

FRESAS



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

Fresas
Rosa

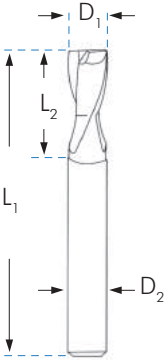
2Z



Ref. FFAL



SERIE CORTA



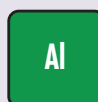
Consultar dimensiones DIN844 en páginas sucesivas



DIN 327				MATERIAL	FF01	FF02	FF60	FT02	FF92	FP05	FT12	FP08	FT01	DIN 844	
ACABADO					HSS	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	ASP 60	ASP 60	ASP 60	ASP 60	HSSCo 8%	
CALIDAD					BRILLANTE	BRILLANTE	TiAIN	TiAlSiN	BRILLANTE	BRILLANTE	TiAlSiN	BRILLANTE	TiAlSiN	BRILLANTE	
					★	★★	★★★	★★★★	★★	Premium Quality	Premium Quality	Premium Quality	Premium Quality	Al	
					TOL e8	TOL e8	TOL e8	TOL e8	TOL h10	TOL e8	TOL e8	TOL h10	TOL h10	TOL e8	
D1	L1	L2	D2		€	€	€	€	€	€	€	€	€	€	
mm	mm	mm	mm												
1,00	47	2,5	6							18,94	24,76	27,62	33,27		
2,00	48	4,0	6	8,85	11,21	18,39	21,05	22,83	15,98	22,01	24,38	30,25		13,57	
2,50	49	5,0	6	8,85	11,21	18,39	21,05	24,29						13,47	
3,00	49	5,0	6	8,85	11,21	18,39	21,05	22,95	15,98	22,01	24,38	30,25		13,17	
3,50	50	6,0	6	9,07	12,17	19,34	22,12	24,29						13,98	
4,00	51	7,0	6	8,68	11,21	18,40	21,06	22,95	14,53	21,04	24,38	30,25		13,57	
4,50	52	8,0	6	9,82	13,40	20,41	23,36	24,29						14,84	
5,00	52	8,0	6	8,68	11,21	18,40	21,06	22,95	14,53	21,04	24,38	30,25		13,57	
5,50	52	8,0	6	10,67	13,86	20,94	23,96	24,29						16,61	
6,00	52	8,0	6	8,68	11,21	18,40	21,06	22,95	14,53	21,04	24,38	30,25		14,70	
6,50	60	10,0	10	13,70	18,14	26,24	30,03							21,73	
7,00	60	10,0	10	12,96	17,60	25,69	29,40	27,65	21,92	29,10	32,26	43,05		19,76	
7,50	61	11,0	10	13,43	17,44	25,52	29,21							23,16	
8,00	61	11,0	10	10,54	14,50	22,69	25,98	24,62	19,04	28,53	32,26	43,05		17,88	
8,50	61	11,0	10	15,08	19,59	28,38	32,49							24,42	
9,00	61	11,0	10	13,47	17,91	26,83	30,70	28,30	23,44	31,43	32,26	44,35		22,14	
9,50	63	13,0	10	14,74	19,16	27,77	31,77								
10,00	63	13,0	10	11,09	14,40	23,37	26,88	24,42	21,21	29,07	32,26	44,35		19,33	
10,50	70	13,0	12		23,02	34,96	39,45								
11,00	70	13,0	12	16,92	21,86	31,99	36,61	34,49						26,69	
12,00	73	16,0	12	14,48	19,29	29,29	33,52	32,56	27,06	37,52	43,92	56,36		24,24	
13,00	73	16,0	12	21,77	28,13	39,44	45,14	43,01						34,55	
14,00	73	16,0	12	20,60	28,13	39,44	45,14	43,01	32,98	46,01	49,64	62,36		33,91	
15,00	73	16,0	12	23,48	31,46	44,68	51,15	46,26						37,25	
16,00	79	19,0	16	21,51	27,84	41,01	46,94	47,00	41,29	54,54	58,04	72,77		36,29	
17,00	79	19,0	16	28,17	37,79	52,35	59,92							50,49	
18,00	79	19,0	16	28,17	37,79	52,41	59,99	57,24	52,29	65,05	73,57	112,15		45,33	
19,00	79	19,0	16	34,56	47,22	63,47	72,65							61,13	
20,00	88	22,0	16		44,70	61,07	69,90								
20,00	88	22,0	20	33,02	44,70	61,07	69,90	68,36	61,60	78,25	85,76	114,55		52,40	
22,00	88	22,0	20	45,30	59,05	80,93	92,63	89,45	78,45	109,75	101,84	131,55		72,95	
24,00	102	26,0	25	56,85	76,20	100,49	115,01	106,90						109,62	
25,00	102	26,0	25	56,86	74,23	96,36	110,29	98,24	104,74	132,24	133,51	166,48		92,85	
26,00	102	26,0	25		87,08	133,43	150,57							145,80	
28,00	102	26,0	25	71,23	93,74	125,04	143,80							112,97	
30,00	102	26,0	25	81,96	106,80	138,42	158,42	142,28						130,01	
32,00	112	32,0	32	84,99	109,71	140,96	161,33							137,70	
36,00	112	32,0	32	109,42	146,75	181,08	207,25								
40,00	130	38,0	40	133,03	180,20	223,88	256,24								

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

2Z



SERIE LARGA



* Consultar fresas con mango roscado hasta fin de existencias.

DIN 327/L				MATERIAL	ACABADO	CALIDAD	FF06	FF67	FT06	FF15	FP21	DIN 844/L			
							HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	ASP 60				
							BRILLANTE	TiAlN	TiAlSiN	BRILLANTE	BRILLANTE				
							★★	★★★	★★★★	★★	Premium Quality				
							TOL e8	TOL e8	TOL e8	TOL h10	TOL h10				
D1	L1	L2	D2				€	€	€	€	€	L1	L2	D2	€
mm	mm	mm	mm									mm	mm	mm	
2,00	54	7	6				12,35	19,50	22,31	25,10	28,63	54	10	6	19,90
2,50	56	8	6				12,43	19,50	22,31	25,13		56	12	6	
3,00	56	8	6				12,35	19,54	22,37	25,13	29,51	56	12	6	20,00
3,50	59	10	6				14,04	23,22	26,59			59	15	6	
4,00	63	11	6				12,42	19,54	22,37	25,13	29,51	63	19	6	20,13
4,50	63	11	6				14,04	19,96	22,85			63	19	6	
5,00	68	13	6				12,42	19,54	22,37	26,61	31,24	68	24	6	20,22
5,50	68	13	6				14,04	23,22	26,59			68	24	6	
6,00	68	13	6				12,42	19,54	22,37	24,04	28,22	68	24	6	20,99
6,50	80	16	10				23,29	38,10	43,00			68	24	6	
7,00	80	16	10				20,50	28,62	32,76	30,32	35,26	80	30	10	30,25
7,50	88	19	10									80	30	10	
8,00	88	19	10				18,04	26,13	29,93	30,32	35,60	88	38	10	28,69
8,50	88	19	10				27,62	37,58	43,01			88	38	10	
9,00	88	19	10				24,28	33,10	37,87	33,27	38,70	88	38	10	30,25
10,00	95	22	10				19,88	30,27	34,64	33,13	39,07	95	45	10	28,69
11,00	102	22	12				31,34	42,27	48,38	44,12		102	45	12	40,20
12,00	110	26	12				28,58	39,97	45,76	43,27	50,56	110	53	12	37,11
13,00	110	26	12									110	53	12	47,18
14,00	110	26	12				37,67	48,86	55,92	57,41	63,38	110	53	12	42,47
15,00	123	32	16									110	53	12	54,26
16,00	123	32	16				43,17	60,30	69,02	65,35	75,63	123	63	16	51,85
17,00	123	32	16									123	63	16	
18,00	123	32	16				49,33	70,77	80,99	78,53	90,88	123	63	16	64,17
20,00	141	38	20				56,73	77,64	88,86	85,15	98,53	141	75	20	76,54
22,00	141	38	20				77,77	105,35	120,57	105,54	122,16	141	75	20	
24,00	166	45	25				118,36	134,03	151,25	141,99		166	90	25	
25,00	166	45	25				111,57	141,76	162,25	129,81	150,23	166	90	25	
26,00	166	45	25				148,15	157,83	178,10			166	90	25	
28,00	166	45	25				135,20	172,59	197,54			166	90	25	
30,00	166	45	25				150,30	185,79	212,64	193,38		166	90	25	
32,00	186	53	32				207,94	242,19	277,19	251,97		186	106	32	
36,00	186	53	32				235,26	275,37	315,17			186	106	32	
40,00	196	63	32				308,28	372,05	425,83			196	125	40	

Fresas

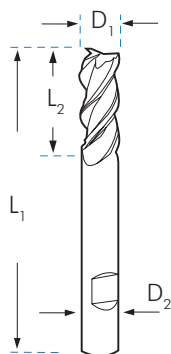
Rosa

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

3Z



SERIE CORTA



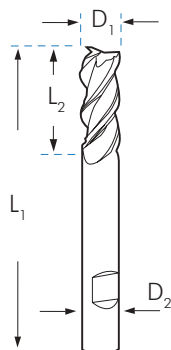
DIN 844				MATERIAL	FF63	FF75	FT63	FF73	FF76	FT73	DIN 327				FP06	FT03
				ACABADO	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%					ASP 60	ASP 60
				CALIDAD	BRILLANTE	TiAIN	TiAISIN	BRILLANTE	TiAIN	TiAISIN					BRILLANTE	TiAISIN
				DESABASTE	★★	★★★	★★★★	★★	★★★	★★★★					Premium Quality	Premium Quality
					TOL k10	TOL k10	TOL k10	TOL k12	TOL k12	TOL k12					TOL e8	TOL e8
D1	L1	L2	D2		€	€	€	€	€		L1	L2	D2		€	€
mm	mm	mm	mm								mm	mm	mm			
1,00	49	3	6								47	2,5	6		19,48	24,48
2,00	51	7	6		12,33	19,40	22,20				48	4,0	6		15,82	23,91
2,50	52	8	6		12,33	19,40	22,20				49	5,0	6			
3,00	52	8	6		12,29	19,40	22,20				49	5,0	6		15,82	23,91
3,50	55	11	6		12,70	19,76	22,73				50	6,0	6			
4,00	55	11	6		12,32	19,40	22,20				51	7,0	6		15,82	23,91
4,50	57	13	6		13,57	20,50	23,47				52	8,0	6			
5,00	57	13	6		12,32	19,49	22,31				52	8,0	6		15,82	23,91
5,50	57	13	6		16,75	26,67	30,52				52	8,0	6			
6,00	57	13	6		12,97	21,79	24,94	35,17	42,47	47,92	52	8,0	6		15,82	23,91
6,50	66	16	10		23,26	35,67	40,26				60	10,0	10			
7,00	66	16	10		18,12	26,19	30,11	41,59	50,70	57,21	60	10,0	10		21,30	29,14
7,50	69	19	10		23,43	36,05	40,69				61	11,0	10			
8,00	69	19	10		16,19	24,18	27,68	36,04	41,98	48,05	61	11,0	10		21,30	29,14
8,50	69	19	10		24,70	37,23	42,01				61	11,0	10			
9,00	69	19	10		20,22	28,99	33,18	42,77	50,20	57,45	61	11,0	10		24,97	32,09
9,50	72	22	10		26,69	39,12	44,14				63	13,0	10			
10,00	72	22	10		17,54	26,24	30,03	36,25	44,62	51,06	63	13,0	10		22,58	30,14
11,00	79	22	12		27,85	41,42	46,75	52,33	60,28	69,00	70	13,0	12			
12,00	83	26	12		22,02	31,32	35,85	43,62	51,35	58,77	73	16,0	12		29,13	38,12
13,00	83	26	12		35,02	48,16	54,36	56,99	66,38	75,99	73	16,0	12			
14,00	83	26	12		30,00	41,09	47,03	49,78	58,57	67,05	73	16,0	12		37,74	46,42
15,00	83	26	12		35,98	49,98	56,41	63,01	68,97	74,62	73	16,0	12			
16,00	92	32	16		32,94	45,85	52,48	60,34	72,78	83,32	79	19,0	16		44,39	53,44
17,00	92	32	16		53,91	70,78	79,87				79	19,0	16			
18,00	92	32	16		41,38	55,98	64,07	66,03	80,12	91,70	79	19,0	16		54,62	65,36
19,00	92	31	16		65,92	81,44	91,91				79	19,0	16			
20,00	104	38	20		47,52	63,10	72,23	80,56	94,24	107,87	88	22,0	20		64,96	78,25
22,00	104	38	20		75,76	95,27	107,52				88	22,0	20		86,71	111,95
25,00	121	45	25		98,98	126,14	142,36	122,03	139,45	159,61	102	26,0	25		108,86	126,24
28,00	121	45	25		114,98	141,05	159,17				102	26,0	25			
30,00	121	45	25		141,45	165,66	186,95	151,75	179,05	204,94	102	26,0	25			
32,00	133	53	32		143,97	178,79	201,76				112	32,0	32			

FRESAS FRONTALES SERIE LARGA DE 3 CORTES DIN 844/L

3Z



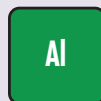
SERIE LARGA



DIN 844/L				MATERIAL	ACABADO	CALIDAD
D1	L1	L2	D2			
mm	mm	mm	mm	€	€	€
1,00	52	7	6			
2,00	54	10	6	16,61	24,32	27,83
2,50	56	12	6	16,93	24,29	27,80
3,00	56	12	6	16,61	24,25	27,75
3,50	59	15	6	18,59	26,00	29,76
4,00	63	19	6	16,61	24,25	27,75
4,50	63	19	6	18,59	26,00	29,76
5,00	68	24	6	16,61	24,25	27,75
5,50	68	24	6	18,59	26,00	29,76
6,00	68	24	6	18,62	25,36	29,03
6,50	68	24	6			
7,00	80	30	10	25,21	33,95	38,86
7,50	80	30	10			
8,00	88	38	10	23,06	30,63	35,05
8,50	88	38	10			
9,00	88	38	10	28,07	36,33	41,59
9,50	88	38	10			
10,00	95	45	10	23,19	33,68	38,55
11,00	102	45	12	35,65	45,87	52,50
12,00	110	53	12	29,51	41,06	47,00
13,00	110	53	12			
14,00	110	53	12	38,43	50,21	57,47
15,00	110	53	12			
16,00	123	63	16	43,30	60,51	69,27
17,00	123	63	16			
18,00	123	63	16	52,47	71,54	81,88
19,00	123	63	16			
20,00	141	75	20	61,59	81,85	93,68
22,00	141	75	20	77,68	105,54	120,80
25,00	166	90	25	113,22	139,43	159,59
28,00	166	90	25	126,04	166,97	191,12
30,00	166	90	25	140,32	178,36	204,14
32,00	186	106	32	166,96	200,87	229,92

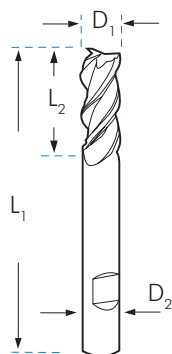
FRESAS FRONTALES SERIE CORTA Y LARGA VARIOS CORTES DIN 844 Y DIN 844/L

4-6 Z



SERIE CORTA

SERIE LARGA



DIN 844					MATERIAL	ACABADO	CALIDAD	FF18	FF20	FT18	FP07	FT09
								HSSCo 8%	HSSCo 8%	HSSCo 8%	ASP 60	ASP 60
								BRILLANTE	TiAIN	TiAISIN	BRILLANTE	TiAISIN
								★★	★★★	★★★★	Premium Quality	Premium Quality
D1	L1	L2	D2	Z	€	€	€	€	€	€	€	€
1,00	49	3	6	4							21,59	25,88
2,00	51	7	6	4	12,36	19,45	22,26				15,78	21,83
2,50	52	8	6	4	12,36	19,45	22,26					
3,00	52	8	6	4	12,36	19,45	22,26				15,78	21,83
3,50	55	11	6	4	12,73	19,81	22,69					
4,00	55	11	6	4	12,36	19,45	22,26				15,78	21,83
4,50	57	13	6	4	13,59	20,54	23,50					
5,00	57	13	6	4	12,36	19,45	22,26				15,78	21,83
5,50	57	13	6	4	19,77	26,67	30,52					
6,00	57	13	6	4	12,90	20,06	22,95				15,78	21,83
6,50	66	16	10	4	19,72	27,76	31,77					
7,00	66	16	10	4	18,12	26,20	29,98				21,45	31,15
7,50	69	16	10	4	23,36	31,19	35,70					
8,00	69	19	10	4	15,95	24,28	27,79				21,35	30,84
8,50	69	19	10	4	24,36	32,98	37,76					
9,00	69	19	10	4	20,13	29,03	33,23				25,23	33,64
9,50	69	19	10	4	25,77	34,31	39,27					
10,00	72	22	10	4	17,45	26,35	30,17				22,68	31,61
11,00	79	22	12	4	24,27	34,29	39,25					
12,00	83	26	12	4	22,02	30,46	34,87				29,95	41,86
13,00	83	26	12	4	31,06	42,36	48,49					
14,00	83	26	12	4	29,32	41,33	47,31				38,91	46,61
15,00	83	26	12	4	33,48	46,19	52,87					
16,00	92	32	16	4	32,67	46,07	52,72				45,60	55,21
17,00	92	32	16	4	40,71	55,17	63,14					
18,00	92	32	16	4	40,24	56,04	64,13				55,61	69,05
19,00	92	31	16	4	47,66	63,41	72,57					
20,00	104	38	20	4	47,12	63,41	72,57				65,41	89,70
22,00	104	38	20	5	65,40	87,90	100,61				86,19	105,79
24,00	121	45	25	5	82,22	103,58	118,55					
25,00	121	45	25	5	78,59	103,09	118,00				111,20	139,51
26,00	121	45	25	5	94,34	125,14	145,30					
28,00	121	45	25	5	93,55	125,42	148,47					
30,00	121	45	25	6	108,75	139,21	167,27					
32,00	133	53	32	6	111,50	142,42	171,12					
36,00	133	53	32	6	148,60	179,93	216,17					
40,00	155	63	40	6	178,64	218,81	262,90					

DIN 844/L					MATERIAL	ACABADO	CALIDAD	FF21	FF23	FT21	FP20
								HSSCo 8%	HSSCo 8%	HSSCo 8%	ASP 60
								BRILLANTE	TiAIN	TiAISIN	BRILLANTE
								★★	★★★	★★★★	Premium Quality
L1	L2	D2	Z	€	€	€	€	€	€	€	€
52	7	6	4								
54	10	6	4	15,09	22,09	25,28	23,44				
56	12	6	4	15,01	22,09	25,28					
56	12	6	4	15,09	22,10	25,29	23,44				
59	15	6	4	19,84	26,79	30,65					
63	19	6	4	15,09	22,10	25,29	23,44				
63	19	6	4	19,84	26,79	30,65					
68	24	6	4	15,09	22,10	25,29	23,44				
68	24	6	4	19,71	26,79	30,65					
68	24	6	4	15,09	22,10	25,29	23,44				
68	24	6	4								
80	30	10	4	22,90	30,73	35,18	34,97				
80	30	10	4								
88	38	10	4	20,80	27,69	31,69	34,97				
88	38	10	4								
88	38	10	4	23,70	32,28	36,95	34,97				
88	38	10	4								
95	45	10	4	20,89	30,56	34,98	34,97				
102	45	12	4	29,69	40,27	46,10					
110	53	12	4	27,34	38,25	43,79	50,70				
110	53	12	4								
110	53	12	4	35,78	46,64	53,39	58,52				
110	53	12	4								
123	63	16	4	39,11	54,87	62,81	72,52				
123	63	16	4								
123	63	16	4	47,77	65,32	74,76	92,79				
123	63	16	4								
141	75	20	4	55,95	75,45	86,36	113,79				
141	75	20	5	77,58	99,44	113,83	127,63				
141	75	25	5								
166	90	25	5	102,87	127,00	145,35	185,40				
166	90	25	5								
166	90	25	5	115,06	151,08	172,91					
166	90	25	6	129,87	165,97	189,97					
186	106	32	6	130,93	167,14	191,30					
186	106	32	6	187,67	225,32	257,88					
217	125	40	6	208,01	268,64	308,94					

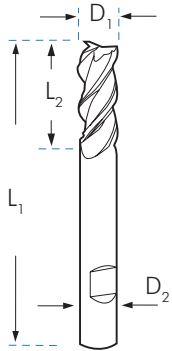
FRESAS FRONTALES DE DESBASTE VARIOS CORTES DIN 844 Y DIN 844/L

4-6 Z



SERIE CORTA

SERIE LARGA



DIN 844		MATERIAL		ACABADO		CALIDAD		DESBASTE		FF25	FF27	FT25	FF100
										HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%
										BRILLANTE	TiAIN	TiAISIN	BRILLANTE
										★★	★★★	★★★★	★★
										NR	NR	NR	NF
D1	L1	L2	D2	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	31,65	38,21	43,73	34,46					
6,50	66	16	10	4									
7,00	66	16	10	3	38,04	45,61	52,20	41,11					
7,50	69	19	10	4									
8,00	69	19	10	3	33,04	40,61	46,48	35,96					
8,50	69	19	10	4									
9,00	69	19	10	3	39,49	47,82	54,74	42,69					
10,00	72	22	10	4	32,78	40,22	46,02	35,95					
11,00	79	22	12	4	48,03	57,61	65,94	52,67					
12,00	83	26	12	4	39,59	49,03	56,11	43,08					
13,00	83	26	12	4	56,21	66,52	76,14	61,21					
14,00	83	26	12	4	45,96	56,86	65,09	50,39					
15,00	83	26	12	4	60,44	73,19	83,77	66,24					
16,00	92	32	16	4	54,52	67,01	76,70	57,71					
17,00	92	32	16	4	74,45	88,58	101,38						
18,00	92	32	16	4	59,45	73,83	84,50	65,16					
19,00	92	31	16	4	87,99	102,67	117,52						
20,00	104	38	20	4	74,50	90,18	103,22	81,68					
SIN CORTE AL CENTRO					FF05	FF74	FT05	FF100					
22,00	104	38	20	6	84,17	108,82							
24,00	121	45	25	6	106,02	129,05	141,34						
25,00	121	45	25	6	105,02	128,30	140,52	117,03					
26,00	121	45	25	6	121,62	157,00	171,94						
28,00	121	45	25	6	121,62	156,58	171,49	133,00					
30,00	121	45	25	6	130,65	171,37	187,69	156,42					
32,00	133	53	32	6	148,01	184,32	201,87	161,88					
36,00	133	53	32	6	175,42	212,40	232,64						
40,00	155	63	32	6	197,21	245,95	269,38						

DIN 844/L		MATERIAL		ACABADO		CALIDAD		DESBASTE		FF29	FF31	FT29
										HSSCo 8%	HSSCo 8%	HSSCo 8%
										BRILLANTE	TiAIN	TiAISIN
										★★	★★★	★★★★
										NR	NR	NR
L1	L2	D2	Z	€	€	€						
54	10	6	3									
56	12	6	3									
56	12	6	3									
59	15	6	3									
63	19	6	3									
63	19	6	3									
68	24	6	3									
68	24	6	3									
68	24	6	3	44,86	50,74	58,35						
68	24	6	4									
80	30	10	3	50,87	57,97	66,35						
80	30	10	4									
88	38	10	3	46,40	53,65	61,40						
88	38	10	4									
88	38	10	3	50,87	58,78	67,27						
95	45	10	4	40,40	49,96	57,19						
102	45	12	4	66,13	75,78	86,74						
110	53	12	4	49,91	60,39	69,12						
110	53	12	4									
110	53	12	4	57,67	68,23	78,10						
110	53	12	4									
123	63	16	4	67,51	82,79	94,75						
123	63	16	4									
123	63	16	4	78,84	96,81	110,80						
123	63	16	4									
141	75	20	4	95,96	114,13	130,63						
					FF08	FF58	FT08					
141	75	20	6	108,09	145,79	159,67						
141	75	25	6									
166	90	25	6	136,50	172,71	189,16						
166	90	25	6									
166	90	25	6	153,93	198,56	217,47						
166	90	25	6	199,57	237,18	259,78						
186	106	32	6	208,73	242,48	265,57						
186	106	32	6	250,64	289,56	317,13						
217	125	40	6	296,34	360,41	394,74						

Fresas

Rosa

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

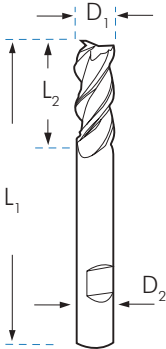
Fresas
Rosa

4-6 Z



SERIE CORTA

SERIE LARGA

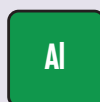


DIN 844					FF03	FF04	FF54	FT04
MATERIAL					HSS	HSSCo 8%	HSSCo 8%	HSSCo 8%
ACABADO					BRILLANTE	BRILLANTE	TiAIN	TiAlSiN
CALIDAD					★	★★	★★★	★★★★
D1 mm	L1 mm	L2 mm	D2 mm	Z	€	€	€	€
2,00	51	7	6	4	8,86	11,62	18,69	21,40
2,50	52	8	6	4	8,86	11,62	18,69	21,40
3,00	52	8	6	4	8,86	11,62	18,69	21,40
3,50	55	11	6	4	9,14	11,98	19,11	21,86
4,00	55	11	6	4	8,86	11,62	18,76	21,46
4,50	57	13	6	4	9,14	11,97	19,11	21,86
5,00	57	13	6	4	8,86	11,62	18,76	21,46
5,50	57	13	6	4	13,77	18,07	25,12	28,75
6,00	57	13	6	4	8,86	11,62	18,75	21,45
6,50	66	16	10	4	13,77	18,07	26,00	29,76
7,00	66	16	10	4	12,99	17,06	25,05	28,67
7,50	69	16	10	4	16,29	21,34	29,12	33,33
8,00	69	19	10	4	10,10	13,10	21,24	24,31
8,50	69	19	10	4	16,97	22,30	30,85	35,31
9,00	69	19	10	4	13,59	17,82	26,61	30,46
9,50	72	22	10	4	18,43	23,56	32,39	37,08
10,00	72	22	10	4	12,34	16,16	25,07	28,69
11,00	79	22	12	4	17,00	22,30	32,34	37,01
12,00	83	26	12	4	14,66	19,29	29,09	33,29
13,00	83	26	12	4	21,86	28,79	39,63	45,35
14,00	83	26	12	4	20,68	27,06	38,12	43,62
15,00	83	26	12	4	23,58	30,89	43,90	50,24
16,00	92	32	16	4	23,00	30,13	43,18	49,42
17,00	92	32	16	4	28,34	37,30	51,63	59,09
18,00	92	32	16	4	28,30	37,14	51,63	59,09
19,00	92	31	16	4	33,52	43,70	59,24	67,81
20,00	104	38	20	4	33,18	43,70	59,24	67,81
22,00	104	38	20	5	46,06	60,65	81,99	93,85
24,00	121	45	25	5	57,21	75,36	96,38	110,32
25,00	121	45	25	5	57,02	75,36	96,38	110,32
26,00	121	45	25	5	71,52	94,21	121,84	139,45
28,00	121	45	25	5	71,52	94,21	125,13	143,21
30,00	121	45	25	6	82,91	108,60	139,53	159,71
32,00	133	53	32	6	85,27	111,40	142,78	163,42
36,00	133	53	32	6	111,59	146,96	178,78	204,62
40,00	143	63	32	6	133,78	176,66	219,39	251,10

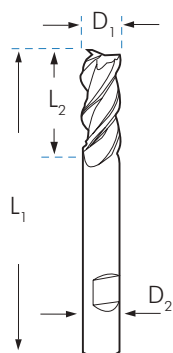
DIN 844/L					FF07	FF57	FT07
MATERIAL					HSSCo 8%	HSSCo 8%	HSSCo 8%
ACABADO					BRILLANTE	TiAIN	TiAlSiN
CALIDAD					★★	★★★	★★★★
L1 mm	L2 mm	D2 mm	Z		€	€	€
54	10	6	4		14,52	22,48	25,85
56	12	6	4		14,52	20,63	23,73
56	12	6	4		14,52	23,38	26,89
59	15	6	4		19,10	28,06	32,27
63	19	6	4		14,52	23,38	26,89
63	19	6	4		19,10	28,06	32,27
68	24	6	4		14,52	23,38	26,89
68	24	6	4		19,10	28,06	32,27
68	24	6	4		14,52	23,38	26,89
80	30	10	4		21,98	32,26	37,10
80	30	10	4				
88	38	10	4		20,17	30,40	34,95
88	38	10	4				
88	38	10	4		22,82	34,02	39,13
88	38	10	4				
95	45	10	4		20,07	32,35	37,21
102	45	12	4		27,45	40,83	46,96
110	53	12	4		25,49	38,83	44,66
110	53	12	4				
110	53	12	4		33,32	47,11	54,18
123	63	16	4		36,42	55,69	64,05
123	63	16	4				
123	63	16	4		44,48	66,17	76,09
123	63	16	4				
141	75	20	4		52,09	75,94	87,33
141	75	20	5		72,25	99,81	114,79
141	75	25	5				
166	90	25	5		95,82	127,80	146,96
166	90	25	5				
166	90	25	5		117,12	157,37	180,99
166	90	25	6		134,05	174,47	200,63
186	106	32	6		133,84	175,70	202,05
186	106	32	6		190,88	241,41	277,63
217	125	40	6		212,18	324,45	373,12

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

3-5 Z



SERIE CORTA



SERIE LARGA



DIN 844 MATERIAL ACABADO DESBASTE CALIDAD					FP10	FT10	FP11	FT11	FP18
					ASP 60	ASP 60	ASP 60	ASP 60	ASP 60
					BRILLANTE	TiAlSiN	BRILLANTE	TiAlSiN	TiAlN
					NF	NF	NR	NR	NR
									
									
D1 mm	L1 mm	L2 mm	D2 mm	Z	€	€	€	€	€
2,00	51	7	6	3					
2,50	52	8	6	3					
3,00	52	8	6	3					
3,50	55	11	6	3					
4,00	55	11	6	3					
4,50	57	13	6	3					
5,00	57	13	6	3					
5,50	57	13	6	3					
6,00	57	13	6	3	38,55	44,65	35,72	38,64	46,68
6,50	66	16	10	3					
7,00	66	16	10	3	49,43	54,32	44,85	51,51	66,27
7,50	69	19	10	3					
8,00	69	19	10	3	42,58	50,04	39,03	45,51	62,25
8,50	69	19	10	3					
9,00	69	19	10	3	51,28	56,67	46,65	53,86	68,01
9,50	72	22	10	4					
10,00	72	22	10	4	40,59	48,56	36,80	46,12	63,87
11,00	79	22	12	4					
12,00	83	26	12	4	53,40	61,04	48,69	56,23	77,95
13,00	83	26	12	4					
14,00	83	26	12	4	64,85	74,41	58,79	67,48	93,15
15,00	83	26	12	4					
16,00	92	32	16	4	79,49	88,47	72,48	82,42	107,42
17,00	92	32	16	4					
18,00	92	32	16	4	87,28	96,19	78,65	90,15	116,27
19,00	92	31	16	4					
20,00	104	38	16	4					
20,00	104	38	20	4	108,27	120,47	97,87	113,01	148,45
22,00	104	38	20	5	133,47	148,41	121,04	138,84	
22,00	121	45	25	5					
24,00	121	45	25	5					
25,00	121	45	25	5	158,22	177,43	143,51	164,33	231,69
26,00	121	45	25	5					
28,00	121	45	25	5					
30,00	121	45	25	5					
32,00	133	53	32	5					
36,00	133	53	32	5					
40,00	155	63	40	5					

DIN 844/L MATERIAL ACABADO DESBASTE CALIDAD				FP15	FT15	FP13	FT13
				ASP 60	ASP 60	ASP 60	ASP 60
				BRILLANTE	TIAISIN	BRILLANTE	TIAISIN
				NF	NF	NR	NR
							
L1 mm	L2 mm	D2 mm	Z	€	€	€	€
54	10	6	3				
56	12	6	3				
56	12	6	3				
59	15	6	3				
63	19	6	3				
63	19	6	3				
68	24	6	3				
68	24	6	3				
68	24	6	3	60,49	64,50	53,66	59,59
68	24	6	3				
80	30	10	3	68,38	78,57	62,10	73,19
80	30	10	3				
88	38	10	3	63,63	68,34	56,31	63,66
88	38	10	3				
88	38	10	3	67,11	77,51	62,10	73,66
88	38	10	3				
95	45	10	4	57,25	64,25	51,01	59,33
102	45	12	4				
110	53	12	4	72,55	79,98	64,07	73,22
110	53	12	4				
110	53	12	4	85,03	98,47	76,47	87,15
110	53	12	4				
123	63	16	4	101,71	112,75	90,75	104,04
123	63	16	4				
123	63	16	4	113,77	133,70	103,65	119,19
123	63	16	4				
141	75	16	4				
141	75	20	4	147,88	163,72	131,02	152,23
141	75	20	5	225,94	243,69	197,85	221,06
141	75	25	5				
141	75	25	5				
166	90	25	5	226,88	251,41	200,13	234,29
166	90	25	5				
166	90	25	5				
166	90	25	5				
186	106	32	5				
186	106	32	5				
217	125	40	5				

Fresas

Rosa

FRESAS SERIE SUPER CORTA Y EXTRA CORTA DE 3 CORTES

3 Z



SERIE SUPER CORTA



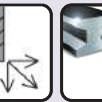
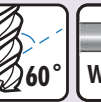
MATERIAL ACABADO					FF51
					HSSCo 8% BRILLANTE
D1 mm	L1 mm	L2 mm	D2 mm	Z	€
1,00	34	2	6	3	11,82
1,50	34	3	6	3	11,82
2,00	35	4	6	3	11,81
2,50	36	5	6	3	11,81
3,00	36	5	6	3	11,81
3,50	37	6	6	3	11,81
4,00	38	7	6	3	11,81
4,50	38	7	6	3	11,81
5,00	39	8	6	3	11,81
5,50	39	8	6	3	11,81
6,00	39	8	6	3	11,81
6,50	42	10	8	3	16,23
7,00	42	10	8	3	16,23
7,50	42	10	8	3	16,23
8,00	43	11	8	3	16,23
8,50	48	11	10	3	18,60
9,00	48	11	10	3	18,60
9,50	48	11	10	3	18,60
10,00	50	13	10	3	18,60

SERIE EXTRA CORTA



MATERIAL ACABADO					FF53
					HSSCo 8% BRILLANTE
D1 mm	L1 mm	L2 mm	D2 mm	Z	€
2,00	38	7	6	3	12,95
2,50	39	8	6	3	12,95
3,00	39	8	6	3	12,95
3,50	41	10	6	3	12,95
4,00	42	11	6	3	12,95
4,50	42	11	6	3	12,95
5,00	44	13	6	3	12,95
5,50	44	13	6	3	12,95
6,00	44	13	6	3	12,95
6,50	48	16	8	3	17,82
7,00	48	16	8	3	17,82
8,00	51	19	8	3	17,82
8,50	56	19	10	3	20,37
9,00	56	19	10	3	20,37
10,00	59	22	10	3	20,37

3-4 Z



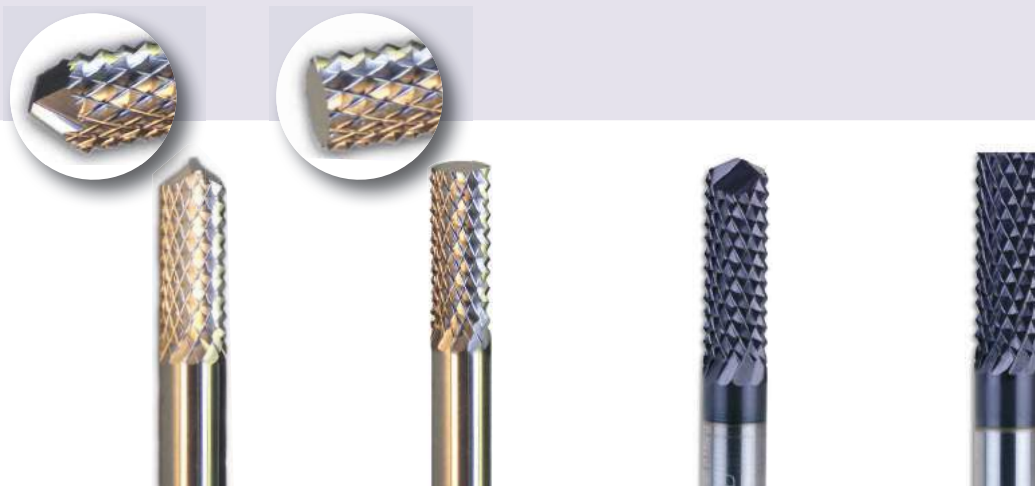
Mejora la extracción de viruta



						FP22
	D1 mm	L1 mm	L2 mm	D2 mm	Z	€
FP220600	6,00	57	13	6	3	30,61
FP220700	7,00	66	16	10	3	41,35
FP220800	8,00	69	19	10	3	41,35
FP220900	9,00	69	19	10	3	41,35
FP221000	10,00	72	22	10	3	41,35
FP221200	12,00	83	26	12	3	56,92
FP221400	14,00	83	26	12	3	64,89
FP221500	15,00	83	26	12	3	79,26
FP221600	16,00	92	32	16	3	79,26
FP221800	18,00	92	32	16	3	111,11
FP222000	20,00	104	38	20	3	132,60
FP222500	25,00	121	45	25	4	

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

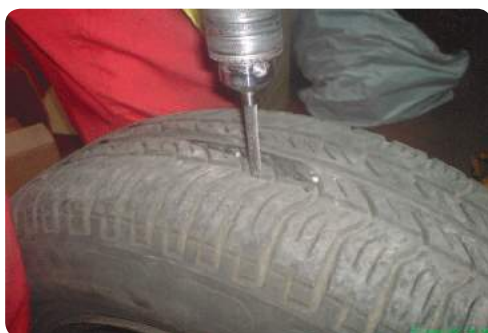
MD



D1 mm	L1 mm	L2 mm	D2 mm		RFC €		RF		RFCTL		RFTL
									TiAIN		TiAIN
1,50	38	5	3,00	RFC0150	14,93	RF0150	14,15	RFC0150TL	22,56	RF0150TL	21,79
2,00	38	10	3,00	RFC0200	14,93	RF0200	14,15	RFC0200TL	22,56	RF0200TL	21,79
3,00	38	12	3,00	RFC0300	14,93	RF0300	14,15	RFC0300TL	22,56	RF0300TL	21,79
5,00	50	16	5,00	RFC0500	29,63	RF0500	26,91	RFC0500TL	37,28	RF0500TL	34,55
6,00	63	25	6,00	RFC0600	35,24	RF0600	31,95	RFC0600TL	44,52	RF0600TL	41,25
6,35	75	30	6,35	RFC0635	39,12	RF0635	35,82	RFC0635TL	48,44	RF0635TL	45,12
8,00	63	25	8,00	RFC0800	58,67	RF0800	53,26	RFC0800TL	67,45	RF0800TL	62,03
10,00	63	25	10,00	RFC1000	74,53	RF1000	67,77	RFC1000TL	83,76	RF1000TL	76,99
12,00	75	25	12,00	RFC1200	93,70	RF1200	85,21	RFC1200TL	105,12	RF1200TL	96,62

FRESA DE METAL DURO PARA REPARACIÓN DE PINCHAZOS

MD



	D1 mm	L1 mm	L2 mm	D2 mm	RN €
RN0300	3,00	38	14	3	14,53
RN0600	6,00	75	50	6	35,06
RN0800	8,00	100	53	8	39,49
RN1000	10,00	100	75	10	61,97

FRESAS DE METAL DURO ACCESORIOS TIPO ROTOZIP



Ref.: RR0317



Ref.: RR0635



Ref.: RR0435



Ref.: RR0247



Ref.: RR0535

		D1 mm	L1 mm	L2 mm	D2 mm	RR €
RR0317	Cortador Azulejo	3,17	50	25	3,17	16,75
RR0635	Cortador Azulejo	6,35	50	25	6,35	28,08
RR0435	Trabajos en Yeso	6,35	52	32	6,35	35,14
RR0247	Argamasa	2,47	38	14	3,17	12,31
RR0535	Fresas para Chapa	6,35	50	10	6,35	30,51

FRESAS DE 1 LABIO HSSCo

HSSCo

Al

PVC

TOL D1
k12TOL D2
h6

SERIE CORTA

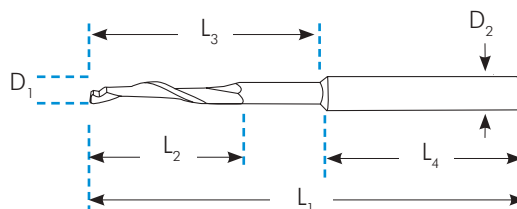


	D1 mm	L1 mm	L2 mm	D2 mm	FF13	
					HSSCo	TiN
					€	€
FF1381	1,0	60	12	8	34,58	50,48
FF1382	2,0	60	12	8	34,58	50,48
FF1383	3,0	60	12	8	13,65	19,92
FF1384	4,0	60	12	8	13,65	19,92
FF1385	5,0	60	13	8	13,65	19,92
FF1386	6,0	60	16	8	13,90	19,92
FF1387	7,0	60	16	8	16,66	23,42
FF1388	8,0	80	16	8	16,66	23,42
FF131010	10,0	80	15	10	17,83	23,42
FF1361	1,0	45	6	6	25,01	33,17
FF13615	1,5	45	6	6	25,01	33,17
FF1362	2,0	45	6	6	25,01	33,17
FF1363	3,0	60	12	6	12,95	18,17
FF1364	4,0	60	12	6	13,00	18,17
FF1365	5,0	60	12	6	13,00	18,17
FF1366	6,0	60	14	6	13,00	18,17

SERIE LARGA



	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	FF14	
						HSSCo	TiN
						€	€
FF1483	3	80	16	45	8	22,67	28,77
FF1484	4	80	16	45	8	19,30	25,55
FF1485	5	80	16	45	8	19,30	25,55
FF1486	6	90	16	45	8	19,30	25,55
FF1487	7	90	20	50	8	24,99	31,51
FF1488	8	100	30	70	8	22,59	29,05
FF1465	5	80	14	45	6	19,29	25,55
FF1466	6	80	14	45	6	19,30	25,55



SERIE EXTRA LARGA



	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	L4 mm	FF14-E	
							HSSCo	TiN
							€	€
FF14-E	5	100	30	55	8	45	18,25	24,52
FF14-EL	5	100	50	-	8	50	23,45	33,30

ALUMINIO LACADO



	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	FF50	
						HSSCo	TiN
						€	€
FF5084	4	80	16	35	8	18,17	24,79
FF5085	5	80	18	35	8	18,17	24,79

MEDIDAS ESPECIALES



FF14 Especiales							
	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	HSSCo	€
FF148412020	4	120	20	-	8		20,18
FF14856018	5	60	18	-	8		16,63
FF14859025	5	90	25	-	8		21,70
FF148510025	5	100	25	-	8		20,17
FF148512014	5	120	14	-	8		20,17
FF14851001817	5	100	18	35	8		20,49
FF14851201461	5	120	14	75	8		27,60
FF14851201817	5	120	18	35	8		27,60
FF1486801421	6	80	14	35	8		22,87
FF14861001835	6	100	18	35	8		22,87
FF14861201461	6	120	14	75	8		33,07

FF14 Especiales							
	D1 mm	L1 mm	L2 mm	L3 mm	D2 mm	HSSCo	€
FF14861003045	6	100	30	45	8		27,73
FF14861006040	6	100	60	-	8		35,61
FF14888025	8	80	25	-	8		17,26
FF148810014	8	100	14	-	8		19,09
FF148812014	8	120	14	-	8		19,46
FF14881201476	8	120	14	90	8		25,01
FF14898014	9	80	14	-	8		20,02
FF148108014	10	80	14	-	8		21,31
FF1410101003040	10	100	30	70	10		26,01
FF1410101201481	10	120	14	95	10		26,01
FF14101012014	10	120	14	-	10		22,33
FF148128014	12	80	14	-	8		24,17

FRESAS DE 1 LABIO DE METAL DURO

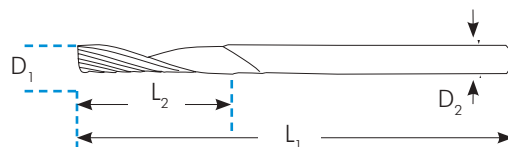
MD

Al

PVC

TOL
h10

TOL D2
h6



HÉLICE A - SERIE CORTA



HÉLICE A - SERIE LARGA



	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13
					MD €
FMGA1331	1,0	35	4,5	3	59,05
FMGA13315	1,5	50	6,0	3	53,14
FMGA1322	2,0	40	10,0	2	41,34
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	82,37
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	104,84
FMGA13550	5,0	50	16,0	5	24,73
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	110,68
FMGA136650	6,0	50	16,0	6	34,91
FMGA1366	6,0	64	20,0	6	40,91
FMGA1368	6,0	64	20,0	8	108,85
FMGA1378	7,0	64	20,0	8	111,57
FMGA138816	8,0	66	16,0	8	40,82
FMGA1388	8,0	76	38,0	8	54,13
FMGA131010	10,0	76	30,0	10	62,67

	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13E
					MD €
FMGA1355E	5	80	38	5	100,28
FMGA1366E	6	85	40	6	110,75
FMGA1388E	8	90	38	8	118,63
FMGA1388EX	8	110	43	8	198,70
FMGA131010E	10	100	40	10	136,08
FMGA131010EL	10	120	60	10	165,36

HÉLICE B



	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13HI
					MD €
FMGA1333HI	3	50	8	3	32,93
FMGA1344HI	4	64	12	4	32,94
FMGA1355HI	5	64	16	5	35,67
FMGA1366HI	6	64	20	6	53,85
FMGA1388HI	8	76	38	8	71,26
FMGA131010HI	10	76	35	10	82,51

HÉLICE C



	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13CO
					MD €
FMGA1366CO	6	64	25	6	111,89
FMGA1388CO	8	64	25	8	154,72
FMGA131010CO	10	76	35	10	181,85
FMGA131212CO	12	76	35	12	241,25

CANAL RECTO



	D1 mm	L1 mm	L2 mm	D2 mm	FMGA13R
					MD €
FMGA1346R	4	64	16	6	37,78
FMGA1356R	5	64	20	6	37,78
FMGA1366R	6	64	25	6	47,27
FMGA1388R	8	64	25	8	69,27
FMGA131010R	10	88	35	10	90,66
FMGA131212R	12	88	35	12	130,85

TIPOS DE HÉLICES

Hélice A

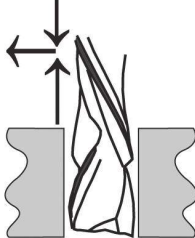
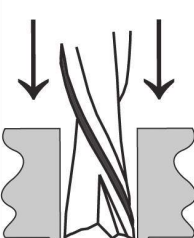
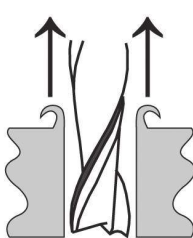
Hélice B

Hélice C

Extracción
de Viruta

Extracción
de Viruta

Extracción
de Viruta



Corte Derecha
Hélice Derecha

Corte Derecha
Hélice Izquierda

Corte Derecha
Doble hélice
Izquierda-Derecha

VELOCIDADES DE CORTE

D1 mm	HSSCo		MD	
	Aluminio (R.P.M.)	P.V.C. (R.P.M.)	Aluminio (R.P.M.)	P.V.C. (R.P.M.)
3,00	12000	12000	19000	19000
4,00	11000	11000	18000	18000
5,00	10000	10000	18000	18000
6,00	10000	10000	17000	17000
7,00	9000	9000	17000	17000
8,00	9000	9000	16000	16000
9,00	9000	9000	16000	16000
10,00	9000	9000	16000	16000

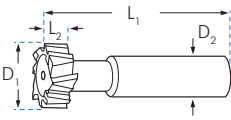
NOTA: Para la serie larga conviene reducir las RPM en un 15%

FRESAS PARA RANURAR

Ref. FF17

RANURAR
EN "T"

DIN
851A



TOL D1
d11

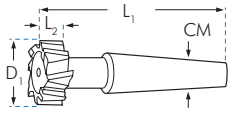
TOL D2
h6

FF17					
D1 x L2 mm	D2 mm	Z	L1 mm	HSSCo €	TiAlN €
11,0x4,0	10	4	53,5	80,31	98,68
12,5x6,0	10	6	57,0	83,49	104,37
16,0x8,0	10	6	62,0	91,80	116,47
18,0x8,0	12	8	70,0	96,70	124,53
21,0x9,0	12	8	74,0	106,50	149,59
25,0x11,0	16	8	82,0	120,20	162,90
32,0x14,0	16	10	90,0	151,62	211,26
40,0x18,0	25	10	108,0	210,31	294,51
50,0x22,0	32	10	124,0	231,82	331,65
60,0x28,0	32	10	139,0	242,33	346,72
72,0x35,0	32	10	153,0	252,87	361,79

Ref. FF17C

RANURAR
EN "T"

DIN
851B



TOL D2
h12

FF17C					
D1 x L2 mm	CM	ROSCA	L1 mm	HSSCo €	TiAlN €
11,0x4,0			53,5		
12,5x6,0			57,0		
16,0x8,0			62,0		
18,0x8,0	1	M6	70,0	105,36	130,64
21,0x9,0	2	M10	74,0	115,68	143,44
25,0x11,0	2	M10	82,0	120,60	149,55
32,0x14,0	2	M10	90,0	160,84	199,44
40,0x18,0	3	M12	108,0	203,34	252,15
50,0x22,0	4	M16	124,0	268,57	333,02
60,0x28,0	4	M16	139,0	355,35	440,63
72,0x35,0	5	M20	153,0	482,33	598,08

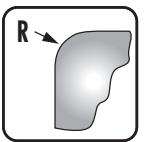
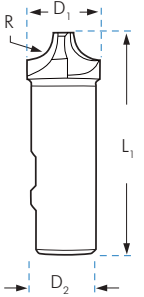
FRESA DE 1/4 DE CÍRCULO PARA
REMATADO DE ARISTAS

4 Z

HSSCo
8%

DIN
6518N

WELDON



FF1/4R					
	TOL H11 R	js 15 D1 mm	TOL h6 D2 mm	L1 mm	€
FF1/4R1	1,0	8	10	60	50,91
FF1/4R1.50	1,5	9	10	60	48,37
FF1/4R2	2,0	10	10	60	40,69
FF1/4R2.50	2,5	11	10	60	46,81
FF1/4R3	3,0	12	12	60	46,64
FF1/4R3.50	3,5	13	12	60	60,75
FF1/4R4	4,0	14	12	60	51,79
FF1/4R4.50	4,5	15	12	60	70,49
FF1/4R5	5,0	16	12	60	59,09
FF1/4R5.50	5,5	19	16	67	70,49
FF1/4R6	6,0	20	16	67	59,20
FF1/4R6.50	6,5	21	16	71	89,72
FF1/4R7	7,0	22	16	71	80,90
FF1/4R7.50	7,5	23	16	71	97,66
FF1/4R8	8,0	24	16	71	80,90
FF1/4R8.50	8,5	25	25	85	119,63
FF1/4R9	9,0	26	25	85	105,44
FF1/4R9.50	9,5	27	25	85	125,73
FF1/4R10	10,0	28	25	85	105,44
FF1/4R10.50	10,5	31	25	90	146,48
FF1/4R11	11,0	32	25	90	140,77
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	186,70
FF1/4R14	14,0	44	25	100	193,73
FF1/4R15	15,0	46	25	100	241,18
FF1/4R16	16,0	48	25	100	221,67
FF1/4R18	18,0	52	32	112	285,93
FF1/4R20	20,0	56	32	112	321,23

FRESA PARA RANURAR
"WOODRUFF"

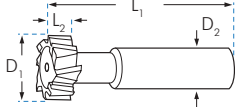
Ref. FF16

TIPO
WOODRUFF

DIN
850B

TOL D1
h12

TOL D2
h6



FF16					
D1 x L2 mm	D2 mm	Z	L1 mm	HSSCo €	TiAlN €
4,5x1,0	6	6	50	43,67	51,65
7,5x1,5	6	6	50	45,47	54,66
7,5x2,0	6	6	50	45,47	54,66
10,5x2,0	6	6	50	48,92	58,98
10,5x2,5	6	6	50	48,92	58,98
10,5x3,0	6	6	50	48,92	58,98
13,5x3,0	10	6	56	49,70	62,08
13,5x4,0	10	6	56	49,70	62,08
16,5x3,0	10	6	56	50,15	66,48
16,5x4,0	10	6	56	50,15	66,48
16,5x5,0	10	6	56	50,15	64,31
19,5x4,0	10	8	63	57,09	75,41
19,5x5,0	10	8	63	57,09	72,26
19,5x6,0	10	8	63	57,09	72,26
22,5x5,0	10	8	63	62,54	83,77
22,5x6,0	10	8	63	62,54	84,18
22,5x8,0	10	8	63	62,54	84,18
25,5x6,0	10	10	63	73,23	104,25
28,5x6,0	10	10	63	74,49	105,50
28,5x8,0	10	10	63	74,49	105,50
28,5x10,0	12	10	71	74,49	105,50
32,5x7,0	12	10	71	92,38	126,26
32,5x8,0	12	10	71	92,38	126,26
32,5x10,0	12	10	71	92,38	126,26
45,5x10,0	12	12	71	146,15	207,77

FRESAS CÓNICAS ANGULARES, CON MANGO CILÍNDRICO HSSCo



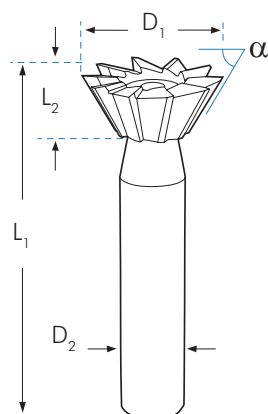
Ref. FF98
Ref. FF99

HSSCo

**DIN
1833A**

**TOL D1
js16**

**TOL D2
h6**



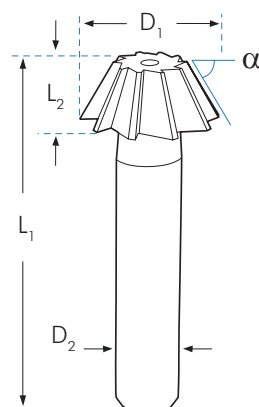
Ref. FF97
Ref. FF95

HSSCo

**DIN
1833B**

**TOL D1
js16**

**TOL D2
h6**



							FF98
45°	D1 mm	α	D2 mm	L1 mm	L2 mm	Z	€
FF981600	16	45°	12	60	4,0	8	81,22
FF982000	20	45°	12	63	5,0	10	86,11
FF982500	25	45°	12	67	6,3	12	105,30
FF983200	32	45°	16	71	8,0	14	117,50

							FF97
45°	D1 mm	α	D2 mm	L1 mm	L2 mm	Z	€
FF971600	16	45°	12	60	4,0	8	65,39
FF972000	20	45°	12	63	5,0	10	73,53
FF972500	25	45°	12	67	6,3	12	82,68
FF973200	32	45°	16	71	8,0	12	94,03

							FF99
60°	D1 mm	α	D2 mm	L1 mm	L2 mm	Z	€
FF991600	16	60°	12	60	6,3	8	81,19
FF992000	20	60°	12	63	8,0	10	86,09
FF992500	25	60°	12	67	10,0	12	105,28
FF993200	32	60°	16	71	12,5	14	117,47

							FF95
60°	D1 mm	α	D2 mm	L1 mm	L2 mm	Z	€
FF951600	16	60°	12	60	6,3	8	64,15
FF952000	20	60°	12	63	8,0	10	72,15
FF952500	25	60°	12	67	10,0	12	81,14
FF953200	32	60°	16	71	12,5	12	92,27

MEDIDAS ESPECIALES							FF99
FF991600-50	16	50°	12	60	5,0	8	91,18
FF992000-50	20	50°	12	63	6,3	10	97,19
FF992500-50	25	50°	12	67	8,0	12	120,09
FF991600-55	16	55°	12	60	5,6	8	91,18
FF992000-55	20	55°	12	63	7,1	10	97,19
FF992500-55	25	55°	12	67	9,0	12	120,09
FF991600-75	16	75°	12	60	8,0	8	91,18
FF992500-75	25	75°	12	67	10,0	12	120,09
FF991600-80	16	80°	12	60	8,0	8	91,18
FF992500-80	25	80°	12	67	10,0	12	120,09
FF991600-85	16	85°	12	60	8,0	8	91,18
FF992500-85	25	85°	12	67	10,0	12	120,09

MEDIDAS ESPECIALES							FF95
FF951600-50	16	50°	12	60	5,0	8	76,12
FF952000-50	20	50°	12	63	6,3	10	97,18
FF952500-50	25	50°	12	67	8,0	12	121,24
FF951600-55	16	55°	12	60	5,6	8	76,12
FF952000-55	20	55°	12	63	7,1	10	97,18
FF952500-55	25	55°	12	67	9,0	12	121,24
FF951600-75	16	75°	12	60	8,0	8	76,12
FF952500-75	25	75°	12	67	10,0	12	121,24

FRESAS FRONTALES CON MANGO CÓNICO SERIE CORTA

4-8 Z



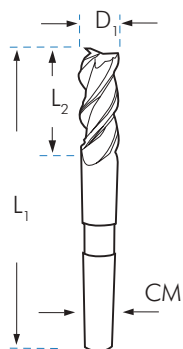
INOX

Al

2 Z



SERIE CORTA



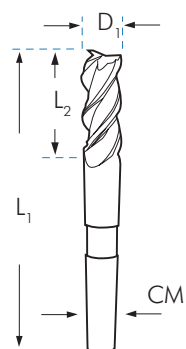
DIN 845B						MATERIAL						DIN 326			FF55	
						FF09	FF35	FF39	FF10	FF46	FF48				HSSCo 8%	
						ACABADO	BRILLANTE	TiN	TiAlN	BRILLANTE	TiN				TiAlN	BRILLANTE
						CALIDAD	★★	★★★	★★★	★★	★★★				★★★	
						DESBASTE				NR	NR				NR	
						TOL k10	TOL k10	TOL k10	TOL k12	TOL k12	TOL k12				TOL e8	
D1 mm	L1 mm	L2 mm	Z	CM	ROSCA	€	€	€	€	€	€	L1 mm	L2 mm	Z	€	
10,00	92	22	4	1	M6	44,19	61,36	63,19	65,54	81,89	84,27	83	13	2	55,56	
12,00	111	26	4	2	M6	58,42	74,94	78,55	66,80	83,61	86,85	86	16	2	57,68	
14,00	111	26	4	2	M10	64,73	82,07	86,81	75,89	93,42	97,97	101	16	2	59,85	
15,00	111	26	4	2	M10	69,45	89,82	94,15	94,82	114,23	119,78					
16,00	117	32	4	2	M10	64,44	85,18	89,28	78,28	99,02	102,85	104	19	2	65,39	
18,00	117	32	4	2	M10	68,45	88,90	93,18	85,91	106,04	111,20	104	19	2	68,54	
20,00	123	38	4	2	M10	76,35	100,12	104,94	94,48	117,92	123,66	107	22	2	71,93	
22,00	123	38	5	2	M10	86,35	108,92	115,22	104,02	126,71	132,86	107	22	2	84,72	
24,00	147	45	6	3	M12	130,59	149,84	159,99	145,03	166,31	174,38	128	26	2	109,61	
25,00	154	45	5	3	M12	117,88	144,98	153,41	145,07	172,25	180,62	128	26	2	115,21	
26,00	147	45	6	3	M12	119,03	150,54	153,41	159,36	185,39	194,43	128	26	2	120,95	
28,00	154	50	5	3	M12	119,03	150,54	153,41	159,41	185,39	194,43	128	26	2	133,54	
30,00	154	50	6	3	M12	131,53	172,97	176,25	187,17	221,40	232,18	128	26	2	147,01	
32,00	178	53	6	4	M16	172,78	221,95	226,18	221,94	273,87	287,18	157	32	2	161,86	
36,00	178	53	6	4	M16	196,80	245,82	252,98	244,67	297,28	311,73	157	32	2	206,46	
40,00	188	63	6	4	M16	237,10	295,02	303,59	341,80	402,34	421,89	163	38	2	237,94	
45,00	188	63	6	4	M16	305,36	373,87	384,63	388,49	444,87	466,50	163	38	2	343,65	
50,00	233	75	6	5	M20	367,87	432,03	444,49	412,00	485,08	508,64	203	45	2	431,72	
56,00	233	75	8	5	M20	507,48	562,01	578,20	586,67	626,97	657,45					
63,00	241	90	8	5	M20	637,14	682,73	702,39	736,86	764,98	802,14					

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

4-8 Z



SERIE LARGA



DIN 845B/L						FF11	FF61	FF71	FF12	FF33	FF43
MATERIAL						HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%	HSSCo 8%
ACABADO						BRILLANTE	TiN	TiAlN	BRILLANTE	TiN	TiAlN
CALIDAD						★★	★★★	★★★	★★	★★★	★★★
DESBASTE						TOL k10	TOL k10	TOL k10	TOL k12	TOL k12	TOL k12
D1 mm	L1 mm	L2 mm	Z	CM	ROSCA	€	€	€	€	€	€
10,00	115	45	4	1	M6	80,27	97,83	101,14	117,14	133,86	138,41
12,00	138	53	4	2	M6	75,68	97,83	104,01	119,34	135,62	141,54
14,00	138	53	4	2	M10	79,64	106,27	110,90	150,36	166,44	173,71
15,00	138	53	4	2	M10	87,43	111,41	116,25	172,91	191,24	199,61
16,00	148	63	4	2	M10	86,54	108,62	113,35	125,07	146,03	152,41
18,00	148	63	4	2	M10	98,32	119,24	124,41	129,82	150,55	157,12
20,00	160	75	4	2	M10	109,08	133,38	139,18	148,92	172,74	180,27
22,00	160	75	5	2	M10	123,45	146,76	153,85	154,67	178,14	185,91
24,00	192	90	5	3	M12	167,92	190,05	200,19	210,01	232,40	244,10
25,00	184	80	5	3	M12	166,77	196,11	206,07	219,57	247,54	258,33
26,00	192	90	5	3	M12	184,71	211,74	222,51	228,17	255,66	266,82
28,00	192	90	5	3	M12	187,17	224,06	236,00	226,51	255,66	266,82
30,00	192	90	5	3	M12	215,76	251,59	264,36	270,14	306,22	319,60
32,00	229	100	6	4	M16	254,37	297,90	313,03	321,72	365,58	381,55
36,00	231	106	6	4	M16	291,27	334,05	351,00	368,50	411,32	429,27
40,00	250	125	6	4	M16	323,65	375,87	394,97	452,83	503,33	525,33
45,00	250	125	6	4	M16	436,21	499,77	526,43	577,58	636,05	663,84
50,00	268	110	6	5	M20	532,36	585,53	616,78	720,77	771,34	805,02
56,00	308	150	8	5	M20	560,23	611,33	645,02	839,92	883,88	931,13
63,00	338	180	8	5	M20	741,03	779,69	821,14	1.057,40	1.089,35	1.147,56

JUEGOS DE FRESAS CON CORTE AL CENTRO EN ESTUCHES DE PLÁSTICO

2 Z

DIN
327

4 Z

DIN
844

REFERENCIA	PTF20	PTF60
Nº FRESAS	8	8
TIPO	Ref. FF02	Ref. FF60
CALIDAD	HSSCo 8%	TiAIN
CONTENIDO	6 8 10 12	6 8 10 12
Ø mm	2 2 2 2	2 2 2 2
P.V.P. €	119,50	189,47

REFERENCIA	PTF24	PTF64
Nº FRESAS	8	8
TIPO	Ref. FF18	Ref. FF20
CALIDAD	HSSCo 8%	TiAIN
CONTENIDO	6 8 10 12	6 8 10 12
Ø mm	2 2 2 2	2 2 2 2
P.V.P. €	132,30	200,73

2 Z

DIN
327

4 Z

DIN
844

REFERENCIA	PTF21	PTF61
Nº FRESAS	6	6
TIPO	Ref. FF02	Ref. FF60
CALIDAD	HSSCo 8%	TiAIN
CONTENIDO	6-8-10-12-16-20	6-8-10-12-16-20
Ø mm		
P.V.P. €	129,33	196,74

REFERENCIA	PTF25	PTF65
Nº FRESAS	6	6
TIPO	Ref. FF18	Ref. FF20
CALIDAD	HSSCo 8%	TiAIN
CONTENIDO	6-8-10-12-16-20	6-8-10-12-16-20
Ø mm		
P.V.P. €	144,42	208,29

2 Z

DIN
327

4 Z

DIN
844

REFERENCIA	PTF22	PTF62
Nº FRESAS	6	6
TIPO	Ref. FF02	Ref. FF60
CALIDAD	HSSCo 8%	TiAIN
CONTENIDO	4-5-6-8-10-12	4-5-6-8-10-12
Ø mm		
P.V.P. €	81,95	131,79

REFERENCIA	PTF26	PTF66
Nº FRESAS	6	6
TIPO	Ref. FF18	Ref. FF20
CALIDAD	HSSCo 8%	TiAIN
CONTENIDO	4-5-6-8-10-12	4-5-6-8-10-12
Ø mm		
P.V.P. €	90,75	139,92

JUEGOS DE FRESAS CON CORTE AL CENTRO EN ESTUCHES METÁLICOS

2 Z



DIN
327

Ref. FF020787

Ref. FT020787

Ref. FF600787



REFERENCIA	FF010787	FF020787	FT020787	FF600787
Nº FRESAS	6	6	6	6
TIPO	Ref. FF01	Ref. FF02	Ref. FT02	Ref. FF60
CALIDAD	HSS	HSSCo 8%	TiAlSiN	TiAlN
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. €	75,86	100,31	114,81	150,15

REFERENCIA	FF010447	FF020447	FT020447	FF600447
Nº FRESAS	6	6	6	6
TIPO	Ref. FF01	Ref. FF02	Ref. FT02	Ref. FF60
CALIDAD	HSS	HSSCo 8%	TiAlSiN	TiAlN
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. €	113,46	150,47	172,22	217,86

REFERENCIA	FF010801	FF020801	FT020801	FF600801
Nº FRESAS	14	14	14	14
TIPO	Ref. FF01	Ref. FF02	Ref. FT02	Ref. FF60
CALIDAD	HSS	HSSCo 8%	TiAlSiN	TiAlN
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. €	269,03	353,51	404,62	499,45

ESTUCHES METÁLICOS VACÍOS PARA FRESAS

2-4 Z



DIN
327

REFERENCIA	EV0787	EV0847	EV0764
Nº FRESAS	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. €	23,65	26,43	76,52



JUEGOS DE FRESAS EN ESTUCHES METÁLICOS

4 Z

DIN
844

Fresas

Rosa



REFERENCIA	FF030787	FF040787	FT040787	FF540787
Nº FRESAS	6	6	6	6
TIPO	Ref. FF03	Ref. FF04	Ref. FT04	Ref. FF54
CALIDAD	HSS	HSSCo 8%	TiAlSiN	TiAlN
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. €	74,61	98,39	113,14	150,14

REFERENCIA	FF030847	FF040847	FT040847	FF540847
Nº FRESAS	6	6	6	6
TIPO	Ref. FF03	Ref. FF04	Ref. FT04	Ref. FF54
CALIDAD	HSS	HSSCo 8%	TiAlSiN	TiAlN
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. €	111,47	149,56	172,00	215,45



REFERENCIA	FF030764	FF040764	FT040764	FF540764
Nº FRESAS	14	14	14	14
TIPO	Ref. FF03	Ref. FF04	Ref. FT04	Ref. FF54
CALIDAD	HSS	HSSCo 8%	TiAlSiN	TiAlN
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. €	260,88	345,47	397,29	496,65

4 Z

DIN
844

NR

REFERENCIA	FF250847	FT250847	FF270847
Nº FRESAS	6	6	6
TIPO	Ref. FF25	Ref. FT25	Ref. FF27
CALIDAD	HSSCo 8%	TiAlSiN	TiAlN
CONTENIDO Ø mm	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20
P.V.P. €	278,39	318,64	334,86

JUEGOS DE FRESAS EN ESTUCHES METÁLICOS

4 Z



DIN
844

REFERENCIA	FF180787	FT180787	FF200787
Nº FRESAS	6	6	6
TIPO	Ref. FF18	Ref. FT18	Ref. FF20
CALIDAD	HSSCo 8%	TiAlSiN	TiAlN
CONTENIDO Ø mm	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12	4 - 5 - 6 - 8 - 10 - 12
P.V.P. €	104,75	119,89	158,27



Ref. FF180787

REFERENCIA	FF180847	FT180847	FF200847
Nº FRESAS	6	6	6
TIPO	Ref. FF18	Ref. FT18	Ref. FF20
CALIDAD	HSSCo 8%	TiAlSiN	TiAlN
CONTENIDO Ø mm	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20	6 - 8 - 10 - 12 - 16 - 20
P.V.P. €	163,76	187,44	227,22



Ref. FF180847

REFERENCIA	FF180764	FT180764	FF200764
Nº FRESAS	14	14	14
TIPO	Ref. FF18	Ref. FT18	Ref. FF20
CALIDAD	HSSCo 8%	TiAlSiN	TiAlN
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. €	374,47	428,60	517,41



Ref. FF180764

EXPOSITOR DE METACRILATO Ref. MF-01

Contenido: 163 Fresas

Ref. FF13	1 Z	HSSCo	Al	SERIE CORTA	$\frac{\varnothing}{\text{Cant.}}$	$\frac{5 \times 8}{5}$	Mango	$\frac{6 \times 8}{5}$	Mango									
Ref. FF14	1 Z	HSSCo	Al	SERIE LARGA	$\frac{\varnothing}{\text{Cant.}}$	$\frac{5 \times 8}{5}$	Mango	$\frac{6 \times 8}{5}$	Mango									
Ref. FF02	2 Z		HSSCo	DIN 327N		$\frac{\varnothing}{\text{Cant.}}$	$\frac{2}{5}$	$\frac{3}{5}$	$\frac{4}{5}$	$\frac{5}{5}$	$\frac{6}{5}$	$\frac{7}{5}$	$\frac{8}{5}$	$\frac{9}{5}$	$\frac{10}{5}$	$\frac{12}{5}$	$\frac{14}{5}$	$\frac{16}{3}$
Ref. FF18	4 Z		HSSCo	DIN 844N		$\frac{\varnothing}{\text{Cant.}}$	$\frac{2}{5}$	$\frac{3}{5}$	$\frac{4}{5}$	$\frac{5}{5}$	$\frac{6}{5}$	$\frac{7}{5}$	$\frac{8}{5}$	$\frac{9}{5}$	$\frac{10}{5}$	$\frac{12}{5}$	$\frac{14}{5}$	$\frac{16}{3}$
Ref. FF25	4 Z		HSSCo	DIN 844N			$\frac{\varnothing}{\text{Cant.}}$	$\frac{6}{3}$	$\frac{7}{3}$	$\frac{8}{3}$	$\frac{9}{3}$	$\frac{10}{3}$	$\frac{11}{3}$	$\frac{12}{3}$	$\frac{14}{3}$	$\frac{16}{3}$		



Dimensiones: ancho 245 x fondo 210 x alto 350 mm

NOTA: Composiciones especiales bajo demanda

P.V.P.: 3.098,22

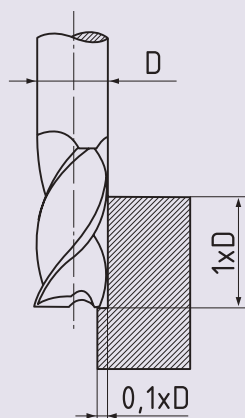
PARÁMETROS DE CORTE ORIENTATIVOS FRESAS HSSCo8%

			DIÁMETRO Ø (mm)													
			2	4	6	8	10	12	18	22	26	30	32	36	40	
ACERO BLANDO 70 kg/mm²	V/C 39	RPM	6207	3104	2069	1552	1241	1035	690	564	477	414	388	345	310	
	AVANCE (mm/min)	Nº cortes	2	50	56	74	84	82	81	80	81	76	68	68	62	60
		3	74	84	112	126	123	121	120	122	115	102	102	93	89	
		4	99	112	149	168	164	161	160	163	153	136	137	124	119	
ACERO TRATADO 120 kg/mm²	V/C 20	RPM	3183	1592	1061	796	637	531	354	289	245	212	199	177	159	
	AVANCE (mm/min)	Nº cortes	2	25	29	38	43	42	41	41	42	39	35	35	32	31
		3	38	43	57	64	63	62	62	63	59	52	53	48	46	
		4	51	57	76	86	84	83	82	83	78	70	70	64	61	
INOXIDABLE	V/C 15	RPM	2387	1194	796	597	477	398	265	217	184	159	149	133	119	
	AVANCE (mm/min)	Nº cortes	2	19	21	29	32	32	31	31	31	29	26	26	24	23
		3	29	32	43	48	47	47	46	47	44	39	39	36	34	
		4	38	43	57	64	63	62	62	63	59	52	53	48	46	
ALUMINIO	V/C 230	RPM	36606	18303	12202	9151	7321	6101	4067	3328	2816	2440	2288	2034	1830	
	AVANCE (mm/min)	Nº cortes	2	293	329	439	494	483	476	472	479	451	400	403	366	351
		3	439	494	659	741	725	714	708	719	676	600	604	549	527	
		4	586	659	879	988	966	952	944	958	901	800	805	732	703	
TITANIO	V/C 12	RPM	1910	955	637	477	382	318	212	174	147	127	119	106	95	
	AVANCE (mm/min)	Nº cortes	2	15	17	23	26	25	25	25	25	24	21	21	19	18
		3	23	26	34	39	38	37	37	38	35	31	32	29	28	
		4	31	34	46	52	50	50	49	50	47	42	42	38	37	

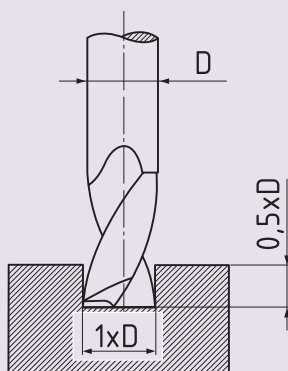
* Para fresas recubiertas y/o ASP 60, multiplicar los parámetros de la tabla por el factor 1,3

* V/C: Velocidad de corte (m/min)

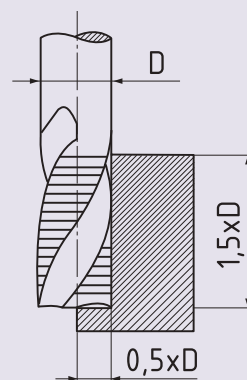
PROFUNDIDAD DE PASADA EN FUNCIÓN DE LA OPERACIÓN A REALIZAR



FRESADO LATERAL

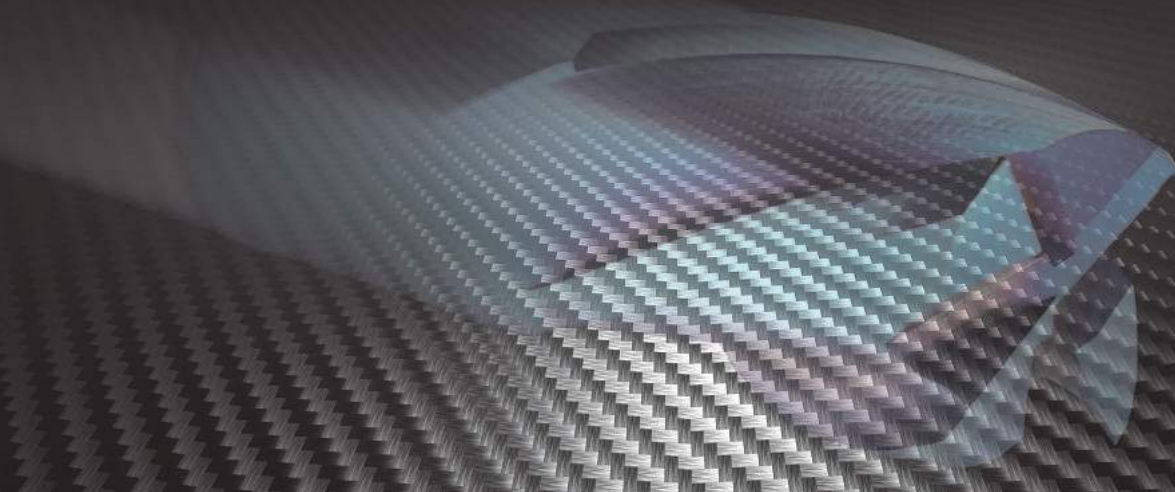
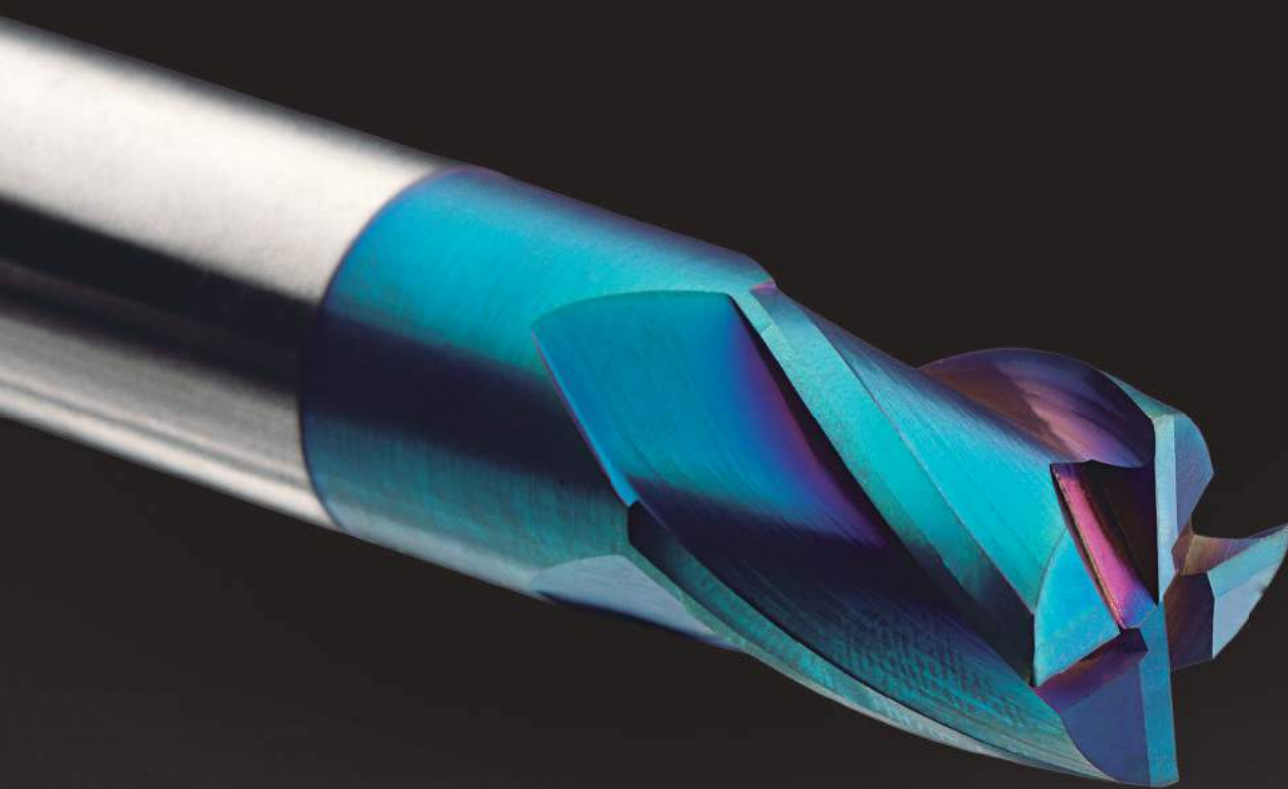


VACIADO



FRESADO BASTO

FRESAS METAL DURO



FRESAS DE METAL DURO INTEGRAL PARA APLICACIONES GENERALES



2 Z



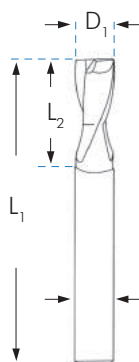
3 Z



4 Z



SERIE CORTA

TOL D1
+0 -0,05TOL D2
h6

				FMD2	FMD2TL	FMD92	FMD92TL	FMD63	FMD63TL	FMD48	FMD48TL	FMD51	FMD51TL
MATERIAL				MD	MD	MD	MD	MD	MD	MD	MD	MD	MD
ACABADO				BRILLANTE	TiAlN	BRILLANTE	TiAlN	BRILLANTE	TiAlN	BRILLANTE	TiAlN	BRILLANTE	TiAlN
CALIDAD				★★	★★★	★★	★★★	★★	★★★	★★	★★★	★★	★★★
D1 mm	L1 mm	L2 mm	D2 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	21,12	27,54	14,02	20,86	14,02	20,86	21,08	28,12
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	23,48	30,55	16,25	23,78	16,25	23,78	25,35	33,09
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	29,05	37,76	20,76	30,05	20,76	30,05	31,63	41,19
6,00	63	19	6	22,71	33,89	32,67	43,21	22,71	33,89	22,71	33,89	34,57	46,06
7,00	63	19	8	29,73	47,26	40,73	57,08	29,73	47,26	29,73	47,26	40,64	58,17
8,00	63	19	8	27,84	40,10	40,73	53,11	27,84	40,10	27,84	40,10	47,01	59,63
9,00	70	22	10	42,79	57,50	57,48	70,95	42,79	57,50	42,79	57,50	58,49	73,63
10,00	70	22	10	47,17	63,93	60,22	76,99	47,17	63,93	47,17	63,93	69,53	86,78
11,00	75	25	11	67,75	85,05	99,41	114,31	67,75	85,05	67,75	85,05		
12,00	75	25	12	59,46	79,08	76,76	94,69	59,46	79,08	59,46	79,08	91,22	111,39
14,00	88	30	14	91,36	117,55	111,44	137,62	91,36	117,55	91,36	117,55	128,66	155,60
16,00	88	32	16	120,81	152,28	136,98	171,82	120,81	152,28	120,81	152,28	155,06	190,88
18,00	100	36	18	177,01	211,60	219,34	253,58	177,01	211,60	177,01	211,60	229,85	270,48
20,00	100	36	20	201,34	241,25	222,17	267,67	201,34	241,25	201,34	241,25	256,50	303,29
25,00	100	38	25	258,24	395,99					258,24	395,99		

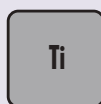
CONDICIONES DE CORTE ORIENTATIVAS

		Ø 2	Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
	RPM	4000	2600	2000	1600	1300	1000	800	660	570	500	400	300
	AVANCE (mm/min)	50	55	55	55	55	55	55	55	55	65	65	65
	RPM	8000	5300	4000	3200	2600	2000	1600	1300	1100	1000	800	600
	AVANCE (mm/min)	55	55	55	55	60	60	60	60	60	70	70	70
	RPM	16000	11000	8000	6400	5300	4000	3200	2600	2300	2000	1600	1200
	AVANCE (mm/min)	290	290	290	290	290	290	290	290	300	300	300	300

* Para obtener parámetros de corte recomendados para fresas recubiertas de TiAlN, multiplicar valores del recuadro por el factor 1,3

FRESAS DE METAL DURO INTEGRAL PARA APLICACIONES GENERALES SERIE LARGA Y EXTRALARGA

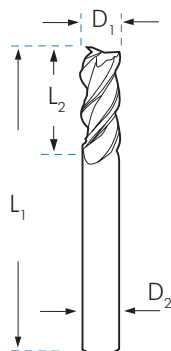
2Z



4Z



SERIE LARGA



				FMD54	FMD54TL	FMD57	FMD57TL	FMD58	FMD58TL
MATERIAL				MD	MD	MD	MD	MD	MD
ACABADO				BRILLANTE	TiAlN	BRILLANTE	TiAlN	BRILLANTE	TiAlN
CALIDAD				★★	★★★	★★	★★★	★★	★★★
D1 mm	L1 mm	L2 mm	D2 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	38	8	58,76	79,85	71,23	92,73	61,70	82,79
10,00	100	38	10	79,73	102,73	88,29	111,95	83,60	104,05
12,00	100	50	12	125,85	162,15	143,76	181,09	129,48	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	256,58	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				MD	MD	MD	MD	MD	MD
ACABADO				BRILLANTE	TiAlN	BRILLANTE	TiAlN	BRILLANTE	TiAlN
CALIDAD				★★	★★★	★★	★★★	★★	★★★
Ø mm	L1 mm	L2 mm	D2 mm	€	€	€	€	€	€
3,00	100	30	3	46,72	75,71	53,49	82,47	44,98	73,97
4,00	100	40	4	50,75	80,87	60,44	90,56	49,42	79,54
5,00	100	40	5	57,36	92,95	67,16	102,74	56,23	91,82
6,00	150	75	6	68,38	108,96	74,26	114,86	68,12	108,72
8,00	150	75	8	94,16	153,67	108,64	168,15	91,55	151,05
10,00	150	75	10	119,27	194,65	133,72	209,11	111,65	187,04
12,00	150	75	12	174,51	284,80	207,37	317,65	169,67	279,95
14,00	150	75	14	241,25	393,71	269,63	422,08	225,53	377,98
16,00	200	75	16	327,77	534,89	382,66	589,80	306,40	513,54
18,00	200	75	18	349,25	569,96	437,66	658,37	342,05	562,75
20,00	200	75	20	511,43	834,61	589,54	912,73	478,10	801,29

FRESAS FRONTALES DE MD INTEGRAL DESBASTE FINO, MEDIO Y GRUESO



MD



30°



CILÍNDRICO

Ti

INC

Ni



					FMD1
D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
TOL D ₁ +0 -0,05	TOL D ₂ h6				
6	6	63	19	3	74,52
8	8	63	19	3	79,99
10	10	63	22	3	102,26
12	12	75	25	4	129,15
16	16	88	32	4	220,98
20	20	100	38	4	258,66



MD



30°



CILÍNDRICO

INOX

50
HRc



					FMD3
D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
TOL D ₁ +0 -0,05	TOL D ₂ h6				
6	6	63	19	3	74,52
8	8	63	19	3	79,99
10	10	63	22	3	102,26
12	12	75	25	4	129,15
16	16	88	32	4	220,98
20	20	100	38	4	258,66



MD



30°



CILÍNDRICO

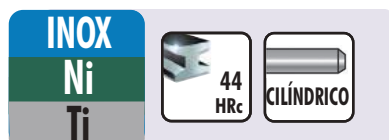
Al

Cu



					FMD6
D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
TOL D ₁ +0 -0,05	TOL D ₂ h6				
6	6	63	19	3	74,52
8	8	63	19	3	79,99
10	10	63	22	3	102,26
12	12	75	25	4	129,15
16	16	88	32	4	220,98
20	20	100	38	4	258,66

FRESAS DE METAL DURO INTEGRAL ESPECIALES PARA INOXIDABLE Y ALEACIONES DE NIQUEL



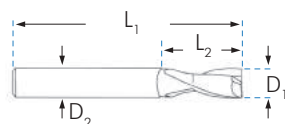
SERIE CORTA



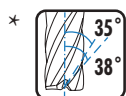
Muy recomendado para mecanizado de inoxidable, titanio y aleaciones de níquel

TOL D₁
+0 -0,05

TOL D₂
h6



				FMT2	FMT92	FMT63	FMT48	FMT81
MATERIAL								
ACABADO				MD	MD	MD	MD	MD
CALIDAD				TiAlSiN	TiAlSiN	TiAlSiN	TiAlSiN	TiAlSiN
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	€	€	€	€	€
1,00	38	3	3	36,68		36,68	36,68	
1,50	38	5	3	35,81		35,81	35,81	
2,00	38	6	3	28,50		28,50	28,50	
2,50	38	7	3	27,85		27,85	27,85	
3,00	38	12	3	23,99	31,67	23,99	23,99	
3,50	50	12	4	29,44		29,44	29,44	
4,00	50	14	4	27,35	35,13	27,35	27,35	
4,50	50	14	5	34,99		34,99	34,99	
5,00	50	16	5	34,56	43,42	34,56	34,56	38,02
6,00	63	19	6	38,97	49,69	38,97	38,97	42,87
7,00	63	19	8	54,35	65,64	54,35	54,35	
8,00	63	19	8	46,12	61,08	46,12	46,12	50,73
9,00	70	22	10	66,13	81,59	66,13	66,13	
10,00	70	22	10	73,52	88,54	73,52	73,52	80,87
11,00	75	25	11	97,81	131,46	97,81	97,81	
12,00	75	25	12	90,94	108,89	90,94	90,94	100,03
14,00	88	30	14	135,18	158,26	135,18	135,18	148,70
16,00	88	32	16	175,12	197,59	175,12	175,12	192,63
18,00	100	36	18	243,34	291,62	243,34	243,34	267,67
20,00	100	36	20	277,44	307,82	277,44	277,44	305,18
25,00	100	38	25	455,39			455,39	



FMT81: Fresa de 4 cortes, corte al centro, Hélice Variable con recubrimiento TiAlSiN.

Su ángulo de Hélice Variable minimiza las vibraciones y junto con el recubrimiento TiAlSiN ofrece un espectacular rendimiento en el mecanizado.

CONDICIONES DE CORTE orientativas

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

FRESA 2 LABIOS, SERIE CORTA, HÉLICE A 35°

INOX

Ref. FMG10

2 Z

MG
MD

TiAlN

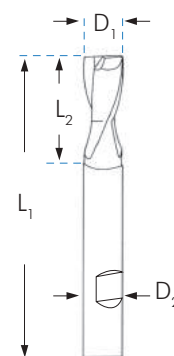
INOX



Ti

INC

SERIE CORTA

Micro
Grano
MD

					FMG10
	TOL -0,03	TOL h6			
	D1 mm	D2 mm	L1 mm	L2 mm	€
FMG100100	1,0	6	40	2,5	61,45
FMG100150	1,5	6	40	4,0	61,45
FMG100200	2,0	6	40	6,0	55,92
FMG100300	3,0	6	45	8,0	55,92
FMG100400	4,0	6	45	11,0	55,92
FMG100500	5,0	6	50	13,0	55,92
FMG100600	6,0	6	50	13,0	55,92
FMG100700	7,0	8	60	16,0	71,50
FMG100800	8,0	8	60	19,0	71,50
FMG100900	9,0	10	70	19,0	105,60
FMG101000	10,0	10	70	22,0	105,60
FMG101200	12,0	12	75	26,0	144,64
FMG101400	14,0	16	85	26,0	239,62
FMG101600	16,0	16	100	32,0	239,62
FMG101800	18,0	16	100	32,0	318,32
FMG102000	20,0	20	105	38,0	396,98
FMG102200	22,0	20	105	38,0	515,98
FMG102500	25,0	25	120	45,0	634,94

REVOLUCIONES Y AVANCES

R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
11.560	190	7.560	120	6.300	90
8.920	210	5.560	140	4.620	120
7.560	300	4.620	180	3.880	150
6.300	320	3.780	190	3.160	160
5.560	350	3.360	220	2.840	180
4.200	380	2.520	200	2.100	180
3.260	330	2.000	160	1.680	160
2.740	280	1.680	130	1.360	130
2.200	220	1.360	110	1.060	110
1.680	170	1.060	80	840	80
1.360	130	840	70	680	60

FRESA 3 LABIOS, SERIE CORTA, HÉLICE A 45°

INOX

Ref. FMD67

3 Z



MD



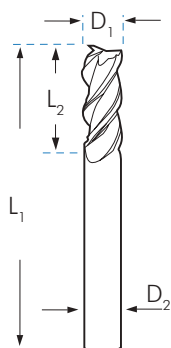
INOX

Ti

Ni

TiAlN

SERIE CORTA

Micro
Grano
MD

					FMD67
	TOL e8	TOL h6			
	D1 mm	D2 mm	L1 mm	L2 mm	€
FMD670300	3	3	32	17	25,03
FMD670400	4	4	40	12	28,54
FMD670500	5	5	50	14	36,06
FMD670600	6	6	63	20	40,67
FMD670800	8	8	63	22	48,12
FMD671000	10	10	70	25	76,72
FMD671200	12	12	75	25	94,90
FMD671400	14	14	83	30	141,06
FMD671600	16	16	88	30	182,74
FMD671800	18	18	100	38	227,77
FMD672000	20	20	100	38	289,50

FRESA 4 LABIOS, SERIE CORTA, HÉLICE A 35°

INOX Ref. FMG12

4 Z

MG MD

35°

WELDON

TiAlN

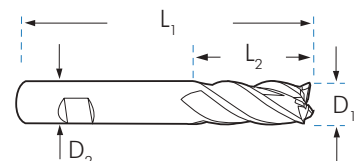
INOX

45 HRC

Ti

INC

SERIE CORTA



					FMG12
	TOL -0,03	TOL h6			
	D1 mm	D2 mm	L1 mm	L2 mm	€
FMG120200	2,0	6	40	6	55,92
FMG120250	2,5	6	40	8	55,92
FMG120300	3,0	6	45	8	55,92
FMG120400	4,0	6	45	11	55,92
FMG120500	5,0	6	50	13	55,92
FMG120600	6,0	6	50	13	55,92
FMG120700	7,0	8	60	16	71,50
FMG120800	8,0	8	60	19	71,50
FMG120900	9,0	10	70	19	105,60
FMG121000	10,0	10	70	22	105,60
FMG121200	12,0	12	75	26	144,64
FMG121400	14,0	16	85	26	239,62
FMG121600	16,0	16	100	32	239,62
FMG121800	18,0	16	100	32	318,32
FMG122000	20,0	20	105	38	396,98
FMG122200	22,0	20	105	38	515,98
FMG122500	25,0	25	120	40	634,94

REVOLUCIONES Y AVANCES					
<30 HRC		30-45 HRC		INOX	
R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
11.560	280	7.560	170	6.300	140
8.920	320	5.560	200	4.620	170
7.560	570	4.620	350	3.880	280
6.300	600	3.780	360	3.160	300
5.560	660	3.360	410	2.840	330
4.200	710	2.520	380	2.100	350
3.260	610	2.000	300	1.680	300
2.740	520	1.680	250	1.360	240
2.200	410	1.360	200	1.060	200
1.680	320	1.060	160	840	150
1.360	250	840	130	680	130

FRESA 6 Y 8 LABIOS, SERIE CORTA, HÉLICE A 45°

INOX Ref. FMG14

6-8 Z

MG MD

45°

WELDON

TiAlN

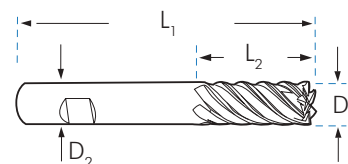
INOX

45 HRC

Ti

INC

SERIE CORTA



						FMG14								
	TOL -0,03	TOL h6						<30 HRC		30-45 HRC		INOX		INC
	D1 mm	D2 mm	L1 mm	L2 mm	Z	€	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
FMG140600	6,0	6	57	13	6	67,27	5.560	2.000	3.880	1.370	3.370	1.100	1.350	280
FMG140800	8,0	8	63	19	6	85,03	4.200	2.000	2.940	1.370	2.490	1.100	1.000	280
FMG141000	10,0	10	72	22	6	121,23	3.360	2.000	2.320	1.370	1.920	1.100	440	280
FMG141200	12,0	12	83	26	6	164,62	2.840	1.680	2.000	1.160	1.610	1.000	400	250
FMG141400	14,0	14	83	26	6	215,86	2.470	1.470	1.740	1.020	1.380	885	355	220
FMG141600	16,0	16	92	32	6	276,51	2.100	1.260	1.480	880	1.160	770	310	190
FMG141800	18,0	18	92	32	8	338,96	1890	1130	1.320	785	1.030	695	280	170
FMG142000	20,0	20	104	38	8	406,06	1680	1010	1.160	690	900	920	250	155
FMG142500	25,0	25	104	44	8	750,97	1500	900	1.100	600	850	540	220	135

FRESAS 4 LABIOS DE HÉLICE VARIABLE

INOX

Ref. FMG81
Ref. FMG82

4 Z

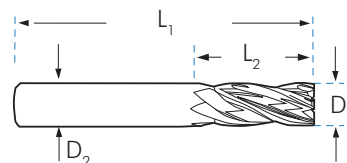
DIN
6527MG
MD

WELDON

TiAIN

INOX

SERIE CORTA

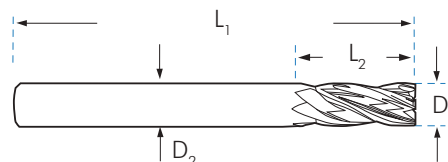
Micro
Grano
MD

					FMG81
	TOL -0,03	TOL h6			
	D1 mm	D2 mm	L1 mm	L2 mm	€
FMG810300	3,0	6	50	5	47,70
FMG810400	4,0	6	54	8	47,70
FMG810500	5,0	6	54	9	47,70
FMG810600	6,0	6	54	10	47,70
FMG810800	8,0	8	58	12	61,10
FMG811000	10,0	10	66	14	89,20
FMG811200	12,0	12	73	16	120,23
FMG811400	14,0	14	75	18	172,54
FMG811600	16,0	16	82	22	202,62
FMG811800	18,0	18	84	24	272,74
FMG812000	20,0	20	92	26	320,35

REVOLUCIONES Y AVANCES

INOX AISI 316L		INOX AISI 304	
R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
10.185	195	14.260	205
7.600	250	14.260	255
6.110	310	8.655	310
5.095	360	7.130	360
3.820	435	5.345	465
3.055	590	4.275	585
2.545	565	3.565	565
2.180	520	3.055	520
1.910	480	2.670	480
1.695	475	2.375	475
1.525	470	2.140	470

SERIE LARGA

Micro
Grano
MD

					FMG82
	TOL -0,03	TOL h6			
	D1 mm	D2 mm	L1 mm	L2 mm	€
FMG820300	3,0	6	57	8	55,81
FMG820400	4,0	6	57	11	55,81
FMG820500	5,0	6	57	13	55,81
FMG820600	6,0	6	57	13	55,81
FMG820800	8,0	8	63	19	71,49
FMG821000	10,0	10	72	22	104,36
FMG821200	12,0	12	83	26	140,66
FMG821400	14,0	14	83	26	201,87
FMG821600	16,0	16	92	32	237,06
FMG821800	18,0	18	92	32	319,11
FMG822000	20,0	20	104	38	374,81

REVOLUCIONES Y AVANCES

INOX AISI 316L		INOX AISI 304	
R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
10.185	195	14.260	205
7.600	250	14.260	255
6.110	310	8.655	310
5.095	360	7.130	360
3.820	435	5.345	465
3.055	590	4.275	585
2.545	565	3.565	565
2.180	520	3.055	520
1.910	480	2.670	480
1.695	475	2.375	475
1.525	470	2.140	470

NUEVA FRESA DE HÉLICE VARIABLE

1. Geometría de labios especial. Su ángulo de hélice variable 35-38° elimina las vibraciones.
2. Excelente acabado de la pieza.
3. Velocidades de trabajo más altas. Máximo rendimiento.
4. Cortes más profundos.
5. Mayor velocidad de evacuación de viruta.

FRESA 3 A 4 LABIOS, SERIE CORTA, HÉLICE A 50°

INOX

Ref. FMG13

3-4 Z

MG MD

WELDON

TiAIN

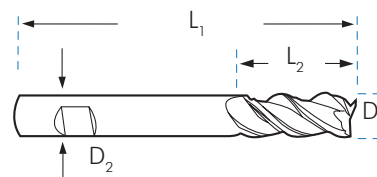
INOX

45 HRc

Ti

INC

SERIE CORTA



FMG13							REVOLUCIONES Y AVANCES							
	TOL -0,03	TOL h6							INOX		INC			
	D1 mm	D2 mm	L1 mm	L2 mm	Z	€	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
FMG130600	6,0	6	50	13	3	72,55	5.560	310	3.360	200	2.840	160	1.280	40
FMG130800	8,0	8	60	19	3	92,80	4.200	310	2.520	180	2.100	160	920	40
FMG131000	10,0	10	70	22	3	137,10	3.260	310	2.000	140	1.680	140	740	40
FMG131200	12,0	12	75	25	3	187,88	2.740	250	1.680	120	1.370	120	620	30
FMG131600	16,0	16	90	32	3	311,36	2.200	200	1.360	100	1.050	100	460	25
FMG131800	18,0	18	90	32	3	454,99	1.940	175	1.210	85	950	85	410	20
FMG132000	20,0	20	100	28	4	515,98	1.680	150	1.060	70	840	70	350	20
FMG132500	25,0	25	120	45	4	825,26	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.

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 3 A 5 LABIOS, DESBASTE FINO

INOX

Ref. FMG15
Ref. FMG16

3-5 Z

MG
MD

NF



TiAIN

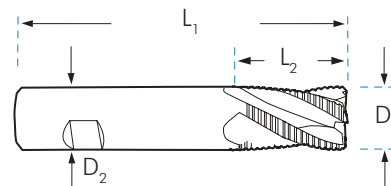
INOX



Ti

INC

SERIE CORTA

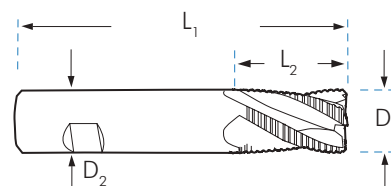
Micro
Grano
MD

FMG15

REVOLUCIONES Y AVANCES

TOL							REVOLUZIONE MINIMA							
	TOL h10	TOL h6												
	D1 mm	D2 mm	L1 mm	L2 mm	Z	€	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
FMG150600	6,0	6	54	7	3	69,09	15.600	2.320	12.400	840	8.400	570	2.400	190
FMG150700	7,0	8	58	8	3	80,73	13.600	2.320	10.800	840	7.350	570	2.100	190
FMG150800	8,0	8	58	9	3	80,73	11.600	2.320	9.200	840	6.300	570	1.800	190
FMG150900	9,0	10	66	13	4	120,39	10.400	2.320	8.400	840	5.700	570	1.550	190
FMG151000	10,0	10	66	14	4	120,39	9.200	2.320	7.600	840	5.100	570	1.300	190
FMG151200	12,0	12	73	16	4	154,44	8.000	2.400	6.000	800	4.200	570	1.200	190
FMG151400	14,0	14	75	18	4	187,32	6.800	2.400	5.200	840	3.600	570	900	130
FMG151600	16,0	16	82	22	4	251,35	6.000	2.400	4.800	760	3.300	510	800	110
FMG151800	18,0	18	84	24	4	321,95	5.200	2.320	4.400	720	2.700	420	700	100
FMG152000	20,0	20	92	26	4	404,28	4.800	2.160	3.600	560	2.400	360	660	100
FMG152500	25,0	25	110	25	5	708,52	4.300	2.150	3.200	620	2.160	410	600	100

SERIE LARGA

Micro
Grano
MD

FMG16

REVOLUCIONES Y AVANCES

	TOL h10	TOL h6					 <30 HRc		 30-45 HRc		INOX		INC	
	D1 mm	D2 mm	L1 mm	L2 mm	Z	€	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
FMG160600	6,0	6	57	16	3	74,24	15.600	2.320	12.400	840	8.400	570	2.400	190
FMG160700	7,0	8	63	16	3	86,77	13.600	2.320	10.800	840	7.350	570	2.100	190
FMG160800	8,0	8	63	16	3	86,77	11.600	2.320	9.200	840	6.300	570	1.800	190
FMG160900	9,0	9	72	19	4	129,41	10.400	2.320	8.400	840	5.700	570	1.550	190
FMG161000	10,0	10	72	22	4	129,41	9.200	2.320	7.600	840	5.100	570	1.300	190
FMG161200	12,0	12	83	26	4	166,05	8.000	2.400	6.000	800	4.200	570	1.200	190
FMG161400	14,0	14	83	26	4	201,37	6.800	2.400	5.200	840	3.600	570	900	130
FMG161600	16,0	16	92	32	4	270,24	6.000	2.400	4.800	760	3.300	510	800	110
FMG161800	18,0	18	92	32	4	346,15	5.200	2.320	4.400	720	2.700	420	700	100
FMG162000	20,0	20	104	38	4	434,67	4.800	2.160	3.600	560	2.400	360	660	100
FMG162500	25,0	25	121	45	5	761,82	4.300	2.150	3.200	620	2.160	410	600	100

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

FRESA 4 A 6 LABIOS, SERIE CORTA, HÉLICE A 45°

INOX Ref. FMG17

4-6 Z

MG MD

45°

NF

WELDON

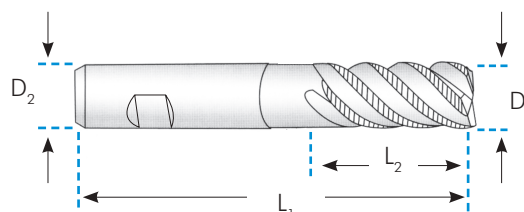
TiAlN

INOX

45 HRc

INC

SERIE CORTA



FMG17							REVOLUCIONES Y AVANCES							
	TOL h10	TOL h6												
	D1 mm	D2 mm	L1 mm	L2 mm	Z	€	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
FMG170600	6,0	6	54	7	4	69,09	15.600	2.320	12.400	840	8.400	570	2.400	190
FMG170800	8,0	8	58	9	4	80,73	11.600	2.320	9.200	840	6.300	570	1.800	190
FMG171000	10,0	10	66	14	4	120,39	9.200	2.320	7.600	840	5.100	570	1.300	190
FMG171200	12,0	12	73	16	4	154,44	8.000	2.400	6.000	800	4.200	570	1.200	190
FMG171600	16,0	16	82	22	5	251,35	6.000	2.400	4.800	760	3.300	510	800	110
FMG172000	20,0	20	92	26	6	404,28	4.800	2.160	3.600	560	2.400	360	660	100

FRESA 3 A 6 LABIOS, SERIE LARGA, HÉLICE A 45°

INOX Ref. FMG18

3-6 Z

MG MD

45°

NF

WELDON

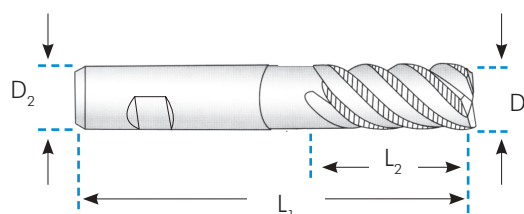
TiAlN

INOX

45 HRc

INC

SERIE LARGA



FMG18							REVOLUCIONES Y AVANCES							
	TOL h10	TOL h6												
	D1 mm	D2 mm	L1 mm	L2 mm	Z	€	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
FMG180400	4,0	6	57	11	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	72,08	18.000	4.600	15.000	1.650	10.200	1.040	2.200	390
FMG180600	6,0	6	57	16	4	72,08	15.600	2.320	12.400	840	8.400	570	2.400	190
FMG180700	7,0	8	63	16	4	84,24	13.600	2.320	10.800	840	7.350	570	2.100	190
FMG180800	8,0	8	63	16	4	84,24	11.600	2.320	9.200	840	6.300	570	1.800	190
FMG180900	9,0	10	72	19	4	125,64	10.400	2.320	8.400	840	5.700	570	1.550	190
FMG181000	10,0	10	72	22	4	125,64	9.200	2.320	7.600	840	5.100	570	1.300	190
FMG181200	12,0	12	83	26	4	161,21	8.000	2.400	6.000	800	4.200	570	1.200	190
FMG181400	14,0	14	83	26	5	195,50	6.800	2.400	5.200	840	3.600	570	900	130
FMG181600	16,0	16	92	32	5	262,37	6.000	2.400	4.800	760	3.300	510	800	110
FMG182000	20,0	20	104	38	6	422,01	4.800	2.160	3.600	560	2.400	360	660	100
FMG182500	25,0	25	121	45	6	739,63	4.300	2.150	3.200	620	2.160	410	600	100

FRESA 4 A 6 LABIOS, SERIE LARGA, HÉLICE A 45°

INOX

Ref. FMG19

4-6 Z

MG
MDMG
MD

NF

WELDON

TiAlN

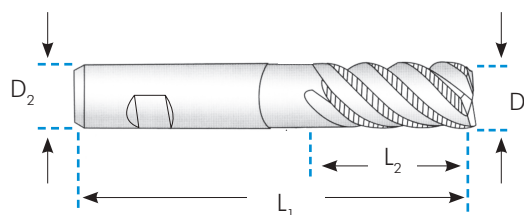
INOX

INC

45
HPc

SERIE LARGA

**Micro
Grano
MD**

**FMG19**

	TOL h10	TOL h6						
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	Z	€
FMG190600	6,0	6	5,5	57	16	20	4	88,99
FMG190800	8,0	8	7,5	63	16	26	4	104,04
FMG191000	10,0	10	9,5	72	22	31	4	155,20
FMG191200	12,0	12	11,5	83	26	37	4	199,14
FMG191600	16,0	16	15,5	100	32	51	5	324,43
FMG192000	20,0	20	19,2	110	38	59	6	521,51

REVOLUCIONES Y AVANCES

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

TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

	de 1 à 3	de 3 à 6	de 6 à 10	de 10 à 18	de 18 à 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 DE METAL DURO INTEGRAL PARA MECANIZADO DE ALUMINIO EN GENERAL

AI



TOL D1

-0,05

TOL D2

h6

2 Z



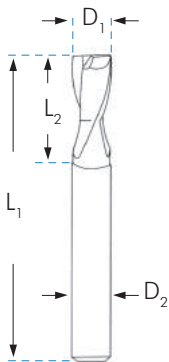
Ref. FM1AL

Ref. FM2AL

3 Z



Ref. FM3AL



				FM1AL	FM2AL					FM3AL
MATERIAL				MD	MD	MATERIAL				MD
ACABADO				BRILLANTE	BRILLANTE	ACABADO				BRILLANTE
CALIDAD				★★★★	★★★★	CALIDAD				★★★★
D1 mm	L1 mm	L2 mm	D2 mm	€	€	D1 mm	L1 mm	L2 mm	D2 mm	€
6,0	63	19	6	39,23	42,20	6,0	63	19	6	39,23
8,0	63	20	8	50,56	54,36	8,0	63	20	8	50,56
10,0	63	22	10	68,94	74,14	10,0	63	22	10	68,94
12,0	75	25	12	96,68	103,97	12,0	75	25	12	96,68
16,0	88	32	16	182,06	195,75	16,0	88	32	16	182,06
20,0	100	36	20	303,32	326,16	20,0	100	36	20	303,32

CONDICIONES DE CORTE

			Ø 2	Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25
AI	FM1AL	R.P.M	22282	14854	11141	8913	7427	5570	4456	3714	3183	2785	2228	1783
		AVANCE mm/min	2670	1780	1340	1070	890	670	530	450	380	330	270	210
	FM2AL	R.P.M	25465	16976	12732	10186	8488	6366	5093	4244	3638	3183	2546	2037
		AVANCE mm/min	3060	2040	1530	1220	1020	760	610	510	440	380	310	240
	FM3AL	R.P.M	22282	14854	11141	8913	7427	5570	4456	3714	3183	2785	2228	1783
		AVANCE mm/min	4010	2670	2010	1600	1340	1000	800	670	570	500	400	320



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

Al

Ref. FMD59

2 Z



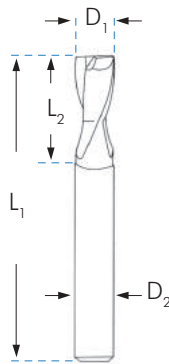
MG
MD



Cu

SERIE CORTA

Micro
Grano
MD



					FMD59	REVOLUCIONES Y AVANCES		
	TOL -0,05	TOL h6				Al		
	D1 mm	D2 mm	L1 mm	L2 mm	€	R.P.M rev./min.	AVANCE 1 mm/min	AVANCE 2 mm/min
FMD590300	3,0	3	38	12	25,75	10.000	700	900
FMD590400	4,0	4	50	14	27,90	10.000	900	1.100
FMD590500	5,0	5	50	19	31,26	10.000	1.000	1.300
FMD590600	6,0	6	63	19	35,49	10.000	1.200	1.500
FMD590800	8,0	8	63	19	46,64	8.000	1.400	1.800
FMD591000	10,0	10	70	22	68,56	8.000	1.700	2.100
FMD591200	12,0	12	83	25	90,60	8.000	2.100	2.600
FMD591400	14,0	14	83	30	127,14	6.000	1.800	2.200
FMD591600	16,0	16	88	32	161,26	6.000	1.900	2.400
FMD591800	18,0	18	88	32	208,65	4.000	1.400	1.800
FMD592000	20,0	20	100	38	265,96	4.000	1.600	1.900

TOLERANCIAS SEGÚN DIN 7160 y 7161

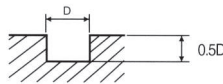
Gama de tolerancias μm / Diámetro nominal en mm

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

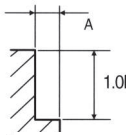
TOL h10	0	0	0	0	0
	- 40	- 48	- 58	- 70	- 84
TOL h6	0	0	0	0	0
	- 6	- 8	- 9	- 11	- 13

Al

AVANCE 1



AVANCE 2



A: $\phi 3 \sim \phi 10 = 0.25 \times D$
 $\phi 12 \sim \phi 20 = 0.5 \times D$

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

Al

Ref. FMGA02

2 Z



MG
MD

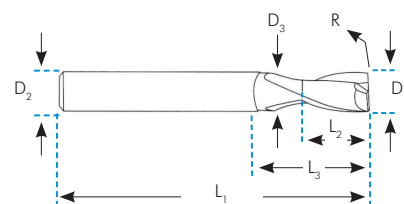


TiAlN

Cu

SERIE CORTA

Micro
Grano
MD



FMGA02							
	TOL -0,03	TOL h6					
	D1 mm	D2 mm	D3 mm	L1 mm	L3 mm	L2 mm	R
FMGA020200	2,0	3	1,9	40	6	3	0,2
FMGA020300	3,0	3	2,9	40	8	4	0,2
FMGA020400	4,0	4	3,8	50	12	5	0,2
FMGA020500	5,0	5	4,8	50	14	8	0,2
FMGA020600	6,0	6	5,7	65	18	8	0,2
FMGA020800	8,0	8	7,7	70	22	10	0,2
FMGA021000	10,0	10	9,7	80	28	14	0,2
FMGA021200	12,0	12	11,5	90	35	16	0,2
FMGA021600	16,0	16	15,5	90	40	20	0,2
FMGA022000	20,0	20	19,5	100	50	25	0,2
							€
							32,07
							32,07
							35,32
							36,72
							55,48
							65,21
							96,32
							133,07
							225,42
							366,34

REVOLUCIONES Y AVANCES

Al		
R.P.M rev./min.	AVANCE 1 mm/min	AVANCE 2 mm/min
22.000	800	1.000
13.000	900	1.200
13.000	1.200	1.400
13.000	1.300	1.700
13.000	1.500	2.000
10.000	1.800	2.300
10.000	2.200	2.700
12.000	2.700	3.400
8.000	2.500	3.100
5.000	2.000	2.500

FRESA 2 LABIOS, SERIE CORTA, HÉLICE A 30°, PARA ALUMINIO

Al

Ref. FMGA03

2 Z



MG
MD

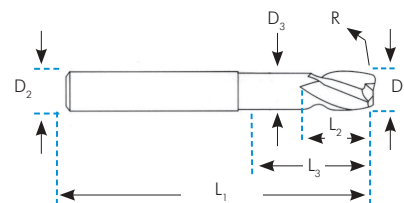


TiAlN

Cu

SERIE CORTA

Micro
Grano
MD



FMGA03							
	TOL -0,03	TOL h6					
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	R
FMGA030400	4,0	6	3,6	50	5	10	0,3
FMGA030600	6,0	6	5,4	60	8	20	0,5
FMGA030800	8,0	8	7,2	70	10	30	0,6
FMGA031000	10,0	10	9,0	80	12	36	0,8
FMGA031200	12,0	12	11,0	90	14	40	1,0
FMGA031600	16,0	16	14,5	100	18	45	1,3
FMGA032000	20,0	20	18,0	100	24	45	1,6
							€
							47,82
							47,82
							66,26
							99,26
							153,73
							244,96
							388,22

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	2.000	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
-0,03

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

TOL
h6

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

FRESA 3 LABIOS, SERIE CORTA, HÉLICE A 40°, PARA ALUMINIO CON PUNTA SEMIESFÉRICA

Al

Ref. FMGA05

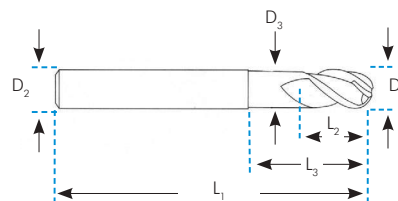
3 Z

MG
MD

TiAlN

Cu

SERIE CORTA

Micro
Grano
MD

	TOL						FMGA05
	-0,03	h6					
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	€
FMGA050200	2,0	6	1,9	60	3,0	5,0	57,64
FMGA050250	2,5	6	2,4	60	4,0	6,0	57,64
FMGA050300	3,0	6	2,8	60	4,5	6,5	57,64
FMGA050350	3,5	6	3,2	65	5,0	7,0	57,93
FMGA050400	4,0	6	3,7	65	6,0	8,0	57,93
FMGA050500	5,0	6	4,6	65	7,5	10,0	57,93
FMGA050600	6,0	6	5,6	75	9,0	12,0	57,93
FMGA050800	8,0	8	7,4	75	12,0	25,0	87,44
FMGA051000	10,0	10	9,4	80	15,0	30,0	129,29
FMGA051200	12,0	12	11,4	90	18,0	36,0	179,81
FMGA051600	16,0	16	15,4	100	24,0	40,0	262,29

REVOLUCIONES Y AVANCES

Al		Cu	
R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min
27.000	950	8.000	240
22.000	950	6.500	240
18.000	950	5.500	240
18.000	1.100	5.500	280
18.000	1.250	5.500	310
18.000	1.350	5.500	340
18.000	1.750	5.500	440
14.000	2.000	4.200	500
14.000	2.350	4.200	580
14.000	3.000	4.200	750
11.000	2.700	3.300	670

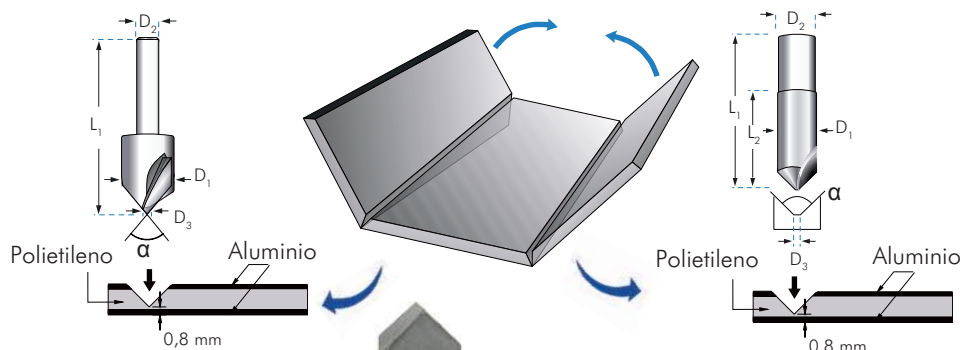
FRESAS ESPECIALES PARA ALUCOBOND

PMD

Ref. FFALUC

MDI

Ref. FFALUC...MDI



DE PLAQUITA SOLDADA

DE METAL DURO INTEGRAL

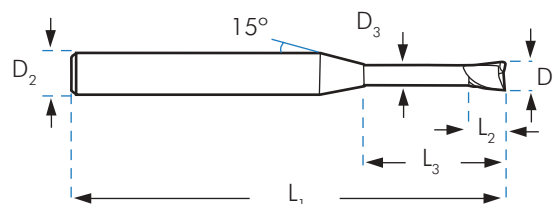
FFALUC						€
	D1 mm	D2 mm	D3 mm	L1 mm	α	
FFALUC1600	16,00	8	2,5	55	90°	141,81
FFALUC1800	18,00	8	2,5	55	90°	143,63
FFALUC2000	20,00	8	2,5	55	90°	147,87
FFALUC1600-135	16,00	8	2,3	55	135°	171,93
FFALUC1800-135	18,00	8	2,3	55	135°	178,35
FFALUC2000-135	20,00	8	2,3	55	135°	204,17

FFALUC...MDI							€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	α	
FFALUC1400MDI	14,00	14	2,5	50	14	90°	147,71
FFALUC1600MDI	16,00	16	2,5	50	16	90°	176,75
FFALUC1800MDI	18,00	18	2,5	50	18	90°	255,43
FFALUC1400MDI-135	14,00	14	0,5	50	14	135°	147,71
FFALUC1600MDI-135	16,00	16	0,5	50	16	135°	176,75
FFALUC1800MDI-135	18,00	18	0,5	50	18	135°	255,43

FRESAS DE METAL DURO FRONTALES CON CUELLO



Ref. FMG74
Ref. FMG75
Ref. FMG76



							FMG74
	TOL -0,015	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG740050	0,5	4	0,45	45	0,7	8	82,54
FMG740100	1,0	4	0,95	55	1,5	20	84,69
FMG740150	1,5	4	1,45	55	2,3	20	76,45
FMG740200	2,0	4	1,95	55	3,0	20	73,36
FMG740300	3,0	6	2,85	60	4,5	20	94,88
FMG740400	4,0	6	3,85	60	6,0	20	94,88
FMG740500	5,0	6	4,85	60	7,5	20	94,88
FMG740600	6,0	6	5,85	80	9,0	20	94,88

							FMG75
	TOL -0,015	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG750200	2,0	4	1,95	70	3,0	30	86,71
FMG750300	3,0	6	2,85	70	4,5	30	98,55
FMG750400	4,0	6	3,85	70	6,0	30	98,55
FMG750500	5,0	6	4,85	80	7,5	30	98,55
FMG750600	6,0	6	5,85	90	9,0	30	98,55

							FMG76
	TOL -0,015	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG760400	4,0	6	3,85	90	6,0	40	108,37
FMG760500	5,0	6	4,85	80	7,5	40	108,37
FMG760600	6,0	6	5,85	100	9,0	40	108,37



FRESAS DE METAL DURO SEMIESFÉRICAS CON CUELLO



Ref. FMG77
Ref. FMG78
Ref. FMG79

2 Z

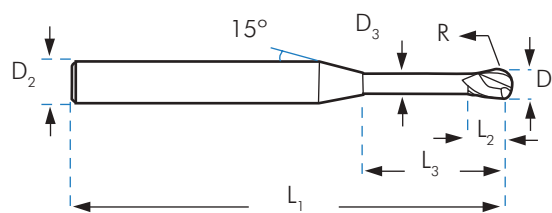
MG
MD

CILÍNDRICO

TiAlN



Micro
Grano
MD

R : $\pm 0,01$ mm

							FMG77
	TOL -0,02	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG770050	0,5	4	0,45	45	0,7	8	82,54
FMG770100	1,0	4	0,95	55	1,5	20	84,69
FMG770150	1,5	4	1,45	55	2,3	20	76,45
FMG770200	2,0	4	1,95	55	3,0	20	73,36
FMG770300	3,0	6	2,85	60	4,5	20	94,88
FMG770400	4,0	6	3,85	65	6,0	20	94,88
FMG770500	5,0	6	4,85	60	7,5	20	94,88
FMG770600	6,0	6	5,85	80	9,0	20	94,88

							FMG78
	TOL -0,02	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG780200	2,0	4	1,95	70	3,0	30	86,71
FMG780300	3,0	6	2,85	70	4,5	30	98,55
FMG780400	4,0	6	3,85	70	6,0	30	98,55
FMG780500	5,0	6	4,85	80	7,5	30	98,55
FMG780600	6,0	6	5,85	90	9,0	30	98,55

							FMG79
	TOL -0,02	TOL h6					€
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	
FMG790400	4,0	6	3,85	90	6,0	40	108,37
FMG790600	5,0	6	5,85	100	9,0	40	108,37

FRESA DE 2 LABIOS PARA ACEROS DE TEMPLE EXTREMO 70HRC



Ref. FMG01

2 Z

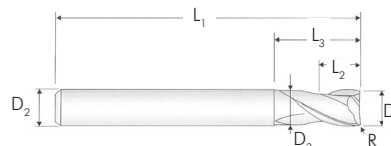
MG
MD

30°



CILÍNDRICO

BLUE

70
HRcMicro
Grano
MD

								FMG01	REVOLUCIONES Y AVANCES							
	TOL Especial	TOL h6														
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	R	€	R.P.M. rev./min.	AVANCE mm/min	R.P.M. rev./min.	AVANCE mm/min	R.P.M. rev./min.	AVANCE mm/min	R.P.M. rev./min.	AVANCE mm/min
FMG010100	1,0	3	-	40	1,5	-	0,1	52,52	25.500	360	20.500	215	16.000	135	12.500	88
FMG010150	1,5	3	-	40	2,2	-	0,1	52,52	21.500	390	17.500	240	13.500	150	11.000	102
FMG010200	2,0	3	1,9	40	3,0	6	0,1	47,65	17.500	420	14.500	260	11.000	160	9.500	115
FMG010250	2,5	3	2,4	40	4,0	6	0,1	47,65	14.500	420	12.000	260	9.250	160	7.950	115
FMG010300	3,0	6	2,9	45	4,0	7	0,1	69,59	11.500	420	9.500	260	7.500	160	6.400	115
FMG010350	3,5	6	3,3	45	5,0	9	0,1	69,59	10.150	430	8.350	270	6.550	165	5.575	118
FMG010400	4,0	6	3,8	45	5,0	9	0,1	69,59	8.800	440	7.200	270	5.600	170	4.750	118
FMG010450	4,5	6	4,3	45	6,0	10	0,1	69,59	8.550	470	6.800	280	5.350	175	4.600	125
FMG010500	5,0	6	4,8	50	6,0	11	0,2	69,59	8.300	500	6.400	285	5.100	180	4.450	132
FMG010600	6,0	6	5,8	50	7,0	14	0,2	69,59	6.900	480	5.300	280	4.200	180	3.700	130
FMG010800	8,0	8	7,8	60	9,0	18	0,2	88,00	5.200	445	4.000	255	3.200	165	2.800	120
FMG011000	10,0	10	9,7	75	12,0	25	0,2	131,53	4.100	415	3.200	240	2.550	155	2.200	112
FMG011200	12,0	12	11,7	75	15,0	30	0,3	181,38	3.500	415	2.650	240	2.100	155	1.860	112
FMG011600	16,0	16	15,7	90	18,0	38	0,3	302,40	2.600	365	2.000	210	1.600	135	1.400	98
FMG012000	20,0	20	19,7	100	24,0	45	0,3	500,01	2.050	335	1.600	295	1.300	125	1.100	88

FRESA DE 4 LABIOS PARA ACEROS DE TEMPLE EXTREMO 70HRC



Ref. FMG04

4 Z

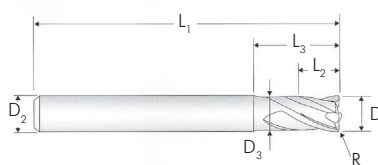
MG
MD

30°



CILÍNDRICO

BLUE

70
HRcMicro
Grano
MD

								FMG04	REVOLUCIONES Y AVANCES							
TOL Especial	TOL h6															
D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	R	€		R.P.M. rev./min.	AVANCE mm/min	R.P.M. rev./min.	AVANCE mm/min	R.P.M. rev./min.	AVANCE mm/min		
FMG040100	1,0	3	-	40	1,5	-	0,1	52,52	25.500	710	20.500	430	16.000	270	12.500	175
FMG040150	1,5	3	-	40	2,2	-	0,1	52,52	21.500	775	17.500	475	13.500	295	11.000	200
FMG040200	2,0	3	1,9	40	3,0	6	0,1	47,65	17.500	840	14.500	520	11.000	320	9.500	230
FMG040250	2,5	3	2,4	40	4,0	6	0,1	47,65	14.500	840	12.000	520	9.250	320	7.950	230
FMG040300	3,0	6	2,9	45	4,0	7	0,1	69,59	11.500	840	9.500	520	7.500	320	6.400	230
FMG040350	3,5	6	3,3	45	5,0	9	0,1	69,59	10.150	860	8.350	530	6.550	328	5.575	240
FMG040400	4,0	6	3,8	45	5,0	9	0,1	69,59	8.800	880	7.200	540	5.600	335	4.750	240
FMG040450	4,5	6	4,3	45	6,0	10	0,1	69,59	8.550	940	6.800	560	5.350	353	4.600	255
FMG040500	5,0	6	4,8	50	6,0	11	0,2	69,59	8.300	1.000	6.400	580	5.100	370	4.450	270
FMG040600	6,0	6	5,8	50	7,0	14	0,2	69,59	6.900	950	5.300	560	4.200	350	3.700	260
FMG040800	8,0	8	7,8	60	9,0	18	0,2	88,00	5.200	900	4.000	520	3.200	330	2.800	240
FMG041000	10,0	10	9,7	75	12,0	25	0,2	131,53	4.100	840	3.200	480	2.550	310	2.200	220
FMG041200	12,0	12	11,7	75	15,0	30	0,3	181,38	3.500	840	2.650	480	2.100	300	1.860	220
FMG041600	16,0	16	15,7	90	18,0	38	0,3	302,40	2.600	730	2.000	420	1.600	270	1.400	200
FMG042000	20,0	20	19,7	100	24,0	45	0,3	500,01	2.050	650	1.600	380	1.300	250	1.100	180



FRESA DE 2 LABIOS SEMIESFÉRICA PARA ACEROS DE TEMPLE EXTREMO 70HRC



Ref. FMG02

2 Z

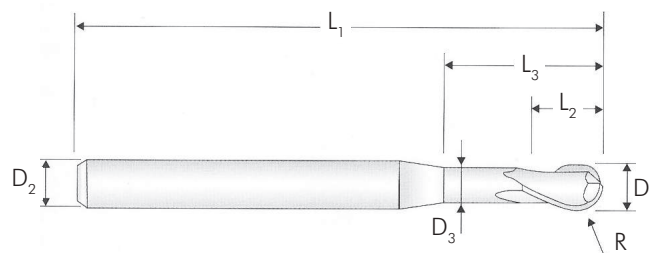
MG
MD

CILÍNDRICO

BLUE



SERIE CORTA

Micro
Grano
MD

FMG02							
TOL Especial	TOL h6						TOL R
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	R
FMG020100	1,0	4	0,95	50	1,0	2,2	0,5
FMG020120	1,2	4	1,10	50	1,2	2,6	0,6
FMG020150	1,5	4	1,40	50	1,5	3,0	0,8
FMG020200	2,0	4	1,90	50	2,0	4,0	1,0
FMG020300	3,0	6	2,90	60	3,0	6,0	1,5
FMG020400	4,0	6	3,30	70	4,0	8,0	2,0
FMG020500	5,0	6	4,90	80	5,0	10,0	2,5
FMG020600	6,0	6	5,90	90	6,0	12,0	3,0
FMG020700	7,0	8	6,90	90	7,0	14,0	3,5
FMG020800	8,0	8	7,90	100	8,0	16,0	4,0
FMG020900	9,0	10	8,90	100	9,0	18,0	4,5
FMG021000	10,0	10	9,90	100	10,0	20,0	5,0
FMG021200	12,0	12	11,90	110	12,0	24,0	6,0
FMG021400	14,0	14	13,80	110	14,0	28,0	7,0
FMG021600	16,0	16	15,80	140	16,0	32,0	8,0
FMG021800	18,0	18	17,80	140	18,0	36,0	9,0
FMG022000	20,0	20	19,80	160	20,0	40,0	10,0
FMG022500	25,0	25	24,80	180	25,0	50,0	12,5
							1.298,28

REVOLUCIONES Y AVANCES

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

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 h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13
TOL R	0 - 5	0 - 10	0 - 10	0 - 10	0 - 10

FRESAS DE 6 LABIOS PARA ACEROS DE TEMPLE EXTREMO 70HRC



Ref. FMG06

6 Z



MG
MD

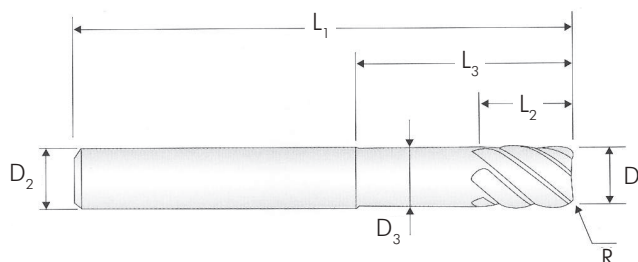


CILÍNDRICO

BLUE



SERIE CORTA



FMG06							
	TOL Especial	TOL h6				TOL R	
	D1 mm	D2 mm	D3 mm	L1 mm	L2 mm	L3 mm	R
FMG060600	6,0	6	5,70	50	6	14	0,5
FMG060800	8,0	8	7,65	60	8	24	0,5
FMG061000	10,0	10	9,65	70	10	30	1,0
FMG061200	12,0	12	11,60	75	12	30	1,0
							€
							99,55
							118,75
							185,25
							221,27

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
rev./min.	mm/min	rev./min.	mm/min	rev./min.	mm/min	rev./min.	mm/min
16.000	4.900	13.500	3.300	10.500	2.100	8.000	1.450
12.000	4.600	10.000	3.100	8.000	2.000	6.000	1.400
9.500	4.100	8.000	2.900	6.400	1.800	4.800	1.300
8.000	3.800	6.600	2.500	5.300	1.600	4.000	1.150

SERIE LARGA

FMG07					
	TOL Especial	TOL h6			
	D1 mm	D2 mm	L1 mm	L2 mm	R
FMG070600	6,0	6	70	13	0,5
FMG070800	8,0	8	90	19	0,5
FMG071000	10,0	10	100	22	0,5
FMG071001	10,0	10	100	22	1,0
FMG071200	12,0	12	110	26	0,5
FMG071201	12,0	12	110	26	1,0
FMG071600	16,0	16	130	32	1,0
FMG071601	16,0	16	130	32	1,5
FMG072000	20,0	20	140	38	1,0
FMG072001	20,0	20	140	38	1,5
FMG072002	20,0	20	140	38	2,0
					€
					113,11
					141,77
					213,60
					213,60
					291,34
					291,34
					491,31
					536,58
					785,45
					719,01
					785,45

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
rev./min.	mm/min	rev./min.	mm/min	rev./min.	mm/min	rev./min.	mm/min
16.000	4.900	13.500	3.300	10.500	2.100	8.000	1.450
12.000	4.600	10.000	3.100	8.000	2.000	6.000	1.400
9.500	4.100	8.000	2.900	6.400	1.800	4.800	1.300
8.000	3.800	6.600	2.500	5.300	1.600	4.000	1.150
8.000	3.800	6.600	2.500	5.300	1.600	4.000	1.150
6.000	3.400	5.000	2.300	4.000	1.250	3.000	870
6.000	3.400	5.000	2.300	4.000	1.250	3.000	870
4.800	3.200	4.000	2.100	3.200	1.020	2.400	690
4.800	3.200	4.000	2.100	3.200	1.020	2.400	690
4.800	3.200	4.000	2.100	3.200	1.020	2.400	690

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

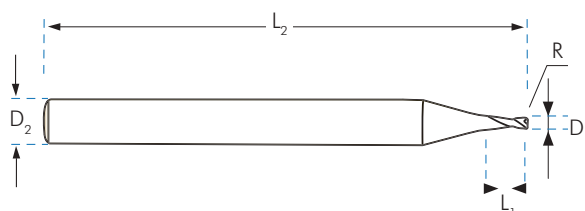
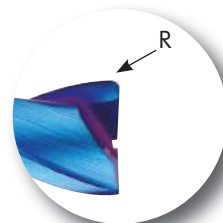
FRESAS PARA ACEROS DE TEMPLE EXTREMO 70HRC,
TECNOLOGÍA DE MICROFRESADO PIEZAS DE PRECISIÓN

Ref. FMG09

2 Z

MG
MD

BLUE

TOL D1
-0,012TOL D2
h6Micro
Grano
MD

	D1 mm	D2 mm	L1 mm	L2 mm	R	€
FMG090030	0,30	6	50	0,45	-	92,11
FMG090040	0,40	6	50	0,60	-	86,44
FMG090050	0,50	6	50	0,70	0,05	75,19
FMG090060	0,60	6	50	0,90	0,05	72,34
FMG090080	0,80	6	50	1,20	0,05	66,66
FMG090100	1,00	6	50	1,50	0,10	63,88
FMG090120	1,20	6	50	1,80	0,10	63,88
FMG090150	1,50	6	50	2,20	0,15	63,88
FMG090200	2,00	6	50	2,20	0,15	57,90

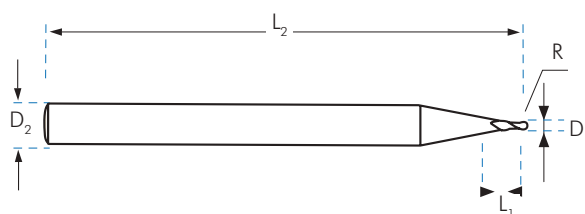
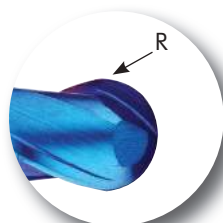


Ref. FMG08

2 Z

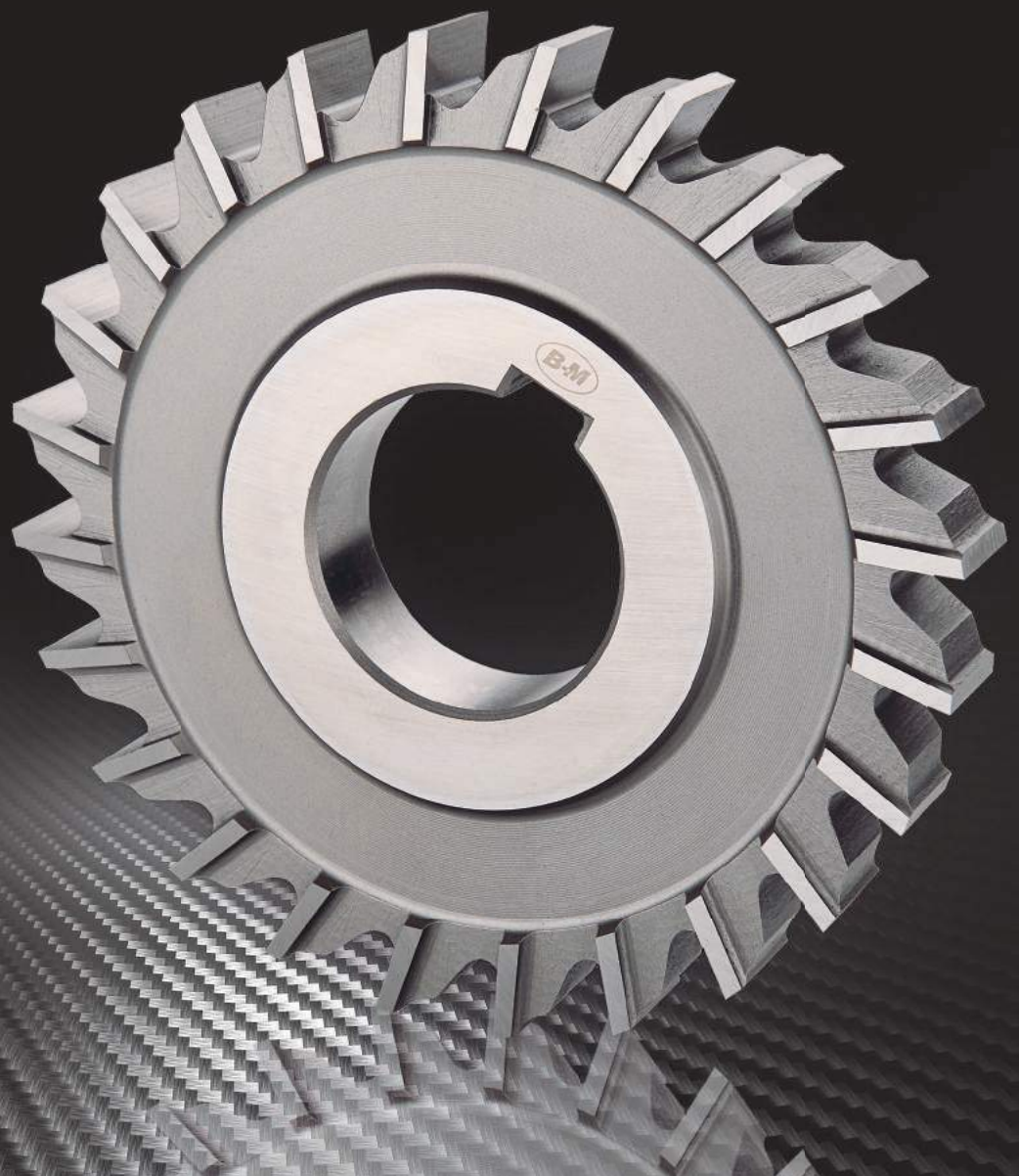
MG
MD

BLUE

TOL D1
-0,012TOL D2
h6Micro
Grano
MD

	D1 mm	D2 mm	L1 mm	L2 mm	R	€
FMG080040	0,40	6	50	0,40	0,20	93,49
FMG080050	0,50	6	50	0,50	0,25	86,30
FMG080060	0,60	6	50	0,60	0,30	79,13
FMG080080	0,80	6	50	0,80	0,40	64,54
FMG080100	1,00	6	50	1,00	0,50	60,77
FMG080120	1,20	6	50	1,20	0,60	60,77
FMG080150	1,50	6	50	1,50	0,75	60,77
FMG080200	2,00	6	50	2,00	1,00	55,06

FRESAS DE AGUJERO

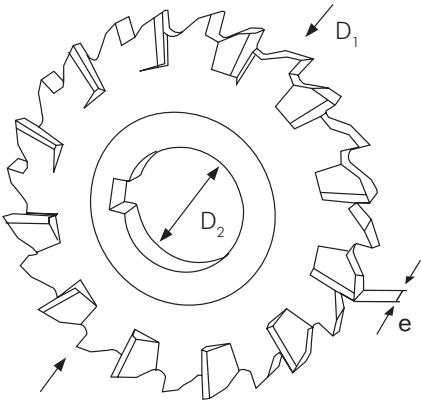


FRESA PARA RANURAR HSSCo DE 3 CORTES CON DIENTE CRUZADO



Ref. FF56

HSSCo
DIN
885A



FF56				
D1 mm	e mm	D2 mm	Z	€
50	4,0	16	12	79,26
50	5,0	16	12	79,26
50	6,0	16	12	91,85
50	8,0	16	12	89,45
50	10,0	16	12	98,50
63	1,6	22	16	189,53
63	2,0	22	16	167,81
63	2,5	22	16	171,30
63	3,0	22	16	176,00
63	4,0	22	12	91,46
63	5,0	22	12	91,46
63	6,0	22	12	94,04
63	8,0	22	12	102,48
63	10,0	22	12	110,27
63	12,0	22	12	117,74
63	14,0	22	12	126,82
63	16,0	22	12	133,49
63	18,0	22	12	159,48
80	1,6	27	20	189,43
80	2,0	27	20	184,01
80	2,5	27	20	187,07
80	3,0	27	20	183,36
80	4,0	27	20	196,47
80	5,0	27	14	124,25
80	6,0	27	14	127,18
80	8,0	27	14	134,21
80	10,0	27	14	143,64
80	12,0	27	14	153,76
80	14,0	27	14	164,41
80	16,0	27	14	168,21
80	18,0	27	14	180,44
80	20,0	27	14	198,40

FF56				
D1 mm	e mm	D2 mm	Z	€
100	1,6	32	24	226,61
100	2,0	32	24	225,38
100	2,5	32	24	225,17
100	3,0	32	24	218,62
100	4,0	32	24	235,69
100	5,0	32	24	249,86
100	6,0	32	16	174,65
100	8,0	32	16	178,34
100	10,0	32	16	184,88
100	12,0	32	16	199,13
100	14,0	32	16	219,23
100	16,0	32	16	229,94
100	18,0	32	16	253,46
100	20,0	32	16	253,46
100	22,0	32	16	284,12
100	25,0	32	16	309,07
125	1,6	32	26	286,59
125	2,0	32	26	275,65
125	2,5	32	26	282,51
125	3,0	32	26	289,38
125	4,0	32	26	310,02
125	5,0	32	26	331,85
125	6,0	32	26	340,05
125	8,0	32	18	275,46
125	10,0	32	18	282,65
125	12,0	32	18	293,36
125	14,0	32	18	318,58
125	16,0	32	18	338,28
125	18,0	32	18	357,82
125	20,0	32	18	380,70
125	22,0	32	18	433,49
125	25,0	32	18	437,68
125	28,0	32	18	478,38

FF56				
D1 mm	e mm	D2 mm	Z	€
160	2,0	40	30	461,28
160	2,5	40	30	444,07
160	3,0	40	30	452,61
160	4,0	40	30	478,25
160	5,0	40	30	506,45
160	6,0	40	30	543,78
160	8,0	40	30	620,67
160	10,0	40	22	456,58
160	12,0	40	22	456,58
160	14,0	40	22	454,35
160	16,0	40	22	497,24
160	18,0	40	22	523,94
160	20,0	40	22	537,82
160	22,0	40	22	591,15
160	25,0	40	22	640,55
160	28,0	40	22	704,12
160	32,0	40	22	752,85
200	12,0	40	24	696,47
200	14,0	40	24	703,29
200	16,0	40	24	724,55
200	18,0	40	24	760,21
200	20,0	40	24	813,05
200	22,0	40	24	815,72
200	25,0	40	24	946,22
200	28,0	40	24	976,13
200	32,0	40	24	1217,38

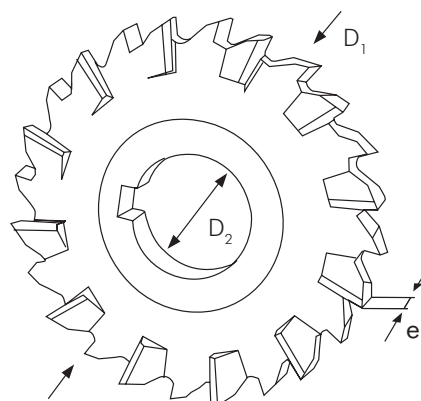
FRESA PARA RANURAR HSSCo DE 3 CORTES CON DIENTE RECTO



Ref. FF59

HSSCo

DIN
885B



FF59				
D1 mm	e mm	D2 mm	Z	€
50	4	16	16	79,01
50	5	16	16	79,01
50	6	16	16	91,57
50	8	16	16	89,18
50	10	16	16	98,20
63	4	22	18	92,05
63	5	22	18	92,05
63	6	22	18	93,27
63	8	22	18	101,40
63	10	22	18	109,11
63	12	22	18	116,87
63	14	22	18	125,87
63	16	22	18	133,13
63	18	22	18	159,00
80	5	27	20	123,82
80	6	27	20	127,08
80	8	27	20	134,11
80	10	27	20	143,16
80	12	27	20	153,28
80	14	27	20	163,92
80	16	27	20	168,18
80	18	27	20	180,40
80	20	27	20	198,36

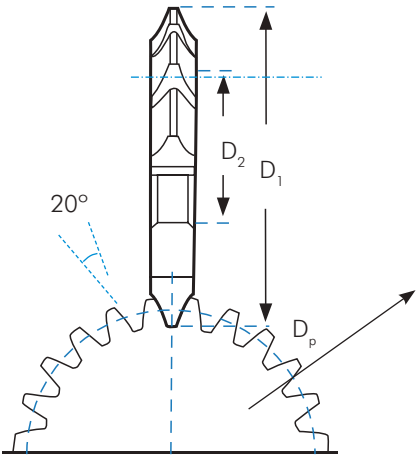
FF59				
D1 mm	e mm	D2 mm	Z	€
100	6	32	22	172,88
100	8	32	22	177,79
100	10	32	22	184,29
100	12	32	22	198,47
100	14	32	22	218,52
100	16	32	22	231,51
100	18	32	22	253,41
100	20	32	22	253,41
100	22	32	22	283,27
100	25	32	22	309,87
125	8	32	24	275,30
125	10	32	24	282,48
125	12	32	24	293,19
125	14	32	24	318,40
125	16	32	24	334,74
125	18	32	24	357,71
125	20	32	24	380,59
125	22	32	24	433,37
125	25	32	24	437,57
125	28	32	24	478,24

FF59				
D1 mm	e mm	D2 mm	Z	€
160	10	40	28	456,45
160	12	40	28	456,45
160	14	40	28	454,22
160	16	40	28	497,09
160	18	40	28	523,79
160	20	40	28	537,67
160	22	40	28	590,98
160	25	40	28	640,37
160	28	40	28	703,92
160	32	40	28	752,63
200	12	40	30	696,27
200	14	40	30	703,09
200	16	40	30	724,35
200	18	40	30	760,00
200	20	40	30	812,82
200	22	40	30	815,50
200	25	40	30	945,96
200	28	40	30	975,86
200	32	40	30	1217,04

FRESA DE MÓDULO PARA TALLADO DE ENGRANAJES

Ref. 99RFM

HSS



Mód. = $\frac{\varnothing\text{Ext}}{(Z+2)}$

MÓDULO FRESA	D ₁ mm	D ₂ mm	99RFM €
0,50	40	16	81,85
0,70	40	16	81,85
0,75	40	16	81,85
0,80	40	16	81,85
1,00	50	16	81,85
1,25	50	16	81,85
1,50	56	22	81,85
1,75	56	22	81,85
2,00	63	22	81,85
2,25	63	22	95,93
2,50	63	22	95,93
2,75	71	27	95,93
3,00	71	27	95,93
3,25	71	27	126,59
3,50	80	27	126,59
3,75	80	27	126,59
4,00	80	27	126,59
4,50	90	32	173,51
5,00	90	32	173,51
6,00	100	32	219,70
7,00	100	32	219,70

NÚMERO DE FRESA / DIENTES A TALLAR

Nº1	Nº2	Nº3	Nº4	Nº5	Nº6	Nº7	Nº8	Set
12-13	14-16	17-20	21-25	26-34	35-54	55-134	135-∞	12-∞

NOTA: El precio depende del módulo, independientemente del nº de dientes a tallar.

FRESAS CILÍNDRICAS, FRONTALES CON CHAVETERO TRANSVERSAL HSSCo

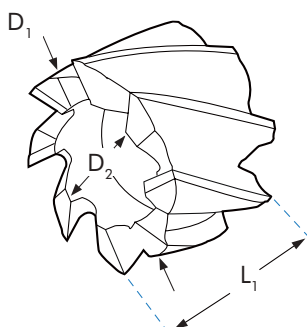


Ref. FF87

HSSCo

DIN
1880

ACABADO



				FF87
D1 mm	D2 mm	L1 mm	Z	€
40	16	32	8	104,23
50	22	36	8	143,41
63	27	40	8	195,96
80	27	45	10	277,36
100	32	50	12	446,52
125	40	56	14	717,08
160	50	63	16	1.281,57



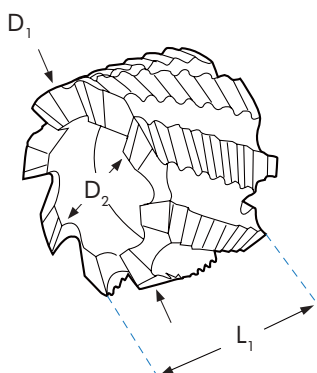
Ref. FF88

HSSCo

DIN
1880



DESBASTE



				FF88
D1 mm	D2 mm	L1 mm	Z	€
40	16	32	6	150,96
50	22	36	6	187,46
63	27	40	8	248,37
80	27	45	8	365,07
100	32	50	10	602,31
125	40	56	12	1.021,83
160	50	63	14	1.773,04

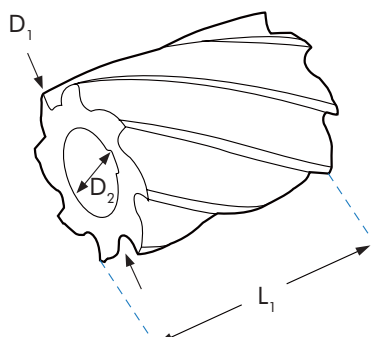


Ref. FF89

HSSCo

DIN
884

CILÍNDRICA PARA PLANEAR



				FF89
D1 mm	D2 mm	L1 mm	Z	€
50	22	40	8	122,56
50	22	63	8	130,59
50	22	80	8	194,67
63	27	50	8	171,37
63	27	70	8	208,49
80	32	63	8	288,83
80	32	100	8	424,60
100	40	70	10	449,37

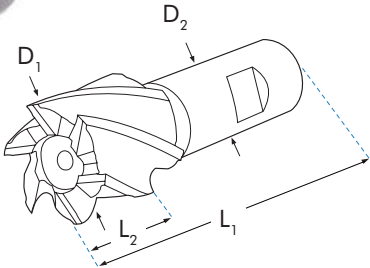
FRESAS CILÍNDRICAS, FRONTALES PARA PLANEAR CON MANGO



Ref. FMF87

HSSCo
8%

ACABADO



					FMF87
D ₁ mm	L ₂ mm	L ₁ mm	D ₂ mm	Z	€
30	30	90	20	6	151,94
35	30	90	20	6	174,38
40	32	95	25	8	217,33

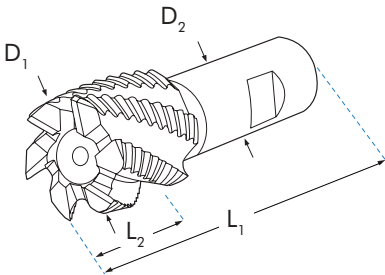


Ref. FMF88

HSSCo
8%

NR

DESBASTE



					FMF88
D ₁ mm	L ₂ mm	L ₁ mm	D ₂ mm	Z	€
30	30	90	20	6	175,65
35	30	90	20	6	225,03
40	32	95	25	8	275,67

FRESAS SEMICIRCULARES, ANGULARES ISÓSCELES HSSCo

Ref. FF77

HSSCo

DIN
847



Ref. FF78

HSSCo

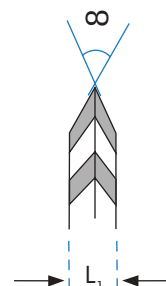
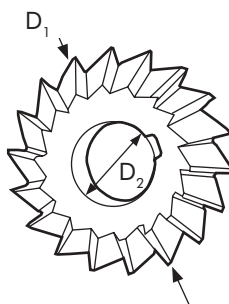
DIN
847



Ref. FF79

HSSCo

DIN
847



FF77						FF78						FF79					
D1 mm	D2 mm	L1 mm	∞	Z	€	D1 mm	D2 mm	L1 mm	∞	Z	€	D1 mm	D2 mm	L1 mm	∞	Z	€
50	16	8	45°	20	139,14	50	16	10	60°	18	141,87	50	16	14	90°	16	141,87
63	22	10	45°	22	165,50	63	22	14	60°	20	168,75	63	22	20	90°	18	168,75
80	27	12	45°	24	231,07	80	27	18	60°	22	235,60	80	27	22	90°	20	235,60
100	32	18	45°	26	288,88	100	32	25	60°	24	294,55	100	32	32	90°	22	294,55

Ref. FF91

HSSCo

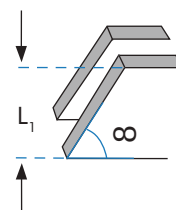
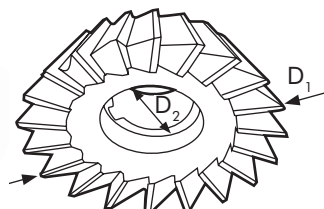
DIN
842



Ref. FF90

HSSCo

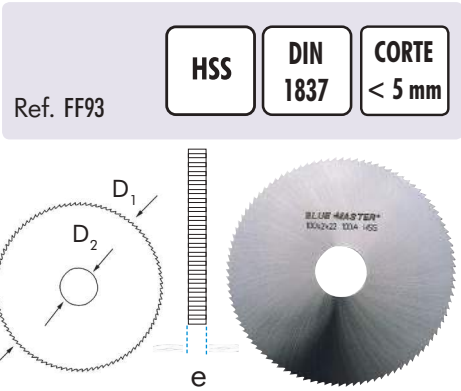
DIN
842



FF91					
D1 mm	D2 mm	L1 mm	∞	Z	€
40	10	13	50°	14	110,02
50	13	16	50°	16	135,67
63	16	20	50°	18	171,50
80	22	25	50°	20	247,09
100	27	32	50°	22	358,37
125	32	40	50°	24	591,80
160	40	50	50°	30	1.035,21

FF90					
D1 mm	D2 mm	L1 mm	∞	Z	€
40	10	13	60°	14	107,88
50	13	16	60°	16	133,04
63	16	20	60°	18	168,17
80	22	25	60°	20	242,30
100	27	32	60°	22	351,40
125	32	40	60°	24	580,32
160	40	50	60°	30	1.015,12

SIERRA CIRCULAR PARA METAL, CORTE FINO hasta 5 mm



Ref. FF93					HSS	DIN 1837	CORTE < 5 mm
D1 mm	e mm	D2 mm	Z	FF93 €			
20	0,20	5	80	13,39			
20	0,25	5	64	13,39			
20	0,30	5	64	12,03			
20	0,40	5	64	12,03			
20	0,50	5	48	11,57			
20	0,60	5	48	11,57			
20	0,80	5	48	11,57			
20	1,00	5	40	11,57			
20	1,20	5	40	13,39			
20	1,60	5	40	14,72			
20	2,00	5	32	15,29			
20	2,50	5	32	18,41			
20	3,00	5	32	19,91			
20	4,00	5	24	26,33			
20	5,00	5	24	30,87			
20	6,00	5	24	35,17			
25	0,20	8	80	13,73			
25	0,25	8	80	13,73			
25	0,30	8	80	12,79			
25	0,40	8	64	12,79			
25	0,50	8	64	12,19			
25	0,60	8	64	12,19			
25	0,80	8	48	12,19			
25	1,00	8	48	12,19			
25	1,20	8	48	14,01			
25	1,60	8	40	14,96			
25	2,00	8	40	16,01			
25	2,50	8	40	17,34			
25	3,00	8	32	23,54			
25	4,00	8	32	27,94			
25	5,00	8	32	32,70			
25	6,00	8	32	36,64			
32	0,20	8	100	14,68			
32	0,25	8	100	14,68			
32	0,30	8	80	13,39			
32	0,40	8	80	13,39			
32	0,50	8	80	12,78			
32	0,60	8	64	12,78			
32	0,80	8	64	12,78			
32	1,00	8	64	12,78			
32	1,20	8	48	14,99			
32	1,60	8	48	15,07			
32	2,00	8	48	16,99			
32	2,50	8	40	18,39			
32	3,00	8	40	20,50			
32	4,00	8	40	29,85			
32	5,00	8	32	36,36			
32	6,00	8	32	38,47			

FF93					FF93 €
D1 mm	e mm	D2 mm	Z	FF93 €	FF93 €
40	0,20	10	128	15,87	15,87
40	0,25	10	100	15,87	15,87
40	0,30	10	100	15,28	15,28
40	0,40	10	100	15,28	15,28
40	0,50	10	80	14,28	14,28
40	0,60	10	80	14,28	14,28
40	0,80	10	80	14,28	14,28
40	1,00	10	64	14,28	14,28
40	1,20	10	64	15,36	15,36
40	1,60	10	64	16,30	16,30
40	2,00	10	48	17,65	17,65
40	2,50	10	48	19,71	19,71
40	3,00	10	48	23,29	23,29
40	4,00	10	40	27,01	27,01
40	5,00	10	40	40,94	40,94
40	6,00	10	40	44,96	44,96
50	0,20	13	128	21,62	21,62
50	0,25	13	128	18,94	18,94
50	0,30	13	128	17,22	17,22
50	0,40	13	100	17,22	17,22
50	0,50	13	100	16,30	16,30
50	0,60	13	100	16,30	16,30
50	0,80	13	80	16,30	16,30
50	1,00	13	80	16,30	16,30
50	1,20	13	80	17,22	17,22
50	1,60	13	64	18,77	18,77
50	2,00	13	64	20,27	20,27
50	2,50	13	64	21,71	21,71
50	3,00	13	48	24,85	24,85
50	4,00	13	48	28,76	28,76
50	5,00	13	48	38,10	38,10
50	6,00	13	40	50,92	50,92
63	0,25	16	160	23,08	23,08
63	0,30	16	128	19,61	19,61
63	0,40	16	128	19,61	19,61
63	0,50	16	128	18,85	18,85
63	0,60	16	100	18,85	18,85
63	0,80	16	100	18,85	18,85
63	1,00	16	100	18,85	18,85
63	1,20	16	80	19,48	19,48
63	1,60	16	80	21,75	21,75
63	2,00	16	80	23,43	23,43
63	2,50	16	64	24,72	24,72
63	3,00	16	64	27,42	27,42
63	4,00	16	64	34,51	34,51
63	5,00	16	48	43,67	43,67
63	6,00	16	48	48,81	48,81
80	0,30	22	160	25,82	25,82
80	0,40	22	160	25,82	25,82
80	0,50	22	128	22,43	22,43
80	0,60	22	128	22,43	22,43
80	0,80	22	128	22,43	22,43
80	1,00	22	100	22,43	22,43
80	1,20	22	100	23,12	23,12
80	1,60	22	100	24,50	24,50
80	2,00	22	80	26,97	26,97
80	2,50	22	80	32,28	32,28
80	3,00	22	80	35,20	35,20
80	4,00	22	64	43,16	43,16
80	5,00	22	64	53,00	53,00
80	6,00	22	64	59,48	59,48

FF93					FF93 €
D1 mm	e mm	D2 mm	Z	FF93 €	FF93 €
100	0,50	22	160	28,37	28,37
100	0,60	22	160	26,03	26,03
100	0,80	22	128	26,03	26,03
100	1,00	22	128	26,03	26,03
100	1,20	22	128	27,06	27,06
100	1,60	22	100	32,54	32,54
100	2,00	22	100	35,88	35,88
100	2,50	22	100	40,32	40,32
100	3,00	22	80	43,67	43,67
100	4,00	22	80	59,48	59,48
100	5,00	22	80	66,49	66,49
100	6,00	22	64	77,74	77,74
125	0,60	22	160	42,37	42,37
125	0,80	22	160	39,64	39,64
125	1,00	22	160	39,64	39,64
125	1,20	22	128	39,64	39,64
125	1,60	22	128	41,46	41,46
125	2,00	22	128	43,85	43,85
125	2,50	22	100	46,43	46,43
125	3,00	22	100	51,63	51,63
125	4,00	22	100	77,12	77,12
125	5,00	22	80	90,18	90,18
125	6,00	22	80	100,64	100,64
160	1,00	32	160	60,75	60,75
160	1,20	32	160	55,76	55,76
160	1,60	32	160	57,59	57,59
160	2,00	32	128	59,48	59,48
160	2,50	32	128	66,23	66,23
160	3,00	32	128	75,22	75,22
160	4,00	32	100	106,18	106,18
160	5,00	32	100	126,08	126,08
160	6,00	32	100	143,79	143,79
200	1,00	32	200	80,36	80,36
200	1,20	32	200	80,36	80,36
200	1,60	32	160	79,73	79,73
200	2,00	32	160	84,43	84,43
200	2,50	32	160	96,25	96,25
200	3,00	32	128	107,74	107,74
200	4,00	32	128	152,70	152,70
200	5,00	32	128	181,44	181,44
200	6,00	32	100	208,43	208,43
250	1,60	32	200	114,80	114,80
250	2,00	32	200	117,00	117,00
250	2,50	32	160	133,75	133,75
250	3,00	32	160	147,54	147,54
250	4,00	32	160	213,91	213,91
250	5,00	32	128	254,93	254,93
250	6,00	32	128	302,06	302,06
315	2,50	40	200	209,52	209,52
315	3,00	40	200	235,20	235,20
315	4,00	40	160	303,82	303,82
315	5,00	40	160	371,91	371,91
315	6,00	40	160	440,02	440,02

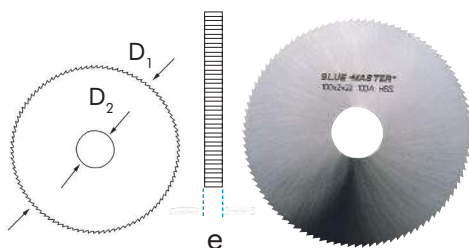
SIERRA CIRCULAR PARA METAL, CORTE GRUESO a partir de 5 mm

Ref. FF94

HSS

DIN
1838

CORTE
> 5 mm



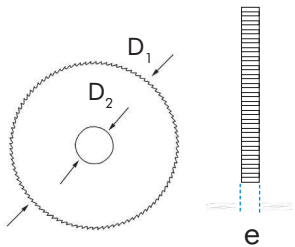
D1 mm	e mm	D2 mm	Z	FF94 €
50	0,5	13	48	18,51
50	0,6	13	48	18,51
50	0,8	13	40	18,51
50	1,0	13	40	18,51
50	1,2	13	40	19,35
50	1,6	13	32	21,05
50	2,0	13	32	21,92
50	2,5	13	32	23,30
50	3,0	13	24	25,18
50	4,0	13	24	32,62
50	5,0	13	24	40,64
50	6,0	13	20	44,34
63	0,5	16	64	20,47
63	0,6	16	48	20,47
63	0,8	16	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	42,76
63	6,0	16	24	47,90
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	26,57
80	2,5	22	40	31,66
80	3,0	22	40	34,52
80	4,0	22	32	42,22
80	5,0	22	32	51,80
80	6,0	22	32	57,92

D1 mm	e mm	D2 mm	Z	FF94 €
100	0,6	22	80	27,10
100	0,8	22	64	25,58
100	1,0	22	64	25,58
100	1,2	22	64	26,56
100	1,6	22	48	32,04
100	2,0	22	48	35,24
100	2,5	22	48	39,58
100	3,0	22	40	42,66
100	4,0	22	40	58,26
100	5,0	22	40	65,18
100	6,0	22	32	76,28
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	40,91
125	2,0	22	64	42,62
125	2,5	22	48	45,51
125	3,0	22	48	50,24
125	4,0	22	48	75,33
125	5,0	22	40	88,43
125	6,0	22	40	98,17
160	1,0	32	80	54,98
160	1,2	32	80	55,02
160	1,6	32	80	56,84
160	2,0	32	64	58,34
160	2,5	32	64	64,92
160	3,0	32	64	74,19
160	4,0	32	48	103,84
160	5,0	32	48	123,67
160	6,0	32	48	139,78

D1 mm	e mm	D2 mm	Z	FF94 €
200	1,2	32	100	64,33
200	1,6	32	80	77,85
200	2,0	32	80	83,51
200	2,5	32	80	94,15
200	3,0	32	64	105,68
200	4,0	32	64	148,38
200	5,0	32	64	176,64
200	6,0	32	48	205,32
250	1,6	32	100	108,12
250	2,0	32	100	115,51
250	2,5	32	80	131,19
250	3,0	32	80	145,42
250	4,0	32	80	212,78
250	5,0	32	64	248,81
250	6,0	32	64	294,51
315	2,5	40	100	206,48
315	3,0	40	100	230,65
315	4,0	40	80	297,95
315	5,0	40	80	361,92
315	6,0	40	80	440,80

SIERRAS CIRCULARES PARA MÁQUINAS TRONZADORAS

Frescos
Rosa



Ref. FF68



Ref. FF69

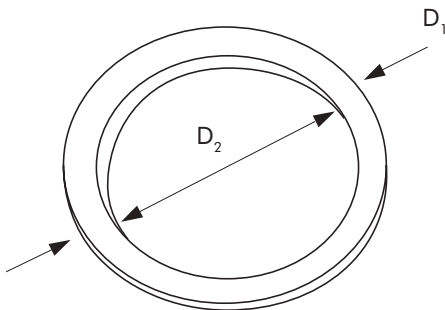


Ref. FF70

			FF68	FF69	FF70		
MATERIAL			HSS	HSSCo	HSS		
ACABADO			OX	BRILLANTE	TiN		
D ₁ mm	e mm	D ₂ mm	€	€	€	Z	
175	2,0	32	83,15	108,09	108,53	70	70/90/110/140/180
200	1,8/2"	32	85,55	116,57	127,04	70	80/100/128/160/200
225	1,6	32	94,55	122,90	136,65	90	90/120/140/180/220
225	2,0	32/40	89,90	116,87	131,68	90	
250	1,2	32/40	119,27	155,04	163,15	110	
250	1,6	32/40	103,24	134,20	150,78	110	90/100/128/160/200/250
250	2,0	32/40	101,88	132,46	148,59	90	
250	2,5	32/40	110,18	149,58	161,69	90	
275	1,6	32/40	136,33	177,24	185,00	110	
275	2,0	32/40	134,10	182,08	182,08	95	90/110/120/140/180/220/280
275	2,5	32/40	139,56	181,43	187,91	95	
300	2,0	32	164,81	214,25	222,16	95	
300	2,5	32	168,55	219,12	224,32	95	90/120/160/180/220/300
300	3,0	32	203,77	264,89	244,72	95	
315	2,0	32	179,79	233,74	242,54	100	
315	2,5	32	180,55	234,70	242,54	100	80/100/120/160/200/240/320
315	3,0	32	218,45	283,97	268,02	100	
350	2,5	32/40/50	230,73	299,96	308,82	120	90/110/120/140/160/180/220/280/350
350	3,0	32/40/50	259,20	336,96	335,02	120	
370	3,0	50	326,61	424,62	415,15	120	90/110/120/140/160/200/220
400	3,0	40/50	380,56	494,74	466,14	120	
400	3,5	40/50	415,02	539,54	485,07	120	100/120/160/200/240/310
425	3,0	40/50	428,52	557,07	582,66	120	
425	3,5	40/50	468,96	609,66	600,15	120	110/160/220/260/320
450	3,0	40/50	557,36	724,56	672,98	120	
450	3,5	40/50	605,30	786,89	718,14	130	110/130/160/200/260/310
450	4,0	40/50	636,76	827,80	764,75	130	
500	3,5	40/50	779,10	1.012,83	954,11	130	100/120/140/180/220/340
500	4,0	40/50	824,05	1.071,26	1.000,72	130	
525	4,0	50	936,43	1.217,36	1.089,57	140	100/140/160/210/270/330
550	4,0	50	981,37	1.275,78	1.172,86	150/210	120/140/170/220/280/340

CASQUILLOS

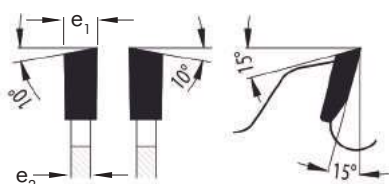
		CRS
D ₁ mm	D ₂ mm	€
32	20,0	11,72
32	25,4	11,72
40	25,4	11,72
40	32,0	11,72



SIERRAS CIRCULARES CON DIENTES DE METAL DURO

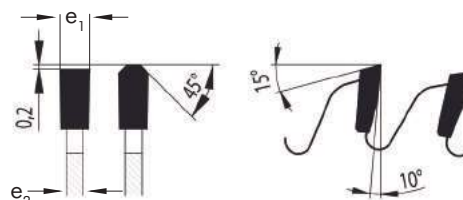
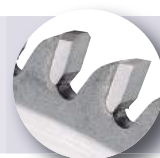
Ref. S1CM

SIERRA UNIVERSAL
PARA CORTE TRANSVERSAL



Ref. S2CM

SIERRA PARA CORTE
DE PANELES LAMINADOS



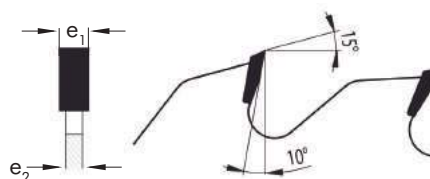
	D1 mm	e1 mm	e2 mm	D2 mm	Z	S1CM €
S1CM160202516	160	2,5	1,6	20	16	41,53
S1CM160202524	160	2,5	1,6	20	24	47,94
S1CM160202536	160	2,5	1,6	20	36	53,91
S1CM160202548	160	2,5	1,6	20	48	62,39
S1CM180202528	180	2,5	1,6	20	28	56,18
S1CM180202556	180	2,5	1,6	20	56	70,63
S1CM200202524	200	2,5	1,6	20	24	52,04
S1CM200202532	200	2,5	1,6	20	32	60,32
S1CM250303240	250	3,2	2,2	30	40	83,06
S1CM250303248	250	3,2	2,2	30	48	89,42
S1CM250303260	250	3,2	2,2	30	60	91,30
S1CM250303264	250	3,2	2,2	30	64	93,57
S1CM250303272	250	3,2	2,2	30	72	101,85
S1CM250303280	250	3,2	2,2	30	80	110,09
S1CM300303248	300	3,2	2,2	30	48	97,70
S1CM300303264	300	3,2	2,2	30	64	110,09
S1CM300303272	300	3,2	2,2	30	72	114,23
S1CM300303296	300	3,2	2,2	30	96	128,73
S1CM315303248	315	3,2	2,2	30	48	110,09
S1CM350303654	350	3,6	2,5	30	54	124,59
S1CM350303672	350	3,6	2,5	30	72	135,09
S1CM350303684	350	3,6	2,5	30	84	141,31
S1CM3503036108	350	3,6	2,5	30	108	160,09
S1CM400303648	400	3,6	2,5	30	48	106,47
S1CM400303664	400	3,6	2,5	30	64	143,38
S1CM400303684	400	3,6	2,5	30	84	160,09
S1CM400303696	400	3,6	2,5	30	96	166,12
S1CM4003036120	400	3,6	2,5	30	120	176,62
S1CM45030456	450	4	2,8	30	56	126,85
S1CM45030472	450	4	2,8	30	72	176,62
S1CM50030464	500	4	2,8	30	64	155,76
S1CM50030484	500	4	2,8	30	84	207,65
S1CM600305290	600	5,2	3,5	30	90	502,65
S1CM70030460	700	4	3	30	60	373,15

	D1 mm	e1 mm	e2 mm	D2 mm	Z	S2CM €
S2CM200303264	200	3,2	2,2	30	64	103,92
S2CM250303260	250	3,2	2,2	30	60	112,16
S2CM250303280	250	3,2	2,2	30	80	132,83
S2CM300303272	300	3,2	2,2	30	72	132,83
S2CM300303272HP*	300	3,2	2,2	30	72*	132,83
S2CM300303296	300	3,2	2,2	30	96	157,84
S2CM3503036108	350	3,6	2,5	30	108	178,70

* Alto Rendimiento

Ref. S3CM

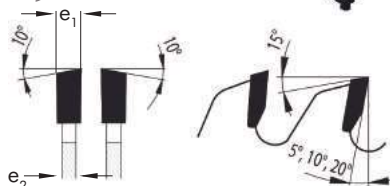
SIERRA PARA RANURAR



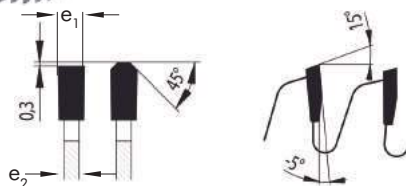
	D1 mm	e1 mm	e2 mm	D2 mm	Z	S3CM €
S3CM150303512	150	3,5	2,5	30	12	53,38
S3CM15030412	150	4	2,5	30	12	55,26
S3CM15030512	150	5	3,5	30	12	57,33
S3CM15030612	150	6	3,5	30	12	57,33
S3CM18030416	180	4	2,5	30	16	63,12
S3CM18030516	180	5	3,5	30	16	65,18
S3CM18030616	180	6	3,5	30	16	67,06
S3CM20030432	200	4	2,5	30	32	83,78

SIERRAS CIRCULARES CON DIENTES DE METAL DURO

Ref. S4CM

HOJAS PARA SIERRA
ELECTROPORTATIL

Ref. S5CM

SIERRA PARA PERFILES
DE ALUMINIO Y PVC

	D1 mm	e1 mm	e2 mm	D2 mm	Z	S4CM €
S4CM127202610	127	2,6	1,6	20	10	29,67
S4CM127202620	127	2,6	1,6	20	20	41,53
S4CM127202636	127	2,6	1,6	20	36	49,62
S4CM130202610	130	2,6	1,6	20	10	31,55
S4CM130202620	130	2,6	1,6	20	20	41,53
S4CM130202636	130	2,6	1,6	20	36	51,31
S4CM140202610	140	2,6	1,6	20	10	31,55
S4CM140202620	140	2,6	1,6	20	20	43,41
S4CM140202642	140	2,6	1,6	20	42	54,11
S4CM150202612	150	2,6	1,6	20	12	35,51
S4CM150202624	150	2,6	1,6	20	24	43,41
S4CM150202640	150	2,6	1,6	20	40	55,99
S4CM150202648	150	2,6	1,6	20	48	62,78
S4CM160202612	160	2,6	1,6	20	12	35,51
S4CM160202624	160	2,6	1,6	20	24	43,41
S4CM160202640	160	2,6	1,6	20	40	58,82
S4CM160202648	160	2,6	1,6	20	48	63,30
S4CM170302612	170	2,6	1,6	30	12	37,58
S4CM170302624	170	2,6	1,6	30	24	45,48
S4CM170302640	170	2,6	1,6	30	40	56,18
S4CM170302654	170	2,6	1,6	30	54	69,33
S4CM180302612	180	2,6	1,6	30	12	37,58
S4CM180302624	180	2,6	1,6	30	24	45,48
S4CM180302640	180	2,6	1,6	30	40	57,33
S4CM180302656	180	2,6	1,6	30	56	71,40
S4CM184302612	184	2,6	1,6	30	12	37,58
S4CM184302624	184	2,6	1,6	30	24	45,48
S4CM184302640	184	2,6	1,6	30	40	59,21
S4CM184302656	184	2,6	1,6	30	56	71,21
S4CM190302614	190	2,6	1,6	30	14	41,53
S4CM190302624	190	2,6	1,6	30	24	47,36
S4CM190302630	190	2,6	1,6	30	30	53,38
S4CM190302640	190	2,6	1,6	30	40	63,12
S4CM190302656	190	2,6	1,6	30	56	71,40
S4CM200302816	200	2,8	1,8	30	16	45,48
S4CM200302830	200	2,8	1,8	30	30	57,33
S4CM200302840	200	2,8	1,8	30	40	67,06
S4CM200302864	200	2,8	1,8	30	64	88,50
S4CM210302818	210	2,8	1,8	30	18	49,43
S4CM210302832	210	2,8	1,8	30	32	59,21
S4CM210302840	210	2,8	1,8	30	40	77,04
S4CM210302864	210	2,8	1,8	30	64	93,37
S4CM216302824	216	2,8	1,8	30	24	59,21
S4CM216302848	216	2,8	1,8	30	48	77,04
S4CM216302864	216	2,8	1,8	30	64	93,37
S4CM230302820	230	2,8	1,8	30	20	51,31
S4CM230302834	230	2,8	1,8	30	34	65,18
S4CM230302848	230	2,8	1,8	30	48	78,92
S4CM230302864	230	2,8	1,8	30	64	93,37

	D1 mm	e1 mm	e2 mm	D2 mm	Z	S5CM €
S5CM160202848	160	2,8	2,2	20	48	65,80
S5CM190302856	190	2,8	2,2	30	56	75,18
S5CM200303260	200	3,2	2,5	30	60	92,19
S5CM250303280	250	3,2	2,5	30	80	127,91
S5CM260303280	260	3,2	2,5	30	80	130,39
S5CM300303296	300	3,2	2,5	30	96	150,37
S5CM330303296	330	3,2	2,5	30	96	166,90
S5CM3503036108	350	3,6	2,8	30	108	180,45
S5CM3803036110	380	3,6	2,8	30	110	194,06
S5CM4003036120	400	3,6	2,8	30	120	203,09

FRESAS LLAVES

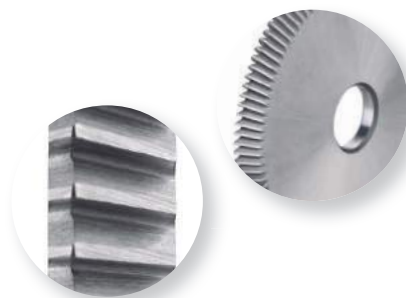


FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO SILCA

FRESAS DE SERRETA O BICÓNICAS



Ref. SLLP01



Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	SLL						€
										
SLLU01	U01	UNOCODE/ULTRACODE	HSSV	60,4	9,52	5,25	80	72	0,5	111,11
SLLU01W	U01W	UNOCODE/ULTRACODE	MD	60,4	9,52	5,25	80	72	0,5	355,00
SLLP21	P21	SILCA DELTA	HSSV	60,4	9,52	5,25	84	72	0,5	95,45
SLLP01	P01	BRAVO / POKER / REKORD / BRAVO SUPER /SUPER MASTER	HSSV	80	16	5	84	110	1	75,22
SLLP01/120	P01/120		HSSV	80	16	5	84	120	1	99,36
SLLP01W	P01W		MD	80	16	5	84	110	1	278,99

SIERRAS CIRCULARES DE CORTE LATERAL



Ref. SLLSG2



Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	SLL				€
								
SLLY2KW	Y2KW	DELTA	MD	63	16	1,35	80	255,66
SLLSG19	SG19	DELTA	HSSV	64,6	9,52	1,5	40	72,25
SLLSG19W	SG19W	DELTA	MD	64,6	9,52	1,5	40	243,34
SLLSG18	SG18	DELTA	HSSV	64,6	9,52	2,4	40	72,25
SLLSG18W	SG18W	DELTA	MD	64,6	9,52	2,4	40	243,34
SLLSG6	SG6	LANCER	HSSV	80	22	1,3	100	74,25
SLLSG6W	SG6W	LANCER	MD	80	22	1,3	100	255,66
SLLSG2	SG2	TARGA/TECH3/TECNICA	HSSV	80	22	1,5	100	74,25
SLLSG2W	SG2W	TARGA/TECH3/TECNICA	MD	80	22	1,5	100	255,66
SLLFSCL4-CAW	FSCL4-CAW	DELTA	MD	80	22	1,8	100	265,77

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO SILCA

SIERRAS PARA LLAVES DE GORJAS



Ref. SLLSG7W



SLL								
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	 mm	 mm	 mm	Z	€
SLLSG14W	SG14W	DELTA	MD	60,4	9,52	1,14	80	204,45
SLLGB1	GB1	ULTRACODE / UNOCODE	HSSV	60,4	9,52	1,7	66	75,00
SLL05	05	UNOCODE/ULTRACODE	HSSV	60,4	9,52	1,8	68	75,00
SLL05W	05W	UNOCODE/ULTRACODE	MD	60,4	9,52	1,8	68	214,56
SLLCU-15C	CU-15C	OPERA /TARGA	MD	63	16	1,5	80	279,48
SLLSG17	SG17	DELTA	HSSV	64,6	9,52	1,8	70	75,00
SLLSG17W	SG17W	DELTA	MD	64,6	9,52	1,8	70	235,67
SLLSG13	SG13	UNOCODE / DELTA	HSSV	64,6	9,52	2	70	75,00
SLLSG13W	SG13W	UNOCODE / DELTA	MD	64,6	9,52	2	70	279,48
SLL06	06	UNOCODE/ULTRACODE	HSSV	64,6	9,52	2,4	70	75,00
SLL06W	06W	UNOCODE/ULTRACODE	MD	64,6	9,52	2,4	70	227,88
SLLSG3	SG3	OPERA /TARGA/TECH3	HSSV	80	22	1	100	71,35
SLLSG3W	SG3W	OPERA /TARGA/TECH3	MD	80	22	1	100	235,67
SLLSG4	SG4	OPERA /TARGA/TECH3	HSSV	80	22	1,25	100	71,35
SLLSG4W	SG4W	OPERA /TARGA/TECH3	MD	80	22	1,25	100	235,67
SLLSG5	SG5	LANCER	HSSV	80	22	1,3	100	71,35
SLLSG5W	SG5W	LANCER	MD	80	22	1,3	100	235,67
SLLSG7	SG7	OPERA / TARGA	HSSV	80	22	1,4	100	71,35
SLLSG7M35	SG7M35	OPERA / TARGA	HSSCo	80	22	1,4	100	91,35
SLLSG7W	SG7W	LANCER	MD	80	22	1,4	100	235,67
SLLSG1	SG1	OPERA /TARGA/TECH3	HSSV	80	22	1,5	100	71,35
SLLSG1W	SG1W	OPERA /TARGA/TECH3	MD	80	22	1,5	100	235,67
SLLSG8	SG8	TECH3 / TECNICA	HSSV	80	22	1,75	100	71,35
SLLSG10	SG10	LANCER	HSSV	80	22	2	100	71,35
SLLSG10W	SG10W	LANCER/ OPERA /TARGA	MD	80	22	2	100	245,67
SLLSG11	SG11	SILCA GT40	HSSV	80	22	2,3	100	71,35
SLLSG12	SG12	TARGA/TECH3/TECNICA/OPERA	HSSV	80	22	2,5	100	71,35
SLLSG58400	SG58400	DELTA	MD	80	22	4	100	225,67
SLLPL1	PL1	PRIMA LASER	HSSV	100	22	1	100	123,11
SLLPL1W	PL1W	PRIMA LASER	MD	100	22	1	100	315,87
SLLPL1,25	PL1,25	PRIMA LASER	HSSV	100	22	1,25	100	123,11
SLLPL1,25W	PL1,25W	PRIMA LASER	MD	100	22	1,25	100	301,22
SLLPL1,5	PL1,5	PRIMA LASER	HSSV	100	22	1,5	100	123,11
SLLPL1,5W	PL1,5W	PRIMA LASER	MD	100	22	1,5	100	301,22
SLLPL1,7W	PL1,7W	PRIMA LASER	MD	100	22	1,7	100	310,45
SLLPL2,0	PL2.0	PRIMA LASER	HSSV	100	22	2	100	123,11
SLLPL2,0W	PL2.0W	PRIMA LASER	MD	100	22	2	100	310,45

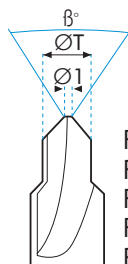
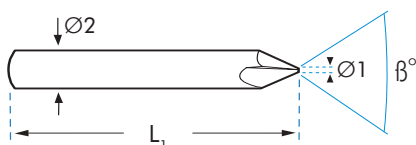
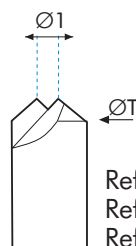
FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO SILCA

FRESAS DE PUNTEAR

MATRIX



Ref. SLLF1W


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

 Ref. SLLF12B
 Ref. SLLF15
 Ref. SLLF37

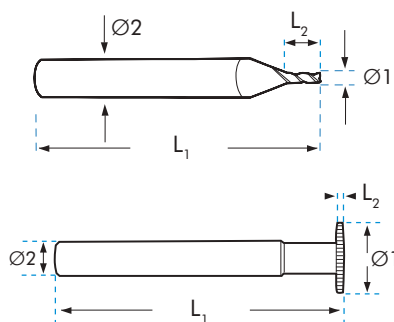

SLL									
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	 β°	Ø1 mm	L1 mm	Ø2 mm	Z	€
SLLF1Z1	F1	MATRIX	HSSV	90°	0,7	48	6	1	47,72
SLLF1	F1	MATRIX	HSSV	90°	0,7	48	6	2	47,72
SLLF1W	F1W	MATRIX	MD	90°	0,7	48	6	1	85,31
SLLF4	F4	MATRIX	HSSV	90°	0,4	48	6	1	47,72
SLLF5	F5	MATRIX	HSSV	90°	0,9	48	6	1	47,72
SLLF6	F6	MATRIX	HSSV	106°	1	48	6	1	47,72
SLLF7	F7	MATRIX	HSSV	72°	0,8	48	6	2	47,74
SLLF12A	F12A	MATRIX	HSSV	100°	0,4	48	6	1	47,72
SLLF12B	F12B	MATRIX	HSSV	90°	8 x 1,8*	48	6	2	47,72
SLLF13	F13	MATRIX	HSSV	90°	0,77	48	6	1	47,72
SLLF14	F14	MATRIX	HSSV	90°	0,9	48	6	1	47,72
SLLF15	F15	MATRIX	HSSV	90°	8 x 0,8*	48	6	1	54,69
SLLF19	F19	MATRIX	HSSCo	90°	2,2 x 0,6*	48	6	1	47,74
SLLF19-CAZ1	F19-CA	MATRIX	MD	90°	2,2 x 0,6*	48	6	1	85,31
SLLF20	F20	MATRIX	HSSV	90°	0,45	48	6	2	47,72
SLLF21	F21	MATRIX	HSSCo	85°	3,2 x 0,8*	48	6	1	54,69
SLLF23	F23	MATRIX	HSSV	90°	4 x 0,8	48	6	1	54,69
SLLF24	F24	MATRIX	HSSV	100°	1,3	48	6	1	47,72
SLLF25	F25	MATRIX	HSSV	90°	3,5 x 0,65*	48	6	1	47,72
SLLF26	F26	MATRIX	HSSV	82°	0,8	48	6	1	47,72
SLLF27-CA	F27-CA	MATRIX	MD	60°	2,4 x 1,9*	48	6	1	113,97
SLLF28	F28	MATRIX	HSSV	76°	0,76	48	6	1	47,72
SLLF29	F29	MATRIX	HSSV	76°	1,9 x 0,76*	48	6	1	47,72
SLLF34	F34	MATRIX	HSSV	50°	1,5	48	6	1	47,72
SLLF34-CAZ1	F34-CA	MATRIX	MD	50°	1,5	48	6	1	85,31
SLLF37	F37	MATRIX	HSSV	90°	6 x 2,1*	48	6	2	54,69
SLLF39	F39	MATRIX	HSSV	90°	0,6	48	6	2	57,96
SLLF42	F42	MATRIX	HSSV	100°	0,7	48	6	1	47,72
SLLF43	F43	MATRIX	HSSCo	90°	1	48	6	1	47,72
SLLF45	F45	MATRIX	HSSV	130°	0,56	48	6	1	47,74
SLLF46	F46	MATRIX	HSSV	100°	0,65	48	6	1	47,74
SLLF49	F49	MATRIX	HSSV	95°	0,8	48	6	1	54,69
SLLF50	F50	MATRIX	HSSV	100°	0,5	48	6	1	54,69
SLLF52-CA	F52-CA	MATRIX	MD	54°	0,86	48	6	2	47,72
SLLF59	F59	MATRIX	HSSV	90°	0,8	48	6	2	47,72

* Ø_T x Ø₁

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO SILCA

FRESAS PARA LLAVES DE REGATA

MATRIX



*Ref.SLLF62W



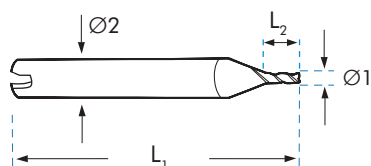
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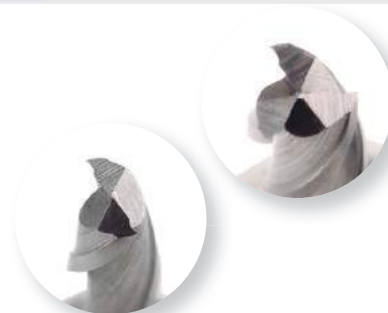
SLL									
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	Ø1 mm	L1 mm	Ø2 mm	L2 mm	Z	€
SLLF3	F3	MATRIX	HSSV	1,5	48	6	2	3	47,72
SLLF8	F8	MATRIX	HSSV	4	48	6	13	3	47,72
SLLF11	F11	MATRIX	HSSV	2,5	48	6	7	3	47,72
SLLF22	F22	MATRIX	HSSV	2,5	42	6	6	3	47,72
SLLF30	F30	MATRIX	HSSV	3	48	6	6	3	47,72
SLLF30Z2	F30	MATRIX	HSSV	3	48	6	6	2	56,09
SLLF44	F44	MATRIX	HSSV	2	40	6	6	3	47,72
SLLF62W*	F62W	MATRIX	MD	11,8	48	6	1	20	152,35

FRESAS PARA LLAVES DE REGATA

QUATTROCODE /TRIAX-E



Ref. SLLW133



SLL									
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	Ø1 mm	L1 mm	Ø2 mm	L2 mm	Z	€
SLLW101	W101	QUATTROCODE /TRIAX-E	MD	2,5	40	6	6	3	108,86
SLLW114	W114	QUATTROCODE /TRIAX-E	MD	2	40	6	6	3	108,88
SLLW117	W117	QUATTROCODE /TRIAX-E	MD	5	48	6	R1	4	88,36
SLLW129	W129	QUATTROCODE /TRIAX-E	MD	3	40	6	6	3	108,86
SLLW131	W131	QUATTROCODE /TRIAX-E	MD	6	40	6	5	3	80,36
SLLW133	W133	QUATTROCODE /TRIAX-E	MD	1,5	40	6	3	3	118,89
SLLW134	W134	QUATTROCODE /TRIAX-E	MD	4	40	6	7	3	108,88
SLLW219	W219	QUATTROCODE /TRIAX-E	MD	1,2	40	6	2	3	108,86
SLLW235	W235	QUATTROCODE /TRIAX-E	MD	1,1	40	6	2	3	108,83
SLLW268	W268	QUATTROCODE /TRIAX-E	MD	1,5	40	6	6	2	108,94

Fresas

Rosa

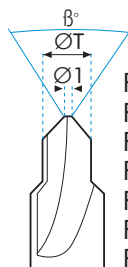
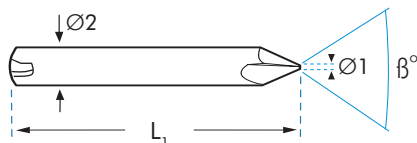
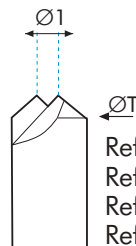
FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO SILCA

FRESAS DE PUNTEAR

QUATTROCODE / TRIAX-E



Ref. SLLW103


 Ref. SLLW112
 Ref. SLLW115
 Ref. SLLW128
 Ref. SLLW135
 Ref. SLLW145
 Ref. SLLW210
 Ref. SLLW213

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

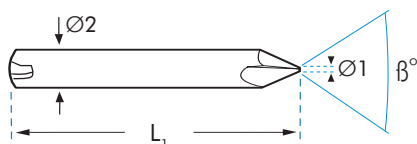

SLL									
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	β°	Ø1 mm	L1 mm	Ø2 mm	Z	€
SLLW102	W102	QUATTROCODE / TRIAX-E	MD	106°	1	40	6	2	76,41
SLLW103	W103	QUATTROCODE / TRIAX-E	MD	90°	0,8	40	6	2	76,41
SLLW104	W104	QUATTROCODE / TRIAX-E	MD	90°	1,2	40	6	2	76,41
SLLW105	W105	QUATTROCODE / TRIAX-E	MD	90°	0,7	40	6	2	76,41
SLLW106	W106	QUATTROCODE / TRIAX-E	MD	90°	0,6	40	6	2	76,41
SLLW107	W107	QUATTROCODE / TRIAX-E	MD	90°	0,9	40	6	2	76,41
SLLW108	W108	QUATTROCODE / TRIAX-E	MD	82°	0,9	40	6	2	76,41
SLLW109	W109	QUATTROCODE / TRIAX-E	MD	110°	0,4	40	6	2	76,41
SLLW110	W110	QUATTROCODE / TRIAX-E	MD	100°	0,6	40	6	2	76,41
SLLW111	W111	QUATTROCODE / TRIAX-E	MD	96°	8x2,75*	40	6	2	85,83
SLLW112	W112	QUATTROCODE / TRIAX-E	MD	60°/0°	1,5*	40	6	2	76,90
SLLW113	W113	QUATTROCODE / TRIAX-E	MD	100°	0,76	40	6	2	76,41
SLLW115	W115	QUATTROCODE / TRIAX-E	MD	54°	0,86*	40	6	1	102,43
SLLW116	W116	QUATTROCODE / TRIAX-E	MD	90°	1	40	6	2	76,41
SLLW118	W118	QUATTROCODE / TRIAX-E	MD	120°	0,6	40	6	2	76,41
SLLW119	W119	QUATTROCODE / TRIAX-E	MD	85°	0,3	40	6	2	76,41
SLLW121	W121	QUATTROCODE / TRIAX-E	MD	86°	0,05	48	6	3	106,31
SLLW122	W122	QUATTROCODE / TRIAX-E	MD	90°	0,55	40	6	2	91,69
SLLW123	W123	QUATTROCODE / TRIAX-E	MD	76°	0,9	40	6	2	76,41
SLLW124	W124	QUATTROCODE / TRIAX-E	MD	90°	8x0,8	48	6	3	146,46
SLLW126	W126	QUATTROCODE / TRIAX-E	MD	80°	3,3*	48	6	2	91,69
SLLW127	W127	QUATTROCODE / TRIAX-E	MD	80°	6x2,1*	48	6	2	91,69
SLLW128	W128	QUATTROCODE / TRIAX-E	MD	90°	0,75*	48	6	1	102,43
SLLW130	W130	QUATTROCODE / TRIAX-E	MD	90°	1,4	40	6	2	102,86
SLLW132	W132	QUATTROCODE / TRIAX-E	MD	60°	2	40	6	1	102,43
SLLW135	W135	QUATTROCODE / TRIAX-E	MD	90°	4x0,55*	40	6	2	102,36
SLLW136	W136	QUATTROCODE / TRIAX-E	MD	76°	2,23	40	6	1	102,43
SLLW138	W138	QUATTROCODE / TRIAX-E	MD	90°	4x0,7	48	6	2	76,41
SLLW139	W139	QUATTROCODE / TRIAX-E	MD	60°/50°	6x0,9*	40	6	2	113,97
SLLW142	W142	QUATTROCODE / TRIAX-E	MD	100°	1,2	40	6	2	76,41
SLLW145	W145	QUATTROCODE / TRIAX-E	MD	90°	3,2x0,8*	48	6	2	102,36
SLLW210	W210	QUATTROCODE / TRIAX-E	MD	90°	5x1,05*	40	6	3	153,31
SLLW213	W213	QUATTROCODE / TRIAX-E	MD	90°	0,95*	40	6	2	115,36
SLLW221	W221	QUATTROCODE / TRIAX-E	MD	90°	0,5	40	6	2	102,86
SLLW225	W225	QUATTROCODE / TRIAX-E	MD	90°	1	40	6	2	102,86
SLLW238	W238	QUATTROCODE / TRIAX-E	MD	90°	0,8	40	6	2	76,41
SLLW261	W261	QUATTROCODE / TRIAX-E	MD	1,1	1,5	48	6	2	115,36
SLLW255	W255	QUATTROCODE / TRIAX-E	MD	90°	4x0,8	48	6	2	102,86
SLLW293	W293	QUATTROCODE / TRIAX-E	MD	90°	0,85	40	6	2	102,86

* Ø_T x Ø₁

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO SILCA

FRESAS DE PUNTEAR

QUATTROCODE / TRIAX-E

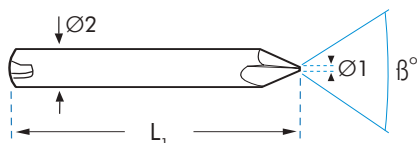


Ref. SLLW103Z1



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

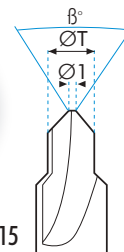
FRESAS DE PUNTEAR



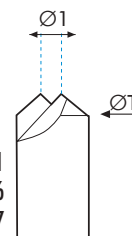
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Ref. SLLH115



Ref. SLLH111
Ref. SLLH126
Ref. SLLH127

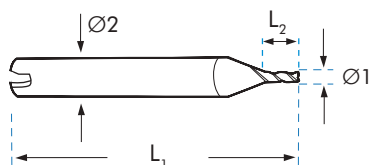


SLL									
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	β°	$\varnothing_1$ mm	L1 mm	$\varnothing_2$ mm	Z	€
SLLH103	H103	QUATTROCODE / TRIAX-E	HSSV	90°	0,8	40	6	2	56,37
SLLH104	H104	QUATTROCODE / TRIAX-E	HSSV	90°	1,2	40	6	2	50,36
SLLH105	H105	QUATTROCODE / TRIAX-E	HSSV	90°	0,7	40	6	2	50,36
SLLH106	H106	QUATTROCODE / TRIAX-E	HSSV	90°	0,6	40	6	2	47,72
SLLH107	H107	QUATTROCODE / TRIAX-E	HSSV	90°	0,9	40	6	2	47,72
SLLH108	H108	QUATTROCODE / TRIAX-E	HSSV	82°	0,9	40	6	2	47,72
SLLH110	H110	QUATTROCODE / TRIAX-E	HSSV	100°	0,6	40	6	2	47,72
SLLH111	H111	QUATTROCODE / TRIAX-E	HSSV	96°	2,75*	40	6	2	47,72
SLLH112	H112	QUATTROCODE / TRIAX-E	HSSV	60°	1,5	40	6	2	47,72
SLLH113	H113	QUATTROCODE / TRIAX-E	HSSV	100°	0,76	40	6	2	47,72
SLLH115	H115	QUATTROCODE / TRIAX-E	HSSV	54°	0,86*	40	6	1	47,72
SLLH116	H116	QUATTROCODE / TRIAX-E	HSSV	90°	1	40	6	2	62,99
SLLH118	H118	QUATTROCODE / TRIAX-E	HSSV	120°	0,6	40	6	1	47,72
SLLH119	H119	QUATTROCODE / TRIAX-E	HSSV	85°	0,3	40	6	2	47,72
SLLH122	H122	QUATTROCODE / TRIAX-E	HSSV	90°	0,55	40	6	2	47,72
SLLH126	H126	QUATTROCODE / TRIAX-E	HSSV	80°	3,3*	48	6	2	71,23
SLLH127	H127	QUATTROCODE / TRIAX-E	HSSV	80°	2,1*	48	6	2	71,23
SLLH128	H128	QUATTROCODE / TRIAX-E	HSSV	90°	0,75	48	6	2	47,72

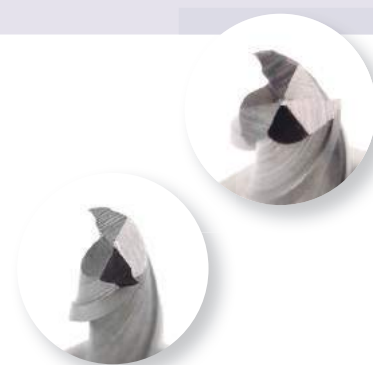
* $\varnothing_T \times \varnothing_1$

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO SILCA

FRESAS PARA LLAVES DE REGATA

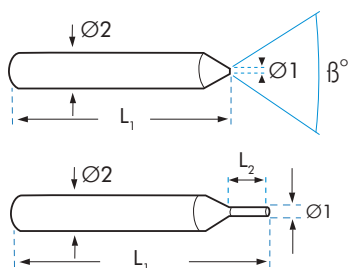


Ref. SLLH101



SLL									
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	MATERIAL	Ø ₁ mm	L ₁ mm	Ø ₂ mm	L ₂ mm	Z	€
SLLH101	H101	QUATTROCODE / TRIAX-E	HSSV	2,5	40	6	6	3	56,06
SLLH114	H114	QUATTROCODE / TRIAX-E	HSSV	2	40	6	6	3	47,72
SLLH117	H117	QUATTROCODE / TRIAX-E	HSSV	5	48	6	R1	4	57,90
SLLH129	H129	QUATTROCODE / TRIAX-E	HSSV	3	40	6	6	3	47,72
SLLH131	H131	QUATTROCODE / TRIAX-E	HSSV	6	40	6	5	3	62,99

PALPADORES



Ref. SLLT1



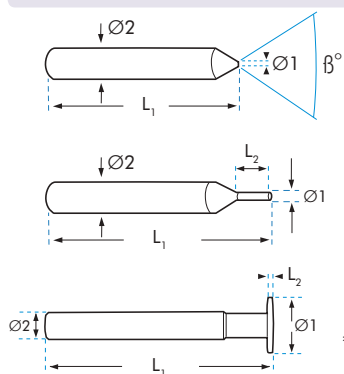
Ref. SLLT3



SLL											
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	Ref. FRESA	MATERIAL	β°	Ø ₁ mm	L ₁ mm	Ø ₂ mm	L ₂ mm	Ø _T mm	€
SLLT1	T1	MATRIX	F1	HSSV	90°	0,7	48	6	-	-	33,32
SLLT2	T2	MATRIX	F2	HSSV	88°	1,6	48	6	-	-	37,53
SLLT3	T3	MATRIX	F3	HSSV	-	1,5	48	6	3	-	37,53
SLLT4	T4	MATRIX	F4	HSSV	90°	0,4	48	6	-	-	37,53
SLLT5	T5	MATRIX	F5	HSSV	90°	0,9	48	6	-	-	37,53
SLLT6	T6	MATRIX	F6	HSSV	106°	1	48	6	15	-	37,53
SLLT7	T7	MATRIX	F7	HSSV	72°	0,8	48	6	2	-	37,53
SLLT8	T8	MATRIX	F8	HSSV	-	4	48	6	12	-	37,53
SLLT11	T11	MATRIX	F11	HSSV	-	2,5	48	6	6	-	37,53
SLLT12A	T12A	MATRIX	F12A	HSSV	100°	0,4	48	6	-	-	37,53
SLLT12B	T12B	MATRIX	F12B	HSSV	90°	8 x 1,8*	48	6	-	-	37,53
SLLT13	T13	MATRIX	F13	HSSV	90°	0,77	48	6	-	-	37,53
SLLT14	T14	MATRIX	F1	HSSV	90°	0,7	48	6	-	-	37,53
SLLT15	T15	MATRIX	F15	HSSV	90°	8 x 0,8	48	6	-	-	37,53
SLLT19	T19	MATRIX	F19	HSSV	90°	2,2 x 0,6*	48	6	-	-	37,53
SLLT20	T20	MATRIX	F20	HSSV	90°	0,45	48	6	-	-	37,53
SLLT21	T21	MATRIX	F21	HSSV	85°	3,2 x 0,8*	48	6	-	-	37,53
SLLT22	T22	MATRIX	F22	HSSV	-	2,5	42	6	6	-	37,53
SLLT23	T23	MATRIX	F23	HSSV	90°	4 x 0,8	48	6	5	-	37,53

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO SILCA

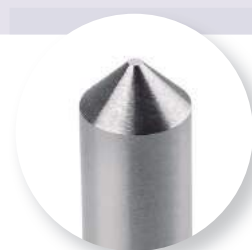
PALPADORES



Ref. SLLT1



Ref. SLLT3



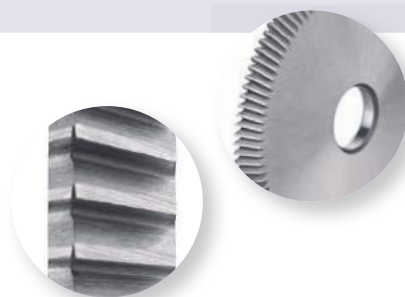
SLL											
Ref. BM	Ref. SILCA	TIPOS DE MÁQUINAS	Ref. FRESA	MATERIAL	β°	$\varnothing_1$ mm	L1 mm	$\varnothing_2$ mm	L2 mm	$\varnothing_T$ mm	€
SLLT24	T24	MATRIX	F24	HSSV	100°	1,3	48	6	-	-	37,53
SLLT25	T25	MATRIX	F25	HSSV	90°	3,5 x 0,65*	48	6	-	-	37,53
SLLT26	T26	MATRIX	F26	HSSV	82°	0,8	48	6	-	-	37,53
SLLT27	T27	MATRIX	F27	HSSV	60°	1,28	48	6	-	-	42,36
SLLT28	T28	MATRIX	F28	HSSV	76°	0,76	48	6	-	-	37,53
SLLT29	T29	MATRIX	F29	HSSV	76°	1,9 x 0,76*	48	6	-	-	37,53
SLLT30	T30	MATRIX	F30	HSSV	-	3	48	6	10	-	37,53
SLLT30-45	T30-45	MATRIX		HSSV	-	3	45	6	10	-	37,53
SLLT33	T33	MATRIX	F33	HSSV	48°	1,4	48	6	-	-	55,96
SLLT34	T34	MATRIX	F34	HSSV	50°	1,5	48	6	-	-	37,53
SLLT37	T37	MATRIX	F37	HSSV	90°	6 x 2,1*	48	6	-	-	37,53
SLLT39	T39	MATRIX	F39	HSSV	90°	0,6	48	6	-	-	37,53
SLLT40	T40	MATRIX	F40	HSSV	108°	0,4	48	6	-	-	37,53
SLLT42	T42	MATRIX	F42	HSSV	100°	0,7	48	6	-	-	37,53
SLLT43	T43	MATRIX	F43	HSSV	90°	1	48	6	-	-	37,53
SLLT44	T44	MATRIX	F44	HSSV	-	2	48	6	8	-	37,53
SLLT44-45	T44-45	MATRIX		HSSV	-	2	45	6	8	-	37,53
SLLT46	T46	MATRIX	F46	HSSV	100°	0,65	48	6	-	-	37,53
SLLT49	T49	MATRIX	F49	HSSV	95°	0,8	48	6	-	-	37,53
SLLT50	T50	MATRIX	F50	HSSV	100°	0,5	48	6	-	-	37,53
SLLT52	T52	MATRIX	F52	HSSV	54°	0,86	48	6	6	2	37,53
SLLT54	T54	MATRIX	F54	HSSV	-	4	40	6	6,5	-	47,72
SLLT55	T55	MATRIX	F55	HSSV	100°	1	48	6	4	-	37,53
SLLT59	T59	MATRIX	F59	HSSV	90°	0,8	48	6	-	-	37,53
SLLT62W*	T62W	MATRIX	F62W	MD	-	11,8	48	6	1	-	74,93
SLLT63	T63	MATRIX	F63	HSSV	78°	0,5	48	6	4	3	37,53
SLLT65	T65	MATRIX	F65	HSSV	90°	1,05	48	6	5	3	37,53
SLLT101	T101	MATRIX		HSSV	-	2,5	40	6	6	-	37,53
SLLT129	T129	MATRIX		HSSV	-	3	40	6	10	-	37,53
SLLU101	U101	QUATTROCODE		MD	-	1,2	48	6	3	-	47,72
SLLU101/H	U101/H	QUATTROCODE /TRIAX-E		MD	-	1,2	48	6	3	-	32,43
SLLU101L	U101L	QUATTROCODE /TRIAX-E		MD	-	2	48	6	6	-	47,72
SLLU102/65	U102/65	QUATTROCODE /TRIAX-E		MD	30°	0,2	48	6	9	2,6	50,97
SLLU102TT	U102TT	QUATTROCODE /TRIAX-E		MD	30°	0,2	26	4	6	2	50,97
SLLU103	U103	QUATTROCODE /TRIAX-E		MD	-	1	48	6	3	-	47,72
SLLU103/H	U103/H	QUATTROCODE /TRIAX-E		MD	-	1	48	6	3	-	32,43
SLLU103-TT	U103-TT	QUATTROCODE /TRIAX-E		MD	-	1	21	4	3	-	47,72
SLLU103-TT/H	U103-TT/H	QUATTROCODE /TRIAX-E		MD	-	1	21	4	3	-	32,43
SLLU111	U111	SILCA VIPER		MD	-	1	40	6	2,2	-	47,72
SLLU111/H	U111/H	SILCA VIPER		MD	-	1	40	6	2,2	-	32,43
SLLB3304	B3304	KEYLINE BIANCHI 994 LASER		MD	-	1	33	6	6	-	47,74
SLLB3310	B3310	KEYLINE BIANCHI 994 LASER		MD	-	1	30	6	2,6	-	47,74
SLLB3310M2	B3310	KEYLINE BIANCHI 994 LASER		HSSV	-	1	30	6	2,6	-	35,36

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO JMA

FRESAS DE SERRETA O BICONICAS



Ref. FLLFP4



		TIPOS DE MÁQUINAS	MATERIAL							FLL	
Ref. BM	Ref. JMA							Z		€	
FLLFP1 (FLL02)	FP1	OREGON	HSSV	25	10	10	100°	60	0,1	78,36	
FLLFP2W	FP2W	VIRGINIA	MD	40	10	6	70°	70	0,1	308,18	
FLLFP3 (FLL04)	FP3	KIS, SPRINT	HSSV	50	12	6	90°	80	0,15	95,36	
FLLFP4 (FLL06)	FP4	KIS	HSSV	53	12,7	6,35	45/15°	72	0,6	98,36	
FLLFP5	FP5	JMA	HSSV	57	12,7	5	90°	80	0,15	122,58	
FLLFP6 (FLL09)	FP6	KIS, SPRINT	HSSV	60	12,7	5	84°	140	0,1	95,36	
FLLFP11ECCO (FLL11)	FP11/ECCO-009	ECCO, ECCO-PLUS	HSSV	63	16	5	84°	80	1	91,23	
FLLFP11W	FP11W	ECCO, ECCO-PLUS	MD	63	16	5	84°	80	1	278,99	
FLLFP12	FP12	TUCSON	HSSV	63	16	5	80°	80	1,25	98,36	
FLLFP12W	FP12W	TUCSON	MD	63	16	5	80°	80	1,25	301,25	
FLLFP13	FP13	DALLAS	HSSV	63	16	5	84°	100	1	122,47	
FLLCU14	CU14	ECCO, ECCO-PLUS	HSSV	63	16	5	80°	80	1,25	120,02	
FLLFP16 (FLL13)	FP16	PROCEDURE	HSSV	70	16	5,25	76°	100	1	122,47	
FLLFP16W	FP16W	PROCEDURE	MD	70	16	5,25	76°	100	1	301,25	
SLLP01	FP24 DAKOTA = P01	DAKOTA, ERREBI	HSSV	80	16	5	84°	110	1	75,22	
FLLFP24 (FLL16)	FP24 ERREBI	SARATOGA, NEVADA,	HSSV	80	16	5	84°	110	1,25	75,22	
FLLFP24W	FP24W ERREBI	DENVER, TITAN, VIENNA	MD	80	16	5	84°	110	1,25	278,99	

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO JMA

SIERRAS CIRCULARES DE CORTE LATERAL



Ref. FLLFP19



				FLL				
Ref. BM	Ref. JMA	TIPOS DE MÁQUINAS	MATERIAL	 mm	 mm	 mm	Z	€
FLLFP7	FP7	ECCO BIT, DETROIT	HSSV	63	16	1,25	80	95,36
FLLFP7W	FP7W	ECCO BIT, DETROIT	MD	63	16	1,25	80	243,34
FLLFP8 (FLL19)	FP8	ECCO BIT, DETROIT	HSSV	63	16	1,4	80	60,02
FLLFP17	FP17	TITAN BIT, SARATOGA, YAKARTA	HSSV	80	16	1,25	100	69,69
FLLFP17W	FP17W	TITAN BIT, SARATOGA, YAKARTA	MD	80	16	1,25	100	255,66
FLLFP18	FP18	ATLANTA, TOPEKA	HSSV	80	22	1,25	100	95,36
FLLFP18W	FP18W	ATLANTA, TOPEKA	MD	80	22	1,25	100	255,66
FLLFP19 (FLL21)	FP19	SARATOGA, YAKARTA, TITAN BIT, DAKOTA	HSSV	80	16	1,4	100	72,25
FLLFP19W	FP19W	SARATOGA, YAKARTA, TITAN BIT, DAKOTA	MD	80	16	1,4	100	239,45
FLLFP20 (FLL22)	FP20	ATLANTA, TOPEKA	HSSV	80	22	1,4	100	72,25
FLLFP21 (FLL24)	FP21	ATLANTA, TOPEKA, DUPLEX, KANSAS	HSSV	80	22	1,5	100	74,25
FLLFP21W	FP21W	ATLANTA, TOPEKA, DUPLEX, KANSAS	MD	80	22	1,5	100	260,66

SIERRAS PARA LLAVES DE GORJAS



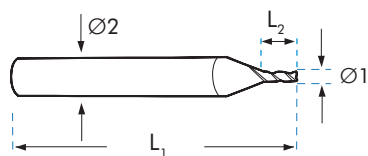
Ref. FLLFP22W



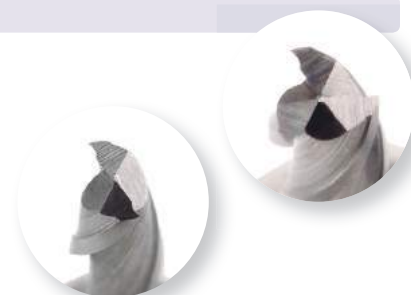
				FLL				
Ref. BM	Ref. JMA	TIPOS DE MÁQUINAS	MATERIAL	 mm	 mm	 mm	Z	€
FLLFP9	FP9	ECCO BIT	HSSV	63	16	1	80	64,56
FLLFP10	FP10	ECCO FORD, ECCO ABBLOY, PASADENA, NEBRASCA	HSSV	63	16	2,4	80	64,56
FLLFP22	FP22	TITAN BIT, DAKOTA, SARATOGA	HSSV	80	16	1	100	68,87
FLLFP22W	FP22W	TITAN BIT, DAKOTA, SARATOGA	MD	80	16	1	100	235,67
FLLFP23	FP23	DUPLEX, ATLANTA, TOPEKA	HSSV	80	22	1	100	71,35
FLLFP23W	FP23W	DUPLEX, ATLANTA, TOPEKA	MD	80	22	1	100	235,67
FF68801416100CO	-	TITAN, DAKOTA, SARATOGA, YAKARTA	HSSCo	80	16	1,4	100	69,36
FLLFP26 (FLL23)	FP26	G, SENNA, DAKOTA, SARATOGA, YAKARTA	HSSV	80	16	1,5	100	72,34
FLLFP26W	FP26W	G, SENNA, DAKOTA, SARATOGA,	MD	80	16	1,5	100	238,98

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO JMA

FRESAS PARA LLAVES DE REGATA

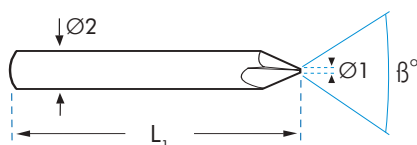


Ref. FLLF3



									FLL
Ref. BM	Ref. JMA	TIPOS DE MÁQUINAS	MATERIAL	Ø ₁ mm	L ₁ mm	Ø ₂ mm	L ₂ mm	Z	€
FLLF3Z3	(FLL32) ≈ F3	ALBANY ARIZONA COLUMBIA DAKAR DAKAR EXPRESS DAY T-COL DAYTONA X CODE	HSSCo 8%	1,5	45	6	3	3	34,00
FLLF3	(FLL44) F3		HSSCo 8%	1,5	45	6	3	2	31,82
FLLF3W	(FLL45) F3W		MD	1,5	45	6	3	2	103,45
FLLF33	(FLL53) F33		HSSCo 8%	2	45	6	4	3	30,72
FLL11Z3	(FLL33) ≈ F11		HSSCo 8%	2,5	45	6	5	3	30,72
FLLF11	(FLL48) F11		HSSCo 8%	2,5	45	6	5	2	27,49
FLLF11W	(FLL49) F11W		MD	2,5	45	6	5	2	78,31
FLLF17	(FLL34) F17		HSSCo 8%	3	45	6	6	3	30,72
FLLF8Z3	(FLL35) ≈ F8		HSSCo 8%	4	45	6	6	3	35,76
FLLF8	(FLL46) F8		HSSCo 8%	4	45	6	7	2	31,82
FLLF8W	(FLL47) F8W		MD	4	45	6	6	2	97,09
FLLF77	(FLL36) -		HSSCo 8%	5	45	6	7	3	35,76
FLLF78	(FLL37) -		HSSCo 8%	6	45	6	8	3	35,76
FLLF78W	(FLL54) -		MD	6	45	6	8	3	78,31
FLLF78WZ4	(FLL55) -		MD	6	45	6	8	4	78,31

FRESAS DE PUNTEAR



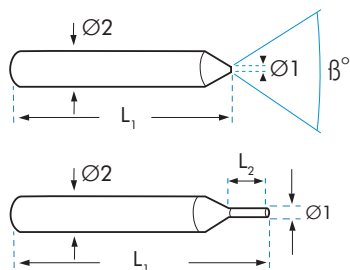
Ref. FLLF1



									FLL
Ref. BM	Ref. JMA	TIPOS DE MÁQUINAS	MATERIAL	β°	Ø ₁ mm	L ₁ mm	Ø ₂ mm	Z	€
FLLF1	(FLL43) F1	ALBANY ARIZONA CAPRI COLUMBIA DAKAR DAKAR EXPRESS DAY T-COL DAYTONA X CODE	HSSCo	90°	0,8	45	6	-	20,94
FLLF1W	(FLL42) F1W		MD	90°	0,8	45	6	-	64,88
FLLF5	(FLL52) F5		HSSCo	90°	0,9	45	6	-	20,94
FLLF5W	(FLL42) F5W		MD	90°	0,9	45	6	-	64,88
FLLF13	(FLL50) F13		HSSCo	100°	0,8	45	6	-	20,94
FLLF13W	(FLL51) F13W		MD	100°	0,8	45	6	-	60,70

PALPADORES PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO JMA

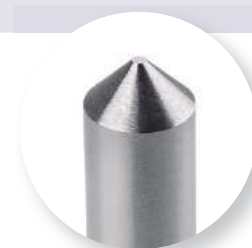
PALPADORES



Ref. FLLP1



Ref. FLLP3



				FLL						
Ref. BM	Ref. JMA	TIPOS DE MÁQUINAS	MATERIAL	 β°	Ø1 mm	L1 mm	Ø2 mm	L2 mm	€	
FLLP1	(PLL38)	P1	HSSV	90°	0,8	45	6	-	17,05	
FLLP3	(PLL32)	P3	HSSV	-	1,5	45	6	4	30,16	
FLLP5		P5	HSSV	90°	0,9	45	6	-	17,05	
FLLP8	(PLL35)	P8	HSSV	-	4	45	6	7	30,16	
FLLP11	(PLL33)	P11	HSSV	-	2,5	45	6	4	30,16	
FLLP13	(PLL50)	P13	HSSV	100°	0,8	45	6	-	17,05	
FLLP17	(PLL34)	P17	HSSV	-	3	45	6	6	30,16	
FLLP52	(PLL52)	-	HSSV	90°	0,9	45	6	-	17,05	
FLLP77	(PLL36)	-	HSSV	-	5	45	6	7	30,16	
FLLP78	(PLL37)	-	HSSV	-	6	45	6	8	30,16	

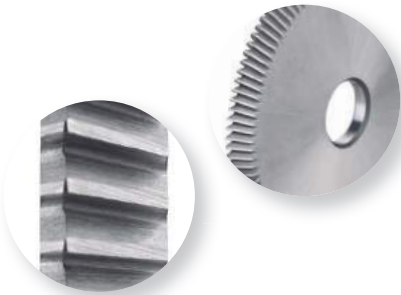
ALBANY
ARIZONA
CAPRI
COLUMBIA
DAKAR
DAKAR EXPRESS
DAY T-COL
DAYTONA
X CODE

FRESAS PARA MÁQUINAS DUPLICADORAS DE LLAVES TIPO FLORA, NOVACLAU, WALKIN

OTRAS FRESAS DE USO GENERAL

Fresas

Rosa

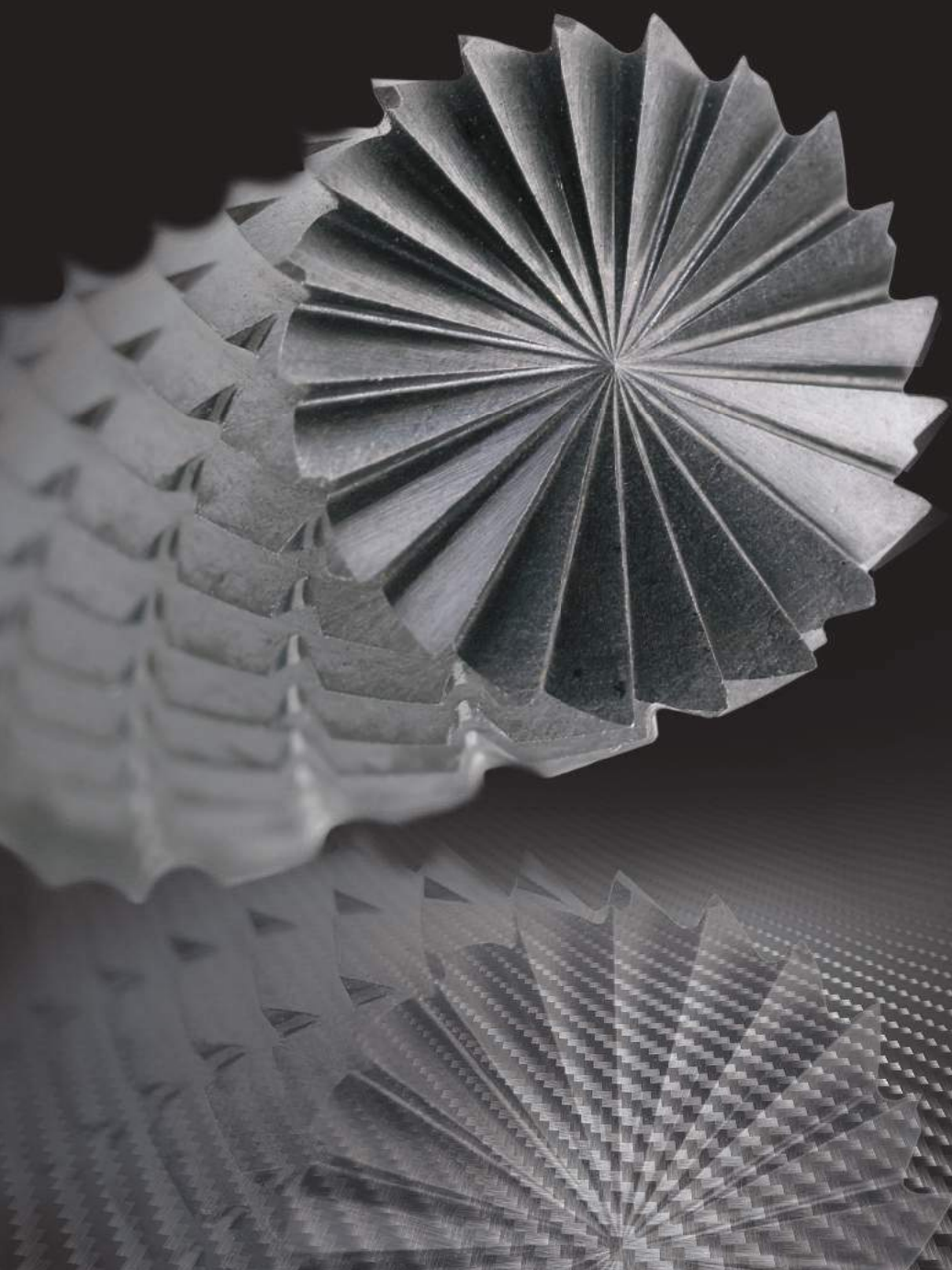


	FLL							
	Ref. BM	TIPOS DE MÁQUINAS	MATERIAL	 mm	 mm	 mm	Z	€
SERRETA Ó BICÓNICAS	FLL01	FLORA	HSSV	23	10	5	36	84,20
	FLL03	YALE	HSSV	40	8	5	80	91,36
	FLL05	NOVACLAU	HSSV	52	16	5	110	107,87
	FLL07	KIS	HSSV	53	12,7	6	80	120,02
	FLL08	KIS	HSSV	55	12	6	80	120,02
	FLL10	NOVACLAU	HSSV	61	12,7	6,5	140	122,20
	FLL11	NOVACLAU	HSSV	62	16	5	80	119,82
	FLL12	NOVACLAU	HSSV	63	16	5	140	119,82
	FLL14	WALKIN	HSSV	70	15	6,5	150	126,86
	FLL15	LINCE	HSSV	70	13	7	88	123,42

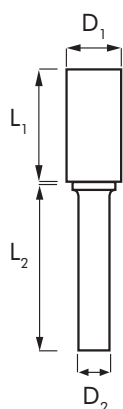


								FLL
CORTE LATERAL	Ref. BM	TIPOS DE MÁQUINAS	MATERIAL	 mm	 mm	 mm	Z	€
	FLL17	JMA-NOVACLAU-WALKIN	HSSV	35	12	3,15	50	62,96
	FLL18	JMA-NOVACLAU-WALKIN	HSSV	63	15	1,40	80	76,99
	FLL20	JMA-NOVACLAU-WALKIN	HSSV	70	16	1,40	100	95,12

FRESAS ROTATIVAS



FRESAS ROTATIVAS HSS

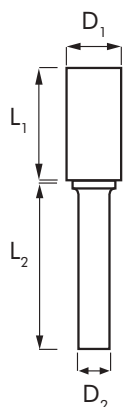
DIMENSIONES DE MANGO: $D_2 \times L_2 = 6 \times 40$ mm.

	Y501	Y508	Y510	Y505	Y504	Y551	Y556	Y552	Y554	Y553
$D_1 \times L_1$	6 x 20	8 x 30	10 x 30	12 x 30	15 x 30	4,5 x 4,5	6 x 6	8 x 8	10 x 10	12 x 12
€	13,93	19,26	19,75	19,75	22,68	13,93	13,93	19,26	19,26	19,26

DIMENSIONES DE MANGO: $D_2 \times L_2 = 6 \times 100$ mm.

	Y501L	Y508L	Y510L	Y505L	Y504L	Y551L	Y556L	Y552L	Y554L	Y553L
$D_1 \times L_1$	6 x 20	8 x 30	10 x 30	12 x 30	15 x 30	4,5 x 4,5	6 x 6	8 x 8	10 x 10	12 x 12
€	18,11	25,07	25,82	25,82	29,76	18,11	18,11	25,07	25,07	25,07

* Dentados disponibles: TG 2 APLICACIÓN: Dentado más habitual, aplicaciones generales.
TG 0 APLICACIÓN: Aleaciones ligeras, aluminio, plástico, metales blandos en general.

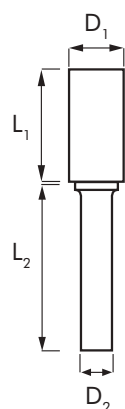
DIMENSIONES DE MANGO: $D_2 \times L_2 = 6 \times 40$ mm.

	Y557	Y502	Y507	Y509	Y511	Y506	Y514	Y571	Y561	Y566
$D_1 \times L_1$	15 x 15	6 x 20	8 x 20	10 x 20	10 x 30	12 x 30	15 x 30	6 x 20	6 x 20	12 x 30
€	22,68	13,93	19,26	19,26	19,75	19,75	22,68	13,93	13,93	19,75

DIMENSIONES DE MANGO: $D_2 \times L_2 = 6 \times 100$ mm.

	Y557L	Y502L	Y507L	Y509L	Y511L	Y506L	Y514L	Y571L	Y561L	Y566L
$D_1 \times L_1$	15 x 15	6 x 20	8 x 20	10 x 20	10 x 30	12 x 30	15 x 30	6 x 20	6 x 20	12 x 30
€	29,76	18,11	25,07	25,07	25,84	25,84	29,76	18,11	18,11	25,82

FRESAS ROTATIVAS HSS

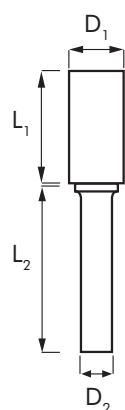


DIMENSIONES DE MANGO: $D_2 \times L_2 = 6 \times 40$ mm.

	Y521	Y532	Y533	Y534	Y536	Y537	Y524	Y525	Y526	Y527
$D_1 \times L_1$	6 x 20	6 x 15	10 x 15	10 x 17	12 x 30	15 x 35	10 x 30	12 x 20	12 x 30	15 x 30
€	13,93	13,93	19,27	19,27	19,75	22,68	19,75	19,27	19,75	22,68

DIMENSIONES DE MANGO: $D_2 \times L_2 = 6 \times 100$ mm.

	Y521L	Y532L	Y533L	Y534L	Y536L	Y537L	Y524L	Y525L	Y526L	Y527L
$D_1 \times L_1$	6 x 20	6 x 15	10 x 15	10 x 17	12 x 30	15 x 35	10 x 30	12 x 20	12 x 30	15 x 30
€	18,11	18,11	25,07	25,07	25,82	29,76	25,84	25,07	25,84	29,76

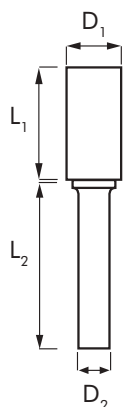


DIMENSIONES DE MANGO: $D_2 \times L_2 = 6 \times 40$ mm.

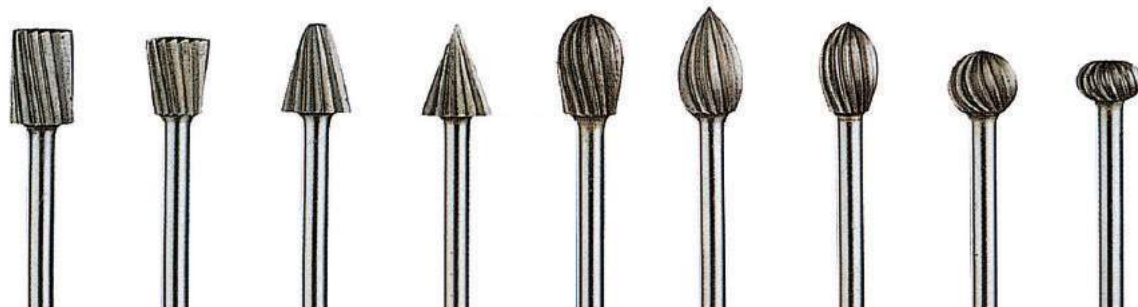
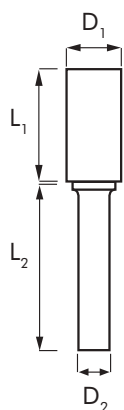
	Y541	Y512	Y545	Y543	Y513	Y503	Y515	Y516	Y547
$D_1 \times L_1$	6 x 10	12 x 12	12 x 20	12 x 20	12 x 15	10 x 15	12 x 30	12 x 30	15 x 30
€	13,93	19,27	19,27	19,27	19,27	19,27	19,75	19,75	22,68

DIMENSIONES DE MANGO: $D_2 \times L_2 = 6 \times 100$ mm.

	Y541L	Y512L	Y545L	Y543L	Y513L	Y503L	Y515L	Y516L	Y547L
$D_1 \times L_1$	6 x 10	12 x 12	12 x 20	12 x 20	12 x 15	10 x 15	12 x 30	12 x 30	15 x 30
€	18,11	25,07	25,07	25,07	25,07	25,07	25,82	25,82	29,76

[illegible]

FRESAS ROTATIVAS PARA GRABADORES HSS

[illegible]

EXPOSITORES DE FRESAS ROTATIVAS EN HSS


Ref. E70SR



Ref. E33SR

REFERENCIA	E70SR							E33SR						
Nº FRESA	70							33						
CALIDAD	HSS							HSS						
CONTENIDO	Y504 Y537 Y526 Y505 Y506 Y510 Y536							Y502 - Y501 - Y541 - Y532 - Y521 - Y571- Y561						
Cantidad	5	5	5	5	5	5	5	Y551 - Y556 - Y507 - Y512 - Y533 - Y534 - Y552						
	Y553	Y525	Y534	Y552	Y502	Y532	Y501	Y554 - Y553 - Y557 - Y509 - Y513 - Y525 - Y545						
	5	5	5	5	5	5	5	Y524 - Y515 - Y536 - Y526 - Y537 - Y547 - Y527						
								Y504 - Y566 - Y516 - Y505 - Y506						
P.V.P. €	1.312,54							624,06						

VELOCIDADES DE CORTE RECOMENDADAS PARA FRESAS ROTATIVAS HSS

Ø mm.	ACERO	ACERO TEMPLADO	INOX	FUNDICIÓN ALUMINIO	ALUMINIO	TITANIO	PLÁSTICO	LATÓN
2	20.000	-	-	20.000	25.000	-	21.000	25.000
3	18.000	-	-	20.000	25.000	-	21.000	25.000
4	16.000	-	-	20.000	25.000	-	21.000	25.000
5	14.000	-	-	20.000	25.000	-	21.000	25.000
6	12.000	-	-	20.000	25.000	-	21.000	25.000
8	10.000	-	-	16.000	21.000	-	14.000	21.000
9	10.000	-	-	16.000	21.000	-	14.000	21.000
10	8.000	-	-	16.000	21.000	-	14.000	21.000
11	6.000	-	-	16.000	21.000	-	14.000	21.000
12	5.000	-	-	16.000	21.000	-	14.000	21.000
14	5.000	-	-	16.000	21.000	-	14.000	21.000
18	5.000	-	-	12.000	17.000	-	9.000	17.000
20	4.500	-	-	12.000	17.000	-	9.000	17.000
22	4.500	-	-	12.000	17.000	-	9.000	17.000
25	4.000	-	-	10.000	15.000	-	9.000	15.000

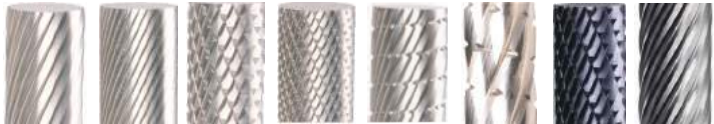
FRESAS ROTATIVAS DE METAL DURO



Dentados Standard



Dentados Especiales



Material	6	2	3	1	4	5	8	9	10	6 TiAlN	3 INOX
Aluminio, Plástico			●						○		
Latón, Cobre, Hierro fundido, Bronce	●	●		○	○	●	○	○		●	
Aceros en General	●	●			○	●	○	○		●	
Acero Inoxidable , Titanio	○	○			○	○	○	○		○	●

- Recomendado
- Muy Recomendado

Tabla de velocidades recomendadas

Velocidad de la fresa rotativa x 1.000 rpm

Diámetro Fresas	Aluminio, Plástico		Latón, Cobre, Hierro fundido, Bronce		Aceros en General		Acero Inoxidable , Titanio	
	Rango de Velocidades	Velocidad de Inicio Recomendada	Rango de Velocidades	Velocidad de Inicio Recomendada	Rango de Velocidades	Velocidad de Inicio Recomendada	Rango de Velocidades	Velocidad de Inicio Recomendada
3mm - 1/8"	60-80	65	45-80	65	60-80	80	60-80	80
6mm - 1/4"	15-60	40	22-60	45	45-60	50	30-45	40
10mm - 3/8"	10-50	25	15-40	30	30-40	30	19-30	25
12mm - 1/2"	7-30	20	11-30	25	22-30	25	15-22	20
16mm - 5/8"	6-20	15	9-20	20	18-20	20	12-18	15
20mm - 3/4"	5-17	10	8-17	12	15-17	15	10-15	10
25mm - 1"	4-13	8	6-13	10	10-13	10	7-11	8

Las velocidades recomendadas están basadas en longitudes standard de mangos de 45 mm., con un máximo saliente de 10 mm.
El máximo de velocidad recomendada en freselines extralargos es de 15.000 RPM

NUEVAS FRESAS ROTATIVAS PARA INOXIDABLE

PROCUT ha diseñado un dentado llamado **3 INOX** específico para trabajar en todo tipo de inoxidables, en especial los que tienen un alto % de Níquel.

Las ventajas del dentado son:

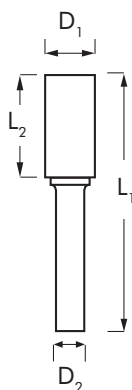
- ▶ La fresa arranca el material sin dejar que el Inoxidable se pegue.
- ▶ Reducción de tiempos de trabajo debido a que las aristas permanecen limpias, al trabajar sin viruta pegada.
- ▶ Menor fricción y calentamiento de pieza y fresa, por tanto, mayor rendimiento.
- ▶ Mejor acabado superficial de la pieza.



CILÍNDRICA SIN CORTE FRONTAL

TIPO
A

MD



TiAlN



							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
3 mm. MANGO	A30106	1.5	6.0	3	38	Monobloc	15,86			15,86	22,67			
	A30211	2.0	11.0	3	38	Monobloc	13,90		✓	13,90	20,46	✓	✓	
	A30212	2.5	12.0	3	38	Monobloc	12,44			12,44	19,97			
	A30314	3.0	14.0	3	38	Monobloc	10,05	20,91	✓	10,19	17,63	✓	✓	22,58
	A30512	5.0	12.7	3	38	Monobloc	27,30			27,30	41,31			
	A30605	6.3	4.7	3	37	Soldada	18,55		✓	18,55	28,00	✓	✓	
	A30612	6.3	12.7	3	45	Soldada	16,53	28,39	✓	17,17	29,37	✓	✓	30,66
SERIE LARGA	A30314-50	3.0	14.0	3	50	Monobloc	23,66	33,11	✓	23,66	✓	✓	✓	
	A30314-75	3.0	14.0	3	75	Monobloc	29,26	40,94	✓	29,53	✓	✓	✓	
	A30314-100	3.0	14.0	3	100	Monobloc	33,98	47,58	✓	33,98	✓	✓	✓	

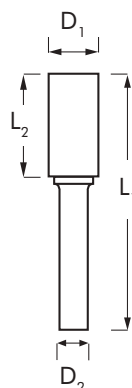
							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
6 mm. MANGO	A60312	3.0	14.0	6	50	Monobloc	27,93			27,93	40,14			
	A60414	4.0	14.0	6	50	Monobloc	25,60			25,60	37,79			
	A60516	5.0	16.0	6	50	Monobloc	21,20			22,01	35,35			
	A60618	6.0	18.0	6	50	Monobloc	20,51	27,71	✓	19,93	31,31	✓	✓	29,93
	A60625	6.0	25.0	6	50	Monobloc	28,63			28,63	45,96			
	A60820	8.0	19.0	6	64	Soldada	25,12	31,10	✓	25,36	38,85	✓	✓	33,59
	A61014	9.6	13.5	6	59	Soldada	29,73			29,73	40,21			
	A61020	9.6	19.0	6	64	Soldada	28,39	31,57	✓	28,67	45,08	✓	✓	34,10
	A61025	9.6	25.0	6	70	Soldada	32,88			32,88	47,16			
	A61125	11.0	25.0	6	70	Soldada	38,72		✓	38,72	56,53	✓	✓	
	A61220	12.7	19.0	6	64	Soldada	44,47		✓	42,81	63,74	✓	✓	
	A61225	12.7	25.0	6	70	Soldada	39,86	46,98	✓	40,63	61,58	✓	✓	50,74
SERIE LARGA	A61525	16.0	25.0	6	70	Soldada	50,16	65,16	✓	51,13	75,80	✓	✓	
	A62025	19.0	25.0	6	70	Soldada	88,44	97,93	✓	88,44	115,32	✓	✓	
	A62525	25.0	25.0	6	70	Soldada	128,85	162,19	✓	128,85	161,27	✓	✓	
	A60618-100	6.0	18.0	6	100	Monobloc	59,78	83,70		59,78	✓	✓	✓	
	A60618-150	6.0	18.0	6	150	Monobloc	77,00	107,78		77,00	✓	✓	✓	
	A60820-170	8.0	19.0	6	172	Soldada	33,81	49,71		33,81	✓	✓	✓	
	A61020-170	9.6	19.0	6	172	Soldada	38,65	53,50		37,21	✓	✓	✓	
	A61225-175	12.7	25.0	6	178	Soldada	60,33	83,70		60,33	✓	✓	✓	

							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
8 mm. MANGO	A81225	12.7	25.0	8	70	Soldada	41,41	49,29	✓	41,41	61,58	✓	✓	
	A81525	16.0	25.0	8	70	Soldada	52,10	65,16	✓	52,10	75,80	✓	✓	
	A82025	19.0	25.0	8	70	Soldada	88,44	97,93	✓	88,44	115,32	✓	✓	
	A82525	25.0	25.0	8	70	Soldada	128,85	162,19	✓	128,85	161,27	✓	✓	

CILÍNDRICA CON CORTE FRONTAL

**TIPO
A/E**

MD



TiAlN



Dentados - P.V.P.

		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2	3	4	6	6+TiAlN	8	9
3 mm. MANGO	A30106E	1.5	6.0	3	38	Monobloc	15,86			15,86	22,67		
	A30211E	2.0	11.0	3	38	Monobloc	13,90		✓	13,90	20,46	✓	✓
	A30212E	2.5	12.0	3	38	Monobloc	12,44			12,44	19,97		
	A30314E	3.0	14.0	3	38	Monobloc	10,56	20,91	✓	10,86	17,63	✓	✓
	A30512E	5.0	12.7	3	38	Monobloc	28,47			28,47	41,31		
	A30605E	6.3	4.7	3	37	Soldada	18,55		✓	18,55	28,00	✓	✓
SERIE LARGA	A30612E	6.3	12.7	3	45	Soldada	18,37	28,39	✓	18,37	29,37	✓	✓
	A30314-50E	3.0	14.0	3	50	Monobloc	26,03		✓	26,03	✓	✓	✓
	A30314-75E	3.0	14.0	3	75	Monobloc	32,17		✓	32,17	✓	✓	✓
	A30314-100E	3.0	14.0	3	100	Monobloc	37,37		✓	37,37	✓	✓	✓

Dentados - P.V.P.

		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2	3	4	6	6+TiAlN	8	9
6 mm. MANGO	A60312E	3.0	14.0	6	50	Monobloc	27,93			27,93	40,14		
	A60414E	4.0	14.0	6	50	Monobloc	25,60			25,60	37,79		
	A60516E	5.0	16.0	6	50	Monobloc	22,24			22,88	35,35		
	A60618E	6.0	18.0	6	50	Monobloc	20,32	30,49	✓	20,32	31,31	✓	✓
	A60625E	6.0	25.0	6	50	Monobloc	29,57			29,57	45,96		
	A60820E	8.0	19.0	6	64	Soldada	26,34	34,24	✓	26,85	38,85	✓	✓
	A61014E	9.6	13.5	6	59	Soldada	29,77			29,77	40,21		
	A61020E	9.6	19.0	6	64	Soldada	29,77	36,11	✓	30,34	45,08	✓	✓
	A61025E	9.6	25.0	6	70	Soldada	35,21			35,21	47,16		
	A61125E	11.0	25.0	6	70	Soldada	38,72		✓	38,72	56,53	✓	✓
	A61220E	12.7	19.0	6	64	Soldada	45,33		✓	45,33	63,74	✓	✓
	A61225E	12.7	25.0	6	70	Soldada	41,79	52,23	✓	42,59	61,58	✓	✓
	A61525E	16.0	25.0	6	70	Soldada	53,59	73,09	✓	51,58	75,80	✓	✓
	A62025E	19.0	25.0	6	70	Soldada	88,44	107,72	✓	88,44	115,32	✓	✓
SERIE LARGA	A62525E	25.0	25.0	6	70	Soldada	142,74	186,38	✓	142,74	175,16	✓	✓
	A60618-100E	6.0	18.0	6	100	Monobloc	65,76			65,76	✓	✓	✓
	A60618-150E	6.0	18.0	6	150	Monobloc	84,68			84,68	✓	✓	✓
	A60820-170E	8.0	19.2	6	170	Soldada	37,19			37,19	✓	✓	✓
	A61020-170E	9.6	19.2	6	170	Soldada	42,52			42,52	✓	✓	✓
	A61225-175E	12.7	25.4	6	175	Soldada	66,37			66,37	✓	✓	✓

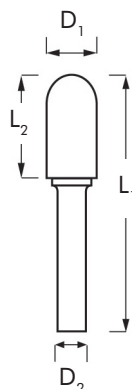
Dentados - P.V.P.

		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2	3	4	6	6+TiAlN	8	9
8 mm. MANGO	A81225E	12.7	25.0	8	70	Soldada	42,59	54,25	✓	42,59	61,58	✓	✓
	A81525E	16.0	25.0	8	70	Soldada	53,59	73,09	✓	53,59	75,80	✓	✓
	A82025E	19.0	25.0	8	70	Soldada	88,44	107,72	✓	88,44	115,32	✓	✓
	A82525E	25.0	25.0	8	70	Soldada	142,74	186,38	✓	142,74	175,16	✓	✓

PUNTA RADIAL (SEMIESFÉRICA)

TIPO
C

MD



TiAlN



		Dentados - P.V.P.												
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
3 mm. MANGO	C30211	2.0	11.0	3	38	Monobloc	12,11		√	12,11	18,66	√	√	
	C30212	2.5	11.0	3	38	Monobloc	12,11			12,11	18,66			
	C30312	3.0	14.0	3	38	Monobloc	12,21	19,84	√	11,76	18,66	√	√	21,43
	C30512	5.0	12.7	3	38	Monobloc	26,78			26,78	42,13			
	C30612	6.3	12.7	3	45	Soldada	18,37	27,14	√	18,37	29,37	√	√	29,31
SERIE LARGA	C30312-50	3.0	14.0	3	50	Monobloc	27,52	38,55	√	27,52	√	√	√	
	C30312-75	3.0	14.0	3	75	Monobloc	33,98	47,58	√	33,98	√	√	√	
	C30312-100	3.0	14.0	3	100	Monobloc	38,72	54,20	√	38,72	√	√	√	

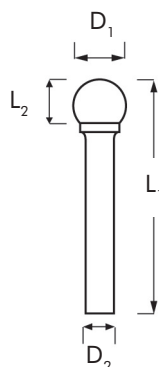
							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
6 mm. MANGO	C60312	3.0	14.0	6	50	Monobloc				29,33	41,31			
	C60413	4.0	14.0	6	50	Monobloc	27,96			27,96	40,55			
	C60516	5.0	16.0	6	50	Monobloc	23,66			23,66	39,55			
	C60618	6.0	18.0	6	50	Monobloc	24,35	32,28	✓	23,22	35,29	✓	✓	34,86
	C60625	6.0	25.0	6	50	Monobloc	33,47			33,47	46,38			
	C60820	8.0	19.0	6	64	Soldada	26,60	33,87	✓	27,12	39,62	✓	✓	36,58
	C61020	9.6	19.0	6	64	Soldada	31,87	35,85	✓	31,56	48,11	✓	✓	38,72
	C61025	9.6	25.0	6	70	Soldada	35,72			35,72	51,28			
	C61125	11.0	25.0	6	70	Soldada	42,53		✓	42,53	60,34	✓	✓	
	C61210	12.0	10.0	6	54	Soldada	46,08			46,08	61,16			
	C61220	12.7	19.0	6	64	Soldada	47,30		✓	45,53	65,70	✓	✓	
	C61225	12.7	25.0	6	70	Soldada	45,12	56,38	✓	45,12	66,64	✓	✓	60,89
	C61525	16.0	25.0	6	70	Soldada	56,73	73,70	✓	57,83	82,15	✓	✓	
C62025	19.0	25.0	6	70	Soldada	95,36	105,83	✓	95,36	122,25	✓	✓		
C62525	25.0	25.0	6	70	Soldada	123,49	164,21		123,49	186,87				
SERIE LARGA	C60618-100	6.0	18.0	6	100	Monobloc	68,39	95,74		68,39	✓	✓	✓	
	C60618-150	6.0	18.0	6	150	Monobloc	88,17	123,44		88,17	✓	✓	✓	
	C60820-170	8.0	19.2	6	175	Soldada	36,97	54,20		36,97	✓	✓	✓	
	C61020-170	9.6	19.2	6	170	Soldada	43,86	59,62		43,05	✓	✓	✓	
	C61225-175	12.7	25.4	6	175	Soldada	69,65	93,68		66,40	✓	✓	✓	

							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
8 mm. MANGO	C81225	12.7	25.0	8	70	Soldada	46,86	58,56	√	46,86	66,64	√	√	
	C81525	16.0	25.0	8	70	Soldada	58,92	73,70	√	57,83	82,15	√	√	
	C82025	19.0	25.0	8	70	Soldada	95,36	105,83	√	95,36	122,25	√	√	
	C82525	25.0	25.0	8	70	Soldada	128,85	164.21		123.49	186.87			

PUNTA BOLA O ESFÉRICA

**TIPO
D**

MD



TiAIN



							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
3 mm. MANGO	D30202	2.0	1.8	3	38	Monobloc	13,90		√	13,90	20,46	√	√	
	D30302	2.5	2.3	3	38	Monobloc	13,02			13,02	19,00			
	D30303	3.0	2.5	3	38	Monobloc	10,99	17,93	√	11,10	18,66	√	√	19,36
	D30404	4.0	3.4	3	38	Monobloc	27,47	32,28	√	27,47	36,16	√	√	
	D30505	5.0	4.7	3	38	Monobloc	30,51			30,51	45,67			
	D30606	6.3	5.0	3	38	Soldada	17,52	27,48	√	17,52	29,38	√	√	29,68
SERIE LARGA	D30303-50	3.0	2.7	3	50	Monobloc	24,51	34,32	√	24,51	√	√	√	
	D30303-75	3.0	2.7	3	75	Monobloc	30,11	42,15	√	30,11	√	√	√	

							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
6 mm. MANGO	D60303	3.0	2.5	6	50	Monobloc	30,66			30,66				
	D60404	4.0	3.0	6	50	Monobloc	26,78			26,78				
	D60505	5.0	4.0	6	50	Monobloc	23,30			23,30				
	D60606	6.0	4.7	6	50	Monobloc	19,97	29,65	√	20,54	31,53	√	√	32,02
	D60808	8.0	6.0	6	52	Soldada	22,29	27,33	√	22,29	34,38	√	√	29,52
	D61010	9.6	8.0	6	54	Soldada	24,94	29,67	√	24,24	39,80	√	√	32,04
	D61111	11.0	9.5	6	55	Soldada	32,98		√	32,98	50,80	√	√	
	D61212	12.7	11.0	6	56	Soldada	32,34	40,06	√	32,65	51,82	√	√	43,26
	D61515	16.0	14.0	6	59	Soldada	41,61	51,10	√	41,61	64,05	√	√	
	D62020	19.0	16.5	6	62	Soldada	57,47	70,60	√	57,47	83,31	√	√	
D62525	25.0	22.0	6	67	Soldada	108,64	139,91	√	108,64	141,08	√	√		
SERIE LARGA	D60808-180	8.0	7.0	6	180	Soldada	29,80	43,70		29,80	√	√	√	
	D61010-185	9.6	8.5	6	185	Soldada	35,40	48,86		35,40	√	√	√	
	D61212-162	12.7	11.4	6	162	Soldada	50,00	65,97		48,13	√	√	√	

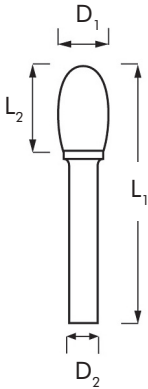
						Dentados - P.V.P.								
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
8 mm. MANGO	D81212	12.7	11.0	8	56	Soldada	33,60	41,26	✓	33,60	51,82	✓	✓	
	D81515	16.0	14.0	8	59	Soldada	41,61	51,11	✓	41,61	64,05	✓	✓	
	D82020	19.0	16.5	8	62	Soldada	57,47	70,60	✓	57,47	83,31	✓	✓	
	D82525	25.0	22.0	8	67	Soldada	108.64	139.91	✓	108.64	141.08	✓	✓	

PUNTA OVAL O GOTA

TIPO

E

MD



TiAlN



							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
3 mm. MANGO	E30306	3.0	6.0	3	38	Monobloc	12,50	20,18	✓	12,50	20,46	✓	✓	
	E30508	5.0	8.0	3	38	Monobloc	26,42			26,42	38,96			
	E30610	6.3	9.5	3	42	Soldada	17,84	27,22	✓	18,20	29,37	✓	✓	
SERIE LARGA	E30306-50	3.0	6.0	3	50	Monobloc	31,92			31,92				
	E30306-75	3.0	6.0	3	75	Monobloc	36,61			36,61				

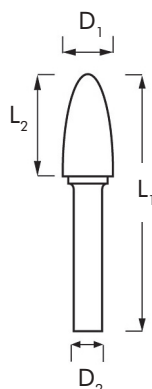
							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2	3	4	6	6+TiAlN	8	9	INOX
6 mm. MANGO	E60610	6.0	10.0	6	50	Monobloc	22,40	32,64	✓	23,50	36,37	✓	✓	
	E60815	8.0	15.0	6	60	Soldada	25,43	35,91	✓	26,18	39,69	✓	✓	38,78
	E61015	9.6	16.0	6	60	Soldada	28,90	34,17	✓	29,75	43,42	✓	✓	36,90
	E61220	12.7	22.0	6	67	Soldada	42,37	54,58	✓	42,37	62,99	✓	✓	58,95
	E61525	16.0	25.0	6	70	Soldada	58,87	75,79	✓	58,87	84,26	✓	✓	
	E62025	19.0	25.0	6	70	Soldada	81,37	101,84	✓	81,37	109,32	✓	✓	
SERIE LARGA	E61015-165	9.6	16.0	6	165	Soldada	50,69			50,69				
	E61220-170	12.7	22.0	6	170	Soldada	65,96			65,96				

							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
8 mm. MANGO	E81220	12.7	22.0	8	67	Soldada	44,45	54,58	✓	43,64	62,99	✓	✓	
	E81525	16.0	25.0	8	70	Soldada	61,75	75,79	✓	61,75	84,26	✓	✓	
	E82025	19.0	25.0	8	70	Soldada	81,37	101,84	✓	81,37	109,32	✓	✓	

FORMA OJIVAL REDONDEADA

**TIPO
F**

MD



TiAlN



		Dentados - P.V.P												
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
3 mm. MANGO	F30306	3.0	6.0	3	38	Monobloc	22,52			22,52	30,66			
	F30308	3.0	8.0	3	38	Monobloc	15,14			15,14	21,70	✓	✓	
	F30312	3.0	14.0	3	38	Monobloc	15,43	21,19	✓	14,71	21,70	✓	✓	22,89
	F30512	5.0	12.7	3	38	Monobloc	27,38			27,38	38,61			
	F30612	6.3	12.7	3	45	Soldada	18,20	25,96	✓	18,20	29,37	✓	✓	28,04
SERIE LARGA	F30312-50	3.0	14.0	3	50	Monobloc	28,38	39,72	✓	28,38	37,79	✓	✓	
	F30312-75	3.0	14.0	3	75	Monobloc	33,93			33,93				

		Dentados - P.V.P												
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
6 mm. MANGO	F60618	6.0	18.0	6	50	Monobloc	23,56	33,71	✓	22,46	34,29	✓	✓	36,41
	F60820	8.0	20.0	6	65	Soldada	27,19	34,02	✓	27,19	39,69	✓	✓	36,74
	F61020	9.6	19.0	6	64	Soldada	34,21	36,07	✓	33,55	49,52	✓	✓	38,96
	F61125	11.0	25.0	6	70	Soldada	43,10		✓	43,10	60,92	✓	✓	
	F61220	12.7	19.0	6	64	Soldada	42,45		✓	42,45	61,27	✓	✓	
	F61225	12.7	25.0	6	70	Soldada	42,69	52,42	✓	43,51	62,88	✓	✓	56,61
	F61525	16.0	25.0	6	70	Soldada	60,63	75,83	✓	58,36	82,72	✓	✓	
	F61530	16.0	30.0	6	75	Soldada	66,73			70,00	96,48			
	F62025	19.0	25.0	6	70	Soldada	78,30	97,93	✓	78,30	105,19	✓	✓	
	F62032	19.0	32.0	6	77	Soldada	108,71	124,30	✓	108,71	141,12	✓	✓	
	F62038	19.0	38.0	6	83	Soldada	137,93	163,94	✓	137,93	170,37	✓	✓	
SERIE LARGA	F60618-150	6.0	18.0	6	150	Monobloc	65,79	93,78		65,79	✓	✓	✓	
	F61020-170	9.6	19.2	6	170	Soldada	42,31	58,33		42,31	✓	✓	✓	
	F61225-175	12.7	25.4	6	175	Soldada	65,65	86,19		62,59				

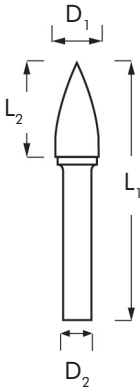
							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
8 mm. MANGO	F81225	12.7	25.0	8	70	Soldada	43,93	53,98	✓	43,93	62,88	✓	✓	
	F81525	16.0	25.0	8	70	Soldada	60,63	74,43	✓	60,63	82,72	✓	✓	
	F82025	19.0	25.0	8	70	Soldada	78,30	97,93	✓	78,30	105,19	✓	✓	
	F82032	19.0	32.0	8	77	Soldada	108,71	124,30	✓	108,71	141,12	✓	✓	
	F82038	19.0	38.0	8	83	Soldada	137,93	163,94	✓	137,93	170,37	✓	✓	

FORMA OJIVAL EN PUNTA

TIPO

G

MD



TiAIN



		Dentados - P.V.P.												
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
3 mm. MANGO	G30306	3.0	6.0	3	38	Monobloc	13,90		√	13,90	20,46	√	√	
	G30310	3.0	10.0	3	38	Monobloc	14,23			14,23	21,15			
	G30312	3.0	14.0	3	38	Monobloc	14,71	21,00	√	14,42	21,70	√	√	
	G30512	5.0	12.7	3	38	Monobloc	27,30			27,30	38,96			
	G30612	6.3	12.7	3	45	Soldada	18,54	25,61	√	18,54	29,37	√	√	
SERIE LARGA	G30312-50	3.0	14.0	3	50	Monobloc	25,37	35,54	√	25,37	√	√	√	
	G30312-75	3.0	14.0	3	75	Monobloc	31,84	44,56	√	31,84	√	√	√	

		Dentados - P.V.P.												
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
6 mm. MANGO	G60618	6.0	18.0	6	50	Monobloc	21,85	37,67	√	22,49	34,31	√	√	40,68
	G60820	8.0	19.0	6	64	Soldada	25,23	40,52	√	25,73	40,56	√	√	43,76
	G61020	9.6	19.0	6	64	Soldada	29,76	48,78	√	30,35	48,41	√	√	52,68
	G61220	12.7	19.0	6	64	Soldada	42,26		√	41,08	61,10	√	√	
	G61225	12.7	25.0	6	70	Soldada	38,96	54,83	√	39,34	63,10	√	√	59,22
	G61230	12.7	30.0	6	75	Soldada	69,99		√	69,99	93,20	√	√	
	G61525	16.0	25.0	6	70	Soldada	59,40	84,89	√	57,18	85,74	√	√	
	G61530	16.0	30.0	6	75	Soldada	82,92		√	82,92	119,10	√	√	
	G62025	19.2	25.0	6	70	Soldada	92,21		√	92,21	119,10	√	√	
G62038	19.2	38.0	6	83	Soldada	129,48		√	129,48	161,92	√	√		
SERIE LARGA	G61020-170	9.6	19.2	6	170	Soldada	44,84	62,28		44,84	√	√	√	
	G61225-175	12.7	25.4	6	175	Soldada	63,65	84,64		60,68	√	√	√	

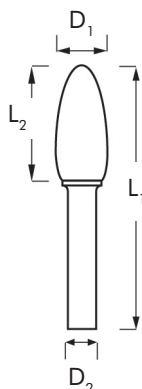
		Dentados - P.V.P.												
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
8 mm. MANGO	G81225	12.7	25.0	8	70	Soldada	40,86		√	40,86	63,10	√	√	
	G81230	12.7	30.0	8	75	Soldada	69,99		√	69,99	93,20	√	√	
	G81525	16.0	25.0	8	70	Soldada	59,40		√	59,40	85,74	√	√	
	G81630	16.0	30.0	8	75	Soldada	86,99		√	86,99	119,10	√	√	
	G82025	19.0	25.0	8	70	Soldada	92,21		√	92,21	119,10	√	√	
	G82038	19.0	38.0	8	83	Soldada	129,48		√	129,48	161,92	√	√	

FORMA LLAMA

**TIPO
H**

MD

TiAlN

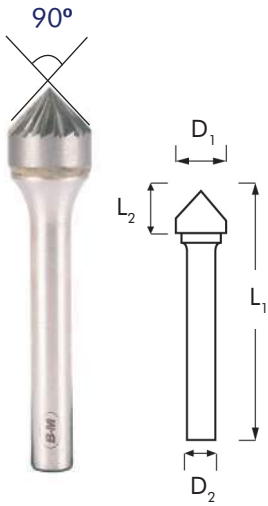
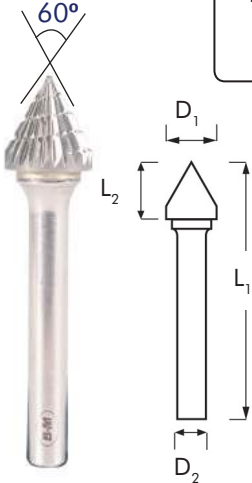


							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2	3	4	6	6+TiAlN	8	9	INOX
3 mm. MANGO	H30306	3.0	6.0	3	38	Monobloc	14,26		✓	14,26	20,70	✓	✓	
	H30510	5.0	9.5	3	38	Monobloc	28,39			28,39	37,95			
	H30612	6.0	10.0	3	43	Soldada	18,86			18,86	25,72			

							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo								
6 mm. MANGO	H60614	6.0	14.0	6	50	Monobloc	25,07			25,07	36,53			
	H60820	8.0	19.0	6	64	Soldada	27,48	40,61	✓	27,75	43,06	✓	✓	43,86
	H61020	10.0	19.0	6	65	Soldada	55,04	62,44		55,04	74,63			67,44
	H61232	12.7	32.0	6	77	Soldada	57,20	82,40	✓	56,09	81,21	✓	✓	88,99
	H61535	16.0	36.0	6	81	Soldada	86,07	111,64	✓	82,04	116,33	✓	✓	
	H62042	19.0	41.0	6	86	Soldada	122,78		✓	122,78	155,21	✓	✓	

							Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Tipo	2 	3 	4 	6 	6+TiAlN 	8 	9 	INOX 
8 mm. MANGO	H81232	12.7	32.0	8	77	Soldada	60,01		✓	60,01	81,21	✓	✓	
	H81535	16.0	36.0	8	81	Soldada	86,07		✓	86,07	116,33	✓	✓	
	H82042	19.0	41.0	8	86	Soldada	122,78		✓	122,78	155,21	✓	✓	

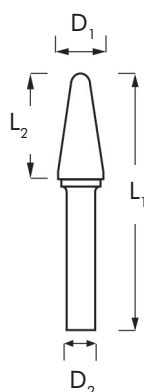
PUNTA CÓNICA 60° Y 90°



		Dentados - P.V.P.												
		TIPO J	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo	2	3	4	6	6+TiAlN	9
3 mm. MANGO	J30303		3.0	2.5	3	38	60°	Monobloc	11,13			11,13	17,69	✓
6 mm. MANGO	J60606		6.0	4.0	6	50	60°	Monobloc	20,36			20,36	31,53	✓
	J61008		9.6	8.0	6	56	60°	Soldada	26,60			26,60	41,92	✓
	J61210		12.7	11.0	6	59	60°	Soldada	32,32			32,32	51,17	✓
	J61512		16.0	14.5	6	63	60°	Soldada	48,63			48,63	71,85	✓
	J62018		19.0	17.5	6	65	60°	Soldada	61,82			61,82	88,70	✓
	J62520		25.0	24.5	6	70	60°	Soldada	96,96			96,96	118,57	✓
8 mm. MANGO	J81210		12.7	11.0	8	59	60°	Soldada	32,32			32,32	51,17	✓
	J81512		16.0	14.5	8	63	60°	Soldada	48,63			48,63	71,85	✓
	J82018		19.0	17.5	8	65	60°	Soldada	61,82			61,82	88,70	✓
	J82520		25.0	24.5	8	70	60°	Soldada	96,96			96,96	118,57	

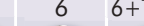
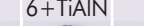
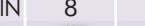
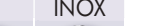
		Dentados - P.V.P.											
	TIPO K	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo	2 	3 	4 	6 	6+TiAlN 	9 
3 mm. MANGO	K30303	3.0	1.5	3	38	90°	Monobloc	11,06			11,06	17,62	✓
6 mm. MANGO	K60603	6.0	3.0	6	50	90°	Monobloc	20,36			20,36	31,53	✓
	K61004	9.6	4.7	6	53	90°	Soldada	26,35			25,12	41,92	✓
	K61206	12.7	6.3	6	55	90°	Soldada	32,32			32,32	51,17	✓
	K61508	16.0	8.0	6	57	90°	Soldada	45,88			43,74	71,85	✓
	K62012	19.0	9.5	6	59	90°	Soldada	63,41			63,41	90,30	✓
	K62512	25.0	12.7	6	61	90°	Soldada	96,96			96,96	118,62	✓
8 mm. MANGO	K81206	12.7	6.3	8	55	90°	Soldada	32,32			32,32	51,17	✓
	K81508	16.0	8.0	8	57	90°	Soldada	45,88			45,88	71,85	✓
	K82012	19.0	9.5	8	59	90°	Soldada	63,41			63,41	90,30	✓
	K82512	25.0	12.7	8	61	90°	Soldada	96,96			96,96	118,62	

CÓNICA REDONDEADA



								Dentados - P.V.P							
		D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo								
3 mm. MANGO	L30310	3.0	10.0	3	38	10°	Monobloc	14,17		√	14,17	20,46	√	√	
	L30312	3.0	14.0	3	38	8°	Monobloc	12,50	21,15	√	12,63	20,46	√	√	
	L30512	5.0	12.7	3	38	14°	Monobloc	31,22			31,22	45,30			
	L30612	6.3	15.8	3	48	22°	Soldada	20,47	33,90	√	21,48	35,26	√	√	

								Dentados - P.V.P.							
		D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo								
6 mm. MANGO	L60618	6.0	18.0	6	50	14°	Monobloc	23,65	35,44	√	23,88	34,83	√	√	
	L60822	8.0	25.4	6	70	14°	Soldada	29,55	46,38	√	30,13	46,33	√		50,09
	L61020	10.0	20.0	6	65	14°	Soldada	35,18	46,95		36,90	49,19			50,71
	L61026	9.6	30.0	6	76	14°	Soldada	36,90	44,42	√	36,21	55,06	√	√	
	L61225	12.0	25.0	6	70	14°	Soldada	43,35	53,73		45,04	61,26			
	L61228	12.7	32.0	6	77	14°	Soldada	45,05	54,25	√	43,79	64,33	√	√	58,59
	L61533	16.0	33.0	6	78	14°	Soldada	80,53	100,72	√	80,53	116,43	√	√	
L62038	19.0	41.0	6	86	14°	Soldada	132,62	147,83	√	132,62	165,06	√	√		
SERIE LARGA	L61026-176	9.6	30.2	6	176	14°	Soldada	53,88	74,57		53,88	√			
	L61228-182	12.7	32.0	6	182	14°	Soldada	65,95	91,01		65,95	√			

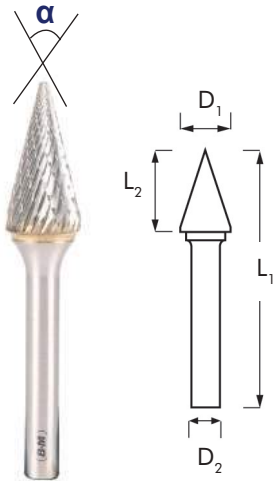
								Dentados - P.V.P							
		D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo								
8 mm. MANGO	L81228	12.7	32.0	8	77	14°	Soldada	45,05	56,90	✓	45,05	64,33	✓	✓	
	L81533	16.0	33.0	8	78	14°	Soldada	84,48	111,99	✓	84,48	116,43	✓	✓	
	L82038	19.0	41.0	8	86	14°	Soldada	132,62	147,83	✓	132,62	165,06	✓	✓	

FORMA CÓNICA EN PUNTA

TIPO

M

MD



TiAlN



Dentados - P.V.P.

3 mm. MANGO

	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo	2	3	4	6	6+TiAlN	8	9
M30308	3.0	8.0	3	38	18°	Monobloc	13,90		✓	13,90	20,46	✓	✓
M30311	3.0	11.0	3	38	14°	Monobloc	15,84	24,54	✓	15,10	22,71	✓	✓
M30315	3.0	15.0	3	38	10°	Monobloc	16,15		✓	16,15	22,71	✓	✓
M30612	6.3	12.7	3	49	22°	Soldada	16,69	29,57	✓	17,18	30,70	✓	✓

Dentados - P.V.P.

6 mm. MANGO

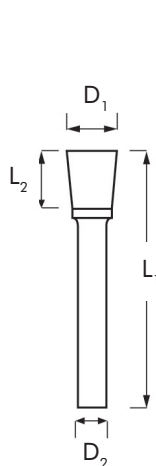
	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo	2	3	4	6	6+TiAlN	8	9
M60612	6.0	12.7	6	50	20°	Monobloc	26,05			26,05	31,87		
M60620	6.0	20.0	6	50	14°	Monobloc	21,27	36,61	✓	22,31	36,16	✓	✓
M60625	6.0	25.0	6	50	10°	Monobloc	28,39			28,39	42,49		
M60818	8.0	18.0	6	64	22°	Soldada	30,60			32,11	49,19		
M61020	9.6	16.0	6	64	28°	Soldada	33,57	46,95	✓	32,90	52,64	✓	✓
M61222	12.7	22.0	6	71	28°	Soldada	42,03	59,98	✓	41,20	66,50	✓	✓
M61525	16.0	25.0	6	71	31°	Soldada	62,89		✓	65,97	96,81	✓	✓

Dentados - P.V.P.

8 mm. MANGO

	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo	2	3	4	6	6+TiAlN	8	9
M81222	12.7	22.0	8	71	28°	Soldada	44,09		✓	44,09	66,50	✓	✓
M81525	16.0	25.0	8	71	31°	Soldada	65,97		✓	65,97	96,81	✓	✓

CONO INVERTIDO



Ejemplo:



N30304



N30304E



3 mm. MANGO

							Dentados - P.V.P.					
	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo	2	3	4	6	6+TiAlN	9
N30304	3.0	4.0	3	38	10°	Monobloc	14,52			14,52	22,71	√
N30304E	3.0	4.0	3	38	10°	Monobloc	16,55			16,55	25,30	
N30606	6.3	6.0	3	39	12°	Soldada	17,95			18,55	29,73	√
N30606E	6.3	6.4	3	39	12°	Soldada	21,00			21,00	27,18	

6 mm. MANGO

							Dentados - P.V.P.					
	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo	2	3	4	6	6+TiAlN	9
N60608	6.0	8.0	6	50	10°	Monobloc	22,56			22,56	33,73	√
N61010	9.6	9.5	6	55	16°	Soldada	32,94			32,94	48,27	√
N61212	12.7	12.7	6	58	28°	Soldada	41,89			41,89	65,40	√
N61520	16.0	19.0	6	64	18°	Soldada	59,81			59,81	83,02	√
N62015	19.0	16.0	6	61	30°	Soldada	75,43			75,43	102,32	√

8 mm. MANGO

							Dentados - P.V.P.					
	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	Tipo	2	3	4	6	6+TiAlN	9
N81212	12.7	12.7	8	58	28°	Soldada	43,95			43,95	65,40	√
N81520	16.0	19.0	8	64	18°	Soldada	59,81			59,81	83,02	√
N82015	19.0	16.0	8	61	30°	Soldada	75,43			75,43	102,32	√

FORMA PASTILLA

TIPO PASTILLA

MD



-	Radial	90°	90°+Radial

3 mm. MANGO

						Dentados - P.V.P.				
	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	2	3	4	6	6+TiAlN
P31001	10.0	1.6	3	34	-	32,19				

6 mm. MANGO

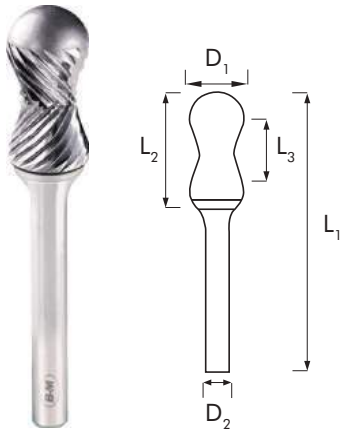
						Dentados - P.V.P.				
	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	2	3	4	6	6+TiAlN
P61202	12.0	2.6	6	48	-	31,61				
P62503	25.0	3.2	6	48	90° + Radial	138,41				
P62505	25.0	5.5	6	50	90°	144,37				
P62506	25.0	6.3	6	51	Radial	122,49				
P63806	38.0	6.1	6	51	90° + Radial	297,47				

8 mm. MANGO

						Dentados - P.V.P.				
	D1 mm	L2 mm	D2 mm	L1 mm	Ángulo	2	3	4	6	6+TiAlN
P82503	25.0	3.2	8	48	90° + Radial	138,41				
P82505	25.0	5.5	8	50	90°	144,37				
P82506	25.0	6.3	8	51	Radial	122,49				
P83806	38.0	6.1	8	51	90° + Radial	297,47				

FRESA RADIAL

MD



Geometría Autocentrante



Redondea arista fácilmente



Guiado fácil y preciso



Excelente acabado superficial de la arista



Referencia	Dimensiones - En mm					Ángulo	€
CMN61225-2	D1	L2	L3	D2	L1	20°	69,50
	12,8	25	16	6	70		

FRESAS ROTATIVAS MICROMÉTRICAS

MATERIALES

MD

INOX

Ti

Ni

FUNDICIÓN

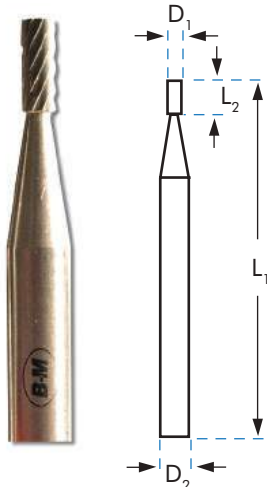


APLICACIONES

- Fabricantes de piezas de precisión.
- Aplicaciones en joyería.
- Fabricación de álabes de turbinas.



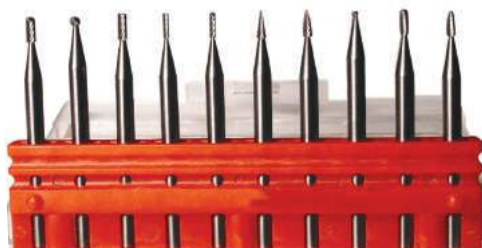
Dentado Standard micro para usos generales



			D1 mm	L1 mm	L2 mm	D2 mm	€
TIPO A	Cilíndrica serie corta	A30104-2M	1,0	38,0	4,0	3,0	21,00
		A31504-2M	1,5	38,0	4,0	3,0	21,00
		A30204-2M	2,0	38,0	4,0	3,0	21,00
TIPO C	Punta radial o Semiesférica	C30104-2M	1,0	38,0	4,0	3,0	21,00
		C31504-2M	1,5	38,0	4,0	3,0	21,00
		C30204-2M	2,0	38,0	4,0	3,0	21,00
TIPO D	Punta bola o esférica	D30101-2M	1,0	38,0	1,0	3,0	21,00
		D31515-2M	1,5	38,0	1,5	3,0	21,00
		D30202-2M	2,0	38,0	2,0	3,0	21,00
TIPO E	Forma oval	E31504-2M	1,5	38,0	4,0	3,0	21,00
TIPO F	Forma ojival redondeado	F31504-2M	1,5	38,0	4,0	3,0	21,00
TIPO G	Forma ojival en punta	G31504-2M	1,5	38,0	4,0	3,0	21,00
TIPO M	Cónica en punta	M31504-2M	1,5	38,0	4,0	3,0	21,00

Velocidad recomendada 70.000 R.P.M.

JUEGO DE FRESAS ROTATIVAS MICROMÉTRICAS



BSMicro

Contenido: 10 Fresas rotativas micrométricas

TIPO A Cilíndrica serie corta:
A30104-2M
A31504-2M

TIPO C Punta radial o Semiesférica:
C30104-2M
C31504-2M

TIPO D Punta bola o esférica:
D30101-2M
D31515-2M

TIPO E Forma oval:
E31504-2M

TIPO F Forma ojival redondeado:
F31504-2M

TIPO G Forma ojival en punta:
G31504-2M

TIPO M Cónica en punta:
M31504-2M

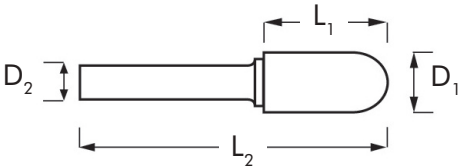
P.V.P.: 195,48 €

FRESA DE CERRAJERO ESPECIAL PARA FRESAR CILINDROS

TIPO

C

MD



		D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Tipo	6 
3 mm. MANGO	Y548TG2	3.0	3	25.0	60	HSS	16,99
	C30325	3.0	3	25.0	60	Monobloc	33,98
6 mm. MANGO	C60625-60	6.0	6	25.0	60	Monobloc	35,99
	C60625-80	6.0	6	25.0	80	Monobloc	42,99
	C60625-100	6.0	6	25.0	100	Monobloc	47,97
	C60625-120	6.0	6	25.0	120	Monobloc	71,96
	C60625-150	6.0	6	25.0	150	Monobloc	95,95

*Monobloc: Integral de Metal Duro



ESTUCHES DE PLÁSTICO DE FRESAS ROTATIVAS DE METAL DURO

MANGO Ø 6 mm.



REFERENCIA	PTFR31	PTFR32	PTFR33
Nº FRESAS	10	10	10
DENTADO	6	6	3
CALIDAD	MD	MD	MD AI
CONTENIDO	A61020-6E A61225-6E C61020-6 C61225-6 L61228-6 E61015-6 G61020-6 G61225-6 D61212-6 F61225-6	A60820-6E A61020-6E C60820-6 C61020-6 D60808-6 D61010-6 F60820-6 F61020-6 L60822-6 L61026-6	A60820-3E A61020-3E C60820-3 C61020-3 D60808-3 D61010-3 F60820-3 F61020-3 L61026-3 L61228-3
P.V.P. €	368,34	283,83	363,51

MANGO Ø 3 mm.

MANGO Ø 6 mm.

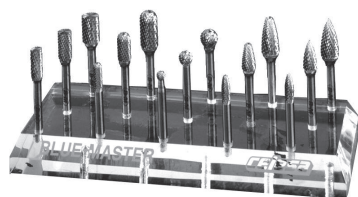


REFERENCIA	PTFR34	PTFR35	PTFR36
Nº FRESAS	10	5	5
DENTADO	6	6	3
CALIDAD	MD	MD	MD AI
CONTENIDO	A30314-6 A30314-6E C30312-6 D30303-6 E30306-6 F30312-6 G30312-6 H30306-6 L30312-6 M30311-6	A61225-6E M61222-6 C61225-6 D61212-6 F61225-6	A61225-3E L61228-3 C61225-3 D61212-3 F61225-3
P.V.P. €	130,95	205,57	260,69

REFERENCIA	PTFR41	PTFR42	PTFR43	PTFR44
Nº FRESAS	4	4	4	4
DENTADO	6	6	6	3
CALIDAD	MD	MD	MD	MD AI
CONTENIDO	A61225-6E C61225-6 F61225-6 G61225-6	A60820-6E C60820-6 F60820-6 G60820-6	A61225-6E C61225-6 M61222-6 G61225-6	A61225-3E C61225-3 F61225-3 G61225-3
P.V.P. €	160,55	99,19	163,87	211,83



* Bajo demanda podemos suministrar otras composiciones según sus necesidades.

EXPOSITORES DE METACRILATO, MINI ESTUCHES Y MALETINES DE FRESAS ROTATIVAS METAL DURO


REFERENCIA	EMFR-01		
Nº FRESAS	15		
CALIDAD	MD		
CONTENIDO	A60618-6E C60618-6 D60606-6 F60618-6 G60618-6	A61020-6E C61020-6 D61010-6 F61020-6 G61020-6	A61225-6E C61225-6 D61212-6 F61225-6 G61225-6
P.V.P. €	460,02		



REFERENCIA	EMFR-02		
Nº FRESAS	15		
CALIDAD	MD		
CONTENIDO	A61225-6 D61212-6 G61225-6 L61228-6 Serie Larga A61225-6-150	A61225-6E E61220-6 H61232-6 M60620-6 C61225-6-150	C61225-6 F61225-6 K61206-6 N61212-6 F61225-6-150
P.V.P. €	674,69		

REFERENCIA	AUTOMOCION			B52		
Nº FRESAS	8			8		
CALIDAD	MD			MD		
CONTENIDO	A60820-6E C60820-6 D60606-6	D60808-6 E61220-6 H61232-6	L61026-6 M61020-6	A61225-6 C61225-6 D61212-6	E61220-6 F61225-6 G61225-6	H61232-6 M61222-6
P.V.P. €	268,53			350,71		



* Bajo demanda podemos suministrar otras composiciones según sus necesidades.


T12

Contenido:

- * 1 Ud. Amoladora 25.000 R.P.M., 0,55 HP, con accionamiento de seguridad y pinza de 6 mm. (gran rendimiento en trabajos de producción).
- * 5 Uds. fresas rotativas Ref. C61225-6
- * 5 Uds. fresas rotativas Ref. F61225-6
- * 1 Ud. Manguera de aire con sus racores.

P.V.P.: 832,57 €

T3

Contenido:

- * 1 Ud. Amoladora 75.000 R.P.M., 0,15 HP, pinza de 3 mm.
- * 10 Uds. fresas rotativas. Mango 3 mm. a elegir.

P.V.P.: 1.060,98 €

EXPOSITORES DE METACRILATO DE FRESAS ROTATIVAS METAL DURO



Ref. MINILUX-1

MINILUX-1

Contenido: 30 fresas rotativas de metal duro			
x 1 Uds :	A61225-6E	D61212-6	G61225-6
	C61225-6	F61225-6	L61228-6
x 2 Uds:	A60820-6E	D60808-6	G60820-6
	A61020-6E	D61010-6	G61020-6
	C60820-6	F60820-6	L60822-6
	C61020-6	F61020-6	L61026-6

Dimensiones: ancho 210 x fondo 210 x alto 210 mm.

P.V.P.: 932,98 €



Ref. MAXILUX-2

MAXILUX-2

Contenido: 180 fresas rotativas de metal duro			
x 5 Uds:	A60618-6	D60606-6	M60620-6
	A60820-6	D60808-6	M61020-6
	A61020-6	D61010-6	M61222-6
	A61225-6	D61212-6	L60618-6
	A60618-6E	F60618-6	L60822-6
	A60820-6E	F60820-6	L61026-6
	A61020-6E	F61020-6	L61228-6
	A61225-6E	F61225-6	H60820-6
	C60618-6	G60618-6	H61232-6
	C60820-6	G60820-6	E60815-6
	C61020-6	G61020-6	E61015-6
	C61225-6	G61225-6	E61220-6

Dimensiones: ancho 250 x fondo 365 x alto 235 mm.

P.V.P.: 5.639,87 €



Ref. BS40

BS40

Contenido: 40 fresas rotativas de metal duro			
x 2 Uds:	A60618-6E	F60618-6	L60618-6
	A60820-6E	F60820-6	L60822-6
	A61020-6E	F61020-6	L61026-6
	A61225-6E	F61225-6	L61228-6
	C60618-6	G60618-6	
	C60820-6	G60820-6	
	C61020-6	G61020-6	
	C61225-6	G61225-6	

Dimensiones: ancho 65 x fondo 245 x alto 300 mm.

P.V.P.: 1.218,88 €

NOTA: El precio de los expositores vacíos: **100,00 €** netos.

NUEVAS AMOLADORAS PARA FRESAS ROTATIVAS



La amplia y completa gama de fresas rotativas **procut** se completa con una NUEVA gama de amoladoras que permiten maximizar su eficiencia y productividad.

Con una excelente relación entre potencia y peso, la NUEVA gama de amoladoras dispone de 4 modelos orientados a sectores tan dispares como aeronáutico, fundición, automoción, astilleros, etc.

La NUEVA gama de herramientas neumáticas industriales optimiza los resultados en todo tipo de aplicaciones, lijado, pulido, rectificado, desbaste y acabado de superficies.

Ofrecen la mejor solución, la mas segura y fiable para todas las aplicaciones de desbaste y acabado.



NUEVAS AMOLADORAS PARA FRESAS ROTATIVAS



AMOLADORA DE ALTA POTENCIA - P25

- Motor con mayor potencia y menor consumo de aire.
- Válvula de aceleración para una acción de arranque más suave.
- Nuevo diseño para mayor ergonomía, comodidad y aislamiento del operario.
- Accionamiento con control de seguridad.

	R.P.M. 6.3 BAR	POTENCIA HP	PESO Kg.	D1 x L1 mm.	EXTENSIÓN portafresas.	Ø mm. PINZA	SALIDA DE AIRE	OPCIÓN CAMBIO DE MOTOR	€
P25	25.000	1.10	0,73	40 x 208	No alargador	6 mm.	Detrás	SÍ	577,82



NUEVA AMOLADORA ANTI-VIBRACIÓN - P25LR

- Única con sistema anti-vibración.
- Válvula de aceleración para una acción de arranque más suave.
- Recomendado para trabajos de larga duración.
- Para trabajos de alta producción que requieren de una mayor precisión y control del proceso.
- Nuevo diseño para mayor ergonomía, comodidad y aislamiento del operario gracias a su sistema de amortiguación.
- Accionamiento con control de seguridad.

	R.P.M. 6.3 BAR	POTENCIA HP	PESO Kg.	D1 x L1 mm.	EXTENSIÓN portafresas.	Ø mm. PINZA	SALIDA DE AIRE	OPCIÓN CAMBIO DE MOTOR	€
P25LR	25.000	1.10	0,80	40 x 208	No alargador	6 mm.	Detrás	SÍ	656,83



AMOLADORA DE MANDO EXTRA LARGO - P25XLR

- Motor con mayor potencia y menor consumo de aire.
- Válvula de aceleración para una acción de arranque más suave.
- Mando ergonómico extra largo que permite ser utilizado con las dos manos, obteniendo así mayor control y precisión durante el proceso.
- Para aplicaciones de acceso complicado.

	R.P.M. 6.3 BAR	POTENCIA HP	PESO Kg.	D1 x L1 mm.	EXTENSIÓN portafresas.	Ø mm. PINZA	SALIDA DE AIRE	OPCIÓN CAMBIO DE MOTOR	€
P25XLR	25.000	1.10	1,3	40 x 345	33 x 177	6 mm.	Detrás	NO	869,19



AMOLADORA TIPO PENCIL - STR71

- Cuerpo diseñado para trabajos complicados.
- Alta velocidad dando como resultado acabados más finos.
- Collar protector de pinza que protege el husillo ofreciendo mayor seguridad al operario.
- Su diseño tipo Pencil proporciona un control más preciso.

	R.P.M. 6.3 BAR	POTENCIA HP	PESO Kg.	D1 x L1 mm.	EXTENSIÓN portafresas.	Ø mm. PINZA	SALIDA DE AIRE	OPCIÓN CAMBIO DE MOTOR	€
STR71	75.000	0.15	0,15	16,5 x 132	No alargador	3 mm.	Detrás	SÍ	660,41



Consulten tarifa de repuestos.

FRESAS ROTATIVAS DE DIAMANTE



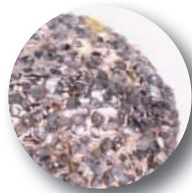
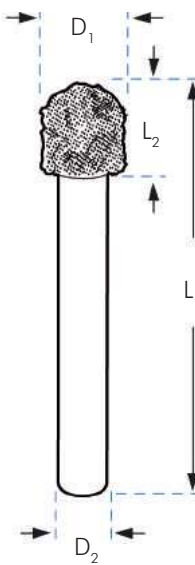
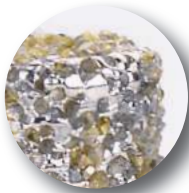
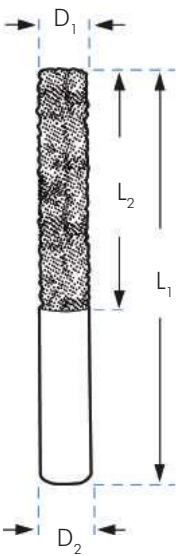
APLICACIONES

Construcción:

- Piedra, porcelánico, mármol, granito

Materiales compuestos:

- Fibra de Vidrio, fibra de carbono, poliéster, plásticos en general

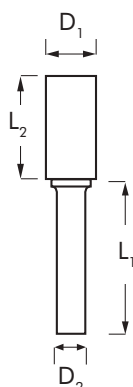


	D1 mm	D2 mm	L1 mm	L2 mm	A..D €
A30211D	2,40	3	38	11,00	33,03
A30314D	3,00	3	38	14,00	36,10
A30605D	6,35	3	44	4,70	35,95
A30612D	6,35	3	51	12,70	43,65
A60610D	6,00	6	50	10,00	50,25
A60820D	8,00	6	64	19,20	54,98
A80838D	8,00	8	66	38,00	78,75
A61020D	9,60	6	64	19,00	59,91
A61125D	11,00	6	70	25,40	80,14
A61220D	12,50	6	64	19,20	79,14
A61225D	12,50	6	70	25,40	82,65
A61525D	15,80	6	70	25,40	99,36
A62025D	19,20	6	70	25,40	131,97
A62525D	25,00	6	70	25,40	152,20

	D1 mm	D2 mm	L1 mm	L2 mm	C..D €
C30211D	2,40	3	38	11,00	37,58
C30612D	6,35	3	51	12,70	49,65
C60618D	6,00	6	50	18,00	57,17
C60820D	8,00	6	64	19,20	62,55
C60840D	8,00	6	64	38,00	70,36
C80838D	8,00	8	66	38,00	74,35
C61020D	9,60	6	64	19,20	67,11
C61011D	10,00	6	50	11,00	92,11
C61035D	10,00	6	66	35,00	71,60
C61125D	11,00	6	70	25,40	89,75
C61220D	12,50	6	64	19,20	88,64
C61225D	12,50	6	70	25,40	92,56
C61525D	15,80	6	70	25,40	111,29
C62025D	19,20	6	70	25,40	147,81
C62525D	25,00	6	70	25,40	170,46

MUELA CERÁMICA CILÍNDRICA

**TIPO
A**



3 mm. MANGO

	D1 mm	L2 mm	D2 mm	L1 mm	A €
MA030408V	4.0	8.0	3	40	3,11
MA030510V	5.0	10.0	3	40	3,18
MA030515V	5.0	15.0	3	40	3,26
MA030613V	6.0	13.0	3	40	3,18
MA030625V	6.0	25.0	3	40	4,92
MA030810V	8.0	10.0	3	40	3,26
MA030816V	8.0	16.0	3	40	4,39
MA031013V	10.0	13.0	3	40	4,39
MA031313V	13.0	13.0	3	40	3,86
MA031340V	13.0	40.0	3	40	6,89
MA032050V*	20.0	50.0	3	40	8,28

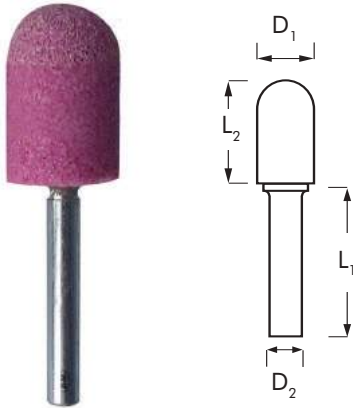
6 mm. MANGO

	D1 mm	L2 mm	D2 mm	L1 mm	A €
MA060510V*	5.0	10.0	6	40	3,39
MA060515V*	5.0	15.0	6	40	3,47
MA060613V	6.0	13.0	6	40	3,39
MA060625V	6.0	25.0	6	40	5,24
MA060810V	8.0	10.0	6	40	3,47
MA060816V	8.0	16.0	6	40	4,68
MA061013V	10.0	13.0	6	40	3,87
MA061020V	10.0	20.0	6	40	4,92
MA061025V	10.0	25.0	6	40	5,24
MA061032V	10.0	32.0	6	40	5,89
MA061313V	13.0	13.0	6	40	4,12
MA061320V	13.0	20.0	6	40	4,76
MA061325V	13.0	25.0	6	40	5,08
MA061340V	13.0	40.0	6	40	7,34
MA061610V	16.0	10.0	6	40	4,84
MA061620V	16.0	20.0	6	40	5,08
MA062010V	20.0	10.0	6	40	5,08
MA062020V	20.0	20.0	6	40	5,32
MA062025V	20.0	25.0	6	40	5,65
MA062032V	20.0	32.0	6	40	6,29
MA062040V	20.0	40.0	6	40	7,58
MA062050V	20.0	50.0	6	40	8,72
MA062510V	25.0	10.0	6	40	5,57
MA062513V	25.0	13.0	6	40	5,65
MA062516V	25.0	16.0	6	40	5,73
MA062525V	25.0	25.0	6	40	6,37
MA062532V	25.0	32.0	6	40	7,10
MA062540V	25.0	40.0	6	40	8,23
MA063216V	32.0	16.0	6	40	6,05
MA063220V	32.0	20.0	6	40	6,37
MA063232V	32.0	32.0	6	40	7,75
MA063240V	32.0	40.0	6	40	9,77
MA064010V	40.0	10.0	6	40	7,67
MA064015V	40.0	15.0	6	40	8,80
MA064020V	40.0	20.0	6	40	9,44
MA064040V	40.0	40.0	6	40	12,75
MA065013V	50.0	13.0	6	40	10,01
MA065025V	50.0	25.0	6	40	12,42
MA065040V	50.0	40.0	6	40	14,93

* Hasta fin de existencias

MUELA CERÁMICA CILÍNDRICA PUNTA RADIAL

TIPO
C

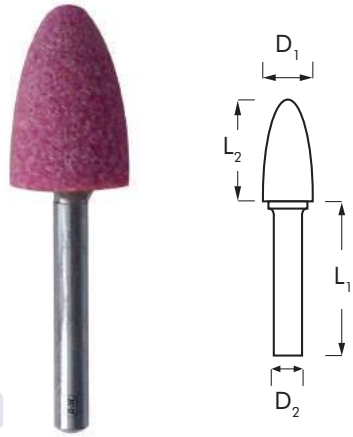


6 mm. MANGO

	D1 mm	L2 mm	D2 mm	L1 mm	C
					€
MC060510V	5.0	10.0	6	40	4,41
MC060816V	8.0	16.0	6	40	6,08
MC061320V	13.0	20.0	6	40	6,18
MC062025V	20.0	25.0	6	40	7,34
MC062532V	25.0	32.0	6	40	9,23

MUELA CERÁMICA OJIVAL

TIPO
F

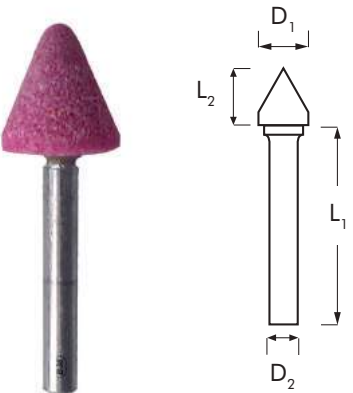


6 mm. MANGO

	D1 mm	L2 mm	D2 mm	L1 mm	F
					€
MF060510V	5.0	10.0	6	40	4,41
MF060816V	8.0	16.0	6	40	6,08
MF061320V	13.0	20.0	6	40	6,18
MF062032V	20.0	32.0	6	40	8,18
MF062050V	20.0	50.0	6	40	11,33
MF062540V	25.0	40.0	6	40	10,70

MUELA CERÁMICA CÓNICA

TIPO
M

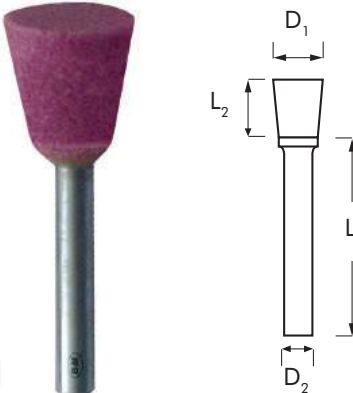


6 mm. MANGO

	D1 mm	L2 mm	D2 mm	L1 mm	M
					€
MM061010V	10.0	10.0	6	40	4,52
MM061025V	10.0	25.0	6	40	6,81
MM061313V	13.0	13.0	6	40	5,34
MM061616V	16.0	16.0	6	40	6,39
MM061645V	16.0	45.0	6	40	11,33
MM062020V	20.0	20.0	6	40	6,92
MM062032V	20.0	32.0	6	40	8,18
MM062040V	20.0	40.0	6	40	9,86
MM062525V	25.0	25.0	6	40	8,28
MM062545V	25.0	45.0	6	40	11,54
MM063232V	32.0	32.0	6	40	10,07
MM063250V	32.0	50.0	6	40	16,15

MUELA CERÁMICA FORMA DE VASO

TIPO
N



6 mm. MANGO

	D1 mm	L2 mm	D2 mm	L1 mm	N
					€
MN062016V	20.0	16.0	6	40	7,86
MN062520V	25.0	20.0	6	40	9,08
MN063225V	32.0	25.0	6	40	10,65
MN064032V	40.0	32.0	6	40	16,58