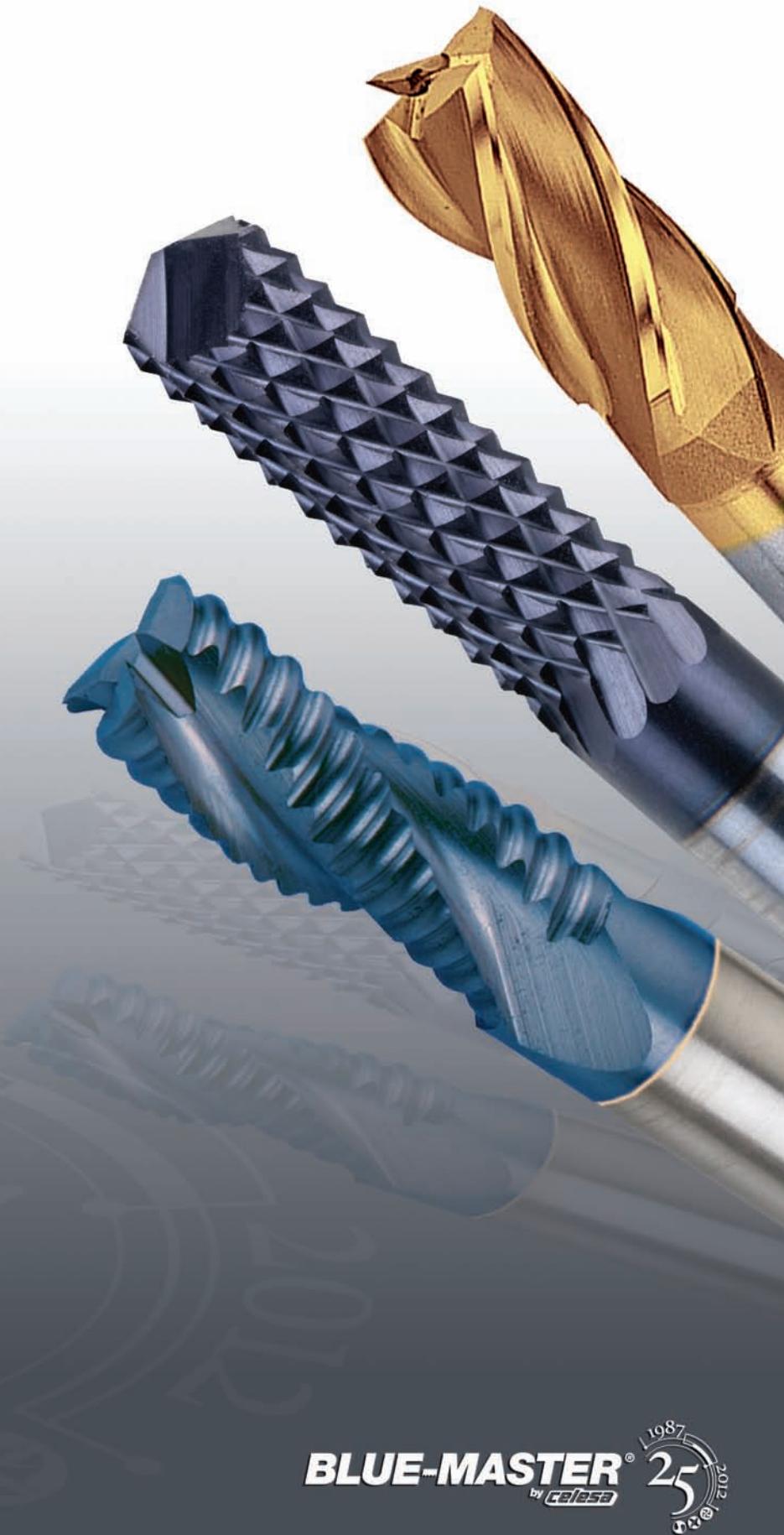


FRESAS



BLUE-MASTER® by CELESTE 

FRESAS FRONTALES SERIE CORTA DE 2 CORTES DIN 327 Y DIN 844

Fresas

Bosch

2 Z



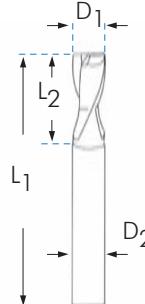
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AI

Ref. FFAL

DIN
844

SERIE CORTA



Consultar dimensiones DIN844 en páginas sucesivas



DIN 327	MATERIAL	FF01	FF02	FF32	FF60	FF92	FP05	FP01	FP08	FP09	FFAL
	ACABADO	HSS	HSS-Co 8%	HSS-Co 8%	HSS-Co 8%	HSS-Co 8%	ASP 60	ASP 60	ASP 60	ASP 60	HSS-Co 8%
	CALIDAD	BRILLANTE	BRILLANTE	TiN	TiAIN	BRILLANTE	BRILLANTE	TiAIN	BRILLANTE	TiAIN	BRILLANTE
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm								
1,00	47	2,5	6								
2,00	48	4,0	6	7,80	10,32	14,93	17,05	21,22	16,86	23,14	25,78
2,50	49	5,0	6	7,80	10,32	14,93	17,05	21,62	14,22	20,57	22,76
3,00	49	5,0	6	7,80	10,32	14,93	17,05	21,12	14,22	20,57	22,76
3,50	50	6,0	6	8,23	11,20	15,79	17,88	21,62			
4,00	51	7,0	6	7,73	10,32	15,19	17,06	21,12	13,11	19,51	22,76
4,50	52	8,0	6	9,06	12,33	15,79	18,70	21,62			
5,00	52	8,0	6	7,73	10,32	15,19	17,06	21,12	13,11	19,51	22,76
5,50	52	8,0	6	9,59	12,76	15,79	19,41	21,62			
6,00	52	8,0	6	7,73	10,32	15,79	17,06	21,12	13,11	19,51	22,76
6,50	60	10,0	10	12,54	16,69	22,47	24,26				
7,00	60	10,0	10	11,96	16,19	22,47	23,81	25,45	19,60	27,97	30,12
7,50	61	11,0	10	12,07	16,05	22,47	23,60				
8,00	61	11,0	10	9,70	13,47	19,92	20,99	22,66	18,58	27,97	30,12
8,50	61	11,0	10	13,55	18,03	24,52	26,31				
9,00	61	11,0	10	12,22	16,49	23,26	24,87	26,04	21,16	30,81	30,12
9,50	63	13,0	10	13,25	17,63	23,26	24,83				
10,00	63	13,0	10	9,87	13,38	19,92	22,26	22,48	19,51	28,93	30,12
10,50	70	13,0	12		20,49	28,60	31,11				
11,00	70	13,0	12	15,06	19,92	26,04	29,65	31,74			
12,00	73	16,0	12	13,13	17,92	23,50	27,08	29,39	25,65	36,60	41,01
13,00	73	16,0	12	19,20	25,63	32,98	36,65	38,83			
14,00	73	16,0	12	18,86	25,63	32,98	36,65	38,83	29,77	43,00	46,35
15,00	73	16,0	12	21,30	28,67	38,25	41,32	41,76			
16,00	79	19,0	16	18,96	25,87	34,13	37,92	42,43	37,28	51,94	54,20
17,00	79	19,0	16	25,56	34,11	44,96	48,53				
18,00	79	19,0	16	25,56	34,11	43,41	48,47	51,68	47,20	62,25	68,70
19,00	79	19,0	16	31,96	43,04	55,13	58,98				
20,00	88	22,0	16		40,74	52,80	56,48				
20,00	88	22,0	20	30,24	40,74	52,80	56,48	61,71	56,69	78,25	80,08
22,00	88	22,0	20	39,94	53,30	67,68	75,21	80,75	70,82	104,52	95,09
24,00	102	26,0	25	52,58	68,14	87,06	93,15	96,50			
25,00	102	26,0	25	50,60	68,98	81,93	89,33	88,69	94,55	125,94	124,66
26,00	102	26,0	25		77,50	100,38	118,76				
28,00	102	26,0	25	64,00	85,43	108,34	116,47				
30,00	102	26,0	25	72,94	97,34	117,68	128,31	129,67			
32,00	112	32,0	32	74,93	99,99	123,40	130,67				
36,00	112	32,0	32	100,22	133,75	153,97	167,86				
40,00	130	38,0	40	123,04	164,24	185,13	207,54				

FRESAS FRONTALES SERIE LARGA DE 2 CORTES DIN 327 Y DIN 844/L

2 Z



Ref. FFLAL



SERIE LARGA

* Consultar fresas con mango roscado hasta fin de existencias.



DIN 327	MATERIAL	FF06	FF62	FF67	FF15	FP21	DIN 844/L	FFLAL				
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm				L ₁ mm	L ₂ mm	D ₂ mm			
2,00	54	7	6	11,26	15,74	18,03	23,21	25,49	54	10	6	17,38
2,50	56	8	6	11,44	15,92	18,03	23,24	26,26	56	12	6	17,47
3,00	56	8	6	11,26	15,92	18,11	23,24	26,26	56	12	6	17,58
3,50	59	10	6	12,26	18,70	21,37	26,26	26,26	59	15	6	17,66
4,00	63	11	6	11,10	15,92	18,11	23,24	26,26	63	19	6	17,75
4,50	63	11	6	12,26	18,70	18,37	26,26	26,26	63	19	6	17,84
5,00	68	13	6	11,10	15,92	18,11	24,60	27,80	68	24	6	17,93
5,50	68	13	6	12,26	18,70	21,37	27,80	27,80	68	24	6	18,02
6,00	68	13	6	11,10	15,92	18,11	22,23	25,12	68	24	6	18,11
6,50	80	16	10	20,35	30,25	34,57	34,57	34,57	68	24	6	18,20
7,00	80	16	10	18,50	23,50	26,60	28,04	31,38	80	30	10	26,42
7,50	88	19	10						80	30	10	
8,00	88	19	10	15,98	22,83	24,17	27,50	31,68	88	38	10	25,06
8,50	88	19	10	24,12	30,54	34,58			88	38	10	
9,00	88	19	10	21,71	30,54	30,68	30,77	34,45	88	38	10	26,42
10,00	95	22	10	17,61	25,78	27,99	30,19	34,78	95	45	10	25,06
11,00	102	22	12	28,84	41,16	39,19	39,45		102	45	12	35,11
12,00	110	26	12	25,32	32,80	36,97	38,69	45,00	110	53	12	32,41
13,00	110	26	12						110	53	12	41,21
14,00	110	26	12	33,37	40,46	45,18	51,34	56,41	110	53	12	37,09
15,00	123	32	16						110	53	12	47,39
16,00	123	32	16	38,24	51,02	55,90	58,43	67,32	123	63	16	45,29
17,00	123	32	16						123	63	16	
18,00	123	32	16	43,70	58,89	65,76	70,23	80,89	123	63	16	56,05
20,00	141	38	20	50,25	64,32	72,15	76,14	87,70	141	75	20	66,85
22,00	141	38	20	68,90	86,85	97,42	94,38	108,73	141	75	20	
24,00	166	45	25	104,85	104,23	121,61	126,97		166	90	25	
25,00	166	45	25	98,83	118,79	131,41	116,08	133,72	166	90	25	
26,00	166	45	25	129,40	127,48	143,20			166	90	25	
28,00	166	45	25	124,42	144,20	160,38			166	90	25	
30,00	166	45	25	138,31	153,14	171,80	178,83		166	90	25	
32,00	186	53	32	191,36	191,41	222,87	233,00		186	106	32	
36,00	186	53	32	209,40	221,78	253,41			186	106	32	
40,00	196	63	32	274,39	299,77	342,38			196	125	40	

FRESAS FRONTALES SERIE CORTA DE 3 CORTES DIN 844 Y DIN 327

Fresas

Rosa

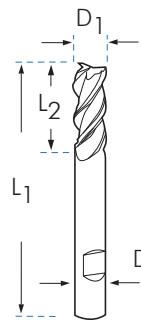
3 Z



INOX

Al

SERIE CORTA



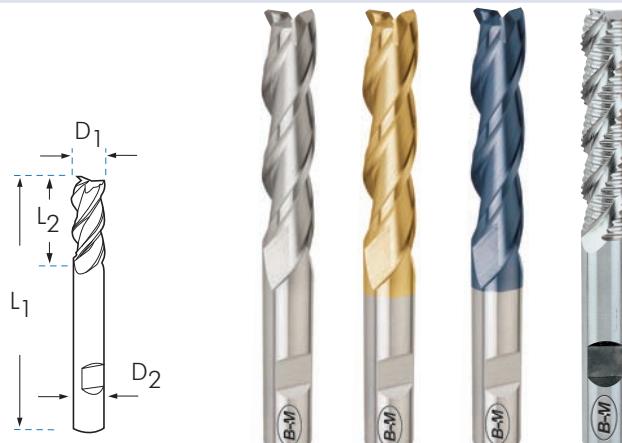
DIN 844	MATERIAL				FF63	FF65	FF75	FF73	FF66	FF76	DIN 327	FP06	FP02		
	ACABADO				BRILLANTE	TiN	TiAIN	BRILLANTE	TiN	TiAIN		ASP 60	ASP 60		
	CALIDAD				★★	★★★	★★★	★★	★★★	★★★		BRILLANTE	TiN		
	DESBASTE				NR	NR	NR	NR	NR	NR		★★★★	★★★★		
D1 mm	L1 mm	L2 mm	D2 mm		€	€	€	€	€	€	L1 mm	L2 mm	D2 mm	€	€
1,00	49	3	6								47	2,5	6	17,34	24,48
2,00	51	7	6	11,13	17,84	18,03					48	4,0	6	14,22	21,16
2,50	52	8	6	11,13	17,84	18,03					49	5,0	6		
3,00	52	8	6	11,20	17,84	18,03					49	5,0	6	14,22	21,16
3,50	55	11	6	11,80	18,50	18,59					50	6,0	6		
4,00	55	11	6	11,45	17,84	18,03					51	7,0	6	14,22	21,16
4,50	57	13	6	12,37	18,50	19,05					52	8,0	6		
5,00	57	13	6	11,45	17,84	18,11					52	8,0	6	14,22	21,16
5,50	57	13	6	14,84	24,40	24,78					52	8,0	6		
6,00	57	13	6	11,70	18,55	19,30	31,01	36,41	37,44		52	8,0	6	14,22	21,16
6,50	66	16	10	20,51	29,64	31,75					60	10,0	10		
7,00	66	16	10	16,68	25,41	24,45	36,67	43,45	44,70		60	10,0	10	19,51	29,14
7,50	69	19	10	20,66	29,94	32,09					61	11,0	10		
8,00	69	19	10	14,62	22,46	22,47	32,38	38,77	38,82		61	11,0	10	19,51	29,14
8,50	69	19	10	21,77	30,91	33,13					61	11,0	10		
9,00	69	19	10	18,26	26,95	26,94	38,07	45,55	46,42		61	11,0	10	22,43	32,09
9,50	72	22	10	23,53	32,50	34,82					63	13,0	10		
10,00	72	22	10	16,26	24,84	24,38	33,04	42,90	41,36		63	13,0	10	20,28	30,14
11,00	79	22	12	24,56	34,42	36,87	47,02	51,85	55,48		70	13,0	12		
12,00	83	26	12	20,46	29,88	29,32	39,95	46,07	47,48		73	16,0	12	26,93	38,12
13,00	83	26	12	30,88	40,01	42,87	51,20	56,84	61,39		73	16,0	12		
14,00	83	26	12	27,75	36,54	37,82	44,72	50,60	54,17		73	16,0	12	33,91	46,42
15,00	83	26	12	31,73	43,19	44,49	56,61	57,70	59,43		73	16,0	12		
16,00	92	32	16	30,61	41,36	42,61	55,52	64,69	67,31		79	19,0	16	39,89	53,44
17,00	92	32	16	47,53	61,15	63,00					79	19,0	16		
18,00	92	32	16	37,71	49,52	51,02	60,77	73,93	74,09		79	19,0	16	49,08	65,36
19,00	92	31	16	58,12	70,36	72,49					79	19,0	16		
20,00	104	38	20	43,73	56,93	58,64	72,38	80,71	87,15		88	22,0	20	58,37	78,25
22,00	104	38	20	66,79	82,31	84,80					88	22,0	20	77,18	108,69
25,00	121	45	25	87,26	108,99	112,28	110,69	120,51	128,96		102	26,0	25	97,81	126,24
28,00	121	45	25	101,38	121,85	125,54					102	26,0	25		
30,00	121	45	25	124,72	143,12	147,45	136,99	157,71	165,58		102	26,0	25		
32,00	133	53	32	126,93	151,44	159,13					112	32,0	32		

FRESAS FRONTALES SERIE LARGA DE 3 CORTES DIN 844/L

3 Z



SERIE LARGA



DIN 844/L	MATERIAL	FF83	FF85	FF86	FF49
	ACABADO	BRILLANTE	TiN	TiAlN	BRILLANTE
	CALIDAD	★★	★★★	★★★	★★
	DESBASTE				NR
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	€	€
1,00	52	7	6		
2,00	54	10	6	15,43	22,00
2,50	56	12	6	15,66	22,87
3,00	56	12	6	15,43	22,00
3,50	59	15	6	17,19	22,87
4,00	63	19	6	15,43	22,00
4,50	63	19	6	17,19	22,87
5,00	68	24	6	15,43	22,00
5,50	68	24	6	17,19	22,87
6,00	68	24	6	17,14	24,66
6,50	68	24	6		23,51
7,00	80	30	10	23,32	31,72
7,50	80	30	10		31,55
8,00	88	38	10	21,43	28,97
8,50	88	38	10		28,39
9,00	88	38	10	25,96	37,36
9,50	88	38	10		33,60
10,00	95	45	10	21,55	31,48
11,00	102	45	12	32,97	45,30
12,00	110	53	12	26,89	34,91
13,00	110	53	12		37,97
14,00	110	53	12	35,03	46,66
15,00	110	53	12		50,17
16,00	123	63	16	40,04	52,15
17,00	123	63	16		56,24
18,00	123	63	16	48,28	61,50
19,00	123	63	16		66,16
20,00	141	75	20	56,13	69,56
22,00	141	75	20	70,80	87,24
25,00	166	90	25	103,69	129,20
28,00	166	90	25	115,99	146,59
30,00	166	90	25	127,88	150,31
32,00	186	106	32	154,40	194,24
					187,59

FRESAS FRONTALES SERIE CORTA Y LARGA VARIOS CORTES DIN 844 Y DIN 844/L

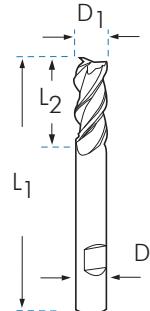
Fresas

Rosa

4-6 Z



SERIE CORTA



SERIE LARGA



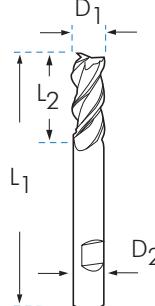
DIN 844	MATERIAL		FF18	FF19	FF20	FP07	FP03	DIN 844/L	FF21	FF22	FF23	FP20
	ACABADO		HSS-Co 8%	HSS-Co 8%	HSS-Co 8%	ASP 60	ASP 60		HSS-Co 8%	HSS-Co 8%	HSS-Co 8%	ASP 60
	CALIDAD		BRILLANTE	TiN	TiAlN	BRILLANTE	TiAlN		BRILLANTE	TiN	TiAlN	BRILLANTE
D	L ₁	L ₂	D ₂	Z	€	€	€	€	€	€	€	€
1,00	49	3	6	4				19,40	25,88			
2,00	51	7	6	4	11,43	18,38	18,03	14,74	20,79			
2,50	52	8	6	4	11,43	18,38	18,03					
3,00	52	8	6	4	11,43	18,38	18,03	14,74	20,79			
3,50	55	11	6	4	11,83	18,73	18,37					
4,00	55	11	6	4	11,43	18,38	18,03	14,74	20,79			
4,50	57	13	6	4	12,57	18,73	18,90					
5,00	57	13	6	4	11,43	18,38	18,03	14,74	20,79			
5,50	57	13	6	4	18,37	25,13	24,66					
6,00	57	13	6	4	11,65	18,38	18,55	14,74	20,79			
6,50	66	16	10	4	18,23	25,68	25,67					
7,00	66	16	10	4	16,76	24,70	24,22	20,83	31,15			
7,50	69	16	10	4	21,60	28,85	28,84					
8,00	69	19	10	4	14,54	21,85	22,45	20,83	30,84			
8,50	69	19	10	4	22,53	30,50	30,50					
9,00	69	19	10	4	18,35	26,18	26,91	23,56	33,64			
9,50	69	19	10	4	23,83	31,75	31,73					
10,00	72	22	10	4	16,14	24,61	24,37	21,70	31,61			
11,00	79	22	12	4	22,12	30,51	31,71					
12,00	83	26	12	4	20,36	27,62	28,17	29,95	41,86			
13,00	83	26	12	4	27,77	37,69	39,17					
14,00	83	26	12	4	26,22	36,20	38,32	36,36	46,61			
15,00	83	26	12	4	29,93	41,66	42,71					
16,00	92	32	16	4	29,22	40,98	42,60	43,43	55,21			
17,00	92	32	16	4	37,74	49,06	51,01					
18,00	92	32	16	4	35,98	49,06	51,95	53,99	69,05			
19,00	92	31	16	4	44,19	56,40	58,63					
20,00	104	38	20	4	42,13	56,40	58,63	62,89	89,70			
22,00	104	38	20	4	58,48	77,67	81,49	80,55	105,79			
24,00	121	45	25	6	76,22	91,72	96,25					
25,00	121	45	25	6	72,67	91,72	95,34	106,41	139,51			
26,00	121	45	25	6	92,49	115,74	120,33					
28,00	121	45	25	6	90,83	120,57	122,96					
30,00	121	45	25	6	107,14	132,04	138,52					
32,00	133	53	32	6	108,25	137,66	141,71					
36,00	133	53	32	6	148,60	173,88	179,03					
40,00	155	63	40	6	178,64	211,45	217,72					

FRESAS FRONTALES CON DESBASTE DE VARIOS CORTES DIN 844 Y DIN 844/L

4-6 Z



SERIE CORTA



SERIE LARGA



DIN 844	MATERIAL				FF25	FF26	FF27	FF100	DIN 844/L	FF29	FF30	FF31
	ACABADO				HSS-Co 8%	HSS-Co 8%	HSS-Co 8%	HSS-Co 8%		HSS-Co 8%	HSS-Co 8%	HSS-Co 8%
	CALIDAD				BRILLANTE	TiN	TiAlN	BRILLANTE		BRILLANTE	TiN	TiAlN
	DESBASTE				NR	NR	NR	NF		NR	NR	NR
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	Z	€	€	€	€	€	€	€	€
2,00	51	7	6	3					54	10	6	3
2,50	52	8	6	3					56	12	6	3
3,00	52	8	6	3					56	12	6	3
3,50	55	11	6	3					59	15	6	3
4,00	55	11	6	3					63	19	6	3
4,50	57	13	6	3					63	19	6	3
5,00	57	13	6	3					68	24	6	3
5,50	57	13	6	3					68	24	6	3
6,00	57	13	6	3	29,34	34,44	35,42	30,81	68	24	6	3
6,50	66	16	10	4					68	24	6	4
7,00	66	16	10	3	35,35	41,10	42,28	36,42	80	30	10	3
7,50	69	19	10	4					80	30	10	4
8,00	69	19	10	3	30,63	36,68	37,74	32,16	88	38	10	3
8,50	69	19	10	4					88	38	10	4
9,00	69	19	10	3	36,70	43,09	44,33	37,81	88	38	10	3
10,00	72	22	10	4	29,45	35,81	37,28	32,15	95	45	10	4
11,00	79	22	12	4	43,99	49,96	53,41	47,09	102	45	10	4
12,00	83	26	12	4	36,70	42,59	45,56	38,52	110	53	12	4
13,00	83	26	12	4	52,11	59,06	61,66	56,33	110	53	12	4
14,00	83	26	12	4	42,09	49,40	52,84	45,06	110	53	12	4
15,00	83	26	12	4	55,35	63,45	67,84	59,24	110	53	12	4
16,00	92	32	16	4	50,54	56,46	62,12	51,12	123	63	16	4
17,00	92	32	16	4	68,18	76,75	82,11		123	63	16	4
18,00	92	32	16	4	54,44	64,14	68,61	58,26	123	63	16	4
19,00	92	31	16	4	81,56	89,00	95,18		123	63	16	4
20,00	104	38	20	4	68,23	78,17	83,60	73,04	141	75	20	4
SIN CORTE AL CENTRO				FF05	FF64	FF74	FF100		FF08	FF38	FF58	
22,00	104	38	20	6	78,40	90,42	101,36		141	75	20	6
24,00	121	45	25	6	98,75	108,23	120,20		141	75	25	6
25,00	121	45	25	6	97,82	107,59	119,50	102,71	166	90	25	6
26,00	121	45	25	6	113,28	130,44	146,23		166	90	25	6
28,00	121	45	25	6	113,28	130,05	145,84	117,82	166	90	25	6
30,00	121	45	25	6	121,69	141,04	159,62		166	90	25	6
32,00	133	53	32	6	137,86	151,67	171,68	143,40	186	106	32	6
36,00	133	53	32	6	163,39	164,26	197,84		186	106	32	6
40,00	155	63	32	6	183,69	212,21	229,09		217	125	40	6

FRESAS FRONTALES, SIN CORTE AL CENTRO, VARIOS CORTES DIN 844 Y DIN 844/L

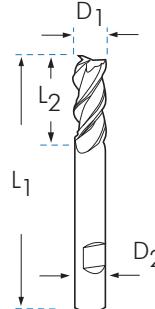
Fresas

Rosca

4-6 Z



SERIE CORTA



SERIE LARGA



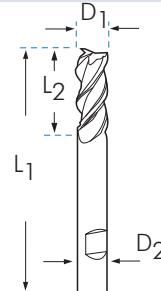
DIN 844	MATERIAL				FF03	FF04	FF34	FF54	DIN 844/L	FF07	FF37	FF57	
	ACABADO				HSS	HSS-Co 8%	HSS-Co 8%	HSS-Co 8%		BRILLANTE	BRILLANTE	TiN	TiAlN
	CALIDAD				★	★★	★★★	★★★		BRILLANTE	TiN	TiAlN	TiAlN
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	Z	€	€	€	€	€	€	€	€	
2,00	51	7	6	4	8,00	10,59	16,84	17,37	54	10	6	4	12,80
2,50	52	8	6	4	8,00	10,59	16,84	17,37	56	12	6	4	12,80
3,00	52	8	6	4	8,00	10,59	16,84	17,37	56	12	6	4	12,80
3,50	55	11	6	4	8,25	10,92	17,15	17,75	59	15	6	4	16,84
4,00	55	11	6	4	8,00	10,59	16,84	17,43	63	19	6	4	12,80
4,50	57	13	6	4	8,25	11,02	17,15	17,75	63	19	6	4	16,84
5,00	57	13	6	4	8,00	10,59	16,84	17,43	68	24	6	4	12,80
5,50	57	13	6	4	12,43	16,63	23,22	23,34	68	24	6	4	16,84
6,00	57	13	6	4	8,00	10,59	17,51	17,42	68	24	6	4	12,80
6,50	66	16	10	4	12,43	16,63	24,28	24,16	68	24	6	4	19,38
7,00	66	16	10	4	11,72	15,70	23,38	23,27	80	30	10	4	26,57
7,50	69	16	10	4	14,70	19,64	27,18	27,06	80	30	10	4	17,78
8,00	69	19	10	4	9,29	12,06	19,82	19,74	88	38	10	4	25,04
8,50	69	19	10	4	15,32	20,33	28,80	28,67	88	38	10	4	27,31
9,00	69	19	10	4	12,27	16,40	24,84	24,73	88	38	10	4	20,12
9,50	72	22	10	4	16,80	21,68	29,95	29,81	88	38	10	4	17,70
10,00	72	22	10	4	11,25	14,73	23,40	23,29	95	45	10	4	26,65
11,00	79	22	12	4	15,34	20,33	28,88	30,05	102	45	12	4	23,99
12,00	83	26	12	4	13,37	17,41	26,23	27,03	110	53	12	4	22,47
13,00	83	26	12	4	19,73	25,99	35,59	36,82	110	53	12	4	31,99
14,00	83	26	12	4	19,03	24,43	34,23	35,42	110	53	12	4	29,38
15,00	83	26	12	4	21,29	27,89	39,42	40,79	110	53	12	4	38,80
16,00	92	32	16	4	20,76	27,20	38,77	40,13	123	63	16	4	20,07
17,00	92	32	16	4	25,58	34,00	46,34	47,98	123	63	16	4	23,64
18,00	92	32	16	4	25,79	33,52	46,34	47,98	123	63	16	4	23,31
19,00	92	31	16	4	29,97	39,83	53,19	55,05	123	63	16	4	25,54
20,00	104	38	20	4	30,24	39,83	53,19	55,05	141	75	20	4	29,45
22,00	104	38	20	6	41,58	55,28	73,62	76,20	141	75	20	4	36,69
24,00	121	45	25	6	51,65	68,68	86,13	89,57	141	75	25	6	42,33
25,00	121	45	25	6	51,97	68,68	86,13	89,57	166	90	25	6	84,48
26,00	121	45	25	6	64,56	85,87	94,49	109,99	166	90	25	6	108,99
28,00	121	45	25	6	64,56	85,87	109,70	116,28	166	90	25	6	114,82
30,00	121	45	25	6	75,57	98,98	137,31	129,67	166	90	25	6	134,71
32,00	133	53	32	6	76,97	101,53	144,82	132,69	186	106	32	6	141,40
36,00	133	53	32	6	100,73	133,94	172,78	166,14	186	106	32	6	156,75
40,00	143	63	32	6	121,93	161,01	194,35	199,95	217	125	40	6	166,29

FRESAS FRONTALES CON DESBASTE VARIOS CORTES DIN 844 Y DIN 844/L

3-5 Z



SERIE CORTA



SERIE LARGA



DIN 844	MATERIAL	ASP 60	ASP 60	ASP 60	ASP 60	ASP 60	FP15	FP16	FP13	FP14
ACABADO	BRILLANTE	TiAIN	BRILLANTE	TiAIN	TiAIN	ASP 60	BRILLANTE	TiAIN	BRILLANTE	TiAIN
DESBASTE	NF	NF	NR	NR	NR	45°	NF	NF	NR	NR
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ 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	34,96	40,96	31,94	36,28	41,94	
6,50	66	16	10	3						
7,00	66	16	10	3	43,78	51,00	39,73	48,37	59,54	
7,50	69	19	10	3						
8,00	69	19	10	3	38,08	46,99	36,29	42,73	55,93	
8,50	69	19	10	3						
9,00	69	19	10	3	45,42	53,21	41,71	50,57	61,10	
9,50	72	22	10	4						
10,00	72	22	10	4	37,73	47,15	34,55	46,12	57,39	
11,00	79	22	12	4						
12,00	83	26	12	4	47,75	57,31	43,96	53,55	70,04	
13,00	83	26	12	4						
14,00	83	26	12	4	58,55	70,53	54,12	63,36	83,69	
15,00	83	26	12	4						
16,00	92	32	16	4	71,09	83,07	65,44	77,39	96,51	
17,00	92	32	16	4						
18,00	92	32	16	4	77,31	90,32	70,33	84,65	104,46	
19,00	92	31	16	4						
20,00	104	38	16	4						
20,00	104	38	20	4	98,24*	113,12*	90,10*	106,11*	133,38*	
22,00	104	38	20	5	119,94*	139,35*	110,34*	130,37*		
22,00	121	45	25	5						
24,00	121	45	25	5						
25,00	121	45	25	5	145,65*	166,60*	132,11*	156,50*	208,17*	
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						

* Sin corte al centro.

FRESAS SERIE SUPER CORTA Y EXTRA CORTA DE 3 CORTES

3 Z



INOX

Al

SERIE SUPER CORTA



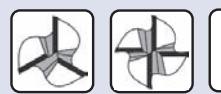
MATERIAL					FF51
ACABADO					
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	Z	
1,00	34	2	6	3	11,04
1,50	34	3	6	3	11,04
2,00	35	4	6	3	11,03
2,50	36	5	6	3	11,03
3,00	36	5	6	3	11,03
3,50	37	6	6	3	11,03
4,00	38	7	6	3	11,03
4,50	38	7	6	3	11,03
5,00	39	8	6	3	11,03
5,50	39	8	6	3	11,03
6,00	39	8	6	3	11,03
6,50	42	10	8	3	15,16
7,00	42	10	8	3	15,16
7,50	42	10	8	3	15,16
8,00	43	11	8	3	15,16
8,50	48	11	10	3	17,36
9,00	48	11	10	3	17,36
9,50	48	11	10	3	17,36
10,00	50	13	10	3	17,36

SERIE EXTRA CORTA



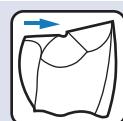
MATERIAL					FF53
ACABADO					
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	Z	
2,00	38	7	6	3	11,75
2,50	39	8	6	3	11,75
3,00	39	8	6	3	11,75
3,50	41	10	6	3	11,75
4,00	42	11	6	3	11,75
4,50	42	11	6	3	11,75
5,00	44	13	6	3	11,75
5,50	44	13	6	3	11,75
6,00	44	13	6	3	11,75
6,50	48	16	8	3	16,16
7,00	48	16	8	3	16,16
8,00	51	19	8	3	16,16
8,50	56	19	10	3	18,48
9,00	56	19	10	3	18,48
10,00	59	22	10	3	18,48

3-4 Z



Al

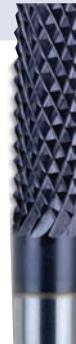
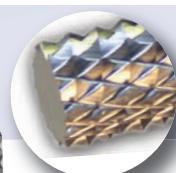
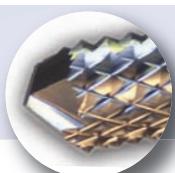
Cu

Mejora la
extracción
de viruta

FP22					
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	Z	
FP220600	6,00	57	13	6	3 28,30
FP220700	7,00	66	16	10	3 38,23
FP220800	8,00	69	19	10	3 38,23
FP220900	9,00	69	19	10	3 38,23
FP221000	10,00	72	22	10	3 38,23
FP221200	12,00	83	26	12	3 52,63
FP221400	14,00	83	26	12	3 60,00
FP221500	15,00	83	26	12	3 73,29
FP221600	16,00	92	32	16	3 73,29
FP221800	18,00	92	32	16	3 102,74
FP222000	20,00	104	38	20	3 122,61
FP222500	25,00	121	45	25	4

FRESAS DE METAL DURO PARA MATERIALES COMPUESTOS: FIBRA DE CARBONO, ETC...

MD



				RFC		RF	TiAlN	RFCTL	TiAlN	RFTL	
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	€		€	€		€	€	
1,50	38	5	3,00	RFC0150	13,54	RF0150	12,84	RFC0150TL	20,47	RF0150TL	19,76
2,00	38	10	3,00	RFC0200	13,54	RF0200	12,84	RFC0200TL	20,47	RF0200TL	19,76
3,00	38	12	3,00	RFC0300	13,54	RF0300	12,84	RFC0300TL	20,47	RF0300TL	19,76
5,00	50	16	5,00	RFC0500	26,88	RF0500	24,41	RFC0500TL	33,81	RF0500TL	31,33
6,00	63	25	6,00	RFC0600	31,96	RF0600	28,98	RFC0600TL	40,38	RF0600TL	37,42
6,35	75	30	6,35	RFC0635	35,49	RF0635	32,49	RFC0635TL	43,93	RF0635TL	40,92
8,00	63	25	8,00	RFC0800	53,22	RF0800	48,30	RFC0800TL	61,18	RF0800TL	56,27
10,00	63	25	10,00	RFC1000	67,60	RF1000	61,47	RFC1000TL	75,97	RF1000TL	69,83
12,00	75	25	12,00	RFC1200	84,99	RF1200	77,29	RFC1200TL	95,34	RF1200TL	87,64

FRESAS DE METAL DURO PARA REPARACIÓN DE PINCHAZOS

MD



	D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	€
RN0300	3,00	38	14	3	13,18
RN0600	6,00	75	50	6	31,80
RN0800	8,00	100	53	8	35,82
RN1000	10,00	100	75	10	56,21

FRESAS DE METAL DURO ACCESORIOS TIPO ROTOZIP



Ref.: **RR0317**



Ref.: **RR0635**



Ref.: **RR0435**



Ref.: **RR0247**



Ref.: **RR0535**

	D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	€	
RR0317	Cortador Azulejo	3,17	50	25	3,17	15,19
RR0635	Cortador Azulejo	6,35	50	25	6,35	25,47
RR0435	Trabajos en Yeso	6,35	52	32	6,35	31,88
RR0247	Argamasa	2,47	38	14	3,17	11,16
RR0535	Fresas para chapa	6,35	50	10	6,35	27,68

FRESAS DE 1 LABIO HSS-Co

Fresas

Rosa

HSS-Co

Al

PVC

SERIE CORTA

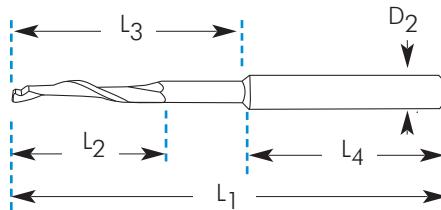


	FF13					
	D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	HSS-Co €	TiN €
FF1381	1,0	60	12	8	21,05	30,73
FF1382	2,0	60	12	8	21,05	30,73
FF1383	3,0	60	12	8	11,71	17,09
FF1384	4,0	60	12	8	11,71	17,09
FF1385	5,0	60	13	8	11,71	17,09
FF1386	6,0	60	16	8	11,93	17,09
FF1387	7,0	60	16	8	14,30	20,09
FF1388	8,0	80	16	8	14,30	20,09
FF131010	10,0	80	15	10	15,30	20,09
FF1361	1,0	45	6	6	21,05	27,92
FF13615	1,5	45	6	6	21,05	27,92
FF1362	2,0	45	6	6	21,05	27,92
FF1363	3,0	60	12	6	11,67	16,37
FF1364	4,0	60	12	6	11,71	16,37
FF1365	5,0	60	12	6	11,71	16,37
FF1366	6,0	60	14	6	11,71	16,37

SERIE LARGA



	FF14						
	D ₁ mm	L ₁ mm	L ₂ mm	L ₃ mm	D ₂ mm	HSS-Co €	TiN €
FF1484	4	80	16	45	8	16,56	21,92
FF1485	5	80	16	45	8	16,56	21,92
FF1486	6	90	16	45	8	16,56	21,92
FF1487	7	90	20	50	8	21,44	27,03
FF1488	8	100	30	70	8	18,86	24,26
FF1465	5	80	14	45	6	16,55	21,92
FF1466	6	80	14	45	6	16,56	21,92



SERIE EXTRA LARGA



ALUMINIO LACADO



	FF50						
	D ₁ mm	L ₁ mm	L ₂ mm	L ₃ mm	D ₂ mm	HSS-Co €	TiN €
FF5084	4	80	16	35	8	16,37	22,33
FF5085	5	80	18	35	8	16,37	22,33

MEDIDAS ESPECIALES



	FF14 Especiales					
	D ₁ mm	L ₁ mm	L ₂ mm	L ₃ mm	D ₂ mm	HSS-Co €
FF148412020	4	120	20	-	8	16,99
FF14856018	5	60	18	-	8	13,75
FF14859025	5	90	25	-	8	17,95
FF148510025	5	100	25	-	8	16,68
FF148512014	5	120	14	-	8	16,68
FF14851001817	5	100	18	35	8	17,25
FF14851201461	5	120	14	75	8	23,23
FF14851201817	5	120	18	35	8	23,23
FF1486801421	6	80	14	35	8	18,91
FF14861001835	6	100	18	35	8	18,91
FF14861201461	6	120	14	75	8	27,85
FF14861003045	6	100	30	45	8	22,94
FF14861006040	6	100	60	-	8	29,45
FF14888025	8	80	25	-	8	14,27
FF148810014	8	100	14	-	8	15,79
FF148812014	8	120	14	-	8	16,10
FF14881201476	8	120	14	90	8	20,68
FF14898014	9	80	14	-	8	16,56
FF148108014	10	80	14	-	8	17,63
FF1410101003040	10	100	30	70	10	21,51
FF1410101201481	10	120	14	95	10	21,51
FF14101012014	10	120	14	-	10	18,47
FF148128014	12	80	14	-	8	19,99

	FF14 Especiales					
	D ₁ mm	L ₁ mm	L ₂ mm	L ₃ mm	D ₂ mm	HSS-Co €
FF148412020	4	120	20	-	8	16,99
FF14856018	5	60	18	-	8	13,75
FF14859025	5	90	25	-	8	17,95
FF148510025	5	100	25	-	8	16,68
FF148512014	5	120	14	-	8	16,68
FF14851001817	5	100	18	35	8	17,25
FF14851201461	5	120	14	75	8	23,23
FF14851201817	5	120	18	35	8	23,23
FF1486801421	6	80	14	35	8	18,91
FF14861001835	6	100	18	35	8	18,91
FF14861201461	6	120	14	75	8	27,85

FRESAS DE 1 LABIO DE METAL DURO

MD **AI** **PVC**

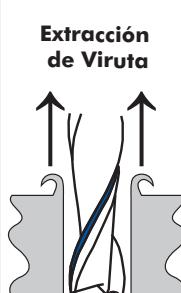
HÉLICE A - SERIE CORTA



	FMGA13				MD €
	D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	
FMGA13305	0,5	35	2,5	3	56,24
FMGA1331	1,0	35	4,5	3	56,24
FMGA13315	1,5	50	6,0	3	50,61
FMGA1322	2,0	40	10,0	2	39,37
FMGA1333	3,0	40	12,0	3	22,75
FMGA1336	3,0	64	12,0	6	54,53
FMGA1338	3,0	64	12,0	8	78,45
FMGA1344	4,0	50	16,0	4	25,02
FMGA1346	4,0	64	16,0	6	49,64
FMGA1348	4,0	64	16,0	8	99,85
FMGA1355	5,0	64	16,0	5	27,09
FMGA1356	5,0	64	16,0	6	54,53
FMGA1358	5,0	64	16,0	8	105,41
FMGA1366	6,0	64	20,0	6	40,91
FMGA1368	6,0	64	20,0	8	103,67
FMGA1378	7,0	64	20,0	8	106,26
FMGA1388	8,0	76	38,0	8	54,13
FMGA131010	10,0	76	30,0	10	62,67

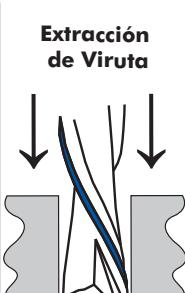
TIPOS DE HÉLICES

Hélice A



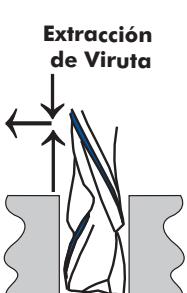
Corte Derecha
Hélice Derecha

Hélice B



Corte Derecha
Hélice Izquierda

Hélice C



Extracción de Viruta
Corte Derecha Doble hélice Izquierda-Derecha

VELOCIDADES DE CORTE

D ₁ mm	HSS-Co		MD	
	Aluminio	P.V.C.	Aluminio	P.V.C.
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

NOTA: Para la serie larga conviene reducir las RPM en un 15%

HÉLICE A - SERIE LARGA



	FMGA13E				MD €
	D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	
FMGA1355E	5	80	38	5	95,50
FMGA1366E	6	85	40	6	105,48
FMGA1388E	8	90	38	8	112,98
FMGA1388EX	8	110	43	8	189,24
FMGA131010E	10	100	40	10	129,60

Fresas

Rosa

HÉLICE B



	FMGA13HI				MD €
	D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	
FMGA1333HI	3	50	8	3	31,36
FMGA1344HI	4	64	12	4	31,37
FMGA1355HI	5	64	16	5	33,97
FMGA1366HI	6	64	20	6	51,29
FMGA1388HI	8	76	38	8	67,87
FMGA131010HI	10	76	35	10	78,58

HÉLICE C



	FMGA13CO				MD €
	D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	
FMGA1366CO	6	64	25	6	106,56
FMGA1388CO	8	64	25	8	147,35
FMGA131010CO	10	76	35	10	173,19
FMGA131212CO	12	76	35	12	229,76

CANAL RECTO



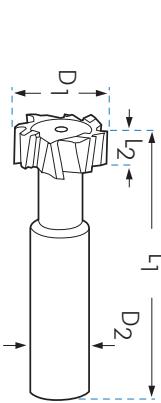
	FMGA13R				MD €
	D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	
FMGA1346R	4	64	16	6	35,98
FMGA1356R	5	64	20	6	35,98
FMGA1366R	6	64	25	6	45,02
FMGA1388R	8	64	25	8	65,97
FMGA131010R	10	88	35	10	86,34
FMGA131212R	12	88	35	12	124,62

FRESAS PARA RANURAR

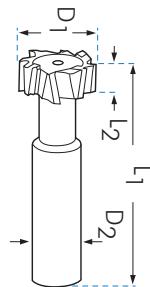
Fresas

Rosa

Ref. FF16

TIPO
WOODRUFFDIN
850B

Ref. FF17

RANURAR
EN "T"DIN
851AA

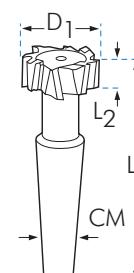
FF17

HSS-Co

TiAIN

D ₁ x L ₂ mm	D ₂ mm	Z	L ₁ mm	HSS-Co €	TiAIN €
11,0 x 4,0	10	6	53,5	74,63	92,59
12,5 x 6,0	10	6	57,0	77,59	97,93
16,0 x 8,0	10	6	62,0	85,30	109,28
18,0 x 8,0	12	8	70,0	89,86	116,85
21,0 x 9,0	12	8	74,0	98,97	140,36
25,0 x 11,0	16	8	82,0	111,70	152,85
32,0 x 14,0	16	10	90,0	144,40	199,21
40,0 x 18,0	25	10	108,0	201,25	277,71
50,0 x 22,0	32	10	124,0	213,33	305,20
60,0 x 28,0	32	10	139,0	223,01	319,07
72,0 x 35,0	32	10	153,0	232,71	332,94

Ref. FF17C

RANURAR
EN "T"DIN
851AA

FF17C

HSS-Co

€

D ₁ x L ₂ mm	CM	ROSCA	L ₁ mm	HSS-Co €
11,0 x 4,0			53,5	
12,5 x 6,0			57,0	
16,0 x 8,0			62,0	
18,0 x 8,0	1	M6	70,0	98,37
21,0 x 9,0	2	M10	74,0	108,01
25,0 x 11,0	2	M10	82,0	112,61
32,0 x 14,0	2	M10	90,0	150,18
40,0 x 18,0	3	M12	108,0	189,86
50,0 x 22,0	4	M16	124,0	250,76
60,0 x 28,0	4	M16	139,0	331,79
72,0 x 35,0	5	M20	153,0	450,35

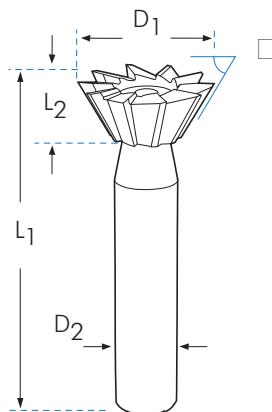
FRESAS CÓNICAS ANGULARES, CON MANGO CILÍNDRICO HSS-Co



Ref. FF98

HSS-Co

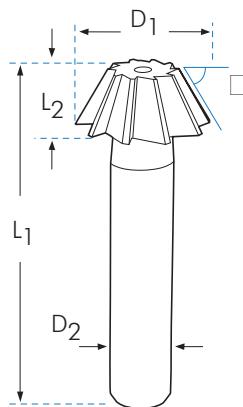
DIN
1833A



Ref. FF97

HSS-Co

DIN
1833B



	FF98						
	D ₁ mm	□	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
FF981600	16	45°	12	60	4,0	8	74,75
FF982000	20	45°	12	63	5,0	10	79,24
FF982500	25	45°	12	67	6,3	12	96,90
FF983200	32	45°	16	71	8,0	14	108,13

	FF97						
	D ₁ mm	□	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
FF971600	16	45°	12	60	4,0	8	60,17
FF972000	20	45°	12	63	5,0	10	67,67
FF972500	25	45°	12	67	6,3	12	76,09
FF973200	32	45°	16	71	8,0	12	86,53



Ref. FF99



Ref. FF95

	FF99						
	D ₁ mm	□	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
FF991600	16	60°	12	60	6,3	8	74,72
FF992000	20	60°	12	63	8,0	10	79,22
FF992500	25	60°	12	67	10,0	12	96,88
FF993200	32	60°	16	71	12,5	14	108,11

	FF95						
	D ₁ mm	□	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
FF951600	16	60°	12	60	6,3	8	59,04
FF952000	20	60°	12	63	8,0	10	66,40
FF952500	25	60°	12	67	10,0	12	74,67
FF953200	32	60°	16	71	12,5	12	84,91

MEDIDAS ESPECIALES							
FF991600-50	16	50°	12	60	5,0	8	82,31
FF992000-50	20	50°	12	63	6,3	10	87,73
FF992500-50	25	50°	12	67	8,0	12	108,41
FF991600-55	16	55°	12	60	5,6	8	82,31
FF992000-55	20	55°	12	63	7,1	10	87,73
FF992500-55	25	55°	12	67	9,0	12	108,41
FF991600-75	16	75°	12	60	8,0	8	82,31
FF992500-75	25	75°	12	67	10,0	12	108,41
FF991600-80	16	80°	12	60	8,0	8	82,31
FF992500-80	25	80°	12	67	10,0	12	108,41
FF991600-85	16	85°	12	60	8,0	8	82,31
FF992500-85	25	85°	12	67	10,0	12	108,41

MEDIDAS ESPECIALES							
FF951600-50	16	50°	12	60	5,0	8	68,71
FF952000-50	20	50°	12	63	6,3	10	87,72
FF952500-50	25	50°	12	67	8,0	12	109,45
FF951600-55	16	55°	12	60	5,6	8	68,71
FF952000-55	20	55°	12	63	7,1	10	87,72
FF952500-55	25	55°	12	67	9,0	12	109,45
FF951600-75	16	75°	12	60	8,0	8	68,71
FF952500-75	25	75°	12	67	10,0	12	109,45
FF951600-80	16	80°	12	60	4,0	8	79,42
FF952500-80	25	80°	12	67	6,3	12	126,53
FF951600-85	16	85°	12	60	4,0	8	79,42
FF952500-85	25	85°	12	67	6,3	12	126,53

FRESAS FRONTALES CON MANGO CÓNICO SERIE CORTA

Fresas

Rosa

4-8 Z



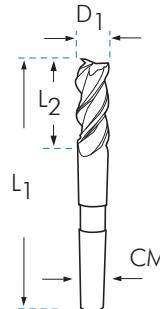
INOX

AI

2 Z



SERIE CORTA



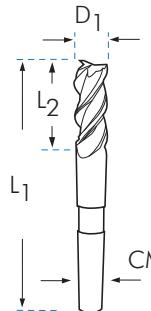
DIN 845B	MATERIAL				FF09	FF35	FF39	FF10	FF46	FF48	DIN 326	FF55	
	ACABADO				HSS-Co 8%		HSS-Co 8%						
	CALIDAD				BRILLANTE	TiN	TiAlN	BRILLANTE	TiN	TiAlN		BRILLANTE	
	DESBASTE				★★	★★★	★★★	★★	★★★	★★★		★★★	
D ₁ mm	L ₁ mm	L ₂ mm	Z	CM	ROSCA	€	€	€	€	€	L ₁ mm	€	
10,00	92	22	4	1	M6	41,07	56,74	59,00	61,20	76,46	78,69	83	51,63
12,00	111	26	4	2	M6	54,28	69,29	73,34	62,37	78,07	81,09	86	53,60
14,00	111	26	4	2	M10	60,16	75,88	81,06	70,86	87,23	91,47	101	55,08
15,00	111	26	4	2	M10	63,91	83,05	87,91	88,53	106,66	111,84	104	59,03
16,00	117	32	4	2	M10	59,30	78,76	83,36	73,09	92,45	96,03	104	63,70
18,00	117	32	4	2	M10	62,99	82,20	87,00	80,22	99,01	103,82	107	66,84
20,00	123	38	4	2	M10	70,26	92,57	97,98	88,22	110,10	115,46	107	78,73
22,00	123	38	5	2	M10	79,47	100,71	107,58	97,13	118,31	124,05	128	98,95
24,00	147	45	6	3	M12	120,17	138,54	149,38	135,41	155,28	162,82	128	104,00
25,00	154	45	5	3	M12	109,54	134,06	143,24	135,45	160,83	168,65	128	109,18
26,00	147	45	6	3	M12	110,61	139,19	143,24	148,79	173,10	181,54	128	120,55
28,00	154	50	5	3	M12	110,61	139,19	143,24	148,84	173,10	181,54	128	132,71
30,00	154	50	6	3	M12	122,23	159,93	164,57	171,40	206,73	216,78	157	146,11
32,00	178	53	6	4	M16	160,56	205,22	211,19	203,24	255,72	268,14	157	190,00
36,00	178	53	6	4	M16	182,88	227,29	233,91	224,06	277,57	291,07	163	221,12
40,00	188	63	6	4	M16	220,33	272,79	280,71	313,00	375,67	393,92	163	310,22
45,00	188	63	6	4	M16	283,76	345,70	359,13	362,74	415,38	435,58	203	389,72
50,00	233	75	6	5	M20	341,85	399,48	415,02	377,29	452,92	474,92		
56,00	233	75	8	5	M20	471,59	519,66	539,87	547,77	585,40	613,86		
63,00	241	90	8	5	M20	592,08	631,28	655,82	688,01	714,26	748,96		

FRESAS FRONTALES CON MANGO CÓNICO SERIE LARGA DIN 845B/L

4-8 Z



SERIE LARGA



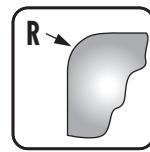
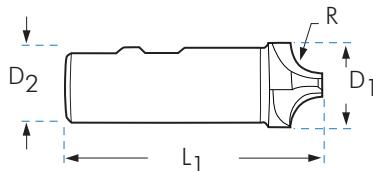
DIN 845B/L	MATERIAL					FF11	FF61	FF71	FF12	FF33	FF43
	ACABADO					HSS-Co 8%					
	CALIDAD					BRILLANTE	TiN	TiAlN	BRILLANTE	TiN	TiAlN
	DESBASTE					★★	★★★	★★★	★★	★★★	★★★
D ₁ mm	L ₁ mm	L ₂ mm	Z	CM	ROSCA	€	€	€	€	€	€
10,00	115	45	4	1	M6	73,87	90,46	93,97	108,31	123,78	128,60
12,00	138	53	4	2	M6	69,64	90,46	96,64	110,35	125,40	131,51
14,00	138	53	4	2	M10	73,29	98,26	103,04	139,03	153,89	161,40
15,00	138	53	4	2	M10	80,46	103,01	108,01	159,88	176,83	185,46
16,00	148	63	4	2	M10	79,64	100,44	105,32	115,64	135,03	141,61
18,00	148	63	4	2	M10	90,48	110,25	115,60	120,04	139,20	145,99
20,00	160	75	4	2	M10	101,36	123,33	129,32	137,70	159,72	167,50
22,00	160	75	5	2	M10	114,72	135,70	143,65	143,01	164,72	172,74
24,00	192	90	5	3	M12	153,05	175,73	186,01	194,18	214,88	226,81
25,00	184	80	5	3	M12	152,00	181,33	191,94	203,02	228,88	240,03
26,00	192	90	5	3	M12	168,35	195,79	207,25	210,97	236,40	247,91
28,00	192	90	5	3	M12	168,96	207,17	219,28	209,44	236,40	247,91
30,00	192	90	5	3	M12	200,50	232,63	246,23	249,79	283,15	296,96
32,00	229	100	6	4	M16	231,84	275,45	291,56	297,48	338,03	354,52
36,00	231	106	6	4	M16	270,68	308,87	326,93	340,73	380,32	398,86
40,00	250	125	6	4	M16	300,76	347,54	367,88	418,71	465,40	488,11
45,00	250	125	6	4	M16	401,43	462,11	489,13	534,06	588,12	616,81
50,00	268	110	6	5	M20	489,91	541,41	573,08	666,46	713,21	747,99
56,00	308	150	8	5	M20	510,60	565,26	599,32	776,62	817,27	865,16
63,00	338	180	8	5	M20	675,38	720,93	762,97	977,72	1.007,26	1.066,25

FRESA DE 1/4 DE CÍRCULO PARA REMATADO DE ARISTAS

Fresas

Rosa

4 Z

HSS-Co
8%DIN
6518NDIN
1835B

		Tol H11	Tol h6	FF1/4R	
	R	D ₁ mm	D ₂ mm	L ₁ mm	€
FF1/4R1	1,0	8	10	60	47,31
FF1/4R1.50	1,5	9	10	60	43,06
FF1/4R2	2,0	10	10	60	37,81
FF1/4R2.50	2,5	11	10	60	43,50
FF1/4R3	3,0	12	12	60	43,34
FF1/4R3.50	3,5	13	12	60	54,08
FF1/4R4	4,0	14	12	60	48,13
FF1/4R4.50	4,5	15	12	60	62,74
FF1/4R5	5,0	16	12	60	54,91
FF1/4R5.50	5,5	19	16	67	62,74
FF1/4R6	6,0	20	16	67	55,01
FF1/4R6.50	6,5	21	16	71	79,86
FF1/4R7	7,0	22	16	71	75,18
FF1/4R7.50	7,5	23	16	71	86,92
FF1/4R8	8,0	24	16	71	75,18
FF1/4R8.50	8,5	25	25	85	106,48
FF1/4R9	9,0	26	25	85	97,98
FF1/4R9.50	9,5	27	25	85	111,90
FF1/4R10	10,0	28	25	85	97,98
FF1/4R10.50	10,5	31	25	90	130,38
FF1/4R11	11,0	32	25	90	128,98
FF1/4R12	12,0	34	25	90	115,98
FF1/4R12.50	12,5	41	25	100	150,62
FF1/4R13	13,0	42	25	100	166,18
FF1/4R14	14,0	44	25	100	177,51
FF1/4R15	15,0	46	25	100	220,98
FF1/4R16	16,0	48	25	100	200,10
FF1/4R18	18,0	52	32	112	261,98
FF1/4R20	20,0	56	32	112	289,98

JUEGOS DE FRESAS EN ESTUCHES DE PLÁSTICO CORTE AL CENTRO

2 Z



DIN
327



4 Z



DIN
844



REFERENCIA	PTF20	PTF60
Nº FRESAS	8	8
TIPO	Ref. FF02	Ref. FF60
CALIDAD	HSS-Co 8%	TiAIN
CONTENIDO Ø mm/Cant.	6 8 10 12 2 2 2 2	6 8 10 12 2 2 2 2
P.V.P. €	111,05	176,07

REFERENCIA	PTF24	PTF64
Nº FRESAS	8	8
TIPO	Ref. FF18	Ref. FF20
CALIDAD	HSS-Co 8%	TiAIN
CONTENIDO Ø mm/Cant.	6 8 10 12 2 2 2 2	6 8 10 12 2 2 2 2
P.V.P. €	122,94	186,54

2 Z



DIN
327



4 Z



DIN
844



REFERENCIA	PTF21	PTF61
Nº FRESAS	6	6
TIPO	Ref. FF02	Ref. FF60
CALIDAD	HSS-Co 8%	TiAIN
CONTENIDO Ø mm	6-8-10-12-16-20	6-8-10-12-16-20
P.V.P. €	120,19	182,82

REFERENCIA	PTF25	PTF65
Nº FRESAS	6	6
TIPO	Ref. FF18	Ref. FF20
CALIDAD	HSS-Co 8%	TiAIN
CONTENIDO Ø mm	6-8-10-12-16-20	6-8-10-12-16-20
P.V.P. €	134,21	193,56

2 Z



DIN
327



4 Z



DIN
844



REFERENCIA	PTF22	PTF62
Nº FRESAS	6	6
TIPO	Ref. FF02	Ref. FF60
CALIDAD	HSS-Co 8%	TiAIN
CONTENIDO Ø mm	4-5-6-8-10-12	4-5-6-8-10-12
P.V.P. €	76,16	122,47

REFERENCIA	PTF26	PTF66
Nº FRESAS	6	6
TIPO	Ref. FF18	Ref. FF20
CALIDAD	HSS-Co 8%	TiAIN
CONTENIDO Ø mm	4-5-6-8-10-12	4-5-6-8-10-12
P.V.P. €	84,33	130,03

JUEGOS DE FRESAS EN ESTUCHES METÁLICOS CORTE AL CENTRO

2 Z

DIN
327

Ref.: FF020787



Ref.: FF320447



REFERENCIA	FF010787	FF020787	FF320787	FF600787
Nº FREASAS	6	6	6	6
TIPO	Ref. FF01	Ref. FF02	Ref. FF32	Ref. FF60
CALIDAD	HSS	HSS-Co 8%	TiN	TiAIN
CONTENIDO 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
P.V.P. €	70,17	93,22	124,52	139,53

REFERENCIA	FF010447	FF020447	FF320447	FF600447
Nº FREASAS	6	6	6	6
TIPO	Ref. FF01	Ref. FF02	Ref. FF32	Ref. FF60
CALIDAD	HSS	HSS-Co 8%	TiN	TiAIN
CONTENIDO 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
P.V.P. €	104,94	139,83	182,60	202,45

REFERENCIA	FF010801	FF020801	FF320801	FF600801
Nº FREASAS	14	14	14	14
TIPO	Ref. FF01	Ref. FF02	Ref. FF32	Ref. FF60
CALIDAD	HSS	HSS-Co 8%	TiN	TiAIN
CONTENIDO 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	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
P.V.P. €	248,82	328,51	419,98	464,13

ESTUCHES METÁLICOS VACÍOS PARA FREASAS

2-4 Z

DIN
327

REFERENCIA	EV0787	EV0847	EV0764
Nº FREASAS	6	6	14
CONTENIDO Ø mm	4 - 5 - 6 - 8 - 10 - 12	6 - 8 - 10 - 12 - 16 - 20	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 12 - 14 - 15 - 16 - 18 - 20
P.V.P. €	22,08	24,68	71,45



JUEGOS DE FRESAS EN ESTUCHES METÁLICOS

4 Z



DIN
844



REFERENCIA	FF030787	FF040787	FF340787	FF540787
Nº FREASAS	6	6	6	6
TIPO	Ref. FF03	Ref. FF04	Ref. FF34	Ref. FF54
CALIDAD	HSS	HSS-Co 8%	TiN	TiAIN
CONTENIDO 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
P.V.P. €	69,33	91,43	134,35	139,52

REFERENCIA	FF030847	FF040847	FF340847	FF540847
Nº FREASAS	6	6	6	6
TIPO	Ref. FF03	Ref. FF04	Ref. FF34	Ref. FF54
CALIDAD	HSS	HSS-Co 8%	TiN	TiAIN
CONTENIDO 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
P.V.P. €	103,59	138,98	193,59	200,22



REFERENCIA	FF030764	FF040764	FF340764	FF540764
Nº FREASAS	14	14	14	14
TIPO	Ref. FF03	Ref. FF04	Ref. FF34	Ref. FF54
CALIDAD	HSS	HSS-Co 8%	TiN	TiAIN
CONTENIDO 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	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
P.V.P. €	242,43	321,04	441,79	461,53

4 Z



DIN
844



FF250847

6

Ref. FF25

HSS-Co 8%

FF260847

6

Ref. FF26

TiN

FF270847

6

Ref. FF27

TiAIN

REFERENCIA
Nº FREASAS
TIPO
CALIDAD
CONTENIDO Ø mm
P.V.P. €

FF250847
6
Ref. FF25
HSS-Co 8%
6 - 8 - 10 - 12 - 16 - 20
258,71

FF260847
6
Ref. FF26
TiN
6 - 8 - 10 - 12 - 16 - 20
298,00

FF270847
6
Ref. FF27
TiAIN
6 - 8 - 10 - 12 - 16 - 20
311,18

JUEGOS DE FRESAS EN ESTUCHES METÁLICOS

Fresas

Rosa



REFERENCIA	FF180787	FF190787	FF200787
Nº FRESAS	6	6	6
TIPO	Ref. FF18	Ref. FF19	Ref. FF20
CALIDAD	HSS-Co 8%	TiN	TiAIN
CONTENIDO Ø mm	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12
P.V.P. €	97,34	143,85	147,08



Ref. FF180787

REFERENCIA	FF180847	FF190847	FF200847
Nº FRESAS	6	6	6
TIPO	Ref. FF18	Ref. FF19	Ref. FF20
CALIDAD	HSS-Co 8%	TiN	TiAIN
CONTENIDO Ø mm	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20
P.V.P. €	152,18	205,93	211,15



Ref. FF180847

REFERENCIA	FF180764	FF190764	FF200764
Nº FRESAS	14	14	14
TIPO	Ref. FF18	Ref. FF19	Ref. FF20
CALIDAD	HSS-Co 8%	TiN	TiAIN
CONTENIDO 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	3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 12 - 14 - 15 - 16 - 18 - 20
P.V.P. €	347,99	470,05	480,82



Ref. FF180764

EXPOSITOR DE METACRILATO

	MF-01			
Ref. FF13	1 Z	HSS-Co	AI	SERIE CORTA
Ref. FF14	1 Z	HSS-Co	AI	SERIE LARGA
Ref. FF02	2 Z	HSS-Co	DIN 327N	30° N
Ref. FF18	4 Z	HSS-Co	DIN 844N	30° N
Ref. FF25	4 Z	HSS-Co	DIN 844N	NR
				Contenido: 163 Fresas
			\varnothing Cant.	$\frac{5 \times 8}{5}$ Mango $\frac{6 \times 8}{5}$ Mango
			\varnothing Cant.	$\frac{5 \times 8}{5}$ Mango $\frac{6 \times 8}{5}$ Mango
			\varnothing Cant.	$\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{5}{5}$ $\frac{6}{5}$ $\frac{7}{5}$ $\frac{8}{5}$ $\frac{9}{5}$ $\frac{10}{5}$ $\frac{12}{5}$ $\frac{14}{5}$ $\frac{16}{3}$
			\varnothing Cant.	$\frac{2}{5}$ $\frac{3}{5}$ $\frac{4}{5}$ $\frac{5}{5}$ $\frac{6}{5}$ $\frac{7}{5}$ $\frac{8}{5}$ $\frac{9}{5}$ $\frac{10}{5}$ $\frac{12}{5}$ $\frac{14}{5}$ $\frac{16}{3}$
			\varnothing Cant.	$\frac{6}{3}$ $\frac{7}{3}$ $\frac{8}{3}$ $\frac{9}{3}$ $\frac{10}{3}$ $\frac{11}{3}$ $\frac{12}{3}$ $\frac{14}{3}$ $\frac{16}{3}$



Dimensiones: ancho 245 x fondo 210 x alto 350 mm

NOTA: Composiciones especiales bajo demanda

P.V.P.: 2.870,92 €

FRESAS DE METAL DURO



1987
BLUE-MASTER®
by CEBASE 25th Anniversary 2012

FRESAS DE METAL DURO INTEGRAL PARA APLICACIONES GENERALES

Fresas

Rosca

2 Z



30° N

44
HRc

CILÍNDRICO

INOX
AL

Ti

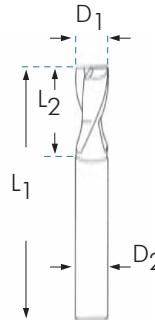
3 Z



4 Z



SERIE CORTA



	FMD2	FMD2TL	FMD92	FMD92TL	FMD63	FMD63TL	FMD48	FMD48TL	FMD51	FMD51TL
MATERIAL	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD
ACABADO	BRILLANTE	TiAIN	BRILLANTE	TiAIN	BRILLANTE	TiAIN	BRILLANTE	TiAIN	BRILLANTE	TiAIN
CALIDAD	★★	★★★	★★	★★★	★★	★★★	★★	★★★	★★	★★★
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm							
€	€	€	€	€	€	€	€	€	€	€
1,00	38	3	3	19,14	31,90	19,14	31,90	19,14	31,90	
1,50	38	5	3	18,67	31,14	18,67	31,14	18,67	31,14	
2,00	38	6	3	15,34	24,78	15,34	24,78	15,34	24,78	
2,50	38	7	3	15,34	24,22	15,34	24,22	15,34	24,22	
3,00	38	12	3	14,02	20,86	20,50	27,54	14,02	20,86	14,02
3,50	50	12	4	17,20	25,60		17,20	25,60	17,20	25,60
4,00	50	14	4	16,25	23,78	22,80	30,55	16,25	23,78	16,25
4,50	50	14	5	18,84	30,43		18,84	30,43	18,84	30,43
5,00	50	16	5	20,76	30,05	28,20	37,76	20,76	30,05	20,76
6,00	63	19	6	22,71	33,89	31,72	43,21	22,71	33,89	22,71
7,00	63	19	8	29,73	47,26	39,54	57,08	29,73	47,26	29,73
8,00	63	19	8	27,84	40,10	40,73	53,11	27,84	40,10	27,84
9,00	70	22	10	42,79	57,50	55,81	70,95	42,79	57,50	42,79
10,00	70	22	10	47,17	63,93	60,22	76,99	47,17	63,93	47,17
11,00	75	25	11	67,75	85,05	96,51	114,31	67,75	85,05	67,75
12,00	75	25	12	59,46	79,08	74,52	94,69	59,46	79,08	59,46
14,00	88	30	14	91,36	117,55	111,44	137,62	91,36	117,55	91,36
16,00	88	32	16	120,81	152,28	136,98	171,82	120,81	152,28	120,81
18,00	100	36	18	177,01	211,60	212,95	253,58	177,01	211,60	177,01
20,00	100	36	20	201,34	241,25	222,17	267,67	201,34	241,25	201,34
25,00	100	38	25	258,24	395,99			258,24	395,99	

FRESAS DE METAL DURO INTEGRAL PARA APLICACIONES GENERALES

SERIE LARGA Y EXTRALARGA

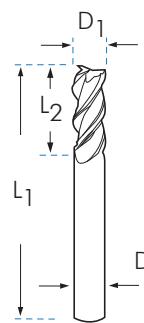
2 Z



4 Z



SERIE LARGA



				FMD54	FMD54TL	FMD57	FMD57TL	FMD58	FMD58TL
				MATERIAL	MATERIAL	MATERIAL	MATERIAL	MATERIAL	MATERIAL
				ACABADO	BRILLANTE	BRILLANTE	BRILLANTE	BRILLANTE	BRILLANTE
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm		€	€	€	€	€
3,00	65	25	3	26,94	40,53	30,24	43,83	26,42	40,01
4,00	65	25	4	27,45	42,12	37,97	53,07	27,45	42,12
5,00	75	25	5	32,43	49,77	43,41	61,24	32,43	49,77
6,00	100	38	6	45,01	62,52	52,67	70,17	41,67	59,18
8,00	100	42	8	58,76	79,85	71,23	92,73	61,70	82,79
10,00	100	42	10	79,73	102,73	88,29	111,95	80,38	104,05
12,00	100	50	12	125,85	162,15	143,76	181,09	122,15	159,48
14,00	125	56	14	150,55	188,79	179,28	217,88	150,56	188,80
16,00	150	75	16	196,68	237,00	223,75	264,08	204,55	244,87
18,00	150	75	18	244,88	317,87	330,57	405,64	244,36	319,44
20,00	150	75	20	319,16	410,39	445,28	539,13	319,16	410,39

SERIE EXTRA LARGA

				FMD53	FMD53TL	FMD55	FMD55TL	FMD56	FMD56TL
				MATERIAL	MATERIAL	MATERIAL	MATERIAL	MATERIAL	MATERIAL
				ACABADO	BRILLANTE	BRILLANTE	BRILLANTE	BRILLANTE	BRILLANTE
Ø mm	L ₁ mm	L ₂ mm	D ₂ mm		€	€	€	€	€
3,00	100	30	3	45,36	73,50	51,93	80,07	43,67	71,82
4,00	100	40	4	49,27	78,51	58,68	87,92	47,98	77,22
5,00	100	40	5	55,69	90,24	65,20	99,75	54,59	89,15
6,00	150	75	6	66,39	105,79	72,10	111,51	66,14	105,55
8,00	150	75	8	91,42	149,19	105,48	163,25	88,88	146,65
10,00	150	75	10	115,80	188,98	129,83	203,02	108,40	181,59
12,00	150	75	12	169,43	276,50	201,33	308,40	164,73	271,80
14,00	150	75	14	234,22	382,24	261,78	409,79	218,96	366,97
16,00	200	75	16	318,22	519,31	371,51	572,62	297,48	498,58
18,00	200	75	18	339,08	553,36	424,91	639,19	332,09	546,36
20,00	200	75	20	496,53	810,30	572,37	886,15	464,17	777,95

FRESAS FRONTALES DE MD INTEGRAL DESBASTE FINO, MEDIO Y GRUESO

Fresas

Rosa



MD



Ti

INC

Ni



MD



INOX



FMD1					
D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
6	6	63	19	3	72,35
8	8	63	19	3	77,66
10	10	63	22	3	99,28
12	12	75	25	4	125,39
16	16	88	32	4	214,54
20	20	100	38	4	251,13

FMD3					
D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
6	6	63	19	3	72,35
8	8	63	19	3	77,66
10	10	63	22	3	99,28
12	12	75	25	4	125,39
16	16	88	32	4	214,54
20	20	100	38	4	251,13



MD



FMD6					
D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
6	6	63	19	3	72,35
8	8	63	19	3	77,66
10	10	63	22	3	99,28
12	12	75	25	4	125,39
16	16	88	32	4	214,54
20	20	100	38	4	251,13

FRESAS SERIE PLUS



BLUE-MASTER®
by  1987


FRESAS 4 LABIOS DE CORTE ARMÓNICO SERIE CORTA

Fresas

Rosa

INOX

Ref. FMG81

4 Z

DIN
6527MG
MD

CILÍNDRICO

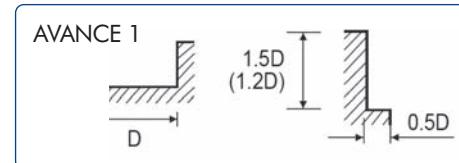
TiAIN

INOX

SERIE CORTA



FMG81					REVOLUCIONES Y AVANCES								
	Tol -0,03	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	€	INOX AISI 316L	R.P.M. Rev./min	AVANCE 1 mm/min	INOX AISI 304	R.P.M. Rev./min	AVANCE 1 mm/min
FMG810300	3,0	6	50	5	47,70			10.185	195	14.260	205		
FMG810400	4,0	6	54	8	47,70			7.600	250	14.260	255		
FMG810500	5,0	6	54	9	47,70			6.110	310	8.655	310		
FMG810600	6,0	6	54	10	47,70			5.095	360	7.130	360		
FMG810800	8,0	8	58	12	61,10			3.820	435	5.345	465		
FMG811000	10,0	10	66	14	89,20			3.055	590	4.275	585		
FMG811200	12,0	12	73	16	120,23			2.545	565	3.565	565		
FMG811400	14,0	14	75	18	172,54			2.180	520	3.055	520		
FMG811600	16,0	16	82	22	202,62			1.910	480	2.670	480		
FMG811800	18,0	18	84	24	272,74			1.695	475	2.375	475		
FMG812000	20,0	20	92	26	320,35			1.525	470	2.140	470		



NUEVA FRESA DE CORTE ARMÓNICO

1. Geometría de labios especial y múltiples hélices que eliminan las vibraciones.
2. Excelente acabado de la pieza.
3. Velocidades más altas.
4. Cortes más profundos.
5. Mayor velocidad de extracción de metal.

FRESAS 4 LABIOS DE CORTE ARMÓNICO SERIE LARGA

INOX

Ref. FMG82

4 Z



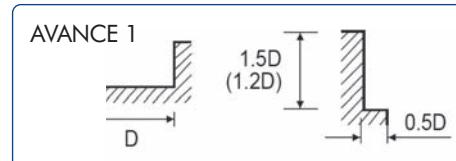
TiAIN

INOX

SERIE LARGA



FMG82					REVOLUCIONES Y AVANCES							
Tol -0,03	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	€	INOX AISI 316L	R.P.M. Rev./min	AVANCE 1 mm/min	INOX AISI 304	R.P.M. Rev./min	AVANCE 1 mm/min
FMG820300	3,0	6	57	8		55,81	10.185	195	14.260	205		
FMG820400	4,0	6	57	11		55,81	7.600	250	14.260	255		
FMG820500	5,0	6	57	13		55,81	6.110	310	8.655	310		
FMG820600	6,0	6	57	13		55,81	5.095	360	7.130	360		
FMG820800	8,0	8	63	19		71,49	3.820	435	5.345	465		
FMG821000	10,0	10	72	22		104,36	3.055	590	4.275	585		
FMG821200	12,0	12	83	26		140,66	2.545	565	3.565	565		
FMG821400	14,0	14	83	26		201,87	2.180	520	3.055	520		
FMG821600	16,0	16	92	32		237,06	1.910	480	2.670	480		
FMG821800	18,0	18	92	32		319,11	1.695	475	2.375	475		
FMG822000	20,0	20	104	38		374,81	1.525	470	2.140	470		
FMG822500	25,0	25	104	38								



NUEVA FRESA DE CORTE ARMÓNICO

1. Geometría de labios especial y múltiples hélices que eliminan las vibraciones.
2. Excelente acabado de la pieza.
3. Velocidades más altas.
4. Cortes más profundos.
5. Mayor velocidad de extracción de metal.

FRESAS 3 LABIOS, SERIE CORTA, HÉLICE A 60°

Fresas

Rosa

INOX

Ref. **FMD67**Ref. **FMD67..TL**

3 Z



MD



60° CILÍNDRICO

INOX

Ti

Ni

SERIE CORTA



					FMD67	FMD67..TL		
	Tol e8	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	€	€
FMD670300	3	3	32	17	23,48	30,90		
FMD670400	4	4	40	12	26,97	35,16		
FMD670500	5	5	50	14	26,97	37,01		
FMD670600	6	6	63	20	29,16	40,55		
FMD670800	8	8	63	22	37,28	50,48		
FMD671000	10	10	70	25	62,09	80,36		
FMD671200	12	12	75	25	89,47	111,16		
FMD671400	14	14	83	30	113,99	142,85		
FMD671600	16	16	88	30	157,43	195,93		
FMD671800	18	18	100	38	185,18	228,96		
FMD672000	20	20	100	38	233,64	284,45		

TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 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

FRESAS 2 LABIOS, SERIE CORTA, HÉLICE A 35°

INOX

Ref. **FMG10**

2 Z



**MG
MD**



WELDON

TiAIN

INOX



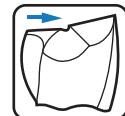
Ti

INC

SERIE CORTA



Mejora la
extracción
de viruta



	FMG10				REVOLUCIONES Y AVANCES								
	Tol e8	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	€	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min
FMG100100	1,0	6	40	2,5			59,66						
FMG100150	1,5	6	40	4,0			59,66						
FMG100200	2,0	6	40	6,0			54,29	11.560	190	7.560	120	6.300	90
FMG100250	2,5	6	40	8,0			54,29						
FMG100300	3,0	6	45	8,0			54,29	8.920	210	5.560	140	4.620	120
FMG100350	3,5	6	45	10,0			54,29						
FMG100400	4,0	6	45	11,0			54,29	7.560	300	4.620	180	3.880	150
FMG100450	4,5	6	45	11,0			54,29						
FMG100500	5,0	6	50	13,0			54,29	6.300	320	3.780	190	3.160	160
FMG100550	5,5	6	50	13,0			54,29						
FMG100600	6,0	6	50	13,0			54,29	5.560	350	3.360	220	2.840	180
FMG100650	6,5	8	60	16,0			69,42						
FMG100700	7,0	8	60	16,0			69,42						
FMG100750	7,5	8	60	16,0			69,42						
FMG100800	8,0	8	60	19,0			69,42	4.200	380	2.520	200	2.100	180
FMG100850	8,5	10	70	19,0			102,52						
FMG100900	9,0	10	70	19,0			102,52						
FMG100950	9,5	10	70	19,0			102,52						
FMG101000	10,0	10	70	22,0			102,52	3.260	330	2.000	160	1.680	160
FMG101100	11,0	12	75	22,0			140,43						
FMG101200	12,0	12	75	26,0			140,43	2.740	280	1.680	130	1.360	130
FMG101400	14,0	16	85	26,0			232,64						
FMG101600	16,0	16	100	32,0			232,64	2.200	220	1.360	110	1.060	110
FMG101800	18,0	16	100	32,0			309,05						
FMG102000	20,0	20	105	38,0			385,42	1.680	170	1.060	80	840	80
FMG102200	22,0	20	105	38,0			500,95						
FMG102500	25,0	25	120	45,0			616,45	1.360	130	840	70	680	60

TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

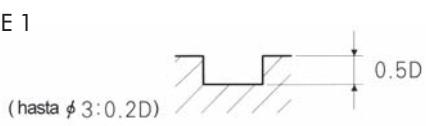
Tol e8

- 14 - 20 - 25 - 32 - 40
- 28 - 38 - 47 - 59 - 73

Tol h6

0 0 0 0 0
- 6 - 8 - 9 - 11 - 13

AVANCE 1



FRESAS 4 LABIOS, SERIE CORTA, HÉLICE A 35°

INOX

Ref. FMG12

4 Z

MG
MD

WELDON

TiAIN

INOX



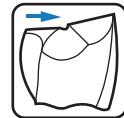
Ti

INC

SERIE CORTA

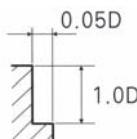


Mejora la extracción de viruta



FMG12				€	REVOLUCIONES Y AVANCES							
Tol e8	Tol h6	D ₁ mm	D ₂ mm		L ₁ mm	L ₂ mm	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min
FMG120200	2,0	6	40	54,29	40	6	11.560	280	7.560	170	6.300	140
FMG120250	2,5	6	40	54,29	45	8	8.920	320	5.560	200	4.620	170
FMG120300	3,0	6	45	54,29	45	8	7.560	570	4.620	350	3.880	280
FMG120350	3,5	6	45	54,29	45	10	6.300	600	3.780	360	3.160	300
FMG120400	4,0	6	45	54,29	45	11	5.560	660	3.360	410	2.840	330
FMG120450	4,5	6	45	54,29	45	11	4.200	710	2.520	380	2.100	350
FMG120500	5,0	6	50	54,29	50	13	3.260	610	2.000	300	1.680	300
FMG120550	5,5	6	50	54,29	50	13	2.740	520	1.680	250	1.360	240
FMG120600	6,0	6	50	54,29	50	13	2.200	410	1.360	200	1.060	200
FMG120650	6,5	8	60	69,42	60	16	1.680	320	1.060	160	840	150
FMG120700	7,0	8	60	69,42	60	16	1.360	250	840	130	680	130
FMG120750	7,5	8	60	69,42	60	16	1.060	200	680	130	500,95	0
FMG120800	8,0	8	60	69,42	60	19	840	160	400	130	0	0
FMG120850	8,5	10	70	102,52	70	19	680	130	300	130	0	0
FMG120900	9,0	10	70	102,52	70	19	500,95	0	0	0	0	0
FMG120950	9,5	10	70	102,52	70	19	0	0	0	0	0	0
FMG121000	10,0	10	70	102,52	70	22	0	0	0	0	0	0
FMG121100	11,0	12	75	140,43	75	22	0	0	0	0	0	0
FMG121200	12,0	12	75	140,43	75	26	0	0	0	0	0	0
FMG121400	14,0	16	85	232,64	85	26	0	0	0	0	0	0
FMG121600	16,0	16	100	232,64	100	32	0	0	0	0	0	0
FMG121800	18,0	16	100	309,05	100	32	0	0	0	0	0	0
FMG122000	20,0	20	105	385,42	105	38	0	0	0	0	0	0
FMG122200	22,0	20	105	500,95	105	38	0	0	0	0	0	0
FMG122500	25,0	25	120	616,45	120	40	0	0	0	0	0	0

AVANCE 1



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol e8

- 14 - 20 - 25 - 32 - 40
- 28 - 38 - 47 - 59 - 73

Tol h6

0 0 0 0 0
- 6 - 8 - 9 - 11 - 13

FRESAS 3 y 4 LABIOS, SERIE CORTA, HÉLICE A 50°

INOX

Ref. **FMG13**

3-4 Z



INOX



Ti

INC

SERIE CORTA



Mejora la extracción de viruta



Fresas

Rosa

FMG13						REVOLUCIONES Y AVANCES									
Tol e8	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 2 mm/min
FMG130600	6,0	6	50	13	3	70,44		5.560	310	3.360	200	2.840	160	1.280	40
FMG130800	8,0	8	60	19	3	90,10		4.200	840	2.520	180	2.100	160	920	40
FMG131000	10,0	10	70	22	3	133,11		3.260	300	2.000	140	1.680	140	740	40
FMG131200	12,0	12	75	25	3	182,41		2.740	250	1.680	120	1.370	120	620	30
FMG131600	16,0	16	90	32	3	302,29		2.200	200	1.360	100	1.050	100	460	25
FMG131800	18,0	18	90	32	3	441,74		1.940	175	1.210	85	950	85	410	20
FMG132000	20,0	20	100	28	4	500,95		1.680	150	1.060	70	840	70	350	20
FMG132500	25,0	25	120	45	4	801,22		1.360	115	840	60	670	60	300	15

NOTA: En operaciones de fresado por una cara deberemos aumentar los avances señalados en un 30%, manteniendo las mismas revoluciones.

AVANCE 1



AVANCE 2



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol e8

- 14 - 20 - 25 - 32 - 40

- 28 - 38 - 47 - 59 - 73

Tol h6

0 0 0 0 0

- 6 - 8 - 9 - 11 - 13

FRESAS 6 y 8 LABIOS, SERIE CORTA, HÉLICE A 45°

Fresas

Rosa

INOX

Ref. FMG14

6-8 Z

MG
MD

WELDON

TiAIN

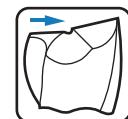
INOX



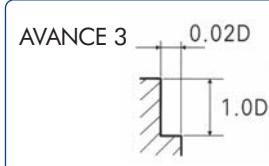
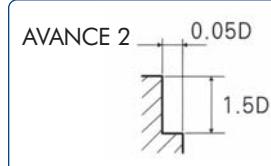
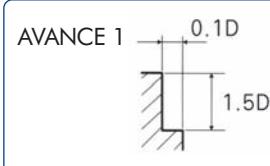
Ti

INC

SERIE CORTA

Mejora la
extracción
de viruta

FMG14						REVOLUCIONES Y AVANCES									
Tol e8	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 2 mm/min	R.P.M. Rev./min	AVANCE 2 mm/min	R.P.M. Rev./min	AVANCE 3 mm/min
FMG140600	6,0	6	57	13	6	65,31		5.560	2.000	3.880	1.370	3.370	1.100	1.350	280
FMG140700	7,0	8	63	16	6	82,55		4.880	2.000	3.410	1.370	2.930	1.100	1.170	280
FMG140800	8,0	8	63	19	6	82,55		4.200	2.000	2.940	1.370	2.490	1.100	1.000	280
FMG140900	9,0	10	72	19	6	123,41		3.780	2.000	2.630	1.370	2.200	1.100	720	280
FMG141000	10,0	10	72	22	6	117,70		3.360	2.000	2.320	1.370	1.920	1.100	440	280
FMG141200	12,0	12	83	26	8	159,83		2.840	1.680	2.000	1.160	1.610	1.000	400	250
FMG141400	14,0	14	83	26	6	209,57		2.470	1.470	1.740	1.020	1.380	885	355	220
FMG141600	16,0	16	92	32	6	268,46		2.100	1.260	1.480	880	1.160	770	310	190
FMG141800	18,0	18	92	32	8	329,09		1.890	1.130	1.320	785	1.030	695	280	170
FMG142000	20,0	20	104	38	8	394,23		1.680	1.010	1.160	690	900	920	250	155
FMG142500	25,0	25	104	44	8	729,10		1.500	900	1.100	600	850	540	220	135



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol e8

- 14 - 20 - 25 - 32 - 40

- 28 - 38 - 47 - 59 - 73

Tol h6

0 0 0 0 0

- 6 - 8 - 9 - 11 - 13

FRESAS 4 y 6 LABIOS, SERIE CORTA, HÉLICE A 30°

INOX

Ref. **FP19**

4-6 Z



**ASP
60**



TiAIN

INOX



Ti

INC

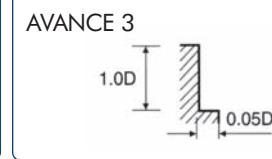
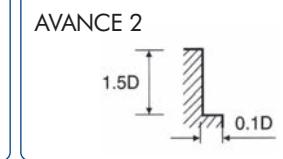
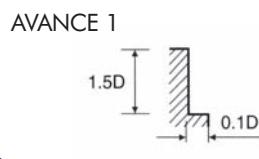
SERIE CORTA

Fresas

Rosa



FP19						REVOLUCIONES Y AVANCES															
Tol e8	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€	R.P.M. Rev./min	<30 HRc	AVANCE 1 mm/min	R.P.M. Rev./min	30-45 HRc	AVANCE 1 mm/min	R.P.M. Rev./min	INOX	AVANCE 2 mm/min	R.P.M. Rev./min	AVANCE 3 mm/min			
FP190300	3,0	6	52	8	4	30,86		4.400	185	1.100	23	2.200	110	880	28						
FP190400	4,0	6	55	11	4	30,86		3.600	210	900	31	1.800	125	720	37						
FP190500	5,0	6	57	13	4	30,86		3.000	225	750	30	1.500	135	600	36						
FP190600	6,0	6	57	13	4	30,86		2.600	235	600	29	1.300	140	480	35						
FP190800	8,0	10	69	19	4	45,33		2.000	250	500	28	1.000	150	400	34						
FP191000	10,0	10	72	22	4	46,83		1.600	285	410	30	800	170	330	36						
FP191200	12,0	12	83	26	4	60,68		1.320	250	340	29	660	150	270	35						
FP191400	14,0	12	83	26	4	72,44		1.160	235	290	27	580	140	230	32						
FP191600	16,0	16	92	32	6	90,61		1.000	225	250	26	500	135	200	31						
FP191800	18,0	16	92	32	6	111,60		900	210	225	23	450	125	180	28						
FP192000	20,0	20	104	38	6	152,12		800	200	200	17	400	120	160	21						
FP192500	25,0	25	121	45	6	235,09		640	165	165	15	320	100	130	18						



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol
e8

- 14 - 20 - 25 - 32 - 40
- 28 - 38 - 47 - 59 - 73

Tol
h6

0 0 0 0 0
- 6 - 8 - 9 - 11 - 13

FRESAS 3 y 5 LABIOS, DESBASTE FINO, SERIE CORTA

Fresas

Rosa

INOX

Ref. FMG15

3-5 Z

MG
MD

30°

NF

WELDON

TiAIN

INOX

45
HRc

Ti

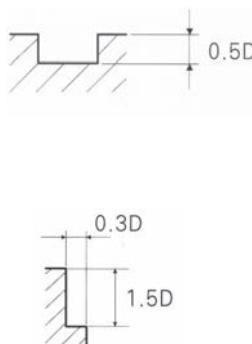
INC

SERIE CORTA

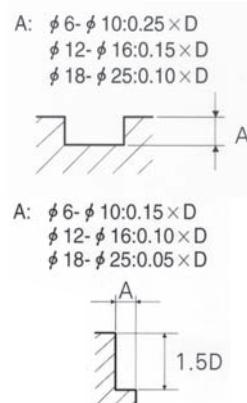


FMG15						€	REVOLUCIONES Y AVANCES							
Tol h10	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 2 mm/min	R.P.M. Rev./min	AVANCE 3 mm/min
FMG150600	6,0	6	54	7	3	67,08	15.600	2.320	12.400	840	8.400	570	2.400	190
FMG150700	7,0	8	58	8	3	78,38	13.600	2.320	10.800	840	7.350	570	2.100	190
FMG150800	8,0	8	58	9	3	78,38	11.600	2.320	9.200	840	6.300	570	1.800	190
FMG150900	9,0	10	66	13	4	116,88	10.400	2.320	8.400	840	5.700	570	1.550	190
FMG151000	10,0	10	66	14	4	116,88	9.200	2.320	7.600	840	5.100	570	1.300	190
FMG151200	12,0	12	73	16	4	149,94	8.000	2.400	6.000	800	4.200	570	1.200	190
FMG151400	14,0	14	75	18	4	181,86	6.800	2.400	5.200	840	3.600	570	900	130
FMG151600	16,0	16	82	22	4	244,03	6.000	2.400	4.800	760	3.300	510	800	110
FMG151800	18,0	18	84	24	4	312,57	5.200	2.320	4.400	720	2.700	420	700	100
FMG152000	20,0	20	92	26	4	392,50	4.800	2.160	3.600	560	2.400	360	660	100
FMG152500	25,0	25	110	25	5	687,88	4.300	2.150	3.200	620	2.160	410	600	100

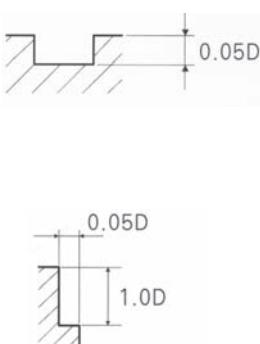
AVANCE 1



AVANCE 2



AVANCE 3



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 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

FRESAS 3 y 5 LABIOS, DESBASTE FINO, SERIE LARGA

INOX

Ref. **FMG16**

3-5 Z



MG
MD

30°

NF

WELDON

TiAIN

INOX

45 HRc

Ti

INC

SERIE LARGA

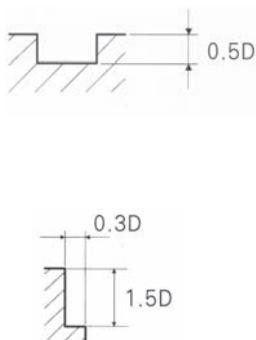


Fresas

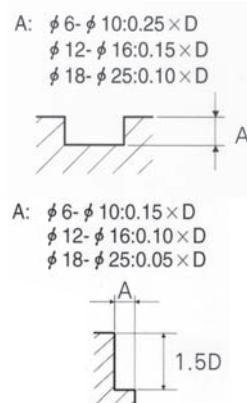
Rosa

FMG16						€	REVOLUCIONES Y AVANCES							
Tol h10	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 2 mm/min	R.P.M. Rev./min	AVANCE 3 mm/min
FMG160600	6,0	6	57	16	3	72,08	15.600	2.320	12.400	840	8.400	570	2.400	190
FMG160700	7,0	7	63	16	3	84,24	13.600	2.320	10.800	840	7.350	570	2.100	190
FMG160800	8,0	8	63	16	3	84,24	11.600	2.320	9.200	840	6.300	570	1.800	190
FMG160900	9,0	9	72	19	4	125,64	10.400	2.320	8.400	840	5.700	570	1.550	190
FMG161000	10,0	10	72	22	4	125,64	9.200	2.320	7.600	840	5.100	570	1.300	190
FMG161200	12,0	12	83	26	4	161,21	8.000	2.400	6.000	800	4.200	570	1.200	190
FMG161400	14,0	14	83	26	4	195,50	6.800	2.400	5.200	840	3.600	570	900	130
FMG161600	16,0	16	92	32	4	262,37	6.000	2.400	4.800	760	3.300	510	800	110
FMG161800	18,0	18	92	32	4	336,07	5.200	2.320	4.400	720	2.700	420	700	100
FMG162000	20,0	20	104	38	4	422,01	4.800	2.160	3.600	560	2.400	360	660	100
FMG162500	25,0	25	121	45	5	739,63	4.300	2.150	3.200	620	2.160	410	600	100

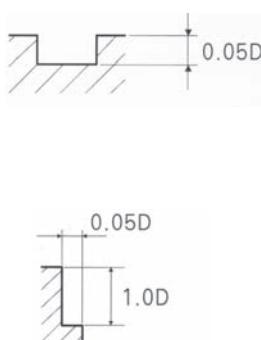
AVANCE 1



AVANCE 2



AVANCE 3



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 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

FRESAS 4 y 6 LABIOS, SERIE CORTA, HÉLICE A 45°

Fresas

Rosa

INOX

Ref. FMG17

4-6 Z

MG
MD

NF



TiAIN

INOX

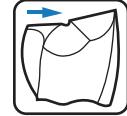


INC

SERIE CORTA

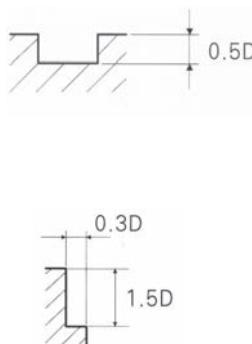


Mejora la extracción de viruta

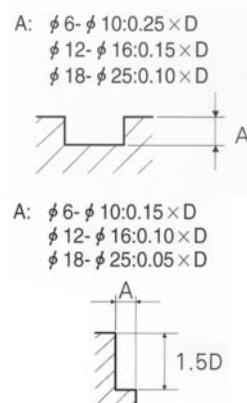


FMG17						REVOLUCIONES Y AVANCES										
	Tol h10	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min	R.P.M. Rev./min	AVANCE 2 mm/min	R.P.M. Rev./min	AVANCE 3 mm/min
FMG170600	6,0	6	54	7	4		4	67,08	15.600	2.320	12.400	840	8.400	570	2.400	190
FMG170800	8,0	8	58	9	4		4	78,38	11.600	2.320	9.200	840	6.300	570	1.800	190
FMG171000	10,0	10	66	14	4		4	116,88	9.200	2.320	7.600	840	5.100	570	1.300	190
FMG171200	12,0	12	73	16	4		4	149,94	8.000	2.400	6.000	800	4.200	570	1.200	190
FMG171600	16,0	16	82	22	5		5	244,03	6.000	2.400	4.800	760	3.300	510	800	110
FMG172000	20,0	20	92	26	6		6	392,50	4.800	2.160	3.600	560	2.400	360	660	100

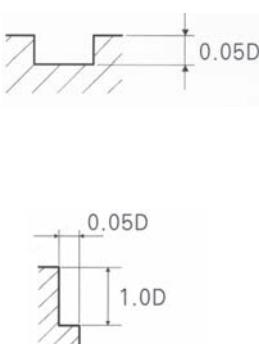
AVANCE 1



AVANCE 2



AVANCE 3



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol h10	0	0	0	0	0
- 40	- 48	- 58	- 70	- 84	
Tol h6	0	0	0	0	0
- 6	- 8	- 9	- 11	- 13	

FRESAS 3 y 6 LABIOS, SERIE LARGA, HÉLICE A 45°

INOX

Ref. **FMG18**

3-6 Z



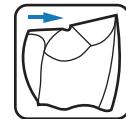
**MG
MD**



SERIE LARGA



Mejora la extracción de viruta

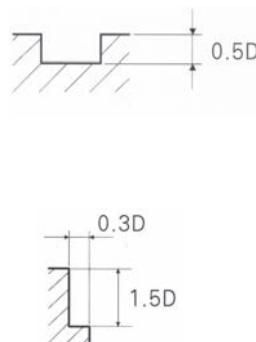


Fresas

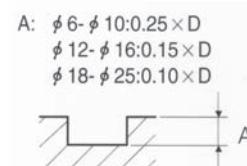
Rosa

FMG18						REVOLUCIONES Y AVANCES										
	Tol h10	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€	R.P.M.	AVANCE 1	R.P.M.	AVANCE 1	R.P.M.	AVANCE 2	R.P.M.	AVANCE 3
									Rev./min	mm/min	Rev./min	mm/min	Rev./min	mm/min	Rev./min	mm/min
FMG180400	4,0	6	57	11	3		3	72,08	20.100	4.600	18.400	1.700	12.600	1.040	3.800	399
FMG180500	5,0	6	57	13	4		4	72,08	18.000	4.600	15.000	1.650	10.200	1.040	2.200	390
FMG180600	6,0	6	57	16	4		4	72,08	15.600	2.320	12.400	840	8.400	570	2.400	190
FMG180700	7,0	8	63	16	4		4	84,24	13.600	2.320	10.800	840	7.350	570	2.100	190
FMG180800	8,0	8	63	16	4		4	84,24	11.600	2.320	9.200	840	6.300	570	1.800	190
FMG180900	9,0	10	72	19	4		4	125,64	10.400	2.320	8.400	840	5.700	570	1.550	190
FMG181000	10,0	10	72	22	4		4	125,64	9.200	2.320	7.600	840	5.100	570	1.300	190
FMG181200	12,0	12	83	26	4		4	161,21	8.000	2.400	6.000	800	4.200	570	1.200	190
FMG181400	14,0	14	83	26	5		5	195,50	6.800	2.400	5.200	840	3.600	570	900	130
FMG181600	16,0	16	92	32	5		5	262,37	6.000	2.400	4.800	760	3.300	510	800	110
FMG182000	20,0	20	104	38	6		6	422,01	4.800	2.160	3.600	560	2.400	360	660	100
FMG182500	25,0	25	121	45	6		6	739,63	4.300	2.150	3.200	620	2.160	410	600	100

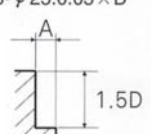
AVANCE 1



AVANCE 2

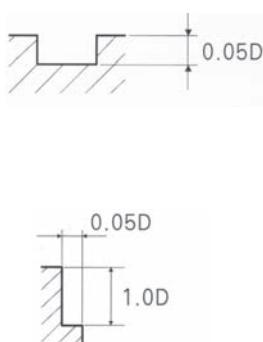


A: $\phi 6 - \phi 10 : 0.25 \times D$
 $\phi 12 - \phi 16 : 0.15 \times D$
 $\phi 18 - \phi 25 : 0.10 \times D$



A: $\phi 6 - \phi 10 : 0.15 \times D$
 $\phi 12 - \phi 16 : 0.10 \times D$
 $\phi 18 - \phi 25 : 0.05 \times D$

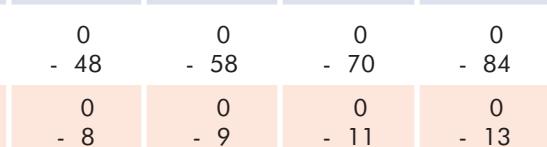
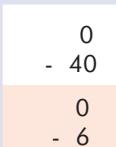
AVANCE 3



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30



FRESAS 4 y 6 LABIOS, SERIE LARGA, HÉLICE A 45°

Fresas

Rosa

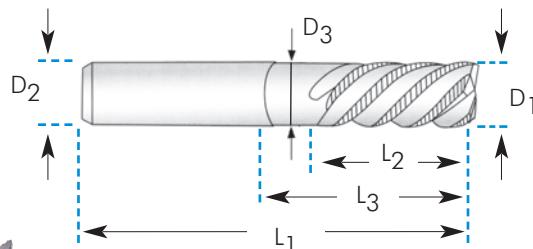
INOX

Ref. FMG19

4-6 Z

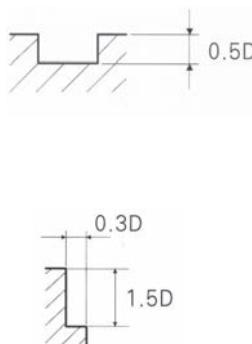


SERIE LARGA

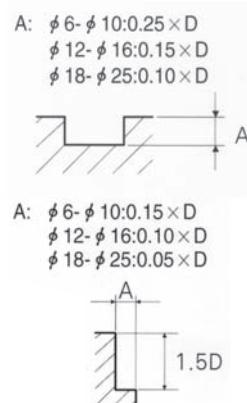
Mejora la
extracción de viruta

	FMG19							€	REVOLUCIONES Y AVANCES						INOX	INC		
	Tol h10	Tol h6	D1	D2	D3	L1	L2	L3	Z	<30 HRc	R.P.M.	AVANCE 1	>30-45 HRc	R.P.M.	AVANCE 1	INOX	R.P.M.	AVANCE 2
FMG190600	6,0	6	5,5	57	16	20	4		86,40	15.600	2.320	12.400	840	8.400	570	2.400	190	
FMG190800	8,0	8	7,5	63	16	26	4		101,01	11.600	2.320	9.200	840	6.300	570	1.800	190	
FMG191000	10,0	10	9,5	72	22	31	4		150,68	9.200	2.320	7.600	840	5.100	570	1.300	190	
FMG191200	12,0	12	11,5	83	26	37	4		193,34	8.000	2.400	6.000	800	4.200	570	1.200	190	
FMG191600	16,0	16	15,5	100	32	51	5		314,98	6.000	2.400	4.800	760	3.300	510	800	110	
FMG192000	20,0	20	19,2	110	38	59	6		506,32	4.800	2.160	3.600	560	2.400	360	660	100	

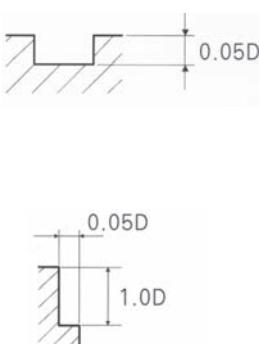
AVANCE 1



AVANCE 2



AVANCE 3



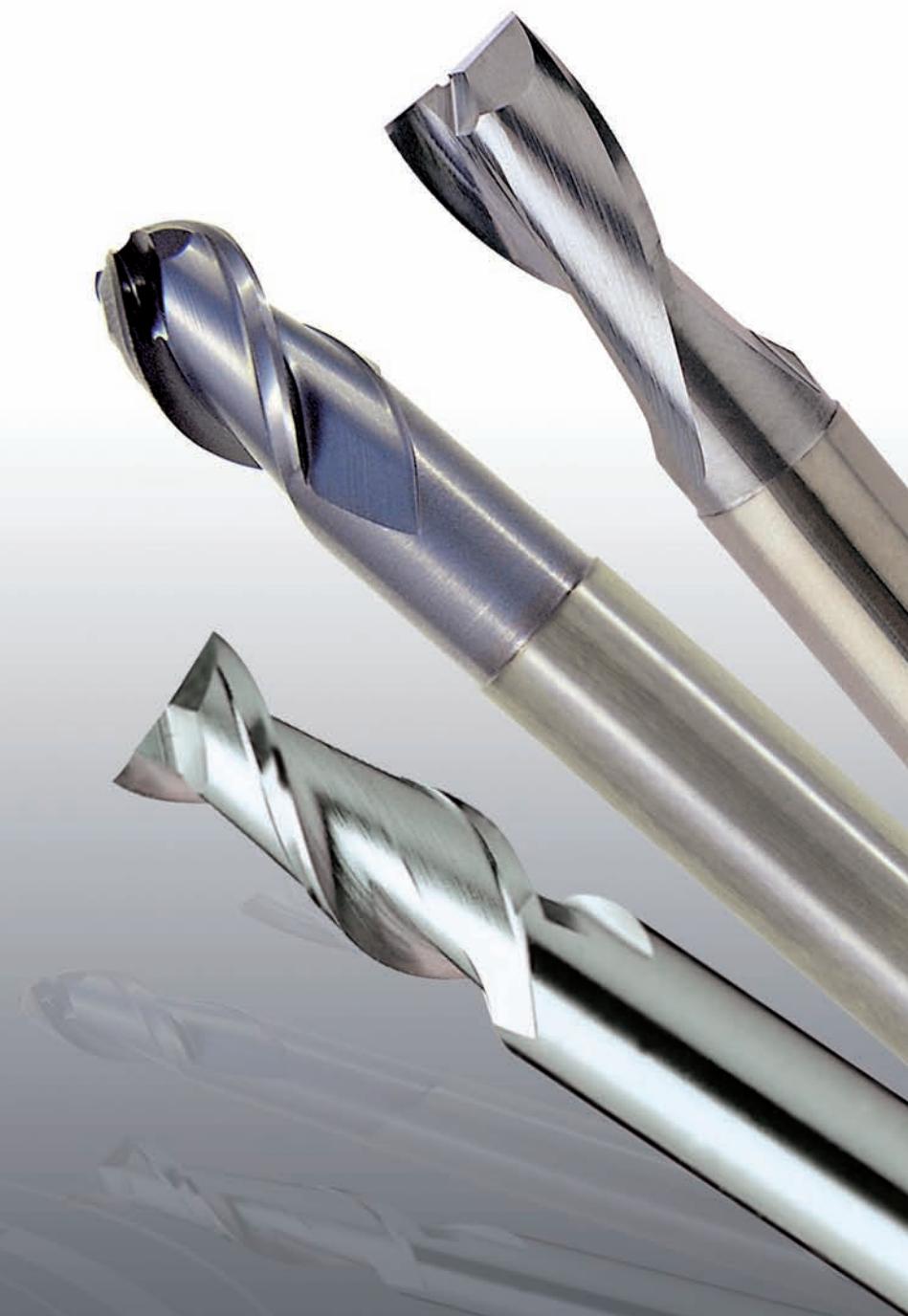
TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 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

FRESAS PARA ALUMINIO SERIE PLUS



1987
25
2012

BLUE-MASTER®
by CEBASE 25 1987-2012

FRESAS 2 LABIOS, SERIE CORTA, HÉLICE A 55°, PARA ALUMINIO

Fresas

Rosa

AI

Ref. FMD59

2 Z

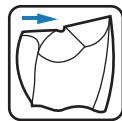
MG
MD55°
CILÍNDRICO

Cu

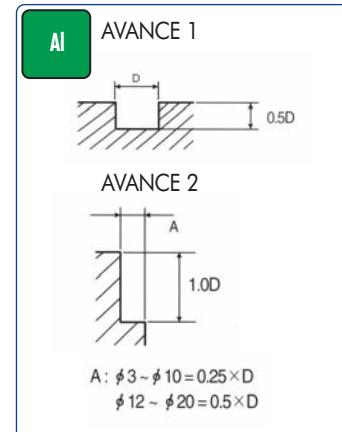
SERIE CORTA



Mejora la extracción de viruta



	FMD59					REVOLUCIONES Y AVANCES		
	Tol h10	Tol h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	€	AI
FMD590300	3,0	3	38	12			25,00	10.000
FMD590400	4,0	4	50	14			27,09	10.000
FMD590500	5,0	5	50	19			30,35	10.000
FMD590600	6,0	6	63	19			34,46	10.000
FMD590800	8,0	8	63	19			45,28	8.000
FMD591000	10,0	10	70	22			66,56	8.000
FMD591200	12,0	12	83	25			87,96	8.000
FMD591400	14,0	14	83	30			123,44	6.000
FMD591600	16,0	16	88	32			156,56	6.000
FMD591800	18,0	18	88	32			202,57	4.000
FMD592000	20,0	20	100	38			258,21	4.000



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol h10	0	0	0	0	0
	- 40	- 48	- 58	- 70	- 84
Tol h6	0	0	0	0	0
	- 6	- 8	- 9	- 11	- 13

FRESAS 2 LABIOS, SERIE CORTA, HÉLICE A 25°, PARA ALUMINIO

Al

Ref. FMGA02

2 Z



MG
MD

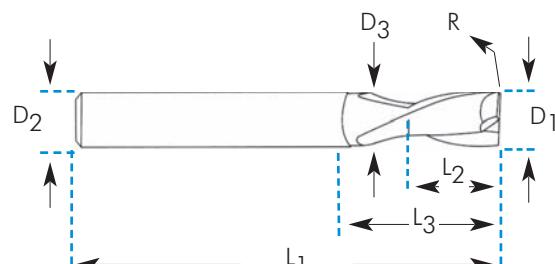
25°

CLÍNDRICO

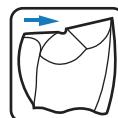
TiAIN

Cu

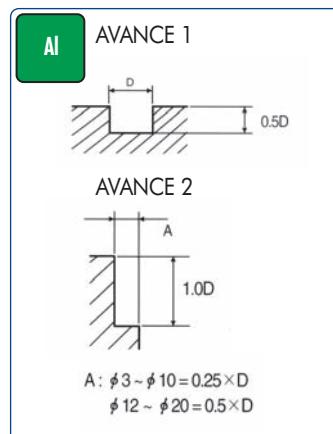
SERIE CORTA



Mejora la extracción de viruta



	FMGA02							REVOLUCIONES Y AVANCES			
	Tol h10	Tol h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₃ mm	L ₂ mm	R	€	AI
FMGA020200	2,0	3	1,9	40	6	3	0,2	31,14	22.000	800	1.000
FMGA020300	3,0	3	2,9	40	8	4	0,2	31,14	13.000	900	1.200
FMGA020400	4,0	4	3,8	50	12	5	0,2	34,29	13.000	1.200	1.400
FMGA020500	5,0	5	4,8	50	14	8	0,2	35,65	13.000	1.300	1.700
FMGA020600	6,0	6	5,7	65	18	8	0,2	53,86	13.000	1.500	2.000
FMGA020800	8,0	8	7,7	70	22	10	0,2	63,31	10.000	1.800	2.300
FMGA021000	10,0	10	9,7	80	28	14	0,2	93,51	10.000	2.200	2.700
FMGA021200	12,0	12	11,5	90	35	16	0,2	129,19	12.000	2.700	3.400
FMGA021600	16,0	16	15,5	90	40	20	0,2	218,85	8.000	2.500	3.100
FMGA022000	20,0	20	19,5	100	50	25	0,2	355,67	5.000	2.000	2.500



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol h10	0	0	0	0	0
	- 40	- 48	- 58	- 70	- 84
Tol h6	0	0	0	0	0
	- 6	- 8	- 9	- 11	- 13

FRESAS 2 LABIOS, SERIE CORTA, HÉLICE A 30°, PARA ALUMINIO CON RADIO DE ENTRADA

Fresas

Rosa

Al

Ref. FMGA03

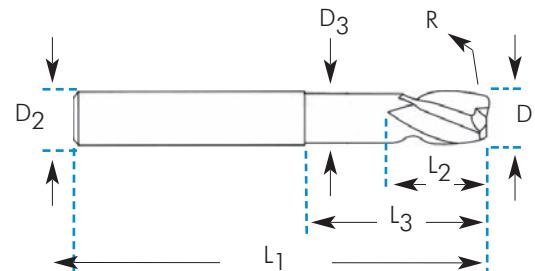
2 Z

MG
MD

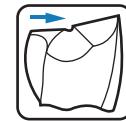
TiAIN

Cu

SERIE CORTA



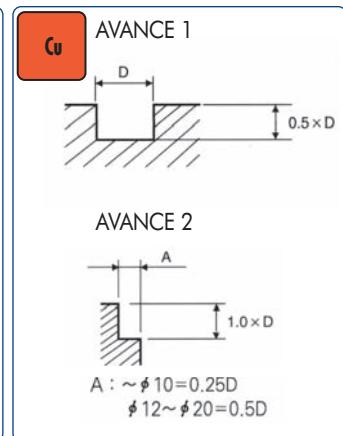
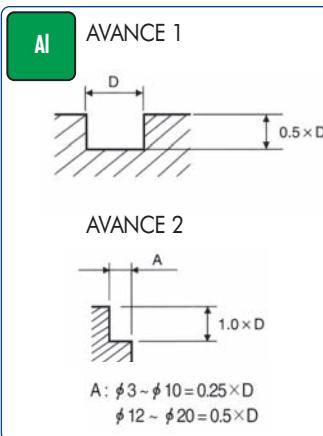
Mejora la extracción de viruta



	FMGA03									
	Tol h10	Tol h6	D ₁	D ₂	D ₃	L ₁	L ₂	L ₃	R	€
	mm	mm	mm	mm	mm	mm	mm	mm	mm	
FMGA030400	4,0	6	3,6	50	5	10	0,3		46,43	
FMGA030600	6,0	6	5,4	60	8	20	0,5		46,43	
FMGA030800	8,0	8	7,2	70	10	30	0,6		64,33	
FMGA031000	10,0	10	9,0	80	12	36	0,8		96,37	
FMGA031200	12,0	12	11,0	90	14	40	1,0		149,25	
FMGA031600	16,0	16	14,5	100	18	45	1,3		237,83	
FMGA032000	20,0	20	18,0	100	24	45	1,6		376,91	

REVOLUCIONES Y AVANCES

Al			Cu		
R.P.M. Rev./min	AVANCE 1 mm/min	AVANCE 2 mm/min	R.P.M. Rev./min	AVANCE 1 mm/min	AVANCE 2 mm/min
13.000	1.200	1.400	3.900	300	350
13.000	1.500	1.200	3.900	380	500
10.000	1.800	2.300	3.000	450	580
10.000	2.200	2.700	3.000	550	680
10.000	2.700	3.400	3.000	680	850
8.000	2.500	3.100	2.400	630	780
5.000	2.000	2.500	1.500	500	630



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol e8	- 14	- 20	- 25	- 32	- 40
	- 28	- 38	- 47	- 59	- 73
Tol h6	0	0	0	0	0
	- 6	- 8	- 9	- 11	- 13

FRESAS 3 LABIOS, SERIE CORTA, HÉLICE A 40°, PARA ALUMINIO CON RADIO DE ENTRADA Y PUNTA SEMIESFÉRICA (RADIAL)

Al

Ref. FMGA05

3 Z



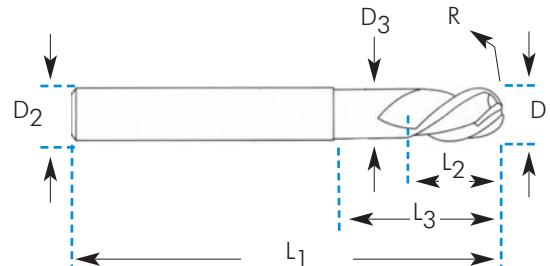
MG
MD



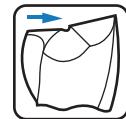
TiAIN

Cu

SERIE CORTA



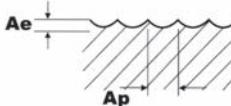
Mejora la
extracción
de viruta



	FMGA05							REVOLUCIONES Y AVANCES				
	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₃ mm	L ₂ mm	R	€	AI R.P.M. Rev./min	AVANCES mm/min	Cu R.P.M. Rev./min	AVANCES mm/min
FMGA050200	2,0	6	1,9	60	5,0	3,0	1,00	55,96	27.000	950	8.000	240
FMGA050250	2,5	6	2,4	60	6,0	4,0	1,25	55,96	22.000	950	6.500	240
FMGA050300	3,0	6	2,8	60	6,5	4,5	1,50	55,96	18.000	950	5.500	240
FMGA050350	3,5	6	3,2	65	7,0	5,0	1,75	56,24	18.000	1.100	5.500	280
FMGA050400	4,0	6	3,7	65	8,0	6,0	2,00	56,24	18.000	1.250	5.500	310
FMGA050500	5,0	6	4,6	65	10,0	7,5	2,50	56,24	18.000	1.350	5.500	340
FMGA050600	6,0	6	5,6	75	12,0	9,0	3,00	56,24	18.000	1.750	5.500	440
FMGA050800	8,0	8	7,4	75	25,0	12,0	4,00	84,89	14.000	2.000	4.200	500
FMGA051000	10,0	10	9,4	80	30,0	15,0	5,00	125,52	14.000	2350	4.200	580
FMGA051200	12,0	12	11,4	90	36,0	18,0	6,00	174,57	14.000	3.000	4.200	750
FMGA051600	16,0	16	15,4	100	40,0	24,0	8,00	254,65	11.000	2.700	3.300	670

$$Ae=0.2 \times D$$

$$Ap=0.5 \times D$$



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol
e8

- 14 - 20 - 25 - 32 - 40
- 28 - 38 - 47 - 59 - 73

Tol
h6

0 0 0 0 0
- 6 - 8 - 9 - 11 - 13

FRESAS ESPECIALES PARA ALUCOBOND

Fresas

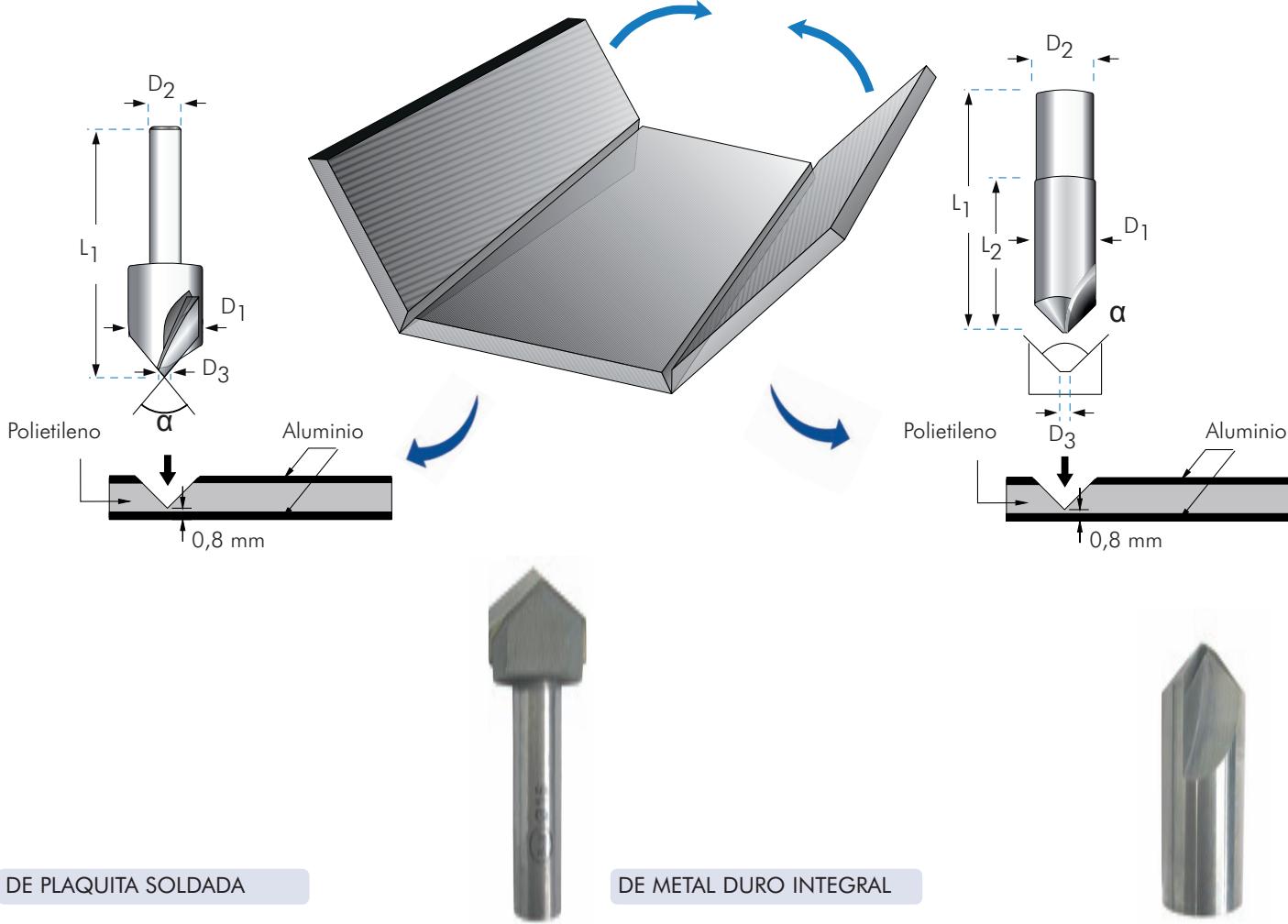
Rosa

Ref. FFALUC

PMD

Ref. FFALUC...MDI

MDI



DE PLAQUITA SOLDADA

DE METAL DURO INTEGRAL

	D ₁	D ₂	D ₃	L ₁	α	€
	mm	mm	mm	mm		
FFALUC1600	16,00	8	2,5	55	90°	137,68
FFALUC1800	18,00	8	2,5	55	90°	139,45
FFALUC2000	20,00	8	2,5	55	90°	143,56
FFALUC1600-135	16,00	8	0,5	55	135°	166,92
FFALUC1800-135	18,00	8	0,5	55	135°	173,16
FFALUC2000-135	20,00	8	0,5	55	135°	198,22

	D ₁	D ₂	D ₃	L ₁	L ₂	α	€
	mm	mm	mm	mm	mm		
FFALUC1400MDI	14,00	14	2,5	50	14	90°	143,41
FFALUC1600MDI	16,00	16	2,5	50	16	90°	171,60
FFALUC1800MDI	18,00	18	2,5	50	18	90°	247,99
FFALUC1400MDI-135	14,00	14	0,5	50	14	135°	143,41
FFALUC1600MDI-135	16,00	16	0,5	50	16	135°	171,60
FFALUC1800MDI-135	18,00	18	0,5	50	18	135°	247,99

FRESAS 50 - 70 HRc



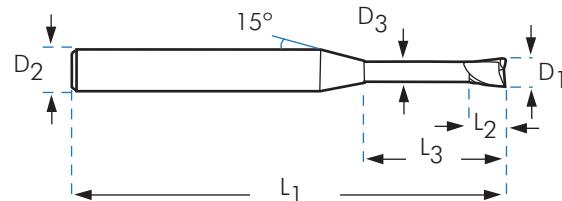
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2012

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by CEBASE 1987-2012 25

FRESAS DE METAL DURO FRONTALES CON CUELLO



Ref. **FMG74**
Ref. **FMG75**
Ref. **FMG76**

**FMG74**

	Tol -0,015	Tol h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	€
FMG740050	0,5	4	0,45	45	0,7	8			80,14
FMG740100	1,0	4	0,95	55	1,5	20,0			82,22
FMG740150	1,5	4	1,45	55	2,3	20,0			74,22
FMG740200	2,0	4	1,95	55	3,0	20,0			71,22
FMG740300	3,0	6	2,85	60	4,5	20,0			92,12
FMG740400	4,0	6	3,85	60	6,0	20,0			92,12
FMG740500	5,0	6	4,85	60	7,5	20,0			92,12
FMG740600	6,0	6	5,85	80	9,0	20,0			92,12

FMG75

	Tol -0,015	Tol h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	€
FMG750200	2,0	4	1,95	70	3,0	30,0			84,18
FMG750300	3,0	6	2,85	70	4,5	30,0			95,68
FMG750400	4,0	6	3,85	70	6,0	30,0			95,68
FMG750500	5,0	6	4,85	80	7,5	30,0			95,68
FMG750600	6,0	6	5,85	90	9,0	30,0			95,68

FMG76

	Tol -0,015	Tol h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	€
FMG760400	4,0	6	3,85	90	6,0	40,0			105,21
FMG760500	5,0	6	4,85	80	7,5	40,0			105,21
FMG760600	6,0	6	5,85	100	9,0	40,0			105,21

FRESAS DE METAL DURO SEMIESFÉRICAS CON CUELLO



Ref. **FMG77**
Ref. **FMG78**
Ref. **FMG79**

2 Z



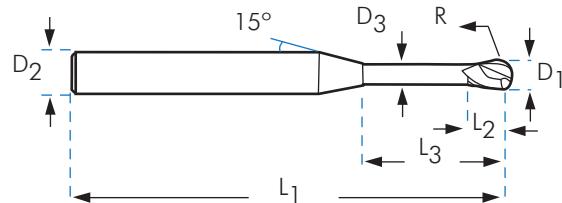
**MG
MD**



CLÍNDRICO



**50
HRc**



R : $\pm 0,01$ mm

FMG77

	Tol -0,02	Tol h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	€
FMG770050	0,5	4	0,45	45	0,7	8			80,14
FMG770100	1,0	4	0,95	55	1,5	20,0			82,22
FMG770150	1,5	4	1,45	55	2,3	20,0			74,22
FMG770200	2,0	4	1,95	55	3,0	20,0			71,22
FMG770300	3,0	6	2,85	60	4,5	20,0			92,12
FMG770400	4,0	6	3,85	65	6,0	20,0			92,12
FMG770500	5,0	6	4,85	60	7,5	20,0			92,12
FMG770600	6,0	6	5,85	80	9,0	20,0			92,12

FMG78

	Tol -0,02	Tol h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	€
FMG780200	2,0	4	1,95	70	3,0	30,0			84,18
FMG780300	3,0	6	2,85	70	4,5	30,0			95,68
FMG780400	4,0	6	3,85	70	6,0	30,0			95,68
FMG780500	5,0	6	4,85	80	7,5	30,0			95,68
FMG780600	6,0	6	5,85	90	9,0	30,0			95,68

FMG79

	Tol -0,02	Tol h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	€
FMG790400	4,0	6	3,85	90	6,0	40,0			105,21
FMG790600	6,0	6	5,85	100	9,0	40,0			105,21

FRESAS 2 LABIOS, SERIE CORTA, CON MANGO LARGO



Ref. FMG01

2 Z

MG
MD

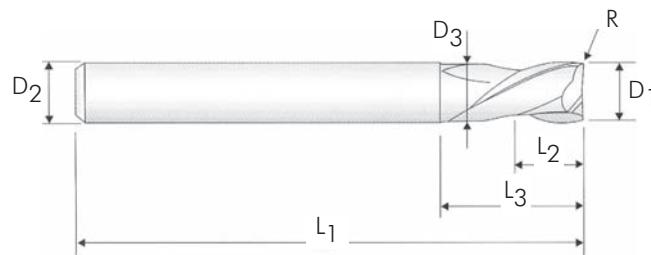
30°



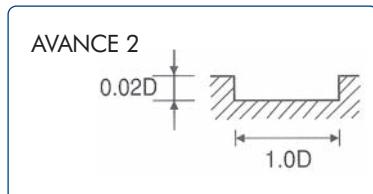
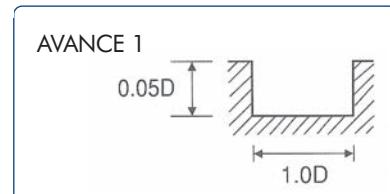
CLÍNDRICO



SERIE CORTA



FMG01								REVOLUCIONES Y AVANCES											
Tol Especial	Tol h6	D1	D2	D3	L1	L2	L3	R	€	50-55 HRc	AVANCE 1	R.P.M.	AVANCE 1	55-60 HRc	AVANCE 1	60-65 HRc	AVANCE 1	65-70 HRc	AVANCE 2
		mm	mm	mm	mm	mm	mm			Rev./min	mm/min	Rev./min	mm/min	Rev./min	mm/min	Rev./min	mm/min	Rev./min	mm/min
FMG010100		1,0	3	-	40	1,5	-	0,1	50,99	25.500	360	20.500	215	16.000	135	12.500	88		
FMG010150		1,5	3	-	40	2,2	-	0,1	50,99	21.500	390	17.500	240	13.500	150	11.000	102		
FMG010200		2,0	3	1,9	40	3,0	6	0,1	46,26	17.500	420	14.500	260	11.000	160	9.500	115		
FMG010250		2,5	3	2,4	40	4,0	6	0,1	46,26	14.500	420	12.000	260	9.250	160	7.950	115		
FMG010300		3,0	6	2,9	45	4,0	7	0,1	67,56	11.500	420	9.500	260	7.500	160	6.400	115		
FMG010350		3,5	6	3,3	45	5,0	9	0,1	67,56	10.150	430	8.350	270	6.550	165	5.575	118		
FMG010400		4,0	6	3,8	45	5,0	9	0,1	67,56	8.800	440	7.200	270	5.600	170	4.750	118		
FMG010450		4,5	6	4,3	45	6,0	10	0,1	67,56	8.550	470	6.800	280	5.350	175	4.600	125		
FMG010500		5,0	6	4,8	50	6,0	11	0,2	67,56	8.300	500	6.400	285	5.100	180	4.450	132		
FMG010600		6,0	6	5,8	50	7,0	14	0,2	67,56	6.900	480	5.300	280	4.200	180	3.700	130		
FMG010800		8,0	8	7,8	60	9,0	18	0,2	85,44	5.200	445	4.000	255	3.200	165	2.800	120		
FMG011000		10,0	10	9,7	75	12,0	25	0,2	127,70	4.100	415	3.200	240	2.550	155	2.200	112		
FMG011200		12,0	12	11,7	75	15,0	30	0,3	176,10	3.500	415	2.650	240	2.100	155	1.860	112		
FMG011600		16,0	16	15,7	90	18,0	38	0,3	293,59	2.600	365	2.000	210	1.600	135	1.400	98		
FMG012000		20,0	20	19,7	100	24,0	45	0,3	485,45	2.050	335	1.600	295	1.300	125	1.100	88		



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol Especial	0	0	0	0	0
	- 12	- 12	- 15	- 15	- 15
Tol h6	0	0	0	0	0
	- 6	- 8	- 9	- 11	- 13



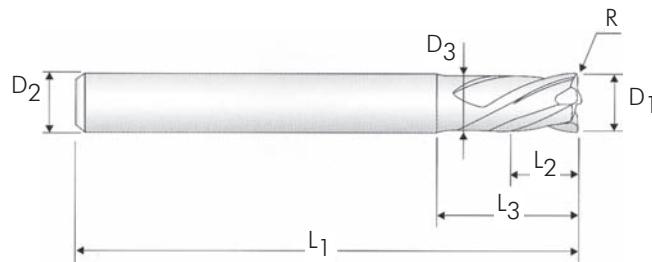
FRESAS 4 LABIOS, SERIE CORTA, CON MANGO LARGO



Ref. **FMG04**



SERIE CORTA

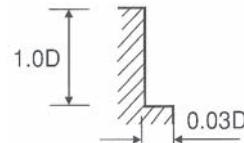


FMG04

REVOLUCIONES Y AVANCES

	Tol Especial	Tol hó	D ₁	D ₂	D ₃	L ₁	L ₂	L ₃	R	€	50-55 HRc	55-60 HRc	60-65 HRc	65-70 HRc
			mm	mm	mm	mm	mm	mm			Rev./min	AVANCE 1 mm/min	Rev./min	AVANCE 1 mm/min
FMG040100	1,0	3	-	40	1,5	-	0,1			50,99	25.500	710	20.500	430
FMG040150	1,5	3	-	40	2,2	-	0,1			50,99	21.500	775	17.500	475
FMG040200	2,0	3	1,9	40	3,0	6	0,1			46,26	17.500	840	14.500	520
FMG040250	2,5	3	2,4	40	4,0	6	0,1			46,26	14.500	840	12.000	520
FMG040300	3,0	6	2,9	45	4,0	7	0,1			67,56	11.500	840	9.500	520
FMG040350	3,5	6	3,3	45	5,0	9	0,1			67,56	10.150	860	8.350	530
FMG040400	4,0	6	3,8	45	5,0	9	0,1			67,56	8.800	880	7.200	540
FMG040450	4,5	6	4,3	45	6,0	10	0,1			67,56	8.550	940	6.800	560
FMG040500	5,0	6	4,8	50	6,0	11	0,2			67,56	8.300	1.000	6.400	580
FMG040600	6,0	6	5,8	50	7,0	14	0,2			67,56	6.900	950	5.300	560
FMG040800	8,0	8	7,8	60	9,0	18	0,2			85,44	5.200	900	4.000	520
FMG041000	10,0	10	9,7	75	12,0	25	0,2			127,70	4.100	840	3.200	480
FMG041200	12,0	12	11,7	75	15,0	30	0,3			176,10	3.500	840	2.650	480
FMG041600	16,0	16	15,7	90	18,0	38	0,3			293,59	2.600	730	2.000	420
FMG042000	20,0	20	19,7	100	24,0	45	0,3			485,45	2.050	650	1.600	380

AVANCE 1



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

Tol Especial	0 - 12	0 - 12	0 - 15	0 - 15	0 - 15
Tol hó	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



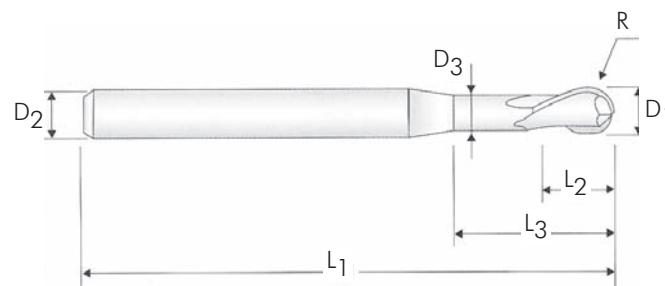
FRESAS 2 LABIOS, RADIAL, SERIE CORTA, CON MANGO LARGO



Ref. **FMG02**

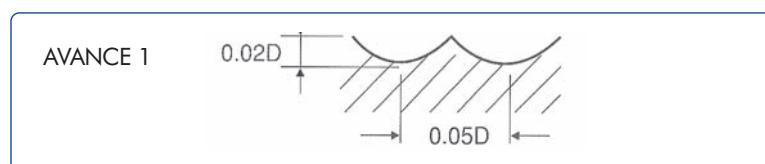


SERIE CORTA



	Tol D ₁	Tol h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	R	€
FMG020100	1,0	4	0,95	50	1,0	2,2	0,5			84,08
FMG020120	1,2	4	1,10	50	1,2	2,6	0,6			84,08
FMG020150	1,5	4	1,40	50	1,5	3,0	0,8			84,08
FMG020200	2,0	4	1,90	50	2,0	4,0	1,0			79,85
FMG020300	3,0	6	2,90	60	3,0	6,0	1,5			79,85
FMG020400	4,0	6	3,30	70	4,0	8,0	2,0			83,44
FMG020500	5,0	6	4,90	80	5,0	10,0	2,5			85,92
FMG020600	6,0	6	5,90	90	6,0	12,0	3,0			92,14
FMG020700	7,0	8	6,90	90	7,0	14,0	3,5			145,26
FMG020800	8,0	8	7,90	100	8,0	16,0	4,0			143,78
FMG020900	9,0	10	8,90	100	9,0	18,0	4,5			237,13
FMG021000	10,0	10	9,90	100	10,0	20,0	5,0			237,13
FMG021200	12,0	12	11,90	110	12,0	24,0	6,0			304,38
FMG021400	14,0	14	13,80	110	14,0	28,0	7,0			384,91
FMG021600	16,0	16	15,80	140	16,0	32,0	8,0			508,12
FMG021800	18,0	18	17,80	140	18,0	36,0	9,0			548,67
FMG022000	20,0	20	19,80	160	20,0	40,0	10,0			777,58
FMG022500	25,0	25	24,80	180	25,0	50,0	12,5			1260,47

REVOLUCIONES Y AVANCES								
50-55 HRc		55-60 HRc		60-65 HRc		65-70 HRc		
R.P.M.	AVANCE 1	R.P.M.	AVANCE 1	R.P.M.	AVANCE 1	R.P.M.	AVANCE 1	R.P.M.
Rev./min	mm/min	Rev./min	mm/min	Rev./min	mm/min	Rev./min	mm/min	Rev./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	
4.500	1.700	4.000	1.350	3.500	1.000	3.200	850	
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	



TOLEFRANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

	de 1 a 3	de 3 a 6	de 6 a 10	de 10 a 18	de 18 a 30
Tol D1	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



FRESAS 6 LABIOS, SERIE CORTA, CON MANGO LARGO



Ref. **FMG06**

6 Z



**MG
MD**

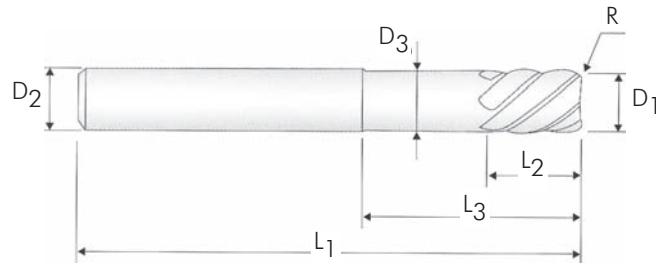


CILÍNDRICO

BLUE



SERIE CORTA



Fresas

Rosa

FMG06

REVOLUCIONES Y AVANCES

	Tol Especial	Tol h6	D ₁	D ₂	D ₃	L ₁	L ₂	L ₃	R	€
			mm	mm	mm	mm	mm	mm	mm	
FMG060600	6,0	6	5,70	50	6	14	0,5			96,65
FMG060800	8,0	8	7,65	60	8	24	0,5			115,29
FMG061000	10,0	10	9,65	70	10	30	1,0			179,85
FMG061200	12,0	12	11,60	75	12	30	1,0			214,83

	50-55 HRc	55-60 HRc	60-65 HRc	65-70 HRc
R.P.M.	AVANCE 1 Rev./min	AVANCE 1 Rev./min	AVANCE 1 Rev./min	AVANCE 1 Rev./min
	mm/min	mm/min	mm/min	mm/min
16.000	4.900	13.500	3.300	10.500
12.000	4.600	10.000	3.100	8.000
9.500	4.100	8.000	2.900	6.400
8.000	3.800	6.600	2.500	5.300

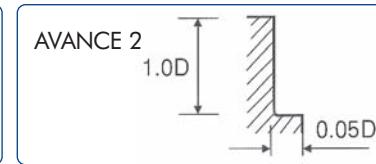
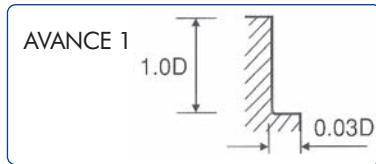
SERIE LARGA

FMG07

REVOLUCIONES Y AVANCES

	Tol Especial	Tol h6	D ₁	D ₂	L ₁	L ₂	R	€
			mm	mm	mm	mm	mm	
FMG070600	6,0	6	70	13	0,5			109,82
FMG070800	8,0	8	90	19	0,5			137,64
FMG071000	10,0	10	100	22	0,5			207,38
FMG071001	10,0	10	100	22	1,0			207,38
FMG071200	12,0	12	110	26	0,5			282,85
FMG071201	12,0	12	110	26	1,0			282,85
FMG071600	16,0	16	130	32	1,0			477,00
FMG071601	16,0	16	130	32	1,5			520,95
FMG072000	20,0	20	140	38	1,0			762,57
FMG072001	20,0	20	140	38	1,5			698,07
FMG072002	20,0	20	140	38	2,0			762,57

	50-55 HRc	55-60 HRc	60-65 HRc	65-70 HRc
R.P.M.	AVANCE 2 Rev./min	AVANCE 1 Rev./min	AVANCE 1 Rev./min	AVANCE 1 Rev./min
	mm/min	mm/min	mm/min	mm/min
16.000	4.900	13.500	3.300	10.500
12.000	4.600	10.000	3.100	8.000
9.500	4.100	8.000	2.900	6.400
8.000	3.800	6.600	2.500	5.300
8.000	3.800	6.600	2.500	5.300
6.000	3.400	5.000	2.300	4.000
6.000	3.400	5.000	2.300	4.000
4.800	3.200	4.000	2.100	3.200
4.800	3.200	4.000	2.100	3.200
4.800	3.200	4.000	2.100	3.200



TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

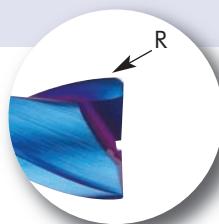
Tol Especial	0	0	0	0	0
- 12	- 12	- 15	- 15	- 15	
Tol h6	0	0	0	0	0
- 6	- 8	- 9	- 11	- 13	

FRESAS DE METAL DURO, TECNOLOGÍA DE MICROFRESADO PIEZAS DE PRECISIÓN



Ref. FMG09

2 Z

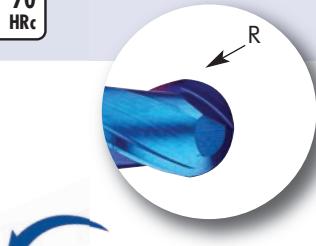


	FMG09					€
	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	R	€
FMG090030	0,30	6	50	0,45	-	89,43
FMG090040	0,40	6	50	0,60	-	83,92
FMG090050	0,50	6	50	0,70	0,05	73,00
FMG090060	0,60	6	50	0,90	0,05	70,23
FMG090080	0,80	6	50	1,20	0,05	64,72
FMG090100	1,00	6	50	1,50	0,10	62,02
FMG090120	1,20	6	50	1,80	0,10	62,02
FMG090150	1,50	6	50	2,20	0,15	62,02
FMG090200	2,00	6	50	2,20	0,15	56,21



Ref. FMG08

2 Z



	FMG08					€
	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	R	€
FMG080040	0,40	6	50	0,40	0,20	90,77
FMG080050	0,50	6	50	0,50	0,25	83,79
FMG080060	0,60	6	50	0,60	0,30	76,83
FMG080080	0,80	6	50	0,80	0,40	62,66
FMG080100	1,00	6	50	1,00	0,50	59,00
FMG080120	1,20	6	50	1,20	0,60	59,00
FMG080150	1,50	6	50	1,50	0,75	59,00
FMG080200	2,00	6	50	2,00	1,00	53,46

FRESAS DE AGUJERO

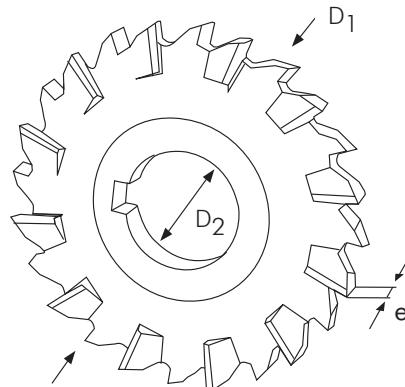


BLUE-MASTER®
by  1987
 25 2012

FRESAS PARA RANURAR HSS-Co DE 3 CORTES CON DIENTE CRUZADO

Fresas

Rosa

Ref. **FF56****HSS-Co****DIN
885A**

				FF56
D ₁ mm	e mm	D ₂ mm	Z	€
50	4,0	16	12	74,01
50	5,0	16	12	74,01
50	6,0	16	12	85,76
50	8,0	16	12	83,52
50	10,0	16	12	91,97
63	1,6	22	16	171,97
63	2,0	22	16	152,26
63	2,5	22	16	155,43
63	3,0	22	16	159,70
63	4,0	22	12	85,39
63	5,0	22	12	85,39
63	6,0	22	12	88,24
63	8,0	22	12	96,87
63	10,0	22	12	104,24
63	12,0	22	12	111,30
63	14,0	22	12	119,88
63	16,0	22	12	126,79
63	18,0	22	12	148,91
80	1,6	27	20	180,41
80	2,0	27	20	175,25
80	2,5	27	20	178,16
80	3,0	27	20	174,63
80	4,0	27	20	187,11
80	5,0	27	14	117,16
80	6,0	27	14	120,22
80	8,0	27	14	126,87
80	10,0	27	14	134,12
80	12,0	27	14	146,44
80	14,0	27	14	153,51
80	16,0	27	14	158,61
80	18,0	27	14	170,15
80	20,0	27	14	187,08

				FF56
D ₁ mm	e mm	D ₂ mm	Z	€
100	1,6	32	24	215,82
100	2,0	32	24	214,65
100	2,5	32	24	214,45
100	3,0	32	24	208,21
100	4,0	32	24	224,47
100	5,0	32	24	237,96
100	6,0	32	16	164,68
100	8,0	32	16	168,17
100	10,0	32	16	174,34
100	12,0	32	16	187,77
100	14,0	32	16	206,72
100	16,0	32	16	216,82
100	18,0	32	16	239,00
100	20,0	32	16	239,00
100	22,0	32	16	265,28
100	25,0	32	16	291,44
125	1,6	32	26	272,94
125	2,0	32	26	262,52
125	2,5	32	26	269,06
125	3,0	32	26	275,60
125	4,0	32	26	295,26
125	5,0	32	26	316,05
125	6,0	32	26	323,86
125	8,0	32	18	259,74
125	10,0	32	18	266,52
125	12,0	32	18	276,62
125	14,0	32	18	300,41
125	16,0	32	18	318,98
125	18,0	32	18	334,10
125	20,0	32	18	355,46
125	22,0	32	18	404,75
125	25,0	32	18	408,67
125	28,0	32	18	446,67

				FF56
D ₁ mm	e mm	D ₂ mm	Z	€
160	2,0	40	30	431,10
160	2,5	40	30	415,02
160	3,0	40	30	423,00
160	4,0	40	30	446,96
160	5,0	40	30	473,32
160	6,0	40	30	508,21
160	8,0	40	30	580,07
160	10,0	40	22	426,31
160	12,0	40	22	426,31
160	14,0	40	22	424,23
160	16,0	40	22	464,27
160	18,0	40	22	489,21
160	20,0	40	22	502,17
160	22,0	40	22	551,96
160	25,0	40	22	598,09
160	28,0	40	22	657,44
160	32,0	40	22	702,94
200	12,0	40	24	650,29
200	14,0	40	24	656,67
200	16,0	40	24	676,52
200	18,0	40	24	709,81
200	20,0	40	24	759,15
200	22,0	40	24	761,65
200	25,0	40	24	883,49
200	28,0	40	24	911,42
200	32,0	40	24	1.136,68

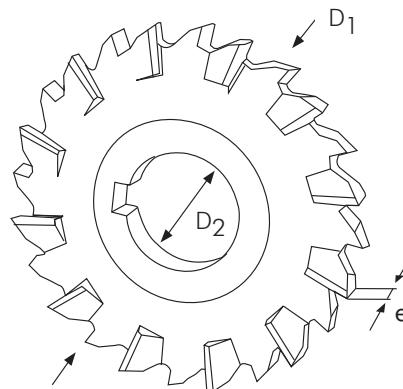
FRESAS PARA RANURAR HSS-Co DE 3 CORTES CON DIENTE RECTO



Ref. **FF59**

HSS-Co

**DIN
885B**



FF59				
D ₁ mm	e mm	D ₂ mm	Z	€
50	4	16	16	75,25
50	5	16	16	75,25
50	6	16	16	87,21
50	8	16	16	84,93
50	10	16	16	93,52
63	4	22	18	87,67
63	5	22	18	87,67
63	6	22	18	88,83
63	8	22	18	96,57
63	10	22	18	103,91
63	12	22	18	111,30
63	14	22	18	119,88
63	16	22	18	126,79
63	18	22	18	151,43

FF59				
D ₁ mm	e mm	D ₂ mm	Z	€
80	5	27	20	117,92
80	6	27	20	121,03
80	8	27	20	127,72
80	10	27	20	136,34
80	12	27	20	145,98
80	14	27	20	156,11
80	16	27	20	160,17
80	18	27	20	171,81
80	20	27	20	188,91
100	6	32	22	158,32
100	8	32	22	166,00
100	10	32	22	175,51
100	12	32	22	189,02
100	14	32	22	208,11
100	16	32	22	220,49
100	18	32	22	241,34
100	20	32	22	241,34
100	22	32	22	269,78
100	25	32	22	281,06
125	8	32	24	249,70
125	10	32	24	256,22
125	12	32	24	276,47
125	14	32	24	300,24
125	16	32	24	303,62
125	18	32	24	337,31
125	20	32	24	358,88
125	22	32	24	408,64
125	25	32	24	412,60
125	28	32	24	450,96

FF59				
D ₁ mm	e mm	D ₂ mm	Z	€
160	10	40	28	430,41
160	12	40	28	430,41
160	14	40	28	428,31
160	16	40	28	468,73
160	18	40	28	493,91
160	20	40	28	507,00
160	22	40	28	557,27
160	25	40	28	603,84
160	28	40	28	663,76
160	32	40	28	709,69
200	12	40	30	656,54
200	14	40	30	662,98
200	16	40	30	683,03
200	18	40	30	716,64
200	20	40	30	766,45
200	22	40	30	768,98
200	25	40	30	891,99
200	28	40	30	920,19
200	32	40	30	1.147,61

125	8	32	24	249,70
125	10	32	24	256,22
125	12	32	24	276,47
125	14	32	24	300,24
125	16	32	24	303,62
125	18	32	24	337,31
125	20	32	24	358,88
125	22	32	24	408,64
125	25	32	24	412,60
125	28	32	24	450,96

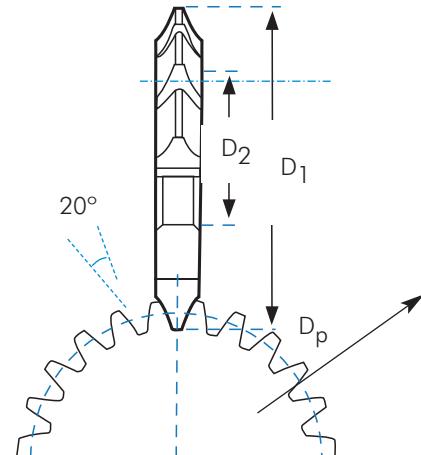
FRESAS DE MÓDULO PARA TALLADO DE ENGRANAJES

Fresas

Rosa

Ref. 99RFM

HSS



MÓDULO FRESA	D ₁ mm	D ₂ mm	NÚMERO DE FRESA / DIENTES A TALLAR										99RFM	€
			Nº1 12 - 13	Nº2 14 - 16	Nº3 17 - 20	Nº4 21 - 25	Nº5 26 - 34	Nº6 35 - 54	Nº7 55 - 134	Nº8 135 - ∞	Set 12 - ∞			
0,50	40	16	201	202	203	204	205	206	207	208	209		75,68	
0,70	40	16	231	232	233	234	235	236	237	238	239		75,68	
0,75	40	16	241	242	243	244	245	246	247	248	249		75,68	
0,80	40	16	251	252	253	254	255	256	257	258	259		75,68	
1,00	50	16	271	272	273	274	275	276	277	278	279		75,68	
1,25	50	16	291	292	293	294	295	296	297	298	299		75,68	
1,50	56	22	311	312	313	314	315	316	317	318	319		75,68	
1,75	56	22	321	322	323	324	325	326	327	328	329		75,68	
2,00	63	22	331	332	333	334	335	336	337	338	339		75,68	
2,25	63	22	341	342	343	344	345	346	347	348	349		88,70	
2,50	63	22	351	352	353	354	355	356	357	358	359		88,70	
2,75	71	27	361	362	363	364	365	366	367	368	369		88,70	
3,00	71	27	371	372	373	374	375	376	377	378	379		88,70	
3,25	71	27	381	382	383	384	385	386	387	388	389		117,05	
3,50	80	27	391	392	393	394	395	396	397	398	399		117,05	
3,75	80	27	401	402	403	404	405	406	407	408	409		117,05	
4,00	80	27	411	412	413	414	415	416	417	418	419		117,05	
4,50	90	32	431	432	433	434	435	436	437	438	439		160,44	
5,00	90	32	451	452	453	454	455	456	457	458	459		160,44	
6,00	100	32	471	472	473	474	475	476	477	478	479		203,15	
7,00	100	32	491	492	493	494	495	496	497	498	499		203,15	

FRESAS CILÍNDRICAS, FRONTALES CON CHAVETERO TRANSVERSAL HSS-Co

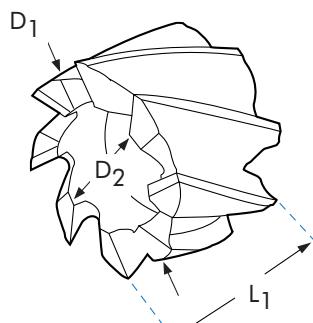


Ref. **FF87**

HSS-Co

**DIN
1880**

ACABADO



FF87				
D ₁ mm	D ₂ mm	L ₁ mm	Z	€
40	16	32	8	97,32
50	22	36	8	131,33
63	27	40	8	179,45
80	27	45	10	258,97
100	32	50	12	416,92
125	40	56	14	669,54
160	50	63	16	1.196,61



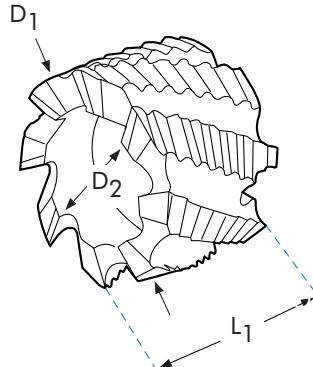
Ref. **FF88**

HSS-Co

**DIN
1880**

NR

DESBASTE



FF88				
D ₁ mm	D ₂ mm	L ₁ mm	Z	€
40	16	32	6	142,35
50	22	36	6	176,76
63	27	40	8	231,90
80	27	45	8	340,87
100	32	50	10	562,38
125	40	56	12	954,09
160	50	63	14	1.655,50

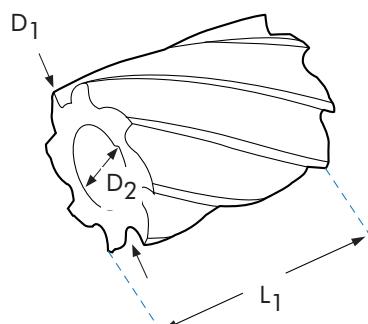
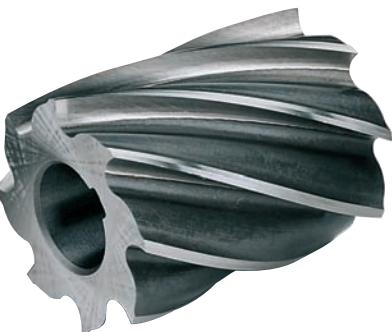


Ref. **FF89**

HSS-Co

**DIN
884**

CILÍNDRICA PARA PLANEAR



FF89				
D ₁ mm	D ₂ mm	L ₁ mm	Z	€
50	22	40	8	114,43
50	22	63	8	121,93
50	22	80	8	181,76
63	27	50	8	160,01
63	27	70	8	194,67
80	32	63	8	269,69
80	32	100	8	396,45
100	40	70	10	419,58

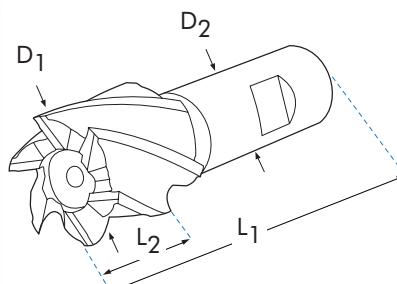
FRESAS CILÍNDRICAS, FRONTALES PARA PLANEAR CON MANGO

Fresas

Rosa

Ref. **FMF87**
**HSS-Co
8%**

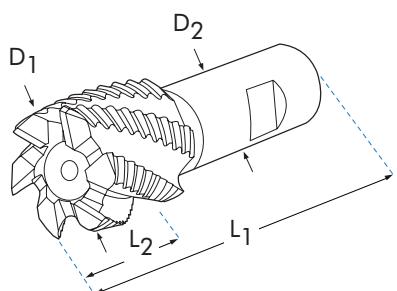
ACABADO



					FMF87
D_1 mm	L_2 mm	L_1 mm	D_2 mm	Z	€
30	30	90	20	6	140,49
35	30	90	20	6	161,24
40	32	95	25	8	200,95

Ref. **FMF88**
**HSS-Co
8%**
NR

DESBASTE



					FMF88
D_1 mm	L_2 mm	L_1 mm	D_2 mm	Z	€
30	30	90	20	6	162,42
35	30	90	20	6	208,07
40	32	95	25	8	254,89

FRESAS SEMICIRCULARES, ANGULARES ISOSCELES HSS-Co

Ref. **FF77**



Ref. **FF78**



Ref. **FF79**



					FF77
D ₁ mm	D ₂ mm	L ₁ mm	∞	Z	€
50	16	8	45°	20	129,91
63	22	10	45°	22	154,53
80	27	12	45°	24	215,75
100	32	18	45°	26	269,73

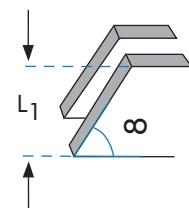
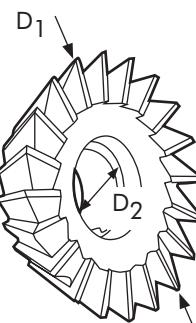
					FF78
D ₁ mm	D ₂ mm	L ₁ mm	∞	Z	€
50	16	10	60°	18	129,91
63	22	14	60°	20	154,53
80	27	18	60°	22	215,75
100	32	25	60°	24	269,73

					FF79
D ₁ mm	D ₂ mm	L ₁ mm	∞	Z	€
50	16	14	90°	16	129,91
63	22	20	90°	18	154,53
80	27	22	90°	20	215,75
100	32	32	90°	22	269,73

Ref. **FF91**



Ref. **FF90**

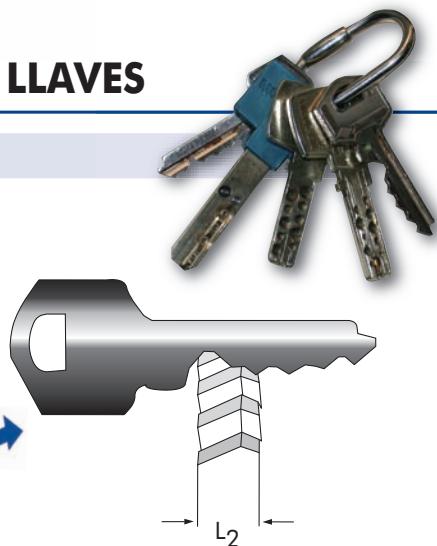
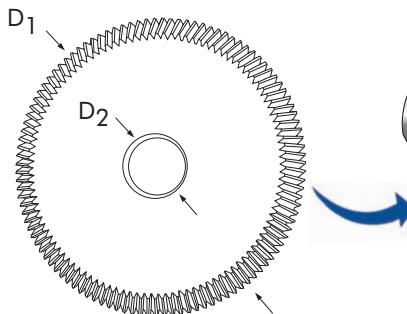


					FF91
D ₁ mm	D ₂ mm	L ₁ mm	∞	Z	€
40	10	13	50°	14	100,75
50	13	16	50°	16	124,24
63	16	20	50°	18	157,05
80	22	25	50°	20	226,27
100	27	32	50°	22	328,17
125	32	40	50°	24	541,94
160	40	50	50°	30	947,99

					FF90
D ₁ mm	D ₂ mm	L ₁ mm	∞	Z	€
40	10	13	60°	14	100,73
50	13	16	60°	16	124,22
63	16	20	60°	18	157,02
80	22	25	60°	20	226,24
100	27	32	60°	22	328,11
125	32	40	60°	24	541,85
160	40	50	60°	30	947,82

FRESAS PARA LA FABRICACIÓN DE LLAVES

FRESAS PARA LLAVES DE LLAVÍN PLANAS



			FLL	FLL..TiALN	TIPOS DE MÁQUINAS	
	D ₁ mm	D ₂ mm	L ₂ mm	Z	HSS €	TiAIN €
FLL01	23	10,0	5,0	36	80,96	102,16
FLL02	25	10,0	10,0	60	69,67	106,75
FLL03	40	8,0	5,0	80	87,85	109,03
FLL04	50	12,0	6,0	80	111,92	134,89
FLL05	52	16,0	5,0	110	103,72	130,20
FLL06	53	12,0	6,0	80	115,40	141,87
FLL07	53	12,7	6,0	80	115,40	141,87
FLL08	55	12,0	6,0	80	115,40	141,87
FLL09	60	12,7	5,0	140	115,21	141,69
FLL10	61	12,7	6,5	140	117,50	151,05
FLL11	62	16,0	5,0	80	115,21	141,69
FLL12	63	16,0	5,0	140	115,21	141,69
FLL13	70	12,7	5,5	88	117,76	154,84
FLL14	70	15,0	6,5	150	121,98	169,65
FLL15	70	13,0	7,0	88	118,67	166,34
FLL16*	80	16,0	5,0	110	118,67	155,74

* **HSS-Co**

FRESAS PARA LLAVES DE BORJA DE PALETÓN Y PALETÓN DOBLE

			FLL	FLL..TiALN	TIPOS DE MÁQUINAS	
	D ₁ mm	D ₂ mm	L ₂ mm	Z	HSS €	TiAIN €
FLL17	35	12	3,15	50	60,54	84,23
FLL18	63	15	1,40	80	74,03	103,12
FLL19	63	16	1,40	80	81,27	113,24
FLL20	70	16	1,40	100	91,46	127,53
FLL21	80	16	1,40	100	97,54	136,05
FLL22	80	22	1,40	100	96,93	135,17
FLL23	80	16	1,50	100	96,93	135,17
FLL24	80	22	1,50	100	96,93	135,17

FRESAS PARA LA FABRICACIÓN DE LLAVES

FRESAS FRONTALES PARA RANURAR LLAVES



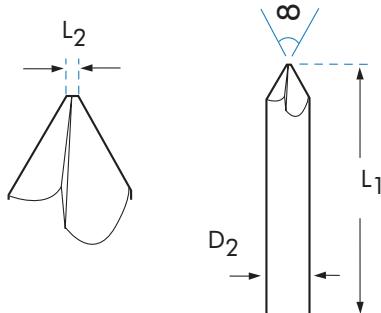
Fresas

Rosa

	FLL			FLL..TiALN		PLL			PLL..TiALN		TIPOS DE MÁQUINAS	
	D ₁ mm	D ₂ mm	L ₁ mm	Z	HSS-Co 8%	TiALN		HSS	TiALN			
FLL32	1,5	6	45	3	32,69	46,48	PLL32	29,00	41,36	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	JMA = F3	
FLL44	1,5	6	45	2	30,60	43,53	PLL32	29,00	41,36	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	JMA = F11	
FLL33	2,5	6	45	3	29,54	42,01	PLL33	29,00	41,36	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	JMA = F8	
FLL48	2,5	6	45	2	26,43	37,56	PLL33	29,00	41,36	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	
FLL34	3,0	6	45	3	29,54	41,90	PLL34	29,00	41,25	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	
FLL35	4,0	6	45	3	34,38	48,66	PLL35	29,00	41,16	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	JMA = F3W	
FLL46	4,0	6	45	2	30,60	43,48	PLL35	29,00	41,16	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	JMA = F11W	
FLL36	5,0	6	45	3	34,38	48,81	PLL36	29,00	41,29	NOVACLAV-WALKIN-SILCA-JMA-DAKAR	JMA = F8W	
FLL37	6,0	6	45	3	61,17	86,89	PLL37	29,00	41,31	NOVACLAV-WALKIN-SILCA-JMA-DAKAR		
FLL45*	1,5	6	45	2	99,47	138,25	PLL32*	29,00	41,36	NOVACLAV-WALKIN-SILCA-JMA-DAKAR		
FLL49*	2,5	6	45	2	75,30	105,43	PLL33*	29,00	41,36	NOVACLAV-WALKIN-SILCA-JMA-DAKAR		
FLL47*	4,0	6	45	2	93,36	130,70	PLL35*	29,00	41,16	NOVACLAV-WALKIN-SILCA-JMA-DAKAR		

* MD

FRESAS FRONTALES PARA PUNTEAR LLAVES



	FLL			FLL..TiALN		PLL			PLL..TiALN		TIPOS DE MÁQUINAS	
	D ₂ mm	L ₁ mm	L ₂ mm	∞	Z	HSS-Co 8%	TiALN		HSS	TiALN		
FLL43	6	45	0,8	90°	2	20,13	28,58	PLL38	16,39	23,39	JMA = F1	
FLL50	6	45	0,8	100°	2	20,13	28,58	PLL50	16,39	23,39	JMA = F13	
FLL42*	6	45	0,8	90°	2	62,38	88,18	PLL38*	16,39	23,39	JMA = F1W	
FLL51*	6	45	0,8	100°	2	58,37	81,72	PLL50*	16,39	23,39	JMA = F13W	

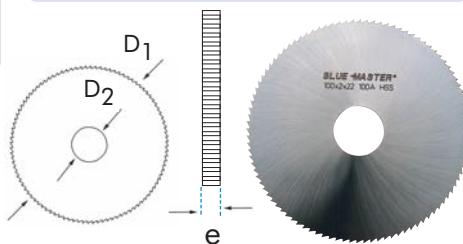
* MD

SIERRAS CIRCULARES PARA METALES, CORTE FINO hasta 5 mm

Fresas

Rosa

Ref. FF93	HSS	DIN 1837	CORTE <5mm
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FF93			
D ₁ mm	e mm	D ₂ mm	Z

20	0,20	5	80	12,56
20	0,25	5	64	12,56
20	0,30	5	64	11,29
20	0,40	5	64	11,29
20	0,50	5	48	10,86
20	0,60	5	48	10,86
20	0,80	5	48	10,86
20	1,00	5	40	10,86
20	1,20	5	40	12,56
20	1,60	5	40	13,88
20	2,00	5	32	14,27
20	2,50	5	32	16,55
20	3,00	5	32	17,89
20	4,00	5	24	23,66
20	5,00	5	24	27,74
20	6,00	5	24	31,61
25	0,20	8	80	12,98
25	0,25	8	80	12,98
25	0,30	8	80	12,00
25	0,40	8	64	12,00
25	0,50	8	64	11,44
25	0,60	8	64	11,44
25	0,80	8	48	11,44
25	1,00	8	48	11,44
25	1,20	8	48	13,14
25	1,60	8	40	13,97
25	2,00	8	40	15,02
25	2,50	8	40	16,31
25	3,00	8	32	21,15
25	4,00	8	32	25,11
25	5,00	8	32	29,38
25	6,00	8	32	32,92
32	0,20	8	100	13,71
32	0,25	8	100	13,71
32	0,30	8	80	12,50
32	0,40	8	80	12,50
32	0,50	8	80	11,93
32	0,60	8	64	11,93
32	0,80	8	64	11,93
32	1,00	8	64	11,93
32	1,20	8	48	14,00
32	1,60	8	48	14,21
32	2,00	8	48	15,86
32	2,50	8	40	17,85
32	3,00	8	40	20,50
32	4,00	8	40	26,83
32	5,00	8	32	32,67
32	6,00	8	32	34,57

FF93			
D ₁ mm	e mm	D ₂ mm	Z

40	0,20	10	128	14,96
40	0,25	10	100	14,96
40	0,30	10	100	14,41
40	0,40	10	100	14,41
40	0,50	10	80	13,47
40	0,60	10	80	13,47
40	0,80	10	80	13,47
40	1,00	10	64	13,47
40	1,20	10	64	14,34
40	1,60	10	64	15,22
40	2,00	10	48	16,48
40	2,50	10	48	19,04
40	3,00	10	48	22,18
40	4,00	10	40	26,35
40	5,00	10	40	36,79
40	6,00	10	40	40,40
50	0,20	13	128	19,43
50	0,25	13	128	17,82
50	0,30	13	128	16,08
50	0,40	13	100	16,08
50	0,50	13	100	15,07
50	0,60	13	100	15,07
50	0,80	13	80	15,07
50	1,00	13	80	15,07
50	1,20	13	80	15,92
50	1,60	13	64	17,36
50	2,00	13	64	18,74
50	2,50	13	64	20,08
50	3,00	13	48	23,32
50	4,00	13	48	27,12
50	5,00	13	48	36,29
50	6,00	13	40	45,76
63	0,25	16	160	20,74
63	0,30	16	128	18,31
63	0,40	16	128	18,31
63	0,50	16	128	17,60
63	0,60	16	100	17,60
63	0,80	16	100	17,60
63	1,00	16	100	17,60
63	1,20	16	80	18,19
63	1,60	16	80	20,30
63	2,00	16	80	21,87
63	2,50	16	64	23,08
63	3,00	16	64	25,60
63	4,00	16	64	32,23
63	5,00	16	48	40,77
63	6,00	16	48	45,58
80	0,30	22	160	23,20
80	0,40	22	160	23,20
80	0,50	22	128	20,94
80	0,60	22	128	20,94
80	0,80	22	128	20,94
80	1,00	22	100	20,94
80	1,20	22	100	21,59
80	1,60	22	100	22,87
80	2,00	22	80	25,19
80	2,50	22	80	30,14
80	3,00	22	80	32,54
80	4,00	22	64	39,90
80	5,00	22	64	49,01
80	6,00	22	64	55,00

FF93			
D ₁ mm	e mm	D ₂ mm	Z

100	0,50	22	160	25,49
100	0,60	22	160	24,30
100	0,80	22	128	24,30
100	1,00	22	128	24,30
100	1,20	22	128	25,26
100	1,60	22	100	30,38
100	2,00	22	100	33,50
100	2,50	22	100	37,65
100	3,00	22	80	40,77
100	4,00	22	80	55,00
100	5,00	22	80	61,48
100	6,00	22	64	71,88
125	0,60	22	160	38,08
125	0,80	22	160	36,30
125	1,00	22	160	36,30
125	1,20	22	128	36,30
125	1,60	22	128	37,97
125	2,00	22	128	40,54
125	2,50	22	100	42,93
125	3,00	22	100	47,74
125	4,00	22	100	71,31
125	5,00	22	80	83,39
125	6,00	22	80	93,06
160	1,00	32	160	54,60
160	1,20	32	160	52,06
160	1,60	32	160	53,25
160	2,00	32	128	55,00
160	2,50	32	128	61,24
160	3,00	32	128	69,55
160	4,00	32	100	98,17
160	5,00	32	100	116,58
160	6,00	32	100	132,95
200	1,00	32	200	72,21
200	1,20	32	200	72,21
200	1,60	32	160	73,72
200	2,00	32	160	78,83
200	2,50	32	160	89,87
200	3,00	32	128	99,62
200	4,00	32	128	141,19
200	5,00	32	128	171,09
200	6,00	32	100	194,61
250	1,60	32	200	103,16
250	2,00	32	200	107,14
250	2,50	32	160	122,48
250	3,00	32	160	135,11
250	4,00	32	160	195,88
250	5,00	32	128	233,45
250	6,00	32	128	276,62
315	2,50	40	200	191,87
315	3,00	40	200	215,38
315	4,00	40	160	278,22
315	5,00	40	160	340,58
315	6,00	40	160	402,95

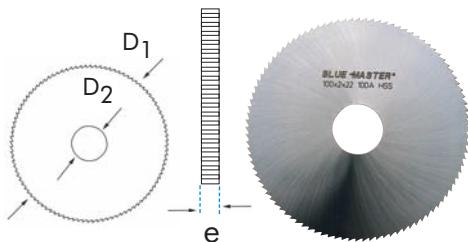
SIERRAS CIRCULARES PARA METALES, CORTE GRUESO a partir de 5 mm

Ref. **FF94**

HSS

**DIN
1838**

**CORTE
> 5mm**



				FF94
D ₁ mm	e mm	D ₂ mm	z	€
50	0,5	13	48	18,51
50	0,6	13	48	18,51
50	0,8	13	40	18,51
50	1,0	13	40	18,51
50	1,2	13	40	19,35
50	1,6	13	32	21,05
50	2,0	13	32	21,92
50	2,5	13	32	23,30
50	3,0	13	24	25,18
50	4,0	13	24	32,62
50	5,0	13	24	40,64
50	6,0	13	20	44,34
63	0,5	16	64	20,47
63	0,6	16	48	20,47
63	0,8	16	48	20,47
63	1,0	16	48	20,47
63	1,2	16	40	20,76
63	1,6	16	40	23,47
63	2,0	16	40	25,29
63	2,5	16	32	26,42
63	3,0	16	32	29,28
63	4,0	16	32	35,42
63	5,0	16	24	41,51
63	6,0	16	24	46,50
80	0,6	22	64	22,79
80	0,8	22	64	22,79
80	1,0	22	48	22,79
80	1,2	22	48	23,51
80	1,6	22	48	25,26
80	2,0	22	40	26,05
80	2,5	22	40	31,35
80	3,0	22	40	34,18
80	4,0	22	32	41,80
80	5,0	22	32	50,29
80	6,0	22	32	57,92

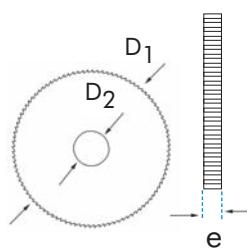
				FF94
D ₁ mm	e mm	D ₂ mm	z	€
100	0,6	22	80	25,33
100	0,8	22	64	25,33
100	1,0	22	64	25,33
100	1,2	22	64	26,30
100	1,6	22	48	31,72
100	2,0	22	48	34,55
100	2,5	22	48	38,05
100	3,0	22	40	41,01
100	4,0	22	40	56,00
100	5,0	22	40	62,65
100	6,0	22	32	72,61
125	0,8	22	80	38,90
125	1,0	22	80	38,90
125	1,2	22	64	38,90
125	1,6	22	64	40,50
125	2,0	22	64	41,37
125	2,5	22	48	43,74
125	3,0	22	48	47,82
125	4,0	22	48	71,71
125	5,0	22	40	84,17
125	6,0	22	40	93,44
160	1,0	32	80	50,37
160	1,2	32	80	52,89
160	1,6	32	80	54,63
160	2,0	32	64	56,08
160	2,5	32	64	62,41
160	3,0	32	64	70,62
160	4,0	32	48	99,82
160	5,0	32	48	118,88
160	6,0	32	48	134,35

				FF94
D ₁ mm	e mm	D ₂ mm	z	€
200	1,2	32	100	58,94
200	1,6	32	80	75,56
200	2,0	32	80	79,49
200	2,5	32	80	89,62
200	3,0	32	64	101,58
200	4,0	32	64	144,03
200	5,0	32	64	171,47
200	6,0	32	48	197,37
250	1,6	32	100	99,07
250	2,0	32	100	111,04
250	2,5	32	80	127,35
250	3,0	32	80	139,78
250	4,0	32	80	202,53
250	5,0	32	64	241,51
250	6,0	32	64	283,10
315	2,5	40	100	198,49
315	3,0	40	100	221,70
315	4,0	40	80	283,60
315	5,0	40	80	347,90
315	6,0	40	80	411,58

SIERRAS CIRCULARES PARA MÁQUINAS TRONZADORAS

Fresas

Rosa



Ref. FF68



Ref. FF69



Ref. FF70



Ref. FF68MD

MATERIAL	FF68	FF69	FF70	BOTON	Z	FF68MD
ACABADO	HSS	HSS-Co	HSS			MD
D ₁ mm	e mm	D ₂ mm		€	€	AI
175	2,0	32		75,42	98,04	98,44
200	1,8/2"	32		77,60	71,10	100,42
225	1,6	32		85,76	111,48	123,94
225	2,0	32/40		81,54	106,00	119,44
250	1,2	32/40		108,18	140,63	147,98
250	1,6	32/40		93,64	121,72	136,76
250	2,0	32/40		92,41	120,14	134,77
250	2,5	32/40		103,38	135,68	146,66
275	1,6	32/40		123,66	160,76	167,80
275	2,0	32/40		121,63	165,15	165,15
275	2,5	32/40		126,58	164,56	170,44
300	2,0	32		149,49	194,33	201,50
300	2,5	32		152,88	198,75	203,47
300	3,0	32		184,83	240,27	221,97
315	2,0	32		163,08	212,01	219,99
315	2,5	32		163,76	212,88	219,99
315	3,0	32		198,14	257,57	243,10
350	2,5	32/40/50		209,28	272,08	280,10
350	3,0	32/40/50		235,10	305,63	303,88
370	3,0	50		296,25	385,14	376,55
400	3,0	40/50		345,18	448,74	422,80
400	3,5	40/50		376,44	489,38	439,97
425	3,0	40/50		388,68	505,28	528,49
425	3,5	40/50		425,36	552,98	544,35
450	3,0	40/50		505,54	657,20	610,41
450	3,5	40/50		549,03	713,73	651,37
450	4,0	40/50		577,56	750,84	693,65
500	3,5	40/50		706,67	918,67	865,41
500	4,0	40/50		747,44	971,67	907,69
525	4,0	50		849,37	1.104,18	988,28
550	4,0	50		890,13	1.157,17	1.063,82



Ref. FF68MD

CASQUILLOS

CRS		€
D ₁ mm	D ₂ mm	€
32	25,4	10,73
40	25,4	10,73
40	32,0	10,73

