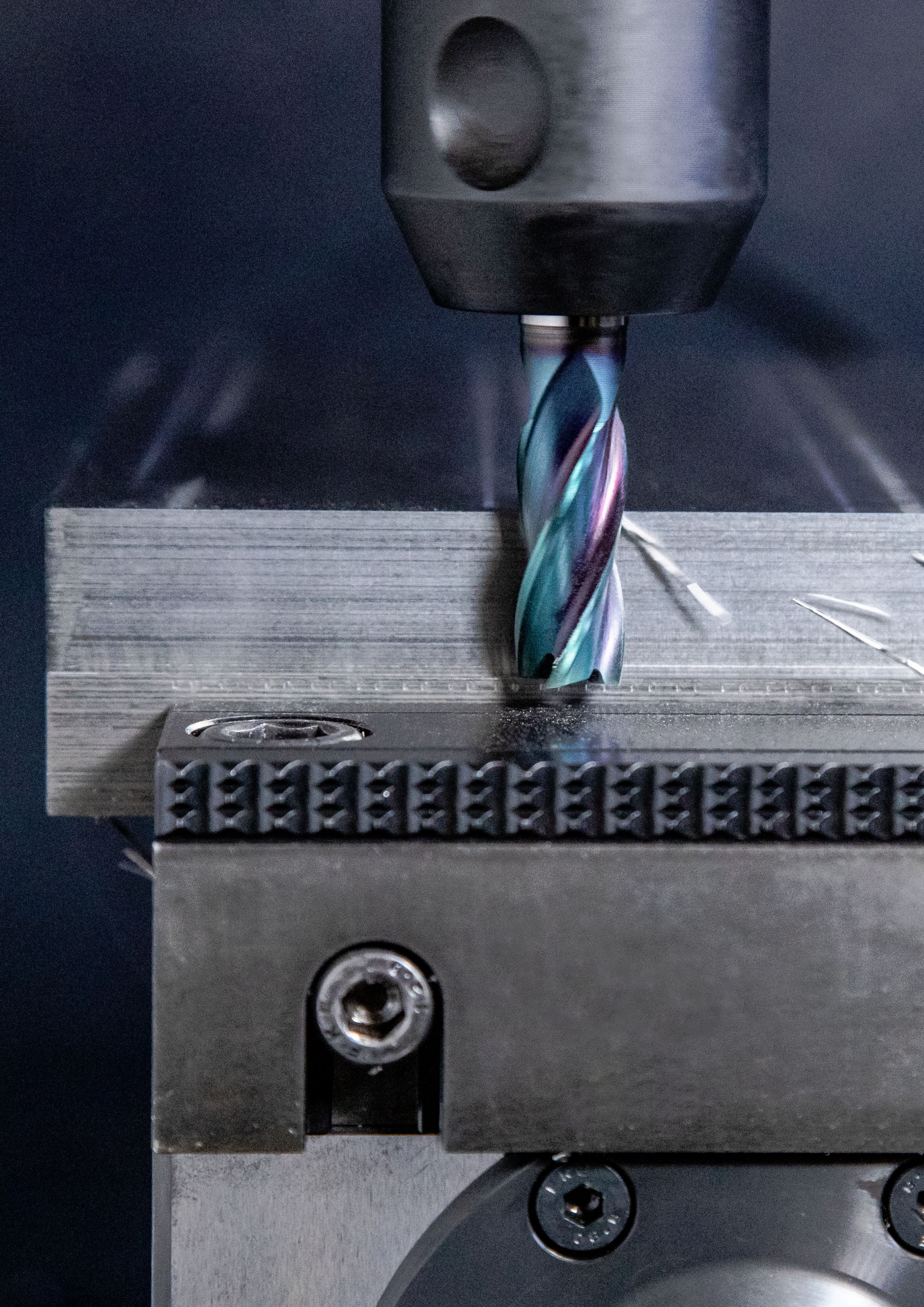


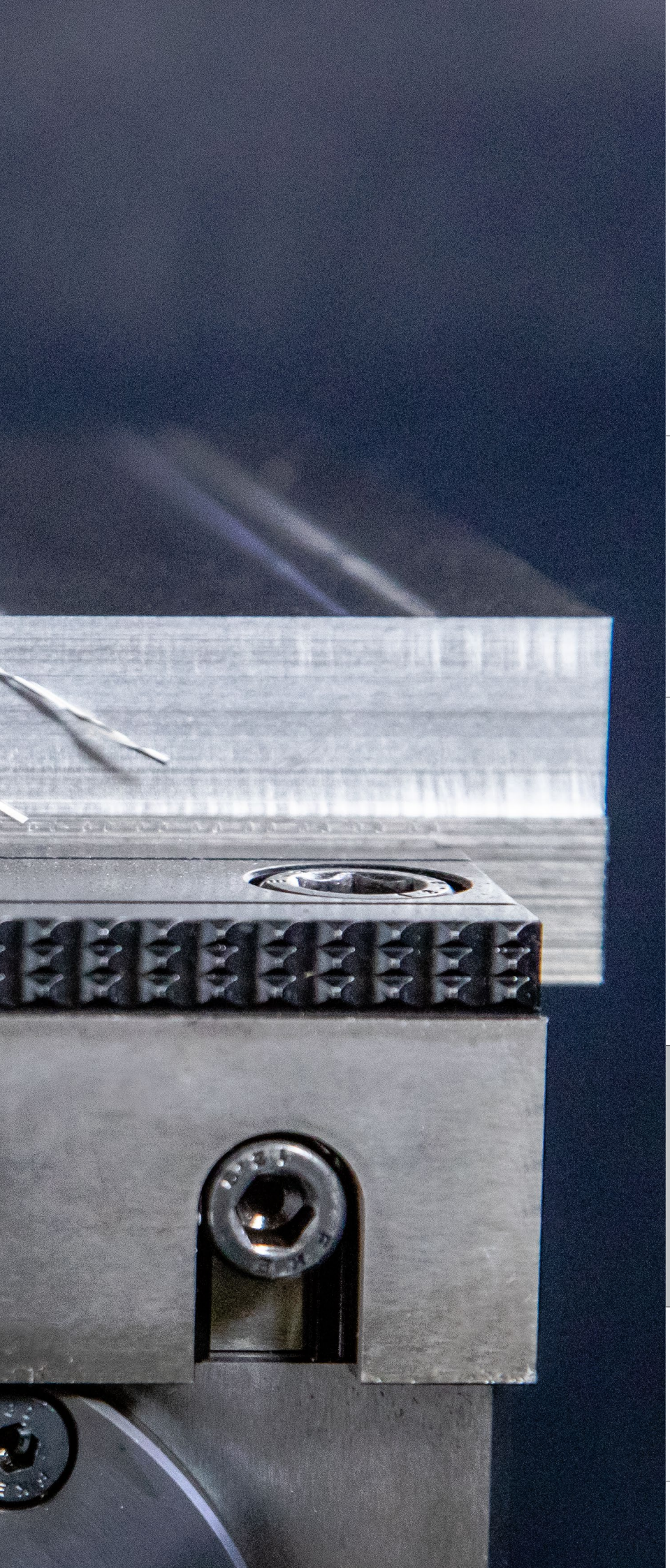


Table of contents

WNT \ Performance

Premium quality tools for high performance.

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

Symbol explanation

Shank

Shank type

Length: extra short / short / medium / long / extra long

Cutting edge preparation

Sharp

Chamfer (CHW = chamfer width in mm)

Full Radius

Application

Machining example

The red arrows describe the possible feed directions

Number of teeth

Cutting geometry
λ_s = helix angle
γ_s = rake angle

● = **Main Application**

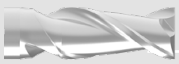
○ = Extended application

Toolfinder

softer — Material to machine — harder

Finish milling

W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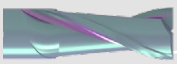
37

N


8–15


25

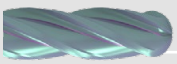

28+29


31


33+34


37

H

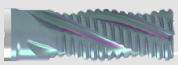

26


32


35+36

Rough and finish machining

NTI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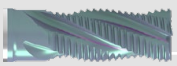
HS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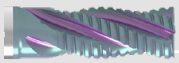
NF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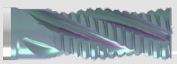
30

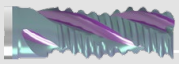

37

HF


19

Rough machining

WR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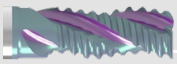
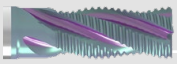
NR


21+22


38

HR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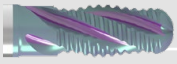
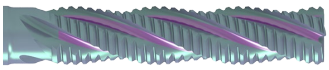
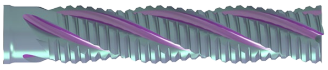
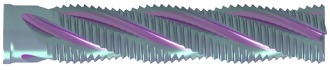
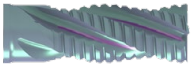
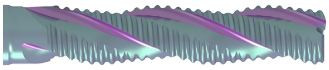
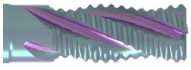
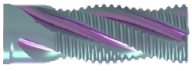
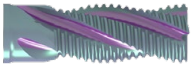

27

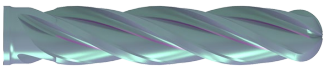
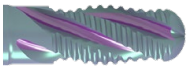
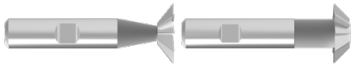
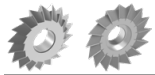
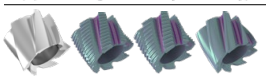

38

13

Overview HSS milling cutters

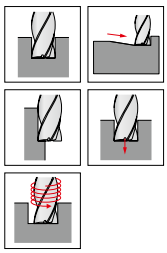
	Tool type	Number of teeth ZEFP	Diameter in mm Ø DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat resistant alloys	hardened materials	Sharp	Chamfer	Radius	Full Radius	Length	Material, e.g. PM = Powdersteel	coated	uncoated	WNT \ Performance
Finishing cutter																		
	W	2	2–22				●			■				■	HSS-E		□	6
	W	3–4	2–40				●			■				■	HSS-E		□	7
	N	2	1–26	●	●	●	○	○		■				■	HSS-E	■	□	8+9
	N	3	1–10	●	●	●	○	○		■				■	HSS-E	■	□	10
	N	3	1,8–24,7	●	●	●	○	○		■				■	HSS-E	■	□	11+12
	N	4–5	4–25	○	●	○	●	●		■				■	HSS-E	■	□	13
	N	4–8	2–50	●	●	●	○	○		■				■	HSS-E	■	□	14+15
Rough and finish milling cutters																		
	NTI	4–6	6–40	○	●	○	○	●			■			■	PM	■		16
	NF	4–5	6–28	●	○	●	○	○		■				■	HSS-E	■		17
	HS	4–6	6–40	○		●		●			■			■	PM	■		18
	HF	4	6–25	●	○	●	○	○		■				■	PM	■		19
Rough milling cutters																		
	WR	3	6–32				●			■				■	HSS-E	■		20
	NR	3	6–25	●	○	●	○	○			■			■	HSS-E	■	□	21
	NR	4–6	6–40	●	○	●	○	○			■			■	HSS-E	■	□	22
	HR	4–6	6–32	●	●	●	○	○			■			■	PM	■		23
	HR	3–6	4–32	●	●	●	○	○			■			■	HSS-E	■	□	24

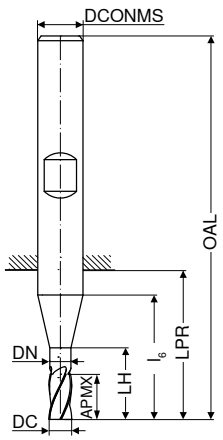
Overview HSS milling cutters

	Tool type	Number of teeth ZEFP	Diameter in mm Ø DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat resistant alloys	hardened materials	Sharp	Chamfer	Radius	Full Radius	Length	Material, e.g. PM = Powdersteel	coated	uncoated	WNT \ Performance
Ball nose end milling cutters																		
	N	2	2–30	●	○	●	○	○					◐		HSS-E	■	□	25
	H	4–5	6–25	●	○	●	○	○					◐		HSS-E	■	□	26
	HR	4	6–20	●	○	●	○	○					◐		HSS-E	■		27
Form / Side and Face / Shell milling cutters																		
	N	6–10	11–60	●	○	●	○	○							HSS-E		□	28
	N	6–12	10,5–45,5	●	○	●	○	○							HSS-E		□	29
	NF	6–8	21–45	●	○	●	○	○							HSS-E		□	30
	N	4–6	1–16	●	○	●	○	○							HSS-E		□	31
	H	10	16–25	●	○	●	○	○							HSS-E		□	32
	N	14–28		●	○	●	○	○							HSS		□	33
		12–52		●	●	●	●	●							HSS-E		□	34–36
		6–12		●	●	●	●	○							HSS-E	■	□	37+38

13

Slot milling cutter HSS-E Co 8





DIN 844

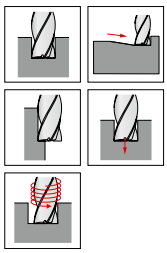
U6

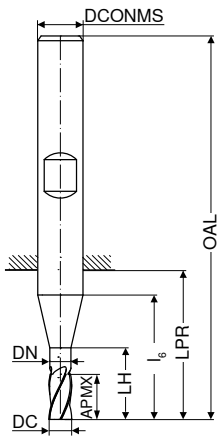
DC e8 mm	APMX mm	DN mm	LH mm	l6 mm	LPR mm	OAL mm	DCONMS h6 mm	ZEFP	Article no. 50 144 ... £	
2.0	7		7	13	15	51	6	2	27.79	**020**
2.5	8		8	14	16	52	6	2	26.51	**025**
3.0	8		8	14	16	52	6	2	25.87	**030**
3.5	10		10	16	18	54	6	2	29.22	**035**
4.0	11		11	17	19	55	6	2	26.51	**040**
4.5	11		11	17	19	55	6	2	30.32	**045**
5.0	13		13	19	21	57	6	2	27.18	**050**
5.5	13		13	19	21	57	6	2	30.99	**055**
6.0	13		13	19	21	57	6	2	27.18	**060**
6.5	16	6.0	22	24	26	66	10	2	36.91	**065**
7.0	16	6.5	22	24	26	66	10	2	34.87	**070**
8.0	19	7.5	25	27	29	69	10	2	31.22	**080**
9.0	19	8.5	26	27	29	69	10	2	39.70	**090**
10.0	22	9.5	30	30	32	72	10	2	37.93	**100**
12.0	26	11.5	36	36	38	83	12	2	43.62	**120**
14.0	26	11.5	36	36	38	83	12	2	50.59	**140**
16.0	32	15.0	42	42	44	92	16	2	55.64	**160**
18.0	32	15.0	42	42	44	92	16	2	70.77	**180**
20.0	38	19.0	52	52	54	104	20	2	86.88	**200**
22.0	38	19.0	52	52	54	104	20	2	126.32	**220**

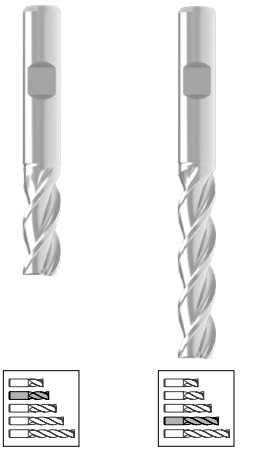
Steel	
Stainless steel	
Cast iron	
Non ferrous metals	●
Heat resistant alloys	
hardened materials	

→ v_c/f_z Page 40–42

End milling cutter HSS-E Co 8







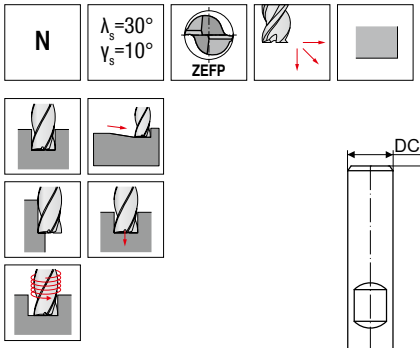
									DIN 69844		DIN 844	
									B		B	
									U8		U8	
DC k10	APMX	DN	LH	l6	LPR	OAL	DCONMS h6	ZEFP	Article no. 50 120 ...		Article no. 50 121 ...	
mm	mm	mm	mm	mm	mm	mm	mm		£		£	
2	7		7	13	15	51	6	3	33.50	020		
3	8		8	14	16	52	6	3	26.16	030		
3	12		12	18	20	56	6	3			32.41	030
4	11		11	17	19	55	6	3	26.51	040		
4	19		19	25	27	63	6	3			32.20	040
5	13		13	19	21	57	6	3	26.98	050		
5	24		24	30	32	68	6	3			32.20	050
6	13	5.5	19	19	21	57	6	3	27.40	060		
6	24	5.5	30	30	32	68	6	3			33.40	060
7	16	6.5	22	24	26	66	10	3	28.81	070		
7	30	6.5	36	38	40	80	10	3			42.29	070
8	19	7.5	25	27	29	69	10	3	30.95	080		
8	38	7.5	44	46	48	88	10	3			35.92	080
9	19	8.5	26	27	29	69	10	3	32.98	090		
9	38	8.5	45	46	48	88	10	3			48.09	090
10	22	9.5	30	30	32	72	10	3	33.98	100		
10	45	9.5	53	53	55	95	10	3			39.66	100
12	26	11.5	36	36	38	83	12	3	37.93	120		
12	53	11.5	63	63	65	110	12	3			44.75	120
14	26	11.5	36	36	38	83	12	3	44.04	140		
14	53	11.5	63	63	65	110	12	3			51.27	140
16	32	15.0	42	42	44	92	16	3	44.47	160		
16	63	15.0	73	73	75	123	16	3			52.02	160
18	32	15.0	42	42	44	92	16	3	73.40	180		
18	63	15.0	73	73	75	123	16	3			90.07	180
20	38	19.0	52	52	54	104	20	3	72.34	200		
20	75	19.0	89	89	91	141	20	3			84.84	200
22	38	19.0	52	52	54	104	20	3	99.95	220		
22	75	19.0	89	89	91	141	20	3			117.24	220
24	90	23.0	106	108	110	166	25	3			161.25	240
25	45	24.0	63	45	65	121	25	4	130.60	250		
25	90	24.0	108	108	110	166	25	4			152.97	250
28	90	24.0	108	108	110	166	25	4			185.22	280
30	90	24.0	108	108	110	166	25	4			220.23	300
32	106	31.0	123	123	126	186	32	4			241.74	320
36	106	31.0	123	123	126	186	32	4			354.31	360
40	125	38.0	142	142	147	217	40	4			428.82	400

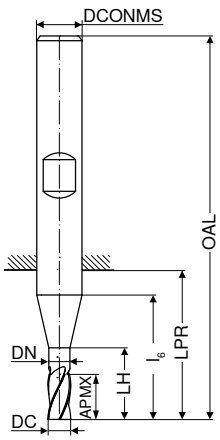
Steel		
Stainless steel		
Cast iron		
Non ferrous metals	●	●
Heat resistant alloys		
hardened materials		

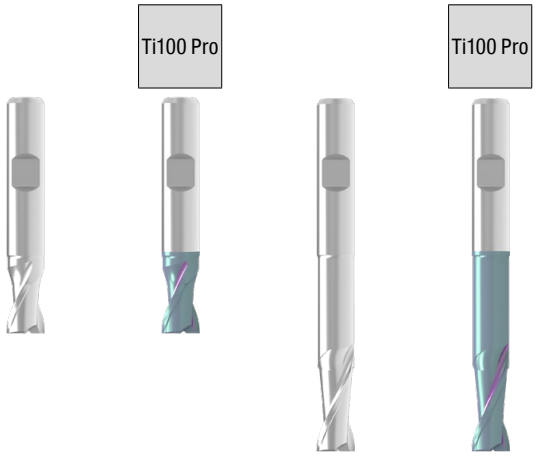
→ v_c/f_z Page 40–42

13

Slot milling cutter HSS-E Co 8







										DIN 327		DIN 327		Factory standard		Factory standard	
										U8		U8		U8		U8	
DC	Tol.	APMX	DN	LH	l_6	LPR	OAL	DCONMS $_{h6}$	ZEFP	Article no. 50 100 ...		Article no. 54 025 ...		Article no. 50 122 ...		Article no. 54 020 ...	
mm		mm	mm	mm	mm	mm	mm	mm		£		£		£		£	
1.00	h10	2.5		2.5	9	11	47	6	2	23.25	010 1)	22.97	010 1)				
1.50	h10	3.0		3.0	9	11	47	6	2	21.95	015 1)	22.09	015 1)				
1.80	h10	4.0		4.0	10	12	48	6	2	15.64	018	29.07	018				
2.00	e8	4.0		4.0	10	12	48	6	2	13.66	020	25.76	020				
2.50	e8	5.0		5.0	11	13	49	6	2	13.66	025	25.76	025				
2.80	h10	5.0		5.0	11	13	49	6	2	14.52	028	21.21	028				
3.00	e8	5.0		5.0	11	13	49	6	2	13.66	030	20.82	030				
3.00	e8	8.0		8.0	18	20	56	6	2					22.00	030	40.69	030
3.50	h10	6.0		6.0	12	14	50	6	2	13.66	035	19.47	035				
3.50	h10	10.0		10.0	21	23	59	6	2					26.31	035	43.73	035
3.80	h10	7.0		7.0	13	15	51	6	2	14.39	038	27.22	038				
4.00	e8	7.0		7.0	13	15	51	6	2	13.66	040	17.64	040				
4.00	e8	11.0		11.0	25	27	63	6	2					23.09	040	27.41	040
4.50	h10	7.0		7.0	13	15	51	6	2	15.56	045	19.47	045				
4.50	h10	11.0		11.0	25	27	63	6	2					28.61	045	30.51	045
4.80	h10	8.0		8.0	14	16	52	6	2	16.95	048	28.09	048				
5.00	e8	8.0		8.0	14	16	52	6	2	13.98	050	19.86	050				
5.00	e8	13.0		13.0	30	32	68	6	2					23.09	050	27.41	050
5.50	h10	8.0		8.0	14	16	52	6	2	15.56	055	20.74	055				
5.50	h10	13.0		13.0	30	32	68	6	2					28.61	055	30.51	055
5.75	h10	8.0		8.0	14	16	52	6	2	15.99	057	28.09	057				
6.00	e8	8.0	5.50	14.0	14	16	52	6	2	13.98	060	19.56	060				
6.00	e8	13.0	5.50	30.0	30	32	68	6	2					24.64	060	28.78	060
6.50	h10	10.0	6.00	16.0	18	20	60	10	2	18.69	065	25.49	065				
6.50	h10	16.0	6.35	36.0	38	40	80	10	2					33.98	065	37.97	065
6.75	h10	10.0	6.50	16.0	18	20	60	10	2	19.24	067	25.49	067				
7.00	e8	10.0	6.50	16.0	18	20	60	10	2	17.97	070	25.49	070				
7.00	e8	16.0	6.35	36.0	38	40	80	10	2					31.22	070	36.42	070
7.50	h10	10.0	7.00	16.0	18	20	60	10	2	19.39	075	25.57	075				
7.50	h10	16.0	7.35	36.0	38	40	80	10	2					33.98	075	37.97	075
7.75	h10	11.0	7.50	17.0	19	21	61	10	2	19.39	077	40.69	077				
8.00	e8	11.0	7.50	17.0	19	21	61	10	2	18.25	080	27.22	080				
8.00	e8	19.0	7.35	44.0	46	48	88	10	2					27.26	080	34.19	080
8.50	h10	11.0	8.00	18.0	19	21	61	10	2	23.54	085	28.78	085				
8.50	h10	19.0	8.35	45.0	46	48	88	10	2					36.47	085	40.08	085
8.70	h10	11.0	8.50	18.0	19	21	61	10	2	24.70	087	43.16	087				
9.00	h10	11.0	8.50	18.0	19	21	61	10	2	21.73	090	40.77	090				
9.00	h10	19.0	8.35	45.0	46	48	88	10	2					33.98	090	55.87	090
9.50	h10	11.0	9.00	18.0	19	21	61	10	2	23.23	095	41.61	095				
9.50	h10	19.0	9.35	45.0	46	48	88	10	2					55.50	095	54.14	095
9.70	h10	13.0	9.50	21.0	21	23	63	10	2	23.23	097	43.12	097				
10.00	e8	13.0	9.50	21.0	21	23	63	10	2	22.57	100	27.04	100				
10.00	e8	22.0	9.35	53.0	53	55	95	10	2					29.89	100	36.21	100
10.50	h10	13.0	10.00	21.0	23	25	70	12	2	41.11	105	43.49	105				
10.70	h10	13.0	10.50	21.0	23	25	70	12	2	44.54	107	46.11	107				
11.00	h10	13.0	10.50	21.0	23	25	70	12	2	30.22	110	39.32	110				
11.00	h10	22.0	10.50	53.0	55	57	102	12	2					38.94	110	43.77	110
11.50	h10	13.0	11.00	21.0	23	25	70	12	2	41.93	115	44.17	115				

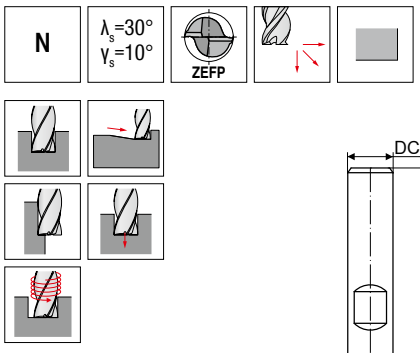
Steel	●	●	●	●
Stainless steel	○	●	○	●
Cast iron	●	●	●	●
Non ferrous metals	○	○	○	○
Heat resistant alloys	○	○	○	○
hardened materials				

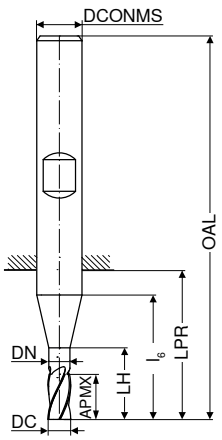
1) Factory standard

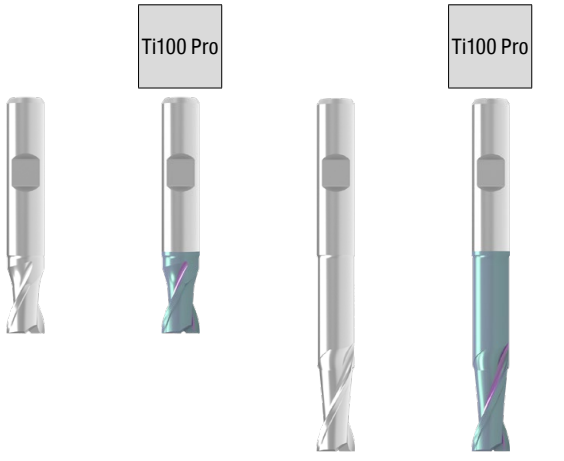
→ v_c/f_z Page 40–42

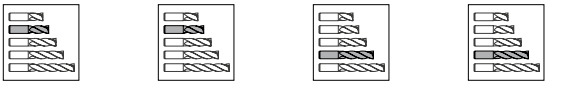
Continued on next page

Slot milling cutter HSS-E Co 8









										DIN 327		DIN 327		Factory standard		Factory standard	
										B		B		B		B	
										U8		U8		U8		U8	
DC	Tol.	APMX	DN	LH	l_6	LPR	OAL	DCONMS $_{h6}$	ZEFP	Article no. 50 100 ...		Article no. 54 025 ...		Article no. 50 122 ...		Article no. 54 020 ...	
mm		mm	mm	mm	mm	mm	mm	mm		£		£		£		£	
11.70	h10	16.0	11.50	26.0	26	28	73	12	2	32.41	117	46.70	117				
12.00	e8	16.0	11.50	26.0	26	28	73	12	2	27.96	120	35.36	120				
12.00	e8	26.0	11.50	63.0	63	65	110	12	2					33.91	120	41.55	120
12.70	h10	16.0	11.50	26.0	26	28	73	12	2	57.28	127	62.97	127				
13.00	h10	16.0	11.50	26.0	26	28	73	12	2	47.59	130	56.27	130				
13.00	h10	26.0	11.50	63.0	63	65	110	12	2					52.75	130	60.84	130
13.70	h10	16.0	11.50	26.0	26	28	73	12	2	39.71	137	52.69	137				
14.00	e8	16.0	11.50	26.0	26	28	73	12	2	34.87	140	47.16	140				
14.00	e8	26.0	11.50	63.0	63	65	110	12	2					42.77	140	55.79	140
14.70	h10	16.0	11.50	26.0	26	28	73	12	2	53.60	147						
15.00	h10	16.0	11.50	26.0	26	28	73	12	2	44.17	150	52.30	150				
15.00	h10	26.0	11.50	63.0	63	65	110	12	2					53.75	150	92.70	150
15.70	h10	19.0	15.00	29.0	29	31	79	16	2	45.05	157	72.34	157				
16.00	e8	19.0	15.00	29.0	29	31	79	16	2	42.88	160	50.76	160				
16.00	e8	32.0	15.00	73.0	73	75	123	16	2					51.19	160	61.78	160
16.70	h10	19.0	15.00	29.0	29	31	79	16	2	72.92	167						
17.00	h10	19.0	15.00	29.0	29	31	79	16	2	69.32	170	81.07	170				
17.00	h10	32.0	15.00	73.0	73	75	123	16	2					113.30	170	118.17	170
17.70	h10	19.0	15.00	29.0	29	31	79	16	2	53.60	177	80.78	177				
18.00	e8	19.0	15.00	29.0	29	31	79	16	2	52.87	180	61.91	180				
18.00	e8	32.0	15.00	73.0	73	75	123	16	2					68.73	180	84.45	180
19.00	h10	19.0	15.00	29.0	29	31	79	16	2	81.78	190	86.59	190				
19.00	h10	32.0	15.00	73.0	73	75	123	16	2					118.70	190	121.93	190
19.70	h10	22.0	19.00	36.0	36	38	88	20	2	65.36	197	95.13	197				
20.00	e8	22.0	19.00	36.0	36	38	88	20	2	61.47	200	74.58	200				
20.00	e8	38.0	19.00	89.0	89	91	141	20	2					67.39	200	85.89	200
21.70	h10	22.0	19.00	36.0	36	38	88	20	2	116.64	217	124.95	217				
22.00	e8	22.0	19.00	36.0	36	38	88	20	2	77.19	220	114.19	220				
22.00	e8	38.0	19.00	89.0	89	91	141	20	2					103.14	220	146.25	220
23.70	h10	26.0	23.00	42.0	44	46	102	25	2	151.78	237	150.51	237				
24.00	e8	26.0	23.00	42.0	44	46	102	25	2	86.14	240	142.26	240				
24.00	e8	45.0	23.00	106.0	108	110	166	25	2					127.99	240	227.07	240
24.70	h10	26.0	24.00	44.0	44	46	102	25	2	151.78	247	145.47	247				
25.00	e8	26.0	24.00	44.0	44	46	102	25	2	84.84	250	143.15	250				
25.00	e8	45.0	24.00	108.0	108	110	166	25	2					127.99	250	151.36	250
26.00	h10	26.0	24.00	44.0	44	46	102	25	2	105.75	260	158.91	260				

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

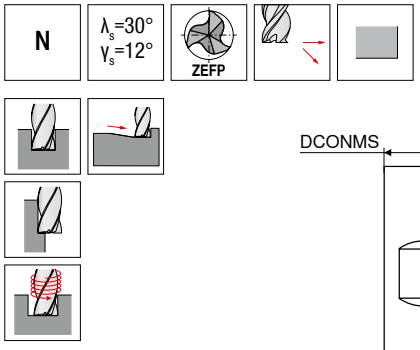
1) Factory standard

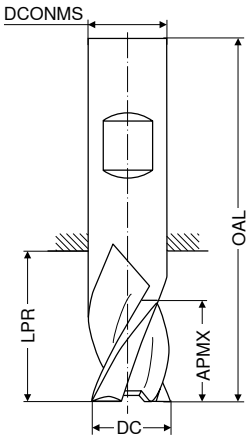
→ v_c/f_z Page 40–42

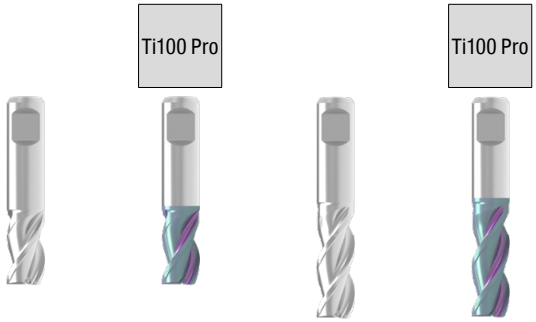
13

Throw-away milling cutter, HSS-E Co 8

▲ Shank similar to DIN 1835 B







						Factory standard		Factory standard		Factory standard		Factory standard	
						B		B		B		B	
						U6		U8		U6		U8	
DC e8	APMX	LPR	OAL	DCONMS h6	ZEFP	Article no. 50 092 ...		Article no. 54 014 ...		Article no. 50 093 ...		Article no. 54 042 ...	
mm	mm	mm	mm	mm		£		£		£		£	
1.00	2	8	34	6	3	12.10	010	15.56	010				
1.50	3	8	34	6	3	12.10	015	15.56	015				
1.50	4	10	35	6	3					13.93	015 1)	17.21	015 1)
1.80	3	8	34	6	3	12.10	018	15.56	018				
2.00	4	9	35	6	3	12.10	020	15.56	020				
2.00	7	12	38	6	3					13.93	020 1)	17.21	020
2.30	4	9	35	6	3	12.10	023	15.56	023				
2.50	5	10	36	6	3	12.10	025	15.56	025				
2.50	8	13	39	6	3					13.93	025 1)	17.21	025
2.80	5	10	36	6	3	12.10	028	15.56	028				
3.00	5	10	36	6	3	12.10	030	15.56	030				
3.00	8	13	39	6	3					13.93	030 1)	17.21	030
3.30	6	11	37	6	3	12.10	033	15.56	033				
3.50	6	11	37	6	3	12.10	035	15.56	035				
3.50	10	15	41	6	3					13.93	035 1)	17.21	035
3.80	7	12	38	6	3	12.10	038	15.56	038				
4.00	7	12	38	6	3	12.10	040	15.56	040				
4.00	11	16	42	6	3					13.93	040 1)	17.21	040
4.30	7	12	38	6	3	12.10	043	15.56	043				
4.50	7	12	38	6	3	12.10	045	15.56	045				
4.50	11	16	42	6	3					13.93	045 1)	17.21	045
4.80	8	13	39	6	3	12.10	048	15.56	048				
5.00	8	13	39	6	3	12.10	050	15.56	050				
5.00	13	18	44	6	3					13.93	050 1)	17.21	050
5.30	8	13	39	6	3	12.10	053	15.56	053				
5.50	8	13	39	6	3	12.10	055	15.56	055				
5.50	13	18	44	6	3					13.93	055 1)	17.21	055
5.75	8	13	39	6	3	12.10	057	15.56	057				
6.00	8	13	39	6	3	12.10	060	15.56	060				
6.00	13	18	44	6	3					13.93	060 1)	17.21	060
6.50	10	14	42	8	3	14.01	065	20.50	065				
6.50	16	20	48	8	3					16.71	065 1)	22.82	065
7.00	10	14	42	8	3	14.01	070	20.50	070				
7.00	16	20	48	8	3					16.71	070 1)	22.82	070
7.50	10	14	42	8	3	14.01	075	20.50	075				
7.50	16	20	48	8	3					16.71	075 1)	22.82	075
8.00	11	15	43	8	3	14.01	080	20.50	080				
8.00	19	23	51	8	3					16.71	080 1)	22.82	080
8.50	11	16	48	10	3	18.14	085	24.20	085				
8.50	19	24	56	10	3					21.01	085 1)	25.89	085
9.00	11	16	48	10	3	18.14	090	24.20	090				
9.00	19	24	56	10	3					21.01	090 1)	25.89	090
9.50	11	16	48	10	3	18.14	095	24.20	095				
9.50	19	24	56	10	3					21.01	095 1)	25.89	095
10.00	13	18	50	10	3	18.14	100	24.20	100				
10.00	22	27	59	10	3					21.01	100 1)	25.89	100

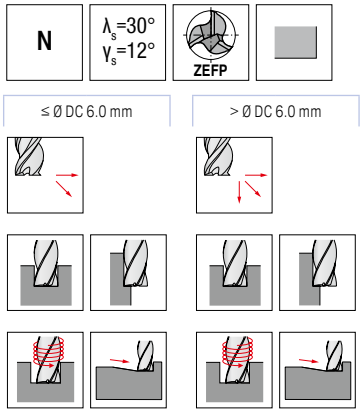
Steel	●	●	●	●
Stainless steel	○	●	○	●
Cast iron	●	●	●	●
Non ferrous metals	○	○	○	○
Heat resistant alloys	○	○	○	○
hardened materials				

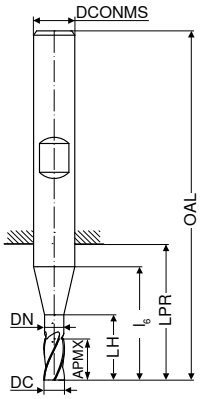
1) Shank tolerance -0,025 / -0,0323

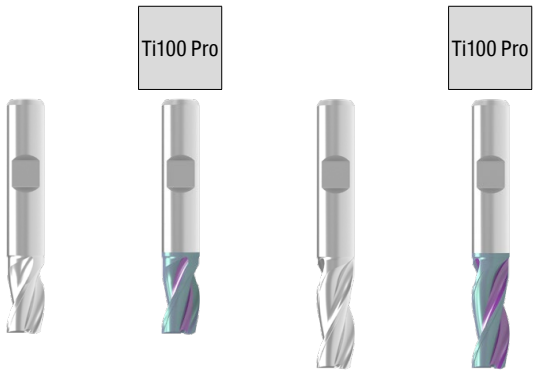
→ v_c/f_z Page 40–42

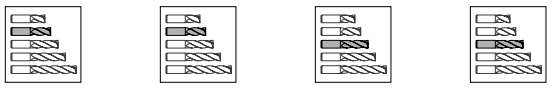
End milling cutter HSS-E Co 8

▲ Ø ≤ 6 mm, 3 teeth cutting to centre









DC	Tol.	APMX	DN	LH	l_6	LPR	OAL	DCONMS $_{h6}$	ZEFP	DIN 327 B U8 Article no. 50 105 ...		DIN 327 B U8 Article no. 54 021 ...		DIN 844 K B U8 Article no. 50 106 ...		DIN 844 K B U8 Article no. 54 016 ...	
mm		mm	mm	mm	mm	mm	mm	mm		£		£		£		£	
1.80	h10	4		4	10	12	48	6	3	24.37	018	24.99	018				
2.00	e8	4		4	10	12	48	6	3	17.54	020	22.18	020				
2.50	e8	5		5	11	13	49	6	3	17.54	025	22.18	025				
2.80	h10	5		5	11	13	49	6	3	24.37	028	27.31	028				
2.80	h10	8		8	18	20	56	6	3					29.48	028 [1]	32.35	028 [1]
3.00	e8	5		5	11	13	49	6	3	17.54	030	22.18	030				
3.00	e8	8		8	14	16	52	6	3					21.46	030	26.83	030
3.50	h10	6		6	12	14	50	6	3	17.54	035	25.97	035				
3.50	h10	10		10	16	18	54	6	3					29.33	035	32.27	035
3.80	h10	7		7	13	15	51	6	3	24.37	038	27.41	038				
3.80	h10	11		11	25	27	63	6	3					29.48	038 [1]	32.35	038 [1]
4.00	e8	7		7	13	15	51	6	3	17.54	040	22.18	040				
4.00	e8	11		11	17	19	55	6	3					21.46	040	19.95	040
4.50	h10	7		7	13	15	51	6	3	17.54	045	25.97	045				
4.50	h10	11		11	17	19	55	6	3					29.48	045	22.58	045
4.80	h10	8		8	14	16	52	6	3	24.37	048	27.31	048				
5.00	e8	8		8	14	16	52	6	3	17.54	050	22.18	050				
5.00	e8	13		13	19	21	57	6	3					21.46	050	19.95	050
5.50	h10	8		8	14	16	52	6	3	17.54	055	25.97	055				
5.50	h10	13		13	19	21	57	6	3					29.33	055	22.58	055
5.75	h10	8		8	14	16	52	6	3	24.37	057	27.31	057				
6.00	e8	8	5.5	14	14	16	52	6	3	17.54	060	22.18	060				
6.00	e8	13	5.5	19	19	21	57	6	3					21.46	060	19.95	060
6.50	h10	10	6.0	16	18	20	60	10	3	27.95	065	31.20	065				
6.50	h10	16	6.0	22	24	26	66	10	3					37.22	065	41.55	065
6.75	h10	10	6.5	16	18	20	60	10	3	35.16	067	36.88	067				
7.00	e8	10	6.5	16	18	20	60	10	3	27.95	070	34.30	070				
7.00	e8	16	6.5	22	24	26	66	10	3					37.22	070	41.55	070
7.50	h10	10	7.0	16	18	20	60	10	3	27.95	075	36.21	075				
7.50	h10	16	7.0	22	24	26	66	10	3					38.76	075	42.22	075
7.75	h10	11	7.5	17	19	21	61	10	3	30.87	077	39.41	077				
8.00	e8	11	7.5	17	19	21	61	10	3	26.16	080	33.98	080				
8.00	e8	19	7.5	25	27	29	69	10	3					30.32	080	28.40	080
8.50	h10	11	8.0	18	19	21	61	10	3	26.16	085	36.21	085				
8.50	h10	19	8.0	26	27	29	69	10	3					46.09	085	47.47	085
8.70	h10	11	8.5	18	19	21	61	10	3	32.67	087	36.88	087				
9.00	h10	11	8.5	18	19	21	61	10	3	29.23	090	36.21	090				
9.00	h10	19	8.5	26	27	29	69	10	3					36.26	090	40.87	090
9.50	h10	11	9.0	18	19	21	61	10	3	29.23	095	36.21	095				
9.50	h10	19	9.0	26	27	29	69	10	3					39.70	095	40.08	095
9.70	h10	13	9.5	21	21	23	63	10	3	29.23	097	40.87	097				
10.00	e8	13	9.5	21	21	23	63	10	3	24.86	100	33.91	100				
10.00	e8	22	9.5	30	30	32	72	10	3					30.32	100	29.34	100
10.50	h10	13	10.0	21	23	25	70	12	3	44.97	105	46.40	105				
10.70	h10	13	10.5	21	23	25	70	12	3	46.09	107	46.97	107				
11.00	h10	13	10.5	21	23	25	70	12	3	33.98	110	37.58	110				

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

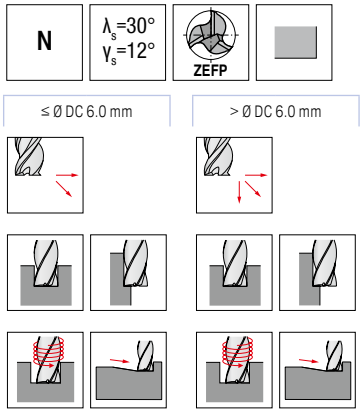
1) Factory standard

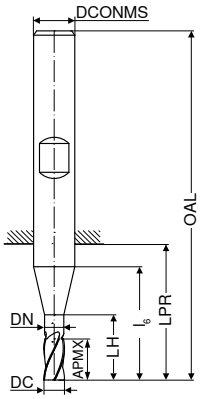
→ v_c/f_z Page 40–42

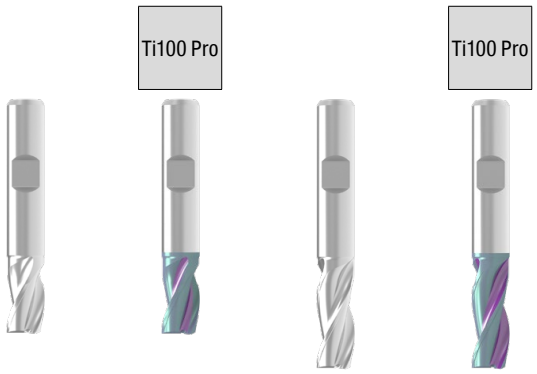
Continued on next page

End milling cutter HSS-E Co 8

▲ Ø ≤ 6 mm, 3 teeth cutting to centre







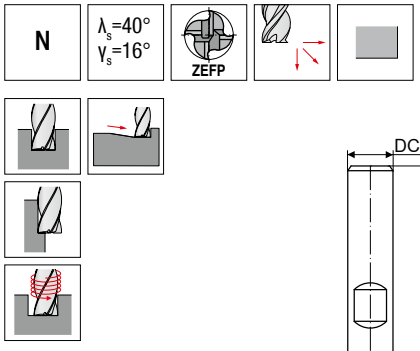
DC	Tol.	APMX	DN	LH	l_6	LPR	OAL	DCONMS $_{h6}$	ZEFP	DIN 327 B U8 Article no. 50 105 ...		DIN 327 B U8 Article no. 54 021 ...		DIN 844 K B U8 Article no. 50 106 ...		DIN 844 K B U8 Article no. 54 016 ...	
mm		mm	mm	mm	mm	mm	mm	mm		£		£		£		£	
11.00	h10	22	10.5	30	32	34	79	12	3					42.34	110	47.16	110
11.50	h10	13	11.0	21	23	25	70	12	3	44.97	115	46.40	115				
11.50	h10	22	11.0	30	32	34	79	12	3					55.22	115	56.47	115
11.70	h10	16	11.5	26	26	28	73	12	3	38.88	117	45.63	117				
12.00	e8	16	11.5	26	26	28	73	12	3	32.54	120	38.94	120				
12.00	e8	26	11.5	36	36	38	83	12	3					36.12	120	32.73	120
12.70	h10	16	11.5	26	26	28	73	12	3	61.02	127	65.10	127				
13.00	h10	16	11.5	26	26	28	73	12	3	43.62	130	52.49	130				
13.00	h10	26	11.5	36	36	38	83	12	3					57.16	130	65.57	130
13.70	h10	16	11.5	26	26	28	73	12	3	50.99	137	53.58	137				
14.00	e8	16	11.5	26	26	28	73	12	3	43.62	140	47.36	140				
14.00	e8	26	11.5	36	36	38	83	12	3					48.41	140	39.91	140
15.00	h10	16	11.5	26	26	28	73	12	3	46.07	150	62.09	150				
15.00	h10	26	11.5	36	36	38	83	12	3					62.57	150	68.29	150
15.50	h10	32	15.0	42	42	44	92	16	3					75.82	155	78.75	155
15.70	h10	19	15.0	29	29	31	79	16	3	50.99	157	71.38	157				
16.00	e8	19	15.0	29	29	31	79	16	3	43.62	160	65.64	160				
16.00	e8	32	15.0	42	42	44	92	16	3					54.39	160	58.11	160
17.00	h10	19	15.0	29	29	31	79	16	3	73.05	170	83.38	170				
17.00	h10	32	15.0	42	42	44	92	16	3					94.91	170	104.97	170
17.70	h10	19	15.0	29	29	31	79	16	3	70.77	177	82.43	177				
18.00	e8	19	15.0	29	29	31	79	16	3	58.30	180	74.38	180				
18.00	e8	32	15.0	42	42	44	92	16	3					66.00	180	67.60	180
19.00	h10	19	15.0	29	29	31	79	16	3	88.27	190	94.13	190				
19.00	h10	32	15.0	42	42	44	92	16	3					100.59	190	109.63	190
19.50	h10	38	19.0	52	52	54	104	20	3					107.77	195	123.59	195
19.70	h10	22	19.0	36	36	38	88	20	3	77.69	197	94.13	197				
20.00	e8	22	19.0	36	36	38	88	20	3	68.28	200	86.59	200				
20.00	e8	38	19.0	52	52	54	104	20	3					76.37	200	70.41	200
21.70	h10	22	19.0	36	36	38	88	20	3	124.51	217	123.98	217				
22.00	e8	22	19.0	36	36	38	88	20	3	97.46	220	111.77	220				
22.00	e8	38	19.0	52	52	54	104	20	3					106.11	220	151.45	220
23.70	h10	26	23.0	42	44	46	102	25	3	150.53	237	157.66	237				
24.00	e8	26	23.0	42	44	46	102	25	3	113.88	240	138.02	240				
24.70	h10	26	24.0	44	44	46	102	25	3	161.73	247	157.66	247				

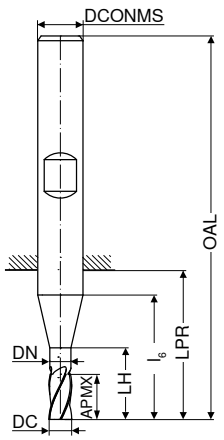
Steel	●	●	●	●
Stainless steel	○	●	○	●
Cast iron	●	●	●	●
Non ferrous metals	○	○	○	○
Heat resistant alloys	○	○	○	○
hardened materials				

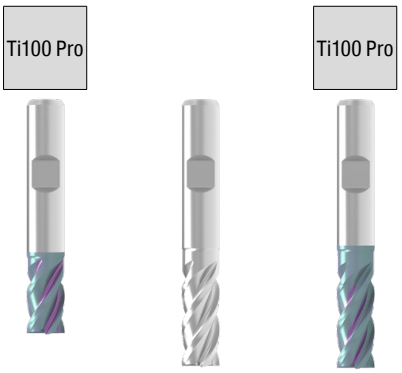
1) Factory standard

→ v_c/f_z Page 40–42

End milling cutter HSS-E Co 8







DC	Tol.	APMX	DN	LH	l_6	LPR	OAL	DCONMS $_{h6}$	ZEFP	Factory standard B U8 Article no. 54 017 ... £		DIN 844 B U8 Article no. 50 124 ... £		DIN 844 B U8 Article no. 54 011 ... £	
mm		mm	mm	mm	mm	mm	mm	mm							
4	k10	11		11	17	19	55	6	4			29.51	040	37.14	040
5	k10	13		13	19	21	57	6	4			29.51	050	38.82	050
6	e8	8	5.5	14	14	16	52	6	4	18.01	060				
6	k10	13	5.5	19	19	21	57	6	4			32.11	060	39.87	060
8	e8	11	7.5	17	19	21	61	10	4	24.61	080				
8	k10	19	7.5	25	27	29	69	10	4			35.45	080	47.66	080
9	k10	19	8.5	26	27	29	69	10	4			40.84	090	52.20	090
10	e8	13	9.5	21	21	23	63	10	4	25.37	100				
10	k10	22	9.5	30	30	32	72	10	4			38.80	100	47.66	100
12	e8	16	11.5	26	26	28	73	12	4	30.79	120				
12	k10	26	11.5	36	36	38	83	12	4			44.62	120	62.47	120
14	e8	16	11.5	26	26	28	73	12	4	42.52	140				
14	k10	26	11.5	36	36	38	83	12	4			59.22	140	85.13	140
15	k10	26	11.5	36	36	38	83	12	4			64.08	150		
16	e8	19	15.0	29	29	31	79	16	4	44.36	160				
16	k10	32	15.0	42	42	44	92	16	4			60.57	160	87.31	160
17	k10	32	15.0	42	42	44	92	16	4			74.11	170	123.16	170
18	e8	19	15.0	29	29	31	79	16	4	51.62	180				
18	k10	32	15.0	42	42	44	92	16	4			82.40	180	121.48	180
20	e8	22	19.0	36	36	38	88	20	4	62.09	200				
20	k10	38	19.0	52	52	54	104	20	4			94.31	200	126.24	200
25	k10	45	24.0	63	63	65	121	25	5			146.66	250	198.15	250

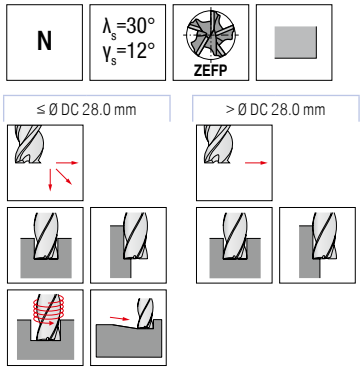
Steel	○	○	○
Stainless steel	●	●	●
Cast iron	○	○	○
Non ferrous metals	●	●	●
Heat resistant alloys	●	●	●
hardened materials			

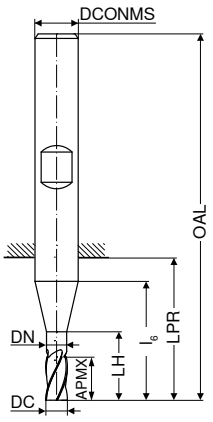
→ v_c/f_z Page 40–42

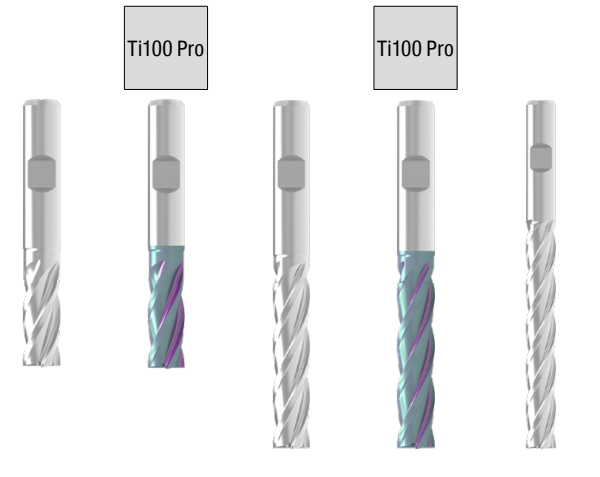
13

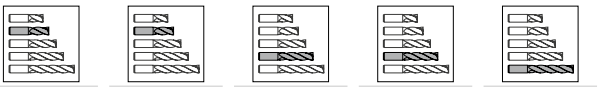
End milling cutter HSS-E Co 8

▲ > Ø 28,0 mm recessed centre









DC k10	APMX	DN	LH	l6	LPR	OAL	DCONMS h6	ZEFP	DIN 69844		DIN 69844		DIN 844		DIN 844		Factory standard	
									U8		U8		U8		U8		U6	
mm	mm	mm	mm	mm	mm	mm	mm		Article no. 50 110 ... £		Article no. 54 018 ... £		Article no. 50 111 ... £		Article no. 54 019 ... £		Article no. 50 104 ... £	
2.0	7		7	13	15	51	6	4	15.56	020	22.39	020						
2.5	8		8	14	16	52	6	4	15.56	025	22.39	025						
3.0	8		8	14	16	52	6	4	15.56	030	22.39	030						
3.0	12		12	18	20	56	6	4					25.72	030	29.65	030		
3.5	10		10	16	18	54	6	4	15.56	035	22.39	035						
4.0	11		11	17	19	55	6	4	15.56	040	22.14	040						
4.0	19		19	25	27	63	6	4					26.43	040	30.03	040		
4.5	11		11	17	19	55	6	4	15.56	045	22.39	045						
5.0	13		13	19	21	57	6	4	15.56	050	22.14	050						
5.0	24		24	30	32	68	6	4					23.23	050	30.03	050		
5.5	13		13	19	21	57	6	4	15.56	055	22.39	055						
6.0	13	5.5	19	19	21	57	6	4	15.56	060	22.51	060						
6.0	24	5.5	30	30	32	68	6	4					23.23	060	28.09	060		
6.0	56	5.5	62	62	64	100	6	4									54.87	060
6.5	16	6.0	22	24	26	66	10	4	19.82	065	36.63	065						
7.0	16	6.5	22	24	26	66	10	4	19.82	070	27.84	070						
7.0	30	6.5	36	38	40	80	10	4					33.86	070	43.68	070		
7.5	16	7.0	22	24	26	66	10	4	19.82	075	36.63	075						
8.0	19	7.5	25	27	29	69	10	4	19.23	080	31.19	080						
8.0	38	7.5	44	46	48	88	10	4					33.86	080	39.41	080		
8.0	70	7.5	73	73	75	115	10	4									65.10	080
8.5	19	8.0	26	27	29	69	10	4	19.82	085	29.09	085						
9.0	19	8.5	26	27	29	69	10	4	21.67	090	37.49	090						
9.0	38	8.5	45	46	48	88	10	4					33.86	090	46.70	090		
9.5	19	9.0	26	27	29	69	10	4	21.67	095	42.55	095						
10.0	22	9.5	30	30	32	72	10	4	21.67	100	32.91	100						
10.0	45	9.5	53	53	55	95	10	4					33.86	100	42.13	100		
10.0	75	9.5	79	79	81	121	10	4									78.46	100
10.5	22	10.0	30	32	34	79	12	4	33.86	105	48.13	105						
11.0	22	10.5	30	32	34	79	12	4	32.25	110	37.37	110						
11.0	45	10.5	53	55	57	102	12	4					44.17	110	50.84	110		
11.5	22	11.0	30	32	34	79	12	4	29.78	115	37.37	115						
12.0	26	11.5	36	36	38	83	12	4	29.78	120	35.88	120						
12.0	53	11.5	63	63	65	110	12	4					44.83	120	45.91	120		
12.0	85		85	85	85	130	12	4									85.13	120
13.0	26	11.5	36	36	38	83	12	4	42.29	130	51.21	130						
14.0	26	11.5	36	36	38	83	12	4	38.22	140	42.18	140						
14.0	53	11.5	63	63	65	110	12	4					51.61	140	54.34	140		

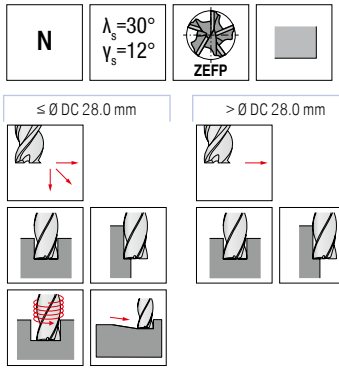
Steel	●	●	●	●	●
Stainless steel	○	●	○	●	○
Cast iron	●	●	●	●	●
Non ferrous metals	○	○	○	○	○
Heat resistant alloys	○	○	○	○	○
hardened materials					

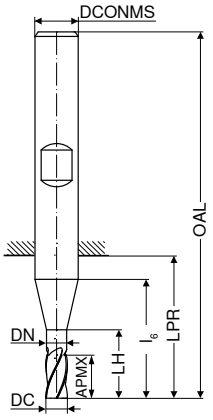
→ v_c/f_z Page 40–42

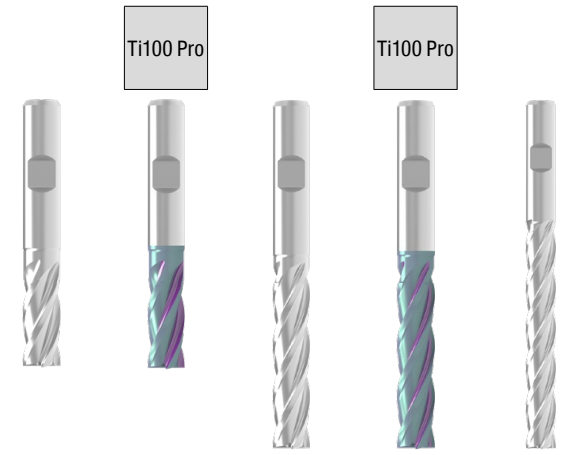
Continued on next page

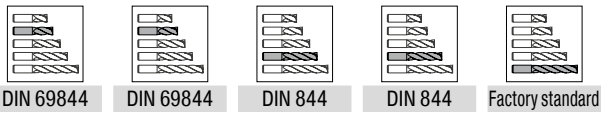
End milling cutter HSS-E Co 8

▲ > Ø 28,0 mm recessed centre









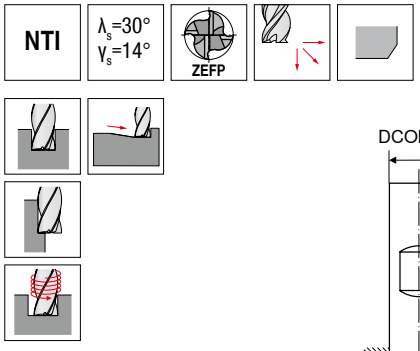
									DIN 69844		DIN 69844		DIN 844		DIN 844		Factory standard	
									B		B		B		B		B	
									U8		U8		U8		U8		U6	
DC k10	APMX	DN	LH	l6	LPR	OAL	DCONMS h6	ZEFP	Article no. 50 110 ...		Article no. 54 018 ...		Article no. 50 111 ...		Article no. 54 019 ...		Article no. 50 104 ...	
mm	mm	mm	mm	mm	mm	mm	mm		£		£		£		£		£	
14.0	85		85	85	85	130	12	4									103.57	140
15.0	26	11.5	36	36	38	83	12	4	44.47	150	53.20	150						
15.0	53	11.5	63	63	65	110	12	4					46.66	150	73.97	150		
16.0	32	15.0	42	42	44	92	16	4	42.29	160	59.50	160						
16.0	63	15.0	73	73	75	123	16	4					62.69	160	73.69	160		
16.0	90	15.0	95	95	97	145	16	4									112.77	160
18.0	32	15.0	42	42	44	92	16	4	57.25	180	68.31	180						
18.0	63	15.0	73	73	75	123	16	4					76.79	180	88.81	180		
18.0	100	15.0	110	110	112	160	16	5									158.37	180
20.0	38	19.0	52	52	54	104	20	4	63.06	200	74.97	200						
20.0	75	19.0	89	89	91	141	20	4					74.82	200	99.95	200		
20.0	110	19.0	128	128	130	180	20	5									163.29	200
22.0	38	19.0	52	52	54	104	20	5	74.82	220	93.77	220						
22.0	75	19.0	89	89	91	141	20	5					97.93	220	143.82	220		
22.0	110	19.0	128	128	130	180	20	5									208.43	220
24.0	45	23.0	61	63	65	121	25	5	93.83	240	116.04	240						
24.0	90	23.0	106	108	110	166	25	5					122.60	240	201.53	240		
25.0	45	24.0	63	63	65	121	25	5	93.83	250	115.31	250						
25.0	90	24.0	108	108	110	166	25	5					122.60	250	200.38	250		
25.0	125	24.0	142	142	144	200	25	6									213.35	250
28.0	45	24.0	63	63	65	121	25	5	98.64	280	130.26	280						
28.0	90	24.0	108	108	110	166	25	5					152.12	280	236.99	280		
28.0	140	24.0	147	147	149	205	25	6									294.16	280
30.0	45	24.0	63	63	65	121	25	5	145.85	300	188.43	300						
30.0	90	24.0	108	108	110	166	25	5					170.24	300	259.63	300		
32.0	53	31.0	70	70	73	133	32	6	145.85	320								
32.0	53	31.0	70	70	73	133	32	5			149.59	320						
32.0	106	31.0	123	123	126	186	32	6					179.44	320	285.97	320		
32.0	160	31.0	167	167	170	230	32	6									355.04	320
36.0	53	31.0	70	70	73	133	32	6	186.93	360	249.04	360						
40.0	63	38.0	80	80	85	155	40	6	243.35	400	295.32	400						
40.0	125	38.0	142	142	147	217	40	6					324.52	400	352.70	400		
40.0	180	31.0	197	197	200	260	32	8									597.30	400
45.0	125	38.0	142	142	147	217	40	8					640.70	450	611.08	450		
50.0	150	48.0	172	172	172	252	50	8					780.56	500	753.92	500		

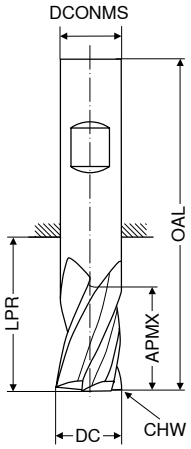
Steel	●	●	●	●	●
Stainless steel	○	●	○	●	○
Cast iron	●	●	●	●	●
Non ferrous metals	○	○	○	○	○
Heat resistant alloys	○	○	○	○	○
hardened materials					

→ v_c/f_z Page 40–42

13

Powdersteel roughing finishing cutter



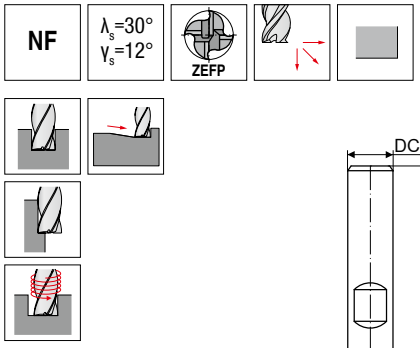


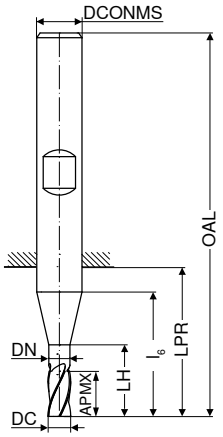
							DIN 69844		DIN 844	
							B		B	
							U8		U8	
DC k12	APMX	LPR	OAL	DCONMS h6	CHW	ZEFP	Article no. 54 007 ...		Article no. 54 008 ...	
mm	mm	mm	mm	mm	mm		£		£	
6	13	21	57	6	0.3	4	82.94	060		
6	24	32	68	6	0.3	4			121.16	060
7	16	26	66	10	0.3	4	119.70	070		
8	19	29	69	10	0.3	4	110.98	080		
8	38	48	88	10	0.3	4			143.38	080
9	19	29	69	10	0.5	4	127.99	090		
10	22	32	72	10	0.5	4	119.70	100		
10	45	55	95	10	0.5	4			150.21	100
12	26	38	83	12	0.7	4	122.90	120		
12	53	65	110	12	0.7	4			167.20	120
14	26	38	83	12	0.8	4	155.31	140		
14	53	65	110	12	0.8	4			199.75	140
16	32	44	92	16	0.8	4	175.93	160		
16	63	75	123	16	0.8	4			227.07	160
18	32	44	92	16	0.8	4	220.23	180		
18	63	75	123	16	0.8	4			288.21	180
20	38	54	104	20	0.8	4	233.76	200		
20	75	91	141	20	0.8	4			312.18	200
25	45	65	121	25	1.0	5	346.32	250		
25	90	110	166	25	1.0	4			506.40	250
30	90	110	166	25	1.3	5			796.21	300
32	53	73	133	32	1.3	6	463.68	320		
32	106	126	186	32	1.3	5			736.50	320
40	63	85	155	40	1.3	6	796.21	400		
40	125	147	217	40	1.3	6			1,145.71	400

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

→ v_c/f_z Page 40–42

Roughing-finishing milling cutter HSS-E Co 5





DIN 69844 | DIN 844

U8 | U8

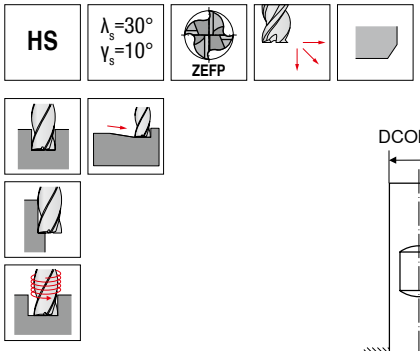
DC k12 mm	APMX mm	DN mm	LH mm	l6 mm	LPR mm	OAL mm	DCONMS h6 mm	ZEFP	Article no. 54 028 ... £		Article no. 54 029 ... £	
6	13	5.5	19	19	21	57	6	4	33.02	060		
6	24	5.5	30	30	32	68	6	4			46.70	060
7	16	6.5	22	24	26	66	10	4	42.13	070		
8	19	7.5	25	27	29	69	10	4	40.39	080		
8	38	7.5	44	46	48	88	10	4			64.12	080
9	19	8.5	26	27	29	69	10	4	49.11	090		
10	22	9.5	30	30	32	72	10	4	46.01	100		
10	45	9.5	53	53	55	95	10	4			67.13	100
11	22	10.5	30	32	32	79	12	4	56.66	110		
11	45	10.5	53	55	57	102	12	4			81.07	110
12	26	11.5	36	36	38	83	12	4	51.35	120		
12	53	11.5	63	63	65	110	12	4			73.23	120
13	26	11.5	36	36	38	83	12	4	64.02	130		
14	26	11.5	36	36	38	83	12	4	58.60	140		
15	26	11.5	36	36	38	83	12	4	75.17	150		
15	53	11.5	63	63	65	110	12	4			103.64	150
16	32	15.0	42	42	44	92	16	4	75.54	160		
16	63	15.0	73	73	75	123	16	4			106.34	160
18	32	15.0	42	42	44	92	16	4	93.57	180		
20	38	19.0	52	52	54	104	20	4	100.92	200		
20	75	19.0	89	89	91	141	20	4			139.44	200
22	75	19.0	89	89	91	141	20	4			251.02	220
22	38	19.0	52	52	54	104	20	4	125.41	220		
25	90	24.0	108	108	110	166	25	4			271.92	250
25	45	24.0	63	63	65	121	25	4	154.29	250		
28	90	24.0	108	108	110	166	25	5			302.44	280

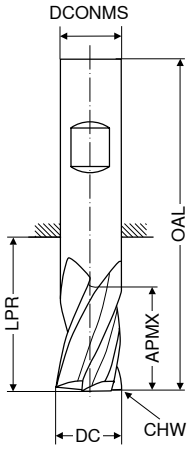
Steel	●	●
Stainless steel	○	○
Cast iron	●	●
Non ferrous metals	○	○
Heat resistant alloys	○	○
hardened materials		

→ v_c/f_z Page 40–42

13

Powdersteel roughing finishing cutter





DIN 69844

U8

DIN 844

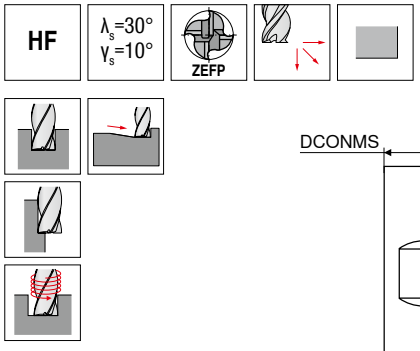
U8

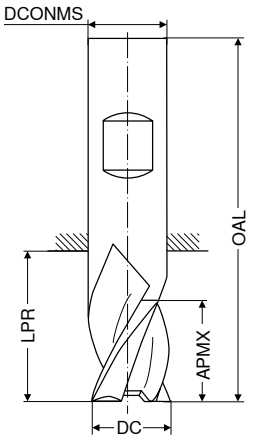
DC k12	APMX	LPR	OAL	DCONMS h6	CHW	ZEFP	Article no. 54 009 ...		Article no. 54 012 ...	
mm	mm	mm	mm	mm	mm		£		£	
6	13	21	57	6	0.45	4	82.94	060		
6	24	32	68	6	0.45	4			121.16	060
8	19	29	69	10	0.45	4	110.98	080		
8	38	48	88	10	0.45	4			143.38	080
10	22	32	72	10	0.45	4	119.70	100		
10	45	55	95	10	0.45	4			150.21	100
12	26	38	83	12	0.45	4	122.90	120		
12	53	65	110	12	0.45	4			167.20	120
14	26	38	83	12	0.45	4	155.31	140		
14	53	65	110	12	0.45	4			199.75	140
16	32	44	92	16	0.60	4	175.93	160		
16	63	75	123	16	0.60	4			227.07	160
18	32	44	92	16	0.60	4	220.23	180		
18	63	75	123	16	0.60	4			288.21	180
20	38	54	104	20	0.60	4	233.76	200		
20	75	91	141	20	0.60	4			312.18	200
22	38	54	104	20	0.60	5	307.09	220		
25	45	65	121	25	0.75	5	346.32	250		
25	90	110	166	25	0.75	5			506.40	250
28	45	65	121	25	0.75	5	434.77	280		
28	90	110	166	25	0.75	5			763.95	280
30	45	65	121	25	0.75	5	502.91	300		
30	90	110	166	25	0.75	5			796.21	300
32	53	73	133	32	0.75	6	463.68	320		
32	106	126	186	32	0.75	5			736.50	320
40	63	85	155	40	0.90	6	796.21	400		

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

→ v_c/f_z Page 40–42

Powdersteel roughing finishing cutter





Ti100 Pro

DIN 844

U8

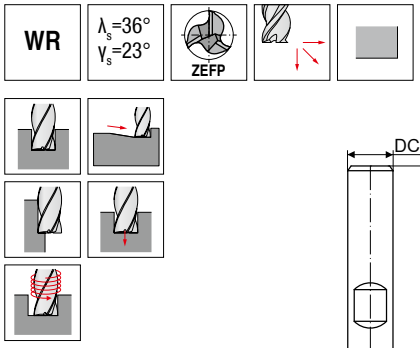
DC k12 mm	APMX mm	LPR mm	OAL mm	DCONMS h6 mm	ZEFP	Article no. 54 034 ... £	
6	13	21	57	6	4	38.61	060
8	19	29	69	10	4	52.63	080
10	22	32	72	10	4	54.79	100
12	26	38	83	12	4	60.51	120
14	26	38	83	12	4	68.81	140
16	32	44	92	16	4	91.42	160
18	32	44	92	16	4	125.80	180
20	38	54	104	20	4	115.71	200
25	45	65	121	25	4	174.74	250

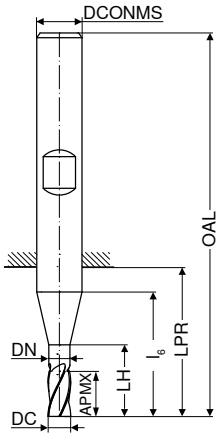
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	○
Heat resistant alloys	○
hardened materials	

→ v_c/f_z Page 40–42

13

Rough milling cutter HSS-E Co 8





DIN 844

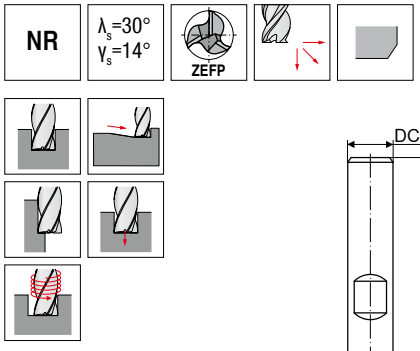
Factory standard

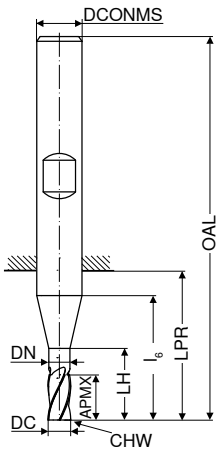
DC k12 mm	APMX mm	DN mm	LH mm	l6 mm	LPR mm	OAL mm	DCONMS h6 mm	ZEFP	U8 Article no. 54 013 ... £		U8 Article no. 54 010 ... £	
6	13	5.5	19	19	21	57	6	3	65.42	060		
6	19	5.5	25	25	27	63	6	3			85.37	060
8	19	7.5	25	27	29	69	10	3	87.23	080		
8	28	7.5	34	36	38	78	10	3			102.57	080
10	22	9.5	30	30	32	72	10	3	97.20	100		
10	34	9.5	42	42	44	84	10	3			105.91	100
12	26	11.5	36	36	38	83	12	3	104.31	120		
12	40	11.5	50	50	52	97	12	3			119.70	120
16	32	15.0	42	42	44	92	16	3	145.13	160		
16	48	15.0	58	58	60	108	16	3			160.40	160
20	38	19.0	52	52	54	104	20	3	194.66	200		
20	56	19.0	70	70	72	122	20	3			228.52	200
25	45	24.0	63	63	65	121	25	3	279.78	250		
25	68	24.0	86	86	88	144	25	3			364.90	250
32	80	31.0	97	97	100	160	32	3			509.89	320

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

→ v_c/f_z Page 40–42

Rough milling cutter HSS-E Co 8





										DIN 69844		DIN 69844		DIN 844		DIN 844	
										B		B		B		B	
										U8		U8		U8		U8	
DC k12	APMX	DN	LH	l6	LPR	OAL	DCONMS h6	CHW	ZEFP	Article no. 50 153 ...		Article no. 54 026 ...		Article no. 50 157 ...		Article no. 54 027 ...	
mm	mm	mm	mm	mm	mm	mm	mm	mm		£		£		£		£	
6	13	5.5	19	19	21	57	6	0.5	3	39.28	060	40.01	060				
6	24	5.5	30	30	32	68	6	0.5	3					46.49	060	48.23	060
7	16	6.5	22	24	26	66	10	0.5	3	44.04	070	50.56	070				
8	19	7.5	25	27	29	69	10	0.7	3	44.62	080	51.04	080				
8	38	7.5	44	46	48	88	10	0.7	3					50.22	080	62.85	080
9	19	8.5	26	27	29	69	10	0.7	3	48.09	090	54.23	090				
9	38	8.5	45	46	48	88	10	0.7	3					55.93	090	65.10	090
10	22	9.5	30	30	32	72	10	0.7	3	44.47	100	51.62	100				
10	45	9.5	53	53	55	95	10	0.7	3					57.25	100	66.05	100
11	22	10.5	30	32	34	79	12	0.7	3	50.59	110	58.79	110				
11	45	10.5	53	55	55	102	12	0.7	3					63.48	110	74.28	110
12	26	11.5	36	36	38	83	12	0.7	3	51.61	120	62.28	120				
12	53	11.5	63	63	65	110	12	0.7	3					61.14	120	75.45	120
14	26	11.5	36	36	38	83	12	0.9	3	60.45	140	66.15	140				
14	53	11.5	63	63	65	110	12	0.9	3					74.82	140	85.02	140
15	26	11.5	36	36	38	83	12	0.9	3	62.93	150	68.01	150				
15	53	11.5	63	63	65	110	12	0.9	3					85.84	150	85.80	150
16	32	15.0	42	42	44	92	16	0.9	3	66.84	160	88.32	160				
16	63	15.0	73	73	75	123	16	0.9	3					84.25	160	114.87	160
18	32	15.0	42	42	44	92	16	0.9	3	83.84	180	101.51	180				
18	63	15.0	73	73	75	123	16	0.9	3					105.18	180	125.80	180
20	38	19.0	52	52	54	104	20	0.9	3	101.00	200	119.70	200				
20	75	19.0	89	89	91	141	20	0.9	3					121.73	200	146.71	200
25	45	24.0	63	63	65	121	25	0.9	3	142.94	250	174.41	250				
25	90	24.0	108	108	110	166	25	0.9	3					180.85	250	224.03	250

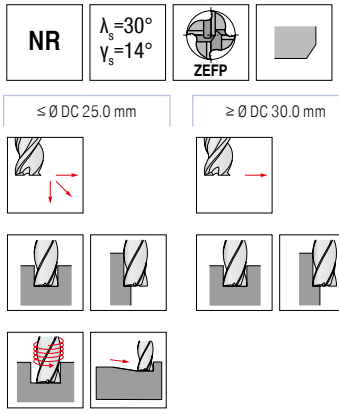
Steel	●	●	●	●
Stainless steel	○	○	○	○
Cast iron	●	●	●	●
Non ferrous metals	○	○	○	○
Heat resistant alloys	○	○	○	○
hardened materials				

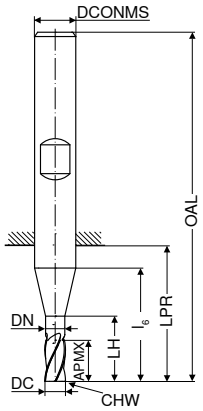
→ v_c/f_z Page 40–42

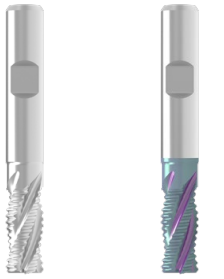
13

Rough milling cutter HSS-E Co 5

▲ > Ø 25,0 mm recessed centre







DIN 69844

B

U8

DIN 69844

B

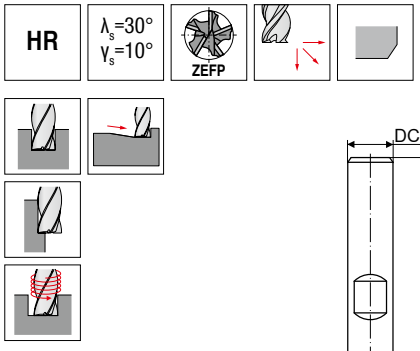
U8

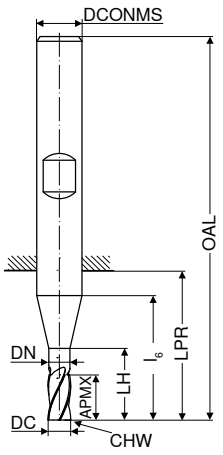
DC k12 mm	APMX mm	DN mm	LH mm	l6 mm	LPR mm	OAL mm	DCONMS h6 mm	CHW mm	ZEFP	Article no. 50 125 ... £		Article no. 54 030 ... £	
6	13	5.5	19	19	21	57	6	0.5	4	34.03	060	33.02	060
7	16	6.5	22	24	26	66	10	0.5	4	41.52	070	44.66	070
8	19	7.5	25	27	29	69	10	0.7	4	34.87	080	40.39	080
9	19	8.5	26	27	29	69	10	0.7	4	43.17	090	50.76	090
10	22	9.5	30	30	32	72	10	0.7	4	34.87	100	46.01	100
11	22	10.5	30	32	32	79	12	0.7	4	51.47	110	56.66	110
12	26	11.5	36	36	38	83	12	0.7	4	48.41	120	51.35	120
13	26	11.5	36	36	38	83	12	0.7	4			64.02	130
14	26	11.5	36	36	38	83	12	0.9	4	50.79	140	57.73	140
15	26	11.5	36	36	38	83	12	0.9	4			75.17	150
16	32	15.0	42	42	44	92	16	0.9	4	57.70	160	75.54	160
18	32	15.0	42	42	44	92	16	0.9	4	64.62	180	84.94	180
20	38	19.0	52	52	54	104	20	0.9	4	80.25	200	101.01	200
22	38	19.0	52	52	54	104	20	0.9	4			124.05	220
24	45	23.0	61	63	65	121	25	0.9	4			155.15	240
25	45	24.0	63	63	65	121	25	0.9	4	118.02	250	154.29	250
30	45	24.0	63	63	65	121	25	1.1	5			203.37	300
32	53	31.0	70	70	73	133	32	1.1	6			209.96	320
40	63	38.0	80	80	85	155	40	1.1	6			415.65	400

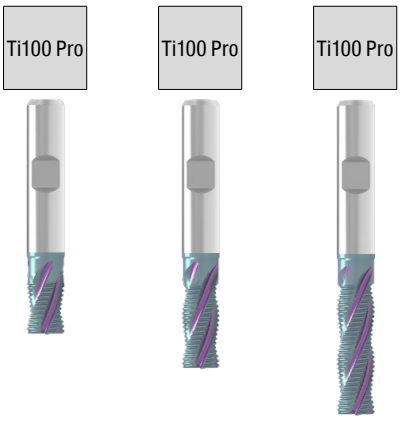
Steel	●	●
Stainless steel	○	○
Cast iron	●	●
Non ferrous metals	○	○
Heat resistant alloys	○	○
hardened materials		

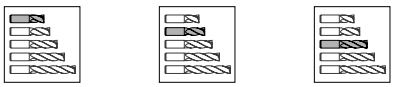
→ v_c/f_z Page 40–42

Powdersteel Fine rough milling cutter









	Factory standard	DIN 844	Factory standard
	B	B	B
	U8	U8	U8
DC k12 / mm	Article no. 54 031 ... £	Article no. 54 032 ... £	Article no. 54 033 ... £
6	48.90 060		
6		35.88 060	
8	54.47 080		
8		48.62 080	
8			62.69 080
10	55.30 100		
10		50.59 100	
10			77.19 100
12	66.11 120		
12		55.79 120	
12			91.53 120
14	84.78 140		
14		63.59 140	
14			116.12 140
16	91.42 160		
16		84.49 160	
16			149.32 160
18	110.94 180		
18		97.62 180	
18			188.34 180
20	123.48 200		
20		108.50 200	
20			227.23 200
22	166.87 220		
22		174.56 220	
22			284.94 220
25	195.29 250		
25		163.57 250	
25			332.78 250
28	271.86 280		
30		259.55 300	
32	330.99 320		
32		230.36 320	

DC k12 / mm	APMX mm	DN mm	LH mm	l6 mm	LPR mm	OAL mm	DCONMS h6 mm	CHW mm	ZEFP
6	8	5.5	14	14	16	52	6	0.35	4
6	13	5.5	19	19	21	57	6	0.35	4
8	11	7.5	17	19	21	61	10	0.45	4
8	19	7.5	25	27	29	69	10	0.45	4
8	28	7.5	34	36	38	78	10	0.45	4
10	13	9.5	21	21	23	63	10	0.45	4
10	22	9.5	30	30	32	72	10	0.45	4
10	34	9.5	42	42	44	84	10	0.45	4
12	16	11.5	26	26	28	73	12	0.60	4
12	26	11.5	36	36	38	83	12	0.60	4
12	40	11.5	50	50	52	97	12	0.60	4
14	16	11.5	26	26	28	73	12	0.60	4
14	26	11.5	36	36	38	83	12	0.60	4
14	40	11.5	50	50	52	97	12	0.60	4
16	19	15.0	29	29	31	79	16	0.70	4
16	32	15.0	42	42	44	92	16	0.70	4
16	48	15.0	58	58	60	108	16	0.70	4
18	19	15.0	29	29	31	79	16	0.70	4
18	32	15.0	42	42	44	92	16	0.70	4
18	48	15.0	58	58	60	108	16	0.70	4
20	22	19.0	36	36	38	88	20	0.70	4
20	38	19.0	52	52	54	104	20	0.70	4
20	56	19.0	70	70	72	122	20	0.70	4
22	22	19.0	36	36	38	88	20	0.70	4
22	38	19.0	52	52	54	104	20	0.70	4
22	56	19.0	70	70	72	122	20	0.70	4
25	26	24.0	44	44	46	102	25	0.70	4
25	45	24.0	63	63	65	121	25	0.70	4
25	68	24.0	86	86	88	144	25	0.70	4
28	26	24.0	44	44	46	102	25	0.90	5
30	45	24.0	63	63	65	121	25	0.90	5
32	32	31.0	49	49	52	112	32	0.90	6
32	53	31.0	70	70	73	133	32	0.90	6

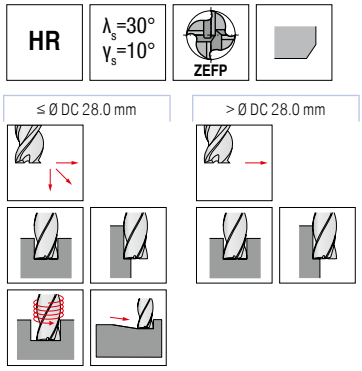
Steel	●	●	●
Stainless steel	●	●	●
Cast iron	●	●	●
Non ferrous metals	○	○	○
Heat resistant alloys	○	○	○
hardened materials			

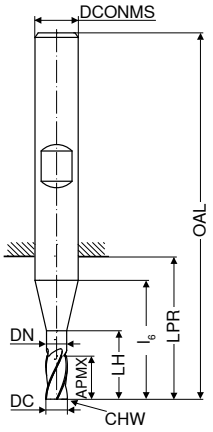
→ v_c/f_z Page 40–42

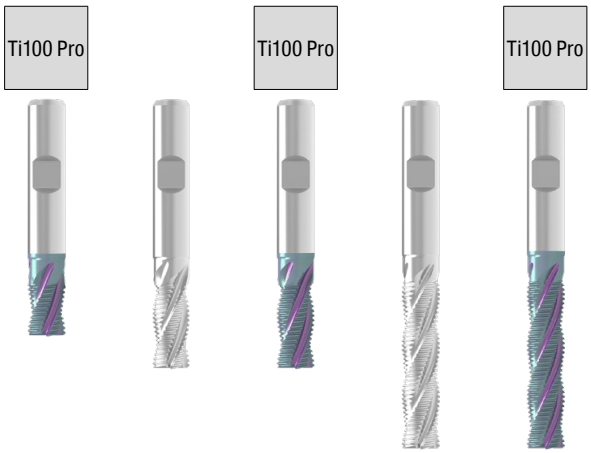
13

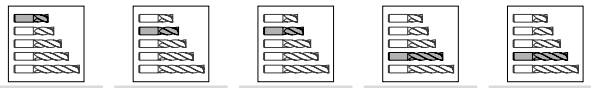
Fine profile milling cutter HSS-E Co 8

▲ > Ø 28,0 mm recessed centre







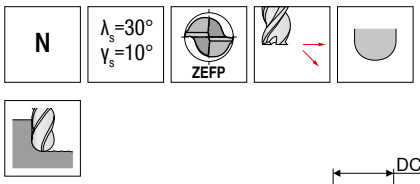


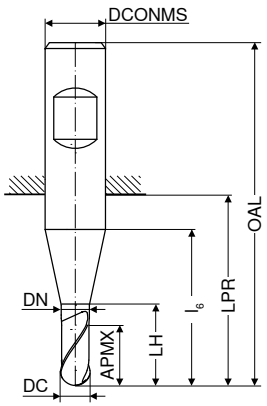
DC k12	APMX	DN	LH	l6	LPR	OAL	DCONMS h6	CHW	ZEFP	U8 Article no. 54 022 ...		U8 Article no. 50 140 ...		U8 Article no. 54 023 ...		U8 Article no. 50 141 ...		U8 Article no. 54 024 ...	
mm	mm	mm	mm	mm	mm	mm	mm	mm		£		£		£		£		£	
4	11		11	17	19	55	6	0.35	3			42.07	040	45.77	040				
5	13		13	19	21	57	6	0.35	3			42.07	050	27.47	050				
6	8	5.5	14	14	16	52	6	0.35	4	34.96	060								
6	13	5.5	19	19	21	57	6	0.35	4			35.57	060	24.74	060				
6	24	5.5	30	30	32	68	6	0.35	4							61.86	060	47.31	060
8	11	7.5	17	19	21	61	10	0.45	4	40.97	080								
8	19	7.5	25	27	29	69	10	0.45	4			37.78	080	29.95	080				
8	38	7.5	44	46	48	88	10	0.45	4							72.09	080	66.00	080
10	13	9.5	21	21	23	63	10	0.45	4	37.48	100								
10	22	9.5	30	30	32	72	10	0.45	4			40.69	100	33.28	100				
10	45	9.5	53	53	55	95	10	0.45	4							77.19	100	68.82	100
12	16	11.5	26	26	28	73	12	0.60	4	44.75	120								
12	26	11.5	36	36	38	83	12	0.60	4			48.57	120	36.86	120				
12	53	11.5	63	63	65	110	12	0.60	4							86.06	120	75.54	120
14	16	11.5	26	26	28	73	12	0.60	4	59.47	140								
14	26	11.5	36	36	38	83	12	0.60	4			54.10	140	49.12	140				
14	53	11.5	63	63	65	110	12	0.60	4							93.55	140	99.04	140
16	19	15.0	29	29	31	79	16	0.70	4	60.63	160								
16	32	15.0	42	42	44	92	16	0.70	4			61.02	160	53.32	160				
16	63	15.0	73	73	75	123	16	0.70	4							112.61	160	109.65	160
18	19	15.0	29	29	31	79	16	0.70	4	80.30	180								
18	32	15.0	42	42	44	92	16	0.70	4			68.78	180	70.27	180				
18	63	15.0	73	73	75	123	16	0.70	4							130.33	180	129.42	180
20	22	19.0	36	36	38	88	20	0.70	4	81.64	200								
20	38	19.0	52	52	54	104	20	0.70	4			85.78	200	73.85	200				
20	75	19.0	89	89	91	141	20	0.70	4							154.27	200	142.37	200
22	38	19.0	52	52	54	114	20	0.70	4			109.31	220	95.15	220				
22	75	19.0	89	89	91	141	20	0.70	4							185.81	220	177.46	220
25	45	24.0	63	63	65	121	25	0.70	4			123.29	250	112.10	250				
25	90	24.0	108	108	110	166	25	0.70	4									283.15	250
28	45	24.0	63	63	65	121	25	0.90	5					132.75	280				
28	90	24.0	108	108	110	166	25	0.90	5									317.17	280
30	45	24.0	63	63	65	121	25	0.90	5					145.12	300				
30	90	24.0	108	108	110	166	25	0.90	5									331.20	300
32	53	31.0	70	70	73	133	32	0.90	6					162.94	320				
32	106	31.0	123	123	126	186	32	0.90	6									334.53	320

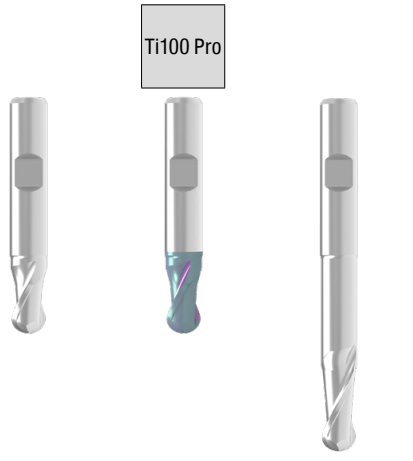
Steel	●	●	●	●	●
Stainless steel	●	○	●	○	●
Cast iron	●	●	●	●	●
Non ferrous metals	○	○	○	○	○
Heat resistant alloys	○	○	○	○	○
hardened materials					

→ v_c/f_z Page 40–42

Ball nosed end milling cutter HSS-E Co 8







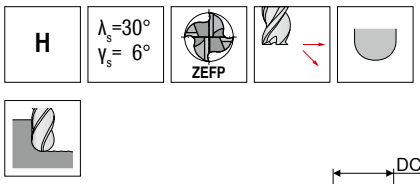
DC h10	APMX	DN	LH	l_6	LPR	OAL	DCONMS h6	ZEFP	Factory standard B U8 Article no. 50 320 ...		Factory standard B U8 Article no. 54 041 ...		Factory standard B U8 Article no. 50 321 ...	
mm	mm	mm	mm	mm	mm	mm	mm		£		£		£	
2	4		4	10	12	48	6	2	33.35	020	31.47	020		
3	5		5	11	13	49	6	2	31.69	030	30.33	030		
3	8		8	18	20	56	6	2					36.91	030
4	7		7	13	15	51	6	2	31.69	040	30.33	040		
4	11		11	25	27	63	6	2					36.91	040
5	8		8	14	16	52	6	2	31.69	050	30.33	050		
5	13		13	30	32	68	6	2					37.94	050
6	8	5.50	14	14	16	52	6	2	31.40	060	30.22	060		
6	13	5.50	30	30	32	68	6	2					38.80	060
7	10	6.50	16	18	20	60	10	2	38.94	070	57.68	070		
7	16	6.35	36	38	40	80	10	2					46.07	070
8	11	7.50	17	19	21	61	10	2	34.74	080	53.60	080		
8	19	7.35	44	46	48	88	10	2					42.57	080
9	11	8.50	18	19	21	61	10	2	41.24	090	62.03	090		
9	19	8.35	45	46	48	88	10	2					47.89	090
10	13	9.50	21	21	23	63	10	2	39.59	100	40.08	100		
10	22	9.35	53	53	55	95	10	2					47.89	100
11	13	10.50	21	23	25	70	12	2	46.19	110				
11	22	10.50	53	55	57	102	12	2					53.33	110
12	16	11.50	26	26	28	73	12	2	44.54	120	46.11	120		
12	26	11.50	63	63	65	110	12	2					54.18	120
13	16	11.50	26	26	28	73	12	2	53.68	130	82.94	130		
14	16	11.50	26	26	28	73	12	2	51.61	140	59.17	140		
14	26	11.50	63	63	65	110	12	2					64.37	140
15	16	11.50	26	26	28	73	12	2	60.75	150	98.37	150		
15	26	11.50	63	63	65	110	12	2					81.53	150
16	19	15.50	29	29	31	79	16	2	63.23	160	100.68	160		
16	32	15.00	73	73	75	123	16	2					81.53	160
18	19	15.50	29	29	31	79	16	2	78.46	180	87.45	180		
18	32	15.00	73	73	75	123	16	2					102.27	180
20	22	19.00	36	36	38	88	20	2	83.70	201	91.05	201		
22	22	19.00	36	36	38	88	20	2	114.27	220				
24	26	23.00	42	44	46	102	25	2	109.31	240	181.88	240		
24	45	23.00	106	108	110	166	25	2					154.00	240
25	26	24.00	44	44	46	102	25	2	109.31	250				
25	45	24.00	108	108	110	166	25	2					144.41	250
26	26	24.00	44	44	46	102	25	2	149.85	260				
28	26	24.00	44	44	46	102	25	2	149.97	280				
30	26	24.00	44	44	46	102	25	2	163.85	300				
30	45	24.00	108	108	110	166	25	2					208.61	300

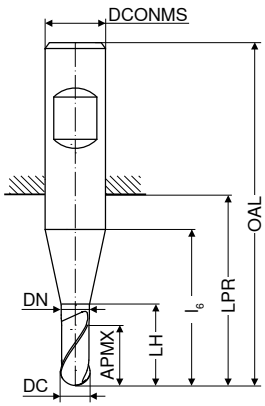
Steel	●	●	●
Stainless steel	○	○	○
Cast iron	●	●	●
Non ferrous metals	○	○	○
Heat resistant alloys	○	○	○
hardened materials			

→ v_c/f_z Page 40–42

13

Ball nosed cutter HSS-E Co 8





									DIN 1889 B		DIN 1889 B		DIN 1889 B	
									U8		U8		U8	
DC k12	APMX	DN	LH	l6	LPR	OAL	DCONMS h6	ZEFP	Article no. 50 308 ...		Article no. 54 038 ...		Article no. 54 039 ...	
mm	mm	mm	mm	mm	mm	mm	mm		£		£		£	
6	13	5.5	19	19	21	57	6	4	89.11	060	68.47	060		
6	24	5.5	30	30	32	68	6	4					80.18	060 1)
8	19	7.5	25	27	29	69	10	4	109.31	080	89.77	080		
8	38	7.5	44	46	48	88	10	4					104.39	080 1)
10	22	9.5	30	30	32	72	10	4	120.24	100	96.36	100		
10	45	9.5	53	53	55	95	10	4					113.41	100
12	26	11.5	36	36	38	83	12	4	118.44	120	107.99	120		
12	53	11.5	63	63	65	110	12	4					128.14	120
16	32	15.0	42	42	44	92	16	4	176.83	160	155.94	160		
16	63	15.0	73	73	75	123	16	4					184.40	160
20	38	19.0	52	52	54	104	20	4			203.27	200		
20	75	19.0	89	89	91	141	20	4					249.47	200
25	45	24.0	63	63	65	121	25	5			263.21	250		

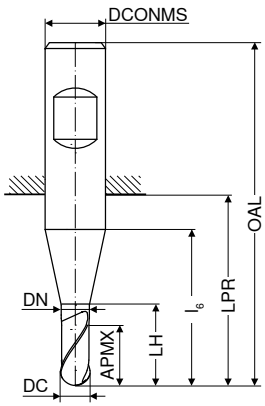
Steel	●	●	●
Stainless steel	○	○	○
Cast iron	●	●	●
Non ferrous metals	○	○	○
Heat resistant alloys	○	○	○
hardened materials			

1) Factory standard

→ v_c/f_z Page 40–42

Ball nosed fine rough milling cutter HSS-E Co 8

HR | λ_s=30° γ_s=10° | ZEFP



Ti100 Pro

DIN 1889 B

U8

DC $_{js14}$ mm	APMX mm	DN mm	LH mm	l_6 mm	LPR mm	OAL mm	DCONMS $_{h6}$ mm	ZEFP	Article no. 54 040 ... £	
6	13	5.5	19	19	21	57	6	4	80.18	**060**
8	19	7.5	25	27	29	69	10	4	98.87	**080**
10	22	9.5	30	30	32	72	10	4	99.27	**100**
12	26	11.5	36	36	38	83	12	4	115.35	**120**
16	32	15.0	42	42	44	92	16	4	170.64	**160**
20	38	19.0	52	52	54	104	20	4	208.23	**200**

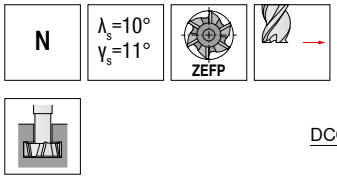
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	○
Heat resistant alloys	○
hardened materials	

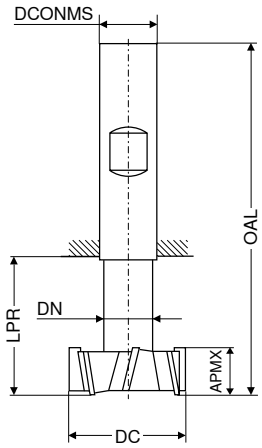
→ v_c/f_z Page 40–42

13

T-slot milling cutter HSS-E Co 5, cross pitched

▲ for slots according to DIN 650





DIN 851 A

B 

U6

DC $_{d11}$ mm	APMX $_{d11}$ mm	DN $_{h12}$ mm	LPR mm	OAL mm	DCONMS $_{h6}$ mm	ZEFP	Article no. 50 240 ... £	
11.0	4	4	13.5	53.5	10	6	88.03	**110**
12.5	6	5	17.0	57.0	10	6	85.84	**125**
16.0	8	7	22.0	62.0	10	6	97.20	**160**
18.0	8	8	25.0	70.0	12	6	110.44	**180**
19.0	9	8	26.0	71.0	12	6	140.78	**190** 1)
21.0	9	10	29.0	74.0	12	6	126.39	**210**
22.0	10	10	30.0	75.0	12	6	164.44	**220** 1)
25.0	11	12	34.0	82.0	16	8	148.61	**250**
28.0	12	13	37.0	85.0	16	8	200.47	**280** 1)
32.0	14	15	42.0	90.0	16	8	213.54	**320**
36.0	16	17	47.0	103.0	25	8	325.69	**360** 1)
40.0	18	19	52.0	108.0	25	10	435.25	**400**
45.0	20	21	57.0	113.0	25	10	463.25	**450** 1)
50.0	22	25	64.0	124.0	32	10	556.30	**500**
60.0	28	30	79.0	139.0	32	10	727.06	**600**

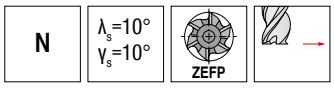
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	○
Heat resistant alloys	○
hardened materials	

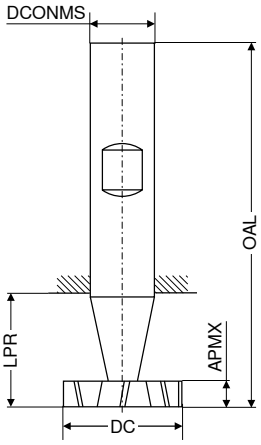
1) Factory standard

→ v_c/f_z Page 43

Slot milling cutter HSS-E Co 5, cross-pitched

▲ for slots according to DIN 6888
▲ CDX = $a_{p\,max.}$





DIN 850
B

U6

DC h12	APMX e8	LPR	OAL	DCONMS h6	CDX	ZEFP	Article no. 50 234 ...	
mm	mm	mm	mm	mm	mm		£	
10.5	2.0	14	50	6	3.25	6	66.11	**100**
10.5	2.5	14	50	6	3.15	6	66.11	**101**
10.5	3.0	14	50	6	3.15	6	66.11	**102**
13.5	2.0	16	56	10	4.45	6	66.05	**130** 1)
13.5	3.0	16	56	10	4.45	6	66.05	**132**
13.5	4.0	16	56	10	4.45	6	66.05	**133**
16.5	3.0	16	56	10	5.95	6	71.68	**161**
16.5	4.0	16	56	10	5.95	6	71.68	**162**
16.5	5.0	16	56	10	5.75	6	71.68	**163**
19.5	3.0	23	63	10	6.95	8	79.61	**190** 1)
19.5	4.0	23	63	10	6.95	8	79.61	**191**
19.5	5.0	23	63	10	6.75	8	79.61	**192**
22.5	4.0	23	63	10	8.25	8	93.92	**220** 1)
22.5	5.0	23	63	10	8.25	8	93.92	**221**
22.5	6.0	23	63	10	8.00	8	93.92	**222**
25.5	5.0	23	63	10	9.00	10	97.93	**250** 1)
25.5	6.0	23	63	10	9.00	10	97.93	**251**
28.5	6.0	23	63	10	10.00	10	136.46	**281**
28.5	8.0	23	63	10	10.00	10	136.46	**283**
32.5	6.0	26	71	12	12.00	10	139.26	**321** 1)
32.5	8.0	26	71	12	12.00	10	139.26	**322**
38.5	8.0	26	71	12	13.35	10	202.08	**381** 1)
45.5	10.0	26	71	12	16.85	12	246.85	**450**

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

1) Factory standard

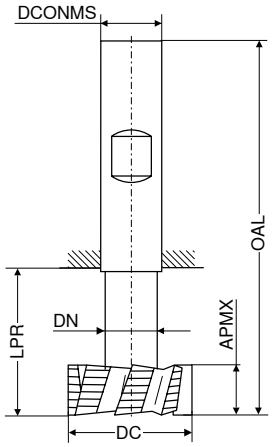
→ v_c/f_z Page 43

13

T-slot milling cutter HSS-E Co 5

▲ for slots according to DIN 650

NF | λ_s=20° γ_s=11° | ZEFP



DIN 851 A

B 

U6

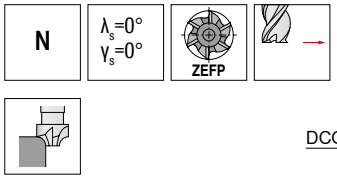
DC $_{d11}$ mm	APMX mm	DN $_{h12}$ mm	LPR mm	OAL mm	DCONMS $_{h6}$ mm	ZEFP	Article no. 50 241 ... £	
21	9	10	29	74	12	6	184.16	**210**
22	10	10	30	75	12	6	217.36	**220** 1)
25	11	12	34	82	16	6	220.52	**250**
28	12	13	37	85	16	6	235.92	**280** 1)
32	14	15	42	90	16	6	304.77	**320**
36	16	17	47	103	25	6	376.87	**360** 1)
40	18	19	52	108	25	8	458.16	**400**
45	20	21	57	113	25	8	552.70	**450** 1)

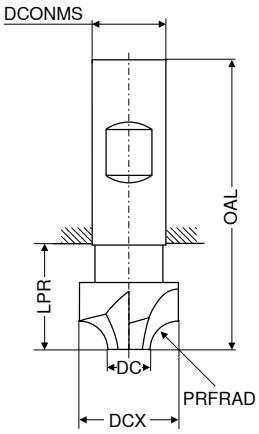
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	○
Heat resistant alloys	○
hardened materials	

1) Factory standard

→ v_c/f_z Page 43

Quarter-round profile milling cutter HSS-E Co 5, concave





DIN 6518

B

U6

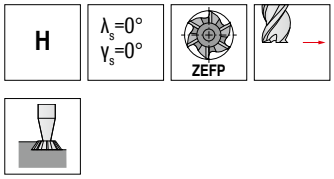
PRFRAD h11	DCX	DC	LPR	OAL	DCONMS h6	ZEFP	Article no. 50 248 ...	
mm	mm	mm	mm	mm	mm		£	
1.0	8	6	20	60	10	4	74.30	**010**
1.5	9	6	20	60	10	4	78.01	**015**
2.0	10	6	20	60	10	4	74.30	**020**
2.5	11	6	20	60	10	4	78.01	**025**
3.0	12	6	15	60	12	4	78.01	**030**
4.0	14	6	15	60	12	4	83.67	**040**
5.0	16	6	15	60	12	4	99.23	**050**
6.0	20	8	19	67	16	4	115.64	**060**
8.0	24	8	23	71	16	4	136.52	**080**
9.0	26	8	29	85	25	4	189.96	**090**
10.0	28	8	29	85	25	4	172.60	**100**
12.0	34	10	34	90	25	4	247.37	**120**
15.0	46	16	44	100	25	6	461.51	**150**
16.0	48	16	44	100	25	6	484.59	**160**

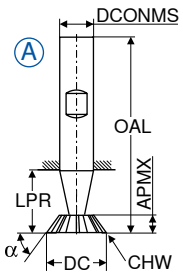
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	○
Heat resistant alloys	○
hardened materials	

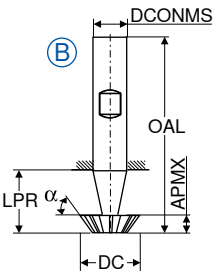
→ v_c/f_z Page 43

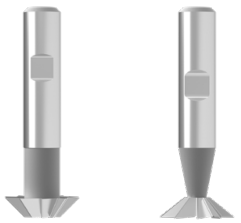
13

Single angle miling cutters HSS-E Co 5









α°	DC mm	APMX mm	LPR mm	OAL mm	DCONMS h6 mm	CHW mm	ZEFP	Fig.	DIN 1833 B U6 Article no. 50 246 ... £		DIN 1833 B U6 Article no. 50 245 ... £	
45	16	4.0	15	60	12	0.3	10	A			73.65	016
	16	4.0	15	60	12		10	B	84.17	016		
	20	5.0	18	63	12	0.3	10	A			110.87	020
	20	5.0	18	63	12		10	B	110.87	020		
	25	6.3	22	67	12	0.3	10	A			131.82	025
	25	6.3	22	67	12		10	B	131.82	025		
60	16	6.3	15	60	12	0.3	10	A			84.17	116
	16	6.3	15	60	12		10	B	84.17	116		
	20	8.0	18	63	12	0.3	10	A			110.87	120
	20	8.0	18	63	12		10	B	110.87	120		
	25	10.0	22	67	12	0.3	10	A			115.35	125
	25	10.0	22	67	12		10	B	131.82	125		
70	16	7.0	15	60	12	0.3	10	A			112.07	216 1)
	20	9.0	18	63	12	0.3	10	A			141.11	220 1)
	25	11.0	19	67	16	0.3	10	A			188.58	225 1)

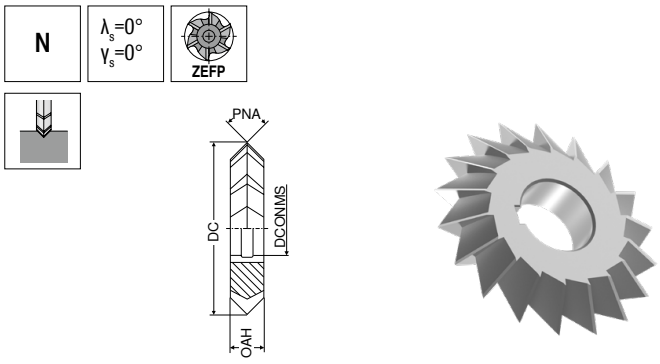
Steel	●	●
Stainless steel	○	○
Cast iron	●	●
Non ferrous metals	○	○
Heat resistant alloys	○	○
hardened materials		

1) Factory standard

→ v_c/f_z Page 44

Double angle milling cutter HSS

▲ with keyway to DIN 138



DIN 847

U6

PNA °	DC mm	OAH mm	DCONMS mm	ZEFP	Article no. 50 360 ... £	
45	50	8	16	22	139.10	045
	63	10	22	24	173.49	145
	80	12	27	26	267.94	245
	100	18	32	28	401.43	345
60	50	10	16	18	139.10	060
	63	14	22	20	193.35	160
	80	18	27	22	310.95	260
	100	25	32	24	498.20	360
90	50	14	16	16	164.97	090
	63	20	22	18	210.32	190
	80	22	27	20	342.26	290
	100	32	32	24	571.91	390
120	50	14	16	16	186.10	120 1)
	63	20	22	16	264.42	121 1)

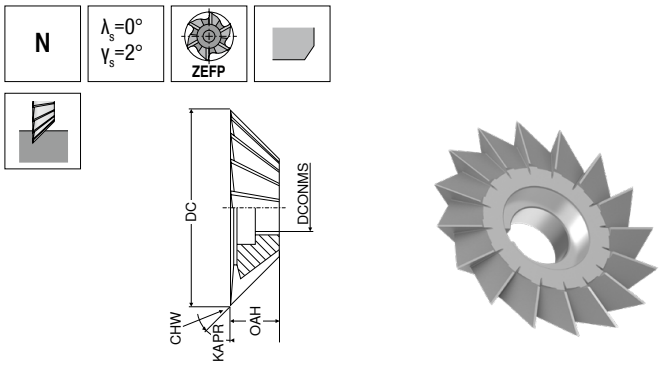
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	○
Heat resistant alloys	○
hardened materials	

1) Factory standard

→ v_c/f_z Page 44

Shell type single angle milling cutter HSS

▲ with keyway to DIN 138



DIN 842 A

U6

KAPR °	DC mm	OAH mm	DCONMS mm	CHW mm	ZEFP	Article no. 50 362 ... £	
45	40	10	10	0.3	14	155.44	045
	50	13	13	0.3	16	213.69	145
	63	18	16	0.3	18	270.16	245
	80	22	22	0.3	20	381.53	345
	100	28	27	0.3	22	576.11	445
50	50	16	13	0.3	16	213.69	150
60	40	13	10	0.3	14	139.26	060
	50	16	13	0.3	16	171.05	160
	63	20	16	0.3	18	239.25	260
	80	25	22	0.3	20	383.83	360
	100	32	27	0.3	22	584.70	460
	125	40	32	0.3	28	985.04	560

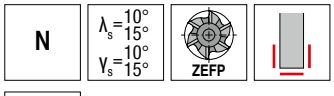
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	○
Heat resistant alloys	○
hardened materials	

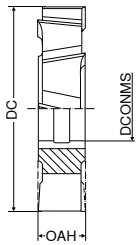
→ v_c/f_z Page 44

13

Side and face milling cutter HSS-E Co 5

▲ Coarse cross-pitched
▲ with keyway to DIN 138





DIN 885 A

U6

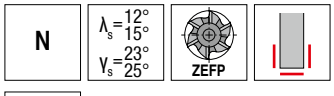
DC js16	OAH k11	DCONMS H7	ZEFP	Article no. 50 348 ...	
mm	mm	mm		£	
50	4	16	12	148.59	100
50	5	16	12	150.95	102
50	6	16	12	153.44	104
50	8	16	12	170.73	106
50	10	16	12	183.75	108
63	4	22	12	161.47	200
63	5	22	12	171.98	202
63	6	22	12	169.35	204
63	8	22	12	186.78	206
63	10	22	12	210.16	208
63	12	22	12	236.45	210
63	14	22	12	267.86	212
80	5	27	14	217.90	300
80	6	27	14	221.35	302
80	8	27	14	236.45	304
80	10	27	14	242.38	306
80	12	27	14	272.97	308
80	14	27	14	312.66	310
80	16	27	14	338.68	312
80	18	27	14	394.00	314
80	20	27	14	421.55	316
100	6	32	14	317.24	400
100	8	32	14	315.15	402
100	10	32	14	337.43	404
100	12	32	14	363.84	406
100	14	32	14	405.77	408
100	16	32	14	428.06	410
100	18	32	14	503.18	412
100	20	32	14	497.50	414
100	25	32	14	643.32	418
125	8	32	16	417.53	500
125	10	32	16	447.69	502
125	12	32	16	485.88	504
125	14	32	16	547.45	506
125	16	32	16	577.45	508
125	18	32	16	626.04	510
125	20	32	16	667.12	512
125	25	32	16	805.87	516
160	10	40	18	660.06	600
160	12	40	18	737.67	602
160	14	40	18	778.06	604
160	16	40	18	837.27	606
160	18	40	18	935.77	608
160	20	40	18	944.90	610
160	25	40	18	1,158.93	614
160	32	40	18	1,469.92	618

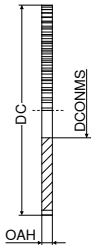
Steel	○
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

→ v_c/f_z Page 45

Narrow side and face milling cutter HSS-E Co 5

▲ Coarse cross-pitched
▲ with keyway to DIN 138





Factory standard

U6

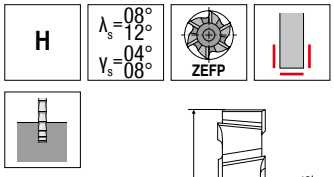
DC js16	OAH k11	DCONMS H7	ZEFP	Article no. 50 342 ...	
mm	mm	mm		£	
63	1.6	22	16	157.87	200
63	2.0	22	16	139.74	202
63	2.5	22	16	142.78	204
63	3.0	22	16	146.66	206
80	1.6	27	20	168.79	300
80	2.0	27	20	163.97	302
80	2.5	27	20	166.87	304
80	3.0	27	20	171.27	306
80	4.0	27	20	183.59	310
100	1.6	32	24	215.42	400
100	2.0	32	24	214.16	402
100	2.5	32	24	213.89	404
100	3.0	32	24	217.76	406
100	4.0	32	24	234.92	410
100	5.0	32	24	248.90	414
125	1.6	32	26	272.28	500
125	2.0	32	26	262.02	502
125	2.5	32	26	268.54	504
125	3.0	32	26	274.92	506
125	4.0	32	26	294.55	510
125	5.0	32	26	315.32	514
125	6.0	32	26	304.92	516
160	2.0	40	30	421.97	600
160	2.5	40	30	406.19	602
160	3.0	40	30	413.95	604
160	4.0	40	30	437.47	606
160	5.0	40	30	463.19	608
160	6.0	40	30	497.35	610
160	8.0	40	22	567.77	612

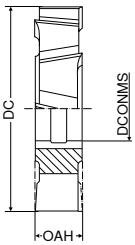
Steel	
Stainless steel	●
Cast iron	
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

→ v_c/f_z Page 45

Side and face milling cutter HSS-E Co 5

▲ Fine cross-pitched version
▲ with keyway to DIN 138





DIN 885 A

U6

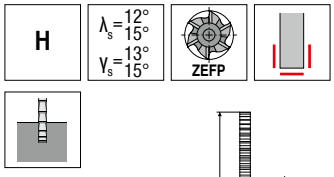
DC js16	OAH k11	DCONMS H7	ZEFP	Article no. 50 349 ...	
mm	mm	mm		£	
50	4	16	16	174.59	100
50	5	16	16	175.72	102
50	6	16	16	184.84	104
50	8	16	16	198.67	106
50	10	16	16	217.47	108
63	4	22	18	191.22	200
63	5	22	18	205.46	202
63	6	22	18	197.15	204
63	8	22	18	221.07	206
63	10	22	18	246.66	208
63	12	22	18	280.16	210
63	14	22	18	314.61	212
80	5	27	20	258.16	300
80	6	27	20	266.73	302
80	8	27	20	277.66	304
80	10	27	18	284.59	306
80	12	27	18	320.57	308
80	14	27	18	370.22	310
80	16	27	18	401.33	312
80	18	27	18	462.65	314
80	20	27	18	462.91	316
100	6	32	22	372.43	400
100	8	32	22	370.08	402
100	10	32	20	399.56	404
100	12	32	20	430.96	406
100	14	32	20	480.61	408
100	16	32	20	506.90	410
100	18	32	20	595.59	412
100	20	32	20	599.60	414
100	25	32	20	742.08	418
125	8	32	24	494.46	500
125	10	32	22	530.15	502
125	12	32	22	570.26	504
125	14	32	22	642.75	506
125	16	32	22	666.29	508
125	18	32	22	767.53	510
125	20	32	22	783.31	512
125	25	32	22	937.85	516
160	10	40	26	788.58	600
160	12	40	26	858.57	602
160	14	40	26	921.96	604
160	16	40	26	991.81	606
160	18	40	26	1,089.06	608
160	20	40	26	1,090.18	610
160	25	40	26	1,361.04	614
160	32	40	26	1,710.78	618

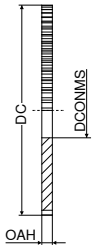
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

→ v_c/f_z Page 45

Narrow side and face milling cutter HSS-E Co 5

▲ Fine cross-pitched version
▲ with keyway to DIN 138





DIN 1834 A

U6

DC js16	OAH k11	DCONMS H7	ZEFP	Article no. 50 340 ...	
mm	mm	mm		£	
63	1.6	22	28	132.64	200
63	2.0	22	28	130.47	202
63	2.5	22	28	133.25	204
63	3.0	22	28	136.96	206
80	1.6	27	32	157.60	300
80	2.0	27	32	153.02	302
80	2.5	27	32	155.65	304
80	3.0	27	32	160.08	306
80	4.0	27	32	171.27	310
100	1.6	32	36	188.44	400
100	2.0	32	36	187.34	402
100	2.5	32	36	187.34	404
100	3.0	32	36	190.64	406
100	4.0	32	36	205.46	410
100	5.0	32	36	225.51	414
125	1.6	32	40	246.82	500
125	2.0	32	40	237.28	502
125	2.5	32	40	244.38	504
125	3.0	32	40	249.16	506
125	4.0	32	40	266.88	510
125	5.0	32	40	285.83	514
125	6.0	32	40	276.31	516
160	2.0	40	48	395.54	600
160	2.5	40	48	380.88	602
160	3.0	40	48	388.08	604
160	4.0	40	48	410.21	606
160	5.0	40	48	434.28	608
160	6.0	40	48	466.25	610
160	8.0	40	36	532.23	612

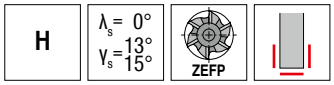
Steel	●
Stainless steel	
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	●
hardened materials	

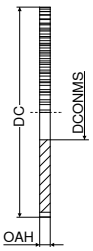
→ v_c/f_z Page 45

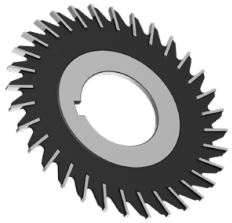
13

Narrow side and face milling cutter HSS-E Co 5

- straight cut
- with keyway to DIN 138







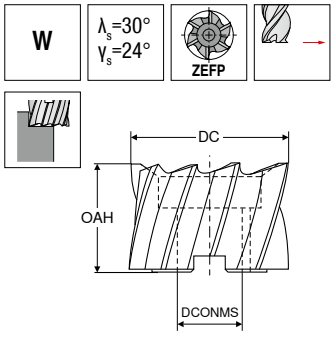
DC js16	OAH k11	DCONMS H7	ZEFP	DIN 1834 B U6 Article no. 50 341 ...	
mm	mm	mm		£	
63	1.6	22	32	173.64	200
63	2.0	22	32	153.73	202
63	2.5	22	32	156.88	204
63	3.0	22	32	161.31	206
80	1.6	27	36	185.67	300
80	2.0	27	36	180.41	302
80	2.5	27	36	183.45	304
80	3.0	27	36	188.29	306
80	4.0	27	36	201.85	310
100	1.6	32	40	222.05	400
100	2.0	32	40	220.80	402
100	2.5	32	40	220.67	404
100	3.0	32	40	224.68	406
100	4.0	32	40	242.26	410
100	5.0	32	40	256.77	414
125	1.6	32	44	299.65	500
125	2.0	32	44	288.19	502
125	2.5	32	44	295.22	504
125	3.0	32	44	302.57	506
125	4.0	32	44	324.01	510
125	5.0	32	44	346.84	514
125	6.0	32	44	335.27	516
160	2.0	40	52	464.01	600
160	2.5	40	52	446.72	602
160	3.0	40	52	455.43	604
160	4.0	40	52	481.18	606
160	5.0	40	52	509.55	608
160	6.0	40	52	547.02	610
160	8.0	40	40	624.37	612

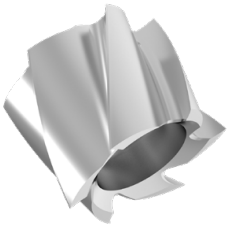
Steel	●
Stainless steel	○
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

→ v_c/f_z Page 45

Face milling cutters HSS-E Co 5

▲ with keyway to DIN 138





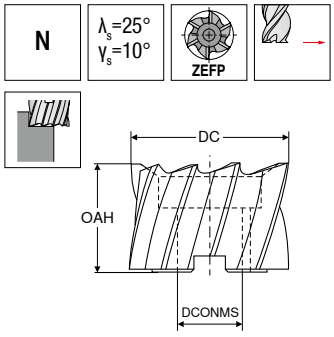
DC k10	OAH	DCONMS	ZEFP	DIN 1880 U8 Article no. 50 255 ... £	
mm	mm	mm			
40	32	16	6	159.50	040
50	36	22	6	203.06	050
63	40	27	6	271.50	063
80	45	27	6	400.66	080
100	50	32	6	649.63	100

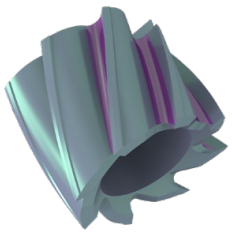
Steel	
Stainless steel	
Cast iron	
Non ferrous metals	●
Heat resistant alloys	
hardened materials	

→ v_c/f_z Page 46+47

Face milling cutters HSS-E Co 5

▲ with keyway to DIN 138





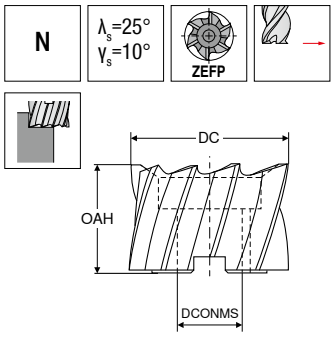
DC k10	OAH	DCONMS	ZEFP	DIN 1880 U8 Article no. 54 035 ... £	
mm	mm	mm			
40	32	16	8	222.42	040
50	36	22	8	272.81	050
63	40	27	8	251.43	063
80	45	27	10	390.86	080
100	50	32	12	655.03	100

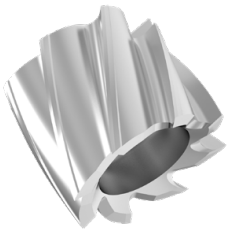
Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

→ v_c/f_z Page 46+47

Face milling cutters HSS-E Co 5

▲ with keyway to DIN 138





DC k10	OAH	DCONMS	ZEFP	DIN 1880 U8 Article no. 50 250 ... £	
mm	mm	mm			
40	32	16	8	151.52	040
50	36	22	8	194.24	050
63	40	27	8	276.00	063
80	45	27	10	404.86	080
100	50	32	12	644.10	100

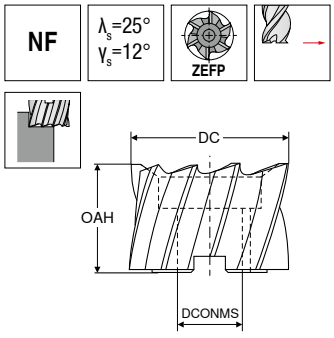
Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

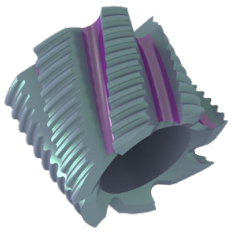
→ v_c/f_z Page 46+47

Roughing-finishing face milling cutters HSS-Co 5

▲ with keyway to DIN 138

▲ Manufacturing tolerance lies on the plus range of the tolerance js14





DC js14	OAH	DCONMS	ZEFP	DIN 1880 U8 Article no. 54 036 ... £	
mm	mm	mm			
40	32	16	7	150.11	040
50	36	22	8	192.62	050
63	40	27	8	393.96	063
80	45	27	10	594.28	080
100	50	32	12	886.70	100

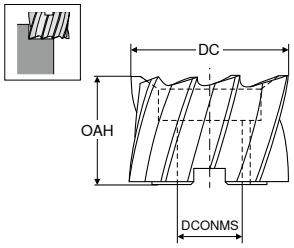
Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

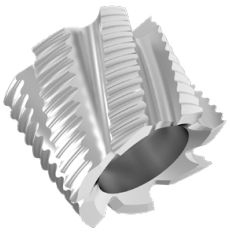
→ v_c/f_z Page 46+47

Roughing face milling cutters HSS-E Co 5

- with keyway to DIN 138
- Manufacturing tolerance lies on the plus range of the tolerance js14

NR | λ_s=25° γ_s=14° | ZEFP





DC js14	OAH	DCONMS	ZEFP	DIN 1880 U8 Article no. 50 260 ... £	
mm	mm	mm			
40	32	16	7	154.39	040
50	36	22	8	204.75	050
63	40	27	8	274.08	063
80	45	27	10	378.52	080
100	50	32	12	574.22	100

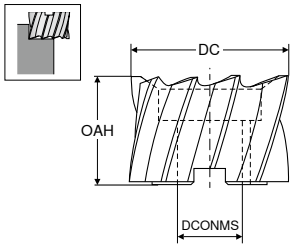
Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

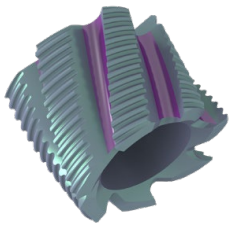
→ v_c/f_z Page 46+47

Roughing-finishing face milling cutters HSS-E Co 8

- with keyway to DIN 138
- Manufacturing tolerance lies on the plus range of the tolerance js14

HR | λ_s=25° γ_s=10° | ZEFP | Ti100 Pro





DC js14	OAH	DCONMS	ZEFP	DIN 1880 U8 Article no. 54 037 ... £	
mm	mm	mm			
40	32	16	7	159.02	040
50	36	22	8	196.60	050
63	40	27	8	425.62	063
80	45	27	10	422.63	080
100	50	32	12	678.10	100

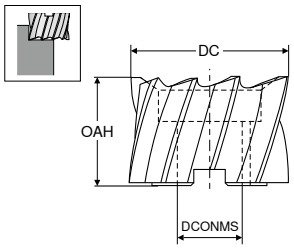
Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	●
Heat resistant alloys	○
hardened materials	

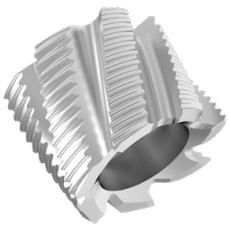
→ v_c/f_z Page 46+47

Roughing-finishing face milling cutters HSS-E Co 8

- with keyway to DIN 138
- Manufacturing tolerance lies on the plus range of the tolerance js14

HR | λ_s=25° γ_s=10° | ZEFP





DC js14	OAH	DCONMS	ZEFP	DIN 1880 U8 Article no. 50 297 ... £	
mm	mm	mm			
40	32	16	7	154.39	040
50	36	22	8	204.75	050
63	40	27	8	274.08	063
80	45	27	10	378.52	080
100	50	32	12	587.71	100

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

→ v_c/f_z Page 46+47

Material examples referring to the cutting data tables

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

Cutting data – slot and end milling cutters

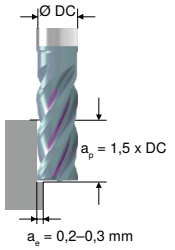
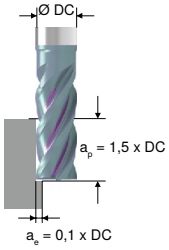
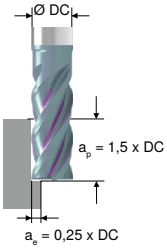
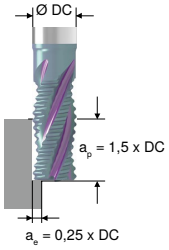
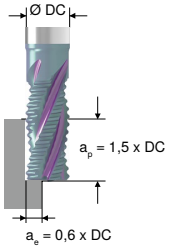
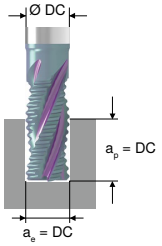
		uncoated	Ti100 Pro	Powder steel	● 1st choice		○ suitable
				Ti100 Pro	Emulsion	Compressed air	MMS
Index	Kf f_z	v_c in m/min					
1.1	1,2	30–40	60–80	65–90	●		
1.2	1,2	25–35	50–65	55–75	●		
1.3	1,2	20–30	45–55	50–65	●		
1.4	1	15–25	40–55	45–65	●		
1.5	1,2	20–30	45–55	50–60	●		
1.6	1	15–20	30–35	35–45	●		
1.7	1,2	20–30	40–55	45–65	●		
1.8	0,8	15–20	30–35	35–45	●		
1.9	1,2	20–30	45–55	50–60	●		
1.10	1	15–20	30–35	35–45	●		
1.11	0,8	15–20	30–35	35–45	●		
1.12	0,8	15–20	30–35	35–45	●		
1.13							
1.14							
1.15	0,8	12–18	25–30	30–40	●		
1.16	0,8	10–15	20–25	25–35	●		
2.1	1	10–15	20–30	25–35	●		
2.2	1	10–15	20–30	25–35	●		
2.3	1	8–12	15–25	20 -30	●		
2.4	0,9	7–10	15–20	20–30	●		
2.5	1	5–8	10–15	15–20	●		
2.6	1	10–15	20–30	25–35	●		
2.7							
3.1	1	18–25	35–45	40 -55	●		
3.2	1	18–25	25–30	30–40	●		
3.3	1	15–20	30–35	35–45	●		
3.4	1	15–20	30–35	35–45	●		
3.5	1	15–25	35–40	40–50	●		
3.6	1	15–20	35–40	40–50	●		
3.7	1	15–20	30–35	35–45	●		
3.8	0,8	12–18	25–30	30–40	●		
4.1	1,9	150–180	240–280	260–300	●		
4.2	1,9	100–130	130–160	150–180	●		
4.3	1,8		100–140	140–160	●		
4.4	1,7		60–130	80–150	●		
4.5							
4.6	1,2	30–50	60–80	80–100	●		
4.7	1,1		110–150	130–170	●		
4.8	0,9	5–10	10–15	20–25	●		
4.9							
4.10							
4.11	1,1		100–140	130–170	●		
4.12	1,1	80–120	120–150	140–180	●		
4.13	2	20–30	25–45	40–60	●		
4.14	2	30–40	50–70	70–90	●		
4.15							
4.16	1,8	90–120	140–170	160–190		●	
4.17	1		30–40	40–50		●	
4.18	1,1		10–20	15–25	●		
4.19							
5.1	1,1	5–10	10–15	15–20	●		
5.2							
5.3							
5.4							
5.5							
5.6							
5.7							
5.8							
5.9	1	10–15	15–25	25–35	●		
5.10	1,1	10–15	15–20	25–35	●		
5.11							
6.1							
6.2							
6.3							
6.4							
6.5							

For full slot milling reduce the cutting speed (v_c), indicated in this table by approx. 15–20 %!

Kf f_z = Correction factor for feed per tooth

Feed per tooth for HSS end mills

Appoximate values (in mm) for the feed per tooth (f_z)

	Peripheral milling										Full slot milling	
												
	f_z in mm		f_z in mm		f_z in mm		f_z in mm		f_z in mm		f_z in mm	
Ø DC mm	uncoated	coated	uncoated	coated	uncoated	coated	uncoated	coated	uncoated	coated	uncoated	coated
2	0,008	0,009	0,008	0,009	0,008	0,009						
3	0,011	0,012	0,010	0,012	0,009	0,010						
4	0,017	0,018	0,014	0,015	0,013	0,014	0,015	0,016	0,013	0,014	0,011	0,012
5	0,024	0,026	0,018	0,020	0,014	0,015	0,019	0,021	0,016	0,018	0,014	0,016
6	0,032	0,035	0,022	0,024	0,015	0,017	0,024	0,027	0,020	0,022	0,018	0,019
8	0,047	0,051	0,029	0,032	0,020	0,022	0,032	0,036	0,027	0,030	0,024	0,026
10	0,065	0,072	0,037	0,041	0,026	0,028	0,042	0,047	0,035	0,039	0,031	0,034
12	0,084	0,091	0,044	0,049	0,031	0,034	0,051	0,057	0,043	0,047	0,037	0,041
14	0,100	0,106	0,054	0,059	0,037	0,041	0,063	0,069	0,053	0,058	0,045	0,050
16	0,111	0,121	0,061	0,067	0,042	0,046	0,072	0,079	0,060	0,066	0,052	0,057
18	0,126	0,136	0,070	0,077	0,048	0,053	0,084	0,093	0,071	0,078	0,061	0,067
20	0,141	0,151	0,076	0,083	0,052	0,057	0,092	0,101	0,077	0,084	0,066	0,073
22	0,160	0,166	0,085	0,094	0,059	0,065	0,104	0,114	0,087	0,096	0,075	0,082
25	0,170	0,188	0,095	0,104	0,065	0,072	0,117	0,129	0,098	0,108	0,084	0,093
28	0,196	0,210	0,109	0,120	0,075	0,083	0,136	0,150	0,114	0,125	0,098	0,108
32	0,212	0,240	0,124	0,137	0,086	0,094	0,157	0,173	0,131	0,145	0,113	0,125
36	0,224	0,240	0,144	0,159	0,099	0,109	0,170	0,194	0,142	0,162	0,126	0,140
40	0,240	0,240	0,157	0,173	0,108	0,119	0,184	0,202	0,154	0,169	0,132	0,146
45	0,240	0,240	0,157	0,173	0,108	0,119	0,200	0,220	0,170	0,180	0,140	0,160
50	0,240	0,240	0,157	0,173	0,108	0,119	0,200	0,220	0,170	0,180	0,140	0,160

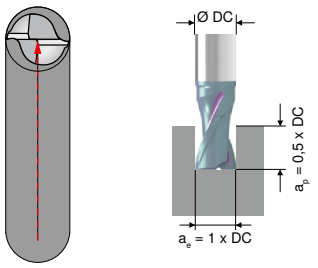
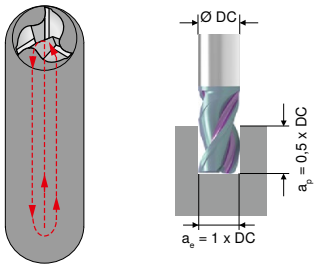
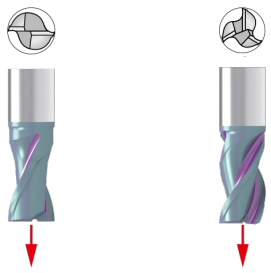
Attention:
In the case of uncoated milling cutters climb milling is preferred to conventional milling. When using coated milling cutters climb milling is necessary in order to achieve optimum results.

Feed rate correction:
Please multiply the f_z value in the table above with the corresponding **correction factor Kf f_z** from the table on → **page 40**.

In general the following is valid:
f_z (milling) = f_z x Kf f_z
f_z (drilling) = f_z (milling) ÷ no. of teeth

Feed per tooth when milling parallel key slots with HSS slot drills

Appoximate values (in mm) for the feed per tooth (f_z)

	Full slot milling (in one cut)		Profile slot milling (internal profile milling)				Circular ramping			
										
			Roughing cut		Finishing cut					
	f_z in mm		f_z in mm				f_z in mm			
Ø DC mm	uncoated	coated	uncoated	coated	uncoated	coated	uncoated	coated	uncoated	coated
2	0,005	0,006	0,005	0,006	0,008	0,009	0,003	0,003	0,002	0,002
3	0,009	0,010	0,009	0,010	0,015	0,016	0,004	0,005	0,003	0,003
4	0,012	0,013	0,012	0,013	0,022	0,024	0,006	0,007	0,004	0,004
5	0,016	0,017	0,016	0,017	0,030	0,033	0,008	0,009	0,005	0,006
6	0,020	0,022	0,020	0,022	0,039	0,043	0,010	0,011	0,007	0,007
8	0,026	0,029	0,026	0,029	0,055	0,061	0,013	0,014	0,009	0,010
10	0,034	0,037	0,034	0,037	0,075	0,082	0,017	0,019	0,011	0,012
12	0,040	0,044	0,040	0,044	0,093	0,101	0,020	0,022	0,013	0,015
14	0,049	0,054	0,049	0,054	0,117	0,118	0,024	0,027	0,016	0,018
16	0,056	0,062	0,056	0,062	0,135	0,135	0,028	0,031	0,019	0,021
18	0,065	0,072	0,065	0,072	0,151	0,151	0,033	0,036	0,022	0,024
20	0,071	0,078	0,071	0,078	0,167	0,167	0,035	0,039	0,024	0,026
22	0,080	0,088	0,080	0,088	0,184	0,184	0,040	0,044	0,027	0,029
25	0,089	0,098	0,089	0,098	0,208	0,208	0,044	0,049	0,030	0,033
28	0,103	0,113	0,103	0,113	0,233	0,233	0,051	0,056	0,034	0,037
32	0,118	0,130	0,118	0,130	0,260	0,260	0,060	0,065	0,040	0,043
36	0,130	0,143	0,130	0,143	0,260	0,260	0,060	0,065	0,040	0,043
40	0,130	0,143	0,130	0,143	0,260	0,260	0,060	0,065	0,040	0,043
45	0,130	0,143	0,130	0,143	0,260	0,260	0,060	0,065	0,040	0,043
50	0,130	0,143	0,130	0,143	0,260	0,260	0,060	0,065	0,040	0,043

Attention:
In the case of uncoated milling cutters climb milling is preferred to conventional milling. When using coated milling cutters climb milling is necessary in order to achieve optimum results.

Feed rate correction:
Please multiply the f_z value in the table above with the corresponding **correction factor Kf f_z** from the table on → **page 40.**

In general the following is valid:
f_z (milling) = f_z x Kf f_z
f_z (drilling) = f_z (milling) ÷ no. of teeth

Cutting data – form cutters

		50 241 ...			50 240 ...						50 234 ...				50 248 ...				● 1st choice		○ suitable
		Ø DC 21–25 mm	Ø DC 28–36 mm	Ø DC 40–45 mm	Ø DC 11–16 mm	Ø DC 18–22 mm	Ø DC 25–32 mm	Ø DC 36–45 mm	Ø DC 50–60 mm		Ø DC 10–17 mm	Ø DC 19–26 mm	Ø DC 28–33 mm	Ø DC 33–46 mm	Ø DC 8–11 mm	Ø DC 12–24 mm	Ø DC 26–34 mm	Ø DC 46–48 mm	Emulsion	Compressed air	MMS
Index	v_c m/min	f_z mm			f_z mm					v_c m/min	f_z mm				f_z mm						
1.1	28	0,07	0,1	0,12	0,015	0,03	0,03	0,03	0,04	28	0,02	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
1.2	28	0,07	0,1	0,12	0,015	0,03	0,03	0,03	0,04	28	0,02	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
1.3	28	0,07	0,1	0,12	0,015	0,03	0,03	0,03	0,04	28	0,02	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
1.4	28	0,07	0,1	0,12	0,015	0,03	0,03	0,03	0,04	28	0,02	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
1.5	28	0,07	0,1	0,12	0,015	0,03	0,03	0,03	0,04	28	0,02	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
1.6	22	0,06	0,08	0,1	0,015	0,03	0,03	0,03	0,04	22	0,02	0,03	0,035	0,045	0,025	0,055	0,08	0,1	●		
1.7	22	0,06	0,08	0,1	0,015	0,03	0,03	0,03	0,04	22	0,02	0,03	0,035	0,045	0,025	0,055	0,08	0,1	●		
1.8																					
1.9	20	0,06	0,08	0,1	0,015	0,03	0,03	0,03	0,04	20	0,02	0,03	0,035	0,045	0,025	0,055	0,08	0,1	●		
1.10																					
1.11																					
1.12																					
1.13																					
1.14																					
1.15																					
1.16																					
2.1	10	0,06	0,08	0,1	0,01	0,025	0,025	0,025	0,03	10	0,02	0,025	0,03	0,04	0,02	0,045	0,08	0,09	●		
2.2	10	0,06	0,08	0,1	0,01	0,025	0,025	0,025	0,03	10	0,02	0,025	0,03	0,04	0,02	0,045	0,08	0,09	●		
2.3	10	0,06	0,08	0,1	0,01	0,025	0,025	0,025	0,03	10	0,02	0,025	0,03	0,04	0,02	0,045	0,08	0,09	●		
2.4																					
2.5																					
2.6	10	0,06	0,08	0,1	0,01	0,025	0,025	0,025	0,03	10	0,02	0,025	0,03	0,04	0,02	0,045	0,08	0,09	●		
2.7																					
3.1	28	0,07	0,1	0,12	0,015	0,03	0,025	0,04	0,035	24	0,025	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
3.2																			●		
3.3	22	0,07	0,1	0,12	0,015	0,03	0,025	0,04	0,035	22	0,025	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
3.4	20	0,07	0,1	0,12	0,015	0,03	0,025	0,04	0,035	20	0,025	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
3.5	20	0,07	0,1	0,12	0,015	0,03	0,025	0,04	0,035	20	0,025	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
3.6	15	0,07	0,1	0,12	0,015	0,03	0,025	0,04	0,035	15	0,025	0,03	0,04	0,05	0,03	0,06	0,1	0,12			
3.7	20	0,07	0,1	0,12	0,015	0,03	0,025	0,04	0,035	20	0,025	0,03	0,04	0,05	0,03	0,06	0,1	0,12	●		
3.8	15	0,07	0,1	0,12	0,015	0,03	0,025	0,04	0,035	15	0,025	0,03	0,04	0,05	0,03	0,06	0,1	0,12			
4.1	100	0,1	0,12	0,15	0,02	0,045	0,045	0,045	0,055	90	0,03	0,04	0,06	0,07	0,035	0,07	0,14	0,15			
4.2	100	0,1	0,12	0,15	0,02	0,045	0,045	0,045	0,055	90	0,03	0,04	0,06	0,07	0,035	0,07	0,14	0,15	●		
4.3	80	0,09	0,11	0,13	0,015	0,04	0,035	0,04	0,045	80	0,03	0,035	0,045	0,055	0,03	0,06	0,12	0,12	●		
4.4	60	0,09	0,11	0,13	0,015	0,04	0,035	0,04	0,045	60	0,03	0,035	0,045	0,055	0,03	0,06	0,12	0,12	●		
4.5																					
4.6	25	0,08	0,1	0,12	0,015	0,04	0,035	0,03	0,035	25	0,02	0,035	0,045	0,055	0,03	0,06	0,12	0,12	●		
4.7	20	0,08	0,1	0,12	0,015	0,04	0,035	0,03	0,035	20	0,02	0,035	0,045	0,055	0,03	0,06	0,12	0,12	●		
4.8																					
4.9																					
4.10																					
4.11	50	0,09	0,11	0,13	0,015	0,03	0,03	0,03	0,04	45	0,02	0,035	0,045	0,055	0,03	0,06	0,12	0,12	●		
4.12	25	0,09	0,11	0,13	0,015	0,03	0,03	0,03	0,04	25	0,02	0,035	0,045	0,055	0,03	0,06	0,12	0,12	●		
4.13	80	0,12	0,15	0,18	0,025	0,06	0,055	0,055	0,07	80	0,04	0,05	0,07	0,09	0,045	0,1	0,18	0,18	●		
4.14	65	0,12	0,15	0,18	0,025	0,06	0,055	0,055	0,07	65	0,04	0,05	0,07	0,09	0,045	0,1	0,18	0,18	●		
4.15																					
4.16	70	0,1	0,12	0,15	0,018	0,04	0,03	0,035	0,045	70	0,03	0,035	0,05	0,06	0,025	0,06	0,1	0,12	●		
4.17																					
4.18																					
4.19																					
5.1																					
5.2																					
5.3																					
5.4																					
5.5																					
5.6																					
5.7																					
5.8																					
5.9	20	0,06	0,08	0,1	0,012	0,025	0,025	0,025	0,035	20	0,015	0,025	0,035	0,045	0,02	0,05	0,07	0,09			
5.10																					
5.11																					
6.1																					
6.2																					
6.3																					
6.4																					
6.5																					

13

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

Cutting data – form cutters

		50 245 ... / 50 246 ...			50 360 ...					50 362 ...				● 1st choice		○ suitable
		Ø DC 16 mm a_e= 3,2	Ø DC 20 mm a_e= 4	Ø DC 25 mm a_e= 5		Ø DC 50 mm a_e= 5	Ø DC 63 mm a_e= 6,3	Ø DC 80 mm a_e= 8	Ø DC 100 mm a_e= 10	Ø DC 40–50 mm	Ø DC 63 mm	Ø DC 80 mm	Ø DC 100 mm			
Index	v_c m/min	f_z mm			v_c m/min	f_z mm				f_z mm				Emulsion	Compressed air	MMS
1.1	28	0,01	0,015	0,018	22	0,01	0,01	0,015	0,02	0,005	0,008	0,01	0,012	●		
1.2	28	0,01	0,015	0,018	22	0,01	0,01	0,015	0,02	0,005	0,008	0,01	0,012	●		
1.3	28	0,01	0,015	0,018	22	0,01	0,01	0,015	0,02	0,005	0,008	0,01	0,012	●		
1.4	28	0,01	0,015	0,018	22	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
1.5	28	0,01	0,015	0,018	22	0,01	0,01	0,015	0,02	0,005	0,008	0,01	0,012	●		
1.6	22	0,01	0,015	0,018	20	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
1.7	22	0,01	0,015	0,018	20	0,01	0,01	0,015	0,02	0,005	0,008	0,01	0,012	●		
1.8																
1.9	20	0,01	0,015	0,015	20	0,01	0,01	0,015	0,02	0,005	0,008	0,01	0,012	●		
1.10																
1.11																
1.12																
1.13																
1.14																
1.15																
1.16																
2.1	10	0,007	0,01	0,012	10	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
2.2	10	0,007	0,01	0,012	10	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
2.3	10	0,007	0,01	0,012	10	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
2.4																
2.5																
2.6	10	0,007	0,01	0,015										●		
2.7																
3.1	24	0,01	0,012	0,015	19	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
3.2					12	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
3.3	22	0,01	0,012	0,015	15	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
3.4	20	0,01	0,012	0,015	12	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
3.5	20	0,01	0,012	0,015	16	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
3.6	15	0,01	0,012	0,015												
3.7	20	0,01	0,012	0,015	13	0,008	0,01	0,012	0,018	0,005	0,008	0,01	0,012	●		
3.8	15	0,01	0,012	0,015												
4.1	90	0,01	0,015	0,02												
4.2	90	0,01	0,015	0,02	70	0,012	0,015	0,02	0,024	0,008	0,012	0,014	0,018	●		
4.3	80	0,01	0,015	0,02	60	0,012	0,015	0,02	0,024	0,008	0,012	0,014	0,018	●		
4.4	60	0,01	0,015	0,02	60	0,012	0,015	0,02	0,024	0,008	0,012	0,014	0,018	●		
4.5																
4.6	25	0,01	0,015	0,02	18	0,01	0,012	0,015	0,018	0,005	0,008	0,01	0,012	●		
4.7	20	0,01	0,015	0,02	20	0,01	0,012	0,015	0,018	0,005	0,008	0,01	0,012	●		
4.8																
4.9																
4.10																
4.11	45	0,01	0,015	0,02	40	0,01	0,012	0,015	0,018	0,005	0,008	0,01	0,012	●		
4.12	25	0,01	0,015	0,015	20	0,01	0,012	0,015	0,018	0,005	0,008	0,01	0,012	●		
4.13	80	0,018	0,02	0,025	65	0,015	0,02	0,025	0,03	0,008	0,012	0,018	0,022	●		
4.14	65	0,018	0,02	0,025	60	0,015	0,02	0,025	0,03	0,008	0,012	0,018	0,022	●		
4.15																
4.16	70	0,01	0,015	0,0175	45	0,01	0,012	0,015	0,018	0,005	0,008	0,01	0,01	●		
4.17																
4.18																
4.19																
5.1																
5.2																
5.3																
5.4																
5.5																
5.6																
5.7																
5.8																
5.9	20	0,008	0,01	0,015	20	0,008	0,01	0,012	0,016	0,005	0,007	0,009	0,012	●		
5.10																
5.11																
6.1																
6.2																
6.3																
6.4																
6.5																

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

Cutting data – side and face cutters

		uncoated						● 1st choice		○ suitable
		Ø DC 50 mm	Ø DC 63 mm	Ø DC 80 mm	Ø DC 100 mm	Ø DC 125 mm	Ø DC 160 mm			
Index	v_c in m/min	f_z mm						Emulsion	Compressed air	MMS
1.1	30–40	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,095–0,11	0,1–0,12	●		
1.2	30–40	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,095–0,11	0,1–0,12	●		
1.3	30–40	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,095–0,11	0,1–0,12	●		
1.4	20–30	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
1.5	20–25	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,095–0,11	0,1–0,12	●		
1.6	15–30	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
1.7	20–25	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
1.8	10–15	0,03–0,04	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	●		
1.9	18–25	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
1.10	15–30	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
1.11	12–18	0,03–0,04	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	●		
1.12	15–20	0,03–0,04	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	●		
1.13										
1.14										
1.15	10–15	0,03–0,04	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	●		
1.16	10–15	0,03–0,04	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	●		
2.1	12–18	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
2.2	10–15	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
2.3	8–12	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
2.4	7–10	0,03–0,04	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	●		
2.5	5–8	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
2.6	10–15	0,03–0,04	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	●		
2.7										
3.1	20–30	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
3.2	18–25	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
3.3	18–25	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
3.4	15–20	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
3.5	25–35	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
3.6	18–25	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
3.7	25–35	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
3.8	18–25	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
4.1	150–180	0,06–0,075	0,075–0,09	0,009–0,1	0,01–0,12	0,12–0,135	0,135–0,15	●		
4.2	100–130	0,06–0,075	0,075–0,09	0,009–0,1	0,01–0,12	0,12–0,135	0,135–0,15	●		
4.3	80–100	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,095–0,11	0,1–0,12	●		
4.4	40–60	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,095–0,11	0,1–0,12	●		
4.5										
4.6	30–50	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,095–0,11	0,1–0,12	●		
4.7	90–110	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
4.8	5–10	0,03–0,04	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	●		
4.9										
4.10										
4.11	80–100	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
4.12	80–120	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
4.13	20–30	0,08–0,1	0,1–0,12	0,12–0,14	0,14–0,16	0,16–0,18	0,18–0,2	●		
4.14	30–40	0,08–0,1	0,1–0,12	0,12–0,14	0,14–0,16	0,16–0,18	0,18–0,2	●		
4.15										
4.16	90–120	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,095–0,11	0,1–0,12		●	
4.17										
4.18										
4.19										
5.1	5–10	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
5.2										
5.3										
5.4										
5.5										
5.6										
5.7										
5.8										
5.9	10–15	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
5.10	10–15	0,04–0,05	0,05–0,06	0,06–0,07	0,07–0,08	0,08–0,09	0,09–0,1	●		
5.11										
6.1										
6.2										
6.3										
6.4										
6.5										

Feed correction factor (Kf f_z) for side and face cutters in relation to the cutting depth (a_e)

a_e	Kf f_z
0,05 x DC	1,4
0,1 x DC	1,0
0,15 x DC	0,8
0,2 x DC	0,7
0,25 x DC	0,6

The indicated feed rates apply to straight pitched cutters with a cutting depth of 0.1 x DC! With cross-pitched cutters the feed rate is to be reduced by 50 %!

13

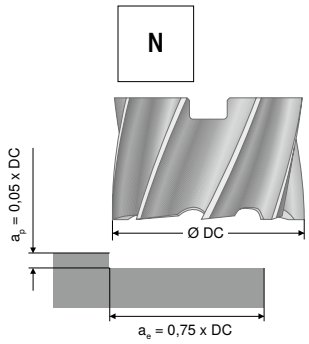
Cutting data – face mills

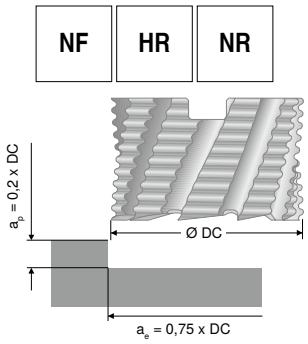
		uncoated	Ti100 Pro	● 1st choice		○ suitable
				Emulsion	Compressed air	MMS
Index	Kf f_z	v_c in m/min				
1.1	**1,2**	**25–30**	**50–60**	●		
1.2	**1,2**	**25–30**	**45–55**	●		
1.3	**1,2**	**25–30**	**45–55**	●		
1.4	**1**	**20–25**	**40–50**	●		
1.5	**1,2**	**20–25**	**40–50**	●		
1.6	**1**	**15–30**	**30–40**	●		
1.7	**1,2**	**20–25**	**40–50**	●		
1.8	**0,8**	**10–15**	**20–30**	●		
1.9	**1,2**	**18–25**	**35–45**	●		
1.10	**1**	**15–30**	**30–40**	●		
1.11	**0,8**	**12–18**	**25–35**	●		
1.12	**0,8**	**15–20**	**30–40**	●		
1.13						
1.14						
1.15	**0,8**	**10–15**	**20–30**	●		
1.16	**0,8**	**10–15**	**20–30**	●		
2.1	**1**	**12–18**	**20–25**	●		
2.2	**1**	**10–15**	**15–20**	●		
2.3	**1**	**8–12**	**20–25**	●		
2.4	**0,9**	**7–10**	**15–20**	●		
2.5	**1**	**5–8**	**10–15**	●		
2.6	**1**	**10–15**	**15–20**	●		
2.7						
3.1	**1**	**20–30**	**30–40**	●		
3.2	**1**	**18–25**	**30–35**	●		
3.3	**1**	**18–25**	**30–35**	●		
3.4	**1**	**15–20**	**25–30**	●		
3.5	**1**	**25–35**	**35–40**	●		
3.6	**1**	**18–25**	**30–35**	●		
3.7	**1**	**25–35**	**35–40**	●		
3.8	**1**	**18–25**	**30–35**	●		
4.1	**1,5**	**150–180**		●		
4.2	**1,5**	**100–130**		●		
4.3	**1,3**	**80–100**		●		
4.4	**1,3**	**40–60**		●		
4.5						
4.6	**1,2**	**30–50**	**60–80**	●		
4.7	**1,1**	**90–110**	**120–150**	●		
4.8	**0,9**	**5–10**	**10–15**	●		
4.9						
4.10						
4.11	**1,1**	**80–100**	**110–140**	●		
4.12	**1,1**	**80–120**	**120–150**	●		
4.13	**2**	**20–30**	**25–45**	●		
4.14	**2**	**30–40**	**50–70**	●		
4.15						
4.16	**1,3**	**90–120**	**120–140**		●	
4.17	**1**		**30–40**		●	
4.18	**1,1**		**15–25**	●		
4.19						
5.1	1,1	5–10	10–15	●		
5.2						
5.3						
5.4						
5.5						
5.6						
5.7						
5.8						
5.9	1	10–15	15–25	●		
5.10	1,1	10–15	15–20	●		
5.11	0,8		10–15	●		
6.1						
6.2						
6.3						
6.4						
6.5						

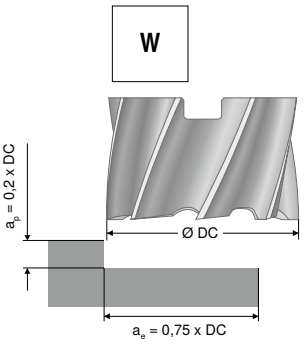
Kf f_z = Correction factor for feed per tooth

Feed per tooth for HSS face mills

Appoximate values (in mm) for the feed per tooth (f_z)







	f_z in mm		f_z in mm		f_z in mm
Ø DC mm	uncoated	Ti100 Pro	uncoated	Ti100 Pro	uncoated
40	0,049	0,054	0,064	0,070	0,060
50	0,055	0,060	0,071	0,078	0,066
63	0,061	0,067	0,079	0,087	0,074
80	0,065	0,071	0,084	0,092	0,078
100	0,059	0,065	0,076	0,084	0,071

Feed rate correction:
Please multiply the f_z value in the table above with the corresponding **correction factor Kf f_z** from the table on → **page 46**.

In general the following is valid:
f_z (milling) = f_z x Kf f_z
f_z (drilling) = f_z (milling) ÷ no. of teeth

Formula for cutting data calculation

Designation	Abbreviation	Unit	Formula
Number of revolutions	n	min^{-1}	$n = \frac{v_c \times 1000}{DC \times \pi}$
Cutting speed	v_c	m/min	$v_c = \frac{DC \times \pi \times n}{1000}$
Feed per tooth	f_z	mm	$f_z = \frac{v_f}{ZEFP \times n}$ $f_z = h_m \times \sqrt{\frac{DC}{a_e}}$
Feed per revolution	f	mm	$f = f_z \times ZEFP$
Feed rate	v_f	mm/min	$v_f = f_z \times ZEFP \times n$
Average chip thickness	h_m	mm	$h_m = f_z \times \sqrt{\frac{a_e}{DC}}$

ZEFP = Number of teeth
a_e = Cutting width (for side milling cutter cutting depth)
DC = Cutting diameter

Coating

Ti100 Pro

- Ti multilayer coating
- HV0.05 = 3500
- Coefficient of friction (against steel) = 0.7
- Maximum application temperature: 900 °C