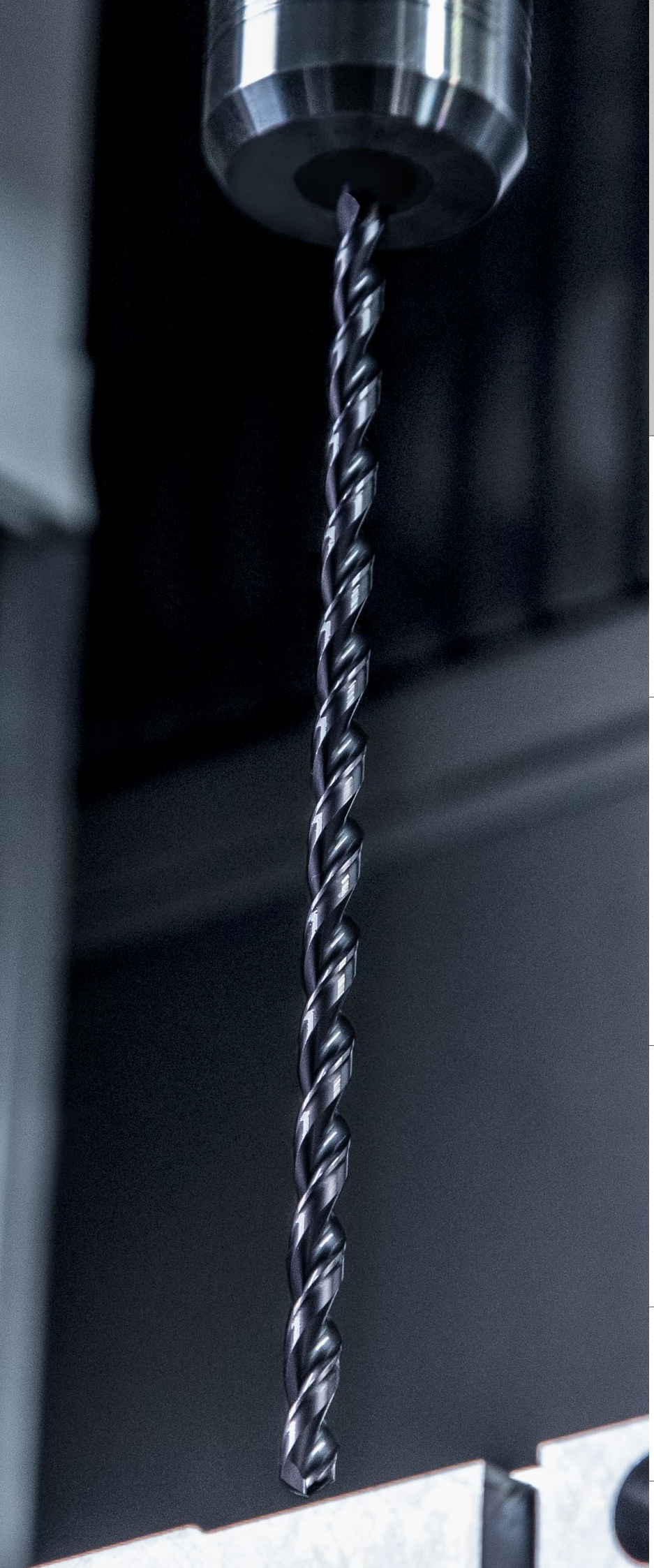


Table of contents

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


Plain cylindrical shank


Cylindrical shank with lateral driving face „Weldon“


Morse taper

Version


Int. coolant supply


self-centering

● = **Main Application**

○ = Extended application

Toolfinder

	Tool type	Cutting 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	9	15				
	UNI	HSS-E-PM TiN	▲ Wear-resistant due to HSS-E-PM and TiN coating ▲ Universal high-performance drill	10–14	16–21				
	UNI	HSS-E TiN	▲ As for Type VX ▲ Without standard shank to DIN 1835 A ▲ Available as a set	10–14	16–21	24–26			
	N	HSS vap.	▲ stable twist drill ▲ also suitable for portable drills ▲ available in set	10–14	16–21				
	WT	HSS-E vap.	▲ for high alloy steel and special alloys (Hastelloy, Inconel, Nimonic)	10–14					
	WT	HSS-E TiN	▲ as Type WT HSS-E vap. ▲ higher wear resistance due to coating	10–14					
	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		16–21	24–26			
	WTL	HSS-E TiN	▲ as WTL HSS-E, but higher v_c and wear resistance due to coating ▲ suitable for steel and cast iron		16–21				
	WTL	HSS-E TiAlN	▲ Special flute profile with large chip spaces ▲ Higher wear resistance due to TiAlN coating				27	28	28
	WTL	HSS F.-nit	▲ special flute profile with large chip gullet ▲ nitrided cutting edge giving increased wear protection to cutting corners and guide lands				27	28	28
	WTL	HSS TiN	▲ as WTL HSS, but higher v_c and wear resistance due to coating			24–26			
	WNX	HSS-E	▲ Wide chip flutes for long-chipping materials ▲ Self-centring	10–14					
	NC	HSS TiAlN	▲ suitable for use with drill bushes ▲ very good chip evacuation with thro' coolant ▲ higher v_c and wear resistance due to coating			23			
Stainless steel	VA	HSS-E	▲ Specialist for stainless and acid-resistant materials ▲ special geometry	10–14	16–21				
Non-ferrous metals	W	HSS	▲ Specialist for non-ferrous metals		16–21				
	WTW	HSS	▲ for non-ferrous metals to 500 N/mm² ▲ for deep holes			24–26			

HSS Drills Overview

	Tool type	Cutting material | Coating	Point angle SIG	Diameter in mm DC	Steel P	Stainless steel M	Cast iron K	Non-ferrous metals N	Heat-resistant S	Tempered steel H	Non metal materials O		coated ■	uncoated □	WNT \ Performance
3xD without thro' coolant															
	VX	HSS-E TiN	118°	2–20	●	●	●	○	○		○		■		9
	UNI	HSS-E-PM TiN	130°	1–14	●		●	○	○	○	○		■		10–14
	UNI	HSS-E TiN	118°	1–14	●	●	●	○	○		○		■		10–14
	N	HSS vap.	118°	0,4–20	○		●	○			○		■		10–14
	VA	HSS-E	130°	1–12	○	●		●	○					□	10–14
	WNX	HSS-E	130°	1–20	●		●	○	○	○	○			□	10–14
	WT	HSS-E vap.	130°	0,4–25	●	●	●	○	○	○			■		10–14
	WT	HSS-E TiN	130°	1–20	●	●	●	○	●	○			■		10–14
5xD without thro' coolant															
	VX	HSS-E TiN	118°	2–20	●	●	●	○	○		○		■		15
	UNI	HSS-E-PM TiN	130°	1–14	●		●	○	○	○	○		■		16–21
	UNI	HSS-E TiN	118°	0,9–14	●	●	●	○	○		○		■		16–21
	N	HSS vap.	118°	0,2–20	○		●	○			○		■		16–21
	VA	HSS-E	130°	1–12	○	●		●	○					□	16–21
	W	HSS	130°	0,20–20				●						□	16–21
	WTL	HSS-E F-nit.	130°	1–16	●	○	●	●	○	○	○		■		16–21
	WTL	HSS-E TiN	130°	1–16	●	○	●	○	○	○	○		■		16–21
up to 10xD without thro' coolant															
	UNI	HSS-E TiN	118°	1–14	●	●	●	○	○		○		■		24–26
	WTL	HSS-E F-nit.	130°	1–12	●	○	●	●	○	○	○		■		24–26
	WTL	HSS TiN	130°	1–14	○		●	○			○		■		24–26
	WTW	HSS	130°	1–14				●						□	24–26

HSS Drills Overview

	Tool type	Cutting material | Coating	Point angle SIG	Diameter in mm DC	Steel P	Stainless steel M	Cast iron K	Non-ferrous metals N	Heat-resistant S	Tempered steel H	Non metal materials O		coated ■	uncoated □	WNT \ Performance
up to 10xD with thro' coolant															
	NC	HSS TiAlN	130°	3–13	○	○	●	○			○		■		23
over 10xD without thro' coolant															
	WTL	HSS F-nit. Series 1	130°	2–13	●		●	●			○		■		27
	WTL	HSS F-nit. series 2	130°	2–13	●		●	●			○		■		28
	WTL	HSS F-nit. series 3	130°	2,5–13	●		●	●			○		■		28
	WTL	HSS-E TiAlN Series 1	130°	3–10,2	●		●	●			○		■		27
	WTL	HSS-E TiAlN series 2	130°	3–12	●		●	●			○		■		28
	WTL	HSS-E TiAlN series 3	130°	4–10	●		●	●			○		■		28
Mini-drill															
	N	HSS-E-PM	118°	0,15–1,45	●	○	●	●	○		○			□	29
Twist Drill Sets															
	N	HSS vap.	118°	1–10	○		●	○			○		■		22
	UNI	HSS-E TiN	118°	1–10	●	●	●	○	○		○		■		22
NC Spot Drill															
	NC-A	HSS	90°	3–20	●	○	●	○	○		○			□	33–35
	NC-A	HSS TiN	90°	3–20	●	○	●	○	○		○		■		33+34
	NC-A	HSS	120°	3–20	●	○	●	○	○		○			□	33+34
	NC-A	HSS TiN	120°	3–20	●	○	●	○	○		○		■		33+34
Centre drills															
	ZB	HSS	118°	0,5–6,3	●	○	●	○	○		○	DIN 333 – Form A/B/R		□	35–37
	ZB	HSS TiN	118°	0,5–6,3	●	○	●	○	○		○	DIN 333 – Form A	■		36
	ZB	HSS-E	118°	0,5–6,3	●	○	●	○	○		○	DIN 333 – Form A		□	36

HSS Drills Overview

	Tool type	Cutting material | Coating	Point angle SIG	Diameter in mm DC	Steel P	Stainless steel M	Cast iron K	Non-ferrous metals N	Heat-resistant S	Tempered steel H	Non metal materials O		coated ■	uncoated □	WNT \ Performance
Stepped drills															
	SB	HSS vap.	118°	2,5–10,2	●	○	●	○	○		○	Countersinking angle 90°	■		39
	SB	HSS	118°	2,5–10,2	●	○	●	○	○		○	Countersinking angle 90°		□	39
	SB	HSS vap.	118°	3,2–10,5	●	○	●	○	○		○	Countersinking angle 90°	■		39
	SB	HSS	118°	3,2–10,5	●	○	●	○	○		○	Countersinking angle 90°		□	39
	SB	HSS vap.	118°	3,4–11	●	○	●	○	○		○	Countersinking angle 180°	■		40
	SB	HSS	118°	3,4–11	●	○	●	○	○		○	Countersinking angle 180°		□	40
	SB	HSS vap.	118°	3,3–17,5	●	○	●	○	○		○	Countersinking angle 60°	■		42
Drills with Morse taper															
3xD															
	WT	HSS-E vap.	130°	13–30	●	●	●	○	○	○			■		29
5xD															
	N	HSS vap.	118°	10–55	○		●	○			○		■		30
	WTL	HSS-E F.-nit/vap.	130°	10–27	●	○	●	●	○	○	○		■		30
10xD															
	N	HSS vap.	118°	10–50	○		●	○			○		■		31
	WTL	HSS-E F.-nit/vap.	130°	10–25	●	○	●	●	○	○	○		■		31
above 10xD															
	WTL	HSS F.-nit/vap. Series 1	130°	10–30	●			●	●		○		■		32
	WTL	HSS F.-nit/vap. series 2	130°	10–30	●		●	●			○		■		32
Core drills															
	N	HSS vap.	120°	12–30	●	○	●	○	○		○	3 Edges	■		38
Stepped drills															
	SB	HSS vap.	118°	6,6–17,5	●	○	●	○	○		○	Countersinking angle 180°	■		41

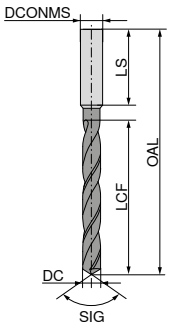
High-performance twist drills similar to DIN 1897, extra-short

- ▲ Shank to DIN 1835 A
- ▲ Special point thinning
- ▲ Very good centering behaviour
- ▲ 4 facet
- ▲ Highest Performance

≤ 3xD

VX

TiN



SIG 118°
HSS-E

10 122 ...

DC h8 mm	OAL mm	LCF mm	DCONMS h6 mm	LS mm	£ T2	
2.00	44	12	3	28	12.55	020
2.10	44	12	3	28	14.21	021
2.20	45	13	3	28	15.32	022
2.30	45	13	3	28	15.32	023
2.40	46	14	3	28	16.03	024
2.50	46	14	3	28	14.01	025
2.60	46	14	3	28	16.03	026
2.70	48	16	3	28	16.58	027
2.80	48	16	3	28	16.58	028
2.90	48	16	3	28	16.58	029
3.00	48	16	3	28	15.32	030
3.10	50	18	4	28	15.32	031
3.20	50	18	4	28	15.32	032
3.30	50	18	4	28	15.32	033
3.40	52	20	4	28	15.32	034
3.50	52	20	4	28	14.56	035
3.60	52	20	4	28	16.27	036
3.70	52	20	4	28	16.58	037
3.80	54	22	4	28	16.24	038
3.90	54	22	4	28	16.58	039
4.00	54	22	4	28	13.48	040
4.10	66	22	6	36	13.48	041
4.20	66	22	6	36	14.21	042
4.30	68	24	6	36	14.94	043
4.40	68	24	6	36	16.96	044
4.50	68	24	6	36	14.01	045
4.60	68	24	6	36	17.71	046
4.70	68	24	6	36	18.06	047
4.80	70	26	6	36	18.06	048
4.90	70	26	6	36	18.06	049
5.00	70	26	6	36	15.32	050
5.10	70	26	6	36	17.71	051
5.20	70	26	6	36	18.25	052
5.30	70	26	6	36	18.45	053
5.40	72	28	6	36	20.47	054
5.50	72	28	6	36	16.24	055
5.55	72	28	6	36	20.47	555
5.60	72	28	6	36	20.47	056
5.70	72	28	6	36	20.47	057
5.80	72	28	6	36	20.47	058
5.90	72	28	6	36	20.47	059
6.00	72	28	6	36	17.15	060
6.10	75	31	8	36	26.56	061
6.20	75	31	8	36	26.56	062
6.30	75	31	8	36	31.71	063
6.40	75	31	8	36	27.54	064
6.50	75	31	8	36	20.12	065
6.60	75	31	8	36	32.28	066
6.70	75	31	8	36	32.28	067
6.80	78	34	8	36	35.31	068
6.90	78	34	8	36	34.84	069
7.00	78	34	8	36	26.56	070
7.10	78	34	8	36	39.06	071

10 122 ...

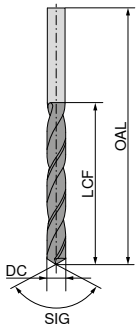
DC h8 mm	OAL mm	LCF mm	DCONMS h6 mm	LS mm	£ T2	
7.20	78	34	8	36	39.67	072
7.30	78	34	8	36	39.67	073
7.40	78	34	8	36	39.67	074
7.45	78	34	8	36	39.67	745
7.50	78	34	8	36	28.02	075
7.60	81	37	8	36	40.26	076
7.70	81	37	8	36	43.33	077
7.80	81	37	8	36	43.33	078
7.90	81	37	8	36	43.33	079
8.00	81	37	8	36	28.76	080
8.10	87	37	10	40	49.17	081
8.20	87	37	10	40	49.17	082
8.30	87	37	10	40	49.17	083
8.40	87	37	10	40	49.17	084
8.50	87	37	10	40	32.62	085
8.60	91	40	10	40	51.09	086
8.70	91	40	10	40	51.09	087
8.80	91	40	10	40	51.09	088
8.90	91	40	10	40	51.09	089
9.00	91	40	10	40	35.59	090
9.10	91	40	10	40	64.05	091
9.20	91	40	10	40	64.05	092
9.30	91	40	10	40	64.05	093
9.35	91	40	10	40	64.05	935
9.40	91	40	10	40	64.05	094
9.50	91	40	10	40	44.48	095
9.60	93	43	10	40	47.99	096
9.70	93	43	10	40	47.99	097
9.80	93	43	10	40	47.99	098
9.90	93	43	10	40	47.99	099
10.00	93	43	10	40	42.79	100
10.20	100	43	12	45	63.32	102
10.30	100	43	12	45	64.42	103
10.50	100	43	12	45	61.50	105
10.70	104	47	12	45	67.23	107
10.80	104	47	12	45	64.63	108
11.00	104	47	12	45	61.50	110
11.10	104	47	12	45	60.16	111
11.50	104	47	12	45	64.05	115
11.70	104	47	12	45	72.01	117
11.80	104	47	12	45	75.19	118
11.90	108	51	12	45	95.09	119
12.00	108	51	12	45	73.56	120
12.10	111	51	16	48	53.57	121
12.30	111	51	16	48	98.05	123
12.50	111	51	16	48	75.77	125
12.70	111	51	16	48	168.10	127
12.80	111	51	16	48	79.82	128
13.00	111	51	16	48	81.44	130
13.50	114	54	16	48	121.95	135
14.00	114	54	16	48	121.95	140
14.50	116	56	16	48	156.18	145
15.00	116	56	16	48	147.07	150
15.50	118	58	16	48	159.06	155
16.00	118	58	16	48	153.66	160
16.50	126	60	20	50	238.22	165
17.00	126	60	20	50	238.22	170
17.50	128	62	20	50	238.22	175
18.00	128	62	20	50	238.22	180
18.50	130	64	20	50	238.22	185
19.00	130	64	20	50	238.22	190
19.50	132	66	20	50	238.22	195
20.00	132	66	20	50	211.89	200

P	●
M	●
K	●
N	○
S	○
H	
O	○

→ v_c Page 44

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

≤ 3xD



	UNI	UNI	N	VA	WNX	WT	WT
	TiN	TiN	vap.			vap.	TiN
							
	SIG 130°	SIG 118°	SIG 118°	SIG 130°	SIG 130°	SIG 130°	SIG 130°
	HSS-E-PM	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E
	10 113 ...	**10 107 ...**	**10 105 ...**	**10 130 ...**	**10 106 ...**	**10 109 ...**	**10 110 ...**

DC h8 mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
0.40		19	2.5					5.90	004 [1]					10.26	00400 [1]		
0.50		20	3.0					4.79	005 [1]					7.41	00500 [1]		
0.55		21	3.5											17.48	00550 [1]		
0.60		21	3.5					5.72	006 [1]					9.12	00600 [1]		
0.65		22	4.0											9.66	00650 [1]		
0.70		23	4.5					5.36	007 [1]					8.36	00700 [1]		
0.75		23	4.5											8.77	00750 [1]		
0.80		24	5.0					4.26	008 [1]					7.24	00800 [1]		
0.85		24	5.0											8.13	00850 [1]		
0.90		25	5.5					4.26	009 [1]					7.24	00900 [1]		
0.95		25	5.5											8.13	00950 [1]		
1.00		26	6.0	10.06	010 [2]	6.44	010 [2]	2.43	010 [1]	6.83	010	3.65	010	5.16	01000 [1]	6.66	010
1.05		26	6.0											6.85	01050 [1]		
1.10		28	7.0	10.06	011 [2]	6.44	011 [2]	2.58	011 [1]	6.65	011	3.98	011	4.98	01100 [1]	7.02	011
1.15		28	7.0											5.52	01150 [1]		
1.20		30	8.0	10.30	012 [2]	6.09	012 [2]	2.58	012 [1]	6.27	012	3.98	012	4.79	01200 [1]	6.66	012
1.25		30	8.0											5.52	01250 [1]		
1.30		30	8.0	10.77	013 [2]	6.44	013 [2]	2.58	013 [1]	6.65	013	3.89	013	4.98	01300 [1]	7.02	013
1.35		32	9.0											5.52	01350 [1]		
1.40		32	9.0	9.92	014 [2]	6.27	014 [2]	2.58	014 [1]	6.65	014	3.89	014	4.98	01400 [1]	7.02	014
1.45		32	9.0											5.52	01450 [1]		
1.50		32	9.0	9.33	015 [2]	5.84	015 [2]	2.22	015 [1]	5.90	015	3.65	015	4.64	01500 [1]	6.66	015
1.55		34	10.0											7.24	01550 [1]		
1.60		34	10.0	9.79	016 [2]	5.84	016 [2]	2.43	016 [1]	5.90	016	3.89	016	4.43	01600 [1]	6.66	016
1.65		34	10.0											5.88	01650 [1]		
1.70		34	10.0	9.92	017 [2]	5.52	017 [2]	2.43	017 [1]	5.72	017	3.89	017	4.43	01700 [1]	6.27	017
1.75		36	11.0											5.36	01750 [1]		
1.80		36	11.0	9.79	018 [2]	5.84	018 [2]	2.58	018 [1]	5.90	018	3.89	018	4.64	01800 [1]	6.66	018
1.83		36	11.0											6.85	01830 [1]		
1.85		36	11.0											5.13	01850 [1]		
1.90		36	11.0	9.79	019 [2]	5.84	019 [2]	2.43	019 [1]	5.90	019	3.89	019	4.64	01900 [1]	6.66	019
1.95		38	12.0											7.78	01950 [1]		
2.00		38	12.0	8.21	020 [2]	5.13	020 [2]	1.69	020 [1]	5.16	020	3.25	020	3.89	02000 [1]	5.84	020
2.05		38	12.0											7.24	02050 [1]		
2.10		38	12.0	10.06	021 [2]	5.52	021 [2]	2.22	021 [1]	5.72	021	3.65	021	4.43	02100 [1]	6.27	021
2.15		40	13.0											6.66	02150 [1]		
2.20		40	13.0	10.06	022 [2]	6.09	022 [2]	2.22	022 [1]	6.27	022	3.65	022	4.98	02200 [1]	6.66	022
2.25		40	13.0											5.36	02250 [1]		
2.30		40	13.0	8.47	023 [2]	5.90	023 [2]	2.43	023 [1]	6.27	023	3.89	023	4.79	02300 [1]	6.66	023
2.35		40	13.0											7.41	02350 [1]		
2.38	3/32	43	14.0	9.28	238 [2]	5.90	238 [2]										
2.40		43	14.0	10.09	024 [2]	6.09	024 [2]	2.43	024	6.44	024	3.89	024	4.95	02400	7.02	024
2.45		43	14.0											5.88	02450		
2.50		43	14.0	8.82	025 [2]	5.52	025 [2]	1.84	025	5.54	025	3.65	025	4.43	02500	6.09	025
2.55		43	14.0											7.41	02550		
2.60		43	14.0	10.44	026 [2]	6.09	026 [2]	2.43	026	6.44	026	3.89	026	4.95	02600	7.02	026
2.65		43	14.0											7.41	02650		
2.70		46	16.0	11.05	027 [2]	6.44	027 [2]	2.43	027	6.65	027	3.89	027	5.13	02700	7.41	027

P	●	●	○	○	●	●	●
M		●		●		●	●
K	●	●	●		●	●	●
N	○	○	○	●	○	○	○
S	○	○		○	○	○	●
H	○				○	○	○
O	○	○	○		○		

1) uncoated
2) self-centering

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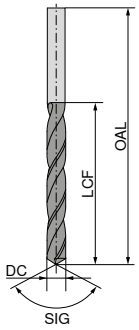
Continued on next page

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

≤ 3xD



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

SIG 130° HSS-E-PM	SIG 118° HSS-E	SIG 118° HSS	SIG 130° HSS-E	SIG 130° HSS-E	SIG 130° HSS-E	SIG 130° HSS-E
10 113 ...	**10 107 ...**	**10 105 ...**	**10 130 ...**	**10 106 ...**	**10 109 ...**	**10 110 ...**

DC $_{h8}$ mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
2.75		46	16.0											7.41	02750		
2.78	7/64	46	16.0	10.73	278 [2]	6.44	278 [2]										
2.80		46	16.0	10.30	028 [2]	6.44	028 [2]	2.43	028	6.65	028	3.98	028	5.13	02800	7.41	028
2.85		46	16.0											7.41	02850		
2.90		46	16.0	10.94	029 [2]	6.44	029 [2]	2.43	029	6.65	029	4.37	029	5.13	02900	7.41	029
2.95		46	16.0											5.36	02950		
3.00		46	16.0	9.28	030 [2]	5.84	030 [2]	1.84	030	5.90	030	3.89	030	4.64	03000	6.27	030
3.05		49	18.0											5.54	03050		
3.10		49	18.0	9.92	031 [2]	6.27	031 [2]	2.43	031	6.65	031	4.54	031	5.13	03100	7.24	031
3.15		49	18.0											8.13	03150		
3.17	1/8	49	18.0	9.79	317 [2]	6.09	317 [2]										
3.20		49	18.0	9.33	032 [2]	5.90	032 [2]	2.22	032	6.44	032	3.89	032	4.95	03200	6.85	032
3.25		49	18.0											5.84	03250		
3.30		49	18.0	9.33	033 [2]	6.44	033 [2]	2.43	033	6.83	033	3.98	033	5.16	03300	7.41	033
3.35		49	18.0											7.41	03350		
3.40		52	20.0	10.77	034 [2]	6.66	034 [2]	2.80	034	6.83	034	4.77	034	5.16	03400	7.41	034
3.45		52	20.0											5.84	03450		
3.50		52	20.0	9.33	035 [2]	6.44	035 [2]	2.22	035	6.83	035	4.54	035	5.16	03500	6.66	035
3.55		52	20.0											5.88	03550		
3.57	9/64	52	20.0	10.59	357 [2]	6.66	357 [2]										
3.60		52	20.0	12.41	036 [2]	6.66	036 [2]	2.80	036	6.83	036	4.77	036	5.16	03600	7.41	036
3.70		52	20.0	10.73	037 [2]	7.01	037 [2]	2.80	037	7.37	037	4.77	037	5.54	03700	8.02	037
3.75		52	20.0											5.88	03750		
3.80		55	22.0	11.44	038 [2]	6.85	038 [2]	2.80	038	7.20	038	4.95	038	5.36	03800	7.41	038
3.85		55	22.0											9.12	03850		
3.90		55	22.0	12.97	039 [2]	7.75	039 [2]	2.80	039			4.95	039	5.54	03900	8.02	039
3.95		55	22.0											9.12	03950		
3.97	5/32	55	22.0	11.69	397 [2]	7.37	397 [2]										
4.00		55	22.0	10.59	040 [2]	6.85	040 [2]	2.22	040	7.20	040	4.95	040	5.52	04000	6.85	040
4.05		55	22.0											6.44	04050		
4.10		55	22.0	12.15	041 [2]	7.24	041 [2]	2.58	041	7.57	041	5.13	041	5.84	04100	7.41	041
4.15		55	22.0											9.12	04150		
4.20		55	22.0	10.59	042 [2]	7.01	042 [2]	2.58	042	7.37	042	4.54	042	5.54	04200	7.41	042
4.25		55	22.0											9.89	04250		
4.30		58	24.0	12.06	043 [2]	7.41	043 [2]	3.71	043	7.75	043	5.13	043	6.09	04300	8.36	043
4.35		58	24.0											9.89	04350		
4.37	11/64	58	24.0	16.21	437 [2]	9.89	437 [2]										
4.40		58	24.0	12.97	044 [2]	8.36	044 [2]	3.71	044			5.13	044	6.09	04400	8.56	044
4.45		58	24.0											10.08	04450		
4.50		58	24.0	12.06	045 [2]	7.41	045 [2]	2.58	045	7.75	045	5.13	045	5.88	04500	7.02	045
4.55		58	24.0											9.89	04550		
4.60		58	24.0	12.15	046 [2]	8.13	046 [2]	3.89	046	8.48	046	5.31	046	6.44	04600	9.30	046
4.65		58	24.0											9.12	04650	9.66	465
4.70		58	24.0	13.51	047 [2]	8.56	047 [2]	3.89	047	8.85	047	5.52	047	6.66	04700	9.66	047
4.75		58	24.0											9.12	04750		
4.76	3/16	62	26.0	13.51	476 [2]	8.56	476 [2]										
4.80		62	26.0	13.77	048 [2]	8.68	048 [2]	3.89	048	9.22	048	5.84	048	7.02	04800	9.66	048
4.85		62	26.0											8.13	04850		

P	●	●	○	○	●	●	●
M		●		●		●	●
K	●	●	●		●	●	●
N	○	○	○	●	○	○	○
S	○	○		○	○	○	●
H	○				○	○	○
O	○	○	○		○		

1) uncoated
2) self-centering

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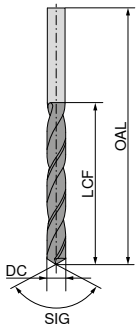
High-performance twist drills similar to DIN 1897, extra-short

≤ 3xD



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

SIG 130° HSS-E-PM	SIG 118° HSS-E	SIG 118° HSS	SIG 130° HSS-E	SIG 130° HSS-E	SIG 130° HSS-E	SIG 130° HSS-E
10 113 ...	**10 107 ...**	**10 105 ...**	**10 130 ...**	**10 106 ...**	**10 109 ...**	**10 110 ...**

DC $_{h8}$ mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
4.90		62	26.0	13.87	**049** [2]	9.60	**049** [2]	3.89	**049**	9.94	**049**	6.09	**049**	7.75	**04900**	9.66	**049**
4.95		62	26.0											11.62	**04950**		
5.00		62	26.0	11.69	**050** [2]	7.57	**050** [2]	2.80	**050**	8.31	**050**	5.52	**050**	6.27	**05000**	7.78	**050**
5.05		62	26.0											13.49	**05050**		
5.10		62	26.0	12.86	**051** [2]	10.13	**051** [2]	3.89	**051**	10.90	**051**						
5.16	13/64	62	26.0	15.33	**516** [2]	13.11	**516** [2]										
5.20		62	26.0	13.87	**052** [2]	12.55	**052** [2]	3.89	**052**	13.28	**052**	6.27	**052**	9.89	**05200**	9.66	**052**
5.25		62	26.0											11.56	**05250**		
5.30		62	26.0	15.70	**053** [2]	13.28	**053** [2]	3.89	**053**	14.21	**053**	6.44	**053**	11.05	**05300**	10.08	**053**
5.40		66	28.0	15.39	**054** [2]	13.11	**054** [2]	4.43	**054**								
5.50		66	28.0	13.15	**055** [2]	9.79	**055** [2]	3.34	**055**	10.50	**055**	6.66	**055**	8.02	**05500**	8.36	**055**
5.55		66	28.0											21.04	**05550**	10.65	**555**
5.56	7/32	66	28.0	14.41	**556** [2]	10.90	**556** [2]										
5.60		66	28.0	15.70	**056** [2]	16.03	**056** [2]	4.43	**056**	16.96	**056**	7.02	**056**	13.12	**05600**	10.65	**056**
5.70		66	28.0	16.83	**057** [2]	16.24	**057** [2]	4.43	**057**	17.35	**057**	7.24	**057**	13.55	**05700**	10.65	**057**
5.75		66	28.0											15.55	**05750**		
5.80		66	28.0	16.08	**058** [2]	17.15	**058** [2]	4.43	**058**	18.06	**058**	7.24	**058**	13.49	**05800**	10.65	**058**
5.85		66	28.0											22.64	**05850**		
5.90		66	28.0	17.75	**059** [2]	17.35	**059** [2]	4.43	**059**	18.25	**059**	7.41	**059**	14.04	**05900**	11.01	**059**
5.95	15/64	66	28.0	26.89	**595** [2]	19.02	**595** [2]							14.27	**05950**		
6.00		66	28.0	14.17	**060** [2]	9.79	**060** [2]	3.34	**060**	10.50	**060**	6.66	**060**	8.02	**06000**	9.12	**060**
6.05		70	31.0											22.64	**06050**		
6.10		70	31.0	16.64	**061** [2]	18.45	**061** [2]	4.79	**061**								
6.20		70	31.0	16.64	**062** [2]	18.80	**062** [2]	4.79	**062**								
6.30		70	31.0	19.06	**063** [2]	20.47	**063** [2]	4.79	**063**								
6.35	1/4	70	31.0	17.50	**635** [2]	20.29	**635** [2]										
6.40		70	31.0	17.65	**064** [2]	20.82	**064** [2]	4.98	**064**							14.91	**064**
6.50		70	31.0	16.64	**065** [2]	11.43	**065** [2]	3.89	**065**	12.18	**065**	7.78	**065**	9.30	**06500**	10.65	**065**
6.55		70	31.0											22.98	**06550**		
6.60		70	31.0	18.34	**066** [2]	21.56	**066** [2]	4.98	**066**	22.88	**066**						
6.65		70	31.0											24.49	**06650**		
6.70		70	31.0	20.22	**067** [2]	21.96	**067** [2]	5.36	**067**	23.60	**067**						
6.75		74	34.0	24.87	**675** [2]	16.80	**675** [2]										
6.80		74	34.0	20.26	**068** [2]	22.49	**068** [2]	6.09	**068**	24.16	**068**	9.66	**068**	18.79	**06800**	15.55	**068**
6.90		74	34.0	20.01	**069** [2]	22.67	**069** [2]	6.65	**069**	24.35	**069**						
7.00		74	34.0	18.56	**070** [2]	13.11	**070** [2]	4.98	**070**	14.01	**070**	8.56	**070**	10.45	**07000**	12.89	**070**
7.10		74	34.0	22.48	**071** [2]	23.60	**071** [2]	6.83	**071**								
7.14	9/32	74	34.0	29.84	**714** [2]	24.16	**714** [2]										
7.20		74	34.0	23.14	**072** [2]	23.81	**072** [2]	6.83	**072**	25.62	**072**	12.36	**072**	20.14	**07200**	17.48	**072**
7.25		74	34.0											20.49	**07250**		
7.30		74	34.0	24.87	**073** [2]	23.96	**073** [2]	7.20	**073**								
7.40		74	34.0	23.29	**074** [2]	23.81	**074** [2]	7.57	**074**			14.04	**074**	20.73	**07400**	17.67	**074**
7.50		74	34.0	19.35	**075** [2]	14.94	**075** [2]	5.36	**075**	16.03	**075**	9.30	**075**	12.36	**07500**	13.49	**075**
7.60		79	37.0	30.21	**076** [2]	22.30	**076** [2]	8.48	**076**			13.55	**076**	22.08	**07600**	19.18	**076**
7.70		79	37.0	32.74	**077** [2]	27.66	**077** [2]	8.48	**077**	29.31	**077**	13.70	**077**	22.03	**07700**	19.18	**077**
7.75		79	37.0											27.71	**07750**		
7.80		79	37.0	24.96	**078** [2]	26.72	**078** [2]	8.48	**078**			13.70	**078**	23.24	**07800**	19.18	**078**
7.90		79	37.0	34.94	**079** [2]	29.31	**079** [2]	8.68	**079**	30.98	**079**	13.12	**079**	23.15	**07900**	19.18	**079**

P	●	●	○	○	●	●	●
M		●		●		●	●
K	●	●	●		●	●	●
N	○	○	○	●	○	○	○
S	○	○		○	○	○	●
H	○				○	○	○
O	○	○	○		○		

1) uncoated
2) self-centering

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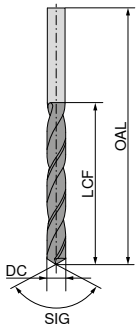
High-performance twist drills similar to DIN 1897, extra-short

≤ 3xD



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

SIG 130° HSS-E-PM	SIG 118° HSS-E	SIG 118° HSS	SIG 130° HSS-E	SIG 130° HSS-E	SIG 130° HSS-E	SIG 130° HSS-E
10 113 ...	**10 107 ...**	**10 105 ...**	**10 130 ...**	**10 106 ...**	**10 109 ...**	**10 110 ...**

DC $_{h8}$ mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
7.94	5/16	79	37.0	23.95	**794** [2]	15.12	**794** [2]								
8.00		79	37.0	23.14	**080** [2]	14.43	**080** [2]	5.54	**080**	14.77	**080**	9.66	**080**	11.62	**08000**	13.88	**080**
8.05		79	37.0											37.24	**08050**		
8.10		79	37.0	29.54	**081** [2]	30.07	**081** [2]	9.22	**081**								
8.15		79	37.0											37.24	**08150**		
8.20		79	37.0	30.76	**082** [2]	31.37	**082** [2]	9.60	**082**							19.18	**082**
8.30		79	37.0	32.26	**083** [2]	33.73	**083** [2]	9.94	**083**								
8.40		79	37.0	30.94	**084** [2]	34.66	**084** [2]	10.13	**084**	36.86	**084**	15.39	**084**	28.31	**08400**	20.14	**084**
8.50		79	37.0	26.89	**085** [2]	17.15	**085** [2]	7.57	**085**	18.06	**085**	11.62	**085**	13.70	**08500**	16.69	**085**
8.55		84	40.0											42.16	**08550**		
8.60		84	40.0			20.60	**086** [2]	10.13	**086**	37.97	**086**						
8.70		84	40.0			23.71	**087** [2]	10.34	**087**	39.06	**087**					20.72	**087**
8.73	11/32	84	40.0	42.52	**873** [2]	27.16	**873** [2]										
8.80		84	40.0	33.74	**088** [2]	22.30	**088** [2]	10.50	**088**			18.59	**088**	31.37	**08800**	20.72	**088**
8.90		84	40.0			29.33	**089** [2]	10.90	**089**								
9.00		84	40.0	27.28	**090** [2]	18.06	**090** [2]	7.20	**090**	19.34	**090**	11.18	**090**	14.43	**09000**	16.93	**090**
9.10		84	40.0			24.70	**091** [2]	12.18	**091**								
9.20		84	40.0			24.88	**092** [2]	13.28	**092**	44.43	**092**	20.49	**092**	34.00	**09200**	27.12	**092**
9.30		84	40.0	30.94	**093** [2]	43.87	**093** [2]	13.48	**093**	46.85	**093**	14.43	**093**	36.21	**09300**	27.12	**093**
9.40		84	40.0			28.85	**094** [2]	13.84	**094**			14.43	**094**	35.87	**09400**	27.12	**094**
9.50		84	40.0	30.21	**095** [2]	19.34	**095** [2]	11.43	**095**	20.82	**095**	13.70	**095**	15.78	**09500**	22.03	**095**
9.60		89	43.0			30.17	**096** [2]	14.56	**096**			22.08	**096**	35.87	**09600**	27.54	**096**
9.65		89	43.0											42.18	**09650**		
9.70		89	43.0			29.33	**097** [2]	14.77	**097**			22.08	**097**	36.64	**09700**	27.54	**097**
9.75		89	43.0											51.79	**09750**		
9.80		89	43.0	35.99	**098** [2]	45.17	**098** [2]	15.48	**098**	48.30	**098**	22.03	**098**	37.24	**09800**	29.46	**098**
9.90		89	43.0			31.34	**099** [2]	15.48	**099**			22.58	**099**	38.33	**09900**	29.46	**099**
10.00		89	43.0	29.75	**100** [2]	22.49	**100** [2]	8.68	**100**	24.16	**100**	12.36	**100**	18.79	**10000**	20.72	**100**
10.10		89	43.0			30.17	**101** [2]	17.15	**101**								
10.20		89	43.0	37.65	**102** [2]	35.75	**102** [2]	14.77	**102**	37.97	**102**	22.08	**102**	28.87	**10200**	29.25	**102**
10.30		89	43.0			28.02	**103** [2]	18.25	**103**					47.22	**10300**		
10.40		89	43.0			32.80	**104** [2]	19.02	**104**								
10.50		89	43.0	35.70	**105** [2]	38.72	**105** [2]	15.48	**105**	41.28	**105**	18.05	**105**	32.32	**10500**	27.87	**105**
10.60		95	47.0					23.81	**106**								
10.70		95	47.0					23.81	**107**					56.32	**10700**		
10.80		95	47.0					24.35	**108**							62.14	**108**
10.90		95	47.0					24.35	**109**								
11.00		95	47.0	39.68	**110** [2]	41.28	**110** [2]	15.48	**110**	43.87	**110**	21.28	**110**	34.00	**11000**	27.87	**110**
11.10		95	47.0					24.35	**111**								
11.11	7/16	95	47.0	46.59	**111** [2]	48.66	**111** [2]										
11.20		95	47.0					25.62	**112**					66.37	**11200**		
11.30		95	47.0					26.00	**113**					68.73	**11300**		
11.40		95	47.0					26.00	**114**					69.30	**11400**		
11.50		95	47.0	45.73	**115** [2]	46.85	**115** [2]	16.43	**115**	49.79	**115**	27.87	**115**	38.92	**11500**	29.06	**115**
11.60		95	47.0					26.00	**116**								
11.70		95	47.0					26.00	**117**	93.62	**117**			69.30	**11700**		
11.75		95	47.0											76.84	**11750**		
11.80		95	47.0					26.36	**118**			35.05	**118**	69.30	**11800**	34.84	**118**

P	●	●	○	○	●	●	●
M		●		●		●	●
K	●	●	●		●	●	●
N	○	○	○	●	○	○	○
S	○	○		○	○	○	●
H	○				○	○	○
O	○	○	○		○		

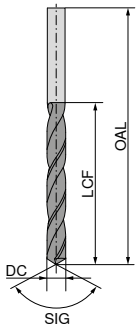
1) uncoated
2) self-centering

→ v_c Page 44+45

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
							
	SIG 130°	SIG 118°	SIG 118°	SIG 130°	SIG 130°	SIG 130°	SIG 130°
	HSS-E-PM	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E
	10 113 ...	**10 107 ...**	**10 105 ...**	**10 130 ...**	**10 106 ...**	**10 109 ...**	**10 110 ...**

DC $_{h8}$ mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
11.90		102	51.0					26.36	119						
12.00		102	51.0	44.75	120 2)	55.10	120 2)	19.73	120	58.64	120	27.87	120	45.86	12000	33.24	120
12.10		102	51.0					27.85	121								
12.20		102	51.0					27.85	122								
12.30		102	51.0	75.83	123 2)	51.25	123 2)	28.20	123			35.05	123	54.20	12300	51.09	123
12.40		102	51.0					28.20	124								
12.50		102	51.0	49.10	125 2)	55.49	125 2)	20.82	125			28.45	125	45.97	12500	34.84	125
12.60		102	51.0					28.76	126								
12.70		102	51.0	62.67	127 2)	42.34	127 2)	27.47	127					47.27	12700		
12.80		102	51.0					29.85	128			42.79	128	71.04	12800	64.38	128
12.90		102	51.0					30.80	129								
13.00		102	51.0	49.10	130 2)	55.49	130 2)	21.23	130			31.75	130	48.57	13000	35.12	130
13.20		102	51.0					31.71	132								
13.30		107	54.0					32.62	133								
13.50		107	54.0	52.15	135 2)	55.49	135 2)	24.35	135			39.31	135	53.61	13500	38.38	135
13.80		107	54.0					33.38	138			51.10	138				
14.00		107	54.0	65.10	140 2)	58.96	140 2)	24.69	140			35.87	140	53.61	14000	40.26	140
14.50		111	56.0					27.47	145			46.44	145	67.35	14500	41.24	145
14.75		111	56.0					42.06	147								
15.00		111	56.0					26.72	150			43.17	150	64.05	15000	42.61	150
15.25		115	58.0					44.43	152								
15.50		115	58.0					29.50	155			65.43	155	80.12	15500	55.56	155
15.75		115	58.0													58.66	157
16.00		115	58.0					29.85	160			51.86	160	65.70	16000	54.79	160
16.50		119	60.0					35.21	165			52.23	165	107.99	16500	80.67	165
17.00		119	60.0					36.15	170			53.80	170	92.09	17000	79.57	170
17.50		123	62.0					37.81	175			54.97	175	109.16	17500	74.42	175
17.75		123	62.0													90.18	177
18.00		123	62.0					38.17	180			54.31	180	102.18	18000	87.07	180
18.50		127	64.0					41.66	185					130.45	18500	97.55	185
19.00		127	64.0					43.87	190			56.18	190	109.16	19000	95.57	190
19.50		131	66.0					46.44	195					127.14	19500	107.22	195
20.00		131	66.0					46.44	200			59.23	200	109.17	20000	102.56	200
20.50		136	68.0											154.05	20500		
21.00		136	68.0											147.85	21000		
21.50		141	70.0											158.50	21500		
22.00		141	70.0											160.05	22000		
23.00		146	72.0											171.82	23000		
24.00		151	75.0											189.08	24000		
25.00		151	75.0											216.37	25000		

P	●	●	○	○	●	●	●
M		●		●		●	●
K	●	●	●		●	●	●
N	○	○	○	●	○	○	○
S	○	○		○	○	○	●
H	○				○	○	○
O	○	○	○		○		

1) uncoated
2) self-centering

→ v_c Page 44+45

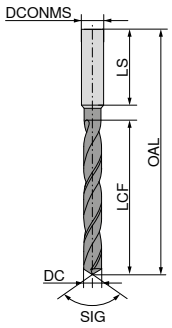
High-performance twist drill similar to DIN 338, short

- With shank to DIN 1835 A
- Special point thinning
- 4 facet
- Highest Performance
- Very good centering behaviour

≤ 5xD

VX

TiN



SIG 118°
HSS-E

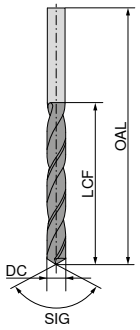
DC h8 mm	OAL mm	LCF mm	DCONMS h6 mm	LS mm	10 124 ... £ T2	
2.00	56	24	3	28	16.27	020
2.10	56	24	3	28	18.62	021
2.20	59	27	3	28	18.62	022
2.30	59	27	3	28	18.62	023
2.40	62	30	3	28	18.62	024
2.50	62	30	3	28	18.62	025
2.60	62	30	3	28	18.62	026
2.70	65	33	3	28	18.62	027
2.80	65	33	3	28	18.62	028
2.90	65	33	3	28	18.62	029
3.00	65	33	3	28	17.71	030
3.10	68	36	4	28	20.29	031
3.20	68	36	4	28	20.29	032
3.30	68	36	4	28	20.29	033
3.40	71	39	4	28	20.29	034
3.50	71	39	4	28	20.29	035
3.60	71	39	4	28	22.58	036
3.70	71	39	4	28	22.58	037
3.80	75	43	4	28	22.58	038
3.90	75	43	4	28	22.58	039
4.00	75	43	4	28	22.58	040
4.10	87	43	6	36	26.17	041
4.20	87	43	6	36	27.66	042
4.30	91	47	6	36	26.17	043
4.40	91	47	6	36	26.17	044
4.50	91	47	6	36	26.17	045
4.60	91	47	6	36	29.69	046
4.65	91	47	6	36	29.69	465
4.70	91	47	6	36	29.69	047
4.80	96	52	6	36	29.69	048
4.90	96	52	6	36	29.69	049
5.00	96	52	6	36	32.28	050
5.10	96	52	6	36	32.28	051
5.20	96	52	6	36	32.28	052
5.30	96	52	6	36	35.61	053
5.40	101	57	6	36	35.61	054
5.50	101	57	6	36	32.28	055
5.55	101	57	6	36	37.04	555
5.60	101	57	6	36	37.04	056
5.70	101	57	6	36	37.04	057
5.80	101	57	6	36	37.04	058
5.90	101	57	6	36	37.04	059
6.00	101	57	6	36	35.21	060
6.10	107	63	8	36	43.49	061
6.20	107	63	8	36	43.49	062
6.30	107	63	8	36	43.49	063
6.40	107	63	8	36	43.49	064
6.50	107	63	8	36	43.49	065
6.60	107	63	8	36	46.65	066
6.70	107	63	8	36	46.65	067
6.80	113	69	8	36	46.65	068
6.90	113	69	8	36	46.65	069
7.00	113	69	8	36	46.65	070
7.10	113	69	8	36	48.56	071
7.20	113	69	8	36	48.56	072
7.30	113	69	8	36	48.56	073
7.40	113	69	8	36	48.56	074
7.50	113	69	8	36	48.56	075
7.55	119	75	8	36	48.50	755
7.60	119	75	8	36	48.50	076
7.70	119	75	8	36	48.50	077
7.80	119	75	8	36	48.50	078
7.90	119	75	8	36	48.50	079
8.00	119	75	8	36	48.50	080
8.10	125	75	10	40	54.31	081
8.20	125	75	10	40	54.31	082
8.30	125	75	10	40	54.31	083
8.40	125	75	10	40	54.31	084
8.50	125	75	10	40	54.77	085
8.60	131	81	10	40	50.53	086
8.70	131	81	10	40	50.53	087
8.80	131	81	10	40	50.53	088
8.90	131	81	10	40	50.53	089
9.00	131	81	10	40	50.53	090
9.10	131	81	10	40	54.31	091
9.20	131	81	10	40	54.31	092
9.30	131	81	10	40	54.31	093
9.40	131	81	10	40	54.31	094
9.50	131	81	10	40	54.31	095
9.55	137	87	10	40	59.23	955
9.60	137	87	10	40	59.23	096
9.70	137	87	10	40	59.23	097
9.80	137	87	10	40	59.23	098
9.90	137	87	10	40	59.23	099
10.00	137	87	10	40	59.23	100
10.10	144	87	12	45	75.10	101
10.20	144	87	12	45	75.10	102
10.30	144	87	12	45	75.10	103
10.40	144	87	12	45	75.10	104
10.50	144	87	12	45	75.10	105
10.70	151	94	12	45	82.47	107
10.80	151	94	12	45	82.47	108
11.00	151	94	12	45	69.51	110
11.20	151	94	12	45	74.42	112
11.30	151	94	12	45	74.42	113
11.40	151	94	12	45	74.42	114
11.50	151	94	12	45	74.42	115
11.60	151	94	12	45	82.05	116
11.70	151	94	12	45	82.05	117
11.80	151	94	12	45	82.05	118
11.90	158	101	12	45	82.05	119
12.00	158	101	12	45	82.05	120
12.20	161	101	16	48	94.27	122
12.30	161	101	16	48	94.27	123
12.50	161	101	16	48	94.27	125
12.70	161	101	16	48	99.29	127
12.80	161	101	16	48	99.29	128
13.00	161	101	16	48	109.52	130
13.50	166	106	16	48	142.02	135
14.00	166	106	16	48	142.02	140
14.50	169	109	16	48	181.71	145
15.00	169	109	16	48	170.69	150
15.50	172	112	16	48	184.99	155
16.00	172	112	16	48	178.61	160
16.50	181	115	20	50	276.90	165
17.00	181	115	20	50	276.90	170
17.50	184	118	20	50	276.90	175
18.00	184	118	20	50	276.90	180
18.50	188	122	20	50	276.90	185
19.00	188	122	20	50	276.90	190
19.50	191	125	20	50	276.90	195
20.00	191	125	20	50	246.16	200

P	●
M	●
K	●
N	○
S	○
H	
O	○

→ v_c Page 46

Twist drill to DIN 338, short

≤ 5xD



	UNI	UNI	N	VA	W	WTL	WTL
	TiN	TiN	vap.			F.-nit	TiN
							
	SIG 130° HSS-E-PM	SIG 118° HSS-E	SIG 118° HSS	SIG 130° HSS-E	SIG 130° HSS	SIG 130° HSS-E	SIG 130° HSS-E
	10 173 ...	**10 171 ...**	**10 152 ...**	**10 175 ...**	**10 161 ...**	**10 168 ...**	**10 170 ...**

DC h8 mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
0.20		19	2.5					5.16	00200 [1]			11.05	00200				
0.25		19	3.0					4.98	00250 [1]			23.60	00250				
0.30		19	3.0					3.49	00300 [1]			12.36	00300				
0.35		19	4.0					3.49	00350 [1]			7.78	00350				
0.40		20	5.0					2.96	00400 [1]			6.44	00400				
0.45		20	5.0					3.16	00450 [1]			6.85	00450				
0.50		22	6.0					2.58	00500 [1]			4.95	00500				
0.55		24	7.0					3.71	00550 [1]			12.00	00550				
0.60		24	7.0					2.43	00600 [1]			5.31	00600				
0.65		26	8.0					3.49	00650 [1]			8.36	00650				
0.70		28	9.0					2.22	00700 [1]			4.77	00700				
0.75		28	9.0					2.58	00750 [1]			5.13	00750				
0.80		30	10.0					2.22	00800 [1]			4.37	00800				
0.85		30	10.0					2.43	00850 [1]			4.95	00850				
0.90		32	11.0			5.54	009 [2]	2.22	00900 [1]			3.98	00900				
0.95		32	11.0					2.43	00950 [1]			4.95	00950				
1.00		34	12.0	7.96	010 [2]	5.54	010 [2]	2.05	01000 [1]	5.31	010	4.37	01000	4.54	010 [1]	9.66	010
1.05		34	12.0					2.22	01050 [1]			4.77	01050				
1.10		36	14.0	8.62	011 [2]	5.54	011 [2]	2.05	01100 [1]	5.31	011	3.89	01100	4.95	011 [1]	10.45	011
1.15		36	14.0					2.22	01150 [1]			4.37	01150				
1.20		38	16.0	8.47	012 [2]	6.27	012 [2]	2.05	01200 [1]	5.88	012	3.89	01200	4.95	012 [1]	10.45	012
1.25		38	16.0			5.90	125 [2]	2.22	01250 [1]			4.37	01250				
1.30		38	16.0	8.62	013 [2]	5.90	013 [2]	2.05	01300 [1]	5.84	013	3.89	01300	4.77	013 [1]	10.26	013
1.35		40	18.0					2.22	01350 [1]			4.37	01350				
1.40		40	18.0	8.72	014 [2]	5.54	014 [2]	2.05	01400 [1]	5.31	014	3.89	01400	4.95	014 [1]	10.45	014
1.45		40	18.0			5.54	145 [2]	2.05	01450 [1]			4.37	01450			13.65	901
1.50		40	18.0	8.21	015 [2]	5.16	015 [2]	1.84	01500 [1]	4.95	015	3.89	01500	4.54	015 [1]	9.66	015
1.55		43	20.0			5.54	155 [2]	2.05	01550 [1]			4.37	01550			16.03	902
1.60		43	20.0	8.21	016 [2]	5.54	016 [2]	1.69	01600 [1]	5.31	016	3.40	01600	4.54	016 [1]	9.66	016
1.65		43	20.0			5.72	165 [2]	2.05	01650 [1]			4.37	01650			16.27	903
1.70		43	20.0	8.82	017 [2]	5.72	017 [2]	1.69	01700 [1]	5.52	017	3.65	01700	4.54	017 [1]	9.66	017
1.75		46	22.0					2.05	01750 [1]			4.37	01750				
1.80		46	22.0	8.72	018 [2]	5.54	018 [2]	1.69	01800 [1]	5.31	018	3.65	01800	4.54	018 [1]	9.66	018
1.85		46	22.0					1.84	01850 [1]			4.37	01850			11.18	904
1.90		46	22.0	8.72	019 [2]	5.72	019 [2]	1.69	01900 [1]	5.52	019	3.65	01900	4.54	019 [1]	9.66	019
1.95		49	24.0					1.84	01950 [1]			3.98	01950				
2.00		49	24.0	8.47	020 [2]	5.13	020 [2]	1.29	02000 [1]	4.54	020	2.86	02000	3.98	020 [1]	8.56	020
2.05		49	24.0					1.84	02050 [1]			3.89	02050			11.97	905
2.10		49	24.0	8.82	021 [2]	6.27	021 [2]	1.69	02100 [1]	5.88	021	3.40	02100	4.54	021 [1]	9.12	021
2.15		53	27.0					1.84	02150 [1]			3.89	02150				
2.20		53	27.0	9.28	022 [2]	6.27	022 [2]	1.69	02200 [1]	5.88	022	3.40	02200	4.54	022 [1]	9.12	022
2.25		53	27.0					1.84	02250 [1]			3.89	02250				
2.30		53	27.0	8.97	023 [2]	6.27	023 [2]	1.69	02300 [1]	5.88	023	3.40	02300	4.54	023 [1]	9.12	023
2.35		53	27.0					2.43	02350 [1]			4.54	02350				
2.38	3/32	57	30.0	8.97	238 [2]	6.27	238 [2]										
2.40		57	30.0	8.47	024 [2]	6.27	024 [2]	1.69	02400	5.88	024	3.40	02400	4.54	024	9.12	024

P				●		●		○		○					●		●
M						●				●					○		○
K				●		●		●							●		●
N				○		○		○		●		●			●		○
S				○		○				○					○		○
H				○											○		○
O				○		○		○							○		○

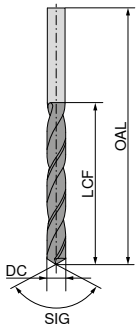
1) uncoated
2) self-centering

→ v_c Page 46+47

Continued on next page

Twist drill to DIN 338, short

≤ 5xD



UNI	UNI	N	VA	W	WTL	WTL
TiN	TiN	vap.			F.-nit	TiN

SIG 130° HSS-E-PM	SIG 118° HSS-E	SIG 118° HSS	SIG 130° HSS-E	SIG 130° HSS	SIG 130° HSS-E	SIG 130° HSS-E
10 173 ...	**10 171 ...**	**10 152 ...**	**10 175 ...**	**10 161 ...**	**10 168 ...**	**10 170 ...**

DC $_{h8}$ mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
2.45		57	30.0					2.22	02450			4.54	02450		
2.50		57	30.0	8.62	025 [2]	5.31	025 [2]	1.69	02500	4.95	025	3.04	02500	3.98	025	8.77	025
2.55		57	30.0			6.27	255 [2]	2.43	02550			5.31	02550				
2.60		57	30.0	8.97	026 [2]	6.27	026 [2]	1.69	02600	6.09	026	3.65	02600	4.54	026	9.12	026
2.65		57	30.0					2.58	02650			5.31	02650				
2.70		61	33.0	9.55	027 [2]	6.27	027 [2]	1.69	02700	6.09	027	3.65	02700	4.77	027	10.08	027
2.75		61	33.0					2.22	02750			5.13	02750				
2.78	7/64	61	33.0	11.64	278 [2]	7.41	278 [2]										
2.80		61	33.0	9.33	028 [2]	6.27	028 [2]	1.69	02800	6.09	028	3.98	02800	4.77	028	10.26	028
2.85		61	33.0					2.43	02850			6.27	02850				
2.90		61	33.0	9.55	029 [2]	6.44	029 [2]	1.69	02900	6.09	029	3.98	02900	4.77	029	10.26	029
2.95		61	33.0					2.22	02950			5.31	02950				
3.00		61	33.0	9.07	030 [2]	5.31	030 [2]	1.50	03000	4.95	030	3.25	03000	4.37	030	9.12	030
3.05		65	36.0					2.05	03050			4.54	03050				
3.10		65	36.0	10.09	031 [2]	6.44	031 [2]	1.84	03100	6.27	031	3.98	03100	4.77	031	10.08	031
3.15		65	36.0					2.05	03150			4.54	03150				
3.17	1/8	65	36.0	10.06	317 [2]	6.09	317 [2]										
3.20		65	36.0	9.92	032 [2]	5.84	032 [2]	1.84	03200	5.31	032	3.65	03200	4.95	032	10.45	032
3.25		65	36.0			6.65	325 [2]	2.05	03250			6.65	03250				
3.30		65	36.0	10.09	033 [2]	5.84	033 [2]	1.84	03300	5.31	033	3.65	03300	4.95	033	10.65	033
3.35		65	36.0					2.22	03350			4.54	03350				
3.40		70	39.0	10.77	034 [2]	6.83	034 [2]	1.84	03400	6.44	034	3.98	03400	5.52	034	11.78	034
3.45		70	39.0					2.22	03450			4.95	03450				
3.50		70	39.0	10.94	035 [2]	5.84	035 [2]	1.69	03500	5.31	035	3.89	03500	4.77	035	10.08	035
3.55		70	39.0					2.22	03550			4.95	03550				
3.57	9/64	70	39.0	10.94	357 [2]	7.01	357 [2]										
3.60		70	39.0	11.05	036 [2]	7.01	036 [2]	2.05	03600	6.85	036	3.98	03600	5.52	036	11.56	036
3.65		70	39.0					2.22	03650			4.77	03650				
3.70		70	39.0	11.05	037 [2]	7.01	037 [2]	2.05	03700	6.85	037	4.37	03700	5.52	037	11.78	037
3.75		70	39.0					2.22	03750			5.13	03750				
3.80		75	43.0	11.69	038 [2]	7.41	038 [2]	2.05	03800	6.85	038	4.54	03800	5.88	038	12.98	038
3.85		75	43.0					2.43	03850			5.13	03850				
3.90		75	43.0	11.97	039 [2]	7.75	039 [2]	2.22	03900	7.02	039	4.54	03900	6.27	039	13.55	039
3.95		75	43.0					2.43	03950			5.13	03950				
3.97	5/32	75	43.0	12.15	397 [2]	8.13	397 [2]										
4.00		75	43.0	11.44	040 [2]	6.09	040 [2]	1.69	04000	5.84	040	3.89	04000	5.13	040	11.05	040
4.05		75	43.0					2.58	04050			6.44	04050				
4.10		75	43.0	11.69	041 [2]	7.37	041 [2]	2.22	04100	7.02	041	4.54	04100	6.27	041	13.55	041
4.15		75	43.0					2.58	04150			6.44	04150				
4.20		75	43.0	11.69	042 [2]	7.37	042 [2]	2.05	04200	7.24	042	3.98	04200	5.84	042	12.55	042
4.25		75	43.0			7.78	425 [2]	2.58	04250			6.44	04250				
4.30		80	47.0	12.46	043 [2]	7.75	043 [2]	2.22	04300	7.24	043	5.52	04300	6.44	043	14.04	043
4.35		80	47.0					3.34	04350			7.78	04350				
4.37	11/64	80	47.0	12.60	437 [2]	8.31	437 [2]										
4.40		80	47.0	12.46	044 [2]	7.78	044 [2]	2.22	04400	7.41	044	5.52	04400	6.44	044	14.04	044
4.45		80	47.0					3.34	04450								

P	●	●	○	○		●	●
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K	●	●	●			●	●
N	○	○	○	●	●	●	○
S	○	○		○		○	○
H	○					○	○
O	○	○	○			○	○

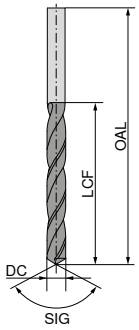
1) uncoated
2) self-centering

→ v_c Page 46+47

Continued on next page

Twist drill to DIN 338, short

≤ 5xD



	UNI	UNI	N	VA	W	WTL	WTL
	TiN	TiN	vap.			F.-nit	TiN
							
	SIG 130°	SIG 118°	SIG 118°	SIG 130°	SIG 130°	SIG 130°	SIG 130°
	HSS-E-PM	HSS-E	HSS	HSS-E	HSS	HSS-E	HSS-E
	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...

DC h8 mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
4.50		80	47.0	12.15	045 2)	7.75	045 2)	2.22	04500	7.24	045	4.95	04500	6.09	045	12.55	045
4.55		80	47.0					3.34	04550			9.66	04550				
4.60		80	47.0	12.86	046 2)	8.31	046 2)	2.22	04600	7.75	046	5.52	04600	6.85	046	14.81	046
4.65		80	47.0			8.48	465 2)	3.34	04650			9.66	04650				
4.70		80	47.0	15.56	047 2)	8.56	047 2)	2.22	04700	7.78	047	5.52	04700	6.85	047	14.81	047
4.75		80	47.0					4.43	04750			7.75	04750				
4.76	3/16	86	52.0	13.15	476 2)	8.48	476 2)										
4.80		86	52.0	13.15	048 2)	8.31	048 2)	2.43	04800	7.78	048	5.52	04800	6.85	048	14.81	048
4.85		86	52.0					5.72	04850			9.66	04850				
4.90		86	52.0	13.37	049 2)	8.48	049 2)	2.43	04900	8.02	049	5.52	04900	7.02	049	15.00	049
4.95		86	52.0			8.48	495 2)	3.71	04950			9.66	04950				
5.00		86	52.0	13.48	050 2)	7.41	050 2)	2.05	05000	6.85	050	5.31	05000	6.27	050	13.49	050
5.05		86	52.0			8.48	505 2)	3.89	05050			11.18	05050				
5.10		86	52.0	13.48	051 2)	8.48	051 2)	4.43	05100	8.02	051	5.84	05100	7.02	051		
5.15		86	52.0					3.89	05150								
5.16	13/64	86	52.0	14.69	516 2)	9.30	516 2)										
5.20		86	52.0	13.87	052 2)	9.12	052 2)	2.58	05200	8.36	052	5.88	05200	7.24	052	16.27	052
5.25		86	52.0					3.89	05250			13.11	05250				
5.30		86	52.0	14.69	053 2)	9.12	053 2)	2.58	05300	8.36	053	5.88	05300				
5.35		93	57.0					4.64	05350								
5.40		93	57.0	18.01	054 2)	9.89	054 2)	2.96	05400			6.27	05400				
5.45		93	57.0					8.48	05450			7.78	05450				
5.50		93	57.0	15.51	055 2)	10.13	055 2)	2.80	05500	9.66	055	5.88	05500	7.24	055	15.78	055
5.55		93	57.0			11.56	555 2)	4.79	05550			7.78	05550				
5.56	7/32	93	57.0	18.25	556 2)	11.56	556 2)										
5.60		93	57.0	16.53	056 2)	10.08	056 2)	2.96	05600	9.30	056	6.85	05600	8.02	056	17.48	056
5.65		93	57.0					4.98	05650			10.65	05650				
5.70		93	57.0	16.32	057 2)	10.08	057 2)	2.96	05700	9.30	057	6.85	05700	8.02	057	17.48	057
5.75		93	57.0			10.08	575 2)	5.72	05750			10.45	05750				
5.80		93	57.0	16.32	058 2)	10.08	058 2)	2.96	05800	9.30	058	6.85	05800	8.02	058	17.67	058
5.85		93	57.0					4.98	05850			12.55	05850				
5.90		93	57.0	17.33	059 2)	10.08	059 2)	3.16	05900	9.30	059	6.85	05900	8.77	059	18.80	059
5.95	15/64	93	57.0	21.24	595 2)	12.89	595 2)	3.16	05950			6.85	05950				
6.00		93	57.0	15.70	060 2)	9.89	060 2)	2.80	06000	9.12	060	6.85	06000	8.02	060	18.59	060
6.05		101	63.0					5.36	06050			15.00	06050				
6.10		101	63.0	17.75	061 2)	11.18	061 2)	3.34	06100			6.85	06100				
6.15		101	63.0					5.36	06150			11.18	06150				
6.20		101	63.0	17.50	062 2)	11.18	062 2)	3.34	06200	10.45	062	6.85	06200			19.58	062
6.25		101	63.0					5.36	06250			11.83	06250				
6.30		101	63.0	19.31	063 2)	11.18	063 2)	3.34	06300			7.24	06300				
6.35	1/4	101	63.0	20.45	635 2)	11.97	635 2)	3.49	06350			7.02	06350				
6.40		101	63.0	20.48	064 2)	11.97	064 2)	3.49	06400			7.24	06400				
6.45		101	63.0					5.90	06450								
6.50		101	63.0	18.84	065 2)	11.05	065 2)	3.34	06500	10.26	065	7.02	06500	9.12	065	19.34	065
6.55		101	63.0					6.27	06550			15.55	06550				
6.60		101	63.0	20.73	066 2)	11.97	066 2)	3.49	06600			8.36	06600				

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N	○	○	○	●	●	●	○
S	○	○		○		○	○
H	○					○	○
O	○	○	○			○	○

1) uncoated
2) self-centering

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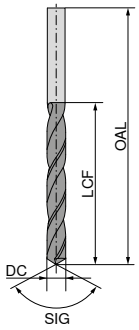
Continued on next page

Twist drill to DIN 338, short

≤ 5xD



	UNI	UNI	N	VA	W	WTL	WTL
	TiN	TiN	vap.			F.-nit	TiN
							
	SIG 130° HSS-E-PM	SIG 118° HSS-E	SIG 118° HSS	SIG 130° HSS-E	SIG 130° HSS	SIG 130° HSS-E	SIG 130° HSS-E
	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...

DC $_{h8}$ mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
6.65		101	63.0					11.23	06650			21.96	06650				
6.70		101	63.0	20.69	067 2)	11.97	067 2)	3.71	06700			8.56	06700				
6.75		109	69.0	27.92	675 2)	16.42	675 2)	4.43	06750			13.11	06750				
6.80		109	69.0	21.24	068 2)	13.55	068 2)	4.43	06800	12.36	068	9.12	06800	10.65	068	23.24	068
6.85		109	69.0					6.83	06850			22.67	06850				
6.90		109	69.0	21.66	069 2)	13.55	069 2)	4.43	06900	12.36	069	9.12	06900				
6.95		109	69.0					7.01	06950			22.67	06950				
7.00		109	69.0	21.24	070 2)	11.56	070 2)	3.89	07000	10.65	070	8.02	07000	9.66	070	20.72	070
7.05		109	69.0					7.57	07050			12.98	07050				
7.10		109	69.0	24.45	071 2)	15.39	071 2)	4.43	07100			11.01	07100				
7.14	9/32	109	69.0	36.58	714 2)	22.98	714 2)										
7.15		109	69.0					13.11	07150								
7.20		109	69.0	24.41	072 2)	15.39	072 2)	4.64	07200	14.43	072	11.01	07200	14.91	072	32.83	072
7.25		109	69.0					12.55	07250			26.56	07250				
7.30		109	69.0	25.28	073 2)	15.39	073 2)	4.64	07300			11.01	07300				
7.35		109	69.0					7.57	07350								
7.40		109	69.0	24.69	074 2)	15.39	074 2)	4.79	07400	14.43	074	11.01	07400	14.91	074	32.32	074
7.45		109	69.0			12.36	745 2)	7.37	07450								
7.50		109	69.0	22.48	075 2)	12.36	075 2)	4.43	07500	11.62	075	9.30	07500	11.05	075	23.71	075
7.55		117	75.0					8.68	07550								
7.60		117	75.0	27.28	076 2)	18.06	076 2)	5.16	07600	17.48	076	12.20	07600	16.27	076	35.61	076
7.65		117	75.0					8.68	07650								
7.70		117	75.0	31.06	077 2)	18.59	077 2)	5.16	07700	17.48	077	12.20	07700	16.27	077	35.61	077
7.75		117	75.0					7.75	07750			21.04	07750				
7.80		117	75.0	26.68	078 2)	18.06	078 2)	5.16	07800	17.48	078	12.20	07800	16.27	078	35.61	078
7.85		117	75.0					8.68	07850								
7.90		117	75.0	31.92	079 2)	18.59	079 2)	5.16	07900	17.48	079	14.04	07900	16.27	079	35.61	079
7.94	5/16	117	75.0	28.60	794 2)	18.06	794 2)										
7.95		117	75.0					9.04	07950								
8.00		117	75.0	25.36	080 2)	15.00	080 2)	4.43	08000	13.88	080	10.26	08000	12.36	080	27.16	080
8.05		117	75.0					9.22	08050			26.91	08050				
8.10		117	75.0	27.79	081 2)	18.06	081 2)	5.36	08100			14.43	08100				
8.15		117	75.0					9.41	08150			26.91	08150				
8.20		117	75.0	27.28	082 2)	19.34	082 2)	5.36	08200			15.00	08200				
8.25		117	75.0					6.44	08250			21.84	08250				
8.30		117	75.0	30.31	083 2)	19.34	083 2)	5.90	08300			15.78	08300				
8.35		117	75.0					10.13	08350								
8.40		117	75.0	30.53	084 2)	20.29	084 2)	5.90	08400	19.34	084	15.78	08400	18.80	084	41.01	084
8.45		117	75.0					10.34	08450			36.69	08450				
8.50		117	75.0	26.11	085 2)	14.81	085 2)	5.72	08500	13.70	085	11.83	08500	14.04	085	30.98	085
8.55		125	81.0					12.00	08550			26.54	08550				
8.60		125	81.0			33.12	086 2)	6.44	08600	20.73	086	15.78	08600			46.07	086
8.65		125	81.0					21.39	08650								
8.70		125	81.0			33.12	087 2)	6.44	08700			17.48	08700				
8.73	11/32	125	81.0	28.30	873 2)	21.76	873 2)										
8.75		125	81.0					10.68	08750			25.26	08750				

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S				○		○				○				○	○
H				○										○	○
O				○		○		○						○	○

1) uncoated
2) self-centering

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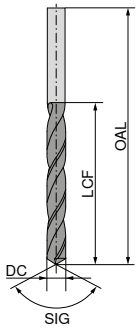
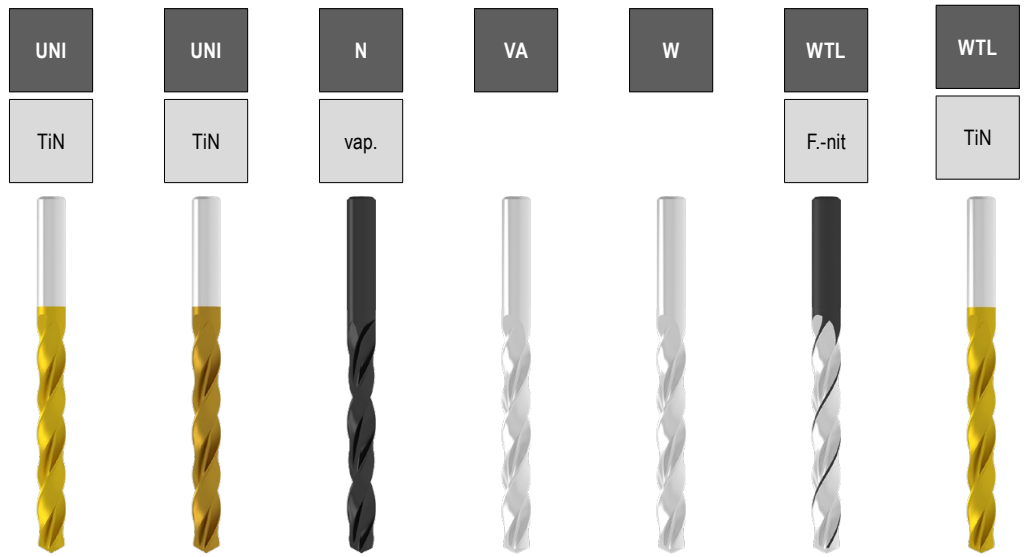
Continued on next page

Twist drill to DIN 338, short

≤ 5xD





				SIG 130° HSS-E-PM		SIG 118° HSS-E		SIG 118° HSS		SIG 130° HSS-E		SIG 130° HSS		SIG 130° HSS-E		SIG 130° HSS-E	
				10 173 ...		10 171 ...		10 152 ...		10 175 ...		10 161 ...		10 168 ...		10 170 ...	
DC h8 mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
8.80		125	81.0	30.53	088 2)	23.05	088 2)	6.65	08800	22.03	088	17.48	08800	21.04	088	47.05	088
8.90		125	81.0			28.45	089 2)	6.83	08900			17.67	08900				
8.95		125	81.0					22.30	08950								
9.00		125	81.0	28.74	090 2)	18.62	090 2)	6.09	09000	18.20	090	12.98	09000	16.32	090	35.31	090
9.05		125	81.0					12.55	09050								
9.10		125	81.0			30.94	091 2)	6.83	09100			19.58	09100				
9.15		125	81.0					22.30	09150								
9.20		125	81.0			31.75	092 2)	6.83	09200	25.84	092	19.58	09200	24.49	092	53.55	092
9.25		125	81.0					16.24	09250			30.60	09250				
9.30		125	81.0	33.18	093 2)	28.20	093 2)	6.83	09300	27.32	093	19.58	09300	24.49	093	53.80	093
9.35		125	81.0			21.96	935 2)	24.16	09350								
9.40		125	81.0			34.84	094 2)	6.83	09400	29.25	094	19.58	09400	24.49	094	53.80	094
9.45		125	81.0					13.48	09450								
9.50		125	81.0	30.21	095 2)	21.96	095 2)	6.83	09500	21.04	095	14.81	09500	17.48	095	37.81	095
9.55		133	87.0					15.12	09550								
9.60		133	87.0			31.51	096 2)	7.57	09600	30.37	096	22.64	09600	25.63	096	57.50	096
9.65		133	87.0					15.12	09650								
9.70		133	87.0			37.02	097 2)	7.57	09700	30.37	097	23.05	09700	28.45	097	61.50	097
9.75		133	87.0					9.94	09750								
9.80		133	87.0	35.99	098 2)	31.51	098 2)	8.48	09800	30.37	098	23.05	09800	28.45	098	61.50	098
9.85		133	87.0					14.77	09850								
9.90		133	87.0			29.02	099 2)	8.48	09900	30.37	099	23.42	09900	28.45	099	61.50	099
9.95		133	87.0					16.43	09950								
10.00		133	87.0	34.13	100 2)	22.08	100 2)	7.20	10000	19.95	100	15.55	10000	19.58	100	44.14	100
10.05		133	87.0					20.82	10050			39.88	10050				
10.10		133	87.0			28.49	101 2)	9.04	10100			23.83	10100				
10.15		133	87.0					37.41	10150								
10.20		133	87.0	39.41	102 2)	29.85	102 2)	9.22	10200	29.25	102	23.83	10200	27.16	102	59.61	102
10.25		133	87.0					12.36	10250			26.91	10250				
10.30		133	87.0			24.88	103 2)	11.07	10300	44.81	103	23.83	10300	35.87	103	79.57	103
10.35		133	87.0					20.82	10350								
10.40		133	87.0			30.81	104 2)	11.07	10400			23.83	10400				
10.45		133	87.0					37.41	10450								
10.50		133	87.0	39.68	105 2)	30.98	105 2)	9.41	10500	29.63	105	19.18	10500	25.38	105	55.56	105
10.55		133	87.0			33.95	955 2)	26.56	10550								
10.60		133	87.0					11.62	10600			34.27	10600				
10.70		142	94.0					13.48	10700	58.67	107	39.26	10700	38.92	107		
10.75		142	94.0					14.77	10750			45.17	10750				
10.80		142	94.0					13.11	10800			40.92	10800				
10.90		142	94.0					13.84	10900			40.92	10900				
11.00		142	94.0	40.99	110 2)	33.95	110 2)	10.68	11000	32.91	110	23.05	11000	30.98	110	64.92	110
11.10		142	94.0					13.84	11100			28.45	11100				
11.11	7/16	142	94.0	51.38	111 2)	65.45	111 2)										
11.20		142	94.0			65.45	112 2)	13.48	11200	63.47	112	36.01	11200	49.76	112	112.44	112
11.30		142	94.0			65.79	113 2)			63.86	113			49.76	113		
11.40		142	94.0			65.79	114 2)	14.21	11400	63.86	114	57.51	11400	49.76	114		

P	●	●	○	○		●	●
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K	●	●	●			●	●
N	○	○	○	●	●	●	○
S	○	○		○		○	○
H	○					○	○
O	○	○	○			○	○

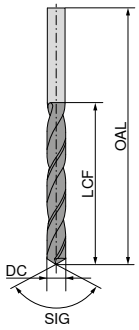
1) uncoated
2) self-centering

→ v_c Page 46+47

Continued on next page

Twist drill to DIN 338, short

≤ 5xD



	UNI	UNI	N	VA	W	WTL	WTL
	TiN	TiN	vap.			F.-nit	TiN
							
	SIG 130° HSS-E-PM	SIG 118° HSS-E	SIG 118° HSS	SIG 130° HSS-E	SIG 130° HSS	SIG 130° HSS-E	SIG 130° HSS-E
	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...

DC h8 mm	DC inch	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2		£ T2		£ T2	
11.50		142	94.0	45.47	115 2)	43.33	115 2)	11.62	11500	42.03	115	25.63	11500	35.31	115	78.94	115
11.60		142	94.0			75.38	116 2)	14.21	11600	72.98	116	39.88	11600	49.76	116		
11.70		142	94.0					14.77	11700	72.98	117	39.88	11700	49.76	117	112.44	117
11.80		142	94.0					14.94	11800	72.98	118	39.88	11800	53.80	118	118.25	118
11.90		151	101.0					16.43	11900	72.98	119	39.88	11900				
12.00		151	101.0	48.59	120 2)	48.30	120 2)	13.11	12000	45.97	120	28.07	12000	37.81	120	82.03	120
12.15		151	101.0			49.58	121 2)										
12.20		151	101.0					17.35	12200			47.62	12200				
12.25		151	101.0					19.02	12250								
12.30		151	101.0	87.22	123 2)	51.25	123 2)										
12.50		151	101.0	50.56	125 2)	49.58	925 2)	14.56	12500			28.07	12500	46.53	125	103.91	125
12.70		151	101.0	66.05	127 2)	38.89	127 2)	16.24	12700			27.32	12700				
12.80		151	101.0					19.34	12800			50.14	12800	82.05	128	178.23	128
13.00		151	101.0	53.74	130 2)	52.88	130 2)	16.03	13000			33.28	13000	46.53	130	103.16	130
13.10		151	101.0			66.89	131 2)										
13.20		151	101.0					20.82	13200			60.96	13200				
13.30		160	108.0			66.89	133 2)										
13.50		160	108.0	95.54	135 2)	66.89	135 2)	18.45	13500			41.24	13500	62.45	135	138.96	135
13.80		160	108.0					26.56	13800			76.65	13800	72.39	138	157.88	138
14.00		160	108.0	65.10	140 2)	64.15	140 2)	20.47	14000			39.49	14000	56.92	140	123.50	140
14.50		169	114.0					21.96	14500			52.26	14500	69.69	145	148.43	145
14.80		169	114.0											145.07	148		
15.00		169	114.0					23.60	15000			46.86	15000	70.04	150	156.18	150
15.25		178	120.0					44.07	15250								
15.50		178	120.0					25.83	15500			66.00	15500	104.10	155	312.56	155
15.80		178	120.0					42.39	15800								
16.00		178	120.0					27.85	16000			62.53	16000	87.86	160	191.79	160
16.50		184	125.0					31.71	16500			104.10	16500				
17.00		184	125.0					33.57	17000			106.05	17000				
17.50		191	130.0					36.69	17500			208.98	17500				
18.00		191	130.0					39.06	18000			114.35	18000				
18.50		198	135.0					42.39	18500								
19.00		198	135.0					45.53	19000			130.45	19000				
19.50		205	140.0					48.30	19500								
20.00		205	140.0					52.88	20000			161.59	20000				

P	●	●	○	○		●	●
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K	●	●	●			●	●
N	○	○	○	●	●	●	○
S	○	○		○		○	○
H	○					○	○
O	○	○	○			○	○

1) uncoated
2) self-centering

→ v_c Page 46+47

Twist drill sets DIN 338, short

▲ In a box
▲ In 0.1 mm steps

≤ 5xD

	N	UNI
	vap.	TiN
		
	Drill set type N	Drill set type UNI TiN
	HSS	HSS-E
	10 158 ...	10 158 ...
DC h8 mm	£ T2	£ T2
1,0 - 5,9	96.94 050	367.65 054 1)
6,0 - 10,0	201.37 100	575.68 104 1)
P	○	●
M		●
K	●	●
N	○	○
S		○
H		
O	○	○

1) self-centering

→ v_c Page 46

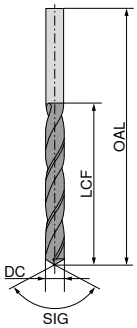
Set of type N vap. contains the drills of Art. No. 10 152 ...
Set of type UNI TiN contains the drills of Art. No. 10 171 ...

Twist drills with coolant hole, factory standard, long

≤ 10xD

NC

TiAlN



SIG 130°
HSS

DC h8 mm	OAL mm	LCF mm	10 224 ... £ T2	
3.0	100	66	158.54	030
3.3	106	69	181.34	033
3.5	112	73	179.40	035
3.8	119	78	221.79	038
4.0	119	78	180.33	040
4.2	119	78	183.46	042
4.5	126	82	182.31	045
4.8	132	87	220.04	048
5.0	132	87	184.42	050
5.5	139	91	191.00	055
5.8	139	91	221.20	058
6.0	139	91	198.36	060
6.5	148	97	212.47	065
6.8	156	102	213.45	068
7.0	156	102	213.45	070
7.5	156	102	220.79	075
7.8	165	109	234.73	078
8.0	165	109	225.08	080
8.5	165	109	235.14	085
8.8	175	115	241.10	088
9.0	175	115	240.56	090
9.5	175	115	248.84	095
9.8	184	121	256.81	098
10.0	184	121	248.84	100
10.2	184	121	256.81	102
10.5	184	121	258.73	105
10.8	195	128	265.49	108
11.0	195	128	258.73	110
11.5	195	128	263.76	115
11.8	205	134	305.34	118
12.0	205	134	268.01	120
12.8	205	134	320.05	128
13.0	205	134	282.33	130

P	○
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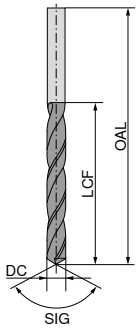
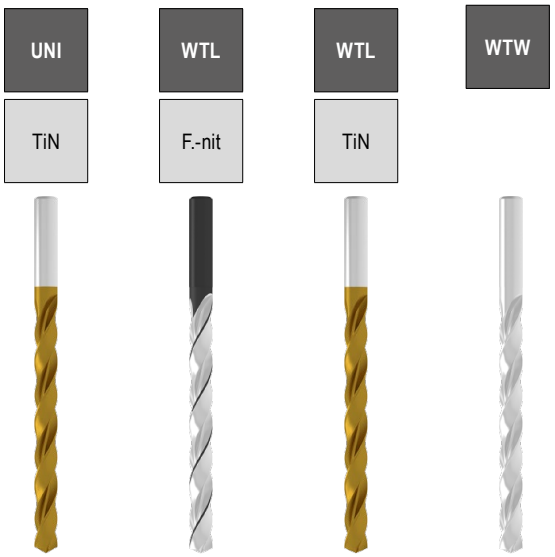
K	●
N	○
S	
H	
O	○

→ v_c Page 48

Twist drills, DIN 340, long

≤ 10xD





DC h8 mm	OAL mm	LCF mm	SIG 118° HSS-E 10 270 ... £ T2		SIG 130° HSS-E 10 225 ... £ T2		SIG 130° HSS 10 210 ... £ T2		SIG 130° HSS 10 200 ... £ T2	
1.0	56	33	10.04	010	11.05	010 1)	19.34	010	8.02	010
1.1	60	37	11.19	011	13.49	011 1)	22.64	011	8.77	011
1.2	65	41	12.50	012	12.98	012 1)			8.02	012
1.3	65	41	12.33	013	12.55	013 1)				
1.4	70	45	12.18	014	11.97	014 1)			7.24	014
1.5	70	45	10.59	015	10.45	015 1)	15.78	015	7.24	015
1.6	76	50	12.50	016	11.56	016 1)	15.48	016	6.66	016
1.7	76	50	13.66	017	11.62	017 1)				
1.8	80	53	13.04	018	11.62	018 1)			6.44	018
1.9	80	53	13.95	019	10.65	019 1)	14.91	019	6.44	019
2.0	85	56	10.35	020	8.36	020 1)	13.88	020	5.52	020
2.1	85	56	11.95	021	10.08	021 1)	16.27	021	6.44	021
2.2	90	59	12.18	022	10.26	022 1)				
2.3	90	59	11.95	023	10.26	023 1)	16.88	023	6.44	023
2.4	95	62	11.07	024	10.45	024	16.93	024	6.44	024
2.5	95	62	10.59	025	8.77	025	14.91	025	5.84	025
2.6	95	62	12.18	026	10.45	026	16.93	026	6.44	026
2.7	100	66	12.88	027	14.94	027	17.42	027	6.44	027
2.8	100	66	12.33	028	10.65	028	17.42	028	6.44	028
2.9	100	66	12.88	029	10.65	029	17.48	029	6.44	029
3.0	100	66	11.41	030	9.12	030	14.81	030	6.09	030
3.1	106	69	13.66	031	11.05	031				
3.2	106	69	12.66	032	10.65	032				
3.3	106	69	13.42	033	11.56	033	18.79	033	7.24	033
3.4	112	73	13.95	034	11.18	034				
3.5	112	73	13.66	035	10.65	035	16.93	035	6.85	035
3.6	112	73	14.14	036	16.03	036	21.46	036	8.36	036
3.7	112	73	13.76	037	11.62	037	20.73	037	8.77	037
3.8	119	78	13.24	038	11.56	038	20.73	038	8.77	038
3.9	119	78	14.82	039	11.78	039	20.72	039	9.12	039
4.0	119	78	14.48	040	11.62	040	18.22	040	7.41	040
4.1	119	78	14.73	041	11.97	041				
4.2	119	78	14.14	042	12.55	042	20.73	042	7.78	042
4.3	126	82	15.78	043	12.98	043	23.15	043	10.08	043
4.4	126	82	13.95	044	12.89	044				
4.5	126	82	14.82	045	13.49	045	21.04	045	9.12	045
4.6	126	82	14.30	046	13.55	046	24.32	046	10.26	046
4.7	126	82	16.54	047	14.04	047	24.32	047	10.45	047
4.8	132	87	16.09	048	14.81	048	24.32	048	10.65	048
4.9	132	87	16.31	049	15.48	049	33.73	049	11.05	049
5.0	132	87	16.54	050	13.49	050	22.03	050	8.77	050
5.1	132	87	18.29	051	15.78	051				

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K	●	●	●	
N	○	●	○	●
S	○	○		
H		○		
O	○	○	○	

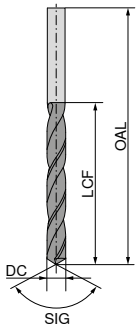
1) uncoated

→ v_c Page 48+49

Continued on next page

Twist drills, DIN 340, long

≤ 10xD



	UNI	WTL	WTL	WTW
	TiN	F.-nit	TiN	
				
	SIG 118° HSS-E	SIG 130° HSS-E	SIG 130° HSS	SIG 130° HSS
DC h8 mm / OAL mm / LCF mm	10 270 ...	10 225 ...	10 210 ...	10 200 ...
	£ T2	£ T2	£ T2	£ T2
5.2 / 132 / 87	17.95 052	16.32 052	27.16 052	11.56 052
5.3 / 132 / 87	19.74 053	16.88 053	27.54 053	11.78 053
5.4 / 139 / 91	21.56 054	16.69 054		
5.5 / 139 / 91	17.19 055	16.27 055	26.40 055	11.18 055
5.6 / 139 / 91	22.47 056	17.48 056	31.75 056	18.06 056
5.7 / 139 / 91	24.82 057	17.67 057	32.91 057	13.55 057
5.8 / 139 / 91	21.79 058	18.20 058	32.66 058	14.04 058
5.9 / 139 / 91	24.31 059	18.22 059	35.05 059	14.43 059
6.0 / 139 / 91	20.65 060	16.88 060	27.16 060	11.62 060
6.1 / 148 / 97	24.49 061	19.34 061		
6.2 / 148 / 97	21.97 062	19.18 062		
6.3 / 148 / 97	24.49 063	19.35 063	38.33 063	16.93 063
6.4 / 148 / 97	22.28 064	20.49 064		
6.5 / 148 / 97	21.40 065	18.59 065	30.37 065	12.98 065
6.6 / 148 / 97	24.67 066	21.29 066		
6.7 / 148 / 97	25.31 067	21.28 067		
6.8 / 156 / 102	27.16 068	23.24 068	46.65 068	19.34 068
6.9 / 156 / 102	28.16 069	23.71 069		
7.0 / 156 / 102	25.55 070	20.72 070	35.61 070	15.55 070
7.1 / 156 / 102	24.67 071	24.49 071		
7.2 / 156 / 102	28.25 072	25.26 072	48.42 072	28.41 072
7.3 / 156 / 102	29.53 073	25.63 073		
7.4 / 156 / 102	30.60 074	38.17 074	49.17 074	28.94 074
7.5 / 156 / 102	31.13 075	24.49 075	43.36 075	18.59 075
7.6 / 165 / 109	33.40 076		50.53 076	21.28 076
7.7 / 165 / 109	31.54 077	29.46 077		21.84 077
7.8 / 165 / 109	34.77 078	30.37 078	52.42 078	22.03 078
7.9 / 165 / 109	33.53 079	30.98 079	50.54 079	31.71 079
8.0 / 165 / 109	28.46 080	22.98 080	41.24 080	17.42 080
8.1 / 165 / 109	31.38 081	44.63 081		
8.2 / 165 / 109	34.22 082	32.91 082		
8.3 / 165 / 109	36.27 083	32.66 083		
8.4 / 165 / 109	38.99 084	34.25 084	56.75 084	34.09 084
8.5 / 165 / 109	33.40 085	29.25 085	52.97 085	22.58 085
8.6 / 175 / 115	33.18 086	35.05 086		
8.7 / 175 / 115	33.53 087	35.61 087		
8.8 / 175 / 115	34.06 088	35.87 088	59.82 088	25.63 088
8.9 / 175 / 115	34.61 089	38.11 089		
9.0 / 175 / 115	35.10 090	28.45 090	49.76 090	21.04 090
9.1 / 175 / 115	35.10 091	53.65 091		
9.2 / 175 / 115	35.10 092	41.39 092		42.61 092
9.3 / 175 / 115	35.10 093	41.59 093		32.32 093

P	●	●	○	
M	●	○		
K	●	●	●	
N	○	●	○	●
S	○	○		
H		○		
O	○	○	○	

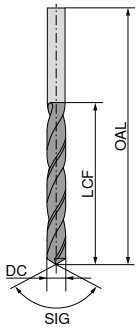
1) uncoated

→ v_c Page 48+49

Continued on next page

Twist drills, DIN 340, long

≤ 10xD



	UNI	WTL	WTL	WTW
	TiN	F.-nit	TiN	
				
	SIG 118° HSS-E	SIG 130° HSS-E	SIG 130° HSS	SIG 130° HSS
	10 270 ...	10 225 ...	10 210 ...	10 200 ...

DC h8 mm	OAL mm	LCF mm	£ T2		£ T2		£ T2		£ T2	
9.4	175	115	35.10	094	58.96	094			46.44	094
9.5	175	115	35.10	095	37.54	095	74.89	095	32.32	095
9.6	184	121	37.18	096					54.94	096
9.7	184	121	38.99	097	51.09	097	95.32	097		
9.8	184	121	41.65	098	51.09	098	101.99	098	41.59	098
9.9	184	121	45.26	099	51.09	099	145.07	099		
10.0	184	121	48.94	100	42.79	100	60.18	100	24.49	100
10.1	184	121	53.47	101						
10.2	184	121	57.11	102	54.97	102	105.37	102	107.08	102
10.3	184	121	61.61	103					72.39	103
10.4	184	121	61.61	104						
10.5	184	121	62.55	105	57.35	105	109.16	105	47.83	105
10.8	195	128			65.43	108				
11.0	195	128	74.25	110	63.02	110	87.71	110	38.92	110
11.5	195	128	75.20	115	78.56	115	146.56	115	63.47	115
11.6	195	128							85.16	116
11.8	195	128			87.07	118			76.26	118
12.0	205	134	76.08	120	78.94	120	111.07	120	47.86	120
12.2	205	134							89.02	122
12.3	205	134							76.26	123
12.5	205	134	83.33	125			113.77	125	50.32	125
13.0	205	134	90.63	130			119.41	130	53.55	130
13.5	214	140	92.40	135						
14.0	214	140	96.07	140			204.54	140	90.36	140

P	●	●	○	
M	●	○		
K	●	●	●	
N	○	●	○	●
S	○	○		
H		○		
O	○	○	○	

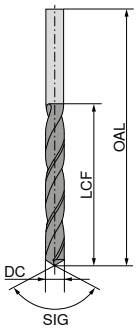
1) uncoated

→ v_c Page 48+49

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

▲ Up to diameter DC of 2.30 mm in uncoated version

> 10xD



WTL
TiAlN
SIG 130°
HSS-E

WTL
F.-nit
SIG 130°
HSS

DC h8 mm	OAL mm	LCF mm	10 236 ... £ T2		10 235 ... £ T2	
2.0	125	85			11.97	020 1)
2.1	125	85			14.81	021 1)
2.2	135	90			14.81	022 1)
2.3	135	90			14.81	023 1)
2.4	140	95			15.55	024
2.5	140	95			11.97	025
2.6	140	95			15.55	026
2.7	150	100			16.32	027
2.8	150	100			16.32	028
2.9	150	100			16.32	029
3.0	150	100	23.19	03000	13.88	030
3.1	155	105			16.93	031
3.2	155	105			16.93	032
3.3	155	105	36.96	03300	16.93	033
3.4	165	115			17.42	034
3.5	165	115	26.42	03500	13.88	035
3.6	165	115			17.42	036
3.7	165	115			18.80	037
3.8	175	120			18.80	038
3.9	175	120			18.80	039
4.0	175	120	25.87	04000	14.04	040
4.1	175	120			18.80	041
4.2	175	120	38.09	04200	19.18	042
4.3	185	125			21.29	043
4.4	185	125			21.29	044
4.5	185	125	29.08	04500	15.00	045
4.6	185	125			21.29	046
4.7	185	125			22.08	047
4.8	195	135			22.03	048
4.9	195	135			22.98	049
5.0	195	135	21.70	05000	16.27	050
5.1	195	135			23.71	051
5.2	195	135			24.49	052
5.3	195	135			24.49	053
5.4	205	140			24.49	054
5.5	205	140	30.73	05500	17.48	055
5.6	205	140			24.49	056
5.7	205	140			25.38	057
5.8	205	140			25.26	058
5.9	205	140			25.26	059
6.0	205	140	32.55	06000	17.48	060
6.1	215	150			27.16	061
6.2	215	150			27.32	062
6.3	215	150			29.25	063
6.4	215	150			29.46	064
6.5	215	150	35.01	06500	23.71	065
6.6	215	150			29.46	066
6.7	215	150			31.37	067
6.8	225	155	32.98	06800	30.76	068
6.9	225	155			32.91	069
7.0	225	155	30.13	07000	25.38	070
7.1	225	155			50.32	071
7.3	225	155			50.32	073
7.4	225	155			50.32	074
7.5	225	155	33.63	07500	28.45	075
7.7	240	165			39.31	077
7.8	240	165			41.39	078
7.9	240	165			41.59	079
8.0	240	165	33.28	08000	30.76	080
8.1	240	165			47.27	081
8.2	240	165			47.27	082
8.3	240	165			47.27	083
8.4	240	165			49.76	084
8.5	240	165	42.85	08500	39.67	085
8.6	250	175			71.35	086
8.7	250	175			53.55	087
8.8	250	175			56.32	088
9.0	250	175	47.83	09000	43.17	090
9.2	250	175			63.86	092
9.4	250	175			68.51	094
9.5	250	175	48.15	09500	49.92	095
9.6	265	185			70.43	096
9.7	265	185			70.43	097
9.8	265	185			71.59	098
9.9	265	185			71.59	099
10.0	265	185	54.26	10000	44.48	100
10.2	265	185	79.56	10200		
10.5	265	185			78.94	105
11.0	280	195			58.10	110
11.5	280	195			71.41	115
12.0	295	205			67.72	120
12.5	295	205			82.83	125
13.0	295	205			82.47	130

	10 236 ...	10 235 ...
P	●	●
M		
K	●	●
N	●	●
S		
H		
O	○	○

1) uncoated

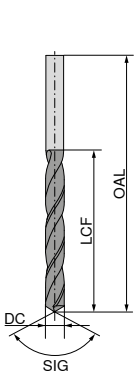
→ v_c Page 50

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

▲ Up to diameter DC of 2.00 mm in uncoated version

> 10xD

WTL | TiAlN



SIG 130°
HSS-E

10 246 ...

WTL | F.-nit

SIG 130°
HSS

10 245 ...

DC h8 mm	OAL mm	LCF mm	£ T2		£ T2	
2.0	160	110			23.71	**020** [1]
2.5	180	120			23.71	**025**
3.0	190	130	31.27	**03000**	18.79	**030**
3.5	210	145	36.68	**03500**	18.59	**035**
4.0	220	150	32.88	**04000**	19.58	**040**
4.5	235	160	36.36	**04500**	21.29	**045**
5.0	245	170	34.98	**05000**	21.29	**050**
5.5	260	180	43.26	**05500**	25.63	**055**
6.0	260	180	44.92	**06000**	25.26	**060**
6.5	275	190	42.98	**06500**	29.06	**065**
7.0	290	200	44.97	**07000**	32.32	**070**
7.5	290	200	48.39	**07500**	38.11	**075**
8.0	305	210	53.46	**08000**	37.54	**080**
8.5	305	210	52.51	**08500**	58.85	**085**
9.0	320	220	58.18	**09000**	57.50	**090**
9.5	320	220	60.60	**09500**	65.50	**095**
10.0	340	235	69.09	**10000**	60.58	**100**
10.2	340	235	77.89	**10200**		
10.5	340	235			87.86	**105**
11.0	365	250			85.76	**110**
11.5	365	250			99.10	**115**
12.0	375	260	100.24	**12000**	96.62	**120**
12.5	375	260			96.62	**125**
13.0	375	260			100.24	**130**

P	●	●
M		
K	●	●
N	●	●
S		
H		
O	○	○

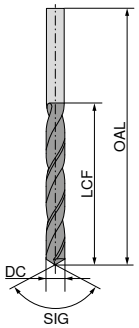
1) uncoated

→ v_c Page 50+51

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

> 10xD

WTL | TiAlN



SIG 130°
HSS-E

10 256 ...

WTL | F.-nit

SIG 130°
HSS

10 255 ...

DC h8 mm	OAL mm	LCF mm	£ T2		£ T2	
2.5	225	150			30.76	**025**
3.0	240	160			30.76	**030**
3.5	265	180			25.38	**035**
4.0	280	190	42.70	**04000**	25.38	**040**
4.5	295	200			30.37	**045**
5.0	315	210	48.34	**05000**	30.37	**050**
5.5	330	225			32.91	**055**
6.0	330	225	55.70	**06000**	34.00	**060**
6.5	350	235			37.54	**065**
7.0	370	250			47.83	**070**
7.5	370	250			54.97	**075**
8.0	390	265	66.10	**08000**	54.87	**080**
8.5	390	265			71.04	**085**
9.0	410	280			76.26	**090**
9.5	410	280			124.23	**095**
10.0	430	295	90.73	**10000**	89.02	**100**
10.5	430	295			97.36	**105**
11.0	455	310			103.16	**110**
11.5	455	310			114.35	**115**
12.0	480	330			121.95	**120**
12.5	480	330			114.35	**125**
13.0	480	330			115.35	**130**

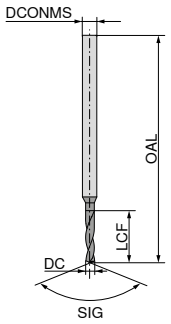
P	●	●
M		
K	●	●
N	●	●
S		
H		
O	○	○

→ v_c Page 50+51

Twist drills, DIN 1899

▲ 4 facet
▲ with reinforced shank

Scope of supply:
Packing quantity 5 pieces (Ø 0.15 mm packing quantity 10 pieces)
price per piece



N

SIG 118°
HSS-E-PM

10 103 ...

DC -0,004 mm	OAL mm	LCF mm	DCONMS h8 mm	£ T2	
0.15	25	0.8	1.0	7.10	**00150**
0.20	25	1.5	1.0	5.84	**00200**
0.25	25	1.9	1.0	3.98	**00250**
0.30	25	1.9	1.0	4.46	**00300**
0.35	25	2.4	1.0	4.10	**00350**
0.40	25	3.0	1.0	4.10	**00400**
0.45	25	3.0	1.0	4.10	**00450**
0.50	25	3.4	1.0	4.10	**00500**
0.55	25	3.9	1.0	4.10	**00550**
0.60	25	3.9	1.0	4.10	**00600**
0.65	25	4.2	1.0	4.10	**00650**
0.70	25	4.8	1.0	3.98	**00700**
0.75	25	4.8	1.0	3.98	**00750**
0.80	25	5.3	1.5	4.10	**00800**
0.85	25	5.3	1.5	4.27	**00850**
0.90	25	6.0	1.5	4.27	**00900**
0.95	25	6.0	1.5	4.27	**00950**
1.00	25	6.8	1.5	4.27	**01000**
1.05	25	6.8	1.5	4.27	**01050**
1.10	25	7.6	1.5	4.27	**01100**
1.15	25	7.6	1.5	4.27	**01150**
1.20	25	8.5	1.5	4.27	**01200**
1.25	25	8.5	1.5	4.27	**01250**
1.30	25	8.5	1.5	4.37	**01300**
1.35	25	9.5	1.5	4.27	**01350**
1.40	25	9.5	1.5	4.27	**01400**
1.45	25	9.5	1.5	4.27	**01450**

P	●
M	○
K	●
N	●
S	○
H	
O	○

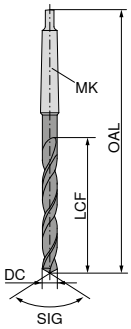
→ v_c Page 52

Twist drill, factory standard, short

≤ 3xD

WT

vap.



SIG 130°
HSS-E

10 285 ...

DC h8 mm	OAL mm	LCF mm	MK	£ T2	
13.0	147	66	1	60.58	**130**
13.5	168	70	2	75.77	**135**
14.0	168	70	2	75.19	**140**
14.5	172	74	2	80.67	**145**
15.0	172	74	2	80.12	**150**
15.5	176	78	2	119.98	**155**
16.0	176	78	2	75.77	**160**
16.5	179	81	2	121.95	**165**
17.0	179	81	2	79.57	**170**
17.5	183	85	2	127.76	**175**
18.0	183	85	2	84.48	**180**
18.5	186	88	2	128.92	**185**
19.0	186	88	2	94.04	**190**
19.5	212	91	3	152.31	**195**
20.0	212	91	3	109.16	**200**
21.0	216	95	3	120.54	**210**
22.0	219	98	3	128.92	**220**
23.0	222	101	3	137.40	**230**
24.0	225	104	3	140.49	**240**
25.0	225	104	3	146.29	**250**
26.0	256	107	4	203.19	**260**
27.0	259	110	4	217.12	**270**
28.0	259	110	4	221.94	**280**
30.0	263	114	4	242.47	**300**

P	●
M	●
K	●
N	○
S	○
H	○
O	

→ v_c Page 45

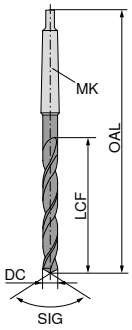
Twist drills, DIN 345

≤ 5xD

N

vap.

WTL



SIG 118°
HSS

SIG 130°
HSS-E

DC h8 mm	OAL mm	LCF mm	MK	10 265 ... £ T2		10 280 ... £ T2	
10.00	168	87	1	22.58	100	56.13	100 1)
10.20	168	87	1	25.63	102	56.75	102 1)
10.50	168	87	1	23.15	105	56.75	105 1)
10.80	175	94	1	30.98	108	63.47	108 1)
11.00	175	94	1	23.71	110	60.58	110 1)
11.20	175	94	1	32.91	112		
11.50	175	94	1	27.54	115	73.56	115 1)
11.80	175	94	1	35.05	118		
12.00	182	101	1	25.38	120	63.47	120 1)
12.20	182	101	1	35.31	122	68.16	122 1)
12.50	182	101	1	26.18	125	64.92	125 1)
12.80	182	101	1	35.87	128		
13.00	182	101	1	27.16	130	71.23	130 1)
13.20	182	101	1	36.47	132		
13.50	189	108	1	30.76	135	84.59	135 1)
13.80	189	108	1	39.31	138		
14.00	189	108	1	29.25	140	75.19	140 1)
14.25	212	114	2	42.72	142	113.77	142 1)
14.50	212	114	2	30.37	145	89.02	145 1)
14.75	212	114	2	46.44	147		
15.00	212	114	2	32.32	150	90.18	150 1)
15.25	218	120	2	43.17	152	114.27	152 1)
15.50	218	120	2	34.00	155	85.24	155 1)
15.75	218	120	2	39.31	157	95.32	157 1)
16.00	218	120	2	34.00	160	92.83	160 1)
16.25	223	125	2	52.23	162		
16.50	223	125	2	37.54	165	95.32	165 2)
16.75	223	125	2	43.17	167		
17.00	223	125	2	38.92	170	90.18	170 2)
17.25	228	130	2	47.86	172	105.37	172 2)
17.50	228	130	2	39.11	175	99.10	175 2)
17.75	228	130	2	48.57	177	109.16	177 2)
18.00	228	130	2	41.01	180	103.70	180 2)
18.25	233	135	2	50.32	182		
18.50	233	135	2	44.81	185	99.10	185 2)
18.75	233	135	2	52.23	187		
19.00	233	135	2	45.26	190	105.37	190 2)
19.25	238	140	2	56.32	192		
19.50	238	140	2	51.09	195		
19.75	238	140	2	58.85	197		
20.00	238	140	2	47.83	200	115.52	200 2)
20.25	243	145	2	63.02	202		
20.50	243	145	2	49.76	205		
20.75	243	145	2	63.60	207		
21.00	243	145	2	54.20	210	136.64	210 2)
21.25	248	150	2	67.35	212		
21.50	248	150	2	62.14	215		
21.75	248	150	2	68.73	217		
22.00	248	150	2	60.18	220	146.88	220 2)
22.25	248	150	2	70.63	222		
22.50	253	155	2	63.60	225	180.73	225 2)
22.75	253	155	2	72.52	227		
23.00	253	155	2	70.43	230	169.51	230 2)
23.50	276	155	3	68.73	235		
23.75	281	160	3	96.37	237		
24.00	281	160	3	73.56	240	185.20	240 2)
24.50	281	160	3	76.26	245		
24.75	281	160	3	105.67	247		
25.00	281	160	3	80.89	250	187.90	250 2)
25.50	286	165	3	82.58	255		
25.75	286	165	3	109.52	257		
26.00	286	165	3	93.12	260	218.12	260 2)
26.50	286	165	3	88.28	265		
26.75	291	170	3	138.97	267		
27.00	291	170	3	90.95	270	251.97	270 2)
27.50	291	170	3	95.57	275		
27.75	291	170	3	136.03	277		
28.00	291	170	3	100.41	280		
28.50	296	175	3	125.64	285		
28.75	296	175	3	195.71	287		
29.00	296	175	3	108.62	290		
29.50	296	175	3	113.41	295		
29.75	296	175	3	144.56	297		
30.00	296	175	3	108.62	300		
30.50	301	180	3	135.29	305		
31.00	301	180	3	131.40	310		
31.50	301	180	3	149.20	315		
32.00	334	185	4	137.97	320		
32.50	334	185	4	158.88	325		
33.00	334	185	4	148.42	330		
33.50	334	185	4	164.47	335		
34.00	339	190	4	173.78	340		
34.50	339	190	4	191.79	345		
35.00	339	190	4	176.68	350		
35.50	339	190	4	204.17	355		
36.00	344	195	4	189.85	360		
36.50	344	195	4	213.45	365		
37.00	344	195	4	207.83	370		
37.50	344	195	4	234.16	375		
38.00	349	200	4	220.04	380		
38.50	349	200	4	264.16	385		
39.00	349	200	4	240.94	390		
39.50	349	200	4	302.08	395		
40.00	349	200	4	250.20	400		
41.00	354	205	4	269.18	410		
42.00	354	205	4	292.59	420		
43.00	359	210	4	311.52	430		
44.00	359	210	4	325.71	440		
45.00	359	210	4	339.81	450		
46.00	364	215	4	353.91	460		
47.00	364	215	4	377.35	470		
48.00	369	220	4	387.03	480		
49.00	369	220	4	405.80	490		
50.00	369	220	4	415.28	500		
51.00	412	225	5	500.22	510		
52.00	412	225	5	537.96	520		
53.00	412	225	5	781.75	530		
54.00	417	230	5	807.94	540		
55.00	417	230	5	821.04	550		

	10 265 ...	10 280 ...
P	○	●
M		○
K	●	●
N	○	●
S		○
H		○
O	○	○

1) nitrided chamfer
2) vaporised

→ v_c Page 47

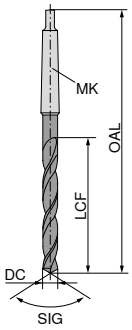
Twist drills, DIN 341, long

≤ 10xD

N

vap.

WTL



SIG 118°
HSS

SIG 130°
HSS-E

DC h8 mm	OAL mm	LCF mm	MK	10 295 ... £ T2		10 297 ... £ T2	
10.00	197	116	1	30.76	100	76.87	100 1)
10.20	197	116	1	35.05	102	73.18	102 1)
10.50	197	116	1	42.20	105	82.40	105 1)
10.80	206	125	1	54.56	108		
11.00	206	125	1	32.91	110	59.82	110 1)
11.20	206	125	1	42.89	112	73.93	112 1)
11.50	206	125	1	32.91	115	62.71	115 1)
11.80	206	125	1	44.14	118	55.56	118 1)
12.00	215	134	1	32.91	120	62.71	120 1)
12.20	215	134	1	58.08	122	54.79	122 1)
12.50	215	134	1	32.66	125	84.77	125 1)
12.80	215	134	1	62.87	128	54.11	128 1)
13.00	215	134	1	32.66	130	64.92	130 1)
13.20	215	134	1	62.87	132		
13.50	223	142	1	36.98	135	67.60	135 1)
13.80	223	142	1	60.58	138	62.14	138 1)
14.00	223	142	1	36.64	140	76.26	140 1)
14.25	245	147	2	57.35	142		
14.50	245	147	2	46.53	145	74.12	145 1)
14.75	245	147	2	57.35	147		
15.00	245	147	2	45.97	150	78.56	150 1)
15.25	251	153	2	57.35	152		
15.50	251	153	2	44.81	155	77.01	155 1)
15.75	251	153	2	58.85	157		
16.00	251	153	2	47.86	160	79.95	160 1)
16.25	257	159	2	64.92	162		
16.50	257	159	2	50.53	165	78.81	165 2)
16.75	257	159	2	63.47	167		
17.00	257	159	2	51.10	170	90.97	170 2)
17.50	263	165	2	57.35	175	87.31	175 2)
17.75	263	165	2	71.59	177		
18.00	263	165	2	56.75	180	92.83	180 2)
18.50	269	171	2	63.60	185	87.31	185 2)
19.00	269	171	2	63.86	190	105.37	190 2)
19.50	275	177	2	73.56	195	106.61	195 2)
20.00	275	177	2	69.86	200	114.74	200 2)
20.50	282	184	2	87.69	205	112.84	205 2)
21.00	282	184	2	79.95	210	134.90	210 2)
21.50	289	191	2	92.83	215		
22.00	289	191	2	87.31	220	146.56	220 2)
22.50	296	198	2	96.37	225		
23.00	296	198	2	90.59	230		
23.50	319	198	3	108.05	235		
24.00	327	206	3	111.07	240	187.90	240 2)
24.50	327	206	3	119.41	245		
25.00	327	206	3	109.91	250	195.06	250 2)
25.50	335	214	3	131.37	255		
26.00	335	214	3	128.49	260		
26.50	335	214	3	137.40	265		
27.00	343	222	3	137.40	270		
27.50	343	222	3	170.49	275		
28.00	343	222	3	153.07	280		
29.00	351	230	3	176.87	290		
29.50	351	230	3	197.96	295		
30.00	351	230	3	176.10	300		
30.50	360	239	3	225.45	305		
31.00	360	239	3	213.67	310		
31.50	360	239	3	238.22	315		
32.00	397	248	4	229.13	320		
33.00	397	248	4	229.13	330		
33.50	397	248	4	265.88	335		
34.00	406	257	4	283.90	340		
35.00	406	257	4	274.78	350		
36.00	416	267	4	315.99	360		
37.00	416	267	4	357.22	370		
37.50	416	267	4	384.68	375		
38.00	426	277	4	343.47	380		
39.00	426	277	4	366.48	390		
40.00	426	277	4	384.68	400		
42.00	436	287	4	435.21	420		
43.00	447	298	4	466.96	430		
44.00	447	298	4	466.96	440		
45.00	447	298	4	644.67	450		
50.00	470	321	4	641.09	500		

P	○	●
M		○
K	●	●
N	○	●
S		○
H		○
O	○	○

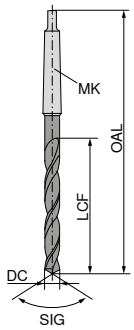
1) nitrided chamfer
2) vaporised

→ v_c Page 49

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

> 10xD

WTL



SIG 130°
HSS

10 305 ...

DC h8 mm	OAL mm	LCF mm	MK	£ T2	
10.0	285	185	1	59.44	100 1)
10.5	285	185	1	72.17	105 1)
11.0	300	195	1	67.60	110 1)
11.5	300	195	1	71.22	115 1)
12.0	310	205	1	77.01	120 1)
12.5	310	205	1	79.57	125 1)
13.0	310	205	1	78.81	130 1)
13.5	325	220	1	90.95	135 1)
14.0	325	220	1	90.18	140 1)
14.5	340	220	2	93.48	145 1)
15.0	340	220	2	98.33	150 1)
15.5	355	230	2	105.37	155 1)
16.0	355	230	2	101.00	160 1)
16.5	355	230	2	103.70	165 2)
17.0	355	230	2	103.49	170 2)
17.5	370	245	2	111.07	175 2)
18.0	370	245	2	114.74	180 2)
18.5	370	245	2	126.55	185 2)
19.0	370	245	2	129.24	190 2)
19.5	385	260	2	139.55	195 2)
20.0	385	260	2	147.67	200 2)
21.0	385	260	2	170.49	210 2)
22.0	405	270	2	178.61	220 2)
23.0	405	270	2	209.76	230 2)
24.0	440	290	3	233.75	240 2)
25.0	440	290	3	238.22	250 2)
26.0	440	290	3	256.59	260 2)
28.0	460	305	3	297.80	280 2)
30.0	460	305	3	343.47	300 2)

P	●
M	
K	●
N	●
S	
H	
O	○

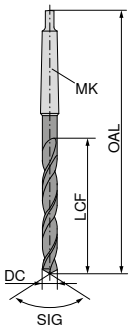
1) nitrided chamfer
2) vaporised

→ v_c Page 51

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

> 10xD

WTL



SIG 130°
HSS

10 315 ...

DC h8 mm	OAL mm	LCF mm	MK	£ T2	
10.0	360	235	1	83.35	100 1)
10.5	360	235	1	141.35	105 1)
11.0	375	250	1	95.32	110 1)
11.5	375	250	1	103.70	115 1)
12.0	395	260	1	116.20	120 1)
13.0	395	260	1	123.84	130 1)
13.5	410	275	1	132.18	135 1)
14.0	410	275	1	132.18	140 1)
14.5	425	275	2	132.94	145 1)
15.0	425	275	2	131.37	150 1)
15.5	445	295	2	139.55	155 1)
16.0	445	295	2	137.40	160 1)
16.5	445	295	2	156.74	165 2)
17.0	445	295	2	147.67	170 2)
17.5	465	310	2	159.46	175 2)
18.0	465	310	2	165.86	180 2)
18.5	465	310	2	178.61	185 2)
19.0	465	310	2	181.49	190 2)
19.5	490	325	2	273.69	195 2)
20.0	490	325	2	204.54	200 2)
21.0	490	325	2	219.04	210 2)
22.0	515	345	2	261.05	220 2)
23.0	515	345	2	352.94	230 2)
24.0	555	365	3	297.80	240 2)
25.0	555	365	3	302.27	250 2)
26.0	555	365	3	352.58	260 2)
28.0	580	385	3	412.15	280 2)
30.0	580	385	3	476.40	300 2)

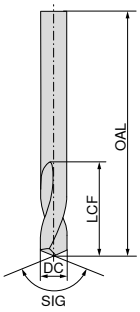
P	●
M	
K	●
N	●
S	
H	
O	○

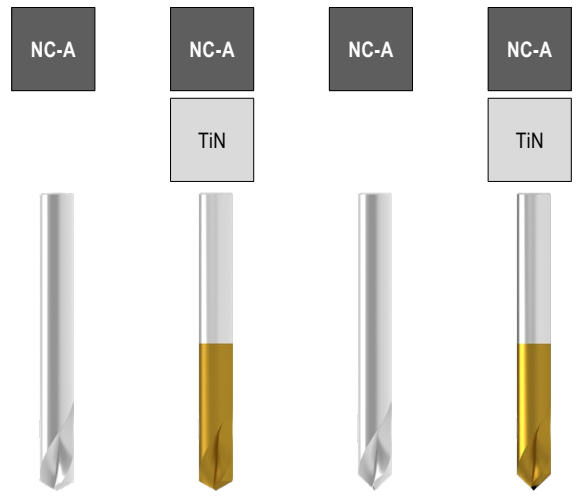
1) nitrided chamfer
2) vaporised

→ v_c Page 51

NC spot drills, factory standard

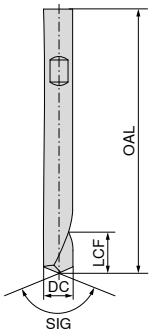
▲ helical flutes

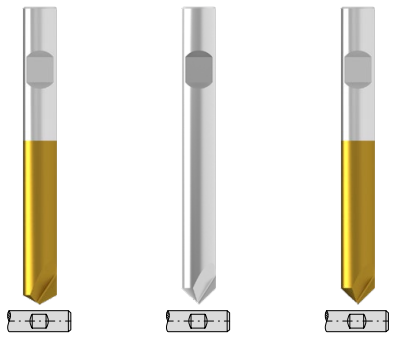




DC h6 mm	OAL mm	LCF mm	SIG 120° HSS 10 510 ... £ T2		SIG 120° HSS 10 512 ... £ T2		SIG 90° HSS 10 520 ... £ T2		SIG 90° HSS 10 522 ... £ T2	
3	46	12.0	10.26	030	22.49	030	9.89	030	22.49	030
4	55	12.0	10.45	040	22.88	040	10.08	040	22.88	040
5	62	14.0	11.05	050	24.35	050	10.65	050	24.35	050
6	66	16.0	11.01	060	25.62	060	10.65	060	25.62	060
8	79	21.0	18.22	080	41.28	080	18.20	080	41.28	080
10	89	25.0	20.73	100	45.53	100	19.02	100	45.53	100
12	102	30.0	29.63	120	66.55	120	29.25	120	66.55	120
16	115	37.5	38.38	160	86.99	160	38.11	160	86.99	160
20	131	45.0	61.89	200	141.54	200	61.37	200	141.54	200

▲ with clamping flat to DIN 1835 B





DC h6 mm	OAL mm	LCF mm	SIG 120° HSS 10 513 ... £ T2		SIG 90° HSS 10 521 ... £ T2		SIG 90° HSS 10 523 ... £ T2	
6	66	7.0	23.32	060	10.45	060	23.32	060
8	79	9.0	33.19	080	14.69	080	33.19	080
10	89	11.5	37.02	100	16.45	100	37.02	100
12	102	14.0	52.03	120	22.85	120	52.03	120
16	115	18.0	68.48	160	29.84	160	68.48	160
20	131	23.0	99.41	200	42.62	200	99.41	200

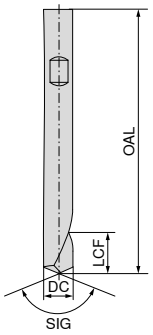
P	●	●	●	●
M	○	○	○	○
K	●	●	●	●
N	○	○	○	○
S	○	○	○	○
H				
O	○	○	○	○

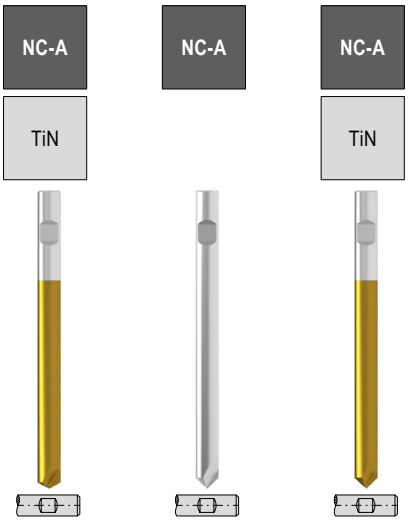
→ v_c Page 53

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	10 532 ... SIG 120° HSS £ T2		10 526 ... SIG 90° HSS £ T2		10 528 ... SIG 90° HSS £ T2	
6	93	7.0	29.06	**060**	12.80	**060**	29.06	**060**
8	117	9.0	45.81	**080**	19.95	**080**	45.81	**080**
10	133	11.5	50.58	**100**	22.03	**100**	50.58	**100**
12	151	14.0	60.01	**120**	26.17	**120**	60.01	**120**
16	178	18.0	92.87	**160**	39.91	**160**	92.87	**160**
20	205	23.0	130.21	**200**	55.39	**200**	130.21	**200**

P	●	●	●
M	○	○	○
K	●	●	●
N	○	○	○
S	○	○	○
H			
O	○	○	○

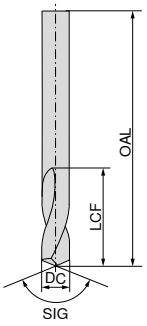
→ v_c Page 53

Suitable only for spot drilling!

NC spot drills, factory standard, long

▲ helical flutes

NC-A



SIG 90°
HSS

10 525 ...

DC h6 mm	OAL mm	LCF mm	£ T2	
6.35	105	17	17.15	**025**
8.00	118	21	31.37	**030**
9.52	132	25	31.71	**040**
12.70	159	30	44.80	**050**
15.87	186	37	39.47	**060**

P	●
M	○
K	●
N	○
S	○
H	
O	○

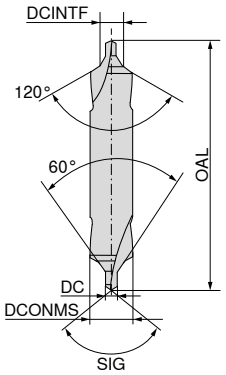
→ v_c Page 53

Suitable only for spot drilling!

Centre drills, DIN 333, form B

▲ with protective countersink 120°

ZB



Right-hand
SIG 118°
HSS

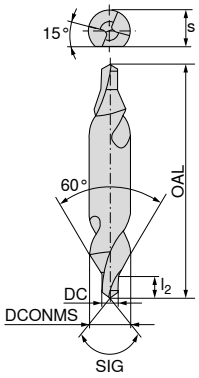
10 480 ...

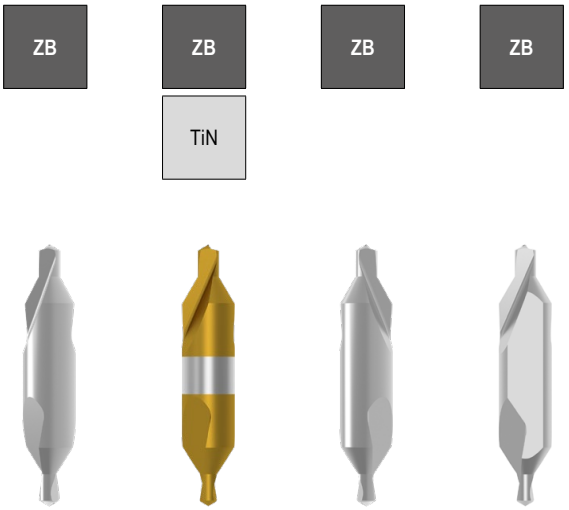
DC mm	DCONMS h8 mm	DCINTF k12 mm	OAL mm	£ T2	
1.00	4.0	2.12	35.5	10.13	**100**
1.25	5.0	2.65	40.0	11.23	**125**
1.60	6.3	3.35	45.0	10.50	**160**
2.00	8.0	4.25	50.0	11.23	**200**
2.50	10.0	5.30	56.0	13.84	**250**
3.15	11.2	6.70	62.0	20.12	**315**
4.00	14.0	8.50	69.0	26.40	**400**
5.00	18.0	10.60	77.0	34.25	**500**

P	●
M	○
K	●
N	○
S	○
H	
O	○

→ v_c Page 53

Centre drills, DIN 333, form A





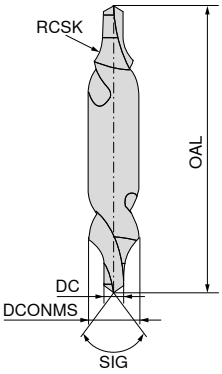
DC	s	DCONMS $_{h8}$	OAL	l_2		Right-hand SIG 118° HSS 10 415 ... £ T2		Right-hand SIG 118° HSS 10 425 ... £ T2		Left-hand SIG 118° HSS 10 435 ... £ T2		Right-hand SIG 118° HSS-E 10 445 ... £ T2	
mm	mm	mm	mm	mm									
0.50		3.15	25.0	0.8		7.20	**050** [2]	17.35	**050** [2]	10.13	**050** [2]		
0.80		3.15	25.0	1.1		7.01	**080** [2]	16.58	**080** [2]	9.94	**080** [2]		
1.00		3.15	31.5	1.3		6.44	**100**	15.32	**100**	9.04	**100**		
1.25		3.15	31.5	1.6		5.57	**125**	17.51	**125**	10.50	**125**		
1.60		4.00	35.5	2.0		5.90	**160**	14.43	**160**	9.66	**160**		
1.60	3.25	4.00	35.5	2.0								11.07	**160** [1]
2.00		5.00	40.0	2.5		4.84	**200**	14.77	**200**	10.34	**200**		
2.00	4.20	5.00	40.0	2.5								8.56	**200** [1]
2.50		6.30	45.0	3.1		5.57	**250**	17.35	**250**	11.07	**250**		
2.50	5.35	6.30	45.0	3.1								9.66	**250** [1]
3.15		8.00	50.0	3.9		9.22	**315**	21.56	**315**	14.01	**315**		
3.15	6.95	8.00	50.0	3.9								12.98	**315** [1]
4.00		10.00	56.0	5.0		14.21	**400**	33.95	**400**	18.45	**400**		
4.00	8.40	10.00	56.0	5.0								24.69	**400** [1]
5.00		12.50	63.0	6.3		20.47	**500**	48.66	**500**	28.94	**500**		
5.00	10.95	12.50	63.0	6.3								26.00	**500** [1]
6.30		16.00	71.0	8.0		29.85	**630**	72.24	**630**	42.39	**630**		
6.30	14.00	16.00	71.0	8.0								60.43	**630** [1]
P						●		●		●		●	
M						○		○		○		○	
K						●		●		●		●	
N						○		○		○		○	
S						○		○		○		○	
H													
O						○		○		○		○	

1) with flat
2) Single ended

→ v_c Page 53

Centre drills, DIN 333, form R

ZB ZB

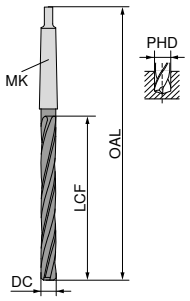


DC mm	DCONMS h8 mm	OAL mm	RCSK mm	Right-hand SIG 118° HSS 10 455 ... £ T2		Left-hand SIG 118° HSS 10 475 ... £ T2	
0.50	3.15	25.0	2.00	7.37	**050** [1]		
0.80	3.15	25.0	2.50	7.20	**080** [1]	14.43	**080** [1]
1.00	3.15	31.5	2.90	6.44	**100**	15.12	**100**
1.25	3.15	31.5	3.15	7.37	**125**	13.70	**125**
1.60	4.00	35.5	4.00	6.09	**160**	11.01	**160**
2.00	5.00	40.0	5.00	6.44	**200**	11.18	**200**
2.50	6.30	45.0	6.30	7.37	**250**	11.56	**250**
3.15	8.00	50.0	8.00	9.41	**315**	16.27	**315**
4.00	10.00	56.0	10.00	13.48	**400**	23.15	**400**
5.00	12.50	63.0	12.50	20.69	**500**	45.90	**500**
6.30	16.00	71.0	16.00	30.80	**630**		
P				●		●	
M				○		○	
K				●		●	
N				○		○	
S				○		○	
H							
O				○		○	

1) Single ended

→ v_c Page 53

Core drills (spiral countersinks)



N

vap.

SIG 120°
HSS

10 228 ...

DC h8 mm	OAL mm	LCF mm	PHD mm	MK	£ T2	
12.00	182	101	8.4	1	57.32	**120**
12.75	182	101	9.1	1	44.70	**127**
13.00	182	101	9.1	1	39.11	**130**
13.75	189	108	9.8	1	44.65	**137**
14.00	189	108	9.8	1	39.67	**140**
14.75	212	114	10.5	2	49.76	**147**
15.00	212	114	10.5	2	44.65	**150**
15.75	218	120	11.2	2	52.45	**157**
16.00	218	120	11.2	2	46.65	**160**
16.75	223	125	11.9	2	54.87	**167**
17.00	223	125	11.9	2	49.76	**170**
17.75	228	130	12.6	2	57.50	**177**
18.00	228	130	12.6	2	49.76	**180**
18.70	233	135	13.3	2	58.08	**187**
19.00	233	135	13.3	2	56.92	**190**
19.70	238	140	14.0	2	58.08	**197**
20.00	238	140	14.0	2	56.92	**200**
20.70	243	145	14.6	2	66.28	**207**
21.00	243	145	14.6	2	66.57	**210**
21.70	248	150	15.3	2	67.92	**217**
22.00	248	150	15.3	2	67.16	**220**
22.70	253	155	16.0	2	73.83	**227**
23.00	253	155	16.0	2	73.08	**230**
23.70	281	160	16.6	3	76.90	**237**
24.00	281	160	16.6	3	75.77	**240**
24.70	281	160	17.3	3	82.03	**247**
25.00	281	160	17.3	3	82.05	**250**
25.70	286	165	18.0	3	85.81	**257**
26.00	286	165	18.0	3	86.52	**260**
26.70	291	170	18.6	3	101.99	**267**
27.00	291	170	18.6	3	100.05	**270**
27.70	291	170	19.3	3	101.00	**277**
28.00	291	170	19.3	3	100.86	**280**
28.70	296	175	20.0	3	110.48	**287**
29.00	296	175	20.0	3	111.67	**290**
29.70	296	175	20.5	3	117.49	**297**
30.00	296	175	20.5	3	115.52	**300**

P	●
M	○
K	●
N	○
S	○
H	
O	○

→ v_c Page 53

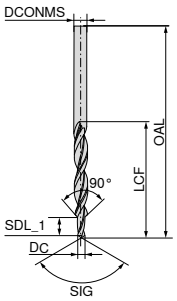
Stepped drills, DIN 8378

▲ 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
▲ the feed rate has to be selected based on the small Ø DC

DIN 8378

SB

vap.



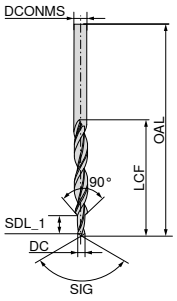
SIG 118°
HSS

10 365 ...

For threads	DC h9 mm	DCONMS h8 mm	OAL mm	SDL_1 mm	LCF mm	£ T2	
M3	2.5	3.4	70	8.8	39	25.84	030
M4	3.3	4.5	80	11.4	47	28.31	040
M5	4.2	5.5	93	13.6	57	29.25	050
M6	5.0	6.6	101	16.5	63	32.66	060
M8	6.8	9.0	125	21.0	81	36.64	080
M10	8.5	11.0	142	25.5	94	47.83	100
M12	10.2	13.5	160	30.0	108	59.82	120

▲ for through holes according to DIN EN 20273 – fine
▲ with 90° screw head countersink
▲ the feed rate has to be selected based on the small Ø DC

DIN 8374



SIG 118°
HSS

10 355 ...

For threads	DC h9 mm	DCONMS h8 mm	OAL mm	SDL_1 mm	LCF mm	£ T2	
M3	3.2	6.0	93	9	57	30.37	030
M4	4.3	8.0	117	11	75	35.12	040
M5	5.3	10.0	133	13	87	44.14	050
M6	6.4	11.5	142	15	94	67.09	060
M8	8.4	15.0	169	19	114	83.21	080
M10	10.5	19.0	198	23	135	128.49	100

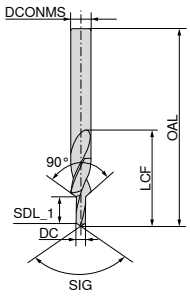
P	●
M	○
K	●
N	○
S	○
H	
O	○

→ v_c Page 53

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
▲ the feed rate has to be selected based on the small Ø DC

SB



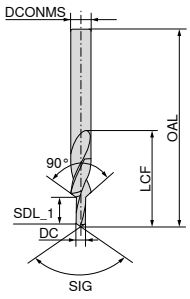
SIG 118°
HSS

10 320 ...

For threads	DC h6 mm	DCONMS h6 mm	OAL mm	SDL_1 mm	LCF mm	£ T2	
M3	2.5	3.4	52	8.8	20	16.69	030
M4	3.3	4.5	58	11.4	24	16.93	040
M5	4.2	5.5	66	13.6	28	18.22	050
M6	5.0	6.6	70	16.5	31	19.34	060
M8	6.8	9.0	84	21.0	40	22.42	080
M10	8.5	11.0	95	25.5	47	29.06	100
M12	10.2	13.5	107	30.0	54	37.24	120

▲ for through holes according to DIN EN 20273 – fine
▲ with 90° screw head countersink
▲ the feed rate has to be selected based on the small Ø DC

DIN 8374



SIG 118°
HSS

10 330 ...

For threads	DC h6 mm	DCONMS h6 mm	OAL mm	SDL_1 mm	LCF mm	£ T2	
M3	3.2	6.0	66	9	28	19.34	030
M4	4.3	8.0	79	11	37	22.08	040
M5	5.3	10.0	89	13	43	27.16	050
M6	6.4	11.5	95	15	47	30.98	060
M8	8.4	15.0	111	19	56	35.12	080
M10	10.5	19.0	127	23	64	52.42	100

P	●
M	○
K	●
N	○
S	○
H	
O	○

→ v_c Page 53

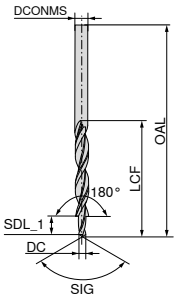
Stepped drills, DIN 8376

▲ Countersinking angle 180°
▲ for through holes according to DIN EN 20273 – Medium
▲ for screw heads to DIN 974-1 – Series 1
▲ the feed rate has to be selected based on the small Ø DC

DIN 8376

SB

vap.



SIG 118°
HSS

10 375 ...

For threads	DC h9 mm	DCONMS h8 mm	OAL mm	SDL_1 mm	LCF mm	£ T2		
M3	3.4	6	93	9	57	30.37	**030**	1)
M4	4.5	8	117	11	75	35.12	**040**	
M5	5.5	10	133	13	87	42.16	**050**	
M6	6.6	11	142	15	94	48.42	**060**	
M8	9.0	15	169	19	114	62.14	**080**	
M10	11.0	18	191	23	130	129.24	**100**	

P	●
M	○
K	●
N	○
S	○
H	
O	○

1) DCONMS not according to DIN 974-1

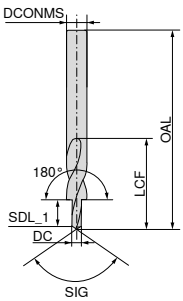
→ v_c Page 53

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
▲ the feed rate has to be selected based on the small Ø DC

DIN 8376

SB



SIG 118°
HSS

10 340 ...

For threads	DC h6 mm	DCONMS h6 mm	OAL mm	SDL_1 mm	LCF mm	£ T2		
M3	3.4	6	66	9	28	18.79	**030**	1)
M4	4.5	8	79	11	37	21.28	**040**	
M5	5.5	10	89	13	43	25.84	**050**	
M6	6.6	11	95	15	47	30.37	**060**	
M8	9.0	15	111	19	56	38.72	**080**	
M10	11.0	18	123	23	62	56.75	**100**	

P	●
M	○
K	●
N	○
S	○
H	
O	○

1) DCONMS not according to DIN 974-1

→ v_c Page 53

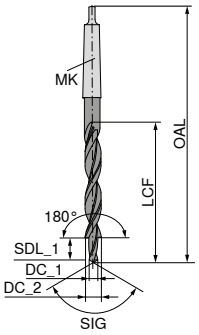
Stepped drills, DIN 8377

▲ Countersinking angle 180°
▲ for through holes according to DIN EN 20273 – Medium
▲ for screw heads to DIN 974-1 – Series 1
▲ the feed rate has to be selected based on the small Ø DC

DIN 8377

SB

vap.



SIG 118°
HSS

							10 405 ...	
For threads	DC_1 h9 mm	DC_2 mm	OAL mm	SDL_1 mm	LCF mm	MK	£ T2	
M6	6.6	11	175	15	94	1	62.14	060
M8	9.0	15	212	19	114	2	81.88	080
M10	11.0	18	228	23	130	2	109.16	100
M12	13.5	20	238	27	140	2	132.18	120
M14	15.5	24	281	31	160	3	169.51	140
M16	17.5	26	286	35	165	3	198.74	160

P	●
M	○
K	●
N	○
S	○
H	
O	○

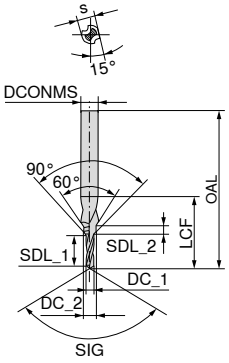
→ v_c Page 53

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
▲ the feed rate has to be selected based on the small Ø DC

SB

vap.



SIG 118°
HSS

10 350 ...

For threads	DC_1 h8 mm	DCONMS h7 mm	DC_2 mm	s mm	OAL mm	SDL_1 mm	LCF mm	SDL_2 mm	£ T2	
M4	3.3	8.0	4.3	6.75	63	11.0	23	1.60	70.27	**040**
M5	4.2	10.0	5.3	8.45	67	13.0	27	2.15	79.95	**050**
M6	5.0	12.5	6.4	10.45	71	16.0	33	2.90	87.31	**060**
M8	6.8	14.0	8.4	12.50	88	19.5	41	3.50	82.63	**080**
M10	8.5	16.0	10.5	14.85	94	23.0	47	4.70	92.83	**100**
M12	10.2	20.0	13.0	18.45	105	28.0	59	6.50	122.46	**120**
M16	14.0	25.0	17.0	23.40	132	33.0	67	8.30	174.17	**160**
M20	17.5	31.5	21.0	29.35	145	38.0	77	10.35	233.75	**200**

P	●
M	○
K	●
N	○
S	○
H	
O	○

→ v_c Page 53

Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength N/mm²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0,15 % C	Annealed	420 N/mm² / 125 HB	1.0401	C15	1.1141	Ck15
		P.1.2	< 0,45 % C	Annealed	640 N/mm² / 190 HB	1.1191	C45E	1.0718	9SMnPb28
		P.1.3		Tempered	840 N/mm² / 250 HB	1.1191	C45E	1.0535	C55
		P.1.4	< 0,75 % C	Annealed	910 N/mm² / 270 HB	1.1223	C60R	1.0535	C55
		P.1.5		Tempered	1010 N/mm² / 300 HB	1.1223	C60R	1.0727	45S20
	Low-alloy steel	P.2.1		Annealed	610 N/mm² / 180 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.2		Tempered	930 N/mm² / 275 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.3		Tempered	1010 N/mm² / 300 HB	1.7225	42CrMo4	1.3505	100Cr6
		P.2.4		Tempered	1200 N/mm² / 375 HB	1.7225	42CrMo4	1.3505	100Cr6
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	680 N/mm² / 200 HB	1.4021	X20Cr13	1.4034	X46Cr13
		P.3.2		Hardened and tempered	1100 N/mm² / 300 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
		P.3.3		Hardened and tempered	1300 N/mm² / 400 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	680 N/mm² / 200 HB	1.4016	X6Cr17	1.2316	X36CrMo16
		P.4.2	Martensitic	Tempered	1010 N/mm² / 300 HB	1.4112	X90CrMoV18	1.2316	X36CrMo16
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	610 N/mm² / 180 HB	1.4301	X5CrNi18-10	1.4571	X6CrNiMoTi17-12-2
		M.2.1	Austenitic	Tempered	300 HB	1.4841	X15CrNiSi25-21	1.4539	X1NiCrMoCu25-20-5
		M.3.1	Austenitic / ferritic (Duplex)		780 N/mm² / 230 HB	1.4462	X2CrNiMoN22-5-3	1.4501	X2CrNiMoCuWN25-7-4
K	Grey cast iron	K.1.1	Pearlitic / ferritic		350 N/mm² / 180 HB	0.6010	GG-10	0.6025	GG-25
		K.1.2	Pearlitic (martensitic)		500 N/mm² / 260 HB	0.6030	GG-30	0.6045	GG-45
	Spherulitic graphite cast iron	K.2.1	Ferritic		540 N/mm² / 160 HB	0.7040	GGG-40	0.7060	GGG-60
		K.2.2	Pearlitic		845 N/mm² / 250 HB	0.7070	GGG-70	0.7080	GGG-80
	Malleable iron	K.3.1	Ferritic		440 N/mm² / 130 HB	0.8035	GTW-35-04	0.8045	GTW-45
		K.3.2	Pearlitic		780 N/mm² / 230 HB	0.8165	GTS-65-02	0.8170	GTS-70-02
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	Al99,5	3.3315	AlMg1
		N.1.2	Hardenable	Age-hardened	340 N/mm² / 100 HB	3.1355	AlCuMg2	3.2315	AlMgSi1
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		250 N/mm² / 75 HB	3.2581	G-AlSi12	3.2163	G-AlSi9Cu3
		N.2.2	≤ 12 % Si, hardenable	Age-hardened	300 N/mm² / 90 HB	3.2134	G-AlSi5Cu1Mg	3.2373	G-AlSi9Mg
		N.2.3	> 12 % Si, non-hardenable		440 N/mm² / 130 HB		G-AlSi17Cu4Mg		G-AlSi18CuNiMg
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		375 N/mm² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0410	CuZn44Pb2
		N.3.2	CuZn, CuSnZn		300 N/mm² / 90 HB	2.0331	CuZn15	2.4070	CuZn28Sn1As
		N.3.3	CuSn, lead-free copper and electrolytic copper		340 N/mm² / 100 HB	2.0060	E-Cu57	2.0590	CuZn40Fe
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn	3.5312	MgAl3Zn
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	680 N/mm² / 200 HB	1.4864	X12NiCrSi 36-16	1.4865	G-X40NiCrSi38-18
		S.1.2		Age-hardened	950 N/mm² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4876	X10NiCrAlTi32-20
		S.2.1	Ni or Co basis	Annealed	840 N/mm² / 250 HB	2.4631	NiCr20TiAl (Nimonic80A)	3.4856	NiCr22Mo9Nb
		S.2.2		Age-hardened	1180 N/mm² / 350 HB	2.4668	NiCr19Nb5Mo3 (Inconel 718)	2.4955	NiFe25Cr20NbTi
		S.2.3		Cast	1080 N/mm² / 320 HB	2.4765	CoCr20W15Ni	1.3401	G-X120Mn12
	Titanium alloys	S.3.1	Pure titanium		400 N/mm²	3.7025	Ti99,8	3.7034	Ti99,7
		S.3.2	Alpha + beta alloys	Age-hardened	1050 N/mm² / 320 HB	3.7165	TiAl6V4	Ti-6246	Ti-6Al-2Sn-4Zr-6Mo
		S.3.3	Beta alloys		1400 N/mm² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr	R56410	Ti-10V-2Fe-3Al
H	Hardened steel	H.1.1		Hardened and tempered	46–55 HRC				
		H.1.2		Hardened and tempered	56–60 HRC				
		H.1.3		Hardened and tempered	61–65 HRC				
		H.1.4		Hardened and tempered	66–70 HRC				
	Chilled iron	H.2.1		Cast	400 HB				
	Hardened cast iron	H.3.1		Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic		≤ 150 N/mm²				
		O.1.2	Plastics, thermoplastic		≤ 100 N/mm²				
		O.2.1	Aramid fibre-reinforced		≤ 1000 N/mm²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 1000 N/mm²				
		O.3.1	Graphite						

*** Tensile strength**

Cutting data standard values – Hole depth 3xD

Index	10 122 ... Type VX-TiN		10 113 ... Type UNI-PM-TiN		10 107 ... Type UNI-TiN		10 105 ... Type N		10 130 ... Type VA	
	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1	46	6	44	6	46	6	28	6	38	5
P.1.2	39	5	37	5	39	5	24	5	32	4
P.1.3	35	5	33	5	35	5	21	5	29	4
P.1.4	32	5	31	5	32	5	20	5	27	4
P.1.5	28	5	26	5	28	5	17	5		
P.2.1	35	5	32	6	35	5	17	4	25	5
P.2.2	24	4	23	5	24	4	12	3	18	4
P.2.3	21	4	19	5	21	4	10	3		
P.2.4	19	3	18	4	19	3	9	2		
P.3.1	17	4	21	4	17	4	13	4		
P.3.2	13	3	16	3	13	3				
P.3.3	12	3	15	3	12	3				
P.4.1	18	4	14	3	18	4			15	3
P.4.2	17	3	14	2	17	3			14	2
M.1.1	15	4			15	4			13	3
M.2.1	12	3			12	3			11	2
M.3.1	10	3			10	3			9	2
K.1.1	41	6	46	6	41	6	30	6		
K.1.2	33	6	37	6	33	6	24	6		
K.2.1	35	6	39	6	35	6	26	6		
K.2.2	27	5	30	5	27	5	20	5		
K.3.1	35	6	39	6	35	6	26	6		
K.3.2	27	5	30	5	27	5	20	5		
N.1.1									80	7
N.1.2									80	7
N.2.1	75	6	69	6	75	6	50	6	65	6
N.2.2	60	5	55	5	60	5	40	5	52	5
N.2.3	52	5	48	5	52	5	35	5	46	5
N.3.1	69	5	64	5	69	5	60	5	60	5
N.3.2	41	4	39	4	41	4	36	4	36	4
N.3.3	55	4	52	4	55	4	48	4	48	4
N.4.1	70	5	60	5	70	5	45	5	6	5
S.1.1			7	2					8	1
S.1.2			6	1					6	1
S.2.1			6	2					7	1
S.2.2										
S.2.3										
S.3.1	9	2			9	2			10	2
S.3.2	6	1			6	1			7	1
S.3.3									6	2
H.1.1			6	1						
H.1.2										
H.1.3										
H.1.4										
H.2.1			10	3						
H.3.1										
O.1.1	29	4	23	4	29	4	20	5		
O.1.2	29	4			29	4	20	5		
O.2.1	29	4	23	4	29	4	20	5		
O.2.2	29	4	23	4	29	4	20	5		
O.3.1										

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.

Index	10 106 ... Type WNX		10 109 ... Type WT		10 110 ... Type WT-TiN		10 285 ... Type WT-MK	
	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1	38	6	38	6	44	6	38	6
P.1.2	32	5	32	5	37	5	32	5
P.1.3	29	5	29	5	33	5	29	5
P.1.4	27	5	27	5	31	5	27	5
P.1.5	23	5	23	5	26	5	23	5
P.2.1	28	6	25	5	29	5	25	5
P.2.2	20	5	18	4	20	4	18	4
P.2.3	17	5	15	4	17	4	15	4
P.2.4	15	4	14	3	16	3	14	3
P.3.1	18	4	16	4	18	4	16	4
P.3.2	14	3	12	3	14	3	12	3
P.3.3	13	3	12	3	14	3	12	3
P.4.1	13	3	14	3	17	3	14	3
P.4.2	12	2	14	2	16	2	14	2
M.1.1			12	3	14	3	12	3
M.2.1			10	2	12	2	10	2
M.3.1			8	2	10	2	8	2
K.1.1	40	6	35	6	40	6	35	6
K.1.2	32	6	28	6	32	6	28	6
K.2.1	34	6	30	6	34	6	30	6
K.2.2	26	5	23	5	26	5	23	5
K.3.1	34	6	30	6	34	6	30	6
K.3.2	26	5	23	5	26	5	23	5
N.1.1								
N.1.2								
N.2.1	60	6						
N.2.2	48	5						
N.2.3	42	5						
N.3.1	56	5	62	5	71	5	62	5
N.3.2	34	4	37	4	43	4	37	4
N.3.3	45	4						
N.4.1	55	5						
S.1.1	6	2	8	1	9	1	8	1
S.1.2	5	1	6	1	7	1	6	1
S.2.1	5	2	7	1	8	1	7	1
S.2.2					5	1		
S.2.3					6	1		
S.3.1			10	2	12	2	10	2
S.3.2			7	1	7	1	7	1
S.3.3			6	2	7	2	6	2
H.1.1	5	1	4	1	5	1	4	1
H.1.2								
H.1.3								
H.1.4								
H.2.1	9	3	8	3	9	3	8	3
H.3.1								
O.1.1	20	4						
O.1.2								
O.2.1	20	4						
O.2.2	20	4						
O.3.1								

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 54**

Cutting data standard values – Hole depth 5xD

Index	10 124 ... Type VX-TiN		10 173 ... Type UNI-PM-TiN		10 171 ... Type UNI-TiN		10 152 ... Type N		10 175 ... Type VA	
	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1	**46**	6	**44**	6	**46**	6	28	6	38	5
P.1.2	**39**	5	**37**	5	**39**	5	24	5	32	4
P.1.3	**35**	5	**33**	5	**35**	5	21	5	29	4
P.1.4	**32**	5	**31**	5	**32**	5	20	5	27	4
P.1.5	**28**	5	**26**	5	**28**	5	17	5		
P.2.1	**35**	5	**32**	6	**35**	5	17	4	25	5
P.2.2	**24**	4	**23**	5	**24**	4	12	3	18	4
P.2.3	**21**	4	**19**	5	**21**	4	10	3		
P.2.4	**19**	3	**18**	4	**19**	3	9	2		
P.3.1	**17**	4	**21**	4	**17**	4	13	4		
P.3.2	**13**	3	**16**	3	**13**	3				
P.3.3	**12**	3	**15**	3	**12**	3				
P.4.1	**18**	4	**14**	3	**18**	4			15	3
P.4.2	**17**	3	**14**	2	**17**	3			14	2
M.1.1	**15**	4			**15**	4			**13**	3
M.2.1	**14**	4			**14**	4			**12**	3
M.3.1	**10**	3			**10**	3			**9**	2
K.1.1	**41**	6	**46**	6	**41**	6	**30**	6		
K.1.2	**33**	6	**37**	6	**33**	6	**24**	6		
K.2.1	**35**	6	**39**	6	**35**	6	**26**	6		
K.2.2	**27**	5	**30**	5	**27**	5	**20**	5		
K.3.1	**35**	6	**39**	6	**35**	6	**26**	6		
K.3.2	**27**	5	**30**	5	**27**	5	**20**	5		
N.1.1									**80**	7
N.1.2									**80**	7
N.2.1	75	6	69	6	75	6	50	6	**65**	6
N.2.2	60	5	55	5	60	5	40	5	**52**	5
N.2.3	52	5	48	5	52	5	35	5	**46**	5
N.3.1	69	5	64	5	69	5	60	5	**60**	5
N.3.2	41	4	39	4	41	4	36	4	**36**	4
N.3.3	55	4	52	4	55	4	48	4	**48**	4
N.4.1	75	6	65	6	70	6	45	6	**60**	6
S.1.1			7	2					8	1
S.1.2			6	1					6	1
S.2.1			6	2					7	1
S.2.2										
S.2.3										
S.3.1	9	2			9	2			10	2
S.3.2	6	1			6	1			7	1
S.3.3									6	1
H.1.1			6	1						
H.1.2										
H.1.3										
H.1.4										
H.2.1			10	3						
H.3.1										
O.1.1	29	4	23	4	29	4	20	5		
O.1.2	29	4			29	4	20	5		
O.2.1	29	4	23	4	29	4	20	5		
O.2.2	29	4	23	4	29	4	20	5		
O.3.1										

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.

Index	10 161 ... Type W		10 168 ... Type WTL		10 170 ... Type WTL-TiN		10 265 ... Type N-MK		10 280 ... Type WTL-MK	
	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1			**32**	6	**37**	6	28	6	**32**	6
P.1.2			**27**	5	**31**	5	24	5	**27**	5
P.1.3			**24**	5	**28**	5	21	5	**24**	5
P.1.4			**23**	5	**26**	5	20	5	**23**	5
P.1.5			**19**	5	**22**	5	17	5	**19**	5
P.2.1			**20**	5	**22**	5	17	4	**20**	5
P.2.2			**14**	4	**16**	4	12	3	**14**	4
P.2.3			**12**	4	**13**	4	10	3	**12**	4
P.2.4			**11**	3	**12**	3	9	2	**11**	3
P.3.1			**15**	4	**17**	4	13	4	**15**	4
P.3.2			**11**	3	**13**	3			**11**	3
P.3.3			**10**	3	**12**	3			**10**	3
P.4.1			**10**	3	**12**	3			**10**	3
P.4.2			**10**	2	**11**	2			**10**	2
M.1.1			9	3	11	3			9	3
M.2.1			8	2					8	2
M.3.1										
K.1.1			**35**	6	**40**	6	**30**	6	**35**	6
K.1.2			**28**	6	**32**	6	**24**	6	**28**	6
K.2.1			**29**	6	**34**	6	**26**	6	**29**	6
K.2.2			**22**	5	**26**	5	**20**	5	**22**	5
K.3.1			**29**	6	**34**	6	**26**	6	**29**	6
K.3.2			**22**	5	**26**	5	**20**	5	**22**	5
N.1.1	**70**	7	**69**	7					**69**	7
N.1.2	**70**	7	**69**	7					**69**	7
N.2.1	**60**	6	**58**	6	66	6	50	6	**58**	6
N.2.2			**46**	5	53	5	40	5	**46**	5
N.2.3			**40**	5	46	5	35	5	**40**	5
N.3.1			**69**	5	79	5	60	5	**69**	5
N.3.2			**41**	4	48	4	36	4	**41**	4
N.3.3	**56**	4	**55**	4	63	4	48	4	**55**	4
N.4.1	**60**	6	**6**	6	60	6	45	6	**50**	6
S.1.1			7	2	8	2			7	2
S.1.2			6	1	6	1			6	1
S.2.1			6	2	7	2			6	2
S.2.2			3	1	4	1			3	1
S.2.3			4	1	5	1			4	1
S.3.1			6	2	7	2			6	2
S.3.2			4	1	4	1			4	1
S.3.3										
H.1.1			5	1	5	1			5	1
H.1.2										
H.1.3										
H.1.4										
H.2.1			9	3	11	3			9	3
H.3.1										
O.1.1			23	4	26	4	20	5	23	4
O.1.2			23	4	26	4	20	5	23	4
O.2.1			23	4	26	4	20	5	23	4
O.2.2			23	4	26	4	20	5	23	4
O.3.1										

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 54**

Cutting data standard values – Hole depth 10xD

Index	10 224 ... Type NC-TiALN		10 270 ... Type UNI-TiN		10 225 ... Type WTL		10 210 ... Type WTL-TiN	
	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1	41	7	**41**	6	**29**	6	29	6
P.1.2	34	6	**35**	5	**25**	5	25	5
P.1.3	30	6	**31**	5	**22**	5	22	5
P.1.4	28	6	**29**	5	**20**	5	20	5
P.1.5	24	6	**25**	5	**17**	5	17	5
P.2.1	25	5	**31**	5	**18**	5	18	5
P.2.2	17	4	**22**	4	**12**	4	12	4
P.2.3	15	4	**19**	4	**11**	4	11	4
P.2.4	14	3	**17**	3	**10**	3	10	3
P.3.1	19	5	**16**	4	**13**	4	13	4
P.3.2			**12**	3	**10**	3	10	3
P.3.3			**10**	2	**8**	3	8	3
P.4.1	13	4	**16**	4	**9**	3		
P.4.2	12	3	**15**	3	**9**	2		
M.1.1	12	4	**13**	4	8	3		
M.2.1	8	3	**8**	3	2	2		
M.3.1			**9**	3				
K.1.1	**43**	7	**37**	6	**31**	6	**31**	6
K.1.2	**35**	7	**30**	6	**25**	6	**25**	6
K.2.1	**37**	7	**32**	6	**26**	6	**26**	6
K.2.2	**28**	6	**24**	5	**20**	5	**20**	5
K.3.1	**37**	7	**32**	6	**26**	6	**26**	6
K.3.2	**28**	6	**24**	5	**20**	5	**20**	5
N.1.1					**62**	7		
N.1.2					**62**	7		
N.2.1	72	7	67	6	**52**	6	52	6
N.2.2	58	6	54	5	**41**	5	41	5
N.2.3	51	6	47	5	**36**	5	36	5
N.3.1	87	6	62	5	**62**	5	62	5
N.3.2	52	5	37	4	**37**	4	37	4
N.3.3	70	5	50	4	**50**	4	50	4
N.4.1	50	6	50	6	**50**	6	50	5
S.1.1					6	2		
S.1.2					5	1		
S.2.1					5	2		
S.2.2					3	1		
S.2.3					4	1		
S.3.1			8	2	5	2		
S.3.2			5	1	3	1		
S.3.3								
H.1.1					4	1		
H.1.2								
H.1.3								
H.1.4								
H.2.1					8	3		
H.3.1								
O.1.1	29	6	26	4	21	4	21	4
O.1.2	29	6	26	4	21	4	21	4
O.2.1	29	6	26	4	21	4	21	4
O.2.2	29	6	26	4	21	4	21	4
O.3.1								

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.

Index	10 200 ... Type WTW		10 295 ... Type N-MK		10 297 ... Type WTL-MK	
	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1			25	6	**29**	6
P.1.2			21	5	**25**	5
P.1.3			19	5	**22**	5
P.1.4			18	5	**20**	5
P.1.5			15	5	**17**	5
P.2.1			15	4	**18**	5
P.2.2			11	3	**12**	4
P.2.3			9	3	**11**	4
P.2.4			8	2	**10**	3
P.3.1			12	4	**13**	4
P.3.2					**10**	3
P.3.3					**8**	3
P.4.1					**9**	3
P.4.2					**9**	2
M.1.1					8	3
M.2.1					2	2
M.3.1						
K.1.1			**27**	6	**31**	6
K.1.2			**22**	6	**25**	6
K.2.1			**23**	6	**26**	6
K.2.2			**18**	5	**20**	5
K.3.1			**23**	6	**26**	6
K.3.2			**18**	5	**20**	5
N.1.1	**72**	7			**62**	7
N.1.2	**72**	7			**62**	7
N.2.1			45	6	**52**	6
N.2.2			36	5	**41**	5
N.2.3			32	5	**36**	5
N.3.1			54	5	**62**	5
N.3.2			32	4	**37**	4
N.3.3			43	4	**50**	4
N.4.1			60	6	**50**	6
S.1.1					6	2
S.1.2					5	1
S.2.1					5	2
S.2.2					3	1
S.2.3					4	1
S.3.1					5	2
S.3.2					3	1
S.3.3						
H.1.1					4	1
H.1.2						
H.1.3						
H.1.4						
H.2.1					8	3
H.3.1						
O.1.1			18	5	21	4
O.1.2			18	5	21	4
O.2.1			18	5	21	4
O.2.2			18	5	21	4
O.3.1						

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 54**

Cutting data standard values – hole depth greater than 10xD

Index	10 235 ... Type WTL-R1		10 245 ... Type WTL-R2		10 255 ... Type WTL-R3		10 236 ... Type WTL-TiAlN-R1	
	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1	21	5	21	5	21	5	24	5
P.1.2	18	4	18	4	18	4	21	4
P.1.3	16	4	16	4	16	4	18	4
P.1.4	15	4	15	4	15	4	17	4
P.1.5	13	4	13	4	13	4	14	4
P.2.1	13	4	13	4	13	4	15	4
P.2.2	9	3	9	3	9	3	10	3
P.2.3	8	3	8	3	8	3	9	3
P.2.4	7	2	7	2	7	2	8	2
P.3.1	10	3	10	3	10	3	11	3
P.3.2	7	2	7	2	7	2	8	2
P.3.3	6	2	6	2	6	2	7	2
P.4.1								
P.4.2								
M.1.1								
M.2.1								
M.3.1								
K.1.1	23	5	23	5	23	5	26	5
K.1.2	18	5	18	5	18	5	21	5
K.2.1	19	5	19	5	19	5	22	5
K.2.2	15	4	15	4	15	4	17	4
K.3.1	19	5	19	5	19	5	22	5
K.3.2	15	4	15	4	15	4	17	4
N.1.1	45	6	45	6	45	6	52	6
N.1.2	45	6	45	6	45	6	52	6
N.2.1	38	5	38	5	38	5	43	5
N.2.2	30	4	30	4	30	4	35	4
N.2.3	26	4	26	4	26	4	30	4
N.3.1	45	4	45	4	45	4	52	4
N.3.2	27	3	27	3	27	3	31	3
N.3.3	36	3	36	3	36	3	41	3
N.4.1	55	5	55	5	55	5	60	6
S.1.1								
S.1.2								
S.2.1								
S.2.2								
S.2.3								
S.3.1								
S.3.2								
S.3.3								
H.1.1								
H.1.2								
H.1.3								
H.1.4								
H.2.1								
H.3.1								
O.1.1	15	3	15	3	15	3	17	3
O.1.2	15	3	15	3	15	3	17	3
O.2.1	15	3	15	3	15	3	17	3
O.2.2	15	3	15	3	15	3	17	3
O.3.1								

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.

Index	10 246 ... Type WTL-TiAlN-R2		10 256 ... Type WTL-TiAlN-R3		10 305 ... Type WTL-MK-R1		10 315 ... Type WTL-MK-R2	
	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1	24	5	24	5	21	5	21	5
P.1.2	21	4	21	4	18	4	18	4
P.1.3	18	4	18	4	16	4	16	4
P.1.4	17	4	17	4	15	4	15	4
P.1.5	14	4	14	4	13	4	13	4
P.2.1	15	4	15	4	13	4	13	4
P.2.2	10	3	10	3	9	3	9	3
P.2.3	9	3	9	3	8	3	8	3
P.2.4	8	2	8	2	7	2	7	2
P.3.1	11	3	11	3	10	3	10	3
P.3.2	8	2	8	2	7	2	7	2
P.3.3	7	2	7	2	6	2	6	2
P.4.1								
P.4.2								
M.1.1								
M.2.1								
M.3.1								
K.1.1	26	5	26	5	23	5	23	5
K.1.2	21	5	21	5	18	5	18	5
K.2.1	22	5	22	5	19	5	19	5
K.2.2	17	4	17	4	15	4	15	4
K.3.1	22	5	22	5	19	5	19	5
K.3.2	17	4	17	4	15	4	15	4
N.1.1	52	6	52	6	45	6	45	6
N.1.2	52	6	52	6	45	6	45	6
N.2.1	43	5	43	5	38	5	38	5
N.2.2	35	4	35	4	30	4	30	4
N.2.3	30	4	30	4	26	4	26	4
N.3.1	52	4	52	4	45	4	45	4
N.3.2	31	3	31	3	27	3	27	3
N.3.3	41	3	41	3	36	3	36	3
N.4.1	60	6	60	6	55	5	55	5
S.1.1								
S.1.2								
S.2.1								
S.2.2								
S.2.3								
S.3.1								
S.3.2								
S.3.3								
H.1.1								
H.1.2								
H.1.3								
H.1.4								
H.2.1								
H.3.1								
O.1.1	17	3	17	3	15	3	15	3
O.1.2	17	3	17	3	15	3	15	3
O.2.1	17	3	17	3	15	3	15	3
O.2.2	17	3	17	3	15	3	15	3
O.3.1								

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 54**

Cutting data standard values – micro drills

Index	v_c m/min	10 103 ...						
		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
		f (mm/rev)						
P.1.1	33	0,009	0,011	0,015	0,019	0,026	0,031	0,050
P.1.2	28	0,007	0,009	0,011	0,014	0,020	0,024	0,041
P.1.3	25	0,007	0,009	0,011	0,014	0,020	0,024	0,041
P.1.4	23	0,007	0,009	0,011	0,014	0,020	0,024	0,041
P.1.5	20	0,007	0,009	0,011	0,014	0,020	0,024	0,041
P.2.1	20	0,005	0,007	0,009	0,011	0,015	0,020	0,035
P.2.2	14	0,004	0,005	0,007	0,008	0,012	0,016	0,029
P.2.3	12	0,004	0,005	0,007	0,008	0,012	0,016	0,029
P.2.4	11	0,003	0,004	0,005	0,007	0,009	0,013	0,024
P.3.1	15	0,005	0,007	0,009	0,011	0,015	0,020	0,035
P.3.2	11	0,004	0,005	0,007	0,008	0,012	0,016	0,029
P.3.3	10	0,004	0,005	0,007	0,008	0,012	0,016	0,029
P.4.1	11	0,004	0,005	0,007	0,008	0,012	0,016	0,029
P.4.2	10	0,003	0,004	0,005	0,007	0,009	0,013	0,024
M.1.1	9	0,004	0,005	0,007	0,008	0,012	0,016	0,029
M.2.1	8	0,004	0,005	0,007	0,008	0,012	0,016	0,029
M.3.1								
K.1.1	35	0,009	0,011	0,015	0,019	0,026	0,031	0,050
K.1.2	28	0,009	0,011	0,015	0,019	0,026	0,031	0,050
K.2.1	30	0,009	0,011	0,015	0,019	0,026	0,031	0,050
K.2.2	23	0,007	0,009	0,011	0,014	0,020	0,024	0,041
K.3.1	30	0,009	0,011	0,015	0,019	0,026	0,031	0,050
K.3.2	23	0,007	0,009	0,011	0,014	0,020	0,024	0,041
N.1.1	70	0,012	0,014	0,019	0,024	0,034	0,038	0,060
N.1.2	70	0,012	0,014	0,019	0,024	0,034	0,038	0,060
N.2.1	59	0,009	0,011	0,015	0,019	0,026	0,031	0,050
N.2.2	47	0,007	0,009	0,011	0,014	0,020	0,024	0,041
N.2.3	41	0,007	0,009	0,011	0,014	0,020	0,024	0,041
N.3.1	70	0,007	0,009	0,011	0,014	0,020	0,024	0,041
N.3.2	42	0,005	0,007	0,009	0,011	0,015	0,020	0,035
N.3.3	56	0,005	0,007	0,009	0,011	0,015	0,020	0,035
N.4.1	42	0,007	0,009	0,011	0,014	0,020	0,024	0,041
S.1.1	7	0,003	0,004	0,005	0,007	0,009	0,013	0,024
S.1.2	6	0,002	0,003	0,004	0,005	0,007	0,010	0,020
S.2.1	6	0,003	0,004	0,005	0,007	0,009	0,013	0,024
S.2.2	4	0,002	0,003	0,004	0,005	0,007	0,010	0,020
S.2.3	4	0,002	0,003	0,004	0,005	0,007	0,010	0,020
S.3.1	6	0,003	0,004	0,005	0,007	0,009	0,013	0,024
S.3.2	4	0,002	0,003	0,004	0,005	0,007	0,010	0,020
S.3.3								
H.1.1								
H.1.2								
H.1.3								
H.1.4								
H.2.1								
H.3.1								
O.1.1	23	0,007	0,009	0,011	0,014	0,020	0,024	0,041
O.1.2	23	0,007	0,009	0,011	0,014	0,020	0,024	0,041
O.2.1	23	0,007	0,009	0,011	0,014	0,020	0,024	0,041
O.2.2	23	0,007	0,009	0,011	0,014	0,020	0,024	0,041
O.3.1								

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.

Cutting data standard values – NC spot drills, Centre drills, Core drills, Stepped drills

Index	10 510 ... / 10 520 ... / 10 521 ... / 10 526 ... / 10 525 ...		10 512 ... / 10 522 ... / 10 513 ... / 10 523 ... / 10 532 ... / 10 528 ...		10 480 ... / 10 415 ... / 10 435 ... / 10 445 ... / 10 455 ... / 10 475 ...		10 425 ...		10 228 ... / 10 365 ... / 10 355 ... / 10 320 ... / 10 330 ... / 10 375 ... / 10 340 ... / 10 405 ... / 10 350 ...	
	Type NC-A		Type NC-A TiN		Type ZB		Type ZB TiN		Type N / SB / SB vap.	
	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F	v_c m/min	F
P.1.1	28	6	32	6	28	6	32	6	28	6
P.1.2	24	5	27	5	24	5	27	5	24	5
P.1.3	24	5	27	5	24	5	27	5	24	5
P.1.4	20	5	23	5	20	5	23	5	20	5
P.1.5	17	5	19	5	17	5	19	5	17	5
P.2.1	17	4	20	4	17	4	20	4	17	4
P.2.2	12	3	14	3	12	3	14	3	12	3
P.2.3	10	3	12	3	10	3	12	3	10	3
P.2.4	9	2	11	2	9	2	11	2	9	2
P.3.1	13	4	15	4	13	4	15	4	13	4
P.3.2	13	4	15	4	13	4	15	4	13	4
P.3.3										
P.4.1	9	3	10	3	9	3	10	3	9	3
P.4.2	8	2	9	2	9	2	10	2	9	2
M.1.1	8	3	9	3	8	3	9	3	8	3
M.2.1	7	2	8	2	7	2	9	2	7	2
M.3.1	7	2	8	2	6	2	7	2	6	2
K.1.1	30	6	35	6	30	6	35	6	30	6
K.1.2	24	6	28	6	24	6	28	6	24	6
K.2.1	26	6	29	6	26	6	29	6	26	6
K.2.2	20	5	22	5	20	5	22	5	20	5
K.3.1	26	6	29	6	26	6	29	6	26	6
K.3.2	20	5	22	5	20	5	22	5	20	5
N.1.1	60	6	65	6	60	7	65	7	60	7
N.1.2	60	6	65	6	60	7	65	7	60	7
N.2.1	50	6	58	6	50	6	58	6	50	6
N.2.2	40	5	46	5	40	5	46	5	40	5
N.2.3	35	5	40	5	35	5	40	5	35	5
N.3.1	60	5	69	5	60	5	69	5	60	5
N.3.2	36	4	41	4	36	4	41	4	36	4
N.3.3	48	4	55	4	48	4	55	4	48	4
N.4.1	20	5	23	5	20	5	23	5	20	5
S.1.1	6	2	7	2	6	2	7	2	6	2
S.1.2	5	1	6	1	5	1	6	1	5	1
S.2.1	5	2	6	2	5	2	6	2	5	2
S.2.2	3	1	3	1	3	1	3	1	3	1
S.2.3	4	1	4	1	4	1	4	1	4	1
S.3.1	5	2	6	2	5	2	6	2	5	2
S.3.2	3	1	4	1	3	1	4	1	3	1
S.3.3										
H.1.1										
H.1.2										
H.1.3										
H.1.4										
H.2.1										
H.3.1										
O.1.1	20	5	23	5	20	5	23	5	20	5
O.1.2	20	5	23	5	20	5	23	5	20	5
O.2.1										
O.2.2	20	5	23	5	20	5	23	5	20	5
O.3.1										

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 54**

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

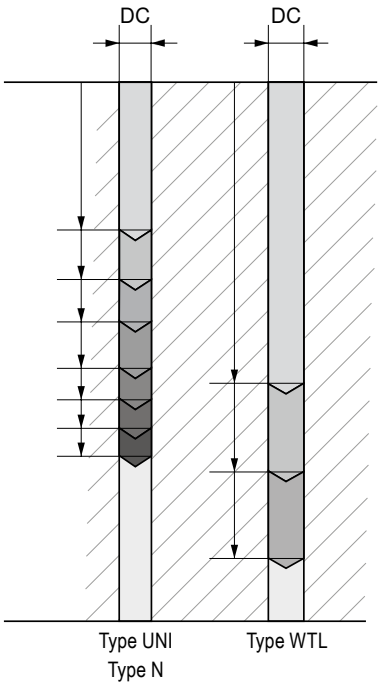
All the indicated data are guide values only and represent average values.

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	12.500	10.000	8.000	6.300	5.000	4.000	3.200	2.500	2.000	1.600	1.250	1.000	800	630	500	400	320
63	10.000	8.000	6.300	5.000	4.000	3.200	2.500	2.000	1.600	1.250	1.000	800	630	500	400	320	250
50	8.000	6.300	5.000	4.000	3.200	2.500	2.000	1.600	1.250	1.000	800	630	500	400	320	250	200
40	6.300	5.000	4.000	3.200	2.500	2.000	1.600	1.250	1.000	800	630	500	400	320	250	200	160
32	5.000	4.000	3.200	2.500	2.000	1.600	1.250	1.000	800	630	500	400	320	250	200	160	125
25	4.000	3.200	2.500	2.000	1.600	1.250	1.000	800	630	500	400	320	250	200	160	125	100
20	3.200	2.500	2.000	1.600	1.250	1.000	800	630	500	400	320	250	200	160	125	100	80
16	2.500	2.000	1.600	1.250	1.000	800	630	500	400	320	250	200	160	125	100	80	63
12	2.000	1.600	1.250	1.000	800	630	500	400	320	250	200	160	125	100	80	63	50
10	1.600	1.250	1.000	800	630	500	400	320	250	200	160	125	100	80	63	50	40
8	1.250	1.000	800	630	500	400	320	250	200	160	125	100	80	63	50	40	32
6	1.000	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

- Cutting edge needs to be sufficiently cooled; this is achieved by removing chips from the hole
- Chip removal frequency depends on the material to be machined, the hole depth and the drill type used
- Using a drill with a flat flute profile (WTL) significantly improves chip transport, which makes it possible to reduce the number of chip removal processes
- When drilling into tough materials and materials that tend to jam, chips should be removed for hole depths ≥ 4xD and the cutting speed v_c reduced as follows: by 10% for hole depths > 4xD, by 15-20% for hole depths > 6xD. It is also recommended to cool using emulsion.
- In the case of deep holes and to improve the positional accuracy, it is recommended to bore a pilot/centring hole.
- Drills with coolant holes and a thro' coolant supply are recommended for extremely deep holes or horizontal drilling applications



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

F.-nit
- Titanium carbon nitride based PVD coating particularly suitable for steel machining
- Applicable up to approx. 450°C

Cutting materials

HSS
- Conventional high speed steel
- Universal cutting material

HSS-E
- Cobalt-alloyed high speed steel
- Cutting material with increased elevated-temperature hardness and heat resistance as well as wear resistance
- Suitable for high cutting temperatures and difficult-to-machine materials

HSS-E-PM
- Cobalt-alloyed high speed steel, produced using powder metallurgy
- Cutting material with a very tight and homogeneous structure
- High hardness, heat resistance and wear resistance