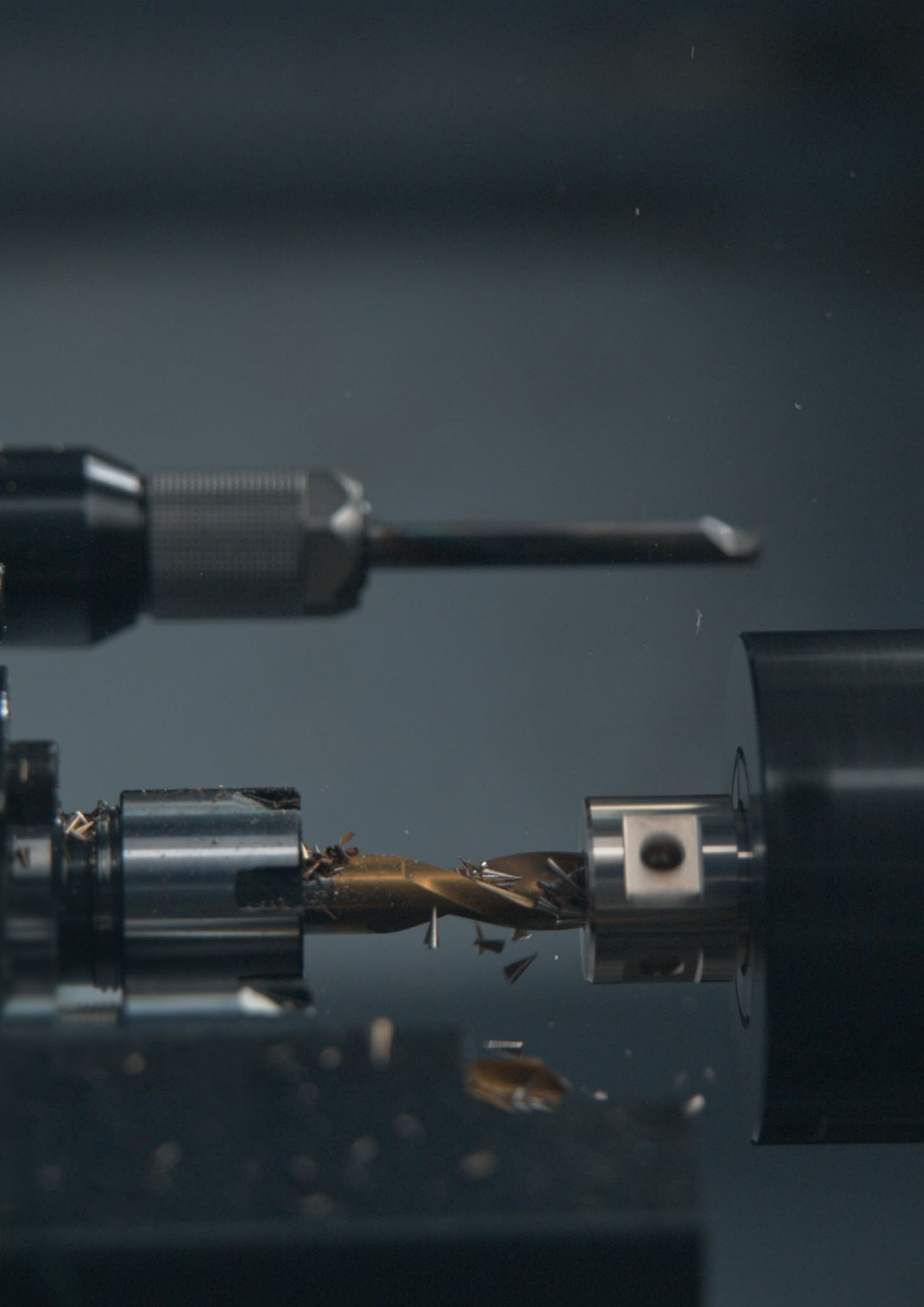

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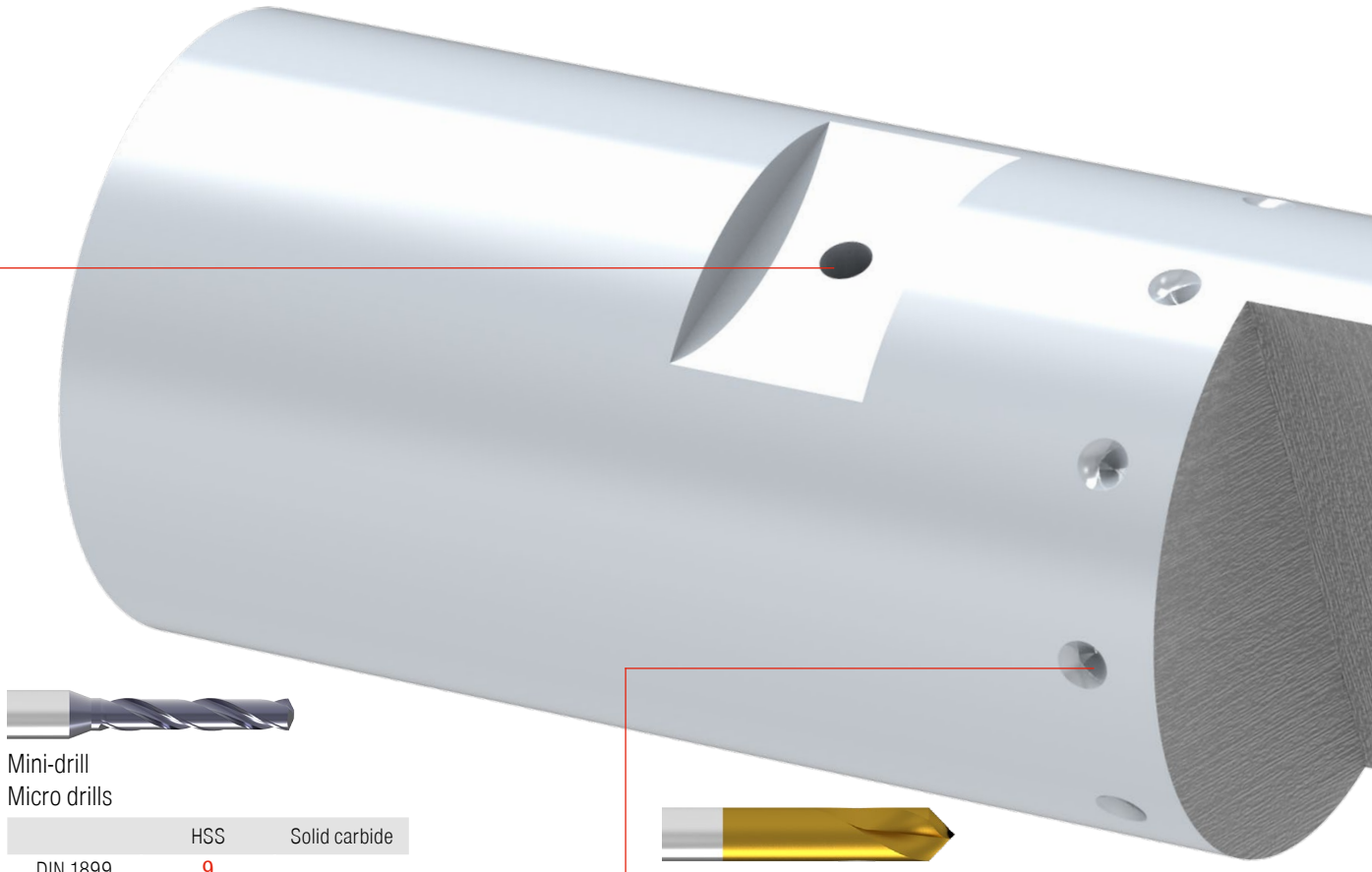
Toolfinder



Mini-drill
Micro drills

	HSS	Solid carbide
DIN 1899	9	
5xD		29+30
8xD		30
12xD		31

NC Spot Drill

	HSS	Solid carbide
90°	9	32
120°	9	32

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.

KOMET \ Performance

Premium quality tools for high performance.

The premium quality tools from the **KOMET 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.

WNT \ Standard

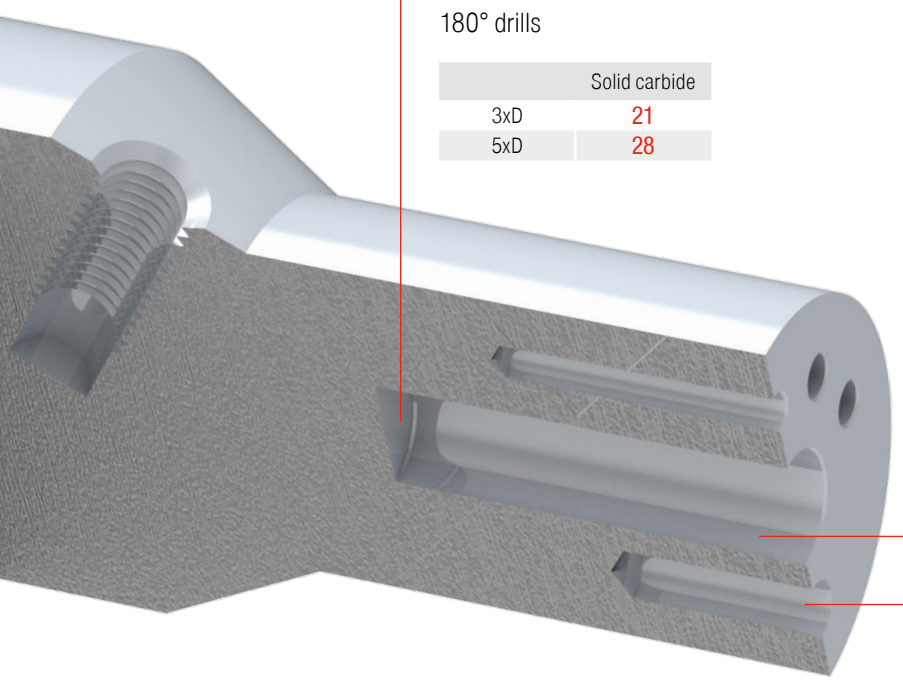
Quality tools for standard applications.

The quality tools of the **WNT Standard** product line are high quality, powerful and reliable and enjoy the highest trust of our customers worldwide. Tools from this product line are the first choice for many standard applications and guarantee optimal results.

KOMET \ Standard

Quality tools for standard applications.

The quality tools of the **KOMET Standard** product line are high quality, high performance, reliable and enjoy the highest level of trust among our customers worldwide. Tools from this product line are the first choice for many standard applications and guarantee optimal results.



Reamers

	HSS	Solid carbide
0,95–12,00	65–69	
0,59–12,05		48–64

180° drills

	Solid carbide
3xD	21
5xD	28

Standard drills

	HSS	Solid carbide
3xD	6	16–20
5xD	7	22–27
10xD	8	

Symbol explanation

HSS drilling

Functional length

≤ 10xD

Shank

DIN 1835 A

Point angle

130°

● = **Main Application**
○ = Extended application

Solid carbide drilling

Functional length

≤ 8xD

Shank

DIN 6535 HA

Version

Int. coolant supply

self-centering

Pilot hole necessary

Point angle

140°

● = **Main Application**
○ = Extended application

Reamers

Shank

DIN 1835 A

DIN 6535 HA

Version

central internal coolant

lateral internal coolant

ZEFP = Number of flutes

● = **Main Application**
○ = Extended application

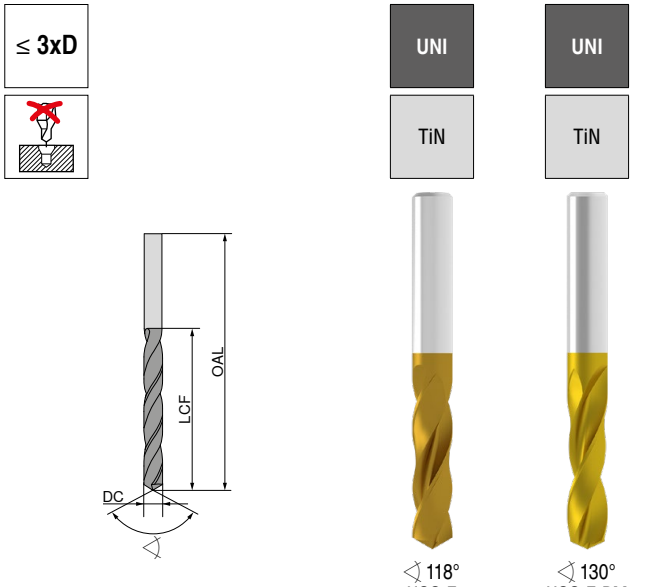
HSS Drills Overview

	Tool type	Material | Coating	Point angle	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							
	UNI	HSS-E TiN	**118°**	1–12	● ● ● ○ ○ ○ A	■	6
	UNI	HSS-E-PM TiN	**130°**	1–12	● ● ○ ○ ○ ○ A	■	6
5xD without thro' coolant							
	UNI	HSS-E TiN	**118°**	0,9–12	● ● ● ○ ○ ○ A	■	7
	UNI	HSS-E-PM TiN	**130°**	1–12	● ● ○ ○ ○ ○ A	■	7
up to 10xD without thro' coolant							
	UNI	HSS-E TiN	**118°**	1–12	● ● ● ○ ○ ○ A	■	8
Mini-drill							
	N	HSS-E-PM	**118°**	0,15–1,45	● ○ ● ● ○ ○ A	□	9
NC Spot Drill							
	NC-A	HSS TiN	**90°**	3–12	● ○ ● ○ A ~B	■	9
	NC-A	HSS TiN	**120°**	3–12	● ○ ● ○ A ~B	■	9

Further dimensions and drills can be found in our → **main catalogue in Chapter 1 HSS drills**

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

≤ 3xD



DC h8 mm	DC inch	OAL mm	LCF mm	10 107 ...	10 113 ...
1,00		26	6	010 1)	010 1)
1,10		28	7	011 1)	011 1)
1,20		30	8	012 1)	012 1)
1,30		30	8	013 1)	013 1)
1,40		32	9	014 1)	014 1)
1,50		32	9	015 1)	015 1)
1,60		34	10	016 1)	016 1)
1,70		34	10	017 1)	017 1)
1,80		36	11	018 1)	018 1)
1,90		36	11	019 1)	019 1)
2,00		38	12	020 1)	020 1)
2,10		38	12	021 1)	021 1)
2,20		40	13	022 1)	022 1)
2,30		40	13	023 1)	023 1)
2,38	3/32	43	14	238 1)	238 1)
2,40		43	14	024 1)	024 1)
2,50		43	14	025 1)	025 1)
2,60		43	14	026 1)	026 1)
2,70		46	16	027 1)	027 1)
2,78	7/64	46	16	278 1)	278 1)
2,80		46	16	028 1)	028 1)
2,90		46	16	029 1)	029 1)
3,00		46	16	030 1)	030 1)
3,10		49	18	031 1)	031 1)
3,17	1/8	49	18	317 1)	317 1)
3,20		49	18	032 1)	032 1)
3,30		49	18	033 1)	033 1)
3,40		52	20	034 1)	034 1)
3,50		52	20	035 1)	035 1)
3,57	9/64	52	20	357 1)	357 1)
3,60		52	20	036 1)	036 1)
3,70		52	20	037 1)	037 1)
3,80		55	22	038 1)	038 1)
3,90		55	22	039 1)	039 1)
3,97	5/32	55	22	397 1)	397 1)
4,00		55	22	040 1)	040 1)
4,10		55	22	041 1)	041 1)
4,20		55	22	042 1)	042 1)
4,30		58	24	043 1)	043 1)
4,37	11/64	58	24	437 1)	437 1)
4,40		58	24	044 1)	044 1)
4,50		58	24	045 1)	045 1)
4,60		58	24	046 1)	046 1)
4,70		58	24	047 1)	047 1)
4,76	3/16	62	26	476 1)	476 1)
4,80		62	26	048 1)	048 1)
4,90		62	26	049 1)	049 1)
5,00		62	26	050 1)	050 1)
5,10		62	26	051 1)	051 1)
5,16	13/64	62	26	516 1)	516 1)
5,20		62	26	052 1)	052 1)
5,30		62	26	053 1)	053 1)
5,40		66	28	054 1)	054 1)
5,50		66	28	055 1)	055 1)
5,56	7/32	66	28	556 1)	556 1)
5,60		66	28	056 1)	056 1)
5,70		66	28	057 1)	057 1)
5,80		66	28	058 1)	058 1)
5,90		66	28	059 1)	059 1)
5,95	15/64	66	28	595 1)	595 1)
6,00		66	28	060 1)	060 1)
6,10		70	31	061 1)	061 1)
6,20		70	31	062 1)	062 1)
6,30		70	31	063 1)	063 1)
6,35	1/4	70	31	635 1)	635 1)
6,40		70	31	064 1)	064 1)
6,50		70	31	065 1)	065 1)
6,60		70	31	066 1)	066 1)
6,70		70	31	067 1)	067 1)
6,75		74	34	675 1)	675 1)
6,80		74	34	068 1)	068 1)
6,90		74	34	069 1)	069 1)
7,00		74	34	070 1)	070 1)
7,10		74	34	071 1)	071 1)
7,14	9/32	74	34	714 1)	714 1)
7,20		74	34	072 1)	072 1)
7,30		74	34	073 1)	073 1)
7,40		74	34	074 1)	074 1)
7,50		74	34	075 1)	075 1)
7,60		79	37	076 1)	076 1)
7,70		79	37	077 1)	077 1)
7,80		79	37	078 1)	078 1)
7,90		79	37	079 1)	079 1)
7,94	5/16	79	37	794 1)	794 1)
8,00		79	37	080 1)	080 1)
8,10		79	37	081 1)	081 1)
8,20		79	37	082 1)	082 1)
8,30		79	37	083 1)	083 1)
8,40		79	37	084 1)	084 1)
8,50		79	37	085 1)	085 1)
8,60		84	40	086 1)	
8,70		84	40	087 1)	
8,73	11/32	84	40	873 1)	873 1)
8,80		84	40	088 1)	088 1)
8,90		84	40	089 1)	
9,00		84	40	090 1)	090 1)
9,10		84	40	091 1)	
9,20		84	40	092 1)	
9,30		84	40	093 1)	093 1)
9,40		84	40	094 1)	
9,50		84	40	095 1)	095 1)
9,60		89	43	096 1)	
9,70		89	43	097 1)	
9,80		89	43	098 1)	098 1)
9,90		89	43	099 1)	
10,00		89	43	100 1)	100 1)
10,10		89	43	101 1)	
10,20		89	43	102 1)	102 1)
10,30		89	43	103 1)	
10,40		89	43	104 1)	
10,50		89	43	105 1)	105 1)
11,00		95	47	110 1)	110 1)
11,11	7/16	95	47	111 1)	111 1)
11,50		95	47	115 1)	115 1)
12,00		102	51	120 1)	120 1)
P				●	●
M				●	
K				●	●
N				○	○
S				○	○
H					○
O				○	○

1) self-centering

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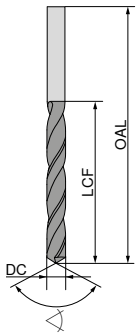
Twist drill to DIN 338, short

≤ 5xD

UNI

TiN



118°
HSS-E

130°
HSS-E-PM

DC h8 mm	DC inch	OAL mm	LCF mm	10 171 ...	10 173 ...
0,90		32	11	009 1)	
1,00		34	12	010 1)	010 1)
1,10		36	14	011 1)	011 1)
1,20		38	16	012 1)	012 1)
1,25		38	16	125 1)	
1,30		38	16	013 1)	013 1)
1,40		40	18	014 1)	014 1)
1,45		40	18	145 1)	
1,50		40	18	015 1)	015 1)
1,55		43	20	155 1)	
1,60		43	20	016 1)	016 1)
1,65		43	20	165 1)	
1,70		43	20	017 1)	017 1)
1,80		46	22	018 1)	018 1)
1,90		46	22	019 1)	019 1)
2,00		49	24	020 1)	020 1)
2,10		49	24	021 1)	021 1)
2,20		53	27	022 1)	022 1)
2,30		53	27	023 1)	023 1)
2,38	3/32	57	30	238 1)	238 1)
2,40		57	30	024 1)	024 1)
2,50		57	30	025 1)	025 1)
2,55		57	30	255 1)	
2,60		57	30	026 1)	026 1)
2,70		61	33	027 1)	027 1)
2,78	7/64	61	33	278 1)	278 1)
2,80		61	33	028 1)	028 1)
2,90		61	33	029 1)	029 1)
3,00		61	33	030 1)	030 1)
3,10		65	36	031 1)	031 1)
3,17	1/8	65	36	317 1)	317 1)
3,20		65	36	032 1)	032 1)
3,25		65	36	325 1)	
3,30		65	36	033 1)	033 1)
3,40		70	39	034 1)	034 1)
3,50		70	39	035 1)	035 1)
3,57	9/64	70	39	357 1)	357 1)
3,60		70	39	036 1)	036 1)
3,70		70	39	037 1)	037 1)
3,80		75	43	038 1)	038 1)
3,90		75	43	039 1)	039 1)
3,97	5/32	75	43	397 1)	397 1)
4,00		75	43	040 1)	040 1)
4,10		75	43	041 1)	041 1)
4,20		75	43	042 1)	042 1)
4,25		75	43	425 1)	
4,30		80	47	043 1)	043 1)
4,37	11/64	80	47	437 1)	437 1)
4,40		80	47	044 1)	044 1)
4,50		80	47	045 1)	045 1)
4,60		80	47	046 1)	046 1)
4,65		80	47	465 1)	
4,70		80	47	047 1)	047 1)
4,76	3/16	86	52	476 1)	476 1)
4,80		86	52	048 1)	048 1)
4,90		86	52	049 1)	049 1)
4,95		86	52	495 1)	
5,00		86	52	050 1)	050 1)
5,05		86	52	505 1)	
5,10		86	52	051 1)	051 1)
5,16	13/64	86	52	516 1)	516 1)
5,20		86	52	052 1)	052 1)
5,30		86	52	053 1)	053 1)
5,40		93	57	054 1)	054 1)
5,50		93	57	055 1)	055 1)
5,55		93	57	555 1)	
5,56	7/32	93	57	556 1)	556 1)
5,60		93	57	056 1)	056 1)
5,70		93	57	057 1)	057 1)
5,75		93	57	575 1)	
5,80		93	57	058 1)	058 1)
5,90		93	57	059 1)	059 1)
5,95	15/64	93	57	595 1)	595 1)
6,00		93	57	060 1)	060 1)
6,10		101	63	061 1)	061 1)
6,20		101	63	062 1)	062 1)
6,30		101	63	063 1)	063 1)
6,35	1/4	101	63	635 1)	635 1)
6,40		101	63	064 1)	064 1)
6,50		101	63	065 1)	065 1)
6,60		101	63	066 1)	066 1)
6,70		101	63	067 1)	067 1)
6,75		109	69	675 1)	675 1)
6,80		109	69	068 1)	068 1)
6,90		109	69	069 1)	069 1)
7,00		109	69	070 1)	070 1)
7,10		109	69	071 1)	071 1)
7,14	9/32	109	69	714 1)	714 1)
7,20		109	69	072 1)	072 1)
7,30		109	69	073 1)	073 1)
7,40		109	69	074 1)	074 1)
7,45		109	69	745 1)	
7,50		109	69	075 1)	075 1)
7,60		117	75	076 1)	076 1)
7,70		117	75	077 1)	077 1)
7,80		117	75	078 1)	078 1)
7,90		117	75	079 1)	079 1)
7,94	5/16	117	75	794 1)	794 1)
8,00		117	75	080 1)	080 1)
8,10		117	75	081 1)	081 1)
8,20		117	75	082 1)	082 1)
8,30		117	75	083 1)	083 1)
8,40		117	75	084 1)	084 1)
8,50		117	75	085 1)	085 1)
8,60		125	81	086 1)	
8,70		125	81	087 1)	
8,73	11/32	125	81	873 1)	873 1)
8,80		125	81	088 1)	088 1)
8,90		125	81	089 1)	
9,00		125	81	090 1)	090 1)
9,10		125	81	091 1)	
9,20		125	81	092 1)	
9,30		125	81	093 1)	093 1)
9,35		125	81	935 1)	
9,40		125	81	094 1)	
9,50		125	81	095 1)	095 1)
9,60		133	87	096 1)	
9,70		133	87	097 1)	
9,80		133	87	098 1)	098 1)
9,90		133	87	099 1)	
10,00		133	87	100 1)	100 1)
10,10		133	87	101 1)	
10,20		133	87	102 1)	102 1)
10,30		133	87	103 1)	
10,40		133	87	104 1)	
10,50		133	87	105 1)	105 1)
10,55		133	87	955 1)	
11,00		142	94	110 1)	110 1)
11,11	7/16	142	94	111 1)	111 1)
11,20		142	94	112 1)	
11,30		142	94	113 1)	
11,40		142	94	114 1)	
11,50		142	94	115 1)	115 1)
11,60		142	94	116 1)	
12,00		151	101	120 1)	120 1)
P				●	●
M				●	
K				●	●
N				○	○
S				○	○
H					○
O				○	○

1) self-centering

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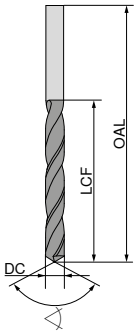
Twist drills, DIN 340, long

≤ 10xD

UNI

TiN



118°
HSS-E

DC h8 mm	OAL mm	LCF mm	10 270 ...
1,0	56	33	010
1,1	60	37	011
1,2	65	41	012
1,3	65	41	013
1,4	70	45	014
1,5	70	45	015
1,6	76	50	016
1,7	76	50	017
1,8	80	53	018
1,9	80	53	019
2,0	85	56	020
2,1	85	56	021
2,2	90	59	022
2,3	90	59	023
2,4	95	62	024
2,5	95	62	025
2,6	95	62	026
2,7	100	66	027
2,8	100	66	028
2,9	100	66	029
3,0	100	66	030
3,1	106	69	031
3,2	106	69	032
3,3	106	69	033
3,4	112	73	034
3,5	112	73	035
3,6	112	73	036
3,7	112	73	037
3,8	119	78	038
3,9	119	78	039
4,0	119	78	040
4,1	119	78	041
4,2	119	78	042
4,3	126	82	043
4,4	126	82	044
4,5	126	82	045
4,6	126	82	046
4,7	126	82	047
4,8	132	87	048
4,9	132	87	049
5,0	132	87	050
5,1	132	87	051
5,2	132	87	052
5,3	132	87	053
5,4	139	91	054
5,5	139	91	055
5,6	139	91	056
5,7	139	91	057
5,8	139	91	058
5,9	139	91	059
6,0	139	91	060
6,1	148	97	061
6,2	148	97	062
6,3	148	97	063
6,4	148	97	064
6,5	148	97	065
6,6	148	97	066
6,7	148	97	067
6,8	156	102	068
6,9	156	102	069
7,0	156	102	070
7,1	156	102	071

DC h8 mm	OAL mm	LCF mm	10 270 ...
7,2	156	102	072
7,3	156	102	073
7,4	156	102	074
7,5	156	102	075
7,6	165	109	076
7,7	165	109	077
7,8	165	109	078
7,9	165	109	079
8,0	165	109	080
8,1	165	109	081
8,2	165	109	082
8,3	165	109	083
8,4	165	109	084
8,5	165	109	085
8,6	175	115	086
8,7	175	115	087
8,8	175	115	088
8,9	175	115	089
9,0	175	115	090
9,1	175	115	091
9,2	175	115	092
9,3	175	115	093
9,4	175	115	094
9,5	175	115	095
9,6	184	121	096
9,7	184	121	097
9,8	184	121	098
9,9	184	121	099
10,0	184	121	100
10,1	184	121	101
10,2	184	121	102
10,3	184	121	103
10,4	184	121	104
10,5	184	121	105
11,0	195	128	110
11,5	195	128	115
12,0	205	134	120

	10 270 ...
P	●
M	●
K	●
N	○
S	○
H	
O	○

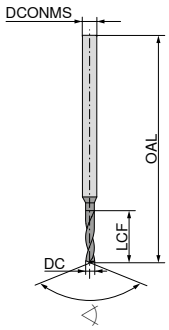
→ v_c Page 11

Twist drills, DIN 1899

▲ 4 facet
▲ with reinforced shank

Scope of supply:

▲ Pack quantity 5 pieces
▲ price per piece



N

118°
HSS-E-PM

10 103 ...

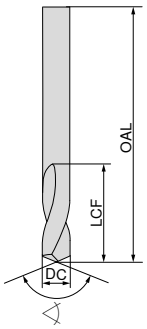
DC $_{-0,004}$ mm	OAL mm	LCF mm	DCONMS $_{h8}$ mm	
0,15	25	0,8	1,0	**00150**
0,20	25	1,5	1,0	**00200**
0,25	25	1,9	1,0	**00250**
0,30	25	1,9	1,0	**00300**
0,35	25	2,4	1,0	**00350**
0,40	25	3,0	1,0	**00400**
0,45	25	3,0	1,0	**00450**
0,50	25	3,4	1,0	**00500**
0,55	25	3,9	1,0	**00550**
0,60	25	3,9	1,0	**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 12

NC spot drills, factory standard

▲ helical flutes



NC-A
TiN

Right-hand
90°
HSS

10 522 ...

NC-A
TiN

Left-hand
120°
HSS

10 512 ...

DC $_{h6}$ mm	OAL mm	LCF mm		
3	46	12	**030**	**030**
4	55	12	**040**	**040**
5	62	14	**050**	**050**
6	66	16	**060**	**060**
8	79	21	**080**	**080**
10	89	25	**100**	**100**
12	102	30	**120**	**120**

P	**25-55**	**25-55**
M	20	20
K	**30-55**	**30-55**
N	65-85	65-85
S		
H		
O		

Material examples for cutting data tables

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

*** Tensile strength**

Cutting data standard values

	Drilling depth 3xD				Drilling depth 5xD				Hole depth 10xD	
	Type UNI-TiN 10 107 ...		Type UNI-PM-TiN 10 113 ...		Type UNI-TiN 10 171 ...		Type UNI-PM-TiN 10 173 ...		Type UNI-TiN 10 270 ...	
Index	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F	v_c in m/min	F
P.1.1	**46**	6	**44**	6	**46**	6	**44**	6	**41**	6
P.1.2	**39**	5	**37**	5	**39**	5	**37**	5	**35**	5
P.1.3	**35**	5	**33**	5	**35**	5	**33**	5	**31**	5
P.1.4	**32**	5	**31**	5	**32**	5	**31**	5	**29**	5
P.1.5	**28**	5	**26**	5	**28**	5	**26**	5	**25**	5
P.2.1	**35**	5	**32**	6	**35**	5	**32**	6	**31**	5
P.2.2	**24**	4	**23**	5	**24**	4	**23**	5	**22**	4
P.2.3	**21**	4	**19**	5	**21**	4	**19**	5	**19**	4
P.2.4	**19**	3	**18**	4	**19**	3	**18**	4	**17**	3
P.3.1	**17**	4	**21**	4	**17**	4	**21**	4	**16**	4
P.3.2	**13**	3	**16**	3	**13**	3	**16**	3	**12**	3
P.3.3	**12**	3	**15**	3	**12**	3	**15**	3	**10**	2
P.4.1	**18**	4	**14**	3	**18**	4	**14**	3	**16**	4
P.4.2	**17**	3	**14**	2	**17**	3	**14**	2	**15**	3
M.1.1	**15**	4			**15**	4			**13**	4
M.2.1	**12**	3			**14**	4			**8**	3
M.3.1	**10**	3			**10**	3			**9**	3
K.1.1	**41**	6	**46**	6	**41**	6	**46**	6	**37**	6
K.1.2	**33**	6	**37**	6	**33**	6	**37**	6	**30**	6
K.2.1	**35**	6	**39**	6	**35**	6	**39**	6	**32**	6
K.2.2	**27**	5	**30**	5	**27**	5	**30**	5	**24**	5
K.3.1	**35**	6	**39**	6	**35**	6	**39**	6	**32**	6
K.3.2	**27**	5	**30**	5	**27**	5	**30**	5	**24**	5
N.1.1										
N.1.2										
N.2.1	75	6	69	6	75	6	69	6	67	6
N.2.2	60	5	55	5	60	5	55	5	54	5
N.2.3	52	5	48	5	52	5	48	5	47	5
N.3.1	69	5	64	5	69	5	64	5	62	5
N.3.2	41	4	39	4	41	4	39	4	37	4
N.3.3	55	4	52	4	55	4	52	4	50	4
N.4.1	70	5	60	5	70	6	65	6	50	6
S.1.1			7	2			7	2		
S.1.2			6	1			6	1		
S.2.1			6	2			6	2		
S.2.2										
S.2.3										
S.3.1	9	2			9	2			8	2
S.3.2	6	1			6	1			5	1
S.3.3										
H.1.1			6	1			6	1		
H.1.2										
H.1.3										
H.1.4										
H.2.1			10	3			10	3		
H.3.1										
O.1.1	29	4	23	4	29	4	23	4	26	4
O.1.2	29	4			29	4			26	4
O.2.1	29	4	23	4	29	4	23	4	26	4
O.2.2	29	4	23	4	29	4	23	4	26	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.

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

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

		Nominal Ø in mm						
		Ø 0,15	Ø 0,20–0,25	Ø 0,30–0,35	Ø 0,40–0,55	Ø 0,60–0,75	Ø 0,80–0,95	Ø 1,00–1,45
Index	v_c in m/min	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.
P.1.1	33	0,0090	0,0110	0,0150	0,0190	0,0260	0,0310	0,0500
P.1.2	28	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
P.1.3	25	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
P.1.4	23	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
P.1.5	20	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
P.2.1	20	0,0050	0,0070	0,0090	0,0110	0,0150	0,0200	0,0350
P.2.2	14	0,0040	0,0050	0,0070	0,0080	0,0120	0,0160	0,0290
P.2.3	12	0,0040	0,0050	0,0070	0,0080	0,0120	0,0160	0,0290
P.2.4	11	0,0030	0,0040	0,0050	0,0070	0,0090	0,0130	0,0240
P.3.1	15	0,0050	0,0070	0,0090	0,0110	0,0150	0,0200	0,0350
P.3.2	11	0,0040	0,0050	0,0070	0,0080	0,0120	0,0160	0,0290
P.3.3	10	0,0040	0,0050	0,0070	0,0080	0,0120	0,0160	0,0290
P.4.1	11	0,0040	0,0050	0,0070	0,0080	0,0120	0,0160	0,0290
P.4.2	10	0,0030	0,0040	0,0050	0,0070	0,0090	0,0130	0,0240
M.1.1	9	0,0040	0,0050	0,0070	0,0080	0,0120	0,0160	0,0290
M.2.1	8	0,0040	0,0050	0,0070	0,0080	0,0120	0,0160	0,0290
M.3.1								
K.1.1	35	0,0090	0,0110	0,0150	0,0190	0,0260	0,0310	0,0500
K.1.2	28	0,0090	0,0110	0,0150	0,0190	0,0260	0,0310	0,0500
K.2.1	30	0,0090	0,0110	0,0150	0,0190	0,0260	0,0310	0,0500
K.2.2	23	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
K.3.1	30	0,0090	0,0110	0,0150	0,0190	0,0260	0,0310	0,0500
K.3.2	23	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
N.1.1	70	0,0120	0,0140	0,0190	0,0240	0,0340	0,0380	0,0600
N.1.2	70	0,0120	0,0140	0,0190	0,0240	0,0340	0,0380	0,0600
N.2.1	59	0,0090	0,0110	0,0150	0,0190	0,0260	0,0310	0,0500
N.2.2	47	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
N.2.3	41	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
N.3.1	70	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
N.3.2	42	0,0050	0,0070	0,0090	0,0110	0,0150	0,0200	0,0350
N.3.3	56	0,0050	0,0070	0,0090	0,0110	0,0150	0,0200	0,0350
N.4.1	42	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
S.1.1	7	0,0030	0,0040	0,0050	0,0070	0,0090	0,0130	0,0240
S.1.2	6	0,0020	0,0030	0,0040	0,0050	0,0070	0,0100	0,0200
S.2.1	6	0,0030	0,0040	0,0050	0,0070	0,0090	0,0130	0,0240
S.2.2	4	0,0020	0,0030	0,0040	0,0050	0,0070	0,0100	0,0200
S.2.3	4	0,0020	0,0030	0,0040	0,0050	0,0070	0,0100	0,0200
S.3.1	6	0,0030	0,0040	0,0050	0,0070	0,0090	0,0130	0,0240
S.3.2	4	0,0020	0,0030	0,0040	0,0050	0,0070	0,0100	0,0200
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	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
O.1.2	23	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
O.2.1	23	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
O.2.2	23	0,0070	0,0090	0,0110	0,0140	0,0200	0,0240	0,0410
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

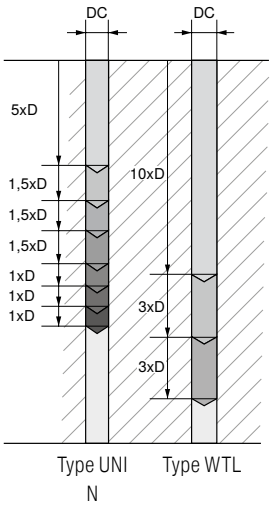
All the indicated data are guide values only and represent average values.

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	12500	10000	8000	6300	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320
63	10000	8000	6300	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250
50	8000	6300	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200
40	6300	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160
32	5000	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125
25	4000	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125	100
20	3200	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125	100	80
16	2500	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125	100	80	63
12	2000	1600	1250	1000	800	630	500	400	320	250	200	160	125	100	80	63	50
10	1600	1250	1000	800	630	500	400	320	250	200	160	125	100	80	63	50	40
8	1250	1000	800	630	500	400	320	250	200	160	125	100	80	63	50	40	32
6	1000	800	630	500	400	320	250	200	160	125	100	80	63	50	40	32	25
5	800	630	500	400	320	250	200	160	125	100	80	63	50	40	32	25	20
4	630	500	400	320	250	200	160	125	100	80	63	50	40	32	25	20	16
3	500	400	320	250	200	160	125	100	80	63	50	40	32	25	20	16	12

Peck frequency for deep drilling

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



Solid carbide drills overview

	Product name	Tool type	Length	Diameter in mm Ø 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	WNT \ Standard
3xD without thro' coolant															
	WTX	UNI	≤ 3xD	3–12	●		●				○	■		16	
	WPC	UNI	≤ 3xD	1–12	●		●					■			17
3xD with thro' coolant															
	WTX	UNI	≤ 3xD	3–12	●		●				○	■		18	
	WTX	Ti	≤ 3xD	3–12	○	●			●			■		19	
	WPC	UNI	≤ 3xD	1–12	●		●					■			20
	WTX	180	≤ 3xD	3–12	●	●	●					■		21	
5xD without thro' coolant															
	WTX	UNI	≤ 5xD	3–12	●		●				○	■		22	
	WPC	UNI	≤ 5xD	3–12	●		●					■			23
5xD with thro' coolant															
	WTX	UNI	≤ 5xD	3–12	●		●				○	■		24	
	WTX	Ti	≤ 5xD	3–12	○	●			●			■		25	
	WTX	AL	≤ 5xD	2,5–12				●				■		26	
	WPC	UNI	≤ 5xD	1–12	●		●					■			27
	WTX	180	≤ 5xD	3–12	●	●	●					■		28	

Further dimensions and drills can be found in our → **main catalogue in Chapter 2 Solid carbide drills**

1

Solid carbide drills overview

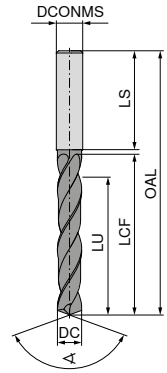
Product name	Tool type	Length	Diameter in mm Ø DC	Steel P	Stainless steel M	Cast iron K	Non-ferrous metals N	Heat-resistant S	Tempered steel H	Non metal materials O	coated ■	uncoated □	WNT \ Performance	WNT \ Standard
5xD micro drill without thro' coolant														
	WTX	MINI	≤ 5xD	0,1–2,9	○		●	●	○			■	29	
					HA									
5xD micro drill with thro' coolant														
	WTX	MICRO	≤ 5xD	0,8–2,9	●	●	●		○			■	30	
					HA									
8xD micro drill with thro' coolant														
	WTX	MICRO	≤ 8xD	0,8–2,9	●	●	●		○			■	30	
					HA									
12xD micro drill with thro‘ coolant														
	WTX	MICRO	≤ 12xD	0,8–2,9	●	●	●		○			■	31	
					HA									
NC Spot Drill														
	NC–A	◁ 90° ◁ 120°	2–12	○		●	●					□		32
				HA										

Further dimensions and drills can be found in our → **main catalogue in Chapter 2 Solid carbide drills**

WTX – High Performance Drill, DIN 6537

≤ 3xD

NOF = 2



UNI

DPX74S

DRAGONSKIN

Solid carbide

11 777 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	11 777 ...
3,00	6	62	20	14	36	03000
3,10	6	62	20	14	36	03100
3,15	6	62	20	14	36	03150
3,20	6	62	20	14	36	03200
3,22	6	62	20	14	36	03220
3,25	6	62	20	14	36	03250
3,30	6	62	20	14	36	03300
3,40	6	62	20	14	36	03400
3,50	6	62	20	14	36	03500
3,60	6	62	20	14	36	03600
3,70	6	62	20	14	36	03700
3,80	6	66	24	17	36	03800
3,85	6	66	24	17	36	03850
3,90	6	66	24	17	36	03900
4,00	6	66	24	17	36	04000
4,10	6	66	24	17	36	04100
4,20	6	66	24	17	36	04200
4,25	6	66	24	17	36	04250
4,30	6	66	24	17	36	04300
4,35	6	66	24	17	36	04350
4,40	6	66	24	17	36	04400
4,45	6	66	24	17	36	04450
4,50	6	66	24	17	36	04500
4,60	6	66	24	17	36	04600
4,65	6	66	24	17	36	04650
4,70	6	66	24	17	36	04700
4,80	6	66	28	20	36	04800
4,90	6	66	28	20	36	04900
4,95	6	66	28	20	36	04950
5,00	6	66	28	20	36	05000
5,05	6	66	28	20	36	05050
5,10	6	66	28	20	36	05100
5,20	6	66	28	20	36	05200
5,30	6	66	28	20	36	05300
5,40	6	66	28	20	36	05400
5,50	6	66	28	20	36	05500
5,55	6	66	28	20	36	05550
5,60	6	66	28	20	36	05600
5,70	6	66	28	20	36	05700
5,75	6	66	28	20	36	05750
5,80	6	66	28	20	36	05800
5,90	6	66	28	20	36	05900
5,95	6	66	28	20	36	05950
6,00	6	66	28	20	36	06000
6,10	8	79	34	24	36	06100
6,20	8	79	34	24	36	06200
6,30	8	79	34	24	36	06300
6,40	8	79	34	24	36	06400
6,50	8	79	34	24	36	06500
6,60	8	79	34	24	36	06600
6,70	8	79	34	24	36	06700

11 777 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	11 777 ...
6,80	8	79	34	24	36	06800
6,90	8	79	34	24	36	06900
7,00	8	79	34	24	36	07000
7,10	8	79	41	29	36	07100
7,20	8	79	41	29	36	07200
7,30	8	79	41	29	36	07300
7,40	8	79	41	29	36	07400
7,45	8	79	41	29	36	07450
7,50	8	79	41	29	36	07500
7,60	8	79	41	29	36	07600
7,70	8	79	41	29	36	07700
7,80	8	79	41	29	36	07800
7,90	8	79	41	29	36	07900
8,00	8	79	41	29	36	08000
8,10	10	89	47	35	40	08100
8,20	10	89	47	35	40	08200
8,30	10	89	47	35	40	08300
8,40	10	89	47	35	40	08400
8,50	10	89	47	35	40	08500
8,60	10	89	47	35	40	08600
8,70	10	89	47	35	40	08700
8,80	10	89	47	35	40	08800
8,90	10	89	47	35	40	08900
9,00	10	89	47	35	40	09000
9,10	10	89	47	35	40	09100
9,20	10	89	47	35	40	09200
9,30	10	89	47	35	40	09300
9,35	10	89	47	35	40	09350
9,40	10	89	47	35	40	09400
9,45	10	89	47	35	40	09450
9,50	10	89	47	35	40	09500
9,60	10	89	47	35	40	09600
9,70	10	89	47	35	40	09700
9,80	10	89	47	35	40	09800
9,90	10	89	47	35	40	09900
10,00	10	89	47	35	40	10000
10,10	12	102	55	40	45	10100
10,20	12	102	55	40	45	10200
10,30	12	102	55	40	45	10300
10,40	12	102	55	40	45	10400
10,50	12	102	55	40	45	10500
10,55	12	102	55	40	45	10550
10,60	12	102	55	40	45	10600
10,70	12	102	55	40	45	10700
10,75	12	102	55	40	45	10750
10,80	12	102	55	40	45	10800
10,90	12	102	55	40	45	10900
11,00	12	102	55	40	45	11000
11,10	12	102	55	40	45	11100
11,20	12	102	55	40	45	11200
11,25	12	102	55	40	45	11250
11,30	12	102	55	40	45	11300
11,35	12	102	55	40	45	11350
11,40	12	102	55	40	45	11400
11,45	12	102	55	40	45	11450
11,50	12	102	55	40	45	11500
11,60	12	102	55	40	45	11600
11,70	12	102	55	40	45	11700
11,80	12	102	55	40	45	11800
11,90	12	102	55	40	45	11900
12,00	12	102	55	40	45	12000

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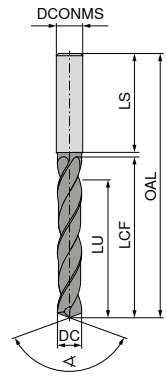
→ v_c Page 34

Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WPC – High Performance Drill, DIN 6537

≤ 3xD

NOF = 2



UNI

TiAlN

HA

140°

Solid carbide

11 600 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
1,00	4	45	5,0	4,5	32,0	010
1,10	4	45	5,5	5,0	31,5	011
1,20	4	45	6,0	5,4	31,0	012
1,30	4	45	6,5	5,9	31,5	013
1,40	4	45	7,0	6,3	30,0	014
1,50	4	50	7,5	6,8	35,0	015
1,60	4	50	8,0	7,2	34,5	016
1,70	4	50	8,5	7,7	34,0	017
1,80	4	50	9,0	8,1	33,5	018
1,90	4	50	9,5	8,6	33,0	019
2,00	6	58	14,0	11,0	36,0	020
2,10	6	58	14,0	11,0	36,0	021
2,20	6	58	14,0	11,0	36,0	022
2,30	6	58	14,0	11,0	36,0	023
2,40	6	58	14,0	11,0	36,0	024
2,50	6	58	14,0	11,0	36,0	025
2,60	6	58	14,0	11,0	36,0	026
2,70	6	58	14,0	11,0	36,0	027
2,80	6	58	14,0	11,0	36,0	028
2,90	6	58	14,0	11,0	36,0	029
3,00	6	62	20,0	14,0	36,0	030
3,10	6	62	20,0	14,0	36,0	031
3,20	6	62	20,0	14,0	36,0	032
3,30	6	62	20,0	14,0	36,0	033
3,40	6	62	20,0	14,0	36,0	034
3,50	6	62	20,0	14,0	36,0	035
3,60	6	62	20,0	14,0	36,0	036
3,70	6	62	20,0	14,0	36,0	037
3,80	6	66	24,0	17,0	36,0	038
3,90	6	66	24,0	17,0	36,0	039
4,00	6	66	24,0	17,0	36,0	040
4,10	6	66	24,0	17,0	36,0	041
4,20	6	66	24,0	17,0	36,0	042
4,30	6	66	24,0	17,0	36,0	043
4,40	6	66	24,0	17,0	36,0	044
4,50	6	66	24,0	17,0	36,0	045
4,60	6	66	24,0	17,0	36,0	046
4,65	6	66	24,0	17,0	36,0	900
4,70	6	66	24,0	17,0	36,0	047
4,80	6	66	28,0	20,0	36,0	048
4,90	6	66	28,0	20,0	36,0	049
5,00	6	66	28,0	20,0	36,0	050
5,10	6	66	28,0	20,0	36,0	051
5,20	6	66	28,0	20,0	36,0	052
5,30	6	66	28,0	20,0	36,0	053
5,40	6	66	28,0	20,0	36,0	054
5,50	6	66	28,0	20,0	36,0	055
5,55	6	66	28,0	20,0	36,0	902
5,60	6	66	28,0	20,0	36,0	056
5,70	6	66	28,0	20,0	36,0	057
5,80	6	66	28,0	20,0	36,0	058
5,90	6	66	28,0	20,0	36,0	059
6,00	6	66	28,0	20,0	36,0	060
6,10	8	79	34,0	24,0	36,0	061

11 600 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
6,20	8	79	34,0	24,0	36,0	062
6,30	8	79	34,0	24,0	36,0	063
6,40	8	79	34,0	24,0	36,0	064
6,50	8	79	34,0	24,0	36,0	065
6,60	8	79	34,0	24,0	36,0	066
6,70	8	79	34,0	24,0	36,0	067
6,80	8	79	34,0	24,0	36,0	068
6,90	8	79	34,0	24,0	36,0	069
7,00	8	79	34,0	24,0	36,0	070
7,10	8	79	41,0	29,0	36,0	071
7,20	8	79	41,0	29,0	36,0	072
7,30	8	79	41,0	29,0	36,0	073
7,40	8	79	41,0	29,0	36,0	074
7,50	8	79	41,0	29,0	36,0	075
7,55	8	79	41,0	29,0	36,0	975
7,60	8	79	41,0	29,0	36,0	076
7,70	8	79	41,0	29,0	36,0	077
7,80	8	79	41,0	29,0	36,0	078
7,90	8	79	41,0	29,0	36,0	079
8,00	8	79	41,0	29,0	36,0	080
8,10	10	89	47,0	35,0	40,0	081
8,20	10	89	47,0	35,0	40,0	082
8,30	10	89	47,0	35,0	40,0	083
8,40	10	89	47,0	35,0	40,0	084
8,50	10	89	47,0	35,0	40,0	085
8,60	10	89	47,0	35,0	40,0	086
8,70	10	89	47,0	35,0	40,0	087
8,80	10	89	47,0	35,0	40,0	088
8,90	10	89	47,0	35,0	40,0	089
9,00	10	89	47,0	35,0	40,0	090
9,10	10	89	47,0	35,0	40,0	091
9,20	10	89	47,0	35,0	40,0	092
9,25	10	89	47,0	35,0	40,0	925
9,30	10	89	47,0	35,0	40,0	093
9,40	10	89	47,0	35,0	40,0	094
9,50	10	89	47,0	35,0	40,0	095
9,60	10	89	47,0	35,0	40,0	096
9,70	10	89	47,0	35,0	40,0	097
9,80	10	89	47,0	35,0	40,0	098
9,90	10	89	47,0	35,0	40,0	099
10,00	10	89	47,0	35,0	40,0	100
10,10	12	102	55,0	40,0	45,0	101
10,20	12	102	55,0	40,0	45,0	102
10,30	12	102	55,0	40,0	45,0	103
10,40	12	102	55,0	40,0	45,0	104
10,50	12	102	55,0	40,0	45,0	105
10,60	12	102	55,0	40,0	45,0	106
10,70	12	102	55,0	40,0	45,0	107
10,80	12	102	55,0	40,0	45,0	108
10,90	12	102	55,0	40,0	45,0	109
11,00	12	102	55,0	40,0	45,0	110
11,10	12	102	55,0	40,0	45,0	111
11,20	12	102	55,0	40,0	45,0	112
11,30	12	102	55,0	40,0	45,0	113
11,40	12	102	55,0	40,0	45,0	114
11,50	12	102	55,0	40,0	45,0	115
11,60	12	102	55,0	40,0	45,0	116
11,70	12	102	55,0	40,0	45,0	117
11,80	12	102	55,0	40,0	45,0	118
11,90	12	102	55,0	40,0	45,0	119
12,00	12	102	55,0	40,0	45,0	120

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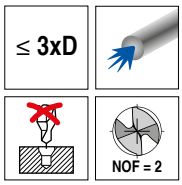
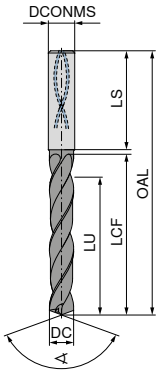
Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High Performance Drill, DIN 6537





UNI

DPX74S

DRAGONSKIN

Solid carbide

11 780 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
3,00	6	62	20	14	36	03000
3,10	6	62	20	14	36	03100
3,15	6	62	20	14	36	03150
3,20	6	62	20	14	36	03200
3,22	6	62	20	14	36	03220
3,25	6	62	20	14	36	03250
3,30	6	62	20	14	36	03300
3,40	6	62	20	14	36	03400
3,50	6	62	20	14	36	03500
3,60	6	62	20	14	36	03600
3,70	6	62	20	14	36	03700
3,80	6	66	24	17	36	03800
3,85	6	66	24	17	36	03850
3,90	6	66	24	17	36	03900
4,00	6	66	24	17	36	04000
4,10	6	66	24	17	36	04100
4,20	6	66	24	17	36	04200
4,25	6	66	24	17	36	04250
4,30	6	66	24	17	36	04300
4,35	6	66	24	17	36	04350
4,40	6	66	24	17	36	04400
4,45	6	66	24	17	36	04450
4,50	6	66	24	17	36	04500
4,60	6	66	24	17	36	04600
4,65	6	66	24	17	36	04650
4,70	6	66	24	17	36	04700
4,80	6	66	28	20	36	04800
4,90	6	66	28	20	36	04900
4,95	6	66	28	20	36	04950
5,00	6	66	28	20	36	05000
5,05	6	66	28	20	36	05050
5,10	6	66	28	20	36	05100
5,20	6	66	28	20	36	05200
5,30	6	66	28	20	36	05300
5,40	6	66	28	20	36	05400
5,50	6	66	28	20	36	05500
5,55	6	66	28	20	36	05550
5,60	6	66	28	20	36	05600
5,70	6	66	28	20	36	05700
5,75	6	66	28	20	36	05750
5,80	6	66	28	20	36	05800
5,90	6	66	28	20	36	05900
5,95	6	66	28	20	36	05950
6,00	6	66	28	20	36	06000
6,10	8	79	34	24	36	06100
6,20	8	79	34	24	36	06200
6,30	8	79	34	24	36	06300
6,40	8	79	34	24	36	06400
6,50	8	79	34	24	36	06500
6,60	8	79	34	24	36	06600
6,70	8	79	34	24	36	06700

11 780 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
6,80	8	79	34	24	36	06800
6,90	8	79	34	24	36	06900
7,00	8	79	34	24	36	07000
7,10	8	79	41	29	36	07100
7,20	8	79	41	29	36	07200
7,30	8	79	41	29	36	07300
7,40	8	79	41	29	36	07400
7,45	8	79	41	29	36	07450
7,50	8	79	41	29	36	07500
7,60	8	79	41	29	36	07600
7,70	8	79	41	29	36	07700
7,80	8	79	41	29	36	07800
7,90	8	79	41	29	36	07900
8,00	8	79	41	29	36	08000
8,10	10	89	47	35	40	08100
8,20	10	89	47	35	40	08200
8,30	10	89	47	35	40	08300
8,40	10	89	47	35	40	08400
8,50	10	89	47	35	40	08500
8,60	10	89	47	35	40	08600
8,70	10	89	47	35	40	08700
8,80	10	89	47	35	40	08800
8,90	10	89	47	35	40	08900
9,00	10	89	47	35	40	09000
9,10	10	89	47	35	40	09100
9,20	10	89	47	35	40	09200
9,30	10	89	47	35	40	09300
9,35	10	89	47	35	40	09350
9,40	10	89	47	35	40	09400
9,45	10	89	47	35	40	09450
9,50	10	89	47	35	40	09500
9,60	10	89	47	35	40	09600
9,70	10	89	47	35	40	09700
9,80	10	89	47	35	40	09800
9,90	10	89	47	35	40	09900
10,00	10	89	47	35	40	10000
10,10	12	102	55	40	45	10100
10,20	12	102	55	40	45	10200
10,30	12	102	55	40	45	10300
10,40	12	102	55	40	45	10400
10,50	12	102	55	40	45	10500
10,55	12	102	55	40	45	10550
10,60	12	102	55	40	45	10600
10,70	12	102	55	40	45	10700
10,75	12	102	55	40	45	10750
10,80	12	102	55	40	45	10800
10,90	12	102	55	40	45	10900
11,00	12	102	55	40	45	11000
11,10	12	102	55	40	45	11100
11,20	12	102	55	40	45	11200
11,25	12	102	55	40	45	11250
11,30	12	102	55	40	45	11300
11,35	12	102	55	40	45	11350
11,40	12	102	55	40	45	11400
11,45	12	102	55	40	45	11450
11,50	12	102	55	40	45	11500
11,60	12	102	55	40	45	11600
11,70	12	102	55	40	45	11700
11,80	12	102	55	40	45	11800
11,90	12	102	55	40	45	11900
12,00	12	102	55	40	45	12000

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Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High-performance drill, DIN 6537

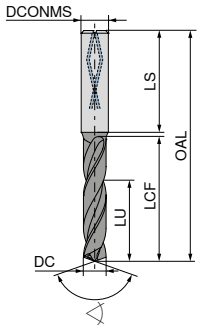
≤ 3xD

NOF = 2

Ti

DPA54

DRAGONSKIN



140°

Solid carbide

10 786 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
3,00	6	62	20	14	36	030
3,10	6	62	20	14	36	031
3,20	6	62	20	14	36	032
3,30	6	62	20	14	36	033
3,40	6	62	20	14	36	034
3,50	6	62	20	14	36	035
3,60	6	62	20	14	36	036
3,70	6	62	20	14	36	037
3,80	6	66	24	17	36	038
3,90	6	66	24	17	36	039
3,97	6	66	24	17	36	900
4,00	6	66	24	17	36	040
4,10	6	66	24	17	36	041
4,20	6	66	24	17	36	042
4,23	6	66	24	17	36	901
4,30	6	66	24	17	36	043
4,40	6	66	24	17	36	044
4,50	6	66	24	17	36	045
4,60	6	66	24	17	36	046
4,70	6	66	24	17	36	047
4,80	6	66	28	20	36	048
4,90	6	66	28	20	36	049
5,00	6	66	28	20	36	050
5,10	6	66	28	20	36	051
5,20	6	66	28	20	36	052
5,30	6	66	28	20	36	053
5,40	6	66	28	20	36	054
5,50	6	66	28	20	36	055
5,56	6	66	28	20	36	902
5,60	6	66	28	20	36	056
5,70	6	66	28	20	36	057
5,80	6	66	28	20	36	058
5,90	6	66	28	20	36	059
6,00	6	66	28	20	36	060
6,10	8	79	34	24	36	061
6,20	8	79	34	24	36	062
6,30	8	79	34	24	36	063
6,35	8	79	34	24	36	903
6,40	8	79	34	24	36	064
6,50	8	79	34	24	36	065
6,60	8	79	34	24	36	066
6,70	8	79	34	24	36	067
6,80	8	79	34	24	36	068
6,90	8	79	34	24	36	069
7,00	8	79	34	24	36	070
7,10	8	79	41	29	36	071
7,20	8	79	41	29	36	072
7,30	8	79	41	29	36	073
7,40	8	79	41	29	36	074
7,50	8	79	41	29	36	075
7,60	8	79	41	29	36	076

10 786 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
7,70	8	79	41	29	36	077
7,80	8	79	41	29	36	078
7,90	8	79	41	29	36	079
7,94	8	79	41	29	36	904
8,00	8	79	41	29	36	080
8,10	10	89	47	35	40	081
8,20	10	89	47	35	40	082
8,30	10	89	47	35	40	083
8,40	10	89	47	35	40	084
8,50	10	89	47	35	40	085
8,60	10	89	47	35	40	086
8,70	10	89	47	35	40	087
8,80	10	89	47	35	40	088
8,90	10	89	47	35	40	089
9,00	10	89	47	35	40	090
9,10	10	89	47	35	40	091
9,20	10	89	47	35	40	092
9,30	10	89	47	35	40	093
9,40	10	89	47	35	40	094
9,50	10	89	47	35	40	095
9,53	10	89	47	35	40	905
9,60	10	89	47	35	40	096
9,70	10	89	47	35	40	097
9,80	10	89	47	35	40	098
9,90	10	89	47	35	40	099
10,00	10	89	47	35	40	100
10,10	12	102	55	40	45	101
10,20	12	102	55	40	45	102
10,30	12	102	55	40	45	103
10,40	12	102	55	40	45	104
10,50	12	102	55	40	45	105
10,60	12	102	55	40	45	106
10,70	12	102	55	40	45	107
10,80	12	102	55	40	45	108
10,90	12	102	55	40	45	109
11,00	12	102	55	40	45	110
11,10	12	102	55	40	45	111
11,11	12	102	55	40	45	906
11,20	12	102	55	40	45	112
11,30	12	102	55	40	45	113
11,40	12	102	55	40	45	114
11,50	12	102	55	40	45	115
11,60	12	102	55	40	45	116
11,70	12	102	55	40	45	117
11,80	12	102	55	40	45	118
11,90	12	102	55	40	45	119
12,00	12	102	55	40	45	120

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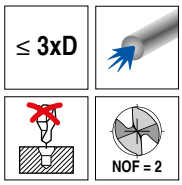
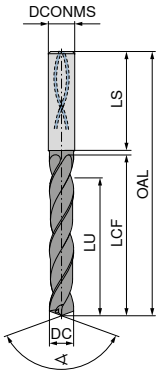
Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WPC – High Performance Drill, DIN 6537





UNI

TiAlN

140°
Solid carbide

11 603 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
1,00	4	45	6,0	4,5	32,0	010
1,10	4	45	6,6	5,0	31,5	011
1,20	4	45	7,2	5,4	31,0	012
1,30	4	45	7,8	5,9	31,5	013
1,40	4	45	8,4	6,3	30,0	014
1,50	4	50	9,0	6,8	35,0	015
1,60	4	50	9,6	7,2	34,5	016
1,70	4	50	10,2	7,7	34,0	017
1,80	4	50	10,8	8,1	33,5	018
1,90	4	50	11,4	8,6	33,0	019
2,00	4	50	12,0	9,0	33,0	020
2,10	4	55	12,6	9,5	37,5	021
2,20	4	55	13,2	9,9	37,0	022
2,30	4	55	13,8	10,4	36,5	023
2,40	4	55	14,4	10,8	36,0	024
2,50	4	55	15,0	11,3	35,5	025
2,60	4	55	15,6	11,7	35,5	026
2,70	4	55	16,2	12,2	35,0	027
2,80	4	55	16,8	12,6	34,0	028
2,90	4	55	17,4	13,1	34,0	029
3,00	6	62	20,0	14,0	36,0	030
3,10	6	62	20,0	14,0	36,0	031
3,20	6	62	20,0	14,0	36,0	032
3,25	6	62	20,0	14,0	36,0	890
3,30	6	62	20,0	14,0	36,0	033
3,40	6	62	20,0	14,0	36,0	034
3,50	6	62	20,0	14,0	36,0	035
3,60	6	62	20,0	14,0	36,0	036
3,70	6	62	20,0	14,0	36,0	037
3,80	6	66	24,0	17,0	36,0	038
3,90	6	66	24,0	17,0	36,0	039
4,00	6	66	24,0	17,0	36,0	040
4,10	6	66	24,0	17,0	36,0	041
4,20	6	66	24,0	17,0	36,0	042
4,30	6	66	24,0	17,0	36,0	043
4,40	6	66	24,0	17,0	36,0	044
4,50	6	66	24,0	17,0	36,0	045
4,60	6	66	24,0	17,0	36,0	046
4,65	6	66	24,0	17,0	36,0	900
4,70	6	66	24,0	17,0	36,0	047
4,80	6	66	28,0	20,0	36,0	048
4,90	6	66	28,0	20,0	36,0	049
5,00	6	66	28,0	20,0	36,0	050
5,10	6	66	28,0	20,0	36,0	051
5,20	6	66	28,0	20,0	36,0	052
5,30	6	66	28,0	20,0	36,0	053
5,40	6	66	28,0	20,0	36,0	054
5,50	6	66	28,0	20,0	36,0	055
5,55	6	66	28,0	20,0	36,0	902
5,60	6	66	28,0	20,0	36,0	056
5,70	6	66	28,0	20,0	36,0	057
5,80	6	66	28,0	20,0	36,0	058
5,90	6	66	28,0	20,0	36,0	059
6,00	6	66	28,0	20,0	36,0	060
6,10	8	79	34,0	24,0	36,0	061
6,20	8	79	34,0	24,0	36,0	062

11 603 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
6,30	8	79	34,0	24,0	36,0	063
6,40	8	79	34,0	24,0	36,0	064
6,50	8	79	34,0	24,0	36,0	065
6,60	8	79	34,0	24,0	36,0	066
6,70	8	79	34,0	24,0	36,0	067
6,80	8	79	34,0	24,0	36,0	068
6,90	8	79	34,0	24,0	36,0	069
7,00	8	79	34,0	24,0	36,0	070
7,10	8	79	41,0	29,0	36,0	071
7,20	8	79	41,0	29,0	36,0	072
7,30	8	79	41,0	29,0	36,0	073
7,40	8	79	41,0	29,0	36,0	074
7,45	8	79	41,0	29,0	36,0	924
7,50	8	79	41,0	29,0	36,0	075
7,55	8	79	41,0	29,0	36,0	975
7,60	8	79	41,0	29,0	36,0	076
7,70	8	79	41,0	29,0	36,0	077
7,80	8	79	41,0	29,0	36,0	078
7,90	8	79	41,0	29,0	36,0	079
8,00	8	79	41,0	29,0	36,0	080
8,10	10	89	47,0	35,0	40,0	081
8,20	10	89	47,0	35,0	40,0	082
8,30	10	89	47,0	35,0	40,0	083
8,40	10	89	47,0	35,0	40,0	084
8,50	10	89	47,0	35,0	40,0	085
8,60	10	89	47,0	35,0	40,0	086
8,70	10	89	47,0	35,0	40,0	087
8,80	10	89	47,0	35,0	40,0	088
8,90	10	89	47,0	35,0	40,0	089
9,00	10	89	47,0	35,0	40,0	090
9,10	10	89	47,0	35,0	40,0	091
9,20	10	89	47,0	35,0	40,0	092
9,25	10	89	47,0	35,0	40,0	925
9,30	10	89	47,0	35,0	40,0	093
9,35	10	89	47,0	35,0	40,0	930
9,40	10	89	47,0	35,0	40,0	094
9,50	10	89	47,0	35,0	40,0	095
9,60	10	89	47,0	35,0	40,0	096
9,70	10	89	47,0	35,0	40,0	097
9,80	10	89	47,0	35,0	40,0	098
9,90	10	89	47,0	35,0	40,0	099
10,00	10	89	47,0	35,0	40,0	100
10,10	12	102	55,0	40,0	45,0	101
10,20	12	102	55,0	40,0	45,0	102
10,30	12	102	55,0	40,0	45,0	103
10,40	12	102	55,0	40,0	45,0	104
10,50	12	102	55,0	40,0	45,0	105
10,60	12	102	55,0	40,0	45,0	106
10,70	12	102	55,0	40,0	45,0	107
10,75	12	102	55,0	40,0	45,0	904
10,80	12	102	55,0	40,0	45,0	108
10,90	12	102	55,0	40,0	45,0	109
11,00	12	102	55,0	40,0	45,0	110
11,10	12	102	55,0	40,0	45,0	111
11,20	12	102	55,0	40,0	45,0	112
11,25	12	102	55,0	40,0	45,0	912
11,30	12	102	55,0	40,0	45,0	113
11,40	12	102	55,0	40,0	45,0	114
11,50	12	102	55,0	40,0	45,0	115
11,60	12	102	55,0	40,0	45,0	116
11,70	12	102	55,0	40,0	45,0	117
11,80	12	102	55,0	40,0	45,0	118
11,90	12	102	55,0	40,0	45,0	119
12,00	12	102	55,0	40,0	45,0	120

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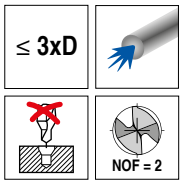
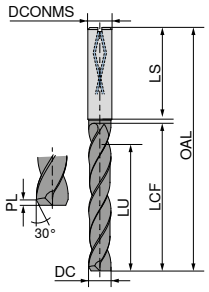
Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High Performance Drill, DIN 6537

- ▲ universal application
- ▲ four guidance lands
- ▲ polished chip flutes
- ▲ Type ALU 3xD on request
- ▲ PL = corner chamfers





180

Ti800

180°
Solid carbide

10 720 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	PL mm	
3,00	6	62	20	14	36	0,15	030
3,10	6	62	20	14	36	0,16	031
3,20	6	62	20	14	36	0,16	032
3,30	6	62	20	14	36	0,17	033
3,40	6	62	20	14	36	0,17	034
3,50	6	62	20	14	36	0,18	035
3,60	6	62	20	14	36	0,18	036
3,70	6	62	20	14	36	0,19	037
3,80	6	66	24	17	36	0,19	038
3,90	6	66	24	17	36	0,20	039
4,00	6	66	24	17	36	0,20	040
4,10	6	66	24	17	36	0,21	041
4,20	6	66	24	17	36	0,21	042
4,30	6	66	24	17	36	0,22	043
4,40	6	66	24	17	36	0,22	044
4,50	6	66	24	17	36	0,23	045
4,60	6	66	24	17	36	0,23	046
4,65	6	66	24	17	36	0,23	900
4,70	6	66	24	17	36	0,24	047
4,80	6	66	28	20	36	0,24	048
4,90	6	66	28	20	36	0,25	049
5,00	6	66	28	20	36	0,25	050
5,10	6	66	28	20	36	0,26	051
5,20	6	66	28	20	36	0,26	052
5,30	6	66	28	20	36	0,27	053
5,40	6	66	28	20	36	0,27	054
5,50	6	66	28	20	36	0,28	055
5,55	6	66	28	20	36	0,28	902
5,60	6	66	28	20	36	0,28	056
5,70	6	66	28	20	36	0,29	057
5,80	6	66	28	20	36	0,29	058
5,90	6	66	28	20	36	0,30	059
6,00	6	66	28	20	36	0,30	060
6,10	8	79	34	24	36	0,31	061
6,20	8	79	34	24	36	0,31	062
6,30	8	79	34	24	36	0,32	063
6,40	8	79	34	24	36	0,32	064
6,50	8	79	34	24	36	0,33	065
6,60	8	79	34	24	36	0,33	066
6,70	8	79	34	24	36	0,34	067
6,80	8	79	34	24	36	0,34	068
6,90	8	79	34	24	36	0,35	069
7,00	8	79	34	24	36	0,35	070
7,10	8	79	41	29	36	0,36	071
7,20	8	79	41	29	36	0,36	072
7,30	8	79	41	29	36	0,37	073
7,40	8	79	41	29	36	0,37	074
7,50	8	79	41	29	36	0,38	075
7,60	8	79	41	29	36	0,38	076
7,70	8	79	41	29	36	0,39	077
7,80	8	79	41	29	36	0,39	078
7,90	8	79	41	29	36	0,40	079
8,00	8	79	41	29	36	0,40	080
8,10	10	89	47	35	40	0,41	081

10 720 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	PL mm	
8,20	10	89	47	35	40	0,41	082
8,30	10	89	47	35	40	0,42	083
8,40	10	89	47	35	40	0,42	084
8,50	10	89	47	35	40	0,43	085
8,60	10	89	47	35	40	0,43	086
8,70	10	89	47	35	40	0,44	087
8,80	10	89	47	35	40	0,44	088
8,90	10	89	47	35	40	0,45	089
9,00	10	89	47	35	40	0,45	090
9,10	10	89	47	35	40	0,46	091
9,20	10	89	47	35	40	0,46	092
9,30	10	89	47	35	40	0,47	093
9,40	10	89	47	35	40	0,47	094
9,50	10	89	47	35	40	0,48	095
9,60	10	89	47	35	40	0,48	096
9,70	10	89	47	35	40	0,49	097
9,80	10	89	47	35	40	0,49	098
9,90	10	89	47	35	40	0,50	099
10,00	10	89	47	35	40	0,50	100
10,10	12	100	53	38	45	0,51	101
10,20	12	100	53	38	45	0,51	102
10,30	12	100	53	38	45	0,52	103
10,40	12	100	53	38	45	0,52	104
10,50	12	100	53	38	45	0,53	105
10,60	12	100	53	38	45	0,53	106
10,70	12	100	53	38	45	0,54	107
10,80	12	100	53	38	45	0,54	108
10,90	12	100	53	38	45	0,55	109
11,00	12	100	53	38	45	0,55	110
11,10	12	100	53	38	45	0,56	111
11,20	12	100	53	38	45	0,56	112
11,30	12	100	53	38	45	0,57	113
11,40	12	100	53	38	45	0,57	114
11,50	12	100	53	38	45	0,58	115
11,60	12	100	53	38	45	0,58	116
11,70	12	100	53	38	45	0,59	117
11,80	12	100	53	38	45	0,59	118
11,90	12	100	53	38	45	0,60	119
12,00	12	100	53	38	45	0,60	120

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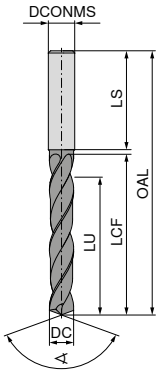
→ v_c Page 38

Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High Performance Drill, DIN 6537

≤ 5xD

NOF = 2



UNI

DPX74S

DRAGONSKIN

HA

140°

Solid carbide

11 783 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
3,00	6	66	28	23	36	03000
3,10	6	66	28	23	36	03100
3,15	6	66	28	23	36	03150
3,20	6	66	28	23	36	03200
3,22	6	66	28	23	36	03220
3,25	6	66	28	23	36	03250
3,30	6	66	28	23	36	03300
3,40	6	66	28	23	36	03400
3,50	6	66	28	23	36	03500
3,60	6	66	28	23	36	03600
3,70	6	66	28	23	36	03700
3,80	6	74	36	29	36	03800
3,85	6	74	36	29	36	03850
3,90	6	74	36	29	36	03900
4,00	6	74	36	29	36	04000
4,10	6	74	36	29	36	04100
4,20	6	74	36	29	36	04200
4,25	6	74	36	29	36	04250
4,30	6	74	36	29	36	04300
4,35	6	74	36	29	36	04350
4,40	6	74	36	29	36	04400
4,45	6	74	36	29	36	04450
4,50	6	74	36	29	36	04500
4,60	6	74	36	29	36	04600
4,65	6	74	36	29	36	04650
4,70	6	74	36	29	36	04700
4,80	6	82	44	35	36	04800
4,90	6	82	44	35	36	04900
4,95	6	82	44	35	36	04950
5,00	6	82	44	35	36	05000
5,05	6	82	44	35	36	05050
5,10	6	82	44	35	36	05100
5,20	6	82	44	35	36	05200
5,30	6	82	44	35	36	05300
5,40	6	82	44	35	36	05400
5,50	6	82	44	35	36	05500
5,55	6	82	44	35	36	05550
5,60	6	82	44	35	36	05600
5,70	6	82	44	35	36	05700
5,75	6	82	44	35	36	05750
5,80	6	82	44	35	36	05800
5,90	6	82	44	35	36	05900
5,95	6	82	44	35	36	05950
6,00	6	82	44	35	36	06000
6,10	8	91	53	43	36	06100
6,20	8	91	53	43	36	06200
6,30	8	91	53	43	36	06300
6,40	8	91	53	43	36	06400
6,50	8	91	53	43	36	06500
6,60	8	91	53	43	36	06600
6,70	8	91	53	43	36	06700

11 783 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
6,80	8	91	53	43	36	06800
6,90	8	91	53	43	36	06900
7,00	8	91	53	43	36	07000
7,10	8	91	53	43	36	07100
7,20	8	91	53	43	36	07200
7,30	8	91	53	43	36	07300
7,40	8	91	53	43	36	07400
7,45	8	91	53	43	36	07450
7,50	8	91	53	43	36	07500
7,60	8	91	53	43	36	07600
7,70	8	91	53	43	36	07700
7,80	8	91	53	43	36	07800
7,90	8	91	53	43	36	07900
8,00	8	91	53	43	36	08000
8,10	10	103	61	49	40	08100
8,20	10	103	61	49	40	08200
8,30	10	103	61	49	40	08300
8,40	10	103	61	49	40	08400
8,50	10	103	61	49	40	08500
8,60	10	103	61	49	40	08600
8,70	10	103	61	49	40	08700
8,80	10	103	61	49	40	08800
8,90	10	103	61	49	40	08900
9,00	10	103	61	49	40	09000
9,10	10	103	61	49	40	09100
9,20	10	103	61	49	40	09200
9,30	10	103	61	49	40	09300
9,35	10	103	61	49	40	09350
9,40	10	103	61	49	40	09400
9,45	10	103	61	49	40	09450
9,50	10	103	61	49	40	09500
9,60	10	103	61	49	40	09600
9,70	10	103	61	49	40	09700
9,80	10	103	61	49	40	09800
9,90	10	103	61	49	40	09900
10,00	10	103	61	49	40	10000
10,10	12	118	71	56	45	10100
10,20	12	118	71	56	45	10200
10,30	12	118	71	56	45	10300
10,40	12	118	71	56	45	10400
10,50	12	118	71	56	45	10500
10,55	12	118	71	56	45	10550
10,60	12	118	71	56	45	10600
10,70	12	118	71	56	45	10700
10,75	12	118	71	56	45	10750
10,80	12	118	71	56	45	10800
10,90	12	118	71	56	45	10900
11,00	12	118	71	56	45	11000
11,10	12	118	71	56	45	11100
11,20	12	118	71	56	45	11200
11,25	12	118	71	56	45	11250
11,30	12	118	71	56	45	11300
11,35	12	118	71	56	45	11350
11,40	12	118	71	56	45	11400
11,45	12	118	71	56	45	11450
11,50	12	118	71	56	45	11500
11,60	12	118	71	56	45	11600
11,70	12	118	71	56	45	11700
11,80	12	118	71	56	45	11800
11,90	12	118	71	56	45	11900
12,00	12	118	71	56	45	12000

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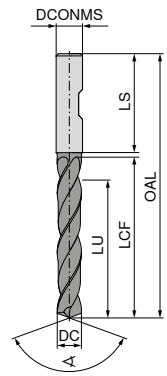
→ v_c Page 34

Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WPC – High Performance Drill, DIN 6537

≤ 5xD

NOF = 2



UNI

TiAlN

140°

Solid carbide

11 606 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
3,00	6	66	28	23	36	030
3,10	6	66	28	23	36	031
3,20	6	66	28	23	36	032
3,30	6	66	28	23	36	033
3,40	6	66	28	23	36	034
3,50	6	66	28	23	36	035
3,60	6	66	28	23	36	036
3,70	6	66	28	23	36	037
3,80	6	74	36	29	36	038
3,90	6	74	36	29	36	039
4,00	6	74	36	29	36	040
4,10	6	74	36	29	36	041
4,20	6	74	36	29	36	042
4,30	6	74	36	29	36	043
4,40	6	74	36	29	36	044
4,50	6	74	36	29	36	045
4,60	6	74	36	29	36	046
4,65	6	74	36	29	36	900
4,70	6	74	36	29	36	047
4,80	6	82	44	35	36	048
4,90	6	82	44	35	36	049
5,00	6	82	44	35	36	050
5,10	6	82	44	35	36	051
5,20	6	82	44	35	36	052
5,30	6	82	44	35	36	053
5,40	6	82	44	35	36	054
5,50	6	82	44	35	36	055
5,55	6	82	44	35	36	902
5,60	6	82	44	35	36	056
5,70	6	82	44	35	36	057
5,80	6	82	44	35	36	058
5,90	6	82	44	35	36	059
6,00	6	82	44	35	36	060
6,10	8	91	53	43	36	061
6,20	8	91	53	43	36	062
6,30	8	91	53	43	36	063
6,40	8	91	53	43	36	064
6,50	8	91	53	43	36	065
6,60	8	91	53	43	36	066
6,70	8	91	53	43	36	067
6,80	8	91	53	43	36	068
6,90	8	91	53	43	36	069
7,00	8	91	53	43	36	070
7,10	8	91	53	43	36	071
7,20	8	91	53	43	36	072
7,30	8	91	53	43	36	073
7,40	8	91	53	43	36	074
7,50	8	91	53	43	36	075
7,55	8	91	53	43	36	975
7,60	8	91	53	43	36	076
7,70	8	91	53	43	36	077
7,80	8	91	53	43	36	078
7,90	8	91	53	43	36	079

11 606 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
8,00	8	91	53	43	36	080
8,10	10	103	61	49	40	081
8,20	10	103	61	49	40	082
8,30	10	103	61	49	40	083
8,40	10	103	61	49	40	084
8,50	10	103	61	49	40	085
8,60	10	103	61	49	40	086
8,70	10	103	61	49	40	087
8,80	10	103	61	49	40	088
8,90	10	103	61	49	40	089
9,00	10	103	61	49	40	090
9,10	10	103	61	49	40	091
9,20	10	103	61	49	40	092
9,25	10	103	61	49	40	925
9,30	10	103	61	49	40	093
9,40	10	103	61	49	40	094
9,50	10	103	61	49	40	095
9,60	10	103	61	49	40	096
9,70	10	103	61	49	40	097
9,80	10	103	61	49	40	098
9,90	10	103	61	49	40	099
10,00	10	103	61	49	40	100
10,10	12	118	71	56	45	101
10,20	12	118	71	56	45	102
10,30	12	118	71	56	45	103
10,40	12	118	71	56	45	104
10,50	12	118	71	56	45	105
10,60	12	118	71	56	45	106
10,70	12	118	71	56	45	107
10,80	12	118	71	56	45	108
10,90	12	118	71	56	45	109
11,00	12	118	71	56	45	110
11,10	12	118	71	56	45	111
11,20	12	118	71	56	45	112
11,30	12	118	71	56	45	113
11,40	12	118	71	56	45	114
11,50	12	118	71	56	45	115
11,60	12	118	71	56	45	116
11,70	12	118	71	56	45	117
11,80	12	118	71	56	45	118
11,90	12	118	71	56	45	119
12,00	12	118	71	56	45	120

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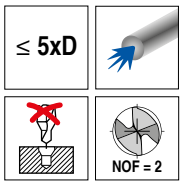
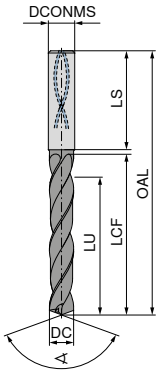
Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High Performance Drill, DIN 6537





UNI

DPX74S

DRAGONSKIN

Solid carbide

11 786 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
3,00	6	66	28	23	36	03000
3,10	6	66	28	23	36	03100
3,15	6	66	28	23	36	03150
3,20	6	66	28	23	36	03200
3,22	6	66	28	23	36	03220
3,25	6	66	28	23	36	03250
3,30	6	66	28	23	36	03300
3,40	6	66	28	23	36	03400
3,50	6	66	28	23	36	03500
3,60	6	66	28	23	36	03600
3,70	6	66	28	23	36	03700
3,80	6	74	36	29	36	03800
3,85	6	74	36	29	36	03850
3,90	6	74	36	29	36	03900
4,00	6	74	36	29	36	04000
4,10	6	74	36	29	36	04100
4,20	6	74	36	29	36	04200
4,25	6	74	36	29	36	04250
4,30	6	74	36	29	36	04300
4,35	6	74	36	29	36	04350
4,40	6	74	36	29	36	04400
4,45	6	74	36	29	36	04450
4,50	6	74	36	29	36	04500
4,60	6	74	36	29	36	04600
4,65	6	74	36	29	36	04650
4,70	6	74	36	29	36	04700
4,80	6	82	44	35	36	04800
4,90	6	82	44	35	36	04900
4,95	6	82	44	35	36	04950
5,00	6	82	44	35	36	05000
5,05	6	82	44	35	36	05050
5,10	6	82	44	35	36	05100
5,20	6	82	44	35	36	05200
5,30	6	82	44	35	36	05300
5,40	6	82	44	35	36	05400
5,50	6	82	44	35	36	05500
5,55	6	82	44	35	36	05550
5,60	6	82	44	35	36	05600
5,70	6	82	44	35	36	05700
5,75	6	82	44	35	36	05750
5,80	6	82	44	35	36	05800
5,90	6	82	44	35	36	05900
5,95	6	82	44	35	36	05950
6,00	6	82	44	35	36	06000
6,10	8	91	53	43	36	06100
6,20	8	91	53	43	36	06200
6,30	8	91	53	43	36	06300
6,40	8	91	53	43	36	06400
6,50	8	91	53	43	36	06500
6,60	8	91	53	43	36	06600
6,70	8	91	53	43	36	06700

11 786 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
6,80	8	91	53	43	36	06800
6,90	8	91	53	43	36	06900
7,00	8	91	53	43	36	07000
7,10	8	91	53	43	36	07100
7,20	8	91	53	43	36	07200
7,30	8	91	53	43	36	07300
7,40	8	91	53	43	36	07400
7,45	8	91	53	43	36	07450
7,50	8	91	53	43	36	07500
7,60	8	91	53	43	36	07600
7,70	8	91	53	43	36	07700
7,80	8	91	53	43	36	07800
7,90	8	91	53	43	36	07900
8,00	8	91	53	43	36	08000
8,10	10	103	61	49	40	08100
8,20	10	103	61	49	40	08200
8,30	10	103	61	49	40	08300
8,40	10	103	61	49	40	08400
8,50	10	103	61	49	40	08500
8,60	10	103	61	49	40	08600
8,70	10	103	61	49	40	08700
8,80	10	103	61	49	40	08800
8,90	10	103	61	49	40	08900
9,00	10	103	61	49	40	09000
9,10	10	103	61	49	40	09100
9,20	10	103	61	49	40	09200
9,30	10	103	61	49	40	09300
9,35	10	103	61	49	40	09350
9,40	10	103	61	49	40	09400
9,45	10	103	61	49	40	09450
9,50	10	103	61	49	40	09500
9,60	10	103	61	49	40	09600
9,70	10	103	61	49	40	09700
9,80	10	103	61	49	40	09800
9,90	10	103	61	49	40	09900
10,00	10	103	61	49	40	10000
10,10	12	118	71	56	45	10100
10,20	12	118	71	56	45	10200
10,30	12	118	71	56	45	10300
10,40	12	118	71	56	45	10400
10,50	12	118	71	56	45	10500
10,55	12	118	71	56	45	10550
10,60	12	118	71	56	45	10600
10,70	12	118	71	56	45	10700
10,75	12	118	71	56	45	10750
10,80	12	118	71	56	45	10800
10,90	12	118	71	56	45	10900
11,00	12	118	71	56	45	11000
11,10	12	118	71	56	45	11100
11,20	12	118	71	56	45	11200
11,25	12	118	71	56	45	11250
11,30	12	118	71	56	45	11300
11,35	12	118	71	56	45	11350
11,40	12	118	71	56	45	11400
11,45	12	118	71	56	45	11450
11,50	12	118	71	56	45	11500
11,60	12	118	71	56	45	11600
11,70	12	118	71	56	45	11700
11,80	12	118	71	56	45	11800
11,90	12	118	71	56	45	11900
12,00	12	118	71	56	45	12000

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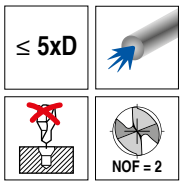
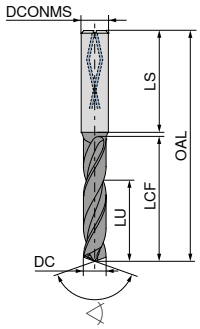
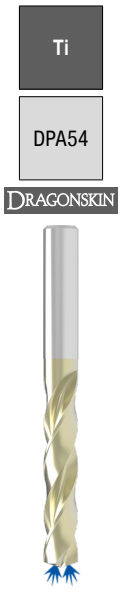
→ v_c Page 34

Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High-performance drill, DIN 6537







10 787 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
3,00	6	66	28	23	36	030
3,10	6	66	28	23	36	031
3,20	6	66	28	23	36	032
3,30	6	66	28	23	36	033
3,40	6	66	28	23	36	034
3,50	6	66	28	23	36	035
3,60	6	66	28	23	36	036
3,70	6	66	28	23	36	037
3,80	6	74	36	29	36	038
3,90	6	74	36	29	36	039
3,97	6	74	36	29	36	900
4,00	6	74	36	29	36	040
4,10	6	74	36	29	36	041
4,20	6	74	36	29	36	042
4,23	6	74	36	29	36	901
4,30	6	74	36	29	36	043
4,40	6	74	36	29	36	044
4,50	6	74	36	29	36	045
4,60	6	74	36	29	36	046
4,70	6	74	36	29	36	047
4,80	6	82	44	35	36	048
4,90	6	82	44	35	36	049
5,00	6	82	44	35	36	050
5,10	6	82	44	35	36	051
5,20	6	82	44	35	36	052
5,30	6	82	44	35	36	053
5,40	6	82	44	35	36	054
5,50	6	82	44	35	36	055
5,56	6	82	44	35	36	902
5,60	6	82	44	35	36	056
5,70	6	82	44	35	36	057
5,80	6	82	44	35	36	058
5,90	6	82	44	35	36	059
6,00	6	82	44	35	36	060
6,10	8	91	53	43	36	061
6,20	8	91	53	43	36	062
6,30	8	91	53	43	36	063
6,35	8	91	53	43	36	903
6,40	8	91	53	43	36	064
6,50	8	91	53	43	36	065
6,60	8	91	53	43	36	066
6,70	8	91	53	43	36	067
6,80	8	91	53	43	36	068
6,90	8	91	53	43	36	069
7,00	8	91	53	43	36	070
7,10	8	91	53	43	36	071
7,20	8	91	53	43	36	072
7,30	8	91	53	43	36	073
7,40	8	91	53	43	36	074
7,50	8	91	53	43	36	075
7,60	8	91	53	43	36	076

10 787 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
7,70	8	91	53	43	36	077
7,80	8	91	53	43	36	078
7,90	8	91	53	43	36	079
7,94	8	91	53	43	36	904
8,00	8	91	53	43	36	080
8,10	10	103	61	49	40	081
8,20	10	103	61	49	40	082
8,30	10	103	61	49	40	083
8,40	10	103	61	49	40	084
8,50	10	103	61	49	40	085
8,60	10	103	61	49	40	086
8,70	10	103	61	49	40	087
8,80	10	103	61	49	40	088
8,90	10	103	61	49	40	089
9,00	10	103	61	49	40	090
9,10	10	103	61	49	40	091
9,20	10	103	61	49	40	092
9,30	10	103	61	49	40	093
9,40	10	103	61	49	40	094
9,50	10	103	61	49	40	095
9,53	10	103	61	49	40	905
9,60	10	103	61	49	40	096
9,70	10	103	61	49	40	097
9,80	10	103	61	49	40	098
9,90	10	103	61	49	40	099
10,00	10	103	61	49	40	100
10,10	12	118	71	54	45	101
10,20	12	118	71	54	45	102
10,30	12	118	71	54	45	103
10,40	12	118	71	54	45	104
10,50	12	118	71	54	45	105
10,60	12	118	71	54	45	106
10,70	12	118	71	54	45	107
10,80	12	118	71	54	45	108
10,90	12	118	71	54	45	109
11,00	12	118	71	54	45	110
11,10	12	118	71	54	45	111
11,11	12	118	71	54	45	906
11,20	12	118	71	54	45	112
11,30	12	118	71	54	45	113
11,40	12	118	71	54	45	114
11,50	12	118	71	54	45	115
11,60	12	118	71	54	45	116
11,70	12	118	71	54	45	117
11,80	12	118	71	54	45	118
11,90	12	118	71	54	45	119
12,00	12	118	71	54	45	120

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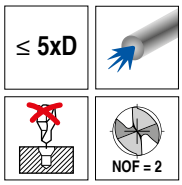
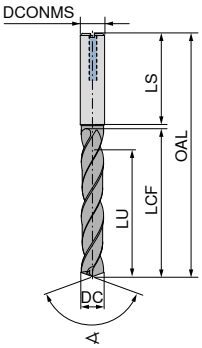
Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High Performance Drill, DIN 6537





AL

DLC

DRAGONSKIN

Solid carbide

10 791 ...

DC h7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
2,5	4	57	21	17	28	02500
2,6	4	57	21	17	28	02600
2,7	4	57	21	17	28	02700
2,8	4	57	21	17	28	02800
2,9	4	57	21	17	28	02900
3,0	6	66	28	23	36	03000
3,1	6	66	28	23	36	03100
3,2	6	66	28	23	36	03200
3,3	6	66	28	23	36	03300
3,4	6	66	28	23	36	03400
3,5	6	66	28	23	36	03500
3,6	6	66	28	23	36	03600
3,7	6	66	28	23	36	03700
3,8	6	74	36	29	36	03800
3,9	6	74	36	29	36	03900
4,0	6	74	36	29	36	04000
4,1	6	74	36	29	36	04100
4,2	6	74	36	29	36	04200
4,3	6	74	36	29	36	04300
4,4	6	74	36	29	36	04400
4,5	6	74	36	29	36	04500
4,6	6	74	36	29	36	04600
4,7	6	74	36	29	36	04700
4,8	6	82	44	35	36	04800
4,9	6	82	44	35	36	04900
5,0	6	82	44	35	36	05000
5,1	6	82	44	35	36	05100
5,2	6	82	44	35	36	05200
5,3	6	82	44	35	36	05300
5,4	6	82	44	35	36	05400
5,5	6	82	44	35	36	05500
5,6	6	82	44	35	36	05600
5,7	6	82	44	35	36	05700
5,8	6	82	44	35	36	05800
5,9	6	82	44	35	36	05900
6,0	6	82	44	35	36	06000
6,1	8	91	53	43	36	06100
6,2	8	91	53	43	36	06200
6,3	8	91	53	43	36	06300
6,4	8	91	53	43	36	06400
6,5	8	91	53	43	36	06500
6,6	8	91	53	43	36	06600
6,7	8	91	53	43	36	06700
6,8	8	91	53	43	36	06800
6,9	8	91	53	43	36	06900
7,0	8	91	53	43	36	07000
7,1	8	91	53	43	36	07100
7,2	8	91	53	43	36	07200
7,3	8	91	53	43	36	07300
7,4	8	91	53	43	36	07400
7,5	8	91	53	43	36	07500

10 791 ...

DC h7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
7,6	8	91	53	43	36	07600
7,7	8	91	53	43	36	07700
7,8	8	91	53	43	36	07800
7,9	8	91	53	43	36	07900
8,0	8	91	53	43	36	08000
8,1	10	103	61	49	40	08100
8,2	10	103	61	49	40	08200
8,3	10	103	61	49	40	08300
8,4	10	103	61	49	40	08400
8,5	10	103	61	49	40	08500
8,6	10	103	61	49	40	08600
8,7	10	103	61	49	40	08700
8,8	10	103	61	49	40	08800
8,9	10	103	61	49	40	08900
9,0	10	103	61	49	40	09000
9,1	10	103	61	49	40	09100
9,2	10	103	61	49	40	09200
9,3	10	103	61	49	40	09300
9,4	10	103	61	49	40	09400
9,5	10	103	61	49	40	09500
9,6	10	103	61	49	40	09600
9,7	10	103	61	49	40	09700
9,8	10	103	61	49	40	09800
9,9	10	103	61	49	40	09900
10,0	10	103	61	49	40	10000
10,1	12	118	71	56	45	10100
10,2	12	118	71	56	45	10200
10,3	12	118	71	56	45	10300
10,4	12	118	71	56	45	10400
10,5	12	118	71	56	45	10500
10,6	12	118	71	56	45	10600
10,7	12	118	71	56	45	10700
10,8	12	118	71	56	45	10800
11,0	12	118	71	56	45	11000
11,1	12	118	71	56	45	11100
11,2	12	118	71	56	45	11200
11,3	12	118	71	56	45	11300
11,4	12	118	71	56	45	11400
11,5	12	118	71	56	45	11500
11,7	12	118	71	56	45	11700
11,8	12	118	71	56	45	11800
12,0	12	118	71	56	45	12000

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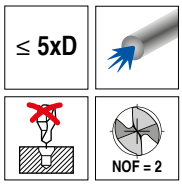
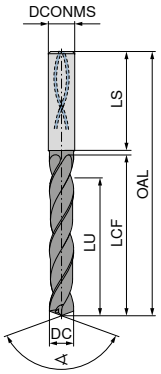
Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WPC – High Performance Drill, DIN 6537





UNI

TiAlN

140°
Solid carbide

11 609 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
1,00	4	45	8,0	6,5	30,0	010
1,10	4	45	8,8	7,2	29,0	011
1,20	4	45	9,6	7,8	29,0	012
1,30	4	45	10,4	8,5	28,5	013
1,40	4	45	11,2	9,1	28,0	014
1,50	4	50	12,0	9,8	32,0	015
1,60	4	50	12,8	10,4	31,0	016
1,70	4	50	13,6	11,1	30,5	017
1,80	4	50	14,4	11,7	30,0	018
1,90	4	50	15,2	12,4	29,5	019
2,00	4	50	16,0	13,0	29,0	020
2,10	4	55	16,8	13,7	33,0	021
2,20	4	55	17,6	14,3	32,5	022
2,30	4	55	18,4	15,0	32,0	023
2,40	4	55	19,2	15,6	31,5	024
2,50	4	55	20,0	16,3	30,5	025
2,60	4	55	20,8	16,9	30,0	026
2,70	4	55	21,6	17,6	29,0	027
2,80	4	55	22,4	18,2	29,0	028
2,90	4	55	23,2	18,9	28,5	029
3,00	6	66	28,0	23,0	36,0	030
3,10	6	66	28,0	23,0	36,0	031
3,20	6	66	28,0	23,0	36,0	032
3,25	6	66	28,0	23,0	36,0	890
3,30	6	66	28,0	23,0	36,0	033
3,40	6	66	28,0	23,0	36,0	034
3,50	6	66	28,0	23,0	36,0	035
3,60	6	66	28,0	23,0	36,0	036
3,70	6	66	28,0	23,0	36,0	037
3,80	6	74	36,0	29,0	36,0	038
3,90	6	74	36,0	29,0	36,0	039
4,00	6	74	36,0	29,0	36,0	040
4,10	6	74	36,0	29,0	36,0	041
4,20	6	74	36,0	29,0	36,0	042
4,30	6	74	36,0	29,0	36,0	043
4,40	6	74	36,0	29,0	36,0	044
4,50	6	74	36,0	29,0	36,0	045
4,60	6	74	36,0	29,0	36,0	046
4,65	6	74	36,0	29,0	36,0	900
4,70	6	74	36,0	29,0	36,0	047
4,80	6	82	44,0	35,0	36,0	048
4,90	6	82	44,0	35,0	36,0	049
5,00	6	82	44,0	35,0	36,0	050
5,10	6	82	44,0	35,0	36,0	051
5,20	6	82	44,0	35,0	36,0	052
5,30	6	82	44,0	35,0	36,0	053
5,40	6	82	44,0	35,0	36,0	054
5,50	6	82	44,0	35,0	36,0	055
5,55	6	82	44,0	35,0	36,0	902
5,60	6	82	44,0	35,0	36,0	056
5,70	6	82	44,0	35,0	36,0	057
5,80	6	82	44,0	35,0	36,0	058
5,90	6	82	44,0	35,0	36,0	059
6,00	6	82	44,0	35,0	36,0	060
6,10	8	91	53,0	43,0	36,0	061
6,20	8	91	53,0	43,0	36,0	062

11 609 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
6,30	8	91	53,0	43,0	36,0	063
6,40	8	91	53,0	43,0	36,0	064
6,50	8	91	53,0	43,0	36,0	065
6,60	8	91	53,0	43,0	36,0	066
6,70	8	91	53,0	43,0	36,0	067
6,80	8	91	53,0	43,0	36,0	068
6,90	8	91	53,0	43,0	36,0	069
7,00	8	91	53,0	43,0	36,0	070
7,10	8	91	53,0	43,0	36,0	071
7,20	8	91	53,0	43,0	36,0	072
7,30	8	91	53,0	43,0	36,0	073
7,40	8	91	53,0	43,0	36,0	074
7,45	8	91	53,0	43,0	36,0	924
7,50	8	91	53,0	43,0	36,0	075
7,55	8	91	53,0	43,0	36,0	975
7,60	8	91	53,0	43,0	36,0	076
7,70	8	91	53,0	43,0	36,0	077
7,80	8	91	53,0	43,0	36,0	078
7,90	8	91	53,0	43,0	36,0	079
8,00	8	91	53,0	43,0	36,0	080
8,10	10	103	61,0	49,0	40,0	081
8,20	10	103	61,0	49,0	40,0	082
8,30	10	103	61,0	49,0	40,0	083
8,40	10	103	61,0	49,0	40,0	084
8,50	10	103	61,0	49,0	40,0	085
8,60	10	103	61,0	49,0	40,0	086
8,70	10	103	61,0	49,0	40,0	087
8,80	10	103	61,0	49,0	40,0	088
8,90	10	103	61,0	49,0	40,0	089
9,00	10	103	61,0	49,0	40,0	090
9,10	10	103	61,0	49,0	40,0	091
9,20	10	103	61,0	49,0	40,0	092
9,25	10	103	61,0	49,0	40,0	925
9,30	10	103	61,0	49,0	40,0	093
9,35	10	103	61,0	49,0	40,0	930
9,40	10	103	61,0	49,0	40,0	094
9,50	10	103	61,0	49,0	40,0	095
9,60	10	103	61,0	49,0	40,0	096
9,70	10	103	61,0	49,0	40,0	097
9,80	10	103	61,0	49,0	40,0	098
9,90	10	103	61,0	49,0	40,0	099
10,00	10	103	61,0	49,0	40,0	100
10,10	12	118	71,0	56,0	45,0	101
10,20	12	118	71,0	56,0	45,0	102
10,30	12	118	71,0	56,0	45,0	103
10,40	12	118	71,0	56,0	45,0	104
10,50	12	118	71,0	56,0	45,0	105
10,60	12	118	71,0	56,0	45,0	106
10,70	12	118	71,0	56,0	45,0	107
10,75	12	118	71,0	56,0	45,0	904
10,80	12	118	71,0	56,0	45,0	108
10,90	12	118	71,0	56,0	45,0	109
11,00	12	118	71,0	56,0	45,0	110
11,10	12	118	71,0	56,0	45,0	111
11,20	12	118	71,0	56,0	45,0	112
11,25	12	118	71,0	56,0	45,0	912
11,30	12	118	71,0	56,0	45,0	113
11,40	12	118	71,0	56,0	45,0	114
11,50	12	118	71,0	56,0	45,0	115
11,60	12	118	71,0	56,0	45,0	116
11,70	12	118	71,0	56,0	45,0	117
11,80	12	118	71,0	56,0	45,0	118
11,90	12	118	71,0	56,0	45,0	119
12,00	12	118	71,0	56,0	45,0	120

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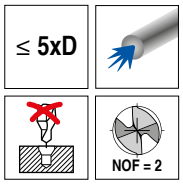
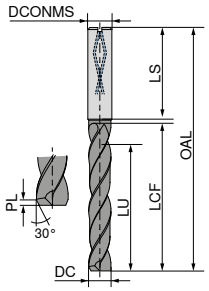
Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High Performance Drill, DIN 6537

- ▲ universal application
- ▲ four guidance lands
- ▲ polished chip flutes
- ▲ Type ALU 5xD on request
- ▲ PL = corner chamfers





180

Ti800

180°
Solid carbide

10 721 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	PL mm	
3,00	6	66	28	23	36	0,15	030
3,10	6	66	28	23	36	0,16	031
3,20	6	66	28	23	36	0,16	032
3,30	6	66	28	23	36	0,17	033
3,40	6	66	28	23	36	0,17	034
3,50	6	66	28	23	36	0,18	035
3,60	6	66	28	23	36	0,18	036
3,70	6	66	28	23	36	0,19	037
3,80	6	74	36	29	36	0,19	038
3,90	6	74	36	29	36	0,20	039
4,00	6	74	36	29	36	0,20	040
4,10	6	74	36	29	36	0,21	041
4,20	6	74	36	29	36	0,21	042
4,30	6	74	36	29	36	0,22	043
4,40	6	74	36	29	36	0,22	044
4,50	6	74	36	29	36	0,23	045
4,60	6	74	36	29	36	0,23	046
4,65	6	74	36	29	36	0,23	900
4,70	6	74	36	29	36	0,24	047
4,80	6	82	44	35	36	0,24	048
4,90	6	82	44	35	36	0,25	049
5,00	6	82	44	35	36	0,25	050
5,10	6	82	44	35	36	0,26	051
5,20	6	82	44	35	36	0,26	052
5,30	6	82	44	35	36	0,27	053
5,40	6	82	44	35	36	0,27	054
5,50	6	82	44	35	36	0,28	055
5,55	6	82	44	35	36	0,28	902
5,60	6	82	44	35	36	0,28	056
5,70	6	82	44	35	36	0,29	057
5,80	6	82	44	35	36	0,29	058
5,90	6	82	44	35	36	0,30	059
6,00	6	82	44	35	36	0,30	060
6,10	8	91	53	43	36	0,31	061
6,20	8	91	53	43	36	0,31	062
6,30	8	91	53	43	36	0,32	063
6,40	8	91	53	43	36	0,32	064
6,50	8	91	53	43	36	0,33	065
6,60	8	91	53	43	36	0,33	066
6,70	8	91	53	43	36	0,34	067
6,80	8	91	53	43	36	0,34	068
6,90	8	91	53	43	36	0,35	069
7,00	8	91	53	43	36	0,35	070
7,10	8	91	53	43	36	0,36	071
7,20	8	91	53	43	36	0,36	072
7,30	8	91	53	43	36	0,37	073
7,40	8	91	53	43	36	0,37	074
7,50	8	91	53	43	36	0,38	075
7,60	8	91	53	43	36	0,38	076
7,70	8	91	53	43	36	0,39	077
7,80	8	91	53	43	36	0,39	078
7,90	8	91	53	43	36	0,40	079
8,00	8	91	53	43	36	0,40	080
8,10	10	103	61	49	40	0,41	081

10 721 ...

DC m7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	PL mm	
8,20	10	103	61	49	40	0,41	082
8,30	10	103	61	49	40	0,42	083
8,40	10	103	61	49	40	0,42	084
8,50	10	103	61	49	40	0,43	085
8,60	10	103	61	49	40	0,43	086
8,70	10	103	61	49	40	0,44	087
8,80	10	103	61	49	40	0,44	088
8,90	10	103	61	49	40	0,45	089
9,00	10	103	61	49	40	0,45	090
9,10	10	103	61	49	40	0,46	091
9,20	10	103	61	49	40	0,46	092
9,30	10	103	61	49	40	0,47	093
9,40	10	103	61	49	40	0,47	094
9,50	10	103	61	49	40	0,48	095
9,60	10	103	61	49	40	0,48	096
9,70	10	103	61	49	40	0,49	097
9,80	10	103	61	49	40	0,49	098
9,90	10	103	61	49	40	0,50	099
10,00	10	103	61	49	40	0,50	100
10,10	12	116	69	54	45	0,51	101
10,20	12	116	69	54	45	0,51	102
10,30	12	116	69	54	45	0,52	103
10,40	12	116	69	54	45	0,52	104
10,50	12	116	69	54	45	0,53	105
10,60	12	116	69	54	45	0,53	106
10,70	12	116	69	54	45	0,54	107
10,80	12	116	69	54	45	0,54	108
10,90	12	116	69	54	45	0,55	109
11,00	12	116	69	54	45	0,55	110
11,10	12	116	69	54	45	0,56	111
11,20	12	116	69	54	45	0,56	112
11,30	12	116	69	54	45	0,57	113
11,40	12	116	69	54	45	0,57	114
11,50	12	116	69	54	45	0,58	115
11,60	12	116	69	54	45	0,58	116
11,70	12	116	69	54	45	0,59	117
11,80	12	116	69	54	45	0,59	118
11,90	12	116	69	54	45	0,60	119
12,00	12	116	69	54	45	0,60	120

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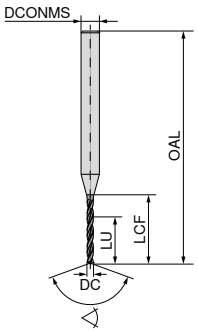
Further dimensions and drills can be found in our
→ **main catalogue in Chapter 2 Solid carbide drills**

WTX – High Performance Drills

▲ standard shank Ø 3 mm h6 for use in heat shrink adapters

≤ 5xD

NOF = 2



MINI

TiAlN

Solid carbide

11 770 ...

DC +0,004 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	
0,10	3	38	1,2	1,0	00100
0,15	3	38	2,0	1,7	00150
0,20	3	38	3,5	3,0	00200
0,25	3	38	3,5	3,0	00250
0,30	3	38	5,5	5,0	00300
0,35	3	38	5,5	5,0	00350
0,40	3	38	7,0	6,0	00400
0,45	3	38	7,0	6,0	00450
0,50	3	38	7,0	6,0	00500
0,55	3	38	7,0	6,0	00550
0,60	3	38	7,0	6,0	00600
0,65	3	38	7,0	6,0	00650
0,70	3	38	10,5	8,0	00700
0,75	3	38	10,5	8,0	00750
0,80	3	38	10,5	8,0	00800
0,85	3	38	10,5	8,0	00850
0,90	3	38	10,5	8,0	00900
0,95	3	38	10,5	8,0	00950
0,97	3	38	10,5	8,0	00970
0,98	3	38	10,5	8,0	00980
0,99	3	38	10,5	8,0	00990
1,00	3	38	10,5	8,0	01000
1,01	3	38	10,5	8,0	01010
1,02	3	38	10,5	8,0	01020
1,03	3	38	10,5	8,0	01030
1,05	3	38	10,5	8,0	01050
1,10	3	38	10,5	8,0	01100
1,15	3	38	10,5	8,0	01150
1,20	3	38	10,5	8,0	01200
1,25	3	38	10,5	8,0	01250
1,30	3	38	10,5	8,0	01300
1,35	3	38	10,5	8,0	01350
1,40	3	38	10,5	8,0	01400
1,45	3	38	10,5	8,0	01450
1,47	3	38	10,5	8,0	01470
1,48	3	38	10,5	8,0	01480
1,49	3	38	10,5	8,0	01490
1,50	3	38	10,5	8,0	01500
1,51	3	38	10,5	8,0	01510
1,52	3	38	10,5	8,0	01520
1,53	3	38	10,5	8,0	01530
1,55	3	38	10,5	8,0	01550
1,60	3	38	10,5	8,0	01600
1,65	3	38	10,5	8,0	01650
1,70	3	38	10,5	8,0	01700
1,75	3	38	10,5	8,0	01750

11 770 ...

DC +0,004 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	
1,80	3	38	10,5	8,0	01800
1,85	3	38	12,0	8,0	01850
1,90	3	38	12,0	8,0	01900
1,95	3	38	12,0	8,0	01950
1,97	3	38	12,0	8,0	01970
1,98	3	38	12,0	8,0	01980
1,99	3	38	12,0	8,0	01990
2,00	3	42	13,0	9,0	02000
2,01	3	42	13,0	9,0	02010
2,02	3	42	13,0	9,0	02020
2,03	3	42	13,0	9,0	02030
2,05	3	42	13,0	9,0	02050
2,10	3	42	13,0	9,0	02100
2,15	3	42	13,0	9,0	02150
2,20	3	46	15,0	10,0	02200
2,25	3	46	15,0	10,0	02250
2,30	3	46	15,0	10,0	02300
2,35	3	46	15,0	10,0	02350
2,40	3	46	15,0	10,0	02400
2,45	3	46	15,0	10,0	02450
2,47	3	46	15,0	10,0	02470
2,48	3	46	15,0	10,0	02480
2,49	3	46	15,0	10,0	02490
2,50	3	46	15,0	10,0	02500
2,51	3	46	15,0	10,0	02510
2,52	3	46	15,0	10,0	02520
2,53	3	46	15,0	10,0	02530
2,60	3	46	15,0	10,0	02600
2,70	3	46	15,0	10,0	02700
2,80	3	46	15,0	10,0	02800
2,90	3	46	15,0	10,0	02900

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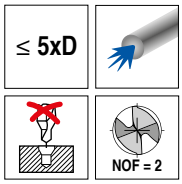
WTX – High Performance Drills

- Specialised micro drill
- Universal application
- Extremely high process security
- Pilot drill for WTX Micro – high-performance deep hole drill

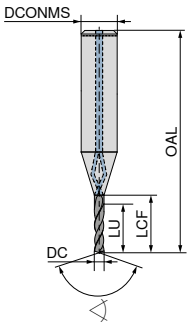


NEW

MICRO

DPX74M

DRAGONSKIN



135°

Solid carbide

10 693 ...

DC m6 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	
0,8	3	39	5,6	4,0	00800
0,9	3	39	6,3	4,5	00900
1,0	3	40	7,0	5,0	01000
1,1	3	41	7,7	5,5	01100
1,2	3	41	8,4	6,0	01200
1,3	3	42	9,1	6,5	01300
1,4	3	42	9,8	7,0	01400
1,5	3	43	10,5	7,5	01500
1,6	3	44	11,2	8,0	01600
1,7	3	44	11,9	8,5	01700
1,8	3	45	12,6	9,0	01800
1,9	3	45	13,3	9,5	01900
2,0	3	46	14,0	10,0	02000
2,1	3	47	14,7	10,5	02100
2,2	3	47	15,4	11,0	02200
2,3	3	48	16,1	11,5	02300
2,4	3	48	16,8	12,0	02400
2,5	3	49	17,5	12,5	02500
2,6	3	50	18,2	13,0	02600
2,7	3	50	18,9	13,5	02700
2,8	3	51	19,6	14,0	02800
2,9	3	51	20,3	14,5	02900

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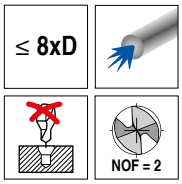
Minimum coolant pressure: 30 bar

WTX – High Performance Drills

- Specialised micro drill
- Universal application
- Extremely high process security

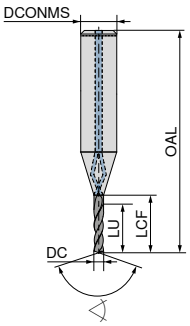


NEW

MICRO

DPX74M

DRAGONSKIN



128°

Solid carbide

10 694 ...

DC h6 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	
0,8	3	41	8	6,4	00800
0,9	3	42	9	7,2	00900
1,0	3	43	10	8,0	01000
1,1	3	44	11	8,8	01100
1,2	3	45	12	9,6	01200
1,3	3	46	13	10,4	01300
1,4	3	47	14	11,2	01400
1,5	3	47	15	12,0	01500
1,6	3	48	16	12,8	01600
1,7	3	49	17	13,6	01700
1,8	3	50	18	14,4	01800
1,9	3	51	19	15,2	01900
2,0	3	52	20	16,0	02000
2,1	3	53	21	16,8	02100
2,2	3	54	22	17,6	02200
2,3	3	55	23	18,4	02300
2,4	3	56	24	19,2	02400
2,5	3	56	25	20,0	02500
2,6	3	57	26	20,8	02600
2,7	3	58	27	21,6	02700
2,8	3	59	28	22,4	02800
2,9	3	60	29	23,2	02900

P	●
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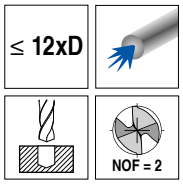
Minimum coolant pressure: 30 bar

WTX – High Performance Drills

- Specialised micro drill
- Universal application
- Extremely high process security
- Pilot drill: 5xD WTX – Micro – high-performance drill

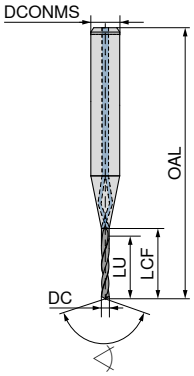


NEW

MICRO

DPX74M

DRAGONSKIN



Solid carbide

10 695 ...

DC h6 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	
0,8	3	44	11,2	9,6	**00800**
0,9	3	46	12,6	10,8	**00900**
1,0	3	47	14,0	12,0	**01000**
1,1	3	48	15,4	13,2	**01100**
1,2	3	50	16,8	14,4	**01200**
1,3	3	51	18,2	15,6	**01300**
1,4	3	52	19,6	16,8	**01400**
1,5	3	53	21,0	18,0	**01500**
1,6	3	55	22,4	19,2	**01600**
1,7	3	56	23,8	20,4	**01700**
1,8	3	57	25,2	21,6	**01800**
1,9	3	59	26,6	22,8	**01900**
2,0	3	60	28,0	24,0	**02000**
2,1	3	61	29,4	25,2	**02100**
2,2	3	63	30,8	26,4	**02200**
2,3	3	64	32,2	27,6	**02300**
2,4	3	65	33,6	28,8	**02400**
2,5	3	67	35,0	30,0	**02500**
2,6	3	68	36,4	31,2	**02600**
2,7	3	69	37,8	32,4	**02700**
2,8	3	70	39,2	33,6	**02800**
2,9	3	72	40,6	34,8	**02900**

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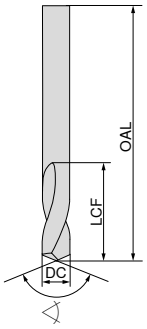
Minimum coolant pressure: 30 bar

NC Spot Drill, factory standard

▲ Spiral flutes

NC-A



HA

120°

Solid carbide

10 703 ...

DC $_{h5}$ mm	OAL mm	LCF mm	
2	32	6	**002**
3	32	8	**003**
4	40	10	**004**
5	50	13	**005**
6	50	13	**006**
8	60	23	**008**
10	70	24	**010**
12	70	24	**012**

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Material examples for cutting data tables

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

*** Tensile strength**

Cutting data standard values – WTX – UNI

Index	Drilling depth 3xD UNI 11 777 ..., 11 780 ...					Drilling depth 5xD UNI 11 783 ..., 11 786 ...				
	v_c m/min without through coolant	v_c m/min with through coolant	Ø 3–5 mm/rev.	Ø 5–8 mm/rev.	Ø 8–12 mm/rev.	v_c m/min without through coolant	v_c m/min with through coolant	Ø 3–5 mm/rev.	Ø 5–8 mm/rev.	Ø 8–12 mm/rev.
P.1.1	**110**	**120**	0,13	0,18	0,25	**110**	**120**	0,13	0,18	0,25
P.1.2	**105**	**115**	0,12	0,18	0,24	**105**	**115**	0,12	0,18	0,24
P.1.3	**100**	**110**	0,12	0,17	0,23	**100**	**110**	0,12	0,17	0,23
P.1.4	**95**	**105**	0,11	0,16	0,21	**95**	**105**	0,11	0,16	0,21
P.1.5	**90**	**100**	0,11	0,15	0,20	**90**	**100**	0,11	0,15	0,20
P.2.1	**105**	**120**	0,15	0,22	0,29	**105**	**120**	0,15	0,22	0,29
P.2.2	**95**	**110**	0,14	0,20	0,27	**95**	**110**	0,14	0,20	0,27
P.2.3	**85**	**100**	0,13	0,18	0,24	**85**	**100**	0,13	0,18	0,24
P.2.4	**65**	**75**	0,12	0,16	0,21	**65**	**75**	0,12	0,16	0,21
P.3.1	**70**	**85**	0,12	0,18	0,24	**70**	**85**	0,12	0,18	0,24
P.3.2	**60**	**65**	0,11	0,15	0,20	**60**	**65**	0,11	0,15	0,20
P.3.3	**50**	**65**	0,09	0,12	0,15	**50**	**65**	0,09	0,12	0,15
P.4.1	**50**	**65**	0,08	0,12	0,16	**50**	**65**	0,08	0,12	0,16
P.4.2	**50**	**65**	0,08	0,12	0,16	**50**	**65**	0,08	0,12	0,16
M.1.1										
M.2.1										
M.3.1										
K.1.1	**85**	**120**	0,17	0,26	0,36	**85**	**120**	0,17	0,26	0,36
K.1.2	**75**	**100**	0,15	0,22	0,29	**75**	**100**	0,15	0,22	0,29
K.2.1	**100**	**160**	0,17	0,25	0,34	**100**	**160**	0,17	0,25	0,34
K.2.2	**75**	**100**	0,15	0,22	0,29	**75**	**100**	0,15	0,22	0,29
K.3.1	**80**	**90**	0,16	0,23	0,32	**80**	**90**	0,16	0,23	0,32
K.3.2	**70**	**80**	0,14	0,19	0,25	**70**	**80**	0,14	0,19	0,25
N.1.1										
N.1.2										
N.2.1										
N.2.2										
N.2.3										
N.3.1										
N.3.2										
N.3.3										
N.4.1										
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	25	25	0,06	0,08	0,11	25	25	0,06	0,08	0,11
H.1.2										
H.1.3										
H.1.4										
H.2.1	35	35	0,08	0,11	0,14	35	35	0,08	0,11	0,14
H.3.1										
O.1.1										
O.1.2										
O.2.1										
O.2.2										
O.3.1										

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

1

Cutting data standard values – WTX – Ti / AL

Index	Hole depth 3xD / 5xD Ti 10 786 ..., 10 787 ...							Drilling depth 5xD AL 10 791 ...							
	v_c m/min with through coolant	Ø 3–4 f mm/rev.	Ø 4–5 f mm/rev.	Ø 5–6 f mm/rev.	Ø 6–8 f mm/rev.	Ø 8–10 f mm/rev.	Ø 10–12 f mm/rev.	v_c m/min with through coolant	Ø 2–3 f mm/rev.	Ø 3–4 f mm/rev.	Ø 4–5 f mm/rev.	Ø 5–6 f mm/rev.	Ø 6–8 f mm/rev.	Ø 8–10 f mm/rev.	Ø 10–12 f mm/rev.
P.1.1															
P.1.2															
P.1.3															
P.1.4															
P.1.5															
P.2.1															
P.2.2															
P.2.3															
P.2.4															
P.3.1															
P.3.2															
P.3.3															
P.4.1	75	0,03	0,04	0,05	0,06	0,08	0,10								
P.4.2	65	0,03	0,04	0,05	0,06	0,08	0,10								
M.1.1	**70**	0,03	0,04	0,05	0,06	0,08	0,10								
M.2.1	**70**	0,03	0,04	0,05	0,06	0,08	0,10								
M.3.1	**70**	0,03	0,04	0,05	0,06	0,08	0,10								
K.1.1															
K.1.2															
K.2.1															
K.2.2															
K.3.1															
K.3.2															
N.1.1								**360**	0,15	0,20	0,23	0,25	0,29	0,32	0,35
N.1.2								**400**	0,15	0,20	0,23	0,25	0,29	0,32	0,35
N.2.1								**360**	0,20	0,23	0,25	0,28	0,32	0,35	0,38
N.2.2								**400**	0,20	0,23	0,25	0,28	0,32	0,35	0,38
N.2.3								**350**	0,15	0,20	0,23	0,25	0,29	0,32	0,35
N.3.1								**200**	0,08	0,11	0,13	0,15	0,19	0,23	0,26
N.3.2								**200**	0,08	0,11	0,13	0,15	0,19	0,23	0,26
N.3.3								**160**	0,08	0,11	0,13	0,15	0,19	0,23	0,26
N.4.1															
S.1.1	**45**	0,02	0,02	0,02	0,04	0,05	0,07								
S.1.2	**45**	0,02	0,02	0,02	0,04	0,05	0,07								
S.2.1	**40**	0,02	0,02	0,02	0,04	0,05	0,07								
S.2.2	**40**	0,02	0,02	0,02	0,04	0,05	0,07								
S.2.3															
S.3.1	**55**	0,02	0,02	0,02	0,04	0,05	0,07								
S.3.2	**45**	0,02	0,02	0,02	0,04	0,05	0,07								
S.3.3															
H.1.1															
H.1.2															
H.1.3															
H.1.4															
H.2.1															
H.3.1															
O.1.1															
O.1.2															
O.2.1															
O.2.2															
O.3.1															

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

Cutting data standard values – WTX – MINI / MICRO

Index	Drilling depth 5xD Mini 11 770 ...					Drilling depth 5xD Micro 10 693 ...							
	v_c m/min without through coolant	< Ø 1,0 f mm/rev.	> Ø 1,0–1,5 f mm/rev.	> Ø 1,5–2,0 f mm/rev.	> Ø 2,0–2,9 f mm/rev.	v_c m/min with through coolant	v_c m/min MMS	< Ø 1,0 f mm/rev.	> Ø 1,0–1,25 f mm/rev.	> Ø 1,25–1,5 f mm/rev.	> Ø 1,5–2,0 f mm/rev.	> Ø 2,0–2,5 f mm/rev.	> Ø 2,5–3,0 f mm/rev.
P.1.1	75	0,01	0,01	0,0125	0,015	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
P.1.2	65	0,02	0,02	0,025	0,03	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.1.3	65	0,01	0,01	0,0125	0,015	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.1.4	65	0,01	0,01	0,0125	0,015	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.1.5	70	0,01	0,01	0,0125	0,015	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.2.1	70	0,01	0,01	0,0125	0,015	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
P.2.2	65	0,01	0,01	0,0125	0,015	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.2.3	65	0,02	0,02	0,025	0,03	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.2.4	65	0,01	0,01	0,0125	0,015								
P.3.1						**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.3.2						**40**	**35**	0,024	0,028	0,034	0,05	0,07	0,095
P.3.3													
P.4.1						**40**		0,012	0,015	0,018	0,028	0,04	0,06
P.4.2						**25**		0,012	0,015	0,018	0,028	0,04	0,06
M.1.1						**30**		0,012	0,015	0,018	0,028	0,04	0,06
M.2.1						**30**		0,012	0,015	0,018	0,028	0,04	0,06
M.3.1						**30**		0,012	0,015	0,018	0,028	0,04	0,06
K.1.1	**70**	0,01	0,01	0,0125	0,015	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.1.2	**70**	0,01	0,01	0,0125	0,015	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.2.1	**70**	0,01	0,01	0,0125	0,015	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.2.2	**70**	0,01	0,01	0,0125	0,015	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.3.1	**70**	0,01	0,01	0,0125	0,015	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.3.2	**70**	0,01	0,01	0,0125	0,015	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
N.1.1	**200**	0,01	0,01	0,0125	0,015								
N.1.2	**200**	0,01	0,01	0,0125	0,015								
N.2.1	**160**	0,01	0,01	0,0125	0,015								
N.2.2	**180**	0,01	0,01	0,0125	0,015								
N.2.3	**130**	0,01	0,01	0,0125	0,015								
N.3.1	**160**	0,01	0,01	0,0125	0,015								
N.3.2	**160**	0,01	0,01	0,0125	0,015								
N.3.3	**100**	0,01	0,01	0,0125	0,015								
N.4.1	**200**	0,01	0,01	0,0125	0,015								
S.1.1						15		0,012	0,015	0,018	0,028	0,04	0,06
S.1.2						15		0,012	0,015	0,018	0,028	0,04	0,06
S.2.1						10		0,012	0,015	0,018	0,028	0,04	0,06
S.2.2						10		0,012	0,015	0,018	0,028	0,04	0,06
S.2.3													
S.3.1	30	0,01	0,01	0,0125	0,015	20		0,012	0,015	0,018	0,028	0,04	0,06
S.3.2	20	0,01	0,01	0,0125	0,015	10		0,012	0,015	0,018	0,028	0,04	0,06
S.3.3													
H.1.1													
H.1.2													
H.1.3													
H.1.4													
H.2.1													
H.3.1													
O.1.1													
O.1.2													
O.2.1													
O.2.2													
O.3.1													

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

			Hole depth 8xD / 12xD Micro 10 694 ..., 10 695 ...					
Index	v_c m/min with through coolant	v_c m/min MMS	< Ø 1,0	> Ø 1,0–1,25	> Ø 1,25–1,5	> Ø 1,5–2,0	> Ø 2,0–2,5	> Ø 2,5–3,0
			f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.
P.1.1	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
P.1.2	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.1.3	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.1.4	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.1.5	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.2.1	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
P.2.2	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.2.3	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.2.4								
P.3.1	**50**	**45**	0,024	0,028	0,034	0,05	0,07	0,095
P.3.2	**40**	**35**	0,024	0,028	0,034	0,05	0,07	0,095
P.3.3								
P.4.1	**40**		0,012	0,015	0,018	0,028	0,04	0,06
P.4.2	**25**		0,012	0,015	0,018	0,028	0,04	0,06
M.1.1	**30**		0,012	0,015	0,018	0,028	0,04	0,06
M.2.1	**30**		0,012	0,015	0,018	0,028	0,04	0,06
M.3.1	**30**		0,012	0,015	0,018	0,028	0,04	0,06
K.1.1	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.1.2	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.2.1	**60**	**05**	0,024	0,028	0,034	0,05	0,07	0,095
K.2.2	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.3.1	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
K.3.2	**60**	**50**	0,024	0,028	0,034	0,05	0,07	0,095
N.1.1								
N.1.2								
N.2.1								
N.2.2								
N.2.3								
N.3.1								
N.3.2								
N.3.3								
N.4.1								
S.1.1	15		0,012	0,015	0,018	0,028	0,04	0,06
S.1.2	15		0,012	0,015	0,018	0,028	0,04	0,06
S.2.1	10		0,012	0,015	0,018	0,028	0,04	0,06
S.2.2	10		0,012	0,015	0,018	0,028	0,04	0,06
S.2.3								
S.3.1	20		0,012	0,015	0,018	0,028	0,04	0,06
S.3.2	10		0,012	0,015	0,018	0,028	0,04	0,06
S.3.3								
H.1.1								
H.1.2								
H.1.3								
H.1.4								
H.2.1								
H.3.1								
O.1.1								
O.1.2								
O.2.1								
O.2.2								
O.3.1								

Cutting data standard values – WTX – 180

	Drilling depth 3xD Type 180 10 720 ...			
Index	v_c m/min with through coolant	Ø 3–5 f mm/rev.	Ø 5–8 f mm/rev.	Ø 8–12 f mm/rev.
P.1.1	90	0,09	0,13	0,18
P.1.2	85	0,09	0,13	0,17
P.1.3	80	0,09	0,12	0,16
P.1.4	75	0,08	0,12	0,16
P.1.5	70	0,08	0,11	0,15
P.2.1	90	0,11	0,16	0,21
P.2.2	80	0,10	0,14	0,19
P.2.3	70	0,09	0,13	0,17
P.2.4	55	0,09	0,12	0,16
P.3.1	60	0,09	0,13	0,17
P.3.2	50	0,08	0,11	0,14
P.3.3	50	0,06	0,09	0,11
P.4.1	50	0,06	0,09	0,11
P.4.2	50	0,06	0,09	0,11
M.1.1	45	0,06	0,09	0,11
M.2.1	40	0,05	0,07	0,10
M.3.1	40	0,05	0,07	0,10
K.1.1	95	0,12	0,19	0,26
K.1.2	80	0,11	0,16	0,21
K.2.1	130	0,12	0,18	0,25
K.2.2	80	0,11	0,16	0,21
K.3.1	70	0,12	0,17	0,23
K.3.2	65	0,10	0,14	0,18
N.1.1				
N.1.2				
N.2.1				
N.2.2				
N.2.3				
N.3.1				
N.3.2				
N.3.3				
N.4.1				
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				
O.1.2				
O.2.1				
O.2.2				
O.3.1				

Cutting data standard values – WTX – 180

Index	v_c m/min with through coolant	Drilling depth 5xD Type 180 10 721 … Ø 3–5 f mm/rev.	Ø 5–8 f mm/rev.	Ø 8–12 f mm/rev.
P.1.1	90	0,09	0,13	0,18
P.1.2	85	0,09	0,13	0,17
P.1.3	80	0,09	0,12	0,16
P.1.4	75	0,08	0,12	0,16
P.1.5	70	0,08	0,11	0,15
P.2.1	90	0,11	0,16	0,21
P.2.2	80	0,10	0,14	0,19
P.2.3	70	0,09	0,13	0,17
P.2.4	55	0,09	0,12	0,16
P.3.1	60	0,09	0,13	0,17
P.3.2	50	0,08	0,11	0,14
P.3.3	50	0,06	0,09	0,11
P.4.1	50	0,06	0,09	0,11
P.4.2	50	0,06	0,09	0,11
M.1.1	45	0,06	0,09	0,11
M.2.1	40	0,05	0,07	0,10
M.3.1	40	0,05	0,07	0,10
K.1.1	95	0,12	0,19	0,26
K.1.2	80	0,11	0,16	0,21
K.2.1	130	0,12	0,18	0,25
K.2.2	80	0,11	0,16	0,21
K.3.1	70	0,12	0,17	0,23
K.3.2	65	0,10	0,14	0,18
N.1.1				
N.1.2				
N.2.1				
N.2.2				
N.2.3				
N.3.1				
N.3.2				
N.3.3				
N.4.1				
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				
O.1.2				
O.2.1				
O.2.2				
O.3.1				

Application Note:

Spot drilling with reduced feedrate

1. Feedrate f [mm/U] should be multiplied by correction factor A_k
2. Drill with reduced feed rate until tool is fully engaged in workpiece by approximately 0.25 x D
3. Retract from the hole at double the feed rate f in mm/U – only with inclined surfaces

   This operation is necessary in order to achieve maximum performance of the drill!
4. Drill the hole with feed rate f [mm/U] without pecking for chip evacuation

Correction factor A_k for f [mm/U] when spot drilling		
Inclination workpiece surface	A_k to 3xD (10 720 …)	A_k to 5xD (10 721 …)
15°	0,5	0,25
30°	0,4	not recommended
45°	0,25	not recommended

For drilling on flat surfaces (inclination 0 °) with the WTX – 180 5xD, we recommend the use of a pilot drill. (WTX – UNI 3xD)

Cutting data standard values – WPC – UNI

Index	v_c m/min without through coolant	v_c m/min with through coolant	Drilling depth 3xD UNI 11 600 ..., 11 603 ... Ø 1–1,5 f mm/rev.	Ø 1,5–2 f mm/rev.	Ø 2–3 f mm/rev.	Ø 3–5 f mm/rev.	Ø 5–8 f mm/rev.	Ø 8–12 f mm/rev.
P.1.1	75	85	0,05	0,06	0,08	0,11	0,15	0,20
P.1.2	70	80	0,05	0,05	0,07	0,10	0,14	0,19
P.1.3	70	75	0,05	0,05	0,07	0,10	0,14	0,18
P.1.4	65	70	0,04	0,05	0,07	0,09	0,13	0,18
P.1.5	60	70	0,04	0,05	0,06	0,09	0,12	0,17
P.2.1	70	85	0,06	0,07	0,09	0,13	0,18	0,24
P.2.2	65	75	0,05	0,06	0,08	0,11	0,16	0,22
P.2.3	55	70	0,05	0,06	0,07	0,10	0,15	0,20
P.2.4	45	55	0,05	0,06	0,07	0,10	0,13	0,17
P.3.1	50	55	0,05	0,05	0,07	0,10	0,15	0,20
P.3.2	40	45	0,04	0,05	0,06	0,09	0,12	0,16
P.3.3	35	45	0,04	0,04	0,06	0,07	0,10	0,13
P.4.1	35	45	0,03	0,04	0,05	0,07	0,10	0,13
P.4.2	35	45	0,03	0,04	0,05	0,07	0,10	0,13
M.1.1								
M.2.1								
M.3.1								
K.1.1	60	80	0,04	0,06	0,09	0,14	0,21	0,30
K.1.2	50	70	0,05	0,06	0,09	0,12	0,18	0,24
K.2.1	70	110	0,05	0,07	0,09	0,14	0,20	0,28
K.2.2	50	70	0,05	0,06	0,09	0,12	0,18	0,24
K.3.1	55	60	0,06	0,07	0,09	0,13	0,19	0,26
K.3.2	50	55	0,05	0,06	0,08	0,11	0,16	0,21
N.1.1								
N.1.2								
N.2.1								
N.2.2								
N.2.3								
N.3.1								
N.3.2								
N.3.3								
N.4.1								
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								
O.1.2								
O.2.1								
O.2.2								
O.3.1								

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

Cutting data standard values – WPC – UNI

Index	v_c m/min without through coolant	v_c m/min with through coolant	Drilling depth 5xD UNI 11 606 ..., 11 609 ... Ø 1–1,5 f mm/rev.	Ø 1,5–2 f mm/rev.	Ø 2–3 f mm/rev.	Ø 3–5 f mm/rev.	Ø 5–8 f mm/rev.	Ø 8–12 f mm/rev.
P.1.1	75	85	0,05	0,06	0,08	0,11	0,15	0,20
P.1.2	70	80	0,05	0,05	0,07	0,10	0,14	0,19
P.1.3	70	75	0,05	0,05	0,07	0,10	0,14	0,18
P.1.4	65	70	0,04	0,05	0,07	0,09	0,13	0,18
P.1.5	60	70	0,04	0,05	0,06	0,09	0,12	0,17
P.2.1	70	85	0,06	0,07	0,09	0,13	0,18	0,24
P.2.2	65	75	0,05	0,06	0,08	0,11	0,16	0,22
P.2.3	55	70	0,05	0,06	0,07	0,10	0,15	0,20
P.2.4	45	55	0,05	0,06	0,07	0,10	0,13	0,17
P.3.1	50	55	0,05	0,05	0,07	0,10	0,15	0,20
P.3.2	40	45	0,04	0,05	0,06	0,09	0,12	0,16
P.3.3	35	45	0,04	0,04	0,06	0,07	0,10	0,13
P.4.1	35	45	0,03	0,04	0,05	0,07	0,10	0,13
P.4.2	35	45	0,03	0,04	0,05	0,07	0,10	0,13
M.1.1								
M.2.1								
M.3.1								
K.1.1	60	80	0,04	0,06	0,09	0,14	0,21	0,30
K.1.2	50	70	0,05	0,06	0,09	0,12	0,18	0,24
K.2.1	70	110	0,05	0,07	0,09	0,14	0,20	0,28
K.2.2	50	70	0,05	0,06	0,09	0,12	0,18	0,24
K.3.1	55	60	0,06	0,07	0,09	0,13	0,19	0,26
K.3.2	50	55	0,05	0,06	0,08	0,11	0,16	0,21
N.1.1								
N.1.2								
N.2.1								
N.2.2								
N.2.3								
N.3.1								
N.3.2								
N.3.3								
N.4.1								
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								
O.1.2								
O.2.1								
O.2.2								
O.3.1								

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

Cutting data standard values – solid carbide NC spot drills

Index	NC Spot Drill NC-A 10 702 ..., 10 703 ...							
	v_c m/min without through coolant	Ø 2–3	Ø 3–4	Ø 4–5	Ø 5–6	Ø 6–8	Ø 8–10	Ø 10–12
		f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.	f mm/rev.
P.1.1	75	0,05	0,07	0,08	0,10	0,12	0,14	0,16
P.1.2	65	0,05	0,07	0,08	0,10	0,12	0,14	0,16
P.1.3	65	0,04	0,05	0,06	0,08	0,10	0,11	0,13
P.1.4	65	0,04	0,05	0,06	0,08	0,10	0,11	0,13
P.1.5	70	0,04	0,05	0,06	0,08	0,10	0,11	0,13
P.2.1	70	0,05	0,07	0,08	0,10	0,12	0,14	0,16
P.2.2	65	0,04	0,05	0,06	0,08	0,10	0,11	0,13
P.2.3	65	0,05	0,07	0,08	0,10	0,12	0,14	0,16
P.2.4	65	0,04	0,05	0,06	0,08	0,10	0,11	0,13
P.3.1								
P.3.2								
P.3.3								
P.4.1								
P.4.2								
M.1.1								
M.2.1								
M.3.1								
K.1.1	**70**	0,04	0,05	0,06	0,08	0,10	0,13	0,15
K.1.2	**70**	0,04	0,05	0,06	0,08	0,10	0,11	0,13
K.2.1	**70**	0,04	0,05	0,06	0,08	0,10	0,11	0,13
K.2.2	**70**	0,04	0,05	0,06	0,08	0,10	0,11	0,13
K.3.1	**70**	0,04	0,05	0,06	0,08	0,10	0,11	0,13
K.3.2	**70**	0,04	0,05	0,06	0,08	0,10	0,11	0,13
N.1.1	**200**	0,01	0,01	0,02	0,02	0,03	0,04	0,05
N.1.2	**200**	0,01	0,01	0,02	0,02	0,03	0,04	0,05
N.2.1	**160**	0,01	0,01	0,02	0,02	0,03	0,04	0,05
N.2.2	**180**	0,01	0,01	0,02	0,02	0,03	0,04	0,05
N.2.3	**130**	0,01	0,01	0,02	0,02	0,03	0,04	0,05
N.3.1	**160**	0,01	0,01	0,01	0,01	0,02	0,03	0,04
N.3.2	**160**	0,01	0,01	0,01	0,01	0,02	0,03	0,04
N.3.3	**100**	0,01	0,01	0,01	0,01	0,02	0,03	0,04
N.4.1								
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								
O.1.2								
O.2.1								
O.2.2								
O.3.1								

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

Important application criteria for WTX drills

Axial offset
The axial run-out of the axis between a rotating work piece and a stationary tool must not exceed 0.04 mm. A larger run-out reduces tool life and drilling quality and can lead to tool breakage.

Run-out
The concentricity error when the tool is rotating should not exceed 0.015 mm.

Cooling lubricant
With internally cooled tools the coolant pressure should be min. 20 bar.
High-quality semi-synthetic or emulsion coolants with min. 10 % oil content and EP additives are recommended. This allows better life, and achieves higher tolerance accuracy and better surface quality. A fine filter system is recommended to prevent possible clogging of the coolant channels.

Drilling into solid
Due to the geometric design of the solid carbide drills, they are suitable for drilling into solid material.
With solid carbide drills ≤ 12xD drilling can be carried out in solid material without the need for centering and spot drilling operations.

Flute run-out
When using WTX drills a safety margin of at least 1 to 1.5xD must be maintained between the work piece and the flute outlet groove of the drill to ensure optimum chip evacuation and prevent chip clogging and tool fracture.

Peck drilling
Pecking should be avoided as there is a very high risk of fracture caused by chips left behind or flushed into the hole.

Secondary tools
If a smaller diameter WTX drill is used as a following tool in the same hole, it should have a smaller drill point angle to ensure that it centres properly.

Interrupted Cuts
Reduce the feedrate on entry to and from cross holes

Drill exit
To avoid severe burr formation, reduce v_c and f.

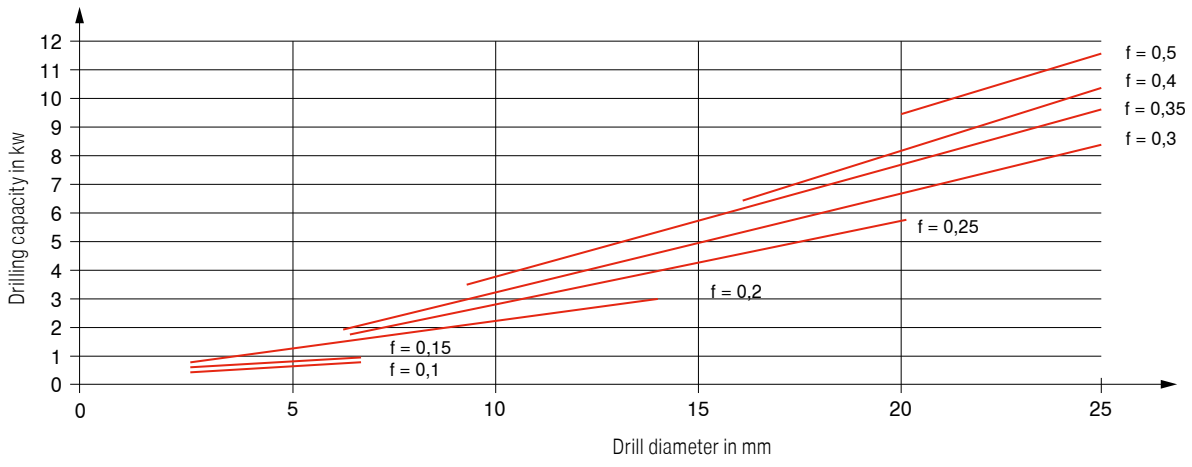
Workpiece clamping
To avoid tool breakages, care must be taken to ensure a proper workpiece clamping without vibration or workpiece deflection.

Tool holding
With optimum clamping high alignment accuracy and tolerances (IT7-8) are possible.
Due to the high surface quality reaming operations can often be dispensed with.

Machine Requirements
Please note the performance diagram

Cutting data table
To control the chip length (comma chip) the feed rates should be no lower than the lower limits quoted in the cutting data table.

Feed rate f in mm/rev.
Drilling capacity relative to the diameter: v_c = 80 m/min.
Tensile strength of the material = 600 N/mm²

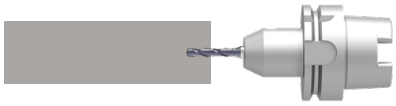


WTX – Micro – recommended application

General references

- During vertical machining, a pilot hole is not required for regular and straight surfaces from Ø 1.0 mm up to a length of 12xD due to the excellent self-centring. During horizontal drilling, a pilot drill must be used for irregular and angled surfaces.
  The WTX Micro 5xD is recommended as a pilot drill.
- To guarantee problem-free insertion of the deep hole twist drill in the pilot hole, during horizontal machining 90° countersinking with suitable NC countersink is recommended.
- During vertical machining, drills from Ø 1.0 mm up to a length of 12xD can also be operated outside the pilot hole without a reduction in speed.
- For through holes, the feed per revolution must be reduced by 50% before exiting the hole.
- For long-chipping materials, pecking may be required every 3xD from a hole depth of 10xD. Peck drilling (retraction) should occur at the pilot hole depth.
- Due to the small thro' coolant Ø during micro drilling, effective filtration of the cooling medium is of the utmost importance.
  Drill < Ø 2.0 mm Filter ≤ 0.010 mm
  Drill < Ø 3.0 mm Filter ≤ 0.020 mm
- The longer the coolant is in the machine, suspended particles and particulate matter in the cooling medium prevent effective coolant flow. Regular replacement of the coolant is therefore recommended.
- A suitable clamping device with maximum radial run-out accuracy and balance quality is required for process-secure production.
  Radial run-out accuracy ≤ 0.003 mm
  Suitable for high-speed areas
- To guarantee a process-secure drilling process, a minimum pressure of 30 bar must be present.

1 Producing the pilot hole

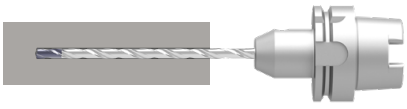


- Pilot hole depth: min. 3xD
- It must be ensured that the prepared pilot hole is free from chips to avoid blocking of the micro deep hole twist drill cutting edges

2 Entering the pilot hole with a deep hole twist drill

- Speed 300 rpm (reverse rotation sometimes possible)
- Entry speed approx. 1000 mm/min
- Switch on cooling
- Increase parameters 0.5–1.0 mm before reaching the bottom of the pilot hole

3 Deep hole drilling

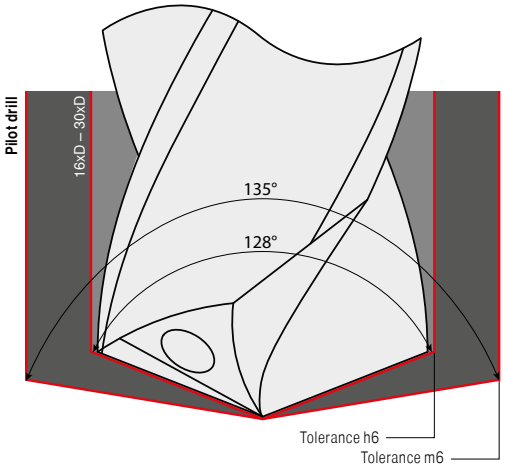


- At hole depth without pecking

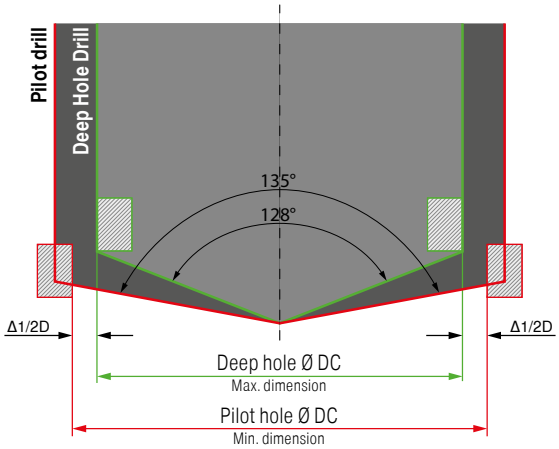
4 Retracting the drill

- Retract drill approx. 1xD
- Reduce speed to 300 rpm
- Exit speed approx. 1000 mm/min
- Switch off emulsion before exiting the hole

Tolerances and angles



The following must apply to use the pilot and deep hole twist drill consecutively and without collisions:
ΔD = ØD (pilot hole) – ØD (deep hole) > 0



Recommendations for solid carbide drilling operations

Reasons for ...	Solutions ...
... Built-up edge	
v_c too low	Increase v_c
Too much material taken off at main cutting edge	Reduce cut
Uncoated cutting edge	Coating
... Corners broken off	
Unstable conditions	Change clamping
Run out too high	Optimize radial run-out
Interrupted cut	Reduce feed rate
... Heavy flank wear	
v_c too low	Reduce v_c
Feed rate too low	Increase feed rate
Clearance angle too small	Increase clearance angle
... Scoring on the tool flanks	
Unstable conditions	Change clamping
Run out too high	Correct radial run-out
Interrupted cut	Reduce feed rate
Abrasive materials	Thicker emulsion or oil
... Round chamfer wear	
Unstable conditions	More stable clamping
Run out too high	Check radial run-out
Back taper too small	Increase back taper
Wrong emulsion or too thin emulsion	Thicker emulsion or oil
... Material broken off at main cutting edge	
Unstable conditions	More stable clamping
Interrupted cut	Reduce feed rate
Wrong type of tool	Optimize tool
Max. tool life has been exceeded	Change tool earlier
... Heavy wear at chisel edge	
v_c too low	Increase v_c
Feed rate too high	Reduce feed rate
Too much material taken off at main cutting edge	Optimize cutting edge
... Material broken off at intersections, drill point and main cutting edge	
Clearance angle too small	Increase clearance angle
Too much material taken off at main cutting edge	Optimize cutting edge
Wrong tool	Other tool
... Plastic deformation of cutting corner	
v_c too high	Reduce v_c
Insufficient emulsion	Increase amount of coolant
Wrong or no corner chamfer	Correct corner chamfer
... Poor surface quality	
Run out too high	Check radial run-out
Insufficient cooling	More emulsion
Unstable conditions	Change toolholding
... Heavy burring on hole exit	
Feed too high	Reduce feed rate
Excessive honing of main cutting edge	Reduce cutting edge

Type overview – WTX High performance drilling tools

- good self-centring
- optimum swarf control
- precise radial run-out
- excellent alignment precision
- high-quality surface finish
- close drilling tolerances
- limited hardening of peripheral zones of the material
- good chip evacuation even with large drilling depths

For all products that are marked with the video icon, a relevant product video can be viewed at **cutting.tools/int/en/type-overview-wtx**

UNI		▲ high-performance solid carbide drill for universal application, for all materials up to 1200 N/mm²	DRAGONSKIN	▶
Ti		▲ specialist for cost effective machining of titanium, titanium alloys and heat resistant alloys	DRAGONSKIN	
AL		▲ solid carbide high performance drill specailly for the machining of aluminium, copper and brass ▲ 6 facet geometry for excellent hole quality	DRAGONSKIN	
180		▲ for inclined surfaces up to 45° and flat bottom holes		
MINI		▲ solid carbide micro drill for the precise manufacture of very small holes from Ø 0.1 to 2.9 mm		
MICRO		▲ Universal high-performance micro drill ▲ Specialised geometry and coating ▲ Pilot drill for WTX Micro deep hole twist drill	DRAGONSKIN	▶

Coatings

DPX74S (DRAGONSKIN)
- ▲ Special TiAlN nanolayer coating
- ▲ Maximum application temperature: 1000 °C

DPX74M (DRAGONSKIN)
- ▲ Universal AlCrN-based monolayer coating developed for micro tools
- ▲ High oxidation, heat and wear resistance
- ▲ Maximum application temperature 1100 °C

DPA54 (DRAGONSKIN)
- ▲ Special multilayer coating
- ▲ High hardness and heat resistance
- ▲ Maximum application temperature: 800 °C

Ti800
- ▲ AlTiN nanolayer coating
- ▲ Maximum application temperature: 1100 °C

TiAlN
- ▲ TiAlN multilayer coating
- ▲ Maximum application temperature: 900 °C

DLC (DRAGONSKIN)
- ▲ Diamond-like carbon coating
- ▲ Specially for machining non-ferrous metals
- ▲ Maximum application temperature: 400 °C

Reamers overview

	Length	Diameter in mm Ø DC	Standard Tolerance	Steel P	Stainless steel M	Cast iron K	Non-ferrous metals N	Heat-resistant S	Tempered steel H	Non metal materials O	Through hole	Blind hole	Int. coolant supply	coated ■	uncoated □	KOMET \ Performance	KOMET \ Standard
Monomax																	
▲ adjustable monoblock reamer in 3xD and 5xD ▲ regrinding and re-tipping on the base body ▲ all common materials																	
	short	5,60–12,00	H7 1/100	●	●	●	●			○	✓	✓	✓	■		48–50	
Fullmax																	
▲ High-speed reamer in shorter and longer version ▲ Reamers for machining steel, stainless and acid-resistant steels, cast materials, aluminium and hardened materials up to 63 HRC ▲ Extremely irregular pitch ▲ Standard shank ~ DIN 6535 HA																	
	short	4,00–12,00 2,96–12,03	H7 1/100	●	●		○	○			✓	✓	✓	■		51–56	
	long	4,00–12,00 2,96–12,03	H7 1/100	●	●		●	○		○	✓	✓	✓	■		57–62	
Solid Carbide Reamers																	
▲ universal solid carbide reamer without thro' coolant ▲ extremely irregular pitch ▲ DIN 6535 HA shank																	
		0,59–12,05	1/100	●		○	●			●	✓				□	63	
		0,59–12,05	1/100	●	○	●		○	○		✓			■		64	
HSS Reamers																	
▲ HSS-E NC machine reamer ▲ DIN 1835 A shank																	
		0,95–12,00	1/100	●		●	●			●	✓				□	65	
▲ HSS-E machine reamer																	
		0,95–12,00	1/100	●	○	●	●	○		●	✓				□		66+67
▲ HSS-E automatic machine reamer DIN 8089																	
		4,00–12,00	H7	●	○	●	●	○		●	✓				□	68	
		3,76–12,00	1/100	●	○	●	●	○		●	✓				□	69	

For further dimensions and drills, please refer to our → **Main catalogue, Chapter 4 Reamers and countersinkers**

Monomax – Selection guide

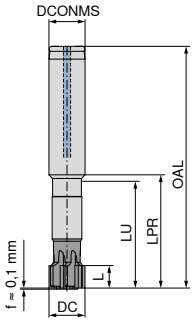
Ø			5,60 – 25,89 mm							
KOMET no. (3xD)			56J.93	56J.93	56J.65	56J.17	56J.71	56H.65	56H.65	56H.17
Lead angle			ASG4000	ASG3000	ASG0106	ASG0706	ASG3000	ASG3000	ASG0106	ASG0706
Lead angle			25°	45°	45°	45°/8°	45°	45°	45°	45°/8°
Grade / coating			DST	DST	DBG-P	DBC	TIN	DBG-P	DBG-P	DBC
Article no. (3xD)			40 635	40 625	40 652	40 648	40 605	40 657	40 644	40 640
Preferred type available			✓	✓	✓		✓			
Application					Through hole			Blind hole		
Material sub-group		Index								
P	Non alloyed steel	P.1.1	●	●			○	●		
		P.1.2								
		P.1.3								
		P.1.4								
		P.1.5								
	Low alloyed steel	P.2.1								
		P.2.2								
		P.2.3								
		P.2.4			●					
	High-alloy steel and high-alloy tool steel	P.3.1							●	
		P.3.2								
		P.3.3								
	Stainless steel	P.4.1								
		P.4.2								
M	Stainless steel	M.1.1			●				●	
		M.2.1								
		M.3.1								
K	Grey cast iron	K.1.1					○	●		
		K.1.2								
	Spherulitic graphite cast iron	K.2.1	○	●				●		
		K.2.2								
	Malleable iron	K.3.1	○	●				●		
		K.3.2								
N	Aluminum alloys	N.1.1								
		N.1.2								
	Cast aluminium alloys	N.2.1				●				●
		N.2.2								
		N.2.3								
	Copper and copper alloys (Bronze, Brass)	N.3.1		○						
		N.3.2					●			
		N.3.3								
	Magnesium alloys	N.4.1								
O	Non-metal materials	O.1.1								
		O.1.2								
		O.2.1								
		O.2.2								
		O.3.1				○				○

* for drilling with interrupted cut use coated HM-reamers

Applications:	
	Main application ●
	Additional range of application ○

Monomax – High-speed reamers, short

- adjustable for smallest bore tolerances
- wear compensation within the tolerance zone
- retraction from the hole at 3–4 times the cutting feed rate
- up to tolerance class IT 5 with absolute process security, from the first hole



	DST	DST	DBG-P	TiN	DBC
					
	56J.93 ≤ 3xD ◁ 45° ASG3000 CERMET Through hole	56J.93 ≤ 3xD ◁ 25° ASG4000 CERMET Through hole	56J.65 ≤ 3xD ◁ 45° ASG0106 HM Through hole	56J.71 ≤ 3xD ◁ 45° ASG3000 HM Through hole	56J.17 ≤ 3xD ◁ 45/8° ASG0706 HM Through hole
	40 625 ...	**40 635 ...**	**40 652 ...**	**40 605 ...**	**40 648 ...**

DC $_{H7}$ mm	OAL mm	L mm	LU mm	LPR mm	DCONMS $_{h6}$ mm	ZEFP									
5,60 - 5,99	85	9,5	35	40	12	4	**xxxx** [2]		**xxxx** [2]		**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
6,00	85	9,5	35	40	12	4	**060**		**060**		**06000**		**060**		**06000** [1]
6,01 - 7,99	85	9,5	35	40	12	4	**xxxx** [2]		**xxxx** [2]		**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
8,00	85	9,5	35	40	12	4	**080**		**080**		**08000**		**080**		**08000** [1]
8,01 - 8,89	85	9,5	35	40	12	4	**xxxx** [2]		**xxxx** [2]		**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
8,90 - 9,89	95	9,5	45	50	12	6	**xxxx** [2]		**xxxx** [2]		**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
9,90 - 9,99	95	9,5	45	50	12	6	**xxxx** [2]		**xxxx** [2]		**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
10,00	95	9,5	45	50	12	6	**100**		**100**		**10000**		**100**		**10000** [1]
10,01 - 11,99	95	9,5	45	50	12	6	**xxxx** [2]		**xxxx** [2]		**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
12,00	95	9,5	45	50	12	6	**120**		**120**		**12000**		**120**		**12000** [1]
P							●		●		●		○		
M											●				
K							●		○				○		
N							○						●		●
S															
H															
O															○

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days / Minimum order 2 pieces
2) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 20 working days / Minimum order 2 pieces

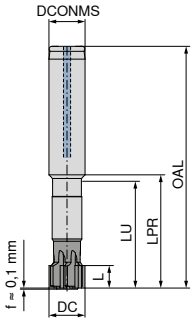
→ v_c Page 71–74

Do not heat shrink tools !

For xxxx please indicate requested Ø in H7 in the order (e.g. 15.89 H7 → article no. 40 635 1589)!
All other diameters and tolerance classes are also possible on request (e.g. 18.5 $^{+0.025}$ or 18 N7).

Monomax – High-speed reamers, short

- adjustable for smallest bore tolerances
- wear compensation within the tolerance zone
- retraction from the hole at 3–4 times the cutting feed rate
- up to tolerance class IT 5 with absolute process security, from the first hole



	DBG-P	DBG-P	DBC
			
	56H.65 ≤ 3xD ◁ 45° ASG0106 HM Blind hole	56H.65 ≤ 3xD ◁ 45° ASG3000 HM Blind hole	56H.17 ≤ 3xD ◁ 45/8° ASG0706 HM Blind hole
	40 644 ...	**40 657 ...**	**40 640 ...**

DC $_{H7}$ mm	OAL mm	L mm	LU mm	LPR mm	DCONMS $_{h6}$ mm	ZEFP					
5,60 - 5,99	85	9,5	35	40	12	4	**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
6,00	85	9,5	35	40	12	4	**06000** [1]		**06000** [1]		**06000** [1]
6,01 - 7,99	85	9,5	35	40	12	4	**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
8,00	85	9,5	35	40	12	4	**08000** [1]		**08000** [1]		**08000** [1]
8,01 - 8,89	85	9,5	35	40	12	4	**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
8,90 - 9,89	95	9,5	45	50	12	6	**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
9,90 - 9,99	95	9,5	45	50	12	6	**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
10,00	95	9,5	45	50	12	6	**10000** [1]		**10000** [1]		**10000** [1]
10,01 - 11,99	95	9,5	45	50	12	6	**xxxx** [1]		**xxxx** [1]		**xxxx** [1]
12,00	95	9,5	45	50	12	6	**12000** [1]		**12000** [1]		**12000** [1]
P							●		●		
M							●				
K									●		
N											●
S											
H											
O											○

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days / Minimum order 2 pieces

→ v_c Page 71–74

Do not heat shrink tools !

For xxxx please indicate requested Ø in H7 in the order (e.g. 15.89 H7 → article no. 40 644 1589)!
All other diameters and tolerance classes are also possible on request (e.g. 18.5 $^{+0.025}$ or 18 N7).

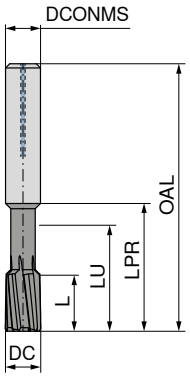
Fullmax – High-performance machine reamers, short

- ▲ extremely irregular pitch
- ▲ designed for high-speed machining
- ▲ specialised geometries and coatings

UNI

NEW

DBG-U



51P.57
HA
Left Hand Helix
30°
ASG2210
Solid carbide
Through hole

40 483 ...

DC $_{H7}$ mm	OAL mm	L mm	LU mm	LPR mm	DCONMS $_{h6}$ mm	ZEFP	
4	50	12	24	28	4	4	**04000**
5	64	12	31	36	6	4	**05000**
6	64	12	31	36	6	4	**06000**
7	70	16	31	36	8	6	**07000**
8	70	16	31	36	8	6	**08000**
9	80	16	35	40	10	6	**09000**
10	80	16	35	40	10	6	**10000**
11	90	20	40	45	12	6	**11000**
12	90	20	40	45	12	6	**12000**

P	●
M	●
K	●
N	○
S	○
H	○
O	

→ v_c Page 75

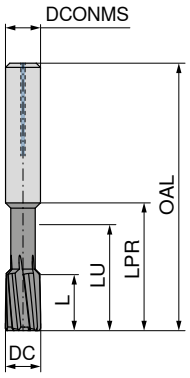
Fullmax – High-performance machine reamers, short

- ▲ extremely irregular pitch
- ▲ designed for high-speed machining
- ▲ specialised geometries and coatings
- ▲ tolerance: Ø 2,96 – 5,96 mm = +0,004 mm
- ▲ tolerance: Ø 5,97 – 20,05 mm = +0,005 mm

UNI

NEW

DBG-U



51P.57
HA
Left Hand Helix
30°
ASG2210
Solid carbide
Through hole

40 489 ...

DC +0,004/+0,005 mm	OAL mm	L mm	LU mm	LPR mm	DCONMS h6 mm	ZEFP	
2,96 - 3,96	50	12	24	28	4	4	**xxxxx** [1]
3,97	50	12	24	28	4	4	**03970**
3,98	50	12	24	28	4	4	**03980**
3,99	50	12	24	28	4	4	**03990**
4,00	50	12	24	28	4	4	**04000**
4,01	50	12	24	28	4	4	**04010**
4,02	50	12	24	28	4	4	**04020**
4,03	50	12	24	28	4	4	**04030**
4,04 - 4,05	50	12	24	28	4	4	**xxxxx** [1]
4,06 - 4,96	64	12	31	36	6	4	**xxxxx** [1]
4,97	64	12	31	36	6	4	**04970**
4,98	64	12	31	36	6	4	**04980**
4,99	64	12	31	36	6	4	**04990**
5,00	64	12	31	36	6	4	**05000**
5,01	64	12	31	36	6	4	**05010**
5,02	64	12	31	36	6	4	**05020**
5,03	64	12	31	36	6	4	**05030**
5,04 - 5,96	64	12	31	36	6	4	**xxxxx** [1]
5,97	64	12	31	36	6	4	**05970**
5,98	64	12	31	36	6	4	**05980**
5,99	64	12	31	36	6	4	**05990**
6,00	64	12	31	36	6	4	**06000**
6,01	64	12	31	36	6	4	**06010**
6,02	64	12	31	36	6	4	**06020**
6,03	64	12	31	36	6	4	**06030**
6,04 - 6,05	64	12	31	36	6	4	**xxxxx** [1]
6,06 - 7,96	70	16	31	36	8	6	**xxxxx** [1]
7,97	70	16	31	36	8	6	**07970**
7,98	70	16	31	36	8	6	**07980**
7,99	70	16	31	36	8	6	**07990**

P	●
M	●
K	●
N	○
S	○
H	○
O	

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days

→ v_c Page 75

This tool concept permits numerous tolerances. For sizes covered please refer to the table on → **page 80**.
For xxxxx please indicate required Ø in the order (e.g. Ø 8.82 mm → Article No. 40 489 08820)!

Continued on next page

Fullmax – High-performance machine reamers, short

- ▲ extremely irregular pitch
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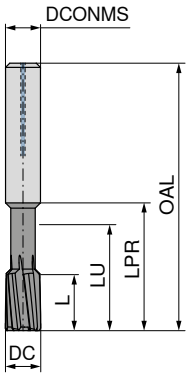
- ▲ specialised geometries and coatings
- ▲ tolerance: Ø 2,96 – 5,96 mm = +0,004 mm
- ▲ tolerance: Ø 5,97 – 20,05 mm = +0,005 mm

UNI

NEW

DBG-U



51P.57
HA
Left Hand Helix
30°
ASG2210
Solid carbide
Through hole

40 489 ...

DC +0,004/+0,005 mm	OAL mm	L mm	LU mm	LPR mm	DCONMS h6 mm	ZEFP	
8,00	70	16	31	36	8	6	**08000**
8,01	70	16	31	36	8	6	**08010**
8,02	70	16	31	36	8	6	**08020**
8,03	70	16	31	36	8	6	**08030**
8,04 - 8,05	70	16	31	36	8	6	**xxxxx** [1]
8,06 - 9,96	80	16	35	40	10	6	**xxxxx** [1]
9,97	80	16	35	40	10	6	**09970**
9,98	80	16	35	40	10	6	**09980**
9,99	80	16	35	40	10	6	**09990**
10,00	80	16	35	40	10	6	**10000**
10,01	80	16	35	40	10	6	**10010**
10,02	80	16	35	40	10	6	**10020**
10,03	80	16	35	40	10	6	**10030**
10,04 - 10,05	80	16	35	40	10	6	**xxxxx** [1]
10,06 - 11,96	90	20	40	45	12	6	**xxxxx** [1]
11,97	90	20	40	45	12	6	**11970**
11,98	90	20	40	45	12	6	**11980**
11,99	90	20	40	45	12	6	**11990**
12,00	90	20	40	45	12	6	**12000**
12,01	90	20	40	45	12	6	**12010**
12,02	90	20	40	45	12	6	**12020**
12,03	90	20	40	45	12	6	**12030**

P	●
M	●
K	●
N	○
S	○
H	○
O	

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days

→ v_c Page 75

This tool concept permits numerous tolerances. For sizes covered please refer to the table on → **page 80**.
For xxxxx please indicate required Ø in the order (e.g. Ø 8.82 mm → Article No. 40 489 08820)!

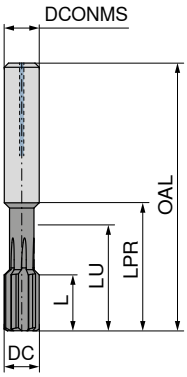
Fullmax – High-performance machine reamers, short

- ▲ extremely irregular pitch
- ▲ designed for high-speed machining
- ▲ specialised geometries and coatings

UNI

NEW

DBG-U



51M.57
HA
straight flute
60°
ASG2110
Solid carbide
Blind hole

40 481 ...

DC H7 mm	OAL mm	L mm	LU mm	LPR mm	DCONMS h6 mm	ZEFP	
4	50	12	24	28	4	4	**04000**
5	64	12	31	36	6	4	**05000**
6	64	12	31	36	6	4	**06000**
7	70	16	31	36	8	6	**07000**
8	70	16	31	36	8	6	**08000**
9	80	16	35	40	10	6	**09000**
10	80	16	35	40	10	6	**10000**
11	90	20	40	45	12	6	**11000**
12	90	20	40	45	12	6	**12000**

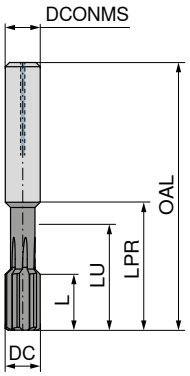
P	●
M	●
K	●
N	○
S	○
H	○
O	

→ v_c Page 75

Fullmax – High-performance machine reamers, short

- extremely irregular pitch
- designed for high-speed machining
- specialised geometries and coatings
- tolerance: Ø 2,96 – 5,96 mm = +0,004 mm
- tolerance: Ø 5,97 – 20,05 mm = +0,005 mm

UNI



NEW

DBG-U

51M.57
HA
straight flute
60°
ASG2110
Solid carbide
Blind hole

40 488 ...

DC +0,004/+0,005 mm	OAL mm	L mm	LU mm	LPR mm	DCONMS h6 mm	ZEFP	
2,96 - 3,96	50	12	24	28	4	4	**xxxxx** [1]
3,97	50	12	24	28	4	4	**03970**
3,98	50	12	24	28	4	4	**03980**
3,99	50	12	24	28	4	4	**03990**
4,00	50	12	24	28	4	4	**04000**
4,01	50	12	24	28	4	4	**04010**
4,02	50	12	24	28	4	4	**04020**
4,03	50	12	24	28	4	4	**04030**
4,04 - 4,05	50	12	24	28	4	4	**xxxxx** [1]
4,06 - 4,96	64	12	31	36	6	4	**xxxxx** [1]
4,97	64	12	31	36	6	4	**04970**
4,98	64	12	31	36	6	4	**04980**
4,99	64	12	31	36	6	4	**04990**
5,00	64	12	31	36	6	4	**05000**
5,01	64	12	31	36	6	4	**05010**
5,02	64	12	31	36	6	4	**05020**
5,03	64	12	31	36	6	4	**05030**
5,04 - 5,96	64	12	31	36	6	4	**xxxxx** [1]
5,97	64	12	31	36	6	4	**05970**
5,98	64	12	31	36	6	4	**05980**
5,99	64	12	31	36	6	4	**05990**
6,00	64	12	31	36	6	4	**06000**
6,01	64	12	31	36	6	4	**06010**
6,02	64	12	31	36	6	4	**06020**
6,03	64	12	31	36	6	4	**06030**
6,04 - 6,05	64	12	31	36	6	4	**xxxxx** [1]
6,06 - 7,96	70	16	31	36	8	6	**xxxxx** [1]
7,97	70	16	31	36	8	6	**07970**
7,98	70	16	31	36	8	6	**07980**
7,99	70	16	31	36	8	6	**07990**

P	●
M	●
K	●
N	○
S	○
H	○
O	

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days

→ v_c Page 75

This tool concept permits numerous tolerances. For sizes covered please refer to the table on → **page 80**.
For xxxxx please indicate required Ø in the order (e.g. Ø 8.82 mm → Article No. 40 488 08820)!

Continued on next page

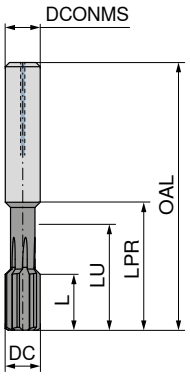
Fullmax – High-performance machine reamers, short

- ▲ extremely irregular pitch
- ▲ designed for high-speed machining
- ▲ specialised geometries and coatings
- ▲ tolerance: Ø 2,96 – 5,96 mm = +0,004 mm
- ▲ tolerance: Ø 5,97 – 20,05 mm = +0,005 mm

UNI

NEW

DBG-U



51M.57
HA
straight flute
60°
ASG2110
Solid carbide
Blind hole

40 488 ...

DC +0,004/+0,005 mm	OAL mm	L mm	LU mm	LPR mm	DCONMS h6 mm	ZEFP	
8,00	70	16	31	36	8	6	**08000**
8,01	70	16	31	36	8	6	**08010**
8,02	70	16	31	36	8	6	**08020**
8,03	70	16	31	36	8	6	**08030**
8,04 - 8,05	70	16	31	36	8	6	**xxxxx** [1]
8,06 - 9,96	80	16	35	40	10	6	**xxxxx** [1]
9,97	80	16	35	40	10	6	**09970**
9,98	80	16	35	40	10	6	**09980**
9,99	80	16	35	40	10	6	**09990**
10,00	80	16	35	40	10	6	**10000**
10,01	80	16	35	40	10	6	**10010**
10,02	80	16	35	40	10	6	**10020**
10,03	80	16	35	40	10	6	**10030**
10,04 - 10,05	80	16	35	40	10	6	**xxxxx** [1]
10,06 - 11,96	90	20	40	45	12	6	**xxxxx** [1]
11,97	90	20	40	45	12	6	**11970**
11,98	90	20	40	45	12	6	**11980**
11,99	90	20	40	45	12	6	**11990**
12,00	90	20	40	45	12	6	**12000**
12,01	90	20	40	45	12	6	**12010**
12,02	90	20	40	45	12	6	**12020**
12,03	90	20	40	45	12	6	**12030**

P	●
M	●
K	●
N	○
S	○
H	○
O	

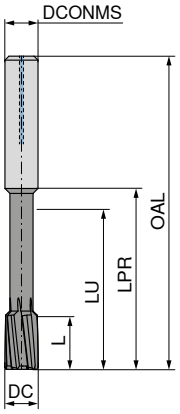
1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days

→ v_c Page 75

This tool concept permits numerous tolerances. For sizes covered please refer to the table on → **page 80**.
For xxxxx please indicate required Ø in the order (e.g. Ø 8.82 mm → Article No. 40 488 08820)!

Fullmax – High-performance machine reamers, long

- extremely irregular pitch
- designed for high-speed machining
- specialised geometries and coatings



	UNI	VA	ALU
	DBG-U	DBQ	DBC-N
			
	52P.57	52S.44	52N.17
	HA	HA	HA
	Left Hand Helix	Left Hand Helix	straight flute
	◁ 30°	◁ 30°	◁ 30°
	ASG2210	ASG2231	ASG2270
	Solid carbide	Solid carbide	Solid carbide
	Through hole	Through hole	Through hole
	40 484 ...	**40 401 ...**	**40 471 ...**

DC $_{H7}$ mm	OAL mm	L mm	LU mm	LPR mm	DCONMS $_{h6}$ mm	ZEFP			
4	60	12	28	32	4	4	**04000**	**04000**	**04000**
5	76	12	35	40	6	4	**05000**	**05000**	**05000**
6	76	12	35	40	6	4	**06000**	**06000**	**06000**
7	101	16	60	65	8	6	**07000**	**07000**	**07000**
8	101	16	60	65	8	6	**08000**	**08000**	**08000**
9	108	16	63	68	10	6	**09000**	**09000**	**09000**
10	108	16	63	68	10	6	**10000**	**10000**	**10000**
11	130	20	80	85	12	6	**11000**	**11000**	**11000**
12	130	20	80	85	12	6	**12000**	**12000**	**12000**
P							●	●	
M							●	●	
K							●		
N							○		●
S							○		
H							○		
O									○

→ v_c Page 76+77

Fullmax – High-performance machine reamers, long

- ▲ extremely irregular pitch
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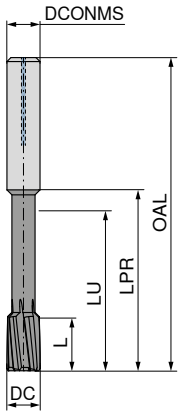
- ▲ specialised geometries and coatings
- ▲ tolerance: Ø 2,96 – 5,96 mm = +0,004 mm
- ▲ tolerance: Ø 5,97 – 20,05 mm = +0,005 mm



UNI	VA	ALU
DBG-U	DBQ	DBC-N

52P.57
HA
Left Hand Helix
◁ 30°
ASG2210
Solid carbide
Through hole

52S.44
HA
Left Hand Helix
◁ 30°
ASG2231
Solid carbide
Through hole

52N.17
HA
straight flute
◁ 30°
ASG2270
Solid carbide
Through hole

DC +0,004/+0,005 mm	OAL mm	L mm	LU mm	LPR mm	DCONMS h6 mm	ZEFP	40 486 ...	40 403 ...	40 473 ...
2,96 - 3,96	60	12	28	32	4	4	xxxxx[1]	xxxxx[2]	xxxxx[1]
3,97	60	12	28	32	4	4	03970	03970	03970[1]
3,98	60	12	28	32	4	4	03980	03980	03980[1]
3,99	60	12	28	32	4	4	03990	03990	03990[1]
4,00	60	12	28	32	4	4	04000	04000	04000[1]
4,01	60	12	28	32	4	4	04010	04010	04010[1]
4,02	60	12	28	32	4	4	04020	04020	04020[1]
4,03	60	12	28	32	4	4	04030	04030	04030[1]
4,04 - 4,05	60	12	28	32	4	4	xxxxx[1]	xxxxx[2]	xxxxx[1]
4,06 - 4,96	76	12	35	40	6	4	xxxxx[1]	xxxxx[2]	xxxxx[1]
4,97	76	12	35	40	6	4	04970	04970	04970[1]
4,98	76	12	35	40	6	4	04980	04980	04980[1]
4,99	76	12	35	40	6	4	04990	04990	04990[1]
5,00	76	12	35	40	6	4	05000	05000	05000[1]
5,01	76	12	35	40	6	4	05010	05010	05010[1]
5,02	76	12	35	40	6	4	05020	05020	05020[1]
5,03	76	12	35	40	6	4	05030	05030	05030[1]
5,04 - 5,96	76	12	35	40	6	4	xxxxx[1]	xxxxx[2]	xxxxx[1]
5,97	76	12	35	40	6	4	05970	05970	05970[1]
5,98	76	12	35	40	6	4	05980	05980	05980[1]
5,99	76	12	35	40	6	4	05990	05990	05990[1]
6,00	76	12	35	40	6	4	06000	06000	06000[1]
6,01	76	12	35	40	6	4	06010	06010	06010[1]
6,02	76	12	35	40	6	4	06020	06020	06020[1]
6,03	76	12	35	40	6	4	06030	06030	06030[1]
6,04 - 6,05	76	12	35	40	6	4	xxxxx[1]	xxxxx[2]	xxxxx[1]
6,06 - 7,96	101	16	60	65	8	6	xxxxx[1]	xxxxx[2]	xxxxx[1]
7,97	101	16	60	65	8	6	07970	07970	07970[1]
7,98	101	16	60	65	8	6	07980	07980	07980[1]
P							●	●	
M							●	●	
K							●		
N							○		●
S							○		
H							○		
O									○

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days
2) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 32 working days

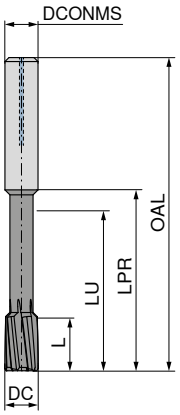
→ v_c Page 76+77

This tool concept permits numerous tolerances. For sizes covered please refer to the table on → **page 80**.
For xxxxx please indicate required Ø in the order (e.g. Ø 8.82 mm → Article No. 40 486 08820)!

Continued on next page

Fullmax – High-performance machine reamers, long

- ▲ extremely irregular pitch
- ▲ designed for high-speed machining
- ▲ specialised geometries and coatings
- ▲ tolerance: Ø 2,96 – 5,96 mm = +0,004 mm
- ▲ tolerance: Ø 5,97 – 20,05 mm = +0,005 mm



UNI	VA	ALU
DBG-U	DBQ	DBC-N



52P.57	52S.44	52N.17
HA	HA	HA
Left Hand Helix	Left Hand Helix	straight flute
◁ 30°	◁ 30°	◁ 30°
ASG2210	ASG2231	ASG2270
Solid carbide	Solid carbide	Solid carbide
Through hole	Through hole	Through hole
40 486 ...	**40 403 ...**	**40 473 ...**

DC +0,004/+0,005 mm	OAL mm	L mm	LU mm	LPR mm	DCONMS h6 mm	ZEFP			
7,99	101	16	60	65	8	6	**07990**	**07990**	**07990** [1]
8,00	101	16	60	65	8	6	**08000**	**08000**	**08000** [1]
8,01	101	16	60	65	8	6	**08010**	**08010**	**08010** [1]
8,02	101	16	60	65	8	6	**08020**	**08020**	**08020** [1]
8,03	101	16	60	65	8	6	**08030**	**08030**	**08030** [1]
8,04 - 8,05	101	16	60	65	8	6	**xxxxx** [1]	**xxxxx** [2]	**xxxxx** [1]
8,06 - 9,96	108	16	63	68	10	6	**xxxxx** [1]	**xxxxx** [2]	**xxxxx** [1]
9,97	108	16	63	68	10	6	**09970**	**09970**	**09970** [1]
9,98	108	16	63	68	10	6	**09980**	**09980**	**09980** [1]
9,99	108	16	63	68	10	6	**09990**	**09990**	**09990** [1]
10,00	108	16	63	68	10	6	**10000**	**10000**	**10000** [1]
10,01	108	16	63	68	10	6	**10010**	**10010**	**10010** [1]
10,02	108	16	63	68	10	6	**10020**	**10020**	**10020** [1]
10,03	108	16	63	68	10	6	**10030**	**10030**	**10030** [1]
10,04 - 10,05	108	16	63	68	10	6	**xxxxx** [1]	**xxxxx** [2]	**xxxxx** [1]
10,06 - 11,96	130	20	80	85	12	6	**xxxxx** [1]	**xxxxx** [2]	**xxxxx** [1]
11,97	130	20	80	85	12	6	**11970**	**11970**	**11970** [1]
11,98	130	20	80	85	12	6	**11980**	**11980**	**11980** [1]
11,99	130	20	80	85	12	6	**11990**	**11990**	**11990** [1]
12,00	130	20	80	85	12	6	**12000**	**12000**	**12000** [1]
12,01	130	20	80	85	12	6	**12010**	**12010**	**12010** [1]
12,02	130	20	80	85	12	6	**12020**	**12020**	**12020** [1]
12,03	130	20	80	85	12	6	**12030**	**12030**	**12030** [1]
P							●	●	
M							●	●	
K							●		
N							○		●
S							○		
H							○		
O									○

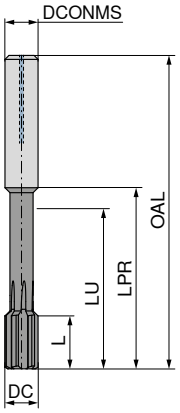
1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days
2) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 32 working days

→ v_c Page 76+77

This tool concept permits numerous tolerances. For sizes covered please refer to the table on → **page 80**.
For xxxxx please indicate required Ø in the order (e.g. Ø 8.82 mm → Article No. 40 486 08820)!

Fullmax – High-performance machine reamers, long

- ▲ extremely irregular pitch
- ▲ designed for high-speed machining
- ▲ specialised geometries and coatings



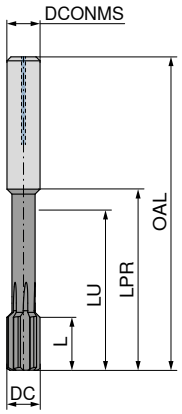
	UNI	VA	ALU
	DBG-U	DBQ	DBC-N
			
	52M.57	52T.45	52Q.17
	HA	HA	HA
	straight flute	straight flute	straight flute
	◁ 60°	◁ 45°	◁ 60°
	ASG2110	ASG2131	ASG2170
	Solid carbide	Solid carbide	Solid carbide
	Blind hole	Blind hole	Blind hole
	40 485 ...	**40 402 ...**	**40 472 ...**

DC $_{H7}$ mm	OAL mm	L mm	LU mm	LPR mm	DCONMS $_{h6}$ mm	ZEFP			
4	60	12	28	32	4	4	**04000**	**04000**	**04000**
5	76	12	35	40	6	4	**05000**	**05000**	**05000**
6	76	12	35	40	6	4	**06000**	**06000**	**06000**
7	101	16	60	65	8	6	**07000**	**07000**	**07000**
8	101	16	60	65	8	6	**08000**	**08000**	**08000**
9	108	16	63	68	10	6	**09000**	**09000**	**09000**
10	108	16	63	68	10	6	**10000**	**10000**	**10000**
11	130	20	80	85	12	6	**11000**	**11000**	**11000**
12	130	20	80	85	12	6	**12000**	**12000**	**12000**
P							●	●	
M							●	●	
K							●		
N							○		●
S							○		
H							○		
O									○

→ v_c Page 76+77

Fullmax – High-performance machine reamers, long

- ▲ extremely irregular pitch
- ▲ designed for high-speed machining
- ▲ specialised geometries and coatings
- ▲ tolerance: Ø 2,96 – 5,96 mm = +0,004 mm
- ▲ tolerance: Ø 5,97 – 20,05 mm = +0,005 mm



UNI	VA	ALU
DBG-U	DBQ	DBC-N
		
52M.57	52T.45	52Q.17
HA 	HA 	HA 
straight flute	straight flute	straight flute
◁ 60°	◁ 45°	◁ 60°
ASG2110	ASG2131	ASG2170
Solid carbide	Solid carbide	Solid carbide
Blind hole	Blind hole	Blind hole
40 487 ...	**40 404 ...**	**40 474 ...**

DC +0,004/+0,005 mm	OAL mm	L mm	LU mm	LPR mm	DCONMS h6 mm	ZEFP			
2,96 - 3,96	60	12	28	32	4	4	**xxxxx**[1]	**xxxxx**[2]	**xxxxx**[1]
3,97	60	12	28	32	4	4	**03970**	**03970**	**03970**[1]
3,98	60	12	28	32	4	4	**03980**	**03980**	**03980**[1]
3,99	60	12	28	32	4	4	**03990**	**03990**	**03990**[1]
4,00	60	12	28	32	4	4	**04000**	**04000**	**04000**[1]
4,01	60	12	28	32	4	4	**04010**	**04010**	**04010**[1]
4,02	60	12	28	32	4	4	**04020**	**04020**	**04020**[1]
4,03	60	12	28	32	4	4	**04030**	**04030**	**04030**[1]
4,04 - 4,05	60	12	28	32	4	4	**xxxxx**[1]	**xxxxx**[2]	**xxxxx**[1]
4,06 - 4,96	76	12	35	40	6	4	**xxxxx**[1]	**xxxxx**[2]	**xxxxx**[1]
4,97	76	12	35	40	6	4	**04970**	**04970**	**04970**[1]
4,98	76	12	35	40	6	4	**04980**	**04980**	**04980**[1]
4,99	76	12	35	40	6	4	**04990**	**04990**	**04990**[1]
5,00	76	12	35	40	6	4	**05000**	**05000**	**05000**[1]
5,01	76	12	35	40	6	4	**05010**	**05010**	**05010**[1]
5,02	76	12	35	40	6	4	**05020**	**05020**	**05020**[1]
5,03	76	12	35	40	6	4	**05030**	**05030**	**05030**[1]
5,04 - 5,96	76	12	35	40	6	4	**xxxxx**[1]	**xxxxx**[2]	**xxxxx**[1]
5,97	76	12	35	40	6	4	**05970**	**05970**	**05970**[1]
5,98	76	12	35	40	6	4	**05980**	**05980**	**05980**[1]
5,99	76	12	35	40	6	4	**05990**	**05990**	**05990**[1]
6,00	76	12	35	40	6	4	**06000**	**06000**	**06000**[1]
6,01	76	12	35	40	6	4	**06010**	**06010**	**06010**[1]
6,02	76	12	35	40	6	4	**06020**	**06020**	**06020**[1]
6,03	76	12	35	40	6	4	**06030**	**06030**	**06030**[1]
6,04 - 6,05	76	12	35	40	6	4	**xxxxx**[1]	**xxxxx**[2]	**xxxxx**[1]
6,06 - 7,96	101	16	60	65	8	6	**xxxxx**[1]	**xxxxx**[2]	**xxxxx**[1]
7,97	101	16	60	65	8	6	**07970**	**07970**	**07970**[1]
7,98	101	16	60	65	8	6	**07980**	**07980**	**07980**[1]
P							●	●	
M							●	●	
K							●		
N							○		●
S							○		
H							○		
O									○

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days

2) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 32 working days

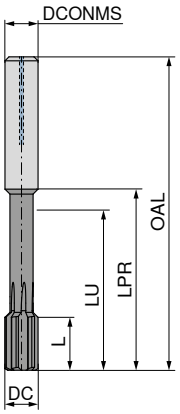
→ v_c Page 76+77

This tool concept permits numerous tolerances. For sizes covered please refer to the table on → **page 80**.
For xxxxx please indicate required Ø in the order (e.g. Ø 8.82 mm → Article no. 40 487 08820)!

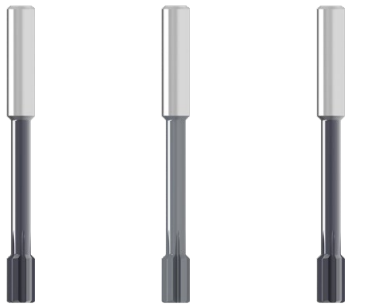
Continued on next page

Fullmax – High-performance machine reamers, long

- ▲ extremely irregular pitch
- ▲ designed for high-speed machining
- ▲ specialised geometries and coatings
- ▲ tolerance: Ø 2,96 – 5,96 mm = +0,004 mm
- ▲ tolerance: Ø 5,97 – 20,05 mm = +0,005 mm



UNI	VA	ALU
DBG-U	DBQ	DBC-N



52M.57
HA
straight flute
60°
ASG2110
Solid carbide
Blind hole

52T.45
HA
straight flute
45°
ASG2131
Solid carbide
Blind hole

52Q.17
HA
straight flute
60°
ASG2170
Solid carbide
Blind hole

DC $_{+0,004/+0,005}$ mm	OAL mm	L mm	LU mm	LPR mm	DCONMS $_{h6}$ mm	ZEFP	40 487 ...	40 404 ...	40 474 ...
7,99	101	16	60	65	8	6	**07990**	**07990**	**07990** [1]
8,00	101	16	60	65	8	6	**08000**	**08000**	**08000** [1]
8,01	101	16	60	65	8	6	**08010**	**08010**	**08010** [1]
8,02	101	16	60	65	8	6	**08020**	**08020**	**08020** [1]
8,03	101	16	60	65	8	6	**08030**	**08030**	**08030** [1]
8,04 - 8,05	101	16	60	65	8	6	**xxxxx** [1]	**xxxxx** [2]	**xxxxx** [1]
8,06 - 9,96	108	16	63	68	10	6	**xxxxx** [1]	**xxxxx** [2]	**xxxxx** [1]
9,97	108	16	63	68	10	6	**09970**	**09970**	**09970** [1]
9,98	108	16	63	68	10	6	**09980**	**09980**	**09980** [1]
9,99	108	16	63	68	10	6	**09990**	**09990**	**09990** [1]
10,00	108	16	63	68	10	6	**10000**	**10000**	**10000** [1]
10,01	108	16	63	68	10	6	**10010**	**10010**	**10010** [1]
10,02	108	16	63	68	10	6	**10020**	**10020**	**10020** [1]
10,03	108	16	63	68	10	6	**10030**	**10030**	**10030** [1]
10,04 - 10,05	108	16	63	68	10	6	**xxxxx** [1]	**xxxxx** [2]	**xxxxx** [1]
10,06 - 11,96	130	20	80	85	12	6	**xxxxx** [1]	**xxxxx** [2]	**xxxxx** [1]
11,97	130	20	80	85	12	6	**11970**	**11970**	**11970** [1]
11,98	130	20	80	85	12	6	**11980**	**11980**	**11980** [1]
11,99	130	20	80	85	12	6	**11990**	**11990**	**11990** [1]
12,00	130	20	80	85	12	6	**12000**	**12000**	**12000** [1]
12,01	130	20	80	85	12	6	**12010**	**12010**	**12010** [1]
12,02	130	20	80	85	12	6	**12020**	**12020**	**12020** [1]
12,03	130	20	80	85	12	6	**12030**	**12030**	**12030** [1]

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

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 25 working days
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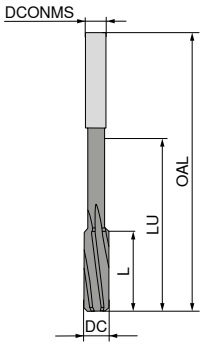
→ v_c Page 76+77

This tool concept permits numerous tolerances. For sizes covered please refer to the table on → **page 80**.
For xxxxx please indicate required Ø in the order (e.g. Ø 8.82 mm → Article no. 40 487 08820)!

NC machine reamers, DIN 8093-2B

- ▲ 0.01 mm steps
- ▲ extremely irregular pitch
- ▲ Ø 0.6–0.94 mm similar to DIN 8093-B
- ▲ Ø 0.95–3.75 mm with centres both ends
- ▲ Ø 3.76–12.05 mm with protected centres

NC 100



~HA

Left Hand Helix
Solid carbide

40 430 ...

DC +0,004 mm	OAL mm	L mm	LU mm	DCONMS h6 mm	ZEFP	
0,59 - 0,64	45	5	7,5	3	4	xxxxx 1)
0,65 - 0,74	45	5	7,5	3	4	xxxxx 1)
0,75 - 0,84	45	6	8,0	3	4	xxxxx 1)
0,85 - 0,95	45	6	8,0	3	4	xxxxx 1)
0,96	50	6	17,5	3	3	00960 1)
0,97	50	6	17,5	3	3	00970 1)
0,98	50	6	17,5	3	3	00980 2)
0,99	50	6	17,5	3	3	00990 2)
1,00	50	6	17,5	3	3	01000 2)
1,01	50	6	17,5	3	3	01010 2)
1,02	50	6	17,5	3	3	01020 2)
1,03	50	6	17,5	3	3	01030 2)
1,04 - 1,06	50	6	17,5	3	3	xxxxx 2)
1,07 - 1,18	50	9	17,5	3	3	xxxxx 2)
1,19 - 1,32	50	9	17,5	3	3	xxxxx 2)
1,33 - 1,50	50	9	18,0	3	3	xxxxx 2)
1,51 - 1,70	50	10	18,0	3	3	xxxxx 2)
1,71 - 1,90	50	11	18,5	3	4	xxxxx 2)
1,91 - 1,97	50	12	18,5	3	4	xxxxx 2)
1,98	50	12	18,5	3	4	01980
1,99	50	12	18,5	3	4	01990
2,00	50	12	18,5	3	4	02000
2,01	50	12	18,5	3	4	02010
2,02	50	12	18,5	3	4	02020
2,03	50	12	18,5	3	4	02030
2,04 - 2,12	50	12	18,5	3	4	xxxxx 2)
2,13 - 2,36	50	12	18,5	3	4	xxxxx 2)
2,37 - 2,47	60	16	29,0	3	4	xxxxx 2)
2,48	60	16	29,0	3	4	02480
2,49	60	16	29,0	3	4	02490
2,50	60	16	29,0	3	4	02500
2,51	60	16	29,0	3	4	02510
2,52	60	16	29,0	3	4	02520
2,53	60	16	29,0	3	4	02530
2,54 - 2,65	60	16	29,0	3	4	xxxxx 2)
2,66 - 2,80	65	17	33,0	4	6	xxxxx 2)
2,81 - 2,96	65	17	33,0	4	6	xxxxx 2)
2,97	65	17	33,0	4	6	02970
2,98	65	17	33,0	4	6	02980
2,99	65	17	33,0	4	6	02990
3,00	65	17	33,0	4	6	03000
3,01	65	17	33,0	4	6	03010
3,02	65	17	33,0	4	6	03020
3,03	65	17	33,0	4	6	03030
3,04 - 3,35	65	18	33,0	4	6	xxxxx 2)
3,36 - 3,75	75	18	43,0	4	6	xxxxx 2)
3,76 - 3,96	75	19	43,0	4	6	xxxxx 2)
3,97	75	19	43,0	4	6	03970
3,98	75	19	43,0	4	6	03980
3,99	75	19	43,0	4	6	03990
4,00	75	19	43,0	4	6	04000
4,01	75	19	43,0	4	6	04010
4,02	75	19	43,0	4	6	04020
4,03	75	19	43,0	4	6	04030
4,04 - 4,25	75	19	43,0	4	6	xxxxx 2)
4,26 - 4,75	80	21	39,0	6	6	xxxxx 2)
4,76 - 4,96	93	23	52,0	6	6	xxxxx 2)
4,97	93	23	52,0	6	6	04970
4,98	93	23	52,0	6	6	04980
4,99	93	23	52,0	6	6	04990

40 430 ...

DC +0,004 mm	OAL mm	L mm	LU mm	DCONMS h6 mm	ZEFP	
5,00	93	23	52,0	6	6	05000
5,01	93	23	52,0	6	6	05010
5,02	93	23	52,0	6	6	05020
5,03	93	23	52,0	6	6	05030
5,04 - 5,30	93	23	52,0	6	6	xxxxx 2)
5,31 - 5,96	93	26	53,0	6	6	xxxxx 2)
5,97	93	26	53,0	6	6	05970
5,98	93	26	53,0	6	6	05980
5,99	93	26	53,0	6	6	05990
6,00	93	26	53,0	6	6	06000
6,01	93	26	53,0	6	6	06010
6,02	93	26	53,0	6	6	06020
6,03	93	26	53,0	6	6	06030
6,04 - 6,70	101	28	61,0	6	6	xxxxx 2)
6,71 - 7,50	109	31	68,0	8	6	xxxxx 2)
7,51 - 7,96	117	33	77,0	8	6	xxxxx 2)
7,97	117	33	77,0	8	6	07970
7,98	117	33	77,0	8	6	07980
7,99	117	33	77,0	8	6	07990
8,00	117	33	77,0	8	6	08000
8,01	117	33	77,0	8	6	08010
8,02	117	33	77,0	8	6	08020
8,03	117	33	77,0	8	6	08030
8,04	117	33	77,0	8	6	08040
8,05 - 8,50	117	33	77,0	8	6	xxxxx 2)
8,51 - 9,04	125	36	80,0	10	6	xxxxx 2)
9,05 - 9,50	125	36	80,0	10	6	xxxxx 2)
9,51 - 9,96	133	38	88,0	10	6	xxxxx 2)
9,97	133	38	88,0	10	6	09970
9,98	133	38	88,0	10	6	09980
9,99	133	38	88,0	10	6	09990
10,00	133	38	88,0	10	6	10000
10,01	133	38	88,0	10	6	10010
10,02	133	38	88,0	10	6	10020
10,03	133	38	88,0	10	6	10030
10,04	133	38	88,0	10	6	10040
10,05	133	38	88,0	10	6	10050
10,06 - 10,60	133	38	88,0	10	6	xxxxx 2)
10,61 - 11,80	142	41	97,0	10	6	xxxxx 2)
11,81 - 11,96	151	44	100,0	12	6	xxxxx 2)
11,97	151	44	100,0	12	6	11970
11,98	151	44	100,0	12	6	11980
11,99	151	44	100,0	12	6	11990
12,00	151	44	100,0	12	6	12000
12,01	151	44	100,0	12	6	12010
12,02	151	44	100,0	12	6	12020
12,03	151	44	100,0	12	6	12030
12,04	151	44	100,0	12	6	12040
12,05	151	44	100,0	12	6	12050

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→ v_c Page 78

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 12 working days / Minimum order 3 pieces

2) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 12 working days

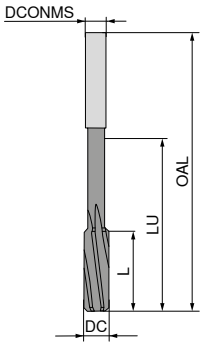
This tool concept permits numerous tolerances.
Please refer to the table on → **page 80** for tolerances covered.
For xxxxx please indicate required Ø in the order
(e.g. Ø 8.05 mm → Article no. 40 430 08050)!

NC machine reamers, DIN 8093-2B

- ▲ 0.01 mm steps
- ▲ extremely irregular pitch
- ▲ Ø 0.6–0.94 mm similar to DIN 8093-B
- ▲ Ø 0.95–3.75 mm with centres both ends
- ▲ Ø 3.76–12.05 mm with protected centres

NC 100

TiAlN



Left Hand Helix
Solid carbide

40 431 ...

DC +0,004 mm	OAL mm	L mm	LU mm	DCONMS h6 mm	ZEFP	
1,00	50	6	17,5	3	3	01000 1)
1,01	50	6	17,5	3	3	01010 1)
1,02	50	6	17,5	3	3	01020 1)
1,03	50	6	17,5	3	3	01030 1)
1,04 - 1,06	50	6	17,5	3	3	xxxxx 1)
1,07 - 1,18	50	9	17,5	3	3	xxxxx 1)
1,19 - 1,32	50	9	17,5	3	3	xxxxx 1)
1,33 - 1,50	50	9	18,0	3	3	xxxxx 1)
1,51 - 1,70	50	10	18,0	3	3	xxxxx 1)
1,71 - 1,90	50	11	18,5	3	4	xxxxx 1)
1,91 - 1,97	50	12	18,5	3	4	xxxxx 1)
1,98	50	12	18,5	3	4	01980
1,99	50	12	18,5	3	4	01990
2,00	50	12	18,5	3	4	02000
2,01	50	12	18,5	3	4	02010
2,02	50	12	18,5	3	4	02020
2,03	50	12	18,5	3	4	02030
2,04 - 2,12	50	12	18,5	3	4	xxxxx 1)
2,13 - 2,36	50	12	18,5	3	4	xxxxx 1)
2,37 - 2,47	60	16	29,0	3	4	xxxxx 1)
2,48	60	16	29,0	3	4	02480
2,49	60	16	29,0	3	4	02490
2,50	60	16	29,0	3	4	02500
2,51	60	16	29,0	3	4	02510
2,52	60	16	29,0	3	4	02520
2,53	60	16	29,0	3	4	02530
2,54 - 2,65	60	16	29,0	3	4	xxxxx 1)
2,66 - 2,80	65	17	33,0	4	6	xxxxx 1)
2,81 - 2,96	65	17	33,0	4	6	xxxxx 1)
2,97	65	17	33,0	4	6	02970
2,98	65	17	33,0	4	6	02980
2,99	65	17	33,0	4	6	02990
3,00	65	17	33,0	4	6	03000
3,01	65	17	33,0	4	6	03010
3,02	65	17	33,0	4	6	03020
3,03	65	17	33,0	4	6	03030
3,04 - 3,35	65	18	33,0	4	6	xxxxx 1)
3,36 - 3,75	75	18	43,0	4	6	xxxxx 1)
3,76 - 3,96	75	19	43,0	4	6	xxxxx 1)
3,97	75	19	43,0	4	6	03970
3,98	75	19	43,0	4	6	03980
3,99	75	19	43,0	4	6	03990
4,00	75	19	43,0	4	6	04000
4,01	75	19	43,0	4	6	04010
4,02	75	19	43,0	4	6	04020
4,03	75	19	43,0	4	6	04030
4,04 - 4,25	75	19	43,0	4	6	xxxxx 1)
4,26 - 4,75	80	21	39,0	6	6	xxxxx 1)
4,76 - 4,96	93	23	52,0	6	6	xxxxx 1)
4,97	93	23	52,0	6	6	04970
4,98	93	23	52,0	6	6	04980
4,99	93	23	52,0	6	6	04990
5,00	93	23	52,0	6	6	05000
5,01	93	23	52,0	6	6	05010
5,02	93	23	52,0	6	6	05020
5,03	93	23	52,0	6	6	05030
5,04 - 5,30	93	23	52,0	6	6	xxxxx 1)
5,31 - 5,96	93	26	53,0	6	6	xxxxx 1)
5,97	93	26	53,0	6	6	05970
5,98	93	26	53,0	6	6	05980

40 431 ...

DC +0,004 mm	OAL mm	L mm	LU mm	DCONMS h6 mm	ZEFP	
5,99	93	26	53,0	6	6	05990
6,00	93	26	53,0	6	6	06000
6,01	93	26	53,0	6	6	06010
6,02	93	26	53,0	6	6	06020
6,03	93	26	53,0	6	6	06030
6,04 - 6,70	101	28	61,0	6	6	xxxxx 1)
6,71 - 7,50	109	31	68,0	8	6	xxxxx 1)
7,51 - 7,96	117	33	77,0	8	6	xxxxx 1)
7,97	117	33	77,0	8	6	07970
7,98	117	33	77,0	8	6	07980
7,99	117	33	77,0	8	6	07990
8,00	117	33	77,0	8	6	08000
8,01	117	33	77,0	8	6	08010
8,02	117	33	77,0	8	6	08020
8,03	117	33	77,0	8	6	08030
8,04	117	33	77,0	8	6	08040
8,05 - 8,50	117	33	77,0	8	6	xxxxx 1)
8,51 - 9,04	125	36	80,0	10	6	xxxxx 1)
9,05 - 9,50	125	36	80,0	10	6	xxxxx 1)
9,51 - 9,96	133	38	88,0	10	6	xxxxx 1)
9,97	133	38	88,0	10	6	09970
9,98	133	38	88,0	10	6	09980
9,99	133	38	88,0	10	6	09990
10,00	133	38	88,0	10	6	10000
10,01	133	38	88,0	10	6	10010
10,02	133	38	88,0	10	6	10020
10,03	133	38	88,0	10	6	10030
10,04	133	38	88,0	10	6	10040
10,05	133	38	88,0	10	6	10050
10,06 - 10,60	133	38	88,0	10	6	xxxxx 1)
10,61 - 11,80	142	41	97,0	10	6	xxxxx 1)
11,81 - 11,96	151	44	100,0	12	6	xxxxx 1)
11,97	151	44	100,0	12	6	11970
11,98	151	44	100,0	12	6	11980
11,99	151	44	100,0	12	6	11990
12,00	151	44	100,0	12	6	12000
12,01	151	44	100,0	12	6	12010
12,02	151	44	100,0	12	6	12020
12,03	151	44	100,0	12	6	12030
12,04	151	44	100,0	12	6	12040
12,05	151	44	100,0	12	6	12050

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→ v_c Page 78

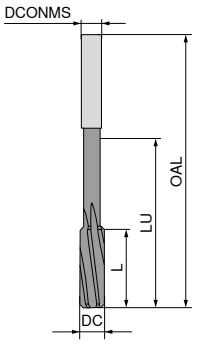
1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 12 working days

This tool concept permits numerous tolerances.
Please refer to the table on → **page 80** for tolerances covered.
For xxxxx please indicate required Ø in the order
(e.g. Ø 8.05 mm → Article no. 40 431 08050)!

NC machine reamers, DIN 212-3-B

- 0.01 mm steps
- tolerance: Ø 1.00 – Ø 5.50 mm = +0.004 mm
- tolerance: Ø 5.51 – Ø 12.00 mm = +0.005 mm

NC 100



Left Hand Helix
HSS-E

40 115 ...

DC mm	OAL mm	L mm	LU mm	DCONMS h6 mm	ZEFP	
0,95 - 0,99	34	5,5	12,5	1	3	xxxxx[1]
1,00	34	5,5	12,5	1	3	01000
1,01	34	5,5	12,5	1	3	01010
1,02	34	5,5	12,5	1	3	01020
1,03 - 1,06	34	5,5	12,5	1	3	xxxxx[1]
1,07 - 1,18	36	6,5	13,0	1	3	xxxxx[1]
1,19 - 1,32	38	7,5	14,0	2	3	xxxxx[1]
1,33 - 1,41	40	8,0	15,5	2	3	xxxxx[1]
1,42 - 1,49	40	8,0	15,5	2	3	xxxxx[1]
1,50	40	8,0	15,5	2	3	01500
1,51	43	9,0	16,0	2	3	01510
1,52	43	9,0	16,0	2	3	01520
1,53 - 1,70	43	9,0	16,0	2	3	xxxxx[1]
1,71 - 1,90	46	10,0	19,0	2	4	xxxxx[1]
1,91 - 1,96	49	11,0	21,0	2	4	xxxxx[1]
1,97	49	11,0	21,0	2	4	01970
1,98	49	11,0	21,0	2	4	01980
1,99	49	11,0	21,0	2	4	01990
2,00	49	11,0	21,0	2	4	02000
2,01	49	11,0	21,0	2	4	02010
2,02	49	11,0	21,0	2	4	02020
2,03 - 2,12	49	11,0	21,0	2	4	xxxxx[1]
2,13 - 2,36	53	12,0	22,0	3	4	xxxxx[1]
2,37 - 2,47	57	14,0	26,0	3	4	xxxxx[1]
2,48	57	14,0	26,0	3	4	02480
2,49	57	14,0	26,0	3	4	02490
2,50	57	14,0	26,0	3	4	02500
2,51	57	14,0	26,0	3	4	02510
2,52	57	14,0	26,0	3	4	02520
2,53 - 2,65	57	14,0	26,0	3	4	xxxxx[1]
2,66 - 2,96	61	15,0	30,0	3	6	xxxxx[1]
2,97	61	15,0	30,0	3	6	02970
2,98	61	15,0	30,0	3	6	02980
2,99	61	15,0	30,0	3	6	02990
3,00	61	15,0	30,0	3	6	03000
3,01	61	15,0	30,0	3	6	03010
3,02	61	15,0	30,0	3	6	03020
3,03	61	15,0	30,0	3	6	03030[1]
3,04 - 3,35	65	16,0	34,0	4	6	xxxxx[1]
3,36 - 3,75	70	18,0	39,0	4	6	xxxxx[1]
3,76 - 3,96	75	19,0	44,0	4	6	xxxxx[1]
3,97	75	19,0	44,0	4	6	03970
3,98	75	19,0	44,0	4	6	03980
3,99	75	19,0	44,0	4	6	03990
4,00	75	19,0	44,0	4	6	04000
4,01	75	19,0	44,0	4	6	04010
4,02	75	19,0	44,0	4	6	04020
4,03 - 4,25	75	19,0	44,0	4	6	xxxxx[1]
4,26 - 4,75	80	21,0	48,0	5	6	xxxxx[1]
4,76 - 4,96	86	23,0	54,0	5	6	xxxxx[1]
4,97	86	23,0	54,0	5	6	04970
4,98	86	23,0	54,0	5	6	04980
4,99	86	23,0	54,0	5	6	04990
5,00	86	23,0	54,0	5	6	05000
5,01	86	23,0	54,0	5	6	05010
5,02	86	23,0	54,0	5	6	05020

40 115 ...

DC mm	OAL mm	L mm	LU mm	DCONMS h6 mm	ZEFP	
5,03 - 5,30	86	23,0	54,0	5	6	xxxxx[1]
5,31 - 5,60	93	26,0	53,0	6	6	xxxxx[1]
5,61 - 5,96	93	26,0	53,0	6	6	xxxxx[1]
5,97	93	26,0	53,0	6	6	05970
5,98	93	26,0	53,0	6	6	05980
5,99	93	26,0	53,0	6	6	05990
6,00	93	26,0	53,0	6	6	06000
6,01	93	26,0	53,0	6	6	06010
6,02	93	26,0	53,0	6	6	06020
6,03	93	26,0	53,0	6	6	06030[1]
6,04 - 6,70	101	28,0	61,0	6	6	xxxxx[1]
6,71 - 7,20	109	31,0	69,0	8	6	xxxxx[1]
7,21 - 7,50	109	31,0	69,0	8	6	xxxxx[1]
7,51 - 7,96	117	33,0	77,0	8	6	xxxxx[1]
7,97	117	33,0	77,0	8	6	07970
7,98	117	33,0	77,0	8	6	07980
7,99	117	33,0	77,0	8	6	07990
8,00	117	33,0	77,0	8	6	08000
8,01	117	33,0	77,0	8	6	08010
8,02	117	33,0	77,0	8	6	08020
8,03 - 8,20	117	33,0	77,0	8	6	xxxxx[1]
8,21 - 8,50	117	33,0	77,0	8	6	xxxxx[1]
8,51 - 8,99	125	36,0	81,0	10	6	xxxxx[1]
9,00	125	36,0	81,0	10	6	09000
9,01	125	36,0	81,0	10	6	09010
9,02	125	36,0	81,0	10	6	09020
9,03 - 9,20	125	36,0	81,0	10	6	xxxxx[1]
9,21 - 9,50	125	36,0	81,0	10	6	xxxxx[1]
9,51 - 9,96	133	38,0	89,0	10	6	xxxxx[1]
9,97	133	38,0	89,0	10	6	09970
9,98	133	38,0	89,0	10	6	09980
9,99	133	38,0	89,0	10	6	09990
10,00	133	38,0	89,0	10	6	10000
10,01	133	38,0	89,0	10	6	10010
10,02	133	38,0	89,0	10	6	10020
10,03 - 10,20	133	38,0	89,0	10	6	xxxxx[1]
10,21 - 10,60	133	38,0	89,0	10	6	xxxxx[1]
10,61 - 11,20	142	41,0	98,0	10	6	xxxxx[1]
11,21 - 11,80	142	41,0	98,0	10	6	xxxxx[1]
11,81 - 11,96	151	44,0	106,0	10	6	xxxxx[1]
11,97	151	44,0	106,0	10	6	11970
11,98	151	44,0	106,0	10	6	11980
11,99	151	44,0	106,0	10	6	11990
12,00	151	44,0	106,0	10	6	12000

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→ v_c Page 79

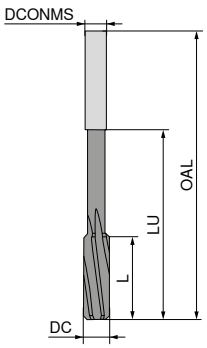
1) Not available ex stock, articles are non-returnable and cannot be exchanged / Minimum order 5 pieces

This tool concept permits numerous tolerances.
Please refer to the table on → **page 80** for tolerances covered.
For xxxxx please indicate required Ø in the order
(e.g. Ø 8.03 mm → Article no. 40 115 08030)!

Machine reamers, DIN 212-B

- ▲ 0.01 mm steps
- ▲ tolerance: Ø 0.95 – 5.50 mm = +0.004 mm
- ▲ tolerance: Ø 5.51 – 12.00 mm = +0.005 mm

N 100



Left Hand Helix
HSS-E

40 140 ...

DC mm	OAL mm	L mm	LU mm	DCONMS h9 mm	ZEFP	
0,95 - 1,06	34	5,5	13	1,0	3	xxxxx 1)
1,07 - 1,18	36	6,5	14	1,1	3	xxxxx 1)
1,19 - 1,32	38	7,5	15	1,2	3	xxxxx 1)
1,33 - 1,39	40	8,0	16	1,4	3	xxxxx 1)
1,40 - 1,47	40	8,0	16	1,4	3	xxxxx 1)
1,48	40	8,0	16	1,4	3	01480
1,49	40	8,0	16	1,4	3	01490
1,50	40	8,0	16	1,4	3	01500
1,51 - 1,70	43	9,0	18	1,6	3	xxxxx 1)
1,71 - 1,90	46	10,0	20	1,8	4	xxxxx 1)
1,91 - 1,97	49	11,0	22	2,0	4	xxxxx 1)
1,98	49	11,0	22	2,0	4	01980
1,99	49	11,0	22	2,0	4	01990
2,00	49	11,0	22	2,0	4	02000
2,01	49	11,0	22	2,0	4	02010
2,02	49	11,0	22	2,0	4	02020
2,03	49	11,0	22	2,0	4	02030
2,04	49	11,0	22	2,0	4	02040
2,05	49	11,0	22	2,0	4	02050
2,06 - 2,09	49	11,0	22	2,0	4	xxxxx 1)
2,10 - 2,12	49	11,0	22	2,0	4	xxxxx 1)
2,13 - 2,36	53	12,0	24	2,2	4	xxxxx 1)
2,37 - 2,49	57	14,0	26	2,5	4	xxxxx 1)
2,50 - 2,59	57	14,0	26	2,5	4	xxxxx 1)
2,60 - 2,65	57	14,0	26	2,5	4	xxxxx 1)
2,66 - 2,80	61	15,0	30	2,8	6	xxxxx 1)
2,81 - 2,94	61	15,0	29	3,0	6	xxxxx 1)
2,95	61	15,0	29	3,0	6	02950
2,96	61	15,0	29	3,0	6	02960
2,97	61	15,0	29	3,0	6	02970
2,98	61	15,0	29	3,0	6	02980
2,99	61	15,0	29	3,0	6	02990
3,00	61	15,0	29	3,0	6	03000
3,01	65	16,0	33	3,2	6	03010
3,02	65	16,0	33	3,2	6	03020
3,03	65	16,0	33	3,2	6	03030
3,04	65	16,0	33	3,2	6	03040
3,05	65	16,0	33	3,2	6	03050
3,06	65	16,0	33	3,2	6	03060
3,07	65	16,0	33	3,2	6	03070
3,08 - 3,09	65	16,0	33	3,2	6	xxxxx 1)
3,10 - 3,35	65	16,0	33	3,2	6	xxxxx 1)
3,36 - 3,49	70	18,0	38	3,5	6	xxxxx 1)
3,50 - 3,59	70	18,0	38	3,5	6	xxxxx 1)
3,60 - 3,75	70	18,0	38	3,5	6	xxxxx 1)
3,76 - 3,81	75	19,0	46	4,0	6	xxxxx 1)
3,82 - 3,94	75	19,0	46	4,0	6	xxxxx 1)
3,95	75	19,0	46	4,0	6	03950
3,96	75	19,0	46	4,0	6	03960
3,97	75	19,0	46	4,0	6	03970
3,98	75	19,0	46	4,0	6	03980
3,99	75	19,0	46	4,0	6	03990

40 140 ...

DC mm	OAL mm	L mm	LU mm	DCONMS h9 mm	ZEFP	
4,00	75	19,0	46	4,0	6	04000
4,01	75	19,0	46	4,0	6	04010
4,02	75	19,0	46	4,0	6	04020
4,03	75	19,0	46	4,0	6	04030
4,04	75	19,0	46	4,0	6	04040
4,05	75	19,0	46	4,0	6	04050
4,06	75	19,0	46	4,0	6	04060
4,07	75	19,0	46	4,0	6	04070
4,08	75	19,0	46	4,0	6	04080
4,09 - 4,20	75	19,0	46	4,0	6	xxxxx 1)
4,21 - 4,25	75	19,0	46	4,0	6	xxxxx 1)
4,26 - 4,75	80	21,0	51	4,5	5	xxxxx 1)
4,76 - 4,95	86	23,0	57	5,0	6	xxxxx 1)
4,96	86	23,0	57	5,0	6	04960
4,97	86	23,0	57	5,0	6	04970
4,98	86	23,0	57	5,0	6	04980
4,99	86	23,0	57	5,0	6	04990
5,00	86	23,0	57	5,0	6	05000
5,01	86	23,0	57	5,0	6	05010
5,02	86	23,0	57	5,0	6	05020
5,03	86	23,0	57	5,0	6	05030
5,04	86	23,0	57	5,0	6	05040
5,05	86	23,0	57	5,0	6	05050
5,06	86	23,0	57	5,0	6	05060
5,07	86	23,0	57	5,0	6	05070
5,08 - 5,20	86	23,0	57	5,0	6	xxxxx 1)
5,21 - 5,30	86	23,0	57	5,0	6	xxxxx 1)
5,31 - 5,94	93	26,0	56	5,6	6	xxxxx 1)
5,95	93	26,0	56	5,6	6	05950
5,96	93	26,0	56	5,6	6	05960
5,97	93	26,0	56	5,6	6	05970
5,98	93	26,0	56	5,6	6	05980
5,99	93	26,0	56	5,6	6	05990

P	●
M	○
K	●
N	●
S	○
H	
O	●

→ v_c Page 79

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 14 working days

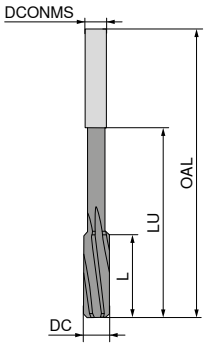
This tool concept permits numerous tolerances.
For achievable tolerances covered, please see the table on → **page 80**.
For xxxxx please indicate required Ø in the order
(e.g. Ø 10.06 mm → Article no. 40 140 10060)!

Continued on next page

Machine reamers, DIN 212-B

- 0.01 mm steps
- tolerance: Ø 0.95 – 5.50 mm = +0.004 mm
- tolerance: Ø 5.51 – 12.00 mm = +0.005 mm

N 100



Left Hand Helix
HSS-E

40 140 ...

DC mm	OAL mm	L mm	LU mm	DCONMS h9 mm	ZEFP	
6,00	93	26	56	5,6	6	06000
6,01	101	28	72	6,3	6	06010
6,02	101	28	72	6,3	6	06020
6,03	101	28	72	6,3	6	06030
6,04	101	28	72	6,3	6	06040
6,05	101	28	72	6,3	6	06050
6,06 - 6,11	101	28	72	6,3	6	xxxxx 1)
6,12 - 6,34	101	28	72	6,3	6	xxxxx 1)
6,35	101	28	72	6,3	6	06350
6,36	101	28	72	6,3	6	06360 1)
6,71 - 6,94	109	31	80	7,1	6	xxxxx 1)
6,95	109	31	80	7,1	6	06950
6,96	109	31	80	7,1	6	06960
6,97	109	31	80	7,1	6	06970
6,98	109	31	80	7,1	6	06980
6,99	109	31	80	7,1	6	06990
7,00	109	31	80	7,1	6	07000
7,01	109	31	80	7,1	6	07010
7,02	109	31	80	7,1	6	07020
7,03	109	31	80	7,1	6	07030
7,04 - 7,50	109	31	80	7,1	6	xxxxx 1)
7,51 - 7,63	117	33	80	7,1	6	xxxxx 1)
7,64 - 7,94	117	33	80	8,0	6	xxxxx 1)
7,95	117	33	84	8,0	6	07950
7,96	117	33	84	8,0	6	07960
7,97	117	33	84	8,0	6	07970
7,98	117	33	84	8,0	6	07980
7,99	117	33	84	8,0	6	07990
8,00	117	33	84	8,0	6	08000
8,01	117	33	84	8,0	6	08010
8,02	117	33	84	8,0	6	08020
8,03	117	33	84	8,0	6	08030
8,04	117	33	84	8,0	6	08040
8,05	117	33	84	8,0	6	08050
8,06 - 8,20	117	33	84	8,0	6	xxxxx 1)
8,21 - 8,50	117	33	84	8,0	6	xxxxx 1)
8,51 - 8,63	125	36	84	8,0	6	xxxxx 1)
8,64 - 8,95	125	36	84	9,0	6	xxxxx 1)
8,96	125	36	92	9,0	6	08960
8,97	125	36	92	9,0	6	08970
8,98	125	36	92	9,0	6	08980
8,99	125	36	92	9,0	6	08990
9,00	125	36	92	9,0	6	09000
9,01	125	36	92	9,0	6	09010
9,02	125	36	92	9,0	6	09020
9,03 - 9,50	125	36	92	9,0	6	xxxxx 1)
9,51 - 9,63	133	38	92	9,0	6	xxxxx 1)
9,64 - 9,95	133	38	92	10,0	6	xxxxx 1)
9,96	133	38	101	10,0	6	09960
9,97	133	38	101	10,0	6	09970
9,98	133	38	101	10,0	6	09980
9,99	133	38	101	10,0	6	09990

40 140 ...

DC mm	OAL mm	L mm	LU mm	DCONMS h9 mm	ZEFP	
10,00	133	38	101	10,0	6	10000
10,01	133	38	101	10,0	6	10010
10,02	133	38	101	10,0	6	10020
10,03	133	38	101	10,0	6	10030
10,04	133	38	101	10,0	6	10040
10,05	133	38	101	10,0	6	10050
10,06 - 10,09	133	38	101	10,0	6	xxxxx 1)
10,10	133	38	101	10,0	6	10100
10,11 - 10,19	133	38	101	10,0	6	xxxxx 1)
10,20	133	38	101	10,0	6	10200
10,21 - 10,69	133	38	101	10,0	6	xxxxx 1)
10,70 - 11,20	142	41	101	10,0	6	xxxxx 1)
11,21 - 11,80	142	41	101	10,0	6	xxxxx 1)
11,81 - 11,95	151	44	110	10,0	6	xxxxx 1)
11,96	151	44	110	10,0	6	11960
11,97	151	44	110	10,0	6	11970
11,98	151	44	110	10,0	6	11980
11,99	151	44	110	10,0	6	11990
12,00	151	44	110	10,0	6	12000

P	●
M	○
K	●
N	●
S	○
H	
O	●

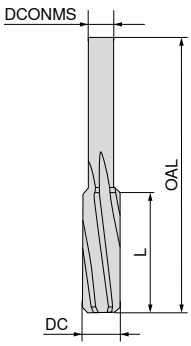
→ v_c Page 79

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 14 working days

This tool concept permits numerous tolerances.
For achievable tolerances covered, please see the table on → **page 80**.
For xxxxx please indicate required Ø in the order
(e.g. Ø 10.06 mm → Article no. 40 140 10060)!

Stub reamers, DIN 8089-B

AR



Left Hand Helix
HSS-E
Through hole

40 145 ...

DC $_{H7}$ mm	OAL mm	L mm	DCONMS $_{h8}$ mm	ZEFP	
4,0	56	20	3,55	6	**040**
4,5	63	22	4,00	6	**045**
5,0	63	22	4,00	6	**050**
5,5	63	22	5,00	6	**055**
6,0	63	22	5,00	6	**060**
6,5	63	22	5,00	6	**065**
7,0	71	25	6,30	6	**070**
8,0	71	25	6,30	6	**080**
9,0	71	25	8,00	6	**090**
10,0	71	25	8,00	6	**100**
11,0	80	28	10,00	6	**110**
12,0	80	28	10,00	6	**120**

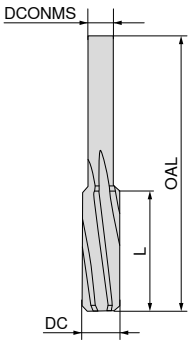
P	●
M	○
K	●
N	●
S	○
H	
O	●

→ v_c Page 79

Stub reamers, DIN 8089-B

- 0.01 mm steps
- tolerance: Ø 3.76 – 5.50 mm = +0.004 mm
- tolerance: Ø 5.51 – 12.00 mm = +0.005 mm

AR 100



HSS-E
Left Hand Helix

40 139 ...

DC mm	OAL mm	L mm	DCONMS h8 mm	ZEFP	
3,76 - 3,81	56	20	3,55	6	xxxxx 1)
3,82 - 3,94	56	20	3,55	6	xxxxx 1)
3,95	56	20	3,55	6	03950
3,96	56	20	3,55	6	03960
3,97	56	20	3,55	6	03970
3,98	56	20	3,55	6	03980
3,99	56	20	3,55	6	03990
4,00	56	20	3,55	6	04000
4,01	56	20	3,55	6	04010
4,02	56	20	3,55	6	04020
4,03 - 4,20	56	20	3,55	6	xxxxx 1)
4,21 - 4,25	56	20	3,55	6	xxxxx 1)
4,26 - 4,75	63	22	4,00	6	xxxxx 1)
4,76 - 4,94	63	22	4,00	6	xxxxx 1)
4,95	63	22	4,00	6	04950
4,96	63	22	4,00	6	04960
4,97	63	22	4,00	6	04970
4,98	63	22	4,00	6	04980
4,99	63	22	4,00	6	04990
5,00	63	22	4,00	6	05000
5,01	63	22	4,00	6	05010
5,02	63	22	4,00	6	05020
5,03	63	22	4,00	6	05030
5,04	63	22	4,00	6	05040
5,05	63	22	4,00	6	05050
5,06 - 5,20	63	22	4,00	6	xxxxx 1)
5,21 - 5,30	63	22	4,00	6	xxxxx 1)
5,31 - 5,70	63	22	5,00	6	xxxxx 1)
5,71 - 5,94	63	22	5,00	6	xxxxx 1)
5,95	63	22	5,00	6	05950
5,96	63	22	5,00	6	05960
5,97	63	22	5,00	6	05970
5,98	63	22	5,00	6	05980
5,99	63	22	5,00	6	05990
6,00	63	22	5,00	6	06000
6,01	63	22	5,00	6	06010
6,02	63	22	5,00	6	06020
6,03 - 6,11	63	22	5,00	6	xxxxx 1)
6,12 - 6,70	63	22	5,00	6	xxxxx 1)
6,71 - 6,94	71	25	6,30	6	xxxxx 1)
6,95	71	25	6,30	6	06950
6,96	71	25	6,30	6	06960
6,97	71	25	6,30	6	06970
6,98	71	25	6,30	6	06980
6,99	71	25	6,30	6	06990
7,00	71	25	6,30	6	07000
7,01	71	25	6,30	6	07010
7,02	71	25	6,30	6	07020
7,03 - 7,25	71	25	6,30	6	xxxxx 1)
7,26 - 7,94	71	25	6,30	6	xxxxx 1)
7,95	71	25	6,30	6	07950
7,96	71	25	6,30	6	07960

40 139 ...

DC mm	OAL mm	L mm	DCONMS h8 mm	ZEFP	
7,97	71	25	6,30	6	07970
7,98	71	25	6,30	6	07980
7,99	71	25	6,30	6	07990
8,00	71	25	6,30	6	08000
8,01	71	25	6,30	6	08010
8,02	71	25	6,30	6	08020
8,03	71	25	6,30	6	08030
8,04	71	25	6,30	6	08040
8,05 - 8,20	71	25	6,30	6	xxxxx 1)
8,21 - 8,50	71	25	6,30	6	xxxxx 1)
8,51 - 8,94	71	25	8,00	6	xxxxx 1)
8,95	71	25	8,00	6	08950
8,96	71	25	8,00	6	08960
8,97	71	25	8,00	6	08970
8,98	71	25	8,00	6	08980
8,99	71	25	8,00	6	08990
9,00	71	25	8,00	6	09000
9,01	71	25	8,00	6	09010 1)
9,02	71	25	8,00	6	09020
9,03 - 9,25	71	25	8,00	6	xxxxx
9,26 - 9,94	71	25	8,00	6	xxxxx 1)
9,95	71	25	8,00	6	09950
9,96	71	25	8,00	6	09960
9,97	71	25	8,00	6	09970
9,98	71	25	8,00	6	09980
9,99	71	25	8,00	6	09990
10,00	71	25	8,00	6	10000
10,01	71	25	8,00	6	10010
10,02	71	25	8,00	6	10020
10,03 - 10,20	71	25	8,00	6	xxxxx 1)
10,21 - 10,60	71	25	8,00	6	xxxxx 1)
10,61 - 11,20	80	28	10,00	6	xxxxx 1)
11,21 - 11,25	80	28	10,00	6	xxxxx 1)
11,26 - 11,94	80	28	10,00	6	xxxxx 1)
11,95	80	28	10,00	6	11950
11,96	80	28	10,00	6	11960
11,97	80	28	10,00	6	11970
11,98	80	28	10,00	6	11980
11,99	80	28	10,00	6	11990
12,00	80	28	10,00	6	12000

P	●
M	○
K	●
N	●
S	○
H	
O	●

→ v_c Page 79

1) Not available ex stock, articles are non-returnable and cannot be exchanged / Delivery time 14 working days

This tool concept permits numerous tolerances.
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For xxxxx please indicate required Ø in the order
(e.g. Ø 10.06 mm → Article no. 40 139 10060)!

Material examples for cutting data tables

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

*** Tensile strength**

Cutting data standard values for Monomax

	Grade / coating	DBC			DBC	
	Article no. / type	40 648 ... / 56J.17 – ASG0706			40 640... / 56H.17 – ASG0706	
	Nominal Ø in mm	5,6–8,899	8,9–12,00	5,6–8,899	8,9–12,00	
	Reaming Allowance Ø	0,10–0,20	0,10–0,30	0,10–0,20	0,10–0,30	
	Number of flutes	4	6	4	6	
Index	v_c m/min	f mm/rev.	f mm/rev.	v_c m/min	f mm/rev.	f mm/rev.
P.1.1						
P.1.2						
P.1.3						
P.1.4						
P.1.5						
P.2.1						
P.2.2						
P.2.3						
P.2.4						
P.3.1						
P.3.2						
P.3.3						
P.4.1						
P.4.2						
M.1.1						
M.2.1						
M.3.1						
K.1.1						
K.1.2						
K.2.1						
K.2.2						
K.3.1						
K.3.2						
N.1.1	**150** (130–300)	0,40–0,60	0,40–0,60	**150** (130–300)	0,40–0,60	0,40–0,60
N.1.2	**150** (130–300)	0,40–0,60	0,40–0,60	**150** (130–300)	0,40–0,60	0,40–0,60
N.2.1	**200** (180–300)	0,40–0,60	0,40–0,60	**200** (180–300)	0,40–0,60	0,40–0,60
N.2.2	**200** (180–300)	0,40–0,60	0,40–0,60	**200** (180–300)	0,40–0,60	0,40–0,60
N.2.3	**200** (180–300)	0,40–0,60	0,40–0,60	**200** (180–300)	0,40–0,60	0,40–0,60
N.3.1						
N.3.2						
N.3.3						
N.4.1						
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						
O.1.2						
O.2.1						
O.2.2						
O.3.1	250 (220–270)	0,40–0,60	0,40–0,60	250 (220–270)	0,40–0,60	0,40–0,60

The cutting data depend extremely on the external conditions, the material and machine type.
The indicated values are possible values which have to be increased or reduced, inside the bracket, according to the application conditions.

Cutting data standard values for Monomax

	Grade / coating	HM-DBG-P			HM-DBG-P	
	Article no. / type	40 657 ... / 56H.65 – ASG3000			40 652 ... / 56J.65 – ASG0106	
	Nominal Ø in mm	5,6–8,899	8,9–12,00		5,6–8,899	8,9–12,00
	Reaming allowance Ø	0,10–0,20	0,10–0,30		0,10–0,20	0,10–0,30
	Number of flutes	4	6		4	6
Index	v_c m/min	f mm/rev.	f mm/rev.	v_c m/min	f mm/rev.	f mm/rev.
P.1.1	**150** (130–200)	0,30–0,50	0,50–0,70			
P.1.2	**150** (130–200)	0,30–0,50	0,50–0,70			
P.1.3	**150** (130–200)	0,30–0,50	0,50–0,70			
P.1.4	**150** (130–200)	0,30–0,50	0,50–0,70			
P.1.5	**150** (130–200)	0,30–0,50	0,50–0,70			
P.2.1	**150** (130–200)	0,30–0,50	0,50–0,70			
P.2.2	**150** (130–200)	0,30–0,50	0,50–0,70			
P.2.3	**150** (130–200)	0,30–0,50	0,50–0,70			
P.2.4	**60** (50–100)	0,20–0,30	0,40–0,50	**60** (50–100)	0,20–0,30	0,40–0,50
P.3.1				**40** (35–60)	0,20–0,30	0,40–0,50
P.3.2				**40** (35–60)	0,20–0,30	0,40–0,50
P.3.3				**30** (25–50)	0,30–0,40	0,40–0,60
P.4.1				**45** (35–60)	0,30–0,40	0,40–0,60
P.4.2				**45** (35–60)	0,30–0,40	0,40–0,60
M.1.1				**30** (25–50)	0,30–0,40	0,40–0,60
M.2.1				**30** (25–50)	0,30–0,40	0,40–0,60
M.3.1				**30** (25–50)	0,30–0,40	0,40–0,60
K.1.1	**150** (130–220)	0,40–0,60	0,70–0,90			
K.1.2	**150** (130–220)	0,40–0,60	0,70–0,90			
K.2.1	**175** (150–300)	0,40–0,60	0,70–0,90			
K.2.2	**120** (100–180)	0,30–0,50	0,50–0,70			
K.3.1	**150** (130–250)	0,40–0,60	0,70–0,90			
K.3.2	**120** (100–180)	0,30–0,50	0,50–0,70			
N.1.1						
N.1.2						
N.2.1						
N.2.2						
N.2.3						
N.3.1						
N.3.2						
N.3.3						
N.4.1						
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						
O.1.2						
O.2.1						
O.2.2						
O.3.1						

The cutting data depend extremely on the external conditions, the material and machine type.
The indicated values are possible values which have to be increased or reduced, inside the bracket, according to the application conditions.

Cutting data standard values for Monomax

	Grade / coating	DST			DST	
	Article no. / type	40 625 ... / 56J.93 – ASG3000			40 635 ... / 56J.93 – ASG4000	
	Nominal Ø in mm	5,6–8,899	8,9–12,00		5,6–8,899	8,9–12,00
	Reaming allowance Ø	0,10–0,20	0,10–0,30		0,10–0,20	0,10–0,30
	Number of flutes	4	6		4	6
Index	v_c m/min	f mm/rev.	f mm/rev.	v_c m/min	f mm/rev.	f mm/rev.
P.1.1	**150** (130–200)	0,30–0,50	0,50–0,70	**150** (130–200)	0,40–0,60	0,70–0,90
P.1.2	**150** (130–200)	0,30–0,50	0,50–0,70	**150** (130–200)	0,40–0,60	0,70–0,90
P.1.3	**150** (130–200)	0,30–0,50	0,50–0,70	**150** (130–200)	0,40–0,60	0,70–0,90
P.1.4	**150** (130–200)	0,30–0,50	0,50–0,70	**150** (130–200)	0,40–0,60	0,70–0,90
P.1.5	**150** (130–200)	0,30–0,50	0,50–0,70	**150** (130–200)	0,40–0,60	0,70–0,90
P.2.1	**150** (130–200)	0,30–0,50	0,50–0,70	**150** (130–200)	0,40–0,60	0,70–0,90
P.2.2	**150** (130–200)	0,30–0,50	0,50–0,70	**150** (130–200)	0,40–0,60	0,70–0,90
P.2.3	**150** (130–200)	0,30–0,50	0,50–0,70	**150** (130–200)	0,40–0,60	0,70–0,90
P.2.4						
P.3.1						
P.3.2						
P.3.3						
P.4.1						
P.4.2						
M.1.1						
M.2.1						
M.3.1						
K.1.1						
K.1.2						
K.2.1	**175** (150–300)	0,40–0,60	0,70–0,90	175 (150–300)	0,40–0,60	0,70–0,90
K.2.2	**120** (100–150)	0,30–0,50	0,50–0,70	120 (100–180)	0,30–0,50	0,50–0,70
K.3.1	**150** (130–250)	0,40–0,60	0,70–0,90	120 (100–180)	0,30–0,50	0,50–0,70
K.3.2	**120** (100–180)	0,30–0,50	0,50–0,70	120 (100–180)	0,30–0,50	0,50–0,70
N.1.1						
N.1.2						
N.2.1						
N.2.2						
N.2.3						
N.3.1	150 (130–300)	0,40–0,60	0,60–0,90			
N.3.2	150 (130–300)	0,40–0,60	0,60–0,90			
N.3.3						
N.4.1						
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						
O.1.2						
O.2.1						
O.2.2						
O.3.1						

The cutting data depend extremely on the external conditions, the material and machine type.
The indicated values are possible values which have to be increased or reduced, inside the bracket, according to the application conditions.

Cutting data standard values for Monomax

	Grade / coating	HM-DBG-P			HM-TiN	
	Article no. / type	40 644 ... / 56H.65 – ASG0106		40 605 ... / 56J.71 – ASG3000		
	Nominal Ø in mm	5,6–8,899	8,9–12,00	5,6–8,899	8,9–12,00	
	Reaming allowance Ø	0,10–0,20	0,10–0,30	0,10–0,20	0,10–0,30	
	Number of flutes	4	6	4	6	
Index	v_c m/min	f mm/rev.	f mm/rev.	v_c m/min	f mm/rev.	f mm/rev.
P.1.1				100 (80–140)	0,30–0,50	0,50–0,70
P.1.2				100 (80–140)	0,30–0,50	0,50–0,70
P.1.3				100 (80–140)	0,30–0,50	0,50–0,70
P.1.4				100 (80–140)	0,30–0,50	0,50–0,70
P.1.5				100 (80–140)	0,30–0,50	0,50–0,70
P.2.1				100 (80–140)	0,30–0,50	0,50–0,70
P.2.2				100 (80–140)	0,30–0,50	0,50–0,70
P.2.3				100 (80–140)	0,30–0,50	0,50–0,70
P.2.4				100 (80–140)	0,30–0,50	0,50–0,70
P.3.1	**30** (25–50)	0,30–0,40	0,40–0,60			
P.3.2	**30** (25–50)	0,30–0,40	0,40–0,60			
P.3.3	**30** (25–50)	0,30–0,40	0,40–0,60			
P.4.1	**45** (35–60)	0,30–0,40	0,40–0,60			
P.4.2	**45** (35–60)	0,30–0,40	0,40–0,60			
M.1.1	**45** (35–60)	0,30–0,40	0,40–0,60			
M.2.1	**45** (35–60)	0,30–0,40	0,40–0,60			
M.3.1	**30** (25–50)	0,30–0,40	0,40–0,60			
K.1.1				80 (60–130)	0,40–0,60	0,70–0,90
K.1.2				80 (60–130)	0,40–0,60	0,70–0,90
K.2.1						
K.2.2						
K.3.1						
K.3.2						
N.1.1						
N.1.2						
N.2.1						
N.2.2						
N.2.3						
N.3.1				**120** (–200)	0,40–0,60	0,60–0,90
N.3.2				**120** (–200)	0,40–0,60	0,60–0,90
N.3.3				**80** (–150)	0,40–0,60	0,60–0,90
N.4.1						
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						
O.1.2						
O.2.1						
O.2.2						
O.3.1						

The cutting data depend extremely on the external conditions, the material and machine type.
The indicated values are possible values which have to be increased or reduced, inside the bracket, according to the application conditions.

Cutting data standard values for Fullmax, short

Type UNI		40 481 ... / 40 483 ... / 40 488 ... / 40 489 ...							
		Ø 2,97 – 4,05		Ø 4,06 – 6,05		Ø 6,06 – 7,55		Ø 7,56 – 12,05	
Number of flutes		4		4		6		6	
Index	v_c m/min	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm
P.1.1	**200** (180–250)	0,65–0,80	0,10–0,20	0,75–0,90	0,10–0,20	1,40–1,60	0,20	1,65–1,80	0,20
P.1.2	**200** (180–250)	0,65–0,80	0,10–0,20	0,75–0,90	0,10–0,20	1,40–1,60	0,20	1,65–1,80	0,20
P.1.3	**200** (180–250)	0,65–0,80	0,10–0,20	0,75–0,90	0,10–0,20	1,40–1,60	0,20	1,65–1,80	0,20
P.1.4	**200** (180–250)	0,65–0,80	0,10–0,20	0,75–0,90	0,10–0,20	1,40–1,60	0,20	1,65–1,80	0,20
P.1.5	**200** (180–250)	0,65–0,80	0,10–0,20	0,75–0,90	0,10–0,20	1,40–1,60	0,20	1,65–1,80	0,20
P.2.1	**200** (180–250)	0,65–0,80	0,10–0,20	0,75–0,90	0,10–0,20	1,40–1,60	0,20	1,65–1,80	0,20
P.2.2	**200** (180–250)	0,65–0,80	0,10–0,20	0,75–0,90	0,10–0,20	1,40–1,60	0,20	1,65–1,80	0,20
P.2.3	**200** (180–250)	0,65–0,80	0,10–0,20	0,75–0,90	0,10–0,20	1,40–1,60	0,20	1,65–1,80	0,20
P.2.4	**65** (55–110)	0,45–0,50	0,10–0,20	0,45–0,60	0,10–0,20	1,00–1,10	0,20	1,20–1,30	0,20
P.3.1	**40** (30–80)	0,40–0,60	0,10–0,20	0,50–0,70	0,10–0,20	1,00–1,30	0,20	1,10–1,40	0,20
P.3.2	**40** (30–80)	0,40–0,60	0,10–0,20	0,50–0,70	0,10–0,20	1,00–1,30	0,20	1,10–1,40	0,20
P.3.3	**40** (30–80)	0,40–0,60	0,10–0,20	0,50–0,70	0,10–0,20	1,00–1,30	0,20	1,10–1,40	0,20
P.4.1	**45** (40–65)	0,45–0,50	0,10–0,20	0,45–0,60	0,10–0,20	1,00–1,10	0,20	1,20–1,30	0,20
P.4.2	**45** (40–65)	0,45–0,50	0,10–0,20	0,45–0,60	0,10–0,20	1,00–1,10	0,20	1,20–1,30	0,20
M.1.1	**40** (35–60)	0,40–0,60	0,10–0,20	0,50–0,70	0,10–0,20	1,00–1,30	0,20	1,10–1,40	0,20
M.2.1	**40** (35–60)	0,40–0,60	0,10–0,20	0,50–0,70	0,10–0,20	1,00–1,30	0,20	1,10–1,40	0,20
M.3.1	**40** (35–60)	0,40–0,60	0,10–0,20	0,50–0,70	0,10–0,20	1,00–1,30	0,20	1,10–1,40	0,20
K.1.1	**200** (180–250)	0,80–1,00	0,10–0,20	0,90–1,20	0,10–0,20	1,50–1,90	0,20	1,50–1,90	0,20
K.1.2	**200** (180–250)	0,80–1,00	0,10–0,20	0,90–1,20	0,10–0,20	1,50–1,90	0,20	1,50–1,90	0,20
K.2.1	**225** (200–300)	0,80–1,00	0,10–0,20	0,90–1,20	0,10–0,20	1,50–1,90	0,20	1,50–1,90	0,20
K.2.2	**120** (100–150)	0,60–0,90	0,10–0,20	0,70–1,00	0,10–0,20	1,20–1,60	0,20	1,20–1,60	0,20
K.3.1	**225** (200–300)	0,80–1,00	0,10–0,20	0,90–1,20	0,10–0,20	1,50–1,90	0,20	1,50–1,90	0,20
K.3.2	**120** (100–150)	0,60–0,90	0,10–0,20	0,70–1,00	0,10–0,20	1,20–1,60	0,20	1,20–1,60	0,20
N.1.1									
N.1.2									
N.2.1									
N.2.2									
N.2.3									
N.3.1	150 (120–250)	0,50–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,40	0,20	1,40–1,70	0,20
N.3.2	100 (80–150)	0,40–0,60	0,10–0,20	0,60–0,80	0,10–0,20	1,00–1,30	0,20	1,20–1,40	0,20
N.3.3									
N.4.1									
S.1.1									
S.1.2									
S.2.1	40 (30–60)	0,30–0,40	0,10–0,20	0,40–0,50	0,10–0,20	0,70–0,90	0,20	0,80–1,10	0,20
S.2.2	40 (30–60)	0,30–0,40	0,10–0,20	0,40–0,50	0,10–0,20	0,70–0,90	0,20	0,80–1,10	0,20
S.2.3									
S.3.1	30 (25–60)	0,30–0,40	0,10–0,20	0,40–0,50	0,10–0,20	0,70–0,90	0,20	0,80–1,10	0,20
S.3.2	30 (25–60)	0,30–0,40	0,10–0,20	0,40–0,50	0,10–0,20	0,70–0,90	0,20	0,80–1,10	0,20
S.3.3									
H.1.1	40 (35–60)	0,20–0,30	0,10–0,20	0,20–0,30	0,10–0,20	0,40–0,60	0,20	0,50–0,60	0,20
H.1.2	30 (25–50)	0,20–0,30	0,10–0,20	0,20–0,30	0,10–0,20	0,40–0,60	0,20	0,50–0,60	0,20
H.1.3	30 (25–50)	0,20–0,30	0,10–0,20	0,20–0,30	0,10–0,20	0,40–0,60	0,20	0,50–0,60	0,20
H.1.4									
H.2.1	40 (35–60)	0,50–0,60	0,10–0,20	0,60–0,90	0,10–0,20	1,10–1,60	0,20	1,20–1,60	0,20
H.3.1	40 (35–60)	0,50–0,60	0,10–0,20	0,60–0,90	0,10–0,20	1,10–1,60	0,20	1,20–1,60	0,20
O.1.1									
O.1.2									
O.2.1									
O.2.2									
O.3.1									

The cutting data depend extremely on the external conditions, the material and machine type.
The indicated values are possible values which have to be increased or reduced, inside the bracket, according to the application conditions.

Cutting data standard values for Fullmax, long

Type UNI		40 484 ... / 40 485 ... / 40 486 ... / 40 487 ...							
		Ø 2,97 – 4,05		Ø 4,06 – 6,05		Ø 6,06 – 7,55		Ø 7,56 – 12,05	
Number of flutes		4		4		6		6	
Index	v_c m/min	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm
P.1.1	**180** (160–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,40–1,80	0,20
P.1.2	**180** (160–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,40–1,80	0,20
P.1.3	**180** (160–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,40–1,80	0,20
P.1.4	**180** (160–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,40–1,80	0,20
P.1.5	**180** (160–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,40–1,80	0,20
P.2.1	**180** (160–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,40–1,80	0,20
P.2.2	**180** (160–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,40–1,80	0,20
P.2.3	**180** (160–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,40–1,80	0,20
P.2.4	**80** (70–120)	0,40–0,50	0,10–0,20	0,40–0,60	0,10–0,20	0,90–1,10	0,20	1,00–1,20	0,20
P.3.1	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
P.3.2	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
P.3.3	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
P.4.1	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
P.4.2	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
M.1.1	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
M.2.1	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
M.3.1	**15** (10–30)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
K.1.1	**120** (100–180)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,30–1,60	0,20
K.1.2	**120** (100–180)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,30–1,60	0,20
K.2.1	**200** (180–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,30–1,60	0,20
K.2.2	**120** (100–150)	0,50–0,60	0,10–0,20	0,50–0,70	0,10–0,20	1,00–1,30	0,20	1,00–1,30	0,20
K.3.1	**200** (180–250)	0,60–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,60	0,20	1,30–1,60	0,20
K.3.2	**120** (100–150)	0,50–0,60	0,10–0,20	0,50–0,70	0,10–0,20	1,00–1,30	0,20	1,00–1,30	0,20
N.1.1									
N.1.2									
N.2.1									
N.2.2									
N.2.3									
N.3.1	150 (130–250)	0,50–0,80	0,10–0,20	0,70–0,90	0,10–0,20	1,30–1,40	0,20	1,40–1,70	0,20
N.3.2	100 (80–150)	0,40–0,60	0,10–0,20	0,60–0,80	0,10–0,20	1,00–1,30	0,20	1,20–1,40	0,20
N.3.3									
N.4.1									
S.1.1									
S.1.2									
S.2.1	40 (30–60)	0,30–0,40	0,10–0,20	0,40–0,50	0,10–0,20	0,70–0,90	0,20	0,80–1,10	0,20
S.2.2	40 (30–60)	0,30–0,40	0,10–0,20	0,40–0,50	0,10–0,20	0,70–0,90	0,20	0,80–1,10	0,20
S.2.3									
S.3.1	30 (25–60)	0,30–0,40	0,10–0,20	0,40–0,50	0,10–0,20	0,70–0,90	0,20	0,80–1,10	0,20
S.3.2	30 (25–60)	0,30–0,40	0,10–0,20	0,40–0,50	0,10–0,20	0,70–0,90	0,20	0,80–1,10	0,20
S.3.3									
H.1.1	40 (35–60)	0,50–0,60	0,10–0,20	0,60–0,90	0,10–0,20	1,10–1,60	0,20	1,20–1,60	0,20
H.1.2	40 (35–60)	0,50–0,60	0,10–0,20	0,60–0,90	0,10–0,20	1,10–1,60	0,20	1,20–1,60	0,20
H.1.3	30 (25–50)	0,50–0,70	0,10–0,20	0,70–1,00	0,10–0,20	1,20–1,70	0,20	1,30–1,70	0,20
H.1.4									
H.2.1	40 (35–60)	0,50–0,60	0,10–0,20	0,60–0,90	0,10–0,20	1,10–1,60	0,20	1,20–1,60	0,20
H.3.1	40 (35–60)	0,50–0,60	0,10–0,20	0,60–0,90	0,10–0,20	1,10–1,60	0,20	1,20–1,60	0,20
O.1.1									
O.1.2									
O.2.1									
O.2.2									
O.3.1									

The cutting data depend extremely on the external conditions, the material and machine type.
The indicated values are possible values which have to be increased or reduced, inside the bracket, according to the application conditions.

Cutting data standard values for Fullmax, long

Type VA		40 401 ... / 40 402 ... / 40 403 ... / 40 404 ...							
		Ø 2,97 – 4,05		Ø 4,06 – 6,05		Ø 6,06 – 7,55		Ø 7,56 – 12,05	
Number of flutes		4		4		6		6	
Index	v_c m/min	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm
P.1.1									
P.1.2									
P.1.3									
P.1.4									
P.1.5									
P.2.1									
P.2.2									
P.2.3									
P.2.4									
P.3.1	20 (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
P.3.2	20 (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
P.3.3	20 (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
P.4.1	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
P.4.2	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
M.1.1	**20** (15–40)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
M.2.1	**15** (10–30)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20
M.3.1	**15** (10–30)	0,32–0,50	0,10–0,20	0,32–0,50	0,10–0,20	0,48–0,60	0,20	0,48–0,60	0,20

Type ALU		40 471 ... / 40 472 ... / 40 473 ... / 40 474 ...							
		Ø 2,97 – 4,05		Ø 4,06 – 6,05		Ø 6,06 – 7,55		Ø 7,56 – 12,05	
Number of flutes		4		4		6		6	
Index	v_c m/min	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm
N.1.1	**200** (180–300)	0,50–0,60	0,10–0,20	0,60–0,90	0,10–0,20	1,10–1,60	0,20	1,20–1,60	0,20
N.1.2	**200** (180–300)	0,50–0,60	0,10–0,20	0,60–0,90	0,10–0,20	1,10–1,60	0,20	1,20–1,60	0,20
N.2.1	**200** (180–250)	0,50–0,70	0,10–0,20	0,70–1,00	0,10–0,20	1,20–1,70	0,20	1,30–1,70	0,20
N.2.2	**200** (180–300)	0,50–0,70	0,10–0,20	0,70–1,00	0,10–0,20	1,20–1,70	0,20	1,30–1,70	0,20
N.2.3	**200** (180–250)	0,50–0,70	0,10–0,20	0,70–1,00	0,10–0,20	1,20–1,70	0,20	1,30–1,70	0,20
N.3.1									
N.3.2									
N.3.3									
N.4.1									
O.3.1	250 (220–270)	0,50–0,70	0,10–0,20	0,70–1,00	0,10–0,20	1,20–1,70	0,20	1,30–1,70	0,20

The cutting data depend extremely on the external conditions, the material and machine type.
The indicated values are possible values which have to be increased or reduced, inside the bracket, according to the application conditions.

Cutting data standard values for solid carbide reamers

	40 430 ...			40 430 ... / 40 431 ...									
	uncoated	to Ø 0.94 mm		uncoated	TiAlN	to Ø 5 mm		to Ø 8 mm		to Ø 10 mm		to Ø 12 mm	
Index	v_c m/min	f mm/rev.	Reaming allowance Ø mm	v_c m/min	v_c m/min	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm
P.1.1	20	0,10	0,10	20	30	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.1.2	20	0,10	0,10	20	30	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.1.3	12	0,10	0,10	12	15	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.1.4	12	0,10	0,10	12	15	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.1.5	12	0,10	0,10	12	15	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.2.1	15	0,10	0,10	15	25	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.2.2	12	0,10	0,10	12	15	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.2.3	12	0,10	0,10	12	15	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.2.4	12	0,10	0,10	12	15	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.3.1	15	0,10	0,10	15	25	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.3.2	12	0,10	0,10	12	15	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.3.3	12	0,10	0,10	12	15	0,10	0,10	0,15	0,15	0,20	0,20	0,20	0,20
P.4.1													
P.4.2													
M.1.1					15	0,08	0,08	0,10	0,10	0,15	0,10	0,15	0,10
M.2.1					15	0,08	0,08	0,10	0,10	0,15	0,10	0,15	0,10
M.3.1					10	0,08	0,08	0,10	0,10	0,15	0,10	0,15	0,10
K.1.1	18	0,10	0,10	18	30	0,10	0,10	0,20	0,15	0,30	0,20	0,30	0,20
K.1.2	18	0,10	0,10	18	30	0,10	0,10	0,20	0,15	0,30	0,20	0,30	0,20
K.2.1	15	0,10	0,10	15	25	0,10	0,10	0,20	0,15	0,30	0,20	0,30	0,20
K.2.2	10	0,10	0,10	10	20	0,10	0,10	0,20	0,15	0,30	0,20	0,30	0,20
K.3.1	15	0,10	0,10	15	25	0,10	0,10	0,20	0,15	0,30	0,20	0,30	0,20
K.3.2	10	0,10	0,10	10	20	0,10	0,10	0,20	0,15	0,30	0,20	0,30	0,20
N.1.1	40	0,15	0,10	40		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
N.1.2	40	0,15	0,10	40		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
N.2.1	25	0,15	0,10	20		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
N.2.2	25	0,15	0,10	20		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
N.2.3													
N.3.1	30	0,15	0,10	30		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
N.3.2	30	0,15	0,10	30		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
N.3.3	30	0,15	0,10	30		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
N.4.1													
S.1.1					10	0,06	0,05	0,10	0,10	0,12	0,10	0,12	0,10
S.1.2					10	0,06	0,05	0,10	0,10	0,12	0,10	0,12	0,10
S.2.1					10	0,06	0,05	0,10	0,10	0,12	0,10	0,12	0,10
S.2.2					10	0,06	0,05	0,10	0,10	0,12	0,10	0,12	0,10
S.2.3					10	0,06	0,05	0,10	0,10	0,12	0,10	0,12	0,10
S.3.1					10	0,06	0,05	0,10	0,10	0,12	0,10	0,12	0,10
S.3.2					10	0,06	0,05	0,10	0,10	0,12	0,10	0,12	0,10
S.3.3					10	0,06	0,05	0,10	0,10	0,12	0,10	0,12	0,10
H.1.1					8	0,05	0,05	0,08	0,05	0,10	0,10	0,10	0,10
H.1.2					8	0,05	0,05	0,08	0,05	0,10	0,10	0,10	0,10
H.1.3													
H.1.4													
H.2.1					8	0,05	0,05	0,08	0,05	0,10	0,10	0,10	0,10
H.3.1													
O.1.1	40	0,15	0,10	40		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
O.1.2	40	0,15	0,10	40		0,15	0,10	0,20	0,15	0,25	0,20	0,25	0,20
O.2.1													
O.2.2													
O.3.1													

The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine.
The specified values represent guideline cutting data that can be adjusted by approx. **±20%** according to the usage conditions.

Cutting data for HSS-E reamers

		40 115 ...							40 140 ... / 40 145 ... / 40 139 ...					
		to Ø 5 mm		to Ø 8 mm		to Ø 12 mm			to Ø 5 mm		to Ø 8 mm		to Ø 12 mm	
Index	v_c m/min	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	v_c m/min	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm	f mm/rev.	Reaming allowance Ø mm
P.1.1	**12**	0,10	0,10	0,15	0,15	0,20	0,20	**15**	0,10	0,10–0,15	0,20	0,15–0,20	0,25	0,20
P.1.2	**12**	0,10	0,10	0,15	0,15	0,20	0,20	**12**	0,10	0,10–0,15	0,20	0,15–0,20	0,25	0,20
P.1.3	**10**	0,10	0,10	0,15	0,15	0,20	0,20	**10**	0,10	0,10–0,15	0,20	0,15–0,20	0,25	0,20
P.1.4	**10**	0,10	0,10	0,15	0,15	0,20	0,20	**10**	0,08	0,10–0,15	0,15	0,15–0,20	0,20	0,20
P.1.5	**10**	0,10	0,10	0,15	0,15	0,20	0,20	**8**	0,08	0,10–0,15	0,15	0,15–0,20	0,20	0,20
P.2.1	**12**	0,10	0,10	0,15	0,15	0,20	0,20	**10**	0,10	0,10–0,15	0,20	0,15–0,20	0,25	0,20
P.2.2	**12**	0,10	0,10	0,15	0,15	0,20	0,20	**8**	0,08	0,10–0,15	0,15	0,15–0,20	0,20	0,20
P.2.3	**10**	0,10	0,10	0,15	0,15	0,20	0,20	**8**	0,08	0,10–0,15	0,15	0,15–0,20	0,20	0,20
P.2.4	**10**	0,10	0,10	0,15	0,15	0,20	0,20	**8**	0,08	0,10–0,15	0,15	0,15–0,20	0,20	0,20
P.3.1	**12**	0,10	0,10	0,15	0,15	0,20	0,20	**8**	0,08	0,10–0,15	0,12	0,15–0,20	0,20	0,20
P.3.2	**10**	0,10	0,10	0,15	0,15	0,20	0,20	**6**	0,08	0,10–0,15	0,12	0,15–0,20	0,20	0,20
P.3.3	**10**	0,10	0,10	0,15	0,15	0,20	0,20	**6**	0,08	0,10–0,15	0,12	0,15–0,20	0,20	0,20
P.4.1								**6**	0,08	0,10–0,15	0,12	0,15–0,20	0,20	0,20
P.4.2								**6**	0,08	0,10–0,15	0,12	0,15–0,20	0,20	0,20
M.1.1								6	0,08	0,10	0,12	0,15	0,20	0,20
M.2.1								4	0,08	0,10	0,12	0,15	0,20	0,20
M.3.1								4	0,08	0,10	0,12	0,15	0,20	0,20
K.1.1	**12**	0,15	0,10	0,20	0,15	0,25	0,20	**14**	0,10	0,10–0,15	0,16	0,20	0,24	0,20
K.1.2	**12**	0,15	0,10	0,20	0,15	0,25	0,20	**12**	0,10	0,10–0,15	0,16	0,20	0,24	0,20
K.2.1	**10**	0,15	0,10	0,20	0,15	0,25	0,20	**12**	0,10	0,10–0,15	0,16	0,15–0,20	0,20	0,20
K.2.2	**10**	0,15	0,10	0,20	0,15	0,25	0,20	**10**	0,10	0,10–0,15	0,16	0,15–0,20	0,20	0,20
K.3.1	**10**	0,15	0,10	0,20	0,15	0,25	0,20	**12**	0,10	0,10–0,15	0,16	0,20	0,24	0,20
K.3.2	**10**	0,15	0,10	0,20	0,15	0,25	0,20	**10**	0,10	0,10–0,15	0,16	0,15–0,20	0,20	0,20
N.1.1	**15**	0,15	0,10	0,20	0,15	0,20	0,20	**20**	0,10	0,15	0,20	0,20	0,25	0,20
N.1.2	**15**	0,15	0,10	0,20	0,15	0,20	0,20	**20**	0,10	0,15	0,20	0,20	0,25	0,20
N.2.1								**18**	0,10	0,15	0,20	0,20	0,25	0,20
N.2.2								**18**	0,10	0,15	0,20	0,20	0,25	0,20
N.2.3														
N.3.1	**20**	0,15	0,10	0,20	0,15	0,20	0,20	**18**	0,10	0,15	0,18	0,30	0,20	0,30
N.3.2	**20**	0,15	0,10	0,20	0,15	0,20	0,20	**15**	0,10	0,15	0,18	0,30	0,20	0,30
N.3.3	**20**	0,15	0,10	0,20	0,15	0,20	0,20	**15**	0,10	0,15	0,18	0,30	0,20	0,30
N.4.1								**18**	0,10	0,15	0,18	0,30	0,20	0,30
S.1.1														
S.1.2														
S.2.1								4	0,08	0,10	0,12	0,15	0,16	0,20
S.2.2								4	0,08	0,10	0,12	0,15	0,16	0,20
S.2.3														
S.3.1								6	0,08	0,10	0,12	0,15	0,16	0,20
S.3.2								4	0,08	0,10	0,10	0,15	0,125	0,20
S.3.3														
H.1.1														
H.1.2														
H.1.3														
H.1.4														
H.2.1														
H.3.1														
O.1.1	**25**	0,15	0,10	0,20	0,15	0,20	0,20	**15**	0,15	0,15	0,20	0,20	0,25	0,20
O.1.2	**25**	0,15	0,10	0,20	0,15	0,20	0,20	**12**	0,12	0,15	0,16	0,20	0,20	0,20
O.2.1														
O.2.2														
O.3.1														

The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine.
The specified values represent guideline cutting data that can be adjusted by approx. **±20%** according to the usage conditions.

Tolerance classes covered with 1/100 reamer

The most common tolerance is H7, so most reamers configured for an H7 fit tolerance.
With the 1/100 reamers, increments of 0.01 mm can be covered, but are also suitable for various other dimensions.
For example, a 1/100 reamer diameter 8.02 mm can be used for a 8.0 fit F7.
Other fit sizes shown in the table.

Tolerance	Nominal Ø in mm											
zone	1,0	2,0	3,0	4,0	5,0	6,0	7,0	8,0	9,0	10,0	11,0	12,0
A9				4,29	5,29	6,29	7,30	8,30	9,30	10,30	11,32	12,32
A11	1,31	2,31	3,31	4,32	5,32	6,32	7,35	8,35	9,35	10,35	11,37	12,37
B8				4,15	5,15	6,15	7,16	8,16	9,16	10,16		
B9				4,16	5,16	6,16	7,17	8,17	9,17	10,17	11,18	12,18
B10	1,17	2,17	3,17	4,17	5,17	6,17	7,19	8,19	9,19	10,19	11,20	12,20
B11	1,18	2,18	3,18	4,19	5,19	6,19	7,22	8,22	9,22	10,22	11,23	12,23
C8				4,08	5,08	6,08	7,09	8,09	9,09	10,09	11,11	12,11
C9	1,07	2,07	3,07	4,09	5,09	6,09	7,10	8,10	9,10	10,10	11,12	12,12
C10	1,09	2,09	3,09	4,10	5,10	6,10	7,12	8,12	9,12	10,12	11,14	12,14
C11	1,10	2,10	3,10	4,12	5,12	6,12	7,15	8,15	9,15	10,15	11,18	12,18
D7											11,06	12,06
D8				4,04	5,04	6,04	7,05	8,05	9,05	10,05	11,06	12,06
D9				4,05	5,05	6,05	7,06	8,06	9,06	10,06	11,08	12,08
D10	1,05	2,05	3,05	4,06	5,06	6,06	7,08	8,08	9,08	10,08	11,10	12,10
D11	1,06	2,06	3,06	4,08	5,08	6,08	7,10	8,10	9,10	10,10	11,13	12,13
E7							7,03	8,03	9,03	10,03	11,04	12,04
E8	1,02	2,02	3,02	4,03	5,03	6,03	7,04	8,04	9,04	10,04	11,05	12,05
E9	1,03	2,03	3,03	4,04	5,04	6,04	7,05	8,05	9,05	10,05	11,06	12,06
F7	1,01	2,01	3,01				7,02	8,02	9,02	10,02	11,02	12,02
F8	1,01	2,01	3,01	4,02	5,02	6,02	7,02	8,02	9,02	10,02	11,03	12,03
F9	1,02	2,02	3,02	4,03	5,03	6,03	7,03	8,03	9,03	10,03	11,04	12,04
F10				4,04	5,04	6,04	7,05	8,05	9,05	10,05	11,07	12,07
G7				4,01	5,01	6,01	7,01	8,01	9,01	10,01		
H7										10,01	11,01	12,01
H8				4,01	5,01	6,01	7,01	8,01	9,01	10,01	11,02	12,02
H9	1,01	2,01	3,01	4,02	5,02	6,02	7,02	8,02	9,02	10,02	11,03	12,03
H10	1,03	2,03	3,03	4,03	5,03	6,03	7,04	8,04	9,04	10,04	11,05	12,05
H11	1,04	2,04	3,04	4,05	5,05	6,05	7,06	8,06	9,06	10,06	11,08	12,08
H12	1,07	2,07	3,07	4,08	5,08	6,08	7,10	8,10	9,10	10,10	11,13	12,13
H13	1,11	2,11	3,11	4,14	5,14	6,14	7,18	8,18	9,18	10,18	11,22	12,22
J6				4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00
J7				4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00
J8	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00
JS7				4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00
JS8	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00
JS9	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,01	12,01
K8	0,99	1,99	2,99				6,99	7,99	8,99	9,99	10,99	11,99
M6							6,99	7,99	8,99	9,99	10,99	11,99
M7							6,99	7,99	8,99	9,99	10,99	11,99
M8	0,99	1,99	2,99	3,99	4,99	5,99	6,99	7,99	8,99	9,99	10,99	11,99
N6				3,99	4,99	5,99						
N7	0,99	1,99	2,99	3,99	4,99	5,99	6,99	7,99	8,99	9,99	10,99	11,99
N8	0,99	1,99	2,99	3,99	4,99	5,99	6,99	7,99	8,99	9,99	10,98	11,98
N9	0,98	1,98	2,98	3,99	4,99	5,99	6,99	7,99	8,99	9,99	10,98	11,98
N10	0,98	1,98	2,98	3,98	4,94	5,98	6,98	7,98	8,98	9,98	10,98	11,98
N11	0,98	1,98	2,98	3,98	4,94	5,98	6,98	7,98	8,98	9,98	10,97	11,97
P6	0,99	1,99	2,99								10,98	11,98
P7	0,99	1,99	2,99				6,98	7,98	8,98	9,98	10,98	11,98
P8	0,99	1,99	2,99	3,98	4,98	5,98					10,97	11,97
R6							6,98	7,98	8,98	9,98		
R7				3,98	4,98	5,98	6,98	7,98	8,98	9,98	10,97	11,97
S6				3,98	4,98	5,98					10,97	11,97
S7	0,98	1,98	2,98	3,98	4,98	5,98	6,97	7,97	8,97	9,97	10,97	11,97
U6							6,97	7,97	8,97	9,97		
U7				3,97	4,97	5,97	6,97	7,97	8,97	9,97		
X7				3,97	4,97	5,97						
X8	0,97	1,97	2,97				6,96	7,96	8,96	9,96	10,95	11,95
X9	0,97	1,97	2,97	3,96	4,96	5,96	6,95	7,95	8,95	9,95		
Z7	0,97	1,97	2,97	3,96	4,96	5,96	6,96	7,96	8,96	9,96	10,95	11,95
Z8	0,97	1,97	2,97	3,96	4,96	5,96	6,95	7,95	8,95	9,95	10,94	11,94
Z9				3,95	4,95	5,95						
Z10	0,96	1,96	2,96	3,95	4,95	5,95	6,94	7,94	8,94	9,94	10,93	11,93
ZA7	0,96	1,96	2,96	3,95	4,95	5,95	6,94	7,94	8,94	9,94		
ZA8							6,94	7,94	8,94	9,94	10,93	11,93
ZB8	0,95	1,95	2,95	3,94	4,94	5,94					10,90	11,90
ZB9	0,95	1,95	2,95	3,94	4,94	5,94	6,92	7,92	8,92	9,92	10,90	11,90

Coatings

HSS drilling

TiN

- TiN coating
- Maximum application temperature: 450 °C

Solid carbide drilling

DPX74S DRAGONSKIN

- Special TiAlN nanolayer coating
- Maximum application temperature: 1000 °C

DPX74M DRAGONSKIN

- Universal AlCrN-based monolayer coating developed for micro tools
- High oxidation, heat and wear resistance
- Maximum application temperature 1100 °C

DPA54 DRAGONSKIN

- Special multilayer coating
- High hardness and heat resistance
- Maximum application temperature: 800 °C

Ti800

- AlTiN nanolayer coating
- Maximum application temperature: 1100 °C

TiAlN

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

DLC DRAGONSKIN

- Diamond-like carbon coating
- Specially for machining non-ferrous metals
- Maximum application temperature: 400 °C

Reamers

DST

- Cermet, uncoated
- ISO | **P15** | **M10** | K10
- The uncoated cermet grade for finish machining stainless and hardened steel
- Particularly wear resistant thanks to high heat resistance

DBF-A

- AlCrN Multilayer coating
- specially developed for the machining of tempered materials < 62 HRC
- maximum application temperature: > 1100 °C

DBC

- Diamond-like carbon coating
- Specially for machining non-ferrous metals
- Maximum application temperature: 400 °C

DBG-U

- AlTiN Multilayer coating
- Especially for universal use in a variety of materials as well as for the machining of tempered materials < 62 HRC
- For high cutting speeds and suitable for MMS application
- Maximum application temperature: 1000 °C

TiAlN

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

DBG-P

- AlTiN Multilayer coating
- Especially for universal use in a variety of materials at high cutting speeds
- Suitable for MMS application
- Maximum application temperature: 1000 °C

DBC-N

- Diamond-like ta-C-Multilayer-carbon coating
- Particularly hard and smooth coating and therefore especially for machining non-ferrous metals
- Maximum application temperature: 500 °C

DBQ

- AlCrN-Multilayer-Beschichtung
- Particularly suitable for machining stainless steels and titanium
- Low formation of built-up edges
- Maximum application temperature: > 1000 °C

TiN

- TiN multilayer coating
- Maximum application temperature: 400 °C