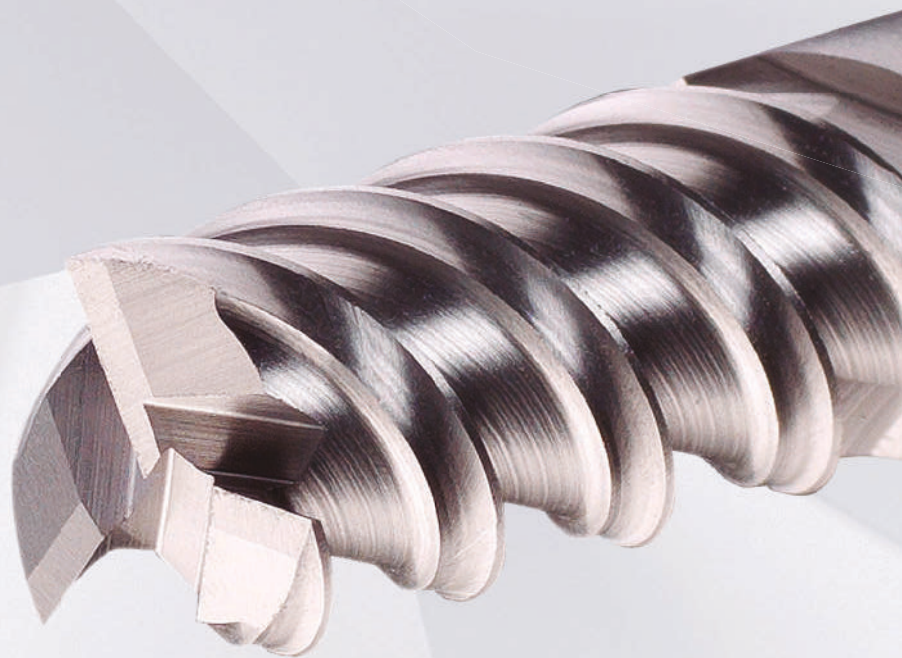


# END MILLS



**BLUE-MASTER<sup>®</sup>**  
*by celesa*

CUTTING TECHNOLOGIES

**2 FLUTE END MILLS**

**2 Z**

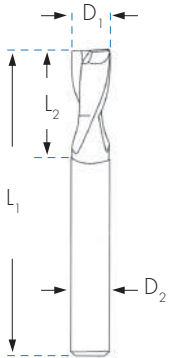


**TOL D2  
h6**

Ref. FFAL



**SHORT SERIES**


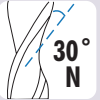




See DIN844 dimensions next pages

DIN 327	MATERIAL				FF01	FF02	FF60	FT02	FF92	FP05	FT12	FP08	FT01	DIN 844	FFAL										
	COATING															HSS	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	ASP 60	ASP 60	ASP 60	ASP 60	HSSCo 8%
	QUALITY															BRIGHT	BRIGHT	TiAlN	TiAlSiN	BRIGHT	BRIGHT	TiAlSiN	BRIGHT	TiAlSiN	BRIGHT
D1 mm	L1 mm	L2 mm	D2 mm	TOL e8 €	TOL e8 €	TOL e8 €	TOL e8 €	TOL h10 €	TOL e8 €	TOL e8 €	TOL h10 €	TOL h10 €	TOL e8 €	TOL e8 €											
1,00	47	2,5	6							23,85	30,89	34,77	41,50												
2,00	48	4,0	6	10,84	13,73	22,52	26,26	27,95		20,12	27,46	30,69	37,73		16,61										
2,50	49	5,0	6	10,84*	13,73	22,52	26,26	29,73							16,94										
3,00	49	5,0	6	10,84	13,73	22,52	26,26	28,09		20,12	27,46	30,69	37,73		16,57										
3,50	50	6,0	6			14,91	23,68	27,59							17,58										
4,00	51	7,0	6	10,63	13,73	22,53	26,27	28,09		18,29	26,25	30,69	37,73		17,06										
4,50	52	8,0	6	10,63*	16,40	24,99	29,14	29,73							18,67										
5,00	52	8,0	6	10,63	13,73	22,53	26,27	28,09		18,29	26,25	30,69	37,73		17,06										
5,50	52	8,0	6			16,97	25,64	29,89							20,89										
6,00	52	8,0	6	10,63	13,73	22,53	26,27	28,09		18,29	26,25	30,69	37,73		18,49										
6,50	60	10,0	10	15,86*	22,21	32,13	37,46								27,33										
7,00	60	10,0	10	15,86	21,55	31,45	36,67	33,85		27,60	36,30	40,61	53,70		24,85										
7,50	61	11,0	10			21,35	31,24	36,43							29,13										
8,00	61	11,0	10	12,90	17,75	27,78	32,41	30,14		23,97	35,59	40,61	53,70		22,49										
8,50	61	11,0	10			23,98	34,75	40,52							30,71										
9,00	61	11,0	10	16,49	21,92	32,85	38,29	34,65		29,51	39,20	40,61	55,32		27,84										
9,50	63	13,0	10			23,46	34,00	39,63																	
10,00	63	13,0	10	13,57	17,63	28,61	33,53	29,90		26,70	36,27	40,61	55,32		24,31										
10,50	70	13,0	12			28,18	42,80	49,21																	
11,00	70	13,0	12			26,76	39,16	45,67							33,57										
12,00	73	16,0	12	17,73	23,62	35,86	41,81	39,86		34,07	46,81	55,30	70,30		30,49										
13,00	73	16,0	12			34,44	48,29	56,31							43,45										
14,00	73	16,0	12	25,22	34,44	48,29	56,31	52,66		41,53	57,40	62,49	77,79		42,65										
15,00	73	16,0	12			38,51	54,70	63,80							46,85										
16,00	79	19,0	16	26,33	34,09	50,20	58,55	57,54		51,99	68,04	73,07	90,77		45,64										
17,00	79	19,0	16			46,27	64,10	74,75							63,51										
18,00	79	19,0	16	34,49	46,27	64,16	74,83	70,08		65,84	81,15	92,62	139,90		57,01										
19,00	79	19,0	16			57,82	77,70	90,63							76,89										
20,00	88	22,0	16			54,73	74,77	87,20																	
20,00	88	22,0	20	40,43	54,73	74,77	87,20	83,69		77,55	97,61	107,97	142,89		65,90										
22,00	88	22,0	20	55,46	72,29	99,09	115,54	109,52		98,77	136,91	128,22	164,10		91,74										
24,00	102	26,0	25	69,60	93,29	123,04	143,46	130,88							137,87										
25,00	102	26,0	25	69,62	90,88	117,98	137,58	120,27		131,86	164,96	168,08	207,67		116,77										
26,00	102	26,0	25			106,61	163,36	187,83							183,38										
28,00	102	26,0	25	87,21	114,76	153,09	179,38								142,09										
30,00	102	26,0	25	100,34	130,76	169,47	197,62	174,20							163,51										
32,00	112	32,0	32	104,05	134,32	172,58	201,25								173,18										
36,00	112	32,0	32	133,96	179,66	221,69	258,52																		
40,00	130	38,0	40	162,87	220,62	274,10	319,64																		

\*Available until end of stock

**2 FLUTE END MILLS**

**2Z**    **INOX** **Al** **TOL D2 h6** Ref. FFLAL 

LONG SERIES



DIN 327/L				MATERIAL COATING QUALITY					DIN 844/L			FFLAL
D1 mm	L1 mm	L2 mm	D2 mm	FF06 HSSCo 8% BRIGHT ★★ TOL e8 €	FF67 HSSCo 8% TiAlN ★★★ TOL e8 €	FT06 HSSCo 8% TiAlSiN ★★★★ TOL e8 €	FF15 HSSCo 8% BRIGHT ★★ TOL h10 €	FP21 ASP 60 BRIGHT Premium Quality TOL h10 €	L1 mm	L2 mm	D2 mm	€
2,00	54	7	6	15,13	23,87	27,83	30,73	36,05	54	10	6	25,03
2,50	56	8	6	15,21	23,87	27,83	30,77		56	12	6	
3,00	56	8	6	15,13	23,93	27,91	30,77	37,15	56	12	6	25,15
3,50	59	10	6	17,19	28,42	33,17			59	15	6	
4,00	63	11	6	15,20	23,93	27,91	30,77	37,15	63	19	6	25,31
4,50	63	11	6	17,19	24,44	28,50			63	19	6	
5,00	68	13	6	15,20	23,93	27,91	32,58	39,33	68	24	6	25,43
5,50	68	13	6	17,19	28,42	33,17			68	24	6	
6,00	68	13	6	15,20	23,93	27,91	29,44	35,53	68	24	6	26,40
6,50	80	16	10	28,51	46,65	53,64			68	24	6	
7,00	80	16	10	25,10	35,04	40,87	37,13	44,40	80	30	10	
7,50	88	19	10						80	30	10	
8,00	88	19	10	22,09	31,99	37,33	37,13	44,81	88	38	10	36,08
8,50	88	19	10	33,81	46,01	53,65			88	38	10	
9,00	88	19	10	29,72	40,52	47,23	40,73	48,72	88	38	10	38,05
10,00	95	22	10	24,34	37,06	43,21	40,56	49,19	95	45	10	36,08
11,00	102	22	12	38,37	51,76	60,35	54,02		102	45	12	50,56
12,00	110	26	12	34,99	48,94	57,08	52,98	63,66	110	53	12	46,67
13,00	110	26	12						110	53	12	
14,00	110	26	12	46,12	59,82	69,75	70,29	79,79	110	53	12	53,42
15,00	123	32	16						110	53	12	
16,00	123	32	16	52,86	73,82	86,10	80,00	95,22	123	63	16	65,21
17,00	123	32	16						123	63	16	
18,00	123	32	16	60,39	86,65	101,02	96,14	114,41	123	63	16	80,70
20,00	141	38	20	69,45	95,05	110,85	104,25	124,05	141	75	20	96,26
22,00	141	38	20	95,22	128,98	150,40	129,22	153,79	141	75	20	
24,00	166	45	25	144,90	164,10	188,67	173,83		166	90	25	
25,00	166	45	25	136,60	173,56	202,39	158,93	189,13	166	90	25	
26,00	166	45	25	181,38	193,23	222,17			166	90	25	
28,00	166	45	25	165,53	211,30	246,41			166	90	25	
30,00	166	45	25	184,01	227,46	265,24	236,75		166	90	25	
32,00	186	53	32	254,58	296,52	345,76	308,48		186	106	32	
36,00	186	53	32	288,02	337,14	393,14			186	106	32	
40,00	196	63	32	377,43	455,50	531,18			196	125	40	





End mills

Pink

**3 FLUTE END MILLS**

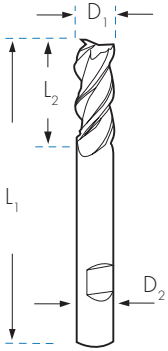
End mills

Pink

**3Z**     **INOX** **Al** **TOL D2 h6**



SHORT SERIES



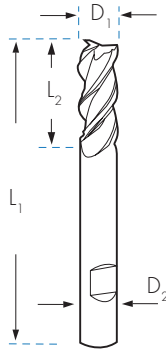
DIN 844				MATERIAL		COATING		QUALITY		ROUGHING		DIN 327			ASP 60		ASP 60	
				HSSCo 8%	HSSCo 8%	BRIGHT	TiAlN	TiAlSiN	BRIGHT	TiAlN	TiAlSiN				★★	★★★	★★★★	★★
D1	L1	L2	D2	TOL k10	TOL k10	TOL k10	TOL k12	TOL k12	TOL k12	TOL k12	L1	L2	D2	TOL e8	TOL e8	€	€	
mm	mm	mm	mm	€	€	€	€	€	€	€	mm	mm	mm	€	€			
1,00	49	3	6								47	2,5	6	25,63	31,92			
2,00	51	7	6	15,09	23,75	27,69					48	4,0	6	20,83	31,18			
2,50	52	8	6	15,09	23,75	27,69					49	5,0	6					
3,00	52	8	6	15,05	23,75	27,69					49	5,0	6	20,83	31,18			
3,50	55	11	6	15,55	24,19	28,36					50	6,0	6					
4,00	55	11	6	15,08	23,75	27,69					51	7,0	6	20,83	31,18			
4,50	57	13	6	16,61	25,10	29,27					52	8,0	6					
5,00	57	13	6	15,08	23,86	27,83					52	8,0	6	20,83	31,18			
5,50	57	13	6	20,50	32,65	38,07					52	8,0	6					
6,00	57	13	6	15,88	26,68	31,11	43,05	52,00	59,77		52	8,0	6	20,83	31,18			
6,50	66	16	10	28,48	43,67	50,22					60	10,0	10					
7,00	66	16	10	22,19	32,07	37,55	50,92	62,07	71,37		60	10,0	10	28,04	38,00			
7,50	69	19	10	28,69	44,13	50,75					61	11,0	10					
8,00	69	19	10	19,82	29,60	34,53	44,12	51,39	59,94		61	11,0	10	28,04	38,00			
8,50	69	19	10	30,24	45,58	52,40					61	11,0	10					
9,00	69	19	10	24,75	35,50	41,39	52,36	61,46	71,67		61	11,0	10					
9,50	72	22	10	32,68	47,89	55,06					63	13,0	10					
10,00	72	22	10	21,47	32,13	37,46	44,39	54,63	63,69		63	13,0	10	29,72	39,31			
11,00	79	22	12	34,10	50,71	58,31	64,06	73,80	86,08		70	13,0	12					
12,00	83	26	12	26,96	38,35	44,72	53,41	62,87	73,32		73	16,0	12	38,34	49,71			
13,00	83	26	12	42,88	58,96	67,80	69,77	81,27	94,79		73	16,0	12					
14,00	83	26	12	36,73	50,30	58,66	60,95	71,71	83,63		73	16,0	12	49,67	60,54			
15,00	83	26	12	44,06	61,19	70,37	77,14	84,44	93,08		73	16,0	12					
16,00	92	32	16	40,33	56,13	65,46	73,88	89,10	103,93		79	19,0	16	58,42	69,69			
17,00	92	32	16	66,00	86,66	99,63					79	19,0	16					
18,00	92	32	16	50,67	68,54	79,93	80,84	98,09	114,39		79	19,0	16	71,89	85,24			
19,00	92	31	16	80,71	99,70	114,65					79	19,0	16					
20,00	104	38	20	58,18	77,25	90,10	98,63	115,38	134,55		88	22,0	20	85,50	102,05			
22,00	104	38	20	92,75	116,64	134,12					88	22,0	20	114,13	145,99			
25,00	121	45	25	121,18	154,43	177,58	149,40	170,73	199,10		102	26,0	25	143,28	164,63			
28,00	121	45	25	140,77	172,69	198,55					102	26,0	25					
30,00	121	45	25	173,17	202,82	233,20	185,79	219,21	255,64		102	26,0	25					
32,00	133	53	32	176,26	218,89	251,68					112	32,0	32					

**3 FLUTE END MILLS**

**3Z**



LONG SERIES








DIN 844/L		MATERIAL COATING QUALITY		FF83	FF86	FT83
				HSSCo 8% BRIGHT ★★	HSSCo 8% TiAlN ★★★	HSSCo 8% TiAlSiN ★★★★
D1 mm	L1 mm	L2 mm	D2 mm	€	€	€
1,00	52	7	6			
2,00	54	10	6	20,34	29,78	34,72
2,50	56	12	6	20,72	29,73	34,68
3,00	56	12	6	20,34	29,69	34,62
3,50	59	15	6	22,76	31,83	37,13
4,00	63	19	6	20,34	29,69	34,62
4,50	63	19	6	22,76	31,83	37,13
5,00	68	24	6	20,34	29,69	34,62
5,50	68	24	6	22,76	31,83	37,13
6,00	68	24	6	22,79	31,05	36,21
6,50	68	24	6			
7,00	80	30	10	30,87	41,57	48,48
7,50	80	30	10			
8,00	88	38	10	28,24	37,50	43,73
8,50	88	38	10			
9,00	88	38	10	34,36	44,48	51,88
9,50	88	38	10			
10,00	95	45	10	28,39	41,24	48,09
11,00	102	45	12	43,65	56,16	65,49
12,00	110	53	12	36,12	50,27	58,63
13,00	110	53	12			
14,00	110	53	12	47,05	61,47	71,69
15,00	110	53	12			
16,00	123	63	16	53,01	74,09	86,41
17,00	123	63	16			
18,00	123	63	16	64,24	87,58	102,14
19,00	123	63	16			
20,00	141	75	20	75,41	100,21	116,85
22,00	141	75	20	95,11	129,22	150,69
25,00	166	90	25	138,61	170,71	199,08
28,00	166	90	25	154,31	204,42	238,40
30,00	166	90	25	171,80	218,36	254,64
32,00	186	106	32	204,41	245,93	286,80

**MULTI-FLUTE END MILLS**

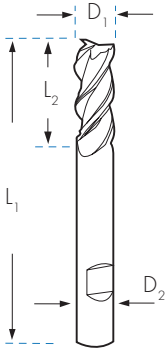
End mills

Pink

**4-6 Z**   **30° N**  **WELDON**  **34 HRc** **INOX** **Al** **TOL D1 k10** **TOL D2 h6** 

**SHORT SERIES**

**LONG SERIES**

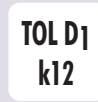


DIN 844					MATERIAL		COATING		QUALITY	
					HSSCo 8%	HSSCo 8%	BRIGHT	TiAlN	★★	★★★
D1 mm	L1 mm	L2 mm	D2 mm	Z	€	€	€	€	€	
1,00	49	3	6	4				28,42	33,75	
2,00	51	7	6	4	15,14	23,82	27,76	20,77	28,47	
2,50	52	8	6	4	15,14	23,82	27,76			
3,00	52	8	6	4	15,14	23,82	27,76	20,77	28,47	
3,50	55	11	6	4	15,59	24,26	28,30			
4,00	55	11	6	4	15,14	23,82	27,76	20,77	28,47	
4,50	57	13	6	4	16,64	25,15	29,32			
5,00	57	13	6	4	15,14	23,82	27,76	20,77	28,47	
5,50	57	13	6	4	24,20	32,65	38,07			
6,00	57	13	6	4	15,80	24,56	28,63	20,77	28,47	
6,50	66	16	10	4	24,15	33,99	39,63			
7,00	66	16	10	4	22,19	32,08	37,40	28,23	40,62	
7,50	69	16	10	4	28,60	38,18	44,53			
8,00	69	19	10	4	19,53	29,72	34,66	28,11	40,22	
8,50	69	19	10	4	29,82	40,38	47,10			
9,00	69	19	10	4	24,64	35,54	41,45	33,21	43,87	
9,50	69	19	10	4	31,55	42,01	48,98			
10,00	72	22	10	4	21,36	32,26	37,63	29,85	41,23	
11,00	79	22	12	4	29,71	41,98	48,96			
12,00	83	26	12	4	26,96	37,29	43,49	39,42	54,59	
13,00	83	26	12	4	38,03	51,87	60,49			
14,00	83	26	12	4	35,89	50,60	59,02	48,98	58,15	
15,00	83	26	12	4	40,99	56,55	65,95			
16,00	92	32	16	4	40,00	56,41	65,76	57,41	68,87	
17,00	92	32	16	4	49,84	67,54	78,76			
18,00	92	32	16	4	49,27	68,61	79,99	70,02	86,13	
19,00	92	31	16	4	58,36	77,64	90,52			
20,00	104	38	20	4	57,68	77,64	90,52	82,35	111,89	
22,00	104	38	20	4	80,07	107,61	125,50	108,50	131,97	
24,00	121	45	25	5	100,66	126,81	147,88			
25,00	121	45	25	5	96,22	126,21	147,19	140,00	174,02	
26,00	121	45	25	5	115,50	153,21	181,25			
28,00	121	45	25	5	114,53	153,55	185,20			
30,00	121	45	25	6	133,14	170,43	208,65			
32,00	133	53	32	6	136,51	174,36	213,46			
36,00	133	53	32	6	206,74	250,33	306,43			
40,00	155	63	32	6	248,54	304,43	372,66			

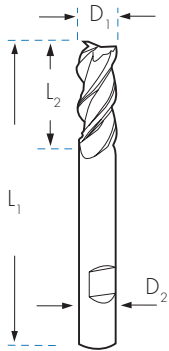
DIN 844/L				MATERIAL		COATING		QUALITY	
				HSSCo 8%	HSSCo 8%	BRIGHT	TiAlN	★★	★★★
L1 mm	L2 mm	D2 mm	Z	€	€	€	€		
52	7	6	4						
54	10	6	4	18,48	27,05	31,54	29,51		
56	12	6	4	18,38	27,05	31,54			
56	12	6	4	18,48	27,06	31,55	29,51		
59	15	6	4	24,29	32,80	38,24			
63	19	6	4	18,48	27,06	31,55	29,51		
63	19	6	4	24,29	32,80	38,24			
68	24	6	4	18,48	27,06	31,55	29,51		
68	24	6	4	24,13	32,80	38,24			
68	24	6	4	18,48	27,06	31,55	29,51		
80	30	10	4	28,04	37,62	43,88	44,02		
80	30	10	4						
88	38	10	4	25,47	33,90	39,53	44,02		
88	38	10	4						
88	38	10	4	29,02	39,52	46,09	44,02		
95	45	10	4						
95	45	10	4	25,58	37,41	43,64	44,02		
102	45	12	4	36,34	49,30	57,51			
110	53	12	4	33,47	46,83	54,63	63,83		
110	53	12	4						
110	53	12	4	43,80	57,10	66,59	73,68		
110	53	12	4						
123	63	16	4	47,88	67,18	78,35	91,30		
123	63	16	4						
123	63	16	4	58,49	79,97	93,26	116,82		
123	63	16	4						
141	75	20	4	68,50	92,38	107,72	143,25		
141	75	20	5	94,99	121,75	141,99	160,68		
141	75	25	5						
166	90	25	5	125,94	155,49	181,31	233,41		
166	90	25	5						
166	90	25	5	140,87	184,97	215,69			
166	90	25	6	159,01	203,19	236,97			
186	106	32	6	160,30	204,63	238,62			
186	106	32	6	229,77	275,86	321,68			
217	125	32	6	254,67	328,90	385,37			

**MULTI-FLUTE ROUGHING END MILLS**

**4-6 Z**



**SHORT SERIES**



**LONG SERIES**

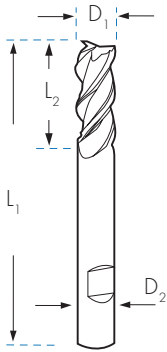


DIN 844		MATERIAL		COATING		QUALITY		ROUGHING	
D1 mm	L1 mm	L2 mm	D2 mm	Z	€	€	€	€	
6,00	57	13	6	4	38,75	46,78	54,55		
7,00	66	16	10	4	46,57	55,84	65,11		
8,00	69	19	10	4	40,45	49,72	57,98		
9,00	69	19	10	4	48,35	58,54	68,29		
10,00	72	22	10	4	40,13	49,24	57,41		
11,00	79	22	12	4	58,81	70,53	82,26		
12,00	83	26	12	4	48,47	60,03	69,99		
13,00	83	26	12	4	68,82	81,44	94,97		
14,00	83	26	12	4	56,27	69,62	81,19		
15,00	83	26	12	4	74,00	89,61	104,50		
16,00	92	32	16	4	66,75	82,04	95,68		
17,00	92	32	16	4	91,15	108,45	126,46		
18,00	92	32	16	4	72,79	90,39	105,40		
19,00	92	31	16	4	107,72	125,70	146,60		
20,00	104	38	20	4	91,21	110,41	128,76		
<b>NO CENTER CUTTING</b>									
22,00	104	38	20	6	103,05	133,23			
24,00	121	45	25	6	129,80	157,99	176,31		
25,00	121	45	25	6	128,58	157,08	175,29		
26,00	121	45	25	6	148,90	192,21	214,48		
28,00	121	45	25	6	162,43	209,12	233,35		
30,00	121	45	25	6	174,49	228,89	255,41		
32,00	133	53	32	6	197,68	246,18	274,70		
36,00	133	53	32	6	234,29	283,68	316,57		
40,00	155	63	32	6	263,39	328,50	366,58		

DIN 844/L		MATERIAL		COATING		QUALITY		ROUGHING	
L1 mm	L2 mm	D2 mm	Z	€	€	€	€		
68	24	6	4	54,92	62,12	72,79			
80	30	10	4	56,62	70,97	82,76			
88	38	10	4	56,80	65,68	76,59			
88	38	10	4	62,28	71,96	83,91			
95	45	10	4	49,47	61,17	71,34			
102	45	12	4	80,96	92,77	108,20			
110	53	12	4	61,11	73,93	86,22			
110	53	12	4						
110	53	12	4	70,61	83,53	97,43			
110	53	12	4						
123	63	16	4	82,65	101,37	118,20			
123	63	16	4						
123	63	16	4	96,53	118,53	138,22			
123	63	16	4						
141	75	20	4	117,48	139,73	162,94			
141	75	20	6	132,33	178,49	199,18			
141	75	25	6						
166	90	25	6	167,11	211,45	235,96			
166	90	25	6						
166	90	25	6	188,45	243,10	271,27			
166	90	25	6	244,33	290,38	324,05			
186	106	32	6	255,55	296,87	331,28			
186	106	32	6	306,86	354,51	395,59			
217	125	40	6	362,81	441,25	492,40			

**NO CENTER CUTTING MULTI-FLUTE END MILLS**
**4-6 Z**

**INOX**
**Al**
**TOL D1  
k10**
**TOL D2  
h6**

**SHORT SERIES**
**LONG SERIES**


DIN 844					MATERIAL				DIN 844/L						
COATING					HSS	HSSCo 8%	HSSCo 8%	HSSCo 8%	MATERIAL						
QUALITY					BRIGHT	BRIGHT	TiAIN	TiAISIN	COATING						
					★	★★	★★★	★★★★	QUALITY						
D1	L1	L2	D2	Z	€	€	€	€	L1	L2	D2	Z	€	€	€
mm	mm	mm	mm						mm	mm	mm				
2,00	51	7	6	4	10,85	14,22	22,88	26,70	54	10	6	4	17,78	27,52	32,24
2,50	52	8	6	4	10,85	14,22	22,88	26,70	56	12	6	4	17,78	25,26	29,60
3,00	52	8	6	4	10,85	14,22	22,88	26,70	56	12	6	4	17,78	28,62	33,54
3,50	55	11	6	4	11,19	14,66	23,40	27,27	59	15	6	4	23,39	34,35	40,25
4,00	55	11	6	4	10,85	14,22	22,97	26,77	63	19	6	4	17,78	28,62	33,54
4,50	57	13	6	4	11,19	14,65	23,40	27,27	63	19	6	4	23,39	34,35	40,25
5,00	57	13	6	4	10,85	14,22	22,97	26,77	68	24	6	4	17,78	28,62	33,54
5,50	57	13	6	4	16,86	22,12	30,76	35,86	68	24	6	4	23,39	34,35	40,25
6,00	57	13	6	4	10,85	14,22	22,96	26,75	68	24	6	4	17,78	28,62	33,54
6,50	66	16	10	4	16,86*	22,12	31,83	37,13	68	24	6	4			
7,00	66	16	10	4	15,91	20,89	30,67	35,76	80	30	10	4	26,91	39,50	46,28
7,50	69	16	10	4	19,94	26,13	35,65	41,58	80	30	10	4			
8,00	69	19	10	4	12,36	16,04	26,00	30,33	88	38	10	4	24,70	37,22	43,59
8,50	69	19	10	4	20,78	27,30	37,77	44,04	88	38	10	4			
9,00	69	19	10	4	16,64	21,81	32,58	37,99	88	38	10	4	27,94	41,65	48,81
9,50	72	22	10	4	22,56	28,84	39,66	46,26	88	38	10	4			
10,00	72	22	10	4	15,10	19,79	30,69	35,78	95	45	10	4	24,57	39,61	46,42
11,00	79	22	12	4	20,81	27,30	39,59	46,17	102	45	12	4	33,61	49,98	58,58
12,00	83	26	12	4	17,95	23,62	35,62	41,53	110	53	12	4	31,21	47,54	55,70
13,00	83	26	12	4	26,76	35,24	48,52	56,57	110	53	12	4			
14,00	83	26	12	4	25,32	33,13	46,67	54,42	110	53	12	4	40,80	57,67	67,58
15,00	83	26	12	4	28,86	37,82	53,75	62,67	110	53	12	4			
16,00	92	32	16	4	28,16	36,88	52,87	61,64	123	63	16	4	44,59	68,18	79,89
17,00	92	32	16	4	34,69	45,66	63,21	73,71	123	63	16	4			
18,00	92	32	16	4	34,65	45,47	63,21	73,71	123	63	16	4	54,46	81,02	94,92
19,00	92	31	16	4	41,04	53,50	72,52	84,59	123	63	16	4			
20,00	104	38	20	4	40,62	53,50	72,52	84,59	141	75	20	4	63,78	92,97	108,93
22,00	104	38	20	5	56,39	74,25	100,38	117,07	141	75	20	5	88,45	122,20	143,19
24,00	121	45	25	5	70,04	92,27	118,00	137,61	141	75	25	5			
25,00	121	45	25	5	69,81	92,27	118,00	137,61	166	90	25	5	117,32	156,46	183,32
26,00	121	45	25	5	87,56	115,35	149,17	173,95	166	90	25	5			
28,00	121	45	25	5	87,56	115,35	153,20	178,64	166	90	25	5	143,39	192,67	225,76
30,00	121	45	25	6	101,51	132,96	170,83	199,22	166	90	25	6	164,12	213,61	250,26
32,00	133	53	32	6	104,40*	136,39	174,80	203,85	186	106	32	6	163,86	215,11	252,03
36,00	133	53	32	6	136,62	179,93	218,88	255,24	186	106	32	6	233,70	295,56	346,31
40,00	143	63	32	6	163,79	216,28	268,60	313,23	217	125	40	6	259,78	397,22	465,43

\*Available until end of stock

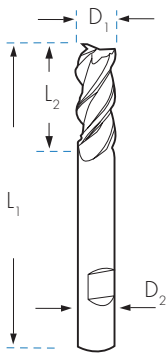


MULTI-FLUTE ROUGHING END MILLS

**3-5 Z**   **30° N**  **34 HRc** **INOX** **Al** **TOL D1 k12** **TOL D2 h6**

SHORT SERIES

LONG SERIES



DIN 844		MATERIAL			FP10	FT10	FP11	FT11
		COATING			ASP 60	ASP 60	ASP 60	ASP 60
		ROUGHING			BRIGHT	TiAlSiN	BRIGHT	TiAlSiN
		QUALITY			NF	NF	NR	NR
D1 mm	L1 mm	L2 mm	D2 mm	Z	€	€	€	€
2,00	51	7	6	3				
2,50	52	8	6	3				
3,00	52	8	6	3				
3,50	55	11	6	3				
4,00	55	11	6	3				
4,50	57	13	6	3				
5,00	57	13	6	3				
5,50	57	13	6	3				
6,00	57	13	6	3	48,53	55,69	44,97	51,71
6,50	66	16	10	3				
7,00	66	16	10	3	62,23	67,76	56,46	64,25
7,50	69	19	10	3				
8,00	69	19	10	3	53,60	62,43	49,14	56,77
8,50	69	19	10	3				
9,00	69	19	10	3	64,56	70,69	58,73	67,19
9,50	72	22	10	3				
10,00	72	22	10	4	51,11	60,58	46,33	57,53
11,00	79	22	12	4				
12,00	83	26	12	4	67,23	76,14	61,30	70,14
13,00	83	26	12	4				
14,00	83	26	12	4	81,64	92,82	74,02	84,17
15,00	83	26	12	4				
16,00	92	32	16	4	100,08	110,35	91,25	102,81
17,00	92	32	16	4				
18,00	92	32	16	4	109,88	119,99	99,01	112,45
19,00	92	31	16	4				
20,00	104	38	20	4	136,31	150,27	123,21	140,97
22,00	104	38	20	5	168,04	185,13	152,38	173,18
24,00	121	45	25	5				
25,00	121	45	25	5	199,19	221,33	180,68	204,99
26,00	121	45	25	5				
28,00	121	45	25	5				
30,00	121	45	25	5				
32,00	133	53	32	5				
36,00	133	53	32	5				
40,00	155	63	40	5				

DIN 844/L		MATERIAL			FP15	FT15	FP13	FT13
		COATING			ASP 60	ASP 60	ASP 60	ASP 60
		ROUGHING			BRIGHT	TiAlSiN	BRIGHT	TiAlSiN
		QUALITY			NF	NF	NR	NR
L1 mm	L2 mm	D2 mm	Z	€	€	€	€	
54	10	6	3					
56	12	6	3					
56	12	6	3					
59	15	6	3					
63	19	6	3					
63	19	6	3					
68	24	6	3					
68	24	6	3					
68	24	6	3	76,15	80,45	67,55	74,34	
68	24	6	3					
80	30	10	3	86,09	98,01	78,18	91,30	
80	30	10	3					
88	38	10	3	80,10	85,25	70,90	79,41	
88	38	10	3					
88	38	10	3	84,49	96,69	78,18	91,88	
88	38	10	3					
95	45	10	4	72,07	80,15	64,22	74,01	
102	45	12	4					
110	53	12	4	91,33	99,77	80,66	91,33	
110	53	12	4					
110	53	12	4	107,05	122,83	96,27	108,71	
110	53	12	4					
123	63	16	4	128,05	140,65	114,25	129,78	
123	63	16	4					
123	63	16	4	143,23	166,78	130,49	148,68	
123	63	16	4					
141	75	20	4	186,18	204,23	164,95	189,89	
141	75	20	5	284,45	303,97	249,08	275,75	
141	75	25	5					
166	90	25	5	285,63	313,61	251,96	292,25	
166	90	25	5					
166	90	25	5					
166	90	25	5					
186	106	32	5					
186	106	32	5					
217	125	40	5					

**3 FLUTE END MILLS SHORT SERIES**
**3Z**

**INOX**
**Al**
**TOL D1**  
e8

**TOL D2**  
h6

**SUPER-SHORT SERIES**
**EXTRA-SHORT SERIES**

MATERIAL					FF51
COATING					HSSCo 8%
					BRIGHT
D1 mm	L1 mm	L2 mm	D2 mm	Z	€
1,00	34	2	6	3	14,48
1,50	34	3	6	3	14,48
2,00	35	4	6	3	14,45
2,50	36	5	6	3	14,45
3,00	36	5	6	3	14,45
3,50	37	6	6	3	14,45
4,00	38	7	6	3	14,45
4,50	38	7	6	3	14,45
5,00	39	8	6	3	14,45
5,50	39	8	6	3	14,45
6,00	39	8	6	3	14,45
6,50	42	10	8	3	19,87
7,00	42	10	8	3	19,87
7,50	42	10	8	3	19,87
8,00	43	11	8	3	19,87
8,50	48	11	10	3	22,77
9,00	48	11	10	3	22,77
9,50	48	11	10	3	22,77
10,00	50	13	10	3	22,77



MATERIAL					FF53
COATING					HSSCo 8%
					BRIGHT
D1 mm	L1 mm	L2 mm	D2 mm	Z	€
2,00	38	7	6	3	15,85
2,50	39	8	6	3	15,85
3,00	39	8	6	3	15,85
3,50	41	10	6	3	15,85
4,00	42	11	6	3	15,85
4,50	42	11	6	3	15,85
5,00	44	13	6	3	15,85
5,50	44	13	6	3	15,85
6,00	44	13	6	3	15,85
6,50	48	16	8	3	21,81
7,00	48	16	8	3	21,81
8,00	51	19	8	3	21,81
8,50	56	19	10	3	24,94
9,00	56	19	10	3	24,94
10,00	59	22	10	3	24,94

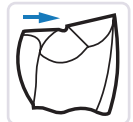

**3Z**

**DIN**  
844N

**HSS**  
PM

**Al**
**Cu**
**TOL D1**  
k10

**TOL D2**  
h6

 Improves chip  
removal


						FP22
	D1 mm	L1 mm	L2 mm	D2 mm	Z	€
FP220600	6,00	57	13	6	3	35,03*
FP220700	7,00	66	16	10	3	47,33*
FP220800	8,00	69	19	10	3	47,33*
FP220900	9,00	69	19	10	3	47,33*
FP221000	10,00	72	22	10	3	47,33*
FP221200	12,00	83	26	12	3	65,14*
FP221400	14,00	83	26	12	3	74,27*
FP221500	15,00	83	26	12	3	90,71*
FP221600	16,00	92	32	16	3	90,71*
FP221800	18,00	92	32	16	3	127,17*
FP222000	20,00	104	38	20	3	151,76*



\*Available until end of stock

**SOLID CARBIDE ROUTERS FOR COMPOSITE AND FIBER GLASS MATERIALS, PHENOLIC BOARDS, ETC**

**SOLID CARBIDE**



REV. AND FEED		
D <sub>1</sub> mm	RPM rev./min	FEED mm/min
1,50	60.000	3.000
2,00	50.000	2.500
3,00	32.000	1.600
5,00	20.000	1.200
6,00	16.000	1.000
6,35	14.000	1.000
8,00	9.000	700
10,00	7.000	550
12,00	6.000	450



D <sub>1</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	D <sub>2</sub> mm	RFC		RF		RFC <sub>TL</sub>		RFTL	
				€		€	TiAIN	€	TiAIN	€	
1,50	38	5	3,00	RFC0150	18,63	RF0150	17,66	RFC0150TL	28,16	RF0150TL	27,19
2,00	38	10	3,00	RFC0200	18,63	RF0200	17,66	RFC0200TL	28,16	RF0200TL	27,19
3,00	38	12	3,00	RFC0300	18,63	RF0300	17,66	RFC0300TL	28,16	RF0300TL	27,19
5,00	50	16	5,00	RFC0500	36,98	RF0500	33,59	RFC0500TL	46,53	RF0500TL	43,12
6,00	63	25	6,00	RFC0600	43,98	RF0600	39,87	RFC0600TL	55,57	RF0600TL	51,48
6,35	75	30	6,35	RFC0635	48,83	RF0635	44,70	RFC0635TL	60,46	RF0635TL	56,31
8,00	63	25	8,00	RFC0800	73,22	RF0800	66,47	RFC0800TL	84,19	RF0800TL	77,41
10,00	63	25	10,00	RFC1000	93,02	RF1000	84,59	RFC1000TL	104,53	RF1000TL	96,09
12,00	75	25	12,00	RFC1200	116,94	RF1200	106,35	RFC1200TL	131,20	RF1200TL	120,58

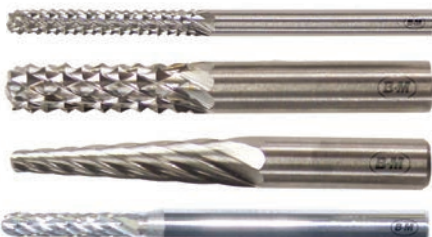
**SOLID CARBIDE TYRE BURRS**

**SOLID CARBIDE**



	RN				
	D <sub>1</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	D <sub>2</sub> mm	€
RN0300	3,00	50	25	3	18,13
RN0600	6,00	80	50	6	43,76
RN0800	8,00	110	50	8	49,28
RN1000	10,00	110	60	10	77,34

**SOLID CARBIDE ROUTERS, ROTOZIP TYPE ACCESSORIES**



		RR				
		D <sub>1</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	D <sub>2</sub> mm	€
RR0317	Tile	3,17	50	25	3,17	20,91*
RR0635	Tile	6,35	50	25	6,35	35,05*
RR0435	Drywall	6,35	52	32	6,35	43,86*
RR0247	Grout	2,47	38	14	3,17	15,37*

\*Available until end of stock

**HSSCo SINGLE FLUTE END MILLS (FOR ALUMINIUM & PVC)**

HSSCo

Al

PVC

TOL D1  
k12TOL D2  
h6

## SHORT SERIES



## FF13

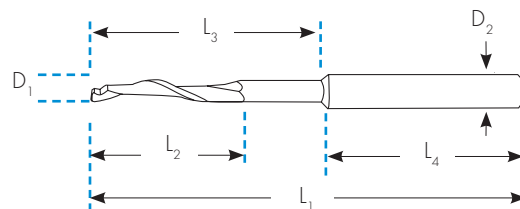
	D1 mm	L1 mm	L2 mm	D2 mm	HSSCo €	TiN €
FF1381	1,0	60	12	8	44,70	62,96
FF1382	2,0	60	12	8	44,70	62,96
FF1383	3,0	60	12	8	17,03	24,85
FF1384	4,0	60	12	8	17,03	24,85
FF1385	5,0	60	13	8	17,03	24,85
FF1386	6,0	60	16	8	17,97	25,75
FF1387	7,0	60	16	8	20,78	29,22
FF1388	8,0	80	16	8	20,78	29,22
FF131010	10,0	80	15	10	23,05	30,28
FF1361	1,0	45	6	6	31,20	41,37
FF13615	1,5	45	6	6	31,20	41,37
FF1362	2,0	45	6	6	31,20	41,37
FF1363	3,0	60	12	6	16,16	22,66
FF1364	4,0	60	12	6	16,21	22,66
FF1365	5,0	60	12	6	16,21	22,66
FF1366	6,0	60	14	6	16,21	22,66

## LONG SERIES



## FF14

	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	HSSCo €	TiN €
FF1483	3	80	16	45	8	29,31	37,20
FF1484	4	80	16	45	8	24,95	33,03
FF1485	5	80	16	45	8	24,95	33,03
FF1486	6	90	16	45	8	24,95	33,03
FF1487	7	90	20	50	8	32,31	40,73
FF1488	8	100	30	70	8	29,21	37,55
FF1465	5	80	14	45	6	24,93	33,03
FF1466	6	80	14	45	6	24,95	33,03



## EXTRA LONG SERIES



## FF14-E

	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	L4 mm	HSSCo €	TiN €
FF1485-E	5	100	30	55	8	45	24,43	30,59
FF1485-EL	5	100	50	-	8	50	29,25	41,54

## LACQUERED ALUMINIUM



## FF50

	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	HSSCo €	TiN €
FF5084	4	80	16	35	8	22,66	30,92
FF5085	5	80	18	35	8	22,66	30,92

## SPECIAL SIZES



## FF14 Specials

	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	HSSCo €
FF148412020	4	120	20	-	8	24,71
FF14856018	5	60	18	-	8	20,37
FF14859025	5	90	25	-	8	26,58
FF148510025	5	100	25	-	8	24,70
FF148512014	5	120	14	-	8	24,70
FF14851001817	5	100	18	35	8	25,10
FF14851201461	5	120	14	75	8	33,80
FF14851201817	5	120	18	35	8	33,80
FF1486801421	6	80	14	35	8	28,00
FF14861001835	6	100	18	35	8	28,00
FF14861201461	6	120	14	75	8	40,50

## FF14 Specials

	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	HSSCo €
FF14861003045	6	100	30	45	8	33,97
FF14861006040	6	100	60	-	8	43,61
FF14888025	8	80	25	-	8	21,14
FF148810014	8	100	14	-	8	23,38
FF148812014	8	120	14	-	8	25,38
FF14881201476	8	120	14	90	8	30,63
FF14898014	9	80	14	-	8	24,52
FF148108014	10	80	14	-	8	26,10
FF1410101003040	10	100	30	70	10	31,86
FF1410101201481	10	120	14	95	10	33,93
FF14101012014	10	120	14	-	10	27,35
FF148128014	12	80	14	-	8	29,60

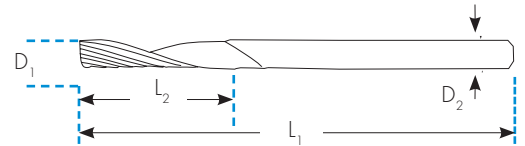
**SOLID CARBIDE SINGLE FLUTE END MILLS (FOR ALUMINIUM & PVC)**

**SOLID CARBIDE** **Al** **PVC** **TOL h10** **TOL D2 h6**

**HELIX A - SHORT SERIES**



A	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13	
					CARBIDE	€
FMGA13305	0,5	39	1,5	3		51,93
FMGA1331	1,0	39	3,0	3		39,81
FMGA13315	1,5	39	4,0	3		35,83
FMGA1322	2,0	40	10,0	2		30,19
FMGA1333	3,0	40	12,0	3		25,57
FMGA1336	3,0	64	12,0	6		44,73
FMGA1338	3,0	64	12,0	8		64,79
FMGA1344	4,0	50	16,0	4		28,11
FMGA1346	4,0	64	16,0	6		45,18
FMGA1348	4,0	64	16,0	8		75,39
FMGA135550	5,0	50	16,0	5		29,17
FMGA1355	5,0	64	16,0	5		31,96
FMGA1356	5,0	64	16,0	6		50,86
FMGA1358	5,0	64	16,0	8		77,10
FMGA136650	6,0	50	16,0	6		39,22
FMGA1366	6,0	64	20,0	6		43,21
FMGA1368	6,0	64	20,0	8		78,27
FMGA1378	7,0	64	20,0	8		87,75
FMGA138816	8,0	66	16,0	8		44,49
FMGA1388	8,0	76	38,0	8		59,00
FMGA131010	10,0	76	30,0	10		73,94



**HELIX A - LONG SERIES**



A	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13E	
					CARBIDE	€
FMGA1355E	5	80	38	5		56,34
FMGA1366E	6	85	40	6		62,22
FMGA1388E	8	90	38	8		79,98
FMGA1388EX	8	110	43	8		104,93
FMGA131010E	10	100	40	10		114,67
FMGA131010EL	10	120	60	10		148,64

**HELIX B**



B	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13HI	
					CARBIDE	€
FMGA1333HI	3	50	8	3		33,31
FMGA1344HI	4	64	12	4		33,31
FMGA1355HI	5	64	16	5		36,07
FMGA1366HI	6	64	20	6		54,45
FMGA1388HI	8	76	38	8		72,06
FMGA131010HI	10	76	35	10		88,08

**HELIX C**

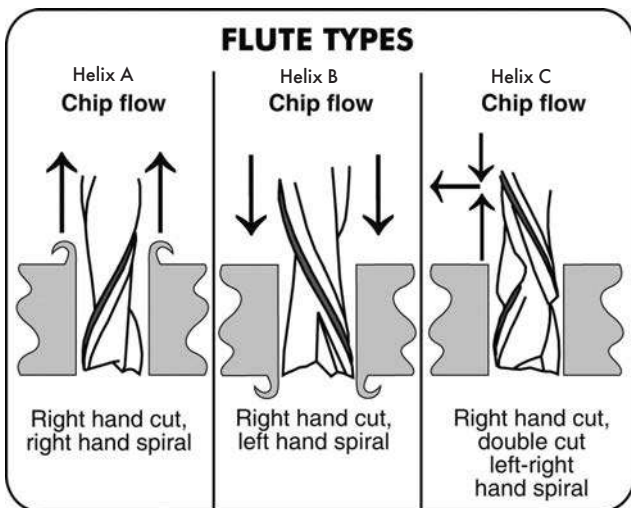


C	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13CO	
					CARBIDE	€
FMGA1366CO	6	64	25	6		132,00
FMGA1388CO	8	64	25	8		182,53
FMGA131010CO	10	76	35	10		214,54
FMGA131212CO	12	76	35	12		284,62

**STRAIGHT FLUTE**



R	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13R	
					CARBIDE	€
FMGA1346R	4	64	16	6		48,81
FMGA1356R	5	64	20	6		48,81
FMGA1366R	6	64	25	6		56,83
FMGA1388R	8	64	25	8		84,06
FMGA131010R	10	88	35	10		110,02
FMGA131212R	12	88	35	12		158,79



**CUTTING SPEED FOR SINGLE FLUTE END MILLS**

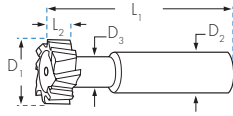
D1 mm	HSSCo		CARBIDE	
	Aluminium (R.P.M.)	PVC (R.P.M.)	Aluminium (R.P.M.)	PVC (R.P.M.)
3,00	12000	12000	19000	19000
4,00	11000	11000	18000	18000
5,00	10000	10000	18000	18000
6,00	10000	10000	17000	17000
7,00	9000	9000	17000	17000
8,00	9000	9000	16000	16000
9,00	9000	9000	16000	16000
10,00	9000	9000	16000	16000

### T SLOT CUTTERS

Ref. FF17

**"T" SLOTS CUTTERS**

**DIN 851A**



TOL D1  
d11

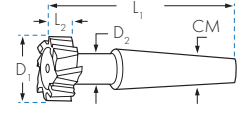
TOL D2  
h6

FF17						
D1 x L2 mm	D2 mm	D3 mm	Z	L1 mm	HSSCo €	TiAIN €
11,0x4,0	10	4	4	53,5	102,04	125,38
12,5x6,0	10	5	6	57,0	106,07	132,61
16,0x8,0	10	7	6	62,0	116,63	147,97
18,0x8,0	12	8	8	70,0	122,86	158,21
21,0x9,0	12	10	8	74,0	135,31	190,06
25,0x11,0	16	12	8	82,0	152,71	206,97
32,0x14,0	16	15	10	90,0	192,63	268,41
40,0x18,0	25	19	10	108,0	267,20	374,18
50,0x22,0	32	25	10	124,0	321,30	421,37
60,0x28,0	32	30	10	139,0	335,87	440,51
72,0x35,0	32	35	10	153,0	350,47	459,66

Ref. FF17C

**"T" SLOTS CUTTERS**

**DIN 851B**



TOL D2  
h12

FF17C						
D1 x L2 mm	MT*	THREAD	D2 mm	L1 mm	HSSCo €	TiAIN €
18,0x8,0	1	M6	8	70	133,86	165,98
21,0x9,0	2	M10	10	74	146,97	182,24
25,0x11,0	2	M10	12	82	153,22	190,00
32,0x14,0	2	M10	16	90	204,35	253,39
40,0x18,0	3	M12	20	108	258,35	320,35
50,0x22,0	4	M16	25	124	341,22	423,10
60,0x28,0	4	M16	31	139	451,47	559,82
72,0x35,0	5	M20	36	153	612,80	759,86

MT\*: Morse taper shank

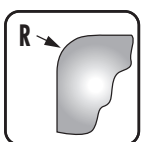
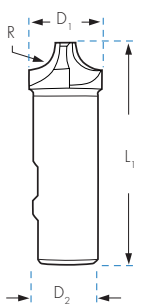
### CORNER RADIUS END MILLS

**4 Z**

**HSSCo 8%**

**DIN 6518N**

**WELDON**



FF1/4R					
	TOL H11 R	js 15 D1 mm	TOL h6 D2 mm	L1 mm	€
FF1/4R1	1,0	8	10	60	71,46
FF1/4R1.50	1,5	9	10	60	69,12
FF1/4R2	2,0	10	10	60	58,15
FF1/4R2.50	2,5	11	10	60	66,90
FF1/4R3	3,0	12	12	60	66,65
FF1/4R3.50	3,5	13	12	60	86,81
FF1/4R4	4,0	14	12	60	74,02
FF1/4R4.50	4,5	15	12	60	98,94
FF1/4R5	5,0	16	12	60	82,94
FF1/4R5.50	5,5	19	16	67	98,94
FF1/4R6	6,0	20	16	67	83,09
FF1/4R6.50	6,5	21	16	71	125,93
FF1/4R7	7,0	22	16	71	113,55
FF1/4R7.50	7,5	23	16	71	137,08
FF1/4R8	8,0	24	16	71	113,55
FF1/4R8.50	8,5	25	25	85	167,91
FF1/4R9	9,0	26	25	85	147,99
FF1/4R9.50	9,5	27	25	85	176,47
FF1/4R10	10,0	28	25	85	147,99
FF1/4R10.50	10,5	31	25	90	205,60
FF1/4R11	11,0	32	25	90	197,58
FF1/4R12	12,0	34	25	90	162,79
FF1/4R12.50	12,5	41	25	100	211,41
FF1/4R13	13,0	42	25	100	262,06
FF1/4R14	14,0	44	25	100	271,92
FF1/4R15	15,0	46	25	100	338,52
FF1/4R16	16,0	48	25	100	311,14
FF1/4R18	18,0	52	32	112	401,34
FF1/4R20	20,0	56	32	112	450,88

### WOODRUFF KEYSEAT CUTTERS

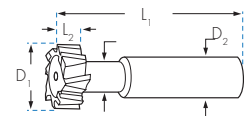
Ref. FF16

**WOODRUFF TYPE**

**DIN 850B**

**TOL D1 h12**

**TOL D2 h6**



FF16					
D1 x L2 mm	D2 mm	Z	L1 mm	HSSCo €	TiAIN €
4,5x1,0	6	6	50	58,01	68,61
7,5x1,5	6	6	50	60,40	72,60
7,5x2,0	6	6	50	60,40	72,60
10,5x2,0	6	6	50	64,98	78,34
10,5x2,5	6	6	50	64,98	78,34
10,5x3,0	6	6	50	64,98	78,34
13,5x3,0	10	6	56	66,01	82,46
13,5x4,0	10	6	56	66,01	82,46
16,5x3,0	10	6	56	66,61	88,30
16,5x4,0	10	6	56	66,61	88,30
16,5x5,0	10	6	56	66,61	85,42
19,5x4,0	10	8	63	75,83	100,17
19,5x5,0	10	8	63	75,83	95,98
19,5x6,0	10	8	63	75,83	95,98
22,5x5,0	10	8	63	83,06	111,26
22,5x6,0	10	8	63	83,06	111,81
22,5x8,0	10	8	63	83,06	111,81
25,5x6,0	10	10	63	97,27	138,47
28,5x6,0	10	10	63	98,95	140,13
28,5x8,0	10	10	63	98,95	140,13
28,5x10,0	12	10	71	98,95	140,13
32,5x7,0	12	10	71	122,71	167,70
32,5x8,0	12	10	71	122,71	167,70
32,5x10,0	12	10	71	122,71	167,70
45,5x10,0	12	12	71	194,12	275,97

**DOVETAIL AND INVERTED DOVETAIL MILLING CUTTERS**



Ref. FF98  
Ref. FF99

**HSSCo**

**DIN 1833A**

**TOL D1 js16**

**TOL D2 h6**



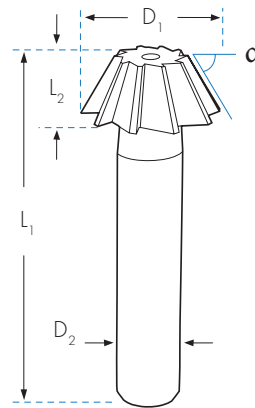
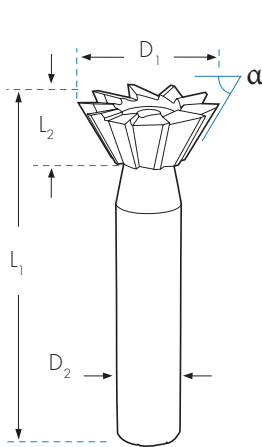
Ref. FF97  
Ref. FF95

**HSSCo**

**DIN 1833B**

**TOL D1 js16**

**TOL D2 h6**



**FF98**

<b>45°</b>	D1 mm	α	D2 mm	L1 mm	L2 mm	Z	€
FF981600	16	45°	12	60	4,0	8	103,15
FF982000	20	45°	12	63	5,0	10	109,37
FF982500	25	45°	12	67	6,3	12	133,76
FF983200	32	45°	16	71	8,0	14	149,25

**FF97**

<b>45°</b>	D1 mm	α	D2 mm	L1 mm	L2 mm	Z	€
FF971600	16	45°	12	60	4,0	8	83,08
FF972000	20	45°	12	63	5,0	10	93,42
FF972500	25	45°	12	67	6,3	12	105,05
FF973200	32	45°	16	71	8,0	12	119,46

**FF99**

<b>60°</b>	D1 mm	α	D2 mm	L1 mm	L2 mm	Z	€
FF991600	16	60°	12	60	6,3	8	103,15
FF992000	20	60°	12	63	8,0	10	109,37
FF992500	25	60°	12	67	10,0	12	133,76
FF993200	32	60°	16	71	12,5	14	149,25

**FF95**

<b>60°</b>	D1 mm	α	D2 mm	L1 mm	L2 mm	Z	€
FF951600	16	60°	12	60	6,3	8	81,50
FF952000	20	60°	12	63	8,0	10	91,66
FF952500	25	60°	12	67	10,0	12	103,09
FF953200	32	60°	16	71	12,5	12	117,23

**SPECIAL SIZES**

**FF99**

FF991600-50	16	50°	12	60	5,0	8	115,84
FF992000-50	20	50°	12	63	6,3	10	123,48
FF992500-50	25	50°	12	67	8,0	12	152,57
FF991600-55	16	55°	12	60	5,6	8	115,84
FF992000-55	20	55°	12	63	7,1	10	123,48
FF992500-55	25	55°	12	67	9,0	12	152,57
FF991600-75	16	75°	12	60	8,0	8	115,84
FF992500-75	25	75°	12	67	10,0	12	152,57
FF991600-80	16	80°	12	60	8,0	8	115,84
FF992500-80	25	80°	12	67	10,0	12	152,57
FF991600-85	16	85°	12	60	8,0	8	115,84
FF992500-85	25	85°	12	67	10,0	12	152,57

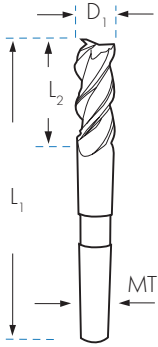
**SPECIAL SIZES**

**FF95**

FF951600-50	16	50°	12	60	5,0	8	96,71
FF952000-50	20	50°	12	63	6,3	10	123,46
FF952500-50	25	50°	12	67	8,0	12	154,03
FF951600-55	16	55°	12	60	5,6	8	96,71
FF952000-55	20	55°	12	63	7,1	10	123,46
FF952500-55	25	55°	12	67	9,0	12	154,03
FF951600-75	16	75°	12	60	8,0	8	96,71
FF952500-75	25	75°	12	67	10,0	12	154,03

**TAPER SHANK END MILLS**
**4-8 Z**

**INOX**
**Al**
**2 Z**

**SHORT SERIES**


DIN 845B		MATERIAL					FF09	FF35	FF39	FF10	FF46	FF48	DIN 326			FF55
		MATERIAL	COATING	QUALITY	ROUGHING	TOL k10										
D1 mm	L1 mm	L2 mm	Z	MT*	THREAD	€	€	€	€	€	€	L1 mm	L2 mm	Z	€	
10,00	92	22	4	1	M6	54,10	75,12	77,36	80,25	100,25	103,17	83	13	2	68,02	
12,00	111	26	4	2	M6	71,52	91,75	96,17	81,79	102,37	106,33	86	16	2	70,62	
14,00	111	26	4	2	M10	79,24	100,47	106,28	92,92	114,38	119,94	101	16	2	73,27	
15,00	111	26	4	2	M10	85,03	109,97	115,27	116,08	139,85	146,65					
16,00	117	32	4	2	M10	78,89	104,29	109,31	95,84	121,23	125,92	104	19	2	80,06	
18,00	117	32	4	2	M10	83,80	108,85	114,08	105,18	129,82	136,15	104	19	2	83,92	
20,00	123	38	4	2	M10	93,48	122,57	128,48	115,68	144,36	151,39	107	22	2	88,07	
22,00	123	38	5	2	M10	105,72	133,35	141,06	127,35	155,13	162,66	107	22	2	103,72	
24,00	147	45	6	3	M12	159,89	183,45	195,88	177,56	203,61	213,49	128	26	2	134,20	
25,00	154	45	5	3	M12	144,32	177,50	187,83	177,61	210,88	221,13	128	26	2	141,05	
26,00	147	45	6	3	M12	145,73	184,31	187,83	195,11	226,97	238,04	128	26	2	134,62	
28,00	154	50	5	3	M12	145,73	184,31	187,83	195,16	226,97	238,04	128	26	2	163,49	
30,00	154	50	6	3	M12	161,03	211,77	215,79	229,15	271,06	284,26	128	26	2	179,98	
32,00	178	53	6	4	M16	211,53	271,73	276,91	271,72	335,30	351,59	157	32	2	198,17	
36,00	178	53	6	4	M16	240,94	300,96	309,73	299,55	363,96	381,66	157	32	2	252,77	
40,00	188	63	6	4	M16	290,28	361,20	371,69	418,46	492,58	516,52	163	38	2	291,31	
45,00	188	63	6	4	M16	373,86	457,73	470,90	475,63	544,65	571,13	163	38	2	420,73	
50,00	233	75	6	5	M20	450,38	528,94	544,19	504,42	593,88	622,73	203	45	2	528,55	
56,00	233	75	8	5	M20	621,31	688,07	707,89	718,26	767,60	804,91					
63,00	241	90	8	5	M20	780,05	835,87	859,94	902,14	936,56	982,06					

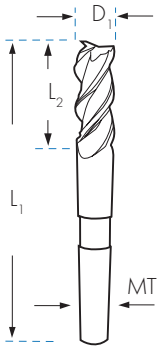
\* Morse taper



**TAPER SHANK END MILLS WITHOUT CENTER CUTTING**

**4-8 Z**     **INOX** **Al**

LONG SERIES



DIN 845B/L		MATERIAL				FF11	FF61	FF71	FF12	FF33	FF43
		COATING				HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%
		QUALITY				BRIGHT	TIN	TiAlN	BRIGHT	TIN	TiAlN
		ROUGHING				★★	★★★	★★★	★★	★★★	★★★
		TOLERANCE				TOL k10	TOL k10	TOL k10	TOL k12	TOL k12	TOL k12
D1 mm	L1 mm	L2 mm	Z	MT*	THREAD	€	€	€	€	€	€
10,00	115	45	4	1	M6	98,27	119,77	123,83	143,42	163,89	169,46
12,00	138	53	4	2	M6	92,65	119,77	127,34	146,11	166,05	173,28
14,00	138	53	4	2	M10	97,50	130,11	135,77	184,09	203,78	212,67
15,00	138	53	4	2	M10	107,04	136,40	142,33	211,70	234,14	244,39
16,00	148	63	4	2	M10	105,95	132,98	138,78	153,12	178,78	186,59
18,00	148	63	4	2	M10	120,37	145,98	152,32	158,94	184,32	192,36
20,00	160	75	4	2	M10	133,55	163,30	170,40	182,33	211,49	220,70
22,00	160	75	5	2	M10	151,14	179,67	188,36	189,37	218,10	227,61
24,00	192	90	5	3	M12	205,58	232,68	245,09	257,11	284,53	298,85
25,00	184	80	5	3	M12	204,18	240,10	252,30	268,82	303,06	316,27
26,00	192	90	5	3	M12	226,14	259,24	272,42	279,35	313,01	326,67
28,00	192	90	5	3	M12	229,15	274,32	288,94	277,32	313,01	326,67
30,00	192	90	5	3	M12	264,15	308,02	323,65	330,74	374,90	391,28
32,00	229	100	6	4	M16	311,42	364,72	383,24	393,88	447,58	467,14
36,00	231	106	6	4	M16	356,60	408,98	429,73	451,15	503,58	525,56
40,00	250	125	6	4	M16	396,24	460,17	483,56	554,40	616,23	643,16
45,00	250	125	6	4	M16	534,05	611,86	644,51	707,14	778,71	812,74
50,00	268	110	6	5	M20	651,77	716,86	755,13	882,44	944,35	985,59
56,00	308	150	8	5	M20	685,89	748,45	789,70	1.028,31	1.082,14	1.139,99
63,00	338	180	8	5	M20	907,25	954,57	1.005,32	1.294,58	1.333,70	1.404,95

\* Morse taper

**CENTER CUTTING END MILLS IN PLASTIC BOXES**

2Z

DIN  
327

4Z

DIN  
844

REFERENCE	<b>PTF20</b>	<b>PTF60</b>
QUANTITY	8	8
TYPE		
QUALITY	HSSCo 8%	<b>TiAlN</b>
CONTENT	<u>6</u> <u>8</u> <u>10</u> <u>12</u>	<u>6</u> <u>8</u> <u>10</u> <u>12</u>
Ø mm	<u>2</u> <u>2</u> <u>2</u> <u>2</u>	<u>2</u> <u>2</u> <u>2</u> <u>2</u>
PRICE €	146,30	231,97

REFERENCE	<b>PTF24</b>	<b>PTF64</b>
QUANTITY	8	8
TYPE		
QUALITY	HSSCo 8%	<b>TiAlN</b>
CONTENT	<u>6</u> <u>8</u> <u>10</u> <u>12</u>	<u>6</u> <u>8</u> <u>10</u> <u>12</u>
Ø mm	<u>2</u> <u>2</u> <u>2</u> <u>2</u>	<u>2</u> <u>2</u> <u>2</u> <u>2</u>
PRICE €	161,98	245,75

2Z

DIN  
327

4Z

DIN  
844

REFERENCE	<b>PTF21</b>	<b>PTF61</b>
QUANTITY	6	6
TYPE		
QUALITY	HSSCo 8%	<b>TiAlN</b>
CONTENT	<u>6-8-10-12-16-20</u>	<u>6-8-10-12-16-20</u>
Ø mm		
PRICE €	158,33	240,87

REFERENCE	<b>PTF25</b>	<b>PTF65</b>
QUANTITY	6	6
TYPE		
QUALITY	HSSCo 8%	<b>TiAlN</b>
CONTENT	<u>6-8-10-12-16-20</u>	<u>6-8-10-12-16-20</u>
Ø mm		
PRICE €	176,81	255,01

2Z

DIN  
327

4Z

DIN  
844

REFERENCE	<b>PTF22</b>	<b>PTF62</b>
QUANTITY	6	6
TYPE		
QUALITY	HSSCo 8%	<b>TiAlN</b>
CONTENT	<u>4-5-6-8-10-12</u>	<u>4-5-6-8-10-12</u>
Ø mm		
PRICE €	100,33	161,35

REFERENCE	<b>PTF26</b>	<b>PTF66</b>
QUANTITY	6	6
TYPE		
QUALITY	HSSCo 8%	<b>TiAlN</b>
CONTENT	<u>4-5-6-8-10-12</u>	<u>4-5-6-8-10-12</u>
Ø mm		
PRICE €	111,10	171,30

**CENTER CUTTING END MILLS IN METAL BOXES**

**2Z**  **DIN 327**

Ref. FF020787



Ref. FT020787



Ref. FF600787



REFERENCE	<b>FF010787</b>	<b>FF020787</b>	<b>FT020787</b>	<b>FF600787</b>
QUANTITY	6	6	6	6
TYPE	Ref. FFO1	Ref. FFO2	Ref. FTO2	Ref. FF60
QUALITY	<b>HSS</b>	<b>HSSCo 8%</b>	<b>TiAlSiN</b>	<b>TiAlN</b>
CONTENT Ø mm	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12
PRICE €	92,87	122,82	143,21	183,83

REFERENCE	<b>FF010447</b>	<b>FF020447</b>	<b>FT020447</b>	<b>FF600447</b>
QUANTITY	6	6	6	6
TYPE	Ref. FFO1	Ref. FFO2	Ref. FTO2	Ref. FF60
QUALITY	<b>HSS</b>	<b>HSSCo 8%</b>	<b>TiAlSiN</b>	<b>TiAlN</b>
CONTENT Ø mm	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20
PRICE €	138,91	184,22	214,83	266,73

REFERENCE	<b>FF010801</b>	<b>FF020801</b>
QUANTITY	14	14
TYPE	Ref. FFO1	Ref. FFO2
QUALITY	<b>HSS</b>	<b>HSSCo 8%</b>
CONTENT Ø mm	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 12 - 14 - 15 - 16 - 18 - 20	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 12 - 14 - 15 - 16 - 18 - 20
PRICE €	299,43*	393,46*

\*Available until end of stock

**EMPTY METAL BOXES FOR END MILLS**

**2-4Z**  **DIN 327**



REFERENCE	<b>EV0787</b>	<b>EV0847</b>
QUANTITY	6	6
CONTENT Ø mm	4 - 5 - 6 - 8 - 10 - 12	6 - 8 - 10 - 12 - 16 - 20
PRICE €	28,95	32,36

**END MILLS IN METAL BOXES**

4 Z


**DIN  
844**


REFERENCE	<b>FF030787</b>	<b>FF040787</b>	<b>FT040787</b>	<b>FF540787</b>
QUANTITY	6	6	6	6
TYPE	Ref. FF03	Ref. FFO4	Ref. FTO4	Ref. FF54
QUALITY	<b>HSS</b>	<b>HSSCo 8%</b>	<b>TiAlSiN</b>	<b>TiAlN</b>
CONTENT Ø mm	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12
PRICE €	91,34	120,46	141,13	183,82

REFERENCE	<b>FF030847</b>	<b>FF040847</b>	<b>FT040847</b>	<b>FF540847</b>
QUANTITY	6	6	6	6
TYPE	Ref. FF03	Ref. FFO4	Ref. FTO4	Ref. FF54
QUALITY	<b>HSS</b>	<b>HSSCo 8%</b>	<b>TiAlSiN</b>	<b>TiAlN</b>
CONTENT Ø mm	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20
PRICE €	136,48	183,11	214,56	263,78



REFERENCE	<b>FF030764</b>	<b>FF040764</b>
QUANTITY	14	14
TYPE	Ref. FF03	Ref. FFO4
QUALITY	<b>HSS</b>	<b>HSSCo 8%</b>
CONTENT Ø mm	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 12 - 14 - 15 - 16 - 18 - 20	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 12 - 14 - 15 - 16 - 18 - 20
PRICE €	290,36*	384,51*

\*Available until end of stock

4 Z


**DIN  
844**
**NR**

REFERENCE	<b>FF250847</b>	<b>FT250847</b>	<b>FF270847</b>
QUANTITY	6	6	6
TYPE	Ref. FF25	Ref. FT25	Ref. FF27
QUALITY	<b>HSSCo 8%</b>	<b>TiAlSiN</b>	<b>TiAlN</b>
CONTENT Ø mm	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20
PRICE €	340,84	397,47	409,97

**END MILLS IN METAL BOXES**

**4 Z**  **DIN 844**

REFERENCE	<b>FF180787</b>	<b>FT180787</b>	<b>FF200787</b>
QUANTITY	6	6	6
TYPE	Ref. FF18	Ref. FT18	Ref. FF20
QUALITY	<b>HSSCo 8%</b>	<b>TiAlSiN</b>	<b>TiAlN</b>
CONTENT Ø mm	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12
PRICE €	128,25	149,56	193,77



Ref. FF180787

REFERENCE	<b>FF180847</b>	<b>FT180847</b>	<b>FF200847</b>
QUANTITY	6	6	6
TYPE	Ref. FF18	Ref. FT18	Ref. FF20
QUALITY	<b>HSSCo 8%</b>	<b>TiAlSiN</b>	<b>TiAlN</b>
CONTENT Ø mm	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20
PRICE €	200,49	233,82	278,19



Ref. FF180847

REFERENCE	<b>FF180764</b>
QUANTITY	14
TYPE	Ref. FF18
QUALITY	<b>HSSCo 8%</b>
CONTENT Ø mm	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 12 - 14 - 15 - 16 - 18 - 20
PRICE €	416,79*










Ref. FF180764

\*Available until end of stock

**163 END MILLS DISPLAY**

Ref. MF-01

MF-01

				Content: 163 End mills																	
Ref. FF13	<b>1 Z</b>	<b>HSSCo</b>	<b>Al</b>	<b>SHORT SERIES</b>	Ø	5 x 8	Shank	6 x 8	Shank												
					Quantity	5		5													
Ref. FF14	<b>1 Z</b>	<b>HSSCo</b>	<b>Al</b>	<b>LONG SERIES</b>	Ø	5 x 8	Shank	6 x 8	Shank												
					Quantity	5		5													
Ref. FF02	<b>2 Z</b>		<b>HSSCo</b>	<b>DIN 327N</b>		Ø	2	3	4	5	6	7	8	9	10	12	14	16			
						Quantity	5	5	5	5	5	5	5	5	5	5	5	3			
Ref. FF18	<b>4 Z</b>		<b>HSSCo</b>	<b>DIN 844N</b>		Ø	2	3	4	5	6	7	8	9	10	12	14	16			
						Quantity	5	5	5	5	5	5	5	5	5	5	5	3			
Ref. FF25	<b>4 Z</b>		<b>HSSCo</b>	<b>DIN 844N</b>			Ø	6	7	8	9	10	11	12	14	16					
						Quantity	3	3	3	3	3	3	3	3	3	3					



Dimensions: width 245 x depth 210 x height 350 mm  
NOTE: Special compositions on request

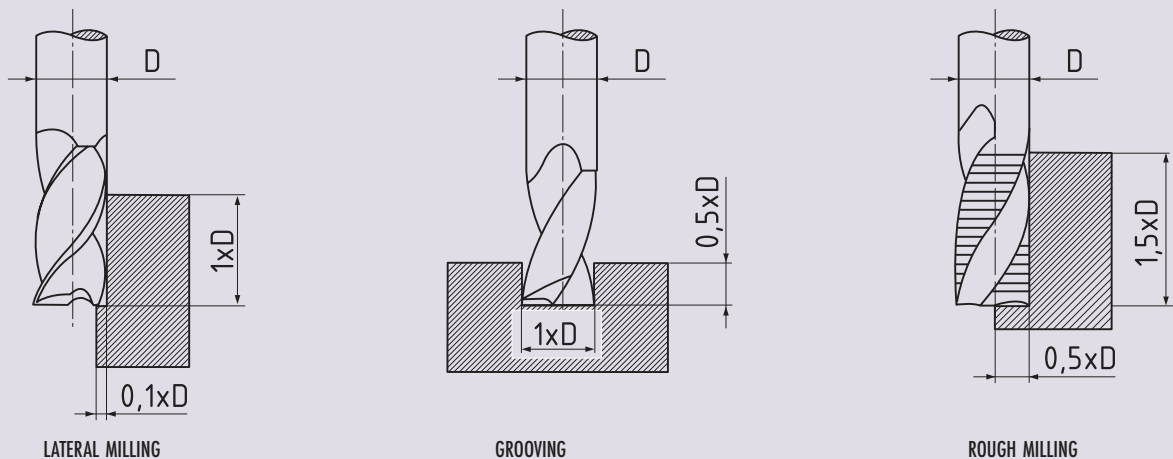
PRICE: 4.142,69 €

**CUTTING CONDITIONS FOR HSSCo 8% END MILLS**

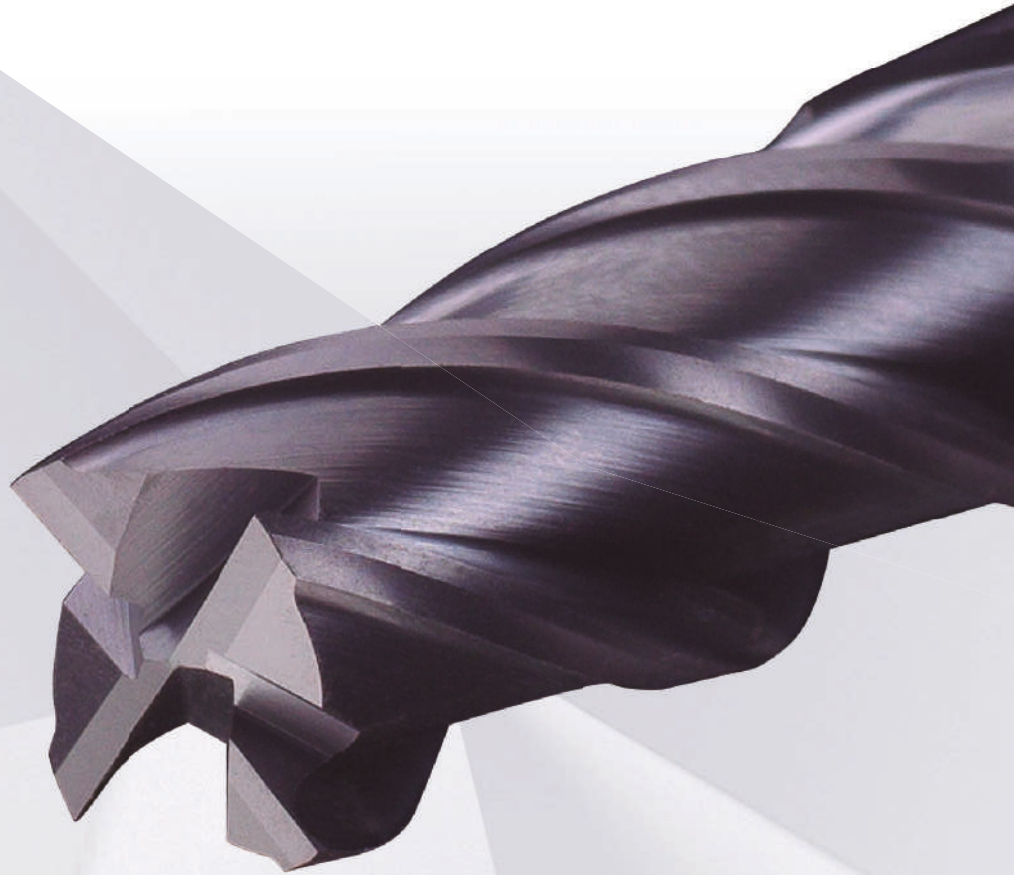
		DIAMETER Ø (mm)														
		2	4	6	8	10	12	18	22	26	30	32	36	40		
<b>SOFT STEEL</b> 70 kg/mm <sup>2</sup>	<b>V/C 39 RPM</b>	<b>6207</b>	<b>3104</b>	<b>2069</b>	<b>1552</b>	<b>1241</b>	<b>1035</b>	<b>690</b>	<b>564</b>	<b>477</b>	<b>414</b>	<b>388</b>	<b>345</b>	<b>310</b>		
	<b>FEED</b> (mm/min)	Flutes	<b>2</b>	50	56	74	84	82	81	80	81	76	68	68	62	60
		No	<b>3</b>	74	84	112	126	123	121	120	122	115	102	102	93	89
		<b>4</b>	99	112	149	168	164	161	160	163	153	136	137	124	119	
<b>TREATED STEEL</b> 120 kg/mm <sup>2</sup>	<b>V/C 20 RPM</b>	<b>3183</b>	<b>1592</b>	<b>1061</b>	<b>796</b>	<b>637</b>	<b>531</b>	<b>354</b>	<b>289</b>	<b>245</b>	<b>212</b>	<b>199</b>	<b>177</b>	<b>159</b>		
	<b>FEED</b> (mm/min)	Flutes	<b>2</b>	25	29	38	43	42	41	41	42	39	35	35	32	31
		No	<b>3</b>	38	43	57	64	63	62	62	63	59	52	53	48	46
		<b>4</b>	51	57	76	86	84	83	82	83	78	70	70	64	61	
<b>STAINLESS STEEL</b>	<b>V/C 15 RPM</b>	<b>2387</b>	<b>1194</b>	<b>796</b>	<b>597</b>	<b>477</b>	<b>398</b>	<b>265</b>	<b>217</b>	<b>184</b>	<b>159</b>	<b>149</b>	<b>133</b>	<b>119</b>		
	<b>FEED</b> (mm/min)	Flutes	<b>2</b>	19	21	29	32	32	31	31	31	29	26	26	24	23
		No	<b>3</b>	29	32	43	48	47	47	46	47	44	39	39	36	34
		<b>4</b>	38	43	57	64	63	62	62	63	59	52	53	48	46	
<b>ALUMINIUM</b>	<b>V/C 230 RPM</b>	<b>36606</b>	<b>18303</b>	<b>12202</b>	<b>9151</b>	<b>7321</b>	<b>6101</b>	<b>4067</b>	<b>3328</b>	<b>2816</b>	<b>2440</b>	<b>2288</b>	<b>2034</b>	<b>1830</b>		
	<b>FEED</b> (mm/min)	Flutes	<b>2</b>	293	329	439	494	483	476	472	479	451	400	403	366	351
		No	<b>3</b>	439	494	659	741	725	714	708	719	676	600	604	549	527
		<b>4</b>	586	659	879	988	966	952	944	958	901	800	805	732	703	
<b>TITANIUM</b>	<b>V/C 12 RPM</b>	<b>1910</b>	<b>955</b>	<b>637</b>	<b>477</b>	<b>382</b>	<b>318</b>	<b>212</b>	<b>174</b>	<b>147</b>	<b>127</b>	<b>119</b>	<b>106</b>	<b>95</b>		
	<b>FEED</b> (mm/min)	Flutes	<b>2</b>	15	17	23	26	25	25	25	25	24	21	21	19	18
		No	<b>3</b>	23	26	34	39	38	37	37	38	35	31	32	29	28
		<b>4</b>	31	34	46	52	50	50	49	50	47	42	42	38	37	

\* In the case of the coated mills the board parameters must be multiplied by 1.3 and for the ASP 60 by 1.8

\* V/C: Cutting speed (m/min)

**MILLING DEPTH ACCORDING TO TYPE OF MILLING**


# SOLID CARBIDE END MILLS



**BLUE-MASTER<sup>®</sup>**  
*by celesa*

CUTTING TECHNOLOGIES

**GENERAL PURPOSE SOLID CARBIDE END MILLS SHORT, LONG & EXTRA LONG SERIES**

End mills


Pink

**INOX**  
**Al**  
**Ti**


**2Z**



**30° N**




**44 HRc**




**STRAIGHT**



**3Z**



**4Z**

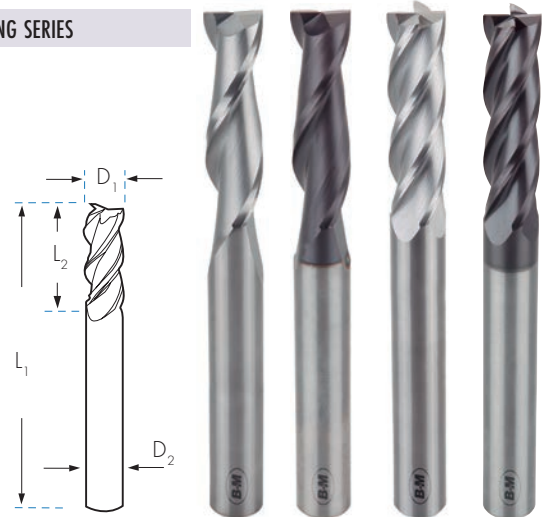


**SHORT SERIES**



				FMD2	FMD2TL	FMD63	FMD63TL	FMD48	FMD48TL
MATERIAL				CARBIDE	CARBIDE	CARBIDE	CARBIDE	CARBIDE	CARBIDE
COATING				BRIGHT	TiAIN	BRIGHT	TiAIN	BRIGHT	TiAIN
QUALITY				★★	★★★	★★	★★★	★★	★★★
				<b>2Z</b>	<b>2Z</b>	<b>3Z</b>	<b>3Z</b>	<b>4Z</b>	<b>4Z</b>
D1 mm	L1 mm	L2 mm	D2 mm	€	€	€	€	€	€
1,00	38	3	3	17,56	23,28	17,56	23,28	17,56	23,28
1,50	38	4	3	17,56	23,28	17,56	23,28	17,56	23,28
2,00	38	6	3	17,56	23,28	17,56	23,28	17,56	23,28
2,50	38	8	3	17,56	23,28	17,56	23,28	17,56	23,28
3,00	38	8	3	16,85	22,57	16,85	22,57	16,85	22,57
3,50	50	11	4	19,69	25,41	19,69	25,41	19,69	25,41
4,00	50	11	4	16,74	22,46	16,74	22,46	16,74	22,46
4,50	50	13	5	21,57	27,29	21,57	27,29	21,57	27,29
5,00	50	13	5	19,01	24,73	19,01	24,73	19,01	24,73
6,00	50	16	6	20,80	26,52	20,80	26,52	20,80	26,52
7,00	60	16	8	34,03	40,90	34,03	40,90	34,03	40,90
8,00	60	19	8	30,92	37,79	30,92	37,79	30,92	37,79
9,00	72	19	10	48,99	57,00	48,99	57,00	48,99	57,00
10,00	72	22	10	46,44	54,45	46,44	54,45	46,44	54,45
11,00	75	26	12	77,57	86,72	77,57	86,72	77,57	86,72
12,00	75	26	12	59,22	68,37	59,22	68,37	59,22	68,37
14,00	84	30	14	90,99	102,44	90,99	102,44	90,99	102,44
16,00	92	32	16	117,56	130,15	117,56	130,15	117,56	130,15
18,00	100	38	18	172,25	189,42	172,25	189,42	172,25	189,42
20,00	100	38	20	195,92	217,67	195,92	217,67	195,92	217,67
25,00	100	45	25	339,97	373,17			339,97	373,17

**LONG SERIES**



				FMD54	FMD54TL	FMD58	FMD58TL
MATERIAL				CARBIDE	CARBIDE	CARBIDE	CARBIDE
COATING				BRIGHT	TiAIN	BRIGHT	TiAIN
QUALITY				★★	★★★	★★	★★★
				<b>2Z</b>	<b>2Z</b>	<b>4Z</b>	<b>4Z</b>
D1 mm	L1 mm	L2 mm	D2 mm	€	€	€	€
3,00	60	15	3	18,65	25,52	18,65	25,52
4,00	80	20	4	19,66	26,52	19,66	26,52
5,00	80	25	5	24,47	31,34	24,47	31,34
6,00	80	25	6	34,51	41,37	34,51	41,37
8,00	90	35	8	39,29	48,45	39,29	48,45
10,00	100	45	10	55,52	64,68	55,52	64,68
12,00	100	50	12	75,79	87,24	75,79	87,24
14,00	150	65	14	124,71	139,59	124,71	139,59
16,00	150	65	16	136,63	151,51	136,63	151,51
18,00	150	65	18			197,33	217,93
20,00	150	70	20	242,37	265,27	242,37	265,27

**EXTRA LONG SERIES**

				FMD53	FMD53TL	FMD56	FMD56TL
MATERIAL				CARBIDE	CARBIDE	CARBIDE	CARBIDE
COATING				BRIGHT	TiAIN	BRIGHT	TiAIN
QUALITY				★★	★★★	★★	★★★
				<b>2Z</b>	<b>2Z</b>	<b>4Z</b>	<b>4Z</b>
Ø mm	L1 mm	L2 mm	D2 mm	€	€	€	€
3,00	75	25	3	40,11	51,56	41,50	52,95
4,00	100	25	4	43,58	55,03	44,94	56,39
5,00	100	25	5	49,25	60,70	51,75	63,20
6,00	150	75	6	82,20	100,52	90,42	108,73
8,00	150	75	8	113,18	134,94	124,50	146,25
10,00	150	75	10	143,37	171,99	157,70	186,32
12,00	150	75	12	209,77	246,40	230,74	267,38
14,00	150	75	14	289,99	334,64	318,99	363,64
16,00	200	75	16	393,99	445,51	433,39	484,91
20,00	200	75	20	614,76	683,45	614,76	683,45



**GENERAL PURPOSE SOLID CARBIDE END MILLS SHORT, LONG & EXTRA LONG SERIES**

**INOX**  
**Al**  
**Ti**

**2Z**




**30° N**

**44 HRc**

**STRAIGHT**

**4Z**

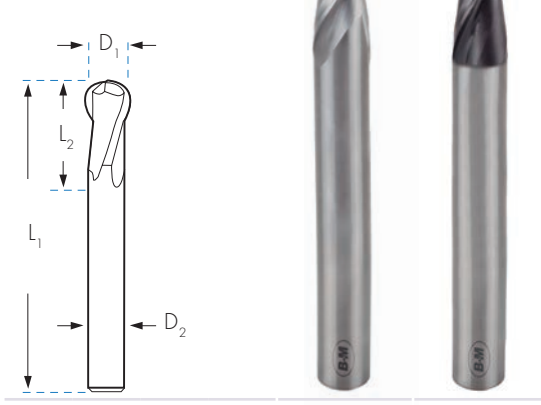


**SHORT SERIES**



MATERIAL				FMD92	FMD92TL	FMD51	FMD51TL
COATING				CARBIDE	CARBIDE	CARBIDE	CARBIDE
QUALITY				BRIGHT	TiAIN	BRIGHT	TiAIN
				★★	★★★	★★	★★★
				<b>2Z</b>	<b>2Z</b>	<b>4Z</b>	<b>4Z</b>
D1 mm	L1 mm	L2 mm	D2 mm	€	€	€	€
1,00	38	2	3	21,07	26,79		
1,50	38	3	3	21,07	26,79		
2,00	38	4	3	21,07	26,79		
2,50	38	5	3	21,07	26,79		
3,00	38	6	3	21,07	26,79	23,18	29,47
4,00	50	8	4	24,01	29,73	26,41	32,70
5,00	50	10	5	25,40	31,13	27,94	34,24
6,00	50	12	6	29,89	35,62	32,89	39,18
8,00	60	15	8	36,90	43,77	46,14	54,72
10,00	75	20	10	55,45	63,46	69,30	79,33
12,00	75	20	12	68,89	78,05	86,11	97,56
14,00	90	25	14	101,98	113,43	127,48	141,79
16,00	100	25	16	129,03	141,62	161,29	177,03
18,00	100	30	18	191,84	209,01	239,80	261,27
20,00	100	30	20	198,88	220,63	248,59	275,79

**LONG SERIES**






MATERIAL				FMD57	FMD57TL
COATING				CARBIDE	CARBIDE
QUALITY				BRIGHT	TiAIN
				★★	★★★
				<b>2Z</b>	<b>2Z</b>
D1 mm	L1 mm	L2 mm	D2 mm	€	€
3,00	60	4	3	31,76	38,63
4,00	80	5	4	36,87	43,74
5,00	80	6	5	43,61	50,48
6,00	80	8	6	50,97	57,83
8,00	100	12	8	67,27	76,43
10,00	100	15	10	83,12	93,42
12,00	100	15	12	144,04	155,49
14,00	150	20	14	180,61	195,50
16,00	150	20	16	228,12	243,00
18,00	150	25	18	354,33	371,50
20,00	150	25	20	470,86	493,75

**EXTRA LONG SERIES**

MATERIAL				FMD55	FMD55TL
COATING				CARBIDE	CARBIDE
QUALITY				BRIGHT	TiAIN
				★★	★★★
				<b>2Z</b>	<b>2Z</b>
D1 mm	L1 mm	L2 mm	D2 mm	€	€
3,00	75	6	3	38,07	49,52
4,00	100	6	4	43,91	55,36
5,00	100	6	5	53,07	64,52
6,00	100	15	6	66,69	78,14
8,00	150	25	8	89,59	106,76
10,00	150	25	10	126,22	143,39
12,00	150	25	12	200,75	232,80
14,00	200	50	14	246,54	283,18
16,00	200	50	16	331,26	371,33
18,00	200	75	18	486,54*	549,50*
20,00	200	75	20	629,64*	704,05*

**RECOMMENDED CUTTING SPEED**

		Ø2	Ø3	Ø4	Ø5	Ø6	Ø8	Ø10	Ø12	Ø14
	RPM	4000	2600	2000	1600	1300	1000	800	660	570
	FEED (mm/min)	50	55	55	55	55	55	55	55	55
	RPM	8000	5300	4000	3200	2600	2000	1600	1300	1100
	FEED (mm/min)	55	55	55	55	60	60	60	60	60
	RPM	16000	11000	8000	6400	5300	4000	3200	2600	2300
	FEED (mm/min)	290	290	290	290	290	290	290	290	300

\* To obtain cutting conditions for end mills TiAIN coated, you have to multiply the figures by 1,3.

\*Available until end of stock

**SOLID CARBIDE FINE, MEDIUM AND COARSE ROUGHING END MILLS**

End mills

Pink



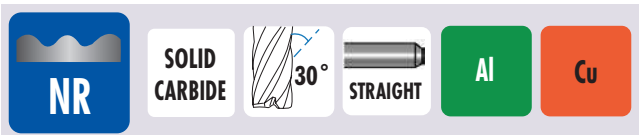
FMD1

D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	Z	€
TOL D <sub>1</sub> +0 -0,05	TOL D <sub>2</sub> h6				
6	6	63	19	3	41,47*
8	8	63	19	3	44,52*
10	10	63	22	3	56,91*
12	12	75	25	4	71,87*
16	16	88	32	4	122,98*
20	20	100	38	4	143,95*

FMD3

D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	Z	€
TOL D <sub>1</sub> +0 -0,05	TOL D <sub>2</sub> h6				
6	6	50	16	4	34,47
8	8	60	19	3	46,71
10	10	75	22	4	71,88
12	12	75	26	4	98,66
16	16	92	32	4	224,45
20	20	100	38	4	336,35

\*Available until end of stock



FMD6

D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	Z	€
TOL D <sub>1</sub> +0 -0,05	TOL D <sub>2</sub> h6				
6	6	63	19	3	41,47*
8	8	63	19	3	44,52*
10	10	63	22	3	56,91*
12	12	75	25	4	71,87*
16	16	88	32	4	122,98*
20	20	100	38	4	143,95*

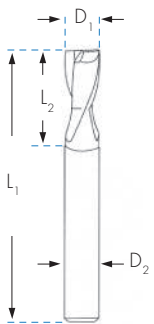
\*Available until end of stock

**SOLID CARBIDE END MILLS GENERAL PURPOSE**

**INOX Ni Ti** **44 HRc** **STRAIGHT** **2Z** **3Z** **4Z** **Micro Grain CARBIDE**

\* Specially recommended for machining of stainless steel and titanium.

**SHORT SERIES**



**TOL D1**  
**+0 -0,05**

**TOL D2**  
**h6**



				FMT2	FMT63	FMT48
				CARBIDE	CARBIDE	CARBIDE
				TiAlSiN	TiAlSiN	TiAlSiN
				Premium Quality	Premium Quality	Premium Quality
				2Z	3Z	4Z
D1	L1	L2	D2	€	€	€
mm	mm	mm	mm			
1,00	38	3	3	44,09	44,09	44,09
1,50	38	4	3	43,05	43,05	43,05
2,00	38	6	3	34,26	34,26	34,26
2,50	38	8	3	33,48	33,48	33,48
3,00	38	8	3	28,84	28,84	28,84
3,50	50	11	4	35,39	35,39	35,39
4,00	50	11	4	32,88	32,88	32,88
4,50	50	13	5	42,06	42,06	42,06
5,00	50	13	5	41,55	41,55	41,55
6,00	50	16	6	46,84	46,84	46,84
7,00	60	16	8	65,33	65,33	65,33
8,00	60	19	8	55,44	55,44	55,44
9,00	72	19	10	79,49	79,49	79,49
10,00	72	22	10	88,38	88,38	88,38
11,00	75	26	12	117,57	117,57	117,57
12,00	75	26	12	109,32	109,32	109,32
14,00	84	30	14	162,50	162,50	162,50
16,00	92	32	16	210,50	210,50	210,50
18,00	100	38	18	292,51	292,51	292,51
20,00	100	38	20	333,49	333,49	333,49
25,00	100	38	25	547,40	547,40	547,40

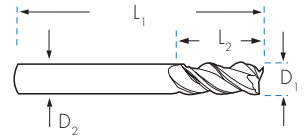
				FMT81
				CARBIDE
				TiAlSiN
				Premium Quality
				4Z
D1	L1	L2	D2	€
mm	mm	mm	mm	
1,00	38	3	3	
1,50	38	5	3	
2,00	38	6	3	
2,50	38	7	3	
3,00	38	12	3	
3,50	50	12	4	
4,00	50	14	4	
4,50	50	14	5	
5,00	50	16	5	45,71
6,00	63	19	6	51,53
7,00	63	19	8	
8,00	63	19	8	60,98
9,00	70	22	10	
10,00	70	22	10	97,21
11,00	75	25	11	
12,00	75	25	12	120,24
14,00	88	30	14	178,74
16,00	88	32	16	231,55
18,00	100	36	18	321,75
20,00	100	36	20	366,84
25,00	100	38	25	

				FMT92
				CARBIDE
				TiAlSiN
				Premium Quality
				2Z
D1	L1	L2	D2	€
mm	mm	mm	mm	
1,00	38	2	3	
1,50	38	3	3	
2,00	38	4	3	
2,50	38	5	3	
3,00	38	6	3	38,07
4,00	50	8	4	42,23
5,00	50	10	5	52,20
6,00	50	12	6	59,72
8,00	60	15	8	73,42
10,00	75	20	10	106,43
12,00	75	20	12	130,89
14,00	90	25	14	190,23
16,00	100	25	16	237,51
18,00	100	30	18	350,54
20,00	100	30	20	370,01

\* FMT81: Variable helix TiAlSiN coated: minimizes the vibrations and allows an impressive efficiency during the machining

**RECOMMENDED CUTTING SPEED**

		Ø 2	Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
	RPM	5600	3640	2800	2240	1820	1400	1120	924	798	700	560	420
	FEED (mm/min)	70	77	77	77	77	77	77	77	77	91	91	70
<b>INOX Ti</b>	RPM	11200	7420	5600	4480	3640	2800	2240	1820	1540	1400	1120	840
	FEED (mm/min)	77	77	77	77	84	84	84	84	84	98	98	77
<b>Ni</b>	RPM	11200	7420	5600	4480	3640	2800	2240	1820	1540	1400	1120	840
	FEED (mm/min)	77	77	77	77	84	84	84	84	84	98	98	77



## SOLID CARBIDE 2 FLUTES END MILLS

INOX

Ref. FMG10

2 Z

MG  
CARBIDE

30°



STRAIGHT

TiAIN

INOX

45  
HRc

Ti

INC

Micro Grain  
CARBIDE

## SHORT SERIES

## R.P.M. &amp; FEED

R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	FMG10					
						TOL -0,03 D1 mm	TOL h6 D2 mm	L1 mm	L2 mm	€	
21.500	170	12.900	101	10.750	84	FMG100100	1,0	6	40	2,5	37,13*
15.000	180	9.000	107	7.500	89	FMG100150	1,5	6	40	4,0	37,13*
11.560	190	7.560	120	6.300	90	FMG100200	2,0	6	50	6,0	37,13
8.920	210	5.560	140	4.620	120	FMG100300	3,0	6	50	8,0	37,13
7.560	300	4.620	180	3.880	150	FMG100400	4,0	6	50	11,0	37,13
6.300	320	3.780	190	3.160	160	FMG100500	5,0	6	50	12,0	37,13
5.560	350	3.360	220	2.840	180	FMG100600	6,0	6	50	12,0	37,13
4.880	385	2.940	220	2.470	180	FMG100700	7,0	8	60	16,0	51,11*
4.200	380	2.520	200	2.100	180	FMG100800	8,0	8	60	15,0	51,11
3.730	375	2.260	190	1.890	180	FMG100900	9,0	10	70	19,0	70,38*
3.260	330	2.000	160	1.680	160	FMG101000	10,0	10	72	20,0	70,38
2.740	280	1.680	130	1.360	130	FMG101200	12,0	12	75	24,0	99,41
2.470	265	1.520	125	1.210	125	FMG101400	14,0	14	85	26,0	115,25*
2.200	220	1.360	110	1.060	110	FMG101600	16,0	16	92	30,0	186,59
1.940	205	1.210	100	950	100	FMG101800	18,0	18	100	32,0	201,00*
1.680	170	1.060	80	840	80	FMG102000	20,0	20	105	38,0	222,00*
1.150	165	970	80	775	75	FMG102200	22,0	20	105	38,0	245,00*
1.360	130	840	70	680	60	FMG102500	25,0	25	120	45,0	289,00*

\*Available until end of stock



## SOLID CARBIDE 3 FLUTES END MILLS VARIABLE HELIX

INOX

Ref. FMD67

3 Z

SOLID  
CARBIDE35°  
38°

STRAIGHT

TiAlSiN

INOX

Ti

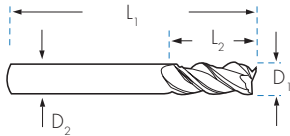
Ni

Micro Grain  
CARBIDE

## SHORT SERIES

	FMD67				
	TOL e8 D1 mm	TOL h6 D2 mm	L1 mm	L2 mm	€
FMD670300	3	6	50	8	31,40
FMD670400	4	6	50	11	31,40
FMD670500	5	6	50	13	31,40
FMD670600	6	6	50	16	31,40
FMD670800	8	8	60	19	39,60
FMD671000	10	10	73	22	58,50
FMD671200	12	12	75	26	79,80
FMD671600	16	16	92	32	155,40
FMD672000	20	20	100	38	229,20





**SOLID CARBIDE 4 FLUTES END MILLS VARIABLE HELIX**

**INOX** Ref. FMG12 **4 Z** **MG CARBIDE** **35°/38°** **WELDON** **TiAlSiN** **INOX** **45 HRc** **Ti** **INC** **Micro Grain CARBIDE**

**SHORT SERIES**

R.P.M. & FEED						FMG12						
R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	TOL -0,03	TOL h6	D1 mm	D2 mm	L1 mm	L2 mm	€
11.560	280	7.560	170	6.300	140	FMG120200		2,0	6	40	6	31,40*
10.240	300	6.560	185	5.460	155	FMG120250		2,5	6	40	8	31,40*
8.920	320	5.560	200	4.620	170	FMG120300		3,0	6	50	8	31,40
7.560	570	4.620	350	3.880	280	FMG120400		4,0	6	50	11	31,40
6.300	600	3.780	360	3.160	300	FMG120500		5,0	6	50	13	31,40
5.560	660	3.360	410	2.840	330	FMG120600		6,0	6	50	16	31,40
4.880	685	2.940	420	2.470	340	FMG120700		7,0	8	60	16	39,60*
4.200	710	2.520	380	2.100	350	FMG120800		8,0	8	60	19	39,60
3.730	660	2.260	340	1.890	325	FMG120900		9,0	10	70	19	58,50*
3.260	610	2.000	300	1.680	300	FMG121000		10,0	10	73	22	58,50
2.740	520	1.680	250	1.360	240	FMG121200		12,0	12	75	26	79,80
2.470	465	1.520	225	1.210	220	FMG121400		14,0	14	85	30	109,00
2.200	410	1.360	200	1.060	200	FMG121600		16,0	16	92	32	155,40
1.940	365	1.210	180	950	175	FMG121800		18,0	18	92	38	229,20
1.680	320	1.060	160	840	150	FMG122000		20,0	20	100	38	229,20
1.360	250	840	130	680	130	FMG122500		25,0	25	120	40	315,25*

\*Available until end of stock



End mills

Pink

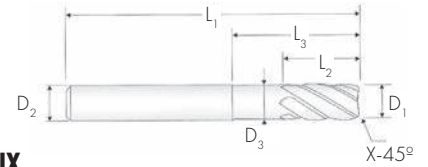
**SOLID CARBIDE 6 FLUTES END MILLS**

**INOX** Ref. FMG14 **6 Z** **MG CARBIDE** **45°** **WELDON** **TiAlN** **INOX** **45 HRc** **Ti** **INC** **Micro Grain CARBIDE**

**SHORT SERIES**

R.P.M. & FEED								FMG14						
R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	TOL -0,03	TOL h6	D1 mm	D2 mm	L1 mm	L2 mm	€
8.900	2.670	5.760	1.555	4.850	1.310	2.100	370	FMG140300		3,0	3	38	8	23,59
7.560	2.260	4.800	1.440	4.100	1.230	1.800	325	FMG140400		4,0	4	50	11	26,10
6.300	2.090	4.050	1.215	3.700	1.180	1.580	300	FMG140500		5,0	5	50	13	33,00
5.560	2.000	3.880	1.370	3.370	1.100	1.350	280	FMG140600		6,0	6	50	16	33,86
4.200	2.000	2.940	1.370	2.490	1.100	1.000	280	FMG140800		8,0	8	60	19	47,36
3.360	2.000	2.320	1.370	1.920	1.100	440	280	FMG141000		10,0	10	75	22	66,05
2.840	1.680	2.000	1.160	1.610	1.000	400	250	FMG141200		12,0	12	75	26	96,71
2.470	1.470	1.740	1.020	1.380	885	355	220	FMG141400		14,0	14	90	32	124,83
2.100	1.260	1.480	880	1.160	770	310	190	FMG141600		16,0	16	100	32	170,32
1.890	1.130	1.320	785	1.030	695	280	170	FMG141800		18,0	18	100	38	197,69
1.680	1.010	1.160	690	900	920	250	155	FMG142000		20,0	20	100	38	246,63
1.500	900	1.100	600	850	540	220	135	FMG142500		25,0	25	100	38	420,39





## SOLID CARBIDE 4 FLUTES END MILLS VARIABLE HELIX

INOX

Ref. FMG83

4 Z

DIN  
6527MG  
CARBIDE

TiAIN

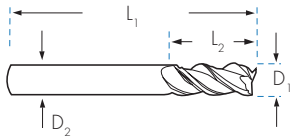
Micro Grain  
CARBIDE

## R.P.M. &amp; FEED

R.P.M. rev./min	INOX AISI 316L	R.P.M. rev./min	INOX AISI 304
	FEED mm/min		FEED mm/min
10.185	195	14.260	205
7.600	250	14.260	255
6.110	310	8.655	310
5.095	360	7.130	360
3.820	435	5.345	465
3.055	590	4.275	585
2.545	565	3.565	565
2.180	520	3.055	520
1.910	480	2.670	480
1.525	470	2.140	470

	FMG83							€
	TOL -0,03	TOL h6	L1 mm	L2 mm	L3 mm	X-45°		
	D1 mm	D2 mm						
FMG830300	3,0	6	57	8	11	0,07	53,09	
FMG830400	4,0	6	57	11	14	0,09	53,09	
FMG830500	5,0	6	57	13	16	0,12	53,09	
FMG830600	6,0	6	57	13	21	0,20	53,09	
FMG830800	8,0	8	63	19	27	0,25	68,01	
FMG831000	10,0	10	73	22	32	0,35	99,28	
FMG831200	12,0	12	83	26	38	0,40	133,81	
FMG831400	14,0	14	84	30	40	0,40	192,03	
FMG831600	16,0	16	92	32	44	0,40	225,52	
FMG832000	20,0	20	104	38	55	0,40	356,55	





**SOLID CARBIDE 3 TO 4 FLUTES END MILLS**

**INOX** Ref. FMG13

3-4 Z

MG CARBIDE

50°

WELDON

TiAlN

INOX

45 HRc

Ti

INC

Micro Grain CARBIDE

SHORT SERIES

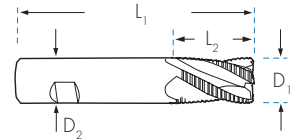
R.P.M. & FEED							
<30 HRc		30-45 HRc		INOX		INC	
R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min
5.560	310	3.360	200	2.840	160	1.280	40
4.200	310	2.520	180	2.100	160	920	40
3.260	310	2.000	140	1.680	140	740	40
2.740	250	1.680	120	1.370	120	620	30
2.200	200	1.360	100	1.050	100	460	25
1.940	175	1.210	85	950	85	410	20
1.680	150	1.060	70	840	70	350	20
1.360	115	840	60	670	60	300	15

FMG13						
	TOL -0,03	TOL h6				
	D1 mm	D2 mm	L1 mm	L2 mm	Z	€
FMG130600	6,0	6	50	13	3	40,38*
FMG130800	8,0	8	60	19	3	51,65*
FMG131000	10,0	10	70	22	3	76,30*
FMG131200	12,0	12	75	25	3	104,56*
FMG131600	16,0	16	90	32	3	173,27*
FMG131800	18,0	18	90	32	3	202,56*
FMG132000	20,0	20	100	28	4	229,72*
FMG132500	25,0	25	120	45	4	367,40*



\*Available until end of stock

TOLERANCES ACCORDING TO DIN 7160 & 7161					
Tolerance range in $\mu\text{m}$ / Nominal diameter in mm					
	1 - 3	3 - 6	6 - 10	10 - 18	18 - 30
TOL e8	- 14 - 28	- 20 - 38	- 25 - 47	- 32 - 59	- 40 - 73
TOL h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



## SOLID CARBIDE 3 TO 5 FLUTES FINE ROUGHING END MILLS

INOX

Ref. FMG15  
Ref. FMG16MG  
CARBIDE

NF



TiAIN

INOX




Ti

INC

Micro Grain  
CARBIDE

## SHORT SERIES


R.P.M. & FEED							
R.P.M. rev./min	FEED mm/min			INOX		INC	
		R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min
15.600	2.320	12.400	840	8.400	570	2.400	190
13.600	2.320	10.800	840	7.350	570	2.100	190
11.600	2.320	9.200	840	6.300	570	1.800	190
10.400	2.320	8.400	840	5.700	570	1.550	190
9.200	2.320	7.600	840	5.100	570	1.300	190
8.000	2.400	6.000	800	4.200	570	1.200	190
6.800	2.400	5.200	840	3.600	570	900	130
6.000	2.400	4.800	760	3.300	510	800	110
5.200	2.320	4.400	720	2.700	420	700	100
4.800	2.160	3.600	560	2.400	360	660	100
4.300	2.150	3.200	620	2.160	410	600	100

	FMG15					€
	TOL h10	TOL h6				
	D1 mm	D2 mm	L1 mm	L2 mm	Z	
FMG150600	6,0	6	54	7	3	38,45*
FMG150700	7,0	8	58	8	3	44,93*
FMG150800	8,0	8	58	9	3	44,93*
FMG150900	9,0	10	66	13	4	67,00*
FMG151000	10,0	10	66	14	4	67,00*
FMG151200	12,0	12	73	16	4	85,95*
FMG151400	14,0	14	75	18	4	104,25*
FMG151600	16,0	16	82	22	4	139,88*
FMG151800	18,0	18	84	24	4	179,17*
FMG152000	20,0	20	92	26	4	202,48*
FMG152500	25,0	25	110	25	5	315,43*

\*Available until end of stock



## LONG SERIES

R.P.M. & FEED							
R.P.M. rev./min	FEED 1 mm/min			INOX		INC	
		R.P.M. rev./min	FEED 1 mm/min	R.P.M. rev./min	FEED 1 mm/min	R.P.M. rev./min	FEED 1 mm/min
15.600	2.320	12.400	840	8.400	570	2.400	190
13.600	2.320	10.800	840	7.350	570	2.100	190
11.600	2.320	9.200	840	6.300	570	1.800	190
10.400	2.320	8.400	840	5.700	570	1.550	190
9.200	2.320	7.600	840	5.100	570	1.300	190
8.000	2.400	6.000	800	4.200	570	1.200	190
6.800	2.400	5.200	840	3.600	570	900	130
6.000	2.400	4.800	760	3.300	510	800	110
5.200	2.320	4.400	720	2.700	420	700	100
4.800	2.160	3.600	560	2.400	360	660	100
4.300	2.150	3.200	620	2.160	410	600	100

	FMG16					€
	TOL h10	TOL h6				
	D1 mm	D2 mm	L1 mm	L2 mm	Z	
FMG160600	6,0	6	57	16	3	41,32*
FMG160700	7,0	8	63	16	3	48,29*
FMG160800	8,0	8	63	16	3	48,29*
FMG160900	9,0	9	72	19	4	72,02*
FMG161000	10,0	10	72	22	4	72,02*
FMG161200	12,0	12	83	26	4	92,41*
FMG161400	14,0	14	83	26	4	112,06*
FMG161600	16,0	16	92	32	4	150,39*
FMG161800	18,0	18	92	32	4	192,63*
FMG162000	20,0	20	104	38	4	217,71*
FMG162500	25,0	25	121	45	5	339,16*

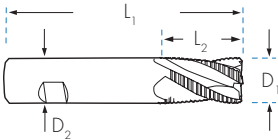
\*Available until end of stock



## TOLERANCES ACCORDING TO DIN 7160 &amp; 7161

Tolerance range in $\mu\text{m}$ / Nominal diameter in mm					
	1 - 3	3 - 6	6 - 10	10 - 18	18 - 30
TOL e8	0	0	0	0	0
	-40	-48	-58	-70	-84
TOL h6	0	0	0	0	0
	-6	-8	-9	-11	-13





**SOLID CARBIDE 4 TO 6 FLUTES FINE ROUGHING END MILLS**

**INOX** Ref. FMG17

4-6 Z

MG CARBIDE

45°

NF WELDON

TiAIN INOX

45 HRc

INC

Micro Grain CARBIDE

**SHORT SERIES**

R.P.M. & FEED								FMG17						
R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	INOX		INC		D1 mm	TOL h10 D2 mm	L1 mm	L2 mm	Z	€	
				R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min							
15.600	2.320	12.400	840	8.400	570	2.400	190	FMG170600	6,0	6	54	7	4	38,45*
11.600	2.320	9.200	840	6.300	570	1.800	190	FMG170800	8,0	8	58	9	4	44,93*
9.200	2.320	7.600	840	5.100	570	1.300	190	FMG171000	10,0	10	66	14	4	67,00*
8.000	2.400	6.000	800	4.200	570	1.200	190	FMG171200	12,0	12	73	16	4	85,95*
6.000	2.400	4.800	760	3.300	510	800	110	FMG171600	16,0	16	82	22	5	139,88*
4.800	2.160	3.600	560	2.400	360	660	100	FMG172000	20,0	20	92	26	6	179,98*

\*Available until end of stock



**CARBIDE 3 TO 6 FLUTES FINE ROUGHING END MILLS**

**INOX** Ref. FMG18

3-6 Z

MG CARBIDE

45°

NF WELDON

TiAIN INOX

45 HRc

INC

Micro Grain CARBIDE

**LONG SERIES**

R.P.M. & FEED								FMG18						
R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min	INOX		INC		D1 mm	TOL h10 D2 mm	L1 mm	L2 mm	Z	€	
				R.P.M. rev./min	FEED mm/min	R.P.M. rev./min	FEED mm/min							
20.100	4.600	18.400	1.700	12.600	1.040	3.800	399	FMG180400	4,0	6	57	11	3	40,12*
18.000	4.600	15.000	1.650	10.200	1.040	2.200	390	FMG180500	5,0	6	57	13	4	40,12*
15.600	2.320	12.400	840	8.400	570	2.400	190	FMG180600	6,0	6	57	16	4	40,12*
13.600	2.320	10.800	840	7.350	570	2.100	190	FMG180700	7,0	8	63	16	4	46,88*
11.600	2.320	9.200	840	6.300	570	1.800	190	FMG180800	8,0	8	63	16	4	46,88*
10.400	2.320	8.400	840	5.700	570	1.550	190	FMG180900	9,0	10	72	19	4	69,92*
9.200	2.320	7.600	840	5.100	570	1.300	190	FMG181000	10,0	10	72	22	4	69,92*
8.000	2.400	6.000	800	4.200	570	1.200	190	FMG181200	12,0	12	83	26	4	89,72*
6.800	2.400	5.200	840	3.600	570	900	130	FMG181400	14,0	14	83	26	5	108,80*
6.000	2.400	4.800	760	3.300	510	800	110	FMG181600	16,0	16	92	32	5	146,01*
4.800	2.160	3.600	560	2.400	360	660	100	FMG182000	20,0	20	104	38	6	234,85*
4.300	2.150	3.200	620	2.160	410	600	100	FMG182500	25,0	25	121	45	6	411,61*

\*Available until end of stock





## SOLID CARBIDE 4 TO 6 FLUTES FINE ROUGHING END MILLS

INOX

Ref. FMG19

4-6 Z

MG  
CARBIDE

NF

WELDON

TiAlN

INOX

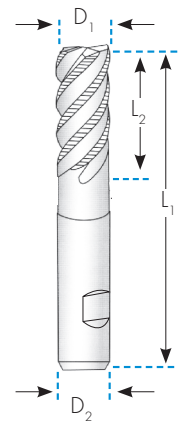
INC

Micro Grain  
CARBIDE

LONG SERIES

	FMG19							
	TOL h10 D1 mm	TOL h6 D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	Z	€
FMG190600	6,0	6	5,5	57	16	20	4	49,53*
FMG190800	8,0	8	7,5	63	16	26	4	57,90*
FMG191000	10,0	10	9,5	72	22	31	4	86,37*
FMG191200	12,0	12	11,5	83	26	37	4	110,82*
FMG191600	16,0	16	15,5	100	32	51	5	144,44*
FMG192000	20,0	20	19,2	110	38	59	6	232,18*

\*Available until end of stock



## R.P.M. &amp; FEED

R.P.M. rev./min	<30 HRc	R.P.M. rev./min	30-45 HRc	R.P.M. rev./min	INOX	R.P.M. rev./min	INC
	FEED 1 mm/min		FEED 1 mm/min		FEED 1 mm/min		FEED 1 mm/min
15.600	2.320	12.400	840	8.400	570	2.400	190
11.600	2.320	9.200	840	6.300	570	1.800	190
9.200	2.320	7.600	840	5.100	570	1.300	190
8.000	2.400	6.000	800	4.200	570	1.200	190
6.000	2.400	4.800	760	3.300	510	800	110
4.800	2.160	3.600	560	2.400	360	660	100

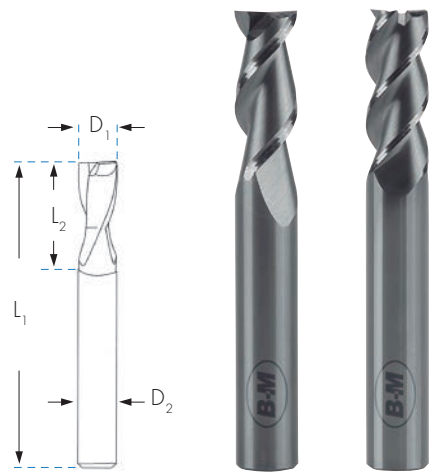
## TOLERANCES ACCORDING TO DIN 7160 &amp; 7161

Tolerance range in $\mu\text{m}$ / Nominal diameter in mm					
	1 - 3	3 - 6	6 - 10	10 - 18	18 - 30
TOL h10	0 -40	0 -48	0 -58	0 -70	0 -84
TOL h6	0 -6	0 -8	0 -9	0 -11	0 -13

**SOLID CARBIDE 2 & 3 FLUTE END MILLS**

**Al**
MG CARBIDE
45° N
STRAIGHT
**2Z**
Ref. FMD59
**3Z**
Ref. FMD33
Micro Grain CARBIDE

**SHORT SERIES**

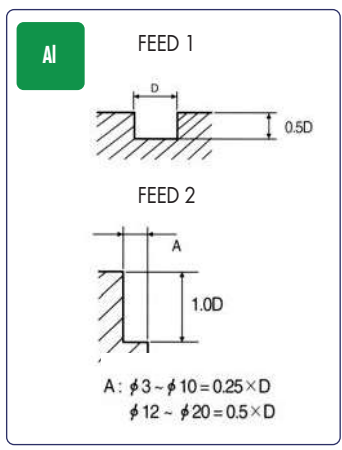


R.P.M. & FEED							FMD59	FMD33
			TOL -0,05	TOL h6			2Z	3Z
R.P.M. rev./min.	FEED 1 mm/min	FEED 2 mm/min	D1 mm	D2 mm	L1 mm	L2 mm	€	€
10.000	700	900	3,0	6,0	50	8	26,54	26,54
10.000	900	1.100	4,0	6,0	50	11	28,75	28,75
10.000	1.000	1.300	5,0	6,0	50	13	29,70	29,70
10.000	1.200	1.500	6,0	6,0	50	16	33,72	33,72
8.000	1.400	1.800	8,0	8,0	60	19	48,05	48,05
8.000	1.700	2.100	10,0	10,0	72	25	70,64	70,64
8.000	2.100	2.600	12,0	12,0	75	30	93,34	93,34
6.000	1.800	2.200	14,0	14,0	84	35	130,99	130,99
6.000	1.900	2.400	16,0	16,0	92	40	166,15	166,15
4.000	1.600	1.900	20,0	20,0	100	45	274,03	274,03

TOLERANCES ACCORDING TO DIN 7160 & 7161

Tolerance range in  $\mu\text{m}$  / Nominal diameter in mm

	1 - 3	3 - 6	6 - 10	10 - 18	18 - 30
<b>TOL</b>	0	0	0	0	0
<b>h10</b>	-40	-48	-58	-70	-84
<b>TOL</b>	0	0	0	0	0
<b>h6</b>	-6	-8	-9	-11	-13



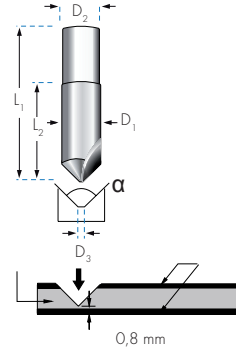
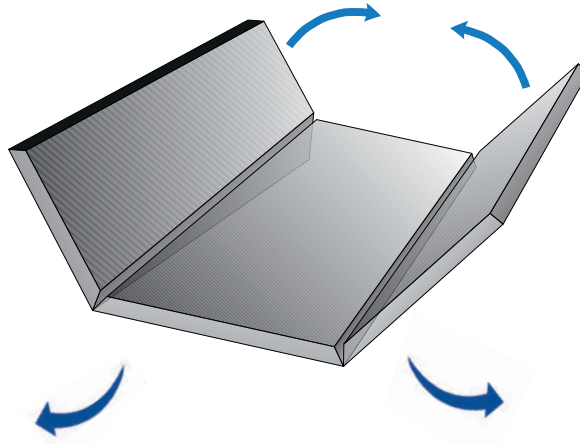
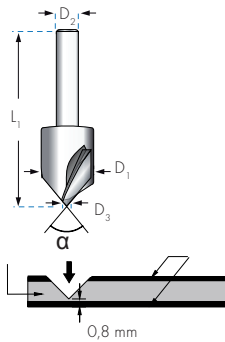


## SPECIAL CARBIDE END MILLS FOR ALUCOBOND

CARBIDE  
TIPPEDSOLID  
CARBIDE

Ref. FFALUC

Ref. FFALUC...MDI



CARBIDE TIPPED

SOLID CARBIDE

	FFALUC					
	D1 mm	D2 mm	D3 mm	L1 mm	$\alpha$	€
FFALUC1600	16,00	8	2,5	55	90°	226,48
FFALUC1800	18,00	8	2,5	55	90°	238,52
FFALUC2000	20,00	8	2,5	55	90°	254,32
FFALUC1600-135	16,00	8	2,3	55	135°	226,48
FFALUC1800-135	18,00	8	2,3	55	135°	238,52
FFALUC2000-135	20,00	8	2,3	55	135°	254,32

	FFALUC...MDI						
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	$\alpha$	€
FFALUC1400MDI	14,00	14	2,5	50	14	90°	135,48
FFALUC1600MDI	16,00	16	2,5	50	16	90°	154,18
FFALUC1800MDI	18,00	18	2,5	50	18	90°	177,86
FFALUC1400MDI-135	14,00	14	0,5	50	14	135°	135,48
FFALUC1600MDI-135	16,00	16	0,5	50	16	135°	154,18
FFALUC1800MDI-135	18,00	18	0,5	50	18	135°	177,86

SOLID CARBIDE 2 FLUTE LONG NECK END MILLS



Ref. FMG74  
Ref. FMG75  
Ref. FMG76



MG  
CARBIDE



STRAIGHT

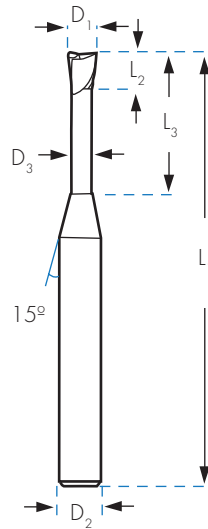
TiAlN



Micro Grain  
CARBIDE

End mills

Pink



FMG74

	TOL -0,015	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG740050	0,5	4	0,45	45	0,7	8	101,06
FMG740100	1,0	4	0,95	55	1,5	20	103,69
FMG740150	1,5	4	1,45	55	2,3	20	93,60
FMG740200	2,0	4	1,95	55	3,0	20	89,82
FMG740300	3,0	6	2,85	60	4,5	20	116,16
FMG740400	4,0	6	3,85	60	6,0	20	116,16
FMG740500	5,0	6	4,85	60	7,5	20	116,16
FMG740600	6,0	6	5,85	80	9,0	20	116,16

FMG75

	TOL -0,015	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG750200	2,0	4	1,95	70	3,0	30	106,16
FMG750300	3,0	6	2,85	70	4,5	30	120,66
FMG750400	4,0	6	3,85	70	6,0	30	120,66
FMG750500	5,0	6	4,85	80	7,5	30	120,66
FMG750600	6,0	6	5,85	90	9,0	30	120,66

FMG76

	TOL -0,015	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG760400	4,0	6	3,85	90	6,0	40	132,68
FMG760500	5,0	6	4,85	80	7,5	40	132,68
FMG760600	6,0	6	5,85	100	9,0	40	132,68

## SOLID CARBIDE 2 FLUTE BALL NOSE END MILLS



Ref. FMG77  
Ref. FMG78  
Ref. FMG79

2 Z

MG  
CARBIDE

30°



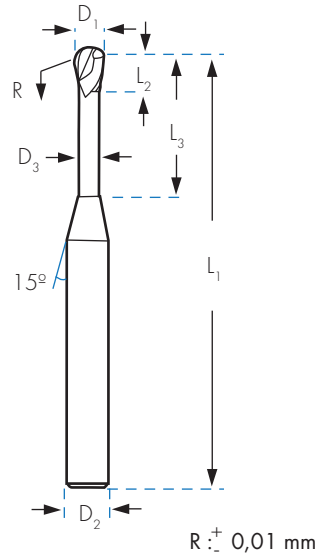
STRAIGHT

TiAlN

50  
HRcMicro Grain  
CARBIDE

End mills

Pink



FMG77

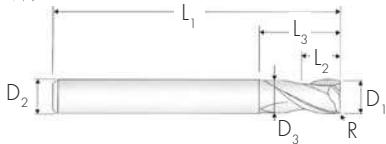
	TOL -0,02	TOL h6					€
	D <sub>1</sub> mm	D <sub>2</sub> mm	D <sub>3</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	L <sub>3</sub> mm	
FMG770050	0,5	4	0,45	45	0,7	8	101,06
FMG770100	1,0	4	0,95	55	1,5	20	103,69
FMG770150	1,5	4	1,45	55	2,3	20	93,60
FMG770200	2,0	4	1,95	55	3,0	20	89,82
FMG770300	3,0	6	2,85	60	4,5	20	116,16
FMG770400	4,0	6	3,85	65	6,0	20	116,16
FMG770500	5,0	6	4,85	60	7,5	20	116,16
FMG770600	6,0	6	5,85	80	9,0	20	116,16

FMG78

	TOL -0,02	TOL h6					€
	D <sub>1</sub> mm	D <sub>2</sub> mm	D <sub>3</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	L <sub>3</sub> mm	
FMG780200	2,0	4	1,95	70	3,0	30	106,16
FMG780300	3,0	6	2,85	70	4,5	30	120,66
FMG780400	4,0	6	3,85	70	6,0	30	120,66
FMG780500	5,0	6	4,85	80	7,5	30	120,66
FMG780600	6,0	6	5,85	90	9,0	30	120,66

FMG79

	TOL -0,02	TOL h6					€
	D <sub>1</sub> mm	D <sub>2</sub> mm	D <sub>3</sub> mm	L <sub>1</sub> mm	L <sub>2</sub> mm	L <sub>3</sub> mm	
FMG790400	4,0	6	3,85	90	6,0	40	132,68
FMG790600	6,0	6	5,85	100	9,0	40	132,68



## SOLID CARBIDE 2 FLUTE STUB CUT END MILLS



Ref. FMG01

2 Z



MG  
CARBIDE



30°



STRAIGHT

BLUE



70  
HRc

Micro Grain  
CARBIDE

### R.P.M. & FEED

50-55 HRc		55-60 HRc		60-65 HRc		65-70 HRc	
R.P.M. rev./min.	FEED mm/min	R.P.M. rev./min.	FEED mm/min	R.P.M. rev./min.	FEED mm/min	R.P.M. rev./min.	FEED mm/min
25.500	360	20.500	215	16.000	135	12.500	88
21.500	390	17.500	240	13.500	150	11.000	102
11.500	420	9.500	260	7.500	160	6.400	115
10.150	430	8.350	270	6.550	165	5.575	118
8.800	440	7.200	270	5.600	170	4.750	118
8.550	470	6.800	280	5.350	175	4.600	125
8.300	500	6.400	285	5.100	180	4.450	132
6.900	480	5.300	280	4.200	180	3.700	130
5.200	445	4.000	255	3.200	165	2.800	120
4.100	415	3.200	240	2.550	155	2.200	112
3.500	415	2.650	240	2.100	155	1.860	112
2.600	365	2.000	210	1.600	135	1.400	98
2.050	335	1.600	295	1.300	125	1.100	88

### FMG01

	Special TOL	TOL h6	D3 mm	L1 mm	L2 mm	L3 mm	R	€
	D1 mm	D2 mm						
FMG010100	1,0	3	-	40	1,5	-	0,1	29,23*
FMG010150	1,5	3	-	40	2,2	-	0,1	29,23*
FMG010300	3,0	6	2,9	45	4,0	7	0,1	38,73*
FMG010350	3,5	6	3,3	45	5,0	9	0,1	38,73*
FMG010400	4,0	6	3,8	45	5,0	9	0,1	38,73*
FMG010450	4,5	6	4,3	45	6,0	10	0,1	38,73*
FMG010500	5,0	6	4,8	50	6,0	11	0,2	38,73*
FMG010600	6,0	6	5,8	50	7,0	14	0,2	38,73*
FMG010800	8,0	8	7,8	60	9,0	18	0,2	48,97*
FMG011000	10,0	10	9,7	75	12,0	25	0,2	73,20*
FMG011200	12,0	12	11,7	75	15,0	30	0,3	100,94*
FMG011600	16,0	16	15,7	90	18,0	38	0,3	168,29*
FMG012000	20,0	20	19,7	100	24,0	45	0,3	222,60*



\*Available until end of stock

## SOLID CARBIDE 4 FLUTE STUB CUT END MILLS



Ref. FMG04

4 Z



MG  
CARBIDE



30°



STRAIGHT

BLUE



70  
HRc

Micro Grain  
CARBIDE

### R.P.M. & FEED

50-55 HRc		55-60 HRc		60-65 HRc		65-70 HRc	
R.P.M. rev./min.	FEED mm/min	R.P.M. rev./min.	FEED mm/min	R.P.M. rev./min.	FEED mm/min	R.P.M. rev./min.	FEED mm/min
25.500	710	20.500	430	16.000	270	12.500	175
21.500	775	17.500	475	13.500	295	11.000	200
17.500	840	14.500	520	11.000	320	9.500	230
14.500	840	12.000	520	9.250	320	7.950	230
11.500	840	9.500	520	7.500	320	6.400	230
10.150	860	8.350	530	6.550	328	5.575	240
8.800	880	7.200	540	5.600	335	4.750	240
8.550	940	6.800	560	5.350	353	4.600	255
8.300	1.000	6.400	580	5.100	370	4.450	270
6.900	950	5.300	560	4.200	350	3.700	260
5.200	900	4.000	520	3.200	330	2.800	240
4.100	840	3.200	480	2.550	310	2.200	220
3.500	840	2.650	480	2.100	300	1.860	220
2.600	730	2.000	420	1.600	270	1.400	200
2.050	650	1.600	380	1.300	250	1.100	180

### FMG04

	Special TOL	TOL h6	D3 mm	L1 mm	L2 mm	L3 mm	R	€
	D1 mm	D2 mm						
FMG040100	1,0	3	-	40	1,5	-	0,1	29,23*
FMG040150	1,5	3	-	40	2,2	-	0,1	29,23*
FMG040200	2,0	3	1,9	40	3,0	6	0,1	26,52*
FMG040250	2,5	3	2,4	40	4,0	6	0,1	26,52*
FMG040300	3,0	6	2,9	45	4,0	7	0,1	38,73*
FMG040350	3,5	6	3,3	45	5,0	9	0,1	38,73*
FMG040400	4,0	6	3,8	45	5,0	9	0,1	38,73*
FMG040450	4,5	6	4,3	45	6,0	10	0,1	38,73*
FMG040500	5,0	6	4,8	50	6,0	11	0,2	38,73*
FMG040600	6,0	6	5,8	50	7,0	14	0,2	38,73*
FMG040800	8,0	8	7,8	60	9,0	18	0,2	48,97*
FMG041000	10,0	10	9,7	75	12,0	25	0,2	73,20*
FMG041200	12,0	12	11,7	75	15,0	30	0,3	100,94*
FMG041600	16,0	16	15,7	90	18,0	38	0,3	168,29*
FMG042000	20,0	20	19,7	100	24,0	45	0,3	222,60*



\*Available until end of stock

## SOLID CARBIDE 2 FLUTE STUB CUT END MILLS



Ref. FMG02

2 Z

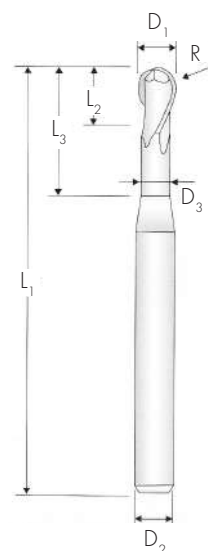
MG  
CARBIDE

30°



STRAIGHT

BLUE

70  
HRcMicro Grain  
CARBIDE

## SHORT SERIES

## R.P.M. &amp; FEED

R.P.M. rev./min.	50-55 HRc		55-60 HRc		60-65 HRc		65-70 HRc	
	R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min
57.000	4.000	54.000	3.400	51.000	2.700	48.000	2.300	
52.750	4.000	50.000	3.300	46.000	2.700	43.000	2.300	
48.500	4.000	44.500	3.275	41.500	2.750	38.250	2.300	
40.000	4.000	35.000	3.150	32.000	2.800	28.500	2.300	
26.500	4.000	23.500	3.150	21.000	2.800	19.000	2.300	
20.000	4.000	17.500	3.150	16.000	2.800	14.500	2.300	
15.000	3.750	13.500	3.050	11.500	2.550	10.500	2.100	
11.000	3.100	10.000	2.500	8.800	2.150	8.000	1.750	
10.000	2.900	9.000	2.325	7.900	2.000	7.250	1.650	
9.000	2.700	8.000	2.150	7.000	1.850	6.500	1.550	
8.250	2.500	7.300	2.025	6.400	1.750	5.900	1.465	
7.500	2.400	6.600	1.900	5.800	1.650	5.300	1.380	
5.600	1.900	5.000	1.550	4.400	1.250	4.000	1.050	
5.000	1.800	4.500	1.450	3.950	1.125	3.600	950	
4.000	1.600	3.600	1.275	3.150	900	2.875	750	
3.600	1.500	3.200	1.200	2.800	800	2.550	660	
-	-	-	-	-	-	-	-	

## FMG02

	Special TOL	TOL h6		TOL R				€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	R	
FMG020100	1,0	4	0,95	50	1,0	2,2	0,5	48,20*
FMG020120	1,2	4	1,10	50	1,2	2,6	0,6	48,20*
FMG020150	1,5	4	1,40	50	1,5	3,0	0,8	48,20*
FMG020200	2,0	4	1,90	50	2,0	4,0	1,0	45,77*
FMG020300	3,0	6	2,90	60	3,0	6,0	1,5	45,77*
FMG020400	4,0	6	3,30	70	4,0	8,0	2,0	47,83*
FMG020500	5,0	6	4,90	80	5,0	10,0	2,5	49,25*
FMG020600	6,0	6	5,90	90	6,0	12,0	3,0	52,81*
FMG020700	7,0	8	6,90	90	7,0	14,0	3,5	83,27*
FMG020800	8,0	8	7,90	100	8,0	16,0	4,0	82,41*
FMG020900	9,0	10	8,90	100	9,0	18,0	4,5	135,92*
FMG021000	10,0	10	9,90	100	10,0	20,0	5,0	135,92*
FMG021200	12,0	12	11,90	110	12,0	24,0	6,0	174,47*
FMG021400	14,0	14	13,80	110	14,0	28,0	7,0	176,50*
FMG021800	18,0	18	17,80	140	18,0	36,0	9,0	251,60*
FMG022000	20,0	20	19,80	160	20,0	40,0	10,0	356,56*
FMG022500	25,0	25	24,80	180	25,0	50,0	12,5	578,00*

\*Available until end of stock

## TOLERANCES ACCORDING TO DIN 7160 &amp; 7161

Tolerance range in  $\mu\text{m}$  / Nominal diameter in mm

	1 - 3	3 - 6	6 - 10	10 - 18	18 - 30
Special TOL	0 - 12	0 - 12	0 - 15	0 - 15	0 - 15
TOL h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13
TOL R	0 - 5	0 - 10	0 - 10	0 - 10	0 - 10



SOLID CARBIDE 6 FLUTE END MILLS



Ref. FMG06

6 Z



MG  
CARBIDE



STRAIGHT

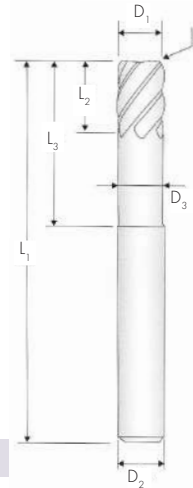
BLUE



Micro Grain  
CARBIDE

End mills

Pink



SHORT SERIES

FMG06

R.P.M. & FEED							
50-55 HRc		55-60 HRc		60-65 HRc		65-70 HRc	
R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min
16.000	4.900	13.500	3.300	10.500	2.100	8.000	1.450
12.000	4.600	10.000	3.100	8.000	2.000	6.000	1.400
9.500	4.100	8.000	2.900	6.400	1.800	4.800	1.300
8.000	3.800	6.600	2.500	5.300	1.600	4.000	1.150

	Special TOL			TOL h6			TOL R		€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	R		
FMG060600	6,0	6	5,70	50	6	14	0,5	55,40*	
FMG060800	8,0	8	7,65	60	8	24	0,5	66,09*	
FMG061000	10,0	10	9,65	70	10	30	1,0	103,09*	
FMG061200	12,0	12	11,60	75	12	30	1,0	123,14*	

\*Available until end of stock

LONG SERIES

FMG07

R.P.M. & FEED							
50-55 HRc		55-60 HRc		60-65 HRc		65-70 HRc	
R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min	R.P.M. rev./min.	FEED 1 mm/min
16.000	4.900	13.500	3.300	10.500	2.100	8.000	1.450
12.000	4.600	10.000	3.100	8.000	2.000	6.000	1.400
9.500	4.100	8.000	2.900	6.400	1.800	4.800	1.300
9.500	4.100	8.000	2.900	6.400	1.800	4.800	1.300
8.000	3.800	6.600	2.500	5.300	1.600	4.000	1.150
8.000	3.800	6.600	2.500	5.300	1.600	4.000	1.150
6.000	3.400	5.000	2.300	4.000	1.250	3.000	870
6.000	3.400	5.000	2.300	4.000	1.250	3.000	870
4.800	3.200	4.000	2.100	3.200	1.020	2.400	690
4.800	3.200	4.000	2.100	3.200	1.020	2.400	690
4.800	3.200	4.000	2.100	3.200	1.020	2.400	690

\*Available until end of stock

	Special TOL		TOL h6		R	€
	D1 mm	D2 mm	L1 mm	L2 mm		
FMG070600	6,0	6	70	13	0,5	62,95*
FMG070800	8,0	8	90	19	0,5	78,90*
FMG071000	10,0	10	100	22	0,5	118,87*
FMG071001	10,0	10	100	22	1,0	133,13*
FMG071200	12,0	12	110	26	0,5	162,13*
FMG071201	12,0	12	110	26	1,0	181,58*
FMG071600	16,0	16	130	32	1,0	218,73*
FMG071601	16,0	16	130	32	1,5	238,88*
FMG072000	20,0	20	140	38	1,0	320,10*
FMG072001	20,0	20	140	38	1,5	349,68*
FMG072002	20,0	20	140	38	2,0	349,68*

TOLERANCES ACCORDING TO DIN 7160 & 7161

Tolerance range in  $\mu\text{m}$  / Nominal diameter in mm

	1 - 3	3 - 6	6 - 10	10 - 18	18 - 30
Special TOL	0 - 12	0 - 12	0 - 15	0 - 15	0 - 15
TOL h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



## SOLID CARBIDE 2 FLUTE MINIATURE END MILLS

70  
HRc

Ref. FMG09

2 Z

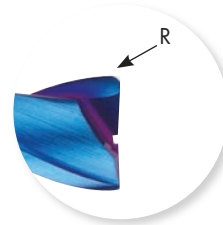
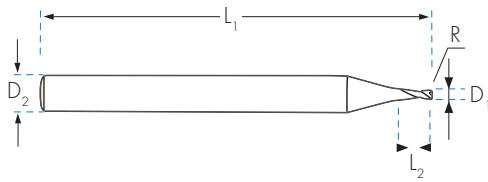
MG  
CARBIDE

30°



STRAIGHT

BLUE

70  
HRcTOL D1  
-0,012TOL D2  
h6Micro Grain  
CARBIDE

FMG09

	D1 mm	D2 mm	L1 mm	L2 mm	R	€
FMG090030	0,30	6	50	0,45	-	112,77
FMG090040	0,40	6	50	0,60	-	105,83
FMG090050	0,50	6	50	0,70	0,05	92,06
FMG090060	0,60	6	50	0,90	0,05	88,56
FMG090080	0,80	6	50	1,20	0,05	81,61
FMG090100	1,00	6	50	1,50	0,10	78,21
FMG090120	1,20	6	50	1,80	0,10	78,21
FMG090150	1,50	6	50	2,20	0,15	78,21
FMG090200	2,00	6	50	2,20	0,15	70,88

70  
HRc

Ref. FMG08

2 Z

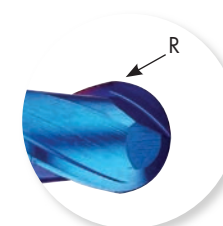
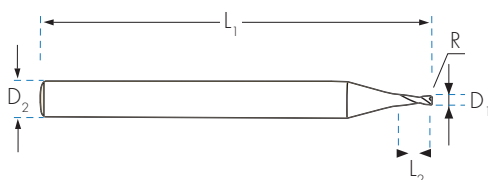
MG  
CARBIDE

30°



STRAIGHT

BLUE

70  
HRcTOL D1  
-0,012TOL D2  
h6Micro Grain  
CARBIDE

FMG08

	D1 mm	D2 mm	L1 mm	L2 mm	R	€
FMG080040	0,40	6	50	0,40	0,20	114,46
FMG080050	0,50	6	50	0,50	0,25	105,66
FMG080060	0,60	6	50	0,60	0,30	96,88
FMG080080	0,80	6	50	0,80	0,40	79,01
FMG080100	1,00	6	50	1,00	0,50	74,40
FMG080120	1,20	6	50	1,20	0,60	74,40
FMG080150	1,50	6	50	1,50	0,75	74,40
FMG080200	2,00	6	50	2,00	1,00	67,41

# SHELL MILLING CUTTERS



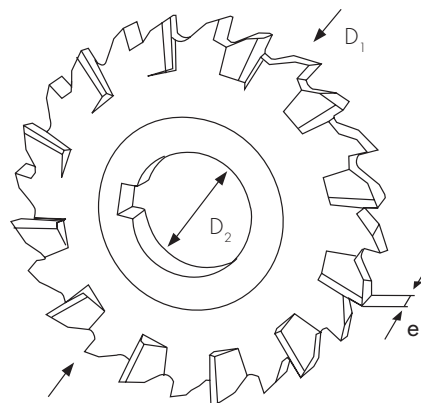
**BLUE-MASTER<sup>®</sup>**  
by *celesa*

CUTTING TECHNOLOGIES

**SIDE AND FACE MILLING CUTTERS CROSS TEETH**


Ref. FF56

HSSCo

DIN  
885A

FF56				
D1 mm	e mm	D2 mm	Z	€
50	4,0	16	12	101,45
50	5,0	16	12	101,45
50	6,0	16	12	117,56
50	8,0	16	12	114,49
50	10,0	16	12	126,07
63	1,6	22	16	217,28
63	2,0	22	16	192,37
63	2,5	22	16	196,38
63	3,0	22	16	201,77
63	4,0	22	12	117,06
63	5,0	22	12	117,06
63	6,0	22	12	120,37
63	8,0	22	12	131,17
63	10,0	22	12	141,14
63	12,0	22	12	150,70
63	14,0	22	12	162,32
63	16,0	22	12	170,86
63	18,0	22	12	204,13
80	1,6	27	20	217,17
80	2,0	27	20	210,94
80	2,5	27	20	214,46
80	3,0	27	20	210,20
80	4,0	27	20	251,47
80	5,0	27	14	159,03
80	6,0	27	14	162,78
80	8,0	27	14	171,79
80	10,0	27	14	183,85
80	12,0	27	14	196,80
80	14,0	27	14	210,44
80	16,0	27	14	215,30
80	18,0	27	14	230,95
80	20,0	27	14	253,94

FF56				
D1 mm	e mm	D2 mm	Z	€
100	1,6	32	24	259,79
100	2,0	32	24	258,38
100	2,5	32	24	258,13
100	3,0	32	24	250,62
100	4,0	32	24	270,19
100	5,0	32	24	286,43
100	6,0	32	16	223,55
100	8,0	32	16	228,26
100	10,0	32	16	236,64
100	12,0	32	16	254,87
100	14,0	32	16	280,60
100	16,0	32	16	294,31
100	18,0	32	16	324,42
100	20,0	32	16	324,42
100	22,0	32	16	363,66
100	25,0	32	16	395,59
125	1,6	32	16	328,54
125	2,0	32	16	316,00
125	2,5	32	16	323,86
125	3,0	32	16	331,74
125	4,0	32	16	355,40
125	5,0	32	16	380,43
125	6,0	32	16	389,83
125	8,0	32	18	352,58
125	10,0	32	18	361,78
125	12,0	32	18	375,49
125	14,0	32	18	407,77
125	16,0	32	18	432,99
125	18,0	32	18	457,99
125	20,0	32	18	487,28
125	22,0	32	18	554,84
125	25,0	32	18	560,21
125	28,0	32	18	612,31

FF56				
D1 mm	e mm	D2 mm	Z	€
160	2,0	40	30	528,80
160	2,5	40	30	509,08
160	3,0	40	30	518,86
160	4,0	40	30	548,26
160	5,0	40	30	580,59
160	6,0	40	30	623,39
160	8,0	40	30	711,53
160	10,0	40	22	584,40
160	12,0	40	22	584,40
160	14,0	40	22	581,54
160	16,0	40	22	636,44
160	18,0	40	22	670,62
160	20,0	40	22	688,38
160	22,0	40	22	756,64
160	25,0	40	22	819,87
160	28,0	40	22	901,24
160	32,0	40	22	963,61
200	12,0	40	24	891,45
200	14,0	40	24	900,17
200	16,0	40	24	927,38
200	18,0	40	24	973,03
200	20,0	40	24	1.040,66
200	22,0	40	24	1.044,09
200	25,0	40	24	1.211,11
200	28,0	40	24	1.249,39
200	32,0	40	24	1.558,18

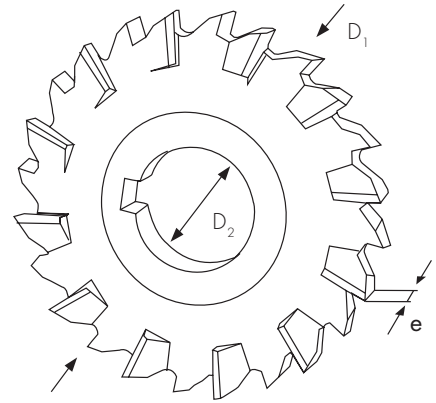
**SIDE AND FACE MILLING CUTTERS STRAIGHT TEETH**



Ref. FF59

**HSSCo**

**DIN  
885B**



End mills

Pink

FF59				
D1 mm	e mm	D2 mm	Z	€
50	4	16	16	101,13
50	5	16	16	101,13
50	6	16	16	117,21
50	8	16	16	114,15
50	10	16	16	125,70
63	4	22	18	117,82
63	5	22	18	117,82
63	6	22	18	119,38
63	8	22	18	129,79
63	10	22	18	139,66
63	12	22	18	149,59
63	14	22	18	161,10
63	16	22	18	170,40
63	18	22	18	203,52
80	5	27	20	158,48
80	6	27	20	162,66
80	8	27	20	171,65
80	10	27	20	183,24
80	12	27	20	196,19
80	14	27	20	209,81
80	16	27	20	215,26
80	18	27	20	230,91
80	20	27	20	253,89

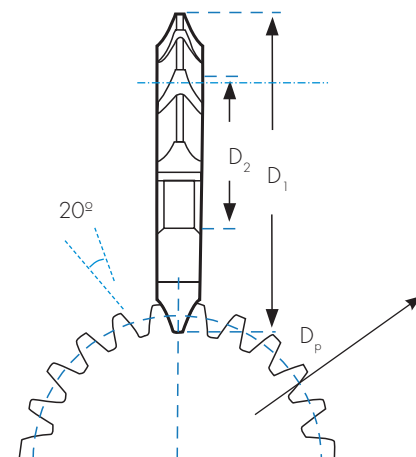
FF59				
D1 mm	e mm	D2 mm	Z	€
100	6	32	22	221,28
100	8	32	22	227,56
100	10	32	22	235,88
100	12	32	22	254,04
100	14	32	22	279,69
100	16	32	22	296,32
100	18	32	22	324,36
100	20	32	22	324,36
100	22	32	22	362,57
100	25	32	22	396,62
125	8	32	24	352,37
125	10	32	24	361,56
125	12	32	24	375,27
125	14	32	24	407,54
125	16	32	24	428,46
125	18	32	24	457,85
125	20	32	24	487,14
125	22	32	24	554,69
125	25	32	24	560,07
125	28	32	24	612,12

FF59				
D1 mm	e mm	D2 mm	Z	€
160	10	40	28	584,23
160	12	40	28	584,23
160	14	40	28	581,38
160	16	40	28	636,25
160	18	40	28	670,43
160	20	40	28	688,19
160	22	40	28	756,42
160	25	40	28	819,64
160	28	40	28	900,98
160	32	40	28	963,33
200	12	40	30	891,19
200	14	40	30	899,92
200	16	40	30	927,13
200	18	40	30	972,76
200	20	40	30	1.040,37
200	22	40	30	1.043,80
200	25	40	30	1.210,78
200	28	40	30	1.249,05
200	32	40	30	1.557,76

## GEAR MILLING CUTTERS

HSS

Ref. 99RFM



MILLING CUTTER UNIT	D <sub>1</sub> mm	D <sub>2</sub> mm	99RFM €
0,50	40	16	126,50
0,70	40	16	126,50
0,75	40	16	126,50
0,80	40	16	126,50
1,00	50	16	126,50
1,25	50	16	126,50
1,50	56	22	129,90
1,75	56	22	129,90
2,00	63	22	129,90
2,25	63	22	152,24
2,50	63	22	152,24
2,75	71	27	152,24
3,00	71	27	152,24
3,25	71	27	200,90
3,50	80	27	200,90
3,75	80	27	200,90
4,00	80	27	200,90
4,50	90	32	275,36
5,00	90	32	275,36
6,00	100	32	348,66
7,00	100	32	348,66

## CUTTER N° / TEETH

N°1	N°2	N°3	N°4	N°5	N°6	N°7	N°8	Set
12-13	14-16	17-20	21-25	26-34	35-54	55-134	135-∞	12-∞

$$\text{Milling cutter unit} = \frac{\text{ØEst}}{(Z+2)}$$

\* Price depends on the n° of milling cutter unit independently of the n° of teeth.

## MULTI-FLUTE SHELL END MILLS WITH DOUBLE DRIVING SLOT

Ref. FF87

HSSCo

DIN  
1880

FINISHING

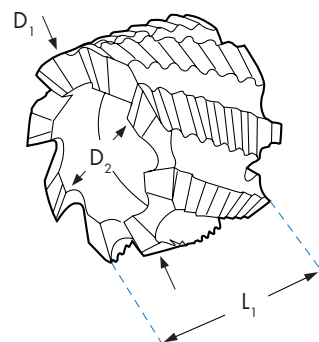
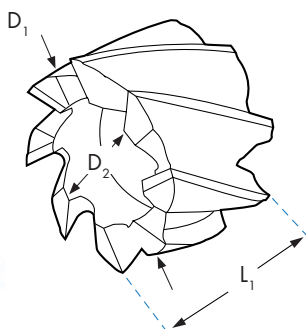
Ref. FF88

HSSCo

DIN  
1880

NR

ROUGHING



FF87				
D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	Z	€
40	16	32	8	133,41
50	22	36	8	183,56
63	27	40	8	250,82
80	27	45	10	355,01
100	32	50	12	571,53
125	40	56	14	917,83
160	50	63	16	1.640,35

FF88				
D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	Z	€
40	16	32	6	193,22
50	22	36	6	239,94
63	27	40	8	317,91
80	27	45	8	467,27
100	32	50	10	770,93
125	40	56	12	1.307,90
160	50	63	14	2.269,40

**MULTI-FLUTE SHELL END MILLS WITH DOUBLE DRIVING SLOT**



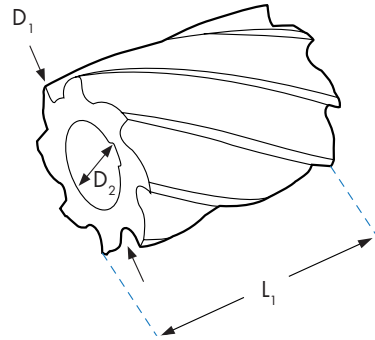
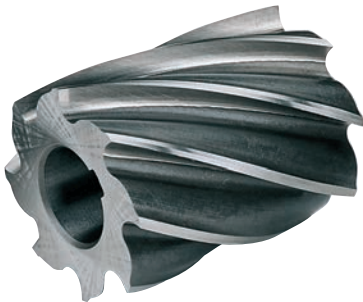
Ref. FF89

**HSSCo**

**DIN 884**



PLAIN



FF89				
D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	Z	€
50	22	63	8	167,15*
50	22	80	8	249,17*
63	27	50	8	219,34*
63	27	70	8	266,86*
80	32	63	8	369,69*
100	40	70	10	575,17*

\* Till end of stock

**PLAIN MILLING CUTTERS WITH SHANK**

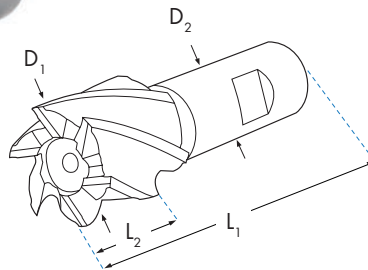


Ref. FMF87

**HSSCo 8%**



FINISHING



FMF87					
D <sub>1</sub> mm	L <sub>2</sub> mm	L <sub>1</sub> mm	D <sub>2</sub> mm	Z	€
30	30	90	20	6	194,48
35	30	90	20	6	223,19
40	32	95	25	8	278,17

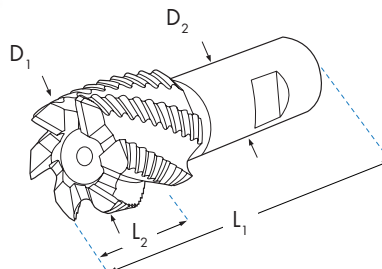


Ref. FMF88

**HSSCo 8%**



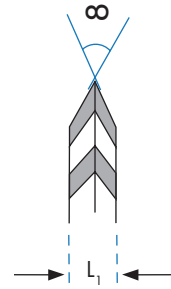
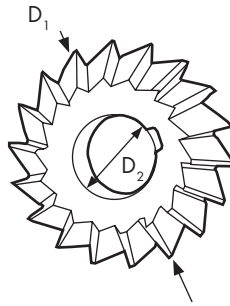
ROUGHING



FMF88					
D <sub>1</sub> mm	L <sub>2</sub> mm	L <sub>1</sub> mm	D <sub>2</sub> mm	Z	€
30	30	90	20	6	224,83
35	30	90	20	6	288,03
40	32	95	25	8	352,84

**HSSCo DOUBLE ANGLE MILLING CUTTERS**

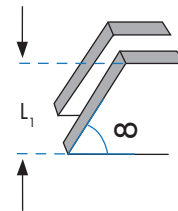
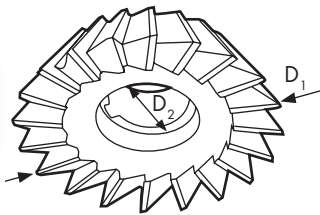
Ref. FF77	HSSCo	DIN 847	45°	Ref. FF78	HSSCo	DIN 847	60°	Ref. FF79	HSSCo	DIN 847	90°
-----------	-------	---------	-----	-----------	-------	---------	-----	-----------	-------	---------	-----



FF77						FF78						FF79					
D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	∞	Z	€	D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	∞	Z	€	D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	∞	Z	€
50	16	8	45°	20	178,09	50	16	10	60°	18	181,59	50	16	14	90°	16	181,59
63	22	10	45°	22	211,83	63	22	14	60°	20	215,99	63	22	20	90°	18	215,99
80	27	12	45°	24	295,76	80	27	18	60°	22	301,55	80	27	22	90°	20	301,55
100	32	18	45°	26	369,75	100	32	25	60°	24	377,00	100	32	32	90°	22	377,00

**HSSCo SINGLE ANGLE MILLING CUTTERS**

Ref. FF91	HSSCo	DIN 842	50°	Ref. FF90	HSSCo	DIN 842	60°
-----------	-------	---------	-----	-----------	-------	---------	-----



FF91						FF90					
D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	∞	Z	€	D <sub>1</sub> mm	D <sub>2</sub> mm	L <sub>1</sub> mm	∞	Z	€
40	10	13	50°	14	140,82	40	10	13	60°	14	138,08
50	13	16	50°	16	173,65	50	13	16	60°	16	170,28
63	16	20	50°	18	219,51	63	16	20	60°	18	215,25
80	22	25	50°	20	316,26	80	22	25	60°	20	310,13
100	27	32	50°	22	458,70	100	27	32	60°	22	449,78
125	32	40	50°	24	757,47	125	32	40	60°	24	742,79
160	40	50	50°	30	1.325,02	160	40	50	60°	30	1.299,30





# KEY CUTTERS

**BLUE-MASTER<sup>®</sup>**  
*by CELESA*

CUTTING TECHNOLOGIES

## LOCKSMITHING TOOLS

### THE WIDEST RANGE OF TOOLS FOR LOCKSMITHS

**DIN  
338**
**CARBIDE  
TIPPED**

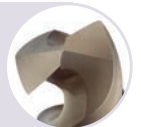
**BRIGHT**
**CAST  
IRON**


Ø mm	L <sub>1</sub> x L <sub>2</sub> mm	1U.	BC7		BC7B	
			€/U.	BLISTER	€/U.	
6,00	93 x 57	BC70600	22,13	BC70600B	1	26,13

Carbide Tipped twist drill (DIN 338) for hard metals.  
High hardness twist drill for hard metals use in locksmithing.  
Go to page 51 for full information.

**DIN  
338**
**HSSCo  
5%**

**GOLD**

**120  
Kg/mm²**


HSSCo twist drill (DIN 338) for metals of 120 Kg/mm².  
High hardness twist drill for general use in locksmithing.  
Go to page 50 for full information.

Ø mm	L <sub>1</sub> x L <sub>2</sub> mm	1U.	BC5		BC5F		BC5B			
			€/U.		€		€			
6,00	93 x 57	BC50600	10	4,83	BC50600F	1	5,39	BC50600B	1	6,25


**DIN  
338**
**CARBIDE  
TIPPED**

**BRIGHT**
**70 HRc**


Ø mm	L <sub>1</sub> x L <sub>2</sub> mm	1U.	BC98		BC98B	
			€/U.		€/U.	
6,00	93 x 57	BC980600	16,35	BC980600B	20,35	

Carbide Tipped twist drill (DIN 338) for very hard metals .  
High hardness twist drill for very hard metals use in locksmithing.  
Go to page 51 for full information.

**SOLID  
CARBIDE**
**TOL D1  
h7**
**TOL D2  
h6**

**TiAIN**
**HARDOX  
600**
**HIGH  
PERFORMANCE**
**70  
HRc**


Ø mm	L <sub>1</sub> x L <sub>2</sub> mm	1U.	BC85		BC85B	
			€/U.		€/U.	
6,00	75 x 35	BC850600	80,37	BC850600B	85,37	

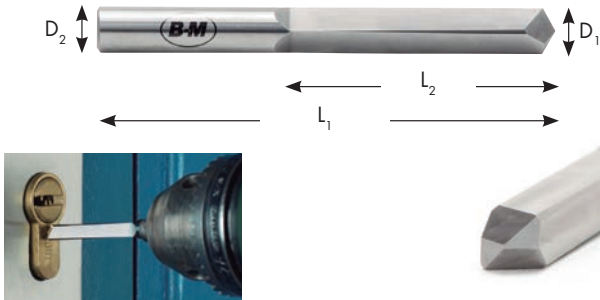
Solid Carbide Drill for hardened steel (up to 70 HRc)  
Maximum hardness drill for hardened metals use in locksmithing.  
Go to page 70 for full information.

**CARBIDE DRILLS FOR CYLINDER**



Solid Carbide square section drill for cylinders and anti-drilling pins.  
THE DRILL Nº1 TO DRILL HIGH HARDNESS CYLINDERS.

\* for antidrilling pins cylinder we recommend to drill at 300 RPM.

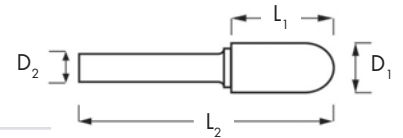
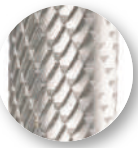


D1 mm	D2 mm	L2 mm	L1 mm	1U.	€	1U.	€
6	6	33	60	BCC06X60MD	60,13	BCC06X60MDB	65,13

**SPECIAL ROTARY BURRS FOR CYLINDERS**



Solid Carbide Rotary Burr for locksmith use, also known as Vampire. Semi-spherical geometry and total lengths from 60 to 150mm. The most appropriate burr for cylinders. Select the adequate option for your application among our wide range.



	D1 mm	D2 mm	L1 mm	L2 mm		1U.		1U.	
3 mm. SHANK	3.0	3	25.0	60	HSS	Y548TG2	21,00	Y548TG2B	24,00
	3.0	3	25.0	60	Monobloc	C30325-6	42,00	C30325-6B	46,00
6 mm. SHANK	6.0	6	25.0	50	Monobloc	C60625-6	39,49	C60625-6B	43,49
	6.0	6	25.0	60	Monobloc	C60625-60-6	44,48	C60625-60-6B	48,48
	6.0	6	25.0	80	Monobloc	C60625-80-6	53,14	C60625-80-6B	57,14
	6.0	6	25.0	100	Monobloc	C60625-100-6	59,29	C60625-100-6B	63,29
	6.0	6	25.0	120	Monobloc	C60625-120-6	88,94	C60625-120-6B	92,94
	6.0	6	25.0	150	Monobloc	C60625-150-6	118,59	C60625-150-6B	122,59



**CYLINDER WITH END CUT**

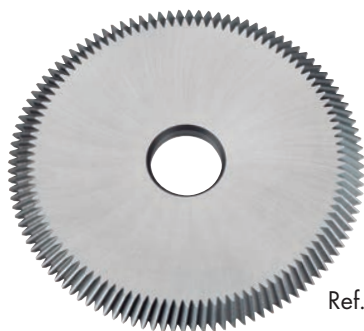


Solid Carbide Rotary Burr A/F form (cylinder with end cut) and C form (semi-spherical) The most appropriate burr for cylinders. Select the adequate option for your application among our wide range.  
Go to pages 335 for full information.

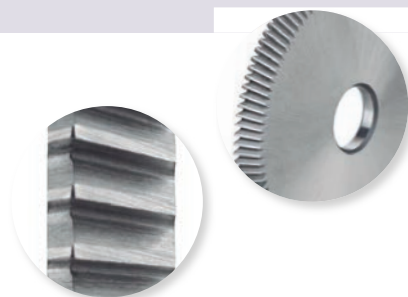


	D1 mm	L2 mm	D2 mm	L1 mm		1U.		1U.	
6 mm. SHANK	6.0	25.0	6	50	Monobloc	A60625-6E	35,21	A60625-6EB	39,21



**CUTTERS FOR JMA KEY DUPLICATING MACHINES**
**DOUBLE ANGLE CUTTERS**


Ref. FLLFP4



Ref. BM	Ref. JMA	MACHINE TYPES	MATERIAL	mm		mm	$\beta^\circ$	Z	mm	FLL	€
FLLFP1 (FLL02)	FP1	OREGON	HSSV	25	10	10	100°	60	0,1		91,57
FLLFP2W	FP2W	VIRGINIA	CARBIDE	40	10	6	70°	70	0,1		360,15
FLLFP3 (FLL04)	FP3	KIS, SPRINT	HSSV	50	12	6	90°	80	0,15		111,45
FLLFP4 (FLL06)	FP4	KIS	HSSV	53	12,7	6,35	45/15°	72	0,6		114,94
FLLFP5	FP5	JMA	HSSV	57	12,7	5	90°	80	0,15		143,25
FLLFP6 (FLL09)	FP6	KIS, SPRINT	HSSV	60	12,7	5	84°	140	0,1		111,45
FLLFP11ECCO (FLL11)	FP11/ECCO-009	ECCO, ECCO-PLUS	HSSV	63	16	5	84°	80	1		106,62
FLLFP11W	FP11W	ECCO, ECCO-PLUS	CARBIDE	63	16	5	84°	80	1		326,05
FLLFP12	FP12	TUCSON	HSSV	63	16	5	80°	80	1,25		114,94
FLLFP12W	FP12W	TUCSON	CARBIDE	63	16	5	80°	80	1,25		352,05
FLLFP13	FP13	DALLAS	HSSV	63	16	5	84°	100	1		143,13
FLLCU14	CU14	ECCO, ECCO-PLUS	HSSV	63	16	5	80°	80	1,25		140,26
FLLFP16 (FLL13)	FP16	PROCEDURE	HSSV	70	16	5,25	76°	100	1		143,13
FLLFP16W	FP16W	PROCEDURE	CARBIDE	70	16	5,25	76°	100	1		352,05
SLLP01	FP24 DAKOTA = P01	DAKOTA, ERREBI SARATOGA, NEVADA, DENVER, TITAN, VIENNA	HSSV	80	16	5	84°	110	1		99,52
SLLP01/120	FP24 DAKOTA=P01/120		HSSV	80	16	5	84°	120	1		101,41
FLLFP24 (FLL16)	FP24 ERREBI		HSSV	80	16	5	84°	110	1,25		87,91
FLLFP24W	FP24W ERREBI		CARBIDE	80	16	5	84°	110	1,25		326,05
FLL99	FP24		HSSV	80	16	5	84°	110	0		101,57






Ref. FLL99: Double angle cutter without lateral chamfer 80x5x16 Z110.

**CUTTERS FOR JMA KEY DUPLICATING MACHINES**

**SIDE MILLING CUTTER**






Ref. FLLFP19

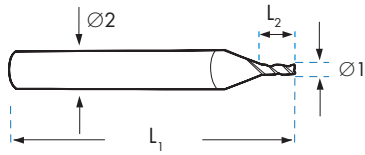
Ref. BM	Ref. JMA	MACHINE TYPES	MATERIAL	mm			Z	FLL	€
									
FLLFP7	FP7	ECCO BIT, DETROIT	HSSV	63	16	1,25	80	111,45	
FLLFP7W	FP7W	ECCO BIT, DETROIT	CARBIDE	63	16	1,25	80	284,38	
FLLFP8 (FLL19)	FP8	ECCO BIT, DETROIT	HSSV	63	16	1,4	80	79,50	
FLLFP17	FP17	TITAN BIT, SARATOGA, YAKARTA	HSSV	80	16	1,25	100	81,44	
FLLFP17W	FP17W	TITAN BIT, SARATOGA, YAKARTA	CARBIDE	80	16	1,25	100	298,78	
FLLFP18	FP18	ATLANTA, TOPEKA	HSSV	80	22	1,25	100	111,45	
FLLFP18W	FP18W	ATLANTA, TOPEKA	CARBIDE	80	22	1,25	100	298,78	
FLLFP19 (FLL21)	FP19	SARATOGA, YAKARTA, TITAN BIT, DAKOTA	HSSV	80	16	1,4	100	84,43	
FLLFP19W	FP19W	SARATOGA, YAKARTA, TITAN BIT, DAKOTA	CARBIDE	80	16	1,4	100	279,84	
FLLFP20 (FLL22)	FP20	ATLANTA, TOPEKA	HSSV	80	22	1,4	100	84,43	
FLLFP21 (FLL24)	FP21 / SLLSG2	ATLANTA, TOPEKA, DUPLEX, KANSAS	HSSV	80	22	1,5	100	86,77	
FLLFP21W	FP21W	ATLANTA, TOPEKA, DUPLEX, KANSAS	CARBIDE	80	22	1,5	100	304,62	

**MILLING SLOT CUTTERS**



Ref. FLLFP22W

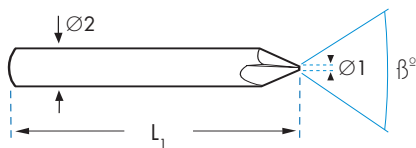
Ref. BM	Ref. JMA	MACHINE TYPES	MATERIAL	mm			Z	FLL	€
									
FLLFP9	FP9	ECCO BIT	HSSV	63	16	1	80	75,45	
FLLFP10	FP10	ECCO FORD, ECCO ABBLOY, PASADENA, NEBRASCA	HSSV	63	16	2,4	80	75,45	
FLLFP22	FP22	TITAN BIT, DAKOTA, SARATOGA	HSSV	80	16	1	100	80,48	
FLLFP22W	FP22W	TITAN BIT, DAKOTA, SARATOGA	CARBIDE	80	16	1	100	275,42	
FLLFP23	FP23	DUPLEX, ATLANTA, TOPEKA	HSSV	80	22	1	100	83,38	
FLLFP23W	FP23W	DUPLEX, ATLANTA, TOPEKA	CARBIDE	80	22	1	100	275,42	
FF68801416100CO	-	TITAN, DAKOTA, SARATOGA, YAKARTA	HSSCo	80	16	1,4	100	81,06	
FLLFP26 (FLL23)	FP26	G, SENNA, DAKOTA, SARATOGA, YAKARTA	HSSV	80	16	1,5	100	84,54	
FLLFP26W	FP26W	G, SENNA, DAKOTA, SARATOGA,	CARBIDE	80	16	1,5	100	279,28	

**CUTTERS FOR JMA KEY DUPLICATING MACHINES**
**LASER CUTTERS**


Ref. FLLF3



Ref. BM	Ref. JMA	MACHINE TYPES	MATERIAL	Ø <sub>1</sub> mm	L <sub>1</sub> mm	Ø <sub>2</sub> mm	L <sub>2</sub> mm	Z	FLL	€
FLLF3Z3 (FLL32)	≈ F3	ALBANY ARIZONA COLUMBIA DAKAR DAKAR EXPRESS DAY T-COL DAYTONA X CODE	HSSCo	1,5	45	6	3	3		39,73
FLLF3 (FLL44)	F3		HSSCo	1,5	45	6	3	2		37,19
FLLF3W (FLL45)	F3W		CARBIDE	1,5	45	6	3	2		120,90
FLLF33 (FLL53)	F33		HSSCo	2	45	6	4	3		35,90
FLL11Z3 (FLL33)	≈ F11		HSSCo	2,5	45	6	5	3		35,90
FLLF11 (FLL48)	F11		HSSCo	2,5	45	6	5	2		32,13
FLLF11W (FLL49)	F11W		CARBIDE	2,5	45	6	5	2		91,52
FLLF17 (FLL34)	F17		HSSCo	3	45	6	6	3		35,90
FLLF8Z3 (FLL35)	≈ F8		HSSCo	4	45	6	6	3		41,79
FLLF8 (FLL46)	F8		HSSCo	4	45	6	7	2		37,19
FLLF8W (FLL47)	F8W		CARBIDE	4	45	6	6	2		113,46
FLLF77 (FLL36)	-		HSSCo	5	45	6	7	3		41,79
FLLF78 (FLL37)	-		HSSCo	6	45	6	8	3		41,79
FLLF78W (FLL54)	-		CARBIDE	6	45	6	8	3		91,52
FLLF78WZ4 (FLL55)	-		CARBIDE	6	45	6	8	4		91,52

**UNIVERSAL DIMPLE CUTTERS FOR JMA AND SILCA DUPLICATING MACHINES**


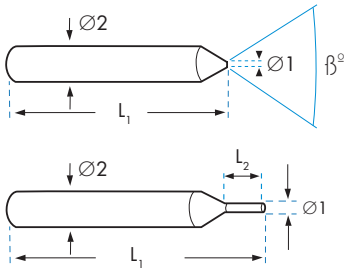
Ref. FLLF1



Ref. BM	Ref. JMA	MACHINE TYPES	MATERIAL	β°	Ø <sub>1</sub> mm	L <sub>1</sub> mm	Ø <sub>2</sub> mm	Z	FLL	€
FLLF82	-	ALBANY ARIZONA CAPRI COLUMBIA DAKAR DAKAR EXPRESS DAY T-COL DAYTONA X CODE	HSSCo	82°	0,9	45	6	2		24,48
FLLF1 (FLL43)	F1		HSSCo	90°	0,8	45	6	2		24,48
FLLF1W (FLL42)	F1W		CARBIDE	90°	0,8	45	6	2		75,82
FLLF5 (FLL52)	F5		HSSCo	90°	0,9	45	6	2		24,48
FLLF5W (FLL42)	F5W		CARBIDE	90°	0,9	45	6	2		75,82
FLLF95	-		HSSCo	95°	0,9	45	6	2		24,48
FLLF13 (FLL50)	F13		HSSCo	100°	0,8	45	6	2		24,48
FLLF13W (FLL51)	F13W		CARBIDE	100°	0,8	45	6	2		70,94
FLLF105	-		HSSCo	105°	0,9	45	6	2		24,48

**CUTTERS FOR JMA KEY DUPLICATING MACHINES**

**TRACER POINTS**



Ref. FLLP1



Ref. FLLP3



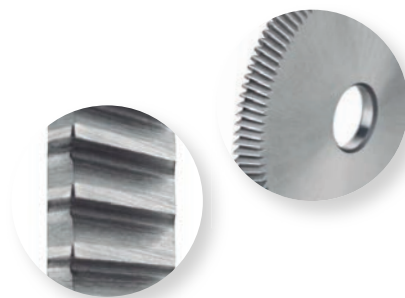
Ref. BM	Ref. JMA	MACHINE TYPES	MATERIAL	$\beta^\circ$	$\varnothing_1$ mm	$L_1$ mm	$\varnothing_2$ mm	$L_2$ mm	FLL	€
FLLP1	(PLL38)	P1	HSSV	90°	0,8	45	6	-		19,93
FLLP3	(PLL32)	P3	HSSV	-	1,5	45	6	4		35,25
FLLP5		P5	HSSV	90°	0,9	45	6	-		19,93
FLLP8	(PLL35)	P8	HSSV	-	4	45	6	7		35,25
FLLP11	(PLL33)	P11	HSSV	-	2,5	45	6	4		35,25
FLLP13	(PLL50)	P13	HSSV	100°	0,8	45	6	-		19,93
FLLP17	(PLL34)	P17	HSSV	-	3	45	6	6		35,25
FLLP52	(PLL52)	-	HSSV	90°	0,9	45	6	-		19,93
FLLP77	(PLL36)	-	HSSV	-	5	45	6	7		35,25
FLLP78	(PLL37)	-	HSSV	-	6	45	6	8		35,25

**KEY LINE CUTTERS**

Ref. BM	Ref. JMA	MACHINE TYPES	MATERIAL	$\beta^\circ$	$\varnothing_1$ mm	$L_1$ mm	$\varnothing_2$ mm	$L_2$ mm	€
V001	-	KEY LINE	CARBIDE	90°	0,4	32	4	-	139,40
V003	-		CARBIDE	-	2,5	32	4	5	139,40
V004	-		CARBIDE	82°	0,5	32	4	-	139,40
V007	-		CARBIDE	100°	0,4	32	4	-	139,40
V012	-		CARBIDE	-	1,5	32	4	4	171,40

**CUTTERS FOR SILCA KEY DUPLICATING MACHINES**
**DOUBLE ANGLE CUTTERS**


Ref. SLLP01



Ref. BM	Ref. SILCA	MACHINE TYPES	MATERIAL	mm		mm	$\beta^\circ$	Z	mm	SLL
				mm	mm					
SLL01F	O1F	FUTURA PRO	CARBIDE	60,4	9,52	3,05	40	110	0	153,96
SLLU01	U01	UNOCODE/ULTRACODE	HSSV	60,4	9,52	5,25	80	72	0,5	123,67
SLLU01W	U01W	UNOCODE/ULTRACODE	CARBIDE	60,4	9,52	5,25	80	72	0,5	395,12
SLLP21	P21	SILCA DELTA	HSSV	60,4	9,52	5,25	84	72	0,5	111,55
SLLP01	P01	BRAVO / POKER / REKORD / BRAVO SUPER / SUPER MASTER	HSSV	80	16	5	84	110	1	99,52
SLLP01/120	P01/120		HSSV	80	16	5	84	120	1	101,41
SLLP01W	P01W		CARBIDE	80	16	5	84	110	1	326,05

**SIDE MILLING CUTTER**


Ref. SLLSG2



Ref. BM	Ref. SILCA	MACHINE TYPES	MATERIAL	mm		mm	Z	SLL
				mm	mm			
SLLY2KW	Y2KW	DELTA	CARBIDE	63	16	1,35	80	298,78
SLLSG19	SG19	DELTA	HSSV	64,6	9,52	1,5	40	84,43
SLLSG19W	SG19W	DELTA	CARBIDE	64,6	9,52	1,5	40	284,38
SLLSG18	SG18	DELTA	HSSV	64,6	9,52	2,4	40	84,43
SLLSG18W	SG18W	DELTA	CARBIDE	64,6	9,52	2,4	40	284,38
SLLSG6	SG6	LANCER	HSSV	80	22	1,3	100	86,77
SLLSG6W	SG6W	LANCER	CARBIDE	80	22	1,3	100	298,78
SLLSG2	SG2	TARGA/TECH3/TECHNICA	HSSV	80	22	1,5	100	86,77
SLLSG2W	SG2W	TARGA/TECH3/TECHNICA	CARBIDE	80	22	1,5	100	298,78
SLLFSL4-CAW	FSCL4-CAW	DELTA	CARBIDE	80	22	1,8	100	310,59



**CUTTERS FOR SILCA KEY DUPLICATING MACHINES**
**MILLING SLOT CUTTERS**


Ref. SLLSG7W



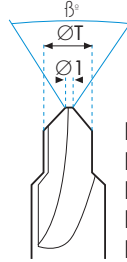
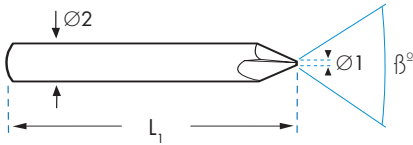
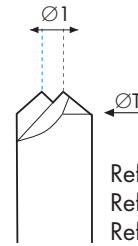
End mills


Pink

Ref. BM	Ref. SILCA	MACHINE TYPES	MATERIAL	mm			Z	SLL	€
SLLSG14W	SG14W	DELTA	CARBIDE	60,4	9,52	1,14	80	238,93	
SLLGB1	GB1	ULTRACODE / UNOCODE	HSSV	60,4	9,52	1,7	66	87,65	
SLL05	05	UNOCODE/ULTRACODE	HSSV	60,4	9,52	1,8	68	87,65	
SLL05W	05W	UNOCODE/ULTRACODE	CARBIDE	60,4	9,52	1,8	68	250,75	
SLLCU-15C	CU-15C	OPERA /TARGA	CARBIDE	63	16	1,5	80	326,61	
SLLSG17	SG17	DELTA	HSSV	64,6	9,52	1,8	70	87,65	
SLLSG17W	SG17W	DELTA	CARBIDE	64,6	9,52	1,8	70	275,42	
SLLSG13	SG13	UNOCODE / DELTA	HSSV	64,6	9,52	2	70	87,65	
SLLSG13W	SG13W	UNOCODE / DELTA	CARBIDE	64,6	9,52	2	70	326,61	
SLL06	06	UNOCODE/ULTRACODE	HSSV	64,6	9,52	2,4	70	87,65	
SLL06W	06W	UNOCODE/ULTRACODE	CARBIDE	64,6	9,52	2,4	70	266,31	
SLLSG3	SG3	OPERA /TARGA/TECH3	HSSV	80	22	1	100	83,38	
SLLSG3W	SG3W	OPERA /TARGA/TECH3	CARBIDE	80	22	1	100	275,42	
SLLSG4	SG4	OPERA /TARGA/TECH3	HSSV	80	22	1,25	100	83,38	
SLLSG4W	SG4W	OPERA /TARGA/TECH3	CARBIDE	80	22	1,25	100	275,42	
SLLSG5	SG5	LANCER	HSSV	80	22	1,3	100	83,38	
SLLSG5W	SG5W	LANCER	CARBIDE	80	22	1,3	100	275,42	
SLLSG7	SG7	OPERA / TARGA	HSSV	80	22	1,4	100	83,38	
SLLSG7M35	SG7M35	OPERA / TARGA	HSSCo	80	22	1,4	100	106,75	
SLLSG7W	SG7W	LANCER	CARBIDE	80	22	1,4	100	275,42	
SLLSG1	SG1	OPERA /TARGA/TECH3	HSSV	80	22	1,5	100	83,38	
SLLSG1W	SG1W	OPERA /TARGA/TECH3	CARBIDE	80	22	1,5	100	275,42	
SLLSG8	SG8	TECH3 / TECHNICA	HSSV	80	22	1,75	100	83,38	
SLLSG10	SG10	LANCER	HSSV	80	22	2	100	83,38	
SLLSG10W	SG10W	LANCER/ OPERA /TARGA	CARBIDE	80	22	2	100	287,10	
SLLSG11	SG11	SILCA GT40	HSSV	80	22	2,3	100	83,38	
SLLSG12	SG12	TARGA/TECH3/TECHNICA/OPERA	HSSV	80	22	2,5	100	83,38	
SLLSG58400	SG58400	DELTA	CARBIDE	80	22	4	100	263,73	
SLLPL1	PL1	PRIMA LASER	HSSV	100	22	1	100	143,87	
SLLPL1W	PL1W	PRIMA LASER	CARBIDE	100	22	1	100	369,14	
SLLPL1,25	PL1,25	PRIMA LASER	HSSV	100	22	1,25	100	143,87	
SLLPL1,25W	PL1,25W	PRIMA LASER	CARBIDE	100	22	1,25	100	352,02	
SLLPL1,5	PL1,5	PRIMA LASER	HSSV	100	22	1,5	100	143,87	
SLLPL1,5W	PL1,5W	PRIMA LASER	CARBIDE	100	22	1,5	100	352,02	
SLLPL1,7W	PL1,7W	PRIMA LASER	CARBIDE	100	22	1,7	100	362,81	
SLLPL2	PL2.0	PRIMA LASER	HSSV	100	22	2	100	143,87	
SLLPL2W	PL2.0W	PRIMA LASER	CARBIDE	100	22	2	100	362,81	

**CUTTERS FOR SILCA KEY DUPLICATING MACHINES**
**DIMPLE CUTTERS**
**MATRIX**


Ref. SLLFIW


 Ref. SLLF19-CAZ1  
 Ref. SLLF19  
 Ref. SLLF43  
 Ref. SLLF21  
 Ref. SLLF25

 Ref. SLLF12B  
 Ref. SLLF15  
 Ref. SLLF37

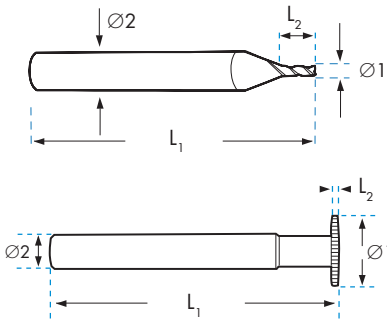

Ref. BM	Ref. SILCA	UNIV.	MACHINE TYPES	MATERIAL		Ø1 mm	L1 mm	Ø2 mm	Z	SLL
										€
SLLF1Z1	F1	FLLF1	MATRIX	HSSV	90°	0,7	48	6	1	55,77
SLLF1	F1	FLLF1	MATRIX	HSSV	90°	0,7	48	6	2	55,77
SLLF1W	F1W	FLLF1W	MATRIX	CARBIDE	90°	0,7	48	6	1	99,70
SLLF4	F4	FLLF1	MATRIX	HSSV	90°	0,4	48	6	1	55,77
SLLF5	F5	FLLF5	MATRIX	HSSV	90°	0,9	48	6	1	55,77
SLLF6	F6	FLLF105	MATRIX	HSSV	106°	1	48	6	1	55,77
SLLF7	F7	FLLF82	MATRIX	HSSV	72°	0,8	48	6	2	55,79
SLLF12A	F12A	FLLF13	MATRIX	HSSV	100°	0,4	48	6	1	55,77
SLLF12B	F12B	FLLF1	MATRIX	HSSV	90°	8 x 1,8*	48	6	2	55,77
SLLF13	F13	FLLF1	MATRIX	HSSV	90°	0,77	48	6	1	55,77
SLLF14	F14	FLLF5	MATRIX	HSSV	90°	0,9	48	6	1	55,77
SLLF15	F15	FLLF1	MATRIX	HSSV	90°	8 x 0,8*	48	6	1	63,91
SLLF19	F19	FLLF1	MATRIX	HSSCo	90°	2,2 x 0,6*	48	6	1	55,79
SLLF19-CAZ1	F19-CA	FLLF1W	MATRIX	CARBIDE	90°	2,2 x 0,6*	48	6	1	99,70
SLLF20	F20	FLLF1	MATRIX	HSSV	90°	0,45	48	6	2	55,77
SLLF21	F21	FLLF82	MATRIX	HSSCo	85°	3,2 x 0,8*	48	6	1	63,91
SLLF23	F23	FLLF1	MATRIX	HSSV	90°	1,5	48	6	2	63,91
SLLF24	F24	FLLF13	MATRIX	HSSV	100°	1,3	48	6	1	55,77
SLLF25	F25	FLLF1	MATRIX	HSSV	90°	3,5 x 0,65*	48	6	1	55,77
SLLF26	F26	FLLF82	MATRIX	HSSV	82°	0,8	48	6	1	55,77
SLLF27-CA	F27-CA	-	MATRIX	CARBIDE	60°	2,4 x 1,9*	48	6	1	133,19
SLLF28	F28	-	MATRIX	HSSV	76°	0,76	48	6	1	55,77
SLLF29	F29	-	MATRIX	HSSV	76°	1,9 x 0,76*	48	6	1	55,77
SLLF34	F34	-	MATRIX	HSSV	50°	1,5	48	6	1	55,77
SLLF34-CAZ1	F34-CA	-	MATRIX	CARBIDE	50°	1,5	48	6	1	99,70
SLLF37	F37	FLLF1	MATRIX	HSSV	90°	6 x 2,1*	48	6	2	63,91
SLLF39	F39	FLLF1	MATRIX	HSSV	90°	0,6	48	6	2	67,74
SLLF42	F42	FLLF13	MATRIX	HSSV	100°	0,7	48	6	1	55,77
SLLF43	F43	FLLF1	MATRIX	HSSCo	90°	1	48	6	1	55,77
SLLF45	F45	-	MATRIX	HSSV	130°	0,56	48	6	1	55,79
SLLF46	F46	FLLF13	MATRIX	HSSV	100°	0,65	48	6	1	55,79
SLLF49	F49	FLLF95	MATRIX	HSSV	95°	0,8	48	6	1	63,91
SLLF50	F50	FLLF13	MATRIX	HSSV	100°	0,5	48	6	1	63,91
SLLF52-CA	F52-CA	-	MATRIX	CARBIDE	54°	0,86	48	6	2	55,77
SLLF59	F59	FLLF1	MATRIX	HSSV	90°	0,8	48	6	2	55,77
SLL01D	01D	-	FUTURA PRO	CARBIDE	90°	0,4	30	6	2	62,62
SLL02D	02D	-	FUTURA PRO	CARBIDE	100°	0,4	30	6	2	62,62

\* Ø1 x Ø1

**CUTTERS FOR SILCA KEY DUPLICATING MACHINES**

**LASER CUTTERS**

**MATRIX**



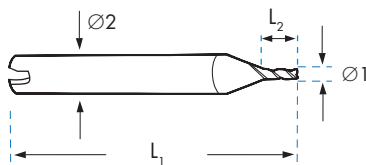
Ref. SLLF3



Ref. BM	Ref. SILCA	MACHINE TYPES	MATERIAL	Ø1 mm	L1 mm	Ø2 mm	L2 mm	Z	€	SLL
SLLF3	F3	MATRIX	HSSV	1,5	48	6	2	3	55,77	
SLLF8	F8	MATRIX	HSSV	4	48	6	13	3	55,77	
SLLF11	F11	MATRIX	HSSV	2,5	48	6	7	3	55,77	
SLLF22	F22	MATRIX	HSSV	2,5	42	6	6	3	55,77	
SLLF30	F30	MATRIX	HSSV	3	48	6	6	3	55,77	
SLLF30Z2	F30	MATRIX	HSSV	3	48	6	6	2	65,55	
SLLF44	F44	MATRIX	HSSV	2	40	6	6	3	55,77	
SLLF62W*	F62W	MATRIX	CARBIDE	11,8	48	6	1	20	178,05	
SLL01L	O1L	FUTURA PRO	CARBIDE	2,5	30	6	3	3	62,62	
SLL02L	O2L	FUTURA PRO	CARBIDE	2	30	6	3	3	62,62	

**LASER CUTTERS**

**QUATTROCODE / TRIAX-E**



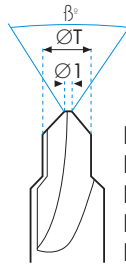
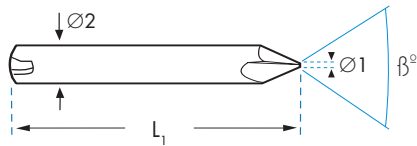
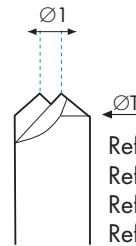
Ref. SLLW133



Ref. BM	Ref. SILCA	MACHINE TYPES	MATERIAL	Ø1 mm	L1 mm	Ø2 mm	L2 mm	Z	€	SLL
SLLW101	W101	QUATTROCODE / TRIAX-E	CARBIDE	2,5	40	6	6	3	127,22	
SLLW114	W114	QUATTROCODE / TRIAX-E	CARBIDE	2	40	6	6	3	127,24	
SLLW117	W117	QUATTROCODE / TRIAX-E	CARBIDE	5	48	6	R1	4	103,26	
SLLW129	W129	QUATTROCODE / TRIAX-E	CARBIDE	3	40	6	6	3	127,22	
SLLW131	W131	QUATTROCODE / TRIAX-E	CARBIDE	6	40	6	5	3	93,91	
SLLW133	W133	QUATTROCODE / TRIAX-E	CARBIDE	1,5	40	6	3	3	138,94	
SLLW134	W134	QUATTROCODE / TRIAX-E	CARBIDE	4	40	6	7	3	127,24	
SLLW219	W219	QUATTROCODE / TRIAX-E	CARBIDE	1,2	40	6	2	3	127,22	
SLLW235	W235	QUATTROCODE / TRIAX-E	CARBIDE	1,1	40	6	2	3	127,19	
SLLW268	W268	QUATTROCODE / TRIAX-E	CARBIDE	1,5	40	6	6	2	127,31	

**CUTTERS FOR SILCA KEY DUPLICATING MACHINES**
**DIMPLE CUTTERS**
**QUATTROCODE /TRIAX-E**


Ref. SLLW103


 Ref. SLLW115  
 Ref. SLLW128  
 Ref. SLLW135  
 Ref. SLLW145  
 Ref. SLLW210

 Ref. SLLW111  
 Ref. SLLW126  
 Ref. SLLW127  
 Ref. SLLW139

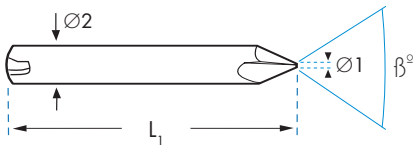

Ref. BM	Ref. SILCA	MACHINE TYPES	MATERIAL	$\beta^\circ$	$\varnothing_1$ mm	$L_1$ mm	$\varnothing_2$ mm	Z	€
SLLW102	W102	QUATTROCODE /TRIAX-E	CARBIDE	106°	1	40	6	2	89,29
SLLW103	W103/W299	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,8	40	6	2	89,29
SLLW104	W104	QUATTROCODE /TRIAX-E	CARBIDE	90°	1,2	40	6	2	89,29
SLLW105	W105	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,7	40	6	2	89,29
SLLW106	W106	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,6	40	6	2	89,29
SLLW107	W107	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,9	40	6	2	89,29
SLLW108	W108	QUATTROCODE /TRIAX-E	CARBIDE	82°	0,9	40	6	2	89,29
SLLW109	W109	QUATTROCODE /TRIAX-E	CARBIDE	110°	0,4	40	6	2	89,29
SLLW110	W110	QUATTROCODE /TRIAX-E	CARBIDE	100°	0,6	40	6	2	89,29
SLLW111	W111	QUATTROCODE /TRIAX-E	CARBIDE	96°	8x2,75*	40	6	2	100,31
SLLW112	W112	QUATTROCODE /TRIAX-E	CARBIDE	60°/0°	1,5	40	6	2	89,87
SLLW113	W113	QUATTROCODE /TRIAX-E	CARBIDE	100°	0,76	40	6	2	89,29
SLLW115	W115	QUATTROCODE /TRIAX-E	CARBIDE	54°	4x0,86*	40	6	1	119,70
SLLW116	W116	QUATTROCODE /TRIAX-E	CARBIDE	90°	1	40	6	2	89,29
SLLW118	W118	QUATTROCODE /TRIAX-E	CARBIDE	120°	0,6	40	6	2	89,29
SLLW119	W119	QUATTROCODE /TRIAX-E	CARBIDE	85°	0,3	40	6	2	89,29
SLLW121	W121	QUATTROCODE /TRIAX-E	CARBIDE	86°	0,05	48	6	3	124,24
SLLW122	W122	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,55	40	6	2	107,15
SLLW123	W123	QUATTROCODE /TRIAX-E	CARBIDE	76°	0,9	40	6	2	89,29
SLLW124	W124	QUATTROCODE /TRIAX-E	CARBIDE	90°	8x0,8*	48	6	3	171,16
SLLW126	W126	QUATTROCODE /TRIAX-E	CARBIDE	80°	3,3	48	6	2	107,15
SLLW127	W127	QUATTROCODE /TRIAX-E	CARBIDE	80°	2,1	48	6	2	107,15
SLLW128	W128	QUATTROCODE /TRIAX-E	CARBIDE	90°	4x0,55*	48	6	1	119,70
SLLW130	W130	QUATTROCODE /TRIAX-E	CARBIDE	90°	1,4	40	6	2	120,20
SLLW132	W132	QUATTROCODE /TRIAX-E	CARBIDE	60°	2	40	6	1	119,70
SLLW135	W135	QUATTROCODE /TRIAX-E	CARBIDE	90°	4x0,55*	40	6	2	119,63
SLLW136	W136	QUATTROCODE /TRIAX-E	CARBIDE	76°	2,23	40	6	1	119,70
SLLW138	W138	QUATTROCODE /TRIAX-E	CARBIDE	90°	4x0,7*	48	6	2	89,29
SLLW139	W139	QUATTROCODE /TRIAX-E	CARBIDE	60°/50°	0,9	40	6	2	133,19
SLLW142	W142	QUATTROCODE /TRIAX-E	CARBIDE	100°	1,2	40	6	2	89,29
SLLW145	W145	QUATTROCODE /TRIAX-E	CARBIDE	90°	3,2x0,8*	48	6	2	119,63
SLLW210	W210	QUATTROCODE /TRIAX-E	CARBIDE	90°	5x1,05*	40	6	3	179,16
SLLW213	W213	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,95*	40	6	2	134,82
SLLW221	W221	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,5	40	6	2	120,20
SLLW225	W225	QUATTROCODE /TRIAX-E	CARBIDE	90°	1	40	6	2	120,20
SLLW238	W238	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,8	40	6	2	89,29
SLLW261	W261	QUATTROCODE /TRIAX-E	CARBIDE	1,1	3x1,5*	48	6	2	134,82
SLLW255	W255	QUATTROCODE /TRIAX-E	CARBIDE	90°	4x0,8*	48	6	2	120,20
SLLW293	W293	QUATTROCODE /TRIAX-E	CARBIDE	90°	0,85	40	6	2	120,20
SLLW299	W299	QUATTROCODE /TRIAX-E	CARBIDE	90°	3x0,80	40	6	2	89,93

 \*  $\varnothing_1 \times \varnothing_1$

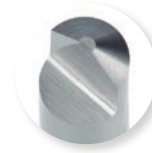
**CUTTERS FOR SILCA KEY DUPLICATING MACHINES**

DIMPLE CUTTERS

QUATTROCODE / TRIAX-E



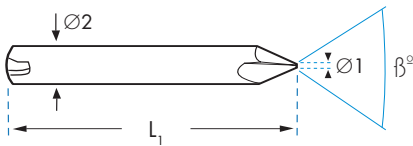
Ref. SLLW103Z1



Ref. BM	Ref. SILCA	MACHINE TYPES	MATERIAL	$\beta^\circ$	$\varnothing_1$ mm	L1 mm	$\varnothing_2$ mm	Z	€
SLLW102Z1	W102 Z1	QUATTROCODE / TRIAX-E	CARBIDE	106°	1	40	6	2	89,87
SLLW103Z1	W103 Z1	QUATTROCODE / TRIAX-E	CARBIDE	90°	0,8	40	6	2	89,87
SLLW104Z1	W104 Z1	QUATTROCODE / TRIAX-E	CARBIDE	90°	1,2	40	6	2	89,87
SLLW105Z1	W105 Z1	QUATTROCODE / TRIAX-E	CARBIDE	90°	0,7	40	6	2	89,87
SLLW106Z1	W106 Z1	QUATTROCODE / TRIAX-E	CARBIDE	90°	0,6	40	6	2	89,87
SLLW107Z1	W107 Z1	QUATTROCODE / TRIAX-E	CARBIDE	90°	0,9	40	6	2	89,87
SLLW108Z1	W108 Z1	QUATTROCODE / TRIAX-E	CARBIDE	82°	0,9	40	6	2	89,87
SLLW109Z1	W109 Z1	QUATTROCODE / TRIAX-E	CARBIDE	110°	0,4	40	6	2	89,87
SLLW113Z1	W113 Z1	QUATTROCODE / TRIAX-E	CARBIDE	100°	0,76	40	6	2	89,87
SLLW116Z1	W116 Z1	QUATTROCODE / TRIAX-E	CARBIDE	90°	1	40	6	2	89,87
SLLW118Z1	W118 Z1	QUATTROCODE / TRIAX-E	CARBIDE	120°	0,6	40	6	2	89,87
SLLW119Z1	W119 Z1	QUATTROCODE / TRIAX-E	CARBIDE	85°	0,3	40	6	2	89,87
SLLW122Z1	W122 Z1	QUATTROCODE / TRIAX-E	CARBIDE	90°	0,55	40	6	2	89,87
SLLW123Z1	W123 Z1	QUATTROCODE / TRIAX-E	CARBIDE	76°	0,9	40	6	2	89,87
SLLW146Z1	W146 Z1	QUATTROCODE / TRIAX-E	CARBIDE	90°	0,25	40	6	1	89,87

SLL

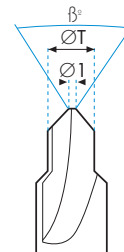
DIMPLE CUTTERS



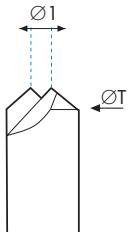
Ref. SLLH103



Ref. SLLH115



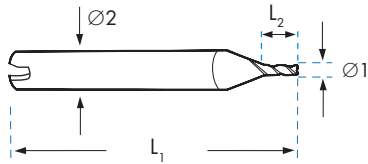
Ref. SLLH111  
Ref. SLLH126  
Ref. SLLH127



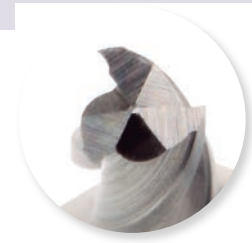
Ref. BM	Ref. SILCA	UNIV.	MACHINE TYPES	MATERIAL	$\beta^\circ$	$\varnothing_1$ mm	L1 mm	$\varnothing_2$ mm	Z	€
SLLH103	H103	FLLF1	QUATTROCODE / TRIAX-E	HSSV	90°	0,8	40	6	2	65,88
SLLH104	H104	FLLF1	QUATTROCODE / TRIAX-E	HSSV	90°	1,2	40	6	2	58,85
SLLH105	H105	FLLF1	QUATTROCODE / TRIAX-E	HSSV	90°	0,7	40	6	2	58,85
SLLH106	H106	FLLF1	QUATTROCODE / TRIAX-E	HSSV	90°	0,6	40	6	2	55,77
SLLH107	H107	FLLF1	QUATTROCODE / TRIAX-E	HSSV	90°	0,9	40	6	2	55,77
SLLH108	H108	FLLF82	QUATTROCODE / TRIAX-E	HSSV	82°	0,9	40	6	2	55,77
SLLH110	H110	FLLF13	QUATTROCODE / TRIAX-E	HSSV	100°	0,6	40	6	2	55,77
SLLH111	H111	FLLF95	QUATTROCODE / TRIAX-E	HSSV	96°	6,4x2,75*	40	6	2	55,77
SLLH112	H112	-	QUATTROCODE / TRIAX-E	HSSV	60°	1,5	40	6	2	55,77
SLLH113	H113	FLLF13	QUATTROCODE / TRIAX-E	HSSV	100°	0,76	40	6	2	55,77
SLLH115	H115	-	QUATTROCODE / TRIAX-E	HSSV	54°	4x0,86*	40	6	1	55,77
SLLH116	H116	FLLF1	QUATTROCODE / TRIAX-E	HSSV	90°	1	40	6	2	73,62
SLLH118	H118	-	QUATTROCODE / TRIAX-E	HSSV	120°	0,6	40	6	1	55,77
SLLH119	H119	FLLF82	QUATTROCODE / TRIAX-E	HSSV	85°	0,3	40	6	2	55,77
SLLH122	H122	FLLF1	QUATTROCODE / TRIAX-E	HSSV	90°	0,55	40	6	2	55,77
SLLH126	H126	FLLF85	QUATTROCODE / TRIAX-E	HSSV	80°	3,3*	48	6	2	83,24
SLLH127	H127	FLLF85	QUATTROCODE / TRIAX-E	HSSV	80°	2,1*	48	6	2	83,24
SLLH128	H128	FLLF1	QUATTROCODE / TRIAX-E	HSSV	90°	0,75	48	6	2	55,77

SLL

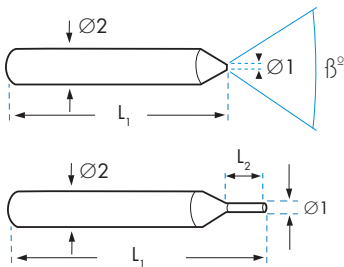
\*  $\varnothing_1 \times \varnothing_1$

**CUTTERS FOR SILCA KEY DUPLICATING MACHINES**
**LASER CUTTERS**


Ref. SLLH101



Ref. BM	Ref. SILCA	MACHINE TYPES	MATERIAL	Ø <sub>1</sub> mm	L <sub>1</sub> mm	Ø <sub>2</sub> mm	L <sub>2</sub> mm	Z	€	SLL
SLLH101	H101	QUATTROCODE / TRIAX-E	HSSV	2,5	40	6	6	3	65,51	
SLLH114	H114	QUATTROCODE / TRIAX-E	HSSV	2	40	6	6	3	55,77	
SLLH117	H117	QUATTROCODE / TRIAX-E	HSSV	5	48	6	R1	4	67,66	
SLLH129	H129	QUATTROCODE / TRIAX-E	HSSV	3	40	6	6	3	55,77	
SLLH131	H131	QUATTROCODE / TRIAX-E	HSSV	6	40	6	5	3	73,62	

**TRACER POINTS**


Ref. SLLT1



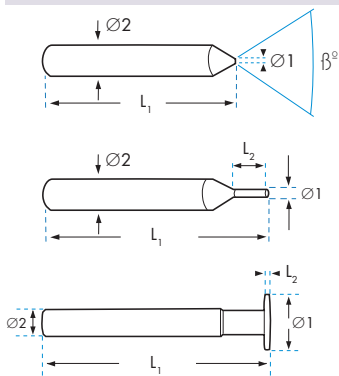
Ref. SLLT3



Ref. BM	Ref. SILCA	MACHINE TYPES	Ref. CUTTER	MATERIAL	β°	Ø <sub>1</sub> mm	L <sub>1</sub> mm	Ø <sub>2</sub> mm	L <sub>2</sub> mm	Ø <sub>T</sub> mm	€	SLL
SLLT1	T1	MATRIX	F1	HSSV	90°	0,7	48	6	-	-	38,94	
SLLT2	T2	MATRIX	F2	HSSV	88°	1,6	48	6	-	-	43,86	
SLLT3	T3	MATRIX	F3	HSSV	-	1,5	48	6	3	-	43,86	
SLLT4	T4	MATRIX	F4	HSSV	90°	0,4	48	6	-	-	43,86	
SLLT5	T5	MATRIX	F5	HSSV	90°	0,9	48	6	-	-	43,86	
SLLT6	T6	MATRIX	F6	HSSV	106°	1	48	6	15	-	43,86	
SLLT7	T7	MATRIX	F7	HSSV	72°	0,8	48	6	2	-	43,86	
SLLT8	T8	MATRIX	F8	HSSV	-	4	48	6	12	-	43,86	
SLLT11	T11	MATRIX	F11	HSSV	-	2,5	48	6	6	-	43,86	
SLLT12A	T12A	MATRIX	F12A	HSSV	100°	0,4	48	6	-	-	43,86	
SLLT12B	T12B	MATRIX	F12B	HSSV	90°	2,8	48	6	-	-	43,86	
SLLT13	T13	MATRIX	F13	HSSV	90°	0,77	48	6	-	-	43,86	
SLLT14	T14	MATRIX	F14	HSSV	90°	0,9	48	6	-	-	43,86	
SLLT15	T15	MATRIX	F15	HSSV	90°	0,8	48	6	-	-	43,86	
SLLT19	T19	MATRIX	F19	HSSV	90°	2,2 x 0,6*	48	6	-	-	43,86	
SLLT20	T20	MATRIX	F20	HSSV	90°	0,45	48	6	-	-	43,86	
SLLT21	T21	MATRIX	F21	HSSV	85°	3,2 x 0,8*	48	6	-	-	43,86	
SLLT22	T22	MATRIX	F22	HSSV	-	2,5	42	6	6	-	43,86	
SLLT23	T23	MATRIX	F23	HSSV	90°	1,5	48	6	5	-	43,86	

CUTTERS FOR SILCA KEY DUPLICATING MACHINES

TRACER POINTS



\*Ref. SLLT62W



Ref. SLLT1



Ref. SLLT3

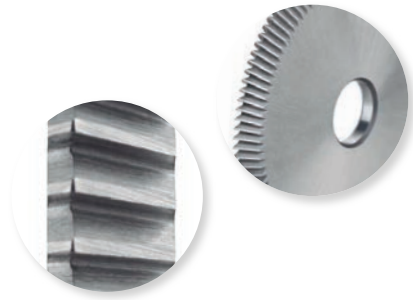


End mills

Pink

Ref. BM	Ref. SILCA	MACHINE TYPES	Ref. CUTTER	MATERIAL	$\beta^\circ$	$\varnothing_1$ mm	L1 mm	$\varnothing_2$ mm	L2 mm	$\varnothing_T$ mm	€
SLLT24	T24	MATRIX	F24	HSSV	100°	1,3	48	6	-	-	43,86
SLLT25	T25	MATRIX	F25	HSSV	90°	3,5 x 0,65*	48	6	-	-	43,86
SLLT26	T26	MATRIX	F26	HSSV	82°	0,8	48	6	-	-	43,86
SLLT27	T27	MATRIX	F27	HSSV	60°	1,28	48	6	-	-	49,51
SLLT28	T28	MATRIX	F28	HSSV	76°	0,76	48	6	-	-	43,86
SLLT29	T29	MATRIX	F29	HSSV	76°	1,9	48	6	-	-	43,86
SLLT30	T30	MATRIX	F30	HSSV	-	3	48	6	10	-	43,86
SLLT30-45	T30-45	MATRIX		HSSV	-	3	45	6	10	-	43,86
SLLT33	T33	MATRIX	F33	HSSV	48°	1,4	48	6	-	-	65,39
SLLT34	T34	MATRIX	F34	HSSV	50°	1,5	48	6	-	-	43,86
SLLT37	T37	MATRIX	F37	HSSV	90°	2,1	48	6	-	-	43,86
SLLT39	T39	MATRIX	F39	HSSV	90°	0,6	48	6	-	-	43,86
SLLT40	T40	MATRIX	F40	HSSV	108°	0,4	48	6	-	-	43,86
SLLT42	T42	MATRIX	F42	HSSV	100°	0,7	48	6	-	-	43,86
SLLT43	T43	MATRIX	F43	HSSV	90°	1	48	6	-	-	43,86
SLLT44	T44	MATRIX	F44	HSSV	-	2	48	6	8	-	43,86
SLLT44-45	T44-45	MATRIX		HSSV	-	2	45	6	8	-	43,86
SLLT46	T46	MATRIX	F46	HSSV	100°	0,65	48	6	-	-	43,86
SLLT49	T49	MATRIX	F49	HSSV	95°	0,8	48	6	-	-	43,86
SLLT50	T50	MATRIX	F50	HSSV	100°	0,5	48	6	-	-	43,86
SLLT52	T52	MATRIX	F52	HSSV	54°	0,86	48	6	6	2	43,86
SLLT54	T54	MATRIX	F54	HSSV	-	4	40	6	6,5	-	55,77
SLLT55	T55	MATRIX	F55	HSSV	100°	1	48	6	4	-	43,86
SLLT59	T59	MATRIX	F59	HSSV	90°	0,8	48	6	-	-	43,86
SLLT62W*	T62W	MATRIX	F62W	CARBIDE	-	11,8	48	6	1	-	87,57
SLLT63	T63	MATRIX	F63	HSSV	78°	0,5	48	6	4	3	43,86
SLLT65	T65	MATRIX	F65	HSSV	90°	1,05	48	6	5	3	43,86
SLLT101	T101	MATRIX		HSSV	-	2,5	40	6	6	-	43,86
SLLT129	T129	MATRIX		HSSV	-	3	40	6	10	-	43,86
SLLU101	U101	QUATTROCODE		CARBIDE	-	1,2	48	6	3	-	55,77
SLLU101/H	U101/H	QUATTROCODE /TRIAX-E		CARBIDE	-	1,2	48	6	3	-	37,89
SLLU102/65	U102/65	QUATTROCODE /TRIAX-E		CARBIDE	30°	0,2	48	6	9	2,6	59,57
SLLU102TT	U102TT	QUATTROCODE /TRIAX-E		CARBIDE	30°	0,2	26	4	6	2	59,57
SLLU103	U103	QUATTROCODE /TRIAX-E		CARBIDE	-	1	48	6	3	-	55,77
SLLU103/H	U103/H	QUATTROCODE /TRIAX-E		CARBIDE	-	1	48	6	3	-	37,89
SLLU103-TT	U103-TT	QUATTROCODE /TRIAX-E		CARBIDE	-	1	21	4	3	-	55,77
SLLU103-TT/H	U103-TT/H	QUATTROCODE /TRIAX-E		CARBIDE	-	1	21	4	3	-	37,89
SLLU111	U111	SILCA VIPER		CARBIDE	-	1	40	6	2,2	-	55,77
SLLU111/H	U111/H	SILCA VIPER		CARBIDE	-	1	40	6	2,2	-	37,89
SLLB3304	B3304	KEYLINE BIANCHI 994 LASER		CARBIDE	-	1	33	6	6	-	55,79
SLLB3310	B3310	KEYLINE BIANCHI 994 LASER		CARBIDE	-	1	30	6	2,6	-	55,79
SLLB3310M2	B3310	KEYLINE BIANCHI 994 LASER		HSSV	-	1	30	6	2,6	-	41,33

SLL

**CUTTERS FOR FLORA, NOVACLAU, WALKIN KEY DUPLICATING MACHINES**
**FURTHER GENERAL PURPOSE KEY CUTTERS**

**DOUBLE ANGLE CUTTERS**

Ref. BM	MACHINE TYPES	MATERIAL	mm		mm	Z	FLL	
			mm	mm			€	
FLL01	FLORA	HSSV	23	10	5	36	98,40	
FLL03	YALE	HSSV	40	8	5	80	106,76	
FLL05	NOVACLAU	HSSV	52	16	5	110	126,06	
FLL07	KIS	HSSV	53	12,7	6	80	140,26	
FLL08	KIS	HSSV	55	12	6	80	140,26	
FLL10	NOVACLAU	HSSV	61	12,7	6,5	140	142,81	
FLL11	NOVACLAU	HSSV	62	16	5	80	140,03	
FLL12	NOVACLAU	HSSV	63	16	5	140	140,03	
FLL14	WALKIN	HSSV	70	15	6,5	150	148,26	
FLL15	LINCE	HSSV	70	13	7	88	144,24	


**SIDE MILLING CUTTER**

Ref. BM	MACHINE TYPES	MATERIAL	mm		mm	Z	FLL	
			mm	mm			€	
FLL17	JMA-NOVACLAU-WALKIN	HSSV	35	12	3,15	50	73,57	
FLL18	JMA-NOVACLAU-WALKIN	HSSV	63	15	1,40	80	89,97	
FLL20	JMA-NOVACLAU-WALKIN	HSSV	70	16	1,40	100	111,16	