

FRESAS DE METAL DURO INTEGRAL ALTO RENDIMIENTO Y PRODUCCIÓN

USO
GENERAL

MD



2 Z



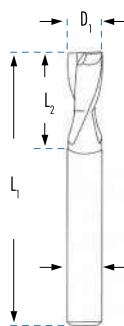
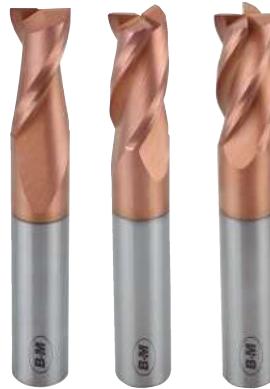
3 Z



4 Z

MUY RECOMENDABLE ALTO
RENDIMIENTO EN MECANIZADO.Micro Grano
MD

SERIE CORTA

TOL D1
+0 -0,05TOL D2
h6

HÉLICE VARIABLE

MATERIAL
ACABADO
CALIDAD

4Z

D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm	€
1,00	38	3	3	45,85
1,50	38	4	3	44,77
2,00	38	6	3	35,63
2,50	38	8	3	34,82
3,00	38	8	3	29,99
3,50	50	11	4	36,81
4,00	50	11	4	34,20
4,50	50	13	5	43,74
5,00	50	13	5	43,21
6,00	50	16	6	48,71
7,00	60	16	8	67,94
8,00	60	19	8	57,66
9,00	72	19	10	82,67
10,00	72	22	10	91,92
11,00	75	26	12	122,27
12,00	75	26	12	113,69
14,00	84	30	14	169,00
16,00	92	32	16	218,92
18,00	100	38	18	304,21
20,00	100	38	20	346,83
25,00	100	38	25	569,30

€

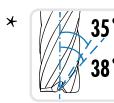
MATERIAL ACABADO CALIDAD	FMT2	FMT63	FMT48
	MD	MD	MD
	Premium Quality	Premium Quality	Premium Quality
2Z	3Z	4Z	
D ₁ mm	L ₁ mm	L ₂ mm	D ₂ mm
1,00	38	3	3
1,50	38	4	3
2,00	38	6	3
2,50	38	8	3
3,00	38	8	3
3,50	50	11	4
4,00	50	11	4
4,50	50	13	5
5,00	50	13	5
6,00	50	16	6
7,00	60	16	8
8,00	60	19	8
9,00	72	19	10
10,00	72	22	10
11,00	75	26	12
12,00	75	26	12
14,00	84	30	14
16,00	92	32	16
18,00	100	38	18
20,00	100	38	20
25,00	100	38	25

MATERIAL ACABADO CALIDAD	FMT81
	MD
	TiAlSiN
4Z	
D ₁ mm	L ₁ mm
1,00	38
1,50	38
2,00	38
2,50	38
3,00	38
3,50	50
4,00	50
4,50	50
5,00	50
6,00	63
7,00	63
8,00	63
9,00	70
10,00	70
11,00	75
12,00	75
14,00	90
16,00	100
18,00	100
20,00	100

€

MATERIAL ACABADO CALIDAD	FMT92
	MD
	TiAlSiN
2Z	
D ₁ mm	L ₁ mm
1,00	38
1,50	38
2,00	38
2,50	38
3,00	38
4,00	50
5,00	50
6,00	50
8,00	60
10,00	75
12,00	75
14,00	90
16,00	100
18,00	100
20,00	100

€



* 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
44 HRc	RPM AVANCE (mm/min)	5600	3640	2800	2240	1820	1400	1120	924	798	700	560
INOX Ti	RPM AVANCE (mm/min)	70	77	77	77	77	77	77	77	91	91	70
Ni	RPM AVANCE (mm/min)	11200	7420	5600	4480	3640	2800	2240	1820	1540	1400	1120

FRESAS TÓRICAS DE METAL DURO

Ref. FMG10R
Ref. FMG54RUSO
GENERAL
TÓRICA

MD



TiAIN

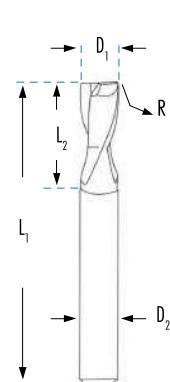
2 Z



4 Z

Micro Grano
MD

D ₁ mm	D ₂ mm	R mm	L ₂ mm	L ₁ mm	FMG10R		FMG54R	
					MATERIAL ACABADO CALIDAD	MD TiAIN ★★ 2Z €	MD TiAIN ★★★ 4Z €	
2	6	0,2	6	50	FMG100200R0,2	27,39	FMG540200R0,2	27,39
2	6	0,5	6	50	FMG100200R0,5	27,39	FMG540200R0,5	27,39
3	6	0,2	8	50	FMG100300R0,2	27,39	FMG540300R0,2	27,39
3	6	0,5	8	50	FMG100300R0,5	27,39	FMG540300R0,5	27,39
4	6	0,2	11	50	FMG100400R0,2	27,39	FMG540400R0,2	27,39
4	6	0,5	11	50	FMG100400R0,5	27,39	FMG540400R0,5	27,39
4	6	1,0	11	50	FMG100400R1	27,39	FMG540400R1	27,39
5	6	0,2	12	50	FMG100500R0,2	27,39	FMG540500R0,2	27,39
5	6	0,5	12	50	FMG100500R0,5	27,39	FMG540500R0,5	27,39
5	6	1,0	12	50	FMG100500R1	27,39	FMG540500R1	27,39
6	6	0,2	12	50	FMG100600R0,2	27,39	FMG540600R0,2	27,39
6	6	0,5	13	50	FMG100600R0,5	27,39	FMG540600R0,5	27,39
6	6	1,0	13	50	FMG100600R1	27,39	FMG540600R1	27,39
6	6	1,5	13	50	FMG100600R1,5	27,39	FMG540600R1,5	27,39
6	6	2,0	13	50	FMG100600R2	27,39	FMG540600R2	27,39
8	8	0,2	15	60	FMG100800R0,2	37,70	FMG540800R0,2	37,70
8	8	0,5	15	60	FMG100800R0,5	37,70	FMG540800R0,5	37,70
8	8	1,0	15	60	FMG100800R1	37,70	FMG540800R1	37,70
8	8	1,5	15	60	FMG100800R1,5	37,70	FMG540800R1,5	37,70
8	8	2,0	15	60	FMG100800R2	37,70	FMG540800R2	37,70
10	10	0,5	20	72	FMG101000R0,5	51,91	FMG541000R0,5	51,91
10	10	1,0	20	72	FMG101000R1	51,91	FMG541000R1	51,91
10	10	1,5	20	72	FMG101000R1,5	51,91	FMG541000R1,5	51,91
10	10	2,0	20	72	FMG101000R2	51,91	FMG541000R2	51,91
10	10	3,0	20	72	FMG101000R3	51,91	FMG541000R3	51,91
12	12	0,5	24	75	FMG101200R0,5	73,32	FMG541200R0,5	73,32
12	12	1,0	24	75	FMG101200R1	73,32	FMG541200R1	73,32
12	12	1,5	24	75	FMG101200R1,5	73,32	FMG541200R1,5	73,32
12	12	2,0	24	75	FMG101200R2	73,32	FMG541200R2	73,32
12	12	3,0	24	75	FMG101200R3	73,32	FMG541200R3	73,32
16	16	0,5	30	92	FMG101600R0,5	137,63	FMG541600R0,5	137,63
16	16	1,0	30	92	FMG101600R1	137,63	FMG541600R1	137,63
16	16	2,0	30	92	FMG101600R2	137,63	FMG541600R2	137,63
16	16	3,0	30	92	FMG101600R3	137,63	FMG541600R3	137,63
16	16	4,0	30	92	FMG101600R4	137,63	FMG541600R4	137,63



FRESAS DE METAL DURO MICROMÉTRICAS, CON Y SIN CUELLO

Fresas

NEW

Ref. FMD22
Ref. FMD35USO
GENERAL
MICRO

MD

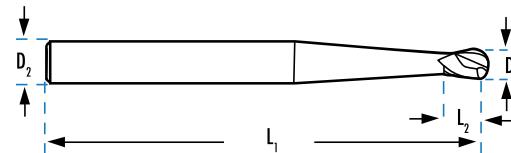
30° N
CILÍNDRICO

TiAlN

2 Z

Micro Grano
MD

SIN CUELLO



Rosa

FRESA ESFÉRICA



FMD35

	TOL -0,015	TOL h6	D1 mm	D2 mm	L2 mm	L1 mm	€
FMD350020X04	0,2	4	0,4	50	48,45		
FMD350030X06	0,3	4	0,6	50	44,63		
FMD350040X08	0,4	4	0,8	50	39,09		
FMD350050X10	0,5	4	1,0	50	37,21		
FMD350060X12	0,6	4	1,2	50	37,21		
FMD350070X14	0,7	4	1,4	50	37,21		
FMD350080X16	0,8	4	1,6	50	37,21		
FMD350090X18	0,9	4	1,8	50	37,21		

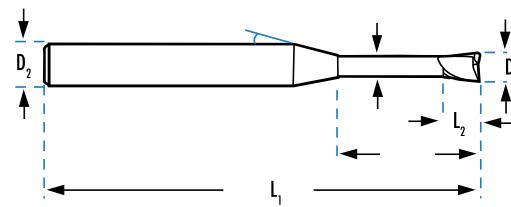
FMD22



FRESA ESFÉRICA

	TOL -0,015	TOL h6	D1 mm	D2 mm	L2 mm	L1 mm	€
FMD220020X04	0,2	4	0,4	50	38,57		
FMD220030X06	0,3	4	0,6	50	36,78		
FMD220040X08	0,4	4	0,8	50	34,41		
FMD220050X10	0,5	4	1,0	50	32,50		
FMD220060X12	0,6	4	1,2	50	32,50		
FMD220070X14	0,7	4	1,4	50	32,50		
FMD220080X16	0,8	4	1,6	50	32,50		
FMD220090X18	0,9	4	1,8	50	32,50		

CON CUELLO



FRESA ESFÉRICA



FMD35

	TOL -0,015	TOL h6	D1 mm	D2 mm	D3 mm	L3 mm	L2 mm	L1 mm	€
FMD350050X04	0,5	4	0,48	4	0,7	50	41,86		
FMD350050X06	0,5	4	0,48	6	0,7	50	41,86		
FMD350060X04	0,6	4	0,57	4	0,9	50	41,86		
FMD350060X06	0,6	4	0,57	6	0,9	50	41,86		
FMD350060X08	0,6	4	0,57	8	0,9	50	41,86		
FMD350080X06	0,8	4	0,76	6	1,2	50	41,86		
FMD350080X08	0,8	4	0,76	8	1,2	50	41,86		
FMD350080X10	0,8	4	0,76	10	1,2	50	41,86		
FMD350120X06	1,2	4	1,15	6	1,8	50	24,44		
FMD350120X08	1,2	4	1,15	8	1,8	50	24,44		
FMD350120X10	1,2	4	1,15	10	1,8	50	24,44		

FMD22



FRESAS DE METAL DURO CON CUELLO

NEW
Ref. FMD22
Ref. FMD44
Ref. FMD35

USO
GENERAL
MICRO

MD



30°



CILÍNDRICO

TiAIN



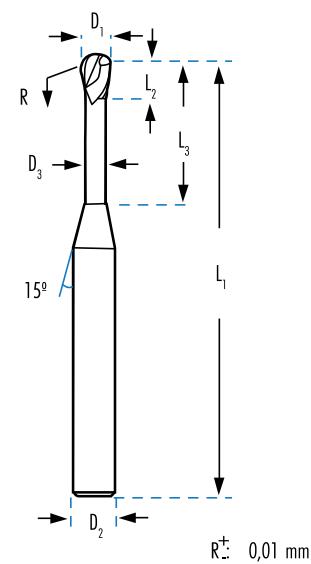
Micro Grano
MD

Fresas

Rosa

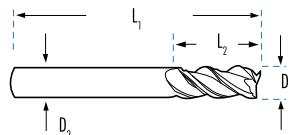
44
HRc

2Z 4Z



MATERIAL	ACABADO	CALIDAD				FMD22	MD	TiAIN	2Z	€	FMD44	MD	TiAIN	4Z	€	FMD35	MD	TiAIN	2Z	€	
			D ₁	D ₂	D ₃																
			mm	mm	mm																
1,0	6	0,95	5	1,5	57	FMD220100X05	32,07				FMD440100X05						FMD350100X05	32,85			
1,0	6	0,95	8	1,5	57	FMD220100X08	32,07				FMD440100X08						FMD350100X08	33,80			
1,0	6	0,95	10	1,5	57	FMD220100X10	32,07				FMD440100X10						FMD350100X10	33,80			
1,0	6	0,95	12	1,5	65	FMD220100X12	33,80				FMD440100X12						FMD350100X12	35,36			
1,0	6	0,95	15	1,5	65	FMD220100X15	33,80				FMD440100X15						FMD350100X15	35,36			
1,0	6	0,95	20	1,5	65	FMD220100X20	33,80				FMD440100X20						FMD350100X20	35,36			
1,5	6	1,42	5	2,0	57	FMD220150X05	32,07				FMD440150X05						FMD350150X05	33,80			
1,5	6	1,42	8	2,0	57	FMD220150X08	32,07				FMD440150X08						FMD350150X08	33,80			
1,5	6	1,42	10	2,0	57	FMD220150X10	32,07				FMD440150X10						FMD350150X10	33,80			
1,5	6	1,42	12	2,0	65	FMD220150X12	33,80				FMD440150X12						FMD350150X12	35,36			
1,5	6	1,42	15	2,0	65	FMD220150X15	33,80				FMD440150X15						FMD350150X15	35,36			
1,5	6	1,42	20	2,0	65	FMD220150X20	33,80				FMD440150X20						FMD350150X20	35,36			
1,5	6	1,42	25	2,0	65	FMD220150X25	33,80				FMD440150X25						FMD350150X25	-			
2,0	6	1,92	6	3,0	57	FMD220200X06	32,07				FMD440200X06	32,07					FMD350200X06	33,80			
2,0	6	1,92	8	3,0	57	FMD220200X08	32,07				FMD440200X08	32,07					FMD350200X08	33,80			
2,0	6	1,92	10	3,0	57	FMD220200X10	32,07				FMD440200X10	32,07					FMD350200X10	33,80			
2,0	6	1,92	12	3,0	60	FMD220200X12	32,93				FMD440200X12	32,93					FMD350200X12	33,80			
2,0	6	1,92	14	3,0	65	FMD220200X14	33,80				FMD440200X14	33,80					FMD350200X14	33,80			
2,0	6	1,92	16	3,0	65	FMD220200X16	33,80				FMD440200X16	33,80					FMD350200X16	34,63			
2,0	6	1,92	20	3,0	65	FMD220200X20	33,80				FMD440200X20	33,80					FMD350200X20	34,63			
2,0	6	1,92	25	3,0	65	FMD220200X25	33,80				FMD440200X25	33,80					FMD350200X25	34,63			
2,0	6	1,92	30	3,0	80	FMD220200X30	41,08				FMD440200X30	41,08					FMD350200X30	42,55			
2,0	6	1,92	35	2,0	80	FMD220200X35	41,08				FMD440200X35	41,08					FMD350200X35	42,55			
2,0	6	1,92	40	3,0	80	FMD220200X40	41,08				FMD440200X40	41,08					FMD350200X40	42,90			
2,0	6	1,92	50	3,0	100	FMD220200X50	44,20				FMD440200X50	44,20					FMD350200X50	46,77			
2,5	6	2,40	10	4,0	57	FMD220250X10	32,07				FMD440250X10	32,07					FMD350250X10	-			
2,5	6	2,40	16	4,0	65	FMD220250X16	33,80				FMD440250X16	33,80					FMD350250X16	-			
2,5	6	2,40	20	4,0	65	FMD220250X20	33,80				FMD440250X20	33,80					FMD350250X20	34,63			
2,5	6	2,40	30	4,0	80	FMD220250X30	41,08				FMD440250X30	41,08					FMD350250X30	42,90			
2,5	6	2,40	40	4,0	80	FMD220250X40	41,08				FMD440250X40	41,08					FMD350250X40	42,90			
3,0	6	2,90	9	5,0	57	FMD220300X09	32,07				FMD440300X09	32,07					FMD350300X09	34,63			
3,0	6	2,90	12	5,0	60	FMD220300X12	32,93				FMD440300X12	32,93					FMD350300X12	34,63			
3,0	6	2,90	15	5,0	65	FMD220300X15	33,80				FMD440300X15	33,80					FMD350300X15	34,63			
3,0	6	2,90	20	5,0	65	FMD220300X20	33,80				FMD440300X20	33,80					FMD350300X20	34,63			
3,0	6	2,90	25	5,0	65	FMD220300X25	33,80				FMD440300X25	33,80					FMD350300X25	35,36			
3,0	6	2,90	30	5,0	80	FMD220300X30	41,08				FMD440300X30	41,08					FMD350300X30	42,90			
3,0	6	2,90	35	5,0	80	FMD220300X35	41,08				FMD440300X35	41,08					FMD350300X35	42,90			
3,0	6	2,90	40	5,0	80	FMD220300X40	41,08				FMD440300X40	41,08					FMD350300X40	42,90			
3,0	6	2,90	50	5,0	100	FMD220300X50	44,20				FMD440300X50	44,20					FMD350300X50	46,77			
3,0	6	4,80	12	7,0	60	FMD220500X12	32,93				FMD440500X12	32,93					FMD350500X12	-			
5,0	6	4,80	20	7,0	65	FMD220500X20	33,80				FMD440500X20	33,80					FMD350500X20	34,63			
5,0	6	4,80	30	7,0	80	FMD220500X30	41,08				FMD440500X30	41,08					FMD350500X30	42,90			
5,0	6	4,80	40	7,0	80	FMD220500X40	41,08				FMD440500X40	41,08					FMD350500X40	42,90			
5,0	6	4,80	50	7,0	100	FMD220500X50	44,20				FMD440500X50	44,20					FMD350500X50	46,77			

FRESA 2 LABIOS, SERIE CORTA, HÉLICE A 30°



SERIE CORTA

REVOLUCIONES Y AVANCES

	<30 HRc		30-45 HRc		INOX		TOL -0,03	TOL h6					FMG10
R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min		D1 mm	D2 mm	L1 mm	L2 mm		€	
21.500	170	12.900	101	10.750	84	FMG100100	1,0	6	40	2,5	25,99*		
15.000	180	9.000	107	7.500	89	FMG100150	1,5	6	40	4,0	25,99*		
11.560	190	7.560	120	6.300	90	FMG100200	2,0	6	50	6,0	38,62		
8.920	210	5.560	140	4.620	120	FMG100300	3,0	6	50	8,0	38,62		
7.560	300	4.620	180	3.880	150	FMG100400	4,0	6	50	11,0	38,62		
6.300	320	3.780	190	3.160	160	FMG100500	5,0	6	50	12,0	38,62		
5.560	350	3.360	220	2.840	180	FMG100600	6,0	6	50	12,0	38,62		
4.880	385	2.940	220	2.470	180	FMG100700	7,0	8	60	16,0	35,78*		
4.200	380	2.520	200	2.100	180	FMG100800	8,0	8	60	15,0	53,15		
3.730	375	2.260	190	1.890	180	FMG100900	9,0	10	70	19,0	49,27*		
3.260	330	2.000	160	1.680	160	FMG101000	10,0	10	72	20,0	73,20		
2.740	280	1.680	130	1.360	130	FMG101200	12,0	12	75	24,0	103,39		
2.470	265	1.520	125	1.210	125	FMG101400	14,0	14	85	26,0	119,86*		
2.200	220	1.360	110	1.060	110	FMG101600	16,0	16	92	30,0	194,05		
1.680	170	1.060	80	840	80	FMG102000	20,0	20	105	38,0	155,40*		
1.360	130	840	70	680	60	FMG102500	25,0	25	120	45,0	202,30*		



*Hasta fin de existencias

FRESA 3 LABIOS, SERIE CORTA, HÉLICE VARIABLE



SERIE CORTA

	TOL e8	TOL h6					FMD67
	D1 mm	D2 mm	L1 mm	L2 mm			€
FMD670300	3	6	50	8			32,66
FMD670400	4	6	50	11			32,66
FMD670500	5	6	50	13			32,66
FMD670600	6	6	50	16			32,66
FMD670800	8	8	60	19			41,18
FMD671000	10	10	73	22			60,84
FMD671200	12	12	75	26			82,99
FMD671400	14	14	85	30			148,11
FMD671600	16	16	92	32			161,62
FMD672000	20	20	100	38			238,37



Fresa de 3 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.

FRESA 4 LABIOS, SERIE CORTA, HÉLICE VARIABLE

Ref. FMG12

INOX

INOX
AISI 316L

Ti

INC



MD

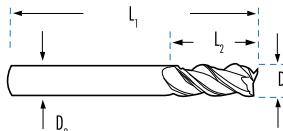


TiAlSiN

4 Z

Micro Grano
MD

SERIE CORTA



REVOLUCIONES Y AVANCES

					INOX			TOL -0,03	TOL h6				FMG12	
R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min			D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm		€	
11.560	280	7.560	170	6.300	140	FMG120200	2,0	6	40	*6	21,98*			
10.240	300	6.560	185	5.460	155	FMG120250	2,5	6	40	*8	21,98*			
8.920	320	5.560	200	4.620	170	FMG120300	3,0	6	50	8	32,66			
7.560	370	4.620	350	3.880	280	FMG120400	4,0	6	50	11	32,66			
6.300	600	3.780	360	3.160	300	FMG120500	5,0	6	50	13	32,66			
5.560	660	3.360	410	2.840	330	FMG120600	6,0	6	50	16	32,66			
4.200	710	2.520	380	2.100	350	FMG120800	8,0	8	60	19	41,18			
3.730	660	2.260	340	1.890	325	FMG120900	9,0	10	70	*19	40,95*			
3.260	610	2.000	300	1.680	300	FMG121000	10,0	10	73	22	60,84			
2.740	520	1.680	250	1.360	240	FMG121200	12,0	12	75	26	82,99			
2.470	465	1.520	225	1.210	220	FMG121400	14,0	14	85	30	113,36			
2.200	410	1.360	200	1.060	200	FMG121600	16,0	16	92	32	161,62			
1.940	365	1.210	180	950	175	FMG121800	18,0	18	92	38	238,37			
1.680	320	1.060	160	840	150	FMG122000	20,0	20	100	38	238,37			

*Hasta fin de existencias

Fresa para materiales de alta dureza. 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.

FRESAS 4 LABIOS DE HÉLICE VARIABLE

Ref. FMG83

INOX

INOX
AISI 316L

Ti

INC

MD



TiAlSiN

4 Z

Micro Grano
MD

REVOLUCIONES Y AVANCES

	INOX AISI 316L		INOX AISI 304			TOL -0,03	TOL h6						FMG83	
R.P.M. rev./min	AVANCE mm/min	R.P.M. rev./min	AVANCE mm/min			D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	L ₃ mm	X-45°		€	
10.185	195	14.260	205	FMG830300	3,0	6	57	8	11	0,07	55,21			
7.600	250	14.260	255	FMG830400	4,0	6	57	11	14	0,09	55,21			
6.110	310	8.655	310	FMG830500	5,0	6	57	13	16	0,12	55,21			
5.095	360	7.130	360	FMG830600	6,0	6	57	13	21	0,20	55,21			
3.820	435	5.345	465	FMG830800	8,0	8	63	19	27	0,25	70,73			
3.055	590	4.275	585	FMG831000	10,0	10	73	22	32	0,35	103,25			
2.545	565	3.565	565	FMG831200	12,0	12	83	26	38	0,40	139,16			
2.180	520	3.055	520	FMG831400	14,0	14	84	30	40	0,40	199,71			
1.910	480	2.670	480	FMG831600	16,0	16	92	32	44	0,40	234,54			
1.525	470	2.140	470	FMG832000	20,0	20	104	38	55	0,40	370,81			

Fresa para materiales de alto contenido en níquel. Fresa de 4 cortes, corte al centro con chaflan a 45° en el corte, 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.

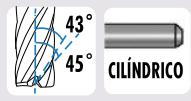
FRESA 4 LABIOS MULTI MATERIAL

NEW

Ref. FMG80

MULTI
MATERIAL
TOP56
HRc

MD

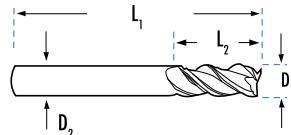


TiAIN

4 Z

Micro Grano
MD

SERIE CORTA



FMG80

	TOL e8	TOL h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	€
	D ₁ mm	D ₂ mm							
FMG800300	3	6	8	20	0,05	57		36,66	
FMG800400	4	6	11	20	0,05	57		36,66	
FMG800500	5	6	13	21	0,07	57		36,66	
FMG800600	6	6	13	21	0,10	57		36,66	
FMG800800	8	8	19	27	0,15	63		44,81	
FMG801000	10	10	22	32	0,15	73		65,00	
FMG801200	12	12	26	38	0,25	83		92,25	
FMG801400	14	14	30	40	0,30	84		117,26	
FMG801600	16	16	32	44	0,35	92		164,49	
FMG801800	20	20	38	55	0,35	104		242,32	



Fresa de 4 cortes, corte al centro, Hélice Variable con recubrimiento TiAlN.

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

FRESA ESFÉRICA 4 LABIOS ESPECIAL MOLDISTAS

NEW

Ref. FMG86

MOLDISTAS



INOX

Ti

65
HRc

MD



TiAlSiN

4 Z

Micro Grano
MD

SERIE CORTA

FMG86

	TOL e8	TOL h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	€
	D ₁ mm	D ₂ mm					
FMG860600	6	6	8	50		33,28	
FMG860600X80	6	6	8	80		43,65	
FMG860600X100	6	6	8	100		48,07	
FMG860600X150	6	6	8	150		63,34	
FMG860800	8	8	10	60		42,61	
FMG860800X100	8	8	10	100		60,39	
FMG860800X150	8	8	10	150		81,52	
FMG861000	10	10	13	72		62,99	
FMG861000X100	10	10	13	100		86,79	
FMG861000X150	10	10	13	150		115,72	
FMG861000X200	10	10	13	200		162,52	
FMG861200	12	12	15	75		86,27	
FMG861200X100	12	12	15	100		121,56	
FMG861200X150	12	12	15	150		169,26	
FMG861200X200	12	12	15	200		198,41	



FRESA 6 LABIOS, HÉLICE A 45°

INOX
Ref. FMG1465
HRc

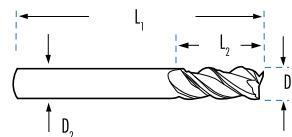
Ti

MD

45°

TiAIN

6 Z

Materiales muy duros
Aceros templados.Micro Grano
MD

SERIE CORTA

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	FMG140300	4Z	3,0	3	38	8	24,53
8.900	2.670	5.760	1.555	4.850	1.310	2.100	370	FMG140400	4Z	4,0	4	50	11	27,14
7.560	2.260	4.800	1.440	4.100	1.230	1.800	325	FMG140500	4Z	5,0	5	50	13	34,32
6.300	2.090	4.050	1.215	3.700	1.180	1.580	300	FMG140600		6,0	6	50	16	35,21
5.560	2.000	3.880	1.370	3.370	1.100	1.350	280	FMG140800		8,0	8	60	19	49,25
4.200	2.000	2.940	1.370	2.490	1.100	1.000	280	FMG141000		10,0	10	75	22	68,69
3.360	2.000	2.320	1.370	1.920	1.100	440	280	FMG141200		12,0	12	75	26	100,58
2.840	1.680	2.000	1.160	1.610	1.000	400	250	FMG141400		14,0	14	90	32	129,82
2.470	1.470	1.740	1.020	1.380	885	355	220	FMG141600		16,0	16	100	32	177,13
2.100	1.260	1.480	880	1.160	770	310	190	FMG141800		18,0	18	100	38	205,60
1.890	1.130	1.320	785	1.030	695	280	170	FMG142000		20,0	20	100	38	256,50
1.680	1.010	1.160	690	900	920	250	155	FMG142500		25,0	25	100	38	437,21
1.500	900	1.100	600	850	540	220	135							



SERIE LARGA

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	FMG250300	4Z	3,0	3	60	15	24,18
8.900	2.670	5.760	1.555	4.850	1.310	2.100	370	FMG250400	4Z	4,0	4	80	20	27,25
7.560	2.260	4.800	1.440	4.100	1.230	1.800	325	FMG250500	4Z	5,0	5	80	25	31,29
6.300	2.090	4.050	1.215	3.700	1.180	1.580	300	FMG250600		6,0	6	80	25	37,94
5.560	2.000	3.880	1.370	3.370	1.100	1.350	280	FMG250800		8,0	8	90	35	55,41
4.200	2.000	2.940	1.370	2.490	1.100	1.000	280	FMG251000		10,0	10	100	45	75,00
3.360	2.000	2.320	1.370	1.920	1.100	440	280	FMG251200		12,0	12	100	50	107,15
2.840	1.680	2.000	1.160	1.610	1.000	400	250	FMG251200X125		12,0	12	125	70	132,67
2.470	1.470	1.740	1.020	1.380	885	355	220	FMG251400		14,0	14	150	65	145,65
2.100	1.260	1.480	880	1.160	770	310	190	FMG251600		16,0	16	150	65	187,15
2.100	1.260	1.480	880	1.160	770	310	190	FMG251600X165		16,0	16	165	100	213,60
1.680	1.010	1.160	690	900	920	250	155	FMG252000		20,0	20	150	70	276,78
1.680	1.010	1.160	690	900	920	250	155	FMG252000X165		20,0	20	165	100	319,26
1.680	1.010	1.160	690	900	920	250	155	FMG252000X200		20,0	20	200	135	408,06
1.500	900	1.100	600	850	540	220	135	FMG252500		25,0	25	150	75	532,10
1.500	900	1.100	600	850	540	220	135	FMG252500X165		25,0	25	165	100	616,06
1.500	900	1.100	600	850	540	220	135	FMG252500X200		25,0	25	200	140	690,82
1.500	900	1.100	600	850	540	220	135	FMG253200		32,0	32	165	100	863,55
								FMG253200X210		32,0	32	210	150	1.036,13



FRESA 2 Y 3 LABIOS, SERIE CORTA, HÉLICE A 45°, PARA ALUMINIO

Al

Cu

PVC



2 Z



Ref. FMD59

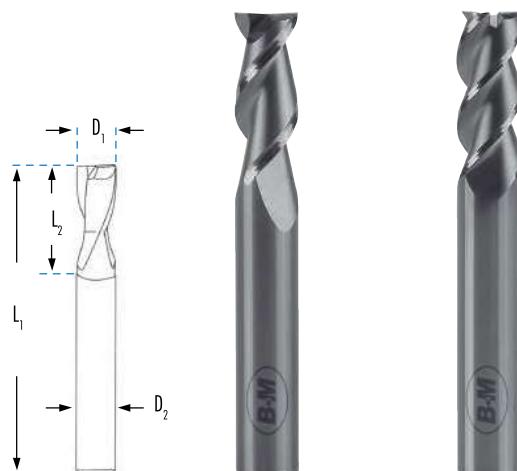
3 Z



Ref. FMD33

Micro Grano
MD

SERIE CORTA



REVOLUCIONES Y AVANCES

Al			TOL -0,05	TOL h6	D1 mm	D2 mm	L1 mm	L2 mm	FMD59	2 Z	FMD33	3 Z
R.P.M rev./min.	AVANCE 1 mm/min	AVANCE 2 mm/min								€		€
10.000	700	900			3,0	6,0	50	8	FMD590300	27,60	FMD330300	27,60
10.000	900	1.100			4,0	6,0	50	11	FMD590400	29,90	FMD330400	29,90
10.000	1.000	1.300			5,0	6,0	50	13	FMD590500	30,89	FMD330500	30,89
10.000	1.200	1.500			6,0	6,0	50	16	FMD590600	35,07	FMD330600	35,07
8.000	1.400	1.800			8,0	8,0	60	19	FMD590800	49,97	FMD330800	49,97
8.000	1.700	2.100			10,0	10,0	72	25	FMD591000	73,47	FMD331000	73,47
8.000	2.100	2.600			12,0	12,0	75	30	FMD591200	97,07	FMD331200	97,07
6.000	1.800	2.200			14,0	14,0	84	35	FMD591400	136,23	FMD331400	136,23
6.000	1.900	2.400			16,0	16,0	92	40	FMD591600	172,80	FMD331600	172,80
4.000	1.600	1.900			20,0	20,0	100	45	FMD592000	284,99	FMD332000	284,99

TOLERANCIAS SEGÚN DIN 7160 y 7161

Gama de tolerancias μm / Diámetro nominal en mm

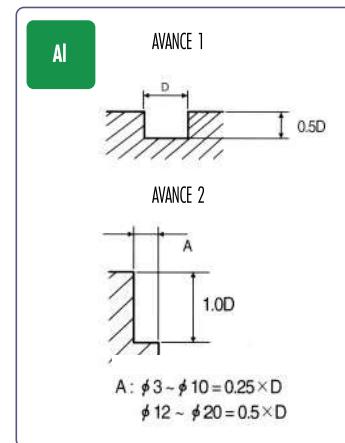
de 1 a 3 de 3 a 6 de 6 a 10 de 10 a 18 de 18 a 30

TOL h10 0 0 0 0 0

- 40 - 48 - 58 - 70 - 84

TOL h6 0 0 0 0 0

- 6 - 8 - 9 - 11 - 13





Cu



2 Z



Ref. FMD69

3 Z



Ref. FMD23

Micro Grano
MD

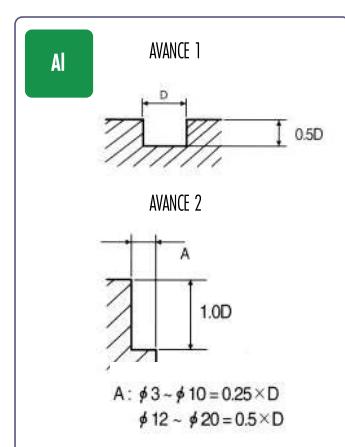
SERIE LARGA



REVOLUCIONES Y AVANCES			AI		TOL -0,05		TOL h6						FMD69		FMD23	
R.P.M rev./min.	AVANCE 1 mm/min	AVANCE 2 mm/min	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm							€			€
10.000	1.200	1.500	6,0	6,0	80	25	FMD690600	40,33	FMD230600	40,33						
8.000	1.400	1.800	8,0	8,0	90	35	FMD690800	57,47	FMD230800	57,47						
8.000	1.700	2.100	10,0	10,0	100	45	FMD691000	84,49	FMD231000	84,49						
8.000	2.100	2.600	12,0	12,0	100	50	FMD691200	111,63	FMD231200	111,63						
6.000	1.800	2.200	14,0	14,0	165	65	FMD691400	156,66	FMD231400	156,66						
6.000	1.900	2.400	16,0	16,0	150	65	FMD691600	198,72	FMD231600	198,72						
4.000	1.600	1.900	20,0	20,0	150	70	FMD692000	327,74	FMD232000	327,74						

TOLERANCIAS SEGÚN DIN 7160 y 7161
Gama de tolerancias μm / Diámetro nominal en mm

	de 1 a 3	de 3 a 6	de 6 a 10	de 10 a 18	de 18 a 30
TOL h10	0 - 40	0 - 48	0 - 58	0 - 70	0 - 84
TOL h6	0 - 6	0 - 8	0 - 9	0 - 11	0 - 13



FRESA DE 2 LABIOS ESFÉRICA, SERIE CORTA Y LARGA, HÉLICE A 45°, PARA ALUMINIO



Cu



2 Z

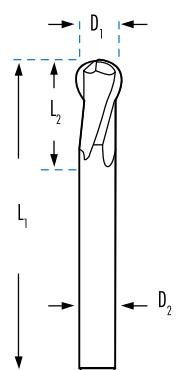
Ref. FMD93
Ref. FMD94Micro Grano
MD

SERIE CORTA

REVOLUCIONES Y AVANCES

Al		
R.P.M rev./min.	AVANCE 1 mm/min	AVANCE 2 mm/min
10.000	700	900
10.000	900	1.100
10.000	1.000	1.300
10.000	1.200	1.500
8.000	1.400	1.800
8.000	1.700	2.100
8.000	2.100	2.600
6.000	1.800	2.200
6.000	1.900	2.400
4.000	1.600	1.900

TOL -0,05	TOL h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	FMD93	2 Z	€
		3,0	6,0	50	6	FMD930300		25,20
		4,0	6,0	50	8	FMD930400		28,72
		5,0	6,0	50	10	FMD930500		30,38
		6,0	6,0	50	12	FMD930600		35,75
		8,0	8,0	60	15	FMD930800		44,13
		10,0	10,0	72	20	FMD931000		66,32
		12,0	12,0	75	24	FMD931200		82,39
		14,0	14,0	83	26	FMD931400		121,97
		16,0	16,0	92	30	FMD931600		154,32
		20,0	20,0	100	40	FMD932000		237,86

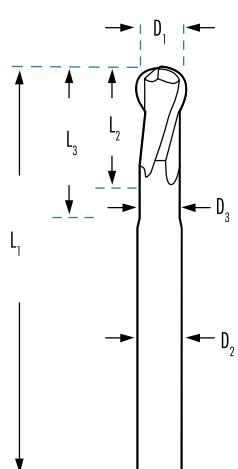


SERIE LARGA

REVOLUCIONES Y AVANCES

Al		
R.P.M rev./min.	AVANCE 1 mm/min	AVANCE 2 mm/min
10.000	1.200	1.500
8.000	1.400	1.800
8.000	1.700	2.100
8.000	2.100	2.600
6.000	1.900	2.400
4.000	1.600	1.900

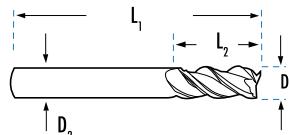
TOL -0,05	TOL h6	D ₁ mm	D ₂ mm	D ₃ mm	L ₃ mm	L ₁ mm	L ₂ mm	FMD94	2 Z	€
		6,0	6,0	5,5	35	80	12	FMD940600		42,33
		8,0	8,0	7,5	35	90	15	FMD940800		47,06
		10,0	10,0	9,5	45	100	20	FMD941000		75,00
		12,0	12,0	11,5	50	100	24	FMD941200		94,47
		16,0	16,0	15,5	92	150	30	FMD941600		185,21
		20,0	20,0	19,5	92	150	40	FMD942000		270,23



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



SERIE CORTA



REVOLUCIONES Y AVANCES								FMG13							
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	TOL -0,03	TOL h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
4.200	310	2.520	180	2.100	160	920	40	FMG130800	8,0	8	60	19	3	30,99*	
3.260	310	2.000	140	1.680	140	740	40	FMG131000	10,0	10	70	22	3	45,78*	
2.740	250	1.680	120	1.370	120	620	30	FMG131200	12,0	12	75	25	3	62,74*	
2.200	200	1.360	100	1.050	100	460	25	FMG131600	16,0	16	90	32	3	103,96*	
1.940	175	1.210	85	950	85	410	20	FMG131800	18,0	18	90	32	3	121,54*	
1.680	150	1.060	70	840	70	350	20	FMG132000	20,0	20	100	28	4	137,83*	
1.360	115	840	60	670	60	300	15	FMG132500	25,0	25	120	45	4	220,44*	

*Hasta fin de existencias

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

FRESAS 3 A 5 LABIOS, DESBASTE FINO

Ref. FMG15
Ref. FMG16

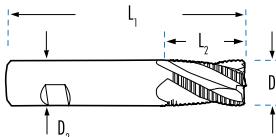
Ti

INC

MD



TiAIN

Micro Grano
MD

SERIE CORTA

REVOLUCIONES Y AVANCES

	<30 HRc		30-45 HRc		INOX		INC		TOL h10	TOL h6					FMG15
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		D1 mm	D2 mm	L1 mm	L2 mm	Z	€	
15.600	2.320	12.400	840	8.400	570	2.400	190	FMG150600	6,0	6	54	7	3	23,07*	
13.600	2.320	10.800	840	7.350	570	2.100	190	FMG150700	7,0	8	58	8	3	26,96*	
11.600	2.320	9.200	840	6.300	570	1.800	190	FMG150800	8,0	8	58	9	3	26,96*	
10.400	2.320	8.400	840	5.700	570	1.550	190	FMG150900	9,0	10	66	13	4	40,20*	
9.200	2.320	7.600	840	5.100	570	1.300	190	FMG151000	10,0	10	66	14	4	40,20*	
8.000	2.400	6.000	800	4.200	570	1.200	190	FMG151200	12,0	12	73	16	4	51,57*	
6.800	2.400	5.200	840	3.600	570	900	130	FMG151400	14,0	14	75	18	4	62,55*	
6.000	2.400	4.800	760	3.300	510	800	110	FMG151600	16,0	16	82	22	4	83,93*	
4.800	2.160	3.600	560	2.400	360	660	100	FMG152000	20,0	20	92	26	4	121,49*	
4.300	2.150	3.200	620	2.160	410	600	100	FMG152500	25,0	25	110	25	5	189,26*	

*Hasta fin de existencias



SERIE LARGA

REVOLUCIONES Y AVANCES

	<30 HRc		30-45 HRc		INOX		INC		TOL h10	TOL h6					FMG16
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		D1 mm	D2 mm	L1 mm	L2 mm	Z	€	
13.600	2.320	10.800	840	7.350	570	2.100	190	FMG160700	7,0	8	63	16	3	28,97*	
11.600	2.320	9.200	840	6.300	570	1.800	190	FMG160800	8,0	8	63	16	3	28,97*	
9.200	2.320	7.600	840	5.100	570	1.300	190	FMG161000	10,0	10	72	22	4	43,21*	
6.800	2.400	5.200	840	3.600	570	900	130	FMG161400	14,0	14	83	26	4	67,24*	
6.000	2.400	4.800	760	3.300	510	800	110	FMG161600	16,0	16	92	32	4	90,23*	
4.800	2.160	3.600	560	2.400	360	660	100	FMG162000	20,0	20	104	38	4	130,63*	
4.300	2.150	3.200	620	2.160	410	600	100	FMG162500	25,0	25	121	45	5	203,50*	

*Hasta fin de existencias



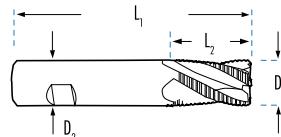
TOLERANCIAS SEGÚN DIN 7160 y 7161

		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°, DESBASTE FINO



SERIE CORTA



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	R.P.M. rev./min	AVANCE mm/min	FMG17	TOL h10	TOL h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
11.600	2.320	9.200	840	6.300	570	1.800	190	FMG170800	8,0	8	58	9	4	26,96*		
8.000	2.400	6.000	800	4.200	570	1.200	190	FMG171200	12,0	12	73	16	4	51,57*		
6.000	2.400	4.800	760	3.300	510	800	110	FMG171600	16,0	16	82	22	5	83,93*		
4.800	2.160	3.600	560	2.400	360	660	100	FMG172000	20,0	20	92	26	6	107,99*		

*Hasta fin de existencias



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



SERIE LARGA

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	R.P.M. rev./min	AVANCE mm/min	FMG18	TOL h10	TOL h6	D ₁ mm	D ₂ mm	L ₁ mm	L ₂ mm	Z	€
20.100	4.600	18.400	1.700	12.600	1.040	3.800	399	FMG180400	4,0	6	57	11	3	24,07*		
15.600	2.320	12.400	840	8.400	570	2.400	190	FMG180600	6,0	6	57	16	4	24,07*		
13.600	2.320	10.800	840	7.350	570	2.100	190	FMG180700	7,0	8	63	16	4	28,13*		
11.600	2.320	9.200	840	6.300	570	1.800	190	FMG180800	8,0	8	63	16	4	28,13*		
9.200	2.320	7.600	840	5.100	570	1.300	190	FMG181000	10,0	10	72	22	4	41,95*		
6.800	2.400	5.200	840	3.600	570	900	130	FMG181400	14,0	14	83	26	5	65,28*		
6.000	2.400	4.800	760	3.300	510	800	110	FMG181600	16,0	16	92	32	5	87,61*		
4.800	2.160	3.600	560	2.400	360	660	100	FMG182000	20,0	20	104	38	6	140,91*		
4.300	2.150	3.200	620	2.160	410	600	100	FMG182500	25,0	25	121	45	6	246,97*		

*Hasta fin de existencias



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



Ref. FMG19



MD



TiAIN

4-6 Z



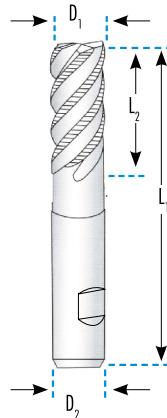
SERIE LARGA

Fresas

Rosa

	FMG19							
	TOL h10	TOL h6	D ₃ mm	L ₁ mm	L ₂ mm	L ₃ mm	Z	€
FMG190600	6,0	6	5,5	57	16	20	4	29,72*
FMG190800	8,0	8	7,5	63	16	26	4	34,74*
FMG191000	10,0	10	9,5	72	22	31	4	51,82*
FMG191200	12,0	12	11,5	83	26	37	4	66,49*
FMG191600	16,0	16	15,5	100	32	51	5	86,66*
FMG192000	20,0	20	19,2	110	38	59	6	139,31*

*Hasta fin de existencias



REVOLUCIONES Y AVANCES

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