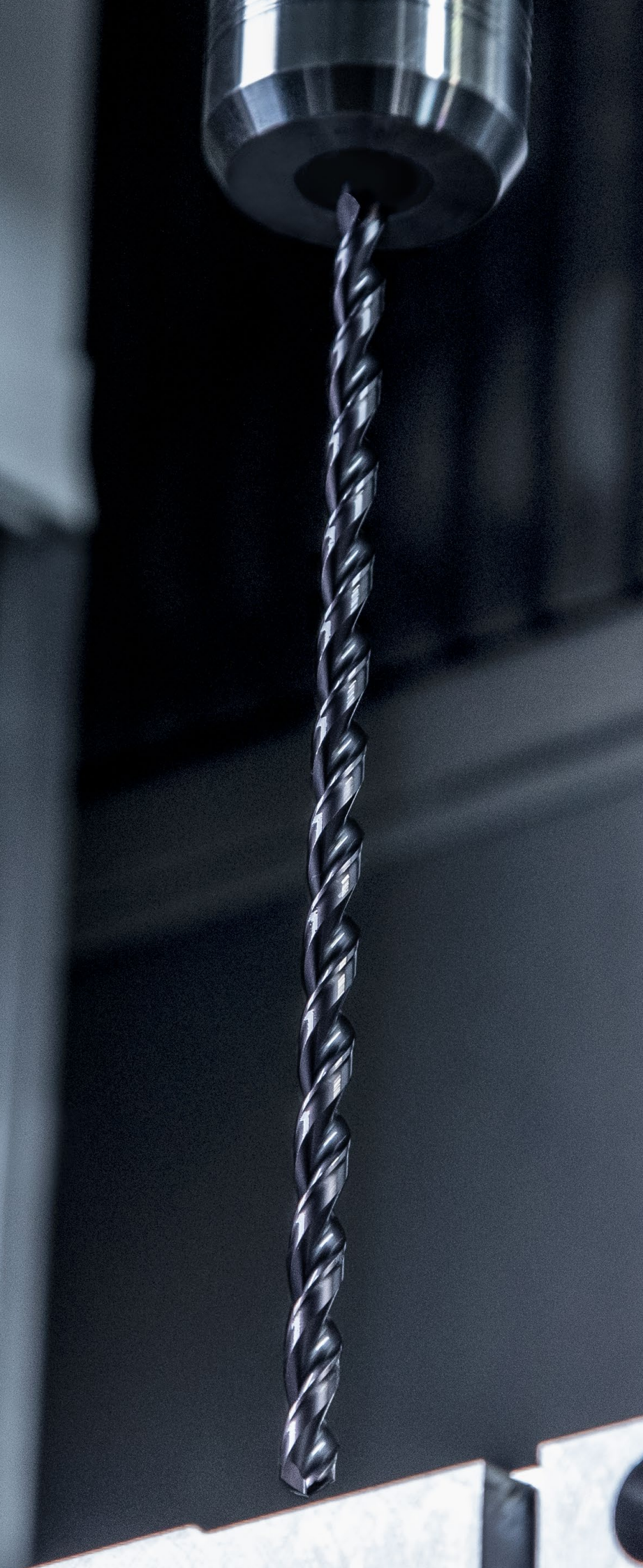






1 HSS drilling

2 Solid carbide drilling

3 Indexable insert drilling

4 Reaming and Countersinking

5 Spindle Tooling

6 Taps and thread formers

7 Circular and Thread Milling

8 Thread turning

9 Turning Tools

10 Multifunctional Tools –
EcoCut and FreeTurn

11 Grooving Tools

12 Miniature turning tools

13 HSS Milling Cutters

14 Solid Carbide milling cutters

15 Milling tools with indexable inserts

16 Adaptors and Accessories

17 Workpiece clamping

18 Material examples

Solid drilling and bore machining

Threading

Turning

Milling

Clamping technology

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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 angled clamping flat „Whistle Notch“



Morse taper



Cylindrical shank with lateral driving face „Weldon“

Version



Int. coolant supply



self-centering

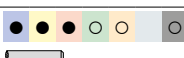
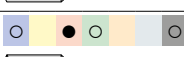
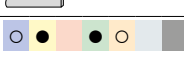
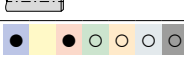
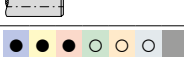
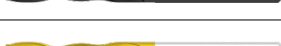
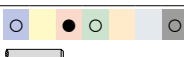
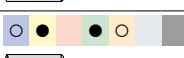
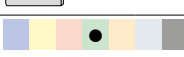
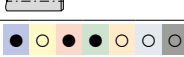
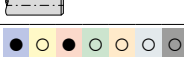
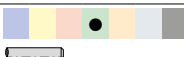
- = Main Application
- = Extended application



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/mm ² ▲ for deep holes			24–26			

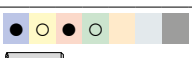
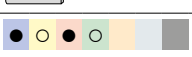
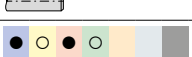
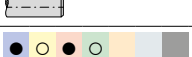
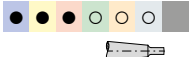
HSS Drills Overview

	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 Stainless steel Cast iron Non-ferrous metals Heat-resistant Tempered steel Non metal materials	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

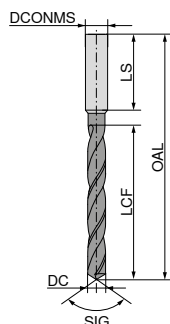
HSS Drills Overview

	Tool type	Cutting material Coating	Point angle SIG	Diameter in mm DC	Steel Stainless steel Cast iron Non-ferrous metals Heat-resistant Tempered steel Non metal materials		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

SIG 118°
HSS-E

10 122 ...

DC _{h8} mm	OAL mm	LCF mm	DCONMS _{h6} mm	LS mm	
2,00	44	12	3	28	020
2,10	44	12	3	28	021
2,20	45	13	3	28	022
2,30	45	13	3	28	023
2,40	46	14	3	28	024
2,50	46	14	3	28	025
2,60	46	14	3	28	026
2,70	48	16	3	28	027
2,80	48	16	3	28	028
2,90	48	16	3	28	029
3,00	48	16	3	28	030
3,10	50	18	4	28	031
3,20	50	18	4	28	032
3,30	50	18	4	28	033
3,40	52	20	4	28	034
3,50	52	20	4	28	035
3,60	52	20	4	28	036
3,70	52	20	4	28	037
3,80	54	22	4	28	038
3,90	54	22	4	28	039
4,00	54	22	4	28	040
4,10	66	22	6	36	041
4,20	66	22	6	36	042
4,30	68	24	6	36	043
4,40	68	24	6	36	044
4,50	68	24	6	36	045
4,60	68	24	6	36	046
4,70	68	24	6	36	047
4,80	70	26	6	36	048
4,90	70	26	6	36	049
5,00	70	26	6	36	050
5,10	70	26	6	36	051
5,20	70	26	6	36	052
5,30	70	26	6	36	053
5,40	72	28	6	36	054
5,50	72	28	6	36	055
5,55	72	28	6	36	055
5,60	72	28	6	36	056
5,70	72	28	6	36	057
5,80	72	28	6	36	058
5,90	72	28	6	36	059
6,00	72	28	6	36	060
6,10	75	31	8	36	061
6,20	75	31	8	36	062
6,30	75	31	8	36	063
6,40	75	31	8	36	064
6,50	75	31	8	36	065
6,60	75	31	8	36	066
6,70	75	31	8	36	067
6,80	78	34	8	36	068
6,90	78	34	8	36	069
7,00	78	34	8	36	070
7,10	78	34	8	36	071

10 122 ...

DC _{h8} mm	OAL mm	LCF mm	DCONMS _{h6} mm	LS mm	
7,20	78	34	8	36	072
7,30	78	34	8	36	073
7,40	78	34	8	36	074
7,45	78	34	8	36	0745
7,50	78	34	8	36	075
7,60	81	37	8	36	076
7,70	81	37	8	36	077
7,80	81	37	8	36	078
7,90	81	37	8	36	079
8,00	81	37	8	36	080
8,10	87	37	10	40	081
8,20	87	37	10	40	082
8,30	87	37	10	40	083
8,40	87	37	10	40	084
8,50	87	37	10	40	085
8,60	91	40	10	40	086
8,70	91	40	10	40	087
8,80	91	40	10	40	088
8,90	91	40	10	40	089
9,00	91	40	10	40	090
9,10	91	40	10	40	091
9,20	91	40	10	40	092
9,30	91	40	10	40	093
9,35	91	40	10	40	0935
9,40	91	40	10	40	094
9,50	91	40	10	40	095
9,60	93	43	10	40	096
9,70	93	43	10	40	097
9,80	93	43	10	40	098
9,90	93	43	10	40	099
10,00	93	43	10	40	100
10,20	100	43	12	45	102
10,30	100	43	12	45	103
10,50	100	43	12	45	105
10,70	104	47	12	45	107
10,80	104	47	12	45	108
11,00	104	47	12	45	110
11,10	104	47	12	45	111
11,50	104	47	12	45	115
11,70	104	47	12	45	117
11,80	104	47	12	45	118
11,90	108	51	12	45	119
12,00	108	51	12	45	120
12,10	111	51	16	48	121
12,30	111	51	16	48	123
12,50	111	51	16	48	125
12,70	111	51	16	48	127
12,80	111	51	16	48	128
13,00	111	51	16	48	130
13,50	114	54	16	48	135
14,00	114	54	16	48	140
14,50	116	56	16	48	145
15,00	116	56	16	48	150
15,50	118	58	16	48	155
16,00	118	58	16	48	160
16,50	126	60	20	50	165
17,00	126	60	20	50	170
17,50	128	62	20	50	175
18,00	128	62	20	50	180
18,50	130	64	20	50	185
19,00	130	64	20	50	190
19,50	132	66	20	50	195
20,00	132	66	20	50	200

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° 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							
0,40		19	2,5			004 ¹⁾			00400 ¹⁾	
0,50		20	3,0			005 ¹⁾			00500 ¹⁾	
0,55		21	3,5						00550 ¹⁾	
0,60		21	3,5			006 ¹⁾			00600 ¹⁾	
0,65		22	4,0						00650 ¹⁾	
0,70		23	4,5			007 ¹⁾			00700 ¹⁾	
0,75		23	4,5						00750 ¹⁾	
0,80		24	5,0			008 ¹⁾			00800 ¹⁾	
0,85		24	5,0						00850 ¹⁾	
0,90		25	5,5			009 ¹⁾			00900 ¹⁾	
0,95		25	5,5						00950 ¹⁾	
1,00		26	6,0	010 ²⁾	010 ²⁾	010 ¹⁾	010	010	01000 ¹⁾	010
1,05		26	6,0						01050 ¹⁾	
1,10		28	7,0	011 ²⁾	011 ²⁾	011 ¹⁾	011	011	01100 ¹⁾	011
1,15		28	7,0						01150 ¹⁾	
1,20		30	8,0	012 ²⁾	012 ²⁾	012 ¹⁾	012	012	01200 ¹⁾	012
1,25		30	8,0						01250 ¹⁾	
1,30		30	8,0	013 ²⁾	013 ²⁾	013 ¹⁾	013	013	01300 ¹⁾	013
1,35		32	9,0						01350 ¹⁾	
1,40		32	9,0	014 ²⁾	014 ²⁾	014 ¹⁾	014	014	01400 ¹⁾	014
1,45		32	9,0						01450 ¹⁾	
1,50		32	9,0	015 ²⁾	015 ²⁾	015 ¹⁾	015	015	01500 ¹⁾	015
1,55		34	10,0						01550 ¹⁾	
1,60		34	10,0	016 ²⁾	016 ²⁾	016 ¹⁾	016	016	01600 ¹⁾	016
1,65		34	10,0						01650 ¹⁾	
1,70		34	10,0	017 ²⁾	017 ²⁾	017 ¹⁾	017	017	01700 ¹⁾	017
1,75		36	11,0						01750 ¹⁾	
1,80		36	11,0	018 ²⁾	018 ²⁾	018 ¹⁾	018	018	01800 ¹⁾	018
1,83		36	11,0						01830 ¹⁾	
1,85		36	11,0						01850 ¹⁾	
1,90		36	11,0	019 ²⁾	019 ²⁾	019 ¹⁾	019	019	01900 ¹⁾	019
1,95		38	12,0						01950 ¹⁾	
2,00		38	12,0	020 ²⁾	020 ²⁾	020 ¹⁾	020	020	02000 ¹⁾	020
2,05		38	12,0						02050 ¹⁾	
2,10		38	12,0	021 ²⁾	021 ²⁾	021 ¹⁾	021	021	02100 ¹⁾	021
2,15		40	13,0						02150 ¹⁾	
2,20		40	13,0	022 ²⁾	022 ²⁾	022 ¹⁾	022	022	02200 ¹⁾	022
2,25		40	13,0						02250 ¹⁾	
2,30		40	13,0	023 ²⁾	023 ²⁾	023 ¹⁾	023	023	02300 ¹⁾	023
2,35		40	13,0						02350 ¹⁾	
2,38	3/32	43	14,0	238 ²⁾	238 ²⁾					
2,40		43	14,0	024 ²⁾	024 ²⁾	024	024	024	02400	024
2,45		43	14,0						02450	
2,50		43	14,0	025 ²⁾	025 ²⁾	025	025	025	02500	025
2,55		43	14,0						02550	
2,60		43	14,0	026 ²⁾	026 ²⁾	026	026	026	02600	026
2,65		43	14,0						02650	
2,70		46	16,0	027 ²⁾	027 ²⁾	027	027	027	02700	027
P				●	●	○	○	●	●	●
M					●		●		●	●
K				●	●	●		●	●	●
N				○	○	○	●	○	○	○
S				○	○		○	○	○	●
H				○				○	○	○
O				○	○	○		○		

- 1) uncoated
2) self-centering

→ v_c Page 44+45

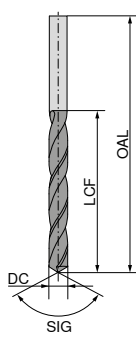
High-performance twist drills similar to DIN 1897, extra-short

≤ 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							
2,75		46	16,0						02750	
2,78	7/64	46	16,0	278 ²⁾	278 ²⁾					
2,80		46	16,0	028 ²⁾	028 ²⁾	028	028	028	02800	028
2,85		46	16,0						02850	
2,90		46	16,0	029 ²⁾	029 ²⁾	029	029	029	02900	029
2,95		46	16,0						02950	
3,00		46	16,0	030 ²⁾	030 ²⁾	030	030	030	03000	030
3,05		49	18,0						03050	
3,10		49	18,0	031 ²⁾	031 ²⁾	031	031	031	03100	031
3,15		49	18,0						03150	
3,17	1/8	49	18,0	317 ²⁾	317 ²⁾					
3,20		49	18,0	032 ²⁾	032 ²⁾	032	032	032	03200	032
3,25		49	18,0						03250	
3,30		49	18,0	033 ²⁾	033 ²⁾	033	033	033	03300	033
3,35		49	18,0						03350	
3,40		52	20,0	034 ²⁾	034 ²⁾	034	034	034	03400	034
3,45		52	20,0						03450	
3,50		52	20,0	035 ²⁾	035 ²⁾	035	035	035	03500	035
3,55		52	20,0						03550	
3,57	9/64	52	20,0	357 ²⁾	357 ²⁾					
3,60		52	20,0	036 ²⁾	036 ²⁾	036	036	036	03600	036
3,70		52	20,0	037 ²⁾	037 ²⁾	037	037	037	03700	037
3,75		52	20,0						03750	
3,80		55	22,0	038 ²⁾	038 ²⁾	038	038	038	03800	038
3,85		55	22,0						03850	
3,90		55	22,0	039 ²⁾	039 ²⁾	039		039	03900	039
3,95		55	22,0						03950	
3,97	5/32	55	22,0	397 ²⁾	397 ²⁾					
4,00		55	22,0	040 ²⁾	040 ²⁾	040	040	040	04000	040
4,05		55	22,0						04050	
4,10		55	22,0	041 ²⁾	041 ²⁾	041	041	041	04100	041
4,15		55	22,0						04150	
4,20		55	22,0	042 ²⁾	042 ²⁾	042	042	042	04200	042
4,25		55	22,0						04250	
4,30		58	24,0	043 ²⁾	043 ²⁾	043	043	043	04300	043
4,35		58	24,0						04350	
4,37	11/64	58	24,0	437 ²⁾	437 ²⁾					
4,40		58	24,0	044 ²⁾	044 ²⁾	044		044	04400	044
4,45		58	24,0						04450	
4,50		58	24,0	045 ²⁾	045 ²⁾	045	045	045	04500	045
4,55		58	24,0						04550	
4,60		58	24,0	046 ²⁾	046 ²⁾	046	046	046	04600	046
4,65		58	24,0						04650	046
4,70		58	24,0	047 ²⁾	047 ²⁾	047	047	047	04700	047
4,75		58	24,0						04750	
4,76	3/16	62	26,0	476 ²⁾	476 ²⁾					
4,80		62	26,0	048 ²⁾	048 ²⁾	048	048	048	04800	048
4,85		62	26,0						04850	
P				●	●	○	○	●	●	●
M					●		●		●	●
K				●	●	●		●	●	●
N				○	○	○	●	○	○	○
S				○	○		○	○	○	●
H				○				○	○	○
O				○	○	○		○		

- 1) uncoated
2) self-centering

→ v_c Page 44+45

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							
4,90		62	26,0	049 ²⁾	049 ²⁾	049	049	049	04900	049
4,95		62	26,0						04950	
5,00		62	26,0	050 ²⁾	050 ²⁾	050	050	050	05000	050
5,05		62	26,0						05050	
5,10		62	26,0	051 ²⁾	051 ²⁾	051	051			
5,16	13/64	62	26,0	516 ²⁾	516 ²⁾					
5,20		62	26,0	052 ²⁾	052 ²⁾	052	052	052	05200	052
5,25		62	26,0						05250	
5,30		62	26,0	053 ²⁾	053 ²⁾	053	053	053	05300	053
5,40		66	28,0	054 ²⁾	054 ²⁾	054				
5,50		66	28,0	055 ²⁾	055 ²⁾	055	055	055	05500	055
5,55		66	28,0						05550	555
5,56	7/32	66	28,0	556 ²⁾	556 ²⁾					
5,60		66	28,0	056 ²⁾	056 ²⁾	056	056	056	05600	056
5,70		66	28,0	057 ²⁾	057 ²⁾	057	057	057	05700	057
5,75		66	28,0						05750	
5,80		66	28,0	058 ²⁾	058 ²⁾	058	058	058	05800	058
5,85		66	28,0						05850	
5,90		66	28,0	059 ²⁾	059 ²⁾	059	059	059	05900	059
5,95	15/64	66	28,0	595 ²⁾	595 ²⁾				05950	
6,00		66	28,0	060 ²⁾	060 ²⁾	060	060	060	06000	060
6,05		70	31,0						06050	
6,10		70	31,0	061 ²⁾	061 ²⁾	061				
6,20		70	31,0	062 ²⁾	062 ²⁾	062				
6,30		70	31,0	063 ²⁾	063 ²⁾	063				
6,35	1/4	70	31,0	635 ²⁾	635 ²⁾					
6,40		70	31,0	064 ²⁾	064 ²⁾	064				064
6,50		70	31,0	065 ²⁾	065 ²⁾	065		065	06500	065
6,55		70	31,0						06550	
6,60		70	31,0	066 ²⁾	066 ²⁾	066	066			
6,65		70	31,0						06650	
6,70		70	31,0	067 ²⁾	067 ²⁾	067	067			
6,75		74	34,0	675 ²⁾	675 ²⁾					
6,80		74	34,0	068 ²⁾	068 ²⁾	068		068	06800	068
6,90		74	34,0	069 ²⁾	069 ²⁾	069	069			
7,00		74	34,0	070 ²⁾	070 ²⁾	070	070	070	07000	070
7,10		74	34,0	071 ²⁾	071 ²⁾	071				
7,14	9/32	74	34,0	714 ²⁾	714 ²⁾					
7,20		74	34,0	072 ²⁾	072 ²⁾	072	072	072	07200	072
7,25		74	34,0						07250	
7,30		74	34,0	073 ²⁾	073 ²⁾	073				
7,40		74	34,0	074 ²⁾	074 ²⁾	074		074	07400	074
7,50		74	34,0	075 ²⁾	075 ²⁾	075	075	075	07500	075
7,60		79	37,0	076 ²⁾	076 ²⁾	076		076	07600	076
7,70		79	37,0	077 ²⁾	077 ²⁾	077	077	077	07700	077
7,75		79	37,0						07750	
7,80		79	37,0	078 ²⁾	078 ²⁾	078		078	07800	078
7,90		79	37,0	079 ²⁾	079 ²⁾	079	079	079	07900	079
P				●	●	○	○	●	●	●
M					●		●		●	●
K				●	●	●		●	●	●
N				○	○	○	●	○	○	○
S				○	○		○	○	○	●
H				○				○	○	○
O				○	○	○		○		○

- 1) uncoated
2) self-centering

→ v_c Page 44+45

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								
7,94	5/16	79	37,0		794 ²⁾	794 ²⁾					
8,00		79	37,0		080 ²⁾	080 ²⁾	080	080	080	08000	080
8,05		79	37,0							08050	
8,10		79	37,0		081 ²⁾	081 ²⁾	081				
8,15		79	37,0							08150	
8,20		79	37,0		082 ²⁾	082 ²⁾	082				082
8,30		79	37,0		083 ²⁾	083 ²⁾	083				
8,40		79	37,0		084 ²⁾	084 ²⁾	084	084	084	08400	084
8,50		79	37,0		085 ²⁾	085 ²⁾	085	085	085	08500	085
8,55		84	40,0							08550	
8,60		84	40,0			086 ²⁾	086	086			
8,70		84	40,0			087 ²⁾	087	087			087
8,73	11/32	84	40,0		873 ²⁾	873 ²⁾					
8,80		84	40,0		088 ²⁾	088 ²⁾	088		088	08800	088
8,90		84	40,0			089 ²⁾	089				
9,00		84	40,0		090 ²⁾	090 ²⁾	090	090	090	09000	090
9,10		84	40,0			091 ²⁾	091				
9,20		84	40,0			092 ²⁾	092	092	092	09200	092
9,30		84	40,0		093 ²⁾	093 ²⁾	093	093	093	09300	093
9,40		84	40,0			094 ²⁾	094		094	09400	094
9,50		84	40,0		095 ²⁾	095 ²⁾	095	095	095	09500	095
9,60		89	43,0			096 ²⁾	096		096	09600	096
9,65		89	43,0							09650	
9,70		89	43,0			097 ²⁾	097		097	09700	097
9,75		89	43,0							09750	
9,80		89	43,0		098 ²⁾	098 ²⁾	098	098	098	09800	098
9,90		89	43,0			099 ²⁾	099		099	09900	099
10,00		89	43,0		100 ²⁾	100 ²⁾	100	100	100	10000	100
10,10		89	43,0			101 ²⁾	101				
10,20		89	43,0		102 ²⁾	102 ²⁾	102	102	102	10200	102
10,30		89	43,0			103 ²⁾	103			10300	
10,40		89	43,0			104 ²⁾	104				
10,50		89	43,0		105 ²⁾	105 ²⁾	105	105	105	10500	105
10,60		95	47,0				106				
10,70		95	47,0				107			10700	
10,80		95	47,0				108				108
10,90		95	47,0				109				
11,00		95	47,0		110 ²⁾	110 ²⁾	110	110	110	11000	110
11,10		95	47,0				111				
11,11	7/16	95	47,0		111 ²⁾	111 ²⁾					
11,20		95	47,0				112			11200	
11,30		95	47,0				113			11300	
11,40		95	47,0				114			11400	
11,50		95	47,0		115 ²⁾	115 ²⁾	115	115	115	11500	115
11,60		95	47,0				116				
11,70		95	47,0				117	117		11700	
11,75		95	47,0							11750	
11,80		95	47,0				118		118	11800	118
P					●	●	○	○	●	●	●
M						●		●		●	●
K					●	●	●		●	●	●
N					○	○	○	●	○	○	○
S					○	○		○	○	○	●
H					○				○	○	○
O					○	○	○		○		

- 1) uncoated
2) self-centering

→ v_c Page 44+45

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							
11,90		102	51,0							
12,00		102	51,0	120 ²⁾	120 ²⁾	119	120	120	12000	120
12,10		102	51,0			121				
12,20		102	51,0			122				
12,30		102	51,0	123 ²⁾	123 ²⁾	123		123	12300	123
12,40		102	51,0			124				
12,50		102	51,0	125 ²⁾	125 ²⁾	125		125	12500	125
12,60		102	51,0			126				
12,70		102	51,0	127 ²⁾	127 ²⁾	127			12700	
12,80		102	51,0			128		128	12800	128
12,90		102	51,0			129				
13,00		102	51,0	130 ²⁾	130 ²⁾	130		130	13000	130
13,20		102	51,0			132				
13,30		107	54,0			133				
13,50		107	54,0	135 ²⁾	135 ²⁾	135		135	13500	135
13,80		107	54,0			138		138		
14,00		107	54,0	140 ²⁾	140 ²⁾	140		140	14000	140
14,50		111	56,0			145		145	14500	145
14,75		111	56,0			147				
15,00		111	56,0			150		150	15000	150
15,25		115	58,0			152				
15,50		115	58,0			155		155	15500	155
15,75		115	58,0							157
16,00		115	58,0			160		160	16000	160
16,50		119	60,0			165		165	16500	165
17,00		119	60,0			170		170	17000	170
17,50		123	62,0			175		175	17500	175
17,75		123	62,0							177
18,00		123	62,0			180		180	18000	180
18,50		127	64,0			185			18500	185
19,00		127	64,0			190		190	19000	190
19,50		131	66,0			195			19500	195
20,00		131	66,0			200		200	20000	200
20,50		136	68,0						20500	
21,00		136	68,0						21000	
21,50		141	70,0						21500	
22,00		141	70,0						22000	
23,00		146	72,0						23000	
24,00		151	75,0						24000	
25,00		151	75,0						25000	
P				●	●	○	○	●	●	●
M					●		●		●	●
K				●	●	●		●	●	●
N				○	○	○	●	○	○	○
S				○	○		○	○	○	●
H				○				○	○	○
O				○	○	○		○		

1) uncoated

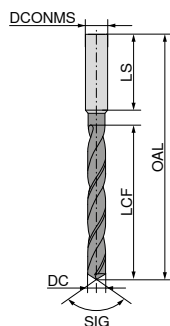
2) self-centering

→ 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

10 124 ...

DC _{h8} mm	OAL mm	LCF mm	DCONMS _{h6} mm	LS mm
2,00	56	24	3	28
2,10	56	24	3	28
2,20	59	27	3	28
2,30	59	27	3	28
2,40	62	30	3	28
2,50	62	30	3	28
2,60	62	30	3	28
2,70	65	33	3	28
2,80	65	33	3	28
2,90	65	33	3	28
3,00	65	33	3	28
3,10	68	36	4	28
3,20	68	36	4	28
3,30	68	36	4	28
3,40	71	39	4	28
3,50	71	39	4	28
3,60	71	39	4	28
3,70	71	39	4	28
3,80	75	43	4	28
3,90	75	43	4	28
4,00	75	43	4	28
4,10	87	43	6	36
4,20	87	43	6	36
4,30	91	47	6	36
4,40	91	47	6	36
4,50	91	47	6	36
4,60	91	47	6	36
4,65	91	47	6	36
4,70	91	47	6	36
4,80	96	52	6	36
4,90	96	52	6	36
5,00	96	52	6	36
5,10	96	52	6	36
5,20	96	52	6	36
5,30	96	52	6	36
5,40	101	57	6	36
5,50	101	57	6	36
5,55	101	57	6	36
5,60	101	57	6	36
5,70	101	57	6	36
5,80	101	57	6	36
5,90	101	57	6	36
6,00	101	57	6	36
6,10	107	63	8	36
6,20	107	63	8	36
6,30	107	63	8	36
6,40	107	63	8	36
6,50	107	63	8	36
6,60	107	63	8	36
6,70	107	63	8	36
6,80	113	69	8	36
6,90	113	69	8	36
7,00	113	69	8	36
7,10	113	69	8	36
7,20	113	69	8	36
7,30	113	69	8	36

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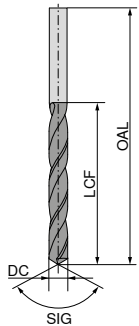
DC _{h8} mm	OAL mm	LCF mm	DCONMS _{h6} mm	LS mm
7,40	113	69	8	36
7,50	113	69	8	36
7,55	119	75	8	36
7,60	119	75	8	36
7,70	119	75	8	36
7,80	119	75	8	36
7,90	119	75	8	36
8,00	119	75	8	36
8,10	125	75	10	40
8,20	125	75	10	40
8,30	125	75	10	40
8,40	125	75	10	40
8,50	125	75	10	40
8,60	131	81	10	40
8,70	131	81	10	40
8,80	131	81	10	40
8,90	131	81	10	40
9,00	131	81	10	40
9,10	131	81	10	40
9,20	131	81	10	40
9,30	131	81	10	40
9,40	131	81	10	40
9,50	131	81	10	40
9,55	137	87	10	40
9,60	137	87	10	40
9,70	137	87	10	40
9,80	137	87	10	40
9,90	137	87	10	40
10,00	137	87	10	40
10,10	144	87	12	45
10,20	144	87	12	45
10,30	144	87	12	45
10,40	144	87	12	45
10,50	144	87	12	45
10,70	151	94	12	45
10,80	151	94	12	45
11,00	151	94	12	45
11,20	151	94	12	45
11,30	151	94	12	45
11,40	151	94	12	45
11,50	151	94	12	45
11,60	151	94	12	45
11,70	151	94	12	45
11,80	151	94	12	45
11,90	158	101	12	45
12,00	158	101	12	45
12,20	161	101	16	48
12,30	161	101	16	48
12,50	161	101	16	48
12,70	161	101	16	48
12,80	161	101	16	48
13,00	161	101	16	48
13,50	166	106	16	48
14,00	166	106	16	48
14,50	169	109	16	48
15,00	169	109	16	48
15,50	172	112	16	48
16,00	172	112	16	48
16,50	181	115	20	50
17,00	181	115	20	50
17,50	184	118	20	50
18,00	184	118	20	50
18,50	188	122	20	50
19,00	188	122	20	50
19,50	191	125	20	50
20,00	191	125	20	50

P	●
M	●
K	●
N	○
S	○
H	
O	○

→ v_c Page 46

Twist drill to DIN 338, short

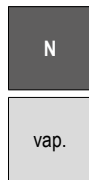
≤ 5xD

SIG 130°
HSS-E-PM

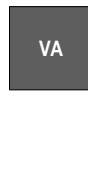
10 173 ...

SIG 118°
HSS-E

10 171 ...

SIG 118°
HSS

10 152 ...

SIG 130°
HSS-E

10 175 ...

SIG 130°
HSS

10 161 ...

SIG 130°
HSS-E

10 168 ...

SIG 130°
HSS-E

10 170 ...

DC _{h8} mm	DC inch	OAL mm	LCF mm	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...
0,20		19	2,5			00200 ¹⁾		00200		
0,25		19	3,0			00250 ¹⁾		00250		
0,30		19	3,0			00300 ¹⁾		00300		
0,35		19	4,0			00350 ¹⁾		00350		
0,40		20	5,0			00400 ¹⁾		00400		
0,45		20	5,0			00450 ¹⁾		00450		
0,50		22	6,0			00500 ¹⁾		00500		
0,55		24	7,0			00550 ¹⁾		00550		
0,60		24	7,0			00600 ¹⁾		00600		
0,65		26	8,0			00650 ¹⁾		00650		
0,70		28	9,0			00700 ¹⁾		00700		
0,75		28	9,0			00750 ¹⁾		00750		
0,80		30	10,0			00800 ¹⁾		00800		
0,85		30	10,0			00850 ¹⁾		00850		
0,90		32	11,0		009	00900 ¹⁾		00900		
0,95		32	11,0			00950 ¹⁾		00950		
1,00		34	12,0	010 ²⁾	010 ²⁾	01000 ¹⁾	010	01000	010 ¹⁾	010
1,05		34	12,0			01050 ¹⁾		01050		
1,10		36	14,0	011 ²⁾	011 ²⁾	01100 ¹⁾	011	01100	011 ¹⁾	011
1,15		36	14,0			01150 ¹⁾		01150		
1,20		38	16,0	012 ²⁾	012 ²⁾	01200 ¹⁾	012	01200	012 ¹⁾	012
1,25		38	16,0		125 ²⁾	01250 ¹⁾		01250		
1,30		38	16,0	013 ²⁾	013 ²⁾	01300 ¹⁾	013	01300	013 ¹⁾	013
1,35		40	18,0			01350 ¹⁾		01350		
1,40		40	18,0	014 ²⁾	014 ²⁾	01400 ¹⁾	014	01400	014 ¹⁾	014
1,45		40	18,0		145 ²⁾	01450 ¹⁾		01450		901
1,50		40	18,0	015 ²⁾	015 ²⁾	01500 ¹⁾	015	01500	015 ¹⁾	015
1,55		43	20,0		155 ²⁾	01550 ¹⁾		01550		902
1,60		43	20,0	016 ²⁾	016 ²⁾	01600 ¹⁾	016	01600	016 ¹⁾	016
1,65		43	20,0		165 ²⁾	01650 ¹⁾		01650		903
1,70		43	20,0	017 ²⁾	017 ²⁾	01700 ¹⁾	017	01700	017 ¹⁾	017
1,75		46	22,0			01750 ¹⁾		01750		
1,80		46	22,0	018 ²⁾	018 ²⁾	01800 ¹⁾	018	01800	018 ¹⁾	018
1,85		46	22,0			01850 ¹⁾		01850		904
1,90		46	22,0	019 ²⁾	019 ²⁾	01900 ¹⁾	019	01900	019 ¹⁾	019
1,95		49	24,0			01950 ¹⁾		01950		
2,00		49	24,0	020 ²⁾	020 ²⁾	02000 ¹⁾	020	02000	020 ¹⁾	020
2,05		49	24,0			02050 ¹⁾		02050		905
2,10		49	24,0	021 ²⁾	021 ²⁾	02100 ¹⁾	021	02100	021 ¹⁾	021
2,15		53	27,0			02150 ¹⁾		02150		
2,20		53	27,0	022 ²⁾	022 ²⁾	02200 ¹⁾	022	02200	022 ¹⁾	022
2,25		53	27,0			02250 ¹⁾		02250		
2,30		53	27,0	023 ²⁾	023 ²⁾	02300 ¹⁾	023	02300	023 ¹⁾	023
2,35		53	27,0			02350 ¹⁾		02350		
2,38	3/32	57	30,0	238 ²⁾	238 ²⁾					
2,40		57	30,0	024 ²⁾	024 ²⁾	02400	024	02400	024	024

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

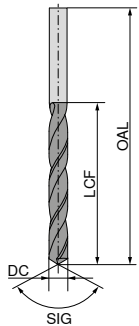
1) uncoated

2) self-centering

→ v_c Page 46+47

Twist drill to DIN 338, short

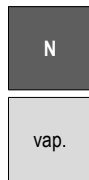
≤ 5xD

SIG 130°
HSS-E-PM

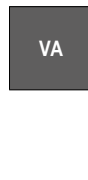
10 173 ...

SIG 118°
HSS-E

10 171 ...

SIG 118°
HSS

10 152 ...

SIG 130°
HSS-E

10 175 ...

SIG 130°
HSS

10 161 ...

SIG 130°
HSS-E

10 168 ...

SIG 130°
HSS-E

10 170 ...

DC _{h8} mm	DC inch	OAL mm	LCF mm	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...
2,45		57	30,0			02450		02450		
2,50		57	30,0	025 ²⁾	025 ²⁾	02500	025	02500	025	025
2,55		57	30,0		255 ²⁾	02550		02550		
2,60		57	30,0	026 ²⁾	026 ²⁾	02600	026	02600	026	026
2,65		57	30,0			02650		02650		
2,70		61	33,0	027 ²⁾	027 ²⁾	02700	027	02700	027	027
2,75		61	33,0			02750		02750		
2,78	7/64	61	33,0	278 ²⁾	278 ²⁾					
2,80		61	33,0	028 ²⁾	028 ²⁾	02800	028	02800	028	028
2,85		61	33,0			02850		02850		
2,90		61	33,0	029 ²⁾	029 ²⁾	02900	029	02900	029	029
2,95		61	33,0			02950		02950		
3,00		61	33,0	030 ²⁾	030 ²⁾	03000	030	03000	030	030
3,05		65	36,0			03050		03050		
3,10		65	36,0	031 ²⁾	031 ²⁾	03100	031	03100	031	031
3,15		65	36,0			03150		03150		
3,17	1/8	65	36,0	317 ²⁾	317 ²⁾					
3,20		65	36,0	032 ²⁾	032 ²⁾	03200	032	03200	032	032
3,25		65	36,0		325 ²⁾	03250		03250		
3,30		65	36,0	033 ²⁾	033 ²⁾	03300	033	03300	033	033
3,35		65	36,0			03350		03350		
3,40		70	39,0	034 ²⁾	034 ²⁾	03400	034	03400	034	034
3,45		70	39,0			03450		03450		
3,50		70	39,0	035 ²⁾	035 ²⁾	03500	035	03500	035	035
3,55		70	39,0			03550		03550		
3,57	9/64	70	39,0	357 ²⁾	357 ²⁾					
3,60		70	39,0	036 ²⁾	036 ²⁾	03600	036	03600	036	036
3,65		70	39,0			03650		03650		
3,70		70	39,0	037 ²⁾	037 ²⁾	03700	037	03700	037	037
3,75		70	39,0			03750		03750		
3,80		75	43,0	038 ²⁾	038 ²⁾	03800	038	03800	038	038
3,85		75	43,0			03850		03850		
3,90		75	43,0	039 ²⁾	039 ²⁾	03900	039	03900	039	039
3,95		75	43,0			03950		03950		
3,97	5/32	75	43,0	397 ²⁾	397 ²⁾					
4,00		75	43,0	040 ²⁾	040 ²⁾	04000	040	04000	040	040
4,05		75	43,0			04050		04050		
4,10		75	43,0	041 ²⁾	041 ²⁾	04100	041	04100	041	041
4,15		75	43,0			04150		04150		
4,20		75	43,0	042 ²⁾	042 ²⁾	04200	042	04200	042	042
4,25		75	43,0		425 ²⁾	04250		04250		
4,30		80	47,0	043 ²⁾	043 ²⁾	04300	043	04300	043	043
4,35		80	47,0			04350		04350		
4,37	11/64	80	47,0	437 ²⁾	437 ²⁾					
4,40		80	47,0	044 ²⁾	044 ²⁾	04400	044	04400	044	044
4,45		80	47,0			04450				

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

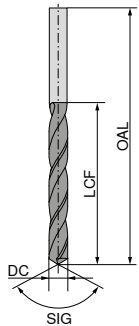
1) uncoated

2) self-centering

→ v_c Page 46+47

Twist drill to DIN 338, short

≤ 5xD

SIG 130°
HSS-E-PM

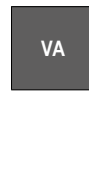
10 173 ...

SIG 118°
HSS-E

10 171 ...

SIG 118°
HSS

10 152 ...

SIG 130°
HSS-E

10 175 ...

SIG 130°
HSS

10 161 ...

SIG 130°
HSS-E

10 168 ...

SIG 130°
HSS-E

10 170 ...

DC _{h8} mm	DC inch	OAL mm	LCF mm	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...
4,50		80	47,0	045 ²⁾	045 ²⁾	04500	045	04500	045	045
4,55		80	47,0			04550		04550		
4,60		80	47,0	046 ²⁾	046 ²⁾	04600	046	04600	046	046
4,65		80	47,0			04650		04650		
4,70		80	47,0	047 ²⁾	047 ²⁾	04700	047	04700	047	047
4,75		80	47,0			04750		04750		
4,76	3/16	86	52,0	476 ²⁾	476 ²⁾					
4,80		86	52,0	048 ²⁾	048 ²⁾	04800	048	04800	048	048
4,85		86	52,0			04850		04850		
4,90		86	52,0	049 ²⁾	049 ²⁾	04900	049	04900	049	049
4,95		86	52,0			04950		04950		
5,00		86	52,0	050 ²⁾	050 ²⁾	05000	050	05000	050	050
5,05		86	52,0			05050		05050		
5,10		86	52,0	051 ²⁾	051 ²⁾	05100	051	05100	051	051
5,15		86	52,0			05150				
5,16	13/64	86	52,0	516 ²⁾	516 ²⁾					
5,20		86	52,0	052 ²⁾	052 ²⁾	05200	052	05200	052	052
5,25		86	52,0			05250		05250		
5,30		86	52,0	053 ²⁾	053 ²⁾	05300	053	05300		
5,35		93	57,0			05350				
5,40		93	57,0	054 ²⁾	054 ²⁾	05400		05400		
5,45		93	57,0			05450		05450		
5,50		93	57,0	055 ²⁾	055 ²⁾	05500	055	05500	055	055
5,55		93	57,0			05550		05550		
5,56	7/32	93	57,0	556 ²⁾	556 ²⁾					
5,60		93	57,0	056 ²⁾	056 ²⁾	05600	056	05600	056	056
5,65		93	57,0			05650		05650		
5,70		93	57,0	057 ²⁾	057 ²⁾	05700	057	05700	057	057
5,75		93	57,0			05750		05750		
5,80		93	57,0	058 ²⁾	058 ²⁾	05800	058	05800	058	058
5,85		93	57,0			05850		05850		
5,90		93	57,0	059 ²⁾	059 ²⁾	05900	059	05900	059	059
5,95	15/64	93	57,0	595 ²⁾	595 ²⁾	05950		05950		
6,00		93	57,0	060 ²⁾	060 ²⁾	06000	060	06000	060	060
6,05		101	63,0			06050		06050		
6,10		101	63,0	061 ²⁾	061 ²⁾	06100		06100		
6,15		101	63,0			06150		06150		
6,20		101	63,0	062 ²⁾	062 ²⁾	06200	062	06200		062
6,25		101	63,0			06250		06250		
6,30		101	63,0	063 ²⁾	063 ²⁾	06300		06300		
6,35	1/4	101	63,0	635 ²⁾	635 ²⁾	06350		06350		
6,40		101	63,0	064 ²⁾	064 ²⁾	06400		06400		
6,45		101	63,0			06450				
6,50		101	63,0	065 ²⁾	065 ²⁾	06500	065	06500	065	065
6,55		101	63,0			06550		06550		
6,60		101	63,0	066 ²⁾	066 ²⁾	06600		06600		

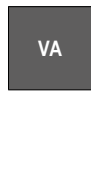
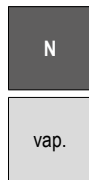
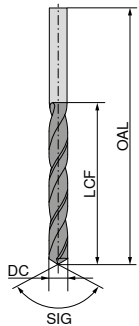
P	●	●	○	○	●	●
M	●	●	●	●	○	○
K	●	●	●	●	●	●
N	○	○	○	●	●	○
S	○	○	○	○	○	○
H	○	○	○	○	○	○
O	○	○	○	○	○	○

- 1) uncoated
2) self-centering

→ v_c Page 46+47

Twist drill to DIN 338, short

≤ 5xD

SIG 130°
HSS-E-PMSIG 118°
HSS-ESIG 118°
HSSSIG 130°
HSS-ESIG 130°
HSSSIG 130°
HSS-ESIG 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	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...
6,65		101	63,0			06650		06650		
6,70		101	63,0	067 ²⁾	067 ²⁾	06700		06700		
6,75		109	69,0	0675 ²⁾	0675 ²⁾	06750		06750		
6,80		109	69,0	068 ²⁾	068 ²⁾	06800	068	06800	068	068
6,85		109	69,0			06850		06850		
6,90		109	69,0	069 ²⁾	069 ²⁾	06900	069	06900		
6,95		109	69,0			06950		06950		
7,00		109	69,0	070 ²⁾	070 ²⁾	07000	070	07000	070	070
7,05		109	69,0			07050		07050		
7,10		109	69,0	071 ²⁾	071 ²⁾	07100		07100		
7,14	9/32	109	69,0	714 ²⁾	714 ²⁾					
7,15		109	69,0			07150				
7,20		109	69,0	072 ²⁾	072 ²⁾	07200	072	07200	072	072
7,25		109	69,0			07250		07250		
7,30		109	69,0	073 ²⁾	073 ²⁾	07300		07300		
7,35		109	69,0			07350				
7,40		109	69,0	074 ²⁾	074 ²⁾	07400	074	07400	074	074
7,45		109	69,0		745 ²⁾	07450				
7,50		109	69,0	075 ²⁾	075 ²⁾	07500	075	07500	075	075
7,55		117	75,0			07550				
7,60		117	75,0	076 ²⁾	076 ²⁾	07600	076	07600	076	076
7,65		117	75,0			07650				
7,70		117	75,0	077 ²⁾	077 ²⁾	07700	077	07700	077	077
7,75		117	75,0			07750		07750		
7,80		117	75,0	078 ²⁾	078 ²⁾	07800	078	07800	078	078
7,85		117	75,0			07850				
7,90		117	75,0	079 ²⁾	079 ²⁾	07900	079	07900	079	079
7,94	5/16	117	75,0	794 ²⁾	794 ²⁾					
7,95		117	75,0			07950				
8,00		117	75,0	080 ²⁾	080 ²⁾	08000	080	08000	080	080
8,05		117	75,0			08050		08050		
8,10		117	75,0	081 ²⁾	081 ²⁾	08100		08100		
8,15		117	75,0			08150		08150		
8,20		117	75,0	082 ²⁾	082 ²⁾	08200		08200		
8,25		117	75,0			08250		08250		
8,30		117	75,0	083 ²⁾	083 ²⁾	08300		08300		
8,35		117	75,0			08350				
8,40		117	75,0	084 ²⁾	084 ²⁾	08400	084	08400	084	084
8,45		117	75,0			08450		08450		
8,50		117	75,0	085 ²⁾	085 ²⁾	08500	085	08500	085	085
8,55		125	81,0			08550		08550		
8,60		125	81,0		086 ²⁾	08600	086	08600		086
8,65		125	81,0			08650				
8,70		125	81,0		087 ²⁾	08700		08700		
8,73	11/32	125	81,0	873 ²⁾	873 ²⁾					
8,75		125	81,0			08750		08750		

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

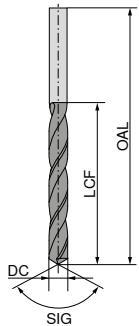
1) uncoated

2) self-centering

→ v_c Page 46+47

Twist drill to DIN 338, short

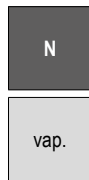
≤ 5xD

SIG 130°
HSS-E-PM

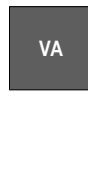
10 173 ...

SIG 118°
HSS-E

10 171 ...

SIG 118°
HSS

10 152 ...

SIG 130°
HSS-E

10 175 ...

SIG 130°
HSS

10 161 ...

SIG 130°
HSS-E

10 168 ...

SIG 130°
HSS-E

10 170 ...

DC _{h8} mm	DC inch	OAL mm	LCF mm	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...
8,80		125	81,0	088 ²⁾	088 ²⁾	08800	088	08800	088	088
8,90		125	81,0		089 ²⁾	08900		08900		
8,95		125	81,0			08950				
9,00		125	81,0	090 ²⁾	090 ²⁾	09000	090	09000	090	090
9,05		125	81,0			09050				
9,10		125	81,0		091 ²⁾	09100		09100		
9,15		125	81,0			09150				
9,20		125	81,0		092 ²⁾	09200	092	09200	092	092
9,25		125	81,0			09250		09250		
9,30		125	81,0	093 ²⁾	093 ²⁾	09300	093	09300	093	093
9,35		125	81,0		935 ²⁾	09350				
9,40		125	81,0		094 ²⁾	09400	094	09400	094	094
9,45		125	81,0			09450				
9,50		125	81,0	095 ²⁾	095 ²⁾	09500	095	09500	095	095
9,55		133	87,0			09550				
9,60		133	87,0		096 ²⁾	09600	096	09600	096	096
9,65		133	87,0			09650				
9,70		133	87,0		097 ²⁾	09700	097	09700	097	097
9,75		133	87,0			09750				
9,80		133	87,0	098 ²⁾	098 ²⁾	09800	098	09800	098	098
9,85		133	87,0			09850				
9,90		133	87,0		099 ²⁾	09900	099	09900	099	099
9,95		133	87,0			09950				
10,00		133	87,0	100 ²⁾	100 ²⁾	10000	100	10000	100	100
10,05		133	87,0			10050		10050		
10,10		133	87,0		101 ²⁾	10100		10100		
10,15		133	87,0			10150				
10,20		133	87,0	102 ²⁾	102 ²⁾	10200	102	10200	102	102
10,25		133	87,0			10250		10250		
10,30		133	87,0		103 ²⁾	10300	103	10300	103	103
10,35		133	87,0			10350				
10,40		133	87,0		104 ²⁾	10400		10400		
10,45		133	87,0			10450				
10,50		133	87,0	105 ²⁾	105 ²⁾	10500	105	10500	105	105
10,55		133	87,0		955 ²⁾	10550				
10,60		133	87,0			10600		10600		
10,70		142	94,0			10700	107	10700	107	
10,75		142	94,0			10750		10750		
10,80		142	94,0			10800		10800		
10,90		142	94,0			10900		10900		
11,00		142	94,0	110 ²⁾	110 ²⁾	11000	110	11000	110	110
11,10		142	94,0			11100		11100		
11,11	7/16	142	94,0	111 ²⁾	111 ²⁾					
11,20		142	94,0		112 ²⁾	11200	112	11200	112	112
11,30		142	94,0		113 ²⁾		113		113	
11,40		142	94,0		114 ²⁾	11400	114	11400	114	

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

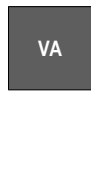
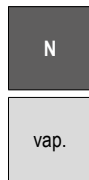
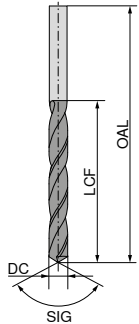
1) uncoated

2) self-centering

→ v_c Page 46+47

Twist drill to DIN 338, short

≤ 5xD

SIG 130°
HSS-E-PMSIG 118°
HSS-ESIG 118°
HSSSIG 130°
HSS-ESIG 130°
HSSSIG 130°
HSS-ESIG 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	10 173 ...	10 171 ...	10 152 ...	10 175 ...	10 161 ...	10 168 ...	10 170 ...
11,50		142	94,0	115 ²⁾	115 ²⁾	11500	115	11500	115	115
11,60		142	94,0		116 ²⁾	11600	116	11600	116	
11,70		142	94,0			11700	117	11700	117	117
11,80		142	94,0			11800	118	11800	118	118
11,90		151	101,0			11900	119	11900		
12,00		151	101,0	120 ²⁾	120 ²⁾	12000	120	12000	120	120
12,15		151	101,0		121 ²⁾					
12,20		151	101,0			12200		12200		
12,25		151	101,0			12250				
12,30		151	101,0	123 ²⁾	123 ²⁾					
12,50		151	101,0	125 ²⁾	925 ²⁾	12500		12500	125	125
12,70		151	101,0	127 ²⁾	127 ²⁾	12700		12700		
12,80		151	101,0			12800		12800	128	128
13,00		151	101,0	130 ²⁾	130 ²⁾	13000		13000	130	130
13,10		151	101,0		131 ²⁾					
13,20		151	101,0			13200		13200		
13,30		160	108,0		133 ²⁾					
13,50		160	108,0	135 ²⁾	135 ²⁾	13500		13500	135	135
13,80		160	108,0			13800		13800	138	138
14,00		160	108,0	140 ²⁾	140 ²⁾	14000		14000	140	140
14,50		169	114,0			14500		14500	145	145
14,80		169	114,0						148	
15,00		169	114,0			15000		15000	150	150
15,25		178	120,0			15250				
15,50		178	120,0			15500		15500	155	155
15,80		178	120,0			15800				
16,00		178	120,0			16000		16000	160	160
16,50		184	125,0			16500		16500		
17,00		184	125,0			17000		17000		
17,50		191	130,0			17500		17500		
18,00		191	130,0			18000		18000		
18,50		198	135,0			18500				
19,00		198	135,0			19000		19000		
19,50		205	140,0			19500				
20,00		205	140,0			20000		20000		
P				●	●	○	○		●	●
M					●		●		○	○
K				●	●	●			●	●
N				○	○	○	●	●	○	○
S				○	○		○		○	○
H				○					○	○
O				○	○	○			○	○

1) uncoated

2) self-centering

→ v_c Page 46+47

Twist drill sets DIN 338, short

- ▲ In metal box
- ▲ In 0.1 mm steps

≤ 5xD



DC _{h8} mm	10 158 ...	10 158 ...
1,0 - 5,9	050	054
6,0 - 10,0	100	104
P	○	●
M		●
K	●	●
N	○	○
S		○
H		
O	○	○

N

vap.

Drill set
type N
HSS

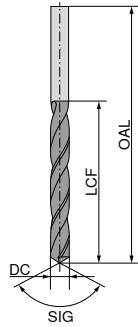
UNI

TiN

Drill set
type UNI TiN
HSS-E

→ 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 $\leq 10xD$ 

NC

TiAlN

SIG 130°
HSS

10 224 ...

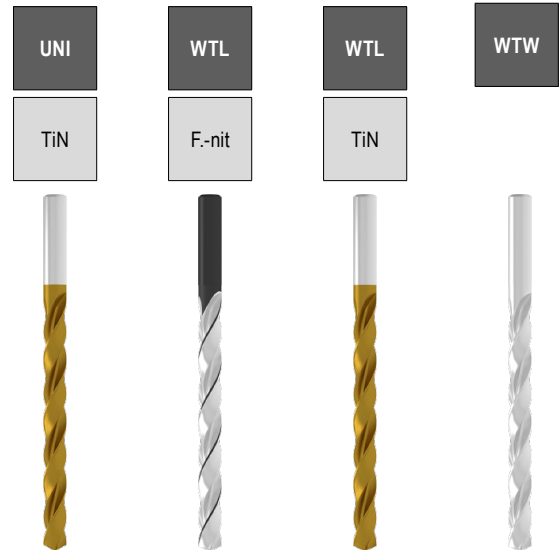
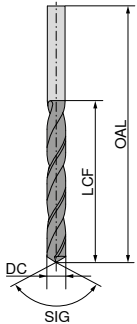
DC _{h8} mm	OAL mm	LCF mm	
3,0	100	66	030
3,3	106	69	033
3,5	112	73	035
3,8	119	78	038
4,0	119	78	040
4,2	119	78	042
4,5	126	82	045
4,8	132	87	048
5,0	132	87	050
5,5	139	91	055
5,8	139	91	058
6,0	139	91	060
6,5	148	97	065
6,8	156	102	068
7,0	156	102	070
7,5	156	102	075
7,8	165	109	078
8,0	165	109	080
8,5	165	109	085
8,8	175	115	088
9,0	175	115	090
9,5	175	115	095
9,8	184	121	098
10,0	184	121	100
10,2	184	121	102
10,5	184	121	105
10,8	195	128	108
11,0	195	128	110
11,5	195	128	115
11,8	205	134	118
12,0	205	134	120
12,8	205	134	128
13,0	205	134	130

P	○
M	○
K	●
N	○
S	○
H	○
O	○

→ v_c Page 48

Twist drills, DIN 340, long

≤ 10xD

SIG 118°
HSS-ESIG 130°
HSS-ESIG 130°
HSSSIG 130°
HSS

10 270 ...

10 225 ...

10 210 ...

10 200 ...

DC _{h8} mm	OAL mm	LCF mm				
1,0	56	33	010	010 ¹⁾	010	010
1,1	60	37	011	011 ¹⁾	011	011
1,2	65	41	012	012 ¹⁾		012
1,3	65	41	013	013 ¹⁾		
1,4	70	45	014	014 ¹⁾		014
1,5	70	45	015	015 ¹⁾	015	015
1,6	76	50	016	016 ¹⁾	016	016
1,7	76	50	017	017 ¹⁾		
1,8	80	53	018	018 ¹⁾		018
1,9	80	53	019	019 ¹⁾	019	019
2,0	85	56	020	020 ¹⁾	020	020
2,1	85	56	021	021 ¹⁾	021	021
2,2	90	59	022	022 ¹⁾		
2,3	90	59	023	023 ¹⁾	023	023
2,4	95	62	024	024	024	024
2,5	95	62	025	025	025	025
2,6	95	62	026	026	026	026
2,7	100	66	027	027	027	027
2,8	100	66	028	028	028	028
2,9	100	66	029	029	029	029
3,0	100	66	030	030	030	030
3,1	106	69	031	031		
3,2	106	69	032	032		
3,3	106	69	033	033	033	033
3,4	112	73	034	034		
3,5	112	73	035	035	035	035
3,6	112	73	036	036	036	036
3,7	112	73	037	037	037	037
3,8	119	78	038	038	038	038
3,9	119	78	039	039	039	039
4,0	119	78	040	040	040	040
4,1	119	78	041	041		
4,2	119	78	042	042	042	042
4,3	126	82	043	043	043	043
4,4	126	82	044	044		
4,5	126	82	045	045	045	045
4,6	126	82	046	046	046	046
4,7	126	82	047	047	047	047
4,8	132	87	048	048	048	048
4,9	132	87	049	049	049	049
5,0	132	87	050	050	050	050
5,1	132	87	051	051		

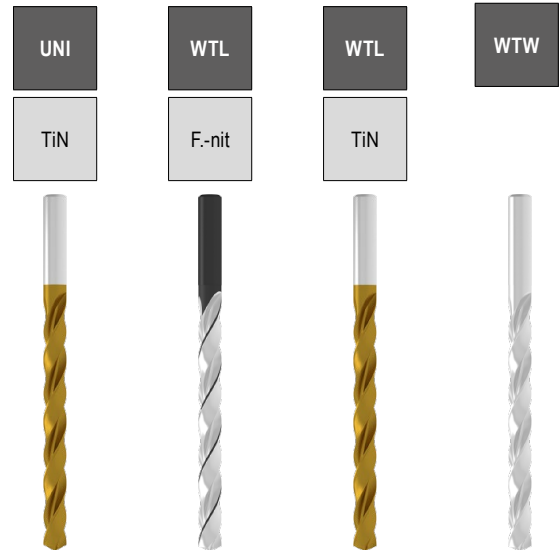
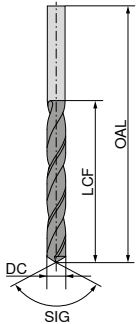
P	●	●	○	
M	●	○		
K	●	●	●	
N	○	●	○	●
S	○	○		
H		○		
O	○	○	○	

1) uncoated

→ v_c Page 48+49

Twist drills, DIN 340, long

≤ 10xD

SIG 118°
HSS-ESIG 130°
HSS-ESIG 130°
HSSSIG 130°
HSS

10 270 ...

10 225 ...

10 210 ...

10 200 ...

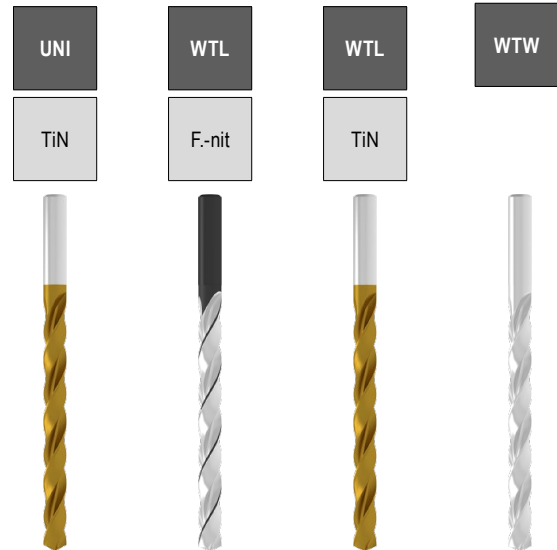
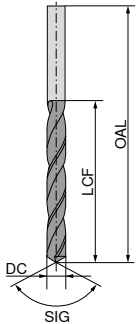
DC _{h8} mm	OAL mm	LCF mm				
5,2	132	87	052	052	052	052
5,3	132	87	053	053	053	053
5,4	139	91	054	054		
5,5	139	91	055	055	055	055
5,6	139	91	056	056	056	056
5,7	139	91	057	057	057	057
5,8	139	91	058	058	058	058
5,9	139	91	059	059	059	059
6,0	139	91	060	060	060	060
6,1	148	97	061	061		
6,2	148	97	062	062		
6,3	148	97	063	063	063	063
6,4	148	97	064	064		
6,5	148	97	065	065	065	065
6,6	148	97	066	066		
6,7	148	97	067	067		
6,8	156	102	068	068	068	068
6,9	156	102	069	069		
7,0	156	102	070	070	070	070
7,1	156	102	071	071		
7,2	156	102	072	072	072	072
7,3	156	102	073	073		
7,4	156	102	074	074	074	074
7,5	156	102	075	075	075	075
7,6	165	109	076		076	076
7,7	165	109	077	077		077
7,8	165	109	078	078	078	078
7,9	165	109	079	079	079	079
8,0	165	109	080	080	080	080
8,1	165	109	081	081		
8,2	165	109	082	082		
8,3	165	109	083	083		
8,4	165	109	084	084	084	084
8,5	165	109	085	085	085	085
8,6	175	115	086	086		
8,7	175	115	087	087		
8,8	175	115	088	088	088	088
8,9	175	115	089	089		
9,0	175	115	090	090	090	090
9,1	175	115	091	091		
9,2	175	115	092	092		092
9,3	175	115	093	093		093

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

1) uncoated

→ v_c Page 48+49

Twist drills, DIN 340, long

 $\leq 10xD$ SIG 118°
HSS-ESIG 130°
HSS-ESIG 130°
HSSSIG 130°
HSS

10 270 ...

10 225 ...

10 210 ...

10 200 ...

DC _{h8} mm	OAL mm	LCF mm				
9,4	175	115	094	094		094
9,5	175	115	095	095	095	095
9,6	184	121	096			096
9,7	184	121	097	097	097	
9,8	184	121	098	098	098	098
9,9	184	121	099	099	099	
10,0	184	121	100	100	100	100
10,1	184	121	101			
10,2	184	121	102	102	102	102
10,3	184	121	103			103
10,4	184	121	104			
10,5	184	121	105	105	105	105
10,8	195	128		108		
11,0	195	128	110	110	110	110
11,5	195	128	115	115	115	115
11,6	195	128				116
11,8	195	128		118		118
12,0	205	134	120	120	120	120
12,2	205	134				122
12,3	205	134				123
12,5	205	134	125		125	125
13,0	205	134	130		130	130
13,5	214	140	135			
14,0	214	140	140		140	140
P			●	●	○	
M			●	○		
K			●	●	●	
N			○	●	○	●
S			○	○		
H				○		
O			○	○	○	

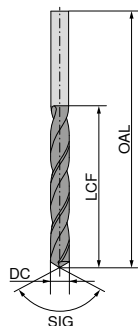
1) uncoated

→ 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



DC _{h8} mm	OAL mm	LCF mm	10 236 ...	10 235 ...
2,0	125	85		020 ¹⁾
2,1	125	85		021 ¹⁾
2,2	135	90		022 ¹⁾
2,3	135	90		023 ¹⁾
2,4	140	95		024
2,5	140	95		025
2,6	140	95		026
2,7	150	100		027
2,8	150	100		028
2,9	150	100		029
3,0	150	100	03000	030
3,1	155	105		031
3,2	155	105		032
3,3	155	105	03300	033
3,4	165	115		034
3,5	165	115	03500	035
3,6	165	115		036
3,7	165	115		037
3,8	175	120		038
3,9	175	120		039
4,0	175	120	04000	040
4,1	175	120		041
4,2	175	120	04200	042
4,3	185	125		043
4,4	185	125		044
4,5	185	125	04500	045
4,6	185	125		046
4,7	185	125		047
4,8	195	135		048
4,9	195	135		049
5,0	195	135	05000	050
5,1	195	135		051
5,2	195	135		052
5,3	195	135		053
5,4	205	140		054
5,5	205	140	05500	055
5,6	205	140		056
5,7	205	140		057
5,8	205	140		058
5,9	205	140		059
6,0	205	140	06000	060
6,1	215	150		061
6,2	215	150		062
6,3	215	150		063
6,4	215	150		064
6,5	215	150	06500	065
6,6	215	150		066
6,7	215	150		067
6,8	225	155	06800	068

DC _{h8} mm	OAL mm	LCF mm
6,9	225	155
7,0	225	155
7,1	225	155
7,3	225	155
7,4	225	155
7,5	225	155
7,7	240	165
7,8	240	165
7,9	240	165
8,0	240	165
8,1	240	165
8,2	240	165
8,3	240	165
8,4	240	165
8,5	240	165
8,6	250	175
8,7	250	175
8,8	250	175
9,0	250	175
9,2	250	175
9,4	250	175
9,5	250	175
9,6	265	185
9,7	265	185
9,8	265	185
9,9	265	185
10,0	265	185
10,2	265	185
10,5	265	185
11,0	280	195
11,5	280	195
12,0	295	205
12,5	295	205
13,0	295	205

10 236 ...	10 235 ...
	069
07000	070
	071
	073
	074
07500	075
	077
	078
	079
08000	080
	081
	082
	083
	084
08500	085
	086
	087
	088
09000	090
	092
	094
09500	095
	096
	097
	098
	099
10000	100
10200	
	105
	110
	115
	120
	125
	130

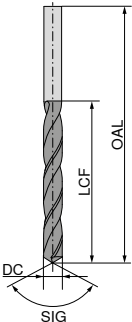
P	●	●
M		
K	●	●
N	●	●
S		
H		
O	○	○

1) uncoated

→ v_c Page 50

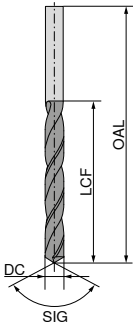
Twist drills, DIN 1869, extra-long,
series 2

▲ Up to diameter DC of 2.00 mm in uncoated version

> 10xD			WTL		WTL
			TiAlN		F.-nit
					
			SIG 130° HSS-E		SIG 130° HSS
DC _{h8} mm	OAL mm	LCF mm	10 246 ...	10 245 ...	
2,0	160	110		020 ¹⁾	
2,5	180	120		025	
3,0	190	130	03000	030	
3,5	210	145	03500	035	
4,0	220	150	04000	040	
4,5	235	160	04500	045	
5,0	245	170	05000	050	
5,5	260	180	05500	055	
6,0	260	180	06000	060	
6,5	275	190	06500	065	
7,0	290	200	07000	070	
7,5	290	200	07500	075	
8,0	305	210	08000	080	
8,5	305	210	08500	085	
9,0	320	220	09000	090	
9,5	320	220	09500	095	
10,0	340	235	10000	100	
10,2	340	235	10200		
10,5	340	235		105	
11,0	365	250		110	
11,5	365	250		115	
12,0	375	260	12000	120	
12,5	375	260		125	
13,0	375	260		130	
P			●	●	
M					
K			●	●	
N			●	●	
S					
H					
O			○	○	

1) uncoated

→ v_c Page 50+51Twist drills, DIN 1869, extra-long,
series 3

> 10xD			WTL		WTL
			TiAlN		F.-nit
					
			SIG 130° HSS-E		SIG 130° HSS
DC _{h8} mm	OAL mm	LCF mm	10 256 ...	10 255 ...	
2,5	225	150		025	
3,0	240	160		030	
3,5	265	180		035	
4,0	280	190	04000	040	
4,5	295	200		045	
5,0	315	210	05000	050	
5,5	330	225		055	
6,0	330	225	06000	060	
6,5	350	235		065	
7,0	370	250		070	
7,5	370	250		075	
8,0	390	265	08000	080	
8,5	390	265		085	
9,0	410	280		090	
9,5	410	280		095	
10,0	430	295	10000	100	
10,5	430	295		105	
11,0	455	310		110	
11,5	455	310		115	
12,0	480	330		120	
12,5	480	330		125	
13,0	480	330		130	
P			●	●	
M					
K			●	●	
N			●	●	
S					
H					
O			○	○	

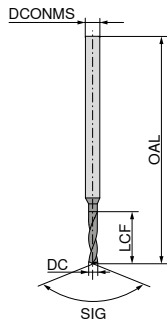
→ v_c Page 50+51

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 pieceSIG 118°
HSS-E-PM

10 103 ...

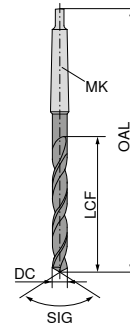
DC mm	OAL mm	LCF mm	DCONMS _{h8} mm	
0,15	25	0,8	1,0	00150
0,20	25	1,5	1,0	00200
0,25	25	1,9	1,0	00250
0,30	25	1,9	1,0	00300
0,35	25	2,4	1,0	00350
0,40	25	3,0	1,0	00400
0,45	25	3,0	1,0	00450
0,50	25	3,4	1,0	00500
0,55	25	3,9	1,0	00550
0,60	25	3,9	1,0	00600
0,65	25	4,2	1,0	00650
0,70	25	4,8	1,0	00700
0,75	25	4,8	1,0	00750
0,80	25	5,3	1,5	00800
0,85	25	5,3	1,5	00850
0,90	25	6,0	1,5	00900
0,95	25	6,0	1,5	00950
1,00	25	6,8	1,5	01000
1,05	25	6,8	1,5	01050
1,10	25	7,6	1,5	01100
1,15	25	7,6	1,5	01150
1,20	25	8,5	1,5	01200
1,25	25	8,5	1,5	01250
1,30	25	8,5	1,5	01300
1,35	25	9,5	1,5	01350
1,40	25	9,5	1,5	01400
1,45	25	9,5	1,5	01450

P	●
M	○
K	○
N	●
S	○
H	○
O	○

→ v_c Page 52

Twist drill, factory standard, short

≤ 3xD

SIG 130°
HSS-E

10 285 ...

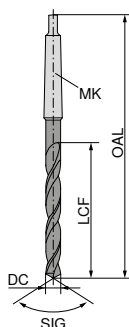
DC _{h8} mm	OAL mm	LCF mm	MK	
13,0	147	66	1	130
13,5	168	70	2	135
14,0	168	70	2	140
14,5	172	74	2	145
15,0	172	74	2	150
15,5	176	78	2	155
16,0	176	78	2	160
16,5	179	81	2	165
17,0	179	81	2	170
17,5	183	85	2	175
18,0	183	85	2	180
18,5	186	88	2	185
19,0	186	88	2	190
19,5	212	91	3	195
20,0	212	91	3	200
21,0	216	95	3	210
22,0	219	98	3	220
23,0	222	101	3	230
24,0	225	104	3	240
25,0	225	104	3	250
26,0	256	107	4	260
27,0	259	110	4	270
28,0	259	110	4	280
30,0	263	114	4	300

P	●
M	●
K	●
N	○
S	○
H	○
O	○

→ v_c Page 45

Twist drills, DIN 345

≤ 5xD



N

vap.

SIG 118°
HSS

WTL

SIG 130°
HSS-E

10 265 ...

10 280 ...

DC _{h8} mm	OAL mm	LCF mm	MK
10,00	168	87	1
10,20	168	87	1
10,50	168	87	1
10,80	175	94	1
11,00	175	94	1
11,20	175	94	1
11,50	175	94	1
11,80	175	94	1
12,00	182	101	1
12,20	182	101	1
12,50	182	101	1
12,80	182	101	1
13,00	182	101	1
13,20	182	101	1
13,50	189	108	1
13,80	189	108	1
14,00	189	108	1
14,25	212	114	2
14,50	212	114	2
14,75	212	114	2
15,00	212	114	2
15,25	218	120	2
15,50	218	120	2
15,75	218	120	2
16,00	218	120	2
16,25	223	125	2
16,50	223	125	2
16,75	223	125	2
17,00	223	125	2
17,25	228	130	2
17,50	228	130	2
17,75	228	130	2
18,00	228	130	2
18,25	233	135	2
18,50	233	135	2
18,75	233	135	2
19,00	233	135	2
19,25	238	140	2
19,50	238	140	2
19,75	238	140	2
20,00	238	140	2
20,25	243	145	2
20,50	243	145	2
20,75	243	145	2
21,00	243	145	2
21,25	248	150	2
21,50	248	150	2
21,75	248	150	2
22,00	248	150	2
22,25	248	150	2
22,50	253	155	2

10 265 ...

10 280 ...

DC _{h8} mm	OAL mm	LCF mm	MK
22,75	253	155	2
23,00	253	155	2
23,50	276	155	3
23,75	281	160	3
24,00	281	160	3
24,50	281	160	3
24,75	281	160	3
25,00	281	160	3
25,50	286	165	3
25,75	286	165	3
26,00	286	165	3
26,50	286	165	3
26,75	291	170	3
27,00	291	170	3
27,50	291	170	3
27,75	291	170	3
28,00	291	170	3
28,50	296	175	3
28,75	296	175	3
29,00	296	175	3
29,50	296	175	3
29,75	296	175	3
30,00	296	175	3
30,50	301	180	3
31,00	301	180	3
31,50	301	180	3
32,00	334	185	4
32,50	334	185	4
33,00	334	185	4
33,50	334	185	4
34,00	339	190	4
34,50	339	190	4
35,00	339	190	4
35,50	339	190	4
36,00	344	195	4
36,50	344	195	4
37,00	344	195	4
37,50	344	195	4
38,00	349	200	4
38,50	349	200	4
39,00	349	200	4
39,50	349	200	4
40,00	349	200	4
41,00	354	205	4
42,00	354	205	4
43,00	359	210	4
44,00	359	210	4
45,00	359	210	4
46,00	364	215	4
47,00	364	215	4
48,00	369	220	4
49,00	369	220	4
50,00	369	220	4
51,00	412	225	5
52,00	412	225	5
53,00	412	225	5
54,00	417	230	5
55,00	417	230	5

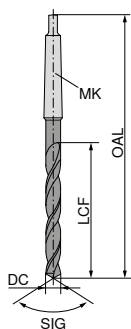
P	○	●
M	○	○
K	●	●
N	○	●
S	○	○
H	○	○
O	○	○

- 1) nitrided chamfer
2) vaporised

→ v_c Page 47

Twist drills, DIN 341, long

≤ 10xD



N

vap.

SIG 118°
HSS

WTL

SIG 130°
HSS-E

10 295 ...

10 297 ...

DC _{h8} mm	OAL mm	LCF mm	MK
26,50	335	214	3
27,00	343	222	3
27,50	343	222	3
28,00	343	222	3
29,00	351	230	3
29,50	351	230	3
30,00	351	230	3
30,50	360	239	3
31,00	360	239	3
31,50	360	239	3
32,00	397	248	4
33,00	397	248	4
33,50	397	248	4
34,00	406	257	4
35,00	406	257	4
36,00	416	267	4
37,00	416	267	4
37,50	416	267	4
38,00	426	277	4
39,00	426	277	4
40,00	426	277	4
42,00	436	287	4
43,00	447	298	4
44,00	447	298	4
45,00	447	298	4
50,00	470	321	4

265
270
275
280
290
295
300
305
310
315
320
330
335
340
350
360
370
375
380
390
400
420
430
440
450
500

DC _{h8} mm	OAL mm	LCF mm	MK
10,00	197	116	1
10,20	197	116	1
10,50	197	116	1
10,80	206	125	1
11,00	206	125	1
11,20	206	125	1
11,50	206	125	1
11,80	206	125	1
12,00	215	134	1
12,20	215	134	1
12,50	215	134	1
12,80	215	134	1
13,00	215	134	1
13,20	215	134	1
13,50	223	142	1
13,80	223	142	1
14,00	223	142	1
14,25	245	147	2
14,50	245	147	2
14,75	245	147	2
15,00	245	147	2
15,25	251	153	2
15,50	251	153	2
15,75	251	153	2
16,00	251	153	2
16,25	257	159	2
16,50	257	159	2
16,75	257	159	2
17,00	257	159	2
17,50	263	165	2
17,75	263	165	2
18,00	263	165	2
18,50	269	171	2
19,00	269	171	2
19,50	275	177	2
20,00	275	177	2
20,50	282	184	2
21,00	282	184	2
21,50	289	191	2
22,00	289	191	2
22,50	296	198	2
23,00	296	198	2
23,50	319	198	3
24,00	327	206	3
24,50	327	206	3
25,00	327	206	3
25,50	335	214	3
26,00	335	214	3

10 295 ...

10 297 ...

100	100 ¹⁾
102	102 ¹⁾
105	105 ¹⁾
108	
110	110 ¹⁾
112	112 ¹⁾
115	115 ¹⁾
118	118 ¹⁾
120	120 ¹⁾
122	122 ¹⁾
125	125 ¹⁾
128	128 ¹⁾
130	130 ¹⁾
132	
135	135 ¹⁾
138	138 ¹⁾
140	140 ¹⁾
142	
145	145 ¹⁾
147	
150	150 ¹⁾
152	
155	155 ¹⁾
157	
160	160 ¹⁾
162	
165	165 ²⁾
167	
170	170 ²⁾
175	175 ²⁾
177	
180	180 ²⁾
185	185 ²⁾
190	190 ²⁾
195	195 ²⁾
200	200 ²⁾
205	205 ²⁾
210	210 ²⁾
215	
220	220 ²⁾
225	
230	
235	
240	240 ²⁾
245	
250	250 ²⁾
255	
260	

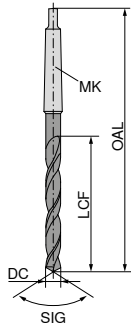
- 1) nitrided chamfer
2) vaporised

→ v_c Page 49

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

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

> 10xD



WTL

SIG 130°
HSS

10 305 ...

DC _{h8} mm	OAL mm	LCF mm	MK	
10,0	285	185	1	100 ¹⁾
10,5	285	185	1	105 ¹⁾
11,0	300	195	1	110 ¹⁾
11,5	300	195	1	115 ¹⁾
12,0	310	205	1	120 ¹⁾
12,5	310	205	1	125 ¹⁾
13,0	310	205	1	130 ¹⁾
13,5	325	220	1	135 ¹⁾
14,0	325	220	1	140 ¹⁾
14,5	340	220	2	145 ¹⁾
15,0	340	220	2	150 ¹⁾
15,5	355	230	2	155 ¹⁾
16,0	355	230	2	160 ¹⁾
16,5	355	230	2	165 ²⁾
17,0	355	230	2	170 ²⁾
17,5	370	245	2	175 ²⁾
18,0	370	245	2	180 ²⁾
18,5	370	245	2	185 ²⁾
19,0	370	245	2	190 ²⁾
19,5	385	260	2	195 ²⁾
20,0	385	260	2	200 ²⁾
21,0	385	260	2	210 ²⁾
22,0	405	270	2	220 ²⁾
23,0	405	270	2	230 ²⁾
24,0	440	290	3	240 ²⁾
25,0	440	290	3	250 ²⁾
26,0	440	290	3	260 ²⁾
28,0	460	305	3	280 ²⁾
30,0	460	305	3	300 ²⁾

P	●
M	
K	●
N	●
S	
H	
O	○

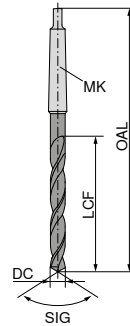
1) nitrided chamfer

2) vaporised

→ v. 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	
10,0	360	235	1	100 ¹⁾
10,5	360	235	1	105 ¹⁾
11,0	375	250	1	110 ¹⁾
11,5	375	250	1	115 ¹⁾
12,0	395	260	1	120 ¹⁾
13,0	395	260	1	130 ¹⁾
13,5	410	275	1	135 ¹⁾
14,0	410	275	1	140 ¹⁾
14,5	425	275	2	145 ¹⁾
15,0	425	275	2	150 ¹⁾
15,5	445	295	2	155 ¹⁾
16,0	445	295	2	160 ¹⁾
16,5	445	295	2	165 ²⁾
17,0	445	295	2	170 ²⁾
17,5	465	310	2	175 ²⁾
18,0	465	310	2	180 ²⁾
18,5	465	310	2	185 ²⁾
19,0	465	310	2	190 ²⁾
19,5	490	325	2	195 ²⁾
20,0	490	325	2	200 ²⁾
21,0	490	325	2	210 ²⁾
22,0	515	345	2	220 ²⁾
23,0	515	345	2	230 ²⁾
24,0	555	365	3	240 ²⁾
25,0	555	365	3	250 ²⁾
26,0	555	365	3	260 ²⁾
28,0	580	385	3	280 ²⁾
30,0	580	385	3	300 ²⁾

P	●
M	
K	●
N	●
S	
H	
O	○

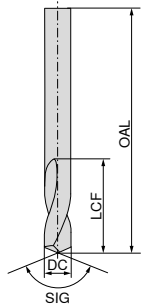
1) nitrided chamfer

2) vaporised

→ v. Page 51

NC spot drills, factory standard

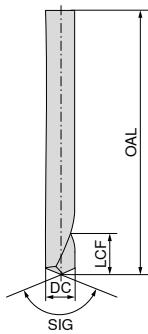
▲ helical flutes



NC-A	NC-A	NC-A	NC-A
	TiN		TiN
SIG 120° HSS	SIG 120° HSS	SIG 90° HSS	SIG 90° HSS
10 510 ...	10 512 ...	10 520 ...	10 522 ...
030	030	030	030
040	040	040	040
050	050	050	050
060	060	060	060
080	080	080	080
100	100	100	100
120	120	120	120
160	160	160	160
200	200	200	200

DC _{h6} mm	OAL mm	LCF mm
3	46	12,0
4	55	12,0
5	62	14,0
6	66	16,0
8	79	21,0
10	89	25,0
12	102	30,0
16	115	37,5
20	131	45,0

▲ with clamping flat to DIN 1835 B



SIG 120° HSS	SIG 90° HSS	SIG 90° HSS
10 513 ...	10 521 ...	10 523 ...
060	060	060
080	080	080
100	100	100
120	120	120
160	160	160
200	200	200

DC _{h6} mm	OAL mm	LCF mm
6	66	7,0
8	79	9,0
10	89	11,5
12	102	14,0
16	115	18,0
20	131	23,0

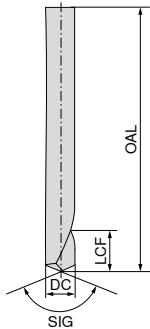
P	15-35	25-55	15-35	25-55
M	10	20	10	20
K	20-35	30-55	20-35	30-55
N	50-70	65-85	50-70	65-85
S				
H				
O				



Suitable only for spot drilling!

NC spot drill factory standard long

▲ with clamping flat to DIN 1835 B



NC-A		NC-A		NC-A	
TiN				TiN	
SIG 120° HSS		SIG 90° HSS		SIG 90° HSS	
10 532 ...		10 526 ...		10 528 ...	
060		060		060	
080		080		080	
100		100		100	
120		120		120	
160		160		160	
200		200		200	
P 25-55		15-35		25-55	
M 20		10		20	
K 30-55		20-35		30-55	
N 65-85		50-70		65-85	
S					
H					
O					

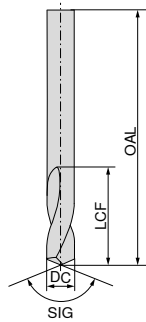
DC _{h6} mm	OAL mm	LCF mm
6	93	7,0
8	117	9,0
10	133	11,5
12	151	14,0
16	178	18,0
20	205	23,0

P	25-55	15-35	25-55
M	20	10	20
K	30-55	20-35	30-55
N	65-85	50-70	65-85
S			
H			
O			

Suitable only for spot drilling!

NC spot drills, factory standard,
long

▲ helical flutes



NC-A

SIG 90°
HSS

10 525 ...

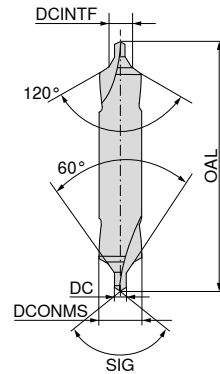
DC _{h6} mm	OAL mm	LCF mm	
6,35	105	17	025
8,00	118	21	030
9,52	132	25	040
12,70	159	30	050
15,87	186	37	060
P			15-35
M			10
K			20-35
N			50-70
S			
H			
O			



Suitable only for spot drilling!

Centre drills, DIN 333, form B

▲ with protective countersink 120°



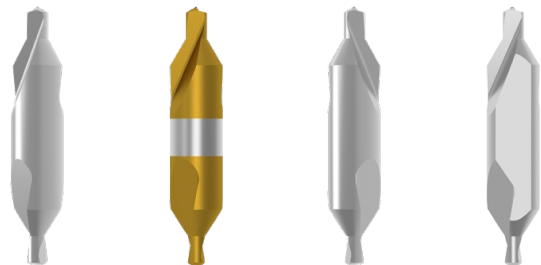
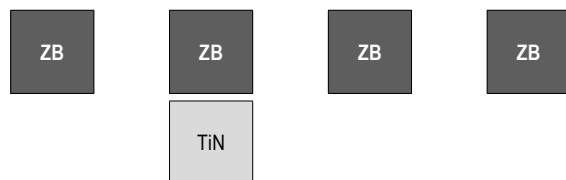
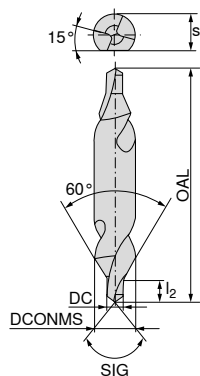
ZB

Right-hand
SIG 118°
HSS

10 480 ...

DC mm	DCONMS _{h8} mm	DCINTF _{k12} mm	OAL mm	
1,00	4,0	2,12	35,5	100
1,25	5,0	2,65	40,0	125
1,60	6,3	3,35	45,0	160
2,00	8,0	4,25	50,0	200
2,50	10,0	5,30	56,0	250
3,15	11,2	6,70	62,0	315
4,00	14,0	8,50	69,0	400
5,00	18,0	10,60	77,0	500
P				15-35
M				10
K				20-35
N				50-70
S				
H				
O				

Centre drills, DIN 333, form A



Right-hand
SIG 118°
HSS

Right-hand
SIG 118°
HSS

Left-hand
SIG 118°
HSS

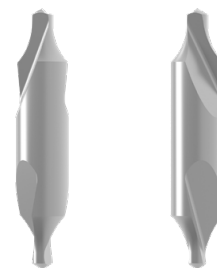
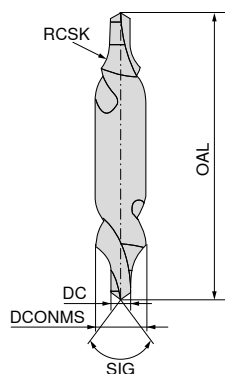
Right-hand
SIG 118°
HSS-E

DC mm	s mm	DCONMS mm	h8 mm	OAL mm	l2 mm	10 415 ...	10 425 ...	10 435 ...	10 445 ...
0,50		3,15	25,0	0,8		050 ²⁾	050 ²⁾	050 ²⁾	
0,80		3,15	25,0	1,1		080 ²⁾	080 ²⁾	080 ²⁾	
1,00		3,15	31,5	1,3		100	100	100	
1,25		3,15	31,5	1,6		125	125	125	
1,60		4,00	35,5	2,0		160	160	160	
1,60	3,25	4,00	35,5	2,0					160 ¹⁾
2,00		5,00	40,0	2,5		200	200	200	
2,00	4,20	5,00	40,0	2,5					200 ¹⁾
2,50		6,30	45,0	3,1		250	250	250	
2,50	5,35	6,30	45,0	3,1					250 ¹⁾
3,15		8,00	50,0	3,9		315	315	315	
3,15	6,95	8,00	50,0	3,9					315 ¹⁾
4,00		10,00	56,0	5,0		400	400	400	
4,00	8,40	10,00	56,0	5,0					400 ¹⁾
5,00		12,50	63,0	6,3		500	500	500	
5,00	10,95	12,50	63,0	6,3					500 ¹⁾
6,30		16,00	71,0	8,0		630	630	630	
6,30	14,00	16,00	71,0	8,0					630 ¹⁾
P						15-35	25-55	15-35	15-35
M						10	20	10	10
K						20-35	30-55	20-35	20-35
N						50-70	65-85	50-70	50-70
S									
H									
O									

1) with flat

2) Single ended

Centre drills, DIN 333, form R



Right-hand
SIG 118°
HSS

Left-hand
SIG 118°
HSS

DC mm	DCONMS _{h8} mm	OAL mm	RCSR mm
0,50	3,15	25,0	2,00
0,80	3,15	25,0	2,50
1,00	3,15	31,5	2,90
1,25	3,15	31,5	3,15
1,60	4,00	35,5	4,00
2,00	5,00	40,0	5,00
2,50	6,30	45,0	6,30
3,15	8,00	50,0	8,00
4,00	10,00	56,0	10,00
5,00	12,50	63,0	12,50
6,30	16,00	71,0	16,00

10 455 ...

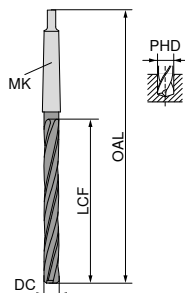
10 475 ...

P	15-35	15-35
M	10	10
K	20-35	20-35
N	50-70	50-70
S		
H		
O		

1) Single ended

Core drills (spiral countersinks)

▲ 3 flute



N

vap.

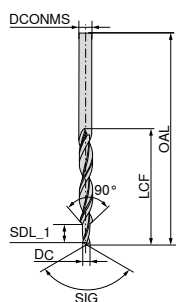
SIG 120°
HSS

10 228 ...

DC _{h8} mm	OAL mm	LCF mm	PHD mm	MK	
12,00	182	101	8,4	1	120
12,75	182	101	9,1	1	127
13,00	182	101	9,1	1	130
13,75	189	108	9,8	1	137
14,00	189	108	9,8	1	140
14,75	212	114	10,5	2	147
15,00	212	114	10,5	2	150
15,75	218	120	11,2	2	157
16,00	218	120	11,2	2	160
16,75	223	125	11,9	2	167
17,00	223	125	11,9	2	170
17,75	228	130	12,6	2	177
18,00	228	130	12,6	2	180
18,70	233	135	13,3	2	187
19,00	233	135	13,3	2	190
19,70	238	140	14,0	2	197
20,00	238	140	14,0	2	200
20,70	243	145	14,6	2	207
21,00	243	145	14,6	2	210
21,70	248	150	15,3	2	217
22,00	248	150	15,3	2	220
22,70	253	155	16,0	2	227
23,00	253	155	16,0	2	230
23,70	281	160	16,6	3	237
24,00	281	160	16,6	3	240
24,70	281	160	17,3	3	247
25,00	281	160	17,3	3	250
25,70	286	165	18,0	3	257
26,00	286	165	18,0	3	260
26,70	291	170	18,6	3	267
27,00	291	170	18,6	3	270
27,70	291	170	19,3	3	277
28,00	291	170	19,3	3	280
28,70	296	175	20,0	3	287
29,00	296	175	20,0	3	290
29,70	296	175	20,5	3	297
30,00	296	175	20,5	3	300
P					15-35
M					10
K					20-35
N					50-80
S					14-28
H					
O					

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

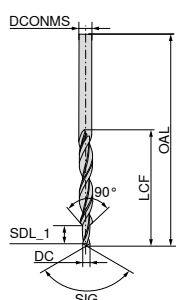
SIG 118°
HSS

10 365 ...

For threads	DC _{h9} mm	DCONMS _{h8} mm	OAL mm	SDL_1 mm	LCF mm
M3	2,5	3,4	70	8,8	39
M4	3,3	4,5	80	11,4	47
M5	4,2	5,5	93	13,6	57
M6	5,0	6,6	101	16,5	63
M8	6,8	9,0	125	21,0	81
M10	8,5	11,0	142	25,5	94
M12	10,2	13,5	160	30,0	108

030
040
050
060
080
100
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

SIG 118°
HSS

10 355 ...

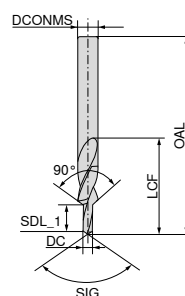
For threads	DC _{h9} mm	DCONMS _{h8} mm	OAL mm	SDL_1 mm	LCF mm
M3	3,2	6,0	93	9	57
M4	4,3	8,0	117	11	75
M5	5,3	10,0	133	13	87
M6	6,4	11,5	142	15	94
M8	8,4	15,0	169	19	114
M10	10,5	19,0	198	23	135

030
040
050
060
080
100

P	15-35
M	10
K	20-35
N	50-80
S	
H	
O	

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

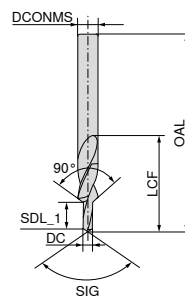
SIG 118°
HSS

10 320 ...

For threads	DC _{h6} mm	DCONMS _{h6} mm	OAL mm	SDL_1 mm	LCF mm
M3	2,5	3,4	52	8,8	20
M4	3,3	4,5	58	11,4	24
M5	4,2	5,5	66	13,6	28
M6	5,0	6,6	70	16,5	31
M8	6,8	9,0	84	21,0	40
M10	8,5	11,0	95	25,5	47
M12	10,2	13,5	107	30,0	54

030
040
050
060
080
100
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

SIG 118°
HSS

10 330 ...

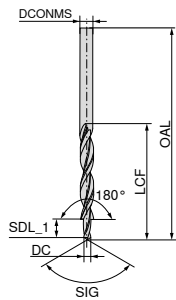
For threads	DC _{h6} mm	DCONMS _{h6} mm	OAL mm	SDL_1 mm	LCF mm
M3	3,2	6,0	66	9	28
M4	4,3	8,0	79	11	37
M5	5,3	10,0	89	13	43
M6	6,4	11,5	95	15	47
M8	8,4	15,0	111	19	56
M10	10,5	19,0	127	23	64

030
040
050
060
080
100

P	15-35
M	10
K	20-35
N	50-80
S	
H	
O	

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



SB

vap.

SIG 118°
HSS

10 375 ...

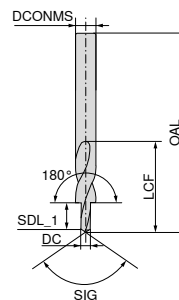
For threads	DC _{h9} mm	DCONMS _{h8} mm	OAL mm	SDL_1 mm	LCF mm	
M3	3,4	6	93	9	57	030 ¹⁾
M4	4,5	8	117	11	75	040
M5	5,5	10	133	13	87	050
M6	6,6	11	142	15	94	060
M8	9,0	15	169	19	114	080
M10	11,0	18	191	23	130	100

P	15-35
M	10
K	20-35
N	50-80
S	
H	
O	

1) DCONMS not according to DIN 974-1

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

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



SB

SIG 118°
HSS

10 340 ...

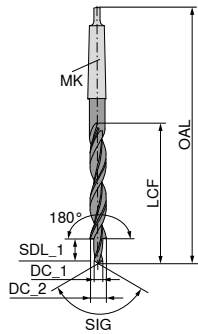
For threads	DC _{h6} mm	DCONMS _{h6} mm	OAL mm	SDL_1 mm	LCF mm	
M3	3,4	6	66	9	28	030 ¹⁾
M4	4,5	8	79	11	37	040
M5	5,5	10	89	13	43	050
M6	6,6	11	95	15	47	060
M8	9,0	15	111	19	56	080
M10	11,0	18	123	23	62	100

P	15-35
M	10
K	20-35
N	50-80
S	
H	
O	

1) DCONMS not according to DIN 974-1

Stepped drills, DIN 8377

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



SIG 118°
HSS

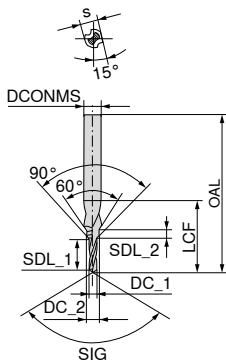
10 405 ...

For threads	DC_1 mm	DC_2 mm	OAL mm	SDL_1 mm	LCF mm	MK	
M6	6,6	11	175	15	94	1	060
M8	9,0	15	212	19	114	2	080
M10	11,0	18	228	23	130	2	100
M12	13,5	20	238	27	140	2	120
M14	15,5	24	281	31	160	3	140
M16	17,5	26	286	35	165	3	160

P	15-35
M	10
K	20-35
N	50-80
S	
H	
O	

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 $\geq \varnothing 3,3$ mm
- ▲ the feed rate has to be selected based on the small $\varnothing$ 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	
M4	3,3	8,0	4,3	6,75	63	11,0	23	1,60	040
M5	4,2	10,0	5,3	8,45	67	13,0	27	2,15	050
M6	5,0	12,5	6,4	10,45	71	16,0	33	2,90	060
M8	6,8	14,0	8,4	12,50	88	19,5	41	3,50	080
M10	8,5	16,0	10,5	14,85	94	23,0	47	4,70	100
M12	10,2	20,0	13,0	18,45	105	28,0	59	6,50	120
M16	14,0	25,0	17,0	23,40	132	33,0	67	8,30	160
M20	17,5	31,5	21,0	29,35	145	38,0	77	10,35	200
P									15-35
M									10
K									20-35
N									50-80
S									
H									
O									

Material examples for cutting data tables

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

* Tensile strength

Cutting data standard values – Hole depth 3xD

Index	10 122 ...		10 113 ...		10 107 ...		10 105 ...		10 130 ...		
	Type VX-TiN		Type UNI-PM-TiN		Type UNI-TiN		Type N		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 ...		10 109 ...		10 110 ...		10 285 ...	
		Type WNX		Type WT		Type WT-TiN		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 $\geq 4xD$ and the cutting speed v_c should be reduced as follows: at drilling depths $> 4xD$ by 10 %, at drilling depths $> 6xD$ by 15–20 %.
It is also recommended to use an emulsion for cooling.



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

Cutting data standard values – Hole depth 5xD

Index	10 124 ...		10 173 ...		10 171 ...		10 152 ...		10 175 ...		
	Type VX-TiN		Type UNI-PM-TiN		Type UNI-TiN		Type N		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 ...		10 168 ...		10 170 ...		10 265 ...		10 280 ...	
		Type W		Type WTL		Type WTL-TiN		Type N-MK		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 $\geq 4xD$ and the cutting speed v_c should be reduced as follows: at drilling depths $> 4xD$ by 10 %, at drilling depths $> 6xD$ by 15–20 %.

It is also recommended to use an emulsion for cooling.



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

Cutting data standard values – Hole depth 10xD

Index	10 224 ...		10 270 ...		10 225 ...		10 210 ...	
	Type NC-TiALN		Type UNI-TiN		Type WTL		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 ...		10 295 ...		10 297 ...	
		Type WTW		Type N-MK		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 $\geq 4xD$ and the cutting speed v_c should be reduced as follows: at drilling depths $> 4xD$ by 10 %, at drilling depths $> 6xD$ by 15–20 %.
It is also recommended to use an emulsion for cooling.



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

Cutting data standard values – hole depth greater than 10xD

Index	10 235 ...		10 245 ...		10 255 ...		10 236 ...		
	Type WTL-R1		Type WTL-R2		Type WTL-R3		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 ...		10 256 ...		10 305 ...		10 315 ...	
		Type WTL-TiAlN-R2		Type WTL-TiAlN-R3		Type WTL-MK-R1		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 $\geq 4xD$ and the cutting speed v_c should be reduced as follows: at drilling depths $> 4xD$ by 10 %, at drilling depths $> 6xD$ by 15–20 %.
It is also recommended to use an emulsion for cooling.



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

Cutting data standard values – micro drills

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.

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



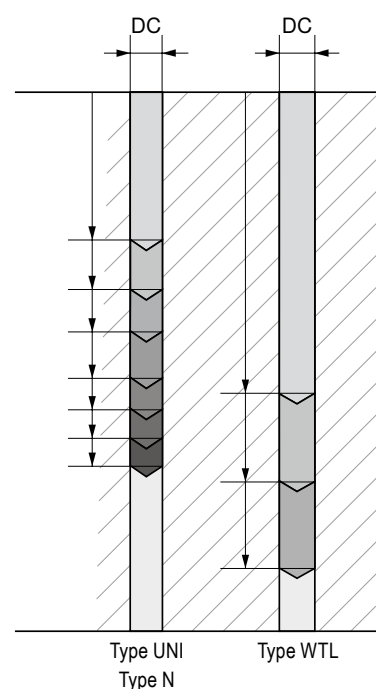
All the indicated data are guide values only and represent average values.

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 $\geq 4xD$ 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

