Alto Rendimento

Per soddisfare i più elevati standard qualitativi dei nostri clienti, Silmax propone utensili con rendimento ottimizzato per le tecnologie di fresatura ad alto rendimento.

Tutta la gamma viene costantemente aggiornata in base alle ultime novità tecnologiche. Un posto di primo piano è rappresentato dalle frese Evolution in metallo duro integrale per la sgrossatura e semifinitura di acciai con geometria asimmetrica ed affilatura frontale specifica per le lavorazioni in rampa fino a 24° d'angolo.

Tutte le frese hanno il trattamento 4S di superfinitura del filo tagliente particolarmente adatto per lavorazioni in condizione estreme in grado di garantire una produttività superiore di circa il 30% rispetto ad un utensile convenzionale.

Nella gamma novità assoluta è la 158, fresa a 4 taglienti con divisione irregolare e nucleo ribassato particolarmente performante per la lavorazione del titanio.

High Performance

In order to meet the highest quality standards of our customers, Silmax proposes tools with optimised yield for high-performance milling technologies.

The whole range is constantly updated according to the latest technological innovations. Leading products in the line are the Evolution end mills, made of integral carbide for roughing and finishing steels, with asymmetrical geometry and specific face sharpening, for ramp machining up to a 24° angle.

All end mills have a super-finishing 4S-treated cutting edge, particularly suitable for machining in extreme conditions and capable of ensuring an increase in productivity of about 30% compared with a conventional tool.

Absolutely new in the range is the 4-flute end mill 158, with unequal flute spacing and double -core, particularly well-performing in a wide range of materials.

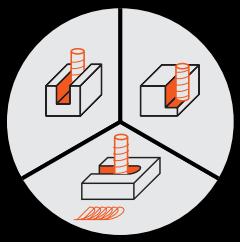
Alto Rendimento
High Performance

Multimateriale

Gli utensili sono stati progettati per lavorare, con parametri molto elevati, un'ampia gamma di acciai, basso e alto legati, ghise e acciai inossidabili.

Multi-material

These tools have been designed for machining a wide range of steels, low-alloy and high-alloy steels, cast irons and stainless steels.

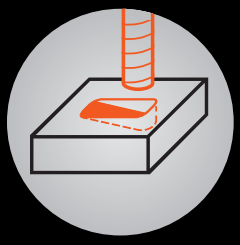


Multiapplicazione

+ Cava fino a 1,5XD, contornitura pesante e contornitura di finitura
+ Lavorare con le strategie della fresatura trocoidale

Multi-application

+ Slotting up to 1,5xD, heavy-duty side milling and finishing side milling
+ Machining with trochoidal milling strategies



Eseguire discese in rampa con angoli di discesa elevati

Execute ramp plunging with high plunging angles

Trattamento Silmax 4S

Trattamento Silmax 4S per il trattamento delle superfici e delle geometrie di taglio, enfatizzando le caratteristiche costruttive dell'utensile e migliorando:

+ Omogeneità del filo tagliente
+ Resistenza all'usura e riduzione degli sforzi di taglio
+ Adesione e resistenza del rivestimento
+ Incremento della produttività del 30%

Silmax 4S Treatment

Silmax 4S treatment for surfaces and cutting geometries, enhancing the tool construction characteristics and improving:

+ Cutting-edge homogeneity
+ Wear-resistance and reduction of shear stress
+ Coating adhesion and resistance
+ 30% increase in productivity

Rivestimento PVD

Il rivestimento utilizzato è Balinit® Alcrona Pro, rivestimento estremamente resistente all'usura, con eccellenti livelli di durezza a caldo e stabilità agli shock termici.
Alcrona Pro® garantisce ottimi risultati anche nella lavorazione a secco e ad elevate velocità di taglio.

PVD Coating

The coating used is Balinit® Alcrona Pro, an extremely wear-resistant coating, with excellent heat-hardness levels and thermal-shock stability.
Alcrona Pro® grants extraordinary results also in dry machining and in high cutting speeds.

Per maggiori informazioni
scarica la brochure digitale.

For further information
download the digital brochure.

silmax.it/hpc

113EV
Fresa 4 taglienti con eliche differenziate e divisione irregolare

4 flute end mill with variable helix and unequal flute spacing

→ 56

113EVR
Fresa 4 taglienti con eliche differenziate e divisione irregolare per lavorazioni in rampa

4 flute finishing end mill with variable helix and unequal f lute spacing for ramp milling

→ 57

013EV
Fresa 4 taglienti a rompitruciolo con eliche differenziate e divisione irregolare

4 flute roughing end mill with chip breaker, variable helix and unequal flute spacing

→ 58

013EVK
Fresa 4 taglienti a rompitruciolo con eliche differenziate e divisione irregolare per lavorazioni cava

4 flute roughing end mill with chip breaker, variable helix and unequal flute spacing for slot milling

→ 58

013EVR
Fresa 4 taglienti a rompitruciolo con eliche differenziate e divisione irregolare per lavorazioni in rampa

4 flute roughing end mill with chip breaker, variable helix and unequal flute spacing for ramp milling

→ 59

158 NEW
Fresa 4 taglienti con divisione irregolare e tagliente extra lungo

4 flute end mill with unequal flute spacing extra long version

→ 65

151
Fresa 3 taglienti per elevate asportazioni

3 flute roughing end mill for high chip removal

→ 67

152
Fresa 4 taglienti con eliche differenziate e divisione irregolare

4 flute end mill with unequal flute spacing and variable helix

→ 69

193
Fresa 5 taglienti con divisione irregolare e tagliente lungo

5 flute end mill with variable helix long version

→ 71

196
Fresa 5/7 taglienti con divisione irregolare e tagliente extra lungo

5/7 flute end mill with variable helix, extra long version

→ 71

155
Fresa multitagliente per superfinitura

Multi-flute end mill for super-finishing

→ 73

SIL SERVICE

L'esperienza Silmax dimostra che un utensile correttamente affilato ha un rendimento uguale a quello nuovo.

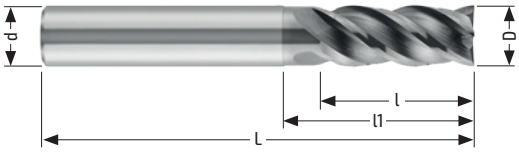
Silmax experience shows that a properly sharpened tool grants the same performances of a new tool.

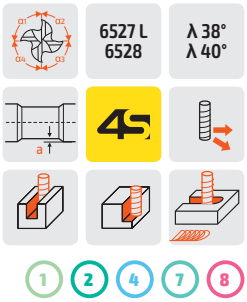
- Riaffilatura e rigenerazione — Resharpening and Reconditioning
- Esecuzione perfetta — Perfect Execution
- Rivestimento PVD — PVD Coating
- Trattamento 4S — 4S Treatment
- Consegna rapida — Fast Delivery

Evolution

113EV

Fresa 4 taglienti con eliche differenziate e divisione irregolare
4 flute end mill with variable helix and unequal flute spacing





1 2 4 7 8

45°

D h10	d h6	L	l ap	l1	a	45° +0,05/+0	Z	Balinit® Alcrona
3,0	6	57	8,0	-	-	0,05	4	HMG113030REV
4,0	4	50	11,0	16,0	0,10	0,05	4	HMG113040EV
4,0	6	57	11,0	-	-	0,05	4	HMG113040REV
5,0	5	50	13,0	18,0	0,10	0,05	4	HMG113050EV
5,0	6	57	13,0	-	-	0,05	4	HMG113050REV
6,0	6	57	13,0	20,0	0,15	0,05	4	HMG113060EV
7,0	7	60	16,0	22,0	0,15	0,05	4	HMG113070EV
8,0	8	63	19,0	25,0	0,15	0,05	4	HMG113080EV
9,0	9	67	19,0	28,0	0,15	0,05	4	HMG113090EV
10,0	10	72	22,0	30,0	0,15	0,05	4	HMG113100EV
12,0	12	83	26,0	36,0	0,20	0,05	4	HMG113120EV
14,0	14	83	26,0	36,0	0,20	0,05	4	HMG113140EV
16,0	16	92	32,0	42,0	0,20	0,05	4	HMG113160EV
20,0	20	104	38,0	52,0	0,20	0,05	4	HMG113200EV

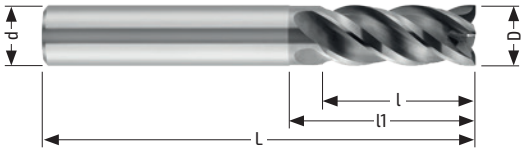
Cr

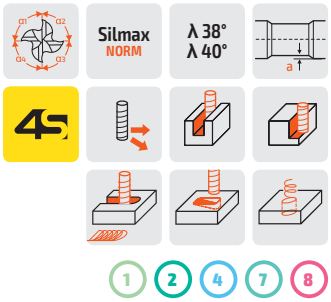
D h10	d h6	L	l ap	l1	a	Cr	Z	Balinit® Alcrona
3,0	6	57	8,0	-	-	0,30	4	HMG113030REV03
3,0	6	57	8,0	-	-	0,50	4	HMG113030REV05
4,0	4	50	11,0	16,0	0,10	0,30	4	HMG113040EV03
4,0	6	57	11,0	-	-	0,30	4	HMG113040REV03
4,0	6	57	11,0	-	-	0,50	4	HMG113040REV05
5,0	6	57	13,0	-	-	0,30	4	HMG113050REV03
5,0	6	57	13,0	-	-	0,50	4	HMG113050REV05
6,0	6	57	13,0	20,0	0,15	0,50	4	HMG113060EV05
6,0	6	57	13,0	20,0	0,15	1,00	4	HMG113060EV10
8,0	8	63	19,0	25,0	0,15	0,50	4	HMG113080EV05
10,0	10	72	22,0	30,0	0,15	0,50	4	HMG113100EV05
10,0	10	72	22,0	30,0	0,15	1,00	4	HMG113100EV10
12,0	12	83	26,0	36,0	0,20	1,00	4	HMG113120EV10

Notes

113EVR

Fresa 4 taglienti con eliche differenziate e divisione irregolare per lavorazioni in rampa / 4 flute finishing end mill with variable helix and unequal flute spacing for ramp milling





1 2 4 7 8

Cr

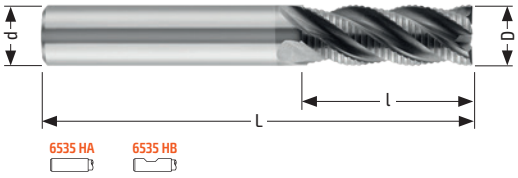
D h10	d h6	L	l ap	l1	a	Cr	Z	Balinit® Alcrona
4,0	6	57	11,0	16,0	0,15	0,10	4	HMG113040EVR
6,0	6	57	13,0	20,0	0,15	0,10	4	HMG113060EVR
8,0	8	63	19,0	25,0	0,15	0,15	4	HMG113080EVR
10,0	10	72	22,0	30,0	0,15	0,20	4	HMG113100EVR
12,0	12	83	26,0	36,0	0,20	0,20	4	HMG113120EVR
16,0	16	92	32,0	42,0	0,20	0,20	4	HMG113160EVR

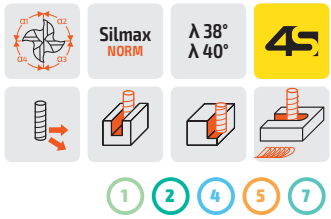
1 Acciaio Steel | 2 Ghise Cast Iron | 3 Acciai Temprati Hardened Steel | 4 Acciaio Inox Stainless Steel | 5 Titanio Titanium | 6 Leghe Leggere Light Alloys | 7 PH Duplex | 8 Superleghe Superalloys | 9 Compositi Composite Materials | → 16 Guida alla lettura Reading guide | → 18 Legenda Legend

Evolution

013EV

Fresa 4 taglienti a rompitruciolo con eliche differenziate e divisione irregolare
4 flute roughing end mill with chip breaker, variable helix and unequal flute spacing



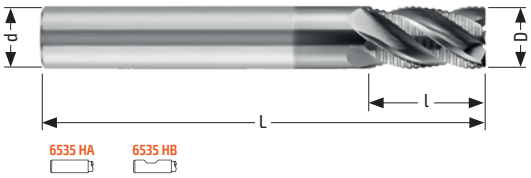


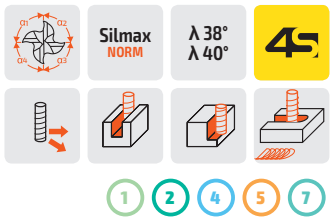
45°

D h10	d h6	L	l ap	45°	6535	Z	Balinit® Alcrona
3,0	6	57	6,0	0,15	HA	3	HMG013F03EV
4,0	6	57	8,0	0,15	HA	3	HMG013F04EV
5,0	6	57	10,0	0,15	HA	3	HMG013F05EV
6,0	6	57	15,0	0,15	HA	4	HMG013F06EV
8,0	8	63	20,0	0,20	HA	4	HMG013F08EV
10,0	10	72	25,0	0,30	HA	4	HMG013F10EV
12,0	12	83	30,0	0,40	HB	4	HMG013F12EV
14,0	14	92	35,0	0,45	HB	4	HMG013F14EV
16,0	16	104	40,0	0,50	HB	4	HMG013F16EV
20,0	20	104	40,0	0,60	HB	4	HMG013F20EV
16,0	16	104	48,0	0,50	HA	6	HMG013F16EVZ6
20,0	20	134	60,0	0,60	HA	6	HMG013F20EVZ6

013EVK

Fresa 4 taglienti a rompitruciolo con eliche differenziate e divisione irregolare per lavorazioni cava / 4 flute roughing end mill with chip breaker, variable helix and unequal flute spacing for slot milling





45°

D h10	d h6	L	l ap	45°	6535	Z	Balinit® Alcrona
6,0	6	57	9,00	0,15	HA	3	HMG013F06EVK
8,0	8	63	12,00	0,20	HA	4	HMG013F08EVK
10,0	10	72	15,00	0,30	HA	4	HMG013F10EVK
12,0	12	83	18,00	0,40	HB	4	HMG013F12EVK

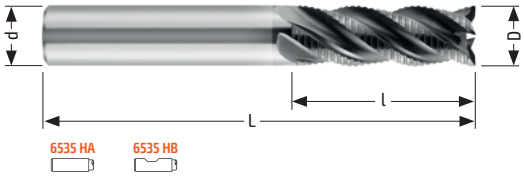
013EV Z6 Suggerite per operazioni di spallamento fino a 3xD, ridurre i parametri in proporzione all'asportazione.
Suitable for side milling operations up to 3xD. Cutting parameters should be inversely proportional to axial removal rates.

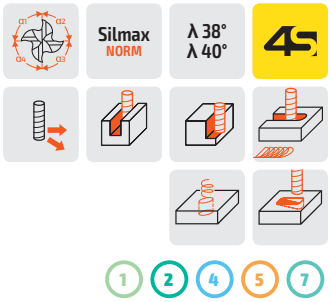
013EVK Maggiore rigidità, suggerite per lavorazioni in cava.
More stiffnes, recommended for slot milling.

Notes

013EVR

Fresa 4 taglienti a rompitruciolo con eliche differenziate e divisione irregolare per lavorazioni in rampa / 4 flute roughing end mill with chip breaker, variable helix and unequal flute spacing for ramp milling





1 2 4 5 7

Cr

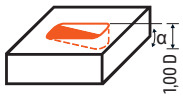
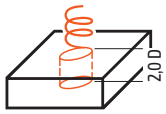
D h10	d h6	L	l ap	Cr	6535	Z	Balinit® Alcrona
6,0	6	57	15,0	0,10	HA	4	HMG013F06EVR
8,0	8	63	20,0	0,15	HA	4	HMG013F08EVR
10,0	10	72	25,0	0,20	HA	4	HMG013F10EVR
12,0	12	83	30,0	0,20	HB	4	HMG013F12EVR
16,0	16	104	40,0	0,20	HB	4	HMG013F16EVR

1 Acciaio Steel
2 Ghise Cast Iron
3 Acciai Temprati Hardened Steel
4 Acciaio Inox Stainless Steel
5 Titanio Titanium
6 Leghe Leggere Light Alloys
7 PH Duplex
8 Superleghe Superalloys
9 Compositi Composite Materials
→16 Guida alla lettura Reading guide
→18 Legenda Legend

Evolution

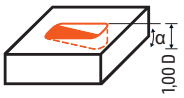
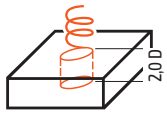
113EVR/113EV

Parametri di lavoro / Working Parameters

Materiale Material	Diametro Diameter	113EVR						113EVR/113EV					
					 Df = 1,60 D ÷ 1,90 D			 1,00 D			 0,50 D		
Acciaio < 800 N/mm² Steel < 800 N/mm²		Rampa lineare/Straight ramp α=24°			Rampa elicoidale/Helical ramp α=20°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=150			Vc=170			Vc=150			Vc=170		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,010	637	15924	0,012	866	18047
	4,0	0,015	716	11937	0,020	1082	13528	0,015	716	11937	0,020	1082	13528
	5,0	-	-	-	-	-	-	0,020	764	9549	0,030	1299	10823
	6,0	0,030	955	7958	0,044	1587	9019	0,030	955	7958	0,044	1587	9019
	7,0	-	-	-	-	-	-	0,035	955	6821	0,051	1577	7730
	8,0	0,040	955	5968	0,058	1569	6764	0,040	955	5968	0,058	1569	6764
	9,0	-	-	-	-	-	-	0,043	912	5305	0,064	1539	6013
	10,0	0,047	898	4775	0,071	1537	5411	0,047	898	4775	0,071	1537	5411
	12,0	0,052	828	3979	0,076	1371	4509	0,052	828	3979	0,076	1371	4509
	14,0	-	-	-	-	-	-	0,058	791	3410	0,081	1252	3865
	16,0	0,061	728	2984	0,085	1150	3382	0,061	728	2984	0,085	1150	3382
	20,0	-	-	-	-	-	-	0,065	621	2387	0,090	974	2706
Acciaio <1000 N/mm² - Ghisa Steel <1000 N/mm² - Cast iron		Rampa lineare/Straight ramp α=22°			Rampa elicoidale/Helical ramp α=20°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=115			Vc=140			Vc=115			Vc=140		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,010	488	12208	0,012	713	14862
	4,0	0,015	549	9151	0,020	891	11141	0,015	549	9151	0,020	891	11141
	5,0	-	-	-	-	-	-	0,019	556	7321	0,030	1070	8913
	6,0	0,026	634	6101	0,040	1188	7427	0,026	634	6101	0,040	1188	7427
	7,0	-	-	-	-	-	-	0,031	648	5229	0,045	1146	6366
	8,0	0,035	641	4576	0,050	1114	5570	0,035	641	4576	0,050	1114	5570
	9,0	-	-	-	-	-	-	0,039	634	4067	0,054	1070	4951
	10,0	0,042	615	3661	0,060	1070	4456	0,042	615	3661	0,060	1070	4456
	12,0	0,047	573	3050	0,067	995	3714	0,047	573	3050	0,067	995	3714
	14,0	-	-	-	-	-	-	0,050	523	2615	0,071	904	3183
	16,0	0,054	494	2288	0,078	869	2785	0,054	494	2288	0,078	869	2785
	20,0	-	-	-	-	-	-	0,058	425	1830	0,085	758	2228
Acciaio < 1300 N/mm² Steel < 1300 N/mm²		Rampa lineare/Straight ramp α=20°			Rampa elicoidale/Helical ramp α=18°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=95			Vc=100			Vc=95			Vc=100		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,010	403	10085	0,012	510	10616
	4,0	0,012	363	7560	0,020	637	7958	0,012	363	7560	0,020	637	7958
	5,0	-	-	-	-	-	-	0,017	411	6048	0,030	764	6366
	6,0	0,022	444	5040	0,040	849	5305	0,022	444	5040	0,040	849	5305
	7,0	-	-	-	-	-	-	0,027	467	4320	0,045	819	4547
	8,0	0,031	469	3780	0,050	796	3979	0,031	469	3780	0,050	796	3979
	9,0	-	-	-	-	-	-	0,035	470	3360	0,054	764	3537
	10,0	0,037	448	3024	0,060	764	3183	0,037	448	3024	0,060	764	3183
	12,0	0,041	413	2520	0,067	711	2653	0,041	413	2520	0,067	711	2653
	14,0	-	-	-	-	-	-	0,046	397	2160	0,071	646	2274
	16,0	0,050	378	1890	0,078	621	1989	0,050	378	1890	0,078	621	1989
	20,0	-	-	-	-	-	-	0,052	314	1512	0,085	541	1592
Acciaio da stampi Mold Steel		Rampa lineare/Straight ramp α=20°			Rampa elicoidale/Helical ramp α=14°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=45			Vc=65			Vc=45			Vc=65		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,010	191	4777	0,012	331	6900
	4,0	0,012	172	3581	0,020	414	5173	0,012	172	3581	0,020	414	5173
	5,0	-	-	-	-	-	-	0,017	195	2865	0,030	497	4138
	6,0	0,022	210	2387	0,040	552	3448	0,022	210	2387	0,040	552	3448
	7,0	-	-	-	-	-	-	0,027	221	2046	0,045	532	2956
	8,0	0,031	222	1790	0,050	517	2586	0,031	222	1790	0,050	517	2586
	9,0	-	-	-	-	-	-	0,035	223	1592	0,054	497	2299
	10,0	0,037	212	1432	0,060	497	2069	0,037	212	1432	0,060	497	2069
	12,0	0,041	196	1194	0,067	462	1724	0,041	196	1194	0,067	462	1724
	14,0	-	-	-	-	-	-	0,046	188	1023	0,071	420	1478
	16,0	0,050	179	895	0,078	403	1293	0,050	179	895	0,078	403	1293
	20,0	-	-	-	-	-	-	0,052	149	716	0,085	352	1035

113EVR/113EV

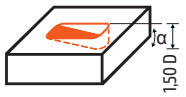
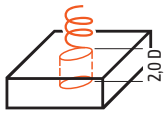
Parametri di lavoro / Working Parameters

Materiale / Material	Diametro / Diameter	113EVR						113EVR/113EV					
					 Df = 1,60 D ÷ 1,90 D			 1,00 D			 0,50 D		
Inox ferritico / Ferritic stainless steel		Rampa lineare/Straight ramp α=24°			Rampa elicoidale/Helical ramp α=20°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=60			Vc=70			Vc=60			Vc=70		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,010	255	6369	0,012	357	7431
	4,0	0,015	286	4775	0,020	446	5570	0,015	286	4775	0,020	446	5570
	5,0	-	-	-	-	-	-	0,019	290	3820	0,030	535	4456
	6,0	0,026	331	3183	0,040	594	3714	0,026	331	3183	0,040	594	3714
	7,0	-	-	-	-	-	-	0,031	338	2728	0,045	573	3183
	8,0	0,035	334	2387	0,050	557	2785	0,035	334	2387	0,050	557	2785
	9,0	-	-	-	-	-	-	0,039	331	2122	0,054	535	2476
	10,0	0,042	321	1910	0,060	535	2228	0,042	321	1910	0,060	535	2228
	12,0	0,047	299	1592	0,067	498	1857	0,047	299	1592	0,067	498	1857
	14,0	-	-	-	-	-	-	0,050	273	1364	0,071	452	1592
	16,0	0,054	258	1194	0,078	434	1393	0,054	258	1194	0,078	434	1393
	20,0	-	-	-	-	-	-	0,058	222	955	0,085	379	1114
Inox austenitico / Austenitic stainless Steel		Rampa lineare/Straight ramp α=18°			Rampa elicoidale/Helical ramp α=15°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=50			Vc=55			Vc=50			Vc=55		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,010	212	5308	0,012	280	5839
	4,0	0,012	191	3979	0,020	350	4377	0,012	191	3979	0,02	350	4377
	5,0	-	-	-	-	-	-	0,017	216	3183	0,03	420	3501
	6,0	0,022	233	2653	0,040	467	2918	0,022	233	2653	0,04	467	2918
	7,0	-	-	-	-	-	-	0,027	246	2274	0,045	450	2501
	8,0	0,031	247	1989	0,050	438	2188	0,031	247	1989	0,05	438	2188
	9,0	-	-	-	-	-	-	0,035	248	1768	0,054	420	1945
	10,0	0,037	236	1592	0,060	420	1751	0,037	236	1592	0,06	420	1751
	12,0	0,041	218	1326	0,067	391	1459	0,041	218	1326	0,067	391	1459
	14,0	-	-	-	-	-	-	0,046	209	1137	0,071	355	1251
	16,0	0,050	199	995	0,078	341	1094	0,050	199	995	0,078	341	1094
	20,0	-	-	-	-	-	-	0,052	166	796	0,085	298	875
Titanio / Titanium		Rampa lineare/Straight ramp α=18°			Rampa elicoidale/Helical ramp α=12°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=40			Vc=45			Vc=40			Vc=45		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,010	170	4246	0,012	229	4777
	4,0	0,015	191	3183	0,012	172	3581	0,015	191	3183	0,012	172	3581
	5,0	-	-	-	-	-	-	0,019	194	2546	0,014	160	2865
	6,0	0,026	221	2122	0,017	162	2387	0,026	221	2122	0,017	162	2387
	7,0	-	-	-	-	-	-	0,031	226	1819	0,020	164	2046
	8,0	0,035	223	1592	0,022	158	1790	0,035	223	1592	0,022	158	1790
	9,0	-	-	-	-	-	-	0,039	221	1415	0,024	153	1592
	10,0	0,042	214	1273	0,026	149	1432	0,042	214	1273	0,026	149	1432
	12,0	0,047	199	1061	0,031	148	1194	0,047	199	1061	0,031	148	1194
	14,0	-	-	-	-	-	-	0,050	182	909	0,035	143	1023
	16,0	0,054	172	796	0,040	143	895	0,054	172	796	0,040	143	895
	20,0	-	-	-	-	-	-	0,058	148	637	0,045	129	716
PH Duplex		Rampa lineare/Straight ramp α=18°			Rampa elicoidale/Helical ramp α=12°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=40			Vc=145			Vc=40			Vc=45		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,010	170	4246	0,012	229	4777
	4,0	0,012	153	3183	0,020	286	3581	0,012	153	3183	0,020	286	3581
	5,0	-	-	-	-	-	-	0,017	173	2546	0,030	344	2865
	6,0	0,022	187	2122	0,040	382	2387	0,022	187	2122	0,040	382	2387
	7,0	-	-	-	-	-	-	0,027	196	1819	0,045	368	2046
	8,0	0,031	197	1592	0,050	358	1790	0,031	197	1592	0,050	358	1790
	9,0	-	-	-	-	-	-	0,035	198	1415	0,054	344	1592
	10,0	0,037	188	1273	0,060	344	1432	0,037	188	1273	0,060	344	1432
	12,0	0,041	174	1061	0,067	320	1194	0,041	174	1061	0,067	320	1194
	14,0	-	-	-	-	-	-	0,046	167	909	0,071	291	1023
	16,0	0,050	159	796	0,078	279	895	0,050	159	796	0,078	279	895
	20,0	-	-	-	-	-	-	0,052	132	637	0,085	244	716

Evolution

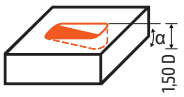
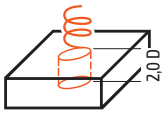
013EVR/013EV

Parametri di lavoro / Working Parameters

Materiale / Material	Diametro / Diameter	013EVR						013EVR/013EV					
					 Df = 1,60 D ÷ 1,90 D			 1,00 D			 0,50 D		
Acciaio < 800 N/mm² Steel < 800 N/mm²		Rampa lineare/Straight ramp α=24°			Rampa elicoidale/Helical ramp α=20°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=140			Vc=160			Vc=140			Vc=160		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,012	713	14854	0,014	951	16977
	4,0	-	-	-	-	-	-	0,018	802	11141	0,020	1019	12732
	5,0	-	-	-	-	-	-	0,024	856	8913	0,030	1222	10186
	6,0	0,032	951	7427	0,050	1698	8488	0,032	951	7427	0,050	1698	8488
	7,0	-	-	-	-	-	-	0,037	942	6366	0,057	1659	7276
	8,0	0,042	936	5570	0,064	1630	6366	0,042	936	5570	0,064	1630	6366
	9,0	-	-	-	-	-	-	0,045	891	4951	0,070	1585	5659
	10,0	0,049	873	4456	0,076	1548	5093	0,049	873	4456	0,076	1548	5093
	12,0	0,054	802	3714	0,082	1392	4244	0,054	802	3714	0,082	1392	4244
	14,0	-	-	-	-	-	-	0,060	764	3183	0,086	1251	3638
	16,0	0,063	702	2785	0,091	1159	3183	0,063	702	2785	0,091	1159	3183
	20,0	-	-	-	-	-	-	0,067	597	2228	0,096	978	2546
Acciaio <1000 N/mm² - Ghisa Steel <1000 N/mm² - Cast iron		Rampa lineare/Straight ramp α=22°			Rampa elicoidale/Helical ramp α=20°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=110			Vc=140			Vc=110			Vc=140		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,012	560	11671	0,014	832	14854
	4,0	-	-	-	-	-	-	0,018	630	8754	0,020	891	11141
	5,0	-	-	-	-	-	-	0,024	672	7003	0,030	1070	8913
	6,0	0,032	747	5836	0,050	1485	7427	0,032	747	5836	0,050	1485	7427
	7,0	-	-	-	-	-	-	0,037	740	5002	0,057	1451	6366
	8,0	0,042	735	4377	0,064	1426	5570	0,042	735	4377	0,064	1426	5570
	9,0	-	-	-	-	-	-	0,045	700	3890	0,070	1386	4951
	10,0	0,049	686	3501	0,076	1355	4456	0,049	686	3501	0,076	1355	4456
	12,0	0,054	630	2918	0,082	1218	3714	0,054	630	2918	0,082	1218	3714
	14,0	-	-	-	-	-	-	0,060	600	2501	0,086	1095	3183
	16,0	0,063	551	2188	0,091	1014	2785	0,063	551	2188	0,091	1014	2785
	20,0	-	-	-	-	-	-	0,067	469	1751	0,096	856	2228
Acciaio < 1300 N/mm² Steel < 1300 N/mm²		Rampa lineare/Straight ramp α=20°			Rampa elicoidale/Helical ramp α=18°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=95			Vc=100			Vc=95			Vc=100		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,012	484	10080	0,014	594	10610
	4,0	-	-	-	-	-	-	0,018	544	7560	0,020	637	7958
	5,0	-	-	-	-	-	-	0,024	581	6048	0,030	764	6366
	6,0	0,032	645	5040	0,050	1061	5305	0,032	645	5040	0,050	1061	5305
	7,0	-	-	-	-	-	-	0,037	639	4320	0,057	1037	4547
	8,0	0,042	635	3780	0,064	1019	3979	0,042	635	3780	0,064	1019	3979
	9,0	-	-	-	-	-	-	0,045	605	3360	0,070	990	3537
	10,0	0,049	593	3024	0,076	968	3183	0,049	593	3024	0,076	968	3183
	12,0	0,054	544	2520	0,082	870	2653	0,054	544	2520	0,082	870	2653
	14,0	-	-	-	-	-	-	0,060	518	2160	0,086	782	2274
	16,0	0,063	476	1890	0,091	724	1989	0,063	476	1890	0,091	724	1989
	20,0	-	-	-	-	-	-	0,067	405	1512	0,096	611	1592
Acciaio da stampi Mold Steel		Rampa lineare/Straight ramp α=20°			Rampa elicoidale/Helical ramp α=14°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=45			Vc=65			Vc=45			Vc=65		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,012	229	4775	0,014	386	6897
	4,0	-	-	-	-	-	-	0,018	258	3581	0,020	414	5173
	5,0	-	-	-	-	-	-	0,024	275	2865	0,030	497	4138
	6,0	0,032	306	2387	0,040	552	3448	0,032	306	2387	0,040	552	3448
	7,0	-	-	-	-	-	-	0,037	303	2046	0,045	532	2956
	8,0	0,042	301	1790	0,050	517	2586	0,042	301	1790	0,050	517	2586
	9,0	-	-	-	-	-	-	0,045	286	1592	0,054	497	2299
	10,0	0,049	281	1432	0,060	497	2069	0,049	281	1432	0,060	497	2069
	12,0	0,054	258	1194	0,067	462	1724	0,054	258	1194	0,067	462	1724
	14,0	-	-	-	-	-	-	0,060	246	1023	0,071	420	1478
	16,0	0,063	226	895	0,078	403	1293	0,063	226	895	0,078	403	1293
	20,0	-	-	-	-	-	-	0,067	192	716	0,085	352	1035

013EVR/013EV

Parametri di lavoro / Working Parameters

Materiale / Material	Diametro / Diameter	013EVR						013EVR/013EV					
					 Df = 1,60 D ÷ 1,90 D			 1,00 D			 0,50 D		
Inox ferritico / Ferritic stainless steel		Rampa lineare/Straight ramp α=24°			Rampa elicoidale/Helical ramp α=20°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=60			Vc=70			Vc=60			Vc=70		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,009	229	6366	0,010	297	7427
	4,0	-	-	-	-	-	-	0,012	229	4775	0,016	357	5570
	5,0	-	-	-	-	-	-	0,017	260	3820	0,021	374	4456
	6,0	0,022	280	3183	0,026	386	3714	0,022	280	3183	0,026	386	3714
	7,0	-	-	-	-	-	-	0,033	360	2728	0,037	471	3183
	8,0	0,038	363	2387	0,042	468	2785	0,038	363	2387	0,042	468	2785
	9,0	-	-	-	-	-	-	0,041	348	2122	0,045	446	2476
	10,0	0,041	313	1910	0,045	401	2228	0,041	313	1910	0,045	401	2228
	12,0	0,045	286	1592	0,049	364	1857	0,045	286	1592	0,049	364	1857
	14,0	-	-	-	-	-	-	0,048	262	1364	0,052	331	1592
	16,0	0,052	248	1194	0,056	312	1393	0,052	248	1194	0,056	312	1393
	20,0	-	-	-	-	-	-	0,062	237	955	0,066	294	1114
Inox austenitico / Austenitic stainless Steel		Rampa lineare/Straight ramp α=18°			Rampa elicoidale/Helical ramp α=15°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=50			Vc=55			Vc=50			Vc=55		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,009	191	5305	0,010	233	5836
	4,0	-	-	-	-	-	-	0,012	191	3979	0,016	280	4377
	5,0	-	-	-	-	-	-	0,017	216	3183	0,021	294	3501
	6,0	0,022	233	2653	0,026	303	2918	0,022	233	2653	0,026	303	2918
	7,0	-	-	-	-	-	-	0,033	300	2274	0,037	370	2501
	8,0	0,038	302	1989	0,042	368	2188	0,038	302	1989	0,042	368	2188
	9,0	-	-	-	-	-	-	0,041	290	1768	0,045	350	1945
	10,0	0,041	261	1592	0,045	315	1751	0,041	261	1592	0,045	315	1751
	12,0	0,045	239	1326	0,049	286	1459	0,045	239	1326	0,049	286	1459
	14,0	-	-	-	-	-	-	0,048	218	1137	0,052	260	1251
	16,0	0,052	207	995	0,056	245	1094	0,052	207	995	0,056	245	1094
	20,0	-	-	-	-	-	-	0,062	197	796	0,066	231	875
Titanio / Titanium		Rampa lineare/Straight ramp α=18°			Rampa elicoidale/Helical ramp α=12°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=40			Vc=45			Vc=40			Vc=45		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,012	204	4244	0,014	267	4775
	4,0	-	-	-	-	-	-	0,018	229	3183	0,020	286	3581
	5,0	-	-	-	-	-	-	0,024	244	2546	0,030	344	2865
	6,0	0,032	272	2122	0,040	382	2387	0,032	272	2122	0,040	382	2387
	7,0	-	-	-	-	-	-	0,037	269	1819	0,045	368	2046
	8,0	0,042	267	1592	0,050	358	1790	0,042	267	1592	0,050	358	1790
	9,0	-	-	-	-	-	-	0,045	255	1415	0,054	344	1592
	10,0	0,049	250	1273	0,060	344	1432	0,049	250	1273	0,060	344	1432
	12,0	0,054	229	1061	0,067	320	1194	0,054	229	1061	0,067	320	1194
	14,0	-	-	-	-	-	-	0,060	218	909	0,071	291	1023
	16,0	0,063	201	796	0,078	279	895	0,063	201	796	0,078	279	895
	20,0	-	-	-	-	-	-	0,067	171	637	0,085	244	716
PH Duplex		Rampa lineare/Straight ramp α=18°			Rampa elicoidale/Helical ramp α=12°			Cava/Slot			Contornitura/Side milling		
	m/min	Vc=40			Vc=45			Vc=40			Vc=45		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	-	-	-	-	-	-	0,009	153	4244	0,010	191	4775
	4,0	-	-	-	-	-	-	0,012	153	3183	0,016	229	3581
	5,0	-	-	-	-	-	-	0,017	173	2546	0,021	241	2865
	6,0	0,022	187	2122	0,026	248	2387	0,022	187	2122	0,026	248	2387
	7,0	-	-	-	-	-	-	0,033	240	1819	0,037	303	2046
	8,0	0,038	242	1592	0,042	301	1790	0,038	242	1592	0,042	301	1790
	9,0	-	-	-	-	-	-	0,041	232	1415	0,045	286	1592
	10,0	0,041	209	1273	0,045	258	1432	0,041	209	1273	0,045	258	1432
	12,0	0,045	191	1061	0,049	234	1194	0,045	191	1061	0,049	234	1194
	14,0	-	-	-	-	-	-	0,048	175	909	0,052	213	1023
	16,0	0,052	166	796	0,056	201	895	0,052	166	796	0,056	201	895
	20,0	-	-	-	-	-	-	0,062	158	637	0,066	189	716

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Parametri di lavoro / Working Parameters

Materiale / Material	Diametro / Diameter	1,00 D			0,05 D		
	m/min	Vc=130			Vc=250		
Acciaio <800 N/mm² / Steel <800 N/mm²	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	0,004	221	13800	0,030	3185	26539
	4,0	0,010	414	10350	0,060	4777	19904
	6,0	0,015	414	6900	0,090	4777	13270
	8,0	0,020	414	5175	0,150	5971	9952
	10,0	0,030	497	4140	0,200	6369	7962
	12,0	0,035	483	3450	0,250	6635	6635
	16,0	0,040	414	2588	0,250	4976	4976
	m/min	Vc=100			Vc=190		
Acciaio <1000 N/mm² - Ghisa / Steel <1000 N/mm² - Cast iron	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	0,004	170	10616	0,030	2420	20170
	4,0	0,010	318	7962	0,060	3631	15127
	6,0	0,015	318	5308	0,090	3631	10085
	8,0	0,020	318	3981	0,150	4538	7564
	10,0	0,030	382	3185	0,200	4841	6051
	12,0	0,035	372	2654	0,250	5042	5042
	16,0	0,040	318	1990	0,250	3782	3782
	m/min	Vc=80			Vc=160		
Acciaio <1300 N/mm² / Steel <1300 N/mm²	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	0,004	136	8493	0,030	2038	16985
	4,0	0,010	255	6369	0,060	3057	12739
	6,0	0,015	255	4246	0,090	3057	8493
	8,0	0,020	255	3185	0,150	3822	6369
	10,0	0,030	306	2548	0,200	4076	5096
	12,0	0,035	297	2123	0,250	4246	4246
	16,0	0,040	255	1592	0,250	3185	3185
	m/min	Vc=60			Vc=110		
Acciai inossidabili / Stainless Steels	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	0,004	102	6369	0,030	1401	11677
	4,0	0,010	191	4777	0,060	2102	8758
	6,0	0,015	191	3185	0,090	2102	5839
	8,0	0,020	191	2389	0,150	2627	4379
	10,0	0,030	229	1911	0,200	2803	3503
	12,0	0,035	223	1592	0,250	2919	2919
	16,0	0,040	191	1194	0,250	2189	2189
	m/min	Vc=60			Vc=90		
Titanio / Titanium	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	3,0	0,004	102	6369	0,030	1146	9554
	4,0	0,010	191	4777	0,060	1720	7166
	6,0	0,015	191	3185	0,090	1720	4777
	8,0	0,020	191	2389	0,150	2150	3583
	10,0	0,030	229	1911	0,200	2293	2866
	12,0	0,035	223	1592	0,250	2389	2389
	16,0	0,040	191	1194	0,250	1791	1791

Notes

NEW

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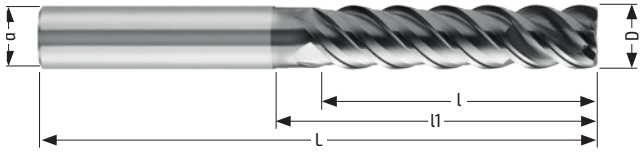
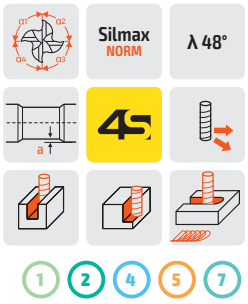
Fresa 4 taglienti con divisione irregolare e tagliente extra lungo
4 flute end mill with unequal flute spacing extra long version





1 2 4 5 7

45°

D e8	d h6	L	l ap	l1	a	45°	Z	Balinit® Alcrona
3,0	6	57	12,0	15,0	0,10	0,05	4	HMG158030
4,0	6	63	16,0	20,0	0,10	0,05	4	HMG158040
5,0	6	70	20,0	25,0	0,10	0,05	4	HMG158050
6,0	6	70	24,0	30,0	0,15	0,05	4	HMG158060
8,0	8	80	32,0	40,0	0,15	0,10	4	HMG158080
10,0	10	87	40,0	46,0	0,15	0,15	4	HMG158100
12,0	12	108	48,0	58,0	0,20	0,15	4	HMG158120
16,0	16	120	64,0	68,0	0,20	0,20	4	HMG158160

1 Acciaio Steel | 2 Ghise Cast Iron | 3 Acciai Temprati Hardened Steel | 4 Acciaio Inox Stainless Steel | 5 Titanio Titanium | 6 Leghe Leggere Light Alloys | 7 PH Duplex | 8 Superleghe Superalloys | 9 Compositi Composite Materials | → 16 Guida alla lettura Reading guide | → 18 Legenda Legend

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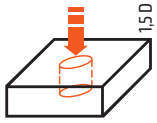
Parametri di lavoro / Working Parameters



Materiale / Material	Diametro / Diameter									
	m/min	Vc=110			Vc=130			Vc=80		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
Acciaio <800 N/mm² Steel <800 N/mm²	2,0	0,010	525	17516	0,010	621	20701	0,007	268	12739
	3,0	0,020	701	11677	0,020	828	13800	0,011	268	8493
	4,0	0,030	788	8758	0,030	932	10350	0,014	268	6369
	5,0	0,040	841	7006	0,040	994	8280	0,018	275	5096
	6,0	0,060	1051	5839	0,060	1242	6900	0,024	306	4246
	8,0	0,080	1051	4379	0,080	1242	5175	0,044	420	3185
	10,0	0,096	1009	3503	0,096	1192	4140	0,060	459	2548
	12,0	0,109	955	2919	0,109	1128	3450	0,073	465	2123
	16,0	0,129	847	2189	0,129	1001	2588	0,093	444	1592
	20,0	0,144	757	1752	0,144	894	2070	0,108	413	1274
	m/min	Vc=90			Vc=105			Vc=65		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
Acciaio <1000 N/mm² - Ghisa Steel <1000 N/mm² - Cast iron	2,0	0,008	344	14331	0,008	401	16720	0,007	217	10350
	3,0	0,015	430	9554	0,015	502	11146	0,011	217	6900
	4,0	0,025	537	7166	0,025	627	8360	0,014	217	5175
	5,0	0,035	602	5732	0,035	702	6688	0,018	224	4140
	6,0	0,055	788	4777	0,055	920	5573	0,022	228	3450
	8,0	0,075	806	3583	0,075	940	4180	0,042	326	2588
	10,0	0,091	782	2866	0,091	913	3344	0,058	360	2070
	12,0	0,104	745	2389	0,104	869	2787	0,071	367	1725
	16,0	0,124	666	1791	0,124	777	2090	0,091	353	1294
	20,0	0,139	598	1433	0,139	697	1672	0,106	329	1035
	m/min	Vc=70			Vc=80			Vc=50		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
Acciaio <1300 N/mm² Steel <1300 N/mm²	2,0	0,008	268	11146	0,008	306	12739	0,006	143	7962
	3,0	0,015	334	7431	0,015	382	8493	0,010	159	5308
	4,0	0,025	418	5573	0,025	478	6369	0,013	155	3981
	5,0	0,035	468	4459	0,035	535	5096	0,016	153	3185
	6,0	0,050	557	3715	0,050	637	4246	0,020	159	2654
	8,0	0,070	585	2787	0,070	669	3185	0,040	239	1990
	10,0	0,086	575	2229	0,086	657	2548	0,056	268	1592
	12,0	0,099	552	1858	0,099	631	2123	0,069	275	1327
	16,0	0,119	497	1393	0,119	568	1592	0,089	266	995
	20,0	0,134	448	1115	0,134	512	1274	0,104	248	796
	m/min	Vc=35			Vc=40			Vc=40		
	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
Acciaio da stampi Mold Steel	2,0	0,008	134	5573	0,008	153	6369	0,006	115	6369
	3,0	0,015	167	3715	0,015	191	4246	0,010	127	4246
	4,0	0,025	209	2787	0,025	239	3185	0,013	124	3185
	5,0	0,035	234	2229	0,035	268	2548	0,016	122	2548
	6,0	0,050	279	1858	0,050	318	2123	0,020	127	2123
	8,0	0,070	293	1393	0,070	334	1592	0,040	191	1592
	10,0	0,086	288	1115	0,086	329	1274	0,056	214	1274
	12,0	0,099	276	929	0,099	315	1062	0,069	220	1062
	16,0	0,119	249	697	0,119	284	796	0,089	213	796
	20,0	0,134	224	557	0,134	256	637	0,104	199	637

Notes

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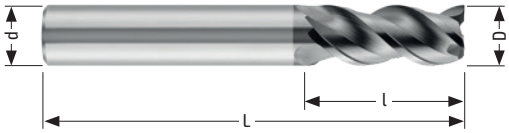
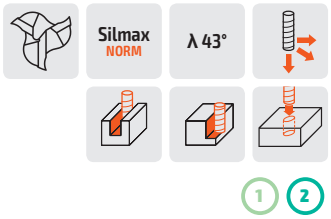
Fresa 3 taglienti per elevate asportazioni
3 flute roughing end mill for high chip removal





45°

D e8	d h6	L	l ap	45°	Z	Balinit® Alcrona
2,0	6	57	5,0	0,06	3	HMG151020
2,5	6	57	7,0	0,06	3	HMG151025
3,0	6	57	8,0	0,06	3	HMG151030
3,5	6	57	8,0	0,06	3	HMG151035
4,0	6	57	11,0	0,06	3	HMG151040
4,5	6	57	13,0	0,06	3	HMG151045
5,0	6	57	13,0	0,06	3	HMG151050
6,0	6	57	13,0	0,06	3	HMG151060
7,0	8	63	19,0	0,10	3	HMG151070
8,0	8	63	19,0	0,10	3	HMG151080
9,0	10	72	22,0	0,10	3	HMG151090
10,0	10	72	22,0	0,10	3	HMG151100
11,0	12	81	26,0	0,10	3	HMG151110
12,0	12	81	26,0	0,10	3	HMG151120
14,0	14	81	26,0	0,10	3	HMG151140
16,0	16	86	32,0	0,10	3	HMG151160
20,0	20	108	38,0	0,10	3	HMG151200

1 Acciaio Steel | 2 Ghise Cast Iron | 3 Acciai Temprati Hardened Steel | 4 Acciaio Inox Stainless Steel | 5 Titanio Titanium | 6 Leghe Leggere Light Alloys | 7 PH Duplex | 8 Superleghe Superalloys | 9 Compositi Composite Materials | → 16 Guida alla lettura Reading guide | → 18 Legenda Legend

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Parametri di lavoro / Working Parameters

Materiale / Material	Diametro / Diameter	 1,00 D			 0,25 D			 0,10 D		
	m/min	Vc=144			Vc=158			Vc=173		
Acciaio <800 N/mm² Steel <800 N/mm²	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	4,0	0,015	688	11465	0,030	1510	12580	0,040	2204	13774
	6,0	0,025	770	7643	0,048	1614	8408	0,078	2862	9172
	8,0	0,041	941	5732	0,064	1610	6306	0,094	2582	6879
	10,0	0,053	978	4586	0,076	1535	5045	0,106	2335	5503
	12,0	0,063	968	3822	0,086	1448	4204	0,116	2130	4586
	16,0	0,079	907	2866	0,102	1286	3153	0,132	1815	3439
	20,0	0,091	838	2293	0,114	1152	2522	0,144	1587	2752
	m/min	Vc=117			Vc=129			Vc140		
Acciaio <1000 N/mm² - Ghisa Steel <1000 N/mm² - Cast iron	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	4,0	0,012	447	9315	0,027	1109	10271	0,035	1561	11146
	6,0	0,023	574	6210	0,044	1202	6831	0,072	2131	7452
	8,0	0,039	725	4658	0,060	1226	5123	0,087	1952	5589
	10,0	0,051	763	3726	0,072	1182	4099	0,100	1781	4471
	12,0	0,061	760	3105	0,082	1122	3416	0,110	1634	3726
	16,0	0,077	718	2329	0,098	1004	2562	0,125	1402	2795
	20,0	0,089	666	1863	0,110	904	2049	0,138	1232	2236
	m/min	Vc=90			Vc=99			Vc=108		
Acciaio <1300 N/mm² Steel <1300 N/mm²	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	4,0	0,010	287	7166	0,025	788	7882	0,030	1032	8599
	6,0	0,021	401	4777	0,040	841	5255	0,065	1490	5732
	8,0	0,037	528	3583	0,056	880	3941	0,081	1390	4299
	10,0	0,049	563	2866	0,068	859	3153	0,093	1281	3439
	12,0	0,059	565	2389	0,078	821	2627	0,103	1182	2866
	16,0	0,075	537	1791	0,094	740	1971	0,119	1023	2150
	20,0	0,087	500	1433	0,106	670	1576	0,131	903	1720
	m/min	Vc=45			Vc=50			Vc=54		
Acciaio da stampi Mold Steel	D mm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm	fz mm/z	F mm/min	n rpm
	4,0	0,025	358	3583	0,025	398	3981	0,025	430	4299
	6,0	0,045	430	2389	0,045	473	2627	0,045	516	2866
	8,0	0,061	436	1791	0,061	479	1971	0,061	523	2150
	10,0	0,073	419	1433	0,073	461	1576	0,073	503	1720
	12,0	0,083	397	1194	0,083	437	1314	0,083	477	1433
	16,0	0,099	355	896	0,099	390	985	0,099	425	1075
	20,0	0,111	319	717	0,111	351	788	0,111	383	860

Notes

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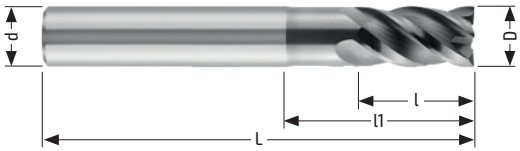
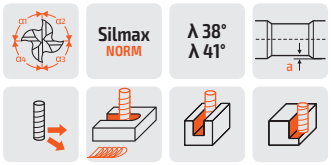
Fresa 4 taglienti con eliche differenziate e divisione irregolare
4 flute end mill with unequal flute spacing and variable helix





1 2

45°

D e8	d h6	L	l ap	l1	a	45° +0,05/+0	Z	Balinit® Alcrona
4,0	6	57	6,0	-	-	0,05	4	HMG152040
5,0	6	57	7,5	-	-	0,05	4	HMG152050
6,0	6	57	9,0	18,0	0,15	0,05	4	HMG152060
8,0	8	63	12,0	24,0	0,15	0,05	4	HMG152080
10,0	10	72	15,0	30,0	0,15	0,05	4	HMG152100
12,0	12	83	18,0	36,0	0,20	0,05	4	HMG152120
16,0	16	92	24,0	42,0	0,20	0,05	4	HMG152160
20,0	20	104	30,0	52,0	0,20	0,05	4	HMG152200

Cr

D e8	d h6	L	l ap	l1	a	Cr	Z	Balinit® Alcrona
6,0	6,00	57	9,0	18,0	0,15	0,50	4	HMG152060CR05
8,0	8,00	63	12,0	24,0	0,15	0,50	4	HMG152080CR05
10,0	10,00	72	15,0	30,0	0,15	1,00	4	HMG152100CR10
12,0	12,00	83	18,0	36,0	0,20	1,00	4	HMG152120CR10
16,0	16,00	92	24,0	42,0	0,20	1,00	4	HMG152160CR10
20,0	20,00	104	30,0	52,0	0,20	1,00	4	HMG152200CR10

1 Acciaio Steel | 2 Ghise Cast Iron | 3 Acciai Temprati Hardened Steel | 4 Acciaio Inox Stainless Steel | 5 Titanio Titanium | 6 Leghe Leggere Light Alloys | 7 PH Duplex | 8 Superleghe Superalloys | 9 Compositi Composite Materials | → 16 Guida alla lettura Reading guide | → 18 Legenda Legend

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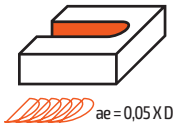
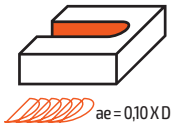
Parametri di lavoro / Working Parameters

Materiale Material	Diametro Diameter	 ae = 0,05 X D		 ae = 0,10 X D	
	m/min	Vc=210-280		Vc=210-280	
Acciaio <1300 N/mm² Steel <1300 N/mm²	**D** mm	**hm** mm	**fz** mm	**hm** mm	**fz** mm
	4,0	0,03	0,09	0,03	0,08
	6,0	0,04	0,13	0,04	0,10
	8,0	0,06	0,19	0,06	0,15
	10,0	0,07	0,22	0,07	0,18
	12,0	0,08	0,25	0,08	0,21
	16,0	0,09	0,28	0,09	0,23

196

	m/min	Vc=210-280		Vc=210-280	
Acciaio <1300 N/mm² Steel <1300 N/mm²	**D** mm	**hm** mm	**fz** mm	**hm** mm	**fz** mm
	4,0	0,03	0,08	0,03	0,06
	6,0	0,03	0,09	0,03	0,08
	8,0	0,05	0,16	0,05	0,13
	10,0	0,06	0,19	0,06	0,15
	12,0	0,07	0,22	0,07	0,18
	16,0	0,08	0,25	0,08	0,21

193

Materiale Material	Diametro Diameter	 0,05 D		 0,10 D	
	m/min	Vc=80-100		Vc=80-100	
Acciaio <1300 N/mm² Steel <1300 N/mm²	**D** mm	**hm** mm	**fz** mm	**hm** mm	**fz** mm
	4,0	0,03	0,09	0,03	0,08
	6,0	0,04	0,13	0,04	0,10
	8,0	0,06	0,19	0,06	0,15
	10,0	0,07	0,22	0,07	0,18
	12,0	0,08	0,25	0,08	0,21
	16,0	0,09	0,28	0,09	0,23

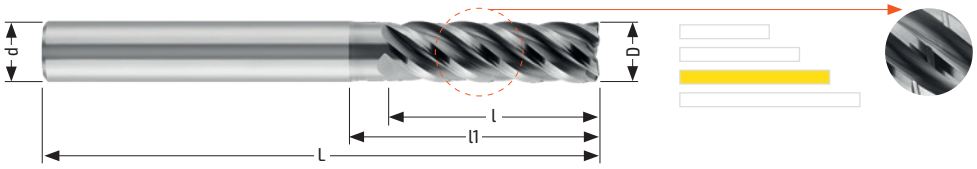
196

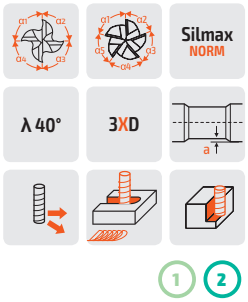
	m/min	Vc=80-100		Vc=80-100	
Acciaio <1300 N/mm² Steel <1300 N/mm²	**D** mm	**hm** mm	**fz** mm	**hm** mm	**fz** mm
	4,0	0,03	0,08	0,03	0,06
	6,0	0,03	0,09	0,03	0,08
	8,0	0,05	0,16	0,05	0,13
	10,0	0,06	0,19	0,06	0,15
	12,0	0,07	0,22	0,07	0,18
	16,0	0,08	0,25	0,08	0,21

Notes

193

Fresa 5 taglienti con divisione irregolare e tagliente lungo
5 flute end mill with variable helix long version





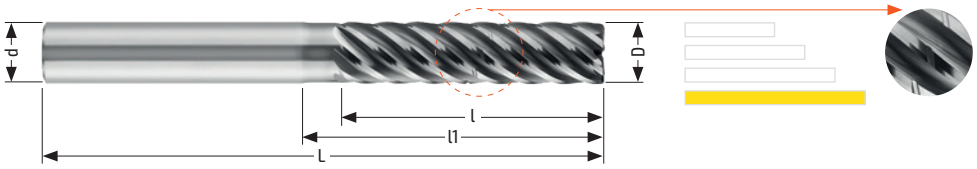
Cr

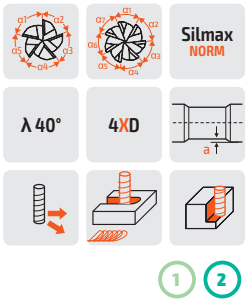
D h10	d h6	L	l ap	l1	a	Cr	Z	Balinit® Alcrona
4,0	6	57	12,0	16,0	0,25	0,20	4	HMG193040
6,0	6	63	18,0	24,0	0,25	0,30	5	HMG193060
8,0	8	70	24,0	31,0	0,25	0,50	5	HMG193080
10,0	10	78	30,0	37,0	0,25	0,50	5	HMG193100
12,0	12	92	36,0	46,0	0,25	0,50	5	HMG193120
16,0	16	110	48,0	60,0	0,25	0,50	5	HMG193160
20,0	20	134	60,0	80,0	0,25	0,50	5	HMG193200*

(*) Diametro 20 mm a richiesta / Diameter 20 mm on request

196

Fresa 5/7 taglienti con divisione irregolare e tagliente extra lungo
5/7 flute end mill with variable helix, extra long version





Cr

D h10	d h6	L	l ap	l1	a	Cr	Z	Balinit® Alcrona
4,0	6	57	16,0	20,0	0,25	0,20	4	HMG196040
6,0	6	70	24,0	30,0	0,25	0,30	5	HMG196060
8,0	8	80	32,0	40,0	0,25	0,50	5	HMG196080
8,0	8	80	32,0	40,0	0,25	0,50	7	HMG196080Z7
10,0	10	87	40,0	46,0	0,25	0,50	5	HMG196100
10,0	10	87	40,0	46,0	0,25	0,50	7	HMG196100Z7
12,0	12	108	48,0	58,0	0,25	0,50	7	HMG196120Z7
16,0	16	120	64,0	68,0	0,25	0,50	7	HMG196160Z7
20,0	20	134	80,0	-	-	0,50	7	HMG196200Z7*

Diametro 20 mm a richiesta / Diameter 20 mm on request

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Parametri di lavoro / Working Parameters

Materiale / Material	Diametro / Diameter			
Acciaio <800 N/mm² Steel <800 N/mm²	m/min	Vc=301		
	D mm	fz mm/z	F mm/min	n rpm
	6,0	0,036	3449	15966
	8,0	0,046	4413	11975
	10,0	0,054	4129	9580
	12,0	0,060	4811	7983
	16,0	0,070	4211	5987
	20,0	0,078	3743	4790
Acciaio <1000 N/mm² - Ghisa Steel <1000 N/mm² - Cast iron	m/min	Vc=224		
	D mm	fz mm/z	F mm/min	n rpm
	6,0	0,033	2569	12972
	8,0	0,043	3352	9729
	10,0	0,051	3168	7783
	12,0	0,057	3714	6486
	16,0	0,067	3275	4865
	20,0	0,075	2924	3892
Acciaio <1300 N/mm² Steel <1300 N/mm²	m/min	Vc=188		
	D mm	fz mm/z	F mm/min	n rpm
	6,0	0,030	1796	9979
	8,0	0,040	2399	7484
	10,0	0,048	2293	5987
	12,0	0,054	2707	4989
	16,0	0,064	2407	3742
	20,0	0,072	2160	2994
Acciaio da stampi Mold Steel	m/min	Vc=94		
	D mm	fz mm/z	F mm/min	n rpm
	6,0	0,030	898	4989
	8,0	0,040	1200	3742
	10,0	0,048	1147	2994
	12,0	0,054	1354	2495
	16,0	0,064	1204	1871
	20,0	0,072	1080	1497

Fresa multitagliente per operazioni di super finitura su acciai fino a 52HRC.
Multi-flute cutters for super-finishing of steel up to 52HRC.

Notes

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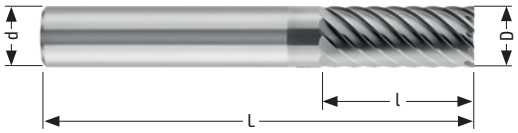
Fresa multitagliente per superfinitura
Multi-flute end mill for super-finishing



Silmax NORM

λ 45°

1 2

90°

D e8	d h6	L	l ap	Z	Balinit® Alcrona
6,0	6	57	13,0	6	HMG155060
8,0	8	63	19,0	8	HMG155080
10,0	10	72	22,0	8	HMG155100
12,0	12	81	26,0	10	HMG155120
16,0	16	86	32,0	10	HMG155160
20,0	20	108	38,0	10	HMG155200

1 Acciaio Steel | 2 Ghise Cast Iron | 3 Acciai Temprati Hardened Steel | 4 Acciaio Inox Stainless Steel | 5 Titanio Titanium | 6 Leghe Leggere Light Alloys | 7 PH Duplex | 8 Superleghe Superalloys | 9 Compositi Composite Materials | → 16 Guida alla lettura Reading guide | → 18 Legenda Legend

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