500	125
12,60		102	51,0			126			12600	
12,70		102	51,0	127 [2]	127	127			12700	
12,80		102	51,0			128		128	12800	128
12,90		102	51,0			129			12900	
13,00		102	51,0	130 [2]	130	130		130	13000	130
13,20		102	51,0			132			13200	
13,30		107	54,0			133				
13,50		107	54,0	135 [2]	135	135		135	13500	135
13,80		107	54,0			138		138		138
14,00		107	54,0	140 [2]	140	140		140	14000	140
14,50		111	56,0			145		145	14500	145
14,75		111	56,0			147				
14,80		111	56,0					148		
15,00		111	56,0			150		150	15000	150
15,25		115	58,0			152			15250	
15,50		115	58,0			155		155	15500	155
15,75		115	58,0							157
16,00		115	58,0			160		160	16000	160
16,50		119	60,0			165		165	16500	165
17,00		119	60,0			170		170	17000	170
17,50		123	62,0			175		175	17500	175
17,75		123	62,0							177
18,00		123	62,0			180		180	18000	180
18,50		127	64,0			185			18500	185
19,00		127	64,0			190		190	19000	190
19,50		131	66,0			195			19500	195
19,75		131	66,0							197
20,00		131	66,0			200		200	20000	200
20,50		136	68,0						20500	
21,00		136	68,0						21000	
21,50		141	70,0						21500	
22,00		141	70,0						22000	
22,20		141	70,0						22200	
23,00		146	72,0						23000	
24,00		151	75,0						24000	
25,00		151	75,0						25000	

Steel	●	●	●	○	●	●	●
Stainless steel	○	●		●	○	○	○
Cast iron	●	●	●	○	○	○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○	○	○	○
Hardened materials		○				○	○

1) uncoated
2) self-centering

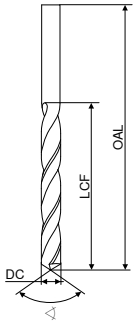
→ v_c Page 46+47

High-performance twist drills similar to DIN 1897, extra-short

▲ left-hand cutting

≤ 3xD

WTL-L



DC h8	OAL	LCF	Article no. 10 112 ...
mm	mm	mm	
1,0	26	6	010 1)
1,1	28	7	011 1)
1,2	30	8	012 1)
1,3	30	8	013 1)
1,4	32	9	014 1)
1,5	32	9	015 1)
1,6	34	10	016 1)
1,7	34	10	017 1)
1,8	36	11	018 1)
1,9	36	11	019 1)
2,0	38	12	020 1)
2,1	38	12	021 1)
2,2	40	13	022 1)
2,3	40	13	023 1)
2,4	43	14	024 2)
2,5	43	14	025 2)
2,6	43	14	026 2)
2,7	46	16	027 2)
2,8	46	16	028 2)
2,9	46	16	029 2)
3,0	46	16	030 2)
3,1	49	18	031 2)
3,2	49	18	032 2)
3,3	49	18	033 2)
3,4	52	20	034 2)
3,5	52	20	035 2)
3,6	52	20	036 2)
3,7	52	20	037 2)
3,8	55	22	038 2)
3,9	55	22	039 2)
4,0	55	22	040 2)
4,1	55	22	041 2)
4,2	55	22	042 2)
4,3	58	24	043 2)
4,4	58	24	044 2)
4,5	58	24	045 2)
4,6	58	24	046 2)
4,7	58	24	047 2)
4,8	62	26	048 2)
4,9	62	26	049 2)
5,0	62	26	050 2)
5,1	62	26	051 2)
5,2	62	26	052 2)
5,3	62	26	053 2)
5,4	66	28	054 2)
5,5	66	28	055 2)
5,6	66	28	056 2)
5,7	66	28	057 2)
5,8	66	28	058 2)
5,9	66	28	059 2)
6,0	66	28	060 2)
6,1	70	31	061 2)
6,2	70	31	062 2)
6,3	70	31	063 2)
6,4	70	31	064 2)
6,5	70	31	065 2)
6,6	70	31	066 2)
6,7	70	31	067 2)
6,8	74	34	068 2)
6,9	74	34	069 2)
7,0	74	34	070 2)
7,2	74	34	072 2)
7,3	74	34	073 2)
7,4	74	34	074 2)
7,5	74	34	075 2)
7,7	79	37	077 2)
8,0	79	37	080 2)
8,1	79	37	081 2)
8,2	79	37	082 2)
8,3	79	37	083 2)
8,5	79	37	085 2)
8,6	84	40	086 2)
8,7	84	40	087 2)
8,8	84	40	088 2)
9,0	84	40	090 2)
9,5	84	40	095 2)
9,7	89	43	097 2)
10,0	89	43	100 2)
10,1	89	43	101 2)
10,2	89	43	102 2)
10,5	89	43	105 2)
11,0	95	47	110 2)
11,5	95	47	115 2)
11,8	95	47	118 2)
12,0	102	51	120 2)
12,5	102	51	125 2)
12,8	102	51	128 2)
13,0	102	51	130 2)
14,0	107	54	140 2)
14,5	111	56	145 2)
15,0	111	56	150 2)
16,0	115	58	160 3)
18,0	123	62	180 3)
19,0	127	64	190 3)

Steel	●
Stainless steel	○
Cast iron	○
Non ferrous metals	●
Heat resistant alloys	
Hardened materials	○

1) uncoated
2) nitrided chamfer
3) vaporised

→ v_c Page 47

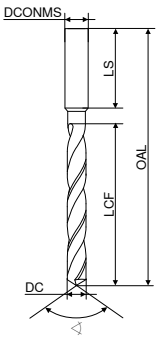
High-performance twist drill similar to DIN 338, short

- with shank to DIN 1835 A
- special point thinning
- 4 facet
- highest Performance
- very good centering behaviour

≤ 5xD

VX

TiN



HSS-E

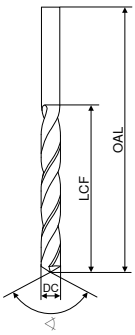
DC h8	OAL	LCF	DCONMS h6	LS	Article no. 10 124 ...
mm	mm	mm	mm	mm	
2,00	56	24	3	28	020
2,10	56	24	3	28	021
2,20	59	27	3	28	022
2,30	59	27	3	28	023
2,40	62	30	3	28	024
2,50	62	30	3	28	025
2,60	62	30	3	28	026
2,70	65	33	3	28	027
2,80	65	33	3	28	028
2,90	65	33	3	28	029
3,00	65	33	3	28	030
3,10	68	36	4	28	031
3,20	68	36	4	28	032
3,30	68	36	4	28	033
3,40	71	39	4	28	034
3,50	71	39	4	28	035
3,60	71	39	4	28	036
3,70	71	39	4	28	037
3,80	75	43	4	28	038
3,90	75	43	4	28	039
4,00	75	43	4	28	040
4,10	87	43	6	36	041
4,20	87	43	6	36	042
4,30	91	47	6	36	043
4,40	91	47	6	36	044
4,50	91	47	6	36	045
4,60	91	47	6	36	046
4,65	91	47	6	36	465
4,70	91	47	6	36	047
4,80	96	52	6	36	048
4,90	96	52	6	36	049
5,00	96	52	6	36	050
5,10	96	52	6	36	051
5,20	96	52	6	36	052
5,30	96	52	6	36	053
5,40	101	57	6	36	054
5,50	101	57	6	36	055
5,55	101	57	6	36	555
5,60	101	57	6	36	056
5,70	101	57	6	36	057
5,80	101	57	6	36	058
5,90	101	57	6	36	059
6,00	101	57	6	36	060
6,10	107	63	8	36	061
6,20	107	63	8	36	062
6,30	107	63	8	36	063
6,40	107	63	8	36	064
6,50	107	63	8	36	065
6,60	107	63	8	36	066
6,70	107	63	8	36	067
6,80	113	69	8	36	068
6,90	113	69	8	36	069
7,00	113	69	8	36	070
7,10	113	69	8	36	071
7,20	113	69	8	36	072
7,30	113	69	8	36	073
7,40	113	69	8	36	074
7,50	113	69	8	36	075
7,55	119	75	8	36	755
7,60	119	75	8	36	076
7,70	119	75	8	36	077
7,80	119	75	8	36	078
7,90	119	75	8	36	079
8,00	119	75	8	36	080
8,10	125	75	10	40	081
8,20	125	75	10	40	082
8,30	125	75	10	40	083
8,40	125	75	10	40	084
8,50	125	75	10	40	085
8,60	131	81	10	40	086
8,70	131	81	10	40	087
8,80	131	81	10	40	088
8,90	131	81	10	40	089
9,00	131	81	10	40	090
9,10	131	81	10	40	091
9,20	131	81	10	40	092
9,30	131	81	10	40	093
9,40	131	81	10	40	094
9,50	131	81	10	40	095
9,55	137	87	10	40	955
9,60	137	87	10	40	096
9,70	137	87	10	40	097
9,80	137	87	10	40	098
9,90	137	87	10	40	099
10,00	137	87	10	40	100
10,10	144	87	12	45	101
10,20	144	87	12	45	102
10,30	144	87	12	45	103
10,40	144	87	12	45	104
10,50	144	87	12	45	105
10,60	144	87	12	45	106
10,70	151	94	12	45	107
10,80	151	94	12	45	108
10,90	151	94	12	45	109
11,00	151	94	12	45	110
11,10	151	94	12	45	111
11,20	151	94	12	45	112
11,30	151	94	12	45	113
11,40	151	94	12	45	114
11,50	151	94	12	45	115
11,60	151	94	12	45	116
11,70	151	94	12	45	117
11,80	151	94	12	45	118
11,90	158	101	12	45	119
12,00	158	101	12	45	120
12,10	161	101	16	48	121
12,20	161	101	16	48	122
12,30	161	101	16	48	123
12,40	161	101	16	48	124
12,50	161	101	16	48	125
12,60	161	101	16	48	126
12,70	161	101	16	48	127
12,80	161	101	16	48	128
12,90	161	101	16	48	129
13,00	161	101	16	48	130
13,50	166	106	16	48	135
14,00	166	106	16	48	140
14,50	169	109	16	48	145
15,00	169	109	16	48	150
15,50	172	112	16	48	155
16,00	172	112	16	48	160
16,50	181	115	20	50	165
17,00	181	115	20	50	170
17,50	184	118	20	50	175
18,00	184	118	20	50	180
18,50	188	122	20	50	185
19,00	188	122	20	50	190
19,50	191	125	20	50	195
20,00	191	125	20	50	200

Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○

→ v_c Page 48

Twist drill to DIN 338, short

≤ 5xD



UNI	UNI	N	VA	W	WTL	WTL
TiN	TiN	vap.			F.-nit	TiN
						
◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 173 ...	Article no. 10 171 ...	Article no. 10 152 ...	Article no. 10 175 ...	Article no. 10 161 ...	Article no. 10 168 ...	Article no. 10 170 ...
mm	inch	mm	mm							
0,20		19	2,5			00200 [1]		00200		
0,25		19	3,0			00250 [1]		00250		
0,30		19	3,0			00300 [1]		00300		
0,35		19	4,0			00350 [1]		00350		
0,40		20	5,0			00400 [1]		00400		
0,45		20	5,0			00450 [1]		00450		
0,50		22	6,0			00500 [1]		00500		
0,55		24	7,0			00550 [1]		00550		
0,60		24	7,0			00600 [1]		00600		
0,65		26	8,0			00650 [1]		00650		
0,70		28	9,0			00700 [1]		00700		
0,75		28	9,0			00750 [1]		00750		
0,80		30	10,0			00800 [1]		00800		
0,85		30	10,0			00850 [1]		00850		
0,90		32	11,0		009	00900 [1]		00900		
0,95		32	11,0			00950 [1]		00950		
1,00		34	12,0	010 [2]	010	01000 [1]	010	01000	010 [1]	010
1,05		34	12,0			01050 [1]		01050		
1,10		36	14,0	011 [2]	011	01100 [1]	011	01100	011 [1]	011
1,15		36	14,0			01150 [1]		01150		
1,20		38	16,0	012 [2]	012	01200 [1]	012	01200	012 [1]	012
1,25		38	16,0		125	01250 [1]		01250		
1,30		38	16,0	013 [2]	013	01300 [1]	013	01300	013 [1]	013
1,35		40	18,0			01350 [1]		01350		
1,40		40	18,0	014 [2]	014	01400 [1]	014	01400	014 [1]	014
1,45		40	18,0		145	01450 [1]		01450		901
1,50		40	18,0	015 [2]	015	01500 [1]	015	01500	015 [1]	015
1,55		43	20,0		155	01550 [1]		01550		902
1,60		43	20,0	016 [2]	016	01600 [1]	016	01600	016 [1]	016
1,65		43	20,0		165	01650 [1]		01650		903
1,70		43	20,0	017 [2]	017	01700 [1]	017	01700	017 [1]	017
1,75		46	22,0			01750 [1]		01750		
1,80		46	22,0	018 [2]	018	01800 [1]	018	01800	018 [1]	018
1,85		46	22,0			01850 [1]		01850		904
1,90		46	22,0	019 [2]	019	01900 [1]	019	01900	019 [1]	019
1,95		49	24,0			01950 [1]		01950		
2,00		49	24,0	020 [2]	020	02000 [1]	020	02000	020 [1]	020
2,05		49	24,0			02050 [1]		02050		905
2,10		49	24,0	021 [2]	021	02100 [1]	021	02100	021 [1]	021
2,15		53	27,0			02150 [1]		02150		
2,20		53	27,0	022 [2]	022	02200 [1]	022	02200	022 [1]	022
2,25		53	27,0			02250 [1]		02250		
2,30		53	27,0	023 [2]	023	02300 [1]	023	02300	023 [1]	023
2,35		53	27,0			02350 [1]		02350		
2,38	3/32	57	30,0	238 [2]	238					
2,40		57	30,0	024 [2]	024	02400	024	02400	024	024

Steel	●	●	●	○		●	●
Stainless steel	○	●		●		○	○
Cast iron	●	●	●	○		○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○			
Hardened materials		○					

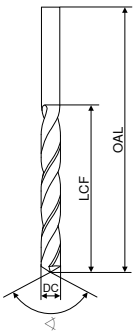
1) uncoated
2) self-centering

→ v_c Page 48+49

Continued on next page

Twist drill to DIN 338, short

≤ 5xD



	UNI	UNI	N	VA	W	WTL	WTL
	TiN	TiN	vap.			F.-nit	TiN
							
	◁ 130° HSS-E-PM	◁ 118° HSS-E	◁ 118° HSS	◁ 130° HSS-E	◁ 130° HSS	◁ 130° HSS-E	◁ 130° HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 173 ...	Article no. 10 171 ...	Article no. 10 152 ...	Article no. 10 175 ...	Article no. 10 161 ...	Article no. 10 168 ...	Article no. 10 170 ...
mm	inch	mm	mm							
2,45		57	30,0			02450		02450		
2,50		57	30,0	025 [2]	025	02500	025	02500	025	025
2,55		57	30,0		255	02550		02550		
2,60		57	30,0	026 [2]	026	02600	026	02600	026	026
2,65		57	30,0			02650		02650		
2,70		61	33,0	027 [2]	027	02700	027	02700	027	027
2,75		61	33,0			02750		02750		
2,78	7/64	61	33,0	278 [2]	278					
2,80		61	33,0	028 [2]	028	02800	028	02800	028	028
2,85		61	33,0			02850		02850		
2,90		61	33,0	029 [2]	029	02900	029	02900	029	029
2,95		61	33,0			02950		02950		
3,00		61	33,0	030 [2]	030	03000	030	03000	030	030
3,05		65	36,0			03050		03050		
3,10		65	36,0	031 [2]	031	03100	031	03100	031	031
3,15		65	36,0			03150		03150		
3,17	1/8	65	36,0	317 [2]	317					
3,20		65	36,0	032 [2]	032	03200	032	03200	032	032
3,25		65	36,0		325	03250		03250		
3,30		65	36,0	033 [2]	033	03300	033	03300	033	033
3,35		65	36,0			03350		03350		
3,40		70	39,0	034 [2]	034	03400	034	03400	034	034
3,45		70	39,0			03450		03450		
3,50		70	39,0	035 [2]	035	03500	035	03500	035	035
3,55		70	39,0			03550		03550		
3,57	9/64	70	39,0	357 [2]	357					
3,60		70	39,0	036 [2]	036	03600	036	03600	036	036
3,65		70	39,0			03650		03650		
3,70		70	39,0	037 [2]	037	03700	037	03700	037	037
3,75		70	39,0			03750		03750		
3,80		75	43,0	038 [2]	038	03800	038	03800	038	038
3,85		75	43,0			03850		03850		
3,90		75	43,0	039 [2]	039	03900	039	03900	039	039
3,95		75	43,0			03950		03950		
3,97	5/32	75	43,0	397 [2]	397					
4,00		75	43,0	040 [2]	040	04000	040	04000	040	040
4,05		75	43,0			04050		04050		
4,10		75	43,0	041 [2]	041	04100	041	04100	041	041
4,15		75	43,0			04150		04150		
4,20		75	43,0	042 [2]	042	04200	042	04200	042	042
4,25		75	43,0		425	04250		04250		
4,30		80	47,0	043 [2]	043	04300	043	04300	043	043
4,35		80	47,0			04350		04350		
4,37	11/64	80	47,0	437 [2]	437					
4,40		80	47,0	044 [2]	044	04400	044	04400	044	044
4,45		80	47,0			04450				

Steel	●	●	●	○		●	●
Stainless steel	○	●		●		○	○
Cast iron	●	●	●	○		○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○			
Hardened materials		○					

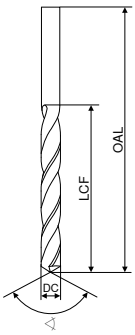
1) uncoated
2) self-centering

→ v_c Page 48+49

Continued on next page

Twist drill to DIN 338, short

≤ 5xD



UNI	UNI	N	VA	W	WTL	WTL
TiN	TiN	vap.			F.-nit	TiN
						
◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 173 ...	Article no. 10 171 ...	Article no. 10 152 ...	Article no. 10 175 ...	Article no. 10 161 ...	Article no. 10 168 ...	Article no. 10 170 ...
mm	inch	mm	mm							
4,50		80	47,0	045 [2]	045	04500	045	04500	045	045
4,55		80	47,0			04550		04550		
4,60		80	47,0	046 [2]	046	04600	046	04600	046	046
4,65		80	47,0		465	04650		04650		
4,70		80	47,0	047 [2]	047	04700	047	04700	047	047
4,75		80	47,0			04750		04750		
4,76	3/16	86	52,0	476 [2]	476					
4,80		86	52,0	048 [2]	048	04800	048	04800	048	048
4,85		86	52,0			04850		04850		
4,90		86	52,0	049 [2]	049	04900	049	04900	049	049
4,95		86	52,0		495	04950		04950		
5,00		86	52,0	050 [2]	050	05000	050	05000	050	050
5,05		86	52,0		505	05050		05050		
5,10		86	52,0	051 [2]	051	05100	051	05100	051	051
5,15		86	52,0			05150				
5,16	13/64	86	52,0	516 [2]	516					
5,20		86	52,0	052 [2]	052	05200	052	05200	052	052
5,25		86	52,0			05250		05250		
5,30		86	52,0	053 [2]	053	05300	053	05300	053	053
5,35		93	57,0			05350				
5,40		93	57,0	054 [2]	054	05400	054	05400	054	054
5,45		93	57,0			05450		05450		
5,50		93	57,0	055 [2]	055	05500	055	05500	055	055
5,55		93	57,0		555	05550		05550		
5,56	7/32	93	57,0	556 [2]	556					
5,60		93	57,0	056 [2]	056	05600	056	05600	056	056
5,65		93	57,0			05650		05650		
5,70		93	57,0	057 [2]	057	05700	057	05700	057	057
5,75		93	57,0		575	05750		05750		
5,80		93	57,0	058 [2]	058	05800	058	05800	058	058
5,85		93	57,0			05850		05850		
5,90		93	57,0	059 [2]	059	05900	059	05900	059	059
5,95	15/64	93	57,0	595 [2]	595	05950		05950		
6,00		93	57,0	060 [2]	060	06000	060	06000	060	060
6,05		101	63,0			06050		06050		
6,10		101	63,0	061 [2]	061	06100	061	06100	061	061
6,15		101	63,0			06150		06150		
6,20		101	63,0	062 [2]	062	06200	062	06200	062	062
6,25		101	63,0			06250		06250		
6,30		101	63,0	063 [2]	063	06300	063	06300	063	063
6,35	1/4	101	63,0	635 [2]	635	06350		06350		
6,40		101	63,0	064 [2]	064	06400	064	06400	064	064
6,45		101	63,0			06450				
6,50		101	63,0	065 [2]	065	06500	065	06500	065	065
6,55		101	63,0			06550		06550		
6,60		101	63,0	066 [2]	066	06600	066	06600	066	066

Steel	●	●	●	○		●	●
Stainless steel	○	●		●		○	○
Cast iron	●	●	●	○		○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○			
Hardened materials		○					

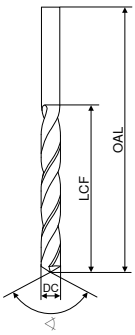
1) uncoated
2) self-centering

→ v_c Page 48+49

Continued on next page

Twist drill to DIN 338, short

≤ 5xD



UNI	UNI	N	VA	W	WTL	WTL
TiN	TiN	vap.			F.-nit	TiN
						
◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 173 ...	Article no. 10 171 ...	Article no. 10 152 ...	Article no. 10 175 ...	Article no. 10 161 ...	Article no. 10 168 ...	Article no. 10 170 ...
mm	inch	mm	mm							
6,65		101	63,0			06650		06650		
6,70		101	63,0	067 [2]	067	06700	067	06700	067	067
6,75		109	69,0	675 [2]	675	06750		06750		
6,80		109	69,0	068 [2]	068	06800	068	06800	068	068
6,85		109	69,0			06850		06850		
6,90		109	69,0	069 [2]	069	06900	069	06900	069	069
6,95		109	69,0			06950		06950		
7,00		109	69,0	070 [2]	070	07000	070	07000	070	070
7,05		109	69,0			07050		07050		
7,10		109	69,0	071 [2]	071	07100	071	07100	071	071
7,14	9/32	109	69,0	714 [2]	714					
7,15		109	69,0			07150				
7,20		109	69,0	072 [2]	072	07200	072	07200	072	072
7,25		109	69,0			07250		07250		
7,30		109	69,0	073 [2]	073	07300	073	07300	073	073
7,35		109	69,0			07350				
7,40		109	69,0	074 [2]	074	07400	074	07400	074	074
7,45		109	69,0		745	07450				
7,50		109	69,0	075 [2]	075	07500	075	07500	075	075
7,55		117	75,0			07550				
7,60		117	75,0	076 [2]	076	07600	076	07600	076	076
7,65		117	75,0			07650				
7,70		117	75,0	077 [2]	077	07700	077	07700	077	077
7,75		117	75,0			07750		07750		
7,80		117	75,0	078 [2]	078	07800	078	07800	078	078
7,85		117	75,0			07850				
7,90		117	75,0	079 [2]	079	07900	079	07900	079	079
7,94	5/16	117	75,0	794 [2]	794					
7,95		117	75,0			07950				
8,00		117	75,0	080 [2]	080	08000	080	08000	080	080
8,05		117	75,0			08050		08050		
8,10		117	75,0	081 [2]	081	08100	081	08100	081	081
8,15		117	75,0			08150		08150		
8,20		117	75,0	082 [2]	082	08200	082	08200	082	082
8,25		117	75,0			08250		08250		
8,30		117	75,0	083 [2]	083	08300	083	08300	083	083
8,35		117	75,0			08350				
8,40		117	75,0	084 [2]	084	08400	084	08400	084	084
8,45		117	75,0			08450		08450		
8,50		117	75,0	085 [2]	085	08500	085	08500	085	085
8,55		125	81,0			08550		08550		
8,60		125	81,0		086	08600	086	08600	086	086
8,65		125	81,0			08650				
8,70		125	81,0		087	08700	087	08700	087	087
8,73	11/32	125	81,0	873 [2]	873					
8,75		125	81,0			08750		08750		

Steel	●	●	●	○		●	●
Stainless steel	○	●		●		○	○
Cast iron	●	●	●	○		○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○			
Hardened materials		○					

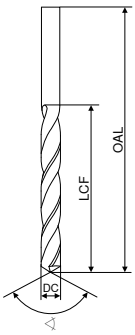
1) uncoated
2) self-centering

→ v_c Page 48+49

Continued on next page

Twist drill to DIN 338, short

≤ 5xD



UNI	UNI	N	VA	W	WTL	WTL
TiN	TiN	vap.			F.-nit	TiN
						
◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 173 ...	Article no. 10 171 ...	Article no. 10 152 ...	Article no. 10 175 ...	Article no. 10 161 ...	Article no. 10 168 ...	Article no. 10 170 ...
mm	inch	mm	mm							
8,80		125	81,0	088 2)	088	08800	088	08800	088	088
8,90		125	81,0		089	08900	089	08900	089	089
8,95		125	81,0			08950				
9,00		125	81,0	090 2)	090	09000	090	09000	090	090
9,05		125	81,0			09050				
9,10		125	81,0		091	09100	091	09100	091	091
9,15		125	81,0			09150				
9,20		125	81,0		092	09200	092	09200	092	092
9,25		125	81,0			09250		09250		
9,30		125	81,0	093 2)	093	09300	093	09300	093	093
9,35		125	81,0		935	09350				
9,40		125	81,0		094	09400	094	09400	094	094
9,45		125	81,0			09450				
9,50		125	81,0	095 2)	095	09500	095	09500	095	095
9,55		133	87,0			09550				
9,60		133	87,0		096	09600	096	09600	096	096
9,65		133	87,0			09650				
9,70		133	87,0		097	09700	097	09700	097	097
9,75		133	87,0			09750				
9,80		133	87,0	098 2)	098	09800	098	09800	098	098
9,85		133	87,0			09850				
9,90		133	87,0		099	09900	099	09900	099	099
9,95		133	87,0			09950				
10,00		133	87,0	100 2)	100	10000	100	10000	100	100
10,05		133	87,0			10050		10050		
10,10		133	87,0		101	10100	101	10100	101	101
10,15		133	87,0			10150				
10,20		133	87,0	102 2)	102	10200	102	10200	102	102
10,25		133	87,0			10250		10250		
10,30		133	87,0		103	10300	103	10300	103	103
10,35		133	87,0			10350				
10,40		133	87,0		104	10400	104	10400	104	104
10,45		133	87,0			10450				
10,50		133	87,0	105 2)	105	10500	105	10500	105	105
10,55		133	87,0		955	10550				
10,60		133	87,0			10600	106	10600	106	
10,70		142	94,0			10700	107	10700	107	107
10,75		142	94,0			10750		10750		
10,80		142	94,0			10800	108	10800	108	108
10,90		142	94,0			10900	109	10900	109	
11,00		142	94,0	110 2)	110	11000	110	11000	110	110
11,10		142	94,0			11100	111	11100	111	
11,11	7/16	142	94,0	111 2)	111					
11,20		142	94,0		112	11200	112	11200	112	112
11,30		142	94,0		113		113		113	
11,40		142	94,0		114	11400	114	11400	114	

Steel	●	●	●	○		●	●
Stainless steel	○	●		●		○	○
Cast iron	●	●	●	○		○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○			
Hardened materials		○					

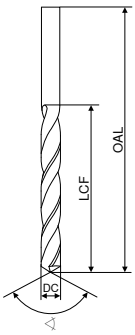
1) uncoated
2) self-centering

→ v_c Page 48+49

Continued on next page

Twist drill to DIN 338, short

≤ 5xD



UNI	UNI	N	VA	W	WTL	WTL
TiN	TiN	vap.			F.-nit	TiN
						
◁ 130°	◁ 118°	◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E-PM	HSS-E	HSS	HSS-E	HSS	HSS-E	HSS-E

DC $_{h8}$	DC	OAL	LCF	Article no. 10 173 ...	Article no. 10 171 ...	Article no. 10 152 ...	Article no. 10 175 ...	Article no. 10 161 ...	Article no. 10 168 ...	Article no. 10 170 ...
mm	inch	mm	mm							
11,50		142	94,0	115 [2]	115	11500	115	11500	115	115
11,60		142	94,0		116	11600	116	11600	116	
11,70		142	94,0			11700	117	11700	117	117
11,80		142	94,0			11800	118	11800	118	118
11,90		151	101,0			11900	119	11900		
12,00		151	101,0	120 [2]	120	12000	120	12000	120	120
12,15		151	101,0		121					
12,20		151	101,0			12200		12200		
12,25		151	101,0			12250				
12,30		151	101,0	123 [2]	123					
12,50		151	101,0	125 [2]	925	12500		12500	125	125
12,70		151	101,0	127 [2]	127	12700		12700		
12,80		151	101,0			12800		12800	128	128
13,00		151	101,0	130 [2]	130	13000		13000	130	130
13,10		151	101,0		131					
13,20		151	101,0			13200		13200		
13,30		160	108,0		133					
13,50		160	108,0	135 [2]	135	13500		13500	135	135
13,80		160	108,0			13800		13800	138	138
14,00		160	108,0	140 [2]	140	14000		14000	140	140
14,50		169	114,0			14500		14500	145	145
14,80		169	114,0						148	148
15,00		169	114,0			15000		15000	150	150
15,25		178	120,0			15250				
15,50		178	120,0			15500		15500	155	155
15,80		178	120,0			15800				
16,00		178	120,0			16000		16000	160	160
16,50		184	125,0			16500		16500		
17,00		184	125,0			17000		17000		
17,50		191	130,0			17500		17500		
18,00		191	130,0			18000		18000		
18,50		198	135,0			18500				
19,00		198	135,0			19000		19000		
19,50		205	140,0			19500				
20,00		205	140,0			20000		20000		

Steel	●	●	●	○		●	●
Stainless steel	○	●		●		○	○
Cast iron	●	●	●	○		○	○
Non ferrous metals	○	●	○	○	●	○	○
Heat resistant alloys	○	○		○			
Hardened materials		○					

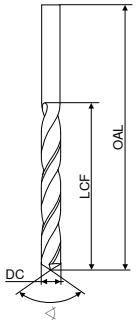
1) uncoated
2) self-centering

→ v_c Page 48+49

Twist drill to DIN 338, short

▲ Article no. 10 169 ... WTL-L – left-hand cutting drill

≤ 5xD



WTL
TiCN

130°
HSS-E

WTL-L
F.-nit

130°
HSS

DC_{h8} mm	OAL mm	LCF mm	Article no. 10 172 ...	Article no. 10 169 ...
1,0	34	12		010 1)
1,3	38	16		013 1)
1,4	40	18		014 1)
1,5	40	18		015 1)
1,6	43	20		016 1)
1,7	43	20		017 1)
1,8	46	22		018 1)
1,9	46	22		019 1)
2,0	49	24		020 1)
2,1	49	24		021 1)
2,2	53	27		022 1)
2,3	53	27		023 1)
2,4	57	30		024
2,5	57	30		025
2,6	57	30		026
2,7	61	33		027
2,8	61	33		028
2,9	61	33		029
3,0	61	33	030	030
3,1	65	36	031	031
3,2	65	36	032	032
3,3	65	36	033	033
3,4	70	39	034	034
3,5	70	39	035	035
3,6	70	39	036	036
3,7	70	39	037	037
3,8	75	43	038	038
3,9	75	43	039	039
4,0	75	43	040	040
4,1	75	43	041	041
4,2	75	43	042	042
4,3	80	47	043	043
4,4	80	47	044	044
4,5	80	47	045	045
4,6	80	47	046	046
4,7	80	47	047	047
4,8	86	52	048	048
4,9	86	52	049	049
5,0	86	52	050	050
5,1	86	52	051	051
5,2	86	52	052	052
5,3	86	52	053	053
5,4	93	57	054	054
5,5	93	57	055	055
5,6	93	57	056	056
5,7	93	57	057	057
5,8	93	57	058	058
5,9	93	57	059	059
6,0	93	57	060	060
6,1	101	63	061	061
6,2	101	63	062	062
6,3	101	63	063	063
6,4	101	63	064	064
6,5	101	63	065	065
6,6	101	63	066	066
6,7	101	63	067	067
6,8	109	69	068	068
6,9	109	69	069	069
7,0	109	69	070	070
7,1	109	69	071	071
7,2	109	69	072	072
7,3	109	69		073
7,4	109	69	074	074
7,5	109	69	075	075
7,7	117	75	077	077
7,8	117	75	078	078
7,9	117	75		079
8,0	117	75	080	080
8,1	117	75	081	081
8,2	117	75	082	082
8,3	117	75		083
8,4	117	75	084	084
8,5	117	75	085	085
8,6	125	81	086	086
8,7	125	81	087	087
8,8	125	81	088	088
8,9	125	81	089	089
9,0	125	81	090	090
9,2	125	81		092
9,3	125	81		093
9,5	125	81	095	095
9,8	133	87		098
9,9	133	87		099
10,0	133	87	100	100
10,1	133	87		101
10,2	133	87	102	102
10,3	133	87		103
10,4	133	87		104
10,5	133	87	105	105
11,0	142	94	110	110
11,5	142	94	115	115
12,0	151	101	120	120
12,2	151	101		122
12,5	151	101		125
13,0	151	101		130
14,0	160	108		140
14,5	169	114		145
15,0	169	114		150
16,0	178	120		160

	Article no. 10 172 ...	Article no. 10 169 ...
Steel	●	●
Stainless steel	○	
Cast iron		○
Non ferrous metals		○
Heat resistant alloys		

1) uncoated

→ v_c Page 49

Twist drill sets DIN 338, short

- ▲ in metal box
- ▲ in 0.1 mm steps

≤ 5xD

	N	UNI
	vap.	TiN
		
	Drill set type N HSS	Drill set type UNI TiN HSS-E
$d_{1\ h8}$ mm	Article no. 10 158 ...	Article no. 10 158 ...
1,0 - 5,9	050	054
6,0 - 10,0	100	104
Steel	●	●
Stainless steel		●
Cast iron	●	●
Non ferrous metals		●
Heat resistant alloys		○

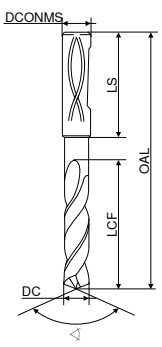
→ v_c Page 48

Set of type N vap. contains the drills of Art. No. 10 152 ...
Set of type UNI TiN contains the drills of Art. No. 10 171 ...

Twist drill with thro' coolant ~ DIN 338, short

- relief ground
- special point thinning
- wide chip flutes
- rounded flute edges
- for long chipping materials up to 1000 N/mm²

≤ 5xD



WNXi

HSS-E

WNXi
TiN

HSS-E

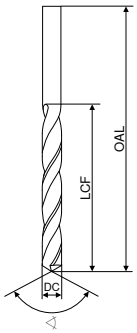
DC h8	OAL	LCF	DCONMS h6	LS	Article no. 10 180 ...	Article no. 10 181 ...
mm	mm	mm	mm	mm		
5,0	82	44	6	38	050	050
5,5	82	44	6	38	055	055
6,0	82	44	6	38	060	060
6,5	91	53	8	38	065	065
6,8	91	53	8	38	068	068
7,0	91	53	8	38	070	070
7,5	91	53	8	38	075	075
7,8	91	53	8	38	078	078
8,0	91	53	8	38	080	080
8,5	103	61	10	42	085	085
9,0	103	61	10	42	090	090
9,5	103	61	10	42	095	095
10,0	103	61	10	42	100	100
10,2	118	71	12	47	102	102
10,5	118	71	12	47	105	105
11,0	118	71	12	47	110	110
11,5	118	71	12	47	115	115
12,0	118	71	12	47	120	120
12,5	124	77	14	47	125	125
13,0	124	77	14	47	130	130
13,5	124	77	14	47	135	135
14,0	124	77	14	47	140	140
14,5	133	83	16	50	145	145
15,0	133	83	16	50	150	150
15,5	133	83	16	50	155	155
16,0	133	83	16	50	160	160
16,5	143	93	18	50	165	165
17,0	143	93	18	50	170	170
17,5	143	93	18	50	175	175
18,0	143	93	18	50	180	180
18,5	153	101	20	52	185	185
19,0	153	101	20	52	190	190
19,5	153	101	20	52	195	195
20,0	153	101	20	52	200	200

Steel	●	●
Stainless steel	●	●
Cast iron	●	●
Non ferrous metals	○	○
Heat resistant alloys	○	○

→ v_c Page 49

Twist drills with coolant hole, factory standard, long

≤ 10xD



NC

HSS

NC
TiAlN

HSS

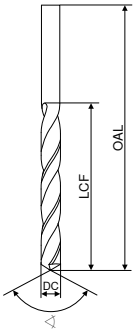
DC h8	OAL	LCF	Article no. 10 223 ...	Article no. 10 224 ...
mm	mm	mm		
3,0	100	66	030	030
3,3	106	69	033	033
3,5	112	73	035	035
3,8	119	78		038
4,0	119	78	040	040
4,2	119	78	042	042
4,5	126	82	045	045
4,8	132	87		048
5,0	132	87	050	050
5,5	139	91	055	055
5,8	139	91		058
6,0	139	91	060	060
6,5	148	97	065	065
6,8	156	102	068	068
7,0	156	102	070	070
7,5	156	102	075	075
7,8	165	109		078
8,0	165	109	080	080
8,5	165	109	085	085
8,8	175	115		088
9,0	175	115	090	090
9,5	175	115	095	095
9,8	184	121		098
10,0	184	121	100	100
10,2	184	121	102	102
10,5	184	121	105	105
10,8	195	128		108
11,0	195	128	110	110
11,5	195	128	115	115
11,8	205	134		118
12,0	205	134	120	120
12,8	205	134		128
13,0	205	134	130	130

Steel	●	●
Stainless steel	○	○
Cast iron	●	●
Non ferrous metals	○	○
Heat resistant alloys	○	○

→ v_c Page 50

Twist drills, DIN 340, long

≤ 10xD



UNI	WTL	WTL	WTL	WTW
TiN	F.-nit	F.-nit	TiN	
				
◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E	HSS-E	HSS	HSS	HSS

DC_{h8}	OAL	LCF	Article no. 10 270 ...	Article no. 10 225 ...	Article no. 10 215 ...	Article no. 10 210 ...	Article no. 10 200 ...
mm	mm	mm					
1,0	56	33	010	010 [1]	010 [1]	010	010
1,1	60	37	011	011 [1]	011 [1]	011	011
1,2	65	41	012	012 [1]	012 [1]	012	012
1,3	65	41	013	013 [1]	013 [1]	013	013
1,4	70	45	014	014 [1]	014 [1]	014	014
1,5	70	45	015	015 [1]	015 [1]	015	015
1,6	76	50	016	016 [1]	016 [1]	016	016
1,7	76	50	017	017 [1]	017 [1]	017	017
1,8	80	53	018	018 [1]	018 [1]	018	018
1,9	80	53	019	019 [1]	019 [1]	019	019
2,0	85	56	020	020 [1]	020 [1]	020	020
2,1	85	56	021	021 [1]	021 [1]	021	021
2,2	90	59	022	022 [1]	022 [1]	022	022
2,3	90	59	023	023 [1]	023 [1]	023	023
2,4	95	62	024	024	024	024	024
2,5	95	62	025	025	025	025	025
2,6	95	62	026	026	026	026	026
2,7	100	66	027	027	027	027	027
2,8	100	66	028	028	028	028	028
2,9	100	66	029	029	029	029	029
3,0	100	66	030	030	030	030	030
3,1	106	69	031	031	031	031	031
3,2	106	69	032	032	032	032	032
3,3	106	69	033	033	033	033	033
3,4	112	73	034	034	034	034	034
3,5	112	73	035	035	035	035	035
3,6	112	73	036	036	036	036	036
3,7	112	73	037	037	037	037	037
3,8	119	78	038	038	038	038	038
3,9	119	78	039	039	039	039	039
4,0	119	78	040	040	040	040	040
4,1	119	78	041	041	041	041	041
4,2	119	78	042	042	042	042	042
4,3	126	82	043	043	043	043	043
4,4	126	82	044	044	044	044	044
4,5	126	82	045	045	045	045	045
4,6	126	82	046	046	046	046	046
4,7	126	82	047	047	047	047	047
4,8	132	87	048	048	048	048	048
4,9	132	87	049	049	049	049	049
5,0	132	87	050	050	050	050	050
5,1	132	87	051	051	051	051	051
5,2	132	87	052	052	052	052	052
5,3	132	87	053	053	053	053	053

Steel	●	●	●	●		
Stainless steel	○	●				
Cast iron	●	●	●	●		
Non ferrous metals	○	●	●	●	●	
Heat resistant alloys						

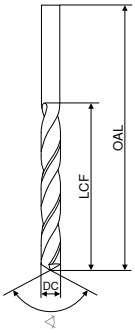
1) uncoated

→ v_c Page 50

Continued on next page

Twist drills, DIN 340, long

≤ 10xD



UNI	WTL	WTL	WTL	WTW
TiN	F.-nit	F.-nit	TiN	
				
◁ 118°	◁ 130°	◁ 130°	◁ 130°	◁ 130°
HSS-E	HSS-E	HSS	HSS	HSS
Article no. 10 270 ...	Article no. 10 225 ...	Article no. 10 215 ...	Article no. 10 210 ...	Article no. 10 200 ...

DC h8	OAL	LCF					
mm	mm	mm					
5,4	139	91	054	054	054	054	054
5,5	139	91	055	055	055	055	055
5,6	139	91	056	056	056	056	056
5,7	139	91	057	057	057	057	057
5,8	139	91	058	058	058	058	058
5,9	139	91	059	059	059	059	059
6,0	139	91	060	060	060	060	060
6,1	148	97	061	061	061	061	061
6,2	148	97	062	062	062	062	062
6,3	148	97	063	063	063	063	063
6,4	148	97	064	064	064	064	064
6,5	148	97	065	065	065	065	065
6,6	148	97	066	066	066	066	066
6,7	148	97	067	067	067	067	067
6,8	156	102	068	068	068	068	068
6,9	156	102	069	069	069	069	069
7,0	156	102	070	070	070	070	070
7,1	156	102	071	071	071		071
7,2	156	102	072	072	072	072	072
7,3	156	102	073	073	073	073	073
7,4	156	102	074	074	074	074	074
7,5	156	102	075	075	075	075	075
7,6	165	109	076		076	076	076
7,7	165	109	077	077	077		077
7,8	165	109	078	078	078	078	078
7,9	165	109	079	079	079	079	079
8,0	165	109	080	080	080	080	080
8,1	165	109	081	081	081	081	081
8,2	165	109	082	082	082	082	082
8,3	165	109	083	083	083	083	083
8,4	165	109	084	084	084	084	084
8,5	165	109	085	085	085	085	085
8,6	175	115	086	086	086	086	086
8,7	175	115	087	087	087	087	
8,8	175	115	088	088	088	088	088
8,9	175	115	089	089	089	089	089
9,0	175	115	090	090	090	090	090
9,1	175	115	091	091	091	091	091
9,2	175	115	092	092	092		092
9,3	175	115	093	093	093		093
9,4	175	115	094	094			094
9,5	175	115	095	095	095	095	095
9,6	184	121	096		096		096
9,7	184	121	097	097	097	097	

Steel	●	●	●	●	
Stainless steel	○	●			
Cast iron	●	●	●	●	
Non ferrous metals	○	●	●	●	●
Heat resistant alloys					

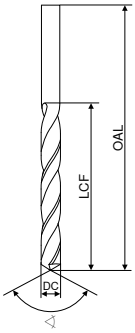
1) uncoated

→ v_c Page 50

Continued on next page

Twist drills, DIN 340, long

≤ 10xD



	UNI	WTL	WTL	WTL	WTW
	TiN	F.-nit	F.-nit	TiN	
					
	◁ 118° HSS-E	◁ 130° HSS-E	◁ 130° HSS	◁ 130° HSS	◁ 130° HSS
DC h8 mm	OAL mm	LCF mm	Article no. 10 270 ...	Article no. 10 225 ...	Article no. 10 215 ...	Article no. 10 210 ...	Article no. 10 200 ...
9,8	184	121	098	098	098	098	098
9,9	184	121	099	099	099	099	
10,0	184	121	100	100	100	100	100
10,1	184	121	101		101	101	
10,2	184	121	102	102	102	102	102
10,3	184	121	103		103		103
10,4	184	121	104		104		104
10,5	184	121	105	105	105	105	105
10,6	184	121				106	
10,8	195	128		108	108		108
11,0	195	128	110	110	110	110	110
11,5	195	128	115	115	115	115	115
11,6	195	128					116
11,8	195	128		118	118		118
12,0	205	134	120	120	120	120	120
12,2	205	134					122
12,3	205	134					123
12,5	205	134	125		125	125	125
13,0	205	134	130		130	130	130
13,5	214	140	135		135		
14,0	214	140	140		140	140	140
Steel			●	●	●	●	
Stainless steel			○	●			
Cast iron			●	●	●	●	
Non ferrous metals			○	●	●	●	●
Heat resistant alloys							

1) uncoated

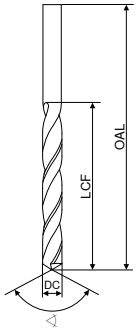
→ v_c Page 50

Twist drills, DIN 1869, extra-long, series 1

> 10xD

WTL

F.-nit



DC h8	OAL	LCF	Article no. 10 235 ...
mm	mm	mm	
2,0	125	85	020 1)
2,1	125	85	021 1)
2,2	135	90	022 1)
2,3	135	90	023 1)
2,4	140	95	024
2,5	140	95	025
2,6	140	95	026
2,7	150	100	027
2,8	150	100	028
2,9	150	100	029
3,0	150	100	030
3,1	155	105	031
3,2	155	105	032
3,3	155	105	033
3,4	165	115	034
3,5	165	115	035
3,6	165	115	036
3,7	165	115	037
3,8	175	120	038
3,9	175	120	039
4,0	175	120	040
4,1	175	120	041
4,2	175	120	042
4,3	185	125	043
4,4	185	125	044
4,5	185	125	045
4,6	185	125	046
4,7	185	125	047
4,8	195	135	048
4,9	195	135	049
5,0	195	135	050
5,1	195	135	051
5,2	195	135	052
5,3	195	135	053
5,4	205	140	054
5,5	205	140	055
5,6	205	140	056
5,7	205	140	057
5,8	205	140	058
5,9	205	140	059
6,0	205	140	060
6,1	215	150	061
6,2	215	150	062
6,3	215	150	063
6,4	215	150	064
6,5	215	150	065
6,6	215	150	066
6,7	215	150	067
6,8	225	155	068
6,9	225	155	069
7,0	225	155	070
7,1	225	155	071
7,3	225	155	073
7,4	225	155	074
7,5	225	155	075
7,7	240	165	077
7,8	240	165	078
7,9	240	165	079
8,0	240	165	080
8,1	240	165	081
8,2	240	165	082
8,3	240	165	083
8,4	240	165	084
8,5	240	165	085
8,6	250	175	086
8,7	250	175	087
8,8	250	175	088
9,0	250	175	090
9,2	250	175	092
9,4	250	175	094
9,5	250	175	095
9,6	265	185	096
9,7	265	185	097
9,8	265	185	098
9,9	265	185	099
10,0	265	185	100
10,5	265	185	105
11,0	280	195	110
11,5	280	195	115
12,0	295	205	120
12,5	295	205	125
13,0	295	205	130

Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	

1) uncoated

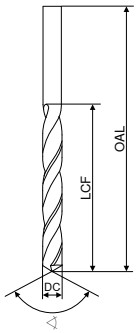
→ v_c Page 51

Twist drills, DIN 1869, extra-long, series 2

> 10xD

WTL

F.-nit



DC h8	OAL	LCF	Article no. 10 245 ...
mm	mm	mm	
2,0	160	110	020 1)
2,5	180	120	025
3,0	190	130	030
3,5	210	145	035
4,0	220	150	040
4,5	235	160	045
5,0	245	170	050
5,5	260	180	055
6,0	260	180	060
6,5	275	190	065
7,0	290	200	070
7,5	290	200	075
8,0	305	210	080
8,5	305	210	085
9,0	320	220	090
9,5	320	220	095
10,0	340	235	100
10,5	340	235	105
11,0	365	250	110
11,5	365	250	115
12,0	375	260	120
12,5	375	260	125
13,0	375	260	130

Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	

1) uncoated

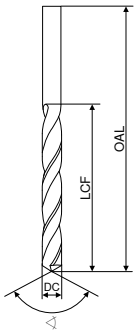
→ v_c Page 51

Twist drills, DIN 1869, extra-long, series 3

> 10xD

WTL

F.-nit



DC h8	OAL	LCF	Article no. 10 255 ...
mm	mm	mm	
2,5	225	150	025
3,0	240	160	030
3,5	265	180	035
4,0	280	190	040
4,5	295	200	045
5,0	315	210	050
5,5	330	225	055
6,0	330	225	060
6,5	350	235	065
7,0	370	250	070
7,5	370	250	075
8,0	390	265	080
8,5	390	265	085
9,0	410	280	090
9,5	410	280	095
10,0	430	295	100
10,5	430	295	105
11,0	455	310	110
11,5	455	310	115
12,0	480	330	120
12,5	480	330	125
13,0	480	330	130

Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	

→ v_c Page 51

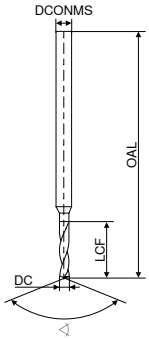
Micro drills, DIN 1899

- 4 facet
- with reinforced shank

Scope of supply:

- pack quantity 5 pieces
- price per piece

N



118°
HSS-E-PM

DC $_{-0,004}$	OAL	LCF	DCONMS $_{h8}$	Article no. 10 103 ...
mm	mm	mm	mm	
0,15	25	0,8	1,0	00150
0,20	25	1,5	1,0	00200
0,25	25	1,9	1,0	00250
0,30	25	1,9	1,0	00300
0,35	25	2,4	1,0	00350
0,40	25	3,0	1,0	00400
0,45	25	3,0	1,0	00450
0,50	25	3,4	1,0	00500
0,55	25	3,9	1,0	00550
0,60	25	3,9	1,0	00600
0,65	25	4,2	1,0	00650
0,70	25	4,8	1,0	00700
0,75	25	4,8	1,0	00750
0,80	25	5,3	1,5	00800
0,85	25	5,3	1,5	00850
0,90	25	6,0	1,5	00900
0,95	25	6,0	1,5	00950
1,00	25	6,8	1,5	01000
1,05	25	6,8	1,5	01050
1,10	25	7,6	1,5	01100
1,15	25	7,6	1,5	01150
1,20	25	8,5	1,5	01200
1,25	25	8,5	1,5	01250
1,30	25	8,5	1,5	01300
1,35	25	9,5	1,5	01350
1,40	25	9,5	1,5	01400
1,45	25	9,5	1,5	01450

Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○

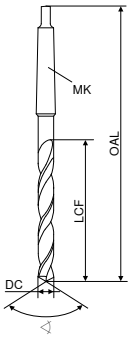
→ v_c Page 52

Twist drill, factory standard, short

≤ 3xD

WT

vap.



130°
HSS-E

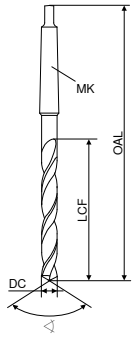
DC $_{h8}$	OAL	LCF	MK	Article no. 10 285 ...
mm	mm	mm		
10,0	138	57	1	100
10,5	138	57	1	105
11,0	142	61	1	110
11,5	142	61	1	115
12,0	147	66	1	120
12,5	147	66	1	125
13,0	147	66	1	130
13,5	168	70	2	135
14,0	168	70	2	140
14,5	172	74	2	145
15,0	172	74	2	150
15,5	176	78	2	155
16,0	176	78	2	160
16,5	179	81	2	165
17,0	179	81	2	170
17,5	183	85	2	175
18,0	183	85	2	180
18,5	186	88	2	185
19,0	186	88	2	190
19,5	212	91	3	195
20,0	212	91	3	200
21,0	216	95	3	210
22,0	219	98	3	220
23,0	222	101	3	230
24,0	225	104	3	240
25,0	225	104	3	250
26,0	256	107	4	260
27,0	259	110	4	270
28,0	259	110	4	280
30,0	263	114	4	300

Steel	●
Stainless steel	○
Cast iron	○
Non ferrous metals	○
Heat resistant alloys	○

→ v_c Page 47

Twist drills, DIN 345

≤ 5xD



N
vap.

HSS

WTL
F.-nit

HSS-E

DC h8 mm	OAL mm	LCF mm	MK	Article no. 10 265 ...	Article no. 10 280 ...
10,00	168	87	1	100	100
10,20	168	87	1	102	102
10,50	168	87	1	105	105
10,80	175	94	1	108	108
11,00	175	94	1	110	110
11,20	175	94	1	112	
11,50	175	94	1	115	115
11,80	175	94	1	118	
12,00	182	101	1	120	120
12,20	182	101	1	122	122
12,50	182	101	1	125	125
12,80	182	101	1	128	
13,00	182	101	1	130	130
13,20	182	101	1	132	
13,50	189	108	1	135	135
13,80	189	108	1	138	
14,00	189	108	1	140	140
14,25	212	114	2	142	142
14,50	212	114	2	145	145
14,75	212	114	2	147	
15,00	212	114	2	150	150
15,25	218	120	2	152	152
15,50	218	120	2	155	155
15,75	218	120	2	157	157
16,00	218	120	2	160	160
16,25	223	125	2	162	
16,50	223	125	2	165	165 [1]
16,75	223	125	2	167	
17,00	223	125	2	170	170 [1]
17,25	228	130	2	172	172 [1]
17,50	228	130	2	175	175 [1]
17,75	228	130	2	177	177 [1]
18,00	228	130	2	180	180 [1]
18,25	233	135	2	182	
18,50	233	135	2	185	185 [1]
18,75	233	135	2	187	
19,00	233	135	2	190	190 [1]
19,25	238	140	2	192	
19,50	238	140	2	195	
19,75	238	140	2	197	
20,00	238	140	2	200	200 [1]
20,25	243	145	2	202	
20,50	243	145	2	205	
20,75	243	145	2	207	
21,00	243	145	2	210	210 [1]
21,25	248	150	2	212	
21,50	248	150	2	215	
21,75	248	150	2	217	
22,00	248	150	2	220	220 [1]
22,25	248	150	2	222	
22,50	253	155	2	225	225 [1]
22,75	253	155	2	227	
23,00	253	155	2	230	230 [1]
23,50	276	155	3	235	
23,75	281	160	3	237	
24,00	281	160	3	240	240 [1]
24,50	281	160	3	245	
24,75	281	160	3	247	
25,00	281	160	3	250	250 [1]
25,50	286	165	3	255	
25,75	286	165	3	257	
26,00	286	165	3	260	260 [1]
26,50	286	165	3	265	
26,75	291	170	3	267	
27,00	291	170	3	270	270 [1]
27,50	291	170	3	275	
27,75	291	170	3	277	
28,00	291	170	3	280	
28,50	296	175	3	285	
28,75	296	175	3	287	
29,00	296	175	3	290	
29,50	296	175	3	295	
29,75	296	175	3	297	
30,00	296	175	3	300	
30,50	301	180	3	305	
31,00	301	180	3	310	
31,50	301	180	3	315	
32,00	334	185	4	320	
32,50	334	185	4	325	
33,00	334	185	4	330	
33,50	334	185	4	335	
34,00	339	190	4	340	
34,50	339	190	4	345	
35,00	339	190	4	350	
35,50	339	190	4	355	
36,00	344	195	4	360	
36,50	344	195	4	365	
37,00	344	195	4	370	
37,50	344	195	4	375	
38,00	349	200	4	380	
38,50	349	200	4	385	
39,00	349	200	4	390	
39,50	349	200	4	395	
40,00	349	200	4	400	
41,00	354	205	4	410	
42,00	354	205	4	420	
43,00	359	210	4	430	
44,00	359	210	4	440	
45,00	359	210	4	450	
46,00	364	215	4	460	
47,00	364	215	4	470	
48,00	369	220	4	480	
49,00	369	220	4	490	
50,00	369	220	4	500	
51,00	412	225	5	510	
52,00	412	225	5	520	
53,00	412	225	5	530	
54,00	417	230	5	540	
55,00	417	230	5	550	
56,00	417	230	5	560	
57,00	422	235	5	570	
58,00	422	235	5	580	
59,00	422	235	5	590	
60,00	422	235	5	600	

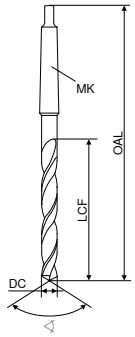
	Article no. 10 265 ...	Article no. 10 280 ...
Steel	●	●
Stainless steel		○
Cast iron	●	○
Non ferrous metals	○	○
Heat resistant alloys		

1) vaporised

→ v_c Page 49

Twist drills, DIN 341, long

≤ 10xD



N
vap.

HSS

WTL
F.-nit

HSS-E

DC h8 mm	OAL mm	LCF mm	MK	Article no. 10 295 ...	Article no. 10 297 ...
10,00	197	116	1	100	100
10,20	197	116	1	102	102
10,50	197	116	1	105	105
10,80	206	125	1	108	
11,00	206	125	1	110	110
11,20	206	125	1	112	112
11,50	206	125	1	115	115
11,80	206	125	1	118	118
12,00	215	134	1	120	120
12,20	215	134	1	122	122
12,50	215	134	1	125	125
12,80	215	134	1	128	128
13,00	215	134	1	130	130
13,20	215	134	1	132	
13,50	223	142	1	135	135
13,80	223	142	1	138	138
14,00	223	142	1	140	140
14,25	245	147	2	142	
14,50	245	147	2	145	145
14,75	245	147	2	147	
15,00	245	147	2	150	150
15,25	251	153	2	152	
15,50	251	153	2	155	155
15,75	251	153	2	157	
16,00	251	153	2	160	160
16,25	257	159	2	162	
16,50	257	159	2	165	165 [1]
16,75	257	159	2	167	
17,00	257	159	2	170	170 [1]
17,25	263	165	2	172	
17,50	263	165	2	175	175 [1]
17,75	263	165	2	177	
18,00	263	165	2	180	180 [1]
18,25	269	171	2	182	
18,50	269	171	2	185	185 [1]
18,75	269	171	2	187	
19,00	269	171	2	190	190 [1]
19,25	275	177	2	192	
19,50	275	177	2	195	195 [1]
19,75	275	177	2	197	
20,00	275	177	2	200	200 [1]
20,50	282	184	2	205	205 [1]
21,00	282	184	2	210	210 [1]
21,50	289	191	2	215	
21,75	289	191	2	217	
22,00	289	191	2	220	220 [1]
22,50	296	198	2	225	
23,00	296	198	2	230	
23,50	319	198	3	235	
24,00	327	206	3	240	240 [1]
24,50	327	206	3	245	
25,00	327	206	3	250	250 [1]
25,50	335	214	3	255	
26,00	335	214	3	260	260 [1]
26,50	335	214	3	265	
27,00	343	222	3	270	
27,50	343	222	3	275	
28,00	343	222	3	280	
29,00	351	230	3	290	
29,50	351	230	3	295	
30,00	351	230	3	300	
30,50	360	239	3	305	
31,00	360	239	3	310	
31,50	360	239	3	315	
32,00	397	248	4	320	
33,00	397	248	4	330	
33,50	397	248	4	335	
34,00	406	257	4	340	
35,00	406	257	4	350	
36,00	416	267	4	360	
37,00	416	267	4	370	
37,50	416	267	4	375	
38,00	426	277	4	380	
39,00	426	277	4	390	
40,00	426	277	4	400	
42,00	436	287	4	420	
43,00	447	298	4	430	
44,00	447	298	4	440	
45,00	447	298	4	450	
50,00	470	321	4	500	

	Article no. 10 295 ...	Article no. 10 297 ...
Steel	●	●
Stainless steel		●
Cast iron	●	●
Non ferrous metals	○	●
Heat resistant alloys		

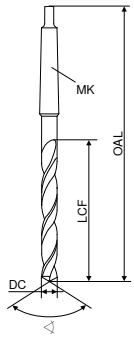
1) vaporised

→ v_c Page 50

Twist drills, DIN 1870, extra-long, series 1

> 10xD

WTL



HSS

DC h8 mm	OAL mm	LCF mm	MK	Article no. 10 305 ...	
10,0	285	185	1	100	1)
10,5	285	185	1	105	1)
11,0	300	195	1	110	1)
11,5	300	195	1	115	1)
12,0	310	205	1	120	1)
12,5	310	205	1	125	1)
13,0	310	205	1	130	1)
13,5	325	220	1	135	1)
14,0	325	220	1	140	1)
14,5	340	220	2	145	1)
15,0	340	220	2	150	1)
15,5	355	230	2	155	1)
16,0	355	230	2	160	1)
16,5	355	230	2	165	2)
17,0	355	230	2	170	2)
17,5	370	245	2	175	2)
18,0	370	245	2	180	2)
18,5	370	245	2	185	2)
19,0	370	245	2	190	2)
19,5	385	260	2	195	2)
20,0	385	260	2	200	2)
21,0	385	260	2	210	2)
22,0	405	270	2	220	2)
23,0	405	270	2	230	2)
24,0	440	290	3	240	2)
25,0	440	290	3	250	2)
26,0	440	290	3	260	2)
28,0	460	305	3	280	2)
30,0	460	305	3	300	2)

Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	

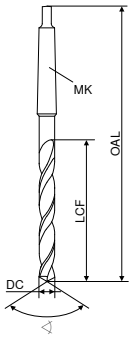
1) nitrided chamfer
2) vaporised

→ v_c Page 51

Twist drills, DIN 1870, extra-long, series 2

> 10xD

WTL



HSS

DC h8 mm	OAL mm	LCF mm	MK	Article no. 10 315 ...	
10,0	360	235	1	100	1)
10,5	360	235	1	105	1)
11,0	375	250	1	110	1)
11,5	375	250	1	115	1)
12,0	395	260	1	120	1)
13,0	395	260	1	130	1)
13,5	410	275	1	135	1)
14,0	410	275	1	140	1)
14,5	425	275	2	145	1)
15,0	425	275	2	150	1)
15,5	445	295	2	155	1)
16,0	445	295	2	160	1)
16,5	445	295	2	165	2)
17,0	445	295	2	170	2)
17,5	465	310	2	175	2)
18,0	465	310	2	180	2)
18,5	465	310	2	185	2)
19,0	465	310	2	190	2)
19,5	490	325	2	195	2)
20,0	490	325	2	200	2)
21,0	490	325	2	210	2)
22,0	515	345	2	220	2)
23,0	515	345	2	230	2)
24,0	555	365	3	240	2)
25,0	555	365	3	250	2)
26,0	555	365	3	260	2)
28,0	580	385	3	280	2)
30,0	580	385	3	300	2)

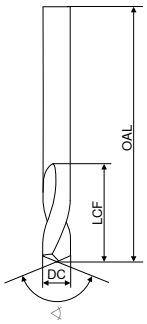
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	

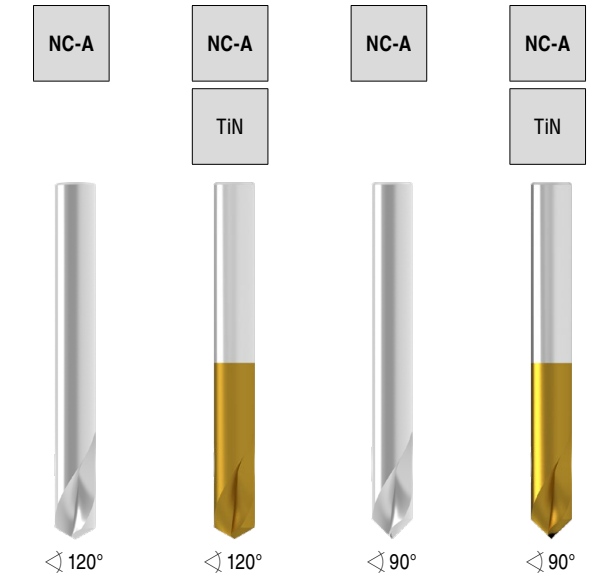
1) nitrided chamfer
2) vaporised

→ v_c Page 51

NC spot drills, factory standard

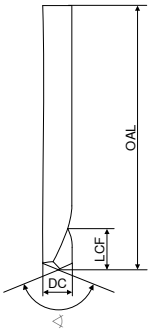
▲ helical flutes

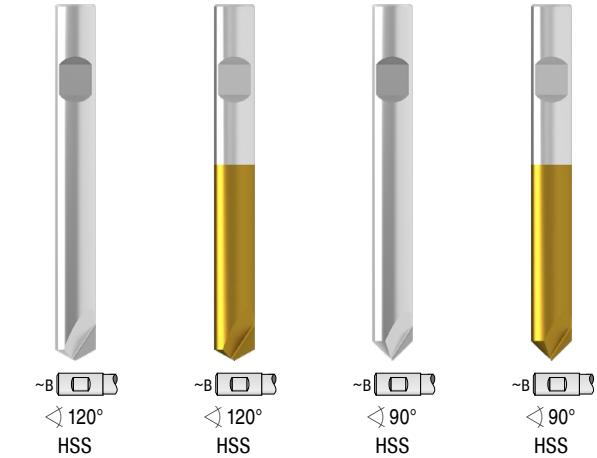




DC h6	OAL	LCF	Article no. 10 510 ...	Article no. 10 512 ...	Article no. 10 520 ...	Article no. 10 522 ...
mm	mm	mm				
3	46	12,0	030	030	030	030
4	55	12,0	040	040	040	040
5	62	14,0	050	050	050	050
6	66	16,0	060	060	060	060
8	79	21,0	080	080	080	080
10	89	25,0	100	100	100	100
12	102	30,0	120	120	120	120
16	115	37,5	160	160	160	160
20	131	45,0	200	200	200	200

▲ with clamping flat to DIN 1835 B





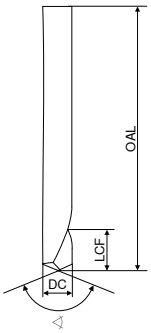
DC h6	OAL	LCF	Article no. 10 511 ...	Article no. 10 513 ...	Article no. 10 521 ...	Article no. 10 523 ...
mm	mm	mm				
6	66	7,0	060	060	060	060
8	79	9,0	080	080	080	080
10	89	11,5	100	100	100	100
12	102	14,0	120	120	120	120
16	115	18,0	160	160	160	160
20	131	23,0	200	200	200	200

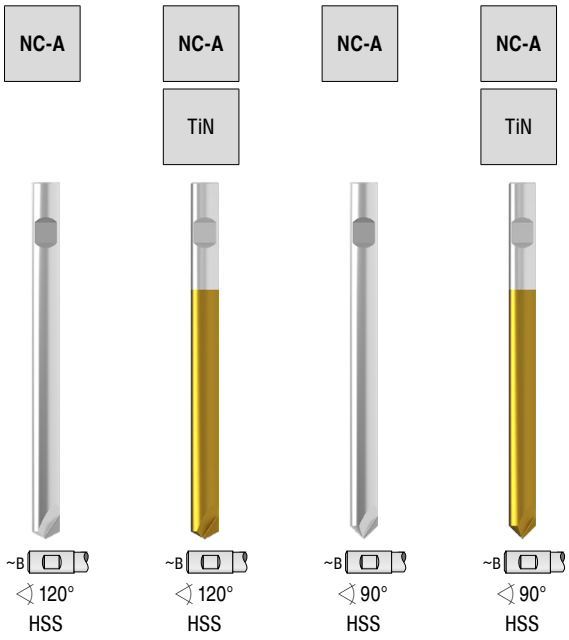
Steel	**15-35**	**25-55**	**15-35**	**25-55**
Stainless steel	10-15	20-25	10-15	20-25
Cast iron	**20-35**	**30-55**	**20-35**	**30-55**
Non ferrous metals	50-70	65-85	50-70	65-85
Heat resistant alloys				

Suitable only for spot drilling!

NC spot Drill Factory Standard Long

▲ with clamping flat to DIN 1835 B





DC h6 mm	OAL mm	LCF mm	Article no. 10 530 ...	Article no. 10 532 ...	Article no. 10 526 ...	Article no. 10 528 ...
6	93	7,0	**060**	**060**	**060**	**060**
8	117	9,0	**080**	**080**	**080**	**080**
10	133	11,5	**100**	**100**	**100**	**100**
12	151	14,0	**120**	**120**	**120**	**120**
16	178	18,0	**160**	**160**	**160**	**160**
20	205	23,0	**200**	**200**	**200**	**200**

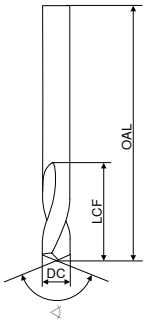
Steel	**15-35**	**25-55**	**15-35**	**25-55**
Stainless steel	10-15	20-25	10-15	20-25
Cast iron	**20-35**	**30-55**	**20-35**	**30-55**
Non ferrous metals	50-70	65-85	50-70	65-85
Heat resistant alloys				

Suitable only for spot drilling!

NC spot drills, factory standard, long

▲ helical flutes

NC-A



90°
HSS

DC h6	OAL	LCF	Article no. 10 525 ...
mm	mm	mm	
6,35	105	17	025
8,00	118	21	030
9,52	132	25	040
12,70	159	30	050
15,87	186	37	060
19,05	213	45	075

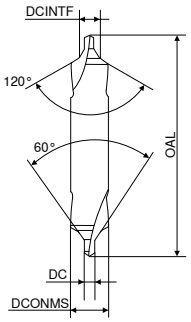
Steel	**15-35**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	50-70
Heat resistant alloys	

Suitable only for spot drilling!

Centre drills, DIN 333, form B

▲ with protective countersink 120°

ZB ZB



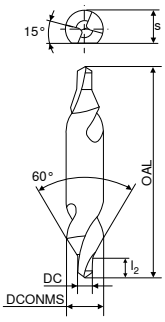
Right-hand
118°
HSS

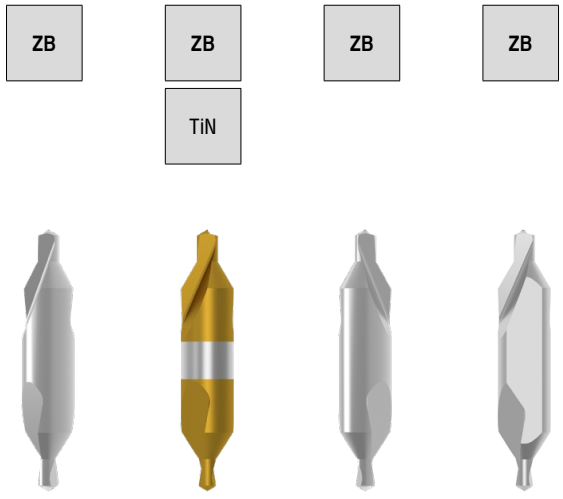
Left-hand
118°
HSS

DC	DCONMS h8	DCINTF k12	OAL	Article no. 10 480 ...	Article no. 10 485 ...
mm	mm	mm	mm		
1,00	4,0	2,12	35,5	100	100
1,25	5,0	2,65	40,0	125	125
1,60	6,3	3,35	45,0	160	160
2,00	8,0	4,25	50,0	200	200
2,50	10,0	5,30	56,0	250	250
3,15	11,2	6,70	62,0	315	315
4,00	14,0	8,50	69,0	400	400
5,00	18,0	10,60	77,0	500	500

Steel	**15-35**	**15-35**
Stainless steel	10-15	10-15
Cast iron	**20-35**	**20-35**
Non ferrous metals	50-70	50-70
Heat resistant alloys		

Centre drills, DIN 333, form A

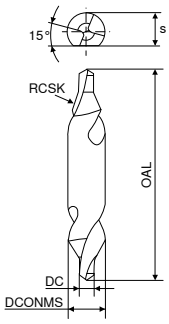




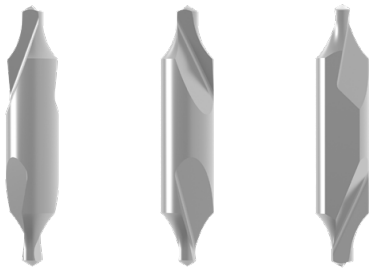
DC	s	DCONMS $_{h8}$	OAL	l_2	Right-hand ◁ 118° HSS	Right-hand ◁ 118° HSS	Left-hand ◁ 118° HSS	Right-hand ◁ 118° HSS-E
mm	mm	mm	mm	mm	Article no. 10 415 ...	Article no. 10 425 ...	Article no. 10 435 ...	Article no. 10 445 ...
0,50		3,15	25,0	0,8	050 [2]	050 [2]	050 [2]	
0,80		3,15	25,0	1,1	080 [2]	080 [2]	080 [2]	
1,00		3,15	31,5	1,3	100	100	100	
1,25		3,15	31,5	1,6	125	125	125	
1,60	3,25	4,00	35,5	2,0				160 [1]
1,60		4,00	35,5	2,0	160	160	160	
2,00	4,20	5,00	40,0	2,5				200 [1]
2,00		5,00	40,0	2,5	200	200	200	
2,50	5,35	6,30	45,0	3,1				250 [1]
2,50		6,30	45,0	3,1	250	250	250	
3,15	6,95	8,00	50,0	3,9				315 [1]
3,15		8,00	50,0	3,9	315	315	315	
4,00	8,40	10,00	56,0	5,0				400 [1]
4,00		10,00	56,0	5,0	400	400	400	
5,00	10,95	12,50	63,0	6,3				500 [1]
5,00		12,50	63,0	6,3	500	500	500	
6,30	14,00	16,00	71,0	8,0				630 [1]
6,30		16,00	71,0	8,0	630	630	630	
Steel					**15-35**	**25-55**	**15-35**	**15-35**
Stainless steel					10-15	20-25	10-15	10-15
Cast iron					**20-35**	**30-55**	**20-35**	**20-35**
Non ferrous metals					50-70	65-85	50-70	50-70
Heat resistant alloys								

1) with flat
2) Single ended

Centre drills, DIN 333, form R



ZB ZB ZB

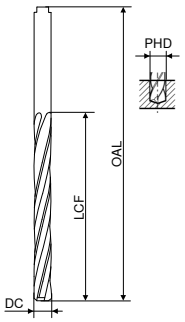


DC	s	DCONMS h8	OAL	RCSK	Right-hand ◁ 118° HSS	Left-hand ◁ 118° HSS	Right-hand ◁ 118° HSS
mm	mm	mm	mm	mm	Article no. 10 455 ...	Article no. 10 475 ...	Article no. 10 465 ...
0,50		3,15	25,0	2,00	050 [2]		
0,80		3,15	25,0	2,50	080 [2]	080 [2]	
1,00		3,15	31,5	2,90	100	100	
1,25		3,15	31,5	3,15	125	125	
1,60	3,25	4,00	35,5	4,00			160 [1]
1,60		4,00	35,5	4,00	160	160	
2,00	4,20	5,00	40,0	5,00			200 [1]
2,00		5,00	40,0	5,00	200	200	
2,50	5,35	6,30	45,0	6,30			250 [1]
2,50		6,30	45,0	6,30	250	250	
3,15	6,95	8,00	50,0	8,00			315 [1]
3,15		8,00	50,0	8,00	315	315	
4,00	8,40	10,00	56,0	10,00			400 [1]
4,00		10,00	56,0	10,00	400	400	
5,00	10,95	12,50	63,0	12,50			500 [1]
5,00		12,50	63,0	12,50	500	500	
6,30	14,00	16,00	71,0	16,00			630 [1]
6,30		16,00	71,0	16,00	630		
Steel					**15-35**	**15-35**	**15-35**
Stainless steel					10-15	10-15	10-15
Cast iron					**20-35**	**20-35**	**20-35**
Non ferrous metals					50-70	50-70	50-70
Heat resistant alloys							

1) with flat
2) Single ended

Core drills (spiral countersinks)

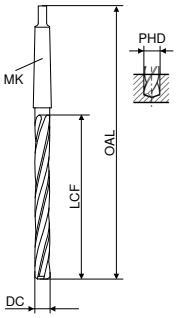
▲ with cylindrical shank, DIN 344



DC h8 mm	OAL mm	LCF mm	PHD mm	Article no. 10 226 ...
3,80	96	64	2,8	038
4,00	96	64	2,8	040
4,80	108	74	3,5	048
5,00	108	74	3,5	050
5,80	116	80	4,2	058
6,00	116	80	4,2	060
6,80	133	93	4,9	068
7,00	133	93	4,9	070
7,80	142	100	5,6	078
8,00	142	100	5,6	080
8,80	151	107	6,3	088
9,00	151	107	6,3	090
9,80	162	116	7,0	098
10,00	162	116	7,0	100
10,75	173	125	7,7	107
11,00	173	125	7,7	110
11,75	184	134	8,4	117
12,00	184	134	8,4	120

Steel	**15-35**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	**50-80**
Heat resistant alloys	14-28

Core drills (spiral countersinks)



DC h8 mm	OAL mm	LCF mm	PHD mm	MK	Article no. 10 228 ...
10,00	168	87	7,0	1	100
10,75	175	94	7,7	1	107
11,00	175	94	7,7	1	110
11,75	182	101	8,4	1	117
12,00	182	101	8,4	1	120
12,75	182	101	9,1	1	127
13,00	182	101	9,1	1	130
13,75	189	108	9,8	1	137
14,00	189	108	9,8	1	140
14,75	212	114	10,5	2	147
15,00	212	114	10,5	2	150
15,75	218	120	11,2	2	157
16,00	218	120	11,2	2	160
16,75	223	125	11,9	2	167
17,00	223	125	11,9	2	170
17,75	228	130	12,6	2	177
18,00	228	130	12,6	2	180
18,70	233	135	13,3	2	187
19,00	233	135	13,3	2	190
19,70	238	140	14,0	2	197
20,00	238	140	14,0	2	200
20,70	243	145	14,6	2	207
21,00	243	145	14,6	2	210
21,70	248	150	15,3	2	217
22,00	248	150	15,3	2	220
22,70	253	155	16,0	2	227
23,00	253	155	16,0	2	230
23,70	281	160	16,6	3	237
24,00	281	160	16,6	3	240
24,70	281	160	17,3	3	247
25,00	281	160	17,3	3	250
25,70	286	165	18,0	3	257
26,00	286	165	18,0	3	260
26,70	291	170	18,6	3	267
27,00	291	170	18,6	3	270
27,70	291	170	19,3	3	277
28,00	291	170	19,3	3	280
28,70	296	175	20,0	3	287
29,00	296	175	20,0	3	290
29,70	296	175	20,5	3	297
30,00	296	175	20,5	3	300

Steel	**15-35**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	**50-80**
Heat resistant alloys	14-28

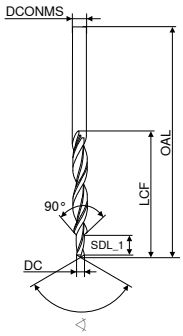
Stepped drills, DIN 8378

- countersinking angle 90°
- for tapping drill holes according to DIN 336, Table 1 with 90° chamfer and for through holes according to DIN EN 20273 – medium

DIN 8378

SB

vap.

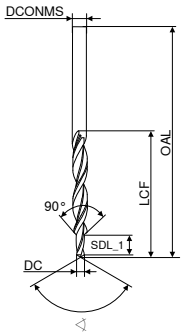


118°
HSS

For threads	DC h9	DCONMS h8	OAL	SDL_1	LCF	Article no. 10 365 ...
	mm	mm	mm	mm	mm	
M3	2,5	3,4	70	8,8	39	030
M4	3,3	4,5	80	11,4	47	040
M5	4,2	5,5	93	13,6	57	050
M6	5,0	6,6	101	16,5	63	060
M8	6,8	9,0	125	21,0	81	080
M10	8,5	11,0	142	25,5	94	100
M12	10,2	13,5	160	30,0	108	120

- for through holes according to DIN EN 20273 – fine
- with 90° screw head countersink

DIN 8374



118°
HSS

For threads	DC h9	DCONMS h8	OAL	SDL_1	LCF	Article no. 10 355 ...
	mm	mm	mm	mm	mm	
M3	3,2	6,0	93	9	57	030
M4	4,3	8,0	117	11	75	040
M5	5,3	10,0	133	13	87	050
M6	6,4	11,5	142	15	94	060
M8	8,4	15,0	169	19	114	080
M10	10,5	19,0	198	23	135	100

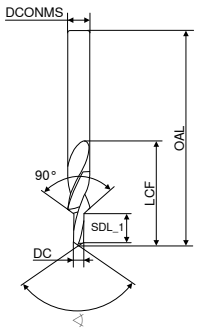
Steel	**10-30**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	50-70
Heat resistant alloys	

Stepped drills, overall length to DIN 1897

- countersinking angle 90°
- for tapping drill holes according to DIN 336, Table 1 with 90° chamfer and for through holes according to DIN EN 20273 – medium

DIN 8378

SB

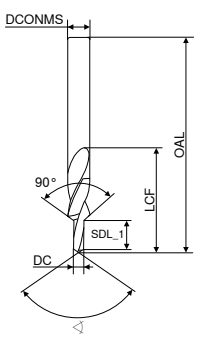


118°
HSS

For threads	DC h6	DCONMS h6	OAL	SDL_1	LCF	Article no. 10 320 ...
	mm	mm	mm	mm	mm	
M3	2,5	3,4	52	8,8	20	030
M4	3,3	4,5	58	11,4	24	040
M5	4,2	5,5	66	13,6	28	050
M6	5,0	6,6	70	16,5	31	060
M8	6,8	9,0	84	21,0	40	080
M10	8,5	11,0	95	25,5	47	100
M12	10,2	13,5	107	30,0	54	120

- for through holes according to DIN EN 20273 – fine
- with 90° screw head countersink

DIN 8374



118°
HSS

For threads	DC h6	DCONMS h6	OAL	SDL_1	LCF	Article no. 10 330 ...
	mm	mm	mm	mm	mm	
M3	3,2	6,0	66	9	28	030
M4	4,3	8,0	79	11	37	040
M5	5,3	10,0	89	13	43	050
M6	6,4	11,5	95	15	47	060
M8	8,4	15,0	111	19	56	080
M10	10,5	19,0	127	23	64	100

Steel	**10-30**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	50-70
Heat resistant alloys	

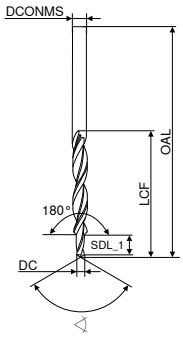
Stepped drills, DIN 8376

- countersinking angle 180°
- for through holes according to DIN EN 20273 – Medium
- for screw heads to DIN 974-1 – Series 1

DIN 8376

SB

vap.



118°
HSS

For threads	DC h9	DCONMS h8	OAL	SDL_1	LCF	Article no. 10 375 ...
	mm	mm	mm	mm	mm	
M3	3,4	6	93	9	57	**030** 1)
M4	4,5	8	117	11	75	**040**
M5	5,5	10	133	13	87	**050**
M6	6,6	11	142	15	94	**060**
M8	9,0	15	169	19	114	**080**
M10	11,0	18	191	23	130	**100**

Steel	**10-30**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	50-70
Heat resistant alloys	

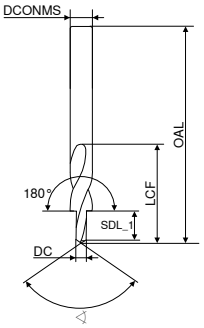
1) DCONMS not according to DIN 974-1

Stepped drills, factory standard, total length according to DIN 1897

- countersinking angle 180°
- for through holes according to DIN EN 20273 – Medium
- for screw heads to DIN 974-1 – Series 1

DIN 8376

SB



118°
HSS

For threads	DC h6	DCONMS h6	OAL	SDL_1	LCF	Article no. 10 340 ...
	mm	mm	mm	mm	mm	
M3	3,4	6	66	9	28	**030** 1)
M4	4,5	8	79	11	37	**040**
M5	5,5	10	89	13	43	**050**
M6	6,6	11	95	15	47	**060**
M8	9,0	15	111	19	56	**080**
M10	11,0	18	123	23	62	**100**

Steel	**10-30**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	50-70
Heat resistant alloys	

1) DCONMS not according to DIN 974-1

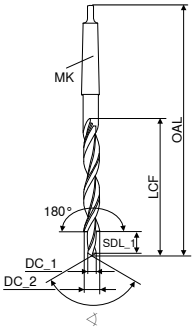
Stepped drills, DIN 8377

- countersinking angle 180°
- for through holes according to DIN EN 20273 – Medium
- for screw heads to DIN 974-1 – Series 1

DIN 8377

SB

vap.



HSS

For threads	DC_1 h9 mm	DC_2 mm	OAL mm	SDL_1 mm	LCF mm	MK	Article no. 10 405 ...
M5	5,5	10	168	13	87	1	**050**
M6	6,6	11	175	15	94	1	**060**
M8	9,0	15	212	19	114	2	**080**
M10	11,0	18	228	23	130	2	**100**
M12	13,5	20	238	27	140	2	**120**
M14	15,5	24	281	31	160	3	**140**
M16	17,5	26	286	35	165	3	**160**
M18	20,0	30	296	39	175	3	**180**
M20	22,0	33	334	43	185	4	**200**

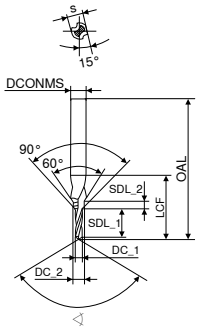
Steel	**10-30**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	50-70
Heat resistant alloys	

Stepped drills for centring, factory standard

- with flat
- countersinking angle 60°
- special drill for creating tapping drill holes with centring, 60° countersinking angle according to DIN 332, sheet 2, form D.
- point thinning ≥ Ø 3,3 mm

SB

vap.



118°
HSS

For threads	DC_1 h8	DCONMS h7	DC_2	s	OAL	SDL_1	LCF	SDL_2	Article no. 10 350 ...
	mm	mm	mm	mm	mm	mm	mm	mm	
M4	3,3	8,0	4,3	6,75	63	11,0	23	1,60	**040**
M5	4,2	10,0	5,3	8,45	67	13,0	27	2,15	**050**
M6	5,0	12,5	6,4	10,45	71	16,0	33	2,90	**060**
M8	6,8	14,0	8,4	12,50	88	19,5	41	3,50	**080**
M10	8,5	16,0	10,5	14,85	94	23,0	47	4,70	**100**
M12	10,2	20,0	13,0	18,45	105	28,0	59	6,50	**120**
M16	14,0	25,0	17,0	23,40	132	33,0	67	8,30	**160**
M20	17,5	31,5	21,0	29,35	145	38,0	77	10,35	**200**
M24	21,0	40,0	25,0	36,50	160	45,0	90	12,00	**240**

Steel	**10-30**
Stainless steel	10-15
Cast iron	**20-35**
Non ferrous metals	50-70
Heat resistant alloys	

Material examples referring to the cutting data tables

	Index	Material	Strength N/mm² / HB / HRC	Material number	Material designation	Material number	Material designation	Material number	Material designation
P	1.1	General construction steel	< 800 N/mm²	1.0402	EN3B				
	1.2	Free cutting steel	< 800 N/mm²	1.0711	EN1A				
	1.3	Hardened steel, non alloyed	< 800 N/mm²	1.0401	EN32C				
	1.4	Alloyed hardened steel	< 1000 N/mm²	1.7325	25 CD4				
	1.5	Tempering steel, unalloyed	< 850 N/mm²	1.5752	EN36	1.0535	EN9		
	1.6	Tempering steel, unalloyed	< 1000 N/mm²	1.6582	EN24				
	1.7	Tempering steel, alloyed	< 800 N/mm²	1.7225	EN19				
	1.8	Tempering steel, alloyed	< 1300 N/mm²	1.8515	EN40B				
	1.9	Steel castings	< 850 N/mm²	0.9650	G-X 260 Cr 27	1.6750	GS-20 NiCrMo 3.7	1.6582	GS-34 CrNiMo 6
	1.10	Nitriding steel	< 1000 N/mm²	1.8509	EN41B				
	1.11	Nitriding steel	< 1200 N/mm²	1.1186	EN8	1.1160	EN14A		
	1.12	Roller bearing steel	< 1200 N/mm²	1.3505	534A99				
	1.13	Spring steel	< 1200 N/mm²		EN45		EN47		EN43
	1.14	High-speed steel	< 1300 N/mm²	1.3343	M2	1.3249	M34		
	1.15	Cold working tool steel	< 1300 N/mm²	1.2379	D2	1.2311	P20		
	1.16	Hot working tool steel	< 1300 N/mm²	1.2344	H13				
M	2.1	Cast steel and sulphured stainless steel	< 850 N/mm²	1.4581	318				
	2.2	Stainless steel, ferritic	< 750 N/mm²	1.4000	403				
	2.3	Stainless steel, martensitic	< 900 N/mm²	1.4057	EN57				
	2.4	Stainless steel, ferritic / martensitic	<1100 N/mm²	1.4028	EN56B				
	2.5	Stainless steel, austenitic / ferritic	< 850 N/mm²	1.4542	17-4PH				
	2.6	Stainless steel, austenitic	< 750 N/mm²	1.4305	303	1.4401	316	1.4301	304
	2.7	Heat resistant steel	< 1100 N/mm²	1.4876	Incoloy 800				
K	3.1	Grey cast iron with lamellar graphite	100–350 N/mm²	0.6015	Grade 150	0.6020	Grade 220	0.6025	Grade 260
	3.2	Grey cast iron with lamellar graphite	300–500 N/mm²	0.6030	Grade 300	0.6035	Grade 350	0.6040	Grade 400
	3.3	Gray cast iron with spheroidal graphite	300–500 N/mm²	0.7040	SG 400-12	0.7043	SG 370-17	0.7050	SG 500-7
	3.4	Gray cast iron with spheroidal graphite	500–900 N/mm²	0.7060	SG 600-3	0.7070	SG 700-2	0.7080	SG 800-2
	3.5	White malleable cast iron	270–450 N/mm²	0.8035	GTW-35	0.8045	GTW-45		
	3.6	White malleable cast iron	500–650 N/mm²	0.8055	GTW-55	0.8065	GTW-65		
	3.7	Black malleable cast iron	300–450 N/mm²	0.8135	GTS-35	0.8145	GTS-45		
	3.8	Black malleable cast iron	500–800 N/mm²	0.8155	GTS-55	0.8170	GTS-70		
N	4.1	Aluminium (non alloyed, low alloyed)	< 350 N/mm²	3.0255	1050 A	3.0275	1070 A	3.0285	1080 A (A8)
	4.2	Aluminium alloys < 0.5 % Si	< 500 N/mm²	3.1325	2017 A (AU4G)	3.4335	7005 (AZ5G)	3.4365	7075 (AZ5GU)
	4.3	Aluminium alloy 0.5–10 % Si	< 400 N/mm²	3.2315	A- G S1	3.2373	A-S9 G	3.2151	A-S 6 U4
	4.4	Aluminium alloys 10–15 % Si	< 400 N/mm²	3.2581	A-S12	3.2583	A-S12 U		
	4.5	Aluminum alloys > 15 % Si	< 400 N/mm²		A-S18	A-S17 U4			
	4.6	Copper (non alloyed, low alloyed)	< 350 N/mm²	2.0040	Cu-c1	2.0060	Cu-a1	2.0090	Cu-b1
	4.7	Copper wrought alloys	< 700 N/mm²	2.1247	Cub2 (Berylium Copper)	2.0855	CuN2S (Nickel Copper)	2.1310	CU-Fe2P
	4.8	Special copper alloys	< 200 HB	2.0916	Cu-A5	2.1525	Cu-S3 M		Ampco 8 (Cu-A6Fe2)
	4.9	Special copper alloys	< 300 HB	2.0978	Cu-Al11 Fe5 Ni5)		Ampco 18 (Cu- A10 Fe3)		
	4.10	Special copper alloys	> 300 HB	2.1247	Cu Be2		Ampco M4		
	4.11	Short-chipping brass, bronze, red bronze	< 600 N/mm²	2.0331	Cu Zn36 Pb1,5	2.0380	Cu Zn39 Pb2 (Ms 56)	2.0410	Cu Zn44 Pb2
	4.12	Long-chipping brass	< 600 N/mm²	2.0335	Cu Zn 36 (Ms63)	2.1293	Cu Cr1 Zr		
	4.13	Thermoplastics		PE	PVC	PS	Polystyrene		Plexiglas
	4.14	Duroplastics		PF	Bakelite		Pertinax		
	4.15	Fibre-reinforced plastics			Carbon Fibre		Fibreglass		Aramid Fibre (Kevlar)
	4.16	Magnesium and magnesium alloys	< 850 N/mm²	3.5812	Mg A7 Z1	3.5662	Mg A9	3.5105	Mg Tr3 Z2 Zn 1
	4.17	Graphite			R8500X		R8650		Technograph 15
	4.18	Tungsten and tungsten alloys			W-Ni Fe (Densimet)		W- Ni Cu (Inermet)		Denal
	4.19	Molybdenum and molybdenum alloys			TZM		MHQ		Mo W
S	5.1	Pure nickel		2.4066	Ni99 (Nickel 200)	2.4068	Lc Ni99 (Nickel 201)		
	5.2	Nickel alloys		1.3912	Fe-Ni36 (Invar)	1.3917	Fe -Ni42 (N42)	1.3922	Fe-Ni48 (N48)
	5.3	Nickel alloys	< 850 N/mm²	2.4375	Ni Cu30 Al (Monel K500)	2.4360	Ni Cu30Fe (Monel 400)	2.4668	
	5.4	Nickel molybdenum alloys		2.4600	Ni Mo30Cr2 (Hastelloy B4)	2.4617	Ni Mo28 (Hastelloy B2)	2.4819	Ni Mo16Cr16 Hastell. C276
	5.5	Nickel-chromium alloys	< 1300 N/mm²	2.4951	Ni Cr20TiAl (Nimonic 80A)	2.4858	Ni Cr21Mo (Inconel 825)	2.4856	Ni Cr22Mo9Nb Inconel 625
	5.6	Cobalt Chrome Alloys	< 1300 N/mm²	2.4964	Co Cr20 W15 Ni10		Co Cr20 Ni16 Mo7		Co Cr28 Mo 6
	5.7	Heat resistant alloys	< 1300 N/mm²	1.4718	Z45 C S 9-3	1.4747	Z80 CSN 20-02	1.4845	Z12 CN 25-20
	5.8	Nickel-cobalt-chromium alloys	< 1400 N/mm²	2.4851	Ni Cr23Fe (Inconel 601)	2.4668	Ni Cr19NbMo (Inconel 718)	2.4602	Ni Cr21Mo14 Hastelloy C22
	5.9	Pure titanium	< 900 N/mm²	3.7025	T35 (Titanium Grade 1)	3.7034	T40 (Titanium Grade 2)	3.7064	T60 (Titanium Grade 4)
	5.10	Titanium alloys	< 700 N/mm²		T-A6-Nb7 (367)		T-A5-Sn2-Mo4-Cr4 (Ti17)		T-A3-V2,5 (Gr18)
	5.11	Titanium alloys	< 1200 N/mm²	3.7165	T-A6-V4 (Ta6V)		T-A4-3V-Mo2-Fe2 (SP700)		T-A5-Sn1-Zr1-V1-Mo (Gr32)
H	6.1		< 45 HRC						
	6.2		46–55 HRC						
	6.3	Tempered steel	56–60 HRC						
	6.4		61–65 HRC						
	6.5		65–70 HRC						

Cutting data standard values – Hole depth 3xD

	Type VX-TiN 10 122 ...		Type UNI-PM-TiN 10 113 ...		Type UNI-TiN 10 107 ...		Type N 10 105 ...		Type VA 10 130 ...		Type WNX 10 106 ...	
Index	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F
1.1	**33–38**	5-6	**37-42**	**5-6**	**33–38**	5-6	**22–27**	5-6			**22–27**	5-6
1.2	**40–44**	6	**44-47**	**6-7**	**40–44**	6	**26–34**	5-6			**22–30**	5-6
1.3	**44**	6	**47**	**4**	**44**	6	**30**	6	36	6	**30**	6
1.4	**18–22**	3-4	**20-25**	**4-5**	**18–22**	3-4			18-32	3-4	**15–18**	3-4
1.5	**40–44**	6	**47**	**6**	**40–44**	6	**25**	5			**25**	5
1.6	**26**	5	**44**	**5**	**26**	5	**16**	5			**20**	5
1.7	**27**	4	**30**	**4**	**27**	4					**18**	4
1.8	**22**	3	**25**	**3**	**22**	3					**15**	3
1.9	**20**	4	**22**	**4**	**20**	4					**18**	4
1.10	**22**	4	**25**	**4**	**22**	4			20	4	**18**	4
1.11	**16**	3	**20**	**4**	**16**	3			15	3	**13**	4
1.12	**20**	4	**25**	**4**	**20**	4	**16**	4			**18**	4
1.13	**9**	2	**10**	**2**	**9**	2			12	2	**6**	2
1.14	**13**	3	**16**	**3**	**13**	3					**12**	3
1.15	**15–20**	3-4	**17-22**	**4-5**	**15–20**	3-4	**12–16**	3-4			**13–18**	3-4
1.16	**15–20**	3-4	**17-22**	**4-5**	**15–20**	3-4	**12–16**	3-4			**13–18**	3-4
2.1	**20**	4	19	**4**	**20**	4			**18**	4	13	4
2.2	**18**	4	17	**4**	**18**	4			**15**	4	11	4
2.3	**18**	4	16	**4**	**18**	4			**14**	3	12	4
2.4	**18**	4	15	**4**	**18**	4					11	4
2.5	**15**	3	14	**3**	**15**	3			**13**	3	10	3
2.6	**16**	3	15	**3**	**16**	3			**12**	3	9	3
2.7	**12**	3	13	**3**	**12**	3					8	3
3.1	**45**	6	**50**	6	**45**	6	**34**	6			31	6
3.2	**40**	6	**44**	6	**40**	6	**26**	6			28	6
3.3	**40**	6	**44**	6	**40**	6	**25**	6			21	6
3.4	**30**	6	**33**	6	**30**	6	**20**	6			17	6
3.5	**42**	6	**44**	6	**42**	6	**26**	6	45	6	21	6
3.6	**35**	6	**33**	6	**35**	6	**23**	6	32	6	18	6
3.7	**32**	6	**44**	6	**32**	6	**22**	6			24	6
3.8	**30**	6	**33**	6	**30**	6	**21**	6			23	6
4.1	**70**	7			**70**	7			90	7	**70**	7
4.2	**70**	7			**70**	7			90	7	**70**	7
4.3	**85**	7			**85**	7			80	7	**50**	7
4.4	**70**	7			**70**	7			70	6	**50**	6
4.5	**70**	6			**70**	6			70	6	**50**	6
4.6	**88**	5	88	5	**88**	5			40	5	**60**	5
4.7	**44**	5	50	5	**44**	5			38	4	**40**	4
4.8	**50**	4	33	5	**50**	4			48	4	**36**	4
4.9	**45**	4	29	5	**45**	4			43	4	**35**	4
4.10	**40**	4	28	5	**40**	4			37	4	**32**	4
4.11	**77**	5	84	5	**77**	5	36-40	4				
4.12	**44**	5	46	5	**44**	5			40	5	**40**	5
4.13	**15**	4	27	5	**15**	4					**28**	4
4.14	**25**	4	22	4	**25**	4	18	4	20	4	**18**	4
4.15												
4.16	**70**	6			**70**	6					**70**	6
4.17												
4.18	**14**	3			**14**	3						
4.19	**18**	4			**18**	4						
5.1	8	2			8	2						
5.2	10	2			10	2						
5.3	8	1			8	1						
5.4	8	1	5	**2**	8	1						
5.5	8	2			8	2						
5.6	8	2			8	2						
5.7	10	2	10	**2**	10	2			7	2	6	2
5.8	8	1			8	1						
5.9	8	1			8	1						
5.10	12	2			12	2			10	2		
5.11	8	2			8	2			6	2		
6.1	8	1			8	1						
6.2												
6.3												
6.4												
6.5												

The cutting data depends extremely on the external conditions, e.g. stability of the tool and tool clamping, material and machine type. The indicated values are possible cutting data which have to be increased or reduced according to the application conditions.

	Type WT 10 109 ...		Type WT-TiN 10 110 ...		Type WTL-L 10 112 ...		Type WT-MK 10 285 ...	
Index	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F
1.1	**30–35**	5	**35–45**	5	**22–27**	5-6	**30–35**	5
1.2	**30–35**	5	**35–45**	5	**26–34**	5-6	**30–40**	5
1.3	**36**	4	**44**	4	**30**	6	**36**	6
1.4	**15–20**	3-4	**18–22**	3-4	**13–16**	3-4	**15–20**	3-4
1.5	**40**	5	**44**	5	**25–34**	5	**35–40**	5
1.6	**35**	4	**38**	4	**16**	5	**35**	4
1.7	**20**	4	**27**	4	**16**	4	**20**	4
1.8	**16**	3	**22**	3	**13**	3	**16**	3
1.9	**16**	3	**18**	3	**16**	4	**16**	3
1.10	**16**	4	**22**	4	**16**	4	**16**	4
1.11	**12**	3	**18**	3	**11**	4	**12**	3
1.12	**15**	4	**17**	4	**16**	4	**20**	4
1.13	**8**	2	**9**	2	**12**	2	**8**	2
1.14	**12**	3	**15**	3	**12**	3	**15**	3
1.15	**12–15**	3-4	**14–19**	3-4	**12–16**	3-4	**12–20**	3-4
1.16	**12–15**	3-4	**14–19**	3-4	**12–16**	3-4	**12–20**	3-4
2.1	16	4	18	4	12	4	16	4
2.2	14	4	15	4	10	3	14	4
2.3	15	3	17	3	11	3	15	3
2.4	14	3	15	3	10	3	14	3
2.5	13	3	15	3	9	3	13	3
2.6	12	3	14	3	8	3	12	3
2.7	11	3	13	3	7	3	11	3
3.1	35	6	40	6	30	6	35	6
3.2	30	6	35	6	25	6	30	6
3.3	30	6	33	6	25	6	30	6
3.4	25	6	27	6	20	6	25	6
3.5	30	6	36	6	26	6	30	6
3.6	28	6	34	6	23	6	28	6
3.7	26	6	30	6	22	6	26	6
3.8	24	6	28	6	21	6	24	6
4.1					**70**	7		
4.2					**70**	7		
4.3					**50**	7		
4.4					**50**	6		
4.5					**45**	6		
4.6					**60**	5		
4.7	38	5	40	5	**40**	4	38	5
4.8	38	4	40	4	**32**	4	38	4
4.9	25	4	32	4	**30**	4	25	4
4.10					**28**	4		
4.11								
4.12					**40**	5		
4.13					**28**	5		
4.14	20	4	25	4	**18**	4	20	4
4.15								
4.16					**70**	6		
4.17								
4.18								
4.19								
5.1								
5.2								
5.3	7	1	8	1			7	1
5.4	7	1	8	1			7	1
5.5	7	1	8	1			7	1
5.6	8	2	10	2			8	2
5.7								
5.8								
5.9	12	2	15	2			10	2
5.10	12	2	15	2			10	2
5.11	8	2	10	2			6	2
6.1	4	1	8	1	6	1-2	4	1
6.2			4	1				
6.3								
6.4								
6.5								

When drilling tough materials which tend to jam, chips should be removed at drilling depth ≥ 4xD and the cutting speed v_c should be reduced as follows: at drilling depths > 4xD by 10%, at drilling depths > 6xD by 15–20%. It is also recommended to use an emulsion for cooling.

v_c = Cutting speed in m/min.
F = Factor for feed selection
Feed approximate values see → **Page 53**

Cutting data standard values – Hole depth 5xD

	Type VX-TiN 10 124 ...		Type UNI-PM-TiN 10 173 ...		Type UNI-TiN 10 171 ...		Type N 10 152 ...		Type VA 10 175 ...		Type W 10 161 ...		Type WTL 10 168 ...	
Index	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F
1.1	**33–38**	5-6	**37-42**	**5-6**	**33–38**	5-6	**22–27**	5-6					**30–35**	5
1.2	**40–44**	5-6	**44-47**	**6-7**	**40–44**	5-6	**26–34**	5-6					**40**	5
1.3	**44**	6	**47**	**4**	**44**	6	**30**	6					**36**	5
1.4	**18–22**	3-4	**20-25**	**4-5**	**18–22**	3-4			16-28	3-4			**15–20**	3-4
1.5	**40–44**	6	**47**	**6**	**40–44**	6	**25**	5					**40**	5
1.6	**26**	5	**44**	**5**	**26**	5							**35**	4
1.7	**27**	4	**30**	**4**	**27**	4							**20**	4
1.8	**22**	3	**25**	**3**	**22**	3							**16**	3
1.9	**20**	4	**22**	**4**	**20**	4							**14**	3
1.10	**22**	4	**25**	**4**	**22**	4			18	4			**16**	4
1.11	**16**	3	**20**	**4**	**16**	3			15	3			**12**	3
1.12	**20**	4	**25**	**4**	**20**	4	**16**	4					**10**	3
1.13	**9**	2	**10**	**2**	**9**	2								
1.14	**13**	3	**16**	**3**	**13**	3							**15**	3
1.15	**15–20**	3-4	**17-22**	**4-5**	**15–20**	3-4	**12–16**	3-4					**15**	4
1.16	**15–20**	3-4	**17-22**	**4-5**	**15–20**	3-4	**12–16**	3-4					**12**	3
2.1	**20**	4	19	**4**	**20**	4			**16**	4			15	4
2.2	**18**	4	17	**4**	**18**	4			**14**	4			14	4
2.3	**18**	4	16	**4**	**18**	4			**13**	4			12	3
2.4	**18**	4	15	**4**	**18**	4			**14**	3			13	3
2.5	**15**	3	14	**3**	**15**	3			**12**	3				
2.6	**16**	3	15	**3**	**16**	3			**11**	3				
2.7	**12**	3	13	**3**	**12**	3			**10**	3				
3.1	**45**	6	**50**	6	**45**	6	**34**	6					36	6
3.2	**40**	6	**44**	6	**40**	6	**26**	6					28	6
3.3	**40**	6	**44**	6	**40**	6	**25**	6					30	6
3.4	**30**	6	**33**	6	**30**	6	**20**	6					22	6
3.5	**42**	6	**44**	6	**42**	6	**26**	6	42	6			28	6
3.6	**35**	6	**33**	6	**35**	6	**23**	6	30	6			23	6
3.7	**32**	6	**44**	6	**32**	6	**22**	6					20	6
3.8	**30**	6	**33**	6	**30**	6	**21**	6					18	6
4.1	**70**	7			**70**	7					**80**	7		
4.2	**70**	7			**70**	7			90	7	**80**	7		
4.3	**85**	7			**85**	7			90	7	**63**	7	70	7
4.4	**70**	7			**70**	7			70	6			55	6
4.5	**70**	6			**70**	6			70	6			55	6
4.6	**88**	5	88	5	**88**	5			55	5	**50**	5	40	5
4.7	**44**	5	50	5	**44**	5			44	4			36	5
4.8	**47**	4	33	5	**47**	4			36	4			28	4
4.9	**43**	4	29	5	**43**	4			30	4			22	4
4.10	**38**	4	28	5	**38**	4			30	3			20	4
4.11	**77**	5	84	5	**77**	5								
4.12	**44**	5	46	5	**44**	5			45	5			45	4
4.13	**15**	4	27	5	**15**	4					**28**	5		
4.14	**25**	4	22	4	**25**	4	18	4					20	4
4.15														
4.16	**70**	6			**70**	6								
4.17														
4.18	**14**	3			**14**	3			11	3				
4.19	**18**	4			**18**	4			13	4				
5.1	8	2			8	2								
5.2	10	2			10	2								
5.3	8	1			8	1								
5.4	8	1	5	**2**	8	1								
5.5	8	2			8	2								
5.6	8	2			8	2								
5.7	10	1	10	**2**	10	1			9	2				
5.8	8	1			8	1								
5.9	8	1			8	1								
5.10	12	2			12	2			10	2				
5.11	8	2			8	2								
6.1	8	1			8	1								
6.2														
6.3														
6.4														
6.5														

The cutting data depends extremely on the external conditions, e.g. stability of the tool and tool clamping, material and machine type. The indicated values are possible cutting data which have to be increased or reduced according to the application conditions.

	Type WTL-TiN 10 170 ...		Type WTL-TiCN 10 172 ...		Type WTL-L 10 169 ...		Type WNXi 10 180 ...		Type WNXi-TiN 10 181 ...		Type N-MK 10 265 ...		Type WTL-MK 10 280 ...	
Index	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F
1.1	**36–42**	5	**36–42**	6	**22–27**	5-6	**42–50**	6-7	**42–60**	6-7	**22–27**	5-6	**30–35**	5
1.2	**42–48**	5	**42–48**	6	**25–32**	5-6	**42–50**	6-7	**42–60**	6-7	**25–32**	5-6	**40**	5
1.3	**48**	4	**48**	7	**32**	6	**50**	7	**62**	7	**30**	6	**36**	6
1.4	**20–24**	3-4	**20–24**	4-5			**16–22**	4-5	**20–31**	4-5			**15–20**	3-4
1.5	**48**	5	**48**	6	**25**	5	**38–48**	6	**48–60**	6	**25**	5	**28–40**	5
1.6	**42**	4	**42**	5			**28**	5	**30**	5			**28**	4
1.7	**34**	4	**34**	5			**25**	5	**30**	5			**18–20**	4
1.8	**30**	3	**30**	4			**20**	4	**25**	4			**16**	3
1.9	**18**	3	**20**	4			**22**	5	**25**	5			**14**	3
1.10	**24**	4	**20**	5			**22**	5	**28**	5			**14–16**	4
1.11	**20**	3	**15**	4			**14**	4	**20**	4			**12**	3
1.12	**13**	3	**15**	4			**24**	5	**26**	5	**16**	4	**10**	3
1.13			**11**	3			**15**	3	**18**	3				
1.14	**17**	3	**17**	4			**18**	4	**20**	4			**10–15**	3
1.15	**18**	4	**21**	5	**16**	4	**16–24**	4-5	**18–30**	4-5	**12–16**	3-4	**15**	4
1.16	**14**	3	**15**	4			**16–24**	4-5	**18–30**	4-5	**12–16**	3-4	**12**	3
2.1	18	4	20	5			**20**	5	**25**	5			15	4
2.2	16	4	18	4			**18**	5	**22**	5			14	4
2.3	14	3	16	4			**16**	5	**20**	5			12	3
2.4	15	3	17	4			**18**	5	**22**	5			13	3
2.5							**15**	4	**19**	4				
2.6							**14**	4	**18**	4				
2.7							**12**	4	**17**	4				
3.1	45	6			32	6	**48**	7	**60**	7	**32**	6	36	6
3.2	36	6			25	6	**42**	7	**52**	7	**25**	6	28	6
3.3	40	6			28	6	**42**	7	**52**	7	**28**	6	30	6
3.4	28	6			20	6	**40**	7	**50**	7	**20**	6	22	6
3.5	36	6			25	6	**42**	7	**52**	7	**25**	6	28	6
3.6	30	6			22	6	**35**	7	**45**	7	**22**	6	23	6
3.7	25	6			18	6	**32**	7	**42**	7	**21**	6	20	6
3.8	22	6			16	6	**30**	7	**40**	7	**20**	6	18	6
4.1					80	7								
4.2					80	7								
4.3	85	7			63	7	95	7	120	7			70-80	7
4.4	70	6			50	6	75	8	95	8			60-70	6
4.5	70	6			50	6	75	8	95	8			60-70	6
4.6	88	5			32	5	78	6	98	6			40	5
4.7	45	5			50	5	55	6	62	6			36	5
4.8	32	4			15	4							28	4
4.9	25	4					42	5	48	5			22	4
4.10	22	4					38	5	44	5			20	4
4.11														
4.12					40	5	55	6	55	6			45	4
4.13							38	6	44	6	28	5		
4.14	24	4			16	4					18	4	18	4
4.15														
4.16														
4.17														
4.18							15	4	20	4				
4.19							18	4	22	5				
5.1							9	3	11	3				
5.2							11	3	13	3				
5.3							9	2	11	2				
5.4							9	2	11	2				
5.5							9	2	11	2				
5.6							11	3	13	3				
5.7							9	2	11	2				
5.8							9	3	11	3				
5.9							9	2	11	2				
5.10							14	3	17	3				
5.11							10	3	12	3				
6.1							8	3	10	3				
6.2							4	3	5	3				
6.3														
6.4														
6.5														

When drilling tough materials which tend to jam, chips should be removed at drilling depth ≥ 4xD and the cutting speed v_c should be reduced as follows: at drilling depths > 4xD by 10 %, at drilling depths > 6xD by 15–20 %. It is also recommended to use an emulsion for cooling.

v_c = Cutting speed in m/min.
F = Factor for feed selection
Feed approximate values see → **Page 53**

Cutting data standard values – Hole depth 10xD and over 10xD

	Hole depth 10xD													
	Type NC 10 223 ...		Type NC-TiALN 10 224 ...		Type UNI-TiN 10 270 ...		Type WTL 10 225 ...		Type WTL 10 215 ...		Type WTL-TiN 10 210 ...		Type WTW 10 200 ...	
Index	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F
1.1	**30–40**	5-6	**50–65**	6-7	**25–32**	5-6	**28–32**	5-6	**22–28**	5-6	**24–30**	5-6		
1.2	**30–40**	5-6	**50–65**	6-7	**28–35**	6	**28–32**	5-6	**22–28**	5-6	**28–32**	5-6		
1.3	**40**	6	**65**	7	**28**	6	**32**	6	**28**	6	**32**	6		
1.4	**12–17**	3-4	**18–25**	4-5	**12–14**	3-4	**13–18**	3-4			**10–14**	4		
1.5	**30–40**	5	**45–55**	6	**25–28**	6	**26–36**	5	**22**	5	**26–36**	5		
1.6	**22**	4	**35**	5	**15**	5	**24**	4-5			**24**	4		
1.7	**20**	3	**30**	4	**13**	4	**16**	4			**18**	4		
1.8	**14**	3	**20**	4	**12**	3	**12**	3						
1.9	**14**	3	**20**	4	**13**	4	**12**	3						
1.10	**14**	4	**20**	5	**13**	4	**14**	4			**12**	4		
1.11	**10**	3	**15**	4	**8**	3	**10**	3						
1.12	**10**	3	**15**	4			**8**	3			**8**	3		
1.13	**7**	2	**12**	3			**6**	2						
1.14	**10**	3	**15**	4	**10**	3	**12**	3						
1.15	**20**	4	**30**	4	**10–13**	3-4	**16**	8	**14**	4	**15**	4		
1.16	**10**	3	**15**	4	**10–13**	3-4	**8**	3			**8**	3		
2.1	14	4	20	4	13	4	**12**	4						
2.2	14	4	20	4			**13**	4						
2.3	12	3	18	3	12	4	**10**	3						
2.4	13	3	20	3			**11**	3						
2.5	11	3	16	3			**9**	3						
2.6	10	3	15	3	8-13	3-4	**8**	3						
2.7							**7**	2-3						
3.1	**40**	6	**65**	7	**32**	6	**28**	6	**28**	6	**36**	6-7		
3.2	**30**	6	**50**	7	**26**	6	**22**	6	**22**	6	**28**	6-7		
3.3	**35**	6	**60**	7	**28**	6	**30**	6	**22**	6	**28**	6-7		
3.4	**25**	6	**40**	7	**20**	6	**24**	6	**18**	6	**22**	6-7		
3.5	**30**	6	**50**	7	**28**	6	**24**	6	**22**	6	**28**	6-7		
3.6	**32**	6	**55**	7	**20**	6	**20**	6	**16**	6	**30**	6-7		
3.7	**24**	6	**36**	7	**28**	6	**16**	6	**14**	6	**20**	6-7		
3.8	**22**	6	**32**	7	**20**	6	**15**	6	**13**	6	**18**	6-7		
4.1					50	7							**65**	7
4.2	80	6	110	7	60	7							**65**	7
4.3	80	6	110	7	60	7	**70**	7	**55**	7	**70**	7		
4.4	75	7	95	8	50	6	**60**	6	**45**	6	**55**	6		
4.5	60	6	80	7	50	6	**60**	6	**45**	6	**55**	6		
4.6	60	5	60	6	24	5	**54**	5	**54**	5	**65**	5		
4.7	40	5	60	6			**30**	5	**28**	5	**36**	5		
4.8	36	4	55	5			**26**	4	**24**	4	**28**	4		
4.9	25	4	35	5			**22**	4	**20**	4	**22**	4		
4.10	23	4	30	5			**20**	4	**18**	4	**20**	4		
4.11					35-50	4-5								
4.12	50	5	65	5	28	5	**38**	5	**34**	5	**44**	5		
4.13	30	5	40	5	12	4							**22**	5
4.14					18	4	**16**	4	**14**	4	**18**	4		
4.15														
4.16					50	6							**63**	6
4.17														
4.18	8	2	10	3										
4.19	7	2	9	3										
5.1	8	2	11	2-3										
5.2	6	2	7	2-3										
5.3	6	1	7	2										
5.4	6	2	7	2										
5.5	6	1	7	2										
5.6	5	1	6	2										
5.7	5	1	6	2										
5.8	5	1	6	1										
5.9	5	1	6	1										
5.10	6	2	7	2-3										
5.11	6	1	7	2-3										
6.1	6	3	7	3										
6.2	4	2	5	2										
6.3														
6.4														
6.5														

The cutting data depends extremely on the external conditions, e.g. stability of the tool and tool clamping, material and machine type. The indicated values are possible cutting data which have to be increased or reduced according to the application conditions.

	Hole depth 10xD				Hole depth above 10xD									
	Type N-MK 10 295 ...		Type WTL-MK 10 297 ...		Type WTL-R1 10 235 ...		Type WTL-R2 10 245 ...		Type WTL-R3 10 255 ...		Type WTL-MK-R1 10 305 ...		Type WTL-MK-R2 10 315 ...	
Index	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F
1.1	**28–36**	5-6	**28–32**	5-6	**18–22**	4-5	**18–22**	4-5	**18–22**	4-5	**18–22**	4-5	**18–22**	4-5
1.2	**28–36**	5-6	**28–32**	5-6	**18–22**	4-5	**18–22**	4-5	**18–22**	4-5	**18–22**	4-5	**18–22**	4-5
1.3	**27**	6	**32**	6	**22**	4	**22**	4	**22**	4	**22**	4	**22**	4
1.4	**14**	4	**10–14**	3-4	**10**	3	**10**	3	**10**	3	**10**	3	**10**	3
1.5	**28–36**	5	**36**	5	**18–22**	4	**18–22**	4	**18–22**	4	**18–22**	4	**18–22**	4
1.6	**22**	4	**24**	4										
1.7	**18**	4	**16**	4	**12**	3	**12**	3	**12**	3	**12**	3	**12**	3
1.8			**12**	3										
1.9			**12**	3										
1.10	**12**	4	**12**	4	**8**	3	**8**	3	**8**	3	**8**	3	**8**	3
1.11			**8**	3										
1.12	**8**	3	**8**	3										
1.13			**6**	2										
1.14			**8**	3	**6**	2	**6**	2	**6**	2	**6**	2	**6**	2
1.15	**18**	4	**16**	4										
1.16	**8**	3	**8**	3										
2.1			**12**	4	8	3	8	3	8	3	8	3	8	3
2.2			**13**	4	8	3	8	3	8	3	8	3	8	3
2.3			**10**	3										
2.4			**11**	3										
2.5			**9**	3										
2.6			**8**	3										
2.7			**7**	2-3										
3.1	**36**	6-7	**28**	6	**22**	5	**22**	5	**22**	5	**22**	5	**22**	5
3.2	**28**	6-7	**22**	6	**18**	5	**18**	5	**18**	5	**18**	5	**18**	5
3.3	**28**	6-7	**30**	6	**20**	5	**20**	5	**20**	5	**20**	5	**20**	5
3.4	**22**	6-7	**24**	6	**14**	5	**14**	5	**14**	5	**14**	5	**14**	5
3.5	**28**	6-7	**22**	6	**18**	5	**18**	5	**18**	5	**18**	5	**18**	5
3.6	**30**	6-7	**20**	6	**16**	5	**16**	5	**16**	5	**16**	5	**16**	5
3.7	**20**	6-7	**16**	6	**14**	5	**14**	5	**14**	5	**14**	5	**14**	5
3.8	**18**	6-7	**15**	6	**12**	5	**12**	5	**12**	5	**12**	5	**12**	5
4.1														
4.2														
4.3	70	7	**70**	7	**45**	6	**45**	6	**45**	6	**45**	6	**45**	6
4.4	55	6	**60**	6	**36**	5	**36**	5	**36**	5	**36**	5	**36**	5
4.5	55	6	**50**	6	**36**	5	**36**	5	**36**	5	**36**	5	**36**	5
4.6	54	5	**54**	5	**22**	4	**22**	4	**22**	4	**22**	4	**22**	4
4.7	36	5	**30**	5	**20**	3	**20**	3	**20**	3	**20**	3	**20**	3
4.8	28	4	**26**	4	**22**	3	**22**	3	**22**	3	**22**	3	**22**	3
4.9	22	4	**22**	4	**22**	3	**22**	3	**22**	3	**22**	3	**22**	3
4.10	20	4	**20**	4	**20**	3	**20**	3	**20**	3	**20**	3	**20**	3
4.11														
4.12	36	4	**38**	5	**28**	4	**28**	4	**28**	4	**28**	4	**28**	4
4.13	22	5			**20**	3	**20**	3	**20**	3	**20**	3	**20**	3
4.14	14	4	**16**	4	**14**	4	**14**	4	**14**	4	**14**	4	**14**	4
4.15														
4.16					**55**	5	**55**	5	**55**	5	**55**	5	**55**	5
4.17														
4.18														
4.19														
5.1														
5.2														
5.3														
5.4														
5.5														
5.6														
5.7														
5.8														
5.9														
5.10														
5.11														
6.1														
6.2														
6.3														
6.4														
6.5														

When drilling tough materials which tend to jam, chips should be removed at drilling depth ≥ 4xD and the cutting speed v_c should be reduced as follows: at drilling depths > 4xD by 10 %, at drilling depths > 6xD by 15–20 %. It is also recommended to use an emulsion for cooling.

v_c = Cutting speed in m/min.
F = Factor for feed selection
Feed approximate values see → **Page 53**

Cutting data standard values – micro drills 10 103 ...

		Nominal Ø in mm						
		Ø 0,15	Ø 0,20–0,25	Ø 0,30–0,35	Ø 0,40–0,55	Ø 0,60–0,75	Ø 0,80–0,95	Ø 1,00–1,45
Index	v_c in m/min	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.
1.1	**18**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
1.2	**18**	0,007	0,009	0,011	0,014	0,020	0,024	0,041
1.3	**18**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
1.4	**14**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
1.5	**18**	0,007	0,009	0,011	0,014	0,020	0,024	0,041
1.6	**14**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
1.7	**14**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
1.8	**12**	0,004	0,005	0,007	0,009	0,012	0,016	0,029
1.9	**12**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
1.10	**14**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
1.11	**12**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
1.12	**14**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
1.13	**8**	0,003	0,004	0,005	0,007	0,009	0,013	0,024
1.14	**14**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
1.15	**12–14**	0,004	0,006	0,008	0,007	0,010	0,014	0,026
1.16	**12–14**	0,004	0,006	0,008	0,007	0,010	0,014	0,026
2.1	**12**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
2.2	**10**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
2.3	**6**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
2.4	**6**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
2.5	**6**	0,004	0,006	0,008	0,007	0,010	0,014	0,026
2.6	**6**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
2.7	**6**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
3.1	**25**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
3.2	**22**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
3.3	**18**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
3.4	**22**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
3.5	**22**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
3.6	**20**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
3.7	**22**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
3.8	**20**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
4.1								
4.2								
4.3	**26**	0,012	0,014	0,019	0,024	0,034	0,038	0,060
4.4	**24**	0,012	0,014	0,019	0,024	0,034	0,038	0,060
4.5	**18**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
4.6	**42**	0,007	0,009	0,011	0,014	0,020	0,024	0,041
4.7	**38**	0,007	0,009	0,011	0,014	0,020	0,024	0,041
4.8	**45**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
4.9	**35**	0,007	0,009	0,011	0,014	0,020	0,024	0,041
4.10	**30**	0,007	0,009	0,011	0,014	0,02	0,024	0,041
4.11								
4.12	**22**	0,007	0,009	0,011	0,014	0,020	0,024	0,041
4.13	**18**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
4.14	**16**	0,005	0,007	0,009	0,011	0,015	0,020	0,035
4.15								
4.16	**75**	0,009	0,011	0,015	0,019	0,026	0,031	0,050
4.17								
4.18	**6**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
4.19	**6**	0,004	0,005	0,007	0,008	0,012	0,016	0,029
5.1	5	0,004	,0,005	0,007	0,008	0,012	0,016	0,029
5.2	5	0,004	0,005	0,007	0,008	0,012	0,016	0,029
5.3	5	0,004	0,005	0,007	0,008	0,012	0,016	0,029
5.4	5	0,004	0,005	0,007	0,008	0,012	0,016	0,029
5.5	5	0,004	0,005	0,007	0,008	0,012	0,016	0,029
5.6	5	0,004	0,005	0,007	0,008	0,012	0,016	0,029
5.7	6	0,005	0,007	0,009	0,011	0,015	0,020	0,035
5.8	5	0,004	0,005	0,007	0,008	0,012	0,016	0,029
5.9	5	0,004	0,005	0,007	0,008	0,012	0,016	0,029
5.10	4	0,003	0,004	0,005	0,007	0,009	0,013	0,024
5.11	4	0,003	0,004	0,005	0,007	0,009	0,013	0,024
6.1	3	0,002	0,003	0,004	0,005	0,007	0,010	0,020
6.2								
6.3								
6.4								
6.5								

The cutting data depends extremely on the external conditions, e.g. stability of the tool and tool clamping, material and machine type. The indicated values are possible cutting data which have to be increased or reduced according to the application conditions.

Feed rate guide values for HSS twist drills

Factor F	Drill diameter in mm															
	0,5	1	2	3	4	5	6	8	10	12	14	16	18	20	26	30
	Feed rate f in mm/rev.															
1	0,004	0,006	0,02	0,03	0,04	0,04	0,05	0,06	0,08	0,08	0,09	0,1	0,12	0,15	0,18	0,19
2	0,006	0,008	0,02	0,03	0,05	0,05	0,05	0,08	0,1	0,1	0,1	0,12	0,12	0,2	0,2	0,2
3	0,007	0,012	0,03	0,05	0,06	0,069	0,08	0,1	0,12	0,13	0,13	0,16	0,16	0,25	0,25	0,25
4	0,008	0,014	0,04	0,06	0,08	0,09	0,1	0,14	0,16	0,16	0,16	0,2	0,2	0,3	0,3	0,3
5	0,01	0,016	0,06	0,08	0,1	0,12	0,13	0,16	0,2	0,2	0,22	0,25	0,25	0,4	0,4	0,4
6	0,012	0,018	0,06	0,1	0,12	0,14	0,16	0,2	0,25	0,25	0,25	0,3	0,3	0,5	0,5	0,5
7	0,014	0,02	0,08	0,13	0,16	0,18	0,2	0,25	0,35	0,35	0,35	0,4	0,4	0,6	0,6	0,6
8	0,016	0,023	0,1	0,16	0,2	0,2	0,25	0,35	0,4	0,4	0,4	0,4	0,5	0,6	0,7	0,8
9	0,019	0,025	0,13	0,17	0,2	0,23	0,32	0,4	0,4	0,5	0,5	0,5	0,6	0,8	0,9	0,9

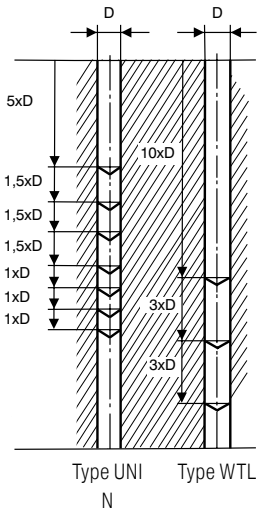
All the indicated data are guide values only and represent average values.

Speed for HSS drills

v_c m/min	Drill diameter in mm															
	2,0	2,5	3,15	4,0	5,0	6,3	8,0	10,0	12,5	16,0	20,0	25,0	31,5	40,0	50,0	63,0	80,0
	Speed in U/min																
80	12500	10000	8000	6300	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320
63	10000	8000	6300	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250
50	8000	6300	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200
40	6300	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160
32	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125
25	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125	100
20	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125	100	80
16	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125	100	80	63
12	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125	100	80	63	50
10	1600	1250	1000	800	630	500	400	320	250	200	160	125	100	80	63	50	40
8	1250	1000	800	630	500	400	320	250	200	160	125	100	80	63	50	40	32
6	1000	800	630	500	400	320	250	200	160	125	100	80	63	50	40	32	25
5	800	630	500	400	320	250	200	160	125	100	80	63	50	40	32	25	20
4	630	500	400	320	250	200	160	125	100	80	63	50	40	32	25	20	16
3	500	400	320	250	200	160	125	100	80	63	50	40	32	25	20	16	12

Peck frequency for deep drilling

- drill must be sufficiently cooled
- by use of a drill with flat chip gullet profile (type WTL) chip transport is substantially improved
- for extremely deep drilling or when machining horizontally through coolant drills with internal coolant supply are recommended



Coatings

TiN

- TiN coating
- maximum application temperature: 450 °C

TiAlN

- TiAlN multilayer coating
- maximum application temperature: 900 °C

vap.

- vaporised
- vaporisation (vapour-deposition) prevents cold welds from forming on the tool and increases the surface hardness and thus the wear resistance

TiCN

- TiCN multilayer coating
- maximum application temperature: 450 °C

F.-nit

- titanium carbon nitride based PVD coating particularly suitable for steel machining
- applicable up to approx. 450 °C