

passion
for precision



Utensili frese ad alto rendimento





fraisa

Empfang

Welcome

Prodotti



- **Il più grande assortimento in Europa di frese in metallo duro integrale**
(4.200 articoli di serie, sistemi di misurazione anglosassoni e modulari esclusi)
- **Leader nel campo delle innovazioni: 30 nuove tecnologie di prodotto**
dal 2011, 5% del fatturato investito nella ricerca e sviluppo
- **Trend setter con HSC, HPC e HDC**
(HSC: High Speed Cutting; HPC: High Performance Cutting; HDC: High Dynamic Cutting)
- **La perfezione è la nostra passione**



PRODOTTI

ToolService

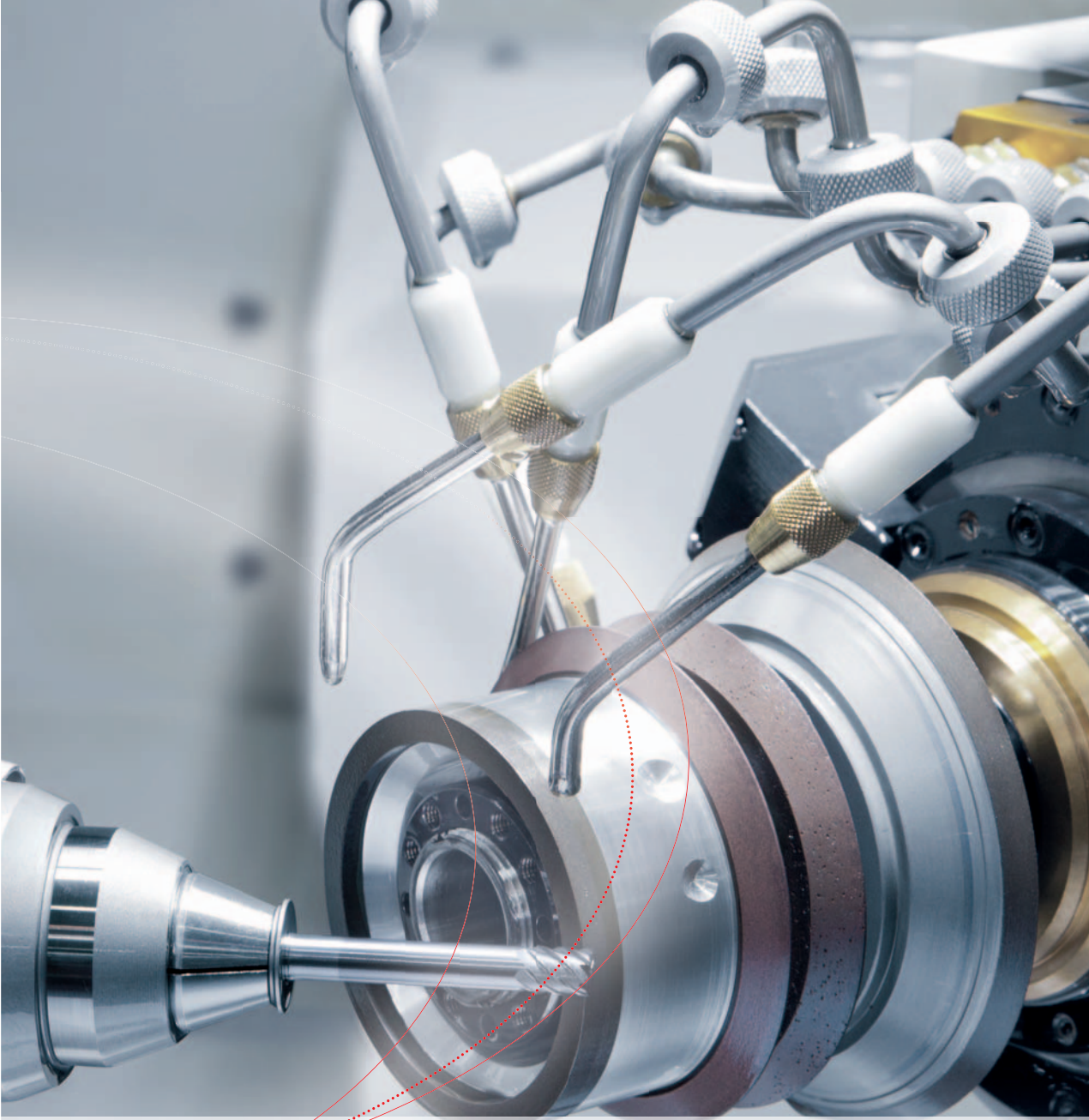


- **Il più grande centro di assistenza tecnica d'Europa per frese in metallo duro integrale**
a Willich, Germania
- **ReTool: gestione utensili ecologicamente ed economicamente perfetta per prodotti FRAISA e di terzi**
- **Esperienza maturata in 20 anni di ReTool e nella preparazione di oltre 5 milioni di frese**
- **Risparmio ecologicamente molto importante di 50.000 kg di tungsteno e 5.000 kg di cobalto all'anno**
grazie alla preparazione di utensili e al recupero di materiali

BLUECOMPETENCE

Alliance Member

www.bluecompetence.net



TOOLSERVICE

Logistica



- Trend setter per sistemi di gestione utensili ToolCare: 15 anni di esperienza, 1.000 sistemi installati, nuova versione 2.1
- ToolCareSecure: garanzia di disponibilità alla consegna al 100%!
- ToolCareConcept: ordinazione di utensili speciali come prodotti di serie
- E-Shop: semplicissima esecuzione delle pratiche di ordinazione ad ogni ora del giorno e della notte
- Consegna il giorno dopo in tutta Europa



LOGISTICA

Tecnologia applicativa



- **40 anni di esperienza nella gestione di dati tecnologici per sistemi di fresatura**
- **ToolSchool: 12 anni di valore aggiunto grazie ad intenso trasferimento di know-how e addestramento specifico per oltre 18.000 clienti**
- **Informazioni applicative precise e affidabili**
su ogni singolo utensile FRAISA
- **ToolExpert: dati applicativi online per tutte le strategie di fresatura e tutti gli utensili FRAISA**
- **Visualizzazione unica nel suo genere di dati applicativi direttamente in catalogo**



APPLICAZIONE

Contatto personale con i clienti

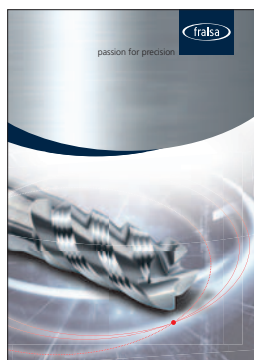


- **Massima competenza grazie all'organizzazione e svolgimento di regolari e intensi corsi di specializzazione e aggiornamento per i propri consulenti**
- **Contatto con il cliente esclusivamente tramite consulenti FRAISA e qualificati partner di distribuzione FRAISA**
- **I consulenti FRAISA sono degli specialisti esperti nelle tecnologie di fresatura**
- **Società di distribuzione su scala nazionale in Germania, Francia, Italia, Ungheria, Stati Uniti, Cina e Svizzera**
- **Comunicazione rapida e snella tra consulenti e direzione dell'azienda**
grazie ad una struttura da media impresa e organizzazione trasparente



CONTATTO CON I CLIENTI

Sostituisce l'edizioni 2014/15



**La maggiorazione sulle
materie prime (MMP)
è compresa nel prezzo.**

Frese per acciaio, acciaio inox, titanio e nichel

15 – 325

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Frese per lavorazioni in 3D

327 – 525

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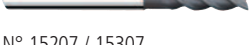
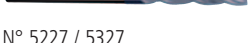
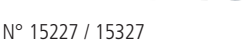


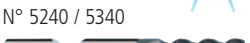
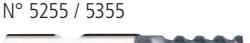

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Frese per acciaio, acciaio inox, titanio e nichel






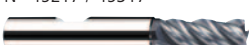






A taglienti lisci, cilindrico

Esecuzione normale

N° 8500 / 8600		NX-NVDS new!	X-Generation X	Sgrossatura Finitura	d_1 4 – 20 r	Rm 850-1500	HRC 48-56	Ti Titanium	29
N° 15222 / 15322		NX-NVD	X-Generation X	Sgrossatura Finitura	d_1 4 – 20 45°	Rm 850-1500	HRC 48-56	Ti Titanium	31
N° 8700 / 8800		ZX-NV	X-Generation X	Sgrossatura Finitura	d_1 3 – 20 r	Ni-/Mn- Alloys			33
N° 8705 / 8805		ZX-NV5	X-Generation X	Sgrossatura Finitura	d_1 6 – 20 r	Ni-/Mn- Alloys			35
N° 5258 / 5358		HX-N	X-Generation X	Sgrossatura Finitura	d_1 5 – 16 45°	Rm 1300-1500	HRC 48-56		37
N° 5214 / 5314		SX-N	X-Generation X	Sgrossatura Finitura	d_1 3 – 16 45°	Inox Stainless			39
N° 8100 / 8200		NB-NVDS new!	Base-X B	Sgrossatura Finitura	d_1 4 – 20 r	Rm <850-1300	Inox Stainless	Ti Titanium	41
N° 8304 / 8404		NB-NVS new!	Base-X B	Sgrossatura Finitura	d_1 2 – 20 r	Rm <850-1100	Inox Stainless		43
N° 15207 / 15307		NB-NVD	Base-X B	Sgrossatura Finitura	d_1 4 – 20 45°	Rm <850-1300	Inox Stainless	Ti Titanium	45
N° 5227 / 5327		NB-NV	Base-X B	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1300	Inox Stainless		47
N° 15227 / 15327		NB-NV	Base-X B	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1100	Inox Stainless		49
N° 15205 / 15305		NB-NV	Base-X B	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1300	Inox Stainless		51
N° 15200 / 15300		NB-NV	Base-X B	Sgrossatura Finitura	d_1 6 – 20 45°	Rm <850-1300	Inox Stainless		53
N° 5240 / 5340			Base-X B	Sgrossatura Finitura	d_1 2 – 20 45°	Rm <850-1100			55
N° 5255 / 5355			Base-X B	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1100	Inox Stainless	Ti Titanium	57

Frese per acciaio, acciaio inox, titanio e nichel









A taglienti lisci, cilindrico

Esecuzione normale								
N° 15233 / 15333		NV3	Base-X B	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1300		59
N° 15334 / 15234		NV3	Base-X B	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1100	Inox Stainless	61
N° 5230 / 5330			Base-X B	Sgrossatura Finitura	d_1 2 – 25 45°	Rm <850-1100		63
N° 5231 / 5331			Base-X B	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1300		67
N° 5200 / 5300			Base-X B	Sgrossatura Finitura	d_1 2 – 20 45°	Rm <850-1100		69
N° 45217 / 45317		NF-NV	Favora® F	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1100	Inox Stainless	71
N° 45340			Favora® F	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1100		73
N° 45333		NF-NV3	Favora® F	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1100	Inox Stainless	75
N° 45330			Favora® F	Sgrossatura Finitura	d_1 3 – 20 45°	Rm <850-1100		77
N° 0110			HSS	Sgrossatura Finitura	d_1 1 – 40 90°	Rm <850-1100		79
N° 0780			HSS	Sgrossatura Finitura	d_1 1 – 25 90°	Rm <850-1100		83
N° 0770			HSS	Sgrossatura Finitura	d_1 1 – 20 90°	Rm <850-1100		87






Frese per acciaio, acciaio inox, titanio e nichel

A taglienti lisci, cilindrico

Esecuzione normale con scarico









N° 15242 / 15342		NX-VD	X-Generation X	Sgrossatura Finitura	d, 4 – 20 45°	Rm 850-1500	HRC 48-56	Ti Titanium	89
N° 5248 / 5348		HX	X-Generation X	Sgrossatura Finitura	d, 3 – 25 45°	Rm 1300-1500	HRC 48-56		91
N° 5244 / 5344		HX-H	X-Generation X	Sgrossatura Finitura	d, 3 – 20 45°	Rm 48-60			93
N° 5218 / 5318		SX	X-Generation X	Sgrossatura Finitura	d, 3 – 20 45°	Inox Stainless			95
N° 5215 / 5315		SX-3	X-Generation X	Sgrossatura Finitura	d, 3 – 16 45°	Inox Stainless			97
N° 5225 / 5325		NB-V	Base-X B	Sgrossatura Finitura	d, 3 – 20 45°	Rm <850-1300	Inox Stainless		99
N° 15252 / 15352		NB-V	Base-X B	Sgrossatura Finitura	d, 3 – 20 45°	Rm <850-1300	Inox Stainless		101
N° 0580		Supracut SNC	HSS	Sgrossatura Finitura	d, 4 – 25 45°	Rm <850-1100	Inox Stainless		103

Esecuzione medio-lunga

N° 15223 / 15323		NX-NVD	X-Generation X	Sgrossatura Finitura	d, 4 – 20 45°	Rm 850-1500	HRC 48-56	Ti Titanium	105
N° 15208 / 15308		NB-NVD	Base-X B	Sgrossatura Finitura	d, 4 – 20 45°	Rm <850-1300	Inox Stainless	Ti Titanium	107
N° 15243 / 15343			Base-X B	Sgrossatura Finitura	d, 2 – 25 45°	Rm <850-1100			109
N° 5332			Base-X B	Sgrossatura Finitura	d, 2 – 20 45°	Rm <850-1100			111
N° 0190			HSS	Sgrossatura Finitura	d, 5 – 32 90°	Rm <850-1100			113

Frese per acciaio, acciaio inox, titanio e nichel

A taglienti lisci, cilindrico

Esecuzione medio-lunga con scarico							
N° 15259 / 15359		NX-VD	X-Generation X	Sgrossatura Finitura	d_1 4 – 16 45°	Rm 850-1500 HRC 48-56 Ti Titanium	115
N° 5251 / 5351		HX	X-Generation X	Sgrossatura Finitura	d_1 6 – 20 45°	Rm 1300-1500 HRC 48-56	117
N° 5219 / 5319		SX	X-Generation X	Sgrossatura Finitura	d_1 6 – 16 45°	Inox Stainless	119
N° 15225 / 15325		NB-V	Base-X B	Sgrossatura Finitura	d_1 6 – 16 45°	Rm <850-1300	121
N° 15253 / 15353		NB-V	Base-X B	Sgrossatura Finitura	d_1 6 – 20 45°	Rm <850-1300	123
N° 15299 / 15399		NV3	Base-X B	Sgrossatura Finitura	d_1 3 – 16 45°	Rm <850-1300	125
N° 15294 / 15394		NV3	Base-X B	Sgrossatura Finitura	d_1 3 – 16 45°	Rm <850-1100 Inox Stainless	127
N° 5333			Base-X B	Sgrossatura Finitura	d_1 3 – 16 45°	Rm <850-1100	129

Frese per acciaio, acciaio inox, titanio e nichel

A taglienti lisci, cilindrico

Esecuzione lunga

N° 15245 / 15345



Base-X	B	Sgrossatura	d, 6 – 20		Rm	<850-1100			131
		Finitura							

N° 0200



HSS	HSS	Sgrossatura	d, 2 – 40		Rm	<850-1100			133
		Finitura							

N° 0270



HSS	HSS	Sgrossatura	d, 2 – 20		Rm	<850-1100			135
		Finitura							

Esecuzione lunga con scarico

N° 5393



Base-X	B	Sgrossatura	d, 3 – 16		Rm	<850-1100			137
		Finitura							

Versione extralunga

N° 15247 / 15347



Base-X	B	Sgrossatura	d, 6 – 20		Rm	<850-1100			139
		Finitura							

Esecuzione corta

N° 5249 / 5349



HX	X-Generation	X	Sgrossatura	d, 1 – 16		Rm	1300-1500	HRC	48-60	141
			Finitura							

N° 5213 / 5313



SX	X-Generation	X	Sgrossatura	d, 3 – 16		Inox	Stainless			143
			Finitura							

N° 5229 / 5329



Cut-V	Base-X	B	Sgrossatura	d, 3 – 16		Rm	<850-1100	Inox	Stainless	145
			Finitura							

N° 5026 / 5036



Base-X	B	Sgrossatura	d, 1.5 – 10		Rm	<850-1100	Inox	Stainless	147
		Finitura							

N° 5299 / 5400



Base-X	B	Sgrossatura	d, 1 – 6		Rm	<850-1100			149
		Finitura							






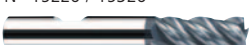

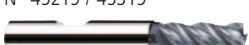
N° 0700






HSS	HSS	Sgrossatura	d, 1 – 25		Rm	<850-1100			151
		Finitura							

Frese per acciaio, acciaio inox, titanio e nichel

A taglienti lisci, torico

Esecuzione normale									
N° 15268 / 15368		NX-RNVD	X X-Generation	Sgrossatura Finitura	r 0,5, 1,0, 1,5, 2,0, 2,5, 4,0	Rm 850-1500	HRC 48-56	Ti Titanium	155
N° 8720 / 8820		ZX-RNV	X X-Generation	Sgrossatura Finitura	r 0,4, 0,5, 0,8, 1,0, 1,5, 2,0, 2,5, 4,0	Ni-/Mn- Alloys			159
N° 5259 / 5359		HX-RN	X X-Generation	Sgrossatura Finitura	r 0,2, 0,5	Rm 1300-1500	HRC 48-60		163
N° 15257 / 15357		HX-RN	X X-Generation	Sgrossatura Finitura	r 1,0, 2,0	Rm 1300-1500	HRC 48-60		165
N° 15212 / 15312		SX-RN	X X-Generation	Sgrossatura Finitura	r 0,5, 1,0, 1,5	Inox Stainless			167
N° 15226 / 15326		NB-RNV	B Base-X	Sgrossatura Finitura	r 0,5, 1,0, 1,5, 2,0, 2,5, 4,0	Rm <850-1300	Inox Stainless		169
N° 5234 / 5334			B Base-X	Sgrossatura Finitura	r 0,2, 0,5	Rm <850-1100			173
N° 45219 / 45319		NF-RNV	F Favora®	Sgrossatura Finitura	r 0,2, 0,5, 0,8, 1,0, 1,5, 2,0, 2,5, 4,0	Rm <850-1100	Inox Stainless		175












Esecuzione normale con scarico									
N° 5253 / 5353		HX-R	X X-Generation	Sgrossatura Finitura	r 1,0	Rm 1300-1500	HRC 48-60		181
N° 5254 / 5354		HX-R	X X-Generation	Sgrossatura Finitura	r 1,5	Rm 1300-1500	HRC 48-60		183
N° 5256 / 5356		HX-R	X X-Generation	Sgrossatura Finitura	r 1,5, 2,0, 2,5, 3,0, 3,5, 4,0	Rm 1300-1500	HRC 48-60		185

Esecuzione medio-lunga con scarico									
N° 5257 / 5357		HX-R	X X-Generation	Sgrossatura Finitura	r 1,5, 2,0, 2,5, 3,0, 3,5	Rm 1300-1500	HRC 48-60		187

Frese per acciaio, acciaio inox, titanio e nichel





Profilata, cilindrica




Esecuzione normale

N° 5279 / 5379		NX-FP	X X-Generation	Sgrossatura Finitura	d ₁ 6 – 20 45°	Rm <850-1300			189
N° 15379		NX-FP	X X-Generation	Sgrossatura Finitura	d ₁ 6 – 20 45°	Rm <850-1300			191
N° 15331		NX-FP	X X-Generation	Sgrossatura Finitura	d ₁ 6 – 20 45°	Rm <850-1300			193
N° 15309		SX-FP	X X-Generation	Sgrossatura Finitura	d ₁ 6 – 20 45°	Inox Stainless			195
N° 15236 / 15336		NB-RP SupraCarb®	B Base-X	Sgrossatura Finitura	d ₁ 3 – 20 45°	Rm <850-1100	Inox Stainless		197
N° 45371		NF-RP	F Favora®	Sgrossatura Finitura	d ₁ 3 – 20 45°	Rm <850-1100			199
N° 0619		Supracut	HSS	Sgrossatura Finitura	d ₁ 5 – 25 45°	Rm 850-1300			201
N° 0540		Supracut FP	HSS	Sgrossatura Finitura	d ₁ 6 – 25 45°	Rm <850-1300	Inox Stainless		203
N° 0610			HSS	Sgrossatura Finitura	d ₁ 5 – 40 45°	Rm <850-1100			205
N° 0609			HSS	Sgrossatura Finitura	d ₁ 6 – 32 45°	Rm <850-1100	Inox Stainless		209
N° 0695			HSS	Sgrossatura Finitura	d ₁ 8 – 32 45°	Rm <850-1100	Inox Stainless		211

Frese per acciaio, acciaio inox, titanio e nichel

Profilata, cilindrica

Esecuzione medio-lunga									
N° 5173		NX-FP	X-Generation X	Sgrossatura Finitura	d_1 6 – 20 45°	Rm <850-1300			213
N° 15238 / 15338		NB-RP SupraCarb®	Base-X B	Sgrossatura Finitura	d_1 6 – 20 45°	Rm <850-1100	Inox Stainless		215
N° 0659		Supracut	HSS	Sgrossatura Finitura	d_1 6 – 25 45°	Rm 850-1300			217
N° 0650			HSS	Sgrossatura Finitura	d_1 5 – 32 45°	Rm <850-1100			219

Esecuzione medio-lunga con scarico									
N° 5174		NX-FP	X-Generation X	Sgrossatura Finitura	d_1 6 – 20 45°	Rm <850-1300			221
N° 15304		SX-FP	X-Generation X	Sgrossatura Finitura	d_1 6 – 20 45°	Inox Stainless			223
N° 15239 / 15339		NB-RP SupraCarb®	Base-X B	Sgrossatura Finitura	d_1 6 – 20 45°	Rm <850-1100	Inox Stainless		225

Frese per acciaio, acciaio inox, titanio e nichel

Profilata, cilindrica

Esecuzione corta

N° 5176



NX-FP

X-Generation
X

Sgrossatura d, 10 – 20



Finitura



45°

Rm
<850-1300

227

N° 15260 / 15360



NB-RP SupraCarb®

new!

Base-X
B

Sgrossatura d, 3 – 16



Finitura



45°

Rm
<850-1100

Inox
Stainless

229

N° 0640



HSS

Sgrossatura d, 5 – 32



Finitura



45°

Rm
<850-1100

231

Esecuzione lunga

N° 15248 / 15348



NB-RP SupraCarb®

Base-X
B

Sgrossatura d, 6 – 20



Finitura



45°

Rm
<850-1100

Inox
Stainless

233

N° 0665



HSS

Sgrossatura d, 5 – 40



Finitura



45°

Rm
<850-1100

235

Versione extralunga con scarico

N° 0621



Supracut

HSS

Sgrossatura d, 6 – 25



Finitura







45°





Rm
850-1300

237

Frese per acciaio, acciaio inox, titanio e nichel

Finitura, cilindrica




Esecuzione normale									
N° 15250		Multicut XF	X X-Generation	Sgrossatura Finitura	d_1 3 – 20 45°	Rm 850-1500	HRC 48-60	Inox Stainless	239
N° 5266 / 5366		Multicut HX-H	X X-Generation	Sgrossatura Finitura	d_1 3 – 20 45°	HRC 48- >60			241
N° 5260 / 5360		Multicut N	B Base-X	Sgrossatura Finitura	d_1 6 – 20 45°	Rm 850-1300			243
N° 45360			F Favora®	Sgrossatura Finitura	d_1 6 – 20 45°	Rm 850-1300			245











Esecuzione medio-lunga									
N° 15251		Multicut XF	X X-Generation	Sgrossatura Finitura	d_1 6 – 20 45°	Rm 850-1500	HRC 48-60	Inox Stainless	247
N° 15266 / 15366		Multicut HX-H	X X-Generation	Sgrossatura Finitura	d_1 6 – 20 45°	HRC 48- >60			249
N° 5265		Multicut N	B Base-X	Sgrossatura Finitura	d_1 6 – 20 45°	Rm 850-1300			251
N° 45362			F Favora®	Sgrossatura Finitura	d_1 6 – 20 45°	Rm 850-1300			253

Esecuzione lunga									
N° 5268		Multicut N	B Base-X	Sgrossatura Finitura	d_1 10 – 25 45°	Rm 850-1300			255

Frese per acciaio, acciaio inox, titanio e nichel













Micro, cilindrico

Gambo ø 6mm									
N° 6502		MicroX	X-Generation X	3xd	d ₁ 1,0 – 3,0 45°	Rm 850-1500	HRC 48-60	Ti Titanium	257
N° 6504		MicroX	X-Generation X	5xd	d ₁ 1,0 – 3,0 45°	Rm 850-1500	HRC 48-60	Ti Titanium	259
N° 6506		MicroX	X-Generation X	8xd	d ₁ 1,0 – 3,0 45°	Rm 850-1500	HRC 48-60	Ti Titanium	261

Gambo ø 3mm									
N° 15711		Microcut-C1H	X-Generation X	1xd	d ₁ 0,2 – 3,0 45°	Rm 850-1500	HRC 48-60	Ti Titanium	263
N° 45709		Micro C1.5	Favora® F	1.5xd	d ₁ 0,1 – 2,9 90°	Rm <850	Inox Stainless	CuZn Gold PI	265
N° 5712		Microcut-C3	Base-X B	3xd	d ₁ 0,2 – 3,0 45°	Rm <850-1500	Inox Stainless	Ti Titanium	269
N° 5722		Microcut-C3H	X-Generation X	3xd	d ₁ 0,5 – 3,0 45°	Rm 850-1500	HRC 48-60	Ti Titanium	271
N° 5710 / 45710			Favora® F	3xd	d ₁ 0,3 – 3,0 90°	Rm <850-1100			273
N° 45713		Micro C3	Favora® F	3xd	d ₁ 0,4 – 2,9 90°	Rm <850	Inox Stainless	CuZn Gold PI	277
N° 15752		Microcut-C3	Base-X B	3xd	d ₁ 0,5 – 3,0 90°	Rm <850-1500	Inox Stainless	Ti Titanium	281
N° 5714		Microcut-C5	Base-X B	5xd	d ₁ 0,5 – 3,0 45°	Rm <850-1500	Inox Stainless	Ti Titanium	283
N° 5724		Microcut-C5H	X-Generation X	5xd	d ₁ 0,5 – 3,0 45°	Rm 850-1500	HRC 48-60	Ti Titanium	285
N° 15754		Microcut-C5	Base-X B	5xd	d ₁ 0,5 – 3,0 90°	Rm <850-1500	Inox Stainless	Ti Titanium	287









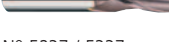
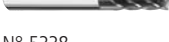

Frese per acciaio, acciaio inox, titanio e nichel

Micro, cilindrico

Gambo ø 3mm									
N° 5716		Microcut-C8	Base-X B	8xd	d ₁ 0.5 – 3.0 	Rm <850-1500	Inox Stainless	Ti Titanium	289
N° 5726		Microcut-C8H		X-Generation X	8xd	d ₁ 0.5 – 3.0 	Rm 850-1500	HRC 48-60	Ti Titanium
N° 5717		Microcut-C10	Base-X B	10xd	d ₁ 0.5 – 3.0 	Rm <850-1500	Inox Stainless	Ti Titanium	293
N° 5721		Microcut-C12		B	12xd	d ₁ 1.0 – 3.0 	Rm <850-1300		
N° 5723		Microcut-C15	Base-X B	15xd	d ₁ 1.0 – 3.0 	Rm <850-1300			297
N° 15725		Microcut-C20		B	20xd	d ₁ 1.0 – 3.0 	Rm <850-1100		

Frese per acciaio, acciaio inox, titanio e nichel

A taglienti lisci, cilindrico

Esecuzione a gambo corto								
N° 15232		Cut-X V	B	Sgrossatura Finitura	d ₁ 1,5 – 10 90°	Rm <850-1100	Inox Stainless	301
N° 5236 / 5336		Cut-X	B	Sgrossatura Finitura	d ₁ 1,5 – 10 90°	Rm <850-1100	Inox Stainless	305
N° 5339		Cut-X 45	B	Sgrossatura Finitura	d ₁ 3 – 10 45°	Rm <850-1100	Inox Stainless	307
N° 5335		Cut-X	B	Sgrossatura Finitura	d ₁ 2 – 10 45°	Rm <850-1100	Inox Stainless	309
N° 5336 / 45336			F	Sgrossatura Finitura	d ₁ 1,5 – 10 90°	Rm <850-1100	Inox Stainless	311
N° 45339			F	Sgrossatura Finitura	d ₁ 3 – 10 45°	Rm <850-1100	Inox Stainless	313
N° 45335			F	Sgrossatura Finitura	d ₁ 2 – 10 45°	Rm <850-1100	Inox Stainless	315
N° 0400			HSS	Sgrossatura Finitura	d ₁ 1 – 20 90°	Rm <850		317
N° 0410			HSS	Sgrossatura Finitura	d ₁ 2 – 20 90°	Rm <850		321
N° 5237 / 5337		Cut-X multi	B	Sgrossatura Finitura	d ₁ 3 – 10 90°	Rm <850-1300	Inox Stainless	323
N° 5338		Cut-X multi	B	Sgrossatura Finitura	d ₁ 3 – 10 45°	Rm <850-1300	Inox Stainless	325

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f / v _{fZ} [mm/min]	Q [cm ² /min]	φZ [°]	φA [°]	
	Acciaio 850 - 1100 N/mm ²	4	4	150	0.030	6.0	1.6	11935	1430	13.5	20°	Vedere pagina 927	
		5	4	150	0.035	7.5	2.0	9550	1335	20.0	20°		
		6	4	150	0.040	9.0	2.4	7960	1275	27.5	20°		
		8	4	150	0.050	12.0	3.2	5970	1195	46.0	20°		
		10	4	150	0.065	15.0	4.0	4775	1240	74.5	20°		
		12	4	150	0.075	18.0	4.8	3980	1195	103.0	20°		
		16	4	150	0.085	24.0	6.4	2985	1015	156.0	20°		
		20	4	150	0.100	30.0	8.0	2385	955	229.0	20°		
		Acciaio 1100 - 1300 N/mm ²	4	4	115	0.030	6.0	1.6	9150	1100	10.5	17.5°	Vedere pagina 927
			5	4	115	0.035	7.5	2.0	7320	1025	15.5	17.5°	
			6	4	115	0.040	9.0	2.4	6100	975	21.0	17.5°	
			8	4	115	0.050	12.0	3.2	4575	915	35.0	17.5°	
			10	4	115	0.065	15.0	4.0	3660	950	57.0	17.5°	
			12	4	115	0.075	18.0	4.8	3050	915	79.0	17.5°	
			16	4	115	0.085	24.0	6.4	2290	780	120.0	17.5°	
			20	4	115	0.100	30.0	8.0	1830	730	175.0	17.5°	
		Acciaio da utensile temprato 52 - 56 HRC	4	4	50	0.015	6.0	1.6	3980	240	2.5	15°	Vedere pagina 927
			5	4	50	0.020	7.5	2.0	3185	255	4.0	15°	
			6	4	50	0.025	9.0	2.4	2655	265	5.5	15°	
			8	4	50	0.030	12.0	3.2	1990	240	9.0	15°	
10			4	50	0.035	15.0	4.0	1590	225	13.5	15°		
12			4	50	0.045	18.0	4.8	1325	240	20.5	15°		
16			4	50	0.055	24.0	6.4	995	220	34.0	15°		
20			4	50	0.070	30.0	8.0	795	225	54.0	15°		
	Leghe di titanio indurite >300 HB [Ti6Al4V]	4	4	60	0.020	6.0	1.6	4775	380	3.5	12°	Vedere pagina 927	
		5	4	60	0.025	7.5	2.0	3820	380	5.5	12°		
		6	4	60	0.030	9.0	2.4	3185	380	8.0	12°		
		8	4	60	0.040	12.0	3.2	2385	380	14.5	12°		
		10	4	60	0.045	15.0	4.0	1910	345	20.5	12°		
		12	4	60	0.055	18.0	4.8	1590	350	30.0	12°		
		16	4	60	0.065	24.0	6.4	1195	310	47.5	12°		
		20	4	60	0.080	30.0	8.0	955	305	73.0	12°		

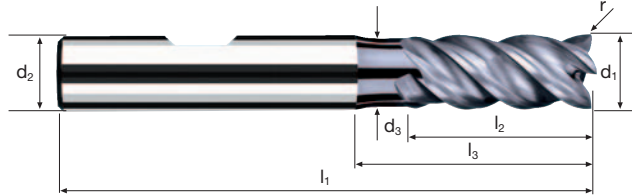
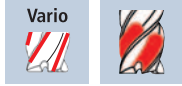
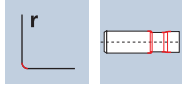
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f / v _{fR} [mm/min]	Q [cm ² /min]	φR [°]	LR [mm]	
	Acciaio 850 - 1100 N/mm ²	4	4	120	0.025	5.0	4	9550	955	19.0	32°	8.0	
		5	4	120	0.025	6.3	5	7640	765	24.0	32°	10.4	
		6	4	120	0.030	7.5	6	6365	765	34.5	32°	12.0	
		8	4	120	0.040	10.0	8	4775	765	61.0	32°	16.0	
		10	4	120	0.050	12.5	10	3820	765	95.5	32°	20.0	
		12	4	120	0.055	15.0	12	3185	700	126.0	32°	24.0	
		16	4	120	0.065	20.0	16	2385	620	198.5	32°	32.0	
		20	4	120	0.075	25.0	20	1910	575	287.5	32°	40.0	
		Acciaio 1100 - 1300 N/mm ²	4	4	90	0.025	5.0	4	7160	715	14.5	28°	9.4
			5	4	90	0.025	6.3	5	5730	575	18.0	28°	12.2
			6	4	90	0.030	7.5	6	4775	575	26.0	28°	14.1
			8	4	90	0.040	10.0	8	3580	575	46.0	28°	18.8
			10	4	90	0.050	12.5	10	2865	575	72.0	28°	23.5
			12	4	90	0.055	15.0	12	2385	525	94.5	28°	28.2
			16	4	90	0.065	20.0	16	1790	465	149.0	28°	37.6
			20	4	90	0.075	25.0	20	1430	430	215.0	28°	47.0
		Acciaio da utensile temprato 52 - 56 HRC	4	4	40	0.010	5.0	4	3185	125	2.5	24°	11.2
			5	4	40	0.015	6.3	5	2545	155	5.0	24°	14.6
			6	4	40	0.020	7.5	6	2120	170	7.5	24°	16.8
			8	4	40	0.025	10.0	8	1590	160	13.0	24°	22.5
10			4	40	0.025	12.5	10	1275	130	16.5	24°	28.1	
12			4	40	0.035	15.0	12	1060	150	27.0	24°	33.7	
16			4	40	0.040	20.0	16	795	125	40.0	24°	44.9	
20			4	40	0.055	25.0	20	635	140	70.0	24°	56.2	
	Leghe di titanio indurite >300 HB [Ti6Al4V]	4	4	50	0.015	5.0	4	3980	240	5.0	19°	14.5	
		5	4	50	0.020	6.3	5	3185	255	8.0	19°	18.9	
		6	4	50	0.025	7.5	6	2655	265	12.0	19°	21.8	
		8	4	50	0.030	10.0	8	1990	240	19.0	19°	29.0	
		10	4	50	0.035	12.5	10	1590	225	28.0	19°	36.3	
		12	4	50	0.040	15.0	12	1325	210	38.0	19°	43.6	
		16	4	50	0.050	20.0	16	995	200	64.0	19°	58.1	
		20	4	50	0.060	25.0	20	795	190	95.0	19°	72.6	

Frese cilindriche NX-NVDS

A taglienti lisci, esecuzione normale con scarico corto
Geometria frontale per fresature in penetrazione ad alto rendimento



HM MG10 λ **45°**
 γ **-10°**



new!

Sgrossatura



Finitura



Rm
850-1100

Rm
1100-1300

Rm
1300-1500

HRC
48-56

HRC
56-60

Ti
Titanium

GG(G)
Tool Steel

Esempio: N° Ordine		Rivestimento		Articolo	Codice-ø					POLYCHROM
		P	8600	.220						P8600
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r	α	z	
.220	4	6	3.7	57	8	16	0.10	3.0°	4	●
.260	5	6	4.6	57	10	18	0.10	1.5°	4	●
.300	6	6	5.5	57	12	20	0.10	0.0°	4	●
.391	8	8	7.4	63	19	26	0.15	0.0°	4	●
.450	10	10	9.2	72	23	31	0.20	0.0°	4	●
.501	12	12	11.0	83	27	37	0.20	0.0°	4	●
.610	16	16	15.0	92	32	43	0.20	0.0°	4	●
.682	20	20	19.0	104	39	53	0.20	0.0°	4	●

Applicazione

Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	150	0.030	6.0	1.6	11935	1430	13.5
5	4	150	0.035	7.5	2.0	9550	1335	20.0
6	4	150	0.040	9.0	2.4	7960	1275	27.5
8	4	150	0.050	12.0	3.2	5970	1195	46.0
10	4	150	0.065	15.0	4.0	4775	1240	74.5
12	4	150	0.075	18.0	4.8	3980	1195	103.0
16	4	150	0.085	24.0	6.4	2985	1015	156.0
20	4	150	0.100	30.0	8.0	2385	955	229.0

Acciaio
1100 - 1300 N/mm²

4	4	115	0.030	6.0	1.6	9150	1100	10.5
5	4	115	0.035	7.5	2.0	7320	1025	15.5
6	4	115	0.040	9.0	2.4	6100	975	21.0
8	4	115	0.050	12.0	3.2	4575	915	35.0
10	4	115	0.065	15.0	4.0	3660	950	57.0
12	4	115	0.075	18.0	4.8	3050	915	79.0
16	4	115	0.085	24.0	6.4	2290	780	120.0
20	4	115	0.100	30.0	8.0	1830	730	175.0

Acciaio da utensile temprato
52 - 56 HRC

4	4	50	0.015	6.0	1.6	3980	240	2.5
5	4	50	0.020	7.5	2.0	3185	255	4.0
6	4	50	0.025	9.0	2.4	2655	265	5.5
8	4	50	0.030	12.0	3.2	1990	240	9.0
10	4	50	0.035	15.0	4.0	1590	225	13.5
12	4	50	0.045	18.0	4.8	1325	240	20.5
16	4	50	0.055	24.0	6.4	995	220	34.0
20	4	50	0.070	30.0	8.0	795	225	54.0

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

4	4	60	0.020	6.0	1.6	4775	380	3.5
5	4	60	0.025	7.5	2.0	3820	380	5.5
6	4	60	0.030	9.0	2.4	3185	380	8.0
8	4	60	0.040	12.0	3.2	2385	380	14.5
10	4	60	0.045	15.0	4.0	1910	345	20.5
12	4	60	0.055	18.0	4.8	1590	350	30.0
16	4	60	0.065	24.0	6.4	1195	310	47.5
20	4	60	0.080	30.0	8.0	955	305	73.0

Applicazione

Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	120	0.025	5.0	4	9550	955	19.0
5	4	120	0.025	6.3	5	7640	765	24.0
6	4	120	0.030	7.5	6	6365	765	34.5
8	4	120	0.040	10.0	8	4775	765	61.0
10	4	120	0.050	12.5	10	3820	765	95.5
12	4	120	0.055	15.0	12	3185	700	126.0
16	4	120	0.065	20.0	16	2385	620	198.5
20	4	120	0.075	25.0	20	1910	575	287.5

Acciaio
1100 - 1300 N/mm²

4	4	90	0.025	5.0	4	7160	715	14.5
5	4	90	0.025	6.3	5	5730	575	18.0
6	4	90	0.030	7.5	6	4775	575	26.0
8	4	90	0.040	10.0	8	3580	575	46.0
10	4	90	0.050	12.5	10	2865	575	72.0
12	4	90	0.055	15.0	12	2385	525	94.5
16	4	90	0.065	20.0	16	1790	465	149.0
20	4	90	0.075	25.0	20	1430	430	215.0

Acciaio da utensile temprato
52 - 56 HRC

4	4	40	0.010	5.0	4	3185	125	2.5
5	4	40	0.015	6.3	5	2545	155	5.0
6	4	40	0.020	7.5	6	2120	170	7.5
8	4	40	0.025	10.0	8	1590	160	13.0
10	4	40	0.025	12.5	10	1275	130	16.5
12	4	40	0.035	15.0	12	1060	150	27.0
16	4	40	0.040	20.0	16	795	125	40.0
20	4	40	0.055	25.0	20	635	140	70.0

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

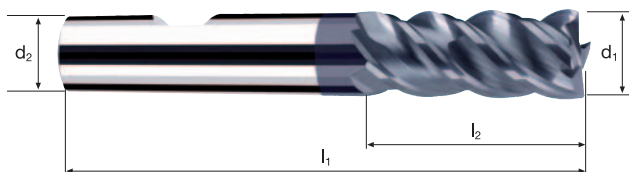
4	4	50	0.015	5.0	4	3980	240	5.0
5	4	50	0.020	6.3	5	3185	255	8.0
6	4	50	0.025	7.5	6	2655	265	12.0
8	4	50	0.030	10.0	8	1990	240	19.0
10	4	50	0.035	12.5	10	1590	225	28.0
12	4	50	0.040	15.0	12	1325	210	38.0
16	4	50	0.050	20.0	16	995	200	64.0
20	4	50	0.060	25.0	20	795	190	95.0

Frese cilindriche NX-NVD

A taglienti lisci, versione normale



**HM
MG10** λ **45°**
 γ **-10°**



Sgrossatura



Finitura



Rm
850-1100

Rm
1100-1300

Rm
1300-1500

HRC
48-56

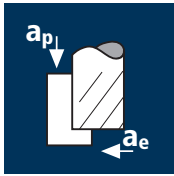
HRC
56-60

Ti
Titanium

GG(G)
Tool Steel

Esempio: N° Ordine		Rivestimento P	Articolo 15322	Codice- ϕ .220							POLYCHROM
ϕ Code	d1 e8	d2 h6	l1	l2	45°	α	z				
.220	4	6	57	8	0.10	4.5°	4				●
.260	5	6	57	10	0.15	2.5°	4				●
.300	6	6	57	12	0.15	0.0°	4				●
.391	8	8	63	19	0.15	0.0°	4				●
.450	10	10	72	23	0.20	0.0°	4				●
.501	12	12	83	27	0.20	0.0°	4				●
.610	16	16	92	32	0.20	0.0°	4				●
.682	20	20	104	39	0.20	0.0°	4				●

Applicazione



Materiale

Leghe a base di nichel
ricotto
Rm <1000 N/mm²
[Inconel 718]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	35	0.010	5.4	1.8	3715	150	1.5
4	4	35	0.015	7.2	2.4	2785	165	2.9
5	4	35	0.020	9.0	3.0	2230	180	4.9
6	4	35	0.020	10.8	3.6	1855	150	5.8
8	4	35	0.030	14.4	4.8	1395	165	11.4
10	4	35	0.035	18.0	6.0	1115	155	16.7
12	4	35	0.045	21.6	7.2	930	165	25.7
16	4	35	0.050	28.8	9.6	695	140	38.7
20	4	35	0.060	36.0	12.0	555	135	58.3

Leghe a base di nichel
indurito
Rm >1000 N/mm²
[Inconel 718]



3	4	25	0.010	5.4	1.8	2655	105	1.0
4	4	25	0.010	7.2	2.4	1990	80	1.4
5	4	25	0.015	9.0	3.0	1590	95	2.6
6	4	25	0.015	10.8	3.6	1325	80	3.1
8	4	25	0.025	14.4	4.8	995	100	6.9
10	4	25	0.030	18.0	6.0	795	95	10.3
12	4	25	0.035	21.6	7.2	665	95	14.8
16	4	25	0.040	28.8	9.6	495	80	22.1
20	4	25	0.050	36.0	12.0	400	80	34.6

Acciaio al manganese
Mn >5%
[1.3964 / Nitronic]
[1.3401 / X120Mn12]



3	4	40	0.010	5.4	1.8	4245	170	1.7
4	4	40	0.015	7.2	2.4	3185	190	3.3
5	4	40	0.020	9.0	3.0	2545	205	5.5
6	4	40	0.020	10.8	3.6	2120	170	6.6
8	4	40	0.030	14.4	4.8	1590	190	13.1
10	4	40	0.035	18.0	6.0	1275	180	19.4
12	4	40	0.045	21.6	7.2	1060	190	29.5
16	4	40	0.050	28.8	9.6	795	160	44.2
20	4	40	0.060	36.0	12.0	635	150	64.8

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



3	4	50	0.015	5.4	1.8	5305	320	3.1
4	4	50	0.020	7.2	2.4	3980	320	5.5
5	4	50	0.030	9.0	3.0	3185	380	10.3
6	4	50	0.035	10.8	3.6	2655	370	14.4
8	4	50	0.045	14.4	4.8	1990	360	24.9
10	4	50	0.055	18.0	6.0	1590	350	37.8
12	4	50	0.065	21.6	7.2	1325	345	53.7
16	4	50	0.070	28.8	9.6	995	280	77.4
20	4	50	0.085	36.0	12.0	795	270	116.6

Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	80	0.010	5.4	1.8	8490	340	3.3
4	4	80	0.015	7.2	2.4	6365	380	6.6
5	4	80	0.020	9.0	3.0	5095	410	11.1
6	4	80	0.020	10.8	3.6	4245	340	13.2
8	4	80	0.030	14.4	4.8	3185	380	26.3
10	4	80	0.035	18.0	6.0	2545	355	38.3
12	4	80	0.045	21.6	7.2	2120	380	59.1
16	4	80	0.050	28.8	9.6	1590	320	88.5
20	4	80	0.060	36.0	12.0	1275	305	131.8

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



3	4	70	0.010	5.4	1.8	7425	295	2.9
4	4	70	0.015	7.2	2.4	5570	335	5.8
5	4	70	0.015	9.0	3.0	4455	265	7.2
6	4	70	0.020	10.8	3.6	3715	295	11.5
8	4	70	0.025	14.4	4.8	2785	280	19.4
10	4	70	0.035	18.0	6.0	2230	310	33.5
12	4	70	0.040	21.6	7.2	1855	295	45.9
16	4	70	0.045	28.8	9.6	1395	250	69.1
20	4	70	0.055	36.0	12.0	1115	245	105.8

Leghe a base di nichel
ricotto
Rm <1000 N/mm²
[Inconel 718]



3	4	25	0.010	4.2	3	2655	105	1.3
4	4	25	0.010	5.6	4	1990	80	1.8
5	4	25	0.015	7.0	5	1590	95	3.3
6	4	25	0.015	8.4	6	1325	80	4.0
8	4	25	0.025	11.2	8	995	100	9.0
10	4	25	0.030	14.0	10	795	95	13.3
12	4	25	0.035	16.8	12	665	95	19.2
16	4	25	0.040	22.4	16	495	80	28.7
20	4	25	0.050	28.0	20	400	80	44.8

Leghe a base di nichel
indurito
Rm >1000 N/mm²
[Inconel 718]



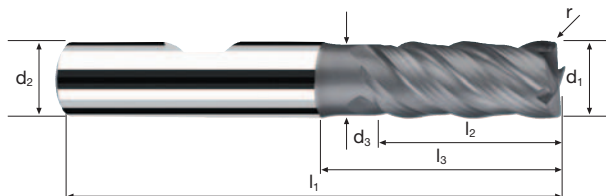
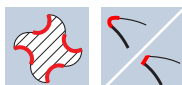
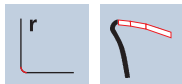
3	4	20	0.005	4.2	3	2120	40	0.5
4	4	20	0.010	5.6	4	1590	65	1.5
5	4	20	0.010	7.0	5	1275	50	1.8
6	4	20	0.015	8.4	6	1060	65	3.3
8	4	20	0.020	11.2	8	795	65	5.8
10	4	20	0.020	14.0	10	635	50	7.0
12	4	20	0.025	16.8	12	530	55	11.1
16	4	20	0.030	22.4	16	400	50	17.9
20	4	20	0.040	28.0	20	320	50	28.0

Frese cilindriche ZX-NV

A taglienti lisci, esecuzione normale con scarico corto



HM X10 λ 40°
 γ 5°



Sgrossatura

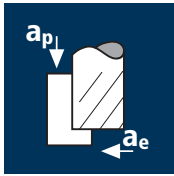


Finitura



										POLYCHROM	
Esempio: N° Ordine											
										P8800	
										P8700	
\emptyset Code	d1 e8	d2 h6	d3	l1	l2	l3	r	α	z		
.180	3	6	2.8	57	8	14	0.10	4.5°	4	●	
.220	4	6	3.7	57	11	16	0.10	3.0°	4	●	
.260	5	6	4.6	57	13	18	0.15	1.5°	4	●	
.300	6	6	5.5	57	13	20	0.15	0.0°	4	●	
.391	8	8	7.4	63	19	26	0.15	0.0°	4	●	
.450	10	10	9.2	72	22	31	0.20	0.0°	4	●	
.501	12	12	11.0	83	26	37	0.20	0.0°	4	●	
.610	16	16	15.0	92	32	43	0.30	0.0°	4	●	
.682	20	20	19.0	104	38	53	0.30	0.0°	4	●	

Applicazione



Materiale

Leghe a base di nichel
ricotto
Rm <1000 N/mm²
[Inconel 718]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	5	45	0.020	10.8	1.2	2385	240	3.1
8	5	45	0.030	14.4	1.6	1790	270	6.2
10	5	45	0.035	18.0	2.0	1430	250	9.0
12	5	45	0.045	21.6	2.4	1195	270	14.0
16	5	45	0.050	28.8	3.2	895	225	20.7
20	5	45	0.060	36.0	4.0	715	215	31.0

Leghe a base di nichel
indurito
Rm >1000 N/mm²
[Inconel 718]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	5	30	0.015	10.8	1.2	1590	120	1.6
8	5	30	0.025	14.4	1.6	1195	150	3.5
10	5	30	0.030	18.0	2.0	955	145	5.2
12	5	30	0.035	21.6	2.4	795	140	7.3
16	5	30	0.040	28.8	3.2	595	120	11.1
20	5	30	0.050	36.0	4.0	475	120	17.3

Acciaio al manganese
Mn >5%
[1.3964 / Nitronic]
[1.3401 / X120Mn12]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	5	50	0.020	10.8	1.2	2655	265	3.4
8	5	50	0.030	14.4	1.6	1990	300	6.9
10	5	50	0.035	18.0	2.0	1590	280	10.1
12	5	50	0.045	21.6	2.4	1325	300	15.6
16	5	50	0.050	28.8	3.2	995	250	23.0
20	5	50	0.060	36.0	4.0	795	240	34.6

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	5	60	0.035	10.8	1.2	3185	555	7.2
8	5	60	0.045	14.4	1.6	2385	535	12.3
10	5	60	0.055	18.0	2.0	1910	525	18.9
12	5	60	0.065	21.6	2.4	1590	515	26.7
16	5	60	0.070	28.8	3.2	1195	420	38.7
20	5	60	0.085	36.0	4.0	955	405	58.3

Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	5	90	0.020	10.8	1.2	4775	480	6.2
8	5	90	0.030	14.4	1.6	3580	535	12.3
10	5	90	0.035	18.0	2.0	2865	500	18.0
12	5	90	0.045	21.6	2.4	2385	535	27.7
16	5	90	0.050	28.8	3.2	1790	450	41.5
20	5	90	0.060	36.0	4.0	1430	430	61.9

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



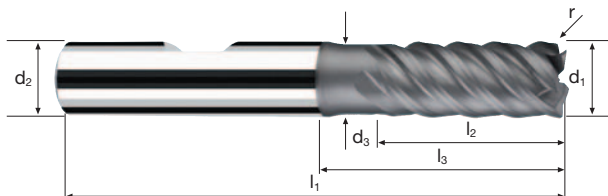
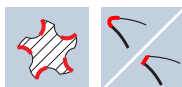
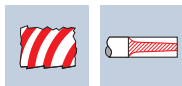
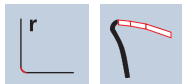
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	5	85	0.020	10.8	1.2	4510	450	5.8
8	5	85	0.025	14.4	1.6	3380	425	9.8
10	5	85	0.035	18.0	2.0	2705	475	17.1
12	5	85	0.040	21.6	2.4	2255	450	23.3
16	5	85	0.045	28.8	3.2	1690	380	35.0
20	5	85	0.055	36.0	4.0	1355	375	54.0

Frese cilindriche ZX-NV5

A taglienti lisci, esecuzione normale con scarico corto



HM X10 λ **40°**
 γ **5°**



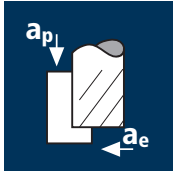







Sgrossatura











Finitura



Esempio: N° Ordine	Rivestimento			Articolo			Codice-Ø			POLYCHROM	
	P	8805	.300							P8805	P8705
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r	z			
.300	6	6	5.5	57	13	20	0.15	5			●
.391	8	8	7.4	63	19	26	0.15	5			●
.450	10	10	9.2	72	22	31	0.20	5			●
.501	12	12	11.0	83	26	37	0.20	5			●
.610	16	16	15.0	92	32	43	0.30	5			●
.682	20	20	19.0	104	38	53	0.30	5			●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	5	4	90	0.040	7.5	0.7	5730	915	5.0
		6	4	90	0.050	9.0	0.9	4775	955	7.5
		8	4	90	0.065	12.0	1.2	3580	930	13.5
		10	4	90	0.085	15.0	1.5	2865	975	22.0
		12	4	90	0.100	18.0	1.8	2385	955	31.0
		16	4	90	0.135	24.0	2.4	1790	965	55.5
Acciaio da utensile temprato 48 - 52 HRC 	Acciaio da utensile temprato 48 - 52 HRC 	5	4	70	0.030	7.5	0.7	4455	535	3.0
		6	4	70	0.035	9.0	0.9	3715	520	4.0
		8	4	70	0.045	12.0	1.2	2785	500	7.0
		10	4	70	0.055	15.0	1.5	2230	490	11.0
		12	4	70	0.065	18.0	1.8	1855	480	15.5
		16	4	70	0.090	24.0	2.4	1395	500	29.0
Acciaio da utensile temprato 52 - 56 HRC 	Acciaio da utensile temprato 52 - 56 HRC 	5	4	50	0.025	7.5	0.7	3185	320	1.5
		6	4	50	0.025	9.0	0.9	2655	265	2.0
		8	4	50	0.035	12.0	1.2	1990	280	4.0
		10	4	50	0.045	15.0	1.5	1590	285	6.5
		12	4	50	0.055	18.0	1.8	1325	290	9.5
		16	4	50	0.075	24.0	2.4	995	300	17.5
Acciaio da utensile temprato 56 - 60 HRC 	Acciaio da utensile temprato 56 - 60 HRC 	5	4	25	0.015	7.5	0.7	1590	95	0.5
		6	4	25	0.020	9.0	0.9	1325	106	1.0
		8	4	25	0.025	12.0	1.2	995	100	1.5
		10	4	25	0.035	15.0	1.5	795	111	2.5
		12	4	25	0.040	18.0	1.8	665	106	3.5
		16	4	25	0.055	24.0	2.4	495	109	6.5

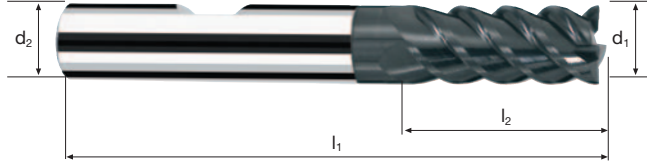
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	5	4	75	0.035	2.5	5	4775	670	8.5
		6	4	75	0.040	3.0	6	3980	635	11.5
		8	4	75	0.055	4.0	8	2985	655	21.0
		10	4	75	0.065	5.0	10	2385	620	31.0
		12	4	75	0.080	6.0	12	1990	635	45.5
		16	4	75	0.105	4.0	16	1490	625	40.0
Acciaio da utensile temprato 48 - 52 HRC 	Acciaio da utensile temprato 48 - 52 HRC 	5	4	60	0.025	2.5	5	3820	380	5.0
		6	4	60	0.030	3.0	6	3185	380	7.0
		8	4	60	0.040	4.0	8	2385	380	12.0
		10	4	60	0.050	5.0	10	1910	380	19.0
		12	4	60	0.060	6.0	12	1590	380	27.5
		16	4	60	0.080	4.0	16	1195	380	24.5
Acciaio da utensile temprato 52 - 56 HRC 	Acciaio da utensile temprato 52 - 56 HRC 	5	4	40	0.020	2.5	5	2545	205	2.5
		6	4	40	0.025	3.0	6	2120	210	4.0
		8	4	40	0.030	4.0	8	1590	190	6.0
		10	4	40	0.040	5.0	10	1275	205	10.5
		12	4	40	0.050	6.0	12	1060	210	15.0
		16	4	40	0.065	4.0	16	795	205	13.0
Acciaio da utensile temprato 56 - 60 HRC 	Acciaio da utensile temprato 56 - 60 HRC 	5	4	20	0.014	2.5	5	1275	71	1.0
		6	4	20	0.017	3.0	6	1060	72	1.5
		8	4	20	0.023	4.0	8	795	73	2.5
		10	4	20	0.029	5.0	10	635	74	3.5
		12	4	20	0.034	6.0	12	530	72	5.0
		16	4	20	0.046	4.0	16	400	74	4.5

Frese cilindriche HX-N

A taglienti lisci, esecuzione normale



HM
MG10 λ **55°**
 γ **-10°**



Sgrossatura



Finitura



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)
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										POLYCHROM		DURO-S	
										P5358		D5358	
										P5258		D5258	
∅ Code	d1 e8	d2 h6		l1	l2	45°	α	z					
.260	5	6		57	13	0.15	2.0°	4	●	●	●	●	
.300	6	6		57	13	0.15	0.0°	4	●	●	●	●	
.391	8	8		63	19	0.15	0.0°	4	●	●	●	●	
.450	10	10		72	22	0.20	0.0°	4	●	●	●	●	
.501	12	12		83	26	0.20	0.0°	4	●	●	●	●	
.610	16	16		92	32	0.20	0.0°	4	●	●	●	●	



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	80	0.015	4.5	1.2	8490	510	3.0
4	4	80	0.020	6.0	1.6	6365	510	5.0
5	4	80	0.025	7.5	2.0	5095	510	7.5
6	4	80	0.025	9.0	2.4	4245	425	9.0
8	4	80	0.035	12.0	3.2	3185	445	17.0
10	4	80	0.045	15.0	4.0	2545	460	27.5
12	4	80	0.050	18.0	4.8	2120	425	36.5
16	4	80	0.075	24.0	3.2	1590	475	36.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	4	70	0.015	4.5	1.2	7425	445	2.5
4	4	70	0.020	6.0	1.6	5570	445	4.5
5	4	70	0.025	7.5	2.0	4455	445	6.5
6	4	70	0.025	9.0	2.4	3715	370	8.0
8	4	70	0.035	12.0	3.2	2785	390	15.0
10	4	70	0.045	15.0	4.0	2230	400	24.0
12	4	70	0.050	18.0	4.8	1855	370	32.0
16	4	70	0.075	24.0	3.2	1395	420	32.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	4	25	0.010	4.5	1.2	2655	105	0.5
4	4	25	0.015	6.0	1.6	1990	120	1.0
5	4	25	0.020	7.5	2.0	1590	125	2.0
6	4	25	0.020	9.0	2.4	1325	105	2.5
8	4	25	0.030	12.0	3.2	995	120	4.5
10	4	25	0.035	15.0	4.0	795	110	6.5
12	4	25	0.040	18.0	4.8	665	105	9.0
16	4	25	0.060	24.0	3.2	495	120	9.0

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

3	4	15	0.010	4.5	1.2	1590	65	0.5
4	4	15	0.015	6.0	1.6	1195	70	0.5
5	4	15	0.020	7.5	2.0	955	75	1.0
6	4	15	0.020	9.0	2.4	795	65	1.5
8	4	15	0.030	12.0	3.2	595	70	2.5
10	4	15	0.035	15.0	4.0	475	65	4.0
12	4	15	0.040	18.0	4.8	400	65	5.5
16	4	15	0.060	24.0	3.2	300	70	5.5



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	60	0.015	1.5	3	6365	380	1.5
4	4	60	0.020	2.0	4	4775	380	3.0
5	4	60	0.025	2.5	5	3820	380	5.0
6	4	60	0.030	3.0	6	3185	380	7.0
8	4	60	0.040	4.0	8	2385	380	12.0
10	4	60	0.055	5.0	10	1910	420	21.0
12	4	60	0.055	6.0	12	1590	350	25.0
16	4	60	0.085	4.0	16	1195	405	26.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	4	55	0.015	1.5	3	5835	350	1.5
4	4	55	0.020	2.0	4	4375	350	3.0
5	4	55	0.025	2.5	5	3500	350	4.5
6	4	55	0.030	3.0	6	2920	350	6.5
8	4	55	0.040	4.0	8	2190	350	11.0
10	4	55	0.055	5.0	10	1750	385	19.5
12	4	55	0.055	6.0	12	1460	320	23.0
16	4	55	0.085	4.0	16	1095	370	23.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	4	20	0.015	1.5	3	2120	125	0.5
4	4	20	0.020	2.0	4	1590	125	1.0
5	4	20	0.025	2.5	5	1275	130	1.5
6	4	20	0.025	3.0	6	1060	105	2.0
8	4	20	0.035	4.0	8	795	110	3.5
10	4	20	0.045	5.0	10	635	115	6.0
12	4	20	0.050	6.0	12	530	105	7.5
16	4	20	0.075	4.0	16	400	120	7.5

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

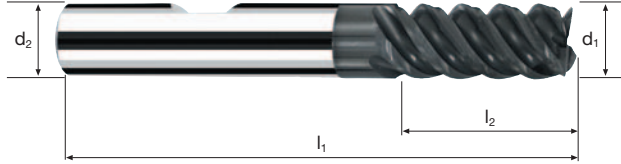
3	4	10	0.015	1.5	3	1060	65	0.5
4	4	10	0.020	2.0	4	795	65	0.5
5	4	10	0.025	2.5	5	635	65	1.0
6	4	10	0.025	3.0	6	530	55	1.0
8	4	10	0.035	4.0	8	400	55	2.0
10	4	10	0.045	5.0	10	320	60	3.0
12	4	10	0.050	6.0	12	265	55	4.0
16	4	10	0.075	4.0	16	200	60	4.0

Frese cilindriche SX-N

A taglienti lisci, esecuzione normale



HM
MG10 λ **55°**
 γ **15°**



Sgrossatura



Finitura



Rm
< 850

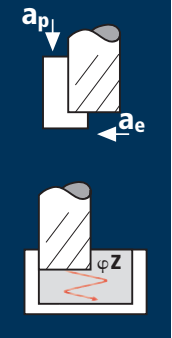
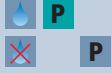



Rm
850-1100

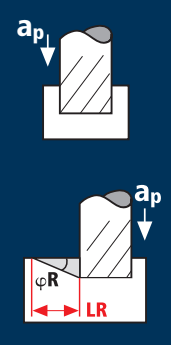




Inox
Stainless

Ti
Titanium

Nickel-Alloys
Tool Steel

Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø					POLYCHROM	
	P	5314	.180							P5314	P5214
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z				
.180	3	6	57	8	0.10	6.0°	4				●
.220	4	6	57	11	0.10	4.0°	4				●
.260	5	6	57	13	0.15	2.0°	4				●
.300	6	6	57	13	0.15	0.0°	4				●
.391	8	8	63	19	0.15	0.0°	4				●
.450	10	10	72	22	0.20	0.0°	4				●
.501	12	12	83	26	0.20	0.0°	4				●
.610	16	16	92	32	0.20	0.0°	4				●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f / v _{fZ} [mm/min]	Q [cm ² /min]	φZ [°]	φA [°]		
	Acciaio < 850 N/mm ² 	4	4	180	0.035	6.0	1.6	14325	2005	19.0	20°	Vedere pagina 927		
		5	4	180	0.040	7.5	2.0	11460	1835	27.5	20°			
		6	4	180	0.050	9.0	2.4	9550	1910	41.5	20°			
		8	4	180	0.060	12.0	3.2	7160	1720	66.0	20°			
		10	4	180	0.075	15.0	4.0	5730	1720	103.0	20°			
		12	4	180	0.085	18.0	4.8	4775	1625	140.5	20°			
		16	4	180	0.095	24.0	6.4	3580	1360	209.0	20°			
		20	4	180	0.110	30.0	8.0	2865	1260	302.5	20°			
		Acciaio 850 - 1100 N/mm ² 	4	4	150	0.030	6.0	1.6	11935	1430	13.5		18°	Vedere pagina 927
			5	4	150	0.035	7.5	2.0	9550	1335	20.0		18°	
	6		4	150	0.040	9.0	2.4	7960	1275	27.5	18°			
	8		4	150	0.050	12.0	3.2	5970	1195	46.0	18°			
	10		4	150	0.065	15.0	4.0	4775	1240	74.5	18°			
	12		4	150	0.075	18.0	4.8	3980	1195	103.0	18°			
	16		4	150	0.085	24.0	6.4	2985	1015	156.0	18°			
	20		4	150	0.100	30.0	8.0	2385	955	229.0	18°			
	Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379] 		4	4	70	0.030	6.0	1.6	5570	670	6.5	12°	Vedere pagina 927	
			5	4	70	0.035	7.5	2.0	4455	625	9.5	12°		
		6	4	70	0.040	9.0	2.4	3715	595	13.0	12°			
		8	4	70	0.050	12.0	3.2	2785	555	21.5	12°			
10		4	70	0.060	15.0	4.0	2230	535	32.0	12°				
12		4	70	0.075	18.0	4.8	1855	555	48.0	12°				
16		4	70	0.085	24.0	6.4	1395	475	73.0	12°				
20		4	70	0.095	30.0	8.0	1115	425	102.0	12°				
Acciaio inossidabile [Cr-Ni/1.4301] 		4	4	90	0.020	6.0	1.6	7160	575	5.5	12°	Vedere pagina 927		
		5	4	90	0.025	7.5	2.0	5730	575	8.5	12°			
	6	4	90	0.030	9.0	2.4	4775	575	12.5	12°				
	8	4	90	0.035	12.0	3.2	3580	500	19.0	12°				
	10	4	90	0.045	15.0	4.0	2865	515	31.0	12°				
	12	4	90	0.055	18.0	4.8	2385	525	45.5	12°				
	16	4	90	0.065	24.0	6.4	1790	465	71.5	12°				
	20	4	90	0.080	30.0	8.0	1430	460	110.5	12°				

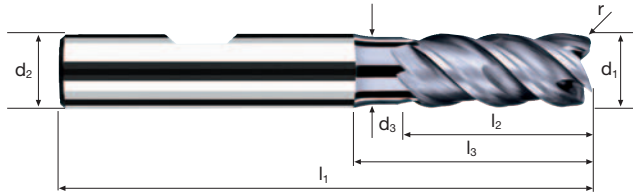
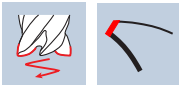
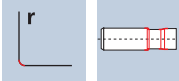
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f / v _{fR} [mm/min]	Q [cm ² /min]	φR [°]	LR [mm]	
	Acciaio < 850 N/mm ² 	4	4	145	0.025	5.0	4	11540	1155	23.0	32°	8.0	
		5	4	145	0.030	6.3	5	9230	1110	34.5	32°	10.4	
		6	4	145	0.040	7.5	6	7695	1230	55.5	32°	12.0	
		8	4	145	0.045	10.0	8	5770	1040	83.0	32°	16.0	
		10	4	145	0.055	12.5	10	4615	1015	127.0	32°	20.0	
		12	4	145	0.065	15.0	12	3845	1000	180.0	32°	24.0	
		16	4	145	0.070	20.0	16	2885	810	259.0	32°	32.0	
		20	4	145	0.085	25.0	20	2310	785	392.5	32°	40.0	
		Acciaio 850 - 1100 N/mm ² 	4	4	120	0.020	5.0	4	9550	765	15.5	29°	9.0
			5	4	120	0.025	6.3	5	7640	765	24.0	29°	11.7
	6		4	120	0.030	7.5	6	6365	765	34.5	29°	13.5	
	8		4	120	0.040	10.0	8	4775	765	61.0	29°	18.0	
	10		4	120	0.050	12.5	10	3820	765	95.5	29°	22.6	
	12		4	120	0.055	15.0	12	3185	700	126.0	29°	27.1	
	16		4	120	0.065	20.0	16	2385	620	198.5	29°	36.1	
	20		4	120	0.075	25.0	20	1910	575	287.5	29°	45.1	
	Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379] 		4	4	55	0.025	5.0	4	4375	440	9.0	19°	14.5
			5	4	55	0.025	6.3	5	3500	350	11.0	19°	18.9
		6	4	55	0.030	7.5	6	2920	350	16.0	19°	21.8	
		8	4	55	0.040	10.0	8	2190	350	28.0	19°	29.0	
10		4	55	0.045	12.5	10	1750	315	39.5	19°	36.3		
12		4	55	0.055	15.0	12	1460	320	57.5	19°	43.6		
16		4	55	0.065	20.0	16	1095	285	91.0	19°	58.1		
20		4	55	0.070	25.0	20	875	245	122.5	19°	72.6		
Acciaio inossidabile [Cr-Ni/1.4301] 		4	4	70	0.015	5.0	4	5570	335	6.5	14°	20.1	
		5	4	70	0.020	6.3	5	4455	355	11.0	14°	26.1	
	6	4	70	0.025	7.5	6	3715	370	16.5	14°	30.1		
	8	4	70	0.025	10.0	8	2785	280	22.5	14°	40.1		
	10	4	70	0.035	12.5	10	2230	310	39.0	14°	50.1		
	12	4	70	0.040	15.0	12	1855	295	53.0	14°	60.2		
	16	4	70	0.050	20.0	16	1395	280	89.5	14°	80.2		
	20	4	70	0.060	25.0	20	1115	270	135.0	14°	100.3		

Frese cilindriche NB-NVDS

A taglienti lisci, esecuzione normale con scarico corto
Geometria frontale per fresature in penetrazione ad alto rendimento



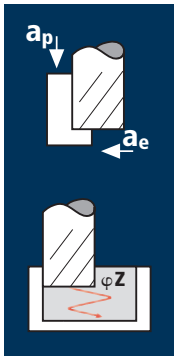
HM
MG10 λ **45°**
 γ **5°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel Alloys
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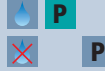
										POLYCHROM	
Esempio: N° Ordine		Rivestimento P	Articolo 8200	Codice-ø .220							P8200
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r	α	z		P8100
.220	4	6	3.7	57	8	16	0.10	3.0°	4		●
.260	5	6	4.6	57	10	18	0.10	1.5°	4		●
.300	6	6	5.5	57	12	20	0.10	0.0°	4		●
.391	8	8	7.4	63	19	26	0.15	0.0°	4		●
.450	10	10	9.2	72	23	31	0.20	0.0°	4		●
.501	12	12	11.0	83	27	37	0.20	0.0°	4		●
.610	16	16	15.0	92	32	43	0.20	0.0°	4		●
.682	20	20	19.0	104	39	53	0.20	0.0°	4		●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Materiale

Ghisa
(grigia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f /v _{fZ} [mm/min]	φ _Z [°]	φ _A [°]
3	4	160	0.010	4.5	0.3	16975	680	16°	Vedere pagina 927
4	4	160	0.015	6.0	0.4	12735	765	16°	
5	4	160	0.015	7.5	0.5	10185	610	16°	
6	4	160	0.020	9.0	0.6	8490	680	16°	
8	4	160	0.025	12.0	0.8	6365	635	16°	
10	4	160	0.035	15.0	1.0	5095	715	16°	
12	4	160	0.040	18.0	1.2	4245	680	16°	
16	4	160	0.055	24.0	1.6	3185	700	16°	
20	4	160	0.065	30.0	2.0	2545	660	16°	

3	4	100	0.010	4.5	0.3	10610	425	15°	Vedere pagina 927
4	4	100	0.015	6.0	0.4	7960	480	15°	
5	4	100	0.015	7.5	0.5	6365	380	15°	
6	4	100	0.020	9.0	0.6	5305	425	15°	
8	4	100	0.025	12.0	0.8	3980	400	15°	
10	4	100	0.035	15.0	1.0	3185	445	15°	
12	4	100	0.040	18.0	1.2	2655	425	15°	
16	4	100	0.055	24.0	1.6	1990	440	15°	
20	4	100	0.065	30.0	2.0	1590	415	15°	

3	4	75	0.010	4.5	0.3	7960	320	9°	Vedere pagina 927
4	4	75	0.015	6.0	0.4	5970	360	9°	
5	4	75	0.015	7.5	0.5	4775	285	9°	
6	4	75	0.020	9.0	0.6	3980	320	9°	
8	4	75	0.025	12.0	0.8	2985	300	9°	
10	4	75	0.035	15.0	1.0	2385	335	9°	
12	4	75	0.040	18.0	1.2	1990	320	9°	
16	4	75	0.055	24.0	1.6	1490	330	9°	
20	4	75	0.065	30.0	2.0	1195	310	9°	

3	4	90	0.010	4.5	0.3	9550	380	9°	Vedere pagina 927
4	4	90	0.015	6.0	0.4	7160	430	9°	
5	4	90	0.015	7.5	0.5	5730	345	9°	
6	4	90	0.020	9.0	0.6	4775	380	9°	
8	4	90	0.025	12.0	0.8	3580	360	9°	
10	4	90	0.035	15.0	1.0	2865	400	9°	
12	4	90	0.040	18.0	1.2	2385	380	9°	
16	4	90	0.055	24.0	1.6	1790	395	9°	
20	4	90	0.065	30.0	2.0	1430	370	9°	

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f /v _{fZ} [mm/min]	φ _Z [°]	φ _A [°]
3	4	120	0.010	4.5	0.3	12735	510	15°	Vedere pagina 927
4	4	120	0.015	6.0	0.4	9550	575	15°	
5	4	120	0.015	7.5	0.5	7640	460	15°	
6	4	120	0.020	9.0	0.6	6365	510	15°	
8	4	120	0.025	12.0	0.8	4775	480	15°	
10	4	120	0.035	15.0	1.0	3820	535	15°	
12	4	120	0.040	18.0	1.2	3185	510	15°	
16	4	120	0.055	24.0	1.6	2385	525	15°	
20	4	120	0.065	30.0	2.0	1910	495	15°	

3	4	230	0.010	4.5	0.3	24405	975	16°	Vedere pagina 927
4	4	230	0.015	6.0	0.4	18305	1100	16°	
5	4	230	0.015	7.5	0.5	14645	880	16°	
6	4	230	0.020	9.0	0.6	12200	975	16°	
8	4	230	0.025	12.0	0.8	9150	915	16°	
10	4	230	0.035	15.0	1.0	7320	1025	16°	
12	4	230	0.040	18.0	1.2	6100	975	16°	
16	4	230	0.055	24.0	1.6	4575	1005	16°	
20	4	230	0.065	30.0	2.0	3660	950	16°	

3	4	95	0.010	4.5	0.3	10080	405	9°	Vedere pagina 927
4	4	95	0.015	6.0	0.4	7560	455	9°	
5	4	95	0.015	7.5	0.5	6050	365	9°	
6	4	95	0.020	9.0	0.6	5040	405	9°	
8	4	95	0.025	12.0	0.8	3780	380	9°	
10	4	95	0.035	15.0	1.0	3025	425	9°	
12	4	95	0.040	18.0	1.2	2520	405	9°	
16	4	95	0.055	24.0	1.6	1890	415	9°	
20	4	95	0.065	30.0	2.0	1510	395	9°	

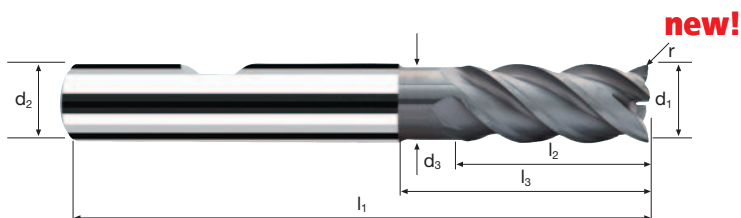
3	4	50	0.010	4.5	0.3	5305	210	7°	Vedere pagina 927
4	4	50	0.015	6.0	0.4	3980	240	7°	
5	4	50	0.015	7.5	0.5	3185	190	7°	
6	4	50	0.020	9.0	0.6	2655	210	7°	
8	4	50	0.025	12.0	0.8	1990	200	7°	
10	4	50	0.035	15.0	1.0	1590	225	7°	
12	4	50	0.040	18.0	1.2	1325	210	7°	
16	4	50	0.055	24.0	1.6	995	220	7°	
20	4	50	0.065	30.0	2.0	795	205	7°	

Frese cilindriche NB-NVS

A taglienti lisci, esecuzione normale con scarico corto
Geometria frontale per fresature in penetrazione ad alto rendimento



HM
MG10 λ 45°
 γ 15°



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Copper Tool Steel
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Esempio: N° Ordine										POLYCHROM	
										P8404	
										P8304	
\emptyset Code	d1 e8	d2 h6	d3	l1	l2	l3	r	α	z		
.140	2.0	6	1.9	57	7	10	0.05	7.0°	4	●	
.160	2.5	6	2.3	57	8	10	0.05	6.5°	4	●	
.178*	3.0	3	2.8	45	8	14	0.05	0.0°	4	●	
.180	3.0	6	2.8	57	8	14	0.05	4.5°	4	●	
.200	3.5	6	3.2	57	8	14	0.05	4.0°	4	●	
.218*	4.0	4	3.7	50	11	16	0.10	0.0°	4	●	
.220	4.0	6	3.7	57	11	16	0.10	3.0°	4	●	
.240	4.5	6	4.1	57	12	16	0.10	2.5°	4	●	
.258*	5.0	5	4.6	50	13	16	0.10	0.0°	4	●	
.260	5.0	6	4.6	57	13	18	0.10	1.5°	4	●	
.280	5.5	6	5.0	57	13	20	0.10	1.0°	4	●	
.300	6.0	6	5.5	57	13	20	0.10	0.0°	4	●	
.331	7.0	8	6.4	63	16	24	0.10	1.5°	4	●	
.391	8.0	8	7.4	63	19	26	0.15	0.0°	4	●	
.420	9.0	10	8.2	72	19	26	0.20	1.5°	4	●	
.450	10.0	10	9.2	72	22	31	0.20	0.0°	4	●	
.501	12.0	12	11.0	83	26	37	0.20	0.0°	4	●	
.610	16.0	16	15.0	92	32	43	0.20	0.0°	4	●	
.682	20.0	20	19.0	104	38	53	0.20	0.0°	4	●	
* solo senza weldon											

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	180	0.035	6.0	1.6	14325	2005	19.0
5	4	180	0.040	7.5	2.0	11460	1835	27.5
6	4	180	0.050	9.0	2.4	9550	1910	41.5
8	4	180	0.060	12.0	3.2	7160	1720	66.0
10	4	180	0.075	15.0	4.0	5730	1720	103.0
12	4	180	0.085	18.0	4.8	4775	1625	140.5
16	4	180	0.095	24.0	6.4	3580	1360	209.0
20	4	180	0.110	30.0	8.0	2865	1260	302.5

Acciaio
850 - 1100 N/mm²

4	4	150	0.030	6.0	1.6	11935	1430	13.5
5	4	150	0.035	7.5	2.0	9550	1335	20.0
6	4	150	0.040	9.0	2.4	7960	1275	27.5
8	4	150	0.050	12.0	3.2	5970	1195	46.0
10	4	150	0.065	15.0	4.0	4775	1240	74.5
12	4	150	0.075	18.0	4.8	3980	1195	103.0
16	4	150	0.085	24.0	6.4	2985	1015	156.0
20	4	150	0.100	30.0	8.0	2385	955	229.0

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

4	4	70	0.030	6.0	1.6	5570	670	6.5
5	4	70	0.035	7.5	2.0	4455	625	9.5
6	4	70	0.040	9.0	2.4	3715	595	13.0
8	4	70	0.050	12.0	3.2	2785	555	21.5
10	4	70	0.060	15.0	4.0	2230	535	32.0
12	4	70	0.075	18.0	4.8	1855	555	48.0
16	4	70	0.085	24.0	6.4	1395	475	73.0
20	4	70	0.095	30.0	8.0	1115	425	102.0

Acciaio inossidabile [Cr-Ni/1.4301]

4	4	90	0.020	6.0	1.6	7160	575	5.5
5	4	90	0.025	7.5	2.0	5730	575	8.5
6	4	90	0.030	9.0	2.4	4775	575	12.5
8	4	90	0.035	12.0	3.2	3580	500	19.0
10	4	90	0.045	15.0	4.0	2865	515	31.0
12	4	90	0.055	18.0	4.8	2385	525	45.5
16	4	90	0.065	24.0	6.4	1790	465	71.5
20	4	90	0.080	30.0	8.0	1430	460	110.5

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	145	0.025	5.0	4	11540	1155	23.0
5	4	145	0.030	6.3	5	9230	1110	34.5
6	4	145	0.040	7.5	6	7695	1230	55.5
8	4	145	0.045	10.0	8	5770	1040	83.0
10	4	145	0.055	12.5	10	4615	1015	127.0
12	4	145	0.065	15.0	12	3845	1000	180.0
16	4	145	0.070	20.0	16	2885	810	259.0
20	4	145	0.085	25.0	20	2310	785	392.5

Acciaio
850 - 1100 N/mm²

4	4	120	0.020	5.0	4	9550	765	15.5
5	4	120	0.025	6.3	5	7640	765	24.0
6	4	120	0.030	7.5	6	6365	765	34.5
8	4	120	0.040	10.0	8	4775	765	61.0
10	4	120	0.050	12.5	10	3820	765	95.5
12	4	120	0.055	15.0	12	3185	700	126.0
16	4	120	0.065	20.0	16	2385	620	198.5
20	4	120	0.075	25.0	20	1910	575	287.5

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

4	4	55	0.025	5.0	4	4375	440	9.0
5	4	55	0.025	6.3	5	3500	350	11.0
6	4	55	0.030	7.5	6	2920	350	16.0
8	4	55	0.040	10.0	8	2190	350	28.0
10	4	55	0.045	12.5	10	1750	315	39.5
12	4	55	0.055	15.0	12	1460	320	57.5
16	4	55	0.065	20.0	16	1095	285	91.0
20	4	55	0.070	25.0	20	875	245	122.5

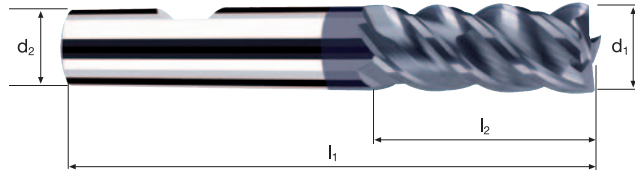
Acciaio inossidabile [Cr-Ni/1.4301]

4	4	70	0.015	5.0	4	5570	335	6.5
5	4	70	0.020	6.3	5	4455	355	11.0
6	4	70	0.025	7.5	6	3715	370	16.5
8	4	70	0.025	10.0	8	2785	280	22.5
10	4	70	0.035	12.5	10	2230	310	39.0
12	4	70	0.040	15.0	12	1855	295	53.0
16	4	70	0.050	20.0	16	1395	280	89.5
20	4	70	0.060	25.0	20	1115	270	135.0

Frese cilindriche NB-NVD

A taglienti lisci, esecuzione normale

**HM
MG10** λ 45°
 γ 5°



Sgrossatura



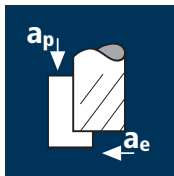
Finitura



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Rm** 1300-1500 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel Nickel Alloys

Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø				POLYCHROM	
		P	15307	.220				P15307	
								P15207	
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.220	4	6	57	8	0.10	4.5°	4		●
.260	5	6	57	10	0.15	2.5°	4		●
.300	6	6	57	12	0.15	0.0°	4		●
.391	8	8	63	19	0.15	0.0°	4		●
.450	10	10	72	23	0.20	0.0°	4		●
.501	12	12	83	27	0.20	0.0°	4		●
.610	16	16	92	32	0.20	0.0°	4		●
.682	20	20	104	39	0.20	0.0°	4		●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

Acciaio inossidabile
[Cr-Ni/1.4301]

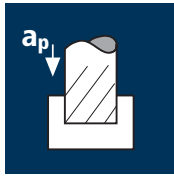
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	190	0.020	4.5	1.2	20160	1615	8.5
4	4	190	0.025	6.0	1.6	15120	1510	14.5
5	4	190	0.035	7.5	2.0	12095	1695	25.5
6	4	190	0.040	9.0	2.4	10080	1615	35.0
8	4	190	0.055	12.0	3.2	7560	1665	64.0
10	4	190	0.070	15.0	4.0	6050	1695	101.5
12	4	190	0.075	18.0	4.8	5040	1510	130.5
16	4	190	0.100	24.0	6.4	3780	1510	232.0
20	4	190	0.130	30.0	8.0	3025	1575	378.0

3	4	140	0.020	4.5	1.2	14855	1190	6.5
4	4	140	0.025	6.0	1.6	11140	1115	10.5
5	4	140	0.035	7.5	2.0	8915	1250	19.0
6	4	140	0.040	9.0	2.4	7425	1190	25.5
8	4	140	0.055	12.0	3.2	5570	1225	47.0
10	4	140	0.070	15.0	4.0	4455	1245	74.5
12	4	140	0.075	18.0	4.8	3715	1115	96.5
16	4	140	0.100	24.0	6.4	2785	1115	171.5
20	4	140	0.130	30.0	8.0	2230	1160	278.5

3	4	70	0.020	4.5	1.2	7425	595	3.0
4	4	70	0.025	6.0	1.6	5570	555	5.5
5	4	70	0.030	7.5	2.0	4455	535	8.0
6	4	70	0.040	9.0	2.4	3715	595	13.0
8	4	70	0.050	12.0	3.2	2785	555	21.5
10	4	70	0.065	15.0	4.0	2230	580	35.0
12	4	70	0.075	18.0	4.8	1855	555	48.0
16	4	70	0.095	24.0	6.4	1395	530	81.5
20	4	70	0.120	30.0	8.0	1115	535	128.5

3	4	90	0.015	4.5	1.2	9550	575	3.0
4	4	90	0.020	6.0	1.6	7160	575	5.5
5	4	90	0.020	7.5	2.0	5730	460	7.0
6	4	90	0.030	9.0	2.4	4775	575	12.5
8	4	90	0.035	12.0	3.2	3580	500	19.0
10	4	90	0.045	15.0	4.0	2865	515	31.0
12	4	90	0.055	18.0	4.8	2385	525	45.5
16	4	90	0.065	24.0	6.4	1790	465	71.5
20	4	90	0.085	30.0	8.0	1430	485	116.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	155	0.015	3	3	16445	985	9.0
4	4	155	0.020	4	4	12335	985	16.0
5	4	155	0.030	5	5	9870	1185	29.5
6	4	155	0.035	6	6	8225	1150	41.5
8	4	155	0.045	8	8	6165	1110	71.0
10	4	155	0.055	10	10	4935	1085	108.5
12	4	155	0.060	12	12	4110	985	142.0
16	4	155	0.075	8	16	3085	925	118.5
20	4	155	0.095	10	20	2465	935	187.0

3	4	105	0.015	3	3	11140	670	6.0
4	4	105	0.020	4	4	8355	670	10.5
5	4	105	0.030	5	5	6685	800	20.0
6	4	105	0.035	6	6	5570	780	28.0
8	4	105	0.045	8	8	4180	750	48.0
10	4	105	0.055	10	10	3340	735	73.5
12	4	105	0.060	12	12	2785	670	96.5
16	4	105	0.075	8	16	2090	625	80.0
20	4	105	0.095	10	20	1670	635	127.0

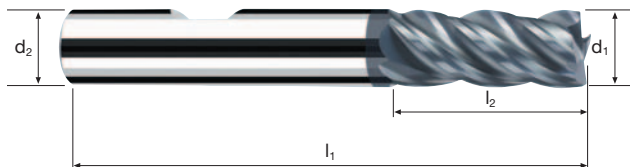
3	4	55	0.015	3	3	5835	350	3.0
4	4	55	0.020	4	4	4375	350	5.5
5	4	55	0.030	5	5	3500	420	10.5
6	4	55	0.035	6	6	2920	410	15.0
8	4	55	0.045	8	8	2190	395	25.5
10	4	55	0.055	10	10	1750	385	38.5
12	4	55	0.060	12	12	1460	350	50.5
16	4	55	0.075	8	16	1095	330	42.0
20	4	55	0.095	10	20	875	335	67.0

3	4	75	0.015	3	3	7960	480	4.5
4	4	75	0.015	4	4	5970	360	6.0
5	4	75	0.025	5	5	4775	480	12.0
6	4	75	0.030	6	6	3980	480	17.5
8	4	75	0.040	8	8	2985	480	30.5
10	4	75	0.045	10	10	2385	430	43.0
12	4	75	0.050	12	12	1990	400	57.5
16	4	75	0.065	8	16	1490	385	49.5
20	4	75	0.080	10	20	1195	380	76.0

Frese cilindriche NB-NV

A taglienti lisci, esecuzione normale

HM
MG10 λ **40°**
 γ **0°**



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300

Rm
1300-1500

Inox
Stainless

Ti
Titanium

GG(G)
Tool Steel
Nickel-Alloys

Esempio: N° Ordine		Rivestimento P	Articolo 5327	Codice-ø .180				POLYCHROM	
								P5327	
								P5227	
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.180	3	6	57	8	0.10	6.0°	4	●	
.220	4	6	57	11	0.10	4.0°	4	●	
.260	5	6	57	13	0.15	2.0°	4	●	
.300	6	6	57	13	0.15	0.0°	4	●	
.391	8	8	63	19	0.15	0.0°	4	●	
.450	10	10	72	22	0.20	0.0°	4	●	
.501	12	12	83	26	0.20	0.0°	4	●	
.610	16	16	92	32	0.20	0.0°	4	●	
.682	20	20	104	38	0.20	0.0°	4	●	



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	105	0.010	5.4	1.4	11140	445	3.0
4	4	105	0.015	7.2	1.8	8355	500	6.5
5	4	105	0.020	9.0	2.3	6685	535	11.0
6	4	105	0.020	10.8	2.7	5570	445	13.0
8	4	105	0.030	14.4	3.6	4180	500	26.0
10	4	105	0.035	18.0	4.5	3340	470	38.0
12	4	105	0.045	21.6	5.4	2785	500	58.5
16	4	105	0.055	28.8	6.4	2090	460	85.0
20	4	105	0.070	36.0	8.0	1670	470	135.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	4	95	0.010	5.4	1.4	10080	405	3.0
4	4	95	0.015	7.2	1.8	7560	455	6.0
5	4	95	0.020	9.0	2.3	6050	485	10.0
6	4	95	0.020	10.8	2.7	5040	405	12.0
8	4	95	0.030	14.4	3.6	3780	455	23.5
10	4	95	0.035	18.0	4.5	3025	425	34.5
12	4	95	0.045	21.6	5.4	2520	455	53.0
16	4	95	0.055	28.8	6.4	1890	415	76.5
20	4	95	0.070	36.0	8.0	1510	425	122.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	4	45	0.010	5.4	1.4	4775	190	1.5
4	4	45	0.010	7.2	1.8	3580	145	2.0
5	4	45	0.015	9.0	2.3	2865	170	3.5
6	4	45	0.015	10.8	2.7	2385	145	4.0
8	4	45	0.020	14.4	3.6	1790	145	7.5
10	4	45	0.025	18.0	4.5	1430	145	11.5
12	4	45	0.030	21.6	5.4	1195	145	17.0
16	4	45	0.040	28.8	6.4	895	145	26.5
20	4	45	0.055	36.0	8.0	715	155	44.5

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

3	4	15	0.008	5.4	1.4	1590	50	0.4
4	4	15	0.010	7.2	1.8	1195	50	0.6
5	4	15	0.014	9.0	2.3	955	55	1.1
6	4	15	0.016	10.8	2.7	795	50	1.5
8	4	15	0.022	14.4	3.6	595	50	2.6
10	4	15	0.026	18.0	4.5	475	50	4.0
12	4	15	0.032	21.6	5.4	400	50	5.8
16	4	15	0.042	28.8	6.4	300	50	9.2
20	4	15	0.052	36.0	8.0	240	50	14.4



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	85	0.010	2.4	3	9020	360	2.5
4	4	85	0.015	3.2	4	6765	405	5.0
5	4	85	0.015	4.0	5	5410	325	6.5
6	4	85	0.020	4.8	6	4510	360	10.5
8	4	85	0.025	6.4	8	3380	340	17.5
10	4	85	0.030	8.0	10	2705	325	26.0
12	4	85	0.040	9.6	12	2255	360	41.5
16	4	85	0.050	12.8	16	1690	340	69.5
20	4	85	0.065	16.0	20	1355	350	112.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	4	75	0.010	2.4	3	7960	320	2.5
4	4	75	0.015	3.2	4	5970	360	4.5
5	4	75	0.015	4.0	5	4775	285	5.5
6	4	75	0.020	4.8	6	3980	320	9.0
8	4	75	0.025	6.4	8	2985	300	15.5
10	4	75	0.030	8.0	10	2385	285	23.0
12	4	75	0.040	9.6	12	1990	320	37.0
16	4	75	0.050	12.8	16	1490	300	61.5
20	4	75	0.065	16.0	20	1195	310	99.0

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	4	35	0.005	2.4	3	3715	75	0.5
4	4	35	0.010	3.2	4	2785	110	1.5
5	4	35	0.010	4.0	5	2230	90	2.0
6	4	35	0.015	4.8	6	1855	110	3.0
8	4	35	0.020	6.4	8	1395	110	5.5
10	4	35	0.025	8.0	10	1115	110	9.0
12	4	35	0.030	9.6	12	930	110	12.5
16	4	35	0.040	12.8	16	695	110	22.5
20	4	35	0.045	16.0	20	555	100	32.0

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

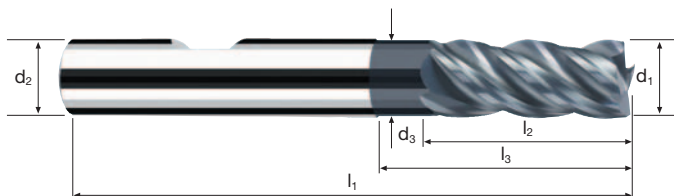
3	4	10	0.005	2.4	3	1060	20	0.1
4	4	10	0.010	3.2	4	795	30	0.4
5	4	10	0.010	4.0	5	635	25	0.5
6	4	10	0.015	4.8	6	530	30	0.9
8	4	10	0.020	6.4	8	400	30	1.5
10	4	10	0.025	8.0	10	320	30	2.4
12	4	10	0.030	9.6	12	265	30	3.5
16	4	10	0.040	12.8	16	200	30	6.1
20	4	10	0.045	16.0	20	160	30	9.6

Frese cilindriche NB-NV

A taglienti lisci, esecuzione normale con scarico corto



HM
MG10 λ **40°**
 γ **10°**



Rm < 850	Rm 850-1100	Rm 1100-1300							Inox Stainless	Ti Titanium	Nickel-Alloys Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 15327	Codice-Ø .180								POLYCHROM	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z				
.180	3	6	2.8	57	8	14	0.10	4.5°	4	●			
.220	4	6	3.7	57	11	16	0.10	3.0°	4	●			
.260	5	6	4.6	57	13	18	0.15	1.5°	4	●			
.300	6	6	5.5	57	13	20	0.15	0.0°	4	●			
.391	8	8	7.4	63	19	26	0.15	0.0°	4	●			
.450	10	10	9.2	72	22	31	0.20	0.0°	4	●			
.501	12	12	11.0	83	26	37	0.20	0.0°	4	●			
.610	16	16	15.0	92	32	43	0.20	0.0°	4	●			
.682	20	20	19.0	104	38	53	0.20	0.0°	4	●			



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	205	0.020	4.5	1.2	21750	1740	9.5
4	4	205	0.025	6.0	1.6	16315	1630	15.5
5	4	205	0.035	7.5	2.0	13050	1825	27.5
6	4	205	0.040	9.0	2.4	10875	1740	37.5
8	4	205	0.055	12.0	3.2	8155	1795	69.0
10	4	205	0.070	15.0	4.0	6525	1825	109.5
12	4	205	0.075	18.0	4.8	5440	1630	141.0
16	4	205	0.100	24.0	6.4	4080	1630	250.5
20	4	205	0.130	30.0	8.0	3265	1700	408.0

Acciaio
850 - 1100 N/mm²

3	4	140	0.020	4.5	1.2	14855	1190	6.5
4	4	140	0.025	6.0	1.6	11140	1115	10.5
5	4	140	0.035	7.5	2.0	8915	1250	19.0
6	4	140	0.040	9.0	2.4	7425	1190	25.5
8	4	140	0.055	12.0	3.2	5570	1225	47.0
10	4	140	0.070	15.0	4.0	4455	1245	74.5
12	4	140	0.075	18.0	4.8	3715	1115	96.5
16	4	140	0.100	24.0	6.4	2785	1115	171.5
20	4	140	0.130	30.0	8.0	2230	1160	278.5

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

3	4	70	0.020	4.5	1.2	7425	595	3.0
4	4	70	0.025	6.0	1.6	5570	555	5.5
5	4	70	0.030	7.5	2.0	4455	535	8.0
6	4	70	0.040	9.0	2.4	3715	595	13.0
8	4	70	0.050	12.0	3.2	2785	555	21.5
10	4	70	0.065	15.0	4.0	2230	580	35.0
12	4	70	0.075	18.0	4.8	1855	555	48.0
16	4	70	0.095	24.0	6.4	1395	530	81.5
20	4	70	0.120	30.0	8.0	1115	535	128.5

Acciaio inossidabile
[Cr-Ni/1.4301]

3	4	90	0.015	4.5	1.2	9550	575	3.0
4	4	90	0.020	6.0	1.6	7160	575	5.5
5	4	90	0.020	7.5	2.0	5730	460	7.0
6	4	90	0.030	9.0	2.4	4775	575	12.5
8	4	90	0.035	12.0	3.2	3580	500	19.0
10	4	90	0.045	15.0	4.0	2865	515	31.0
12	4	90	0.055	18.0	4.8	2385	525	45.5
16	4	90	0.065	24.0	6.4	1790	465	71.5
20	4	90	0.085	30.0	8.0	1430	485	116.5



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	170	0.015	3	3	18040	1080	9.5
4	4	170	0.020	4	4	13530	1080	17.5
5	4	170	0.030	5	5	10825	1300	32.5
6	4	170	0.035	6	6	9020	1265	45.5
8	4	170	0.045	8	8	6765	1220	78.0
10	4	170	0.055	10	10	5410	1190	119.0
12	4	170	0.060	12	12	4510	1080	155.5
16	4	170	0.075	8	16	3380	1015	130.0
20	4	170	0.095	10	20	2705	1030	206.0

Acciaio
850 - 1100 N/mm²

3	4	105	0.015	3	3	11140	670	6.0
4	4	105	0.020	4	4	8355	670	10.5
5	4	105	0.030	5	5	6685	800	20.0
6	4	105	0.035	6	6	5570	780	28.0
8	4	105	0.045	8	8	4180	750	48.0
10	4	105	0.055	10	10	3340	735	73.5
12	4	105	0.060	12	12	2785	670	96.5
16	4	105	0.075	8	16	2090	625	80.0
20	4	105	0.095	10	20	1670	635	127.0

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

3	4	55	0.015	3	3	5835	350	3.0
4	4	55	0.020	4	4	4375	350	5.5
5	4	55	0.030	5	5	3500	420	10.5
6	4	55	0.035	6	6	2920	410	15.0
8	4	55	0.045	8	8	2190	395	25.5
10	4	55	0.055	10	10	1750	385	38.5
12	4	55	0.060	12	12	1460	350	50.5
16	4	55	0.075	8	16	1095	330	42.0
20	4	55	0.095	10	20	875	335	67.0

Acciaio inossidabile
[Cr-Ni/1.4301]

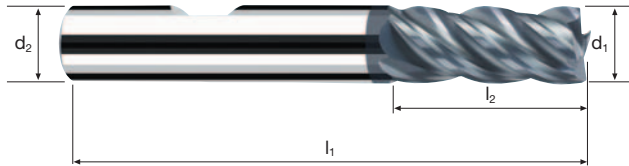
3	4	70	0.010	3	3	7425	295	2.5
4	4	70	0.015	4	4	5570	335	5.5
5	4	70	0.025	5	5	4455	445	11.0
6	4	70	0.030	6	6	3715	445	16.0
8	4	70	0.035	8	8	2785	390	25.0
10	4	70	0.045	10	10	2230	400	40.0
12	4	70	0.050	12	12	1855	370	53.5
16	4	70	0.060	8	16	1395	335	43.0
20	4	70	0.075	10	20	1115	335	67.0

Frese cilindriche NB-NV

A taglienti lisci, esecuzione normale



HM
MG10 λ **40°**
 γ **0°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys
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Esempio: N° Ordine		Rivestimento P	Articolo 15305	Codice- ϕ .180				POLYCHROM	
ϕ Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.180	3	6	57	8	0.10	6.0°	4	●	
.220	4	6	57	11	0.10	4.0°	4	●	
.260	5	6	57	13	0.15	2.0°	4	●	
.300	6	6	57	13	0.15	0.0°	4	●	
.391	8	8	63	19	0.15	0.0°	4	●	
.450	10	10	72	22	0.20	0.0°	4	●	
.501	12	12	83	26	0.20	0.0°	4	●	
.610	16	16	92	32	0.20	0.0°	4	●	
.682	20	20	104	38	0.20	0.0°	4	●	



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	215	0.030	9.0	2.1	11405	1370	26.0
8	4	215	0.040	12.0	2.8	8555	1370	46.0
10	4	215	0.050	15.0	3.5	6845	1370	72.0
12	4	215	0.055	18.0	4.2	5705	1255	95.0
16	4	215	0.070	24.0	5.6	4275	1195	160.5
20	4	215	0.090	30.0	7.0	3420	1230	258.5

Acciaio
850 - 1100 N/mm²

6	4	150	0.030	9.0	2.1	7960	955	18.0
8	4	150	0.040	12.0	2.8	5970	955	32.0
10	4	150	0.050	15.0	3.5	4775	955	50.0
12	4	150	0.055	18.0	4.2	3980	875	66.0
16	4	150	0.070	24.0	5.6	2985	835	112.0
20	4	150	0.090	30.0	7.0	2385	860	180.5

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

6	4	80	0.030	9.0	2.1	4245	510	9.5
8	4	80	0.035	12.0	2.8	3185	445	15.0
10	4	80	0.045	15.0	3.5	2545	460	24.0
12	4	80	0.055	18.0	4.2	2120	465	35.0
16	4	80	0.065	24.0	5.6	1590	415	56.0
20	4	80	0.085	30.0	7.0	1275	435	91.5

Acciaio inossidabile [Cr-Ni/1.4301]

6	4	105	0.020	9.0	2.1	5570	445	8.5
8	4	105	0.025	12.0	2.8	4180	420	14.0
10	4	105	0.030	15.0	3.5	3340	400	21.0
12	4	105	0.040	18.0	4.2	2785	445	33.5
16	4	105	0.045	24.0	5.6	2090	375	50.5
20	4	105	0.060	30.0	7.0	1670	400	84.0



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	180	0.025	5.4	6	9550	955	31.0
8	4	180	0.030	7.2	8	7160	860	49.5
10	4	180	0.040	9.0	10	5730	915	82.5
12	4	180	0.040	10.8	12	4775	765	99.0
16	4	180	0.055	14.4	16	3580	790	182.0
20	4	180	0.065	10.0	20	2865	745	149.0

Acciaio
850 - 1100 N/mm²

6	4	115	0.025	5.4	6	6100	610	20.0
8	4	115	0.030	7.2	8	4575	550	31.5
10	4	115	0.040	9.0	10	3660	585	52.5
12	4	115	0.040	10.8	12	3050	490	63.5
16	4	115	0.055	14.4	16	2290	505	116.5
20	4	115	0.065	10.0	20	1830	475	95.0

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

6	4	65	0.025	5.4	6	3450	345	11.0
8	4	65	0.030	7.2	8	2585	310	18.0
10	4	65	0.040	9.0	10	2070	330	29.5
12	4	65	0.040	10.8	12	1725	275	35.5
16	4	65	0.055	14.4	16	1295	285	65.5
20	4	65	0.065	10.0	20	1035	270	54.0

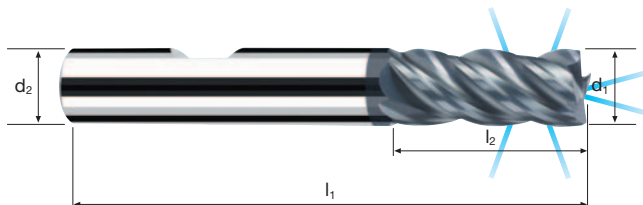
Acciaio inossidabile [Cr-Ni/1.4301]

6	4	85	0.020	5.4	6	4510	360	11.5
8	4	85	0.025	7.2	8	3380	340	19.5
10	4	85	0.030	9.0	10	2705	325	29.5
12	4	85	0.035	10.8	12	2255	315	41.0
16	4	85	0.040	14.4	16	1690	270	62.0
20	4	85	0.055	10.0	20	1355	300	60.0

Frese cilindriche NB-NV

A taglienti lisci, versione normale, con canale di aerazione/raffreddamento integrato

HM MG10 λ **40°**
 γ **0°**



Sgrossatura



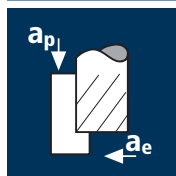
Finitura



Rm < 850 Rm 850-1100 Rm 1100-1300 Rm 1300-1500 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel Nickel-Alloys

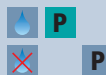
Esempio: N° Ordine							POLYCHROM	
		Rivestimento	Articolo	Codice-ø				
		P	15300	.300				
ø Code	d1 e8	d2 h6	l1	l2	45°	z		
.300	6	6	57	13	0.15	4	●	
.391	8	8	63	19	0.15	4	●	
.450	10	10	72	22	0.20	4	●	
.501	12	12	83	26	0.20	4	●	
.610	16	16	92	32	0.20	4	●	
.682	20	20	104	38	0.20	4	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	160	0.010	4.5	0.3	16975	680
4	4	160	0.015	6.0	0.4	12735	765
5	4	160	0.015	7.5	0.5	10185	610
6	4	160	0.020	9.0	0.6	8490	680
8	4	160	0.025	12.0	0.8	6365	635
10	4	160	0.035	15.0	1.0	5095	715
12	4	160	0.040	18.0	1.2	4245	680
16	4	160	0.055	24.0	1.6	3185	700
20	4	160	0.065	30.0	2.0	2545	660
3	4	100	0.010	4.5	0.3	10610	425
4	4	100	0.015	6.0	0.4	7960	480
5	4	100	0.015	7.5	0.5	6365	380
6	4	100	0.020	9.0	0.6	5305	425
8	4	100	0.025	12.0	0.8	3980	400
10	4	100	0.035	15.0	1.0	3185	445
12	4	100	0.040	18.0	1.2	2655	425
16	4	100	0.055	24.0	1.6	1990	440
20	4	100	0.065	30.0	2.0	1590	415
3	4	75	0.010	4.5	0.3	7960	320
4	4	75	0.015	6.0	0.4	5970	360
5	4	75	0.015	7.5	0.5	4775	285
6	4	75	0.020	9.0	0.6	3980	320
8	4	75	0.025	12.0	0.8	2985	300
10	4	75	0.035	15.0	1.0	2385	335
12	4	75	0.040	18.0	1.2	1990	320
16	4	75	0.055	24.0	1.6	1490	330
20	4	75	0.065	30.0	2.0	1195	310
3	4	90	0.010	4.5	0.3	9550	380
4	4	90	0.015	6.0	0.4	7160	430
5	4	90	0.015	7.5	0.5	5730	345
6	4	90	0.020	9.0	0.6	4775	380
8	4	90	0.025	12.0	0.8	3580	360
10	4	90	0.035	15.0	1.0	2865	400
12	4	90	0.040	18.0	1.2	2385	380
16	4	90	0.055	24.0	1.6	1790	395
20	4	90	0.065	30.0	2.0	1430	370

Materiale

Ghisa
(grigia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]

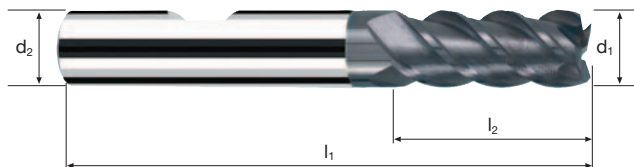


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	120	0.010	4.5	0.3	12735	510
4	4	120	0.015	6.0	0.4	9550	575
5	4	120	0.015	7.5	0.5	7640	460
6	4	120	0.020	9.0	0.6	6365	510
8	4	120	0.025	12.0	0.8	4775	480
10	4	120	0.035	15.0	1.0	3820	535
12	4	120	0.040	18.0	1.2	3185	510
16	4	120	0.055	24.0	1.6	2385	525
20	4	120	0.065	30.0	2.0	1910	495
3	4	230	0.010	4.5	0.3	24405	975
4	4	230	0.015	6.0	0.4	18305	1100
5	4	230	0.015	7.5	0.5	14645	880
6	4	230	0.020	9.0	0.6	12200	975
8	4	230	0.025	12.0	0.8	9150	915
10	4	230	0.035	15.0	1.0	7320	1025
12	4	230	0.040	18.0	1.2	6100	975
16	4	230	0.055	24.0	1.6	4575	1005
20	4	230	0.065	30.0	2.0	3660	950
3	4	95	0.010	4.5	0.3	10080	405
4	4	95	0.015	6.0	0.4	7560	455
5	4	95	0.015	7.5	0.5	6050	365
6	4	95	0.020	9.0	0.6	5040	405
8	4	95	0.025	12.0	0.8	3780	380
10	4	95	0.035	15.0	1.0	3025	425
12	4	95	0.040	18.0	1.2	2520	405
16	4	95	0.055	24.0	1.6	1890	415
20	4	95	0.065	30.0	2.0	1510	395
3	4	50	0.010	4.5	0.3	5305	210
4	4	50	0.015	6.0	0.4	3980	240
5	4	50	0.015	7.5	0.5	3185	190
6	4	50	0.020	9.0	0.6	2655	210
8	4	50	0.025	12.0	0.8	1990	200
10	4	50	0.035	15.0	1.0	1590	225
12	4	50	0.040	18.0	1.2	1325	210
16	4	50	0.055	24.0	1.6	995	220
20	4	50	0.065	30.0	2.0	795	205

Frese cilindriche

A taglienti lisci, esecuzione normale

HM
MG10 λ **45°**
 γ **15°**



Sgrossatura



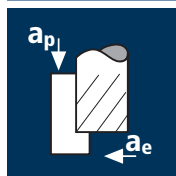
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Copper
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Esempio: N° Ordine		Rivestimento P	Articolo 5340	Codice-ø .140				POLYCHROM	
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.140	2.0	6	54	7	0.10	7.5°	4		●
.160	2.5	6	54	8	0.10	6.5°	4		●
.178*	3.0	3	45	8	0.10	0.0°	4		●
.180	3.0	6	57	8	0.10	6.0°	4		●
.218*	4.0	4	50	11	0.10	0.0°	4		●
.220	4.0	6	57	11	0.10	3.5°	4		●
.258*	5.0	5	50	13	0.15	0.0°	4		●
.260	5.0	6	57	13	0.15	2.0°	4		●
.300	6.0	6	57	13	0.15	0.0°	4		●
.331	7.0	8	63	16	0.15	1.5°	4		●
.391	8.0	8	63	19	0.15	0.0°	4		●
.420	9.0	10	72	19	0.20	1.5°	4		●
.450	10.0	10	72	22	0.20	0.0°	4		●
.501	12.0	12	83	26	0.20	0.0°	4		●
.570	14.0	14	83	26	0.20	0.0°	4		●
.610	16.0	16	92	32	0.20	0.0°	4		●
.640	18.0	18	92	32	0.20	0.0°	4		●
.682	20.0	20	104	38	0.20	0.0°	4		●
* solo senza weldon									

Applicazione

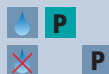


Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
4	4	160	0.015	6.0	1.0	12735	765
6	4	160	0.020	9.0	1.5	8490	680
8	4	160	0.025	12.0	2.0	6365	635
10	4	160	0.035	15.0	2.5	5095	715
12	4	160	0.040	18.0	3.0	4245	680
14	4	160	0.045	21.0	3.5	3640	655
16	4	160	0.055	24.0	4.0	3185	700
18	4	160	0.060	27.0	4.5	2830	680
20	4	160	0.065	30.0	5.0	2545	660
4	4	100	0.015	6.0	1.0	7960	480
6	4	100	0.020	9.0	1.5	5305	425
8	4	100	0.025	12.0	2.0	3980	400
10	4	100	0.035	15.0	2.5	3185	445
12	4	100	0.040	18.0	3.0	2655	425
14	4	100	0.045	21.0	3.5	2275	410
16	4	100	0.055	24.0	4.0	1990	440
18	4	100	0.060	27.0	4.5	1770	425
20	4	100	0.065	30.0	5.0	1590	415
4	4	75	0.015	6.0	0.4	5970	360
6	4	75	0.020	9.0	0.6	3980	320
8	4	75	0.025	12.0	0.8	2985	300
10	4	75	0.035	15.0	1.0	2385	335
12	4	75	0.040	18.0	1.2	1990	320
14	4	75	0.045	21.0	1.4	1705	305
16	4	75	0.055	24.0	1.6	1490	330
18	4	75	0.060	27.0	1.8	1325	320
20	4	75	0.065	30.0	2.0	1195	310
4	4	90	0.015	6.0	1.0	7160	430
6	4	90	0.020	9.0	1.5	4775	380
8	4	90	0.025	12.0	2.0	3580	360
10	4	90	0.035	15.0	2.5	2865	400
12	4	90	0.040	18.0	3.0	2385	380
14	4	90	0.045	21.0	3.5	2045	370
16	4	90	0.055	24.0	4.0	1790	395
18	4	90	0.060	27.0	4.5	1590	380
20	4	90	0.065	30.0	5.0	1430	370

Materiale

Ghisa
(grigia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]

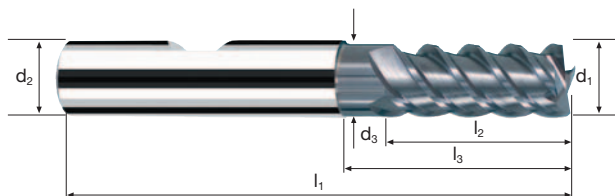


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
4	4	120	0.015	6.0	1.0	9550	575
6	4	120	0.020	9.0	1.5	6365	510
8	4	120	0.025	12.0	2.0	4775	480
10	4	120	0.035	15.0	2.5	3820	535
12	4	120	0.040	18.0	3.0	3185	510
14	4	120	0.045	21.0	3.5	2730	490
16	4	120	0.055	24.0	4.0	2385	525
18	4	120	0.060	27.0	4.5	2120	510
20	4	120	0.065	30.0	5.0	1910	495
4	4	230	0.015	6.0	1.0	18305	1100
6	4	230	0.020	9.0	1.5	12200	975
8	4	230	0.025	12.0	2.0	9150	915
10	4	230	0.035	15.0	2.5	7320	1025
12	4	230	0.040	18.0	3.0	6100	975
14	4	230	0.045	21.0	3.5	5230	940
16	4	230	0.055	24.0	4.0	4575	1005
18	4	230	0.060	27.0	4.5	4065	975
20	4	230	0.065	30.0	5.0	3660	950
4	4	95	0.015	6.0	1.0	7560	455
6	4	95	0.020	9.0	1.5	5040	405
8	4	95	0.025	12.0	2.0	3780	380
10	4	95	0.035	15.0	2.5	3025	425
12	4	95	0.040	18.0	3.0	2520	405
14	4	95	0.045	21.0	3.5	2160	390
16	4	95	0.055	24.0	4.0	1890	415
18	4	95	0.060	27.0	4.5	1680	405
20	4	95	0.065	30.0	5.0	1510	395
4	4	50	0.015	6.0	1.0	3980	240
6	4	50	0.020	9.0	1.5	2655	210
8	4	50	0.025	12.0	2.0	1990	200
10	4	50	0.035	15.0	2.5	1590	225
12	4	50	0.040	18.0	3.0	1325	210
14	4	50	0.045	21.0	3.5	1135	205
16	4	50	0.055	24.0	4.0	995	220
18	4	50	0.060	27.0	4.5	885	210
20	4	50	0.065	30.0	5.0	795	205

Frese cilindriche

A taglienti lisci, esecuzione normale con scarico corto

HM MG10 λ **55°**
 γ **15°**



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300

Inox
Stainless

Ti
Titanium

GG(G)
Gold / Platinum

										POLYCHROM	TRIBO
Esempio: N° Ordine										P5355	T5355
										P5255	T5255
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.180	3	6	2.8	57	8	14	0.10	4.5°	4	●	●
.220	4	6	3.7	57	11	16	0.10	3.0°	4	●	●
.260	5	6	4.6	57	13	18	0.15	1.5°	4	●	●
.300	6	6	5.5	57	13	20	0.15	0.0°	4	●	●
.331*	7	8	-	63	16	-	0.15	1.5°	4	●	●
.391	8	8	7.4	63	19	26	0.15	0.0°	4	●	●
.420*	9	10	-	72	19	-	0.20	1.5°	4	●	●
.450	10	10	9.2	72	22	31	0.20	0.0°	4	●	●
.470*	11	12	-	83	26	-	0.20	1.0°	4	●	●
.501	12	12	11.0	83	26	37	0.20	0.0°	4	●	●
.570	14	14	13.0	83	26	37	0.20	0.0°	4	●	●
.610	16	16	15.0	92	32	43	0.20	0.0°	4	●	●
.640	18	18	17.0	92	32	43	0.20	0.0°	4	●	●
.682	20	20	19.0	104	38	53	0.20	0.0°	4	●	●
* solo senza scarico corto											

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	3	190	0.015	4.5	1.4	20160	905	5.5
		4	3	190	0.015	6.0	1.8	15120	680	7.5
		5	3	190	0.020	7.5	2.3	12095	725	12.0
		6	3	190	0.040	9.0	2.7	10080	1210	29.5
		8	3	190	0.050	12.0	3.6	7560	1135	49.0
		10	3	190	0.065	15.0	4.5	6050	1180	79.5
		12	3	190	0.075	18.0	5.4	5040	1135	110.5
		16	3	190	0.100	24.0	7.2	3780	1135	196.0
		20	3	190	0.125	30.0	9.0	3025	1135	306.5
			Acciaio 850 - 1100 N/mm ² 	3	3	140	0.015	4.5	1.4	14855
4	3	140		0.015	6.0	1.8	11140	500	5.5	
5	3	140		0.020	7.5	2.3	8915	535	9.0	
6	3	140		0.040	9.0	2.7	7425	890	21.5	
8	3	140		0.050	12.0	3.6	5570	835	36.0	
10	3	140		0.065	15.0	4.5	4455	870	58.5	
12	3	140		0.075	18.0	5.4	3715	835	81.0	
16	3	140		0.100	24.0	7.2	2785	835	144.5	
20	3	140		0.125	30.0	9.0	2230	835	225.5	
	Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379] 	3		3	70	0.010	4.5	1.4	7425	225
4		3	70	0.015	6.0	1.8	5570	250	2.5	
5		3	70	0.015	7.5	2.3	4455	200	3.5	
6		3	70	0.035	9.0	2.7	3715	390	9.5	
8		3	70	0.045	12.0	3.6	2785	375	16.0	
10		3	70	0.055	15.0	4.5	2230	370	25.0	
12		3	70	0.065	18.0	5.4	1855	360	35.0	
16		3	70	0.085	24.0	7.2	1395	355	61.5	
20		3	70	0.110	30.0	9.0	1115	370	100.0	
		Acciaio inossidabile [Cr-Ni/1.4301] 	3	3	90	0.010	4.5	1.4	9550	285
4	3		90	0.010	6.0	1.8	7160	215	2.5	
5	3		90	0.010	7.5	2.3	5730	170	3.0	
6	3		90	0.030	9.0	2.7	4775	430	10.5	
8	3		90	0.035	12.0	3.6	3580	375	16.0	
10	3		90	0.045	15.0	4.5	2865	385	26.0	
12	3		90	0.050	18.0	5.4	2385	360	35.0	
16	3		90	0.070	24.0	7.2	1790	375	65.0	
20	3		90	0.090	30.0	9.0	1430	385	104.0	

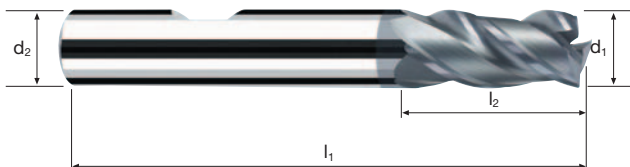
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	3	155	0.015	4.5	3	16445	740	10.0
		4	3	155	0.015	6.0	4	12335	555	13.5
		5	3	155	0.025	7.5	5	9870	740	28.0
		6	3	155	0.030	9.0	6	8225	740	40.0
		8	3	155	0.040	12.0	8	6165	740	71.0
		10	3	155	0.050	15.0	10	4935	740	111.0
		12	3	155	0.060	18.0	12	4110	740	160.0
		16	3	155	0.080	16.0	16	3085	740	189.5
		20	3	155	0.100	20.0	20	2465	740	296.0
			Acciaio 850 - 1100 N/mm ² 	3	3	105	0.015	4.5	3	11140
4	3	105		0.015	6.0	4	8355	375	9.0	
5	3	105		0.025	7.5	5	6685	500	19.0	
6	3	105		0.030	9.0	6	5570	500	27.0	
8	3	105		0.040	12.0	8	4180	500	48.0	
10	3	105		0.050	15.0	10	3340	500	75.0	
12	3	105		0.060	18.0	12	2785	500	108.0	
16	3	105		0.080	16.0	16	2090	500	128.0	
20	3	105		0.100	20.0	20	1670	500	200.0	
	Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379] 	3		3	55	0.010	4.5	3	5835	175
4		3	55	0.015	6.0	4	4375	195	4.5	
5		3	55	0.015	7.5	5	3500	160	6.0	
6		3	55	0.030	9.0	6	2920	265	14.5	
8		3	55	0.040	12.0	8	2190	265	25.5	
10		3	55	0.050	15.0	10	1750	265	40.0	
12		3	55	0.060	18.0	12	1460	265	57.0	
16		3	55	0.080	16.0	16	1095	265	68.0	
20		3	55	0.100	20.0	20	875	265	106.0	
		Acciaio inossidabile [Cr-Ni/1.4301] 	3	3	75	0.010	4.5	3	7960	240
4	3		75	0.010	6.0	4	5970	180	4.5	
5	3		75	0.010	7.5	5	4775	145	5.5	
6	3		75	0.025	9.0	6	3980	300	16.0	
8	3		75	0.030	12.0	8	2985	270	26.0	
10	3		75	0.040	15.0	10	2385	285	43.0	
12	3		75	0.050	18.0	12	1990	300	65.0	
16	3		75	0.065	16.0	16	1490	290	74.0	
20	3		75	0.080	20.0	20	1195	285	114.0	

Frese cilindriche NV3

A taglienti lisci, esecuzione normale



HM
MG10 λ **40°**
 γ **0°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 15333	Codice-ø .180				POLYCHROM	
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.180	3	6	57	7	0.10	6.0°	3	●	
.220	4	6	57	8	0.10	4.5°	3	●	
.260	5	6	57	10	0.15	2.5°	3	●	
.300	6	6	57	10	0.15	0.0°	3	●	
.391	8	8	63	16	0.15	0.0°	3	●	
.450	10	10	72	19	0.20	0.0°	3	●	
.501	12	12	83	22	0.20	0.0°	3	●	
.610	16	16	92	26	0.20	0.0°	3	●	
.682	20	20	104	32	0.20	0.0°	3	●	

Applicazione

Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	105	0.010	4.5	2.1	11140	335	3.0
4	3	105	0.015	6.0	2.8	8355	375	6.5
5	3	105	0.020	7.5	3.5	6685	400	10.5
6	3	105	0.020	9.0	4.2	5570	335	12.5
8	3	105	0.030	12.0	5.6	4180	375	25.0
10	3	105	0.035	15.0	7.0	3340	350	37.0
12	3	105	0.045	18.0	8.4	2785	375	56.5
16	3	105	0.055	24.0	9.6	2090	345	79.5
20	3	105	0.070	30.0	12.0	1670	350	126.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	3	95	0.010	4.5	2.1	10080	300	3.0
4	3	95	0.015	6.0	2.8	7560	340	5.5
5	3	95	0.020	7.5	3.5	6050	365	9.5
6	3	95	0.020	9.0	4.2	5040	300	11.5
8	3	95	0.030	12.0	5.6	3780	340	23.0
10	3	95	0.035	15.0	7.0	3025	320	33.5
12	3	95	0.045	18.0	8.4	2520	340	51.5
16	3	95	0.055	24.0	9.6	1890	310	71.5
20	3	95	0.070	30.0	12.0	1510	315	113.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	3	45	0.010	4.5	2.1	4775	145	1.5
4	3	45	0.010	6.0	2.8	3580	105	2.0
5	3	45	0.015	7.5	3.5	2865	130	3.5
6	3	45	0.015	9.0	4.2	2385	105	4.0
8	3	45	0.020	12.0	5.6	1790	105	7.0
10	3	45	0.025	15.0	7.0	1430	105	11.0
12	3	45	0.030	18.0	8.4	1195	110	16.5
16	3	45	0.040	24.0	9.6	895	105	24.0
20	3	45	0.055	30.0	12.0	715	120	43.0

Leg. a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

3	3	15	0.010	4.5	2.1	1590	50	0.5
4	3	15	0.010	6.0	2.8	1195	35	0.5
5	3	15	0.015	7.5	3.5	955	45	1.0
6	3	15	0.015	9.0	4.2	795	35	1.5
8	3	15	0.020	12.0	5.6	595	35	2.5
10	3	15	0.025	15.0	7.0	475	35	3.5
12	3	15	0.030	18.0	8.4	400	35	5.5
16	3	15	0.040	24.0	9.6	300	35	8.0
20	3	15	0.055	30.0	12.0	240	40	14.5

Applicazione

Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	85	0.010	4.8	3	9020	270	4.0
4	3	85	0.015	6.4	4	6765	305	8.0
5	3	85	0.015	8.0	5	5410	245	10.0
6	3	85	0.020	9.6	6	4510	270	15.5
8	3	85	0.025	12.8	8	3380	255	26.0
10	3	85	0.030	16.0	10	2705	245	39.0
12	3	85	0.040	19.2	12	2255	270	62.0
16	3	85	0.050	22.4	16	1690	255	91.5
20	3	85	0.065	28.0	20	1355	265	148.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	3	75	0.010	4.8	3	7960	240	3.5
4	3	75	0.015	6.4	4	5970	270	7.0
5	3	75	0.015	8.0	5	4775	215	8.5
6	3	75	0.020	9.6	6	3980	240	14.0
8	3	75	0.025	12.8	8	2985	225	23.0
10	3	75	0.030	16.0	10	2385	215	34.5
12	3	75	0.040	19.2	12	1990	240	55.5
16	3	75	0.050	22.4	16	1490	225	80.5
20	3	75	0.065	28.0	20	1195	235	131.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	3	35	0.005	4.8	3	3715	55	1.0
4	3	35	0.010	6.4	4	2785	85	2.0
5	3	35	0.010	8.0	5	2230	65	2.5
6	3	35	0.015	9.6	6	1855	85	5.0
8	3	35	0.020	12.8	8	1395	85	8.5
10	3	35	0.025	16.0	10	1115	85	13.5
12	3	35	0.030	19.2	12	930	85	19.5
16	3	35	0.040	22.4	16	695	85	30.5
20	3	35	0.045	28.0	20	555	75	42.0

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

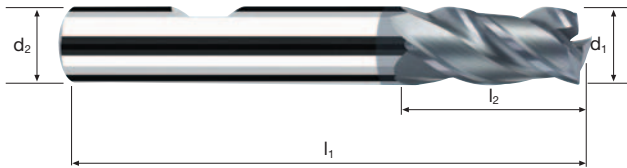
3	3	10	0.005	4.8	3	1060	15	0.2
4	3	10	0.010	6.4	4	795	25	0.5
5	3	10	0.010	8.0	5	635	20	1.0
6	3	10	0.015	9.6	6	530	25	1.5
8	3	10	0.020	12.8	8	400	25	2.5
10	3	10	0.025	16.0	10	320	25	4.0
12	3	10	0.030	19.2	12	265	25	6.0
16	3	10	0.040	22.4	16	200	25	9.0
20	3	10	0.045	28.0	20	160	20	11.0

Frese cilindriche NV3

A taglienti lisci, esecuzione normale



HM λ 40°
MG10 γ 10°



Sgrossatura

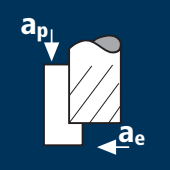
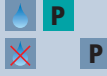
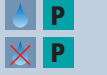









Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	Nickel-Alloys Tool Steel
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Esempio: N° Ordine		Rivestimento		Articolo	Codice-Ø			POLYCHROM	
		P		15334	.180				P15334
									P15234
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.180	3	6	57	7	0.10	6.0°	3		●
.220	4	6	57	8	0.10	4.5°	3		●
.260	5	6	57	10	0.15	2.5°	3		●
.300	6	6	57	10	0.15	0.0°	3		●
.391	8	8	63	16	0.15	0.0°	3		●
.450	10	10	72	19	0.20	0.0°	3		●
.501	12	12	83	22	0.20	0.0°	3		●
.610	16	16	92	26	0.20	0.0°	3		●
.682	20	20	104	32	0.20	0.0°	3		●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	2.0	3	115	0.005	3.0	0.2	18305	275	0.2
		2.5	3	115	0.010	3.8	0.3	14645	440	0.4
		3.0	3	115	0.010	4.5	0.3	12200	365	0.5
		3.5	3	115	0.010	5.3	0.4	10460	315	0.6
		4.0	3	115	0.015	6.0	0.4	9150	410	1.0
		5.0	3	115	0.015	7.5	0.5	7320	330	1.2
		6.0	3	115	0.020	9.0	0.6	6100	365	2.0
		7.0	3	115	0.025	10.5	0.7	5230	390	2.9
		8.0	3	115	0.025	12.0	0.8	4575	345	3.3
			Acciaio 850 - 1100 N/mm ² 	2.0	3	75	0.005	3.0	0.2	11935
2.5	3			75	0.010	3.8	0.3	9550	285	0.3
3.0	3			75	0.010	4.5	0.3	7960	240	0.3
3.5	3			75	0.010	5.3	0.4	6820	205	0.4
4.0	3			75	0.015	6.0	0.4	5970	270	0.6
5.0	3			75	0.015	7.5	0.5	4775	215	0.8
6.0	3			75	0.020	9.0	0.6	3980	240	1.3
7.0	3			75	0.025	10.5	0.7	3410	255	1.9
8.0	3			75	0.025	12.0	0.8	2985	225	2.2
	Acciaio inossidabile [Cr-Ni/1.4301] 			2.0	3	60	0.005	3.0	0.2	9550
		2.5	3	60	0.010	3.8	0.3	7640	230	0.2
		3.0	3	60	0.010	4.5	0.3	6365	190	0.3
		3.5	3	60	0.010	5.3	0.4	5455	165	0.3
		4.0	3	60	0.015	6.0	0.4	4775	215	0.5
		5.0	3	60	0.015	7.5	0.5	3820	170	0.6
		6.0	3	60	0.020	9.0	0.6	3185	190	1.0
		7.0	3	60	0.025	10.5	0.7	2730	205	1.5
		8.0	3	60	0.025	12.0	0.8	2385	180	1.7
			Ghisa (griglia / sferoidale) 	2.0	3	150	0.005	3.0	0.2	23875
2.5	3			150	0.010	3.8	0.3	19100	575	0.5
3.0	3			150	0.010	4.5	0.3	15915	475	0.6
3.5	3			150	0.010	5.3	0.4	13640	410	0.8
4.0	3			150	0.015	6.0	0.4	11935	535	1.3
5.0	3			150	0.015	7.5	0.5	9550	430	1.6
6.0	3			150	0.020	9.0	0.6	7960	480	2.6
7.0	3			150	0.025	10.5	0.7	6820	510	3.7
8.0	3			150	0.025	12.0	0.8	5970	450	4.3

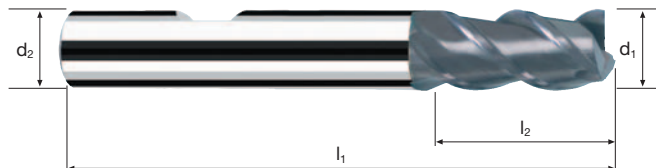
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	2.0	3	85	0.005	1.0	2	13530	205	0.5
		2.5	3	85	0.005	1.3	3	10825	160	0.5
		3.0	3	85	0.010	1.5	3	9020	270	1.0
		3.5	3	85	0.010	1.8	4	7730	230	1.5
		4.0	3	85	0.010	2.0	4	6765	205	1.5
		5.0	3	85	0.015	2.5	5	5410	245	3.0
		6.0	3	85	0.015	3.0	6	4510	205	3.5
		7.0	3	85	0.020	3.5	7	3865	230	5.5
		8.0	3	85	0.020	4.0	8	3380	205	6.5
			Acciaio 850 - 1100 N/mm ² 	2.0	3	60	0.005	1.0	2	9550
2.5	3			60	0.005	1.3	3	7640	115	0.5
3.0	3			60	0.010	1.5	3	6365	190	1.0
3.5	3			60	0.010	1.8	4	5455	165	1.0
4.0	3			60	0.010	2.0	4	4775	145	1.0
5.0	3			60	0.015	2.5	5	3820	170	2.0
6.0	3			60	0.015	3.0	6	3185	145	2.5
7.0	3			60	0.020	3.5	7	2730	165	4.0
8.0	3			60	0.020	4.0	8	2385	145	4.5
	Acciaio inossidabile [Cr-Ni/1.4301] 			2.0	3	40	0.005	1.0	2	6365
		2.5	3	40	0.005	1.3	3	5095	75	0.2
		3.0	3	40	0.010	1.5	3	4245	125	0.5
		3.5	3	40	0.010	1.8	4	3640	110	0.5
		4.0	3	40	0.010	2.0	4	3185	95	1.0
		5.0	3	40	0.015	2.5	5	2545	115	1.5
		6.0	3	40	0.015	3.0	6	2120	95	1.5
		7.0	3	40	0.020	3.5	7	1820	110	2.5
		8.0	3	40	0.020	4.0	8	1590	95	3.0
			Ghisa (griglia / sferoidale) 	2.0	3	105	0.005	1.0	2	16710
2.5	3			105	0.010	1.3	3	13370	400	1.5
3.0	3			105	0.010	1.5	3	11140	335	1.5
3.5	3			105	0.010	1.8	4	9550	285	1.5
4.0	3			105	0.010	2.0	4	8355	250	2.0
5.0	3			105	0.015	2.5	5	6685	300	4.0
6.0	3			105	0.020	3.0	6	5570	335	6.0
7.0	3			105	0.020	3.5	7	4775	285	7.0
8.0	3			105	0.025	4.0	8	4180	315	10.0

Frese cilindriche

A taglienti lisci, esecuzione normale



HM
MG10 λ **45°**
 γ **15°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Copper
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Esempio: N° Ordine		Rivestimento P	Articolo 5330	Codice-ø .138				POLYCHROM	
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z	5330	P5330
.138*	2.0	2.0	42	6	0.10	0.0°	3	●	●
.140	2.0	6.0	54	6	0.10	8.0°	3	●	●
.158*	2.5	2.5	42	7	0.10	0.0°	3	●	●
.160	2.5	6.0	54	6	0.10	7.5°	3	●	●
.178*	3.0	3.0	45	7	0.10	0.0°	3	●	●
.180	3.0	6.0	57	7	0.10	6.0°	3	●	●
.198*	3.5	3.5	50	7	0.10	0.0°	3	●	●
.200	3.5	6.0	57	7	0.10	5.5°	3	●	●
.218*	4.0	4.0	50	8	0.10	0.0°	3	●	●
.220	4.0	6.0	57	8	0.10	4.5°	3	●	●
.238*	4.5	4.5	50	8	0.15	0.0°	3	●	●
.240	4.5	6.0	57	8	0.10	3.5°	3	●	●
.258*	5.0	5.0	50	10	0.15	0.0°	3	●	●
.260	5.0	6.0	57	10	0.15	2.5°	3	●	●
.278*	5.5	5.5	57	10	0.15	0.0°	3	●	●
.280	5.5	6.0	57	10	0.15	1.5°	3	●	●
.300	6.0	6.0	57	10	0.15	0.0°	3	●	●
.322	6.5	8.0	63	13	0.15	2.5°	3	●	●
.331	7.0	8.0	63	13	0.15	2.0°	3	●	●
.362	7.5	8.0	63	16	0.15	1.0°	3	●	●
.391	8.0	8.0	63	16	0.15	0.0°	3	●	●
* solo senza weldon									

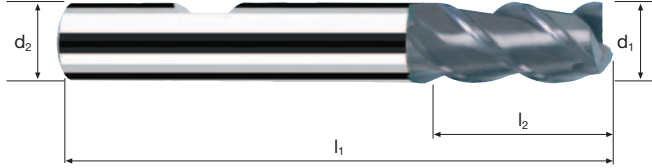
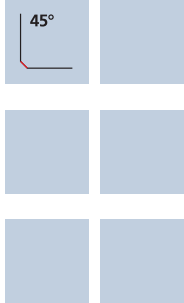
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	9	3	115	0.030	13.5	0.9	4065	365	4.5
		10	3	115	0.035	15.0	1.0	3660	385	6.0
		12	3	115	0.040	18.0	1.2	3050	365	8.0
		14	3	115	0.045	21.0	1.4	2615	355	10.5
		16	3	115	0.055	24.0	1.6	2290	380	14.5
		18	3	115	0.060	27.0	1.8	2035	365	17.5
		20	3	115	0.065	30.0	2.0	1830	355	21.5
		22	3	115	0.075	33.0	2.2	1665	375	27.0
		25	3	115	0.085	37.5	2.5	1465	375	35.0
			Acciaio 850 - 1100 N/mm ² 	9	3	75	0.030	13.5	0.9	2655
10	3			75	0.035	15.0	1.0	2385	250	4.0
12	3			75	0.040	18.0	1.2	1990	240	5.0
14	3			75	0.045	21.0	1.4	1705	230	7.0
16	3			75	0.055	24.0	1.6	1490	245	9.5
18	3			75	0.060	27.0	1.8	1325	240	11.5
20	3			75	0.065	30.0	2.0	1195	235	14.0
22	3			75	0.075	33.0	2.2	1085	245	18.0
25	3			75	0.085	37.5	2.5	955	245	23.0
	Acciaio inossidabile [Cr-Ni/1.4301] 			9	3	60	0.030	13.5	0.9	2120
		10	3	60	0.035	15.0	1.0	1910	200	3.0
		12	3	60	0.040	18.0	1.2	1590	190	4.0
		14	3	60	0.045	21.0	1.4	1365	185	5.5
		16	3	60	0.055	24.0	1.6	1195	195	7.5
		18	3	60	0.060	27.0	1.8	1060	190	9.0
		20	3	60	0.065	30.0	2.0	955	185	11.0
		22	3	60	0.075	33.0	2.2	870	195	14.0
		25	3	60	0.085	37.5	2.5	765	195	18.5
			Ghisa (grigia / sferoidale) 	9	3	150	0.030	13.5	0.9	5305
10	3			150	0.035	15.0	1.0	4775	500	7.5
12	3			150	0.040	18.0	1.2	3980	480	10.5
14	3			150	0.045	21.0	1.4	3410	460	13.5
16	3			150	0.055	24.0	1.6	2985	495	19.0
18	3			150	0.060	27.0	1.8	2655	480	23.5
20	3			150	0.065	30.0	2.0	2385	465	28.0
22	3			150	0.075	33.0	2.2	2170	490	35.5
25	3			150	0.085	37.5	2.5	1910	485	45.5

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	9	3	85	0.025	4.5	9	3005	225	9.0
		10	3	85	0.030	5.0	10	2705	245	12.5
		12	3	85	0.035	6.0	12	2255	235	17.0
		14	3	85	0.040	7.0	14	1935	230	22.5
		16	3	85	0.045	8.0	16	1690	230	29.5
		18	3	85	0.050	9.0	18	1505	225	36.5
		20	3	85	0.055	10.0	20	1355	225	45.0
		22	3	85	0.060	11.0	22	1230	220	53.0
		25	3	85	0.070	12.5	25	1080	225	70.5
			Acciaio 850 - 1100 N/mm ² 	9	3	60	0.025	4.5	9	2120
10	3			60	0.025	5.0	10	1910	145	7.5
12	3			60	0.030	6.0	12	1590	145	10.5
14	3			60	0.035	7.0	14	1365	145	14.0
16	3			60	0.040	8.0	16	1195	145	18.5
18	3			60	0.045	9.0	18	1060	145	23.5
20	3			60	0.050	10.0	20	955	145	29.0
22	3			60	0.055	11.0	22	870	145	35.0
25	3			60	0.065	12.5	25	765	150	47.0
	Acciaio inossidabile [Cr-Ni/1.4301] 			9	3	40	0.025	4.5	9	1415
		10	3	40	0.025	5.0	10	1275	95	5.0
		12	3	40	0.030	6.0	12	1060	95	7.0
		14	3	40	0.035	7.0	14	910	95	9.5
		16	3	40	0.040	8.0	16	795	95	12.0
		18	3	40	0.045	9.0	18	705	95	15.5
		20	3	40	0.050	10.0	20	635	95	19.0
		22	3	40	0.055	11.0	22	580	95	23.0
		25	3	40	0.065	12.5	25	510	100	31.5
			Ghisa (grigia / sferoidale) 	9	3	105	0.030	4.5	9	3715
10	3			105	0.030	5.0	10	3340	300	15.0
12	3			105	0.035	6.0	12	2785	290	21.0
14	3			105	0.045	7.0	14	2385	320	31.5
16	3			105	0.050	8.0	16	2090	315	40.5
18	3			105	0.055	9.0	18	1855	305	49.5
20	3			105	0.060	10.0	20	1670	300	60.0
22	3			105	0.065	11.0	22	1520	295	71.5
25	3			105	0.075	12.5	25	1335	300	94.0

Frese cilindriche

A taglienti lisci, esecuzione normale

HM
MG10 λ **45°**
 γ **15°**



Sgrossatura



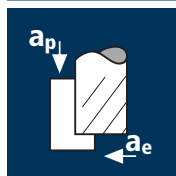
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Copper
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Esempio: N° Ordine		Rivestimento P	Articolo 5330	Codice-ø .410				POLYCHROM	
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z	5330	P5330
.410	8.5	10.0	72	16	0.20	2.5°	3	●	●
.420	9.0	10.0	72	16	0.20	1.5°	3	●	●
.430	9.5	10.0	72	19	0.20	1.0°	3	●	●
.450	10.0	10.0	72	19	0.20	0.0°	3	●	●
.470	11.0	12.0	83	22	0.20	1.5°	3	●	●
.501	12.0	12.0	83	22	0.20	0.0°	3	●	●
.540	13.0	14.0	83	22	0.20	1.5°	3	●	●
.570	14.0	14.0	83	22	0.20	0.0°	3	●	●
.581	15.0	16.0	92	26	0.20	1.0°	3	●	●
.610	16.0	16.0	92	26	0.20	0.0°	3	●	●
.640	18.0	18.0	92	26	0.20	0.0°	3	●	●
.682	20.0	20.0	104	32	0.20	0.0°	3	●	●
.710	22.0	20.0	104	38	0.25	0.0°	3	●	●
.772	25.0	25.0	121	45	0.25	0.0°	3	●	●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	190	0.010	4.5	1.4	20160	605	3.5
4	3	190	0.015	6.0	1.8	15120	680	7.5
5	3	190	0.015	7.5	2.3	12095	545	9.0
6	3	190	0.035	9.0	2.7	10080	1060	26.0
8	3	190	0.045	12.0	3.6	7560	1020	44.0
10	3	190	0.055	15.0	4.5	6050	1000	67.5
12	3	190	0.065	18.0	5.4	5040	985	95.5
16	3	190	0.085	24.0	7.2	3780	965	167.0
20	3	190	0.110	30.0	9.0	3025	1000	270.0

3	3	140	0.010	4.5	1.4	14855	445	2.5
4	3	140	0.015	6.0	1.8	11140	500	5.5
5	3	140	0.015	7.5	2.3	8915	400	7.0
6	3	140	0.035	9.0	2.7	7425	780	19.0
8	3	140	0.045	12.0	3.6	5570	750	32.5
10	3	140	0.055	15.0	4.5	4455	735	49.5
12	3	140	0.065	18.0	5.4	3715	725	70.5
16	3	140	0.085	24.0	7.2	2785	710	122.5
20	3	140	0.110	30.0	9.0	2230	735	198.5

3	3	90	0.005	4.5	1.4	9550	145	1.0
4	3	90	0.010	6.0	1.8	7160	215	2.5
5	3	90	0.010	7.5	2.3	5730	170	3.0
6	3	90	0.025	9.0	2.7	4775	360	8.5
8	3	90	0.030	12.0	3.6	3580	320	14.0
10	3	90	0.040	15.0	4.5	2865	345	23.5
12	3	90	0.045	18.0	5.4	2385	320	31.0
16	3	90	0.060	24.0	7.2	1790	320	55.5
20	3	90	0.075	30.0	9.0	1430	320	86.5

3	3	135	0.010	4.5	1.4	14325	430	2.5
4	3	135	0.015	6.0	1.8	10745	485	5.0
5	3	135	0.015	7.5	2.3	8595	385	6.5
6	3	135	0.035	9.0	2.7	7160	750	18.0
8	3	135	0.045	12.0	3.6	5370	725	31.5
10	3	135	0.055	15.0	4.5	4295	710	48.0
12	3	135	0.065	18.0	5.4	3580	700	68.0
16	3	135	0.085	24.0	7.2	2685	685	118.5
20	3	135	0.110	30.0	9.0	2150	710	191.5

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	155	0.010	4.5	3	16445	495	6.5
4	3	155	0.015	6.0	4	12335	555	13.5
5	3	155	0.020	7.5	5	9870	590	22.0
6	3	155	0.025	9.0	6	8225	615	33.0
8	3	155	0.035	12.0	8	6165	645	62.0
10	3	155	0.040	15.0	10	4935	590	88.5
12	3	155	0.050	18.0	12	4110	615	133.0
16	3	155	0.065	16.0	16	3085	600	153.5
20	3	155	0.085	20.0	20	2465	630	252.0

3	3	105	0.010	4.5	3	11140	335	4.5
4	3	105	0.015	6.0	4	8355	375	9.0
5	3	105	0.020	7.5	5	6685	400	15.0
6	3	105	0.025	9.0	6	5570	420	22.5
8	3	105	0.035	12.0	8	4180	440	42.0
10	3	105	0.040	15.0	10	3340	400	60.0
12	3	105	0.050	18.0	12	2785	420	90.5
16	3	105	0.065	16.0	16	2090	410	105.0
20	3	105	0.085	20.0	20	1670	425	170.0

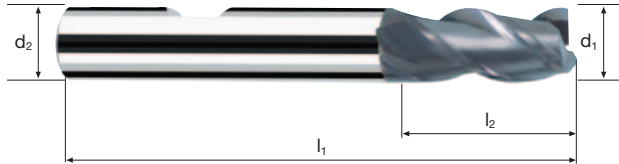
3	3	75	0.010	1.5	3	7960	240	1.0
4	3	75	0.010	2.0	4	5970	180	1.5
5	3	75	0.015	2.5	5	4775	215	2.5
6	3	75	0.020	3.0	6	3980	240	4.5
8	3	75	0.030	4.0	8	2985	270	8.5
10	3	75	0.030	5.0	10	2385	215	11.0
12	3	75	0.040	6.0	12	1990	240	17.5
16	3	75	0.050	8.0	16	1490	225	29.0
20	3	75	0.070	10.0	20	1195	250	50.0

3	3	115	0.010	4.5	3	12200	365	5.0
4	3	115	0.010	6.0	4	9150	275	6.5
5	3	115	0.015	7.5	5	7320	330	12.5
6	3	115	0.025	9.0	6	6100	460	25.0
8	3	115	0.035	12.0	8	4575	480	46.0
10	3	115	0.045	15.0	10	3660	495	74.5
12	3	115	0.055	18.0	12	3050	505	109.0
16	3	115	0.075	16.0	16	2290	515	132.0
20	3	115	0.090	20.0	20	1830	495	198.0

Frese cilindriche

A taglienti lisci, esecuzione normale

**HM
MG10** λ **40°**
 γ **5°**



Sgrossatura

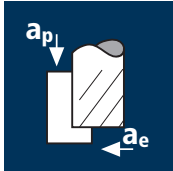

















Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G)
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Esempio: N° Ordine									POLYCHROM		
									P	5331	.180
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z				
.180	3	6	57	7	0.10	6.0°	3			●	
.220	4	6	57	8	0.10	4.5°	3			●	
.260	5	6	57	10	0.15	2.5°	3			●	
.300	6	6	57	10	0.15	0.0°	3			●	
.391	8	8	63	16	0.15	0.0°	3			●	
.450	10	10	72	19	0.20	0.0°	3			●	
.501	12	12	83	22	0.20	0.0°	3			●	
.610	16	16	92	26	0.20	0.0°	3			●	
.682	20	20	104	32	0.20	0.0°	3			●	

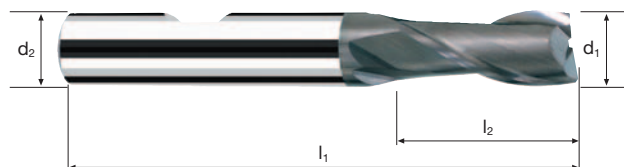
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  P  P	3	2	115	0.010	3	1.4	12200	245	1.0
		4	2	115	0.015	4	1.8	9150	275	2.0
		5	2	115	0.020	5	2.3	7320	295	3.5
		6	2	115	0.025	6	2.7	6100	305	5.0
		8	2	115	0.030	8	3.6	4575	275	8.0
		10	2	115	0.040	10	4.5	3660	295	13.5
		12	2	115	0.050	12	5.4	3050	305	20.0
		16	2	115	0.065	16	7.2	2290	300	34.5
		20	2	115	0.080	20	9.0	1830	295	53.0
			Acciaio 850 - 1100 N/mm ²  P  P	3	2	75	0.010	3	1.4	7960
4	2			75	0.015	4	1.8	5970	180	1.5
5	2			75	0.020	5	2.3	4775	190	2.0
6	2			75	0.020	6	2.7	3980	160	2.5
8	2			75	0.030	8	3.6	2985	180	5.0
10	2			75	0.035	10	4.5	2385	165	7.5
12	2			75	0.045	12	5.4	1990	180	11.5
16	2			75	0.060	16	7.2	1490	180	20.5
20	2			75	0.070	20	9.0	1195	165	29.5
	Acciaio inossidabile [Cr-Ni/1.4301]  P			3	2	60	0.010	3	1.4	6365
		4	2	60	0.015	4	1.8	4775	145	1.0
		5	2	60	0.020	5	2.3	3820	155	1.5
		6	2	60	0.020	6	2.7	3185	125	2.0
		8	2	60	0.030	8	3.6	2385	145	4.0
		10	2	60	0.035	10	4.5	1910	135	6.0
		12	2	60	0.045	12	5.4	1590	145	9.5
		16	2	60	0.060	16	7.2	1195	145	16.5
		20	2	60	0.070	20	9.0	955	135	24.5
			Ghisa (grigia / sferoidale)  P  P	3	2	150	0.015	3	1.4	15915
4	2			150	0.020	4	1.8	11935	475	3.5
5	2			150	0.020	5	2.3	9550	380	4.5
6	2			150	0.025	6	2.7	7960	400	6.5
8	2			150	0.035	8	3.6	5970	420	12.0
10	2			150	0.045	10	4.5	4775	430	19.5
12	2			150	0.055	12	5.4	3980	440	28.5
16	2			150	0.070	16	7.2	2985	420	48.5
20	2			150	0.090	20	9.0	2385	430	77.5

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  P  P	3	2	85	0.010	1.5	3	9020	180	1.0
		4	2	85	0.010	2.0	4	6765	135	1.0
		5	2	85	0.015	2.5	5	5410	160	2.0
		6	2	85	0.015	3.0	6	4510	135	2.5
		8	2	85	0.020	4.0	8	3380	135	4.5
		10	2	85	0.030	5.0	10	2705	160	8.0
		12	2	85	0.035	6.0	12	2255	160	11.5
		16	2	85	0.045	8.0	16	1690	150	19.0
		20	2	85	0.055	10.0	20	1355	150	30.0
			Acciaio 850 - 1100 N/mm ²  P  P	3	2	60	0.010	1.5	3	6365
4	2			60	0.010	2.0	4	4775	95	1.0
5	2			60	0.015	2.5	5	3820	115	1.5
6	2			60	0.015	3.0	6	3185	95	1.5
8	2			60	0.020	4.0	8	2385	95	3.0
10	2			60	0.025	5.0	10	1910	95	5.0
12	2			60	0.030	6.0	12	1590	95	7.0
16	2			60	0.040	8.0	16	1195	95	12.0
20	2			60	0.050	10.0	20	955	95	19.0
	Acciaio inossidabile [Cr-Ni/1.4301]  P			3	2	40	0.010	1.5	3	4245
		4	2	40	0.010	2.0	4	3185	65	0.5
		5	2	40	0.015	2.5	5	2545	75	1.0
		6	2	40	0.015	3.0	6	2120	65	1.0
		8	2	40	0.020	4.0	8	1590	65	2.0
		10	2	40	0.025	5.0	10	1275	65	3.5
		12	2	40	0.030	6.0	12	1060	65	4.5
		16	2	40	0.040	8.0	16	795	65	8.5
		20	2	40	0.050	10.0	20	635	65	13.0
			Ghisa (grigia / sferoidale)  P  P	3	2	105	0.010	1.5	3	11140
4	2			105	0.010	2.0	4	8355	165	1.5
5	2			105	0.015	2.5	5	6685	200	2.5
6	2			105	0.020	3.0	6	5570	225	4.0
8	2			105	0.025	4.0	8	4180	210	6.5
10	2			105	0.030	5.0	10	3340	200	10.0
12	2			105	0.035	6.0	12	2785	195	14.0
16	2			105	0.050	8.0	16	2090	210	27.0
20	2			105	0.060	10.0	20	1670	200	40.0

Frese cilindriche

A taglienti lisci, esecuzione normale

HM
MG10 λ **30°**
 γ **12°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Copper
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Esempio: N° Ordine		Rivestimento P	Articolo 5300	Codice-ø .138				POLYCHROM	
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.138*	2.0	2.0	42	6	0.10	0.0°	2		●
.140	2.0	6.0	54	6	0.10	8.0°	2		●
.158*	2.5	2.5	42	7	0.10	0.0°	2		●
.160	2.5	6.0	54	6	0.10	7.5°	2		●
.178*	3.0	3.0	45	7	0.10	0.0°	2		●
.180	3.0	6.0	57	7	0.10	6.0°	2		●
.200	3.5	6.0	57	7	0.10	5.5°	2		●
.218*	4.0	4.0	50	8	0.10	0.0°	2		●
.220	4.0	6.0	57	8	0.10	4.5°	2		●
.240	4.5	6.0	57	8	0.15	3.5°	2		●
.258*	5.0	5.0	50	10	0.15	0.0°	2		●
.260	5.0	6.0	57	10	0.15	2.5°	2		●
.280	5.5	6.0	57	10	0.15	1.5°	2		●
.300	6.0	6.0	57	10	0.15	0.0°	2		●
.331	7.0	8.0	63	13	0.15	2.0°	2		●
.391	8.0	8.0	63	16	0.15	0.0°	2		●
.420	9.0	10.0	72	16	0.20	1.5°	2		●
.450	10.0	10.0	72	19	0.20	0.0°	2		●
.501	12.0	12.0	83	22	0.20	0.0°	2		●
.610	16.0	16.0	92	26	0.20	0.0°	2		●
.682	20.0	20.0	104	32	0.20	0.0°	2		●
* solo senza weldon									



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	170	0.015	4.5	1.2	18040	1080	6.0
4	4	170	0.020	6.0	1.6	13530	1080	10.5
5	4	170	0.025	7.5	2.0	10825	1085	16.5
6	4	170	0.030	9.0	2.4	9020	1080	23.5
8	4	170	0.040	12.0	3.2	6765	1080	41.5
10	4	170	0.050	15.0	4.0	5410	1080	65.0
12	4	170	0.060	18.0	4.8	4510	1080	93.5
16	4	170	0.075	24.0	6.4	3380	1015	156.0
20	4	170	0.095	30.0	8.0	2705	1030	247.0

Acciaio
850 - 1100 N/mm²

3	4	120	0.015	4.5	1.2	12735	765	4.0
4	4	120	0.020	6.0	1.6	9550	765	7.5
5	4	120	0.025	7.5	2.0	7640	765	11.5
6	4	120	0.030	9.0	2.4	6365	765	16.5
8	4	120	0.040	12.0	3.2	4775	765	29.5
10	4	120	0.050	15.0	4.0	3820	765	46.0
12	4	120	0.060	18.0	4.8	3185	765	66.0
16	4	120	0.075	24.0	6.4	2385	715	110.0
20	4	120	0.095	30.0	8.0	1910	725	174.0

Acciaio inossidabile
[Cr-Ni/1.4301]

3	4	80	0.010	4.5	1.2	8490	340	2.0
4	4	80	0.015	6.0	1.6	6365	380	3.5
5	4	80	0.020	7.5	2.0	5095	410	6.0
6	4	80	0.025	9.0	2.4	4245	425	9.0
8	4	80	0.030	12.0	3.2	3185	380	14.5
10	4	80	0.040	15.0	4.0	2545	405	24.5
12	4	80	0.050	18.0	4.8	2120	425	36.5
16	4	80	0.060	24.0	6.4	1590	380	58.5
20	4	80	0.075	30.0	8.0	1275	385	92.5

Ghisa
(grigia / sferoidale)

3	4	135	0.015	4.5	1.2	14325	860	4.5
4	4	135	0.020	6.0	1.6	10745	860	8.5
5	4	135	0.030	7.5	2.0	8595	1030	15.5
6	4	135	0.035	9.0	2.4	7160	1000	21.5
8	4	135	0.045	12.0	3.2	5370	965	37.0
10	4	135	0.055	15.0	4.0	4295	945	56.5
12	4	135	0.065	18.0	4.8	3580	930	80.5
16	4	135	0.085	24.0	6.4	2685	915	140.5
20	4	135	0.105	30.0	8.0	2150	905	217.0



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	135	0.010	3.0	3	14325	575	5.0
4	4	135	0.015	4.0	4	10745	645	10.5
5	4	135	0.020	5.0	5	8595	690	17.5
6	4	135	0.025	6.0	6	7160	715	25.5
8	4	135	0.030	8.0	8	5370	645	41.5
10	4	135	0.040	10.0	10	4295	685	68.5
12	4	135	0.045	12.0	12	3580	645	93.0
16	4	135	0.055	8.0	16	2685	590	75.5
20	4	135	0.070	10.0	20	2150	600	120.0

Acciaio
850 - 1100 N/mm²

3	4	95	0.010	3.0	3	10080	405	3.5
4	4	95	0.015	4.0	4	7560	455	7.5
5	4	95	0.020	5.0	5	6050	485	12.0
6	4	95	0.025	6.0	6	5040	505	18.0
8	4	95	0.030	8.0	8	3780	455	29.0
10	4	95	0.040	10.0	10	3025	485	48.5
12	4	95	0.045	12.0	12	2520	455	65.5
16	4	95	0.055	8.0	16	1890	415	53.0
20	4	95	0.070	10.0	20	1510	425	85.0

Acciaio inossidabile
[Cr-Ni/1.4301]

3	4	65	0.010	2.1	3	6895	275	1.5
4	4	65	0.010	2.8	4	5175	205	2.5
5	4	65	0.015	3.5	5	4140	250	4.5
6	4	65	0.020	4.2	6	3450	275	7.0
8	4	65	0.025	8.0	8	2585	260	16.5
10	4	65	0.030	10.0	10	2070	250	25.0
12	4	65	0.040	12.0	12	1725	275	39.5
16	4	65	0.045	8.0	16	1295	235	30.0
20	4	65	0.055	10.0	20	1035	230	46.0

Ghisa
(grigia / sferoidale)

3	4	115	0.010	3.0	3	12200	490	4.5
4	4	115	0.015	4.0	4	9150	550	9.0
5	4	115	0.025	5.0	5	7320	730	18.5
6	4	115	0.025	6.0	6	6100	610	22.0
8	4	115	0.035	8.0	8	4575	640	41.0
10	4	115	0.040	10.0	10	3660	585	58.5
12	4	115	0.050	12.0	12	3050	610	88.0
16	4	115	0.065	8.0	16	2290	595	76.0
20	4	115	0.080	10.0	20	1830	585	117.0

Frese cilindriche NF-NV

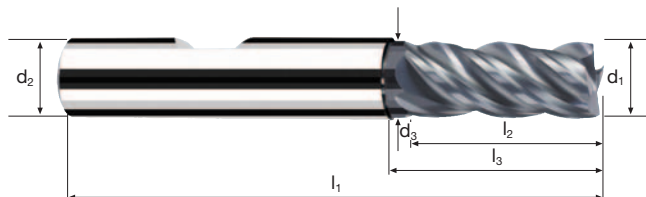
A taglienti lisci, esecuzione normale con scarico corto



HM λ 40°
 γ 6°

45°

Vario



Sgrossatura



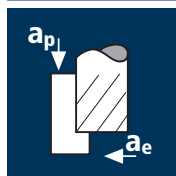
Finitura



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel Nickel Alloys

Esempio: N° Ordine										POLYCHROM	
										P45317	
										P45217	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.178*	3	3	-	45	8	-	0.10	0.0°	4	●	
.180	3	6	2.8	57	8	14	0.10	4.5°	4	●	
.218*	4	4	-	50	11	-	0.10	0.0°	4	●	
.220	4	6	3.7	57	11	16	0.10	3.0°	4	●	
.258*	5	5	-	50	13	-	0.15	0.0°	4	●	
.260	5	6	4.6	57	13	18	0.15	1.5°	4	●	
.300	6	6	5.5	57	13	20	0.15	0.0°	4	●	
.391	8	8	7.4	63	19	26	0.15	0.0°	4	●	
.450	10	10	9.2	72	22	31	0.20	0.0°	4	●	
.501	12	12	11.0	83	26	37	0.20	0.0°	4	●	
.610	16	16	15.0	92	32	43	0.20	0.0°	4	●	
.682	20	20	19.0	104	38	53	0.20	0.0°	4	●	
* solo senza weldon, senza scarico corto											

Applicazione



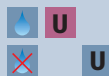
Materiale

Acciaio
< 850 N/mm²



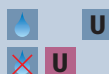
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	150	0.010	4.5	0.25	15915	635
4	4	150	0.015	6.0	0.30	11935	715
5	4	150	0.015	7.5	0.40	9550	575
6	4	150	0.020	9.0	0.50	7960	635
8	4	150	0.025	12.0	0.65	5970	595
10	4	150	0.035	15.0	0.80	4775	670
12	4	150	0.040	18.0	0.95	3980	635
16	4	150	0.055	24.0	1.30	2985	655
20	4	150	0.065	30.0	1.60	2385	620

Acciaio
850 - 1100 N/mm²



3	4	95	0.010	4.5	0.25	10080	405
4	4	95	0.015	6.0	0.30	7560	455
5	4	95	0.015	7.5	0.40	6050	365
6	4	95	0.020	9.0	0.50	5040	405
8	4	95	0.025	12.0	0.65	3780	380
10	4	95	0.035	15.0	0.80	3025	425
12	4	95	0.040	18.0	0.95	2520	405
16	4	95	0.055	24.0	1.30	1890	415
20	4	95	0.065	30.0	1.60	1510	395

Acciaio
1100 - 1300 N/mm²



3	4	70	0.010	4.5	0.25	7425	295
4	4	70	0.015	6.0	0.30	5570	335
5	4	70	0.015	7.5	0.40	4455	265
6	4	70	0.020	9.0	0.50	3715	295
8	4	70	0.025	12.0	0.65	2785	280
10	4	70	0.035	15.0	0.80	2230	310
12	4	70	0.040	18.0	0.95	1855	295
16	4	70	0.055	24.0	1.30	1395	305
20	4	70	0.065	30.0	1.60	1115	290

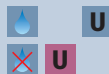
Acciaio inossidabile
[Cr-Ni/1.4301]



3	4	80	0.010	4.5	0.25	8490	340
4	4	80	0.015	6.0	0.30	6365	380
5	4	80	0.015	7.5	0.40	5095	305
6	4	80	0.020	9.0	0.50	4245	340
8	4	80	0.025	12.0	0.65	3185	320
10	4	80	0.035	15.0	0.80	2545	355
12	4	80	0.040	18.0	0.95	2120	340
16	4	80	0.055	24.0	1.30	1590	350
20	4	80	0.065	30.0	1.60	1275	330

Materiale

Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	110	0.010	4.5	0.25	11670	465
4	4	110	0.015	6.0	0.30	8755	525
5	4	110	0.015	7.5	0.40	7005	420
6	4	110	0.020	9.0	0.50	5835	465
8	4	110	0.025	12.0	0.65	4375	440
10	4	110	0.035	15.0	0.80	3500	490
12	4	110	0.040	18.0	0.95	2920	465
16	4	110	0.055	24.0	1.30	2190	480
20	4	110	0.065	30.0	1.60	1750	455

Rame non legato



3	4	120	0.010	4.5	0.25	12735	510
4	4	120	0.015	6.0	0.30	9550	575
5	4	120	0.015	7.5	0.40	7640	460
6	4	120	0.020	9.0	0.50	6365	510
8	4	120	0.025	12.0	0.65	4775	480
10	4	120	0.035	15.0	0.80	3820	535
12	4	120	0.040	18.0	0.95	3185	510
16	4	120	0.055	24.0	1.30	2385	525
20	4	120	0.065	30.0	1.60	1910	495

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



3	4	70	0.010	4.5	0.25	7425	295
4	4	70	0.015	6.0	0.30	5570	335
5	4	70	0.015	7.5	0.40	4455	265
6	4	70	0.020	9.0	0.50	3715	295
8	4	70	0.025	12.0	0.65	2785	280
10	4	70	0.035	15.0	0.80	2230	310
12	4	70	0.040	18.0	0.95	1855	295
16	4	70	0.055	24.0	1.30	1395	305
20	4	70	0.065	30.0	1.60	1115	290

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]

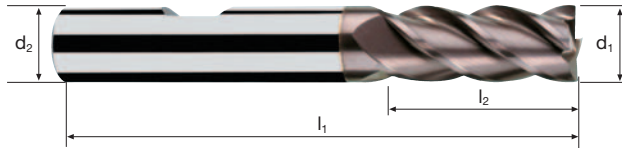


3	4	35	0.010	4.5	0.25	3715	150
4	4	35	0.015	6.0	0.30	2785	165
5	4	35	0.015	7.5	0.40	2230	135
6	4	35	0.020	9.0	0.50	1855	150
8	4	35	0.025	12.0	0.65	1395	140
10	4	35	0.035	15.0	0.80	1115	155
12	4	35	0.040	18.0	0.95	930	150
16	4	35	0.055	24.0	1.30	695	155
20	4	35	0.065	30.0	1.60	555	145

Frese cilindriche

A taglienti lisci, esecuzione normale

HM λ 40°
γ 12°



Sgrossatura



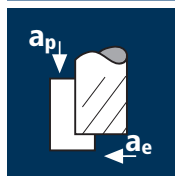
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300						Inox Stainless	Ti Titanium	GG(G) Copper
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Esempio: N° Ordine							UNICUT-4X	
							U45340	
Rivestimento		Articolo		Codice-Ø				
U		45340		.178				
Ø Code	d1 e8	d2 h6	l1	l2	45°	z		
.178*	3	3	45	8	0.10	4	●	
.218*	4	4	50	11	0.10	4	●	
.258*	5	5	50	13	0.15	4	●	
.300	6	6	57	13	0.15	4	●	
.391	8	8	63	19	0.15	4	●	
.450	10	10	72	22	0.20	4	●	
.501	12	12	83	26	0.20	4	●	
.610	16	16	92	32	0.20	4	●	
.682	20	20	104	38	0.20	4	●	
* solo senza weldon								

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Ghisa
(grigia / sferoidale)

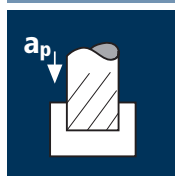
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	165	0.010	4.5	2.0	17510	525	4.5
4	3	165	0.015	6.0	2.6	13130	590	9.0
5	3	165	0.020	7.5	3.3	10505	630	15.5
6	3	165	0.020	9.0	3.9	8755	525	18.5
8	3	165	0.030	12.0	5.2	6565	590	37.0
10	3	165	0.035	15.0	6.5	5250	550	53.5
12	3	165	0.045	18.0	7.8	4375	590	83.0
16	3	165	0.055	24.0	8.8	3285	540	114.0
20	3	165	0.070	30.0	11.0	2625	550	181.5

3	3	110	0.010	4.5	2.0	11670	350	3.0
4	3	110	0.015	6.0	2.6	8755	395	6.0
5	3	110	0.020	7.5	3.3	7005	420	10.0
6	3	110	0.020	9.0	3.9	5835	350	12.5
8	3	110	0.030	12.0	5.2	4375	395	24.5
10	3	110	0.035	15.0	6.5	3500	370	36.0
12	3	110	0.045	18.0	7.8	2920	395	55.5
16	3	110	0.055	24.0	8.8	2190	360	76.0
20	3	110	0.070	30.0	11.0	1750	370	122.0

3	3	80	0.010	4.5	2.0	8490	255	2.0
4	3	80	0.010	6.0	2.6	6365	190	3.0
5	3	80	0.015	7.5	3.3	5095	230	5.5
6	3	80	0.015	9.0	3.9	4245	190	6.5
8	3	80	0.020	12.0	5.2	3185	190	12.0
10	3	80	0.025	15.0	6.5	2545	190	18.5
12	3	80	0.030	18.0	7.8	2120	190	26.5
16	3	80	0.040	24.0	8.8	1590	190	40.0
20	3	80	0.055	30.0	11.0	1275	210	69.5

3	3	130	0.010	4.5	2.0	13795	415	3.5
4	3	130	0.015	6.0	2.6	10345	465	7.5
5	3	130	0.020	7.5	3.3	8275	495	12.0
6	3	130	0.020	9.0	3.9	6895	415	14.5
8	3	130	0.030	12.0	5.2	5175	465	29.0
10	3	130	0.035	15.0	6.5	4140	435	42.5
12	3	130	0.045	18.0	7.8	3450	465	65.5
16	3	130	0.055	24.0	8.8	2585	425	90.0
20	3	130	0.070	30.0	11.0	2070	435	143.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Ghisa
(grigia / sferoidale)

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	130	0.010	4.2	3	13795	415	5.0
4	3	130	0.015	5.6	4	10345	465	10.5
5	3	130	0.015	7.0	5	8275	370	13.0
6	3	130	0.020	8.4	6	6895	415	21.0
8	3	130	0.025	11.2	8	5175	390	35.0
10	3	130	0.030	14.0	10	4140	375	52.5
12	3	130	0.040	16.8	12	3450	415	83.5
16	3	130	0.050	19.2	16	2585	390	120.0
20	3	130	0.065	24.0	20	2070	405	194.5

3	3	85	0.010	4.2	3	9020	270	3.5
4	3	85	0.015	5.6	4	6765	305	7.0
5	3	85	0.015	7.0	5	5410	245	8.5
6	3	85	0.020	8.4	6	4510	270	13.5
8	3	85	0.025	11.2	8	3380	255	23.0
10	3	85	0.030	14.0	10	2705	245	34.5
12	3	85	0.040	16.8	12	2255	270	54.5
16	3	85	0.050	19.2	16	1690	255	78.5
20	3	85	0.065	24.0	20	1355	265	127.0

3	3	65	0.005	4.2	3	6895	105	1.5
4	3	65	0.010	5.6	4	5175	155	3.5
5	3	65	0.010	7.0	5	4140	125	4.5
6	3	65	0.015	8.4	6	3450	155	8.0
8	3	65	0.020	11.2	8	2585	155	14.0
10	3	65	0.025	14.0	10	2070	155	21.5
12	3	65	0.030	16.8	12	1725	155	31.0
16	3	65	0.040	19.2	16	1295	155	47.5
20	3	65	0.045	24.0	20	1035	140	67.0

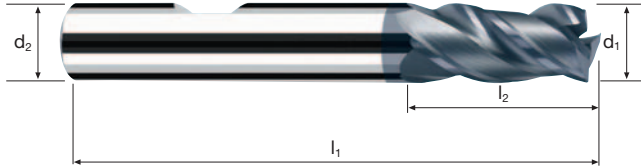
3	3	110	0.010	4.2	3	11670	350	4.4
4	3	110	0.015	5.6	4	8755	395	9.0
5	3	110	0.015	7.0	5	7005	315	11.0
6	3	110	0.020	8.4	6	5835	350	17.5
8	3	110	0.025	11.2	8	4375	330	29.5
10	3	110	0.030	14.0	10	3500	315	44.0
12	3	110	0.040	16.8	12	2920	350	70.5
16	3	110	0.050	19.2	16	2190	330	101.5
20	3	110	0.065	24.0	20	1750	340	163.0

Frese cilindriche NF-NV3

A taglienti lisci, esecuzione normale



HM λ 40°
 γ 6°



Sgrossatura

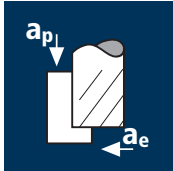



























Finitura



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel Nickel Alloys

Esempio: N° Ordine		Rivestimento P	Articolo 45333	Codice-ø .180				POLYCHROM	
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z	P45333	
.180	3	6	57	7	0.10	6.0°	3	●	
.220	4	6	57	8	0.10	4.5°	3	●	
.260	5	6	57	10	0.15	2.5°	3	●	
.300	6	6	57	10	0.15	0.0°	3	●	
.391	8	8	63	16	0.15	0.0°	3	●	
.450	10	10	72	19	0.20	0.0°	3	●	
.501	12	12	83	22	0.20	0.0°	3	●	
.610	16	16	92	26	0.20	0.0°	3	●	
.682	20	20	104	32	0.20	0.0°	3	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	3	3	105	0.010	3.0	0.3	11140	335	0.5
		4	3	105	0.015	4.0	0.4	8355	375	0.5
		5	3	105	0.015	5.0	0.5	6685	300	1.0
		6	3	105	0.020	6.0	0.6	5570	335	1.0
		8	3	105	0.025	8.0	0.8	4180	315	2.0
		10	3	105	0.035	10.0	1.0	3340	350	3.5
		12	3	105	0.040	12.0	1.2	2785	335	5.0
		16	3	105	0.055	16.0	1.6	2090	345	9.0
		20	3	105	0.065	20.0	2.0	1670	325	13.0
		Acciaio 850 - 1100 N/mm ²    	3	3	65	0.010	3.0	0.3	6895	205
4	3		65	0.015	4.0	0.4	5175	235	0.5	
5	3		65	0.015	5.0	0.5	4140	185	0.5	
6	3		65	0.020	6.0	0.6	3450	205	0.5	
8	3		65	0.025	8.0	0.8	2585	195	1.0	
10	3		65	0.035	10.0	1.0	2070	215	2.0	
12	3		65	0.040	12.0	1.2	1725	205	3.0	
16	3		65	0.055	16.0	1.6	1295	215	5.5	
20	3		65	0.065	20.0	2.0	1035	200	8.0	
Acciaio inossidabile [Cr-Ni/1.4301]  	3		3	65	0.010	3.0	0.3	6895	205	0.0
	4	3	65	0.015	4.0	0.4	5175	235	0.5	
	5	3	65	0.015	5.0	0.5	4140	185	0.5	
	6	3	65	0.020	6.0	0.6	3450	205	0.5	
	8	3	65	0.025	8.0	0.8	2585	195	1.0	
	10	3	65	0.035	10.0	1.0	2070	215	2.0	
	12	3	65	0.040	12.0	1.2	1725	205	3.0	
	16	3	65	0.055	16.0	1.6	1295	215	5.5	
	20	3	65	0.065	20.0	2.0	1035	200	8.0	
	Ghisa (griglia / sferoidale)    	3	3	140	0.010	3.0	0.3	14855	445	0.5
4		3	140	0.015	4.0	0.4	11140	500	1.0	
5		3	140	0.015	5.0	0.5	8915	400	1.0	
6		3	140	0.020	6.0	0.6	7425	445	1.5	
8		3	140	0.025	8.0	0.8	5570	420	2.5	
10		3	140	0.035	10.0	1.0	4455	470	4.5	
12		3	140	0.040	12.0	1.2	3715	445	6.5	
16		3	140	0.055	16.0	1.6	2785	460	12.0	
20		3	140	0.065	20.0	2.0	2230	435	17.5	

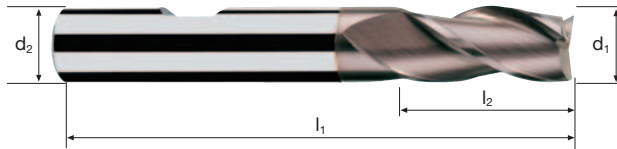
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	3	3	75	0.010	0.6	3	7960	240	0.5
		4	3	75	0.010	0.8	4	5970	180	0.5
		5	3	75	0.015	1.0	5	4775	215	1.0
		6	3	75	0.015	1.2	6	3980	180	1.5
		8	3	75	0.020	1.6	8	2985	180	2.5
		10	3	75	0.030	2.0	10	2385	215	4.5
		12	3	75	0.035	2.4	12	1990	210	6.0
		16	3	75	0.045	3.2	16	1490	200	10.0
		20	3	75	0.055	4.0	20	1195	195	15.5
		Acciaio 850 - 1100 N/mm ²    	3	3	50	0.010	0.6	3	5305	160
4	3		50	0.010	0.8	4	3980	120	0.5	
5	3		50	0.015	1.0	5	3185	145	0.5	
6	3		50	0.015	1.2	6	2655	120	1.0	
8	3		50	0.020	1.6	8	1990	120	1.5	
10	3		50	0.025	2.0	10	1590	120	2.5	
12	3		50	0.030	2.4	12	1325	120	3.5	
16	3		50	0.040	3.2	16	995	120	6.0	
20	3		50	0.050	4.0	20	795	120	9.5	
Acciaio inossidabile [Cr-Ni/1.4301]  	3		3	50	0.010	0.6	3	5305	160	0.5
	4	3	50	0.010	0.8	4	3980	120	0.5	
	5	3	50	0.015	1.0	5	3185	145	0.5	
	6	3	50	0.015	1.2	6	2655	120	1.0	
	8	3	50	0.020	1.6	8	1990	120	1.5	
	10	3	50	0.025	2.0	10	1590	120	2.5	
	12	3	50	0.030	2.4	12	1325	120	3.5	
	16	3	50	0.040	3.2	16	995	120	6.0	
	20	3	50	0.050	4.0	20	795	120	9.5	
	Ghisa (griglia / sferoidale)    	3	3	95	0.010	0.6	3	10080	300	0.5
4		3	95	0.010	0.8	4	7560	225	0.5	
5		3	95	0.015	1.0	5	6050	270	1.5	
6		3	95	0.020	1.2	6	5040	300	2.0	
8		3	95	0.025	1.6	8	3780	285	3.5	
10		3	95	0.030	2.0	10	3025	270	5.5	
12		3	95	0.035	2.4	12	2520	265	7.5	
16		3	95	0.050	3.2	16	1890	285	14.5	
20		3	95	0.060	4.0	20	1510	270	21.5	

Frese cilindriche

A taglienti lisci, esecuzione normale



HM λ 35°
 γ 12°



Sgrossatura



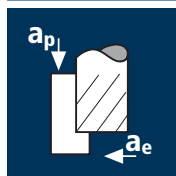
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Aluminium Copper
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Esempio: N° Ordine		Rivestimento U	Articolo 45330	Codice-ø .178				UNICUT-4X U45330
ø Code	d1 e8	d2 h6	l1	l2	45°	z		
.178*	3	3	45	7	0.10	3	●	
.218*	4	4	50	8	0.10	3	●	
.258*	5	5	50	10	0.15	3	●	
.300	6	6	57	10	0.15	3	●	
.391	8	8	63	16	0.15	3	●	
.450	10	10	72	19	0.20	3	●	
.501	12	12	83	22	0.20	3	●	
.610	16	16	92	26	0.20	3	●	
.682	20	20	104	32	0.20	3	●	
* solo senza weldon								

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	65	0.005	3	0.05	10345	205
4	4	65	0.010	6	0.10	5175	205
5	4	65	0.015	8	0.15	4140	250
6	4	65	0.015	9	0.15	3450	205
8	4	65	0.025	12	0.20	2585	260
10	4	65	0.030	15	0.25	2070	250
12	4	65	0.035	18	0.30	1725	240
16	4	65	0.045	24	0.40	1295	235
20	4	65	0.055	30	0.50	1035	230

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	54	0.005	3	0.05	8595	170
4	4	54	0.010	6	0.10	4295	170
5	4	54	0.015	8	0.15	3440	205
6	4	54	0.015	9	0.15	2865	170
8	4	54	0.025	12	0.20	2150	215
10	4	54	0.030	15	0.25	1720	205
12	4	54	0.035	18	0.30	1430	200
16	4	54	0.045	24	0.40	1075	195
20	4	54	0.055	30	0.50	860	190

Acciaio
1100 - 1300 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	42	0.005	3	0.05	6685	135
4	4	42	0.010	6	0.10	3340	135
5	4	42	0.015	8	0.15	2675	160
6	4	42	0.015	9	0.15	2230	135
8	4	42	0.025	12	0.20	1670	165
10	4	42	0.030	15	0.25	1335	160
12	4	42	0.035	18	0.30	1115	155
16	4	42	0.045	24	0.40	835	150
20	4	42	0.055	30	0.50	670	145

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	30	0.005	3	0.05	4775	95
4	4	30	0.010	6	0.10	2385	95
5	4	30	0.015	8	0.15	1910	115
6	4	30	0.015	9	0.15	1590	95
8	4	30	0.025	12	0.20	1195	120
10	4	30	0.030	15	0.25	955	115
12	4	30	0.035	18	0.30	795	110
16	4	30	0.045	24	0.40	595	105
20	4	30	0.055	30	0.50	475	105

Materiale

Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	50	0.005	3	0.05	7960	160
4	4	50	0.010	6	0.10	3980	160
5	4	50	0.015	8	0.15	3185	190
6	4	50	0.015	9	0.15	2655	160
8	4	50	0.025	12	0.20	1990	200
10	4	50	0.030	15	0.25	1590	190
12	4	50	0.035	18	0.30	1325	185
16	4	50	0.045	24	0.40	995	180
20	4	50	0.055	30	0.50	795	175

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	26	0.005	3	0.05	4140	85
4	4	26	0.010	6	0.10	2070	85
5	4	26	0.015	8	0.15	1655	100
6	4	26	0.015	9	0.15	1380	85
8	4	26	0.025	12	0.20	1035	105
10	4	26	0.030	15	0.25	830	100
12	4	26	0.035	18	0.30	690	95
16	4	26	0.045	24	0.40	515	95
20	4	26	0.055	30	0.50	415	90

Rame non legato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	80	0.005	3	0.05	12735	255
4	4	80	0.010	6	0.10	6365	255
5	4	80	0.015	8	0.15	5095	305
6	4	80	0.015	9	0.15	4245	255
8	4	80	0.025	12	0.20	3185	320
10	4	80	0.030	15	0.25	2545	305
12	4	80	0.035	18	0.30	2120	295
16	4	80	0.045	24	0.40	1590	285
20	4	80	0.055	30	0.50	1275	280

Alluminio malleabile
Si < 6%



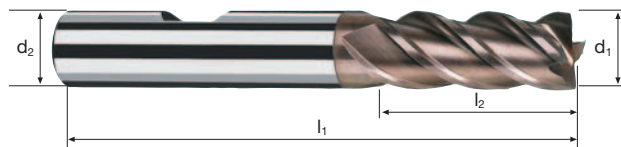
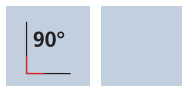
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	100	0.005	3	0.05	15915	320
4	4	100	0.010	6	0.10	7960	320
5	4	100	0.015	8	0.15	6365	380
6	4	100	0.015	9	0.15	5305	320
8	4	100	0.025	12	0.20	3980	400
10	4	100	0.030	15	0.25	3185	380
12	4	100	0.035	18	0.30	2655	370
16	4	100	0.045	24	0.40	1990	360
20	4	100	0.055	30	0.50	1590	350

Frese cilindriche

A taglienti lisci, esecuzione normale



HSS-E λ 40°
Co8 γ 15°



Sgrossatura



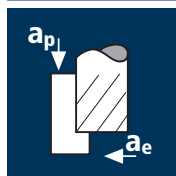
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine		Rivestimento U	Articolo 0110	Codice-ø .100					UNICUT-4X U0110
ø Code	d1 k8	d2 h6	l1	l2	α	Z			
.100	1.0	6	49	5	3.0°	4			●
.120	1.5	6	50	6	3.0°	4			●
.140	2.0	6	51	7	2.5°	4			●
.160	2.5	6	52	8	2.0°	4			●
.180	3.0	6	52	8	2.0°	4			●
.200	3.5	6	54	10	1.5°	4			●
.220	4.0	6	55	11	1.5°	4			●
.240	4.5	6	55	11	1.0°	4			●
.260	5.0	6	57	13	1.0°	4			●
.280	5.5	6	57	13	1.0°	4			●
.300	6.0	6	57	13	0.0°	4			●
.342	7.0	10	66	16	1.5°	4			●
.391	8.0	8	63	19	0.0°	4			●
.420	9.0	10	69	19	0.5°	4			●
.450	10.0	10	72	22	0.0°	4			●
.470	11.0	12	79	22	0.5°	4			●
.501	12.0	12	83	26	0.0°	4			●
.570	14.0	12	83	26	0.0°	4			●
.581	15.0	12	83	26	0.0°	4			●
.610	16.0	16	92	32	0.0°	4			●
.640	18.0	16	92	32	0.0°	4			●
.682	20.0	20	104	38	0.0°	4			●
.690	21.0	20	104	38	0.0°	4			●

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
22	4	65	0.065	33	0.55	940	245
24	4	65	0.070	36	0.60	860	240
25	4	65	0.070	38	0.65	830	230
28	6	65	0.080	42	0.70	740	355
30	6	65	0.085	45	0.75	690	350
32	6	65	0.090	48	0.80	645	350
36	6	65	0.105	54	0.90	575	360
40	6	65	0.115	60	1.00	515	355

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
22	4	54	0.065	33	0.55	780	205
24	4	54	0.070	36	0.60	715	200
25	4	54	0.070	38	0.65	690	195
28	6	54	0.080	42	0.70	615	295
30	6	54	0.085	45	0.75	575	295
32	6	54	0.090	48	0.80	535	290
36	6	54	0.105	54	0.90	475	300
40	6	54	0.115	60	1.00	430	295

Acciaio
1100 - 1300 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
22	4	42	0.065	33	0.55	610	160
24	4	42	0.070	36	0.60	555	155
25	4	42	0.070	38	0.65	535	150
28	6	42	0.080	42	0.70	475	230
30	6	42	0.085	45	0.75	445	225
32	6	42	0.090	48	0.80	420	225
36	6	42	0.105	54	0.90	370	235
40	6	42	0.115	60	1.00	335	230

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
22	4	30	0.065	33	0.55	435	115
24	4	30	0.070	36	0.60	400	110
25	4	30	0.070	38	0.65	380	105
28	6	30	0.080	42	0.70	340	165
30	6	30	0.085	45	0.75	320	165
32	6	30	0.090	48	0.80	300	160
36	6	30	0.105	54	0.90	265	165
40	6	30	0.115	60	1.00	240	165

Materiale

Ghisa
(griglia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
22	4	50	0.065	33	0.55	725	190
24	4	50	0.070	36	0.60	665	185
25	4	50	0.070	38	0.65	635	180
28	6	50	0.080	42	0.70	570	275
30	6	50	0.085	45	0.75	530	270
32	6	50	0.090	48	0.80	495	265
36	6	50	0.105	54	0.90	440	275
40	6	50	0.115	60	1.00	400	275

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
22	4	26	0.065	33	0.55	375	100
24	4	26	0.070	36	0.60	345	95
25	4	26	0.070	38	0.65	330	90
28	6	26	0.080	42	0.70	295	140
30	6	26	0.085	45	0.75	275	140
32	6	26	0.090	48	0.80	260	140
36	6	26	0.105	54	0.90	230	145
40	6	26	0.115	60	1.00	205	140

Rame non legato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
22	4	80	0.065	33	0.55	1160	300
24	4	80	0.070	36	0.60	1060	295
25	4	80	0.070	38	0.65	1020	285
28	6	80	0.080	42	0.70	910	435
30	6	80	0.085	45	0.75	850	435
32	6	80	0.090	48	0.80	795	430
36	6	80	0.105	54	0.90	705	445
40	6	80	0.115	60	1.00	635	440

Alluminio malleabile
Si < 6%



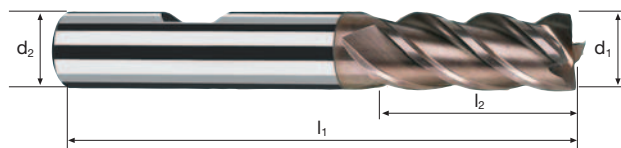
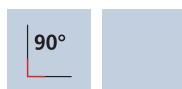
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
22	4	100	0.065	33	0.55	1445	375
24	4	100	0.070	36	0.60	1325	370
25	4	100	0.070	38	0.65	1275	355
28	6	100	0.080	42	0.70	1135	545
30	6	100	0.085	45	0.75	1060	540
32	6	100	0.090	48	0.80	995	535
36	6	100	0.105	54	0.90	885	560
40	6	100	0.115	60	1.00	795	550

Frese cilindriche

A taglienti lisci, esecuzione normale



HSS-E λ **40°**
Co8 γ **15°**



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300



Inox
Stainless

Ti
Titanium

GG(G)
Aluminium
Copper

		Rivestimento		Articolo		Codice- ϕ				UNICUT-4X
Esempio: N° Ordine		U		0110		.710				U0110
ϕ Code	d1 k8	d2 h6		l1	l2	α	z			
.710	22.0	20		104	38	0.0°	4			●
.741	24.0	20		111	45	0.0°	4			●
.772	25.0	25		121	45	0.0°	4			●
.800	28.0	25		121	45	0.0°	6			●
.810	30.0	25		121	45	0.0°	6			●
.832	32.0	32		133	53	0.0°	6			●
.860	36.0	32		133	53	0.0°	6			●
.881	40.0	32		143	63	0.0°	6			●
										●
										●
										●
										●
										●
										●
										●
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										●
										●
										●
										●
										●
										●
										●
										●
										●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	2	3	64	0.005	3.0	0.2	10185	155	0.1
		3	3	64	0.010	4.5	0.2	6790	205	0.2
		4	3	64	0.010	6.0	0.3	5095	155	0.3
		5	3	64	0.015	7.5	0.4	4075	185	0.5
		6	3	64	0.020	9.0	0.4	3395	205	0.7
		8	3	64	0.025	12.0	0.6	2545	190	1.3
		10	3	64	0.030	15.0	0.7	2035	185	1.9
		12	3	64	0.045	18.0	0.9	1700	230	3.5
		16	3	64	0.060	24.0	1.1	1275	230	6.1
		2	3	52	0.005	3.0	0.2	8275	125	0.1
		3	3	52	0.010	4.5	0.2	5520	165	0.1
		4	3	52	0.010	6.0	0.3	4140	125	0.2
		5	3	52	0.015	7.5	0.4	3310	150	0.4
		6	3	52	0.020	9.0	0.4	2760	165	0.6
		8	3	52	0.025	12.0	0.6	2070	155	1.0
		10	3	52	0.030	15.0	0.7	1655	150	1.6
12	3	52	0.045	18.0	0.9	1380	185	2.8		
16	3	52	0.060	24.0	1.1	1035	185	4.9		
	Acciaio inossidabile [Cr-Ni/1.4301] 	2	3	26	0.005	3.0	0.2	4140	60	0.1
		3	3	26	0.010	4.5	0.2	2760	85	0.1
		4	3	26	0.010	6.0	0.3	2070	60	0.1
		5	3	26	0.015	7.5	0.4	1655	75	0.2
		6	3	26	0.020	9.0	0.4	1380	85	0.3
		8	3	26	0.025	12.0	0.6	1035	80	0.5
		10	3	26	0.030	15.0	0.7	830	75	0.8
		12	3	26	0.045	18.0	0.9	690	95	1.5
		16	3	26	0.060	24.0	1.1	515	95	2.5
		2	3	45	0.005	3.0	0.2	7160	105	0.1
		3	3	45	0.010	4.5	0.2	4775	145	0.1
		4	3	45	0.010	6.0	0.3	3580	105	0.2
		5	3	45	0.015	7.5	0.4	2865	130	0.3
		6	3	45	0.020	9.0	0.4	2385	145	0.5
		8	3	45	0.025	12.0	0.6	1790	135	0.9
		10	3	45	0.030	15.0	0.7	1430	130	1.4
12	3	45	0.045	18.0	0.9	1195	160	2.4		
16	3	45	0.060	24.0	1.1	895	160	4.2		
	Ghisa (grigia / sferoidale) 	2	3	45	0.005	3.0	0.2	7160	105	0.1
		3	3	45	0.010	4.5	0.2	4775	145	0.1
		4	3	45	0.010	6.0	0.3	3580	105	0.2
		5	3	45	0.015	7.5	0.4	2865	130	0.3
		6	3	45	0.020	9.0	0.4	2385	145	0.5
		8	3	45	0.025	12.0	0.6	1790	135	0.9
		10	3	45	0.030	15.0	0.7	1430	130	1.4
		12	3	45	0.045	18.0	0.9	1195	160	2.4
		16	3	45	0.060	24.0	1.1	895	160	4.2

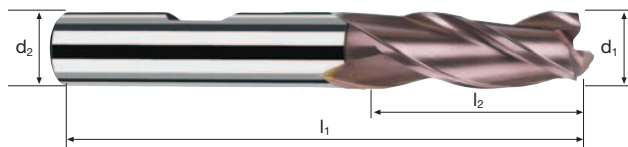
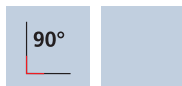
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]		
	Acciaio < 850 N/mm ² 	2	3	60	0.005	1.0	2	9550	145	0.3		
		3	3	60	0.010	1.5	3	6365	190	0.9		
		4	3	60	0.010	2.0	4	4775	145	1.2		
		5	3	60	0.015	2.5	5	3820	170	2.1		
		6	3	60	0.020	3.0	6	3185	190	3.4		
		8	3	60	0.025	4.0	8	2385	180	5.8		
		10	3	60	0.030	5.0	10	1910	170	8.5		
		12	3	60	0.045	6.0	12	1590	215	15.5		
		16	3	60	0.065	8.0	16	1195	235	30.1		
		2	3	50	0.005	1.0	2	7960	120	0.2		
		3	3	50	0.010	1.5	3	5305	160	0.7		
		4	3	50	0.010	2.0	4	3980	120	1.0		
		5	3	50	0.015	2.5	5	3185	145	1.8		
		6	3	50	0.020	3.0	6	2655	160	2.9		
		8	3	50	0.025	4.0	8	1990	150	4.8		
		10	3	50	0.030	5.0	10	1590	145	7.3		
12	3	50	0.045	6.0	12	1325	180	13.0				
16	3	50	0.065	8.0	16	995	195	25.0				
	Acciaio 850 - 1100 N/mm ² 	2	3	23	0.005	1.0	2	3660	55	0.1		
		3	3	23	0.010	1.5	3	2440	75	0.3		
		4	3	23	0.010	2.0	4	1830	55	0.4		
		5	3	23	0.015	2.5	5	1465	65	0.8		
		6	3	23	0.020	3.0	6	1220	75	1.4		
		8	3	23	0.025	4.0	8	915	70	2.2		
		10	3	23	0.030	5.0	10	730	65	3.3		
		12	3	23	0.045	6.0	12	610	80	5.8		
		16	3	23	0.065	8.0	16	460	90	11.5		
		2	3	40	0.005	1.0	2	6365	95	0.2		
		3	3	40	0.010	1.5	3	4245	125	0.6		
		4	3	40	0.010	2.0	4	3185	95	0.8		
		5	3	40	0.015	2.5	5	2545	115	1.4		
		6	3	40	0.020	3.0	6	2120	125	2.3		
		8	3	40	0.025	4.0	8	1590	120	3.8		
		10	3	40	0.030	5.0	10	1275	115	5.8		
12	3	40	0.045	6.0	12	1060	145	10.4				
16	3	40	0.065	8.0	16	795	155	19.8				
	Acciaio inossidabile [Cr-Ni/1.4301] 	2	3	23	0.005	1.0	2	3660	55	0.1		
		3	3	23	0.010	1.5	3	2440	75	0.3		
		4	3	23	0.010	2.0	4	1830	55	0.4		
		5	3	23	0.015	2.5	5	1465	65	0.8		
		6	3	23	0.020	3.0	6	1220	75	1.4		
		8	3	23	0.025	4.0	8	915	70	2.2		
		10	3	23	0.030	5.0	10	730	65	3.3		
		12	3	23	0.045	6.0	12	610	80	5.8		
		16	3	23	0.065	8.0	16	460	90	11.5		
			Ghisa (grigia / sferoidale) 	2	3	40	0.005	1.0	2	6365	95	0.2
				3	3	40	0.010	1.5	3	4245	125	0.6
				4	3	40	0.010	2.0	4	3185	95	0.8
				5	3	40	0.015	2.5	5	2545	115	1.4
				6	3	40	0.020	3.0	6	2120	125	2.3
				8	3	40	0.025	4.0	8	1590	120	3.8
				10	3	40	0.030	5.0	10	1275	115	5.8
12	3			40	0.045	6.0	12	1060	145	10.4		
16	3			40	0.065	8.0	16	795	155	19.8		

Frese cilindriche

A taglienti lisci, esecuzione normale



HSS-E λ 30°
Co8 γ 15°



Sgrossatura



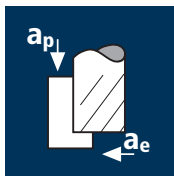
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Aluminium Copper
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Esempio: N° Ordine		Rivestimento U	Articolo 0780	Codice-ø .100			UNICUT-4X U0780	
ø Code	d1 f8	d2 h6	l1	l2	α	z		
.100	1.0	6	49	5	10.5°	3	●	
.120	1.5	6	50	6	10.0°	3	●	
.140	2.0	6	51	7	8.5°	3	●	
.160	2.5	6	52	8	6.5°	3	●	
.180	3.0	6	52	8	6.0°	3	●	
.200	3.5	6	54	10	4.5°	3	●	
.220	4.0	6	55	11	3.5°	3	●	
.240	4.5	6	55	11	2.5°	3	●	
.260	5.0	6	57	13	1.5°	3	●	
.280	5.5	6	57	13	1.0°	3	●	
.300	6.0	6	57	13	0.0°	3	●	
.322	6.5	10	66	16	4.0°	3	●	
.342	7.0	10	66	16	3.5°	3	●	
.391	8.0	8	63	19	0.0°	3	●	
.402	8.0	10	69	19	2.5°	3	●	
.420	9.0	10	69	19	1.5°	3	●	
.450	10.0	10	72	22	0.0°	3	●	
.470	11.0	12	79	22	1.0°	3	●	
.501	12.0	12	83	26	0.0°	3	●	
.540	13.0	12	83	26	0.0°	3	●	
.570	14.0	12	83	26	0.0°	3	●	
.581	15.0	12	83	26	0.0°	3	●	
.610	16.0	16	92	32	0.0°	3	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Ghisa
(griglia / sferoidale)

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
18	3	64	0.070	27.0	1.3	1130	235	8.0
20	3	64	0.080	30.0	1.4	1020	245	10.5
22	3	64	0.085	33.0	1.6	925	235	12.0
25	3	64	0.100	37.5	1.8	815	245	16.0

18	3	52	0.070	27.0	1.3	920	195	6.5
20	3	52	0.080	30.0	1.4	830	200	8.5
22	3	52	0.085	33.0	1.6	750	190	9.5
25	3	52	0.100	37.5	1.8	660	200	13.0

18	3	26	0.070	27.0	1.3	460	95	3.0
20	3	26	0.080	30.0	1.4	415	100	4.0
22	3	26	0.085	33.0	1.6	375	95	5.0
25	3	26	0.100	37.5	1.8	330	100	6.5

18	3	45	0.070	27.0	1.3	795	165	5.5
20	3	45	0.080	30.0	1.4	715	170	7.0
22	3	45	0.085	33.0	1.6	650	165	8.5
25	3	45	0.100	37.5	1.8	575	175	11.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Ghisa
(griglia / sferoidale)

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
18	3	60	0.070	9.0	18	1060	225	36.5
20	3	60	0.080	10.0	20	955	230	46.0
22	3	60	0.085	11.0	22	870	220	53.0
25	3	60	0.100	12.5	25	765	230	72.0

18	3	50	0.070	9.0	18	885	185	30.0
20	3	50	0.080	10.0	20	795	190	38.0
22	3	50	0.085	11.0	22	725	185	45.0
25	3	50	0.100	12.5	25	635	190	59.5

18	3	23	0.070	9.0	18	405	85	14.0
20	3	23	0.080	10.0	20	365	90	18.0
22	3	23	0.085	11.0	22	335	85	20.5
25	3	23	0.100	12.5	25	295	90	28.0

18	3	40	0.070	9.0	18	705	150	24.5
20	3	40	0.080	10.0	20	635	150	30.0
22	3	40	0.085	11.0	22	580	150	36.5
25	3	40	0.100	12.5	25	510	155	48.5

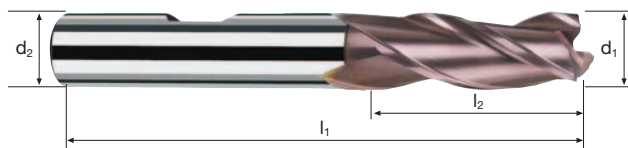
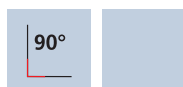
Frese cilindriche

A taglienti lisci, esecuzione normale



HSS-E
Co8

λ **30°**
 γ **15°**



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

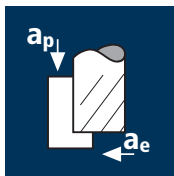
Rm
1100-1300

Inox
Stainless

GG(G)
Aluminium
Copper

		Rivestimento		Articolo		Codice-ø				UNICUT-4X	
Esempio: N° Ordine		U		0780		.640				U0780	
Ø Code	d1 f8	d2 h6		l1	l2		α	z			
.640	18.0	16		92	32		0.0°	3			●
.671	20.0	16		98	38		0.0°	3			●
.682	20.0	20		104	38		0.0°	3			●
.710	22.0	20		104	38		0.0°	3			●
.772	25.0	25		121	45		0.0°	3			●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Ghisa
(griglia / sferoidale)

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
2	2	60	0.010	2.0	0.5	9550	190	0.2
3	2	60	0.015	3.0	0.8	6365	190	0.4
5	2	60	0.020	5.0	1.3	3820	155	1.0
6	2	60	0.025	6.0	1.5	3185	160	1.4
8	2	60	0.035	8.0	2.0	2385	165	2.6
10	2	60	0.045	10.0	2.5	1910	170	4.3
12	2	60	0.065	12.0	3.0	1590	205	7.4
16	2	60	0.090	16.0	4.0	1195	215	13.8
20	2	60	0.110	20.0	5.0	955	210	21.0

2	2	48	0.010	2.0	0.5	7640	155	0.2
3	2	48	0.015	3.0	0.8	5095	155	0.3
5	2	48	0.020	5.0	1.3	3055	120	0.8
6	2	48	0.025	6.0	1.5	2545	125	1.1
8	2	48	0.035	8.0	2.0	1910	135	2.2
10	2	48	0.045	10.0	2.5	1530	140	3.5
12	2	48	0.065	12.0	3.0	1275	165	5.9
16	2	48	0.090	16.0	4.0	955	170	10.9
20	2	48	0.110	20.0	5.0	765	170	17.0

2	2	25	0.010	2.0	0.5	3980	80	0.1
3	2	25	0.015	3.0	0.8	2655	80	0.2
5	2	25	0.020	5.0	1.3	1590	65	0.4
6	2	25	0.025	6.0	1.5	1325	65	0.6
8	2	25	0.035	8.0	2.0	995	70	1.1
10	2	25	0.045	10.0	2.5	795	70	1.8
12	2	25	0.065	12.0	3.0	665	85	3.1
16	2	25	0.090	16.0	4.0	495	90	5.8
20	2	25	0.110	20.0	5.0	400	90	9.0

2	2	42	0.010	2.0	0.5	6685	135	0.1
3	2	42	0.015	3.0	0.8	4455	135	0.3
5	2	42	0.020	5.0	1.3	2675	105	0.7
6	2	42	0.025	6.0	1.5	2230	110	1.0
8	2	42	0.035	8.0	2.0	1670	115	1.8
10	2	42	0.045	10.0	2.5	1335	120	3.0
12	2	42	0.065	12.0	3.0	1115	145	5.2
16	2	42	0.090	16.0	4.0	835	150	9.6
20	2	42	0.110	20.0	5.0	670	145	14.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Ghisa
(griglia / sferoidale)

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
2	2	55	0.005	0.8	2	8755	90	0.1
3	2	55	0.010	1.2	3	5835	115	0.4
5	2	55	0.015	2.0	5	3500	105	1.1
6	2	55	0.020	2.4	6	2920	115	1.7
8	2	55	0.025	3.2	8	2190	110	2.8
10	2	55	0.035	4.0	10	1750	125	5.0
12	2	55	0.055	4.8	12	1460	160	9.2
16	2	55	0.070	6.4	16	1095	155	15.9
20	2	55	0.090	8.0	20	875	160	25.6

2	2	45	0.005	0.8	2	7160	70	0.1
3	2	45	0.010	1.2	3	4775	95	0.3
5	2	45	0.015	2.0	5	2865	85	0.9
6	2	45	0.020	2.4	6	2385	95	1.4
8	2	45	0.025	3.2	8	1790	90	2.3
10	2	45	0.035	4.0	10	1430	100	4.0
12	2	45	0.055	4.8	12	1195	130	7.5
16	2	45	0.070	6.4	16	895	125	12.8
20	2	45	0.090	8.0	20	715	130	20.8

2	2	22	0.005	0.8	2	3500	35	0.1
3	2	22	0.010	1.2	3	2335	45	0.2
5	2	22	0.015	2.0	5	1400	40	0.4
6	2	22	0.020	2.4	6	1165	45	0.6
8	2	22	0.025	3.2	8	875	45	1.2
10	2	22	0.035	4.0	10	700	50	2.0
12	2	22	0.055	4.8	12	585	65	3.7
16	2	22	0.070	6.4	16	440	60	6.1
20	2	22	0.090	8.0	20	350	65	10.4

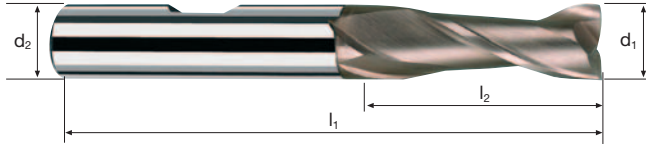
2	2	36	0.005	0.8	2	5730	55	0.1
3	2	36	0.010	1.2	3	3820	75	0.3
5	2	36	0.015	2.0	5	2290	70	0.7
6	2	36	0.020	2.4	6	1910	75	1.1
8	2	36	0.025	3.2	8	1430	70	1.8
10	2	36	0.035	4.0	10	1145	80	3.2
12	2	36	0.055	4.8	12	955	105	6.0
16	2	36	0.070	6.4	16	715	100	10.2
20	2	36	0.090	8.0	20	575	105	16.8

Frese cilindriche

A taglienti lisci, esecuzione normale



HSS-E
Co8 λ **30°**
 γ **15°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Aluminium Copper
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Esempio: N° Ordine								UNICUT-4X		
Rivestimento		Articolo		Codice-ø				U0770		
U		0770		.100						
Ø Code	d1 f8	d2 h6	l1	l2	α	Z				
.100	1.0	6	49	5	11.5°	2	●			
.120	1.5	6	50	6	10.0°	2	●			
.140	2.0	6	51	7	8.5°	2	●			
.160	2.5	6	52	8	6.5°	2	●			
.180	3.0	6	52	8	6.0°	2	●			
.220	4.0	6	55	11	3.5°	2	●			
.260	5.0	6	57	13	1.5°	2	●			
.300	6.0	6	57	13	0.0°	2	●			
.391	8.0	8	63	19	0.0°	2	●			
.450	10.0	10	72	22	0.0°	2	●			
.501	12.0	12	83	26	0.0°	2	●			
.570	14.0	12	83	26	0.0°	2	●			
.610	16.0	16	92	32	0.0°	2	●			
.682	20.0	20	104	38	0.0°	2	●			

Applicazione

Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	150	0.025	4	2.6	11935	1195	12.5
5	4	150	0.035	5	3.3	9550	1335	21.5
6	4	150	0.040	6	3.9	7960	1275	30.0
8	4	150	0.055	8	5.2	5970	1315	54.5
10	4	150	0.065	10	6.5	4775	1240	80.5
12	4	150	0.080	12	7.8	3980	1275	119.5
16	4	150	0.090	16	10.4	2985	1075	179.0
20	4	150	0.110	20	13.0	2385	1050	273.0

Acciaio
1100 - 1300 N/mm²

4	4	115	0.025	4	2.6	9150	915	9.5
5	4	115	0.035	5	3.3	7320	1025	16.5
6	4	115	0.040	6	3.9	6100	975	23.0
8	4	115	0.055	8	5.2	4575	1005	42.0
10	4	115	0.065	10	6.5	3660	950	62.0
12	4	115	0.080	12	7.8	3050	975	91.5
16	4	115	0.090	16	10.4	2290	825	137.5
20	4	115	0.110	20	13.0	1830	805	209.5

Acciaio da
utensile temprato
52 - 56 HRC

4	4	50	0.015	4	2.6	3980	240	2.5
5	4	50	0.020	5	3.3	3185	255	4.0
6	4	50	0.025	6	3.9	2655	265	6.0
8	4	50	0.035	8	5.2	1990	280	11.5
10	4	50	0.040	10	6.5	1590	255	16.5
12	4	50	0.050	12	7.8	1325	265	25.0
16	4	50	0.055	16	10.4	995	220	36.5
20	4	50	0.065	20	13.0	795	205	53.5

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

4	4	60	0.015	4	2.6	4775	285	3.0
5	4	60	0.025	5	3.3	3820	380	6.0
6	4	60	0.030	6	3.9	3185	380	9.0
8	4	60	0.040	8	5.2	2385	380	16.0
10	4	60	0.045	10	6.5	1910	345	22.5
12	4	60	0.060	12	7.8	1590	380	35.5
16	4	60	0.065	16	10.4	1195	310	51.5
20	4	60	0.075	20	13.0	955	285	74.0

Applicazione

Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	120	0.020	3.6	4	9550	765	11.0
5	4	120	0.025	4.5	5	7640	765	17.0
6	4	120	0.035	5.4	6	6365	890	29.0
8	4	120	0.045	7.2	8	4775	860	49.5
10	4	120	0.055	9.0	10	3820	840	75.5
12	4	120	0.065	10.8	12	3185	830	107.5
16	4	120	0.075	12.8	16	2385	715	146.5
20	4	120	0.095	16.0	20	1910	725	232.0

Acciaio
1100 - 1300 N/mm²

4	4	90	0.020	3.6	4	7160	575	8.5
5	4	90	0.025	4.5	5	5730	575	13.0
6	4	90	0.035	5.4	6	4775	670	21.5
8	4	90	0.045	7.2	8	3580	645	37.0
10	4	90	0.055	9.0	10	2865	630	56.5
12	4	90	0.065	10.8	12	2385	620	80.5
16	4	90	0.075	12.8	16	1790	535	109.5
20	4	90	0.095	16.0	20	1430	545	174.5

Acciaio da
utensile temprato
52 - 56 HRC

4	4	40	0.010	3.6	4	3185	125	2.0
5	4	40	0.015	4.5	5	2545	155	3.5
6	4	40	0.020	5.4	6	2120	170	5.5
8	4	40	0.025	7.2	8	1590	160	9.0
10	4	40	0.035	9.0	10	1275	180	16.0
12	4	40	0.040	10.8	12	1060	170	22.0
16	4	40	0.045	12.8	16	795	145	29.5
20	4	40	0.055	16.0	20	635	140	45.0

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

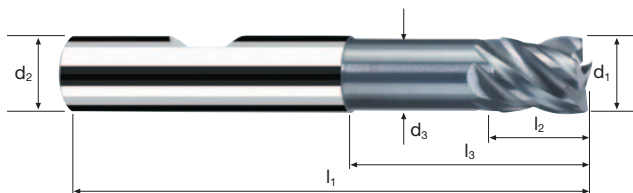
4	4	50	0.015	3.6	4	3980	240	3.5
5	4	50	0.020	4.5	5	3185	255	5.5
6	4	50	0.025	5.4	6	2655	265	8.5
8	4	50	0.035	7.2	8	1990	280	16.0
10	4	50	0.045	9.0	10	1590	285	25.5
12	4	50	0.050	10.8	12	1325	265	34.5
16	4	50	0.060	12.8	16	995	240	49.0
20	4	50	0.070	16.0	20	795	225	72.0

Frese cilindriche NX-VD

A taglienti lisci, esecuzione normale con scarico



HM
MG10 λ **45°**
 γ **-10°**



Sgrossatura

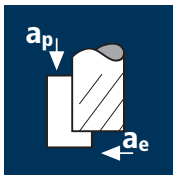











Finitura



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60		Ti Titanium	GG(G) Tool steel
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Esempio: N° Ordine										POLYCHROM	
										P15342	
										P15242	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.220	4	6	3.7	57	6	16	0.10	3.0°	4	●	
.260	5	6	4.6	57	8	18	0.15	1.5°	4	●	
.300	6	6	5.5	57	9	20	0.15	0.0°	4	●	
.391	8	8	7.4	63	12	26	0.15	0.0°	4	●	
.450	10	10	9.2	72	15	31	0.20	0.0°	4	●	
.501	12	12	11.0	83	18	37	0.20	0.0°	4	●	
.610	16	16	15.0	92	24	43	0.20	0.0°	4	●	
.682	20	20	19.0	104	30	53	0.20	0.0°	4	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	3	4	110	0.020	3	1.8	11670	935	5.0
		4	4	110	0.025	4	2.4	8755	875	8.5
		5	4	110	0.030	5	3.0	7005	840	12.5
		6	4	110	0.040	6	3.6	5835	935	20.0
		8	4	110	0.050	8	4.8	4375	875	33.5
		10	4	110	0.065	10	6.0	3500	910	54.5
		12	4	110	0.075	12	7.2	2920	875	75.5
		16	4	110	0.100	16	4.0	2190	875	56.0
		20	4	110	0.125	20	5.0	1750	875	87.5
			Acciaio da utensile temprato 48 - 52 HRC 	3	4	70	0.015	3	1.8	7425
4	4			70	0.020	4	2.4	5570	445	4.5
5	4			70	0.030	5	3.0	4455	535	8.0
6	4			70	0.035	6	3.6	3715	520	11.0
8	4			70	0.045	8	4.8	2785	500	19.0
10	4			70	0.055	10	6.0	2230	490	29.5
12	4			70	0.065	12	7.2	1855	480	41.5
16	4			70	0.090	16	4.0	1395	500	32.0
20	4			70	0.110	20	5.0	1115	490	49.0
	Acciaio da utensile temprato 52 - 56 HRC 			3	4	50	0.015	3	1.8	5305
		4	4	50	0.020	4	2.4	3980	320	3.0
		5	4	50	0.025	5	3.0	3185	320	5.0
		6	4	50	0.025	6	3.6	2655	265	5.5
		8	4	50	0.035	8	4.8	1990	280	11.0
		10	4	50	0.045	10	6.0	1590	285	17.0
		12	4	50	0.055	12	3.0	1325	290	10.5
		16	4	50	0.075	16	4.0	995	300	19.0
		20	4	50	0.090	20	5.0	795	285	28.5
			Acciaio da utensile temprato 56 - 60 HRC 	3	4	25	0.010	3	1.8	2655
4	4			25	0.015	4	2.4	1990	119	1.0
5	4			25	0.015	5	3.0	1590	95	1.5
6	4			25	0.020	6	3.6	1325	106	2.5
8	4			25	0.025	8	4.8	995	100	4.0
10	4			25	0.035	10	6.0	795	111	6.5
12	4			25	0.040	12	3.0	665	106	4.0
16	4			25	0.055	16	4.0	495	109	7.0
20	4			25	0.065	20	5.0	400	104	10.5

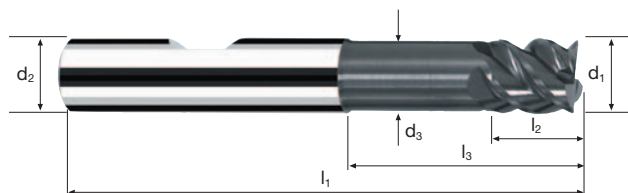
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	3	4	95	0.015	1.5	3	10080	605	2.5
		4	4	95	0.020	2.0	4	7560	605	5.0
		5	4	95	0.025	2.5	5	6050	605	7.5
		6	4	95	0.030	3.0	6	5040	605	11.0
		8	4	95	0.040	4.0	8	3780	605	19.5
		10	4	95	0.050	5.0	10	3025	605	30.5
		12	4	95	0.060	6.0	12	2520	605	43.5
		16	4	95	0.080	4.0	16	1890	605	38.5
		20	4	95	0.100	5.0	20	1510	605	60.5
			Acciaio da utensile temprato 48 - 52 HRC 	3	4	60	0.015	1.5	3	6365
4	4			60	0.020	2.0	4	4775	380	3.0
5	4			60	0.025	2.5	5	3820	380	5.0
6	4			60	0.025	3.0	6	3185	320	6.0
8	4			60	0.035	4.0	8	2385	335	10.5
10	4			60	0.045	5.0	10	1910	345	17.5
12	4			60	0.055	6.0	12	1590	350	25.0
16	4			60	0.075	4.0	16	1195	360	23.0
20	4			60	0.090	5.0	20	955	345	34.5
	Acciaio da utensile temprato 52 - 56 HRC 			3	4	40	0.010	1.5	3	4245
		4	4	40	0.015	2.0	4	3185	190	1.5
		5	4	40	0.020	2.5	5	2545	205	2.5
		6	4	40	0.025	3.0	6	2120	210	4.0
		8	4	40	0.030	4.0	8	1590	190	6.0
		10	4	40	0.040	5.0	10	1275	205	10.5
		12	4	40	0.050	6.0	12	1060	210	15.0
		16	4	40	0.065	4.0	16	795	205	13.0
		20	4	40	0.080	5.0	20	635	205	20.5
			Acciaio da utensile temprato 56 - 60 HRC 	3	4	20	0.009	1.5	3	2120
4	4			20	0.011	2.0	4	1590	70	0.5
5	4			20	0.014	2.5	5	1275	71	1.0
6	4			20	0.017	3.0	6	1060	72	1.5
8	4			20	0.023	4.0	8	795	73	2.5
10	4			20	0.029	5.0	10	635	74	3.5
12	4			20	0.034	6.0	12	530	72	5.0
16	4			20	0.046	4.0	16	400	74	4.5
20	4			20	0.057	5.0	20	320	73	7.5

Frese cilindriche HX

A taglienti lisci, esecuzione normale con scarico



HM
MG10 λ **55°**
 γ -**10°**



Sgrossatura

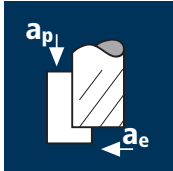











Finitura



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)
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Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø					POLYCHROM	DURO-S
	P	5348	.180							P5348	D5348
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.180	3	6	2.8	57	4	14	0.10	4.5°	4	●	●
.220	4	6	3.7	57	5	16	0.10	3.0°	4	●	●
.260	5	6	4.6	57	6	18	0.15	1.5°	4	●	●
.300	6	6	5.5	57	7	20	0.15	0.0°	4	●	●
.391	8	8	7.4	63	9	26	0.15	0.0°	4	●	●
.450	10	10	9.2	72	11	31	0.20	0.0°	4	●	●
.501	12	12	11.0	83	13	37	0.20	0.0°	4	●	●
.610	16	16	15.0	92	17	43	0.20	0.0°	4	●	●
.682	20	20	19.0	104	21	53	0.20	0.0°	4	●	●
.772	25	25	24.0	121	26	64	0.25	0.0°	4	●	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 48 - 52 HRC  D	3	4	75	0.020	3	1.2	7960	635	2.5
		4	4	75	0.025	4	1.6	5970	595	4.0
		5	4	75	0.030	5	2.0	4775	575	6.0
		6	4	75	0.040	6	2.4	3980	635	9.0
		8	4	75	0.050	8	3.2	2985	595	15.0
		10	4	75	0.065	10	4.0	2385	620	25.0
		12	4	75	0.075	12	4.8	1990	595	34.5
		16	4	75	0.100	16	4.0	1490	595	38.0
		20	4	75	0.125	20	5.0	1195	600	60.0
			Acciaio da utensile temprato 52 - 56 HRC  D	3	4	60	0.015	3	1.2	6365
4	4			60	0.020	4	1.6	4775	380	2.5
5	4			60	0.030	5	2.0	3820	460	4.5
6	4			60	0.035	6	2.4	3185	445	6.5
8	4			60	0.045	8	3.2	2385	430	11.0
10	4			60	0.055	10	4.0	1910	420	17.0
12	4			60	0.065	12	3.0	1590	415	15.0
16	4			60	0.090	16	4.0	1195	430	27.5
20	4			60	0.110	20	5.0	955	420	42.0
	Acciaio da utensile temprato 56 - 60 HRC  D			3	4	30	0.015	3	1.2	3185
		4	4	30	0.020	4	1.6	2385	190	1.0
		5	4	30	0.025	5	2.0	1910	190	2.0
		6	4	30	0.025	6	2.4	1590	160	2.5
		8	4	30	0.035	8	3.2	1195	165	4.0
		10	4	30	0.045	10	4.0	955	170	7.0
		12	4	30	0.055	12	3.0	795	175	6.5
		16	4	30	0.075	16	4.0	595	180	11.5
		20	4	30	0.090	20	5.0	475	170	17.0
			Acciaio da utensile temprato > 60 HRC  D	3	4	25	0.010	3	1.2	2655
4	4			25	0.010	4	1.6	1990	80	0.5
5	4			25	0.015	5	2.0	1590	95	1.0
6	4			25	0.015	6	2.4	1325	80	1.0
8	4			25	0.025	8	3.2	995	100	2.5
10	4			25	0.030	10	4.0	795	95	4.0
12	4			25	0.035	12	3.0	665	93	3.5
16	4			25	0.045	16	4.0	495	89	5.5
20	4			25	0.055	20	5.0	400	88	9.0

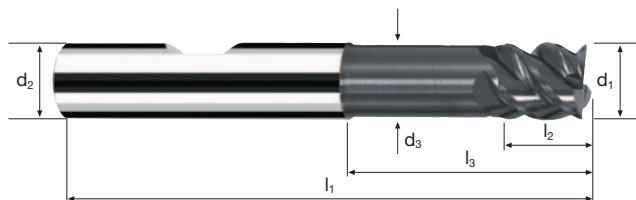
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 48 - 52 HRC  D	3	4	70	0.015	1.5	3	7425	445	2.0
		4	4	70	0.020	2.0	4	5570	445	3.5
		5	4	70	0.030	2.5	5	4455	535	6.5
		6	4	70	0.035	3.0	6	3715	520	9.5
		8	4	70	0.045	4.0	8	2785	500	16.0
		10	4	70	0.055	5.0	10	2230	490	24.5
		12	4	70	0.065	6.0	12	1855	480	34.5
		16	4	70	0.090	4.0	16	1395	500	32.0
		20	4	70	0.110	5.0	20	1115	490	49.0
			Acciaio da utensile temprato 52 - 56 HRC  D	3	4	50	0.015	1.5	3	5305
4	4			50	0.020	2.0	4	3980	320	2.5
5	4			50	0.025	2.5	5	3185	320	4.0
6	4			50	0.025	3.0	6	2655	265	5.0
8	4			50	0.035	4.0	8	1990	280	9.0
10	4			50	0.045	5.0	10	1590	285	14.5
12	4			50	0.055	6.0	12	1325	290	21.0
16	4			50	0.075	4.0	16	995	300	19.0
20	4			50	0.090	5.0	20	795	285	28.5
	Acciaio da utensile temprato 56 - 60 HRC  D			3	4	30	0.010	1.5	3	3185
		4	4	30	0.013	2.0	4	2385	125	1.0
		5	4	30	0.017	2.5	5	1910	130	1.5
		6	4	30	0.020	3.0	6	1590	125	2.5
		8	4	30	0.027	4.0	8	1195	130	4.0
		10	4	30	0.033	5.0	10	955	125	6.5
		12	4	30	0.040	6.0	12	795	125	9.0
		16	4	30	0.053	4.0	16	595	125	8.0
		20	4	30	0.067	5.0	20	475	125	12.5
			Acciaio da utensile temprato > 60 HRC  D	3	4	20	0.008	1.5	3	2120
4	4			20	0.011	2.0	4	1590	70	0.5
5	4			20	0.013	2.5	5	1275	66	1.0
6	4			20	0.016	3.0	6	1060	68	1.0
8	4			20	0.021	4.0	8	795	67	2.0
10	4			20	0.026	5.0	10	635	66	3.5
12	4			20	0.032	6.0	12	530	68	5.0
16	4			20	0.042	4.0	16	400	67	4.5
20	4			20	0.053	5.0	20	320	68	7.0

Frese cilindriche HX-H

A taglienti lisci, esecuzione normale con scarico



HM
XT λ **55°**
 γ **-10°**



Sgrossatura



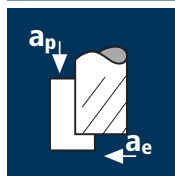
Finitura



			Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			HSS
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Esempio: N° Ordine										DURO-S
										D5344
										D5244
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z	
.180	3	6	2.8	57	4	14	0.10	4.5°	4	●
.220	4	6	3.7	57	5	16	0.10	3.0°	4	●
.260	5	6	4.6	57	6	18	0.15	1.5°	4	●
.300	6	6	5.5	57	7	20	0.15	0.0°	4	●
.391	8	8	7.4	63	9	26	0.15	0.0°	4	●
.450	10	10	9.2	72	11	31	0.20	0.0°	4	●
.501	12	12	11.0	83	13	37	0.20	0.0°	4	●
.610	16	16	15.0	92	17	43	0.20	0.0°	4	●
.682	20	20	19.0	104	21	53	0.20	0.0°	4	●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	80	0.015	3	1.2	8490	510	2.0
4	4	80	0.020	4	1.6	6365	510	3.5
5	4	80	0.025	5	2.0	5095	510	5.0
6	4	80	0.030	6	2.4	4245	510	7.5
8	4	80	0.040	8	3.2	3185	510	13.0
10	4	80	0.055	10	4.0	2545	560	22.5
12	4	80	0.065	12	4.8	2120	550	31.5
16	4	80	0.085	16	4.0	1590	540	34.5
20	4	80	0.090	20	5.0	1275	460	46.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



3	4	70	0.015	3	1.2	7425	445	1.5
4	4	70	0.020	4	1.6	5570	445	3.0
5	4	70	0.025	5	2.0	4455	445	4.5
6	4	70	0.030	6	2.4	3715	445	6.5
8	4	70	0.040	8	3.2	2785	445	11.5
10	4	70	0.055	10	4.0	2230	490	19.5
12	4	70	0.065	12	4.8	1855	480	27.5
16	4	70	0.085	16	4.0	1395	475	30.5
20	4	70	0.090	20	5.0	1115	400	40.0

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



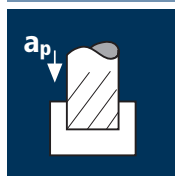
3	4	25	0.015	3	1.2	2655	160	0.5
4	4	25	0.020	4	1.6	1990	160	1.0
5	4	25	0.025	5	2.0	1590	160	1.5
6	4	25	0.030	6	2.4	1325	160	2.5
8	4	25	0.035	8	3.2	995	140	3.5
10	4	25	0.045	10	4.0	795	145	6.0
12	4	25	0.050	12	4.8	665	135	8.0
16	4	25	0.065	16	4.0	495	130	8.5
20	4	25	0.085	20	5.0	400	135	13.5

Leghe a base di nichel
indurite
R_m > 1000 N/mm²
[Inconel 718]



3	4	15	0.015	3	1.2	1590	95	0.5
4	4	15	0.020	4	1.6	1195	95	0.5
5	4	15	0.025	5	2.0	955	95	1.0
6	4	15	0.030	6	2.4	795	95	1.5
8	4	15	0.035	8	3.2	595	85	2.0
10	4	15	0.045	10	4.0	475	85	3.5
12	4	15	0.050	12	4.8	400	80	4.5
16	4	15	0.065	16	4.0	300	80	5.0
20	4	15	0.085	20	5.0	240	80	8.0

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	60	0.015	2.3	3	6365	380	2.5
4	4	60	0.020	3.0	4	4775	380	4.5
5	4	60	0.025	3.8	5	3820	380	7.0
6	4	60	0.030	4.5	6	3185	380	10.5
8	4	60	0.040	6.0	8	2385	380	18.0
10	4	60	0.055	7.5	10	1910	420	31.5
12	4	60	0.055	9.0	12	1590	350	38.0
16	4	60	0.085	8.0	16	1195	405	52.0
20	4	60	0.105	10.0	20	955	400	80.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



3	4	55	0.015	2.3	3	5835	350	2.5
4	4	55	0.020	3.0	4	4375	350	4.0
5	4	55	0.025	3.8	5	3500	350	6.5
6	4	55	0.030	4.5	6	2920	350	9.5
8	4	55	0.040	6.0	8	2190	350	17.0
10	4	55	0.055	7.5	10	1750	385	29.0
12	4	55	0.065	9.0	12	1460	380	41.0
16	4	55	0.085	8.0	16	1095	370	47.5
20	4	55	0.105	10.0	20	875	370	74.0

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



3	4	20	0.015	2.3	3	2120	125	1.0
4	4	20	0.020	3.0	4	1590	125	1.5
5	4	20	0.025	3.8	5	1275	130	2.5
6	4	20	0.030	4.5	6	1060	125	3.5
8	4	20	0.035	6.0	8	795	110	5.5
10	4	20	0.045	7.5	10	635	115	8.5
12	4	20	0.050	9.0	12	530	105	11.5
16	4	20	0.070	8.0	16	400	110	14.0
20	4	20	0.090	10.0	20	320	115	23.0

Leghe a base di nichel
indurite
R_m > 1000 N/mm²
[Inconel 718]



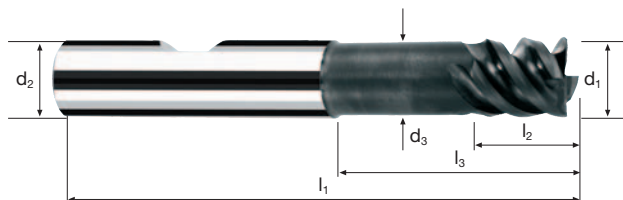
3	4	10	0.015	2.3	3	1060	65	0.5
4	4	10	0.020	3.0	4	795	65	1.0
5	4	10	0.025	3.8	5	635	65	1.0
6	4	10	0.030	4.5	6	530	65	2.0
8	4	10	0.035	6.0	8	400	55	2.5
10	4	10	0.045	7.5	10	320	60	4.5
12	4	10	0.050	9.0	12	265	55	6.0
16	4	10	0.070	8.0	16	200	55	7.0
20	4	10	0.090	10.0	20	160	60	12.0

Frese cilindriche SX

A taglienti lisci, esecuzione normale con scarico



HM
MG10 λ 55°
 γ 15°



Sgrossatura



Finitura



Rm < 850 Rm 850-1100 **Inox** Stainless **Ti** Titanium **Nickel-Alloys** Tool Steel

										POLYCHROM	
Esempio: Rivestimento Articolo Codice-Ø											
N° Ordine P 5318 .180											
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.180	3	6	2.8	57	4	14	0.10	4.5°	4	●	
.220	4	6	3.7	57	5	16	0.10	3.0°	4	●	
.260	5	6	4.6	57	6	18	0.15	1.5°	4	●	
.300	6	6	5.5	57	7	20	0.15	0.0°	4	●	
.391	8	8	7.4	63	9	26	0.15	0.0°	4	●	
.450	10	10	9.2	72	11	31	0.20	0.0°	4	●	
.501	12	12	11.0	83	13	37	0.20	0.0°	4	●	
.610	16	16	15.0	92	17	43	0.20	0.0°	4	●	
.682	20	20	19.0	104	21	53	0.20	0.0°	4	●	

Applicazione

Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	80	0.015	3	1.2	8490	380	1.5
4	3	80	0.020	4	1.6	6365	380	2.5
5	3	80	0.025	5	2.0	5095	380	4.0
6	3	80	0.030	6	2.4	4245	380	5.5
8	3	80	0.040	8	3.2	3185	380	9.5
10	3	80	0.055	10	4.0	2545	420	17.0
12	3	80	0.065	12	4.8	2120	415	24.0
16	3	80	0.085	16	4.0	1590	405	26.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	3	70	0.015	3	1.2	7425	335	1.0
4	3	70	0.020	4	1.6	5570	335	2.0
5	3	70	0.025	5	2.0	4455	335	3.5
6	3	70	0.030	6	2.4	3715	335	5.0
8	3	70	0.040	8	3.2	2785	335	8.5
10	3	70	0.055	10	4.0	2230	370	15.0
12	3	70	0.065	12	4.8	1855	360	20.5
16	3	70	0.085	16	4.0	1395	355	22.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	3	25	0.015	3	1.2	2655	120	0.5
4	3	25	0.020	4	1.6	1990	120	1.0
5	3	25	0.025	5	2.0	1590	120	1.0
6	3	25	0.030	6	2.4	1325	120	1.5
8	3	25	0.035	8	3.2	995	105	2.5
10	3	25	0.045	10	4.0	795	105	4.0
12	3	25	0.050	12	4.8	665	100	6.0
16	3	25	0.060	16	4.0	495	90	6.0

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

3	3	15	0.015	3	1.2	1590	70	0.5
4	3	15	0.020	4	1.6	1195	70	0.5
5	3	15	0.025	5	2.0	955	70	0.5
6	3	15	0.030	6	2.4	795	70	1.0
8	3	15	0.035	8	3.2	595	60	1.5
10	3	15	0.045	10	4.0	475	65	2.5
12	3	15	0.050	12	4.8	400	60	3.5
16	3	15	0.060	16	4.0	300	55	3.5

Applicazione

Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	60	0.015	1.5	3	6365	285	1.5
4	3	60	0.020	2.0	4	4775	285	2.5
5	3	60	0.025	2.5	5	3820	285	3.5
6	3	60	0.030	3.0	6	3185	285	5.0
8	3	60	0.040	4.0	8	2385	285	9.0
10	3	60	0.055	5.0	10	1910	315	16.0
12	3	60	0.065	6.0	12	1590	310	22.5
16	3	60	0.085	4.0	16	1195	305	19.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	3	55	0.015	1.5	3	5835	265	1.0
4	3	55	0.020	2.0	4	4375	265	2.0
5	3	55	0.025	2.5	5	3500	265	3.5
6	3	55	0.030	3.0	6	2920	265	5.0
8	3	55	0.040	4.0	8	2190	265	8.5
10	3	55	0.055	5.0	10	1750	290	14.5
12	3	55	0.065	6.0	12	1460	285	20.5
16	3	55	0.085	4.0	16	1095	280	18.0

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	3	20	0.015	1.5	3	2120	95	0.5
4	3	20	0.020	2.0	4	1590	95	1.0
5	3	20	0.025	2.5	5	1275	95	1.0
6	3	20	0.030	3.0	6	1060	95	1.5
8	3	20	0.035	4.0	8	795	85	2.5
10	3	20	0.045	5.0	10	635	85	4.5
12	3	20	0.050	6.0	12	530	80	6.0
16	3	20	0.060	4.0	16	400	70	4.5

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

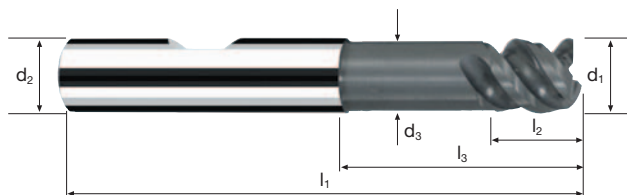
3	3	10	0.015	1.5	3	1060	50	0.2
4	3	10	0.020	2.0	4	795	50	0.5
5	3	10	0.025	2.5	5	635	50	0.5
6	3	10	0.030	3.0	6	530	50	1.0
8	3	10	0.035	4.0	8	400	40	1.5
10	3	10	0.045	5.0	10	320	45	2.5
12	3	10	0.050	6.0	12	265	40	3.0
16	3	10	0.060	4.0	16	200	35	2.0

Frese cilindriche SX-3

A taglienti lisci, esecuzione normale con scarico



HM λ 55°
MG10 γ 15°



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Inox
Stainless

Ti
Titanium

Nickel-Alloys
Tool Steel

Esempio: N° Ordine		Rivestimento P		Articolo 5315	Codice- ϕ .180					POLYCHROM	
										P5315	
										P5215	
ϕ Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.180	3	6	2.8	57	4	14	0.10	4.5°	3		●
.220	4	6	3.7	57	5	16	0.10	3.0°	3		●
.260	5	6	4.6	57	6	18	0.15	1.5°	3		●
.300	6	6	5.5	57	7	20	0.15	0.0°	3		●
.391	8	8	7.4	63	9	26	0.15	0.0°	3		●
.450	10	10	9.2	72	11	31	0.20	0.0°	3		●
.501	12	12	11.0	83	13	37	0.20	0.0°	3		●
.610	16	16	15.0	92	17	43	0.20	0.0°	3		●

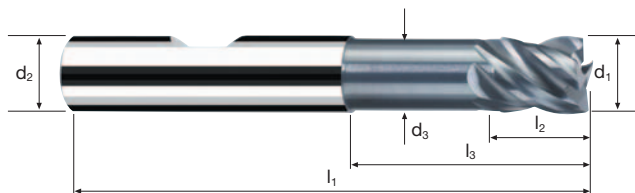
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	4	190	0.020	3	1.4	20160	1615	6.5
		4	4	190	0.030	4	1.8	15120	1815	13.0
		5	4	190	0.040	5	2.3	12095	1935	22.0
		6	4	190	0.050	6	2.7	10080	2015	32.5
		8	4	190	0.065	8	3.6	7560	1965	56.5
		10	4	190	0.080	10	4.5	6050	1935	87.0
		12	4	190	0.095	12	5.4	5040	1915	124.0
		16	4	190	0.125	16	7.2	3780	1890	217.5
		20	4	190	0.155	20	9.0	3025	1875	337.5
			Acciaio 850 - 1100 N/mm ² 	3	4	140	0.020	3	1.4	14855
4	4			140	0.030	4	1.8	11140	1335	9.5
5	4			140	0.040	5	2.3	8915	1425	16.0
6	4			140	0.050	6	2.7	7425	1485	24.0
8	4			140	0.065	8	3.6	5570	1450	42.0
10	4			140	0.080	10	4.5	4455	1425	64.0
12	4			140	0.095	12	5.4	3715	1410	91.5
16	4			140	0.125	16	7.2	2785	1395	160.5
20	4			140	0.155	20	9.0	2230	1385	249.5
	Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379] 			3	4	70	0.020	3	1.4	7425
		4	4	70	0.030	4	1.8	5570	670	5.0
		5	4	70	0.035	5	2.3	4455	625	7.0
		6	4	70	0.045	6	2.7	3715	670	11.0
		8	4	70	0.060	8	3.6	2785	670	19.5
		10	4	70	0.070	10	4.5	2230	625	28.0
		12	4	70	0.085	12	5.4	1855	630	41.0
		16	4	70	0.110	16	7.2	1395	615	71.0
		20	4	70	0.140	20	9.0	1115	625	112.5
			Acciaio inossidabile [Cr-Ni/1.4301] 	3	4	90	0.015	3	1.4	9550
4	4			90	0.020	4	1.8	7160	575	4.0
5	4			90	0.025	5	2.3	5730	575	6.5
6	4			90	0.030	6	2.7	4775	575	9.5
8	4			90	0.040	8	3.6	3580	575	16.5
10	4			90	0.050	10	4.5	2865	575	26.0
12	4			90	0.060	12	5.4	2385	570	37.0
16	4			90	0.075	16	7.2	1790	535	61.5
20	4			90	0.100	20	9.0	1430	570	102.5

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	4	155	0.015	2.4	3	16445	985	7.0
		4	4	155	0.020	3.2	4	12335	985	12.5
		5	4	155	0.030	4.0	5	9870	1185	23.5
		6	4	155	0.040	4.8	6	8225	1315	38.0
		8	4	155	0.050	6.4	8	6165	1235	63.0
		10	4	155	0.065	8.0	10	4935	1285	103.0
		12	4	155	0.075	9.6	12	4110	1235	142.5
		16	4	155	0.075	8.0	16	3085	925	118.5
		20	4	155	0.095	10.0	20	2465	935	187.0
			Acciaio 850 - 1100 N/mm ² 	3	4	105	0.015	2.4	3	11140
4	4			105	0.020	3.2	4	8355	670	8.5
5	4			105	0.030	4.0	5	6685	800	16.0
6	4			105	0.040	4.8	6	5570	890	25.5
8	4			105	0.050	6.4	8	4180	835	43.0
10	4			105	0.065	8.0	10	3340	870	69.5
12	4			105	0.075	9.6	12	2785	835	96.0
16	4			105	0.075	8.0	16	2090	625	80.0
20	4			105	0.095	10.0	20	1670	635	127.0
	Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379] 			3	4	55	0.015	2.4	3	5835
		4	4	55	0.020	3.2	4	4375	350	4.5
		5	4	55	0.030	4.0	5	3500	420	8.5
		6	4	55	0.035	4.8	6	2920	410	12.0
		8	4	55	0.045	6.4	8	2190	395	20.0
		10	4	55	0.055	8.0	10	1750	385	31.0
		12	4	55	0.060	9.6	12	1460	350	40.5
		16	4	55	0.075	8.0	16	1095	330	42.0
		20	4	55	0.095	10.0	20	875	335	67.0
			Acciaio inossidabile [Cr-Ni/1.4301] 	3	4	75	0.015	2.4	3	7960
4	4			75	0.020	3.2	4	5970	480	6.0
5	4			75	0.025	4.0	5	4775	480	9.5
6	4			75	0.030	4.8	6	3980	480	14.0
8	4			75	0.040	6.4	8	2985	480	24.5
10	4			75	0.050	8.0	10	2385	475	38.0
12	4			75	0.055	9.6	12	1990	440	50.5
16	4			75	0.070	8.0	16	1490	415	53.0
20	4			75	0.085	10.0	20	1195	405	81.0

Frese cilindriche NB-V

A taglienti lisci, esecuzione normale con scarico

HM
MG10 λ **40°**
 γ **0°**



Sgrossatura



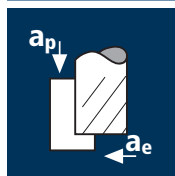
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys
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Esempio: N° Ordine										POLYCHROM	
										P5325	
										P5225	
\emptyset Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	45°	α	z		
.180	3	6	2.8	57	4	14	0.10	4.5°	4		●
.220	4	6	3.7	57	5	16	0.10	3.0°	4		●
.260	5	6	4.6	57	6	18	0.15	1.5°	4		●
.300	6	6	5.5	57	7	20	0.15	0.0°	4		●
.391	8	8	7.4	63	9	26	0.15	0.0°	4		●
.450	10	10	9.2	72	11	31	0.20	0.0°	4		●
.501	12	12	11.0	83	13	37	0.20	0.0°	4		●
.610	16	16	15.0	92	17	43	0.20	0.0°	4		●
.682	20	20	19.0	104	21	53	0.20	0.0°	4		●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

Acciaio inossidabile
[Cr-Ni/1.4301]

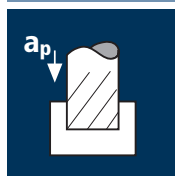
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	190	0.020	3	1.4	20160	1615	6.5
4	4	190	0.030	4	1.8	15120	1815	13.0
5	4	190	0.040	5	2.3	12095	1935	22.0
6	4	190	0.050	6	2.7	10080	2015	32.5
8	4	190	0.065	8	3.6	7560	1965	56.5
10	4	190	0.080	10	4.5	6050	1935	87.0
12	4	190	0.095	12	5.4	5040	1915	124.0
16	4	190	0.125	16	7.2	3780	1890	217.5
20	4	190	0.155	20	9.0	3025	1875	337.5

3	4	140	0.020	3	1.4	14855	1190	5.0
4	4	140	0.030	4	1.8	11140	1335	9.5
5	4	140	0.040	5	2.3	8915	1425	16.0
6	4	140	0.050	6	2.7	7425	1485	24.0
8	4	140	0.065	8	3.6	5570	1450	42.0
10	4	140	0.080	10	4.5	4455	1425	64.0
12	4	140	0.095	12	5.4	3715	1410	91.5
16	4	140	0.125	16	7.2	2785	1395	160.5
20	4	140	0.155	20	9.0	2230	1385	249.5

3	4	70	0.020	3	1.4	7425	595	2.5
4	4	70	0.030	4	1.8	5570	670	5.0
5	4	70	0.035	5	2.3	4455	625	7.0
6	4	70	0.045	6	2.7	3715	670	11.0
8	4	70	0.060	8	3.6	2785	670	19.5
10	4	70	0.070	10	4.5	2230	625	28.0
12	4	70	0.085	12	5.4	1855	630	41.0
16	4	70	0.110	16	7.2	1395	615	71.0
20	4	70	0.140	20	9.0	1115	625	112.5

3	4	90	0.015	3	1.4	9550	575	2.5
4	4	90	0.020	4	1.8	7160	575	4.0
5	4	90	0.025	5	2.3	5730	575	6.5
6	4	90	0.030	6	2.7	4775	575	9.5
8	4	90	0.040	8	3.6	3580	575	16.5
10	4	90	0.050	10	4.5	2865	575	26.0
12	4	90	0.060	12	5.4	2385	570	37.0
16	4	90	0.075	16	7.2	1790	535	61.5
20	4	90	0.100	20	9.0	1430	570	102.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	155	0.015	2.4	3	16445	985	7.0
4	4	155	0.020	3.2	4	12335	985	12.5
5	4	155	0.030	4.0	5	9870	1185	23.5
6	4	155	0.040	4.8	6	8225	1315	38.0
8	4	155	0.050	6.4	8	6165	1235	63.0
10	4	155	0.065	8.0	10	4935	1285	103.0
12	4	155	0.075	9.6	12	4110	1235	142.5
16	4	155	0.075	8.0	16	3085	925	118.5
20	4	155	0.095	10.0	20	2465	935	187.0

3	4	105	0.015	2.4	3	11140	670	5.0
4	4	105	0.020	3.2	4	8355	670	8.5
5	4	105	0.030	4.0	5	6685	800	16.0
6	4	105	0.040	4.8	6	5570	890	25.5
8	4	105	0.050	6.4	8	4180	835	43.0
10	4	105	0.065	8.0	10	3340	870	69.5
12	4	105	0.075	9.6	12	2785	835	96.0
16	4	105	0.075	8.0	16	2090	625	80.0
20	4	105	0.095	10.0	20	1670	635	127.0

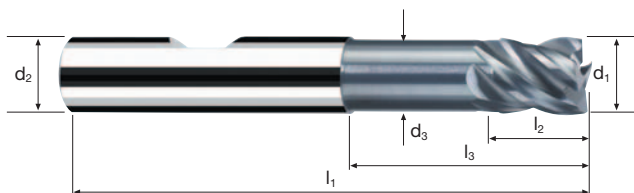
3	4	55	0.015	2.4	3	5835	350	2.5
4	4	55	0.020	3.2	4	4375	350	4.5
5	4	55	0.030	4.0	5	3500	420	8.5
6	4	55	0.035	4.8	6	2920	410	12.0
8	4	55	0.045	6.4	8	2190	395	20.0
10	4	55	0.055	8.0	10	1750	385	31.0
12	4	55	0.060	9.6	12	1460	350	40.5
16	4	55	0.075	8.0	16	1095	330	42.0
20	4	55	0.095	10.0	20	875	335	67.0

3	4	75	0.015	2.4	3	7960	480	3.5
4	4	75	0.020	3.2	4	5970	480	6.0
5	4	75	0.025	4.0	5	4775	480	9.5
6	4	75	0.030	4.8	6	3980	480	14.0
8	4	75	0.040	6.4	8	2985	480	24.5
10	4	75	0.050	8.0	10	2385	475	38.0
12	4	75	0.055	9.6	12	1990	440	50.5
16	4	75	0.070	8.0	16	1490	415	53.0
20	4	75	0.085	10.0	20	1195	405	81.0

Frese cilindriche NB-V

A taglienti lisci, esecuzione normale con scarico

HM
MG10 λ **40°**
 γ **0°**



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300

Rm
1300-1500

Rm
> 1500

Rm
> 1800

Rm
> 2000

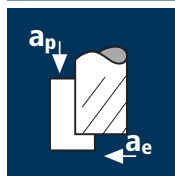
Inox
Stainless

Ti
Titanium

GG(G)
Tool Steel
Nickel-Alloys

Esempio: N° Ordine										POLYCHROM	
		Rivestimento	Articolo	Codice-ø							
		P	15352	.180						P15352	
										P15252	
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.180	3	6	2.8	57	4	14	0.10	4.5°	4	●	
.220	4	6	3.7	57	5	16	0.10	3.0°	4	●	
.260	5	6	4.6	57	6	18	0.15	1.5°	4	●	
.300	6	6	5.5	57	7	20	0.15	0.0°	4	●	
.391	8	8	7.4	63	9	26	0.15	0.0°	4	●	
.450	10	10	9.2	72	11	31	0.20	0.0°	4	●	
.501	12	12	11.0	83	13	37	0.20	0.0°	4	●	
.610	16	16	15.0	92	17	43	0.20	0.0°	4	●	
.682	20	20	19.0	104	21	53	0.20	0.0°	4	●	

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	28	0.035	4	2.2	2230	310	2.5
5	4	28	0.045	5	2.8	1785	320	4.5
6	4	28	0.050	6	3.3	1485	295	6.0
8	4	28	0.070	8	4.4	1115	310	11.0
10	4	28	0.085	10	5.5	890	305	17.0
12	4	28	0.105	12	6.6	745	315	25.0
16	4	28	0.125	16	8.8	555	280	39.5
20	4	28	0.155	20	11.0	445	275	60.5
25	4	28	0.180	25	13.8	355	255	87.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

4	4	25	0.035	4	2.2	1990	280	2.5
5	4	25	0.045	5	2.8	1590	285	4.0
6	4	25	0.050	6	3.3	1325	265	5.0
8	4	25	0.070	8	4.4	995	280	10.0
10	4	25	0.085	10	5.5	795	270	15.0
12	4	25	0.105	12	6.6	665	280	22.0
16	4	25	0.125	16	8.8	495	250	35.0
20	4	25	0.155	20	11.0	400	250	55.0
25	4	25	0.180	25	13.8	320	230	79.0

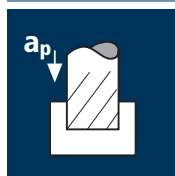
Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]

4	4	12	0.035	4	2.2	955	135	1.0
5	4	12	0.045	5	2.8	765	140	2.0
6	4	12	0.050	6	3.3	635	125	2.5
8	4	12	0.070	8	4.4	475	135	5.0
10	4	12	0.085	10	5.5	380	130	7.0
12	4	12	0.105	12	6.6	320	135	10.5
16	4	12	0.125	16	8.8	240	120	17.0
20	4	12	0.155	20	11.0	190	120	26.5
25	4	12	0.180	25	13.8	155	110	38.0

Leghe a base di nichel
indurite
R_m > 1000 N/mm²
[Inconel 718]

4	4	7	0.030	4	2.2	555	65	0.5
5	4	7	0.035	5	2.8	445	60	1.0
6	4	7	0.040	6	3.3	370	60	1.0
8	4	7	0.055	8	4.4	280	60	2.0
10	4	7	0.070	10	5.5	225	65	3.5
12	4	7	0.085	12	6.6	185	65	5.0
16	4	7	0.100	16	8.8	140	55	7.5
20	4	7	0.125	20	11.0	110	55	12.0
25	4	7	0.145	25	13.8	90	50	17.0

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	25	0.025	2.0	4	1990	200	1.5
5	4	25	0.035	2.5	5	1590	225	3.0
6	4	25	0.040	3.0	6	1325	210	4.0
8	4	25	0.055	4.0	8	995	220	7.0
10	4	25	0.065	5.0	10	795	205	10.5
12	4	25	0.080	6.0	12	665	215	15.5
16	4	25	0.095	8.0	16	495	190	24.5
20	4	25	0.115	10.0	20	400	185	37.0
25	4	25	0.135	12.5	25	320	175	54.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

4	4	22	0.025	2.0	4	1750	175	1.5
5	4	22	0.035	2.5	5	1400	195	2.5
6	4	22	0.040	3.0	6	1165	185	3.5
8	4	22	0.055	4.0	8	875	195	6.0
10	4	22	0.065	5.0	10	700	180	9.0
12	4	22	0.080	6.0	12	585	185	13.5
16	4	22	0.095	8.0	16	440	165	21.0
20	4	22	0.115	10.0	20	350	160	32.0
25	4	22	0.135	12.5	25	280	150	47.0

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]

4	4	10	0.025	2.0	4	795	80	0.5
5	4	10	0.035	2.5	5	635	90	1.0
6	4	10	0.040	3.0	6	530	85	1.5
8	4	10	0.055	4.0	8	400	90	3.0
10	4	10	0.065	5.0	10	320	85	4.5
12	4	10	0.080	6.0	12	265	85	6.0
16	4	10	0.095	8.0	16	200	75	9.5
20	4	10	0.115	10.0	20	160	75	15.0
25	4	10	0.135	12.5	25	125	70	22.0

Leghe a base di nichel
indurite
R_m > 1000 N/mm²
[Inconel 718]

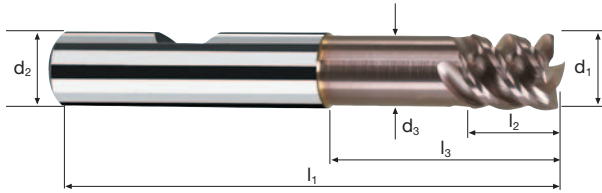
4	4	7	0.025	2.0	4	555	55	0.5
5	4	7	0.025	2.5	5	445	45	0.5
6	4	7	0.030	3.0	6	370	45	1.0
8	4	7	0.040	4.0	8	280	45	1.5
10	4	7	0.055	5.0	10	225	50	2.5
12	4	7	0.065	6.0	12	185	50	3.5
16	4	7	0.075	8.0	16	140	40	5.0
20	4	7	0.095	10.0	20	110	40	8.0
25	4	7	0.110	12.5	25	90	40	12.5

Frese cilindriche Supracut SNC

A taglienti lisci, esecuzione normale con scarico



HSS PM/F λ 55° γ 15°



Sgrossatura



Finitura



Rm < 850
 Rm 850-1100
 Rm 1100-1300
 Inox Stainless
 Ti Titanium
 Nickel-Alloys

Esempio: N° Ordine										UNICUT-4X
										U0580 .220
										U
										0580
										.220
										UNICUT-4X
										U0580
\emptyset Code	d1 k8	d2 h6	d3	l1	l2	l3	45°	α	z	
.220	4	6	3.7	57	5	16	0.10	1.5°	4	●
.260	5	6	4.6	57	6	18	0.15	1.0°	4	●
.300	6	6	5.5	57	7	20	0.15	0.0°	4	●
.391	8	8	7.4	63	9	26	0.15	0.0°	4	●
.450	10	10	9.2	72	11	31	0.20	0.0°	4	●
.501	12	12	11.0	83	13	37	0.20	0.0°	4	●
.610	16	16	15.0	92	17	43	0.20	0.0°	4	●
.682	20	20	19.0	104	21	53	0.20	0.0°	4	●
.772	25	25	24.0	121	26	64	0.25	0.0°	4	●

Applicazione

Materiale

Acciaio
1100 - 1300 N/mm²

P

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	115	0.025	7.2	0.8	9150	915	5.5
5	4	115	0.035	9.0	1.0	7320	1025	9.0
6	4	115	0.040	10.8	1.2	6100	975	12.5
8	4	115	0.055	14.4	1.6	4575	1005	23.0
10	4	115	0.065	18.0	2.0	3660	950	34.0
12	4	115	0.080	21.6	2.4	3050	975	50.5
16	4	115	0.090	28.8	3.2	2290	825	76.0
20	4	115	0.110	36.0	4.0	1830	805	116.0

Acciaio
1300 - 1500 N/mm²

P

4	4	80	0.025	7.2	0.8	6365	635	3.5
5	4	80	0.030	9.0	1.0	5095	610	5.5
6	4	80	0.035	10.8	1.2	4245	595	7.5
8	4	80	0.045	14.4	1.6	3185	575	13.0
10	4	80	0.060	18.0	2.0	2545	610	22.0
12	4	80	0.070	21.6	2.4	2120	595	31.0
16	4	80	0.080	28.8	3.2	1590	510	47.0
20	4	80	0.100	36.0	4.0	1275	510	73.5

Acciaio da utensile temprato
52 - 56 HRC

P

4	4	50	0.015	7.2	0.8	3980	240	1.5
5	4	50	0.020	9.0	1.0	3185	255	2.5
6	4	50	0.020	10.8	1.2	2655	210	2.5
8	4	50	0.025	14.4	1.6	1990	200	4.5
10	4	50	0.035	18.0	2.0	1590	225	8.0
12	4	50	0.040	21.6	2.4	1325	210	11.0
16	4	50	0.050	28.8	3.2	995	200	18.5
20	4	50	0.060	36.0	4.0	795	190	27.5

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

P

4	4	60	0.015	7.2	0.8	4775	285	1.5
5	4	60	0.025	9.0	1.0	3820	380	3.5
6	4	60	0.025	10.8	1.2	3185	320	4.0
8	4	60	0.030	14.4	1.6	2385	285	6.5
10	4	60	0.040	18.0	2.0	1910	305	11.0
12	4	60	0.045	21.6	2.4	1590	285	15.0
16	4	60	0.060	28.8	3.2	1195	285	26.5
20	4	60	0.070	36.0	4.0	955	265	38.0

Applicazione

Materiale

Acciaio
1100 - 1300 N/mm²

P

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	90	0.015	6.0	4	7160	430	10.5
5	4	90	0.015	7.5	5	5730	345	13.0
6	4	90	0.020	9.0	6	4775	380	20.5
8	4	90	0.025	12.0	8	3580	360	34.5
10	4	90	0.035	15.0	10	2865	400	60.0
12	4	90	0.040	18.0	12	2385	380	82.0
16	4	90	0.050	24.0	16	1790	360	138.0
20	4	90	0.060	30.0	20	1430	345	207.0

Acciaio
1300 - 1500 N/mm²

P

4	4	65	0.010	6.0	4	5175	205	5.0
5	4	65	0.015	7.5	5	4140	250	9.5
6	4	65	0.020	9.0	6	3450	275	15.0
8	4	65	0.025	12.0	8	2585	260	25.0
10	4	65	0.030	15.0	10	2070	250	37.5
12	4	65	0.035	18.0	12	1725	240	52.0
16	4	65	0.045	24.0	16	1295	235	90.0
20	4	65	0.055	30.0	20	1035	230	138.0

Acciaio da utensile temprato
52 - 56 HRC

P

4	4	40	0.010	4.0	4.0	3185	125	2.0
5	4	40	0.010	5.0	5.0	2545	100	2.5
6	4	40	0.015	6.0	6.0	2120	125	4.5
8	4	40	0.020	8.0	8.0	1590	125	8.0
10	4	40	0.025	10.0	10.0	1275	130	13.0
12	4	40	0.025	12.0	12.0	1060	105	15.0
16	4	40	0.030	16.0	16.0	795	95	24.5
20	4	40	0.040	20.0	20.0	635	100	40.0

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

P

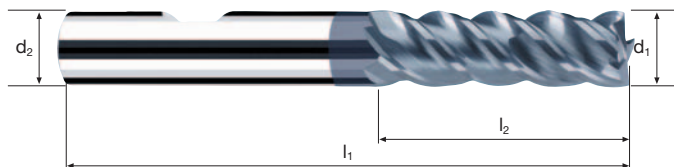
4	4	50	0.010	6.0	4	3980	160	4.0
5	4	50	0.015	7.5	5	3185	190	7.0
6	4	50	0.020	9.0	6	2655	210	11.5
8	4	50	0.025	12.0	8	1990	200	19.0
10	4	50	0.030	15.0	10	1590	190	28.5
12	4	50	0.035	18.0	12	1325	185	40.0
16	4	50	0.045	24.0	16	995	180	69.0
20	4	50	0.055	30.0	20	795	175	105.0

Frese cilindriche NX-NVD

A taglienti lisci, esecuzione medio-lunga



HM
MG10 λ **45°**
 γ **-10°**



Sgrossatura



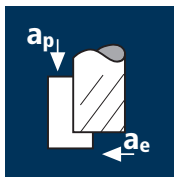
Finitura



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60		Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine								POLYCHROM	
		Rivestimento P	Articolo 15323	Codice-ø .220				P15323	
							P15223		
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.220	4	6	63	13	0.10	3.5°	4	●	
.260	5	6	63	16	0.15	1.5°	4	●	
.300	6	6	63	21	0.15	0.0°	4	●	
.391	8	8	72	31	0.15	0.0°	4	●	
.450	10	10	84	37	0.20	0.0°	4	●	
.501	12	12	97	44	0.20	0.0°	4	●	
.610	16	16	108	53	0.20	0.0°	4	●	
.682	20	20	122	62	0.20	0.0°	4	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	180	0.025	7.2	0.8	14325	1435	8.5
5	4	180	0.030	9.0	1.0	11460	1375	12.5
6	4	180	0.040	10.8	1.2	9550	1530	20.0
8	4	180	0.050	14.4	1.6	7160	1430	33.0
10	4	180	0.065	18.0	2.0	5730	1490	53.5
12	4	180	0.075	21.6	2.4	4775	1435	74.5
16	4	180	0.085	28.8	3.2	3580	1215	112.0
20	4	180	0.105	36.0	4.0	2865	1205	173.5

4	4	150	0.025	7.2	0.8	11935	1195	7.0
5	4	150	0.030	9.0	1.0	9550	1145	10.5
6	4	150	0.040	10.8	1.2	7960	1275	16.5
8	4	150	0.050	14.4	1.6	5970	1195	27.5
10	4	150	0.065	18.0	2.0	4775	1240	44.5
12	4	150	0.075	21.6	2.4	3980	1195	62.0
16	4	150	0.085	28.8	3.2	2985	1015	93.5
20	4	150	0.105	36.0	4.0	2385	1000	144.0

4	4	70	0.025	7.2	0.8	5570	555	3.0
5	4	70	0.030	9.0	1.0	4455	535	5.0
6	4	70	0.035	10.8	1.2	3715	520	6.5
8	4	70	0.045	14.4	1.6	2785	500	11.5
10	4	70	0.060	18.0	2.0	2230	535	19.5
12	4	70	0.070	21.6	2.4	1855	520	27.0
16	4	70	0.080	28.8	3.2	1395	445	41.0
20	4	70	0.100	36.0	4.0	1115	445	64.0

4	4	85	0.020	7.2	0.8	6765	540	3.0
5	4	85	0.020	9.0	1.0	5410	435	4.0
6	4	85	0.025	10.8	1.2	4510	450	6.0
8	4	85	0.030	14.4	1.6	3380	405	9.5
10	4	85	0.040	18.0	2.0	2705	435	15.5
12	4	85	0.050	21.6	2.4	2255	450	23.5
16	4	85	0.055	28.8	3.2	1690	370	34.0
20	4	85	0.070	36.0	4.0	1355	380	54.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
4	4	145	0.015	5.4	4	11540	690	15.0
5	4	145	0.015	6.8	5	9230	555	18.5
6	4	145	0.020	8.1	6	7695	615	30.0
8	4	145	0.025	10.8	8	5770	575	49.5
10	4	145	0.035	13.5	10	4615	645	87.0
12	4	145	0.040	16.2	12	3845	615	119.5
16	4	145	0.050	19.2	16	2885	575	176.5
20	4	145	0.060	24.0	20	2310	555	266.5

4	4	120	0.015	5.4	4	9550	575	12.5
5	4	120	0.015	6.8	5	7640	460	15.5
6	4	120	0.020	8.1	6	6365	510	25.0
8	4	120	0.025	10.8	8	4775	480	41.5
10	4	120	0.035	13.5	10	3820	535	72.0
12	4	120	0.040	16.2	12	3185	510	99.0
16	4	120	0.050	19.2	16	2385	475	146.0
20	4	120	0.060	24.0	20	1910	460	221.0

4	4	55	0.010	5.4	4	4375	175	4.0
5	4	55	0.015	6.8	5	3500	210	7.0
6	4	55	0.020	8.1	6	2920	235	11.5
8	4	55	0.025	10.8	8	2190	220	19.0
10	4	55	0.030	13.5	10	1750	210	28.5
12	4	55	0.035	16.2	12	1460	205	40.0
16	4	55	0.045	19.2	16	1095	195	60.0
20	4	55	0.055	24.0	20	875	195	93.5

4	4	65	0.010	5.4	4	5175	205	4.5
5	4	65	0.010	6.8	5	4140	165	5.5
6	4	65	0.015	8.1	6	3450	205	10.0
8	4	65	0.020	10.8	8	2585	205	17.5
10	4	65	0.025	13.5	10	2070	205	27.5
12	4	65	0.030	16.2	12	1725	205	40.0
16	4	65	0.035	19.2	16	1295	180	55.5
20	4	65	0.045	24.0	20	1035	185	89.0

Frese cilindriche NB-NVD

A taglienti lisci, esecuzione medio-lunga



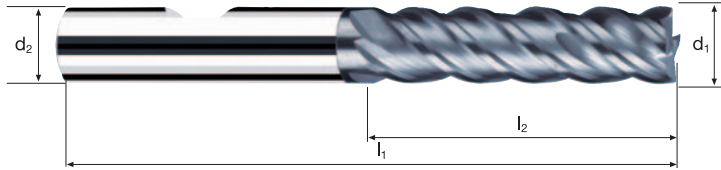
HM MG10 λ 45°
 γ 5°

45°

Vario

Sgrossatura

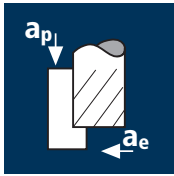
Finitura



Rm < 850 Rm 850-1100 Rm 1100-1300 Rm 1300-1500 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel Nickel-Alloys

Esempio: N° Ordine		Rivestimento P	Articolo 15308	Codice- ϕ .220					POLYCHROM	
									P15308	
									P15208	
ϕ Code	d1 e8	d2 h6	l1	l2	45°	α	z			
.220	4	6	63	13	0.10	3.5°	4	●		
.260	5	6	63	16	0.15	1.5°	4	●		
.300	6	6	63	21	0.15	0.0°	4	●		
.391	8	8	72	31	0.15	0.0°	4	●		
.450	10	10	84	37	0.20	0.0°	4	●		
.501	12	12	97	44	0.20	0.0°	4	●		
.610	16	16	108	53	0.20	0.0°	4	●		
.682	20	20	122	62	0.20	0.0°	4	●		

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	130	0.005	4	0.2	20690	415
3	4	130	0.010	6	0.2	13795	550
4	4	130	0.010	8	0.3	10345	415
6	4	130	0.015	12	0.5	6895	415
8	4	130	0.025	16	0.6	5175	520
10	4	130	0.030	20	0.8	4140	495
12	4	130	0.035	24	1.0	3450	485
16	4	130	0.045	32	1.3	2585	465
20	4	130	0.055	40	1.6	2070	455

2	4	85	0.005	4	0.2	13530	270
3	4	85	0.010	6	0.2	9020	360
4	4	85	0.010	8	0.3	6765	270
6	4	85	0.015	12	0.5	4510	270
8	4	85	0.025	16	0.6	3380	340
10	4	85	0.030	20	0.8	2705	325
12	4	85	0.035	24	1.0	2255	315
16	4	85	0.045	32	1.3	1690	305
20	4	85	0.055	40	1.6	1355	300

2	4	60	0.005	4	0.2	9550	190
3	4	60	0.010	6	0.2	6365	255
4	4	60	0.010	8	0.3	4775	190
6	4	60	0.015	12	0.5	3185	190
8	4	60	0.025	16	0.6	2385	240
10	4	60	0.030	20	0.8	1910	230
12	4	60	0.035	24	1.0	1590	225
16	4	60	0.045	32	1.3	1195	215
20	4	60	0.055	40	1.6	955	210

2	4	70	0.005	4	0.2	11140	225
3	4	70	0.010	6	0.2	7425	295
4	4	70	0.010	8	0.3	5570	225
6	4	70	0.015	12	0.5	3715	225
8	4	70	0.025	16	0.6	2785	280
10	4	70	0.030	20	0.8	2230	270
12	4	70	0.035	24	1.0	1855	260
16	4	70	0.045	32	1.3	1395	250
20	4	70	0.055	40	1.6	1115	245

Materiale

Ghisa
(grigia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	4	95	0.005	4	0.2	15120	300
3	4	95	0.010	6	0.2	10080	405
4	4	95	0.010	8	0.3	7560	300
6	4	95	0.015	12	0.5	5040	300
8	4	95	0.025	16	0.6	3780	380
10	4	95	0.030	20	0.8	3025	365
12	4	95	0.035	24	1.0	2520	355
16	4	95	0.045	32	1.3	1890	340
20	4	95	0.055	40	1.6	1510	330

2	4	180	0.005	4	0.2	28650	575
3	4	180	0.010	6	0.2	19100	765
4	4	180	0.010	8	0.3	14325	575
6	4	180	0.015	12	0.5	9550	575
8	4	180	0.025	16	0.6	7160	715
10	4	180	0.030	20	0.8	5730	690
12	4	180	0.035	24	1.0	4775	670
16	4	180	0.045	32	1.3	3580	645
20	4	180	0.055	40	1.6	2865	630

2	4	80	0.005	4	0.2	12735	255
3	4	80	0.010	6	0.2	8490	340
4	4	80	0.010	8	0.3	6365	255
6	4	80	0.015	12	0.5	4245	255
8	4	80	0.025	16	0.6	3185	320
10	4	80	0.030	20	0.8	2545	305
12	4	80	0.035	24	1.0	2120	295
16	4	80	0.045	32	1.3	1590	285
20	4	80	0.055	40	1.6	1275	280

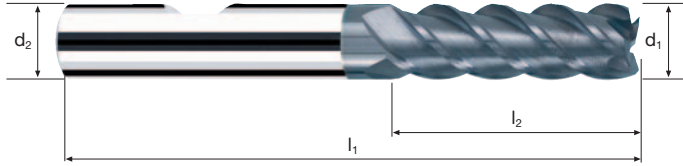
2	4	30	0.005	4	0.2	4775	95
3	4	30	0.010	6	0.2	3185	125
4	4	30	0.010	8	0.3	2385	95
6	4	30	0.015	12	0.5	1590	95
8	4	30	0.025	16	0.6	1195	120
10	4	30	0.030	20	0.8	955	115
12	4	30	0.035	24	1.0	795	110
16	4	30	0.045	32	1.3	595	105
20	4	30	0.055	40	1.6	475	105

Frese cilindriche

A taglienti lisci, esecuzione medio-lunga



HM
MG10 λ **45°**
 γ **15°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Copper
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Esempio: N° Ordine		Rivestimento P	Articolo 15343	Codice-ø .140				POLYCHROM	
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.140	2.0	6	63	12	0.10	6.0°	4	●	
.160	2.5	6	63	13	0.10	5.0°	4	●	
.180	3.0	6	63	14	0.10	4.5°	4	●	
.220	4.0	6	63	17	0.10	3.0°	4	●	
.260	5.0	6	63	19	0.15	1.5°	4	●	
.300	6.0	6	63	19	0.15	0.0°	4	●	
.391	8.0	8	72	28	0.15	0.0°	4	●	
.450	10.0	10	84	34	0.20	0.0°	4	●	
.501	12.0	12	97	40	0.20	0.0°	4	●	
.610	16.0	16	108	48	0.20	0.0°	4	●	
.682	20.0	20	122	56	0.20	0.0°	4	●	
.772	25.0	25	144	70	0.25	0.0°	4	●	

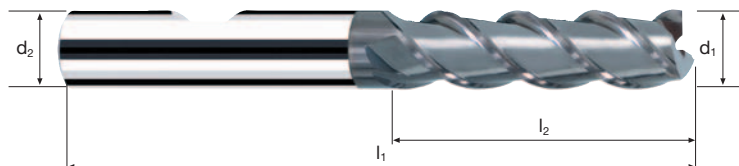
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ² 	2	3	105	0.005	5.0	0.1	16710	250
		3	3	105	0.010	7.5	0.2	11140	335
		4	3	105	0.010	10.0	0.2	8355	250
		6	3	105	0.015	15.0	0.3	5570	250
		8	3	105	0.020	20.0	0.4	4180	250
		10	3	105	0.025	25.0	0.5	3340	250
		12	3	105	0.030	30.0	0.6	2785	250
		16	3	105	0.040	40.0	0.8	2090	250
		20	3	105	0.050	50.0	1.0	1670	250
			Acciaio 850 - 1100 N/mm ² 	2	3	75	0.005	5.0	0.1
3	3			75	0.010	7.5	0.2	7960	240
4	3			75	0.010	10.0	0.2	5970	180
6	3			75	0.015	15.0	0.3	3980	180
8	3			75	0.020	20.0	0.4	2985	180
10	3			75	0.025	25.0	0.5	2385	180
12	3			75	0.030	30.0	0.6	1990	180
16	3			75	0.040	40.0	0.8	1490	180
20	3			75	0.050	50.0	1.0	1195	180
	Ghisa (grigia / sferoidale) 			2	3	150	0.005	5.0	0.1
		3	3	150	0.010	7.5	0.2	15915	475
		4	3	150	0.010	10.0	0.2	11935	360
		6	3	150	0.015	15.0	0.3	7960	360
		8	3	150	0.020	20.0	0.4	5970	360
		10	3	150	0.025	25.0	0.5	4775	360
		12	3	150	0.030	30.0	0.6	3980	360
		16	3	150	0.040	40.0	0.8	2985	360
		20	3	150	0.050	50.0	1.0	2385	360
			Acciaio inossidabile [Cr-Ni/1.4301] 	2	3	50	0.005	5.0	0.1
3	3			50	0.010	7.5	0.2	5305	160
4	3			50	0.010	10.0	0.2	3980	120
6	3			50	0.015	15.0	0.3	2655	120
8	3			50	0.020	20.0	0.4	1990	120
10	3			50	0.025	25.0	0.5	1590	120
12	3			50	0.030	30.0	0.6	1325	120
16	3			50	0.040	40.0	0.8	995	120
20	3			50	0.050	50.0	1.0	795	120

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ² 	2	3	70	0.005	0.4	2	11140	165
		3	3	70	0.005	0.6	3	7425	110
		4	3	70	0.010	0.8	4	5570	165
		6	3	70	0.010	1.2	6	3715	110
		8	3	70	0.015	1.6	8	2785	125
		10	3	70	0.020	2.0	10	2230	135
		12	3	70	0.025	2.4	12	1855	140
		16	3	70	0.030	3.2	16	1395	125
		20	3	70	0.040	4.0	20	1115	135
			Acciaio 850 - 1100 N/mm ² 	2	3	60	0.005	0.4	2
3	3			60	0.005	0.6	3	6365	95
4	3			60	0.005	0.8	4	4775	70
6	3			60	0.010	1.2	6	3185	95
8	3			60	0.015	1.6	8	2385	105
10	3			60	0.020	2.0	10	1910	115
12	3			60	0.020	2.4	12	1590	95
16	3			60	0.030	3.2	16	1195	110
20	3			60	0.040	4.0	20	955	115
	Ghisa (grigia / sferoidale) 			2	3	105	0.005	0.4	2
		3	3	105	0.005	0.6	3	11140	165
		4	3	105	0.010	0.8	4	8355	250
		6	3	105	0.015	1.2	6	5570	250
		8	3	105	0.020	1.6	8	4180	250
		10	3	105	0.020	2.0	10	3340	200
		12	3	105	0.025	2.4	12	2785	210
		16	3	105	0.035	3.2	16	2090	220
		20	3	105	0.040	4.0	20	1670	200
			Acciaio inossidabile [Cr-Ni/1.4301] 	2	3	35	0.005	0.4	2
3	3			35	0.005	0.6	3	3715	55
4	3			35	0.005	0.8	4	2785	40
6	3			35	0.010	1.2	6	1855	55
8	3			35	0.015	1.6	8	1395	65
10	3			35	0.020	2.0	10	1115	65
12	3			35	0.020	2.4	12	930	55
16	3			35	0.030	3.2	16	695	65
20	3			35	0.040	4.0	20	555	65

Frese cilindriche

A taglienti lisci, esecuzione medio-lunga

HM
MG10 λ 45°
γ 15°



Sgrossatura



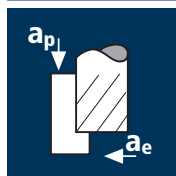
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300						Inox Stainless	Ti Titanium	GG(G) Copper
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Esempio: N° Ordine											POLYCHROM	
											5332	P5332
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z					
.140	2.0	6	63	12	0.10	6.0°	3	●	●			
.160	2.5	6	63	13	0.10	5.0°	3	●	●			
.180	3.0	6	63	14	0.10	4.5°	3	●	●			
.220	4.0	6	63	17	0.10	3.0°	3	●	●			
.260	5.0	6	63	19	0.15	1.5°	3	●	●			
.300	6.0	6	63	19	0.15	0.0°	3	●	●			
.331	7.0	8	72	24	0.15	1.5°	3	●	●			
.391	8.0	8	72	28	0.15	0.0°	3	●	●			
.420	9.0	10	84	28	0.20	1.0°	3	●	●			
.450	10.0	10	84	34	0.20	0.0°	3	●	●			
.501	12.0	12	97	40	0.20	0.0°	3	●	●			
.610	16.0	16	108	48	0.20	0.0°	3	●	●			
.682	20.0	20	122	56	0.20	0.0°	3	●	●			

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	44	0.015	15	0.10	2335	140
8	4	44	0.020	20	0.15	1750	140
10	4	44	0.020	25	0.20	1400	110
12	4	44	0.025	30	0.25	1165	115
16	4	44	0.035	40	0.30	875	125
20	4	44	0.045	50	0.40	700	125
25	4	44	0.055	63	0.50	560	125
30	6	44	0.065	75	0.60	465	180
32	6	44	0.070	80	0.65	440	185

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	36	0.015	15	0.10	1910	115
8	4	36	0.020	20	0.15	1430	115
10	4	36	0.020	25	0.20	1145	90
12	4	36	0.025	30	0.25	955	95
16	4	36	0.035	40	0.30	715	100
20	4	36	0.045	50	0.40	575	105
25	4	36	0.055	63	0.50	460	100
30	6	36	0.065	75	0.60	380	150
32	6	36	0.070	80	0.65	360	150

Acciaio
1100 - 1300 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	30	0.015	15	0.10	1590	95
8	4	30	0.020	20	0.15	1195	95
10	4	30	0.020	25	0.20	955	75
12	4	30	0.025	30	0.25	795	80
16	4	30	0.035	40	0.30	595	85
20	4	30	0.045	50	0.40	475	85
25	4	30	0.055	63	0.50	380	85
30	6	30	0.065	75	0.60	320	125
32	6	30	0.070	80	0.65	300	125

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	25	0.015	15	0.10	1325	80
8	4	25	0.020	20	0.15	995	80
10	4	25	0.020	25	0.20	795	65
12	4	25	0.025	30	0.25	665	65
16	4	25	0.035	40	0.30	495	70
20	4	25	0.045	50	0.40	400	70
25	4	25	0.055	63	0.50	320	70
30	6	25	0.065	75	0.60	265	105
32	6	25	0.070	80	0.65	250	105

Materiale

Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	34	0.015	15	0.10	1805	110
8	4	34	0.020	20	0.15	1355	110
10	4	34	0.020	25	0.20	1080	85
12	4	34	0.025	30	0.25	900	90
16	4	34	0.035	40	0.30	675	95
20	4	34	0.045	50	0.40	540	95
25	4	34	0.055	63	0.50	435	95
30	6	34	0.065	75	0.60	360	140
32	6	34	0.070	80	0.65	340	145

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	18	0.015	15	0.10	955	55
8	4	18	0.020	20	0.15	715	55
10	4	18	0.020	25	0.20	575	45
12	4	18	0.025	30	0.25	475	50
16	4	18	0.035	40	0.30	360	50
20	4	18	0.045	50	0.40	285	50
25	4	18	0.055	63	0.50	230	50
30	6	18	0.065	75	0.60	190	75
32	6	18	0.070	80	0.65	180	75

Rame non legato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	60	0.015	15	0.10	3185	190
8	4	60	0.020	20	0.15	2385	190
10	4	60	0.020	25	0.20	1910	155
12	4	60	0.025	30	0.25	1590	160
16	4	60	0.035	40	0.30	1195	165
20	4	60	0.045	50	0.40	955	170
25	4	60	0.055	63	0.50	765	170
30	6	60	0.065	75	0.60	635	250
32	6	60	0.070	80	0.65	595	250

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	70	0.015	15	0.10	3715	225
8	4	70	0.020	20	0.15	2785	225
10	4	70	0.020	25	0.20	2230	180
12	4	70	0.025	30	0.25	1855	185
16	4	70	0.035	40	0.30	1395	195
20	4	70	0.045	50	0.40	1115	200
25	4	70	0.055	63	0.50	890	195
30	6	70	0.065	75	0.60	745	290
32	6	70	0.070	80	0.65	695	290

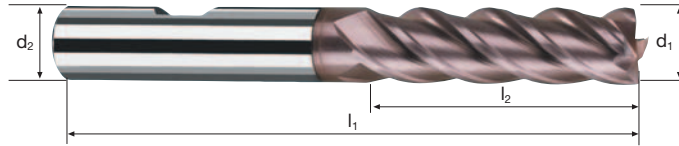
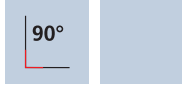
Frese cilindriche

A taglienti lisci, esecuzione medio-lunga



HSS-E
Co8

λ 40°
 γ 15°



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G) Aluminium Copper
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Esempio: N° Ordine		Rivestimento U	Articolo 0190	Codice-ø .260				UNICUT-4X
ø Code	d1 k8	d2 h6	l1	l2	α	Z		
.260	5	6	63	19	1.5°	4		●
.300	6	6	63	19	0.0°	4		●
.402	8	10	78	28	2.0°	4		●
.450	10	10	84	34	0.0°	4		●
.501	12	12	97	40	0.0°	4		●
.570	14	12	97	40	0.0°	4		●
.610	16	16	108	48	0.0°	4		●
.640	18	16	108	48	0.0°	4		●
.682	20	20	122	56	0.0°	4		●
.710	22	20	122	56	0.0°	4		●
.772	25	25	144	68	0.0°	4		●
.810	30	25	144	68	0.0°	6		●
.832	32	32	160	80	0.0°	6		●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio 850 - 1100 N/mm ² P P	4	4	150	0.025	4	1.8	11935	1195	8.5
		5	4	150	0.035	5	2.3	9550	1335	15.0
		6	4	150	0.040	6	2.7	7960	1275	20.5
		8	4	150	0.055	8	3.6	5970	1315	38.0
		10	4	150	0.065	10	4.5	4775	1240	56.0
		12	4	150	0.080	12	5.4	3980	1275	82.5
		16	4	150	0.090	16	7.2	2985	1075	124.0
Acciaio 1100 - 1300 N/mm ² P P	4	4	115	0.025	4	1.8	9150	915	6.5	
	5	4	115	0.035	5	2.3	7320	1025	11.5	
	6	4	115	0.040	6	2.7	6100	975	16.0	
	8	4	115	0.055	8	3.6	4575	1005	29.0	
	10	4	115	0.065	10	4.5	3660	950	43.0	
	12	4	115	0.080	12	5.4	3050	975	63.0	
	16	4	115	0.090	16	7.2	2290	825	95.0	
Acciaio 1300 - 1500 N/mm ² P	4	4	80	0.025	4	1.8	6365	635	4.5	
	5	4	80	0.030	5	2.3	5095	610	7.0	
	6	4	80	0.035	6	2.7	4245	595	9.5	
	8	4	80	0.045	8	3.6	3185	575	16.5	
	10	4	80	0.060	10	4.5	2545	610	27.5	
	12	4	80	0.070	12	5.4	2120	595	38.5	
	16	4	80	0.080	16	7.2	1590	510	59.0	
Leghe di titanio indurite >300 HB [Ti6Al4V] P	4	4	50	0.015	4	1.8	3980	240	1.5	
	5	4	50	0.020	5	2.3	3185	255	3.0	
	6	4	50	0.020	6	2.7	2655	210	3.5	
	8	4	50	0.025	8	3.6	1990	200	6.0	
	10	4	50	0.035	10	4.5	1590	225	10.0	
	12	4	50	0.040	12	5.4	1325	210	13.5	
	16	4	50	0.050	16	7.2	995	200	23.0	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio 850 - 1100 N/mm ² P P	4	4	115	0.020	3.2	4	9150	730	9.5
		5	4	115	0.025	4.0	5	7320	730	14.5
		6	4	115	0.035	4.8	6	6100	855	24.5
		8	4	115	0.045	6.4	8	4575	825	42.0
		10	4	115	0.055	8.0	10	3660	805	64.5
		12	4	115	0.065	9.6	12	3050	795	91.5
		16	4	115	0.075	11.2	16	2290	685	123.0
Acciaio 1100 - 1300 N/mm ² P P	4	4	90	0.020	3.2	4	7160	575	7.5	
	5	4	90	0.025	4.0	5	5730	575	11.5	
	6	4	90	0.035	4.8	6	4775	670	19.5	
	8	4	90	0.045	6.4	8	3580	645	33.0	
	10	4	90	0.055	8.0	10	2865	630	50.5	
	12	4	90	0.065	9.6	12	2385	620	71.5	
	16	4	90	0.075	11.2	16	1790	535	96.0	
Acciaio 1300 - 1500 N/mm ² P	4	4	65	0.020	3.2	4	5175	415	5.5	
	5	4	65	0.025	4.0	5	4140	415	8.5	
	6	4	65	0.030	4.8	6	3450	415	12.0	
	8	4	65	0.040	6.4	8	2585	415	21.0	
	10	4	65	0.050	8.0	10	2070	415	33.0	
	12	4	65	0.060	9.6	12	1725	415	48.0	
	16	4	65	0.070	11.2	16	1295	365	65.5	
Leghe di titanio indurite >300 HB [Ti6Al4V] P	4	4	40	0.015	3.2	4	3185	190	2.5	
	5	4	40	0.015	4.0	5	2545	155	3.0	
	6	4	40	0.020	4.8	6	2120	170	5.0	
	8	4	40	0.025	6.4	8	1590	160	8.0	
	10	4	40	0.035	8.0	10	1275	180	14.5	
	12	4	40	0.040	9.6	12	1060	170	19.5	
	16	4	40	0.045	11.2	16	795	145	26.0	

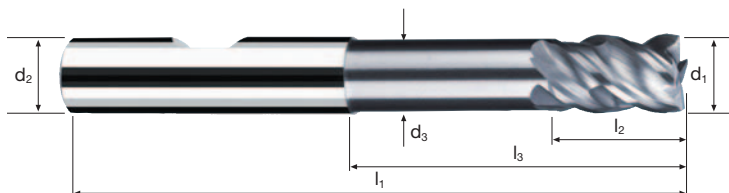
Frese cilindriche NX-VD

A taglienti lisci, esecuzione medio-lunga con scarico



**HM
MG10**

λ 45°
 γ -10°



Sgrossatura



Finitura



Rm
850-1100

Rm
1100-1300

Rm
1300-1500

HRC
48-56

HRC
56-60

Ti
Titanium

**GG(G)
Tool steel**

Esempio:
N° Ordine

Rivestimento
P

Articolo
15359

Codice-Ø
.220



POLYCHROM

P15359

P15259

Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z	
.220	4	6	3.7	63	6	22	0.10	2.5°	4	●
.260	5	6	4.6	63	8	24	0.15	1.5°	4	●
.300	6	6	5.5	63	9	26	0.15	0.0°	4	●
.391	8	8	7.4	72	12	35	0.15	0.0°	4	●
.450	10	10	9.2	84	15	43	0.20	0.0°	4	●
.501	12	12	11.0	97	18	51	0.20	0.0°	4	●
.610	16	16	15.0	108	24	59	0.20	0.0°	4	●

Applicazione

Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	90	0.045	6	2.4	4775	860	12.5
8	4	90	0.060	8	3.2	3580	860	22.0
10	4	90	0.075	10	4.0	2865	860	34.5
12	4	90	0.090	12	4.8	2385	860	49.5
16	4	90	0.120	16	3.2	1790	860	44.0
20	4	90	0.150	20	4.0	1430	860	69.0

Acciaio da utensile temprato 48 - 52 HRC

6	4	70	0.030	6	2.4	3715	445	6.5
8	4	70	0.040	8	3.2	2785	445	11.5
10	4	70	0.050	10	4.0	2230	445	18.0
12	4	70	0.060	12	4.8	1855	445	25.5
16	4	70	0.080	16	3.2	1395	445	23.0
20	4	70	0.100	20	4.0	1115	445	35.5

Acciaio da utensile temprato 52 - 56 HRC

6	4	50	0.025	6	2.4	2655	265	4.0
8	4	50	0.035	8	3.2	1990	280	7.0
10	4	50	0.040	10	4.0	1590	255	10.0
12	4	50	0.050	12	4.8	1325	265	15.5
16	4	50	0.065	16	3.2	995	260	13.5
20	4	50	0.080	20	4.0	795	255	20.5

Acciaio da utensile temprato 56 - 60 HRC

6	4	25	0.020	6	2.4	1325	106	1.5
8	4	25	0.025	8	3.2	995	100	2.5
10	4	25	0.030	10	4.0	795	95	4.0
12	4	25	0.035	12	4.8	665	93	5.5
16	4	25	0.050	16	3.2	495	99	5.0
20	4	25	0.060	20	4.0	400	96	7.5

Applicazione

Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	75	0.035	2.4	6	3980	555	8.0
8	4	75	0.050	3.2	8	2985	595	15.0
10	4	75	0.060	4.0	10	2385	570	23.0
12	4	75	0.070	4.8	12	1990	555	32.0
16	4	75	0.095	3.2	16	1490	565	29.0
20	4	75	0.120	4.0	20	1195	575	46.0

Acciaio da utensile temprato 48 - 52 HRC

6	4	60	0.025	2.4	6	3185	320	4.5
8	4	60	0.035	3.2	8	2385	335	8.5
10	4	60	0.045	4.0	10	1910	345	14.0
12	4	60	0.055	4.8	12	1590	350	20.0
16	4	60	0.070	3.2	16	1195	335	17.0
20	4	60	0.090	4.0	20	955	345	27.5

Acciaio da utensile temprato 52 - 56 HRC

6	4	40	0.020	2.4	6	2120	170	2.5
8	4	40	0.030	3.2	8	1590	190	5.0
10	4	40	0.035	4.0	10	1275	180	7.0
12	4	40	0.045	4.8	12	1060	190	11.0
16	4	40	0.060	3.2	16	795	190	9.5
20	4	40	0.070	4.0	20	635	180	14.5

Acciaio da utensile temprato 56 - 60 HRC

6	4	20	0.015	2.4	6	1060	64	1.0
8	4	20	0.021	3.2	8	795	67	1.5
10	4	20	0.026	4.0	10	635	66	2.5
12	4	20	0.031	4.8	12	530	66	4.0
16	4	20	0.041	3.2	16	400	66	3.5
20	4	20	0.051	4.0	20	320	65	5.0

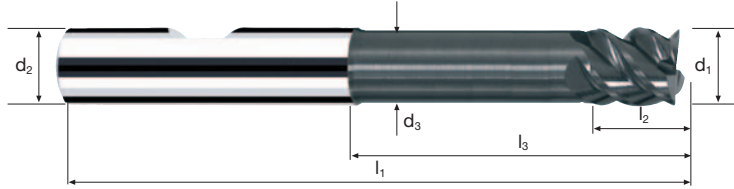
Frese cilindriche HX

A taglienti lisci, esecuzione medio-lunga con scarico



HM
MG10

λ **55°**
 γ **-10°**



Sgrossatura



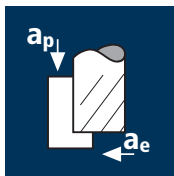
Finitura



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	GG(G)
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Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø		45°	z	POLYCHROM		DURO-S	
	P		5351		.300						P5351	D5351
ø Code	d1 e8	d2 h6	d3	l1	l2	l3						
.300	6	6	5.5	70	7	33	0.15	4	●		●	
.391	8	8	7.4	80	9	43	0.15	4	●		●	
.450	10	10	9.2	84	11	43	0.20	4	●		●	
.501	12	12	11.0	97	13	51	0.20	4	●		●	
.610	16	16	15.0	115	17	66	0.20	4	●		●	
.682	20	20	19.0	130	21	79	0.20	4	●		●	

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	80	0.030	6	1.8	4245	510	5.5
8	4	80	0.040	8	2.4	3185	510	10.0
10	4	80	0.055	10	3.0	2545	560	17.0
12	4	80	0.060	12	3.6	2120	510	22.0
16	4	80	0.085	16	2.4	1590	540	20.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

6	4	70	0.030	6	1.8	3715	445	5.0
8	4	70	0.040	8	2.4	2785	445	8.5
10	4	70	0.055	10	3.0	2230	490	14.5
12	4	70	0.060	12	3.6	1855	445	19.0
16	4	70	0.085	16	2.4	1395	475	18.0

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

6	4	25	0.030	6	1.8	1325	160	1.5
8	4	25	0.035	8	2.4	995	140	2.5
10	4	25	0.045	10	3.0	795	145	4.5
12	4	25	0.050	12	3.6	665	135	6.0
16	4	25	0.060	16	2.4	495	120	4.5

Leghe a base di nichel indurite
R_m > 1000 N/mm² [Inconel 718]

6	4	15	0.030	6	1.8	795	95	1.0
8	4	15	0.035	8	2.4	595	85	1.5
10	4	15	0.045	10	3.0	475	85	2.5
12	4	15	0.050	12	3.6	400	80	3.5
16	4	15	0.060	16	2.4	300	70	2.5

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	60	0.030	1.5	6	3185	380	3.5
8	4	60	0.040	2.0	8	2385	380	6.0
10	4	60	0.055	2.5	10	1910	420	10.5
12	4	60	0.065	3.0	12	1590	415	15.0
16	4	60	0.085	2.4	16	1195	405	15.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

6	4	55	0.030	1.5	6	2920	350	3.0
8	4	55	0.040	2.0	8	2190	350	5.5
10	4	55	0.055	2.5	10	1750	385	9.5
12	4	55	0.065	3.0	12	1460	380	13.5
16	4	55	0.085	2.4	16	1095	370	14.0

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

6	4	20	0.030	1.5	6	1060	125	1.0
8	4	20	0.035	2.0	8	795	110	2.0
10	4	20	0.045	2.5	10	635	115	3.0
12	4	20	0.050	3.0	12	530	105	4.0
16	4	20	0.060	2.4	16	400	95	3.5

Leghe a base di nichel indurite
R_m > 1000 N/mm² [Inconel 718]

6	4	10	0.030	1.5	6	530	65	0.5
8	4	10	0.035	2.0	8	400	55	1.0
10	4	10	0.045	2.5	10	320	60	1.5
12	4	10	0.050	3.0	12	265	55	2.0
16	4	10	0.060	2.4	16	200	50	2.0

Frese cilindriche SX

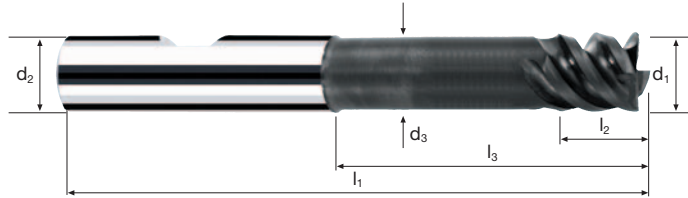
A taglienti lisci, esecuzione medio-lunga con scarico



HM
MG10

λ 55°
 γ 15°

45°



Sgrossatura



Finitura



Rm
 < 850

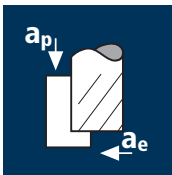

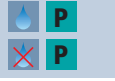
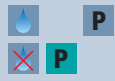

Rm
 850-1100




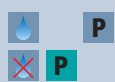


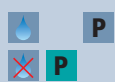


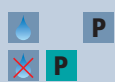


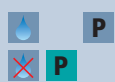

Inox
 Stainless

Ti
 Titanium

Nickel-Alloys
 Tool Steel

									POLYCHROM
Esempio: N° Ordine									P5319
Rivestimento: P Articolo: 5319 Codice-ø: .300									P5219
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z	
.300	6	6	5.5	70	7	33	0.15	4	●
.391	8	8	7.4	80	9	43	0.15	4	●
.450	10	10	9.2	84	11	43	0.20	4	●
.501	12	12	11.0	97	13	51	0.20	4	●
.610	16	16	15.0	115	17	66	0.20	4	●

Applicazione	Materiale	d ₁ [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]		
	<p>Acciaio < 850 N/mm²</p> 	6	4	190	0.050	6	1.8	10080	2015	22.0		
		8	4	190	0.065	8	2.4	7560	1965	37.5		
		10	4	190	0.080	10	3.0	6050	1935	58.0		
		12	4	190	0.095	12	3.6	5040	1915	82.5		
		16	4	190	0.125	16	3.2	3780	1890	97.0		
<p>Acciaio 850 - 1100 N/mm²</p> 	<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p> 	<p>Acciaio inossidabile [Cr-Ni/1.4301]</p> 	6	4	140	0.050	6	1.8	7425	1485	16.0	
			8	4	140	0.065	8	2.4	5570	1450	28.0	
			10	4	140	0.080	10	3.0	4455	1425	43.0	
			12	4	140	0.095	12	3.6	3715	1410	61.0	
			16	4	140	0.125	16	3.2	2785	1395	71.5	

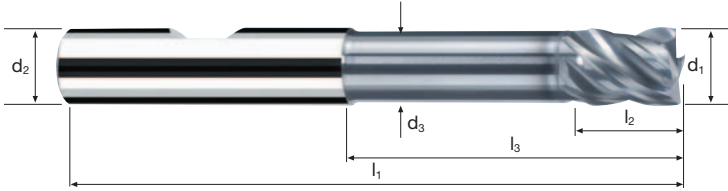
Applicazione	Materiale	d ₁ [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]				
	<p>Acciaio < 850 N/mm²</p> 	<p>Acciaio 850 - 1100 N/mm²</p> 	<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p> 	<p>Acciaio inossidabile [Cr-Ni/1.4301]</p> 	6	4	155	0.040	4.2	6	8225	1315	33.0	
					8	4	155	0.050	5.6	8	6165	1235	55.5	
					10	4	155	0.065	7.0	10	4935	1285	90.0	
					12	4	155	0.075	8.4	12	4110	1235	124.5	
					16	4	155	0.075	6.4	16	3085	925	94.5	
<p>Acciaio 850 - 1100 N/mm²</p> 	<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p> 	<p>Acciaio inossidabile [Cr-Ni/1.4301]</p> 	6	4	105	0.040	4.2	6	5570	890	22.5			
			8	4	105	0.050	5.6	8	4180	835	37.5			
			10	4	105	0.065	7.0	10	3340	870	61.0			
			12	4	105	0.075	8.4	12	2785	835	84.0			
			16	4	105	0.075	6.4	16	2090	625	64.0			
<p>Acciaio 850 - 1100 N/mm²</p> 	<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p> 	<p>Acciaio inossidabile [Cr-Ni/1.4301]</p> 	6	4	55	0.035	4.2	6	2920	410	10.5			
			8	4	55	0.045	5.6	8	2190	395	17.5			
			10	4	55	0.055	7.0	10	1750	385	27.0			
			12	4	55	0.060	8.4	12	1460	350	35.5			
			16	4	55	0.075	6.4	16	1095	330	34.0			
<p>Acciaio 850 - 1100 N/mm²</p> 	<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p> 	<p>Acciaio inossidabile [Cr-Ni/1.4301]</p> 	6	4	75	0.030	4.2	6	3980	480	12.0			
			8	4	75	0.035	5.6	8	2985	420	19.0			
			10	4	75	0.045	7.0	10	2385	430	30.0			
			12	4	75	0.050	8.4	12	1990	400	40.5			
			16	4	75	0.060	6.4	16	1490	360	37.0			

Frese cilindriche NB-V

A taglienti lisci, esecuzione medio-lunga con scarico



HM
MG10 λ **40°**
 γ **0°**



Sgrossatura



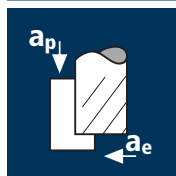
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 15325	Codice-ø .300						POLYCHROM	
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z			
.300	6	6	5.5	70	7	33	0.15	4	●		
.391	8	8	7.4	80	9	43	0.15	4	●		
.450	10	10	9.2	84	11	43	0.20	4	●		
.501	12	12	11.0	97	13	51	0.20	4	●		
.610	16	16	15.0	115	17	66	0.20	4	●		

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

Acciaio inossidabile [Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	190	0.050	6	1.8	10080	2015	22.0
8	4	190	0.065	8	2.4	7560	1965	37.5
10	4	190	0.080	10	3.0	6050	1935	58.0
12	4	190	0.095	12	3.6	5040	1915	82.5
16	4	190	0.125	16	3.2	3780	1890	97.0
20	4	190	0.145	20	4.0	3025	1755	140.5

6	4	140	0.050	6	1.8	7425	1485	16.0
8	4	140	0.065	8	2.4	5570	1450	28.0
10	4	140	0.080	10	3.0	4455	1425	43.0
12	4	140	0.095	12	3.6	3715	1410	61.0
16	4	140	0.125	16	3.2	2785	1395	71.5
20	4	140	0.145	20	4.0	2230	1295	103.5

6	4	70	0.045	6	1.8	3715	670	7.0
8	4	70	0.060	8	2.4	2785	670	13.0
10	4	70	0.070	10	3.0	2230	625	19.0
12	4	70	0.085	12	3.6	1855	630	27.0
16	4	70	0.110	16	3.2	1395	615	31.5
20	4	70	0.130	20	4.0	1115	580	46.5

6	4	90	0.035	6	1.8	4775	670	7.0
8	4	90	0.050	8	2.4	3580	715	13.5
10	4	90	0.055	10	3.0	2865	630	19.0
12	4	90	0.070	12	3.6	2385	670	29.0
16	4	90	0.090	16	3.2	1790	645	33.0
20	4	90	0.105	20	4.0	1430	600	48.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

Acciaio inossidabile [Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	155	0.040	4.2	6	8225	1315	33.0
8	4	155	0.050	5.6	8	6165	1235	55.5
10	4	155	0.065	7.0	10	4935	1285	90.0
12	4	155	0.075	8.4	12	4110	1235	124.5
16	4	155	0.075	6.4	16	3085	925	94.5
20	4	155	0.080	8.0	20	2465	790	126.5

6	4	105	0.040	4.2	6	5570	890	22.5
8	4	105	0.050	5.6	8	4180	835	37.5
10	4	105	0.065	7.0	10	3340	870	61.0
12	4	105	0.075	8.4	12	2785	835	84.0
16	4	105	0.075	6.4	16	2090	625	64.0
20	4	105	0.080	8.0	20	1670	535	85.5

6	4	55	0.035	4.2	6	2920	410	10.5
8	4	55	0.045	5.6	8	2190	395	17.5
10	4	55	0.055	7.0	10	1750	385	27.0
12	4	55	0.060	8.4	12	1460	350	35.5
16	4	55	0.075	6.4	16	1095	330	34.0
20	4	55	0.080	8.0	20	875	280	45.0

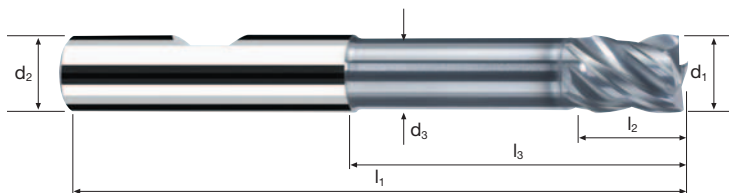
6	4	75	0.030	4.2	6	3980	480	12.0
8	4	75	0.035	5.6	8	2985	420	19.0
10	4	75	0.045	7.0	10	2385	430	30.0
12	4	75	0.050	8.4	12	1990	400	40.5
16	4	75	0.060	6.4	16	1490	360	37.0
20	4	75	0.065	8.0	20	1195	310	49.5

Frese cilindriche NB-V

A taglienti lisci, esecuzione medio-lunga con scarico



HM
MG10 λ **40°**
 γ **0°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine									POLYCHROM	
									P15353	
									P15253	
\emptyset Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z		
.300	6	6	5.5	63	7	26	0.15	4	●	
.391	8	8	7.4	72	9	35	0.15	4	●	
.450	10	10	9.2	84	11	43	0.20	4	●	
.501	12	12	11.0	97	13	51	0.20	4	●	
.610	16	16	15.0	108	17	59	0.20	4	●	
.682	20	20	19.0	122	21	71	0.20	4	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	<p>Acciaio < 850 N/mm²</p>	3	3	190	0.015	4.5	1.2	20160	905	5.0
		4	3	190	0.015	6.0	1.6	15120	680	6.5
		5	3	190	0.020	7.5	2.0	12095	725	11.0
		6	3	190	0.040	9.0	2.4	10080	1210	26.0
		8	3	190	0.050	12.0	3.2	7560	1135	43.5
		10	3	190	0.065	15.0	4.0	6050	1180	71.0
		12	3	190	0.075	18.0	4.8	5040	1135	98.0
		16	3	190	0.085	24.0	6.4	3780	965	148.0
		3	3	140	0.015	4.5	1.2	14855	670	3.5
		4	3	140	0.015	6.0	1.6	11140	500	5.0
		5	3	140	0.020	7.5	2.0	8915	535	8.0
		6	3	140	0.040	9.0	2.4	7425	890	19.0
		8	3	140	0.050	12.0	3.2	5570	835	32.0
		10	3	140	0.065	15.0	4.0	4455	870	52.0
		12	3	140	0.075	18.0	4.8	3715	835	72.0
		16	3	140	0.085	24.0	6.4	2785	710	109.0
	<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p>	3	3	70	0.010	4.5	1.2	7425	225	1.0
		4	3	70	0.015	6.0	1.6	5570	250	2.5
		5	3	70	0.015	7.5	2.0	4455	200	3.0
		6	3	70	0.035	9.0	2.4	3715	390	8.5
		8	3	70	0.045	12.0	3.2	2785	375	14.5
		10	3	70	0.055	15.0	4.0	2230	370	22.0
		12	3	70	0.065	18.0	4.8	1855	360	31.0
		16	3	70	0.075	24.0	6.4	1395	315	48.5
		3	3	90	0.010	4.5	1.2	9550	285	1.5
		4	3	90	0.010	6.0	1.6	7160	215	2.0
		5	3	90	0.010	7.5	2.0	5730	170	2.5
		6	3	90	0.030	9.0	2.4	4775	430	9.5
		8	3	90	0.035	12.0	3.2	3580	375	14.5
		10	3	90	0.045	15.0	4.0	2865	385	23.0
		12	3	90	0.050	18.0	4.8	2385	360	31.0
		16	3	90	0.060	24.0	6.4	1790	320	49.0

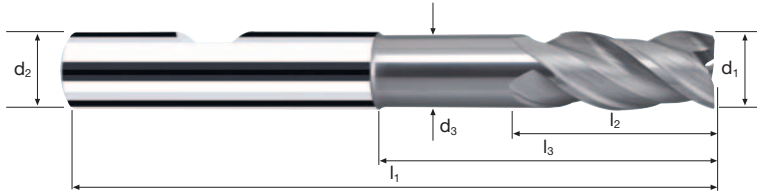
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	<p>Acciaio < 850 N/mm²</p>	3	3	155	0.015	4.2	3	16445	740	9.5
		4	3	155	0.015	5.6	4	12335	555	12.5
		5	3	155	0.025	7.0	5	9870	740	26.0
		6	3	155	0.030	8.4	6	8225	740	37.5
		8	3	155	0.040	11.2	8	6165	740	66.5
		10	3	155	0.050	14.0	10	4935	740	103.5
		12	3	155	0.060	16.8	12	4110	740	149.0
		16	3	155	0.070	14.4	16	3085	650	150.0
		3	3	105	0.015	4.2	3	11140	500	6.5
		4	3	105	0.015	5.6	4	8355	375	8.5
		5	3	105	0.025	7.0	5	6685	500	17.5
		6	3	105	0.030	8.4	6	5570	500	25.0
		8	3	105	0.040	11.2	8	4180	500	45.0
		10	3	105	0.050	14.0	10	3340	500	70.0
		12	3	105	0.060	16.8	12	2785	500	101.0
		16	3	105	0.070	14.4	16	2090	440	101.5
	<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p>	3	3	55	0.010	4.2	3	5835	175	2.0
		4	3	55	0.015	5.6	4	4375	195	4.5
		5	3	55	0.015	7.0	5	3500	160	5.5
		6	3	55	0.030	8.4	6	2920	265	13.5
		8	3	55	0.040	11.2	8	2190	265	23.5
		10	3	55	0.050	14.0	10	1750	265	37.0
		12	3	55	0.060	16.8	12	1460	265	53.5
		16	3	55	0.070	14.4	16	1095	230	53.0
		3	3	70	0.010	4.2	3	7425	225	3.0
		4	3	70	0.010	5.6	4	5570	165	3.5
		5	3	70	0.010	7.0	5	4455	135	4.5
		6	3	70	0.025	8.4	6	3715	280	14.0
		8	3	70	0.030	11.2	8	2785	250	22.5
		10	3	70	0.040	14.0	10	2230	270	38.0
		12	3	70	0.050	16.8	12	1855	280	56.5
		16	3	70	0.055	14.4	16	1395	230	53.0

Frese cilindriche NV3

A taglienti lisci, esecuzione medio-lunga con scarico



HM
MG10 λ 40°
 γ 0°



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500					Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine										POLYCHROM
Rivestimento Articolo Codice-Ø										
P 15399 .180										P15399
										P15299
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z	
.180	3	6	2.8	63	8	20	0.10	3.5°	3	●
.220	4	6	3.7	63	11	22	0.10	2.5°	3	●
.260	5	6	4.6	63	13	24	0.15	1.5°	3	●
.300	6	6	5.5	63	13	26	0.15	0.0°	3	●
.391	8	8	7.4	72	19	35	0.15	0.0°	3	●
.450	10	10	9.2	84	22	43	0.20	0.0°	3	●
.501	12	12	11.0	97	26	51	0.20	0.0°	3	●
.610	16	16	15.0	108	32	59	0.20	0.0°	3	●

Applicazione

Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	105	0.010	4.5	2.0	11140	335	3.0
4	3	105	0.015	6.0	2.6	8355	375	6.0
5	3	105	0.020	7.5	3.3	6685	400	10.0
6	3	105	0.020	9.0	3.9	5570	335	12.0
8	3	105	0.030	12.0	5.2	4180	375	23.5
10	3	105	0.035	15.0	6.5	3340	350	34.0
12	3	105	0.045	18.0	7.8	2785	375	52.5
16	3	105	0.055	24.0	8.8	2090	345	73.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	3	95	0.010	4.5	2.0	10080	300	2.5
4	3	95	0.015	6.0	2.6	7560	340	5.5
5	3	95	0.020	7.5	3.3	6050	365	9.0
6	3	95	0.020	9.0	3.9	5040	300	10.5
8	3	95	0.030	12.0	5.2	3780	340	21.0
10	3	95	0.035	15.0	6.5	3025	320	31.0
12	3	95	0.045	18.0	7.8	2520	340	47.5
16	3	95	0.055	24.0	8.8	1890	310	65.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

3	3	45	0.010	4.5	2.0	4775	145	1.5
4	3	45	0.010	6.0	2.6	3580	105	1.5
5	3	45	0.015	7.5	3.3	2865	130	3.0
6	3	45	0.015	9.0	3.9	2385	105	3.5
8	3	45	0.020	12.0	5.2	1790	105	6.5
10	3	45	0.025	15.0	6.5	1430	105	10.0
12	3	45	0.030	18.0	7.8	1195	110	15.5
16	3	45	0.040	24.0	8.8	895	105	22.0

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

3	3	15	0.010	4.5	2.0	1590	50	0.5
4	3	15	0.010	6.0	2.6	1195	35	0.5
5	3	15	0.015	7.5	3.3	955	45	1.0
6	3	15	0.015	9.0	3.9	795	35	1.0
8	3	15	0.020	12.0	5.2	595	35	2.0
10	3	15	0.025	15.0	6.5	475	35	3.5
12	3	15	0.030	18.0	7.8	400	35	5.0
16	3	15	0.040	24.0	8.8	300	35	7.5

Applicazione

Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	85	0.010	4.5	3	9020	270	3.5
4	3	85	0.015	6.0	4	6765	305	7.5
5	3	85	0.015	7.5	5	5410	245	9.0
6	3	85	0.020	9.0	6	4510	270	14.5
8	3	85	0.025	12.0	8	3380	255	24.5
10	3	85	0.030	15.0	10	2705	245	37.0
12	3	85	0.040	18.0	12	2255	270	58.5
16	3	85	0.050	20.8	16	1690	255	85.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

3	3	75	0.010	4.5	3	7960	240	3.0
4	3	75	0.015	6.0	4	5970	270	6.5
5	3	75	0.015	7.5	5	4775	215	8.0
6	3	75	0.020	9.0	6	3980	240	13.0
8	3	75	0.025	12.0	8	2985	225	21.5
10	3	75	0.030	15.0	10	2385	215	32.5
12	3	75	0.040	18.0	12	1990	240	52.0
16	3	75	0.050	20.8	16	1490	225	75.0

Acciaio resistente al calore
[17-4 PH]

3	3	35	0.005	4.5	3	3715	55	0.5
4	3	35	0.010	6.0	4	2785	85	2.0
5	3	35	0.010	7.5	5	2230	65	2.5
6	3	35	0.015	9.0	6	1855	85	4.5
8	3	35	0.020	12.0	8	1395	85	8.0
10	3	35	0.025	15.0	10	1115	85	13.0
12	3	35	0.030	18.0	12	930	85	18.5
16	3	35	0.040	20.8	16	695	85	28.5

Leghe a base di nichel indurite
R_m > 1000 N/mm²
[Inconel 718]

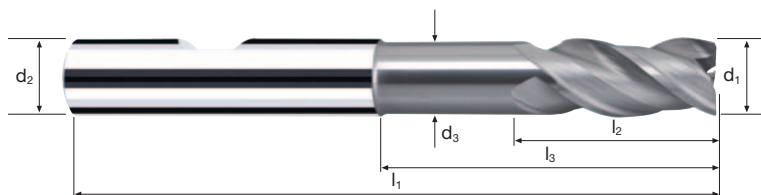
3	3	10	0.005	4.5	3	1060	15	0.2
4	3	10	0.010	6.0	4	795	25	0.5
5	3	10	0.010	7.5	5	635	20	1.0
6	3	10	0.015	9.0	6	530	25	1.5
8	3	10	0.020	12.0	8	400	25	2.5
10	3	10	0.025	15.0	10	320	25	4.0
12	3	10	0.030	18.0	12	265	25	5.5
16	3	10	0.040	20.8	16	200	25	8.5

Frese cilindriche NV3

A taglienti lisci, esecuzione medio-lunga con scarico



HM
MG10 λ **40°**
 γ **10°**



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

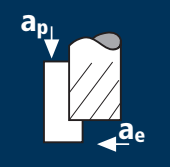

Rm
1100-1300


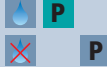
Inox
Stainless

Ti
Titanium

Nickel-Alloys
Tool Steel

Esempio: N° Ordine										POLYCHROM				
										P15394				
										P15294				
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z					
										Rivestimento		Articolo		Codice-ø
										P	15394	.180		
.180	3	6	2.8	63	8	20	0.10	3.5°	3	●				
.220	4	6	3.7	63	11	22	0.10	2.5°	3	●				
.260	5	6	4.6	63	13	24	0.15	1.5°	3	●				
.300	6	6	5.5	63	13	26	0.15	0.0°	3	●				
.391	8	8	7.4	72	19	35	0.15	0.0°	3	●				
.450	10	10	9.2	84	22	43	0.20	0.0°	3	●				
.501	12	12	11.0	97	26	51	0.20	0.0°	3	●				
.610	16	16	15.0	108	32	59	0.20	0.0°	3	●				

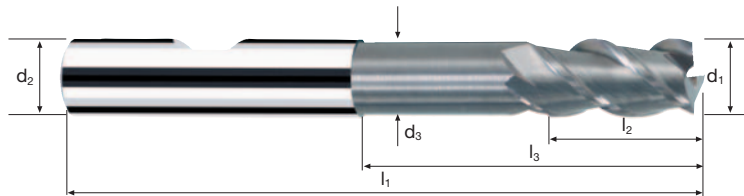
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ² 	3	3	105	0.010	4.5	0.2	11140	335
		4	3	105	0.010	6.0	0.2	8355	250
		5	3	105	0.015	7.5	0.3	6685	300
		6	3	105	0.015	9.0	0.3	5570	250
		8	3	105	0.020	12.0	0.4	4180	250
		10	3	105	0.025	15.0	0.5	3340	250
		12	3	105	0.030	18.0	0.6	2785	250
		16	3	105	0.040	24.0	0.8	2090	250
		3	3	75	0.010	4.5	0.2	7960	240
		4	3	75	0.010	6.0	0.2	5970	180
		5	3	75	0.015	7.5	0.3	4775	215
		6	3	75	0.015	9.0	0.3	3980	180
		8	3	75	0.020	12.0	0.4	2985	180
		10	3	75	0.025	15.0	0.5	2385	180
		12	3	75	0.030	18.0	0.6	1990	180
		16	3	75	0.040	24.0	0.8	1490	180
3	3	150	0.010	4.5	0.2	15915	475		
4	3	150	0.010	6.0	0.2	11935	360		
5	3	150	0.015	7.5	0.3	9550	430		
6	3	150	0.015	9.0	0.3	7960	360		
8	3	150	0.020	12.0	0.4	5970	360		
10	3	150	0.025	15.0	0.5	4775	360		
12	3	150	0.030	18.0	0.6	3980	360		
16	3	150	0.040	24.0	0.8	2985	360		
3	3	50	0.010	4.5	0.2	5305	160		
4	3	50	0.010	6.0	0.2	3980	120		
5	3	50	0.015	7.5	0.3	3185	145		
6	3	50	0.015	9.0	0.3	2655	120		
8	3	50	0.020	12.0	0.4	1990	120		
10	3	50	0.025	15.0	0.5	1590	120		
12	3	50	0.030	18.0	0.6	1325	120		
16	3	50	0.040	24.0	0.8	995	120		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	3	75	0.005	0.6	3	7960	120	0.2
		4	3	75	0.010	0.8	4	5970	180	0.6
		5	3	75	0.010	1.0	5	4775	145	0.7
		6	3	75	0.010	1.2	6	3980	120	0.9
		8	3	75	0.015	1.6	8	2985	135	1.7
		10	3	75	0.020	2.0	10	2385	145	2.9
		12	3	75	0.025	2.4	12	1990	150	4.3
		16	3	75	0.030	3.2	16	1490	135	6.9
		3	3	60	0.005	0.6	3	6365	95	0.2
		4	3	60	0.005	0.8	4	4775	70	0.2
		5	3	60	0.010	1.0	5	3820	115	0.6
		6	3	60	0.010	1.2	6	3185	95	0.7
		8	3	60	0.015	1.6	8	2385	105	1.3
		10	3	60	0.020	2.0	10	1910	115	2.3
		12	3	60	0.020	2.4	12	1590	95	2.7
		16	3	60	0.030	3.2	16	1195	110	5.6
3	3	105	0.005	0.6	3	11140	165	0.3		
4	3	105	0.010	0.8	4	8355	250	0.8		
5	3	105	0.010	1.0	5	6685	200	1.0		
6	3	105	0.015	1.2	6	5570	250	1.8		
8	3	105	0.020	1.6	8	4180	250	3.2		
10	3	105	0.020	2.0	10	3340	200	4.0		
12	3	105	0.025	2.4	12	2785	210	6.0		
16	3	105	0.035	3.2	16	2090	220	11.3		
3	3	35	0.005	0.6	3	3715	55	0.1		
4	3	35	0.005	0.8	4	2785	40	0.1		
5	3	35	0.010	1.0	5	2230	65	0.3		
6	3	35	0.010	1.2	6	1855	55	0.4		
8	3	35	0.015	1.6	8	1395	65	0.8		
10	3	35	0.020	2.0	10	1115	65	1.3		
12	3	35	0.020	2.4	12	930	55	1.6		
16	3	35	0.030	3.2	16	695	65	3.3		

Frese cilindriche

A taglienti lisci, esecuzione medio-lunga con scarico

HM
MG10 λ **45°**
 γ **15°**



Sgrossatura



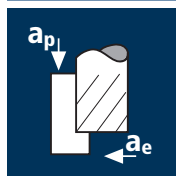
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300				Inox Stainless		GG(G) Copper
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										POLYCHROM	
Esempio: Rivestimento Articolo Codice-ø										5333	P5333
N° Ordine											
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.180	3	6	2.8	63	8	14	0.10	4.5°	3	●	●
.220	4	6	3.7	63	11	16	0.10	3.0°	3	●	●
.260	5	6	4.6	63	13	18	0.15	1.5°	3	●	●
.300	6	6	5.5	63	13	26	0.15	0.0°	3	●	●
.391	8	8	7.4	72	19	35	0.15	0.0°	3	●	●
.450	10	10	9.2	84	22	43	0.20	0.0°	3	●	●
.501	12	12	11.0	97	26	51	0.20	0.0°	3	●	●
.610	16	16	15.0	108	32	59	0.20	0.0°	3	●	●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Materiale

Ghisa
(grigia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	75	0.015	15	0.4	3980	240
8	4	75	0.020	20	0.5	2985	240
10	4	75	0.025	25	0.6	2385	240
12	4	75	0.030	30	0.7	1990	240
16	4	75	0.040	40	1.0	1490	240
20	4	75	0.050	50	1.2	1195	240

6	4	50	0.015	15	0.4	2655	160
8	4	50	0.020	20	0.5	1990	160
10	4	50	0.025	25	0.6	1590	160
12	4	50	0.030	30	0.7	1325	160
16	4	50	0.040	40	1.0	995	160
20	4	50	0.050	50	1.2	795	160

6	4	40	0.015	15	0.4	2120	125
8	4	40	0.020	20	0.5	1590	125
10	4	40	0.025	25	0.6	1275	130
12	4	40	0.030	30	0.7	1060	125
16	4	40	0.040	40	1.0	795	125
20	4	40	0.050	50	1.2	635	125

6	4	45	0.015	15	0.4	2385	145
8	4	45	0.020	20	0.5	1790	145
10	4	45	0.025	25	0.6	1430	145
12	4	45	0.030	30	0.7	1195	145
16	4	45	0.040	40	1.0	895	145
20	4	45	0.050	50	1.2	715	145

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	60	0.015	15	0.4	3185	190
8	4	60	0.020	20	0.5	2385	190
10	4	60	0.025	25	0.6	1910	190
12	4	60	0.030	30	0.7	1590	190
16	4	60	0.040	40	1.0	1195	190
20	4	60	0.050	50	1.2	955	190

6	4	110	0.015	15	0.4	5835	350
8	4	110	0.020	20	0.5	4375	350
10	4	110	0.025	25	0.6	3500	350
12	4	110	0.030	30	0.7	2920	350
16	4	110	0.040	40	1.0	2190	350
20	4	110	0.050	50	1.2	1750	350

6	4	50	0.015	15	0.4	2655	160
8	4	50	0.020	20	0.5	1990	160
10	4	50	0.025	25	0.6	1590	160
12	4	50	0.030	30	0.7	1325	160
16	4	50	0.040	40	1.0	995	160
20	4	50	0.050	50	1.2	795	160

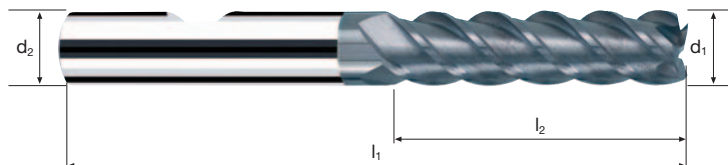
6	4	25	0.015	15	0.4	1325	80
8	4	25	0.020	20	0.5	995	80
10	4	25	0.025	25	0.6	795	80
12	4	25	0.030	30	0.7	665	80
16	4	25	0.040	40	1.0	495	80
20	4	25	0.050	50	1.2	400	80

Frese cilindriche

A taglienti lisci, esecuzione lunga



HM
MG10 λ **45°**
 γ **15°**



Sgrossatura



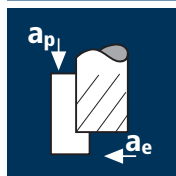
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300						Inox Stainless	Ti Titanium	GG(G) Copper
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Esempio: N° Ordine		Rivestimento P	Articolo 15345	Codice- ϕ .300				POLYCHROM
ϕ Code	d1 e8	d2 h6	l1	l2	45°	z		
.300	6	6	70	26	0.15	4		●
.391	8	8	80	36	0.15	4		●
.450	10	10	100	45	0.20	4		●
.501	12	12	110	53	0.20	4		●
.610	16	16	123	63	0.20	4		●
.682	20	20	141	75	0.20	4		●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



Materiale

Ghisa
(griglia / sferoidale)



Acciaio inossidabile
[Cr-Ni/1.4301]



Rame non legato



Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
4	4	32	0.005	11	0.05	2545	50
6	4	32	0.010	17	0.10	1700	70
8	4	32	0.015	22	0.10	1275	75
10	4	32	0.020	28	0.15	1020	80
12	4	32	0.020	34	0.20	850	70
16	4	32	0.030	45	0.25	635	75
20	4	32	0.035	56	0.30	510	70
30	6	32	0.055	84	0.45	340	110
40	6	32	0.075	112	0.60	255	115

4	4	25	0.005	11	0.05	1990	40
6	4	25	0.010	17	0.10	1325	55
8	4	25	0.015	22	0.10	995	60
10	4	25	0.020	28	0.15	795	65
12	4	25	0.020	34	0.20	665	55
16	4	25	0.030	45	0.25	495	60
20	4	25	0.035	56	0.30	400	55
30	6	25	0.055	84	0.45	265	85
40	6	25	0.075	112	0.60	200	90

4	4	20	0.005	11	0.05	1590	30
6	4	20	0.010	17	0.10	1060	40
8	4	20	0.015	22	0.10	795	50
10	4	20	0.020	28	0.15	635	50
12	4	20	0.020	34	0.20	530	40
16	4	20	0.030	45	0.25	400	50
20	4	20	0.035	56	0.30	320	45
30	6	20	0.055	84	0.45	210	70
40	6	20	0.075	112	0.60	160	70

4	4	18	0.005	11	0.05	1430	30
6	4	18	0.010	17	0.10	955	40
8	4	18	0.015	22	0.10	715	45
10	4	18	0.020	28	0.15	575	45
12	4	18	0.020	34	0.20	475	40
16	4	18	0.030	45	0.25	360	45
20	4	18	0.035	56	0.30	285	40
30	6	18	0.055	84	0.45	190	65
40	6	18	0.075	112	0.60	145	65

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
4	4	24	0.005	11	0.05	1910	40
6	4	24	0.010	17	0.10	1275	50
8	4	24	0.015	22	0.10	955	55
10	4	24	0.020	28	0.15	765	60
12	4	24	0.020	34	0.20	635	50
16	4	24	0.030	45	0.25	475	55
20	4	24	0.035	56	0.30	380	55
30	6	24	0.055	84	0.45	255	85
40	6	24	0.075	112	0.60	190	85

4	4	15	0.005	11	0.05	1195	25
6	4	15	0.010	17	0.10	795	30
8	4	15	0.015	22	0.10	595	35
10	4	15	0.020	28	0.15	475	40
12	4	15	0.020	34	0.20	400	30
16	4	15	0.030	45	0.25	300	35
20	4	15	0.035	56	0.30	240	35
30	6	15	0.055	84	0.45	160	55
40	6	15	0.075	112	0.60	120	55

4	4	40	0.005	11	0.05	3185	65
6	4	40	0.010	17	0.10	2120	85
8	4	40	0.015	22	0.10	1590	95
10	4	40	0.020	28	0.15	1275	100
12	4	40	0.020	34	0.20	1060	85
16	4	40	0.030	45	0.25	795	95
20	4	40	0.035	56	0.30	635	90
30	6	40	0.055	84	0.45	425	140
40	6	40	0.075	112	0.60	320	145

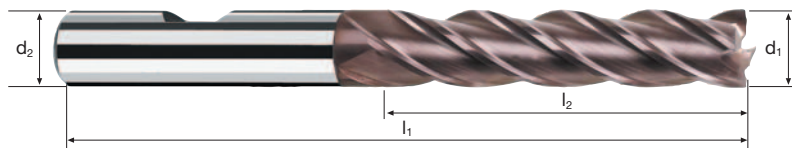
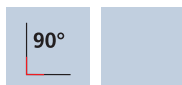
4	4	50	0.005	11	0.05	3980	80
6	4	50	0.010	17	0.10	2655	105
8	4	50	0.015	22	0.10	1990	120
10	4	50	0.020	28	0.15	1590	125
12	4	50	0.020	34	0.20	1325	105
16	4	50	0.030	45	0.25	995	120
20	4	50	0.035	56	0.30	795	110
30	6	50	0.055	84	0.45	530	175
40	6	50	0.075	112	0.60	400	180

Frese cilindriche

A taglienti lisci, esecuzione lunga



HSS-E
Co8 λ **35°**
 γ **15°**



Sgrossatura

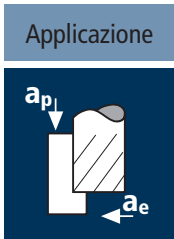


Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Copper
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Esempio: N° Ordine		Rivestimento U	Articolo 0200	Codice- ϕ .140					UNICUT-4X
ϕ Code	d1 k8	d2 h6	l1	l2	α	Z			U0200
.140	2.0	6	54	10	7.0°	4			●
.160	2.5	6	56	12	5.5°	4			●
.180	3.0	6	56	12	4.5°	4			●
.220	4.0	6	63	19	2.5°	4			●
.260	5.0	6	68	24	1.0°	4			●
.300	6.0	6	68	24	0.0°	4			●
.391	8.0	8	82	38	0.0°	4			●
.450	10.0	10	95	45	0.0°	4			●
.501	12.0	12	110	53	0.0°	4			●
.570	14.0	12	110	53	0.0°	4			●
.610	16.0	16	123	63	0.0°	4			●
.640	18.0	16	123	63	0.0°	4			●
.682	20.0	20	141	75	0.0°	4			●
.772	25.0	25	166	90	0.0°	4			●
.810	30.0	25	166	90	0.0°	6			●
.832	32.0	32	186	106	0.0°	6			●
.860	36.0	32	186	106	0.0°	6			●
.881	40.0	32	205	125	0.0°	6			●
.892	40.0	40	217	125	0.0°	6			●



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	3	34	0.005	7.0	0.05	5410	80
4	3	34	0.005	14.0	0.10	2705	40
5	3	34	0.005	17.5	0.10	2165	30
6	3	34	0.010	21.0	0.10	1805	55
8	3	34	0.010	28.0	0.15	1355	40
10	3	34	0.015	35.0	0.20	1080	50
12	3	34	0.015	42.0	0.25	900	40
16	3	34	0.020	56.0	0.30	675	40
20	3	34	0.025	70.0	0.40	540	40

Acciaio
850 - 1100 N/mm²

2	3	22	0.005	7.0	0.05	3500	55
4	3	22	0.005	14.0	0.10	1750	25
5	3	22	0.005	17.5	0.10	1400	20
6	3	22	0.010	21.0	0.10	1165	35
8	3	22	0.010	28.0	0.15	875	25
10	3	22	0.015	35.0	0.20	700	30
12	3	22	0.015	42.0	0.25	585	25
16	3	22	0.020	56.0	0.30	440	25
20	3	22	0.025	70.0	0.40	350	25

Ghisa
(grigia / sferoidale)

2	3	20	0.005	7.0	0.05	3185	50
4	3	20	0.005	14.0	0.10	1590	25
5	3	20	0.005	17.5	0.10	1275	20
6	3	20	0.010	21.0	0.10	1060	30
8	3	20	0.010	28.0	0.15	795	25
10	3	20	0.015	35.0	0.20	635	30
12	3	20	0.015	42.0	0.25	530	25
16	3	20	0.020	56.0	0.30	400	25
20	3	20	0.025	70.0	0.40	320	25

Acciaio inossidabile
[Cr-Ni/1.4301]

2	3	15	0.005	7.0	0.05	2385	35
4	3	15	0.005	14.0	0.10	1195	20
5	3	15	0.005	17.5	0.10	955	15
6	3	15	0.010	21.0	0.10	795	25
8	3	15	0.010	28.0	0.15	595	20
10	3	15	0.015	35.0	0.20	475	20
12	3	15	0.015	42.0	0.25	400	20
16	3	15	0.020	56.0	0.30	300	20
20	3	15	0.025	70.0	0.40	240	20

Materiale

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	3	12	0.005	7.0	0.05	1910	30
4	3	12	0.005	14.0	0.10	955	15
5	3	12	0.005	17.5	0.10	765	10
6	3	12	0.010	21.0	0.10	635	20
8	3	12	0.010	28.0	0.15	475	15
10	3	12	0.015	35.0	0.20	380	15
12	3	12	0.015	42.0	0.25	320	15
16	3	12	0.020	56.0	0.30	240	15
20	3	12	0.025	70.0	0.40	190	15

Rame non legato

2	3	40	0.005	7.0	0.05	6365	95
4	3	40	0.005	14.0	0.10	3185	50
5	3	40	0.005	17.5	0.10	2545	40
6	3	40	0.010	21.0	0.10	2120	65
8	3	40	0.010	28.0	0.15	1590	50
10	3	40	0.015	35.0	0.20	1275	55
12	3	40	0.015	42.0	0.25	1060	50
16	3	40	0.020	56.0	0.30	795	50
20	3	40	0.025	70.0	0.40	635	50

Alluminio malleabile
Si < 6%

2	3	50	0.005	7.0	0.05	7960	120
4	3	50	0.005	14.0	0.10	3980	60
5	3	50	0.005	17.5	0.10	3185	50
6	3	50	0.010	21.0	0.10	2655	80
8	3	50	0.010	28.0	0.15	1990	60
10	3	50	0.015	35.0	0.20	1590	70
12	3	50	0.015	42.0	0.25	1325	60
16	3	50	0.020	56.0	0.30	995	60
20	3	50	0.025	70.0	0.40	795	60

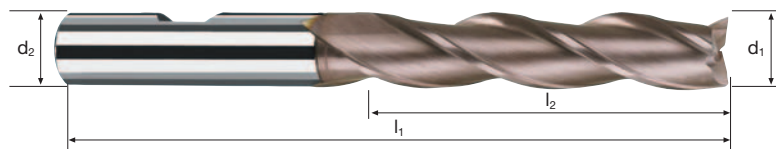
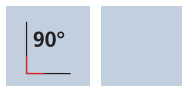
Materiale

Frese cilindriche

A taglienti lisci, esecuzione lunga



HSS-E
Co8 λ **30°**
 γ **15°**



Sgrossatura

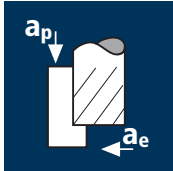

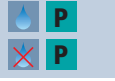
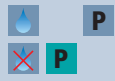






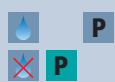

Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300						Inox Stainless	Ti Titanium	GG(G) Copper
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Esempio: N° Ordine									UNICUT-4X
		Rivestimento U	Articolo 0270	Codice-ø .140					U0270
ø Code	d1 k8	d2 h6	l1	l2	α	Z			
.140	2.0	6	54	10	7.0°	3			●
.160	2.5	6	56	12	5.5°	3			●
.180	3.0	6	56	12	4.5°	3			●
.200	3.5	6	59	15	3.5°	3			●
.220	4.0	6	63	19	2.5°	3			●
.260	5.0	6	68	24	1.0°	3			●
.300	6.0	6	68	24	0.0°	3			●
.391	8.0	8	82	38	0.0°	3			●
.450	10.0	10	95	45	0.0°	3			●
.501	12.0	12	110	53	0.0°	3			●
.570	14.0	12	110	53	0.0°	3			●
.610	16.0	16	123	63	0.0°	3			●
.640	18.0	16	123	63	0.0°	3			●
.682	20.0	20	141	75	0.0°	3			●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	3	105	0.010	4.5	0.1	11140	335	0.1
		4	3	105	0.010	6.0	0.1	8355	250	0.2
		5	3	105	0.015	7.5	0.1	6685	300	0.3
		6	3	105	0.015	9.0	0.2	5570	250	0.3
		8	3	105	0.020	12.0	0.2	4180	250	0.6
		10	3	105	0.025	15.0	0.3	3340	250	0.9
		12	3	105	0.030	18.0	0.3	2785	250	1.4
16	3	105	0.040	24.0	0.4	2090	250	2.4		
	Acciaio 850 - 1100 N/mm ² 	3	3	75	0.010	4.5	0.1	7960	240	0.1
		4	3	75	0.010	6.0	0.1	5970	180	0.1
		5	3	75	0.015	7.5	0.1	4775	215	0.0
		6	3	75	0.015	9.0	0.2	3980	180	0.0
		8	3	75	0.020	12.0	0.2	2985	180	0.5
		10	3	75	0.025	15.0	0.3	2385	180	0.5
		12	3	75	0.030	18.0	0.3	1990	180	1.0
16	3	75	0.040	24.0	0.4	1490	180	1.5		
	Ghisa (grigia / sferoidale) 	3	3	150	0.010	4.5	0.1	15915	475	0.2
		4	3	150	0.010	6.0	0.1	11935	360	0.2
		5	3	150	0.015	7.5	0.1	9550	430	0.4
		6	3	150	0.015	9.0	0.2	7960	360	0.5
		8	3	150	0.020	12.0	0.2	5970	360	0.9
		10	3	150	0.025	15.0	0.3	4775	360	1.4
		12	3	150	0.030	18.0	0.3	3980	360	1.9
16	3	150	0.040	24.0	0.4	2985	360	3.5		
	Acciaio inossidabile [Cr-Ni/1.4301] 	3	3	50	0.010	4.5	0.1	5305	160	0.1
		4	3	50	0.010	6.0	0.1	3980	120	0.1
		5	3	50	0.015	7.5	0.1	3185	145	0.1
		6	3	50	0.015	9.0	0.2	2655	120	0.2
		8	3	50	0.020	12.0	0.2	1990	120	0.3
		10	3	50	0.025	15.0	0.3	1590	120	0.5
		12	3	50	0.030	18.0	0.3	1325	120	0.6
16	3	50	0.040	24.0	0.4	995	120	1.2		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	3	90	0.005	0.3	3	9550	145	0.1
		4	3	90	0.010	0.4	4	7160	215	0.3
		5	3	90	0.010	0.5	5	5730	170	0.4
		6	3	90	0.010	0.6	6	4775	145	0.5
		8	3	90	0.015	0.8	8	3580	160	1.0
		10	3	90	0.020	1.0	10	2865	170	1.7
		12	3	90	0.025	1.2	12	2385	180	2.6
16	3	90	0.030	1.6	16	1790	160	4.1		
	Acciaio 850 - 1100 N/mm ² 	3	3	60	0.005	0.3	3	6365	95	0.1
		4	3	60	0.005	0.4	4	4775	70	0.1
		5	3	60	0.010	0.5	5	3820	115	0.3
		6	3	60	0.010	0.6	6	3185	95	0.3
		8	3	60	0.015	0.8	8	2385	105	0.7
		10	3	60	0.020	1.0	10	1910	115	1.2
		12	3	60	0.020	1.2	12	1590	95	1.4
16	3	60	0.030	1.6	16	1195	110	2.8		
	Ghisa (grigia / sferoidale) 	3	3	105	0.005	0.3	3	11140	165	0.1
		4	3	105	0.010	0.4	4	8355	250	0.4
		5	3	105	0.010	0.5	5	6685	200	0.5
		6	3	105	0.015	0.6	6	5570	250	0.9
		8	3	105	0.020	0.8	8	4180	250	1.6
		10	3	105	0.020	1.0	10	3340	200	2.0
		12	3	105	0.025	1.2	12	2785	210	3.0
16	3	105	0.035	1.6	16	2090	220	5.6		
	Acciaio inossidabile [Cr-Ni/1.4301] 	3	3	35	0.005	0.3	3	3715	55	0.1
		4	3	35	0.005	0.4	4	2785	40	0.1
		5	3	35	0.010	0.5	5	2230	65	0.2
		6	3	35	0.010	0.6	6	1855	55	0.2
		8	3	35	0.015	0.8	8	1395	65	0.4
		10	3	35	0.020	1.0	10	1115	65	0.7
		12	3	35	0.020	1.2	12	930	55	0.8
16	3	35	0.030	1.6	16	695	65	1.7		

Frese cilindriche

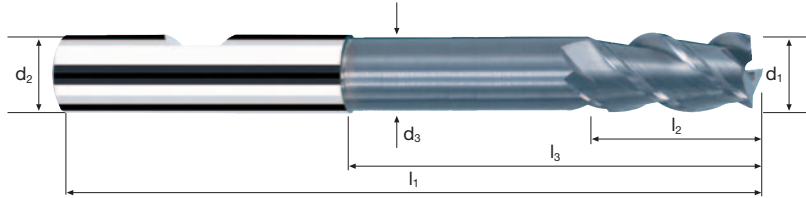
A taglienti lisci, esecuzione lunga con scarico



HM
MG10

λ **45°**
 γ **15°**

45°



Sgrossatura



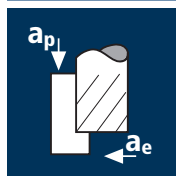
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300				Inox Stainless		GG(G) Copper
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Esempio: N° Ordine		Rivestimento P	Articolo 5393	Codice- ϕ .180						POLYCHROM	
ϕ Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	45°	α	z	P5393	
.180	3	6	2.8	70	8	16	0.10	4.0°	3	●	
.220	4	6	3.7	70	11	18	0.10	3.0°	3	●	
.260	5	6	4.6	70	13	21	0.15	1.5°	3	●	
.300	6	6	5.5	70	13	33	0.15	0.0°	3	●	
.391	8	8	7.4	90	19	53	0.15	0.0°	3	●	
.450	10	10	9.2	100	22	59	0.20	0.0°	3	●	
.501	12	12	11.0	110	26	64	0.20	0.0°	3	●	
.610	16	16	15.0	123	32	74	0.20	0.0°	3	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Materiale

Ghisa
(grigia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	30	0.010	18	0.1	1590	65
8	4	30	0.015	24	0.2	1195	70
10	4	30	0.020	30	0.2	955	75
12	4	30	0.025	36	0.2	795	80
16	4	30	0.030	48	0.3	595	70
20	4	30	0.040	60	0.4	475	75

6	4	25	0.010	18	0.1	1325	55
8	4	25	0.015	24	0.2	995	60
10	4	25	0.020	30	0.2	795	65
12	4	25	0.025	36	0.2	665	65
16	4	25	0.030	48	0.3	495	60
20	4	25	0.040	60	0.4	400	65

6	4	20	0.010	18	0.1	1060	40
8	4	20	0.015	24	0.2	795	50
10	4	20	0.020	30	0.2	635	50
12	4	20	0.025	36	0.2	530	55
16	4	20	0.030	48	0.3	400	50
20	4	20	0.040	60	0.4	320	50

6	4	25	0.010	18	0.1	1325	55
8	4	25	0.015	24	0.2	995	60
10	4	25	0.020	30	0.2	795	65
12	4	25	0.025	36	0.2	665	65
16	4	25	0.030	48	0.3	495	60
20	4	25	0.040	60	0.4	400	65

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	30	0.010	18	0.1	1590	65
8	4	30	0.015	24	0.2	1195	70
10	4	30	0.020	30	0.2	955	75
12	4	30	0.025	36	0.2	795	80
16	4	30	0.030	48	0.3	595	70
20	4	30	0.040	60	0.4	475	75

6	4	30	0.010	18	0.1	1590	65
8	4	30	0.015	24	0.2	1195	70
10	4	30	0.020	30	0.2	955	75
12	4	30	0.025	36	0.2	795	80
16	4	30	0.030	48	0.3	595	70
20	4	30	0.040	60	0.4	475	75

6	4	25	0.010	18	0.1	1325	55
8	4	25	0.015	24	0.2	995	60
10	4	25	0.020	30	0.2	795	65
12	4	25	0.025	36	0.2	665	65
16	4	25	0.030	48	0.3	495	60
20	4	25	0.040	60	0.4	400	65

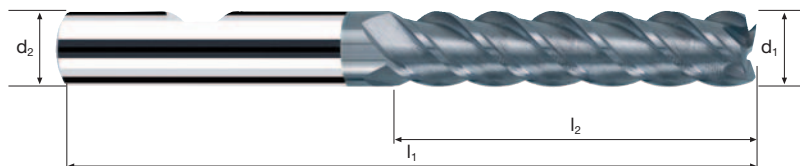
6	4	20	0.010	18	0.1	1060	40
8	4	20	0.015	24	0.2	795	50
10	4	20	0.020	30	0.2	635	50
12	4	20	0.025	36	0.2	530	55
16	4	20	0.030	48	0.3	400	50
20	4	20	0.040	60	0.4	320	50

Frese cilindriche

A taglienti lisci, esecuzione extralunga



HM λ 45°
MG10 γ 15°



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Copper
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Esempio: N° Ordine	Rivestimento		Articolo	Codice-ø		45°	z	POLYCHROM
	P	15347	.300					
ø Code	d1 e8	d2 h6	l1	l2				
.300	6	6	75	31		0.15	4	●
.391	8	8	90	45		0.15	4	●
.450	10	10	100	52		0.20	4	●
.501	12	12	120	69		0.20	4	●
.610	16	16	135	75		0.20	4	●
.682	20	20	166	100		0.20	4	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	2	3	90	0.020	2	1.2	14325	860	2.0
		3	4	90	0.030	3	1.8	9550	1145	6.0
		4	4	90	0.035	4	2.4	7160	1000	9.5
		5	4	90	0.045	5	3.0	5730	1030	15.5
		6	4	90	0.055	6	1.5	4775	1050	9.5
		8	4	90	0.075	8	4.8	3580	1075	41.5
		10	4	90	0.090	10	6.0	2865	1030	62.0
		12	4	90	0.110	12	7.2	2385	1050	90.5
		16	4	90	0.145	16	4.0	1790	1040	66.5
		2	3	70	0.010	2	1.2	11140	335	1.0
		3	4	70	0.020	3	1.8	7425	595	3.0
		4	4	70	0.025	4	2.4	5570	555	5.5
		5	4	70	0.030	5	3.0	4455	535	8.0
		6	4	70	0.035	6	1.5	3715	520	4.5
		8	4	70	0.050	8	4.8	2785	555	21.5
		10	4	70	0.060	10	6.0	2230	535	32.0
12	4	70	0.075	12	7.2	1855	555	48.0		
16	4	70	0.100	16	4.0	1395	560	36.0		
2	3	50	0.010	2	1.2	7960	240	.5		
3	4	50	0.015	3	1.8	5305	320	1.5		
4	4	50	0.020	4	2.4	3980	320	3.0		
5	4	50	0.025	5	3.0	3185	320	5.0		
6	4	50	0.030	6	1.5	2655	320	3.0		
8	4	50	0.040	8	4.8	1990	320	12.5		
10	4	50	0.050	10	6.0	1590	320	19.0		
12	4	50	0.060	12	7.2	1325	320	27.5		
16	4	50	0.080	16	4.0	995	320	20.5		
2	3	25	0.005	2	1.2	3980	60	0.1		
3	4	25	0.010	3	1.8	2655	105	0.5		
4	4	25	0.015	4	2.4	1990	120	1.0		
5	4	25	0.020	5	3.0	1590	125	2.0		
6	4	25	0.020	6	1.5	1325	105	1.0		
8	4	25	0.030	8	4.8	995	120	4.5		
10	4	25	0.035	10	6.0	795	110	6.5		
12	4	25	0.045	12	7.2	665	120	10.5		
16	4	25	0.060	16	4.0	495	120	7.5		

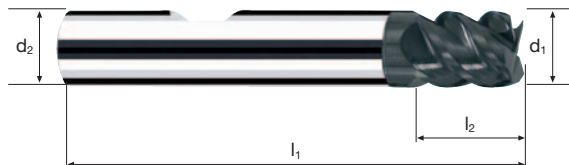
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	2	3	75	0.015	1.0	2	11935	535	1.0
		3	4	75	0.020	1.5	3	7960	635	3.0
		4	4	75	0.030	2.0	4	5970	715	5.5
		5	4	75	0.035	2.5	5	4775	670	8.5
		6	4	75	0.045	3.0	6	3980	715	13.0
		8	4	75	0.060	4.0	8	2985	715	23.0
		10	4	75	0.075	5.0	10	2385	715	36.0
		12	4	75	0.090	6.0	12	1990	715	51.5
		16	4	75	0.115	4.0	16	1490	685	44.0
		2	3	60	0.010	1.0	2	9550	285	.5
		3	4	60	0.015	1.5	3	6365	380	1.5
		4	4	60	0.020	2.0	4	4775	380	3.0
		5	4	60	0.030	2.5	5	3820	460	6.0
		6	4	60	0.035	3.0	6	3185	445	8.0
		8	4	60	0.045	4.0	8	2385	430	14.0
		10	4	60	0.055	5.0	10	1910	420	21.0
12	4	60	0.065	6.0	12	1590	415	30.0		
16	4	60	0.090	4.0	16	1195	430	27.5		
2	3	40	0.010	1.0	2	6365	190	0.5		
3	4	40	0.015	1.5	3	4245	255	1.0		
4	4	40	0.020	2.0	4	3185	255	2.0		
5	4	40	0.020	2.5	5	2545	205	2.5		
6	4	40	0.025	3.0	6	2120	210	4.0		
8	4	40	0.035	4.0	8	1590	225	7.0		
10	4	40	0.045	5.0	10	1275	230	11.5		
12	4	40	0.055	6.0	12	1060	235	17.0		
16	4	40	0.070	4.0	16	795	225	14.5		
2	3	20	0.006	1.0	2	3185	55	0.1		
3	4	20	0.009	1.5	3	2120	75	0.5		
4	4	20	0.013	2.0	4	1590	85	0.5		
5	4	20	0.016	2.5	5	1275	80	1.0		
6	4	20	0.019	3.0	6	1060	80	1.5		
8	4	20	0.025	4.0	8	795	80	2.5		
10	4	20	0.031	5.0	10	635	80	4.0		
12	4	20	0.038	6.0	12	530	80	6.0		
16	4	20	0.050	4.0	16	400	80	5.0		

Frese cilindriche HX

A taglienti lisci, esecuzione corta



HM
MG10 λ **55°**
 γ **-10°**



Sgrossatura



Finitura



Rm
1100-1300

Rm
1300-1500

HRC
48-56

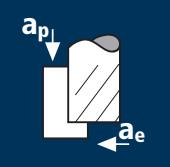






HRC
56-60








HRC
> 60

Ti
Titanium

GG(G)

		Rivestimento		Articolo		Codice-ø					POLYCHROM	DURO-S		
Esempio: N° Ordine		P		5349		.100					P5349	D5349		
											P5249	D5249		
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z							
.100	1.0	6	50	1.0	0.07	13.0°	3						●	●
.108	1.2	6	50	1.2	0.07	12.5°	3						●	●
.120	1.5	6	50	1.5	0.07	12.0°	3						●	●
.140	2.0	6	50	2.0	0.10	11.0°	3						●	●
.148	2.2	6	50	2.2	0.10	10.0°	3						●	●
.160	2.5	6	50	2.5	0.10	9.5°	3						●	●
.180	3.0	6	50	3.0	0.10	8.5°	4						●	●
.220	4.0	6	54	4.0	0.10	6.5°	4						●	●
.260	5.0	6	54	5.0	0.15	3.5°	4						●	●
.300	6.0	6	54	7.0	0.15	0.0°	4						●	●
.391	8.0	8	58	9.0	0.15	0.0°	4						●	●
.450	10.0	10	66	11.0	0.20	0.0°	4						●	●
.501	12.0	12	73	13.0	0.20	0.0°	4						●	●
.610	16.0	16	82	17.0	0.20	0.0°	4						●	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio inossidabile [Cr-Ni/1.4301]  	3	4	80	0.015	3	1.8	8490	510	3.0
		4	4	80	0.020	4	2.4	6365	510	5.0
		5	4	80	0.025	5	3.0	5095	510	7.5
		6	4	80	0.030	6	3.6	4245	510	11.0
		8	4	80	0.040	8	4.8	3185	510	19.5
		10	4	80	0.050	10	6.0	2545	510	30.5
		12	4	80	0.060	12	7.2	2120	510	44.0
		16	4	80	0.075	16	6.4	1590	475	48.5
		3	4	70	0.015	3	1.8	7425	445	2.5
		4	4	70	0.020	4	2.4	5570	445	4.5
		5	4	70	0.025	5	3.0	4455	445	6.5
		6	4	70	0.030	6	3.6	3715	445	9.5
		8	4	70	0.040	8	4.8	2785	445	17.0
		10	4	70	0.050	10	6.0	2230	445	26.5
		12	4	70	0.060	12	7.2	1855	445	38.5
		16	4	70	0.075	16	6.4	1395	420	43.0
 	Acciaio resistente al calore Acciaio duplex [1.4462] [17-4 PH]	3	4	25	0.015	3	1.8	2655	160	1.0
		4	4	25	0.020	4	2.4	1990	160	1.5
		5	4	25	0.025	5	3.0	1590	160	2.5
		6	4	25	0.030	6	3.6	1325	160	3.5
		8	4	25	0.035	8	4.8	995	140	5.5
		10	4	25	0.045	10	6.0	795	145	8.5
		12	4	25	0.050	12	7.2	665	135	11.5
		16	4	25	0.060	16	6.4	495	120	12.5
		3	4	15	0.015	3	1.8	1590	95	0.5
		4	4	15	0.020	4	2.4	1195	95	1.0
		5	4	15	0.025	5	3.0	955	95	1.5
		6	4	15	0.030	6	3.6	795	95	2.0
		8	4	15	0.035	8	4.8	595	85	3.5
		10	4	15	0.045	10	6.0	475	85	5.0
		12	4	15	0.050	12	7.2	400	80	7.0
		16	4	15	0.060	16	6.4	300	70	7.0
 	Leghe a base di nichel indurite R _m > 1000 N/mm ² [Inconel 718]	3	4	15	0.015	3	1.8	1590	95	0.5
		4	4	15	0.020	4	2.4	1195	95	1.0
		5	4	15	0.025	5	3.0	955	95	1.5
		6	4	15	0.030	6	3.6	795	95	2.0
		8	4	15	0.035	8	4.8	595	85	3.5
		10	4	15	0.045	10	6.0	475	85	5.0
		12	4	15	0.050	12	7.2	400	80	7.0
		16	4	15	0.060	16	6.4	300	70	7.0

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio inossidabile [Cr-Ni/1.4301]  	3	4	60	0.015	2.1	3	6365	380	2.5
		4	4	60	0.020	2.8	4	4775	380	4.5
		5	4	60	0.025	3.5	5	3820	380	6.5
		6	4	60	0.030	4.2	6	3185	380	9.5
		8	4	60	0.040	5.6	8	2385	380	17.0
		10	4	60	0.045	7.0	10	1910	345	24.0
		12	4	60	0.045	8.4	12	1590	285	28.5
		16	4	60	0.065	6.4	16	1195	310	31.5
		3	4	55	0.015	2.1	3	5835	350	2.0
		4	4	55	0.020	2.8	4	4375	350	4.0
		5	4	55	0.025	3.5	5	3500	350	6.0
		6	4	55	0.030	4.2	6	2920	350	9.0
		8	4	55	0.040	5.6	8	2190	350	15.5
		10	4	55	0.045	7.0	10	1750	315	22.0
		12	4	55	0.045	8.4	12	1460	265	26.5
		16	4	55	0.065	6.4	16	1095	285	29.0
 	Acciaio resistente al calore Acciaio duplex [1.4462] [17-4 PH]	3	4	20	0.015	2.1	3	2120	125	1.0
		4	4	20	0.020	2.8	4	1590	125	1.5
		5	4	20	0.025	3.5	5	1275	130	2.5
		6	4	20	0.030	4.2	6	1060	125	3.0
		8	4	20	0.035	5.6	8	795	110	5.0
		10	4	20	0.045	7.0	10	635	115	8.0
		12	4	20	0.045	8.4	12	530	95	9.5
		16	4	20	0.060	6.4	16	400	95	9.5
		3	4	10	0.015	2.1	3	1060	65	0.5
		4	4	10	0.020	2.8	4	795	65	0.5
		5	4	10	0.025	3.5	5	635	65	1.0
		6	4	10	0.030	4.2	6	530	65	1.5
		8	4	10	0.035	5.6	8	400	55	2.5
		10	4	10	0.045	7.0	10	320	60	4.0
		12	4	10	0.045	8.4	12	265	50	5.0
		16	4	10	0.060	6.4	16	200	50	5.0
 	Leghe a base di nichel indurite R _m > 1000 N/mm ² [Inconel 718]	3	4	10	0.015	2.1	3	1060	65	0.5
		4	4	10	0.020	2.8	4	795	65	0.5
		5	4	10	0.025	3.5	5	635	65	1.0
		6	4	10	0.030	4.2	6	530	65	1.5
		8	4	10	0.035	5.6	8	400	55	2.5
		10	4	10	0.045	7.0	10	320	60	4.0
		12	4	10	0.045	8.4	12	265	50	5.0
		16	4	10	0.060	6.4	16	200	50	5.0

Frese cilindriche SX

A taglienti lisci, esecuzione corta



HM λ 55°
MG10 γ 15°



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

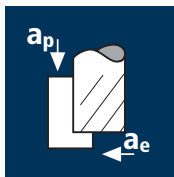
Inox
Stainless

Ti
Titanium

Nickel-Alloys
Tool Steel

Esempio: N° Ordine		Rivestimento P	Articolo 5313	Codice-ø .180				POLYCHROM	
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.180	3	6	50	3	0.10	8.5°	4	●	
.220	4	6	54	4	0.10	6.5°	4	●	
.260	5	6	54	5	0.15	3.5°	4	●	
.300	6	6	54	7	0.15	0.0°	4	●	
.391	8	8	58	9	0.15	0.0°	4	●	
.450	10	10	66	11	0.20	0.0°	4	●	
.501	12	12	73	13	0.20	0.0°	4	●	
.610	16	16	82	17	0.20	0.0°	4	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	190	0.020	3	1.4	20160	1615	6.5
4	4	190	0.025	4	1.8	15120	1510	11.0
5	4	190	0.035	5	2.3	12095	1695	19.0
6	4	190	0.040	6	2.7	10080	1615	26.0
8	4	190	0.055	8	3.6	7560	1665	48.0
10	4	190	0.070	10	4.5	6050	1695	76.5
12	4	190	0.075	12	5.4	5040	1510	98.0
16	4	190	0.100	16	4.0	3780	1510	96.5

3	4	140	0.020	3	1.4	14855	1190	5.0
4	4	140	0.025	4	1.8	11140	1115	8.0
5	4	140	0.035	5	2.3	8915	1250	14.0
6	4	140	0.040	6	2.7	7425	1190	19.5
8	4	140	0.055	8	3.6	5570	1225	35.5
10	4	140	0.070	10	4.5	4455	1245	56.0
12	4	140	0.075	12	5.4	3715	1115	72.5
16	4	140	0.100	16	4.0	2785	1115	71.5

3	4	70	0.020	3	1.4	7425	595	2.5
4	4	70	0.025	4	1.8	5570	555	4.0
5	4	70	0.030	5	2.3	4455	535	6.0
6	4	70	0.040	6	2.7	3715	595	9.5
8	4	70	0.050	8	3.6	2785	555	16.0
10	4	70	0.065	10	4.5	2230	580	26.0
12	4	70	0.075	12	5.4	1855	555	36.0
16	4	70	0.095	16	4.0	1395	530	34.0

3	4	90	0.015	3	1.4	9550	575	2.5
4	4	90	0.020	4	1.8	7160	575	4.0
5	4	90	0.020	5	2.3	5730	460	5.0
6	4	90	0.030	6	2.7	4775	575	9.5
8	4	90	0.035	8	3.6	3580	500	14.5
10	4	90	0.045	10	4.5	2865	515	23.0
12	4	90	0.055	12	5.4	2385	525	34.0
16	4	90	0.065	16	4.0	1790	465	30.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	155	0.015	2.4	3	16445	985	7.0
4	4	155	0.020	3.2	4	12335	985	12.5
5	4	155	0.030	4.0	5	9870	1185	23.5
6	4	155	0.035	4.8	6	8225	1150	33.0
8	4	155	0.045	6.4	8	6165	1110	57.0
10	4	155	0.055	8.0	10	4935	1085	87.0
12	4	155	0.060	9.6	12	4110	985	113.5
16	4	155	0.075	6.4	16	3085	925	94.5

3	4	105	0.015	2.4	3	11140	670	5.0
4	4	105	0.020	3.2	4	8355	670	8.5
5	4	105	0.030	4.0	5	6685	800	16.0
6	4	105	0.035	4.8	6	5570	780	22.5
8	4	105	0.045	6.4	8	4180	750	38.5
10	4	105	0.055	8.0	10	3340	735	59.0
12	4	105	0.060	9.6	12	2785	670	77.0
16	4	105	0.075	6.4	16	2090	625	64.0

3	4	55	0.015	2.4	3	5835	350	2.5
4	4	55	0.020	3.2	4	4375	350	4.5
5	4	55	0.030	4.0	5	3500	420	8.5
6	4	55	0.035	4.8	6	2920	410	12.0
8	4	55	0.045	6.4	8	2190	395	20.0
10	4	55	0.055	8.0	10	1750	385	31.0
12	4	55	0.060	9.6	12	1460	350	40.5
16	4	55	0.075	6.4	16	1095	330	34.0

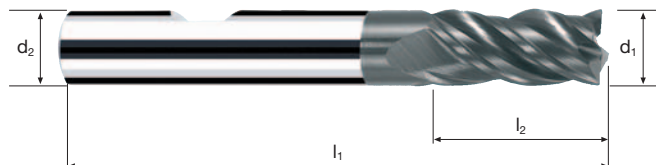
3	4	70	0.010	2.4	3	7425	295	2.0
4	4	70	0.015	3.2	4	5570	335	4.5
5	4	70	0.025	4.0	5	4455	445	9.0
6	4	70	0.030	4.8	6	3715	445	13.0
8	4	70	0.035	6.4	8	2785	390	20.0
10	4	70	0.045	8.0	10	2230	400	32.0
12	4	70	0.050	9.6	12	1855	370	42.5
16	4	70	0.060	6.4	16	1395	335	34.5

Frese cilindriche Cut-V

A taglienti lisci, esecuzione corta



**HM
MG10** λ **40°**
 γ **0°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500			Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys
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Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z	POLYCHROM
								P5329
								P5229
.180	3	6	50	6	0.10	7.0°	4	●
.220	4	6	50	8	0.10	4.5°	4	●
.260	5	6	50	9	0.15	2.5°	4	●
.300	6	6	50	10	0.15	0.0°	4	●
.391	8	8	54	13	0.15	0.0°	4	●
.450	10	10	63	16	0.20	0.0°	4	●
.501	12	12	73	19	0.20	0.0°	4	●
.610	16	16	82	25	0.20	0.0°	4	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ² 	1.5	3	190	0.010	1.8	0.2	40320	1210
		2.0	3	190	0.015	2.4	0.2	30240	1360
		2.5	3	190	0.015	3.0	0.3	24190	1090
		3.0	3	190	0.020	3.6	0.3	20160	1210
		4.0	3	190	0.025	4.8	0.4	15120	1135
		5.0	3	190	0.035	6.0	0.5	12095	1270
		6.0	3	190	0.040	7.2	0.6	10080	1210
		8.0	3	190	0.055	9.6	0.8	7560	1245
		10.0	3	190	0.065	12.0	1.0	6050	1180
			Acciaio 850 - 1100 N/mm ² 	1.5	3	130	0.010	1.8	0.2
2.0	3			130	0.015	2.4	0.2	20690	930
2.5	3			130	0.015	3.0	0.3	16555	745
3.0	3			130	0.020	3.6	0.3	13795	830
4.0	3			130	0.025	4.8	0.4	10345	775
5.0	3			130	0.035	6.0	0.5	8275	870
6.0	3			130	0.040	7.2	0.6	6895	825
8.0	3			130	0.050	9.6	0.8	5175	775
10.0	3			130	0.060	12.0	1.0	4140	745
	Leghe di titanio indurite >300 HB [Ti6Al4V] 			1.5	3	50	0.005	1.8	0.2
		2.0	3	50	0.010	2.4	0.2	7960	240
		2.5	3	50	0.010	3.0	0.3	6365	190
		3.0	3	50	0.010	3.6	0.3	5305	160
		4.0	3	50	0.015	4.8	0.4	3980	180
		5.0	3	50	0.020	6.0	0.5	3185	190
		6.0	3	50	0.020	7.2	0.6	2655	160
		8.0	3	50	0.030	9.6	0.8	1990	180
		10.0	3	50	0.035	12.0	1.0	1590	165
			Acciaio inossidabile [Cr-Ni/1.4301] 	1.5	3	80	0.005	1.8	0.2
2.0	3			80	0.010	2.4	0.2	12735	380
2.5	3			80	0.010	3.0	0.3	10185	305
3.0	3			80	0.015	3.6	0.3	8490	380
4.0	3			80	0.020	4.8	0.4	6365	380
5.0	3			80	0.025	6.0	0.5	5095	380
6.0	3			80	0.030	7.2	0.6	4245	380
8.0	3			80	0.040	9.6	0.8	3185	380
10.0	3			80	0.045	12.0	1.0	2545	345

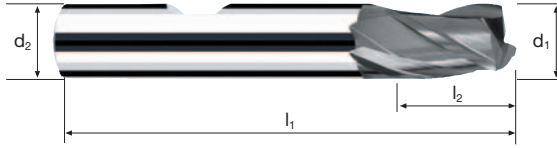
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	1.5	3	140	0.010	0.6	1.5	29710	890	1.0
		2.0	3	140	0.010	0.8	2.0	22280	670	1.0
		2.5	3	140	0.015	1.0	2.5	17825	800	2.0
		3.0	3	140	0.015	1.2	3.0	14855	670	2.5
		4.0	3	140	0.020	1.6	4.0	11140	670	4.5
		5.0	3	140	0.030	2.0	5.0	8915	800	8.0
		6.0	3	140	0.035	2.4	6.0	7425	780	11.0
		8.0	3	140	0.045	3.2	8.0	5570	750	19.0
		10.0	3	140	0.055	4.0	10.0	4455	735	29.5
			Acciaio 850 - 1100 N/mm ² 	1.5	3	85	0.010	0.6	1.5	18040
2.0	3			85	0.010	0.8	2.0	13530	405	0.5
2.5	3			85	0.015	1.0	2.5	10825	485	1.0
3.0	3			85	0.015	1.2	3.0	9020	405	1.5
4.0	3			85	0.020	1.6	4.0	6765	405	2.5
5.0	3			85	0.030	2.0	5.0	5410	485	5.0
6.0	3			85	0.035	2.4	6.0	4510	475	7.0
8.0	3			85	0.045	3.2	8.0	3380	455	11.5
10.0	3			85	0.050	4.0	10.0	2705	405	16.0
	Leghe di titanio indurite >300 HB [Ti6Al4V] 			1.5	3	40	0.005	0.6	1.5	8490
		2.0	3	40	0.005	0.8	2.0	6365	95	0.0
		2.5	3	40	0.010	1.0	2.5	5095	155	0.5
		3.0	3	40	0.010	1.2	3.0	4245	125	0.5
		4.0	3	40	0.010	1.6	4.0	3185	95	0.5
		5.0	3	40	0.015	2.0	5.0	2545	115	1.0
		6.0	3	40	0.020	2.4	6.0	2120	125	2.0
		8.0	3	40	0.025	3.2	8.0	1590	120	3.0
		10.0	3	40	0.030	4.0	10.0	1275	115	4.5
			Acciaio inossidabile [Cr-Ni/1.4301] 	1.5	3	55	0.005	0.6	1.5	11670
2.0	3			55	0.005	0.8	2.0	8755	130	0.0
2.5	3			55	0.010	1.0	2.5	7005	210	0.5
3.0	3			55	0.010	1.2	3.0	5835	175	0.5
4.0	3			55	0.015	1.6	4.0	4375	195	1.0
5.0	3			55	0.020	2.0	5.0	3500	210	2.0
6.0	3			55	0.025	2.4	6.0	2920	220	3.0
8.0	3			55	0.030	3.2	8.0	2190	195	5.0
10.0	3			55	0.040	4.0	10.0	1750	210	8.5

Frese cilindriche

A taglienti lisci, esecuzione corta

HM
MG10 λ 30°
 γ 12°

90°



Sgrossatura



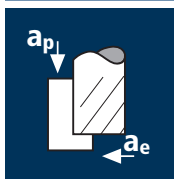
Finitura



Rm < 850 Rm 850-1100 Rm 1100-1300 Inox Stainless Ti Titanium GG(G) Nickel-Alloys

Esempio: N° Ordine	Rivestimento			Articolo		Codice-ø			POLYCHROM	TRIBO
	P	5036	.120					P5036	T5036	
Ø Code	d1 e8	d2 h6	l1	l2		α	Z		T5026	
.120	1.5	6	50	5		9.0°	3	●	●	
.140	2.0	6	50	5		8.5°	3	●	●	
.160	2.5	6	50	5		8.0°	3	●	●	
.180	3.0	6	50	6		6.5°	3	●	●	
.200	3.5	6	50	8		5.0°	3	●	●	
.220	4.0	6	50	8		4.5°	3	●	●	
.240	4.5	6	50	8		3.5°	3	●	●	
.260	5.0	6	50	9		2.5°	3	●	●	
.300	6.0	6	50	10		0.0°	3	●	●	
.331	7.0	8	54	10		2.5°	3	●	●	
.391	8.0	8	54	12		0.0°	3	●	●	
.420	9.0	10	63	12		2.0°	3	●	●	
.450	10.0	10	63	13		0.0°	3	●	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Ghisa
(grigia / sferoidale)

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1	2	115	0.005	1	0.45	36605	365
2	2	115	0.010	2	0.90	18305	365
3	2	115	0.010	3	1.35	12200	245
4	2	115	0.015	4	1.80	9150	275
5	2	115	0.020	5	2.25	7320	295
6	2	115	0.025	6	2.70	6100	305

1	2	75	0.005	1	0.45	23875	240
2	2	75	0.005	2	0.90	11935	120
3	2	75	0.010	3	1.35	7960	160
4	2	75	0.015	4	1.80	5970	180
5	2	75	0.020	5	2.25	4775	190
6	2	75	0.020	6	2.70	3980	160

1	2	150	0.005	1	0.45	47750	480
2	2	150	0.010	2	0.90	23875	480
3	2	150	0.015	3	1.35	15915	475
4	2	150	0.020	4	1.80	11935	475
5	2	150	0.020	5	2.25	9550	380
6	2	150	0.025	6	2.70	7960	400

1	2	40	0.005	1	0.45	12735	125
2	2	40	0.005	2	0.90	6365	65
3	2	40	0.010	3	1.35	4245	85
4	2	40	0.015	4	1.80	3185	95
5	2	40	0.020	5	2.25	2545	100
6	2	40	0.020	6	2.70	2120	85

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Ghisa
(grigia / sferoidale)

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1	2	85	0.005	0.5	1	27055	270
2	2	85	0.005	1.0	2	13530	135
3	2	85	0.010	1.5	3	9020	180
4	2	85	0.010	2.0	4	6765	135
5	2	85	0.015	2.5	5	5410	160
6	2	85	0.015	3.0	6	4510	135

1	2	60	0.005	0.5	1	19100	190
2	2	60	0.005	1.0	2	9550	95
3	2	60	0.010	1.5	3	6365	125
4	2	60	0.010	2.0	4	4775	95
5	2	60	0.015	2.5	5	3820	115
6	2	60	0.015	3.0	6	3185	95

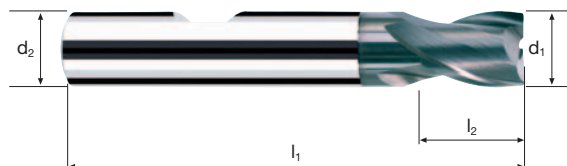
1	2	105	0.005	0.5	1	33425	335
2	2	105	0.005	1.0	2	16710	165
3	2	105	0.010	1.5	3	11140	225
4	2	105	0.010	2.0	4	8355	165
5	2	105	0.015	2.5	5	6685	200
6	2	105	0.020	3.0	6	5570	225

1	2	30	0.005	0.5	1	9550	95
2	2	30	0.005	1.0	2	4775	50
3	2	30	0.010	1.5	3	3185	65
4	2	30	0.010	2.0	4	2385	50
5	2	30	0.015	2.5	5	1910	55
6	2	30	0.015	3.0	6	1590	50

Frese cilindriche

A taglienti lisci, esecuzione corta

HM
MG10 λ 30°
 γ 12°



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300



Inox
Stainless

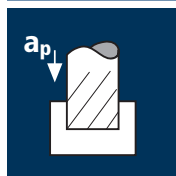


GG(G)
Copper



										POLYCHROM
										P5400
										P5299
Esempio: N° Ordine										
										new!
Ø	d1	d2	l1	l2	45°	α	z			
Code	e8	h6								
.100	1.0	6	50	3	0.07	11.0°	2			●
.120	1.5	6	50	3	0.07	10.5°	2			●
.140	2.0	6	50	3	0.10	10.0°	2			●
.160	2.5	6	50	3	0.10	9.5°	2			●
.180	3.0	6	50	4	0.10	8.0°	2			●
.220	4.0	6	54	5	0.10	5.5°	2			●
.260	5.0	6	54	6	0.15	3.0°	2			●
.300	6.0	6	54	7	0.15	0.0°	2			●

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1.0	2	44	0.002	0.5	1.0	14005	55
2.0	2	44	0.004	1.0	2.0	7005	55
3.0	2	44	0.006	1.5	3.0	4670	55
4.0	2	44	0.008	2.0	4.0	3500	55
5.0	2	44	0.012	2.5	5.0	2800	65
6.0	2	44	0.014	3.0	6.0	2335	65
8.0	2	44	0.018	4.0	8.0	1750	65
9.0	2	44	0.020	4.5	9.0	1555	60
10.0	2	44	0.022	5.0	10.0	1400	60

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1.0	2	36	0.002	0.5	1.0	11460	45
2.0	2	36	0.004	1.0	2.0	5730	45
3.0	2	36	0.006	1.5	3.0	3820	45
4.0	2	36	0.008	2.0	4.0	2865	45
5.0	2	36	0.012	2.5	5.0	2290	55
6.0	2	36	0.014	3.0	6.0	1910	55
8.0	2	36	0.018	4.0	8.0	1430	50
9.0	2	36	0.020	4.5	9.0	1275	50
10.0	2	36	0.022	5.0	10.0	1145	50

Acciaio
1100 - 1300 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1.0	2	28	0.002	0.5	1.0	8915	35
2.0	2	28	0.004	1.0	2.0	4455	35
3.0	2	28	0.006	1.5	3.0	2970	35
4.0	2	28	0.008	2.0	4.0	2230	35
5.0	2	28	0.012	2.5	5.0	1785	45
6.0	2	28	0.014	3.0	6.0	1485	40
8.0	2	28	0.018	4.0	8.0	1115	40
9.0	2	28	0.020	4.5	9.0	990	40
10.0	2	28	0.022	5.0	10.0	890	40

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1.0	2	25	0.002	0.5	1.0	7960	30
2.0	2	25	0.004	1.0	2.0	3980	30
3.0	2	25	0.006	1.5	3.0	2655	30
4.0	2	25	0.008	2.0	4.0	1990	30
5.0	2	25	0.012	2.5	5.0	1590	40
6.0	2	25	0.014	3.0	6.0	1325	35
8.0	2	25	0.018	4.0	8.0	995	35
9.0	2	25	0.020	4.5	9.0	885	35
10.0	2	25	0.022	5.0	10.0	795	35

Materiale

Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1.0	2	34	0.002	0.5	1.0	10825	45
2.0	2	34	0.004	1.0	2.0	5410	45
3.0	2	34	0.006	1.5	3.0	3610	45
4.0	2	34	0.008	2.0	4.0	2705	45
5.0	2	34	0.012	2.5	5.0	2165	50
6.0	2	34	0.014	3.0	6.0	1805	50
8.0	2	34	0.018	4.0	8.0	1355	50
9.0	2	34	0.020	4.5	9.0	1205	50
10.0	2	34	0.022	5.0	10.0	1080	50

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1.0	2	18	0.002	0.5	1.0	5730	25
2.0	2	18	0.004	1.0	2.0	2865	25
3.0	2	18	0.006	1.5	3.0	1910	25
4.0	2	18	0.008	2.0	4.0	1430	25
5.0	2	18	0.012	2.5	5.0	1145	25
6.0	2	18	0.014	3.0	6.0	955	25
8.0	2	18	0.018	4.0	8.0	715	25
9.0	2	18	0.020	4.5	9.0	635	25
10.0	2	18	0.022	5.0	10.0	575	25

Rame non legato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1.0	2	80	0.002	0.5	1.0	25465	100
2.0	2	80	0.004	1.0	2.0	12735	100
3.0	2	80	0.006	1.5	3.0	8490	100
4.0	2	80	0.008	2.0	4.0	6365	100
5.0	2	80	0.012	2.5	5.0	5095	120
6.0	2	80	0.014	3.0	6.0	4245	120
8.0	2	80	0.018	4.0	8.0	3185	115
9.0	2	80	0.020	4.5	9.0	2830	115
10.0	2	80	0.022	5.0	10.0	2545	110

Alluminio malleabile
Si < 6%



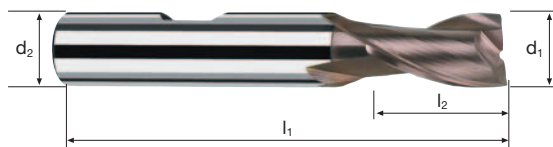
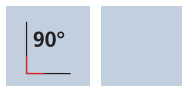
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
1.0	2	100	0.002	0.5	1.0	31830	125
2.0	2	100	0.004	1.0	2.0	15915	125
3.0	2	100	0.006	1.5	3.0	10610	125
4.0	2	100	0.008	2.0	4.0	7960	125
5.0	2	100	0.012	2.5	5.0	6365	155
6.0	2	100	0.014	3.0	6.0	5305	150
8.0	2	100	0.018	4.0	8.0	3980	145
9.0	2	100	0.020	4.5	9.0	3535	140
10.0	2	100	0.022	5.0	10.0	3185	140

Frese cilindriche

A taglienti lisci, esecuzione corta



HSS-E λ 30°
Co8 γ 15°



Sgrossatura



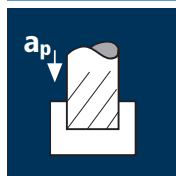
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine		Rivestimento U	Articolo 0700	Codice- ϕ .100					UNICUT-4X
ϕ Code	d1 h8	d2 h6	l1	l2	α	z			U0700
.100	1.0	6	47	3	14.0°	2			●
.120	1.5	6	47	3	13.0°	2			●
.140*	2.0	6	48	4	11.0°	2			●
.160	2.5	6	49	5	8.0°	2			●
.180*	3.0	6	49	5	7.0°	2			●
.200	3.5	6	50	6	5.5°	2			●
.220*	4.0	6	51	7	4.0°	2			●
.240	4.5	6	51	7	3.0°	2			●
.260*	5.0	6	52	8	2.0°	2			●
.280	5.5	6	52	8	1.0°	2			●
.300*	6.0	6	52	8	0.0°	2			●
.322	6.5	10	60	10	5.5°	2			●
.331	7.0	8	54	10	2.0°	2			●
.362	7.5	10	60	10	4.0°	2			●
.391*	8.0	8	55	11	0.0°	2			●
.410	8.5	10	61	11	2.5°	2			●
.420	9.0	10	61	11	1.5°	2			●
.440	9.7	10	63	13	0.0°	2			●
.450*	10.0	10	63	13	0.0°	2			●
* Tolleranza d1 per la scanalatura della linguetta di aggiustamento P9									

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	2	44	0.024	5.5	11.0	1275	60
12.0	2	44	0.026	6.0	12.0	1165	60
13.0	2	44	0.028	6.5	13.0	1075	60
14.0	2	44	0.032	7.0	14.0	1000	65
16.0	2	44	0.036	8.0	16.0	875	65
18.0	2	44	0.040	9.0	18.0	780	60
20.0	2	44	0.044	10.0	20.0	700	60
22.0	2	44	0.048	11.0	22.0	635	60
25.0	2	44	0.056	12.5	25.0	560	65

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	2	36	0.024	5.5	11.0	1040	50
12.0	2	36	0.026	6.0	12.0	955	50
13.0	2	36	0.028	6.5	13.0	880	50
14.0	2	36	0.032	7.0	14.0	820	50
16.0	2	36	0.036	8.0	16.0	715	50
18.0	2	36	0.040	9.0	18.0	635	50
20.0	2	36	0.044	10.0	20.0	575	50
22.0	2	36	0.048	11.0	22.0	520	50
25.0	2	36	0.056	12.5	25.0	460	50

Acciaio
1100 - 1300 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	2	28	0.024	5.5	11.0	810	40
12.0	2	28	0.026	6.0	12.0	745	40
13.0	2	28	0.028	6.5	13.0	685	40
14.0	2	28	0.032	7.0	14.0	635	40
16.0	2	28	0.036	8.0	16.0	555	40
18.0	2	28	0.040	9.0	18.0	495	40
20.0	2	28	0.044	10.0	20.0	445	40
22.0	2	28	0.048	11.0	22.0	405	40
25.0	2	28	0.056	12.5	25.0	355	40

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	2	25	0.024	5.5	11.0	725	35
12.0	2	25	0.026	6.0	12.0	665	35
13.0	2	25	0.028	6.5	13.0	610	35
14.0	2	25	0.032	7.0	14.0	570	35
16.0	2	25	0.036	8.0	16.0	495	35
18.0	2	25	0.040	9.0	18.0	440	35
20.0	2	25	0.044	10.0	20.0	400	35
22.0	2	25	0.048	11.0	22.0	360	35
25.0	2	25	0.056	12.5	25.0	320	35

Materiale

Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	2	34	0.024	5.5	11.0	985	45
12.0	2	34	0.026	6.0	12.0	900	45
13.0	2	34	0.028	6.5	13.0	835	45
14.0	2	34	0.032	7.0	14.0	775	50
16.0	2	34	0.036	8.0	16.0	675	50
18.0	2	34	0.040	9.0	18.0	600	50
20.0	2	34	0.044	10.0	20.0	540	50
22.0	2	34	0.048	11.0	22.0	490	45
25.0	2	34	0.056	12.5	25.0	435	50

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	2	18	0.024	5.5	11.0	520	25
12.0	2	18	0.026	6.0	12.0	475	25
13.0	2	18	0.028	6.5	13.0	440	25
14.0	2	18	0.032	7.0	14.0	410	25
16.0	2	18	0.036	8.0	16.0	360	25
18.0	2	18	0.040	9.0	18.0	320	25
20.0	2	18	0.044	10.0	20.0	285	25
22.0	2	18	0.048	11.0	22.0	260	25
25.0	2	18	0.056	12.5	25.0	230	25

Rame non legato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	2	80	0.024	5.5	11.0	2315	110
12.0	2	80	0.026	6.0	12.0	2120	110
13.0	2	80	0.028	6.5	13.0	1960	110
14.0	2	80	0.032	7.0	14.0	1820	115
16.0	2	80	0.036	8.0	16.0	1590	115
18.0	2	80	0.040	9.0	18.0	1415	115
20.0	2	80	0.044	10.0	20.0	1275	110
22.0	2	80	0.048	11.0	22.0	1160	110
25.0	2	80	0.056	12.5	25.0	1020	115

Alluminio malleabile
Si < 6%

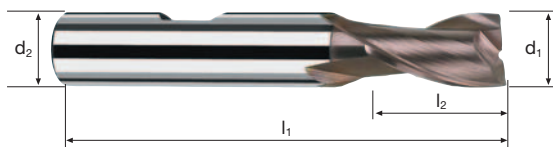


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	2	100	0.024	5.5	11.0	2895	140
12.0	2	100	0.026	6.0	12.0	2655	140
13.0	2	100	0.028	6.5	13.0	2450	135
14.0	2	100	0.032	7.0	14.0	2275	145
16.0	2	100	0.036	8.0	16.0	1990	145
18.0	2	100	0.040	9.0	18.0	1770	140
20.0	2	100	0.044	10.0	20.0	1590	140
22.0	2	100	0.048	11.0	22.0	1445	140
25.0	2	100	0.056	12.5	25.0	1275	145

Frese cilindriche

A taglienti lisci, esecuzione corta

HSS-E λ 30°
Co8 γ 15°



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300

Inox
Stainless

Ti
Titanium

GG(G)
Aluminium
Copper

Esempio: N° Ordine		Rivestimento U	Articolo 0700	Codice-ø .460				UNICUT-4X
Ø Code	d1 h8	d2 h6	l1	l2	α	Z		U0700
.460	10.5	12	70	13	2.0°	2		●
.470	11.0	12	70	13	1.5°	2		●
.501 *	12.0	12	73	16	0.0°	2		●
.540	13.0	12	73	16	0.0°	2		●
.570 *	14.0	12	73	16	0.0°	2		●
.581	15.0	12	73	16	0.0°	2		●
.610 *	16.0	16	79	19	0.0°	2		●
.620	17.0	16	79	19	0.0°	2		●
.640 *	18.0	16	79	19	0.0°	2		●
.650	19.0	16	79	19	0.0°	2		●
.682 *	20.0	20	88	22	0.0°	2		●
.710 *	22.0	20	88	22	0.0°	2		●
.772 *	25.0	25	102	26	0.0°	2		●
* Tolleranza d1 per la scanalatura della linguetta di aggiustamento P9								

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio 850 - 1100 N/mm ² 	4	4	150	0.025	6.0	1.6	11935	1195	11.5	
		5	4	150	0.035	7.5	2.0	9550	1335	20.0	
		6	4	150	0.040	9.0	2.4	7960	1275	27.5	
		8	4	150	0.055	12.0	3.2	5970	1315	50.5	
		10	4	150	0.065	15.0	4.0	4775	1240	74.5	
		12	4	150	0.080	18.0	4.8	3980	1275	110.0	
		16	4	150	0.090	24.0	6.4	2985	1075	165.0	
		20	4	150	0.110	30.0	8.0	2385	1050	252.0	
		Acciaio 1100 - 1300 N/mm ² 	4	4	115	0.025	6.0	1.6	9150	915	9.0
			5	4	115	0.035	7.5	2.0	7320	1025	15.5
6	4		115	0.040	9.0	2.4	6100	975	21.0		
8	4		115	0.055	12.0	3.2	4575	1005	38.5		
10	4		115	0.065	15.0	4.0	3660	950	57.0		
12	4		115	0.080	18.0	4.8	3050	975	84.0		
16	4		115	0.090	24.0	6.4	2290	825	126.5		
20	4		115	0.110	30.0	8.0	1830	805	193.0		
Acciaio da utensile temprato 52 - 56 HRC 	4		4	55	0.015	6.0	1.2	4375	265	2.0	
	5		4	55	0.020	7.5	1.5	3500	280	3.0	
	6	4	55	0.020	9.0	1.8	2920	235	4.0		
	8	4	55	0.025	12.0	2.4	2190	220	6.5		
	10	4	55	0.035	15.0	3.0	1750	245	11.0		
	12	4	55	0.040	18.0	3.6	1460	235	15.0		
	16	4	55	0.050	24.0	4.8	1095	220	25.5		
	20	4	55	0.060	30.0	6.0	875	210	38.0		
	Leghe di titanio indurite >300 HB [Ti6Al4V] 	4	4	50	0.015	6.0	1.6	3980	240	2.5	
		5	4	50	0.020	7.5	2.0	3185	255	4.0	
6		4	50	0.020	9.0	2.4	2655	210	4.5		
8		4	50	0.025	12.0	3.2	1990	200	7.5		
10		4	50	0.035	15.0	4.0	1590	225	13.5		
12		4	50	0.040	18.0	4.8	1325	210	18.0		
16		4	50	0.050	24.0	6.4	995	200	30.5		
20		4	50	0.060	30.0	8.0	795	190	45.5		

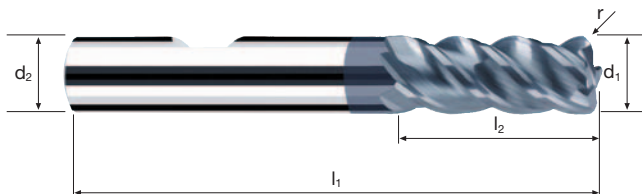
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio 850 - 1100 N/mm ² 	4	4	115	0.020	5.0	4	9150	730	14.5	
		5	4	115	0.025	6.3	5	7320	730	23.0	
		6	4	115	0.025	7.5	6	6100	610	27.5	
		8	4	115	0.035	10.0	8	4575	640	51.0	
		10	4	115	0.045	12.5	10	3660	660	82.5	
		12	4	115	0.055	15.0	12	3050	670	120.5	
		16	4	115	0.065	20.0	16	2290	595	190.5	
		20	4	115	0.080	25.0	20	1830	585	292.5	
		Acciaio 1100 - 1300 N/mm ² 	4	4	90	0.020	5.0	4	7160	575	11.5
			5	4	90	0.025	6.3	5	5730	575	18.0
6	4		90	0.025	7.5	6	4775	480	21.5		
8	4		90	0.035	10.0	8	3580	500	40.0		
10	4		90	0.045	12.5	10	2865	515	64.5		
12	4		90	0.055	15.0	12	2385	525	94.5		
16	4		90	0.065	20.0	16	1790	465	149.0		
20	4		90	0.080	25.0	20	1430	460	230.0		
Acciaio da utensile temprato 52 - 56 HRC 	4		4	50	0.010	4.0	4	3980	160	2.5	
	5		4	50	0.010	5.0	5	3185	125	3.0	
	6	4	50	0.015	6.0	6	2655	160	6.0		
	8	4	50	0.020	8.0	8	1990	160	10.0		
	10	4	50	0.025	10.0	10	1590	160	16.0		
	12	4	50	0.030	12.0	12	1325	160	23.0		
	16	4	50	0.035	16.0	16	995	140	36.0		
	20	4	50	0.045	20.0	20	795	145	58.0		
	Leghe di titanio indurite >300 HB [Ti6Al4V] 	4	4	40	0.010	5.0	4	3185	125	2.5	
		5	4	40	0.015	6.3	5	2545	155	5.0	
6		4	40	0.020	7.5	6	2120	170	7.5		
8		4	40	0.025	10.0	8	1590	160	13.0		
10		4	40	0.030	12.5	10	1275	155	19.5		
12		4	40	0.040	15.0	12	1060	170	30.5		
16		4	40	0.045	20.0	16	795	145	46.5		
20		4	40	0.055	25.0	20	635	140	70.0		

Frese toriche NX-RNVD

A taglienti lisci, esecuzione normale



HM
MG10 λ **45°**
 γ **-10°**



Sgrossatura



Finitura



Rm
850-1100

Rm
1100-1300

Rm
1300-1500

HRC
48-56

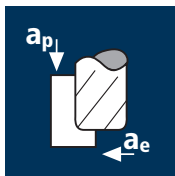
HRC
56-60

Ti
Titanium

GG(G)
Tool Steel

Esempio: N° Ordine		Rivestimento P	Articolo 15368	Codice-ø .220					POLYCHROM
									P15368
									P15268
Ø Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	α	z		
.220	4	6	57	8	0.5	4.5°	4		●
.260	5	6	57	10	0.5	2.5°	4		●
.300	6	6	57	12	0.5	0.0°	4		●
.388	8	8	63	19	0.5	0.0°	4		●
.448	10	10	72	23	0.5	0.0°	4		●
.498	12	12	83	27	0.5	0.0°	4		●
.302	6	6	57	12	1.0	0.0°	4		●
.391	8	8	63	19	1.0	0.0°	4		●
.450	10	10	72	23	1.0	0.0°	4		●
.501	12	12	83	27	1.0	0.0°	4		●
.608	16	16	92	32	1.0	0.0°	4		●
.680	20	20	104	39	1.0	0.0°	4		●
.453	10	10	72	23	1.5	0.0°	4		●
.503	12	12	83	27	1.5	0.0°	4		●
.610	16	16	92	32	1.5	0.0°	4		●
.505	12	12	83	27	2.0	0.0°	4		●
.611	16	16	92	32	2.0	0.0°	4		●
.683	20	20	104	39	2.0	0.0°	4		●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

P
 P

Acciaio
1100 - 1300 N/mm²

P
 P

Acciaio da
utensile temprato
52 - 56 HRC

P

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

P

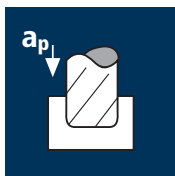
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
10	4	150	0.065	15.0	4.0	4775	1240	74.5
12	4	150	0.080	18.0	4.8	3980	1275	110.0
16	4	150	0.090	24.0	6.4	2985	1075	165.0
20	4	150	0.110	30.0	8.0	2385	1050	252.0

10	4	115	0.065	15.0	4.0	3660	950	57.0
12	4	115	0.080	18.0	4.8	3050	975	84.0
16	4	115	0.090	24.0	6.4	2290	825	126.5
20	4	115	0.110	30.0	8.0	1830	805	193.0

10	4	55	0.035	15.0	3.0	1750	245	11.0
12	4	55	0.040	18.0	3.6	1460	235	15.0
16	4	55	0.050	24.0	4.8	1095	220	25.5
20	4	55	0.060	30.0	6.0	875	210	38.0

10	4	50	0.035	15.0	4.0	1590	225	13.5
12	4	50	0.040	18.0	4.8	1325	210	18.0
16	4	50	0.050	24.0	6.4	995	200	30.5
20	4	50	0.060	30.0	8.0	795	190	45.5

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

P
 P

Acciaio
1100 - 1300 N/mm²

P
 P

Acciaio da
utensile temprato
52 - 56 HRC

P

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

P

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
10	4	115	0.045	12.5	10	3660	660	82.5
12	4	115	0.055	15.0	12	3050	670	120.5
16	4	115	0.065	20.0	16	2290	595	190.5
20	4	115	0.080	25.0	20	1830	585	292.5

10	4	90	0.045	12.5	10	2865	515	64.5
12	4	90	0.055	15.0	12	2385	525	94.5
16	4	90	0.065	20.0	16	1790	465	149.0
20	4	90	0.080	25.0	20	1430	460	230.0

10	4	50	0.025	10.0	10	1590	160	16.0
12	4	50	0.030	12.0	12	1325	160	23.0
16	4	50	0.035	16.0	16	995	140	36.0
20	4	50	0.045	20.0	20	795	145	58.0

10	4	40	0.030	12.5	10	1275	155	19.5
12	4	40	0.040	15.0	12	1060	170	30.5
16	4	40	0.045	20.0	16	795	145	46.5
20	4	40	0.055	25.0	20	635	140	70.0

Frese toriche NX-RNVD

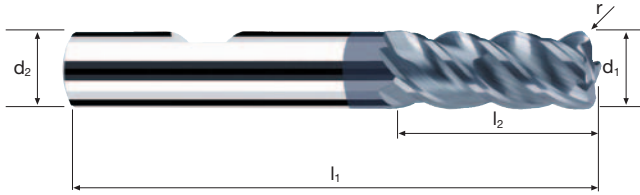
A taglienti lisci, esecuzione normale



HM
MG10

λ **45°**
 γ **-10°**

Vario



Sgrossatura



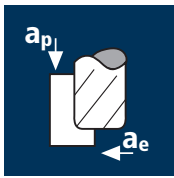
Finitura



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60		Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine								POLYCHROM	
								P15368	
								P15268	
\emptyset Code	d_1 e8	d_2 h6	l_1	l_2	r 0/+0.03	α	Z		
.457	10	10	72	23	2.5	0.0°	4	●	
.506	12	12	83	27	2.5	0.0°	4	●	
.612	16	16	92	32	2.5	0.0°	4	●	
.684	20	20	104	39	2.5	0.0°	4	●	
.508	12	12	83	27	4.0	0.0°	4	●	
.614	16	16	92	32	4.0	0.0°	4	●	
.686	20	20	104	39	4.0	0.0°	4	●	

Applicazione



Materiale

Leghe a base di nichel
ricotto
Rm <1000 N/mm²
[Inconel 718]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	35	0.010	5.4	1.4	3715	150	1.1
4	4	35	0.015	7.2	1.8	2785	165	2.1
5	4	35	0.020	9.0	2.3	2230	180	3.6
6	4	35	0.020	10.8	2.7	1855	150	4.4
8	4	35	0.030	14.4	3.6	1395	165	8.6
10	4	35	0.035	18.0	4.5	1115	155	12.6
12	4	35	0.045	21.6	5.4	930	165	19.2
16	4	35	0.050	28.8	7.2	695	140	29.0

Leghe a base di nichel
indurito
Rm >1000 N/mm²
[Inconel 718]



3	4	25	0.010	5.4	1.4	2655	105	0.8
4	4	25	0.010	7.2	1.8	1990	80	1.0
5	4	25	0.015	9.0	2.3	1590	95	1.9
6	4	25	0.015	10.8	2.7	1325	80	2.3
8	4	25	0.025	14.4	3.6	995	100	5.2
10	4	25	0.030	18.0	4.5	795	95	7.7
12	4	25	0.035	21.6	5.4	665	95	11.1
16	4	25	0.040	28.8	7.2	495	80	16.6

Acciaio al manganese
Mn >5%
[1.3964 / Nitronic]
[1.3401 / X120Mn12]



3	4	40	0.010	5.4	1.4	4245	170	1.2
4	4	40	0.015	7.2	1.8	3185	190	2.5
5	4	40	0.020	9.0	2.3	2545	205	4.2
6	4	40	0.020	10.8	2.7	2120	170	5.0
8	4	40	0.030	14.4	3.6	1590	190	9.8
10	4	40	0.035	18.0	4.5	1275	180	14.6
12	4	40	0.045	21.6	5.4	1060	190	22.2
16	4	40	0.050	28.8	7.2	795	160	33.2

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



3	4	50	0.015	5.4	1.4	5305	320	2.3
4	4	50	0.020	7.2	1.8	3980	320	4.1
5	4	50	0.030	9.0	2.3	3185	380	7.7
6	4	50	0.035	10.8	2.7	2655	370	10.8
8	4	50	0.045	14.4	3.6	1990	360	18.7
10	4	50	0.055	18.0	4.5	1590	350	28.4
12	4	50	0.065	21.6	5.4	1325	345	40.2
16	4	50	0.070	28.8	7.2	995	280	58.1

Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



3	4	80	0.010	5.4	1.4	8490	340	2.5
4	4	80	0.015	7.2	1.8	6365	380	4.9
5	4	80	0.020	9.0	2.3	5095	410	8.3
6	4	80	0.020	10.8	2.7	4245	340	9.9
8	4	80	0.030	14.4	3.6	3185	380	19.7
10	4	80	0.035	18.0	4.5	2545	355	28.8
12	4	80	0.045	21.6	5.4	2120	380	44.3
16	4	80	0.050	28.8	7.2	1590	320	66.4

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



3	4	70	0.010	5.4	1.4	7425	295	2.2
4	4	70	0.015	7.2	1.8	5570	335	4.3
5	4	70	0.015	9.0	2.3	4455	265	5.4
6	4	70	0.020	10.8	2.7	3715	295	8.6
8	4	70	0.025	14.4	3.6	2785	280	14.5
10	4	70	0.035	18.0	4.5	2230	310	25.1
12	4	70	0.040	21.6	5.4	1855	295	34.4
16	4	70	0.045	28.8	7.2	1395	250	51.8

Leghe a base di nichel
ricotto
Rm <1000 N/mm²
[Inconel 718]



3	4	25	0.010	3.8	3.0	2655	105	1.2
4	4	25	0.010	5.0	4.0	1990	80	1.6
5	4	25	0.015	6.3	5.0	1590	95	3.0
6	4	25	0.015	7.5	6.0	1325	80	3.6
8	4	25	0.025	10.0	8.0	995	100	8.0
10	4	25	0.030	12.5	10.0	795	95	11.9
12	4	25	0.035	15.0	12.0	665	95	17.1
16	4	25	0.040	20.0	16.0	495	80	25.6

Leghe a base di nichel
indurito
Rm >1000 N/mm²
[Inconel 718]



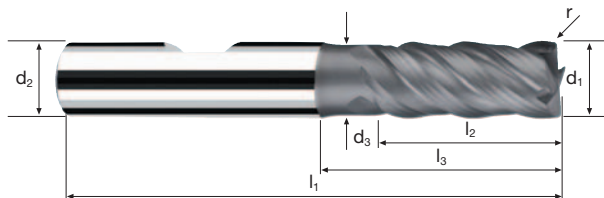
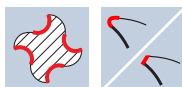
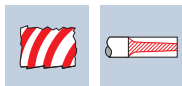
3	4	20	0.005	3.8	3.0	2120	40	0.5
4	4	20	0.010	5.0	4.0	1590	65	1.3
5	4	20	0.010	6.3	5.0	1275	50	1.6
6	4	20	0.015	7.5	6.0	1060	65	2.9
8	4	20	0.020	10.0	8.0	795	65	5.2
10	4	20	0.020	12.5	10.0	635	50	6.3
12	4	20	0.025	15.0	12.0	530	55	9.9
16	4	20	0.030	20.0	16.0	400	50	16.0

Frese toriche ZX-RNV

A taglienti lisci, esecuzione normale con scarico corto



HM X10 λ 40°
 γ 5°



Sgrossatura

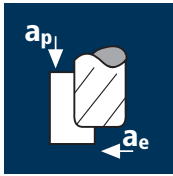


Finitura



										POLYCHROM
Esempio: N° Ordine										P8820
Rivestimento Articolo Codice-ø										P8720
P 8820 .299										
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z	
.299	6	6	5.5	57	13	20	0.4	0.0°	4	●
.387	8	8	7.4	63	19	26	0.4	0.0°	4	●
.447	10	10	9.2	72	22	31	0.4	0.0°	4	●
.497	12	12	11.0	83	26	37	0.4	0.0°	4	●
.180	3	6	2.8	57	8	14	0.5	4.5°	4	●
.220	4	6	3.7	57	11	16	0.5	3.0°	4	●
.260	5	6	4.6	57	13	18	0.5	1.5°	4	●
.300	6	6	5.5	57	13	20	0.5	0.0°	4	●
.388	8	8	7.4	63	19	26	0.5	0.0°	4	●
.448	10	10	9.2	72	22	31	0.5	0.0°	4	●
.498	12	12	11.0	83	26	37	0.5	0.0°	4	●
.301	6	6	5.5	57	13	20	0.8	0.0°	4	●
.389	8	8	7.4	63	19	26	0.8	0.0°	4	●
.449	10	10	9.2	72	22	31	0.8	0.0°	4	●
.499	12	12	11.0	83	26	37	0.8	0.0°	4	●
.607	16	16	15.0	92	32	43	0.8	0.0°	4	●

Applicazione



Materiale

Leghe a base di nichel
ricotto
Rm <1000 N/mm²
[Inconel 718]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	35	0.020	10.8	2.4	1855	150	3.9
8	4	35	0.025	14.4	3.2	1395	140	6.5
10	4	35	0.030	18.0	4.0	1115	135	9.7
12	4	35	0.040	21.6	4.8	930	150	15.6
16	4	35	0.045	28.8	6.4	695	125	23.0
20	4	35	0.055	36.0	8.0	555	120	34.6

Leghe a base di nichel
indurito
Rm >1000 N/mm²
[Inconel 718]



6	4	25	0.015	10.8	2.4	1325	80	2.1
8	4	25	0.020	14.4	3.2	995	80	3.7
10	4	25	0.025	18.0	4.0	795	80	5.8
12	4	25	0.030	21.6	4.8	665	80	8.3
16	4	25	0.035	28.8	6.4	495	70	12.9
20	4	25	0.045	36.0	8.0	400	70	20.2

Acciaio al manganese
Mn >5%
[1.3964 / Nitronic]
[1.3401 / X120Mn12]



6	4	40	0.020	10.8	2.4	2120	170	4.4
8	4	40	0.025	14.4	3.2	1590	160	7.4
10	4	40	0.030	18.0	4.0	1275	155	11.2
12	4	40	0.040	21.6	4.8	1060	170	17.6
16	4	40	0.045	28.8	6.4	795	145	26.7
20	4	40	0.055	36.0	8.0	635	140	40.3

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



6	4	50	0.030	10.8	2.4	2655	320	8.3
8	4	50	0.040	14.4	3.2	1990	320	14.7
10	4	50	0.050	18.0	4.0	1590	320	23.0
12	4	50	0.060	21.6	4.8	1325	320	33.2
16	4	50	0.065	28.8	6.4	995	260	47.9
20	4	50	0.080	36.0	8.0	795	255	73.4

Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	80	0.020	10.8	2.4	4245	340	8.8
8	4	80	0.025	14.4	3.2	3185	320	14.7
10	4	80	0.030	18.0	4.0	2545	305	22.0
12	4	80	0.040	21.6	4.8	2120	340	35.3
16	4	80	0.045	28.8	6.4	1590	285	52.5
20	4	80	0.055	36.0	8.0	1275	280	80.6

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



6	4	70	0.020	10.8	2.4	3715	295	7.6
8	4	70	0.025	14.4	3.2	2785	280	12.9
10	4	70	0.030	18.0	4.0	2230	270	19.4
12	4	70	0.035	21.6	4.8	1855	260	27.0
16	4	70	0.040	28.8	6.4	1395	225	41.5
20	4	70	0.050	36.0	8.0	1115	225	64.8

Leghe a base di nichel
ricotto
Rm <1000 N/mm²
[Inconel 718]

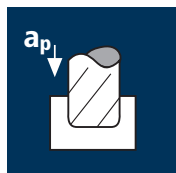


6	4	25	0.015	7.2	6.0	1325	80	3.5
8	4	25	0.020	9.6	8.0	995	80	6.1
10	4	25	0.025	12.0	10.0	795	80	9.6
12	4	25	0.030	14.4	12.0	665	80	13.8
16	4	25	0.035	19.2	16.0	495	70	21.5
20	4	25	0.045	24.0	20.0	400	70	33.6

Leghe a base di nichel
indurito
Rm >1000 N/mm²
[Inconel 718]



6	4	20	0.010	7.2	6.0	1060	40	1.7
8	4	20	0.015	9.6	8.0	795	50	3.8
10	4	20	0.020	12.0	10.0	635	50	6.0
12	4	20	0.025	14.4	12.0	530	55	9.5
16	4	20	0.030	19.2	16.0	400	50	15.4
20	4	20	0.035	24.0	20.0	320	45	21.6



Frese toriche ZX-RNV

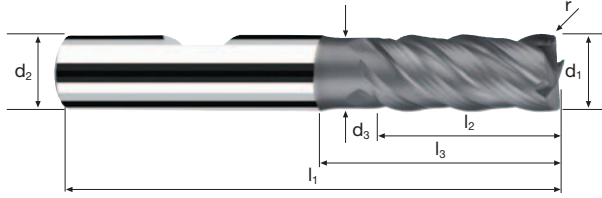
A taglienti lisci, esecuzione normale con scarico corto



HM X10 λ 40° γ 5°

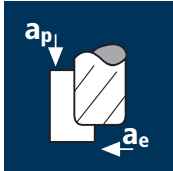







Sgrossatura

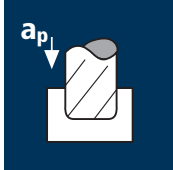







Finitura



Material options: Inox Stainless, Ti Titanium, Nickel-Alloys, Mangan-Steels, HSS

Esempio: Rivestimento Articolo Codice-ø										POLYCHROM						
N° Ordine										P	8820	.302			P8820	P8720
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z							
.302	6	6	5.5	57	13	20	1.0	0.0°	4							●
.391	8	8	7.4	63	19	26	1.0	0.0°	4							●
.450	10	10	9.2	72	22	31	1.0	0.0°	4							●
.501	12	12	11.0	83	26	37	1.0	0.0°	4							●
.608	16	16	15.0	92	32	43	1.0	0.0°	4							●
.680	20	20	19.0	104	38	53	1.0	0.0°	4							●
.453	10	10	9.2	72	22	31	1.5	0.0°	4							●
.503	12	12	11.0	83	26	37	1.5	0.0°	4							●
.610	16	16	15.0	92	32	43	1.5	0.0°	4							●
.505	12	12	11.0	83	26	37	2.0	0.0°	4							●
.611	16	16	15.0	92	32	43	2.0	0.0°	4							●
.683	20	20	19.0	104	38	53	2.0	0.0°	4							●
.457	10	10	9.2	72	22	31	2.5	0.0°	4							●
.506	12	12	11.0	83	26	37	2.5	0.0°	4							●
.612	16	16	15.0	92	32	43	2.5	0.0°	4							●
.684	20	20	19.0	104	38	53	2.5	0.0°	4							●
.508	12	12	11.0	83	26	37	4.0	0.0°	4							●
.614	16	16	15.0	92	32	43	4.0	0.0°	4							●
.686	20	20	19.0	104	38.0	53	4.0	0.0°	4							●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	3	4	110	0.025	4.5	0.45	11670	1165	2.5
		4	4	110	0.035	6.0	0.60	8755	1225	4.5
		5	4	110	0.040	7.5	0.75	7005	1120	6.5
		6	4	110	0.050	9.0	0.90	5835	1165	9.5
		8	4	110	0.065	12.0	1.20	4375	1140	16.5
		10	4	110	0.085	15.0	1.50	3500	1190	27.0
		12	4	110	0.100	18.0	1.80	2920	1170	38.0
16	4	110	0.135	24.0	2.40	2190	1185	68.5		
	Acciaio da utensile temprato 48 - 52 HRC 	3	4	70	0.015	4.5	0.45	7425	445	1.0
		4	4	70	0.020	6.0	0.60	5570	445	1.5
		5	4	70	0.030	7.5	0.75	4455	535	3.0
		6	4	70	0.035	9.0	0.90	3715	520	4.0
		8	4	70	0.045	12.0	1.20	2785	500	7.0
		10	4	70	0.055	15.0	1.50	2230	490	11.0
		12	4	70	0.065	18.0	1.80	1855	480	15.5
16	4	70	0.090	24.0	2.40	1395	500	29.0		
	Acciaio da utensile temprato 52 - 56 HRC 	3	4	50	0.015	4.5	0.45	5305	320	0.5
		4	4	50	0.020	6.0	0.60	3980	320	1.0
		5	4	50	0.025	7.5	0.75	3185	320	2.0
		6	4	50	0.025	9.0	0.90	2655	265	2.0
		8	4	50	0.035	12.0	1.20	1990	280	4.0
		10	4	50	0.045	15.0	1.50	1590	285	6.5
		12	4	50	0.055	18.0	1.80	1325	290	9.5
16	4	50	0.075	24.0	2.40	995	300	17.5		
	Acciaio da utensile temprato 56 - 60 HRC 	3	4	25	0.010	4.5	0.45	2655	106	0.2
		4	4	25	0.015	6.0	0.60	1990	119	0.4
		5	4	25	0.015	7.5	0.75	1590	95	0.5
		6	4	25	0.020	9.0	0.90	1325	106	1.0
		8	4	25	0.025	12.0	1.20	995	100	1.5
		10	4	25	0.035	15.0	1.50	795	111	2.5
		12	4	25	0.040	18.0	1.80	665	106	3.5
16	4	25	0.055	24.0	2.40	495	109	6.5		

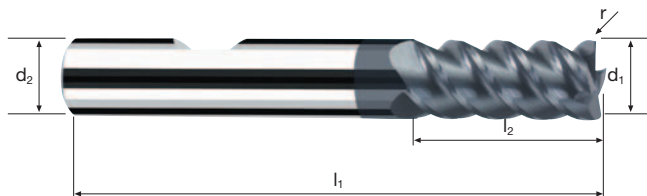
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	3	4	95	0.020	1.5	3	10080	805	3.5
		4	4	95	0.025	2.0	4	7560	755	6.0
		5	4	95	0.035	2.5	5	6050	845	10.5
		6	4	95	0.040	3.0	6	5040	805	14.5
		8	4	95	0.055	4.0	8	3780	830	26.5
		10	4	95	0.065	5.0	10	3025	785	39.5
		12	4	95	0.080	6.0	12	2520	805	58.0
16	4	95	0.105	4.0	16	1890	795	51.0		
	Acciaio da utensile temprato 48 - 52 HRC 	3	4	60	0.015	1.5	3	6365	380	1.5
		4	4	60	0.020	2.0	4	4775	380	3.0
		5	4	60	0.025	2.5	5	3820	380	5.0
		6	4	60	0.030	3.0	6	3185	380	7.0
		8	4	60	0.040	4.0	8	2385	380	12.0
		10	4	60	0.050	5.0	10	1910	380	19.0
		12	4	60	0.060	6.0	12	1590	380	27.5
16	4	60	0.080	4.0	16	1195	380	24.5		
	Acciaio da utensile temprato 52 - 56 HRC 	3	4	40	0.010	1.5	3	4245	170	1.0
		4	4	40	0.015	2.0	4	3185	190	1.5
		5	4	40	0.020	2.5	5	2545	205	2.5
		6	4	40	0.025	3.0	6	2120	210	4.0
		8	4	40	0.030	4.0	8	1590	190	6.0
		10	4	40	0.040	5.0	10	1275	205	10.5
		12	4	40	0.050	6.0	12	1060	210	15.0
16	4	40	0.065	4.0	16	795	205	13.0		
	Acciaio da utensile temprato 56 - 60 HRC 	3	4	20	0.009	1.5	3	2120	76	0.3
		4	4	20	0.011	2.0	4	1590	70	0.5
		5	4	20	0.014	2.5	5	1275	71	1.0
		6	4	20	0.017	3.0	6	1060	72	1.5
		8	4	20	0.023	4.0	8	795	73	2.5
		10	4	20	0.029	5.0	10	635	74	3.5
		12	4	20	0.034	6.0	12	530	72	5.0
16	4	20	0.046	4.0	16	400	74	4.5		

Frese toriche HX-RN

A taglienti lisci, esecuzione normale



HM
MG10 λ **55°**
 γ **-10°**



Sgrossatura



Finitura



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	GG(G)
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Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø				POLYCHROM	DURO-S
	P	5359	.178						P5359	D5359
ø Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	α	z			
.178	3	6	57	8	0.2	6.0°	4	●	●	
.218	4	6	57	11	0.2	4.0°	4	●	●	
.258	5	6	57	13	0.2	2.0°	4	●	●	
.297	6	6	57	13	0.2	0.0°	4	●	●	
.388	8	8	63	19	0.2	0.0°	4	●	●	
.445	10	10	72	22	0.2	0.0°	4	●	●	
.496	12	12	83	26	0.2	0.0°	4	●	●	
.605	16	16	92	32	0.2	0.0°	4	●	●	
.180	3	6	57	8	0.5	6.0°	4	●	●	
.220	4	6	57	11	0.5	4.0°	4	●	●	
.260	5	6	57	13	0.5	2.0°	4	●	●	
.300	6	6	57	13	0.5	0.0°	4	●	●	
.391	8	8	63	19	0.5	0.0°	4	●	●	
.450	10	10	72	22	0.5	0.0°	4	●	●	
.501	12	12	83	26	0.5	0.0°	4	●	●	
.610	16	16	92	32	0.5	0.0°	4	●	●	

Applicazione

Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	110	0.050	9	0.9	5835	1165	9.5
8	4	110	0.065	12	1.2	4375	1140	16.5
10	4	110	0.085	15	1.5	3500	1190	27.0
12	4	110	0.100	18	1.8	2920	1170	38.0
16	4	110	0.135	24	2.4	2190	1185	68.5
20	4	110	0.165	30	3.0	1750	1155	104.0

Acciaio da utensile temprato 48 - 52 HRC

6	4	70	0.035	9	0.9	3715	520	4.0
8	4	70	0.045	12	1.2	2785	500	7.0
10	4	70	0.055	15	1.5	2230	490	11.0
12	4	70	0.065	18	1.8	1855	480	15.5
16	4	70	0.090	24	2.4	1395	500	29.0
20	4	70	0.110	30	3.0	1115	490	44.0

Acciaio da utensile temprato 52 - 56 HRC

6	4	50	0.025	9	0.9	2655	265	2.0
8	4	50	0.035	12	1.2	1990	280	4.0
10	4	50	0.045	15	1.5	1590	285	6.5
12	4	50	0.055	18	1.8	1325	290	9.5
16	4	50	0.075	24	2.4	995	300	17.5
20	4	50	0.090	30	3.0	795	285	25.5

Acciaio da utensile temprato 56 - 60 HRC

6	4	25	0.020	9	0.9	1325	106	0.9
8	4	25	0.025	12	1.2	995	100	1.4
10	4	25	0.035	15	1.5	795	111	2.5
12	4	25	0.040	18	1.8	665	106	3.5
16	4	25	0.055	24	2.4	495	109	6.5
20	4	25	0.065	30	3.0	400	104	9.5

Applicazione

Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	95	0.040	3	6	5040	805	14.5
8	4	95	0.055	4	8	3780	830	26.5
10	4	95	0.065	5	10	3025	785	39.5
12	4	95	0.080	6	12	2520	805	58.0
16	4	95	0.105	4	16	1890	795	51.0
20	4	95	0.135	5	20	1510	815	81.5

Acciaio da utensile temprato 48 - 52 HRC

6	4	60	0.030	3	6	3185	380	7.0
8	4	60	0.040	4	8	2385	380	12.0
10	4	60	0.050	5	10	1910	380	19.0
12	4	60	0.060	6	12	1590	380	27.5
16	4	60	0.080	4	16	1195	380	24.5
20	4	60	0.100	5	20	955	380	38.0

Acciaio da utensile temprato 52 - 56 HRC

6	4	40	0.025	3	6	2120	210	4.0
8	4	40	0.030	4	8	1590	190	6.0
10	4	40	0.040	5	10	1275	205	10.5
12	4	40	0.050	6	12	1060	210	15.0
16	4	40	0.065	4	16	795	205	13.0
20	4	40	0.080	5	20	635	205	20.5

Acciaio da utensile temprato 56 - 60 HRC

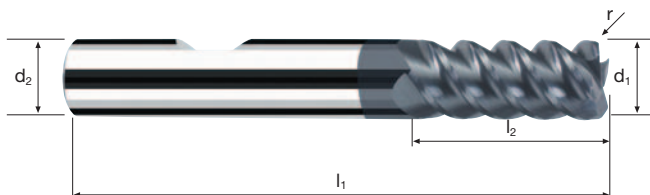
6	4	20	0.017	3	6	1060	72	1.3
8	4	20	0.023	4	8	795	73	2.5
10	4	20	0.029	5	10	635	74	3.5
12	4	20	0.034	6	12	530	72	5.0
16	4	20	0.046	4	16	400	74	4.5
20	4	20	0.057	5	20	320	73	7.5

Frese toriche HX-RN

A taglienti lisci, esecuzione normale



HM
MG10 λ **55°**
 γ -**10°**



Sgrossatura



Finitura



Rm
1100-1300

Rm
1300-1500

HRC
48-56

HRC
56-60

HRC
> 60

Ti
Titanium

GG(G)

Esempio: N° Ordine							POLYCHROM	
		Rivestimento	Articolo	Codice-ø				P15357
		P	15357	.302				P15257
ø Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	z		
.302	6	6	57	13	1.0	4		●
.391	8	8	63	19	1.0	4		●
.450	10	10	72	22	1.0	4		●
.501	12	12	83	26	1.0	4		●
.608	16	16	92	32	1.0	4		●
.680	20	20	104	38	1.0	4		●
.306	6	6	57	13	2.0	4		●
.395	8	8	63	19	2.0	4		●
.455	10	10	72	22	2.0	4		●
.505	12	12	83	26	2.0	4		●
.611	16	16	92	32	2.0	4		●
.683	20	20	104	38	2.0	4		●



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

P

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	80	0.025	9	2.4	4245	425	9.0
8	4	80	0.035	12	3.2	3185	445	17.0
10	4	80	0.045	15	4.0	2545	460	27.5
12	4	80	0.050	18	4.8	2120	425	36.5
16	4	80	0.075	24	3.2	1590	475	36.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

P

6	4	70	0.025	9	2.4	3715	370	8.0
8	4	70	0.035	12	3.2	2785	390	15.0
10	4	70	0.045	15	4.0	2230	400	24.0
12	4	70	0.050	18	4.8	1855	370	32.0
16	4	70	0.075	24	3.2	1395	420	32.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

P

6	4	25	0.020	9	2.4	1325	105	2.5
8	4	25	0.030	12	3.2	995	120	4.5
10	4	25	0.035	15	4.0	795	110	6.5
12	4	25	0.040	18	4.8	665	105	9.0
16	4	25	0.060	24	3.2	495	120	9.0

Leghe a base di nichel indurite
R_m > 1000 N/mm² [Inconel 718]

P

6	4	15	0.020	9	2.4	795	65	1.5
8	4	15	0.030	12	3.2	595	70	2.5
10	4	15	0.035	15	4.0	475	65	4.0
12	4	15	0.040	18	4.8	400	65	5.5
16	4	15	0.060	24	3.2	300	70	5.5



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

P

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	60	0.030	3	6	3185	380	7.0
8	4	60	0.040	4	8	2385	380	12.0
10	4	60	0.055	5	10	1910	420	21.0
12	4	60	0.055	6	12	1590	350	25.0
16	4	60	0.085	4	16	1195	405	26.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

P

6	4	55	0.030	3	6	2920	350	6.5
8	4	55	0.040	4	8	2190	350	11.0
10	4	55	0.055	5	10	1750	385	19.5
12	4	55	0.055	6	12	1460	320	23.0
16	4	55	0.085	4	16	1095	370	23.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

P

6	4	20	0.025	3	6	1060	105	2.0
8	4	20	0.035	4	8	795	110	3.5
10	4	20	0.045	5	10	635	115	6.0
12	4	20	0.050	6	12	530	105	7.5
16	4	20	0.075	4	16	400	120	7.5

Leghe a base di nichel indurite
R_m > 1000 N/mm² [Inconel 718]

P

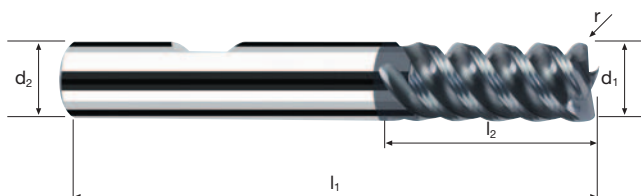
6	4	10	0.025	3	6	530	55	1.0
8	4	10	0.035	4	8	400	55	2.0
10	4	10	0.045	5	10	320	60	3.0
12	4	10	0.050	6	12	265	55	4.0
16	4	10	0.075	4	16	200	60	4.0

Frese toriche SX-RN

A taglienti lisci, esecuzione normale



HM
MG10 λ **55°**
 γ **15°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 15312	Codice- ϕ .300				POLYCHROM
ϕ Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	z		
.300	6	6	57	13	0.5	4		●
.388	8	8	63	19	0.5	4		●
.448	10	10	72	22	0.5	4		●
.498	12	12	83	26	0.5	4		●
.606	16	16	92	32	0.5	4		●
.302	6	6	57	13	1.0	4		●
.391	8	8	63	19	1.0	4		●
.450	10	10	72	22	1.0	4		●
.501	12	12	83	26	1.0	4		●
.608	16	16	92	32	1.0	4		●
.304	6	6	57	13	1.5	4		●
.393	8	8	63	19	1.5	4		●
.453	10	10	72	22	1.5	4		●
.503	12	12	83	26	1.5	4		●
.610	16	16	92	32	1.5	4		●



Materiale

<p>Acciaio < 850 N/mm²</p>
<p>Acciaio 850 - 1100 N/mm²</p>
<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p>
<p>Acciaio inossidabile [Cr-Ni/1.4301]</p>

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	190	0.020	4.5	1.2	20160	1615	8.5
4	4	190	0.025	6.0	1.6	15120	1510	14.5
5	4	190	0.035	7.5	2.0	12095	1695	25.5
6	4	190	0.040	9.0	2.4	10080	1615	35.0
8	4	190	0.055	12.0	3.2	7560	1665	64.0
10	4	190	0.070	15.0	4.0	6050	1695	101.5
12	4	190	0.075	18.0	4.8	5040	1510	130.5
16	4	190	0.100	24.0	6.4	3780	1510	232.0
20	4	190	0.130	30.0	8.0	3025	1575	378.0
3	4	140	0.020	4.5	1.2	14855	1190	6.5
4	4	140	0.025	6.0	1.6	11140	1115	10.5
5	4	140	0.035	7.5	2.0	8915	1250	19.0
6	4	140	0.040	9.0	2.4	7425	1190	25.5
8	4	140	0.055	12.0	3.2	5570	1225	47.0
10	4	140	0.070	15.0	4.0	4455	1245	74.5
12	4	140	0.075	18.0	4.8	3715	1115	96.5
16	4	140	0.100	24.0	6.4	2785	1115	171.5
20	4	140	0.130	30.0	8.0	2230	1160	278.5
3	4	70	0.020	4.5	1.2	7425	595	3.0
4	4	70	0.025	6.0	1.6	5570	555	5.5
5	4	70	0.030	7.5	2.0	4455	535	8.0
6	4	70	0.040	9.0	2.4	3715	595	13.0
8	4	70	0.050	12.0	3.2	2785	555	21.5
10	4	70	0.065	15.0	4.0	2230	580	35.0
12	4	70	0.075	18.0	4.8	1855	555	48.0
16	4	70	0.095	24.0	6.4	1395	530	81.5
20	4	70	0.120	30.0	8.0	1115	535	128.5
3	4	90	0.015	4.5	1.2	9550	575	3.0
4	4	90	0.020	6.0	1.6	7160	575	5.5
5	4	90	0.020	7.5	2.0	5730	460	7.0
6	4	90	0.030	9.0	2.4	4775	575	12.5
8	4	90	0.035	12.0	3.2	3580	500	19.0
10	4	90	0.045	15.0	4.0	2865	515	31.0
12	4	90	0.055	18.0	4.8	2385	525	45.5
16	4	90	0.065	24.0	6.4	1790	465	71.5
20	4	90	0.085	30.0	8.0	1430	485	116.5



Materiale

<p>Acciaio < 850 N/mm²</p>
<p>Acciaio 850 - 1100 N/mm²</p>
<p>Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]</p>
<p>Acciaio inossidabile [Cr-Ni/1.4301]</p>

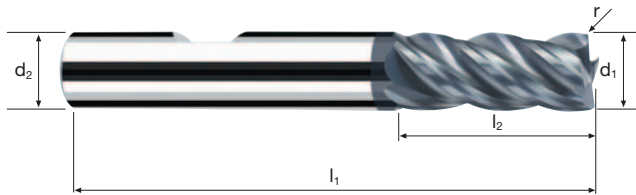
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	155	0.015	3	3	16445	985	9.0
4	4	155	0.020	4	4	12335	985	16.0
5	4	155	0.030	5	5	9870	1185	29.5
6	4	155	0.035	6	6	8225	1150	41.5
8	4	155	0.045	8	8	6165	1110	71.0
10	4	155	0.055	10	10	4935	1085	108.5
12	4	155	0.060	12	12	4110	985	142.0
16	4	155	0.075	8	16	3085	925	118.5
20	4	155	0.095	10	20	2465	935	187.0
3	4	105	0.015	3	3	11140	670	6.0
4	4	105	0.020	4	4	8355	670	10.5
5	4	105	0.030	5	5	6685	800	20.0
6	4	105	0.035	6	6	5570	780	28.0
8	4	105	0.045	8	8	4180	750	48.0
10	4	105	0.055	10	10	3340	735	73.5
12	4	105	0.060	12	12	2785	670	96.5
16	4	105	0.075	8	16	2090	625	80.0
20	4	105	0.095	10	20	1670	635	127.0
3	4	55	0.015	3	3	5835	350	3.0
4	4	55	0.020	4	4	4375	350	5.5
5	4	55	0.030	5	5	3500	420	10.5
6	4	55	0.035	6	6	2920	410	15.0
8	4	55	0.045	8	8	2190	395	25.5
10	4	55	0.055	10	10	1750	385	38.5
12	4	55	0.060	12	12	1460	350	50.5
16	4	55	0.075	8	16	1095	330	42.0
20	4	55	0.095	10	20	875	335	67.0
3	4	70	0.010	3	3	7425	295	2.5
4	4	70	0.015	4	4	5570	335	5.5
5	4	70	0.025	5	5	4455	445	11.0
6	4	70	0.030	6	6	3715	445	16.0
8	4	70	0.035	8	8	2785	390	25.0
10	4	70	0.045	10	10	2230	400	40.0
12	4	70	0.050	12	12	1855	370	53.5
16	4	70	0.060	8	16	1395	335	43.0
20	4	70	0.075	10	20	1115	335	67.0

Frese toriche NB-RNV

A taglienti lisci, esecuzione normale



HM
MG10 λ **40°**
 γ **0°**



Sgrossatura

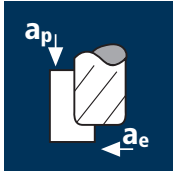









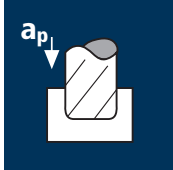







Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys
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Esempio: N° Ordine		Rivestimento P	Articolo 15326	Codice-ø .180					POLYCHROM
Ø Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	α	z		
.180	3	6	57	8	0.5	6.0°	4	●	
.220	4	6	57	11	0.5	4.0°	4	●	
.260	5	6	57	13	0.5	2.0°	4	●	
.300	6	6	57	13	0.5	0.0°	4	●	
.388	8	8	63	19	0.5	0.0°	4	●	
.448	10	10	72	22	0.5	0.0°	4	●	
.498	12	12	83	26	0.5	0.0°	4	●	
.302	6	6	57	13	1.0	0.0°	4	●	
.391	8	8	63	19	1.0	0.0°	4	●	
.450	10	10	72	22	1.0	0.0°	4	●	
.501	12	12	83	26	1.0	0.0°	4	●	
.608	16	16	92	32	1.0	0.0°	4	●	
.680	20	20	104	38	1.0	0.0°	4	●	
.453	10	10	72	22	1.5	0.0°	4	●	
.503	12	12	83	26	1.5	0.0°	4	●	
.610	16	16	92	32	1.5	0.0°	4	●	
.505	12	12	83	26	2.0	0.0°	4	●	
.611	16	16	92	32	2.0	0.0°	4	●	
.683	20	20	104	38	2.0	0.0°	4	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  P  P	10	4	190	0.070	15.0	4.0	6050	1695	101.5
		12	4	190	0.075	18.0	4.8	5040	1510	130.5
		16	4	190	0.100	24.0	6.4	3780	1510	232.0
		20	4	190	0.130	30.0	8.0	3025	1575	378.0
Acciaio 850 - 1100 N/mm ²  P  P	10	4	140	0.070	15.0	4.0	4455	1245	74.5	
	12	4	140	0.075	18.0	4.8	3715	1115	96.5	
	16	4	140	0.100	24.0	6.4	2785	1115	171.5	
	20	4	140	0.130	30.0	8.0	2230	1160	278.5	
Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]  P  P	10	4	70	0.065	15.0	4.0	2230	580	35.0	
	12	4	70	0.075	18.0	4.8	1855	555	48.0	
	16	4	70	0.095	24.0	6.4	1395	530	81.5	
	20	4	70	0.120	30.0	8.0	1115	535	128.5	
Acciaio inossidabile [Cr-Ni/1.4301]  P	10	4	90	0.045	15.0	4.0	2865	515	31.0	
	12	4	90	0.055	18.0	4.8	2385	525	45.5	
	16	4	90	0.065	24.0	6.4	1790	465	71.5	
	20	4	90	0.085	30.0	8.0	1430	485	116.5	

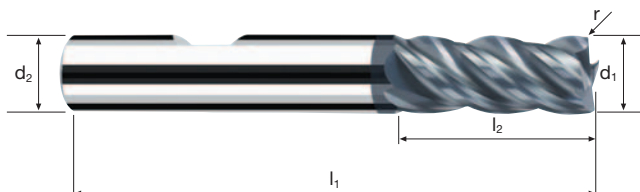
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  P  P	10	4	155	0.055	10	10	4935	1085	108.5
		12	4	155	0.060	12	12	4110	985	142.0
		16	4	155	0.075	8	16	3085	925	118.5
		20	4	155	0.095	10	20	2465	935	187.0
Acciaio 850 - 1100 N/mm ²  P  P	10	4	105	0.055	10	10	3340	735	73.5	
	12	4	105	0.060	12	12	2785	670	96.5	
	16	4	105	0.075	8	16	2090	625	80.0	
	20	4	105	0.095	10	20	1670	635	127.0	
Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]  P  P	10	4	55	0.055	10	10	1750	385	38.5	
	12	4	55	0.060	12	12	1460	350	50.5	
	16	4	55	0.075	8	16	1095	330	42.0	
	20	4	55	0.095	10	20	875	335	67.0	
Acciaio inossidabile [Cr-Ni/1.4301]  P	10	4	70	0.045	10	10	2230	400	40.0	
	12	4	70	0.050	12	12	1855	370	53.5	
	16	4	70	0.060	8	16	1395	335	43.0	
	20	4	70	0.075	10	20	1115	335	67.0	

Frese toriche NB-RNV

A taglienti lisci, esecuzione normale



HM
MG10 λ **40°**
 γ **0°**



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300

Rm
1300-1500

Rm

Rm

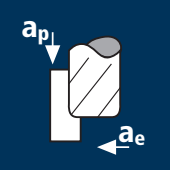
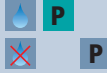
Rm

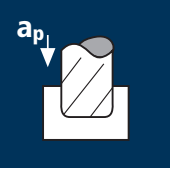
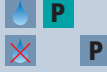
Inox
Stainless

Ti
Titanium

GG(G)
Tool Steel
Nickel-Alloys

Esempio: N° Ordine		Rivestimento P	Articolo 15326	Codice-ø .457				POLYCHROM	
Ø Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	α	z		
.457	10	10	72	22	2.5	0.0°	4	●	
.506	12	12	83	26	2.5	0.0°	4	●	
.612	16	16	92	32	2.5	0.0°	4	●	
.684	20	20	104	38	2.5	0.0°	4	●	
.508	12	12	83	26	4.0	0.0°	4	●	
.614	16	16	92	32	4.0	0.0°	4	●	
.686	20	20	104	38	4.0	0.0°	4	●	

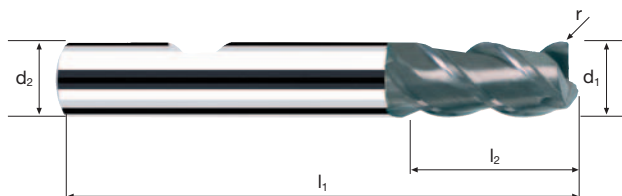
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	3	115	0.010	4.5	0.3	12200	365	0.5
		4	3	115	0.015	6.0	0.4	9150	410	1.0
		5	3	115	0.015	7.5	0.5	7320	330	1.0
		6	3	115	0.020	9.0	0.6	6100	365	2.0
		8	3	115	0.025	12.0	0.8	4575	345	3.5
		10	3	115	0.035	15.0	1.0	3660	385	6.0
		12	3	115	0.040	18.0	1.2	3050	365	8.0
		3	3	75	0.010	4.5	0.3	7960	240	0.5
		4	3	75	0.015	6.0	0.4	5970	270	0.5
		5	3	75	0.015	7.5	0.5	4775	215	1.0
		6	3	75	0.020	9.0	0.6	3980	240	1.5
		8	3	75	0.025	12.0	0.8	2985	225	2.0
10	3	75	0.035	15.0	1.0	2385	250	4.0		
12	3	75	0.040	18.0	1.2	1990	240	5.0		
3	3	150	0.010	4.5	0.3	15915	475	0.5		
4	3	150	0.015	6.0	0.4	11935	535	1.5		
5	3	150	0.015	7.5	0.5	9550	430	1.5		
6	3	150	0.020	9.0	0.6	7960	480	2.5		
8	3	150	0.025	12.0	0.8	5970	450	4.5		
10	3	150	0.035	15.0	1.0	4775	500	7.5		
12	3	150	0.040	18.0	1.2	3980	480	10.5		
3	3	60	0.010	4.5	0.3	6365	190	0.3		
4	3	60	0.015	6.0	0.4	4775	215	0.5		
5	3	60	0.015	7.5	0.5	3820	170	0.5		
6	3	60	0.020	9.0	0.6	3185	190	1.0		
8	3	60	0.025	12.0	0.8	2385	180	1.5		
10	3	60	0.035	15.0	1.0	1910	200	3.0		
12	3	60	0.040	18.0	1.2	1590	190	4.0		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	3	3	85	0.010	1.5	3	9020	270	1.0
		4	3	85	0.010	2.0	4	6765	205	1.5
		5	3	85	0.015	2.5	5	5410	245	3.0
		6	3	85	0.015	3.0	6	4510	205	3.5
		8	3	85	0.020	4.0	8	3380	205	6.5
		10	3	85	0.030	5.0	10	2705	245	12.5
		12	3	85	0.035	6.0	12	2255	235	17.0
		3	3	60	0.010	1.5	3	6365	190	1.0
		4	3	60	0.010	2.0	4	4775	145	1.0
		5	3	60	0.015	2.5	5	3820	170	2.0
		6	3	60	0.015	3.0	6	3185	145	2.5
		8	3	60	0.020	4.0	8	2385	145	4.5
10	3	60	0.025	5.0	10	1910	145	7.5		
12	3	60	0.030	6.0	12	1590	145	10.5		
3	3	105	0.010	1.5	3	11140	335	1.5		
4	3	105	0.010	2.0	4	8355	250	2.0		
5	3	105	0.015	2.5	5	6685	300	4.0		
6	3	105	0.020	3.0	6	5570	335	6.0		
8	3	105	0.025	4.0	8	4180	315	10.0		
10	3	105	0.030	5.0	10	3340	300	15.0		
12	3	105	0.035	6.0	12	2785	290	21.0		
3	3	40	0.010	1.5	3	4245	125	0.5		
4	3	40	0.010	2.0	4	3185	95	1.0		
5	3	40	0.015	2.5	5	2545	115	1.5		
6	3	40	0.015	3.0	6	2120	95	1.5		
8	3	40	0.020	4.0	8	1590	95	3.0		
10	3	40	0.025	5.0	10	1275	95	5.0		
12	3	40	0.030	6.0	12	1060	95	7.0		

Frese toriche

A taglienti lisci, esecuzione normale

HM
MG10 λ 45°
 γ 15°



Sgrossatura



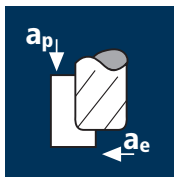
Finitura



Rm < 850 Rm 850-1100 Rm 1100-1300 Inox Stainless GG(G) Copper

Esempio: N° Ordine								POLYCHROM	
								P5334	
								P5234	
Ø Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	α	Z		
.178	3	6	57	7	0.2	6.0°	3	●	
.218	4	6	57	8	0.2	4.5°	3	●	
.258	5	6	57	10	0.2	2.5°	3	●	
.297	6	6	57	10	0.2	0.0°	3	●	
.388	8	8	63	16	0.2	0.0°	3	●	
.445	10	10	72	19	0.2	0.0°	3	●	
.496	12	12	83	22	0.2	0.0°	3	●	
.180	3	6	57	7	0.5	6.0°	3	●	
.220	4	6	57	8	0.5	4.5°	3	●	
.260	5	6	57	10	0.5	2.5°	3	●	
.300	6	6	57	10	0.5	0.0°	3	●	
.391	8	8	63	16	0.5	0.0°	3	●	
.450	10	10	72	19	0.5	0.0°	3	●	
.501	12	12	83	22	0.5	0.0°	3	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²



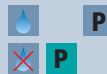
Acciaio
850 - 1100 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Ghisa
(grigia / sferoidale)



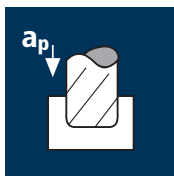
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	170	0.015	4.5	1.2	18040	1080	6.0
4	4	170	0.020	6.0	1.6	13530	1080	10.5
5	4	170	0.025	7.5	2.0	10825	1085	16.5
6	4	170	0.030	9.0	2.4	9020	1080	23.5
8	4	170	0.040	12.0	3.2	6765	1080	41.5
10	4	170	0.050	15.0	4.0	5410	1080	65.0
12	4	170	0.060	18.0	4.8	4510	1080	93.5

3	4	120	0.015	4.5	1.2	12735	765	4.0
4	4	120	0.020	6.0	1.6	9550	765	7.5
5	4	120	0.025	7.5	2.0	7640	765	11.5
6	4	120	0.030	9.0	2.4	6365	765	16.5
8	4	120	0.040	12.0	3.2	4775	765	29.5
10	4	120	0.050	15.0	4.0	3820	765	46.0
12	4	120	0.060	18.0	4.8	3185	765	66.0

3	4	80	0.010	4.5	1.2	8490	340	2.0
4	4	80	0.015	6.0	1.6	6365	380	3.5
5	4	80	0.020	7.5	2.0	5095	410	6.0
6	4	80	0.025	9.0	2.4	4245	425	9.0
8	4	80	0.030	12.0	3.2	3185	380	14.5
10	4	80	0.040	15.0	4.0	2545	405	24.5
12	4	80	0.050	18.0	4.8	2120	425	36.5

3	4	150	0.015	4.5	1.2	15915	955	5.0
4	4	150	0.020	6.0	1.6	11935	955	9.0
5	4	150	0.030	7.5	2.0	9550	1145	17.0
6	4	150	0.035	9.0	2.4	7960	1115	24.0
8	4	150	0.045	12.0	3.2	5970	1075	41.5
10	4	150	0.055	15.0	4.0	4775	1050	63.0
12	4	150	0.065	18.0	4.8	3980	1035	89.5

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	135	0.010	3.0	3	14325	575	5.0
4	4	135	0.015	4.0	4	10745	645	10.5
5	4	135	0.020	5.0	5	8595	690	17.5
6	4	135	0.025	6.0	6	7160	715	25.5
8	4	135	0.030	8.0	8	5370	645	41.5
10	4	135	0.040	10.0	10	4295	685	68.5
12	4	135	0.045	12.0	12	3580	645	93.0

3	4	95	0.010	3.0	3	10080	405	3.5
4	4	95	0.015	4.0	4	7560	455	7.5
5	4	95	0.020	5.0	5	6050	485	12.0
6	4	95	0.025	6.0	6	5040	505	18.0
8	4	95	0.030	8.0	8	3780	455	29.0
10	4	95	0.040	10.0	10	3025	485	48.5
12	4	95	0.045	12.0	12	2520	455	65.5

3	4	65	0.010	2.1	3	6895	275	1.5
4	4	65	0.010	2.8	4	5175	205	2.5
5	4	65	0.015	3.5	5	4140	250	4.5
6	4	65	0.020	4.2	6	3450	275	7.0
8	4	65	0.025	8.0	8	2585	260	16.5
10	4	65	0.030	10.0	10	2070	250	25.0
12	4	65	0.040	12.0	12	1725	275	39.5

3	4	125	0.010	3.0	3	13265	530	5.0
4	4	125	0.015	4.0	4	9945	595	9.5
5	4	125	0.025	5.0	5	7960	795	20.0
6	4	125	0.025	6.0	6	6630	665	24.0
8	4	125	0.035	8.0	8	4975	695	44.5
10	4	125	0.040	10.0	10	3980	635	63.5
12	4	125	0.050	12.0	12	3315	665	96.0

Frese toriche NF-RNV

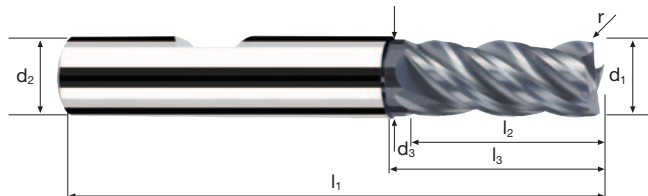
A taglienti lisci, esecuzione normale con scarico corto



HM λ 40°
 γ 6°



Vario



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300

Rm
> 1300

Rm
> 1500

Rm
> 1700

Rm
> 1900

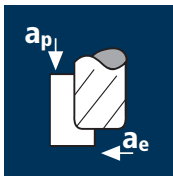
Inox
Stainless

Ti
Titanium

GG(G)
Tool Steel
Nickel-Alloys

Esempio: N° Ordine										POLYCHROM	
										P45319	
										P45219	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.178	3	6	2.8	57	8	14	0.2	4.5°	4	●	
.218	4	6	3.7	57	11	16	0.2	3.0°	4	●	
.258	5	6	4.6	57	13	18	0.2	1.5°	4	●	
.297	6	6	5.5	57	13	20	0.2	0.0°	4	●	
.385	8	8	7.4	63	19	26	0.2	0.0°	4	●	
.445	10	10	9.2	72	22	31	0.2	0.0°	4	●	
.496	12	12	11.0	83	26	37	0.2	0.0°	4	●	
.180	3	6	2.8	57	8	14	0.5	4.5°	4	●	
.220	4	6	3.7	57	11	16	0.5	3.0°	4	●	
.260	5	6	4.6	57	13	18	0.5	1.5°	4	●	
.300	6	6	5.5	57	13	20	0.5	0.0°	4	●	
.388	8	8	7.4	63	19	26	0.5	0.0°	4	●	
.448	10	10	9.2	72	22	31	0.5	0.0°	4	●	
.498	12	12	11.0	83	26	37	0.5	0.0°	4	●	
.301	6	6	5.5	57	13	20	0.8	0.0°	4	●	
.389	8	8	7.4	63	19	26	0.8	0.0°	4	●	
.449	10	10	9.2	72	22	31	0.8	0.0°	4	●	
.499	12	12	11.0	83	26	37	0.8	0.0°	4	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Ghisa
(griglia / sferoidale)

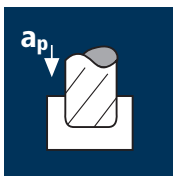
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	170	0.030	9.0	2.4	9020	1080	23.5
8	4	170	0.040	12.0	3.2	6765	1080	41.5
10	4	170	0.050	15.0	4.0	5410	1080	65.0
12	4	170	0.060	18.0	4.8	4510	1080	93.5
16	4	170	0.075	24.0	6.4	3380	1015	156.0
20	4	170	0.095	30.0	8.0	2705	1030	247.0

6	4	120	0.030	9.0	2.4	6365	765	16.5
8	4	120	0.040	12.0	3.2	4775	765	29.5
10	4	120	0.050	15.0	4.0	3820	765	46.0
12	4	120	0.060	18.0	4.8	3185	765	66.0
16	4	120	0.075	24.0	6.4	2385	715	110.0
20	4	120	0.095	30.0	8.0	1910	725	174.0

6	4	80	0.025	9.0	2.4	4245	425	9.0
8	4	80	0.030	12.0	3.2	3185	380	14.5
10	4	80	0.040	15.0	4.0	2545	405	24.5
12	4	80	0.050	18.0	4.8	2120	425	36.5
16	4	80	0.060	24.0	6.4	1590	380	58.5
20	4	80	0.075	30.0	8.0	1275	385	92.5

6	4	150	0.035	9.0	2.4	7960	1115	24.0
8	4	150	0.045	12.0	3.2	5970	1075	41.5
10	4	150	0.055	15.0	4.0	4775	1050	63.0
12	4	150	0.065	18.0	4.8	3980	1035	89.5
16	4	150	0.085	24.0	6.4	2985	1015	156.0
20	4	150	0.105	30.0	8.0	2385	1000	240.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Ghisa
(griglia / sferoidale)

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	135	0.025	6.0	6	7160	715	25.5
8	4	135	0.030	8.0	8	5370	645	41.5
10	4	135	0.040	10.0	10	4295	685	68.5
12	4	135	0.045	12.0	12	3580	645	93.0
16	4	135	0.055	8.0	16	2685	590	75.5
20	4	135	0.070	10.0	20	2150	600	120.0

6	4	95	0.025	6.0	6	5040	505	18.0
8	4	95	0.030	8.0	8	3780	455	29.0
10	4	95	0.040	10.0	10	3025	485	48.5
12	4	95	0.045	12.0	12	2520	455	65.5
16	4	95	0.055	8.0	16	1890	415	53.0
20	4	95	0.070	10.0	20	1510	425	85.0

6	4	65	0.020	4.2	6	3450	275	7.0
8	4	65	0.025	8.0	8	2585	260	16.5
10	4	65	0.030	10.0	10	2070	250	25.0
12	4	65	0.040	12.0	12	1725	275	39.5
16	4	65	0.045	8.0	16	1295	235	30.0
20	4	65	0.055	10.0	20	1035	230	46.0

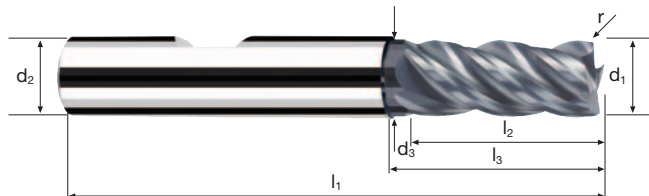
6	4	125	0.025	6.0	6	6630	665	24.0
8	4	125	0.035	8.0	8	4975	695	44.5
10	4	125	0.040	10.0	10	3980	635	63.5
12	4	125	0.050	12.0	12	3315	665	96.0
16	4	125	0.065	8.0	16	2485	645	82.5
20	4	125	0.080	10.0	20	1990	635	127.0

Frese toriche NF-RNV

A taglienti lisci, esecuzione normale con scarico corto



HM λ 40°
 γ 6°



Sgrossatura

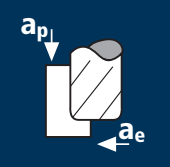









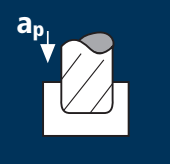







Finitura



Rm < 850 Rm 850-1100 Rm 1100-1300 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel Nickel-Alloys

Esempio: N° Ordine										POLYCHROM	
										P45319	
										P45219	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.302	6	6	5.5	57	13	20	1.0	0.0°	4	●	
.391	8	8	7.4	63	19	26	1.0	0.0°	4	●	
.450	10	10	9.2	72	22	31	1.0	0.0°	4	●	
.501	12	12	11.0	83	26	37	1.0	0.0°	4	●	
.608	16	16	15.0	92	32	43	1.0	0.0°	4	●	
.680	20	20	19.0	104	38	53	1.0	0.0°	4	●	
.453	10	10	9.2	72	22	31	1.5	0.0°	4	●	
.503	12	12	11.0	83	26	37	1.5	0.0°	4	●	
.610	16	16	15.0	92	32	43	1.5	0.0°	4	●	
.505	12	12	11.0	83	26	37	2.0	0.0°	4	●	
.611	16	16	15.0	92	32	43	2.0	0.0°	4	●	
.683	20	20	19.0	104	38	53	2.0	0.0°	4	●	

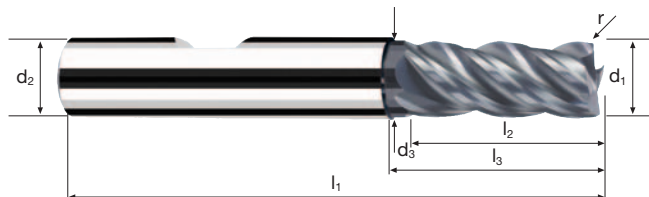
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  P  P	10	4	170	0.050	15.0	4.0	5410	1080	65.0
		12	4	170	0.060	18.0	4.8	4510	1080	93.5
		16	4	170	0.075	24.0	6.4	3380	1015	156.0
		20	4	170	0.095	30.0	8.0	2705	1030	247.0
Acciaio 850 - 1100 N/mm ²  P  P	10	4	120	0.050	15.0	4.0	3820	765	46.0	
	12	4	120	0.060	18.0	4.8	3185	765	66.0	
	16	4	120	0.075	24.0	6.4	2385	715	110.0	
	20	4	120	0.095	30.0	8.0	1910	725	174.0	
Acciaio inossidabile [Cr-Ni/1.4301]  P	10	4	80	0.040	15.0	4.0	2545	405	24.5	
	12	4	80	0.050	18.0	4.8	2120	425	36.5	
	16	4	80	0.060	24.0	6.4	1590	380	58.5	
	20	4	80	0.075	30.0	8.0	1275	385	92.5	
Ghisa (griglia / sferoidale)  P  P	10	4	150	0.055	15.0	4.0	4775	1050	63.0	
	12	4	150	0.065	18.0	4.8	3980	1035	89.5	
	16	4	150	0.085	24.0	6.4	2985	1015	156.0	
	20	4	150	0.105	30.0	8.0	2385	1000	240.0	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  P  P	10	4	135	0.040	10.0	10	4295	685	68.5
		12	4	135	0.045	12.0	12	3580	645	93.0
		16	4	135	0.055	8.0	16	2685	590	75.5
		20	4	135	0.070	10.0	20	2150	600	120.0
Acciaio 850 - 1100 N/mm ²  P  P	10	4	95	0.040	10.0	10	3025	485	48.5	
	12	4	95	0.045	12.0	12	2520	455	65.5	
	16	4	95	0.055	8.0	16	1890	415	53.0	
	20	4	95	0.070	10.0	20	1510	425	85.0	
Acciaio inossidabile [Cr-Ni/1.4301]  P	10	4	65	0.030	10.0	10	2070	250	25.0	
	12	4	65	0.040	12.0	12	1725	275	39.5	
	16	4	65	0.045	8.0	16	1295	235	30.0	
	20	4	65	0.055	10.0	20	1035	230	46.0	
Ghisa (griglia / sferoidale)  P  P	10	4	125	0.040	10.0	10	3980	635	63.5	
	12	4	125	0.050	12.0	12	3315	665	96.0	
	16	4	125	0.065	8.0	16	2485	645	82.5	
	20	4	125	0.080	10.0	20	1990	635	127.0	

Frese toriche NF-RNV

A taglienti lisci, esecuzione normale con scarico corto

HM	λ 40° γ 6°
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Sgrossatura



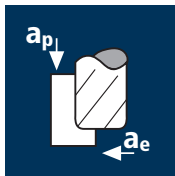
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys
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Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z	POLYCHROM	
										P45319	P45219
.457	10	10	9.2	72	22	31	2.5	0.0°	4		●
.506	12	12	11.0	83	26	37	2.5	0.0°	4		●
.612	16	16	15.0	92	32	43	2.5	0.0°	4		●
.684	20	20	19.0	104	38	53	2.5	0.0°	4		●
.508	12	12	11.0	83	26	37	4.0	0.0°	4		●
.614	16	16	15.0	92	32	43	4.0	0.0°	4		●
.686	20	20	19.0	104	38	53	4.0	0.0°	4		●

Applicazione



Materiale

Acciaio
1100 - 1300 N/mm²

Acciaio da
utensile temprato
42 - 48 HRC

Acciaio da
utensile temprato
48 - 52 HRC

Acciaio da
utensile temprato
52 - 56 HRC

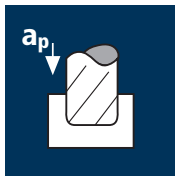
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	150	0.050	6	3.6	7960	1590	34.5
8	4	150	0.065	8	4.8	5970	1550	59.5
10	4	150	0.085	10	6.0	4775	1625	97.5
12	4	150	0.100	12	7.2	3980	1590	137.5
16	4	150	0.135	16	6.4	2985	1610	165.0

6	4	120	0.035	6	3.6	6365	890	19.0
8	4	120	0.045	8	4.8	4775	860	33.0
10	4	120	0.055	10	6.0	3820	840	50.5
12	4	120	0.065	12	7.2	3185	830	71.5
16	4	120	0.090	16	6.4	2385	860	88.0

6	4	80	0.025	6	3.6	4245	425	9.0
8	4	80	0.035	8	4.8	3185	445	17.0
10	4	80	0.045	10	6.0	2545	460	27.5
12	4	80	0.055	12	7.2	2120	465	40.0
16	4	80	0.075	16	6.4	1590	475	48.5

6	4	60	0.020	6	3.6	3185	255	5.5
8	4	60	0.025	8	4.8	2385	240	9.0
10	4	60	0.035	10	6.0	1910	265	16.0
12	4	60	0.040	12	7.2	1590	255	22.0
16	4	60	0.055	16	6.4	1195	265	27.0

Applicazione



Materiale

Acciaio
1100 - 1300 N/mm²

Acciaio da
utensile temprato
42 - 48 HRC

Acciaio da
utensile temprato
48 - 52 HRC

Acciaio da
utensile temprato
52 - 56 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	120	0.040	3.0	6	6365	1020	18.5
8	4	120	0.050	4.0	8	4775	955	30.5
10	4	120	0.070	5.0	10	3820	1070	53.5
12	4	120	0.080	6.0	12	3185	1020	73.5
16	4	120	0.110	4.0	16	2385	1050	67.0

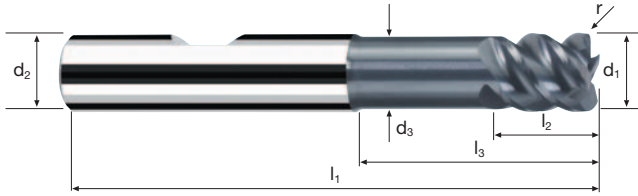
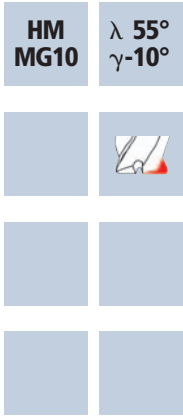
6	4	100	0.030	3.0	6	5305	635	11.5
8	4	100	0.035	4.0	8	3980	555	18.0
10	4	100	0.045	5.0	10	3185	575	29.0
12	4	100	0.050	6.0	12	2655	530	38.0
16	4	100	0.070	4.0	16	1990	555	35.5

6	4	60	0.020	3.0	6	3185	255	4.5
8	4	60	0.030	4.0	8	2385	285	9.0
10	4	60	0.035	5.0	10	1910	265	13.5
12	4	60	0.045	6.0	12	1590	285	20.5
16	4	60	0.060	4.0	16	1195	285	18.0

6	4	40	0.015	3.0	6	2120	125	2.5
8	4	40	0.020	4.0	8	1590	125	4.0
10	4	40	0.030	5.0	10	1275	155	8.0
12	4	40	0.030	6.0	12	1060	125	9.0
16	4	40	0.045	4.0	16	795	145	9.5

Frese toriche HX-R

A taglienti lisci, esecuzione normale con scarico



Sgrossatura

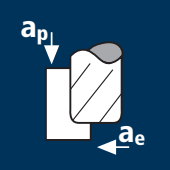







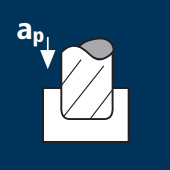





Finitura



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)
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									POLYCHROM	DURO-S	
Esempio: N° Ordine										P5353	D5353
Rivestimento: P Articolo: 5353 Codice-ø: .300									P5253	D5253	
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	z			
.300	6	6	5.5	57	7	20	1.0	4	•	•	
.391	8	8	7.4	63	9	26	1.0	4	•	•	
.450	10	10	9.2	72	11	31	1.0	4	•	•	
.501	12	12	11.0	83	13	37	1.0	4	•	•	
.610	16	16	15.0	92	17	43	1.0	4	•	•	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio 1100 - 1300 N/mm ²  D  D	8	4	150	0.065	8	4.8	5970	1550	59.5
		10	4	150	0.085	10	6.0	4775	1625	97.5
		12	4	150	0.100	12	7.2	3980	1590	137.5
		16	4	150	0.135	16	6.4	2985	1610	165.0
Acciaio da utensile temprato 42 - 48 HRC  D	8	4	120	0.045	8	4.8	4775	860	33.0	
	10	4	120	0.055	10	6.0	3820	840	50.5	
	12	4	120	0.065	12	7.2	3185	830	71.5	
	16	4	120	0.090	16	6.4	2385	860	88.0	
Acciaio da utensile temprato 48 - 52 HRC  D	8	4	80	0.035	8	4.8	3185	445	17.0	
	10	4	80	0.045	10	6.0	2545	460	27.5	
	12	4	80	0.055	12	7.2	2120	465	40.0	
	16	4	80	0.075	16	6.4	1590	475	48.5	
Acciaio da utensile temprato 52 - 56 HRC  D	8	4	60	0.025	8	4.8	2385	240	9.0	
	10	4	60	0.035	10	6.0	1910	265	16.0	
	12	4	60	0.040	12	7.2	1590	255	22.0	
	16	4	60	0.055	16	6.4	1195	265	27.0	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio 1100 - 1300 N/mm ²  D  D	8	4	120	0.050	4.0	8	4775	955	30.5
		10	4	120	0.070	5.0	10	3820	1070	53.5
		12	4	120	0.080	6.0	12	3185	1020	73.5
		16	4	120	0.110	4.0	16	2385	1050	67.0
Acciaio da utensile temprato 42 - 48 HRC  D	8	4	100	0.035	4.0	8	3980	555	18.0	
	10	4	100	0.045	5.0	10	3185	575	29.0	
	12	4	100	0.050	6.0	12	2655	530	38.0	
	16	4	100	0.070	4.0	16	1990	555	35.5	
Acciaio da utensile temprato 48 - 52 HRC  D	8	4	60	0.030	4.0	8	2385	285	9.0	
	10	4	60	0.035	5.0	10	1910	265	13.5	
	12	4	60	0.045	6.0	12	1590	285	20.5	
	16	4	60	0.060	4.0	16	1195	285	18.0	
Acciaio da utensile temprato 52 - 56 HRC  D	8	4	40	0.020	4.0	8	1590	125	4.0	
	10	4	40	0.030	5.0	10	1275	155	8.0	
	12	4	40	0.030	6.0	12	1060	125	9.0	
	16	4	40	0.045	4.0	16	795	145	9.5	

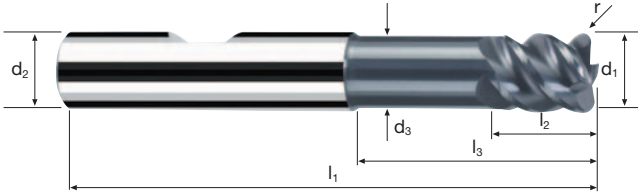
Frese toriche HX-R

A taglienti lisci, esecuzione normale con scarico



HM
MG10

λ **55°**
 γ **-10°**



Sgrossatura



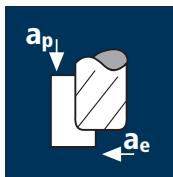
Finitura



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	GG(G)
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Esempio: N° Ordine	Rivestimento			Articolo			Codice-ø			DURO-S	
	D	5354	.391							D5354	D5254
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	z			
.391	8	8	7.4	63	9	26	1.5	4	●		
.450	10	10	9.2	72	11	31	1.5	4	●		
.501	12	12	11.0	83	13	37	1.5	4	●		
.610	16	16	15.0	92	17	43	1.5	4	●		

Applicazione




Materiale

Acciaio
1100 - 1300 N/mm²


 **D**

 **D**


Acciaio da
utensile temprato
42 - 48 HRC

 **D**

Acciaio da
utensile temprato
48 - 52 HRC

 **D**

Acciaio da
utensile temprato
52 - 56 HRC

 **D**

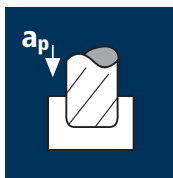
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	150	0.050	6	3.6	7960	1590	34.5
8	4	150	0.065	8	4.8	5970	1550	59.5
10	4	150	0.085	10	6.0	4775	1625	97.5
12	4	150	0.100	12	7.2	3980	1590	137.5
16	4	150	0.135	16	6.4	2985	1610	165.0

6	4	120	0.035	6	3.6	6365	890	19.0
8	4	120	0.045	8	4.8	4775	860	33.0
10	4	120	0.055	10	6.0	3820	840	50.5
12	4	120	0.065	12	7.2	3185	830	71.5
16	4	120	0.090	16	6.4	2385	860	88.0

6	4	80	0.025	6	3.6	4245	425	9.0
8	4	80	0.035	8	4.8	3185	445	17.0
10	4	80	0.045	10	6.0	2545	460	27.5
12	4	80	0.055	12	7.2	2120	465	40.0
16	4	80	0.075	16	6.4	1590	475	48.5

6	4	60	0.020	6	3.6	3185	255	5.5
8	4	60	0.025	8	4.8	2385	240	9.0
10	4	60	0.035	10	6.0	1910	265	16.0
12	4	60	0.040	12	7.2	1590	255	22.0
16	4	60	0.055	16	6.4	1195	265	27.0

Applicazione




Materiale

Acciaio
1100 - 1300 N/mm²


 **D**

 **D**


Acciaio da
utensile temprato
42 - 48 HRC

 **D**

Acciaio da
utensile temprato
48 - 52 HRC

 **D**

Acciaio da
utensile temprato
52 - 56 HRC

 **D**

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	120	0.040	3.0	6	6365	1020	18.5
8	4	120	0.050	4.0	8	4775	955	30.5
10	4	120	0.070	5.0	10	3820	1070	53.5
12	4	120	0.080	6.0	12	3185	1020	73.5
16	4	120	0.110	4.0	16	2385	1050	67.0

6	4	100	0.030	3.0	6	5305	635	11.5
8	4	100	0.035	4.0	8	3980	555	18.0
10	4	100	0.045	5.0	10	3185	575	29.0
12	4	100	0.050	6.0	12	2655	530	38.0
16	4	100	0.070	4.0	16	1990	555	35.5

6	4	60	0.020	3.0	6	3185	255	4.5
8	4	60	0.030	4.0	8	2385	285	9.0
10	4	60	0.035	5.0	10	1910	265	13.5
12	4	60	0.045	6.0	12	1590	285	20.5
16	4	60	0.060	4.0	16	1195	285	18.0

6	4	40	0.015	3.0	6	2120	125	2.5
8	4	40	0.020	4.0	8	1590	125	4.0
10	4	40	0.030	5.0	10	1275	155	8.0
12	4	40	0.030	6.0	12	1060	125	9.0
16	4	40	0.045	4.0	16	795	145	9.5

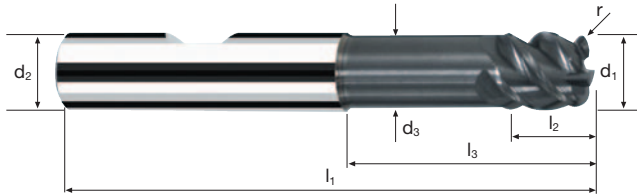
Frese toriche HX-R

A taglienti lisci, esecuzione normale con scarico



HM
MG10

λ 55°
 γ -10°



Sgrossatura



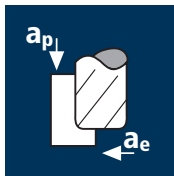
Finitura



Rm 1100-1300 **Rm** 1300-1500 **HRC** 48-56 **HRC** 56-60 **HRC** > 60 **Ti** Titanium **GG(G)**

Esempio: N° Ordine	Rivestimento			Articolo			Codice-ø			z	DURO-S	
	D	5356	.300	l1	l2	l3	r	0/+0.03				
.300	d1 e8	d2 h6	d3	57	7	20	1.5	0/+0.03	4		●	
.391	8	8	7.4	63	9	26	2.0	0/+0.03	4		●	
.450	10	10	9.2	72	11	31	2.5	0/+0.03	4		●	
.501	12	12	11.0	83	13	37	3.0	0/+0.03	4		●	
.605	16	16	15.0	92	17	43	2.5	0/+0.03	4		●	
.610	16	16	15.0	92	17	43	3.5	0/+0.03	4		●	
.615	16	16	15.0	92	17	43	4.0	0/+0.03	4		●	

Applicazione



Materiale

Acciaio
1100 - 1300 N/mm²

Acciaio da
utensile temprato
42 - 48 HRC

Acciaio da
utensile temprato
48 - 52 HRC

Acciaio da
utensile temprato
52 - 56 HRC

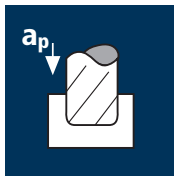
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	120	0.050	6	2.4	6365	1275	18.5
8	4	120	0.065	8	3.2	4775	1240	31.5
10	4	120	0.085	10	4.0	3820	1300	52.0
12	4	120	0.100	12	4.8	3185	1275	73.5
16	4	120	0.135	16	3.2	2385	1290	66.0

6	4	80	0.035	6	2.4	4245	595	8.5
8	4	80	0.045	8	3.2	3185	575	14.5
10	4	80	0.055	10	4.0	2545	560	22.5
12	4	80	0.065	12	4.8	2120	550	31.5
16	4	80	0.090	16	3.2	1590	570	29.0

6	4	60	0.025	6	2.4	3185	320	4.5
8	4	60	0.035	8	3.2	2385	335	8.5
10	4	60	0.045	10	4.0	1910	345	14.0
12	4	60	0.055	12	4.8	1590	350	20.0
16	4	60	0.075	16	3.2	1195	360	18.5

6	4	30	0.020	6	2.4	1590	125	2.0
8	4	30	0.025	8	3.2	1195	120	3.0
10	4	30	0.035	10	4.0	955	135	5.5
12	4	30	0.040	12	4.8	795	125	7.0
16	4	30	0.055	16	3.2	595	130	6.5

Applicazione



Materiale

Acciaio
1100 - 1300 N/mm²

Acciaio da
utensile temprato
42 - 48 HRC

Acciaio da
utensile temprato
48 - 52 HRC

Acciaio da
utensile temprato
52 - 56 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	100	0.040	3.0	6	5305	850	15.5
8	4	100	0.050	4.0	8	3980	795	25.5
10	4	100	0.070	5.0	10	3185	890	44.5
12	4	100	0.080	6.0	12	2655	850	61.0
16	4	100	0.110	4.0	16	1990	875	56.0

6	4	60	0.030	3.0	6	3185	380	7.0
8	4	60	0.035	4.0	8	2385	335	10.5
10	4	60	0.045	5.0	10	1910	345	17.5
12	4	60	0.050	6.0	12	1590	320	23.0
16	4	60	0.070	4.0	16	1195	335	21.5

6	4	40	0.020	3.0	6	2120	170	3.0
8	4	40	0.030	4.0	8	1590	190	6.0
10	4	40	0.035	5.0	10	1275	180	9.0
12	4	40	0.045	6.0	12	1060	190	13.5
16	4	40	0.060	4.0	16	795	190	12.0

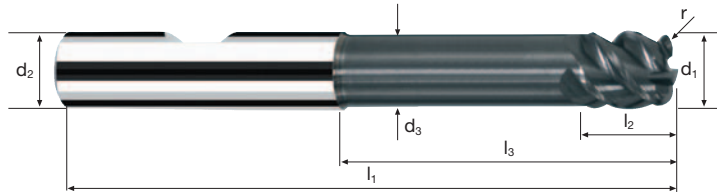
6	4	20	0.015	3.0	6	1060	65	1.0
8	4	20	0.020	4.0	8	795	65	2.0
10	4	20	0.030	5.0	10	635	75	4.0
12	4	20	0.030	6.0	12	530	65	4.5
16	4	20	0.045	4.0	16	400	70	4.5

Frese toriche HX-R

A taglienti lisci, esecuzione medio-lunga con scarico



HM
MG10 λ **55°**
 γ **-10°**



Sgrossatura



Finitura



Rm
1100-1300

Rm
1300-1500

HRC
48-56

HRC
56-60

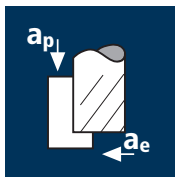
HRC
> 60

Ti
Titanium

GG(G)

Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø				POLYCHROM		DURO-S	
	P		5357		.300				P5357	D5357		
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	z				
.300	6	6	5.5	70	7	33	1.5	4	●	●		
.391	8	8	7.4	80	9	43	2.0	4	●	●		
.450	10	10	9.2	84	11	43	2.5	4	●	●		
.501	12	12	11.0	97	13	51	3.0	4	●	●		
.610	16	16	15.0	115	17	66	3.5	4	●	●		

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

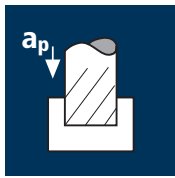
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	180	0.025	9	3.6	9550	955	31.0
8	4	180	0.030	12	4.8	7160	860	49.5
10	4	180	0.050	15	6.0	5730	1145	103.0
12	4	180	0.055	18	7.2	4775	1050	136.0
16	4	180	0.055	24	9.6	3580	790	182.0
16	6	180	0.050	24	9.6	3580	1075	247.5
20	4	180	0.060	30	12.0	2865	690	248.5
20	6	180	0.055	30	12.0	2865	945	340.0

6	4	150	0.025	9	3.6	7960	795	26.0
8	4	150	0.030	12	4.8	5970	715	41.0
10	4	150	0.050	15	6.0	4775	955	86.0
12	4	150	0.055	18	7.2	3980	875	113.5
16	4	150	0.055	24	9.6	2985	655	151.0
16	6	150	0.050	24	9.6	2985	895	206.0
20	4	150	0.060	30	12.0	2385	570	205.0
20	6	150	0.055	30	12.0	2385	785	282.5

6	4	120	0.025	9	3.6	6365	635	20.5
8	4	120	0.030	12	4.8	4775	575	33.0
10	4	120	0.050	15	6.0	3820	765	69.0
12	4	120	0.055	18	7.2	3185	700	90.5
16	4	120	0.055	24	9.6	2385	525	121.0
16	6	120	0.050	24	9.6	2385	715	164.5
20	4	120	0.060	30	12.0	1910	460	165.5
20	6	120	0.055	30	12.0	1910	630	227.0

6	4	80	0.025	9	3.6	4245	425	14.0
8	4	80	0.030	12	4.8	3185	380	22.0
10	4	80	0.050	15	6.0	2545	510	46.0
12	4	80	0.055	18	7.2	2120	465	60.5
16	4	80	0.055	24	9.6	1590	350	80.5
16	6	80	0.050	24	9.6	1590	475	109.5
20	4	80	0.060	30	12.0	1275	305	110.0
20	6	80	0.055	30	12.0	1275	420	151.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	150	0.025	9	6	7960	795	43.0
8	4	150	0.030	12	8	5970	715	68.5
10	4	150	0.050	15	10	4775	955	143.5
12	4	150	0.055	18	12	3980	875	189.0
16	4	150	0.055	24	16	2985	655	251.5
20	4	150	0.060	30	20	2385	570	342.0

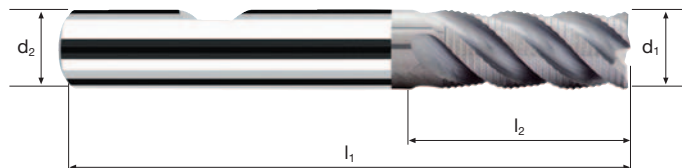
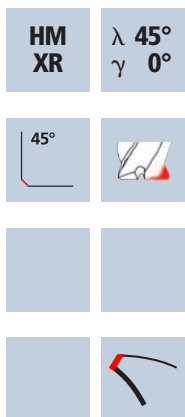
6	4	100	0.020	9	6	5305	425	23.0
8	4	100	0.025	12	8	3980	400	38.5
10	4	100	0.030	15	10	3185	380	57.0
12	4	100	0.040	18	12	2655	425	92.0
16	4	100	0.050	24	16	1990	400	153.5
20	4	100	0.055	30	20	1590	350	210.0

6	4	80	0.020	9	6	4245	340	18.5
8	4	80	0.025	12	8	3185	320	30.5
10	4	80	0.030	15	10	2545	305	46.0
12	4	80	0.040	18	12	2120	340	73.5
16	4	80	0.050	24	16	1590	320	123.0
20	4	80	0.055	30	20	1275	280	168.0

6	4	60	0.020	9	6	3185	255	14.0
8	4	60	0.025	12	8	2385	240	23.0
10	4	60	0.030	15	10	1910	230	34.5
12	4	60	0.040	18	12	1590	255	55.0
16	4	60	0.050	24	16	1195	240	92.0
20	4	60	0.055	30	20	955	210	126.0

Frese cilindriche NX-FP

Profilata, esecuzione normale



Sgrossatura



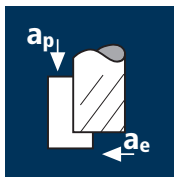
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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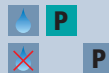
Esempio: N° Ordine									POLYCHROM
		Rivestimento P	Articolo 5379	Codice-ø .300					P5379
Ø Code	d1 e8	d2 h6	l1	l2	45°	z			P5279
.300	6	6	57	13	0.35	4			●
.391	8	8	63	19	0.45	4			●
.450	10	10	72	22	0.60	4			●
.501	12	12	83	26	0.60	4			●
.608	16	16	92	32	0.70	4			●
.610	16	16	92	32	0.70	6			●
.680	20	20	104	38	0.70	4			●
.682	20	20	104	38	0.70	6			●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	180	0.025	9	3.3	9550	955	28.5
8	4	180	0.030	12	4.4	7160	860	45.5
10	4	180	0.050	15	5.5	5730	1145	94.5
12	4	180	0.055	18	6.6	4775	1050	124.5
16	4	180	0.055	24	8.8	3580	790	167.0
16	6	180	0.050	24	8.8	3580	1075	227.0
20	4	180	0.060	30	11.0	2865	690	227.5
20	6	180	0.055	30	11.0	2865	945	312.0

6	4	150	0.025	9	3.3	7960	795	23.5
8	4	150	0.030	12	4.4	5970	715	38.0
10	4	150	0.050	15	5.5	4775	955	79.0
12	4	150	0.055	18	6.6	3980	875	104.0
16	4	150	0.055	24	8.8	2985	655	138.5
16	6	150	0.050	24	8.8	2985	895	189.0
20	4	150	0.060	30	11.0	2385	570	188.0
20	6	150	0.055	30	11.0	2385	785	259.0

6	4	120	0.025	9	3.3	6365	635	19.0
8	4	120	0.030	12	4.4	4775	575	30.5
10	4	120	0.050	15	5.5	3820	765	63.0
12	4	120	0.055	18	6.6	3185	700	83.0
16	4	120	0.055	24	8.8	2385	525	111.0
16	6	120	0.050	24	8.8	2385	715	151.0
20	4	120	0.060	30	11.0	1910	460	152.0
20	6	120	0.055	30	11.0	1910	630	208.0

6	4	80	0.025	9	3.3	4245	425	12.5
8	4	80	0.030	12	4.4	3185	380	20.0
10	4	80	0.050	15	5.5	2545	510	42.0
12	4	80	0.055	18	6.6	2120	465	55.0
16	4	80	0.055	24	8.8	1590	350	74.0
16	6	80	0.050	24	8.8	1590	475	100.5
20	4	80	0.060	30	11.0	1275	305	100.5
20	6	80	0.055	30	11.0	1275	420	138.5

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	150	0.025	8.4	6	7960	795	40.0
8	4	150	0.030	11.2	8	5970	715	64.0
10	4	150	0.050	14.0	10	4775	955	133.5
12	4	150	0.055	16.8	12	3980	875	176.5
16	4	150	0.055	22.4	16	2985	655	235.0
20	4	150	0.060	28.0	20	2385	570	319.0

6	4	100	0.020	8.4	6	5305	425	21.5
8	4	100	0.025	11.2	8	3980	400	36.0
10	4	100	0.030	14.0	10	3185	380	53.0
12	4	100	0.040	16.8	12	2655	425	85.5
16	4	100	0.050	22.4	16	1990	400	143.5
20	4	100	0.055	28.0	20	1590	350	196.0

6	4	80	0.020	8.4	6	4245	340	17.0
8	4	80	0.025	11.2	8	3185	320	28.5
10	4	80	0.030	14.0	10	2545	305	42.5
12	4	80	0.040	16.8	12	2120	340	68.5
16	4	80	0.050	22.4	16	1590	320	114.5
20	4	80	0.055	28.0	20	1275	280	157.0

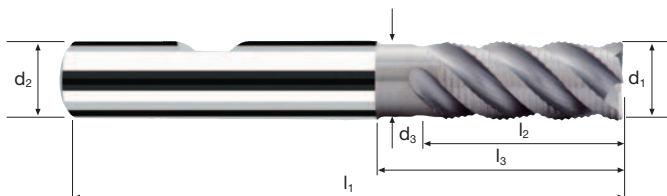
6	4	60	0.020	8.4	6	3185	255	13.0
8	4	60	0.025	11.2	8	2385	240	21.5
10	4	60	0.030	14.0	10	1910	230	32.0
12	4	60	0.040	16.8	12	1590	255	51.5
16	4	60	0.050	22.4	16	1195	240	86.0
20	4	60	0.055	28.0	20	955	210	117.5

Frese cilindriche NX-FP

Profilata, esecuzione normale con scarico corto



HM
XR λ 45°
 γ 0°



Sgrossatura



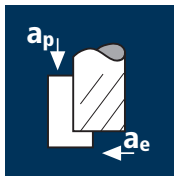
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 15379	Codice-Ø .300						POLYCHROM	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z			
.300	6	6	5.5	57	13	20	0.35	4	●		
.391	8	8	7.4	63	19	26	0.45	4	●		
.450	10	10	9.2	72	22	31	0.60	4	●		
.501	12	12	11.0	83	26	37	0.60	4	●		
.608	16	16	15.0	92	32	43	0.70	4	●		
.610	16	16	15.0	92	32	43	0.70	6	●		
.680	20	20	19.0	104	38	53	0.70	4	●		
.682	20	20	19.0	104	38	53	0.70	6	●		

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

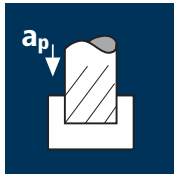
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	200	0.020	9.0	2.7	10610	850	20.5
8	4	200	0.030	12.0	3.6	7960	955	41.5
10	4	200	0.040	15.0	4.5	6365	1020	69.0
12	4	200	0.045	18.0	5.4	5305	955	93.0
16	4	200	0.050	24.0	7.2	3980	795	137.5
20	4	200	0.055	30.0	9.0	3185	700	189.0

6	4	160	0.020	9.0	2.7	8490	680	16.5
8	4	160	0.030	12.0	3.6	6365	765	33.0
10	4	160	0.040	15.0	4.5	5095	815	55.0
12	4	160	0.045	18.0	5.4	4245	765	74.5
16	4	160	0.050	24.0	7.2	3185	635	109.5
20	4	160	0.055	30.0	9.0	2545	560	151.0

6	4	130	0.020	9.0	2.7	6895	550	13.5
8	4	130	0.030	12.0	3.6	5175	620	27.0
10	4	130	0.040	15.0	4.5	4140	660	44.5
12	4	130	0.045	18.0	5.4	3450	620	60.5
16	4	130	0.050	24.0	7.2	2585	515	89.0
20	4	130	0.055	30.0	9.0	2070	455	123.0

6	4	90	0.020	9.0	2.7	4775	380	9.0
8	4	90	0.030	12.0	3.6	3580	430	18.5
10	4	90	0.040	15.0	4.5	2865	460	31.0
12	4	90	0.045	18.0	5.4	2385	430	42.0
16	4	90	0.050	24.0	7.2	1790	360	62.0
20	4	90	0.055	30.0	9.0	1430	315	85.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	160	0.020	6.0	6	8490	680	24.5
8	4	160	0.025	8.0	8	6365	635	40.5
10	4	160	0.035	10.0	10	5095	715	71.5
12	4	160	0.040	12.0	12	4245	680	98.0
16	4	160	0.045	16.0	16	3185	575	147.0
20	4	160	0.050	20.0	20	2545	510	204.0

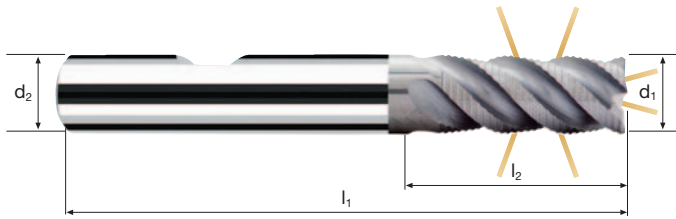
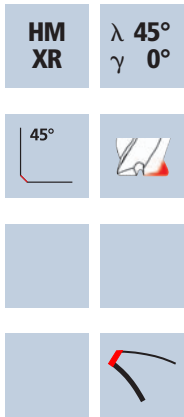
6	4	110	0.020	5.4	6	5835	465	15.0
8	4	110	0.025	7.2	8	4375	440	25.5
10	4	110	0.035	9.0	10	3500	490	44.0
12	4	110	0.040	10.8	12	2920	465	60.5
16	4	110	0.045	14.4	16	2190	395	91.0
20	4	110	0.050	18.0	20	1750	350	126.0

6	4	90	0.020	5.4	6	4775	380	12.5
8	4	90	0.025	7.2	8	3580	360	20.5
10	4	90	0.035	9.0	10	2865	400	36.0
12	4	90	0.040	10.8	12	2385	380	49.0
16	4	90	0.045	14.4	16	1790	320	73.5
20	4	90	0.050	18.0	20	1430	285	102.5

6	4	70	0.020	5.4	6	3715	295	9.5
8	4	70	0.025	7.2	8	2785	280	16.0
10	4	70	0.035	9.0	10	2230	310	28.0
12	4	70	0.040	10.8	12	1855	295	38.0
16	4	70	0.045	14.4	16	1395	250	57.5
20	4	70	0.050	18.0	20	1115	225	81.0

Frese cilindriche NX-FP

Profilata, versione normale, con canale di aerazione integrato



Sgrossatura

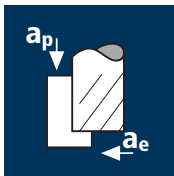


Finitura



Esempio: N° Ordine								POLYCHROM	
Rivestimento Articolo Codice-ø								P15331	
P 15331 .300									
Ø Code	d1 e8	d2 h6	l1	l2	45°	z			
.300	6	6	57	13	0.35	4	●		
.391	8	8	63	19	0.45	4	●		
.450	10	10	72	22	0.60	4	●		
.501	12	12	83	26	0.60	4	●		
.608	16	16	92	32	0.70	4	●		
.680	20	20	104	38	0.70	4	●		

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	60	0.015	10.8	3.6	3185	190	7.5
8	4	60	0.020	14.4	4.8	2385	190	13.0
10	4	60	0.025	18.0	6.0	1910	190	20.5
12	4	60	0.030	21.6	7.2	1590	190	29.5
16	4	60	0.035	28.8	9.6	1195	165	45.5
20	4	60	0.045	36.0	12.0	955	170	73.5

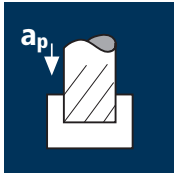
Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

6	4	55	0.015	10.8	3.6	2920	175	7.0
8	4	55	0.020	14.4	4.8	2190	175	12.0
10	4	55	0.025	18.0	6.0	1750	175	19.0
12	4	55	0.030	21.6	7.2	1460	175	27.0
16	4	55	0.035	28.8	9.6	1095	155	43.0
20	4	55	0.045	36.0	12.0	875	160	69.0

Acciaio resistente al calore
Acciaio duplex [1.4462]
[17-4 PH]

6	4	25	0.010	10.8	3.6	1325	55	2.0
8	4	25	0.015	14.4	4.8	995	60	4.0
10	4	25	0.020	18.0	6.0	795	65	7.0
12	4	25	0.025	21.6	7.2	665	65	10.0
16	4	25	0.030	28.8	9.6	495	60	16.5
20	4	25	0.040	36.0	12.0	400	65	28.0

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	50	0.015	9	6	2655	160	8.5
8	4	50	0.020	12	8	1990	160	15.5
10	4	50	0.020	15	10	1590	125	19.0
12	4	50	0.025	18	12	1325	135	29.0
16	4	50	0.035	24	16	995	140	54.0
20	4	50	0.040	30	20	795	125	75.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

6	4	45	0.015	9	6	2385	145	8.0
8	4	45	0.020	12	8	1790	145	14.0
10	4	45	0.020	15	10	1430	115	17.5
12	4	45	0.025	18	12	1195	120	26.0
16	4	45	0.035	24	16	895	125	48.0
20	4	45	0.040	30	20	715	115	69.0

Acciaio resistente al calore
Acciaio duplex [1.4462]
[17-4 PH]

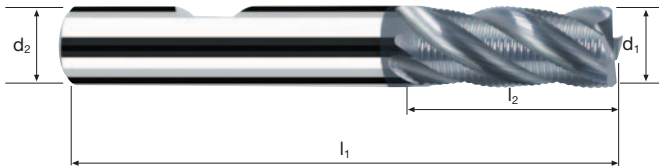
6	4	20	0.010	9	6	1060	40	2.0
8	4	20	0.015	12	8	795	50	5.0
10	4	20	0.020	15	10	635	50	7.5
12	4	20	0.020	18	12	530	40	8.5
16	4	20	0.030	24	16	400	50	19.0
20	4	20	0.035	30	20	320	45	27.0

Frese cilindriche SX-FP

Profilata, esecuzione normale



HM λ **35°**
XR γ **0°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 15309	Codice-ø .300			POLYCHROM	
						P15309		
ø Code	d1 e8	d2 h6	l1	l2	45°	z		
.300	6	6	57	13	0.35	4	●	
.391	8	8	63	19	0.45	4	●	
.450	10	10	72	22	0.60	4	●	
.501	12	12	83	26	0.60	4	●	
.610	16	16	92	32	0.70	4	●	
.682	20	20	104	38	0.70	4	●	

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	180	0.015	3.6	1.8	19100	860	5.5
4	3	180	0.020	4.8	2.4	14325	860	10.0
5	4	180	0.025	6.0	3.0	11460	1145	20.5
6	4	180	0.030	7.2	3.6	9550	1145	29.5
8	4	180	0.040	9.6	4.8	7160	1145	53.0
10	4	180	0.050	12.0	6.0	5730	1145	82.5
12	4	180	0.055	14.4	7.2	4775	1050	109.0
16	4	180	0.055	19.2	9.6	3580	790	145.5
20	4	180	0.060	24.0	12.0	2865	690	198.5

Acciaio
850 - 1100 N/mm²

3	3	130	0.015	3.6	1.8	13795	620	4.0
4	3	130	0.020	4.8	2.4	10345	620	7.0
5	4	130	0.025	6.0	3.0	8275	830	15.0
6	4	130	0.030	7.2	3.6	6895	825	21.5
8	4	130	0.040	9.6	4.8	5175	830	38.0
10	4	130	0.050	12.0	6.0	4140	830	60.0
12	4	130	0.055	14.4	7.2	3450	760	79.0
16	4	130	0.055	19.2	9.6	2585	570	105.0
20	4	130	0.060	24.0	12.0	2070	495	142.5

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

3	3	45	0.010	3.6	1.8	4775	145	1.0
4	3	45	0.015	4.8	2.4	3580	160	2.0
5	4	45	0.020	6.0	3.0	2865	230	4.0
6	4	45	0.025	7.2	3.6	2385	240	6.0
8	4	45	0.030	9.6	4.8	1790	215	10.0
10	4	45	0.040	12.0	6.0	1430	230	16.5
12	4	45	0.045	14.4	7.2	1195	215	22.5
16	4	45	0.045	19.2	9.6	895	160	29.5
20	4	45	0.050	24.0	12.0	715	145	42.0

Acciaio inossidabile
[Cr-Ni/1.4301]

3	3	60	0.010	3.6	1.8	6365	190	1.0
4	3	60	0.015	4.8	2.4	4775	215	2.5
5	4	60	0.020	6.0	3.0	3820	305	5.5
6	4	60	0.025	7.2	3.6	3185	320	8.5
8	4	60	0.030	9.6	4.8	2385	285	13.0
10	4	60	0.040	12.0	6.0	1910	305	22.0
12	4	60	0.045	14.4	7.2	1590	285	29.5
16	4	60	0.045	19.2	9.6	1195	215	39.5
20	4	60	0.050	24.0	12.0	955	190	54.5

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	150	0.015	3.0	3	15915	715	6.5
4	3	150	0.020	4.0	4	11935	715	11.5
5	4	150	0.025	5.0	5	9550	955	24.0
6	4	150	0.030	6.0	6	7960	955	34.5
8	4	150	0.040	8.0	8	5970	955	61.0
10	4	150	0.050	10.0	10	4775	955	95.5
12	4	150	0.055	12.0	12	3980	875	126.0
16	4	150	0.055	16.0	16	2985	655	167.5
20	4	150	0.060	20.0	20	2385	570	228.0

Acciaio
850 - 1100 N/mm²

3	3	80	0.015	3.0	3	8490	380	3.5
4	3	80	0.020	4.0	4	6365	380	6.0
5	4	80	0.025	5.0	5	5095	510	13.0
6	4	80	0.030	6.0	6	4245	510	18.5
8	4	80	0.040	8.0	8	3185	510	32.5
10	4	80	0.050	10.0	10	2545	510	51.0
12	4	80	0.055	12.0	12	2120	465	67.0
16	4	80	0.055	16.0	16	1590	350	89.5
20	4	80	0.060	20.0	20	1275	305	122.0

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

3	3	35	0.010	3.0	3	3715	110	1.0
4	3	35	0.015	4.0	4	2785	125	2.0
5	4	35	0.020	5.0	5	2230	180	4.5
6	4	35	0.025	6.0	6	1855	185	6.5
8	4	35	0.030	8.0	8	1395	165	10.5
10	4	35	0.040	10.0	10	1115	180	18.0
12	4	35	0.045	12.0	12	930	165	24.0
16	4	35	0.045	16.0	16	695	125	32.0
20	4	35	0.050	20.0	20	555	110	44.0

Acciaio inossidabile
[Cr-Ni/1.4301]

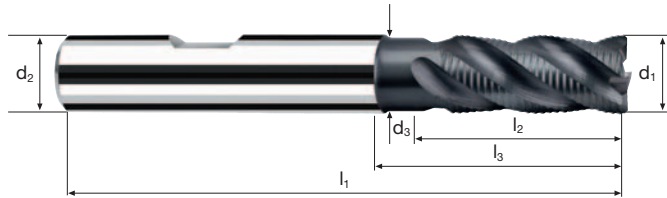
3	3	50	0.010	3.0	3	5305	160	1.5
4	3	50	0.015	4.0	4	3980	180	3.0
5	4	50	0.020	5.0	5	3185	255	6.5
6	4	50	0.025	6.0	6	2655	265	9.5
8	4	50	0.030	8.0	8	1990	240	15.5
10	4	50	0.040	10.0	10	1590	255	25.5
12	4	50	0.045	12.0	12	1325	240	34.5
16	4	50	0.045	16.0	16	995	180	46.0
20	4	50	0.050	20.0	20	795	160	64.0

Frese cilindriche NB-RP SupraCarb®

Profilata, esecuzione normale con scarico corto



HM
MG10 λ **38°**
 γ **0°**



Sgrossatura



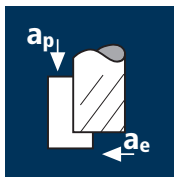
Finitura



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel

Esempio: N° Ordine										POLYCHROM	
										P15336	
										P15236	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	α	z		
.180	3	6	2.8	57	8	14	0.25	4.5°	3		●
.220	4	6	3.7	57	11	16	0.30	3.0°	3		●
.260	5	6	4.6	57	13	18	0.35	1.5°	4		●
.300	6	6	5.5	57	13	20	0.35	0.0°	4		●
.391	8	8	7.4	63	19	26	0.45	0.0°	4		●
.450	10	10	9.2	72	22	31	0.60	0.0°	4		●
.501	12	12	11.0	83	26	37	0.60	0.0°	4		●
.570	14	14	13.0	83	26	37	0.60	0.0°	4		●
.610	16	16	15.0	92	32	43	0.70	0.0°	4		●
.612	16	16	15.0	92	32	43	0.70	0.0°	6		●
.640	18	18	17.0	92	32	43	0.70	0.0°	4		●
.682	20	20	19.0	104	38	53	0.70	0.0°	4		●
.684	20	20	19.0	104	38	53	0.70	0.0°	6		●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	180	0.015	3.6	1.8	19100	860	5.5
4	3	180	0.020	4.8	2.4	14325	860	10.0
5	4	180	0.025	6.0	3.0	11460	1145	20.5
6	4	180	0.030	7.2	3.6	9550	1145	29.5
8	4	180	0.040	9.6	4.8	7160	1145	53.0
10	4	180	0.050	12.0	6.0	5730	1145	82.5
12	4	180	0.055	14.4	7.2	4775	1050	109.0
16	4	180	0.055	19.2	9.6	3580	790	145.5
20	4	180	0.060	24.0	12.0	2865	690	198.5

3	3	130	0.015	3.6	1.8	13795	620	4.0
4	3	130	0.020	4.8	2.4	10345	620	7.0
5	4	130	0.025	6.0	3.0	8275	830	15.0
6	4	130	0.030	7.2	3.6	6895	825	21.5
8	4	130	0.040	9.6	4.8	5175	830	38.0
10	4	130	0.050	12.0	6.0	4140	830	60.0
12	4	130	0.055	14.4	7.2	3450	760	79.0
16	4	130	0.055	19.2	9.6	2585	570	105.0
20	4	130	0.060	24.0	12.0	2070	495	142.5

3	3	45	0.010	3.6	1.8	4775	145	1.0
4	3	45	0.015	4.8	2.4	3580	160	2.0
5	4	45	0.020	6.0	3.0	2865	230	4.0
6	4	45	0.025	7.2	3.6	2385	240	6.0
8	4	45	0.030	9.6	4.8	1790	215	10.0
10	4	45	0.040	12.0	6.0	1430	230	16.5
12	4	45	0.045	14.4	7.2	1195	215	22.5
16	4	45	0.045	19.2	9.6	895	160	29.5
20	4	45	0.050	24.0	12.0	715	145	42.0

3	3	55	0.010	3.6	1.8	5835	175	1.0
4	3	55	0.015	4.8	2.4	4375	195	2.0
5	4	55	0.020	6.0	3.0	3500	280	5.0
6	4	55	0.025	7.2	3.6	2920	290	7.5
8	4	55	0.030	9.6	4.8	2190	265	12.0
10	4	55	0.040	12.0	6.0	1750	280	20.0
12	4	55	0.045	14.4	7.2	1460	265	27.5
16	4	55	0.045	19.2	9.6	1095	195	36.0
20	4	55	0.050	24.0	12.0	875	175	50.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	150	0.015	3.0	3	15915	715	6.5
4	3	150	0.020	4.0	4	11935	715	11.5
5	4	150	0.025	5.0	5	9550	955	24.0
6	4	150	0.030	6.0	6	7960	955	34.5
8	4	150	0.040	8.0	8	5970	955	61.0
10	4	150	0.050	10.0	10	4775	955	95.5
12	4	150	0.055	12.0	12	3980	875	126.0
16	4	150	0.055	16.0	16	2985	655	167.5
20	4	150	0.060	20.0	20	2385	570	228.0

3	3	80	0.015	3.0	3	8490	380	3.5
4	3	80	0.020	4.0	4	6365	380	6.0
5	4	80	0.025	5.0	5	5095	510	13.0
6	4	80	0.030	6.0	6	4245	510	18.5
8	4	80	0.040	8.0	8	3185	510	32.5
10	4	80	0.050	10.0	10	2545	510	51.0
12	4	80	0.055	12.0	12	2120	465	67.0
16	4	80	0.055	16.0	16	1590	350	89.5
20	4	80	0.060	20.0	20	1275	305	122.0

3	3	35	0.010	3.0	3	3715	110	1.0
4	3	35	0.015	4.0	4	2785	125	2.0
5	4	35	0.020	5.0	5	2230	180	4.5
6	4	35	0.025	6.0	6	1855	185	6.5
8	4	35	0.030	8.0	8	1395	165	10.5
10	4	35	0.040	10.0	10	1115	180	18.0
12	4	35	0.045	12.0	12	930	165	24.0
16	4	35	0.045	16.0	16	695	125	32.0
20	4	35	0.050	20.0	20	555	110	44.0

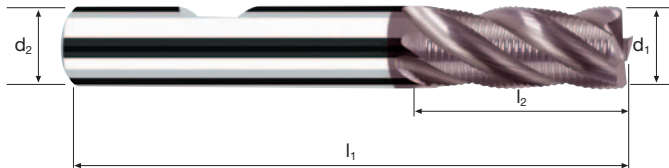
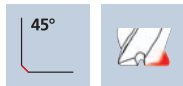
3	3	45	0.010	3.0	3	4775	145	1.5
4	3	45	0.015	4.0	4	3580	160	2.5
5	4	45	0.020	5.0	5	2865	230	6.0
6	4	45	0.025	6.0	6	2385	240	8.5
8	4	45	0.030	8.0	8	1790	215	14.0
10	4	45	0.040	10.0	10	1430	230	23.0
12	4	45	0.045	12.0	12	1195	215	31.0
16	4	45	0.045	16.0	16	895	160	41.0
20	4	45	0.050	20.0	20	715	145	58.0

Frese cilindriche NF-RP

Profilata, esecuzione normale



HM	λ 38° γ 0°
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Sgrossatura

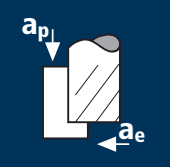



















Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G)
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Esempio: N° Ordine		Rivestimento		Articolo		Codice-ø					UNICUT-4X	
		U		45371		.180					U45371	
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z					
.180	3	6	57	8	0.25	6.0°	3					●
.220	4	6	57	11	0.30	4.0°	3					●
.260	5	6	57	13	0.35	2.0°	4					●
.300	6	6	57	13	0.35	0.0°	4					●
.391	8	8	63	19	0.45	0.0°	4					●
.450	10	10	72	22	0.60	0.0°	4					●
.501	12	12	83	26	0.60	0.0°	4					●
.610	16	16	92	32	0.70	0.0°	4					●
.612	16	16	92	32	0.70	0.0°	6					●
.682	20	20	104	38	0.70	0.0°	4					●
.684	20	20	104	38	0.70	0.0°	6					●
												●
												●
												●
												●
												●
												●
												●
												●
												●
												●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio 850 - 1100 N/mm ²  	5	4	55	0.025	5	2.3	3500	350	4.0
		6	4	55	0.030	6	2.7	2920	350	5.5
		8	4	55	0.040	8	3.6	2190	350	10.0
		10	4	55	0.050	10	4.5	1750	350	16.0
		12	4	55	0.080	12	5.4	1460	465	30.0
		16	4	55	0.105	16	7.2	1095	460	53.0
		20	4	55	0.130	20	9.0	875	455	82.0
		22	4	55	0.145	22	9.9	795	460	100.0
		25	4	55	0.165	25	11.3	700	460	129.5
			Acciaio 1100 - 1300 N/mm ²  	5	4	42	0.025	5	2.3	2675
6	4			42	0.030	6	2.7	2230	270	4.5
8	4			42	0.040	8	3.6	1670	265	7.5
10	4			42	0.050	10	4.5	1335	265	12.0
12	4			42	0.080	12	5.4	1115	355	23.0
16	4			42	0.105	16	7.2	835	350	40.5
20	4			42	0.130	20	9.0	670	350	63.0
22	4			42	0.145	22	9.9	610	355	77.5
25	4			42	0.165	25	11.3	535	355	100.0
	Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]  			5	4	25	0.025	5	2.3	1590
		6	4	25	0.030	6	2.7	1325	160	2.5
		8	4	25	0.040	8	3.6	995	160	4.5
		10	4	25	0.050	10	4.5	795	160	7.0
		12	4	25	0.080	12	5.4	665	215	14.0
		16	4	25	0.105	16	7.2	495	210	24.0
		20	4	25	0.130	20	9.0	400	210	38.0
		22	4	25	0.145	22	9.9	360	210	45.5
		25	4	25	0.165	25	11.3	320	210	59.0
			Ghisa (griglia / sferoidale)  	5	4	47	0.025	5	2.3	2990
6	4			47	0.030	6	2.7	2495	300	5.0
8	4			47	0.040	8	3.6	1870	300	8.5
10	4			47	0.050	10	4.5	1495	300	13.5
12	4			47	0.080	12	5.4	1245	400	26.0
16	4			47	0.105	16	7.2	935	395	45.5
20	4			47	0.130	20	9.0	750	390	70.0
22	4			47	0.145	22	9.9	680	395	86.0
25	4			47	0.165	25	11.3	600	395	111.0

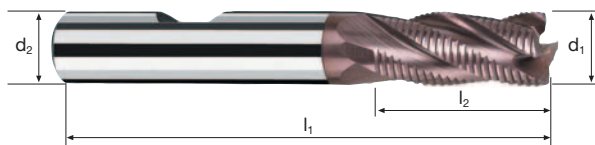
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio 850 - 1100 N/mm ²  	5	4	53	0.020	5	5	3375	270	7.0
		6	4	53	0.020	6	6	2810	225	8.0
		8	4	53	0.030	8	8	2110	255	16.5
		10	4	53	0.035	10	10	1685	235	23.5
		12	4	53	0.060	12	12	1405	335	48.0
		16	4	53	0.080	16	16	1055	340	87.0
		20	4	53	0.100	20	20	845	340	136.0
		22	4	53	0.110	22	22	765	335	162.0
		25	4	53	0.125	25	25	675	340	212.5
			Acciaio 1100 - 1300 N/mm ²  	5	4	40	0.020	5	5	2545
6	4			40	0.020	6	6	2120	170	6.0
8	4			40	0.030	8	8	1590	190	12.0
10	4			40	0.035	10	10	1275	180	18.0
12	4			40	0.060	12	12	1060	255	36.5
16	4			40	0.080	16	16	795	255	65.5
20	4			40	0.100	20	20	635	255	102.0
22	4			40	0.110	22	22	580	255	123.5
25	4			40	0.125	25	25	510	255	159.5
	Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]  			5	4	22	0.020	5	5	1400
		6	4	22	0.020	6	6	1165	95	3.5
		8	4	22	0.030	8	8	875	105	6.5
		10	4	22	0.035	10	10	700	100	10.0
		12	4	22	0.060	12	12	585	140	20.0
		16	4	22	0.080	16	16	440	140	36.0
		20	4	22	0.100	20	20	350	140	56.0
		22	4	22	0.110	22	22	320	140	68.0
		25	4	22	0.125	25	25	280	140	87.5
			Ghisa (griglia / sferoidale)  	5	4	42	0.020	5	5	2675
6	4			42	0.020	6	6	2230	180	6.5
8	4			42	0.030	8	8	1670	200	13.0
10	4			42	0.035	10	10	1335	185	18.5
12	4			42	0.060	12	12	1115	270	39.0
16	4			42	0.080	16	16	835	265	68.0
20	4			42	0.100	20	20	670	270	108.0
22	4			42	0.110	22	22	610	270	130.5
25	4			42	0.125	25	25	535	270	169.0

Frese cilindriche Supracut

Profilata NRC, esecuzione normale



HSS PM/F λ **30°**
 γ **12°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300							GG(G)
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Esempio: N° Ordine		Rivestimento U	Articolo 0619	Codice- ϕ .260						UNICUT-4X
ϕ Code	d1 k8	d2 h6	l1	l2	45°	α	z		U0619	
.260	5	6	57	13	0.40	1.5°	4		●	
.300	6	6	57	13	0.40	0.0°	4		●	
.331	7	8	60	16	0.40	1.5°	4		●	
.391	8	8	63	19	0.40	0.0°	4		●	
.402	8	10	69	19	0.40	2.5°	4		●	
.420	9	10	69	19	0.40	1.5°	4		●	
.450	10	10	72	22	0.40	0.0°	4		●	
.470	11	12	79	22	0.40	1.0°	4		●	
.501	12	12	83	26	0.40	0.0°	4		●	
.570	14	12	83	26	0.40	0.0°	4		●	
.610	16	16	92	32	0.50	0.0°	4		●	
.640	18	16	92	32	0.50	0.0°	4		●	
.682	20	20	104	38	0.50	0.0°	4		●	
.710	22	20	104	38	0.70	0.0°	4		●	
.772	25	25	121	45	0.70	0.0°	4		●	

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	68	0.030	9.0	2	3610	435	9.5
8	4	68	0.040	12.0	3	2705	435	16.5
10	4	68	0.050	15.0	4	2165	435	26.0
12	4	68	0.080	18.0	5	1805	580	50.0
16	4	68	0.105	24.0	6	1355	570	87.5
20	4	68	0.130	30.0	8	1080	560	134.5
25	4	68	0.165	37.5	10	865	570	214.0

Acciaio
850 - 1100 N/mm²

6	4	52	0.030	9.0	2	2760	330	7.0
8	4	52	0.040	12.0	3	2070	330	12.5
10	4	52	0.050	15.0	4	1655	330	20.0
12	4	52	0.080	18.0	5	1380	440	38.0
16	4	52	0.105	24.0	6	1035	435	67.0
20	4	52	0.130	30.0	8	830	430	103.0
25	4	52	0.165	37.5	10	660	435	163.0

Acciaio
1100 - 1300 N/mm²

6	4	40	0.030	9.0	2	2120	255	5.5
8	4	40	0.040	12.0	3	1590	255	10.0
10	4	40	0.050	15.0	4	1275	255	15.5
12	4	40	0.080	18.0	5	1060	340	29.5
16	4	40	0.105	24.0	6	795	335	51.5
20	4	40	0.130	30.0	8	635	330	79.0
25	4	40	0.165	37.5	10	510	335	125.5

Acciaio inossidabile
[Cr-Ni/1.4301]

6	4	30	0.030	9.0	2	1590	190	4.0
8	4	30	0.040	12.0	3	1195	190	7.5
10	4	30	0.050	15.0	4	955	190	11.5
12	4	30	0.080	18.0	5	795	255	22.0
16	4	30	0.105	24.0	6	595	250	38.5
20	4	30	0.130	30.0	8	475	245	59.0
25	4	30	0.165	37.5	10	380	250	94.0

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	62	0.020	6	6	3290	265	9.5
8	4	62	0.030	8	8	2465	295	19.0
10	4	62	0.035	10	10	1975	275	27.5
12	4	62	0.060	12	12	1645	395	57.0
16	4	62	0.080	16	16	1235	395	101.0
20	4	62	0.100	20	20	985	395	158.0
25	4	62	0.125	25	25	790	395	247.0

Acciaio
850 - 1100 N/mm²

6	4	50	0.020	6	6	2655	210	7.5
8	4	50	0.030	8	8	1990	240	15.5
10	4	50	0.035	10	10	1590	225	22.5
12	4	50	0.060	12	12	1325	320	46.0
16	4	50	0.080	16	16	995	320	82.0
20	4	50	0.100	20	20	795	320	128.0
25	4	50	0.125	25	25	635	320	200.0

Acciaio
1100 - 1300 N/mm²

6	4	37	0.020	6	6	1965	155	5.5
8	4	37	0.030	8	8	1470	175	11.0
10	4	37	0.035	10	10	1180	165	16.5
12	4	37	0.060	12	12	980	235	34.0
16	4	37	0.080	16	16	735	235	60.0
20	4	37	0.100	20	20	590	235	94.0
25	4	37	0.125	25	25	470	235	147.0

Acciaio inossidabile
[Cr-Ni/1.4301]

6	4	25	0.020	6	6	1325	105	4.0
8	4	25	0.030	8	8	995	120	7.5
10	4	25	0.035	10	10	795	110	11.0
12	4	25	0.060	12	12	665	160	23.0
16	4	25	0.080	16	16	495	160	41.0
20	4	25	0.100	20	20	400	160	64.0
25	4	25	0.125	25	25	320	160	100.0

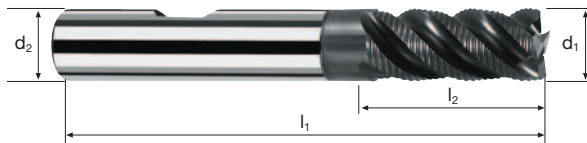
Frese cilindriche Supracut FP

Profilata, esecuzione normale



**HSS
PM/F**

λ 45°
 γ 2°



Sgrossatura



Finitura



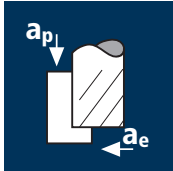








Rm
< 850










Rm
850-1100

Rm
1100-1300

Inox
Stainless

Esempio: N° Ordine		Rivestimento P	Articolo 0540	Codice- ϕ .300			POLYCHROM
ϕ Code	d1 k8	d2 h6	l1	l2	45°	z	P0540
.300	6	6	57	13	0.35	4	●
.391	8	8	63	19	0.45	4	●
.450	10	10	72	22	0.60	4	●
.501	12	12	83	26	0.60	4	●
.610	16	16	92	32	0.70	4	●
.682	20	20	104	38	0.70	4	●
.772	25	25	121	45	0.85	4	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	5	3	60	0.025	5	2.0	3820	285	3.0
		6	3	60	0.025	6	2.4	3185	240	3.5
		8	4	60	0.035	8	3.2	2385	335	8.5
		10	4	60	0.045	10	4.0	1910	345	14.0
		12	4	60	0.070	12	4.8	1590	445	25.5
		16	4	60	0.095	16	6.4	1195	455	46.5
		20	4	60	0.115	20	8.0	955	440	70.5
		22	4	60	0.130	22	8.8	870	450	87.0
		25	4	60	0.145	25	10.0	765	445	111.5
			Acciaio 850 - 1100 N/mm ²  	5	3	48	0.025	5	2.0	3055
6	3			48	0.025	6	2.4	2545	190	2.5
8	4			48	0.035	8	3.2	1910	265	7.0
10	4			48	0.045	10	4.0	1530	275	11.0
12	4			48	0.070	12	4.8	1275	355	20.5
16	4			48	0.095	16	6.4	955	365	37.5
20	4			48	0.115	20	8.0	765	350	56.0
22	4			48	0.130	22	8.8	695	360	69.5
25	4			48	0.145	25	10.0	610	355	89.0
	Acciaio inossidabile [Cr-Ni/1.4301]  			5	3	25	0.025	5	2.0	1590
		6	3	25	0.025	6	2.4	1325	100	1.5
		8	4	25	0.035	8	3.2	995	140	3.5
		10	4	25	0.045	10	4.0	795	145	6.0
		12	4	25	0.070	12	4.8	665	185	10.5
		16	4	25	0.095	16	6.4	495	190	19.5
		20	4	25	0.115	20	8.0	400	185	29.5
		22	4	25	0.130	22	8.8	360	185	36.0
		25	4	25	0.145	25	10.0	320	185	46.5
			Ghisa (grigia / sferoidale)  	5	3	42	0.025	5	2.0	2675
6	3			42	0.025	6	2.4	2230	165	2.5
8	4			42	0.035	8	3.2	1670	235	6.0
10	4			42	0.045	10	4.0	1335	240	9.5
12	4			42	0.070	12	4.8	1115	310	18.0
16	4			42	0.095	16	6.4	835	315	32.5
20	4			42	0.115	20	8.0	670	310	49.5
22	4			42	0.130	22	8.8	610	315	61.0
25	4			42	0.145	25	10.0	535	310	77.5

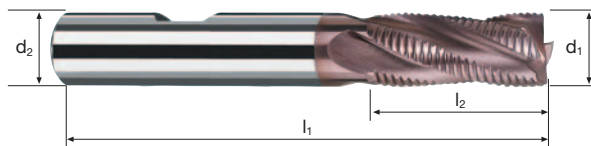
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	5	3	55	0.015	5	5	3500	160	4.0
		6	3	55	0.020	6	6	2920	175	6.5
		8	4	55	0.025	8	8	2190	220	14.0
		10	4	55	0.035	10	10	1750	245	24.5
		12	4	55	0.055	12	12	1460	320	46.0
		16	4	55	0.070	16	16	1095	305	78.0
		20	4	55	0.090	20	20	875	315	126.0
		22	4	55	0.095	22	22	795	300	145.0
		25	4	55	0.110	25	25	700	310	194.0
			Acciaio 850 - 1100 N/mm ²  	5	3	45	0.015	5	5	2865
6	3			45	0.020	6	6	2385	145	5.0
8	4			45	0.025	8	8	1790	180	11.5
10	4			45	0.035	10	10	1430	200	20.0
12	4			45	0.055	12	12	1195	265	38.0
16	4			45	0.070	16	16	895	250	64.0
20	4			45	0.090	20	20	715	255	102.0
22	4			45	0.095	22	22	650	245	118.5
25	4			45	0.110	25	25	575	255	159.5
	Acciaio inossidabile [Cr-Ni/1.4301]  			5	3	22	0.015	5	5	1400
		6	3	22	0.020	6	6	1165	70	2.5
		8	4	22	0.025	8	8	875	90	6.0
		10	4	22	0.035	10	10	700	100	10.0
		12	4	22	0.055	12	12	585	130	18.5
		16	4	22	0.070	16	16	440	125	32.0
		20	4	22	0.090	20	20	350	125	50.0
		22	4	22	0.095	22	22	320	120	58.0
		25	4	22	0.110	25	25	280	125	78.0
			Ghisa (grigia / sferoidale)  	5	3	36	0.015	5	5	2290
6	3			36	0.020	6	6	1910	115	4.0
8	4			36	0.025	8	8	1430	145	9.5
10	4			36	0.035	10	10	1145	160	16.0
12	4			36	0.055	12	12	955	210	30.0
16	4			36	0.070	16	16	715	200	51.0
20	4			36	0.090	20	20	575	205	82.0
22	4			36	0.095	22	22	520	200	97.0
25	4			36	0.110	25	25	460	200	125.0

Frese cilindriche

Profilata NRF, esecuzione normale



HSS-E λ 25°
Co8 γ 10°



Sgrossatura

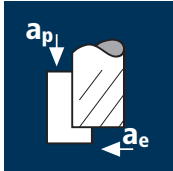











Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G)
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Esempio: N° Ordine		Rivestimento U	Articolo 0610	Codice- ϕ .260					UNICUT-4X
ϕ Code	d1 k12	d2 h6	l1	l2	45°	α	z		U0610
.260	5	6	57	13	0.40	1.0°	3		●
.300	6	6	57	13	0.40	0.0°	3		●
.342	7	10	66	16	0.40	3.5°	3		●
.391	8	8	63	19	0.40	0.0°	4		●
.402	8	10	69	19	0.40	2.5°	4		●
.420	9	10	69	19	0.40	1.5°	4		●
.450	10	10	72	22	0.40	0.0°	4		●
.470	11	12	79	22	0.40	1.0°	4		●
.501	12	12	83	26	0.40	0.0°	4		●
.540	13	12	83	26	0.40	0.0°	4		●
.570	14	12	83	26	0.40	0.0°	4		●
.581	15	12	83	26	0.50	0.0°	4		●
.610	16	16	92	32	0.50	0.0°	4		●
.640	18	16	92	32	0.50	0.0°	4		●
.671	20	16	98	38	0.50	0.0°	4		●
.682	20	20	104	38	0.50	0.0°	4		●
.710	22	20	104	38	0.70	0.0°	4		●
.741	24	20	111	45	0.70	0.0°	4		●
.761	25	20	111	45	0.70	0.0°	4		●
.772	25	25	121	45	0.70	0.0°	4		●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  U	28	6	60	0.115	28	11.2	680	470	147.5
		30	6	60	0.120	30	12.0	635	455	164.0
		32	6	60	0.130	32	12.8	595	465	190.5
		36	6	60	0.145	36	14.4	530	460	238.5
		40	6	60	0.160	40	16.0	475	455	291.0
Acciaio 850 - 1100 N/mm ²  U	28	6	48	0.115	28	11.2	545	375	117.5	
	30	6	48	0.120	30	12.0	510	365	131.5	
	32	6	48	0.130	32	12.8	475	370	151.5	
	36	6	48	0.145	36	14.4	425	370	192.0	
	40	6	48	0.160	40	16.0	380	365	233.5	
Acciaio inossidabile [Cr-Ni/1.4301]  U	28	6	25	0.115	28	11.2	285	195	61.0	
	30	6	25	0.120	30	12.0	265	190	68.5	
	32	6	25	0.130	32	12.8	250	195	80.0	
	36	6	25	0.145	36	14.4	220	190	98.5	
	40	6	25	0.160	40	16.0	200	190	121.5	
Ghisa (griglia / sferoidale)  U	28	6	42	0.115	28	11.2	475	330	103.5	
	30	6	42	0.120	30	12.0	445	320	115.0	
	32	6	42	0.130	32	12.8	420	330	135.0	
	36	6	42	0.145	36	14.4	370	320	166.0	
	40	6	42	0.160	40	16.0	335	320	205.0	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  U	28	6	55	0.085	28	28	625	320	251.0
		30	6	55	0.090	30	30	585	315	283.5
		32	6	55	0.095	32	32	545	310	317.5
		36	6	55	0.105	36	36	485	305	395.5
		40	6	55	0.120	40	40	440	315	504.0
Acciaio 850 - 1100 N/mm ²  U	28	6	45	0.085	28	28	510	260	204.0	
	30	6	45	0.090	30	30	475	255	229.5	
	32	6	45	0.095	32	32	450	255	261.0	
	36	6	45	0.105	36	36	400	250	324.0	
	40	6	45	0.120	40	40	360	260	416.0	
Acciaio inossidabile [Cr-Ni/1.4301]  U	28	6	22	0.085	28	28	250	130	102.0	
	30	6	22	0.090	30	30	235	125	112.5	
	32	6	22	0.095	32	32	220	125	128.0	
	36	6	22	0.105	36	36	195	125	162.0	
	40	6	22	0.120	40	40	175	125	200.0	
Ghisa (griglia / sferoidale)  U	28	6	36	0.085	28	28	410	210	164.5	
	30	6	36	0.090	30	30	380	205	184.5	
	32	6	36	0.095	32	32	360	205	210.0	
	36	6	36	0.105	36	36	320	200	259.0	
	40	6	36	0.120	40	40	285	205	328.0	

Frese cilindriche

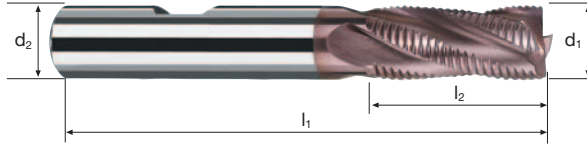
Profilata NRF, esecuzione normale

HSS

Favora®
Base-X
X-Generation

HSS-E
Co8

λ 25°
 γ 10°



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

Rm
1100-1300

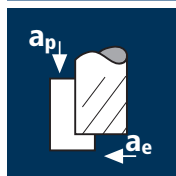
Inox
Stainless

Ti
Titanium

GG(G)

Esempio: N° Ordine		Rivestimento U	Articolo 0610	Codice-ø .800					UNICUT-4X
Ø Code	d1 k12	d2 h6	l1	l2	45°	α	z		U0610
.800	28	25	121	45	0.70	0.0°	6	●	
.810	30	25	121	45	0.70	0.0°	6	●	
.832	32	32	133	53	0.70	0.0°	6	●	
.860	36	32	133	53	0.90	0.0°	6	●	
.881	40	32	143	63	0.90	0.0°	6	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	64	0.025	6	2.4	3395	340	5.0
8	4	64	0.035	8	3.2	2545	355	9.0
10	4	64	0.045	10	4.0	2035	365	14.5
12	4	64	0.070	12	4.8	1700	475	27.5
16	4	64	0.095	16	6.4	1275	485	49.5
18	4	64	0.105	18	7.2	1130	475	61.5
20	4	64	0.115	20	8.0	1020	470	75.0
25	6	64	0.145	25	10.0	815	710	177.5
32	7	64	0.130	32	12.8	635	580	237.5

Acciaio
850 - 1100 N/mm²

6	4	52	0.025	6	2.4	2760	275	4.0
8	4	52	0.035	8	3.2	2070	290	7.5
10	4	52	0.045	10	4.0	1655	300	12.0
12	4	52	0.070	12	4.8	1380	385	22.0
16	4	52	0.095	16	6.4	1035	395	40.5
18	4	52	0.105	18	7.2	920	385	50.0
20	4	52	0.115	20	8.0	830	380	61.0
25	6	52	0.145	25	10.0	660	575	144.0
32	7	52	0.130	32	12.8	515	470	192.5

Acciaio inossidabile
[Cr-Ni/1.4301]

6	4	26	0.025	6	2.4	1380	140	2.0
8	4	26	0.035	8	3.2	1035	145	3.5
10	4	26	0.045	10	4.0	830	150	6.0
12	4	26	0.070	12	4.8	690	195	11.0
16	4	26	0.095	16	6.4	515	195	20.0
18	4	26	0.105	18	7.2	460	195	25.5
20	4	26	0.115	20	8.0	415	190	30.5
25	6	26	0.145	25	10.0	330	285	71.5
32	7	26	0.130	32	12.8	260	235	96.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

6	4	22	0.025	6	2.4	1165	115	1.5
8	4	22	0.035	8	3.2	875	125	3.0
10	4	22	0.045	10	4.0	700	125	5.0
12	4	22	0.070	12	4.8	585	165	9.5
16	4	22	0.095	16	6.4	440	165	17.0
18	4	22	0.105	18	7.2	390	165	21.5
20	4	22	0.115	20	8.0	350	160	25.5
25	6	22	0.145	25	10.0	280	245	61.5
32	7	22	0.130	32	12.8	220	200	82.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	58	0.020	6	6	3075	245	9.0
8	4	58	0.025	8	8	2310	230	14.5
10	4	58	0.035	10	10	1845	260	26.0
12	4	58	0.055	12	12	1540	340	49.0
16	4	58	0.070	16	16	1155	325	83.0
18	4	58	0.080	18	18	1025	330	107.0
20	4	58	0.090	20	20	925	335	134.0
25	6	58	0.110	25	25	740	490	306.5
32	7	58	0.095	32	32	575	380	389.0

Acciaio
850 - 1100 N/mm²

6	4	48	0.020	6	6	2545	205	7.5
8	4	48	0.025	8	8	1910	190	12.0
10	4	48	0.035	10	10	1530	215	21.5
12	4	48	0.055	12	12	1275	280	40.5
16	4	48	0.070	16	16	955	265	68.0
18	4	48	0.080	18	18	850	270	87.5
20	4	48	0.090	20	20	765	275	110.0
25	6	48	0.110	25	25	610	405	253.0
32	7	48	0.095	32	32	475	315	322.5

Acciaio inossidabile
[Cr-Ni/1.4301]

6	4	23	0.020	6	6	1220	100	3.5
8	4	23	0.025	8	8	915	90	6.0
10	4	23	0.035	10	10	730	100	10.0
12	4	23	0.055	12	12	610	135	19.5
16	4	23	0.070	16	16	460	130	33.5
18	4	23	0.080	18	18	405	130	42.0
20	4	23	0.090	20	20	365	130	52.0
25	6	23	0.110	25	25	295	195	122.0
32	7	23	0.095	32	32	230	155	158.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

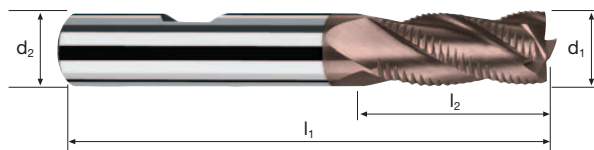
6	4	20	0.020	6	6	1060	85	3.0
8	4	20	0.025	8	8	795	80	5.0
10	4	20	0.035	10	10	635	90	9.0
12	4	20	0.055	12	12	530	115	16.5
16	4	20	0.070	16	16	400	110	28.0
18	4	20	0.080	18	18	355	115	37.5
20	4	20	0.090	20	20	320	115	46.0
25	6	20	0.110	25	25	255	170	106.5
32	7	20	0.095	32	32	200	135	138.0

Frese cilindriche

Profilata NRF, esecuzione normale



HSS-E
Co8 λ **30°**
 γ **12°**



Sgrossatura

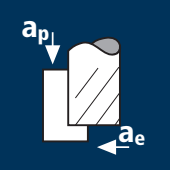



















Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G)
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Esempio: N° Ordine		Rivestimento U	Articolo 0609	Codice-ø .300					UNICUT-4X
ø Code	d1 k12	d2 h6	l1	l2	45°	α	z		
.300	6	6	57	13	0.40	0.0°	4	●	
.342	7	10	66	16	0.40	3.0°	4	●	
.402	8	10	69	19	0.40	2.5°	4	●	
.420	9	10	69	19	0.40	1.5°	4	●	
.450	10	10	72	22	0.40	0.0°	4	●	
.470	11	12	79	22	0.40	1.0°	4	●	
.501	12	12	83	26	0.40	0.0°	4	●	
.540	13	12	83	26	0.40	0.0°	4	●	
.570	14	12	83	26	0.40	0.0°	4	●	
.592	15	16	86	26	0.50	1.0°	4	●	
.610	16	16	92	32	0.50	0.0°	4	●	
.640	18	16	92	32	0.50	0.0°	4	●	
.682	20	20	104	38	0.50	0.0°	4	●	
.686	20	20	104	38	0.50	0.0°	6	●	
.710	22	20	104	38	0.70	0.0°	6	●	
.772	25	25	121	45	0.70	0.0°	6	●	
.832	32	32	133	53	0.70	0.0°	7	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio < 850 N/mm ²  	8	4	65	0.035	8	3.2	2585	360	9.0	
		10	4	65	0.045	10	4.0	2070	375	15.0	
		12	4	65	0.070	12	4.8	1725	485	28.0	
		16	4	65	0.095	16	6.4	1295	490	50.0	
		20	4	65	0.115	20	8.0	1035	475	76.0	
		25	6	65	0.145	25	10.0	830	720	180.0	
		32	7	65	0.130	32	12.8	645	585	239.5	
Acciaio 850 - 1100 N/mm ²  	8	4	54	0.035	8	3.2	2150	300	7.5		
	10	4	54	0.045	10	4.0	1720	310	12.5		
	12	4	54	0.070	12	4.8	1430	400	23.0		
	16	4	54	0.095	16	6.4	1075	410	42.0		
	20	4	54	0.115	20	8.0	860	395	63.0		
	25	6	54	0.145	25	10.0	690	600	150.0		
	32	7	54	0.130	32	12.8	535	485	198.5		
Acciaio inossidabile [Cr-Ni/1.4301]  	8	4	28	0.035	8	3.2	1115	155	4.0		
	10	4	28	0.045	10	4.0	890	160	6.5		
	12	4	28	0.070	12	4.8	745	210	12.0		
	16	4	28	0.095	16	6.4	555	210	21.5		
	20	4	28	0.115	20	8.0	445	205	33.0		
	25	6	28	0.145	25	10.0	355	310	77.5		
	32	7	28	0.130	32	12.8	280	255	104.5		
Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]  	8	4	22	0.035	8	3.2	875	125	3.0		
	10	4	22	0.045	10	4.0	700	125	5.0		
	12	4	22	0.070	12	4.8	585	165	9.5		
	16	4	22	0.095	16	6.4	440	165	17.0		
	20	4	22	0.115	20	8.0	350	160	25.5		
	25	6	22	0.145	25	10.0	280	245	61.5		
	32	7	22	0.130	32	12.8	220	200	82.0		

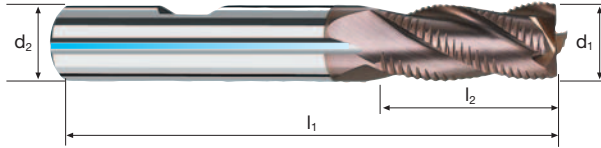
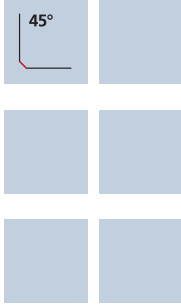
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio < 850 N/mm ²  	8	4	60	0.025	8	8	2385	240	15.5	
		10	4	60	0.035	10	10	1910	265	26.5	
		12	4	60	0.055	12	12	1590	350	50.5	
		16	4	60	0.070	16	16	1195	335	86.0	
		20	4	60	0.090	20	20	955	345	138.0	
		25	6	60	0.110	25	25	765	505	315.5	
		32	7	60	0.095	32	32	595	395	404.5	
Acciaio 850 - 1100 N/mm ²  	8	4	50	0.025	8	8	1990	200	13.0		
	10	4	50	0.035	10	10	1590	225	22.5		
	12	4	50	0.055	12	12	1325	290	42.0		
	16	4	50	0.070	16	16	995	280	71.5		
	20	4	50	0.090	20	20	795	285	114.0		
	25	6	50	0.110	25	25	635	420	262.5		
	32	7	50	0.095	32	32	495	330	338.0		
Acciaio inossidabile [Cr-Ni/1.4301]  	8	4	25	0.025	8	8	995	100	6.5		
	10	4	25	0.035	10	10	795	110	11.0		
	12	4	25	0.055	12	12	665	145	21.0		
	16	4	25	0.070	16	16	495	140	36.0		
	20	4	25	0.090	20	20	400	145	58.0		
	25	6	25	0.110	25	25	320	210	131.5		
	32	7	25	0.095	32	32	250	165	169.0		
Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]  	8	4	20	0.025	8	8	795	80	5.0		
	10	4	20	0.035	10	10	635	90	9.0		
	12	4	20	0.055	12	12	530	115	16.5		
	16	4	20	0.070	16	16	400	110	28.0		
	20	4	20	0.090	20	20	320	115	46.0		
	25	6	20	0.110	25	25	255	170	106.5		
	32	7	20	0.095	32	32	200	135	138.0		

Frese cilindriche

Profilata NRF, esecuzione normale, Pericool



HSS-E
Co8 λ 30°
 γ 12°



Sgrossatura



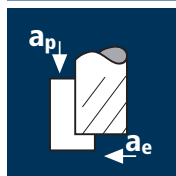
Finitura



Rm < 850 Rm 850-1100 Rm 1100-1300 **Inox** Stainless **Ti** Titanium GG(G)

Esempio: N° Ordine								Rivestimento	Articolo	Codice-ø		UNICUT-4X
								U	0695	.402		U0695
Ø Code	d1 k12	d2 h6	l1	l2	45°	α	z					
.402	8	10	69	19	0.40	1.0°	4					●
.450	10	10	72	22	0.40	0.0°	4					●
.501	12	12	83	26	0.40	0.0°	4					●
.610	16	16	92	32	0.50	0.0°	4					●
.682	20	20	104	38	0.50	0.0°	4					●
.772	25	25	121	45	0.70	0.0°	6					●
.832	32	32	133	53	0.70	0.0°	7					●

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	180	0.030	12	1.2	9550	1145	16.5
8	4	180	0.040	16	1.6	7160	1145	29.5
10	4	180	0.055	20	2.0	5730	1260	50.5
12	4	180	0.065	24	2.4	4775	1240	71.5
16	4	180	0.070	32	3.2	3580	1000	102.5
20	4	180	0.075	40	4.0	2865	860	137.5

Acciaio
850 - 1100 N/mm²



6	4	150	0.030	12	1.2	7960	955	14.0
8	4	150	0.040	16	1.6	5970	955	24.5
10	4	150	0.055	20	2.0	4775	1050	42.0
12	4	150	0.065	24	2.4	3980	1035	59.5
16	4	150	0.070	32	3.2	2985	835	85.5
20	4	150	0.075	40	4.0	2385	715	114.5

Acciaio
1100 - 1300 N/mm²



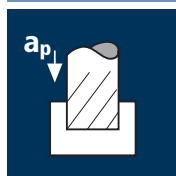
6	4	120	0.030	12	1.2	6365	765	11.0
8	4	120	0.040	16	1.6	4775	765	19.5
10	4	120	0.055	20	2.0	3820	840	33.5
12	4	120	0.065	24	2.4	3185	830	48.0
16	4	120	0.070	32	3.2	2385	670	68.5
20	4	120	0.075	40	4.0	1910	575	92.0

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



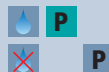
6	4	80	0.030	12	1.2	4245	510	7.5
8	4	80	0.040	16	1.6	3185	510	13.0
10	4	80	0.055	20	2.0	2545	560	22.5
12	4	80	0.065	24	2.4	2120	550	31.5
16	4	80	0.070	32	3.2	1590	445	45.5
20	4	80	0.075	40	4.0	1275	385	61.5

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	150	0.020	4.2	6	7960	635	16.0
8	4	150	0.025	5.6	8	5970	595	26.5
10	4	150	0.035	7.0	10	4775	670	47.0
12	4	150	0.040	8.4	12	3980	635	64.0
16	4	150	0.050	11.2	16	2985	595	106.5
20	4	150	0.050	14.0	20	2385	475	133.0

Acciaio
850 - 1100 N/mm²



6	4	100	0.020	4.2	6	5305	425	10.5
8	4	100	0.025	5.6	8	3980	400	18.0
10	4	100	0.035	7.0	10	3185	445	31.0
12	4	100	0.040	8.4	12	2655	425	43.0
16	4	100	0.050	11.2	16	1990	400	71.5
20	4	100	0.050	14.0	20	1590	320	89.5

Acciaio
1100 - 1300 N/mm²



6	4	80	0.020	4.2	6	4245	340	8.5
8	4	80	0.025	5.6	8	3185	320	14.5
10	4	80	0.035	7.0	10	2545	355	25.0
12	4	80	0.040	8.4	12	2120	340	34.5
16	4	80	0.050	11.2	16	1590	320	57.5
20	4	80	0.050	14.0	20	1275	255	71.5

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



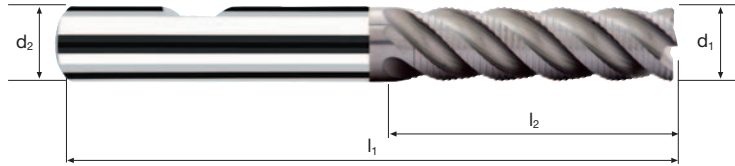
6	4	60	0.020	4.2	6	3185	255	6.5
8	4	60	0.025	5.6	8	2385	240	11.0
10	4	60	0.035	7.0	10	1910	265	18.5
12	4	60	0.040	8.4	12	1590	255	25.5
16	4	60	0.050	11.2	16	1195	240	43.0
20	4	60	0.050	14.0	20	955	190	53.0

Frese cilindriche NX-FP

Profilata, esecuzione medio-lunga



HM λ **45°**
XR γ **0°**



Sgrossatura



Finitura



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Rm** 1300-1500 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel

Esempio: N° Ordine							POLYCHROM	
							P5173	
		Rivestimento	Articolo	Codice-ø				
		P	5173	.300				
Ø Code	d1 e8	d2 h6	l1	l2	45°	z		
.300	6	6	63	19	0.35	4	●	
.391	8	8	72	28	0.45	4	●	
.450	10	10	84	34	0.60	4	●	
.501	12	12	97	40	0.60	4	●	
.610	16	16	108	48	0.70	4	●	
.682	20	20	122	56	0.70	4	●	

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	180	0.035	9.6	1.2	9550	1335	15.5
8	4	180	0.045	12.8	1.6	7160	1290	26.5
10	4	180	0.060	16.0	2.0	5730	1375	44.0
12	4	180	0.070	19.2	2.4	4775	1335	61.5
16	4	180	0.075	25.6	3.2	3580	1075	88.0
20	4	180	0.080	32.0	4.0	2865	915	117.0

Acciaio
850 - 1100 N/mm²

6	4	130	0.035	9.6	1.2	6895	965	11.0
8	4	130	0.045	12.8	1.6	5175	930	19.0
10	4	130	0.060	16.0	2.0	4140	995	32.0
12	4	130	0.070	19.2	2.4	3450	965	44.5
16	4	130	0.075	25.6	3.2	2585	775	63.5
20	4	130	0.080	32.0	4.0	2070	660	84.5

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

6	4	45	0.025	9.6	1.2	2385	240	3.0
8	4	45	0.035	12.8	1.6	1790	250	5.0
10	4	45	0.045	16.0	2.0	1430	255	8.0
12	4	45	0.055	19.2	2.4	1195	265	12.0
16	4	45	0.060	25.6	3.2	895	215	17.5
20	4	45	0.065	32.0	4.0	715	185	23.5

Acciaio inossidabile
[Cr-Ni/1.4301]

6	4	60	0.025	9.6	1.2	3185	320	3.5
8	4	60	0.035	12.8	1.6	2385	335	7.0
10	4	60	0.045	16.0	2.0	1910	345	11.0
12	4	60	0.055	19.2	2.4	1590	350	16.0
16	4	60	0.060	25.6	3.2	1195	285	23.5
20	4	60	0.065	32.0	4.0	955	250	32.0

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	150	0.030	3.3	6	7960	955	19.0
8	4	150	0.040	4.4	8	5970	955	33.5
10	4	150	0.050	5.5	10	4775	955	52.5
12	4	150	0.055	6.6	12	3980	875	69.5
16	4	150	0.055	8.8	16	2985	655	92.0
20	4	150	0.060	11.0	20	2385	570	125.5

Acciaio
850 - 1100 N/mm²

6	4	80	0.030	3.3	6	4245	510	10.0
8	4	80	0.040	4.4	8	3185	510	18.0
10	4	80	0.050	5.5	10	2545	510	28.0
12	4	80	0.055	6.6	12	2120	465	37.0
16	4	80	0.055	8.8	16	1590	350	49.5
20	4	80	0.060	11.0	20	1275	305	67.0

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

6	4	35	0.025	3.3	6	1855	185	3.5
8	4	35	0.030	4.4	8	1395	165	6.0
10	4	35	0.040	5.5	10	1115	180	10.0
12	4	35	0.045	6.6	12	930	165	13.0
16	4	35	0.045	8.8	16	695	125	17.5
20	4	35	0.050	11.0	20	555	110	24.0

Acciaio inossidabile
[Cr-Ni/1.4301]

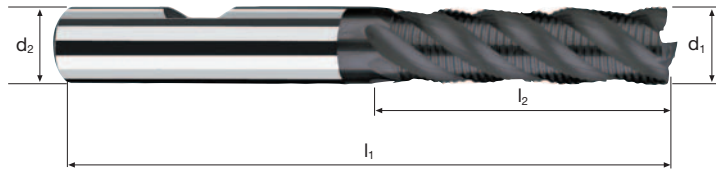
6	4	50	0.025	3.3	6	2655	265	5.0
8	4	50	0.030	4.4	8	1990	240	8.5
10	4	50	0.040	5.5	10	1590	255	14.0
12	4	50	0.045	6.6	12	1325	240	19.0
16	4	50	0.045	8.8	16	995	180	25.5
20	4	50	0.050	11.0	20	795	160	35.0

Frese cilindriche NB-RP SupraCarb®

Profilata, esecuzione medio-lunga



HM
MG10 λ **38°**
 γ **0°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine							POLYCHROM	
								P15338
								P15238
\emptyset Code	d1 e8	d2 h6	l1	l2	45°	z		
.300	6	6	63	19	0.35	4		●
.391	8	8	72	28	0.45	4		●
.450	10	10	84	34	0.60	4		●
.501	12	12	97	40	0.60	4		●
.610	16	16	108	48	0.70	4		●
.682	20	20	122	56	0.70	4		●

Applicazione

Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	38	0.025	12	1.5	2015	200	3.5
8	4	38	0.030	16	2.0	1510	180	6.0
10	4	38	0.040	20	2.5	1210	195	10.0
12	4	38	0.060	24	3.0	1010	240	17.5
16	4	38	0.085	32	4.0	755	255	32.5
20	4	38	0.105	40	5.0	605	255	51.0
25	4	38	0.130	50	6.3	485	250	78.0

Acciaio
1100 - 1300 N/mm²

6	4	30	0.025	12	1.5	1590	160	3.0
8	4	30	0.030	16	2.0	1195	145	4.5
10	4	30	0.040	20	2.5	955	155	8.0
12	4	30	0.060	24	3.0	795	190	13.5
16	4	30	0.085	32	4.0	595	200	25.5
20	4	30	0.105	40	5.0	475	200	40.0
25	4	30	0.130	50	6.3	380	200	62.5

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

6	4	24	0.025	12	1.5	1275	130	2.5
8	4	24	0.030	16	2.0	955	115	3.5
10	4	24	0.040	20	2.5	765	120	6.0
12	4	24	0.060	24	3.0	635	150	11.0
16	4	24	0.085	32	4.0	475	160	20.5
20	4	24	0.105	40	5.0	380	160	32.0
25	4	24	0.130	50	6.3	305	160	50.0

Ghisa (grigia / sferoidale)

6	4	34	0.025	12	1.5	1805	180	3.0
8	4	34	0.030	16	2.0	1355	165	5.5
10	4	34	0.040	20	2.5	1080	175	9.0
12	4	34	0.060	24	3.0	900	215	15.5
16	4	34	0.085	32	4.0	675	230	29.5
20	4	34	0.105	40	5.0	540	225	45.0
25	4	34	0.130	50	6.3	435	225	70.5

Applicazione

Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	35	0.020	4	6	1855	150	4.0
8	4	35	0.030	6	8	1395	165	7.5
10	4	35	0.035	7	10	1115	155	11.0
12	4	35	0.060	8	12	930	225	22.5
16	4	35	0.080	11	16	695	220	39.5
20	4	35	0.100	14	20	555	220	61.5
25	4	35	0.125	18	25	445	225	98.5

Acciaio
1100 - 1300 N/mm²

6	4	25	0.020	4	6	1325	105	2.5
8	4	25	0.030	6	8	995	120	5.5
10	4	25	0.035	7	10	795	110	7.5
12	4	25	0.060	8	12	665	160	16.0
16	4	25	0.080	11	16	495	160	28.5
20	4	25	0.100	14	20	400	160	45.0
25	4	25	0.125	18	25	320	160	70.0

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

6	4	18	0.020	4	6	955	75	2.0
8	4	18	0.030	6	8	715	85	4.0
10	4	18	0.035	7	10	575	80	5.5
12	4	18	0.060	8	12	475	115	11.5
16	4	18	0.080	11	16	360	115	20.5
20	4	18	0.100	14	20	285	115	32.0
25	4	18	0.125	18	25	230	115	50.5

Ghisa (grigia / sferoidale)

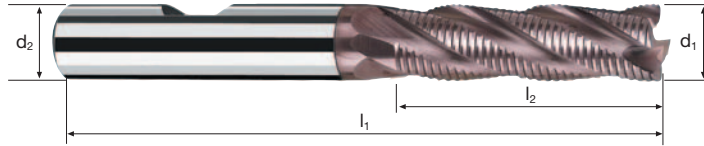
6	4	29	0.020	4	6	1540	125	3.0
8	4	29	0.030	6	8	1155	140	6.5
10	4	29	0.035	7	10	925	130	9.0
12	4	29	0.060	8	12	770	185	18.5
16	4	29	0.080	11	16	575	185	33.0
20	4	29	0.100	14	20	460	185	52.0
25	4	29	0.125	18	25	370	185	81.0

Frese cilindriche Supracut

Profilata NRC, esecuzione medio-lunga



HSS PM/F λ **30°**
γ **12°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300									GG(G)
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Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø					UNICUT-4X
		U	0659	.300					U0659
ø Code	d1 k8	d2 h6	l1	l2	45°	z			
.300	6	6	63	19	0.40	4			●
.402	8	10	78	28	0.40	4			●
.450	10	10	84	34	0.40	4			●
.501	12	12	97	40	0.40	4			●
.610	16	16	108	48	0.50	4			●
.682	20	20	122	56	0.50	4			●
.772	25	25	144	68	0.70	4			●



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	36	0.020	12	1.5	1910	115	2.0
8	4	36	0.030	16	2.0	1430	170	5.5
10	4	36	0.035	20	2.5	1145	160	8.0
12	4	36	0.055	24	3.0	955	210	15.0
16	4	36	0.075	32	4.0	715	215	27.5
20	4	36	0.095	40	5.0	575	220	44.0
25	4	36	0.115	50	6.3	460	210	65.5
30	6	36	0.095	60	7.5	380	215	97.0
32	6	36	0.105	64	8.0	360	225	115.0

Acciaio
850 - 1100 N/mm²

6	3	30	0.020	12	1.5	1590	95	1.5
8	4	30	0.030	16	2.0	1195	145	4.5
10	4	30	0.035	20	2.5	955	135	7.0
12	4	30	0.055	24	3.0	795	175	12.5
16	4	30	0.075	32	4.0	595	180	23.0
20	4	30	0.095	40	5.0	475	180	36.0
25	4	30	0.115	50	6.3	380	175	54.5
30	6	30	0.095	60	7.5	320	180	81.0
32	6	30	0.105	64	8.0	300	190	97.5

Acciaio inossidabile
[Cr-Ni/1.4301]

6	3	15	0.020	12	1.5	795	50	1.0
8	4	15	0.030	16	2.0	595	70	2.0
10	4	15	0.035	20	2.5	475	65	3.5
12	4	15	0.055	24	3.0	400	90	6.5
16	4	15	0.075	32	4.0	300	90	11.5
20	4	15	0.095	40	5.0	240	90	18.0
25	4	15	0.115	50	6.3	190	85	26.5
30	6	15	0.095	60	7.5	160	90	40.5
32	6	15	0.105	64	8.0	150	95	48.5

Ghisa
(grigia / sferoidale)

6	3	28	0.020	12	1.5	1485	90	1.5
8	4	28	0.030	16	2.0	1115	135	4.5
10	4	28	0.035	20	2.5	890	125	6.5
12	4	28	0.055	24	3.0	745	165	12.0
16	4	28	0.075	32	4.0	555	165	21.0
20	4	28	0.095	40	5.0	445	170	34.0
25	4	28	0.115	50	6.3	355	165	51.5
30	6	28	0.095	60	7.5	295	170	76.5
32	6	28	0.105	64	8.0	280	175	89.5



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	30	0.020	4.2	6	1590	95	2.5
8	4	30	0.025	5.6	8	1195	120	5.5
10	4	30	0.035	7.0	10	955	135	9.5
12	4	30	0.055	8.4	12	795	175	17.5
16	4	30	0.070	11.2	16	595	165	29.5
20	4	30	0.090	14.0	20	475	170	47.5
25	4	30	0.110	17.5	25	380	165	72.0
30	6	30	0.090	21.0	30	320	175	110.5
32	6	30	0.095	22.4	32	300	170	122.0

Acciaio
850 - 1100 N/mm²

6	3	26	0.020	4.2	6	1380	85	2.0
8	4	26	0.025	5.6	8	1035	105	4.5
10	4	26	0.035	7.0	10	830	115	8.0
12	4	26	0.055	8.4	12	690	150	15.0
16	4	26	0.070	11.2	16	515	145	26.0
20	4	26	0.090	14.0	20	415	150	42.0
25	4	26	0.110	17.5	25	330	145	63.5
30	6	26	0.090	21.0	30	275	150	94.5
32	6	26	0.095	22.4	32	260	150	107.5

Acciaio inossidabile
[Cr-Ni/1.4301]

6	3	14	0.020	4.2	6	745	45	1.0
8	4	14	0.025	5.6	8	555	55	2.5
10	4	14	0.035	7.0	10	445	60	4.0
12	4	14	0.055	8.4	12	370	80	8.0
16	4	14	0.070	11.2	16	280	80	14.5
20	4	14	0.090	14.0	20	225	80	22.5
25	4	14	0.110	17.5	25	180	80	35.0
30	6	14	0.090	21.0	30	150	80	50.5
32	6	14	0.095	22.4	32	140	80	57.5

Ghisa
(grigia / sferoidale)

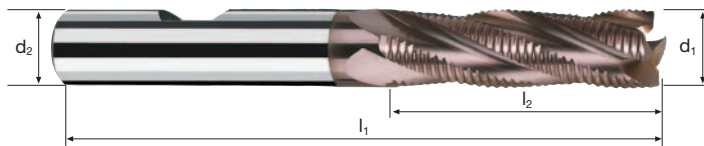
6	3	22	0.020	4.2	6	1165	70	2.0
8	4	22	0.025	5.6	8	875	90	4.0
10	4	22	0.035	7.0	10	700	100	7.0
12	4	22	0.055	8.4	12	585	130	13.0
16	4	22	0.070	11.2	16	440	125	22.5
20	4	22	0.090	14.0	20	350	125	35.0
25	4	22	0.110	17.5	25	280	125	54.5
30	6	22	0.090	21.0	30	235	125	79.0
32	6	22	0.095	22.4	32	220	125	89.5

Frese cilindriche

Profilata NRF, esecuzione medio-lunga



HSS-E λ **25°**
Co8 γ **10°**



Sgrossatura



Finitura



Rm

< 850

Rm

850-1100

Rm

1100-1300

Inox

Stainless

Ti

Titanium

GG(G)

Esempio:
N° Ordine

Rivestimento

U

Articolo

0650

Codice-ø

.260

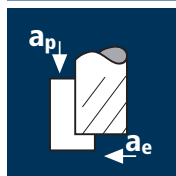


UNICUT-4X

U0650

ø Code	d1 k12	d2 h6	l1	l2	45°	α	z	
.260	5	6	63	19	0.40	1.5°	3	●
.300	6	6	63	19	0.40	0.0°	3	●
.402	8	10	78	28	0.40	2.0°	4	●
.450	10	10	84	34	0.40	0.0°	4	●
.501	12	12	97	40	0.40	0.0°	4	●
.570	14	12	97	40	0.40	0.0°	4	●
.610	16	16	108	48	0.50	0.0°	4	●
.640	18	16	108	48	0.50	0.0°	4	●
.682	20	20	122	56	0.50	0.0°	4	●
.710	22	20	122	56	0.70	0.0°	4	●
.772	25	25	144	68	0.70	0.0°	4	●
.800	28	25	144	68	0.70	0.0°	6	●
.810	30	25	144	68	0.70	0.0°	6	●
.832	32	32	160	80	0.70	0.0°	6	●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	180	0.030	9	1.8	9550	1145	18.5
8	4	180	0.040	12	2.4	7160	1145	33.0
10	4	180	0.055	15	3.0	5730	1260	56.5
12	4	180	0.065	18	3.6	4775	1240	80.5
16	4	180	0.070	24	4.8	3580	1000	115.0
20	4	180	0.075	30	6.0	2865	860	155.0

6	4	150	0.030	9	1.8	7960	955	15.5
8	4	150	0.040	12	2.4	5970	955	27.5
10	4	150	0.055	15	3.0	4775	1050	47.5
12	4	150	0.065	18	3.6	3980	1035	67.0
16	4	150	0.070	24	4.8	2985	835	96.0
20	4	150	0.075	30	6.0	2385	715	128.5

6	4	120	0.030	9	1.8	6365	765	12.5
8	4	120	0.040	12	2.4	4775	765	22.0
10	4	120	0.055	15	3.0	3820	840	38.0
12	4	120	0.065	18	3.6	3185	830	54.0
16	4	120	0.070	24	4.8	2385	670	77.0
20	4	120	0.075	30	6.0	1910	575	103.5

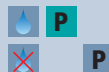
6	4	80	0.030	9	1.8	4245	510	8.5
8	4	80	0.040	12	2.4	3185	510	14.5
10	4	80	0.055	15	3.0	2545	560	25.0
12	4	80	0.065	18	3.6	2120	550	35.5
16	4	80	0.070	24	4.8	1590	445	51.5
20	4	80	0.075	30	6.0	1275	385	69.5

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	150	0.025	4.8	6	7960	795	23.0
8	4	150	0.030	6.4	8	5970	715	36.5
10	4	150	0.040	8.0	10	4775	765	61.0
12	4	150	0.050	9.6	12	3980	795	91.5
16	4	150	0.060	12.8	16	2985	715	146.5
20	4	150	0.060	16.0	20	2385	570	182.5

6	4	100	0.020	4.8	6	5305	425	12.0
8	4	100	0.025	6.4	8	3980	400	20.5
10	4	100	0.035	8.0	10	3185	445	35.5
12	4	100	0.040	9.6	12	2655	425	49.0
16	4	100	0.050	12.8	16	1990	400	82.0
20	4	100	0.050	16.0	20	1590	320	102.5

6	4	80	0.020	4.8	6	4245	340	10.0
8	4	80	0.025	6.4	8	3185	320	16.5
10	4	80	0.035	8.0	10	2545	355	28.5
12	4	80	0.040	9.6	12	2120	340	39.0
16	4	80	0.050	12.8	16	1590	320	65.5
20	4	80	0.050	16.0	20	1275	255	81.5

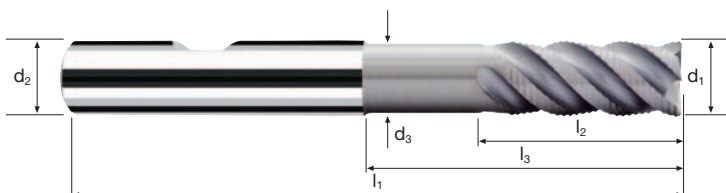
6	4	60	0.020	4.8	6	3185	255	7.5
8	4	60	0.025	6.4	8	2385	240	12.5
10	4	60	0.035	8.0	10	1910	265	21.0
12	4	60	0.040	9.6	12	1590	255	29.5
16	4	60	0.050	12.8	16	1195	240	49.0
20	4	60	0.050	16.0	20	955	190	61.0

Frese cilindriche NX-FP

Profilata, esecuzione medio-lunga con scarico



HM
XR λ **45°**
 γ **0°**



Sgrossatura



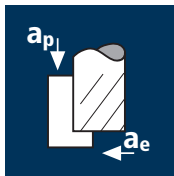
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 5174	Codice- ϕ .300						POLYCHROM
ϕ Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z		P5174
.300	6	6	5.5	63	13	26	0.35	4		●
.391	8	8	7.4	72	19	35	0.45	4		●
.450	10	10	9.2	84	22	43	0.60	4		●
.501	12	12	11.0	97	26	51	0.60	4		●
.610	16	16	15.0	108	32	59	0.70	4		●
.682	20	20	19.0	122	38	71	0.70	4		●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	60	0.015	10.8	3.3	3185	190	7.0
8	4	60	0.020	14.4	4.4	2385	190	12.0
10	4	60	0.020	18.0	5.5	1910	155	15.5
12	4	60	0.025	21.6	6.6	1590	160	23.0
16	4	60	0.030	28.8	8.8	1195	145	36.5
20	4	60	0.040	36.0	11.0	955	155	61.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



6	4	55	0.015	10.8	3.3	2920	175	6.0
8	4	55	0.020	14.4	4.4	2190	175	11.0
10	4	55	0.020	18.0	5.5	1750	140	14.0
12	4	55	0.025	21.6	6.6	1460	145	20.5
16	4	55	0.030	28.8	8.8	1095	130	33.0
20	4	55	0.040	36.0	11.0	875	140	55.5

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



6	4	25	0.010	10.8	3.3	1325	55	2.0
8	4	25	0.015	14.4	4.4	995	60	4.0
10	4	25	0.020	18.0	5.5	795	65	6.5
12	4	25	0.020	21.6	6.6	665	55	8.0
16	4	25	0.030	28.8	8.8	495	60	15.0
20	4	25	0.035	36.0	11.0	400	55	22.0

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	50	0.015	6	6	2655	160	6.0
8	4	50	0.020	8	8	1990	160	10.0
10	4	50	0.020	10	10	1590	125	12.5
12	4	50	0.025	12	12	1325	135	19.5
16	4	50	0.035	16	16	995	140	36.0
20	4	50	0.045	20	20	795	145	58.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



6	4	45	0.015	6	6	2385	145	5.0
8	4	45	0.020	8	8	1790	145	9.5
10	4	45	0.020	10	10	1430	115	11.5
12	4	45	0.025	12	12	1195	120	17.5
16	4	45	0.035	16	16	895	125	32.0
20	4	45	0.045	20	20	715	130	52.0

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



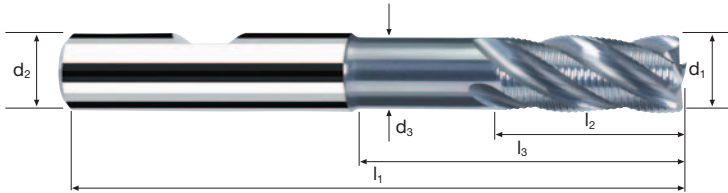
6	4	15	0.010	6	6	795	30	1.0
8	4	15	0.015	8	8	595	35	2.0
10	4	15	0.020	10	10	475	40	4.0
12	4	15	0.025	12	12	400	40	6.0
16	4	15	0.030	16	16	300	35	9.0
20	4	15	0.040	20	20	240	40	16.0

Frese cilindriche SX-FP

Profilata, esecuzione medio-lunga con scarico



HM λ **35°**
XR γ **0°**



Sgrossatura

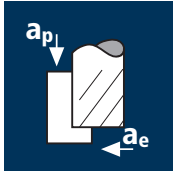























Finitura



Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Esempio: N° Ordine										POLYCHROM						
										P15304						
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z	Rivestimento		Articolo		Codice-Ø			
									P	15304	.300					
.300	6	6	5.5	63	13	26	0.35	4							●	
.391	8	8	7.4	72	19	35	0.45	4							●	
.450	10	10	9.2	84	22	43	0.60	4							●	
.501	12	12	11.0	97	26	51	0.60	4							●	
.610	16	16	15.0	108	32	59	0.70	4							●	
.682	20	20	19.0	122	38	71	0.70	4							●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	6	4	180	0.035	7.2	1.8	9550	1335	17.5
		8	4	180	0.045	9.6	2.4	7160	1290	29.5
		10	4	180	0.060	12.0	3.0	5730	1375	49.5
		12	4	180	0.070	14.4	3.6	4775	1335	69.0
		16	4	180	0.075	19.2	4.8	3580	1075	99.0
		20	4	180	0.080	24.0	6.0	2865	915	132.0
Acciaio 850 - 1100 N/mm ²    	6	4	130	0.035	7.2	1.8	6895	965	12.5	
	8	4	130	0.045	9.6	2.4	5175	930	21.5	
	10	4	130	0.060	12.0	3.0	4140	995	36.0	
	12	4	130	0.070	14.4	3.6	3450	965	50.0	
	16	4	130	0.075	19.2	4.8	2585	775	71.5	
	20	4	130	0.080	24.0	6.0	2070	660	95.0	
Leghe di titanio indurite >300 HB [Ti6Al4V]  	6	4	45	0.025	7.2	1.8	2385	240	3.0	
	8	4	45	0.035	9.6	2.4	1790	250	6.0	
	10	4	45	0.045	12.0	3.0	1430	255	9.0	
	12	4	45	0.055	14.4	3.6	1195	265	13.5	
	16	4	45	0.060	19.2	4.8	895	215	20.0	
	20	4	45	0.065	24.0	6.0	715	185	26.5	
Acciaio inossidabile [Cr-Ni/1.4301]  	6	4	60	0.025	7.2	1.8	3185	320	4.0	
	8	4	60	0.035	9.6	2.4	2385	335	7.5	
	10	4	60	0.045	12.0	3.0	1910	345	12.5	
	12	4	60	0.055	14.4	3.6	1590	350	18.0	
	16	4	60	0.060	19.2	4.8	1195	285	26.5	
	20	4	60	0.065	24.0	6.0	955	250	36.0	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	6	4	150	0.030	3.6	6	7960	955	20.5
		8	4	150	0.040	4.8	8	5970	955	36.5
		10	4	150	0.050	6.0	10	4775	955	57.5
		12	4	150	0.055	7.2	12	3980	875	75.5
		16	4	150	0.055	9.6	16	2985	655	100.5
		20	4	150	0.060	12.0	20	2385	570	137.0
Acciaio 850 - 1100 N/mm ²    	6	4	80	0.030	3.6	6	4245	510	11.0	
	8	4	80	0.040	4.8	8	3185	510	19.5	
	10	4	80	0.050	6.0	10	2545	510	30.5	
	12	4	80	0.055	7.2	12	2120	465	40.0	
	16	4	80	0.055	9.6	16	1590	350	54.0	
	20	4	80	0.060	12.0	20	1275	305	73.0	
Leghe di titanio indurite >300 HB [Ti6Al4V]  	6	4	35	0.025	3.6	6	1855	185	4.0	
	8	4	35	0.030	4.8	8	1395	165	6.5	
	10	4	35	0.040	6.0	10	1115	180	11.0	
	12	4	35	0.045	7.2	12	930	165	14.5	
	16	4	35	0.045	9.6	16	695	125	19.0	
	20	4	35	0.050	12.0	20	555	110	26.5	
Acciaio inossidabile [Cr-Ni/1.4301]  	6	4	50	0.025	3.6	6	2655	265	5.5	
	8	4	50	0.030	4.8	8	1990	240	9.0	
	10	4	50	0.040	6.0	10	1590	255	15.5	
	12	4	50	0.045	7.2	12	1325	240	20.5	
	16	4	50	0.045	9.6	16	995	180	27.5	
	20	4	50	0.050	12.0	20	795	160	38.5	

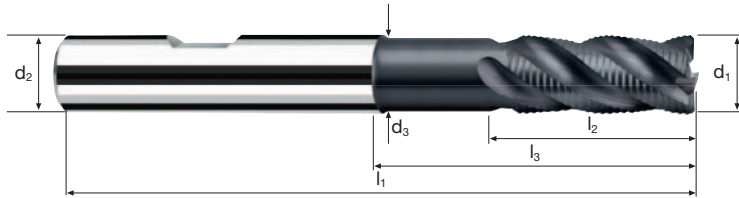
Frese cilindriche NB-RP SupraCarb®

Profilata, esecuzione medio-lunga con scarico



HM
MG10

λ 38°
 γ 0°



Sgrossatura



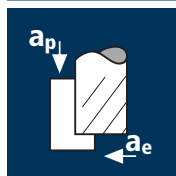
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine									POLYCHROM	
									P15339	P15239
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z		
.300	6	6	5.5	63	13	26	0.35	4		●
.391	8	8	7.4	72	19	35	0.45	4		●
.450	10	10	9.2	84	22	43	0.60	4		●
.501	12	12	11.0	97	26	51	0.60	4		●
.610	16	16	15.0	108	32	59	0.70	4		●
.682	20	20	19.0	122	38	71	0.70	4		●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
10	4	180	0.050	10	8.0	5730	1145	91.5
12	4	180	0.060	12	9.6	4775	1145	132.0
16	4	180	0.065	16	12.8	3580	930	190.5
20	4	180	0.080	20	16.0	2865	915	293.0

10	4	150	0.050	10	8.0	4775	955	76.5
12	4	150	0.060	12	9.6	3980	955	110.0
16	4	150	0.065	16	12.8	2985	775	158.5
20	4	150	0.080	20	16.0	2385	765	245.0

10	4	120	0.050	10	8.0	3820	765	61.0
12	4	120	0.055	12	9.6	3185	700	80.5
16	4	120	0.050	16	12.8	2385	475	97.5
20	4	120	0.060	20	16.0	1910	460	147.0

10	4	80	0.050	10	8.0	2545	510	41.0
12	4	80	0.055	12	9.6	2120	465	53.5
16	4	80	0.050	16	12.8	1590	320	65.5
20	4	80	0.060	20	16.0	1275	305	97.5

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
10	4	150	0.050	10	10	4775	955	95.5
12	4	150	0.050	12	12	3980	795	114.5
16	4	150	0.055	16	16	2985	655	167.5
20	4	150	0.060	20	20	2385	570	228.0

10	4	100	0.050	10	10	3185	635	63.5
12	4	100	0.050	12	12	2655	530	76.5
16	4	100	0.055	16	16	1990	440	112.5
20	4	100	0.060	20	20	1590	380	152.0

10	4	80	0.050	10	10	2545	510	51.0
12	4	80	0.050	12	12	2120	425	61.0
16	4	80	0.055	16	16	1590	350	89.5
20	4	80	0.060	20	20	1275	305	122.0

10	4	60	0.050	10	10	1910	380	38.0
12	4	60	0.050	12	12	1590	320	46.0
16	4	60	0.055	16	16	1195	265	68.0
20	4	60	0.060	20	20	955	230	92.0

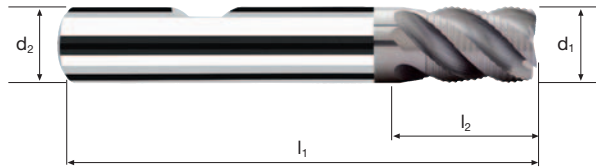
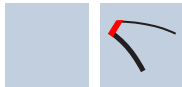
Frese cilindriche NX-FP

Profilata, esecuzione corta



HM
XR

λ **45°**
 γ **0°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine							POLYCHROM	
							P5176	
Ø Code	d1 e8	d2 h6	l1	l2	45°	z		
.450	10	10	66	14	0.60	4	●	
.501	12	12	73	16	0.60	4	●	
.610	16	16	82	22	0.70	4	●	
.682	20	20	92	26	0.70	4	●	

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	180	0.015	3.0	2.1	19100	860	5.5
4	3	180	0.020	4.0	2.8	14325	860	9.5
5	4	180	0.030	5.0	3.5	11460	1375	24.0
6	4	180	0.035	6.0	4.2	9550	1335	33.5
8	4	180	0.045	8.0	5.6	7160	1290	58.0
10	4	180	0.055	10.0	7.0	5730	1260	88.0
12	4	180	0.060	12.0	8.4	4775	1145	115.5
16	4	180	0.065	16.0	11.2	3580	930	166.5

Acciaio
850 - 1100 N/mm²

3	3	130	0.015	3.0	2.1	13795	620	4.0
4	3	130	0.020	4.0	2.8	10345	620	7.0
5	4	130	0.030	5.0	3.5	8275	995	17.5
6	4	130	0.035	6.0	4.2	6895	965	24.5
8	4	130	0.045	8.0	5.6	5175	930	41.5
10	4	130	0.055	10.0	7.0	4140	910	63.5
12	4	130	0.060	12.0	8.4	3450	830	83.5
16	4	130	0.065	16.0	11.2	2585	670	120.0

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

3	3	45	0.015	3.0	2.1	4775	215	1.5
4	3	45	0.020	4.0	2.8	3580	215	2.5
5	4	45	0.020	5.0	3.5	2865	230	4.0
6	4	45	0.025	6.0	4.2	2385	240	6.0
8	4	45	0.035	8.0	5.6	1790	250	11.0
10	4	45	0.045	10.0	7.0	1430	255	18.0
12	4	45	0.050	12.0	8.4	1195	240	24.0
16	4	45	0.050	16.0	11.2	895	180	32.5

Acciaio inossidabile
[Cr-Ni/1.4301]

3	3	60	0.015	3.0	2.1	6365	285	2.0
4	3	60	0.020	4.0	2.8	4775	285	3.0
5	4	60	0.020	5.0	3.5	3820	305	5.5
6	4	60	0.025	6.0	4.2	3185	320	8.0
8	4	60	0.035	8.0	5.6	2385	335	15.0
10	4	60	0.045	10.0	7.0	1910	345	24.0
12	4	60	0.050	12.0	8.4	1590	320	32.5
16	4	60	0.050	16.0	11.2	1195	240	43.0

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	150	0.015	3.0	3	15915	715	6.5
4	3	150	0.020	4.0	4	11935	715	11.5
5	4	150	0.025	5.0	5	9550	955	24.0
6	4	150	0.030	6.0	6	7960	955	34.5
8	4	150	0.040	8.0	8	5970	955	61.0
10	4	150	0.050	10.0	10	4775	955	95.5
12	4	150	0.055	12.0	12	3980	875	126.0
16	4	150	0.055	16.0	16	2985	655	167.5

Acciaio
850 - 1100 N/mm²

3	3	80	0.015	3.0	3	8490	380	3.5
4	3	80	0.020	4.0	4	6365	380	6.0
5	4	80	0.025	5.0	5	5095	510	13.0
6	4	80	0.030	6.0	6	4245	510	18.5
8	4	80	0.040	8.0	8	3185	510	32.5
10	4	80	0.050	10.0	10	2545	510	51.0
12	4	80	0.055	12.0	12	2120	465	67.0
16	4	80	0.055	16.0	16	1590	350	89.5

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

3	3	35	0.010	3.0	3	3715	110	1.0
4	3	35	0.015	4.0	4	2785	125	2.0
5	4	35	0.020	5.0	5	2230	180	4.5
6	4	35	0.025	6.0	6	1855	185	6.5
8	4	35	0.030	8.0	8	1395	165	10.5
10	4	35	0.040	10.0	10	1115	180	18.0
12	4	35	0.045	12.0	12	930	165	24.0
16	4	35	0.045	16.0	16	695	125	32.0

Acciaio inossidabile
[Cr-Ni/1.4301]

3	3	50	0.010	3.0	3	5305	160	1.5
4	3	50	0.015	4.0	4	3980	180	3.0
5	4	50	0.020	5.0	5	3185	255	6.5
6	4	50	0.025	6.0	6	2655	265	9.5
8	4	50	0.030	8.0	8	1990	240	15.5
10	4	50	0.040	10.0	10	1590	255	25.5
12	4	50	0.045	12.0	12	1325	240	34.5
16	4	50	0.045	16.0	16	995	180	46.0

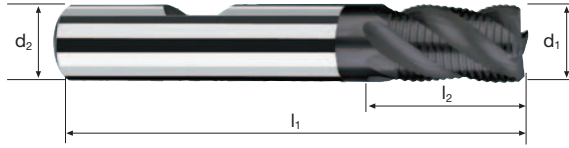
Frese cilindriche NB-RP SupraCarb®

Profilata, esecuzione corta



HM
MG10

λ **38°**
 γ **0°**



new!

Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300						Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 15360	Codice- ϕ .180						POLYCHROM
ϕ Code	d1 e8	d2 h6	l1	l2	45°	z				P15360
.180	3	6	50	5	0.25	3				●
.220	4	6	54	8	0.30	3				●
.260	5	6	54	9	0.35	4				●
.300	6	6	54	10	0.35	4				●
.391	8	8	58	12	0.45	4				●
.450	10	10	66	14	0.60	4				●
.501	12	12	73	16	0.60	4				●
.610	16	16	82	22	0.70	4				●
.612	16	16	82	22	0.70	6				●



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
5	3	60	0.025	5	2.0	3820	285	3.0
6	3	60	0.030	6	2.4	3185	285	4.0
8	4	60	0.045	8	3.2	2385	430	11.0
10	4	60	0.055	10	4.0	1910	420	17.0
12	4	60	0.085	12	4.8	1590	540	31.0
16	4	60	0.110	16	6.4	1195	525	54.0
20	4	60	0.140	20	8.0	955	535	85.5
25	4	60	0.175	25	10.0	765	535	134.0
32	6	60	0.155	32	12.8	595	555	227.5

Acciaio
850 - 1100 N/mm²

5	3	48	0.025	5	2.0	3055	230	2.5
6	3	48	0.030	6	2.4	2545	230	3.5
8	4	48	0.045	8	3.2	1910	345	9.0
10	4	48	0.055	10	4.0	1530	335	13.5
12	4	48	0.085	12	4.8	1275	435	25.0
16	4	48	0.110	16	6.4	955	420	43.0
20	4	48	0.140	20	8.0	765	430	69.0
25	4	48	0.175	25	10.0	610	425	106.5
32	6	48	0.155	32	12.8	475	440	180.0

Acciaio inossidabile
[Cr-Ni/1.4301]

5	3	25	0.025	5	2.0	1590	120	1.0
6	3	25	0.030	6	2.4	1325	120	1.5
8	4	25	0.045	8	3.2	995	180	4.5
10	4	25	0.055	10	4.0	795	175	7.0
12	4	25	0.085	12	4.8	665	225	13.0
16	4	25	0.110	16	6.4	495	220	22.5
20	4	25	0.140	20	8.0	400	225	36.0
25	4	25	0.175	25	10.0	320	225	56.5
32	6	25	0.155	32	12.8	250	230	94.0

Ghisa
(grigia / sferoidale)

5	3	42	0.025	5	2.0	2675	200	2.0
6	3	42	0.030	6	2.4	2230	200	3.0
8	4	42	0.045	8	3.2	1670	300	7.5
10	4	42	0.055	10	4.0	1335	295	12.0
12	4	42	0.085	12	4.8	1115	380	22.0
16	4	42	0.110	16	6.4	835	365	37.5
20	4	42	0.140	20	8.0	670	375	60.0
25	4	42	0.175	25	10.0	535	375	94.0
32	6	42	0.155	32	12.8	420	390	159.5



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
5	3	55	0.020	5.0	5	3500	210	5.5
6	3	55	0.025	6.0	6	2920	220	8.0
8	4	55	0.030	8.0	8	2190	265	17.0
10	4	55	0.040	10.0	10	1750	280	28.0
12	4	55	0.065	12.0	12	1460	380	54.5
16	4	55	0.085	16.0	16	1095	370	94.5
20	4	55	0.105	20.0	20	875	370	148.0
25	4	55	0.130	25.0	25	700	365	228.0
32	6	55	0.115	32.0	32	545	375	384.0

Acciaio
850 - 1100 N/mm²

5	3	45	0.020	5.0	5	2865	170	4.5
6	3	45	0.025	6.0	6	2385	180	6.5
8	4	45	0.030	8.0	8	1790	215	14.0
10	4	45	0.040	10.0	10	1430	230	23.0
12	4	45	0.065	12.0	12	1195	310	44.5
16	4	45	0.085	16.0	16	895	305	78.0
20	4	45	0.105	20.0	20	715	300	120.0
25	4	45	0.130	25.0	25	575	300	187.5
32	6	45	0.115	32.0	32	450	310	317.5

Acciaio inossidabile
[Cr-Ni/1.4301]

5	3	22	0.020	5.0	5	1400	85	2.0
6	3	22	0.025	6.0	6	1165	85	3.0
8	4	22	0.030	8.0	8	875	105	6.5
10	4	22	0.040	10.0	10	700	110	11.0
12	4	22	0.065	12.0	12	585	150	21.5
16	4	22	0.085	16.0	16	440	150	38.5
20	4	22	0.105	20.0	20	350	145	58.0
25	4	22	0.130	25.0	25	280	145	90.5
32	6	22	0.115	32.0	32	220	150	153.5

Ghisa
(grigia / sferoidale)

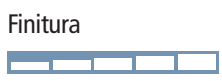
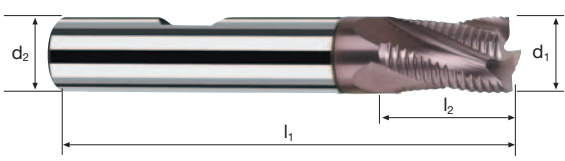
5	3	36	0.020	5.0	5	2290	135	3.5
6	3	36	0.025	6.0	6	1910	145	5.0
8	4	36	0.030	8.0	8	1430	170	11.0
10	4	36	0.040	10.0	10	1145	185	18.5
12	4	36	0.065	12.0	12	955	250	36.0
16	4	36	0.085	16.0	16	715	245	62.5
20	4	36	0.105	20.0	20	575	240	96.0
25	4	36	0.130	25.0	25	460	240	150.0
32	6	36	0.115	32.0	32	360	250	256.0

Frese cilindriche

Profilata NRF, esecuzione corta



HSS-E λ **25°**
Co8 γ **10°**



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G)
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		Rivestimento		Articolo		Codice-ø					UNICUT-4X
Esempio: N° Ordine		U		0640		.260					U0640
ø Code	d1 k12	d2 h6		l1	l2	45°	α	z			
.260	5	6		52	8	0.40	2.0°	3			●
.300	6	6		52	8	0.40	0.0°	3			●
.391	8	8		55	11	0.40	0.0°	4			●
.450	10	10		63	13	0.40	0.0°	4			●
.501	12	12		73	16	0.40	0.0°	4			●
.610	16	16		79	19	0.50	0.0°	4			●
.682	20	20		88	22	0.50	0.0°	4			●
.772	25	25		102	26	0.70	0.0°	4			●
.832	32	32		112	32	0.70	0.0°	6			●

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	180	0.030	7.2	1.5	9550	1145	12.5
8	4	180	0.040	9.6	2.0	7160	1145	22.0
10	4	180	0.055	12.0	2.5	5730	1260	38.0
12	4	180	0.065	14.4	3.0	4775	1240	53.5
16	4	180	0.070	19.2	4.0	3580	1000	77.0
20	4	180	0.075	24.0	5.0	2865	860	103.0

Acciaio
850 - 1100 N/mm²

6	4	130	0.030	7.2	1.5	6895	825	9.0
8	4	130	0.040	9.6	2.0	5175	830	16.0
10	4	130	0.055	12.0	2.5	4140	910	27.5
12	4	130	0.065	14.4	3.0	3450	895	38.5
16	4	130	0.070	19.2	4.0	2585	725	55.5
20	4	130	0.075	24.0	5.0	2070	620	74.5

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

6	4	45	0.025	7.2	1.5	2385	240	2.5
8	4	45	0.035	9.6	2.0	1790	250	5.0
10	4	45	0.045	12.0	2.5	1430	255	7.5
12	4	45	0.055	14.4	3.0	1195	265	11.5
16	4	45	0.060	19.2	4.0	895	215	16.5
20	4	45	0.065	24.0	5.0	715	185	22.0

Acciaio inossidabile
[Cr-Ni/1.4301]

6	4	60	0.025	7.2	1.5	3185	320	3.5
8	4	60	0.035	9.6	2.0	2385	335	6.5
10	4	60	0.045	12.0	2.5	1910	345	10.5
12	4	60	0.055	14.4	3.0	1590	350	15.0
16	4	60	0.060	19.2	4.0	1195	285	22.0
20	4	60	0.065	24.0	5.0	955	250	30.0

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	150	0.025	3.0	6	7960	795	14.5
8	4	150	0.035	4.0	8	5970	835	26.5
10	4	150	0.045	5.0	10	4775	860	43.0
12	4	150	0.050	6.0	12	3980	795	57.0
16	4	150	0.050	8.0	16	2985	595	76.0
20	4	150	0.055	10.0	20	2385	525	105.0

Acciaio
850 - 1100 N/mm²

6	4	80	0.025	3.0	6	4245	425	7.5
8	4	80	0.035	4.0	8	3185	445	14.0
10	4	80	0.045	5.0	10	2545	460	23.0
12	4	80	0.050	6.0	12	2120	425	30.5
16	4	80	0.050	8.0	16	1590	320	41.0
20	4	80	0.055	10.0	20	1275	280	56.0

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

6	4	35	0.020	3.0	6	1855	150	2.5
8	4	35	0.030	4.0	8	1395	165	5.5
10	4	35	0.035	5.0	10	1115	155	8.0
12	4	35	0.040	6.0	12	930	150	11.0
16	4	35	0.040	8.0	16	695	110	14.0
20	4	35	0.045	10.0	20	555	100	20.0

Acciaio inossidabile
[Cr-Ni/1.4301]

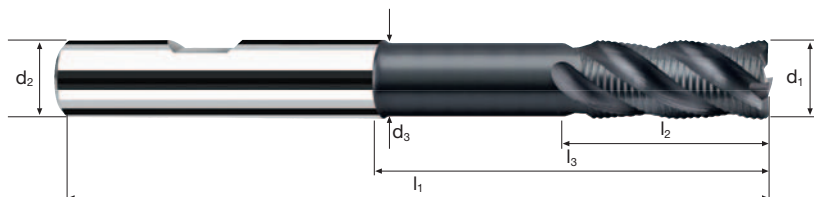
6	4	50	0.020	3.0	6	2655	210	4.0
8	4	50	0.030	4.0	8	1990	240	7.5
10	4	50	0.035	5.0	10	1590	225	11.5
12	4	50	0.040	6.0	12	1325	210	15.0
16	4	50	0.040	8.0	16	995	160	20.5
20	4	50	0.045	10.0	20	795	145	29.0

Frese cilindriche NB-RP SupraCarb®

Profilata, esecuzione lunga con scarico



HM
MG10 λ **38°**
 γ **0°**



Sgrossatura



Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine		Rivestimento P	Articolo 15348	Codice-ø .300						POLYCHROM	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z			
.300	6	6	5.5	70	13	33	0.35	4	●		
.391	8	8	7.4	80	19	43	0.45	4	●		
.450	10	10	9.2	100	22	59	0.60	4	●		
.501	12	12	11.0	110	26	64	0.60	4	●		
.610	16	16	15.0	123	32	74	0.70	4	●		
.682	20	20	19.0	141	38	90	0.70	4	●		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]		
	Acciaio < 850 N/mm ² 	6	3	28	0.020	15	2.4	1485	90	3.0		
		8	4	28	0.030	20	3.2	1115	135	8.5		
		10	4	28	0.035	25	4.0	890	125	12.5		
		12	4	28	0.055	30	4.8	745	165	24.0		
		16	4	28	0.075	40	6.4	555	165	42.0		
		20	4	28	0.095	50	8.0	445	170	68.0		
		25	4	28	0.115	63	10.0	355	165	103.0		
		32	6	28	0.105	80	12.8	280	175	179.0		
		40	6	28	0.130	100	16.0	225	175	280.0		
			Acciaio 850 - 1100 N/mm ²	6	3	22	0.020	15	2.4	1165	70	2.5
				8	4	22	0.030	20	3.2	875	105	6.5
				10	4	22	0.035	25	4.0	700	100	10.0
12	4			22	0.055	30	4.8	585	130	18.5		
16	4			22	0.075	40	6.4	440	130	33.5		
20	4			22	0.095	50	8.0	350	135	54.0		
25	4			22	0.115	63	10.0	280	130	81.5		
32	6			22	0.105	80	12.8	220	140	143.5		
40	6			22	0.130	100	16.0	175	135	216.0		
	Acciaio inossidabile [Cr-Ni/1.4301]			6	3	11	0.020	15	2.4	585	35	1.5
				8	4	11	0.030	20	3.2	440	55	3.5
				10	4	11	0.035	25	4.0	350	50	5.0
		12	4	11	0.055	30	4.8	290	65	9.5		
		16	4	11	0.075	40	6.4	220	65	16.5		
		20	4	11	0.095	50	8.0	175	65	26.0		
		25	4	11	0.115	63	10.0	140	65	40.5		
		32	6	11	0.105	80	12.8	110	70	71.5		
		40	6	11	0.130	100	16.0	90	70	112.0		
			Ghisa (grigia / sferoidale)	6	3	20	0.020	15	2.4	1060	65	2.5
				8	4	20	0.030	20	3.2	795	95	6.0
				10	4	20	0.035	25	4.0	635	90	9.0
12	4			20	0.055	30	4.8	530	115	16.5		
16	4			20	0.075	40	6.4	400	120	30.5		
20	4			20	0.095	50	8.0	320	120	48.0		
25	4			20	0.115	63	10.0	255	115	72.0		
32	6			20	0.105	80	12.8	200	125	128.0		
40	6			20	0.130	100	16.0	160	125	200.0		

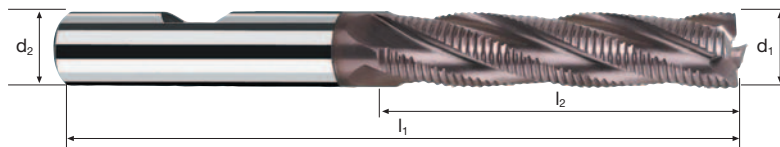
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]		
	Acciaio < 850 N/mm ² 	6	3	25	0.020	3.0	6	1325	80	1.5		
		8	4	25	0.025	4.0	8	995	100	3.0		
		10	4	25	0.035	5.0	10	795	110	5.5		
		12	4	25	0.055	6.0	12	665	145	10.5		
		16	4	25	0.070	8.0	16	495	140	18.0		
		20	4	25	0.090	10.0	20	400	145	29.0		
		25	4	25	0.110	12.5	25	320	140	44.0		
		32	6	25	0.095	16.0	32	250	145	74.0		
		40	6	25	0.120	20.0	40	200	145	116.0		
			Acciaio 850 - 1100 N/mm ²	6	3	18	0.020	3.0	6	955	55	1.0
				8	4	18	0.025	4.0	8	715	70	2.0
				10	4	18	0.035	5.0	10	575	80	4.0
12	4			18	0.055	6.0	12	475	105	7.5		
16	4			18	0.070	8.0	16	360	100	13.0		
20	4			18	0.090	10.0	20	285	105	21.0		
25	4			18	0.110	12.5	25	230	100	31.5		
32	6			18	0.095	16.0	32	180	105	54.0		
40	6			18	0.120	20.0	40	145	105	84.0		
	Acciaio inossidabile [Cr-Ni/1.4301]			6	3	10	0.020	3.0	6	530	30	0.5
				8	4	10	0.025	4.0	8	400	40	1.5
				10	4	10	0.035	5.0	10	320	45	2.5
		12	4	10	0.055	6.0	12	265	60	4.5		
		16	4	10	0.070	8.0	16	200	55	7.0		
		20	4	10	0.090	10.0	20	160	60	12.0		
		25	4	10	0.110	12.5	25	125	55	17.0		
		32	6	10	0.095	16.0	32	100	55	28.0		
		40	6	10	0.120	20.0	40	80	60	48.0		
			Ghisa (grigia / sferoidale)	6	3	16	0.020	3.0	6	850	50	1.0
				8	4	16	0.025	4.0	8	635	65	2.0
				10	4	16	0.035	5.0	10	510	70	3.5
12	4			16	0.055	6.0	12	425	95	7.0		
16	4			16	0.070	8.0	16	320	90	11.5		
20	4			16	0.090	10.0	20	255	90	18.0		
25	4			16	0.110	12.5	25	205	90	28.0		
32	6			16	0.095	16.0	32	160	90	46.0		
40	6			16	0.120	20.0	40	125	90	72.0		

Frese cilindriche

Profilata NRF, esecuzione lunga



HSS-E λ 25°
Co8 γ 10°



Sgrossatura

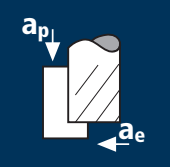



















Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		GG(G)
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Esempio: N° Ordine		Rivestimento U	Articolo 0665	Codice- ϕ .260					UNICUT-4X
ϕ Code	d1 k12	d2 h6	l1	l2	45°	α	z		
.260	5	6	68	24	0.40	1.0°	3	●	
.300	6	6	68	24	0.40	0.0°	3	●	
.342	7	10	80	30	0.40	2.5°	3	●	
.391	8	8	82	38	0.40	0.0°	4	●	
.402	8	10	88	38	0.40	1.0°	4	●	
.420	9	10	88	38	0.40	0.0°	4	●	
.450	10	10	95	45	0.40	0.0°	4	●	
.470	11	12	102	45	0.40	0.0°	4	●	
.501	12	12	110	53	0.40	0.0°	4	●	
.540	13	12	110	53	0.40	0.0°	4	●	
.570	14	12	110	53	0.40	0.0°	4	●	
.610	16	16	123	63	0.50	0.0°	4	●	
.640	18	16	123	63	0.50	0.0°	4	●	
.682	20	20	141	75	0.50	0.0°	4	●	
.710	22	20	141	75	0.70	0.0°	4	●	
.772	25	25	166	90	0.70	0.0°	4	●	
.800	28	25	166	90	0.70	0.0°	6	●	
.810	30	25	166	90	0.70	0.0°	6	●	
.832	32	32	186	106	0.70	0.0°	6	●	
.860	36	32	186	106	0.90	0.0°	6	●	
.892	40	40	217	125	0.90	0.0°	6	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio 850 - 1100 N/mm ²  	6	4	27	0.015	6	1.2	1430	85	0.5
		8	4	27	0.020	8	1.6	1075	85	1.0
		10	4	27	0.025	10	2.0	860	85	1.5
		12	4	27	0.035	12	2.4	715	100	3.0
		16	4	27	0.050	16	3.2	535	105	5.5
		20	4	27	0.060	20	4.0	430	105	8.5
		25	4	27	0.080	25	5.0	345	110	14.0
Acciaio 1100 - 1300 N/mm ²  	6	4	22	0.015	6	1.2	1165	70	0.5	
	8	4	22	0.020	8	1.6	875	70	1.0	
	10	4	22	0.025	10	2.0	700	70	1.5	
	12	4	22	0.035	12	2.4	585	80	2.5	
	16	4	22	0.050	16	3.2	440	90	4.5	
	20	4	22	0.060	20	4.0	350	85	7.0	
	25	4	22	0.080	25	5.0	280	90	11.5	
Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]  	6	4	16	0.015	6	1.2	850	50	0.5	
	8	4	16	0.020	8	1.6	635	50	0.5	
	10	4	16	0.025	10	2.0	510	50	1.0	
	12	4	16	0.035	12	2.4	425	60	1.5	
	16	4	16	0.050	16	3.2	320	65	3.5	
	20	4	16	0.060	20	4.0	255	60	5.0	
	25	4	16	0.080	25	5.0	205	65	8.0	
Ghisa (grigia / sferoidale)  	6	4	24	0.015	6	1.2	1275	75	0.5	
	8	4	24	0.020	8	1.6	955	75	1.0	
	10	4	24	0.025	10	2.0	765	75	1.5	
	12	4	24	0.035	12	2.4	635	90	2.5	
	16	4	24	0.050	16	3.2	475	95	5.0	
	20	4	24	0.060	20	4.0	380	90	7.0	
	25	4	24	0.080	25	5.0	305	100	12.5	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio 850 - 1100 N/mm ²  	6	4	24	0.020	3	6	1275	100	2.0
		8	4	24	0.025	4	8	955	95	3.0
		10	4	24	0.030	5	10	765	90	4.5
		12	4	24	0.045	6	12	635	115	8.5
		16	4	24	0.065	8	16	475	125	16.0
		20	4	24	0.080	10	20	380	120	24.0
		25	4	24	0.100	13	25	305	120	37.5
Acciaio 1100 - 1300 N/mm ²  	6	4	20	0.020	3	6	1060	85	1.5	
	8	4	20	0.025	4	8	795	80	2.5	
	10	4	20	0.030	5	10	635	75	4.0	
	12	4	20	0.045	6	12	530	95	7.0	
	16	4	20	0.065	8	16	400	105	13.5	
	20	4	20	0.080	10	20	320	100	20.0	
	25	4	20	0.100	13	25	255	100	31.5	
Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]  	6	4	14	0.020	3	6	745	60	1.0	
	8	4	14	0.025	4	8	555	55	2.0	
	10	4	14	0.030	5	10	445	55	3.0	
	12	4	14	0.045	6	12	370	65	4.5	
	16	4	14	0.065	8	16	280	75	9.5	
	20	4	14	0.080	10	20	225	70	14.0	
	25	4	14	0.100	13	25	180	70	22.0	
Ghisa (grigia / sferoidale)  	6	4	21	0.020	3	6	1115	90	1.5	
	8	4	21	0.025	4	8	835	85	2.5	
	10	4	21	0.030	5	10	670	80	4.0	
	12	4	21	0.045	6	12	555	100	7.0	
	16	4	21	0.065	8	16	420	110	14.0	
	20	4	21	0.080	10	20	335	105	21.0	
	25	4	21	0.100	13	25	265	105	33.0	

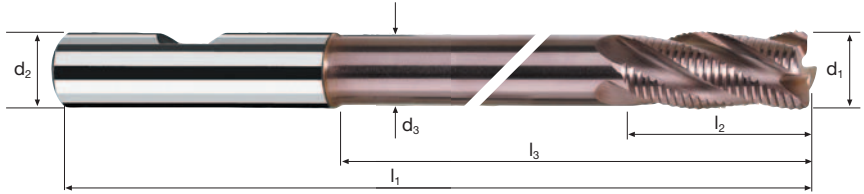
Frese cilindriche Supracut

Profilata NRC, esecuzione extralunga con scarico



HSS PM/F λ 30°
 γ 12°

45°



Sgrossatura



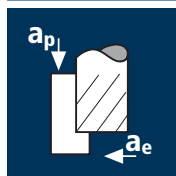
Finitura



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 GG(G)

		Rivestimento		Articolo		Codice-ø				UNICUT-4X	
Esempio: N° Ordine		U		0621		.300				U0621	
ø Code	d1 k8	d2 h6	d3	l1	l2	l3	45°	z			
.300	6	6	5.5	81	13	44	0.40	4	●		
.391	8	8	7.4	101	19	64	0.40	4	●		
.450	10	10	9.2	117	22	76	0.40	4	●		
.501	12	12	11.0	136	26	90	0.40	4	●		
.610	16	16	14.5	155	32	106	0.50	4	●		
.682	20	20	18.0	179	38	128	0.50	4	●		
.772	25	25	23.0	211	45	154	0.70	4	●		

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	5	180	0.010	5	0.05	19100	955
4	5	180	0.010	6	0.05	14325	715
5	5	180	0.015	8	0.05	11460	860
6	5	180	0.015	9	0.10	9550	715
8	7	180	0.025	12	0.10	7160	1255
10	7	180	0.030	15	0.10	5730	1205
12	7	180	0.035	18	0.10	4775	1170
16	7	180	0.045	24	0.20	3580	1130
20	7	180	0.055	30	0.20	2865	1105
3	5	150	0.010	5	0.05	15915	795
4	5	150	0.010	6	0.05	11935	595
5	5	150	0.015	8	0.05	9550	715
6	5	150	0.015	9	0.10	7960	595
8	7	150	0.025	12	0.10	5970	1045
10	7	150	0.030	15	0.10	4775	1005
12	7	150	0.035	18	0.10	3980	975
16	7	150	0.045	24	0.20	2985	940
20	7	150	0.055	30	0.20	2385	920
3	5	120	0.008	5	0.05	12735	510
4	5	120	0.010	6	0.05	9550	480
5	5	120	0.012	8	0.05	7640	460
6	5	120	0.016	9	0.10	6365	510
8	7	120	0.020	12	0.10	4775	670
10	7	120	0.026	15	0.10	3820	695
12	7	120	0.030	18	0.10	3185	670
16	7	120	0.040	24	0.20	2385	670
20	7	120	0.050	30	0.20	1910	670
3	5	100	0.008	5	0.05	10610	425
4	5	100	0.010	6	0.05	7960	400
5	5	100	0.012	8	0.05	6365	380
6	5	100	0.016	9	0.10	5305	425
8	7	100	0.020	12	0.10	3980	555
10	7	100	0.026	15	0.10	3185	580
12	7	100	0.030	18	0.10	2655	560
16	7	100	0.040	24	0.20	1990	555
20	7	100	0.050	30	0.20	1590	555

Materiale

Alluminio malleabile
Si < 6%



Ghisa
(grigia / sferoidale)



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Acciaio inossidabile
[Cr-Ni/1.4301]



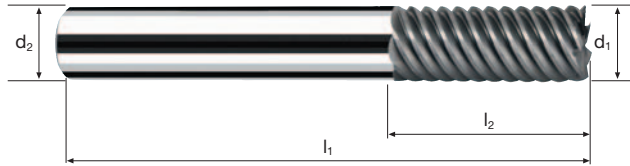
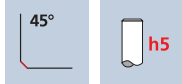
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	5	450	0.010	5	0.05	47750	2390
4	5	450	0.010	6	0.05	35810	1790
5	5	450	0.015	8	0.05	28650	2150
6	5	450	0.015	9	0.10	23875	1790
8	7	450	0.025	12	0.10	17905	3135
10	7	450	0.030	15	0.10	14325	3010
12	7	450	0.035	18	0.10	11935	2925
16	7	450	0.045	24	0.20	8955	2820
20	7	450	0.055	30	0.20	7160	2755
3	5	180	0.010	5	0.05	19100	955
4	5	180	0.010	6	0.05	14325	715
5	5	180	0.015	8	0.05	11460	860
6	5	180	0.015	9	0.10	9550	715
8	7	180	0.025	12	0.10	7160	1255
10	7	180	0.030	15	0.10	5730	1205
12	7	180	0.035	18	0.10	4775	1170
16	7	180	0.045	24	0.20	3580	1130
20	7	180	0.055	30	0.20	2865	1105
3	5	70	0.010	5	0.05	7425	370
4	5	70	0.010	6	0.05	5570	280
5	5	70	0.015	8	0.05	4455	335
6	5	70	0.015	9	0.10	3715	280
8	7	70	0.025	12	0.10	2785	485
10	7	70	0.030	15	0.10	2230	470
12	7	70	0.035	18	0.10	1855	455
16	7	70	0.045	24	0.20	1395	440
20	7	70	0.055	30	0.20	1115	430
3	5	80	0.010	5	0.05	8490	425
4	5	80	0.010	6	0.05	6365	320
5	5	80	0.015	8	0.05	5095	380
6	5	80	0.015	9	0.10	4245	320
8	7	80	0.025	12	0.10	3185	555
10	7	80	0.030	15	0.10	2545	535
12	7	80	0.035	18	0.10	2120	520
16	7	80	0.045	24	0.20	1590	500
20	7	80	0.055	30	0.20	1275	490

Frese cilindriche Multicut XF

Finitura, esecuzione normale



HM λ 65°
XA γ 8°



Sgrossatura



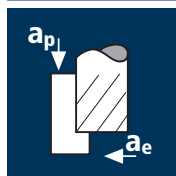
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium
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Esempio: N° Ordine								POLYCHROM	
		Rivestimento	Articolo	Codice-ø					
		P	15250	.180					P15250
ø Code	d1 e8	d2 h5	l1	l2	45°	α	z		
.180	3	6	57	8	-	6.0°	5		●
.220	4	6	57	11	-	4.0°	5		●
.260	5	6	57	13	-	2.0°	5		●
.300	6	6	57	13	0.15	0.0°	5		●
.391	8	8	63	19	0.15	0.0°	7		●
.450	10	10	72	22	0.20	0.0°	7		●
.501	12	12	83	26	0.20	0.0°	7		●
.610	16	16	92	32	0.20	0.0°	7		●
.682	20	20	104	38	0.20	0.0°	7		●

Applicazione



Materiale

Acciaio da
utensile temprato
48 - 52 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	150	0.008	4.5	0.1	15915	510
4	4	150	0.010	6.0	0.1	11935	475
5	5	150	0.014	7.5	0.1	9550	670
6	6	150	0.016	9.0	0.1	7960	765
8	6	150	0.022	12.0	0.1	5970	790
10	6	150	0.028	15.0	0.1	4775	800
12	6	150	0.032	18.0	0.1	3980	765
16	6	150	0.044	24.0	0.2	2985	790
20	8	150	0.054	30.0	0.2	2385	1030

Acciaio da
utensile temprato
52 - 56 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	120	0.008	4.5	0.1	12735	410
4	4	120	0.010	6.0	0.1	9550	380
5	5	120	0.014	7.5	0.1	7640	535
6	6	120	0.016	9.0	0.1	6365	610
8	6	120	0.022	12.0	0.1	4775	630
10	6	120	0.028	15.0	0.1	3820	640
12	6	120	0.032	18.0	0.1	3185	610
16	6	120	0.044	24.0	0.2	2385	630
20	8	120	0.054	30.0	0.2	1910	825

Acciaio da
utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	100	0.008	4.5	0.1	10610	340
4	4	100	0.010	6.0	0.1	7960	320
5	5	100	0.014	7.5	0.1	6365	445
6	6	100	0.016	9.0	0.1	5305	510
8	6	100	0.022	12.0	0.1	3980	525
10	6	100	0.028	15.0	0.1	3185	535
12	6	100	0.032	18.0	0.1	2655	510
16	6	100	0.044	24.0	0.2	1990	525
20	8	100	0.054	30.0	0.2	1590	685

Acciaio da
utensile temprato
> 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	80	0.008	4.5	0.1	8490	270
4	4	80	0.010	6.0	0.1	6365	255
5	5	80	0.012	7.5	0.1	5095	305
6	6	80	0.016	9.0	0.1	4245	410
8	6	80	0.020	12.0	0.1	3185	380
10	6	80	0.026	15.0	0.1	2545	395
12	6	80	0.030	18.0	0.1	2120	380
16	6	80	0.040	24.0	0.2	1590	380
20	8	80	0.050	30.0	0.2	1275	510

Materiale

Acciaio a taglio rapido
temprato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	50	0.008	4.5	0.1	5305	170
4	4	50	0.010	6.0	0.1	3980	160
5	5	50	0.012	7.5	0.1	3185	190
6	6	50	0.016	9.0	0.1	2655	255
8	6	50	0.020	12.0	0.1	1990	240
10	6	50	0.026	15.0	0.1	1590	250
12	6	50	0.030	18.0	0.1	1325	240
16	6	50	0.040	24.0	0.2	995	240
20	8	50	0.050	30.0	0.2	795	320

Ghisa
(grigia / sferoidale)



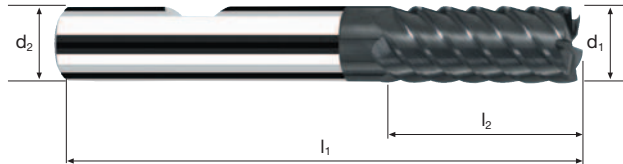
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	220	0.008	4.5	0.1	23345	745
4	4	220	0.010	6.0	0.1	17510	700
5	5	220	0.014	7.5	0.1	14005	980
6	6	220	0.016	9.0	0.1	11670	1120
8	6	220	0.022	12.0	0.1	8755	1155
10	6	220	0.028	15.0	0.1	7005	1175
12	6	220	0.032	18.0	0.1	5835	1120
16	6	220	0.044	24.0	0.2	4375	1155
20	8	220	0.054	30.0	0.2	3500	1510

Frese cilindriche Multicut HX-H

Finitura, esecuzione normale



HM λ 55°
XA γ -10°



Sgrossatura



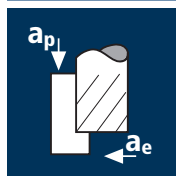
Finitura



			HRC 48-56	HRC 56-60	HRC > 60			HSS GG(G)
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Esempio: N° Ordine									DURO-S
		Rivestimento D	Articolo 5366	Codice- ϕ .180					D5366
ϕ Code	d1 e8	d2 h6	l1	l2	45°	α	z		D5266
.180	3	6	57	8	0.10	6.0°	4		●
.220	4	6	57	11	0.10	4.0°	4		●
.260	5	6	57	13	0.15	2.0°	5		●
.300	6	6	57	13	0.15	0.0°	6		●
.391	8	8	63	19	0.15	0.0°	6		●
.450	10	10	72	22	0.20	0.0°	6		●
.501	12	12	83	26	0.20	0.0°	6		●
.610	16	16	92	32	0.20	0.0°	6		●
.682	20	20	104	38	0.20	0.0°	8		●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	140	0.015	9	0.1	7425	670
8	6	140	0.025	12	0.1	5570	835
10	6	140	0.030	15	0.1	4455	800
12	6	140	0.035	18	0.1	3715	780
16	8	140	0.045	24	0.2	2785	1005
20	10	140	0.055	30	0.2	2230	1225

6	6	120	0.015	9	0.1	6365	575
8	6	120	0.025	12	0.1	4775	715
10	6	120	0.030	15	0.1	3820	690
12	6	120	0.035	18	0.1	3185	670
16	8	120	0.045	24	0.2	2385	860
20	10	120	0.055	30	0.2	1910	1050

6	6	80	0.016	9	0.1	4245	410
8	6	80	0.020	12	0.1	3185	380
10	6	80	0.026	15	0.1	2545	395
12	6	80	0.030	18	0.1	2120	380
16	8	80	0.040	24	0.2	1590	510
20	10	80	0.050	30	0.2	1275	640

6	6	140	0.015	9	0.1	7425	670
8	6	140	0.025	12	0.1	5570	835
10	6	140	0.030	15	0.1	4455	800
12	6	140	0.035	18	0.1	3715	780
16	8	140	0.045	24	0.2	2785	1005
20	10	140	0.055	30	0.2	2230	1225

Materiale

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Rame non legato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	60	0.015	9	0.1	3185	285
8	6	60	0.025	12	0.1	2385	360
10	6	60	0.030	15	0.1	1910	345
12	6	60	0.035	18	0.1	1590	335
16	8	60	0.045	24	0.2	1195	430
20	10	60	0.055	30	0.2	955	525

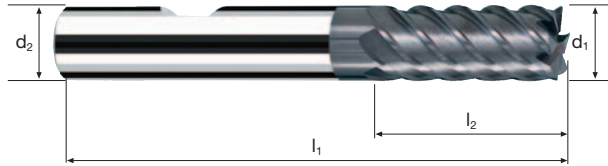
6	6	200	0.015	9	0.1	10610	955
8	6	200	0.025	12	0.1	7960	1195
10	6	200	0.030	15	0.1	6365	1145
12	6	200	0.035	18	0.1	5305	1115
16	8	200	0.045	24	0.2	3980	1435
20	10	200	0.055	30	0.2	3185	1750

Frese cilindriche Multicut N

Finitura, esecuzione normale



HM
MG10 λ **45°**
 γ **8°**



Sgrossatura



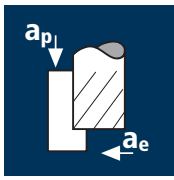
Finitura



Rm 850-1100	Rm 1100-1300	Rm 1300-1500					Ti Titanium	GG(G) Copper
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Esempio: N° Ordine							POLYCHROM	
Rivestimento Articolo Codice-ø								
P 5360 .300								
ø Code	d1 e8	d2 h6	l1	l2	45°	z		
.300	6	6	57	13	0.15	6	●	
.391	8	8	63	19	0.15	6	●	
.450	10	10	72	22	0.20	6	●	
.501	12	12	83	26	0.20	6	●	
.610	16	16	92	32	0.20	8	●	
.682	20	20	104	38	0.20	10	●	

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²

Ghisa
(grigia / sferoidale)

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	120	0.016	9	0.1	6365	610
8	6	120	0.020	12	0.1	4775	575
10	6	120	0.026	15	0.1	3820	595
12	6	120	0.030	18	0.1	3185	575
16	6	120	0.040	24	0.2	2385	570
20	6	120	0.050	30	0.2	1910	575

6	6	100	0.016	9	0.1	5305	510
8	6	100	0.020	12	0.1	3980	480
10	6	100	0.026	15	0.1	3185	495
12	6	100	0.030	18	0.1	2655	480
16	6	100	0.040	24	0.2	1990	480
20	6	100	0.050	30	0.2	1590	475

6	6	120	0.016	9	0.1	6365	610
8	6	120	0.020	12	0.1	4775	575
10	6	120	0.026	15	0.1	3820	595
12	6	120	0.030	18	0.1	3185	575
16	6	120	0.040	24	0.2	2385	570
20	6	120	0.050	30	0.2	1910	575

6	6	50	0.016	9	0.1	2655	255
8	6	50	0.020	12	0.1	1990	240
10	6	50	0.026	15	0.1	1590	250
12	6	50	0.030	18	0.1	1325	240
16	6	50	0.040	24	0.2	995	240
20	6	50	0.050	30	0.2	795	240

Materiale

Rame non legato

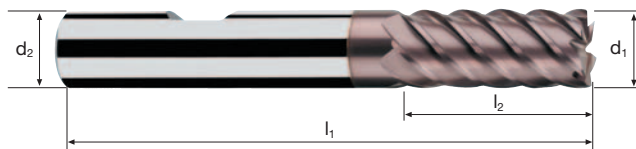
 

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	180	0.016	9	0.1	9550	915
8	6	180	0.020	12	0.1	7160	860
10	6	180	0.026	15	0.1	5730	895
12	6	180	0.030	18	0.1	4775	860
16	6	180	0.040	24	0.2	3580	860
20	6	180	0.050	30	0.2	2865	860

Frese cilindriche

Finitura, esecuzione normale

HM λ **45°**
 γ **8°**



Sgrossatura



Finitura



Rm
850-1100

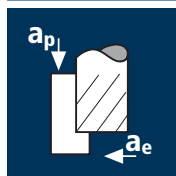
Rm
1100-1300

Ti
Titanium

**GG(G)
Copper**

		Rivestimento			Articolo		Codice-ø				UNICUT-4X
Esempio: N° Ordine		U			45360		.300				U45360
ø Code	d1 e8	d2 h6	l1	l2	45°	z					
.300	6	6	57	13	0.15	6					•
.391	8	8	63	19	0.15	6					•
.450	10	10	72	22	0.20	6					•
.501	12	12	83	26	0.20	6					•
.610	16	16	92	32	0.20	6					•
.682	20	20	104	38	0.20	6					•

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	5	150	0.015	15	0.15	7960	595
8	7	150	0.025	20	0.15	5970	1045
10	7	150	0.030	25	0.15	4775	1005
12	7	150	0.035	30	0.15	3980	975
16	7	150	0.045	40	0.25	2985	940
20	7	150	0.055	50	0.25	2385	920

6	5	120	0.015	15	0.15	6365	475
8	7	120	0.025	20	0.15	4775	835
10	7	120	0.030	25	0.15	3820	800
12	7	120	0.035	30	0.15	3185	780
16	7	120	0.045	40	0.25	2385	750
20	7	120	0.055	50	0.25	1910	735

6	5	100	0.016	15	0.15	5305	425
8	7	100	0.020	20	0.15	3980	555
10	7	100	0.026	25	0.15	3185	580
12	7	100	0.030	30	0.15	2655	560
16	7	100	0.040	40	0.25	1990	555
20	7	100	0.050	50	0.25	1590	555

6	5	80	0.016	15	0.15	4245	340
8	7	80	0.020	20	0.15	3185	445
10	7	80	0.026	25	0.15	2545	465
12	7	80	0.030	30	0.15	2120	445
16	7	80	0.040	40	0.25	1590	445
20	7	80	0.050	50	0.25	1275	445

Materiale

Alluminio malleabile
Si < 6%



Ghisa
(grigia / sferoidale)



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	5	360	0.015	15	0.15	19100	1435
8	7	360	0.025	20	0.15	14325	2505
10	7	360	0.030	25	0.15	11460	2405
12	7	360	0.035	30	0.15	9550	2340
16	7	360	0.045	40	0.25	7160	2255
20	7	360	0.055	50	0.25	5730	2205

6	5	150	0.015	15	0.15	7960	595
8	7	150	0.025	20	0.15	5970	1045
10	7	150	0.030	25	0.15	4775	1005
12	7	150	0.035	30	0.15	3980	975
16	7	150	0.045	40	0.25	2985	940
20	7	150	0.055	50	0.25	2385	920

6	5	60	0.015	15	0.15	3185	240
8	7	60	0.025	20	0.15	2385	415
10	7	60	0.030	25	0.15	1910	400
12	7	60	0.035	30	0.15	1590	390
16	7	60	0.045	40	0.25	1195	375
20	7	60	0.055	50	0.25	955	370

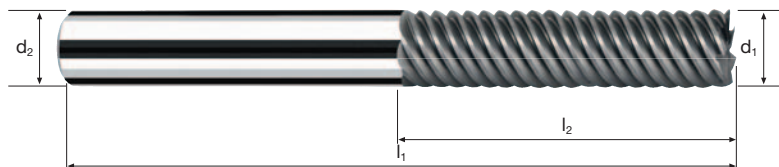
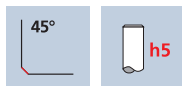
6	5	70	0.015	15	0.15	3715	280
8	7	70	0.025	20	0.15	2785	485
10	7	70	0.030	25	0.15	2230	470
12	7	70	0.035	30	0.15	1855	455
16	7	70	0.045	40	0.25	1395	440
20	7	70	0.055	50	0.25	1115	430

Frese cilindriche Multicut XF

Finitura, esecuzione medio-lunga



HM
XA λ **65°**
 γ **8°**



Sgrossatura



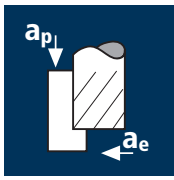
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium
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Esempio: N° Ordine		Rivestimento P	Articolo 15251	Codice-ø .300			POLYCHROM	
Ø Code	d1 e8	d2 h5	l1	l2	45°	z	P15251	
.300	6	6	63	19	0.15	5	●	
.391	8	8	72	28	0.15	7	●	
.450	10	10	84	34	0.20	7	●	
.501	12	12	97	40	0.20	7	●	
.610	16	16	108	48	0.20	7	●	
.682	20	20	122	56	0.20	7	●	

Applicazione



Materiale

Acciaio da utensile temprato
48 - 52 HRC

D

Acciaio da utensile temprato
52 - 56 HRC

D

Acciaio da utensile temprato
56 - 60 HRC

D

Acciaio da utensile temprato
> 60 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	120	0.016	15	0.15	6365	610
8	6	120	0.022	20	0.15	4775	630
10	6	120	0.028	25	0.15	3820	640
12	6	120	0.032	30	0.15	3185	610
16	6	120	0.044	40	0.25	2385	630
20	8	120	0.054	50	0.25	1910	825

6	6	100	0.016	15	0.15	5305	510
8	6	100	0.022	20	0.15	3980	525
10	6	100	0.028	25	0.15	3185	535
12	6	100	0.032	30	0.15	2655	510
16	6	100	0.044	40	0.25	1990	525
20	8	100	0.054	50	0.25	1590	685

6	6	80	0.016	15	0.15	4245	410
8	6	80	0.022	20	0.15	3185	420
10	6	80	0.028	25	0.15	2545	430
12	6	80	0.032	30	0.15	2120	405
16	6	80	0.044	40	0.25	1590	420
20	8	80	0.054	50	0.25	1275	550

6	6	50	0.016	15	0.15	2655	255
8	6	50	0.020	20	0.15	1990	240
10	6	50	0.026	25	0.15	1590	250
12	6	50	0.030	30	0.15	1325	240
16	6	50	0.040	40	0.25	995	240
20	8	50	0.050	50	0.25	795	320

Materiale

Acciaio a taglio rapido temprato

D

Ghisa (grigia / sferoidale)

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	40	0.016	15	0.15	2120	205
8	6	40	0.020	20	0.15	1590	190
10	6	40	0.026	25	0.15	1275	200
12	6	40	0.030	30	0.15	1060	190
16	6	40	0.040	40	0.25	795	190
20	8	40	0.050	50	0.25	635	255

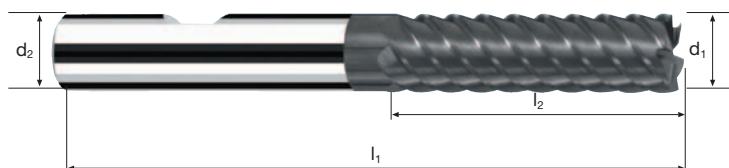
6	6	180	0.016	15	0.15	9550	915
8	6	180	0.022	20	0.15	7160	945
10	6	180	0.028	25	0.15	5730	965
12	6	180	0.032	30	0.15	4775	915
16	6	180	0.044	40	0.25	3580	945
20	8	180	0.054	50	0.25	2865	1240

Frese cilindriche Multicut HX-H

Finitura, esecuzione medio-lunga



HM
XA λ **55°**
 γ -**10°**



Sgrossatura



Finitura



HRC
48-56

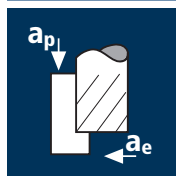
HRC
56-60

HRC
> 60

HSS
GG(G)

Esempio: N° Ordine								Rivestimento		Articolo		Codice- ϕ		DURO-S	
								D		15366		.300		D15366	
														D15266	
ϕ Code	d1 e8	d2 h6	l1	l2	45°	z									
.300	6	6	63	19	0.15	6							●		
.391	8	8	72	28	0.15	6							●		
.450	10	10	84	34	0.20	6							●		
.501	12	12	97	40	0.20	6							●		
.610	16	16	108	48	0.20	6							●		
.682	20	20	122	56	0.20	8							●		

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	120	0.015	15	0.15	6365	575
8	6	120	0.025	20	0.15	4775	715
10	6	120	0.030	25	0.15	3820	690
12	6	120	0.035	30	0.15	3185	670
16	8	120	0.045	40	0.25	2385	860
20	10	120	0.055	50	0.25	1910	1050

6	6	100	0.015	15	0.15	5305	475
8	6	100	0.025	20	0.15	3980	595
10	6	100	0.030	25	0.15	3185	575
12	6	100	0.035	30	0.15	2655	560
16	8	100	0.045	40	0.25	1990	715
20	10	100	0.055	50	0.25	1590	875

6	6	60	0.016	15	0.15	3185	305
8	6	60	0.020	20	0.15	2385	285
10	6	60	0.026	25	0.15	1910	300
12	6	60	0.030	30	0.15	1590	285
16	8	60	0.040	40	0.25	1195	380
20	10	60	0.050	50	0.25	955	480

6	6	120	0.015	15	0.15	6365	575
8	6	120	0.025	20	0.15	4775	715
10	6	120	0.030	25	0.15	3820	690
12	6	120	0.035	30	0.15	3185	670
16	8	120	0.045	40	0.25	2385	860
20	10	120	0.055	50	0.25	1910	1050

Materiale

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Rame non legato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	50	0.015	15	0.15	2655	240
8	6	50	0.025	20	0.15	1990	300
10	6	50	0.030	25	0.15	1590	285
12	6	50	0.035	30	0.15	1325	280
16	8	50	0.045	40	0.25	995	360
20	10	50	0.055	50	0.25	795	435

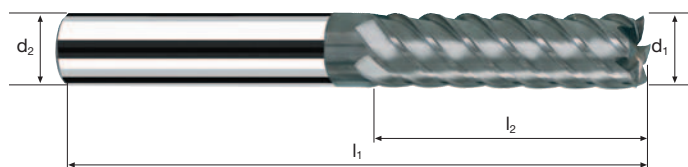
6	6	160	0.015	15	0.15	8490	765
8	6	160	0.025	20	0.15	6365	955
10	6	160	0.030	25	0.15	5095	915
12	6	160	0.035	30	0.15	4245	890
16	8	160	0.045	40	0.25	3185	1145
20	10	160	0.055	50	0.25	2545	1400

Frese cilindriche Multicut N

Finitura, esecuzione medio-lunga



HM
MG10 λ **45°**
 γ **8°**



Sgrossatura



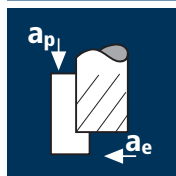
Finitura



Rm 850-1100 **Rm** 1100-1300 **Rm** 1300-1500 **Ti** Titanium **GG(G) Copper**

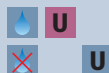
Esempio: N° Ordine							POLYCHROM
							P5265
\emptyset Code	d_1 e8	d_2 h6	l_1	l_2	45°	z	
.300	6	6	63	19	0.15	6	●
.391	8	8	72	28	0.15	6	●
.450	10	10	84	34	0.20	6	●
.501	12	12	97	40	0.20	6	●
.610	16	16	108	48	0.20	8	●
.682	20	20	122	56	0.20	10	●

Applicazione

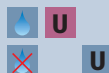


Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Ghisa
(grigia / sferoidale)



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	100	0.016	15	0.15	5305	510
8	6	100	0.020	20	0.15	3980	480
10	6	100	0.026	25	0.15	3185	495
12	6	100	0.030	30	0.15	2655	480
16	6	100	0.040	40	0.25	1990	480
20	6	100	0.050	50	0.25	1590	475

6	6	80	0.016	15	0.15	4245	410
8	6	80	0.020	20	0.15	3185	380
10	6	80	0.026	25	0.15	2545	395
12	6	80	0.030	30	0.15	2120	380
16	6	80	0.040	40	0.25	1590	380
20	6	80	0.050	50	0.25	1275	385

6	6	100	0.016	15	0.15	5305	510
8	6	100	0.020	20	0.15	3980	480
10	6	100	0.026	25	0.15	3185	495
12	6	100	0.030	30	0.15	2655	480
16	6	100	0.040	40	0.25	1990	480
20	6	100	0.050	50	0.25	1590	475

6	6	40	0.016	15	0.15	2120	205
8	6	40	0.020	20	0.15	1590	190
10	6	40	0.026	25	0.15	1275	200
12	6	40	0.030	30	0.15	1060	190
16	6	40	0.040	40	0.25	795	190
20	6	40	0.050	50	0.25	635	190

Materiale

Rame non legato



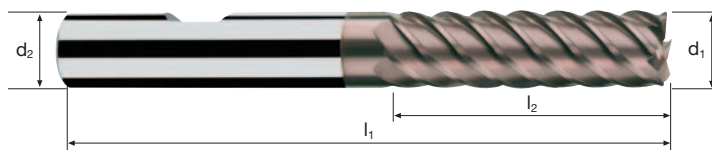
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	6	150	0.016	15	0.15	7960	765
8	6	150	0.020	20	0.15	5970	715
10	6	150	0.026	25	0.15	4775	745
12	6	150	0.030	30	0.15	3980	715
16	6	150	0.040	40	0.25	2985	715
20	6	150	0.050	50	0.25	2385	715

Frese cilindriche

Finitura, esecuzione medio-lunga



HM λ 45°
 γ 8°



Sgrossatura



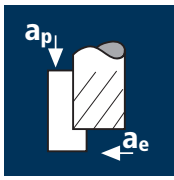
Finitura



Rm 850-1100	Rm 1100-1300						Ti Titanium	GG(G) Copper
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Esempio: N° Ordine								UNICUT-4X U45362
		Rivestimento U	Articolo 45362	Codice- ϕ .300				
ϕ Code	d1 e8	d2 h6	l1	l2	45°	z		
.300	6	6	63	19	0.15	6		●
.391	8	8	72	28	0.15	6		●
.450	10	10	84	34	0.20	6		●
.501	12	12	97	40	0.20	6		●
.610	16	16	108	48	0.20	6		●
.682	20	20	122	56	0.20	6		●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

P
 P

Acciaio
1100 - 1300 N/mm²

P
 P

Ghisa
(griglia / sferoidale)

P
 P

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

P

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
10	6	30	0.026	40	0.15	955	150
12	6	30	0.030	48	0.15	795	145
16	8	30	0.040	64	0.25	595	190
20	10	30	0.050	80	0.25	475	240
25	12	30	0.062	100	0.25	380	285

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
10	6	20	0.026	40	0.15	635	100
12	6	20	0.030	48	0.15	530	95
16	8	20	0.040	64	0.25	400	130
20	10	20	0.050	80	0.25	320	160
25	12	20	0.062	100	0.25	255	190

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
10	6	30	0.026	40	0.15	955	150
12	6	30	0.030	48	0.15	795	145
16	8	30	0.040	64	0.25	595	190
20	10	30	0.050	80	0.25	475	240
25	12	30	0.062	100	0.25	380	285

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
10	6	20	0.026	40	0.15	635	100
12	6	20	0.030	48	0.15	530	95
16	8	20	0.040	64	0.25	400	130
20	10	20	0.050	80	0.25	320	160
25	12	20	0.062	100	0.25	255	190

Materiale

Rame non legato

P

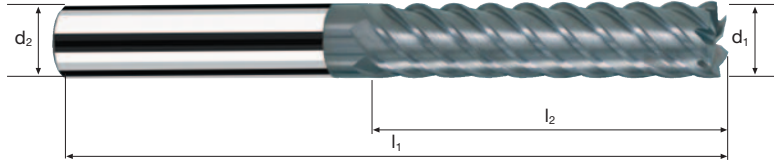
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
10	6	30	0.026	40	0.15	955	150
12	6	30	0.030	48	0.15	795	145
16	8	30	0.040	64	0.25	595	190
20	10	30	0.050	80	0.25	475	240
25	12	30	0.062	100	0.25	380	285

Frese cilindriche Multicut N

Finitura, esecuzione lunga



HM λ **45°**
MG10 γ **8°**



Sgrossatura



Finitura



Rm
850-1100

Rm
1100-1300

Ti
Titanium

GG(G)
Copper

Esempio: N° Ordine		Rivestimento P	Articolo 5268	Codice-ø .450				POLYCHROM
Ø Code	d1 e8	d2 h6	l1	l2	45°	z		P5268
.450	10	10	100	45	0.20	6		●
.501	12	12	110	53	0.20	6		●
.610	16	16	123	63	0.20	8		●
.615	16	16	135	80	0.20	8		●
.682	20	20	141	75	0.20	10		●
.685	20	20	166	100	0.20	10		●
.688	20	20	191	125	0.20	10		●
.772	25	25	255	175	0.25	12		●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	1.0	2	140	0.025	0.06	0.20	44565	2230	27.0
		1.2	2	140	0.030	0.07	0.24	37135	2230	37.5
		1.5	2	140	0.040	0.09	0.30	29710	2375	64.0
		2.0	2	140	0.050	0.12	0.40	22280	2230	107.0
		2.5	2	140	0.065	0.15	0.50	17825	2315	173.5
		3.0	2	140	0.075	0.18	0.60	14855	2230	241.0
Acciaio da utensile temprato 48 - 52 HRC 	1.0	2	120	0.024	0.06	0.20	38200	1835	22.0	
	1.2	2	120	0.028	0.07	0.24	31830	1780	30.0	
	1.5	2	120	0.038	0.09	0.30	25465	1935	52.0	
	2.0	2	120	0.048	0.12	0.40	19100	1835	88.0	
	2.5	2	120	0.062	0.15	0.50	15280	1895	142.0	
	3.0	2	120	0.072	0.18	0.60	12735	1835	198.0	
Acciaio da utensile temprato 52 - 56 HRC 	1.0	2	100	0.022	0.06	0.20	31830	1400	17.0	
	1.2	2	100	0.026	0.07	0.24	26525	1380	23.0	
	1.5	2	100	0.036	0.09	0.30	21220	1530	41.5	
	2.0	2	100	0.044	0.12	0.40	15915	1400	67.0	
	2.5	2	100	0.058	0.15	0.50	12735	1475	110.5	
	3.0	2	100	0.066	0.18	0.60	10610	1400	151.0	
Acciaio da utensile temprato 56 - 60 HRC 	1.0	2	60	0.020	0.06	0.20	19100	765	9.0	
	1.2	2	60	0.024	0.07	0.24	15915	765	13.0	
	1.5	2	60	0.032	0.09	0.30	12735	815	22.0	
	2.0	2	60	0.040	0.12	0.40	9550	765	36.5	
	2.5	2	60	0.052	0.15	0.50	7640	795	59.5	
	3.0	2	60	0.060	0.18	0.60	6365	765	82.5	

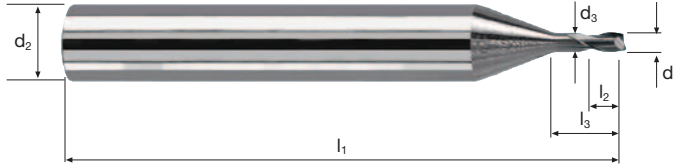
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	1.0	2	120	0.020	0.10	1.0	38200	1530	153.0
		1.2	2	120	0.025	0.12	1.2	31830	1590	229.0
		1.5	2	120	0.035	0.15	1.5	25465	1785	401.5
		2.0	2	120	0.045	0.20	2.0	19100	1720	688.0
		2.5	2	120	0.055	0.25	2.5	15280	1680	1050.0
		3.0	2	120	0.065	0.30	3.0	12735	1655	1489.5
Acciaio da utensile temprato 48 - 52 HRC 	1.0	2	100	0.020	0.10	1.0	31830	1275	127.5	
	1.2	2	100	0.024	0.12	1.2	26525	1275	183.5	
	1.5	2	100	0.034	0.15	1.5	21220	1445	325.0	
	2.0	2	100	0.042	0.20	2.0	15915	1335	534.0	
	2.5	2	100	0.052	0.25	2.5	12735	1325	828.0	
	3.0	2	100	0.062	0.30	3.0	10610	1315	1183.5	
Acciaio da utensile temprato 52 - 56 HRC 	1.0	2	80	0.018	0.10	1.0	25465	915	91.5	
	1.2	2	80	0.022	0.12	1.2	21220	935	134.5	
	1.5	2	80	0.030	0.15	1.5	16975	1020	229.5	
	2.0	2	80	0.040	0.20	2.0	12735	1020	408.0	
	2.5	2	80	0.048	0.25	2.5	10185	980	612.5	
	3.0	2	80	0.058	0.30	3.0	8490	985	886.5	
Acciaio da utensile temprato 56 - 60 HRC 	1.0	2	40	0.016	0.10	1.0	12735	410	41.0	
	1.2	2	40	0.020	0.12	1.2	10610	425	61.0	
	1.5	2	40	0.028	0.15	1.5	8490	475	107.0	
	2.0	2	40	0.036	0.20	2.0	6365	460	184.0	
	2.5	2	40	0.044	0.25	2.5	5095	450	281.5	
	3.0	2	40	0.052	0.30	3.0	4245	440	396.0	

Frese cilindriche MicroX

Gambo Ø 6mm, scarico cilindrico, 3xd



HM
XA λ **25°**
 γ **-10°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine										X-AL
										X6502
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	45°	α	z	
.100	1.0	6	0.95	57	1.0	3.0	0.07	11.5°	2	●
.108	1.2	6	1.10	57	1.2	3.6	0.07	11.0°	2	●
.120	1.5	6	1.40	57	1.5	4.5	0.07	10.0°	2	●
.140	2.0	6	1.90	57	2.0	6.0	0.10	8.5°	2	●
.160	2.5	6	2.30	57	2.5	7.5	0.10	7.5°	2	●
.180	3.0	6	2.80	57	3.0	9.0	0.10	6.0°	2	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	1.0	2	140	0.025	0.06	0.20	44565	2230	27.0
		1.2	2	140	0.030	0.07	0.24	37135	2230	37.5
		1.5	2	140	0.040	0.08	0.30	29710	2375	57.0
		2.0	2	140	0.050	0.11	0.40	22280	2230	98.0
		2.5	2	140	0.065	0.14	0.50	17825	2315	162.0
		3.0	2	140	0.075	0.17	0.60	14855	2230	227.5
Acciaio da utensile temprato 48 - 52 HRC 	1.0	2	120	0.024	0.06	0.20	38200	1835	22.0	
	1.2	2	120	0.028	0.07	0.24	31830	1780	30.0	
	1.5	2	120	0.038	0.08	0.30	25465	1935	46.5	
	2.0	2	120	0.048	0.11	0.40	19100	1835	80.5	
	2.5	2	120	0.062	0.14	0.50	15280	1895	132.5	
	3.0	2	120	0.072	0.17	0.60	12735	1835	187.0	
Acciaio da utensile temprato 52 - 56 HRC 	1.0	2	100	0.022	0.06	0.20	31830	1400	17.0	
	1.2	2	100	0.026	0.07	0.24	26525	1380	23.0	
	1.5	2	100	0.036	0.08	0.30	21220	1530	36.5	
	2.0	2	100	0.044	0.11	0.40	15915	1400	61.5	
	2.5	2	100	0.058	0.14	0.50	12735	1475	103.5	
	3.0	2	100	0.066	0.17	0.60	10610	1400	143.0	
Acciaio da utensile temprato 56 - 60 HRC 	1.0	2	60	0.020	0.06	0.20	19100	765	9.0	
	1.2	2	60	0.024	0.07	0.24	15915	765	13.0	
	1.5	2	60	0.032	0.08	0.30	12735	815	19.5	
	2.0	2	60	0.040	0.11	0.40	9550	765	33.5	
	2.5	2	60	0.052	0.14	0.50	7640	795	55.5	
	3.0	2	60	0.060	0.17	0.60	6365	765	78.0	

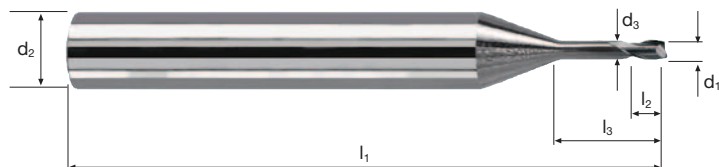
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	1.0	2	120	0.020	0.08	1.0	38200	1530	122.5
		1.2	2	120	0.025	0.10	1.2	31830	1590	191.0
		1.5	2	120	0.035	0.12	1.5	25465	1785	321.5
		2.0	2	120	0.045	0.16	2.0	19100	1720	550.5
		2.5	2	120	0.055	0.20	2.5	15280	1680	840.0
		3.0	2	120	0.065	0.24	3.0	12735	1655	1191.5
Acciaio da utensile temprato 48 - 52 HRC 	1.0	2	100	0.020	0.08	1.0	31830	1275	102.0	
	1.2	2	100	0.024	0.10	1.2	26525	1275	153.0	
	1.5	2	100	0.034	0.12	1.5	21220	1445	260.0	
	2.0	2	100	0.042	0.16	2.0	15915	1335	427.0	
	2.5	2	100	0.052	0.20	2.5	12735	1325	662.5	
	3.0	2	100	0.062	0.24	3.0	10610	1315	947.0	
Acciaio da utensile temprato 52 - 56 HRC 	1.0	2	80	0.018	0.08	1.0	25465	915	73.0	
	1.2	2	80	0.022	0.10	1.2	21220	935	112.0	
	1.5	2	80	0.030	0.12	1.5	16975	1020	183.5	
	2.0	2	80	0.040	0.16	2.0	12735	1020	326.5	
	2.5	2	80	0.048	0.20	2.5	10185	980	490.0	
	3.0	2	80	0.058	0.24	3.0	8490	985	709.0	
Acciaio da utensile temprato 56 - 60 HRC 	1.0	2	40	0.016	0.08	1.0	12735	410	33.0	
	1.2	2	40	0.020	0.10	1.2	10610	425	51.0	
	1.5	2	40	0.028	0.12	1.5	8490	475	85.5	
	2.0	2	40	0.036	0.16	2.0	6365	460	147.0	
	2.5	2	40	0.044	0.20	2.5	5095	450	225.0	
	3.0	2	40	0.052	0.24	3.0	4245	440	317.0	

Frese cilindriche MicroX

Gambo Ø 6mm, scarico cilindrico, 5xd



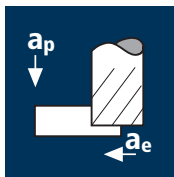
HM λ **25°**
XA γ **-10°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine										X-AL
		Rivestimento X	Articolo 6504	Codice-ø .100						X6504
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	45°	α	z	
.100	1.0	6	0.95	57	1.0	5.0	0.07	10.0°	2	●
.108	1.2	6	1.10	57	1.2	6.0	0.07	9.5°	2	●
.120	1.5	6	1.40	61	1.5	7.5	0.07	8.5°	2	●
.140	2.0	6	1.90	61	2.0	10.0	0.10	7.0°	2	●
.160	2.5	6	2.30	61	2.5	12.5	0.10	5.5°	2	●
.180	3.0	6	2.80	66	3.0	15.0	0.10	4.5°	2	●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



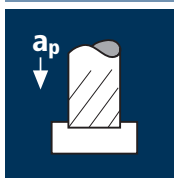
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
1.0	2	140	0.025	0.05	0.18	44565	2230	20.0
1.2	2	140	0.030	0.05	0.22	37135	2230	24.5
1.5	2	140	0.040	0.07	0.27	29710	2375	45.0
2.0	2	140	0.050	0.09	0.36	22280	2230	72.5
2.5	2	140	0.065	0.11	0.45	17825	2315	114.5
3.0	2	140	0.075	0.14	0.54	14855	2230	168.5

1.0	2	120	0.024	0.05	0.18	38200	1835	16.5
1.2	2	120	0.028	0.05	0.22	31830	1780	19.5
1.5	2	120	0.038	0.07	0.27	25465	1935	36.5
2.0	2	120	0.048	0.09	0.36	19100	1835	59.5
2.5	2	120	0.062	0.11	0.45	15280	1895	94.0
3.0	2	120	0.072	0.14	0.54	12735	1835	138.5

1.0	2	100	0.022	0.05	0.18	31830	1400	12.5
1.2	2	100	0.026	0.05	0.22	26525	1380	15.0
1.5	2	100	0.036	0.07	0.27	21220	1530	29.0
2.0	2	100	0.044	0.09	0.36	15915	1400	45.5
2.5	2	100	0.058	0.11	0.45	12735	1475	73.0
3.0	2	100	0.066	0.14	0.54	10610	1400	106.0

1.0	2	60	0.020	0.05	0.18	19100	765	7.0
1.2	2	60	0.024	0.05	0.22	15915	765	8.5
1.5	2	60	0.032	0.07	0.27	12735	815	15.5
2.0	2	60	0.040	0.09	0.36	9550	765	25.0
2.5	2	60	0.052	0.11	0.45	7640	795	39.5
3.0	2	60	0.060	0.14	0.54	6365	765	58.0

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
1.0	2	120	0.020	0.05	1.0	38200	1530	76.5
1.2	2	120	0.025	0.06	1.2	31830	1590	114.5
1.5	2	120	0.035	0.08	1.5	25465	1785	214.0
2.0	2	120	0.045	0.10	2.0	19100	1720	344.0
2.5	2	120	0.055	0.13	2.5	15280	1680	546.0
3.0	2	120	0.065	0.15	3.0	12735	1655	744.5

1.0	2	100	0.020	0.05	1.0	31830	1275	64.0
1.2	2	100	0.024	0.06	1.2	26525	1275	92.0
1.5	2	100	0.034	0.08	1.5	21220	1445	173.5
2.0	2	100	0.042	0.10	2.0	15915	1335	267.0
2.5	2	100	0.052	0.13	2.5	12735	1325	430.5
3.0	2	100	0.062	0.15	3.0	10610	1315	591.5

1.0	2	80	0.018	0.05	1.0	25465	915	46.0
1.2	2	80	0.022	0.06	1.2	21220	935	67.5
1.5	2	80	0.030	0.08	1.5	16975	1020	122.5
2.0	2	80	0.040	0.10	2.0	12735	1020	204.0
2.5	2	80	0.048	0.13	2.5	10185	980	318.5
3.0	2	80	0.058	0.15	3.0	8490	985	443.0

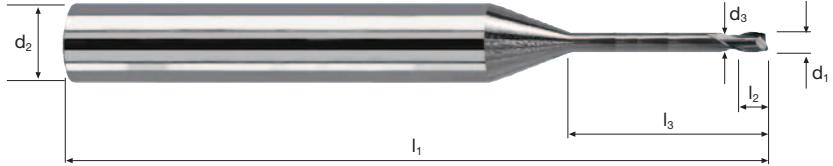
1.0	2	40	0.016	0.05	1.0	12735	410	20.5
1.2	2	40	0.020	0.06	1.2	10610	425	30.5
1.5	2	40	0.028	0.08	1.5	8490	475	57.0
2.0	2	40	0.036	0.10	2.0	6365	460	92.0
2.5	2	40	0.044	0.13	2.5	5095	450	146.5
3.0	2	40	0.052	0.15	3.0	4245	440	198.0

Frese cilindriche MicroX

Gambo Ø 6mm, scarico cilindrico, 8xd

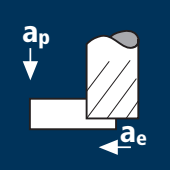









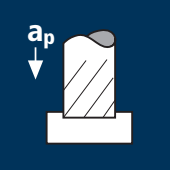







**HM
XA** λ **25°**
 γ **-10°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine		Rivestimento X		Articolo 6506		Codice-Ø .100				X-AL
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	45°	α	z	X6506
.100	1.0	6	0.95	61	1.0	8.0	0.07	8.5°	2	●
.108	1.2	6	1.10	61	1.2	9.6	0.07	7.5°	2	●
.120	1.5	6	1.40	61	1.5	12.0	0.07	6.5°	2	●
.140	2.0	6	1.90	66	2.0	16.0	0.10	5.0°	2	●
.160	2.5	6	2.30	69	2.5	20.0	0.10	4.0°	2	●
.180	3.0	6	2.80	75	3.0	24.0	0.10	3.0°	2	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	0.2	2	140	0.005	0.01	0.04	60000	600	0.0
		0.5	2	140	0.015	0.03	0.10	60000	1800	5.5
		0.8	2	140	0.020	0.05	0.16	55705	2230	18.0
		1.0	2	140	0.025	0.06	0.20	44565	2230	27.0
		1.2	2	140	0.030	0.07	0.24	37135	2230	37.5
		1.5	2	140	0.040	0.09	0.30	29710	2375	64.0
		2.0	2	140	0.050	0.12	0.40	22280	2230	107.0
		2.5	2	140	0.065	0.15	0.50	17825	2315	173.5
		3.0	2	140	0.075	0.18	0.60	14855	2230	241.0
		Acciaio da utensile temprato 48 - 52 HRC 	Acciaio da utensile temprato 48 - 52 HRC 	0.2	2	120	0.004	0.01	0.04	60000
0.5	2			120	0.014	0.03	0.10	60000	1680	5.0
0.8	2			120	0.020	0.05	0.16	47750	1910	15.5
1.0	2			120	0.024	0.06	0.20	38200	1835	22.0
1.2	2			120	0.028	0.07	0.24	31830	1780	30.0
1.5	2			120	0.038	0.09	0.30	25465	1935	52.0
2.0	2			120	0.048	0.12	0.40	19100	1835	88.0
2.5	2			120	0.062	0.15	0.50	15280	1895	142.0
3.0	2			120	0.072	0.18	0.60	12735	1835	198.0
Acciaio da utensile temprato 52 - 56 HRC 	Acciaio da utensile temprato 52 - 56 HRC 			0.2	2	100	0.004	0.01	0.04	60000
		0.5	2	100	0.014	0.03	0.10	60000	1680	5.0
		0.8	2	100	0.018	0.05	0.16	39790	1430	11.5
		1.0	2	100	0.022	0.06	0.20	31830	1400	17.0
		1.2	2	100	0.026	0.07	0.24	26525	1380	23.0
		1.5	2	100	0.036	0.09	0.30	21220	1530	41.5
		2.0	2	100	0.044	0.12	0.40	15915	1400	67.0
		2.5	2	100	0.058	0.15	0.50	12735	1475	110.5
		3.0	2	100	0.066	0.18	0.60	10610	1400	151.0
		Acciaio da utensile temprato 56 - 60 HRC 	Acciaio da utensile temprato 56 - 60 HRC 	0.2	2	60	0.004	0.01	0.04	60000
0.5	2			60	0.012	0.03	0.10	38200	915	2.5
0.8	2			60	0.016	0.05	0.16	23875	765	6.0
1.0	2			60	0.020	0.06	0.20	19100	765	9.0
1.2	2			60	0.024	0.07	0.24	15915	765	13.0
1.5	2			60	0.032	0.09	0.30	12735	815	22.0
2.0	2			60	0.040	0.12	0.40	9550	765	36.5
2.5	2			60	0.052	0.15	0.50	7640	795	59.5
3.0	2			60	0.060	0.18	0.60	6365	765	82.5

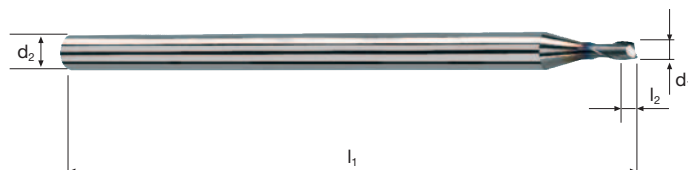
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	0.2	2	120	0.005	0.02	0.2	60000	600	2.5
		0.5	2	120	0.010	0.06	0.5	60000	1200	36.0
		0.8	2	120	0.020	0.09	0.8	47750	1910	137.5
		1.0	2	120	0.020	0.11	1.0	38200	1530	168.5
		1.2	2	120	0.025	0.13	1.2	31830	1590	248.0
		1.5	2	120	0.035	0.17	1.5	25465	1785	455.0
		2.0	2	120	0.045	0.22	2.0	19100	1720	757.0
		2.5	2	120	0.055	0.28	2.5	15280	1680	1176.0
		3.0	2	120	0.065	0.33	3.0	12735	1655	1638.5
		Acciaio da utensile temprato 48 - 52 HRC 	Acciaio da utensile temprato 48 - 52 HRC 	0.2	2	100	0.004	0.02	0.2	60000
0.5	2			100	0.010	0.06	0.5	60000	1200	36.0
0.8	2			100	0.020	0.09	0.8	39790	1590	114.5
1.0	2			100	0.020	0.11	1.0	31830	1275	140.5
1.2	2			100	0.024	0.13	1.2	26525	1275	199.0
1.5	2			100	0.034	0.17	1.5	21220	1445	368.5
2.0	2			100	0.042	0.22	2.0	15915	1335	587.5
2.5	2			100	0.052	0.28	2.5	12735	1325	927.5
3.0	2			100	0.062	0.33	3.0	10610	1315	1302.0
Acciaio da utensile temprato 52 - 56 HRC 	Acciaio da utensile temprato 52 - 56 HRC 			0.2	2	80	0.004	0.02	0.2	60000
		0.5	2	80	0.008	0.06	0.5	50930	815	24.5
		0.8	2	80	0.018	0.09	0.8	31830	1145	82.5
		1.0	2	80	0.018	0.11	1.0	25465	915	100.5
		1.2	2	80	0.022	0.13	1.2	21220	935	146.0
		1.5	2	80	0.030	0.17	1.5	16975	1020	260.0
		2.0	2	80	0.040	0.22	2.0	12735	1020	449.0
		2.5	2	80	0.048	0.28	2.5	10185	980	686.0
		3.0	2	80	0.058	0.33	3.0	8490	985	975.0
		Acciaio da utensile temprato 56 - 60 HRC 	Acciaio da utensile temprato 56 - 60 HRC 	0.2	2	40	0.004	0.02	0.2	60000
0.5	2			40	0.008	0.06	0.5	25465	405	12.0
0.8	2			40	0.016	0.09	0.8	15915	510	36.5
1.0	2			40	0.016	0.11	1.0	12735	410	45.0
1.2	2			40	0.020	0.13	1.2	10610	425	66.5
1.5	2			40	0.028	0.17	1.5	8490	475	121.0
2.0	2			40	0.036	0.22	2.0	6365	460	202.5
2.5	2			40	0.044	0.28	2.5	5095	450	315.0
3.0	2			40	0.052	0.33	3.0	4245	440	435.5

Frese cilindriche Microcut-C1H

Gambo Ø 3 mm, 1xd

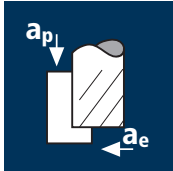












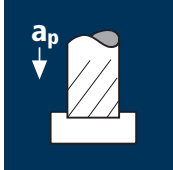










HM
XA λ **25°**
 γ **-10°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium
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Esempio: N° Ordine D 15711 .020								DURO-S	
Rivestimento Articolo Codice-ø								DURO-S	
Ø Code	d1 ±0.01	d2 h6	l1	l2	45°	α	z	D15711	
.020	0.2	3	40	0.24	-	14.5°	2	●	
.030	0.3	3	40	0.36	-	14.0°	2	●	
.040	0.4	3	40	0.48	-	14.0°	2	●	
.050	0.5	3	40	0.60	-	13.5°	2	●	
.060	0.6	3	40	0.72	-	13.0°	2	●	
.080	0.8	3	40	0.96	-	12.5°	2	●	
.100	1.0	3	50	1.20	0.07	11.5°	2	●	
.108	1.2	3	50	1.40	0.07	10.5°	2	●	
.120	1.5	3	50	1.80	0.07	9.5°	2	●	
.140	2.0	3	50	2.40	0.10	7.0°	2	●	
.160	2.5	3	50	3.00	0.10	4.0°	2	●	
.180	3.0	3	50	3.60	0.10	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio < 850 N/mm ²  	0.2	2	180	0.002	0.20	0.04	60000	240	2.0
		0.4	2	180	0.004	0.40	0.08	60000	480	15.5
		0.6	2	180	0.008	0.60	0.12	60000	960	69.0
		0.8	2	180	0.010	0.80	0.16	60000	1200	153.5
		1.0	2	180	0.012	1.00	0.20	57295	1375	275.0
		1.2	2	180	0.014	1.20	0.24	47750	1335	384.5
		1.5	2	180	0.018	1.50	0.30	38200	1375	618.5
		1.8	2	180	0.022	1.80	0.36	31830	1400	907.0
		2.0	2	180	0.024	2.00	0.40	28650	1375	1100.0
			Ottone a truciolo corto CuZn    	0.2	2	190	0.002	0.20	0.04	60000
0.4	2			190	0.004	0.40	0.08	60000	480	15.5
0.6	2			190	0.008	0.60	0.12	60000	960	69.0
0.8	2			190	0.012	0.80	0.16	60000	1440	184.5
1.0	2			190	0.014	1.00	0.20	60000	1680	336.0
1.2	2			190	0.016	1.20	0.24	50400	1615	465.0
1.5	2			190	0.020	1.50	0.30	40320	1615	726.5
1.8	2			190	0.024	1.80	0.36	33600	1615	1046.5
2.0	2			190	0.026	2.00	0.40	30240	1570	1256.0
	Acciaio inossidabile [Cr-Ni/1.4301]  			0.2	2	70	0.002	0.20	0.04	60000
		0.4	2	70	0.004	0.40	0.08	55705	445	14.0
		0.6	2	70	0.006	0.60	0.12	37135	445	32.0
		0.8	2	70	0.008	0.80	0.16	27855	445	57.0
		1.0	2	70	0.010	1.00	0.20	22280	445	89.0
		1.2	2	70	0.012	1.20	0.24	18570	445	128.0
		1.5	2	70	0.014	1.50	0.30	14855	415	186.5
		1.8	2	70	0.018	1.80	0.36	12380	445	288.5
		2.0	2	70	0.020	2.00	0.40	11140	445	356.0
			Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]  	0.2	2	50	0.002	0.20	0.04	60000
0.4	2			50	0.002	0.40	0.08	39790	160	5.0
0.6	2			50	0.006	0.60	0.12	26525	320	23.0
0.8	2			50	0.008	0.80	0.16	19895	320	41.0
1.0	2			50	0.008	1.00	0.20	15915	255	51.0
1.2	2			50	0.010	1.20	0.24	13265	265	76.5
1.5	2			50	0.012	1.50	0.30	10610	255	114.5
1.8	2			50	0.016	1.80	0.36	8840	285	184.5
2.0	2			50	0.016	2.00	0.40	7960	255	204.0

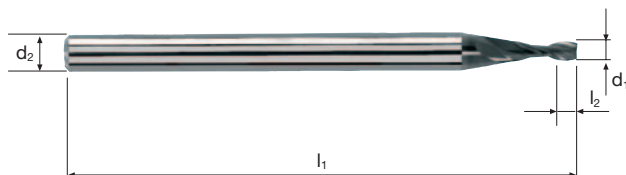
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio < 850 N/mm ²  	0.2	2	160	0.002	0.04	0.2	60000	240	2.0
		0.4	2	160	0.004	0.08	0.4	60000	480	15.5
		0.6	2	160	0.006	0.12	0.6	60000	720	52.0
		0.8	2	160	0.008	0.16	0.8	60000	960	123.0
		1.0	2	160	0.012	0.20	1.0	50930	1220	244.0
		1.2	2	160	0.014	0.24	1.2	42445	1190	342.5
		1.5	2	160	0.016	0.30	1.5	33955	1085	488.0
		1.8	2	160	0.020	0.36	1.8	28295	1130	732.0
		2.0	2	160	0.022	0.40	2.0	25465	1120	896.0
			Ottone a truciolo corto CuZn    	0.2	2	170	0.002	0.04	0.2	60000
0.4	2			170	0.004	0.08	0.4	60000	480	15.5
0.6	2			170	0.006	0.12	0.6	60000	720	52.0
0.8	2			170	0.008	0.16	0.8	60000	960	123.0
1.0	2			170	0.012	0.20	1.0	54115	1300	260.0
1.2	2			170	0.014	0.24	1.2	45095	1265	364.5
1.5	2			170	0.016	0.30	1.5	36075	1155	520.0
1.8	2			170	0.022	0.36	1.8	30065	1325	858.5
2.0	2			170	0.024	0.40	2.0	27055	1300	1040.0
	Acciaio inossidabile [Cr-Ni/1.4301]  			0.2	2	60	0.002	0.04	0.2	60000
		0.4	2	60	0.004	0.08	0.4	47750	380	12.0
		0.6	2	60	0.006	0.12	0.6	31830	380	27.5
		0.8	2	60	0.008	0.16	0.8	23875	380	48.5
		1.0	2	60	0.010	0.20	1.0	19100	380	76.0
		1.2	2	60	0.012	0.24	1.2	15915	380	109.5
		1.5	2	60	0.014	0.30	1.5	12735	355	159.5
		1.8	2	60	0.018	0.36	1.8	10610	380	246.0
		2.0	2	60	0.020	0.40	2.0	9550	380	304.0
			Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]  	0.2	2	40	0.002	0.04	0.2	60000
0.4	2			40	0.004	0.08	0.4	31830	255	8.0
0.6	2			40	0.004	0.12	0.6	21220	170	12.0
0.8	2			40	0.006	0.16	0.8	15915	190	24.5
1.0	2			40	0.010	0.20	1.0	12735	255	51.0
1.2	2			40	0.012	0.24	1.2	10610	255	73.5
1.5	2			40	0.012	0.30	1.5	8490	205	92.0
1.8	2			40	0.016	0.36	1.8	7075	225	146.0
2.0	2			40	0.018	0.40	2.0	6365	230	184.0

Frese cilindriche Micro C1.5

Gambo ø 3mm, 1.5xd



HM λ **30°**
 γ **8°**



Rm
< 850

Rm
850-1100

Rm
1100-1300

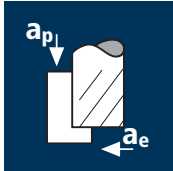












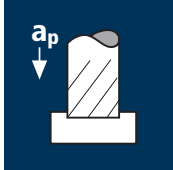










Inox
Stainless

Ti
Titanium

CuZn Brass
Gold / Platinum
Copper

Esempio: N° Ordine		Rivestimento M	Articolo 45709	Codice-ø .010			MICRO	
ø Code	d1 ±0.01	d2 h6	l1	l2	α	Z	45709	M45709
.010	0.10	3	40	0.15	14.5°	2	●	●
.015	0.15	3	40	0.23	14.5°	2	●	●
.020	0.20	3	40	0.30	14.5°	2	●	●
.025	0.25	3	40	0.38	14.0°	2	●	●
.030	0.30	3	40	0.45	14.0°	2	●	●
.040	0.40	3	40	0.60	13.5°	2	●	●
.050	0.50	3	40	0.75	13.0°	2	●	●
.060	0.60	3	40	0.90	12.5°	2	●	●
.070	0.70	3	40	1.05	12.5°	2	●	●
.080	0.80	3	40	1.20	12.0°	2	●	●
.090	0.90	3	40	1.35	11.5°	2	●	●
.100	1.00	3	40	1.50	11.0°	2	●	●
.104	1.10	3	40	1.65	10.5°	2	●	●
.108	1.20	3	40	1.80	10.0°	2	●	●
.112	1.30	3	40	1.95	9.5°	2	●	●
.116	1.40	3	40	2.10	9.0°	2	●	●
.120	1.50	3	40	2.25	8.5°	2	●	●
.123	1.60	3	40	2.40	8.0°	2	●	●
.126	1.70	3	40	2.55	7.5°	2	●	●
.130	1.80	3	40	2.70	7.0°	2	●	●
.135	1.90	3	40	2.85	6.5°	2	●	●
.140	2.00	3	40	3.00	6.0°	2	●	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio < 850 N/mm ²  	2.1	2	180	0.024	2.10	0.42	27285	1310	1155.5
		2.2	2	180	0.026	2.20	0.44	26045	1355	1311.5
		2.3	2	180	0.028	2.30	0.46	24910	1395	1476.0
		2.4	2	180	0.028	2.40	0.48	23875	1335	1538.0
		2.5	2	180	0.030	2.50	0.50	22920	1375	1719.0
		3.0	2	180	0.036	3.00	0.60	19100	1375	2475.0
Ottone a truciolo corto CuZn    	2.1	2	190	0.026	2.10	0.42	28800	1500	1323.0	
	2.2	2	190	0.028	2.20	0.44	27490	1540	1490.5	
	2.3	2	190	0.030	2.30	0.46	26295	1580	1671.5	
	2.4	2	190	0.030	2.40	0.48	25200	1510	1739.5	
	2.5	2	190	0.034	2.50	0.50	24190	1645	2056.5	
	3.0	2	190	0.040	3.00	0.60	20160	1615	2907.0	
Acciaio inossidabile [Cr-Ni/1.4301]  	2.1	2	70	0.020	2.10	0.42	10610	425	375.0	
	2.2	2	70	0.020	2.20	0.44	10130	405	392.0	
	2.3	2	70	0.022	2.30	0.46	9690	425	449.5	
	2.4	2	70	0.022	2.40	0.48	9285	410	472.5	
	2.5	2	70	0.024	2.50	0.50	8915	430	537.5	
	3.0	2	70	0.028	3.00	0.60	7425	415	747.0	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]  	2.1	2	50	0.016	2.10	0.42	7580	245	216.0	
	2.2	2	50	0.018	2.20	0.44	7235	260	251.5	
	2.3	2	50	0.020	2.30	0.46	6920	275	291.0	
	2.4	2	50	0.020	2.40	0.48	6630	265	305.5	
	2.5	2	50	0.022	2.50	0.50	6365	280	350.0	
	3.0	2	50	0.026	3.00	0.60	5305	275	495.0	

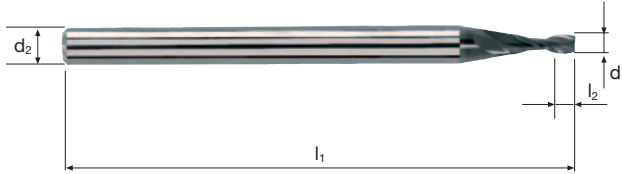
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio < 850 N/mm ²  	2.1	2	160	0.024	0.42	2.1	24255	1165	1027.5
		2.2	2	160	0.024	0.44	2.2	23150	1110	1074.5
		2.3	2	160	0.026	0.46	2.3	22145	1150	1216.5
		2.4	2	160	0.026	0.48	2.4	21220	1105	1273.0
		2.5	2	160	0.028	0.50	2.5	20370	1140	1425.0
		3.0	2	160	0.034	0.60	3.0	16975	1155	2079.0
Ottone a truciolo corto CuZn    	2.1	2	170	0.026	0.42	2.1	25770	1340	1182.0	
	2.2	2	170	0.026	0.44	2.2	24595	1280	1239.0	
	2.3	2	170	0.028	0.46	2.3	23530	1320	1396.5	
	2.4	2	170	0.028	0.48	2.4	22550	1265	1457.5	
	2.5	2	170	0.030	0.50	2.5	21645	1300	1625.0	
	3.0	2	170	0.036	0.60	3.0	18040	1300	2340.0	
Acciaio inossidabile [Cr-Ni/1.4301]  	2.1	2	60	0.022	0.42	2.1	9095	400	353.0	
	2.2	2	60	0.022	0.44	2.2	8680	380	368.0	
	2.3	2	60	0.022	0.46	2.3	8305	365	386.0	
	2.4	2	60	0.022	0.48	2.4	7960	350	403.0	
	2.5	2	60	0.024	0.50	2.5	7640	365	456.5	
	3.0	2	60	0.030	0.60	3.0	6365	380	684.0	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]  	2.1	2	40	0.020	0.42	2.1	6065	245	216.0	
	2.2	2	40	0.020	0.44	2.2	5790	230	222.5	
	2.3	2	40	0.020	0.46	2.3	5535	220	233.0	
	2.4	2	40	0.020	0.48	2.4	5305	210	242.0	
	2.5	2	40	0.022	0.50	2.5	5095	225	281.5	
	3.0	2	40	0.028	0.60	3.0	4245	240	432.0	

Frese cilindriche Micro C1.5

Gambo ø 3mm, 1.5xd



HM	λ 30° γ 8°



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	CuZn Brass Gold / Platinum Copper
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								MICRO	
Esempio: N° Ordine								45709	M45709
		Rivestimento M	Articolo 45709	Codice-ø .143					
Ø Code	d1 ±0.01	d2 h6	l1	l2	α	z			
.143	2.10	3	40	3.15	5.5°	2	●	●	
.146	2.20	3	40	3.30	5.0°	2	●	●	
.150	2.30	3	40	3.45	4.5°	2	●	●	
.155	2.40	3	40	3.60	4.0°	2	●	●	
.160	2.50	3	40	3.75	3.0°	2	●	●	
.165	2.60	3	45	3.90	2.5°	2	●	●	
.170	2.70	3	45	4.05	2.0°	2	●	●	
.172	2.80	3	45	4.20	1.5°	2	●	●	
.176	2.90	3	45	4.35	1.0°	2	●	●	



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.2	2	180	0.004	0.16	0.03	60000	480	2.5
0.5	2	180	0.012	0.40	0.08	60000	1440	46.0
0.8	2	180	0.018	0.64	0.12	60000	2160	166.0
1.0	2	180	0.022	0.80	0.15	57295	2520	302.5
1.2	2	180	0.026	0.96	0.18	47750	2485	429.5
1.5	2	180	0.034	1.20	0.23	38200	2600	717.5
2.0	2	180	0.044	1.60	0.30	28650	2520	1209.5
2.5	2	180	0.056	2.00	0.38	22920	2565	1949.5
3.0	2	180	0.066	2.40	0.45	19100	2520	2721.5

Acciaio
1100 - 1300 N/mm²

0.2	2	160	0.004	0.16	0.03	60000	480	2.5
0.5	2	160	0.010	0.40	0.08	60000	1200	38.5
0.8	2	160	0.016	0.64	0.12	60000	1920	147.5
1.0	2	160	0.020	0.80	0.15	50930	2035	244.0
1.2	2	160	0.024	0.96	0.18	42445	2035	351.5
1.5	2	160	0.030	1.20	0.23	33955	2035	561.5
2.0	2	160	0.040	1.60	0.30	25465	2035	977.0
2.5	2	160	0.050	2.00	0.38	20370	2035	1546.5
3.0	2	160	0.060	2.40	0.45	16975	2035	2198.0

Acciaio inossidabile
[Cr-Ni/1.4301]

0.2	2	80	0.004	0.16	0.03	60000	480	2.5
0.5	2	80	0.010	0.40	0.08	50930	1020	32.5
0.8	2	80	0.014	0.64	0.12	31830	890	68.5
1.0	2	80	0.018	0.80	0.15	25465	915	110.0
1.2	2	80	0.020	0.96	0.18	21220	850	147.0
1.5	2	80	0.028	1.20	0.23	16975	950	262.0
2.0	2	80	0.036	1.60	0.30	12735	915	439.0
2.5	2	80	0.044	2.00	0.38	10185	895	680.0
3.0	2	80	0.052	2.40	0.45	8490	885	956.0

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

0.2	2	60	0.002	0.16	0.03	60000	240	1.0
0.5	2	60	0.008	0.40	0.08	38200	610	19.5
0.8	2	60	0.012	0.64	0.12	23875	575	44.0
1.0	2	60	0.016	0.80	0.15	19100	610	73.0
1.2	2	60	0.018	0.96	0.18	15915	575	99.5
1.5	2	60	0.024	1.20	0.23	12735	610	168.5
2.0	2	60	0.030	1.60	0.30	9550	575	276.0
2.5	2	60	0.040	2.00	0.38	7640	610	463.5
3.0	2	60	0.046	2.40	0.45	6365	585	632.0



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.2	2	160	0.004	0.02	0.2	60000	480	2.0
0.5	2	160	0.010	0.06	0.5	60000	1200	36.0
0.8	2	160	0.014	0.10	0.8	60000	1680	134.5
1.0	2	160	0.018	0.12	1.0	50930	1835	220.0
1.2	2	160	0.022	0.14	1.2	42445	1870	314.0
1.5	2	160	0.028	0.18	1.5	33955	1900	513.0
2.0	2	160	0.036	0.24	2.0	25465	1835	881.0
2.5	2	160	0.046	0.30	2.5	20370	1875	1406.5
3.0	2	160	0.054	0.36	3.0	16975	1835	1982.0

Acciaio
1100 - 1300 N/mm²

0.2	2	140	0.004	0.02	0.2	60000	480	2.0
0.5	2	140	0.010	0.06	0.5	60000	1200	36.0
0.8	2	140	0.014	0.10	0.8	55705	1560	125.0
1.0	2	140	0.018	0.12	1.0	44565	1605	192.5
1.2	2	140	0.020	0.14	1.2	37135	1485	249.5
1.5	2	140	0.026	0.18	1.5	29710	1545	417.0
2.0	2	140	0.034	0.24	2.0	22280	1515	727.0
2.5	2	140	0.044	0.30	2.5	17825	1570	1177.5
3.0	2	140	0.052	0.36	3.0	14855	1545	1668.5

Acciaio inossidabile
[Cr-Ni/1.4301]

0.2	2	70	0.004	0.02	0.2	60000	480	2.0
0.5	2	70	0.008	0.06	0.5	44565	715	21.5
0.8	2	70	0.012	0.10	0.8	27855	670	53.5
1.0	2	70	0.016	0.12	1.0	22280	715	86.0
1.2	2	70	0.020	0.14	1.2	18570	745	125.0
1.5	2	70	0.024	0.18	1.5	14855	715	193.0
2.0	2	70	0.032	0.24	2.0	11140	715	343.0
2.5	2	70	0.040	0.30	2.5	8915	715	536.5
3.0	2	70	0.048	0.36	3.0	7425	715	772.0

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

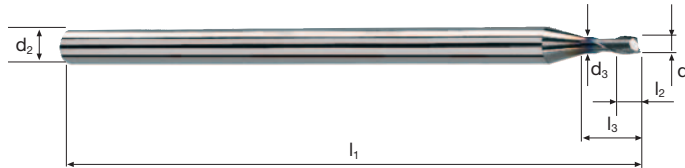
0.2	2	50	0.004	0.02	0.2	60000	480	2.0
0.5	2	50	0.008	0.06	0.5	31830	510	15.5
0.8	2	50	0.012	0.10	0.8	19895	475	38.0
1.0	2	50	0.014	0.12	1.0	15915	445	53.5
1.2	2	50	0.018	0.14	1.2	13265	480	80.5
1.5	2	50	0.022	0.18	1.5	10610	465	125.5
2.0	2	50	0.028	0.24	2.0	7960	445	213.5
2.5	2	50	0.036	0.30	2.5	6365	460	345.0
3.0	2	50	0.044	0.36	3.0	5305	465	502.0

Frese cilindriche Microcut-C3

Gambo Ø 3 mm, scarico cilindrico, 3xd

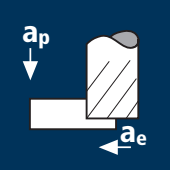






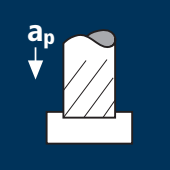




HM λ 25°
Micro γ 6°



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Rm** 1300-1500 **Inox** Stainless **Ti** Titanium **Cobalt-Chrome Gold / Platinum Copper**

Esempio: N° Ordine										MICRO
										M5712
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z	
.020	0.2	3	0.18	40	0.24	0.6	-	9.5°	2	●
.030	0.3	3	0.25	40	0.36	0.9	-	9.0°	2	●
.040	0.4	3	0.35	40	0.48	1.2	-	9.0°	2	●
.050	0.5	3	0.45	40	0.60	1.5	-	11.5°	2	●
.060	0.6	3	0.55	40	0.72	1.8	-	11.0°	2	●
.080	0.8	3	0.75	40	0.96	2.4	-	10.0°	2	●
.100	1.0	3	0.95	50	1.20	3.0	0.07	8.5°	2	●
.108	1.2	3	1.10	50	1.44	3.6	0.07	7.5°	2	●
.120	1.5	3	1.40	50	1.80	4.5	0.07	6.0°	2	●
.140	2.0	3	1.90	50	2.40	6.0	0.10	4.0°	2	●
.160	2.5	3	2.30	50	3.00	7.5	0.10	2.0°	2	●
.180	3.0	3	2.80	50	3.60	9.0	0.10	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	0.5	2	140	0.015	0.03	0.10	60000	1800	5.5
		0.6	2	140	0.015	0.03	0.12	60000	1800	6.5
		0.8	2	140	0.020	0.04	0.16	55705	2230	14.5
		1.0	2	140	0.025	0.06	0.20	44565	2230	27.0
		1.2	2	140	0.030	0.07	0.24	37135	2230	37.5
		1.5	2	140	0.040	0.08	0.30	29710	2375	57.0
		2.0	2	140	0.050	0.11	0.40	22280	2230	98.0
		2.5	2	140	0.065	0.14	0.50	17825	2315	162.0
		3.0	2	140	0.075	0.17	0.60	14855	2230	227.5
			Acciaio da utensile temprato 48 - 52 HRC 	0.5	2	120	0.014	0.03	0.10	60000
0.6	2			120	0.014	0.03	0.12	60000	1680	6.0
0.8	2			120	0.020	0.04	0.16	47750	1910	12.0
1.0	2			120	0.024	0.06	0.20	38200	1835	22.0
1.2	2			120	0.028	0.07	0.24	31830	1780	30.0
1.5	2			120	0.038	0.08	0.30	25465	1935	46.5
2.0	2			120	0.048	0.11	0.40	19100	1835	80.5
2.5	2			120	0.062	0.14	0.50	15280	1895	132.5
3.0	2			120	0.072	0.17	0.60	12735	1835	187.0
	Acciaio da utensile temprato 52 - 56 HRC 			0.5	2	100	0.014	0.03	0.10	60000
		0.6	2	100	0.014	0.03	0.12	53055	1485	5.5
		0.8	2	100	0.018	0.04	0.16	39790	1430	9.0
		1.0	2	100	0.022	0.06	0.20	31830	1400	17.0
		1.2	2	100	0.026	0.07	0.24	26525	1380	23.0
		1.5	2	100	0.036	0.08	0.30	21220	1530	36.5
		2.0	2	100	0.044	0.11	0.40	15915	1400	61.5
		2.5	2	100	0.058	0.14	0.50	12735	1475	103.5
		3.0	2	100	0.066	0.17	0.60	10610	1400	143.0
			Acciaio da utensile temprato 56 - 60 HRC 	0.5	2	60	0.012	0.03	0.10	38200
0.6	2			60	0.012	0.03	0.12	31830	765	3.0
0.8	2			60	0.016	0.04	0.16	23875	765	5.0
1.0	2			60	0.020	0.06	0.20	19100	765	9.0
1.2	2			60	0.024	0.07	0.24	15915	765	13.0
1.5	2			60	0.032	0.08	0.30	12735	815	19.5
2.0	2			60	0.040	0.11	0.40	9550	765	33.5
2.5	2			60	0.052	0.14	0.50	7640	795	55.5
3.0	2			60	0.060	0.17	0.60	6365	765	78.0

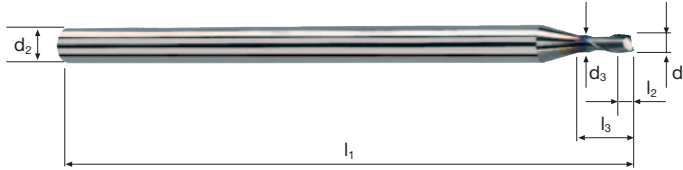
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	0.5	2	120	0.010	0.05	0.5	60000	1200	30.0
		0.6	2	120	0.015	0.05	0.6	60000	1800	54.0
		0.8	2	120	0.020	0.07	0.8	47750	1910	107.0
		1.0	2	120	0.020	0.09	1.0	38200	1530	137.5
		1.2	2	120	0.025	0.11	1.2	31830	1590	210.0
		1.5	2	120	0.035	0.14	1.5	25465	1785	375.0
		2.0	2	120	0.045	0.18	2.0	19100	1720	619.0
		2.5	2	120	0.055	0.23	2.5	15280	1680	966.0
		3.0	2	120	0.065	0.27	3.0	12735	1655	1340.5
			Acciaio da utensile temprato 48 - 52 HRC 	0.5	2	100	0.010	0.05	0.5	60000
0.6	2			100	0.014	0.05	0.6	53055	1485	44.5
0.8	2			100	0.020	0.07	0.8	39790	1590	89.0
1.0	2			100	0.020	0.09	1.0	31830	1275	115.0
1.2	2			100	0.024	0.11	1.2	26525	1275	168.5
1.5	2			100	0.034	0.14	1.5	21220	1445	303.5
2.0	2			100	0.042	0.18	2.0	15915	1335	480.5
2.5	2			100	0.052	0.23	2.5	12735	1325	762.0
3.0	2			100	0.062	0.27	3.0	10610	1315	1065.0
	Acciaio da utensile temprato 52 - 56 HRC 			0.5	2	80	0.008	0.05	0.5	50930
		0.6	2	80	0.014	0.05	0.6	42445	1190	35.5
		0.8	2	80	0.018	0.07	0.8	31830	1145	64.0
		1.0	2	80	0.018	0.09	1.0	25465	915	82.5
		1.2	2	80	0.022	0.11	1.2	21220	935	123.5
		1.5	2	80	0.030	0.14	1.5	16975	1020	214.0
		2.0	2	80	0.040	0.18	2.0	12735	1020	367.0
		2.5	2	80	0.048	0.23	2.5	10185	980	563.5
		3.0	2	80	0.058	0.27	3.0	8490	985	798.0
			Acciaio da utensile temprato 56 - 60 HRC 	0.5	2	40	0.008	0.05	0.5	25465
0.6	2			40	0.012	0.05	0.6	21220	510	15.5
0.8	2			40	0.016	0.07	0.8	15915	510	28.5
1.0	2			40	0.016	0.09	1.0	12735	410	37.0
1.2	2			40	0.020	0.11	1.2	10610	425	56.0
1.5	2			40	0.028	0.14	1.5	8490	475	100.0
2.0	2			40	0.036	0.18	2.0	6365	460	165.5
2.5	2			40	0.044	0.23	2.5	5095	450	259.0
3.0	2			40	0.052	0.27	3.0	4245	440	356.5

Frese cilindriche Microcut-C3H

Gambo Ø 3 mm, scarico cilindrico, 3xd



HM λ 25°
XA γ -10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	
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Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z	Esempio: N° Ordine		DURO-S
										Rivestimento D	Articolo 5722	Codice-Ø .050
.050	0.5	3	0.45	40	0.60	1.5	-	11.5°	2			●
.060	0.6	3	0.55	40	0.72	1.8	-	11.0°	2			●
.080	0.8	3	0.75	40	0.96	2.4	-	10.0°	2			●
.100	1.0	3	0.95	50	1.20	3.0	0.07	8.5°	2			●
.108	1.2	3	1.10	50	1.44	3.6	0.07	7.5°	2			●
.120	1.5	3	1.40	50	1.80	4.5	0.07	6.0°	2			●
.140	2.0	3	1.90	50	2.40	6.0	0.10	4.0°	2			●
.160	2.5	3	2.30	50	3.00	7.5	0.10	2.0°	2			●
.180	3.0	3	2.80	50	3.60	9.0	0.10	0.0°	2			●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio < 850 N/mm ² 	0.3	2	180	0.006	0.24	0.05	60000	720	8.5
		0.5	2	180	0.010	0.40	0.08	60000	1200	38.5
		0.6	2	180	0.010	0.48	0.09	60000	1200	52.0
		0.8	2	180	0.014	0.64	0.12	60000	1680	129.0
		1.0	2	180	0.018	0.80	0.15	57295	2065	248.0
		1.2	2	180	0.022	0.96	0.18	47750	2100	363.0
		1.5	2	180	0.028	1.20	0.23	38200	2140	590.5
		1.8	2	180	0.032	1.44	0.27	31830	2035	791.0
		2.0	2	180	0.036	1.60	0.30	28650	2065	991.0
			Acciaio 850 - 1100 N/mm ² 	0.3	2	160	0.006	0.24	0.05	60000
0.5	2			160	0.010	0.40	0.08	60000	1200	38.5
0.6	2			160	0.010	0.48	0.09	60000	1200	52.0
0.8	2			160	0.012	0.64	0.12	60000	1440	110.5
1.0	2			160	0.016	0.80	0.15	50930	1630	195.5
1.2	2			160	0.020	0.96	0.18	42445	1700	294.0
1.5	2			160	0.026	1.20	0.23	33955	1765	487.0
1.8	2			160	0.028	1.44	0.27	28295	1585	616.0
2.0	2			160	0.032	1.60	0.30	25465	1630	782.5
	Acciaio inossidabile [Cr-Ni/1.4301]			0.3	2	70	0.004	0.24	0.05	60000
		0.5	2	70	0.008	0.40	0.08	44565	715	23.0
		0.6	2	70	0.008	0.48	0.09	37135	595	25.5
		0.8	2	70	0.012	0.64	0.12	27855	670	51.5
		1.0	2	70	0.014	0.80	0.15	22280	625	75.0
		1.2	2	70	0.018	0.96	0.18	18570	670	116.0
		1.5	2	70	0.022	1.20	0.23	14855	655	181.0
		1.8	2	70	0.026	1.44	0.27	12380	645	251.0
		2.0	2	70	0.028	1.60	0.30	11140	625	300.0
			Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]	0.3	2	50	0.004	0.24	0.05	53055
0.5	2			50	0.008	0.40	0.08	31830	510	16.5
0.6	2			50	0.008	0.48	0.09	26525	425	18.5
0.8	2			50	0.010	0.64	0.12	19895	400	30.5
1.0	2			50	0.012	0.80	0.15	15915	380	45.5
1.2	2			50	0.016	0.96	0.18	13265	425	73.5
1.5	2			50	0.020	1.20	0.23	10610	425	117.5
1.8	2			50	0.022	1.44	0.27	8840	390	151.5
2.0	2			50	0.026	1.60	0.30	7960	415	199.0

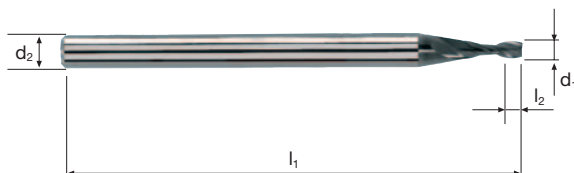
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio < 850 N/mm ² 	0.3	2	160	0.006	0.04	0.3	60000	720	8.5
		0.5	2	160	0.008	0.06	0.5	60000	960	29.0
		0.6	2	160	0.010	0.07	0.6	60000	1200	50.5
		0.8	2	160	0.014	0.10	0.8	60000	1680	134.5
		1.0	2	160	0.016	0.12	1.0	50930	1630	195.5
		1.2	2	160	0.020	0.14	1.2	42445	1700	285.5
		1.5	2	160	0.026	0.18	1.5	33955	1765	476.5
		1.8	2	160	0.030	0.22	1.8	28295	1700	673.0
		2.0	2	160	0.034	0.24	2.0	25465	1730	830.5
			Acciaio 850 - 1100 N/mm ² 	0.3	2	140	0.006	0.04	0.3	60000
0.5	2			140	0.008	0.06	0.5	60000	960	29.0
0.6	2			140	0.010	0.07	0.6	60000	1200	50.5
0.8	2			140	0.014	0.10	0.8	55705	1560	125.0
1.0	2			140	0.016	0.12	1.0	44565	1425	171.0
1.2	2			140	0.020	0.14	1.2	37135	1485	249.5
1.5	2			140	0.024	0.18	1.5	29710	1425	385.0
1.8	2			140	0.028	0.22	1.8	24760	1385	548.5
2.0	2			140	0.032	0.24	2.0	22280	1425	684.0
	Acciaio inossidabile [Cr-Ni/1.4301]			0.3	2	60	0.006	0.04	0.3	60000
		0.5	2	60	0.008	0.06	0.5	38200	610	18.5
		0.6	2	60	0.008	0.07	0.6	31830	510	21.5
		0.8	2	60	0.012	0.10	0.8	23875	575	46.0
		1.0	2	60	0.014	0.12	1.0	19100	535	64.0
		1.2	2	60	0.018	0.14	1.2	15915	575	96.5
		1.5	2	60	0.022	0.18	1.5	12735	560	151.0
		1.8	2	60	0.026	0.22	1.8	10610	550	218.0
		2.0	2	60	0.030	0.24	2.0	9550	575	276.0
			Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]	0.3	2	40	0.004	0.04	0.3	42445
0.5	2			40	0.006	0.06	0.5	25465	305	9.0
0.6	2			40	0.008	0.07	0.6	21220	340	14.5
0.8	2			40	0.012	0.10	0.8	15915	380	30.5
1.0	2			40	0.012	0.12	1.0	12735	305	36.5
1.2	2			40	0.016	0.14	1.2	10610	340	57.0
1.5	2			40	0.020	0.18	1.5	8490	340	92.0
1.8	2			40	0.024	0.22	1.8	7075	340	134.5
2.0	2			40	0.028	0.24	2.0	6365	355	170.5

Frese cilindriche

Gambo Ø 3 mm, 3xd



HM λ 30°
 γ 12°



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **Copper Aluminium**

Esempio: N° Ordine		Rivestimento M	Articolo 45710	Codice-ø .030			MICRO	
							5710	M45710
Ø Code	d1 ±0.01	d2 h6	l1	l2	α	z		
.030	0.3	3	40	1.0	9.0°	2	●	●
.040	0.4	3	40	1.0	9.0°	2	●	●
.050	0.5	3	40	1.5	8.5°	2	●	●
.060	0.6	3	40	1.5	8.5°	2	●	●
.070	0.7	3	40	2.0	8.0°	2	●	●
.080	0.8	3	40	2.0	8.0°	2	●	●
.090	0.9	3	40	2.5	7.5°	2	●	●
.100	1.0	3	40	3.0	7.0°	2	●	●
.104	1.1	3	40	3.0	6.5°	2	●	●
.108	1.2	3	40	4.0	6.0°	2	●	●
.112	1.3	3	40	4.0	5.5°	2	●	●
.116	1.4	3	40	4.0	5.5°	2	●	●
.120	1.5	3	40	4.0	5.5°	2	●	●
.123	1.6	3	40	5.0	4.5°	2	●	●
.126	1.7	3	40	5.0	5.5°	2	●	●
.130	1.8	3	40	5.0	5.5°	2	●	●
.135	1.9	3	40	5.0	5.0°	2	●	●
.140	2.0	3	40	5.0	4.5°	2	●	●



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
2.1	2	180	0.038	1.68	0.32	27285	2075	1115.5
2.2	2	180	0.040	1.76	0.33	26045	2085	1211.0
2.3	2	180	0.042	1.84	0.35	24910	2090	1346.0
2.4	2	180	0.044	1.92	0.36	23875	2100	1451.5
2.5	2	180	0.046	2.00	0.38	22920	2110	1603.5
3.0	2	180	0.054	2.40	0.45	19100	2065	2230.0

Acciaio
850 - 1100 N/mm²

2.1	2	160	0.034	1.68	0.32	24255	1650	887.0
2.2	2	160	0.036	1.76	0.33	23150	1665	967.0
2.3	2	160	0.038	1.84	0.35	22145	1685	1085.0
2.4	2	160	0.040	1.92	0.36	21220	1700	1175.0
2.5	2	160	0.042	2.00	0.38	20370	1710	1299.5
3.0	2	160	0.048	2.40	0.45	16975	1630	1760.5

Acciaio inossidabile
[Cr-Ni/1.4301]

2.1	2	70	0.030	1.68	0.32	10610	635	341.5
2.2	2	70	0.032	1.76	0.33	10130	650	377.5
2.3	2	70	0.034	1.84	0.35	9690	660	425.0
2.4	2	70	0.036	1.92	0.36	9285	670	463.0
2.5	2	70	0.038	2.00	0.38	8915	640	486.5
3.0	2	70	0.044	2.40	0.45	7425	655	707.5

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

2.1	2	50	0.026	1.68	0.32	7580	395	212.5
2.2	2	50	0.028	1.76	0.33	7235	405	235.0
2.3	2	50	0.030	1.84	0.35	6920	415	267.5
2.4	2	50	0.032	1.92	0.36	6630	400	276.5
2.5	2	50	0.034	2.00	0.38	6365	405	308.0
3.0	2	50	0.038	2.40	0.45	5305	405	437.5



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
2.1	2	160	0.036	0.25	2.1	24255	1745	916.0
2.2	2	160	0.038	0.26	2.2	23150	1665	952.5
2.3	2	160	0.040	0.28	2.3	22145	1685	1085.0
2.4	2	160	0.042	0.29	2.4	21220	1700	1183.0
2.5	2	160	0.044	0.30	2.5	20370	1710	1282.5
3.0	2	160	0.050	0.36	3.0	16975	1700	1836.0

Acciaio
850 - 1100 N/mm²

2.1	2	140	0.034	0.25	2.1	21220	1445	758.5
2.2	2	140	0.036	0.26	2.2	20255	1375	786.5
2.3	2	140	0.038	0.28	2.3	19375	1395	898.5
2.4	2	140	0.040	0.29	2.4	18570	1410	981.5
2.5	2	140	0.042	0.30	2.5	17825	1425	1069.0
3.0	2	140	0.048	0.36	3.0	14855	1425	1539.0

Acciaio inossidabile
[Cr-Ni/1.4301]

2.1	2	60	0.032	0.25	2.1	9095	580	304.5
2.2	2	60	0.034	0.26	2.2	8680	555	317.5
2.3	2	60	0.036	0.28	2.3	8305	565	364.0
2.4	2	60	0.038	0.29	2.4	7960	575	400.0
2.5	2	60	0.040	0.30	2.5	7640	550	412.5
3.0	2	60	0.044	0.36	3.0	6365	560	605.0

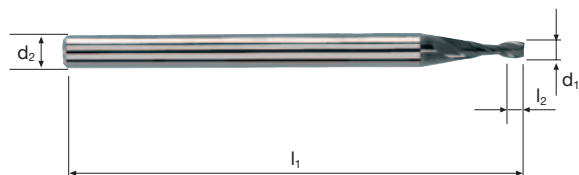
Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

2.1	2	40	0.028	0.25	2.1	6065	340	178.5
2.2	2	40	0.028	0.26	2.2	5790	325	186.0
2.3	2	40	0.030	0.28	2.3	5535	330	212.5
2.4	2	40	0.032	0.29	2.4	5305	340	236.5
2.5	2	40	0.034	0.30	2.5	5095	345	259.0
3.0	2	40	0.040	0.36	3.0	4245	340	367.0

Frese cilindriche

Gambo Ø 3 mm, 3xd

HM λ 30°
 γ 12°



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	Copper Aluminium
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		Rivestimento			Articolo	Codice-Ø			MICRO	
Esempio: N° Ordine		M	45710	.143				5710	M45710	
Ø Code	d1 ±0.01	d2 h6	l1	l2	α	z				
.143	2.1	3	40	6.0	4.0°	2	•	•	•	•
.146	2.2	3	40	6.0	3.5°	2	•	•	•	•
.150	2.3	3	40	6.0	3.0°	2	•	•	•	•
.155	2.4	3	40	6.0	2.5°	2	•	•	•	•
.160	2.5	3	40	7.0	2.0°	2	•	•	•	•
.180	3.0	4	44	10.0	2.5°	2	•	•	•	•



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.4	3	180	0.004	0.48	0.04	60000	720	14.0
0.6	3	180	0.008	0.72	0.06	60000	1440	62.0
0.8	3	180	0.010	0.96	0.08	60000	1800	138.0
1.0	3	180	0.012	1.20	0.10	57295	2065	248.0
1.2	3	180	0.014	1.44	0.12	47750	2005	346.5
1.4	3	180	0.016	1.68	0.14	40925	1965	462.0
1.6	3	180	0.018	1.92	0.16	35810	1935	594.5
1.8	3	180	0.022	2.16	0.18	31830	2100	816.5
2.0	3	180	0.024	2.40	0.20	28650	2065	991.0

Ottone a truciolo corto
CuZn

0.4	3	190	0.004	0.48	0.04	60000	720	14.0
0.6	3	190	0.008	0.72	0.06	60000	1440	62.0
0.8	3	190	0.012	0.96	0.08	60000	2160	166.0
1.0	3	190	0.014	1.20	0.10	60000	2520	302.5
1.2	3	190	0.016	1.44	0.12	50400	2420	418.0
1.4	3	190	0.018	1.68	0.14	43200	2335	549.0
1.6	3	190	0.020	1.92	0.16	37800	2270	697.5
1.8	3	190	0.024	2.16	0.18	33600	2420	941.0
2.0	3	190	0.026	2.40	0.20	30240	2360	1133.0

Acciaio inossidabile
[Cr-Ni/1.4301]

0.4	3	70	0.004	0.48	0.04	55705	670	13.0
0.6	3	70	0.006	0.72	0.06	37135	670	29.0
0.8	3	70	0.008	0.96	0.08	27855	670	51.5
1.0	3	70	0.010	1.20	0.10	22280	670	80.5
1.2	3	70	0.012	1.44	0.12	18570	670	116.0
1.4	3	70	0.012	1.68	0.14	15915	575	135.0
1.6	3	70	0.014	1.92	0.16	13925	585	179.5
1.8	3	70	0.018	2.16	0.18	12380	670	260.5
2.0	3	70	0.020	2.40	0.20	11140	670	321.5

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

0.4	3	50	0.002	0.48	0.04	39790	240	4.5
0.6	3	50	0.006	0.72	0.06	26525	475	20.5
0.8	3	50	0.008	0.96	0.08	19895	475	36.5
1.0	3	50	0.008	1.20	0.10	15915	380	45.5
1.2	3	50	0.010	1.44	0.12	13265	400	69.0
1.4	3	50	0.012	1.68	0.14	11370	410	96.5
1.6	3	50	0.012	1.92	0.16	9945	360	110.5
1.8	3	50	0.016	2.16	0.18	8840	425	165.0
2.0	3	50	0.016	2.40	0.20	7960	380	182.5



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.4	3	160	0.004	0.05	0.4	60000	720	14.5
0.6	3	160	0.006	0.07	0.6	60000	1080	45.5
0.8	3	160	0.008	0.10	0.8	60000	1440	115.0
1.0	3	160	0.012	0.12	1.0	50930	1835	220.0
1.2	3	160	0.014	0.14	1.2	42445	1785	300.0
1.4	3	160	0.016	0.17	1.4	36380	1745	415.5
1.6	3	160	0.018	0.19	1.6	31830	1720	523.0
1.8	3	160	0.020	0.22	1.8	28295	1700	673.0
2.0	3	160	0.022	0.24	2.0	25465	1680	806.5

Ottone a truciolo corto
CuZn

0.4	3	170	0.004	0.05	0.4	60000	720	14.5
0.6	3	170	0.006	0.07	0.6	60000	1080	45.5
0.8	3	170	0.008	0.10	0.8	60000	1440	115.0
1.0	3	170	0.012	0.12	1.0	54115	1950	234.0
1.2	3	170	0.014	0.14	1.2	45095	1895	318.5
1.4	3	170	0.016	0.17	1.4	38655	1855	441.5
1.6	3	170	0.018	0.19	1.6	33820	1825	555.0
1.8	3	170	0.022	0.22	1.8	30065	1985	786.0
2.0	3	170	0.024	0.24	2.0	27055	1950	936.0

Acciaio inossidabile
[Cr-Ni/1.4301]

0.4	3	60	0.004	0.05	0.4	47750	575	11.5
0.6	3	60	0.006	0.07	0.6	31830	575	24.0
0.8	3	60	0.008	0.10	0.8	23875	575	46.0
1.0	3	60	0.010	0.12	1.0	19100	575	69.0
1.2	3	60	0.012	0.14	1.2	15915	575	96.5
1.4	3	60	0.014	0.17	1.4	13640	575	137.0
1.6	3	60	0.016	0.19	1.6	11935	575	175.0
1.8	3	60	0.018	0.22	1.8	10610	575	227.5
2.0	3	60	0.020	0.24	2.0	9550	575	276.0

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

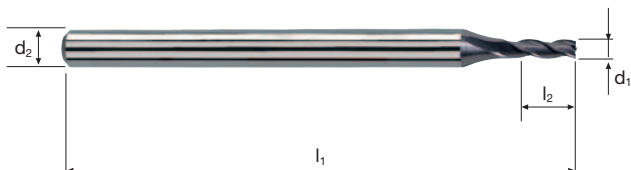
0.4	3	40	0.004	0.05	0.4	31830	380	7.5
0.6	3	40	0.004	0.07	0.6	21220	255	10.5
0.8	3	40	0.006	0.10	0.8	15915	285	23.0
1.0	3	40	0.010	0.12	1.0	12735	380	45.5
1.2	3	40	0.012	0.14	1.2	10610	380	64.0
1.4	3	40	0.012	0.17	1.4	9095	325	77.5
1.6	3	40	0.014	0.19	1.6	7960	335	102.0
1.8	3	40	0.016	0.22	1.8	7075	340	134.5
2.0	3	40	0.018	0.24	2.0	6365	345	165.5

Frese cilindriche Micro C3

Gambo \varnothing 3mm, 3xd

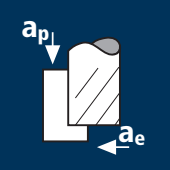












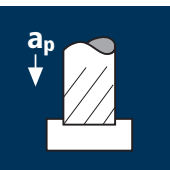










HM λ **30°**
 γ **8°**



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **CuZn Brass** Gold / Platinum Copper

Esempio: N° Ordine								MICRO	
		Rivestimento M	Articolo 45713	Codice- \varnothing .040				45713	M45713
\varnothing Code	d_1 ± 0.01	d_2 h6	l_1	l_2	α	z			
.040	0.40	3	40	1.2	12.5°	3	●	●	
.050	0.50	3	40	1.5	11.5°	3	●	●	
.060	0.60	3	40	1.8	11.0°	3	●	●	
.070	0.70	3	40	2.1	10.5°	3	●	●	
.080	0.80	3	40	2.4	10.0°	3	●	●	
.090	0.90	3	40	2.7	9.0°	3	●	●	
.100	1.00	3	40	3.0	8.5°	3	●	●	
.104	1.10	3	40	3.3	8.0°	3	●	●	
.108	1.20	3	40	3.6	7.5°	3	●	●	
.112	1.30	3	40	3.9	7.0°	3	●	●	
.116	1.40	3	40	4.2	6.5°	3	●	●	
.120	1.50	3	40	4.5	6.0°	3	●	●	
.123	1.60	3	40	4.8	5.5°	3	●	●	
.126	1.70	3	40	5.1	5.0°	3	●	●	
.130	1.80	3	40	5.4	4.5°	3	●	●	
.135	1.90	3	40	5.7	4.5°	3	●	●	
.140	2.00	3	40	6.0	4.0°	3	●	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio < 850 N/mm ²  	2.1	3	180	0.024	2.52	0.21	27285	1965	1040.0
		2.2	3	180	0.026	2.64	0.22	26045	2030	1179.0
		2.3	3	180	0.028	2.76	0.23	24910	2090	1326.5
		2.4	3	180	0.028	2.88	0.24	23875	2005	1386.0
		2.5	3	180	0.030	3.00	0.25	22920	2065	1549.0
		3.0	3	180	0.036	3.60	0.30	19100	2065	2230.0
Ottone a truciolo corto CuZn    	2.1	3	190	0.026	2.52	0.21	28800	2245	1188.0	
	2.2	3	190	0.028	2.64	0.22	27490	2310	1341.5	
	2.3	3	190	0.030	2.76	0.23	26295	2365	1501.5	
	2.4	3	190	0.030	2.88	0.24	25200	2270	1569.0	
	2.5	3	190	0.034	3.00	0.25	24190	2465	1849.0	
	3.0	3	190	0.040	3.60	0.30	20160	2420	2613.5	
Acciaio inossidabile [Cr-Ni/1.4301]  	2.1	3	70	0.020	2.52	0.21	10610	635	336.0	
	2.2	3	70	0.020	2.64	0.22	10130	610	354.5	
	2.3	3	70	0.022	2.76	0.23	9690	640	406.5	
	2.4	3	70	0.022	2.88	0.24	9285	615	425.0	
	2.5	3	70	0.024	3.00	0.25	8915	640	480.0	
	3.0	3	70	0.028	3.60	0.30	7425	625	675.0	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]  	2.1	3	50	0.016	2.52	0.21	7580	365	193.0	
	2.2	3	50	0.018	2.64	0.22	7235	390	226.5	
	2.3	3	50	0.020	2.76	0.23	6920	415	263.5	
	2.4	3	50	0.020	2.88	0.24	6630	400	276.5	
	2.5	3	50	0.022	3.00	0.25	6365	420	315.0	
	3.0	3	50	0.026	3.60	0.30	5305	415	448.0	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio < 850 N/mm ²  	2.1	3	160	0.024	0.25	2.1	24255	1745	916.0
		2.2	3	160	0.024	0.26	2.2	23150	1665	952.5
		2.3	3	160	0.026	0.28	2.3	22145	1725	1111.0
		2.4	3	160	0.026	0.29	2.4	21220	1655	1152.0
		2.5	3	160	0.028	0.30	2.5	20370	1710	1282.5
		3.0	3	160	0.034	0.36	3.0	16975	1730	1868.5
Ottone a truciolo corto CuZn    	2.1	3	170	0.026	0.25	2.1	25770	2010	1055.5	
	2.2	3	170	0.026	0.26	2.2	24595	1920	1098.0	
	2.3	3	170	0.028	0.28	2.3	23530	1975	1272.0	
	2.4	3	170	0.028	0.29	2.4	22550	1895	1319.0	
	2.5	3	170	0.030	0.30	2.5	21645	1950	1462.5	
	3.0	3	170	0.036	0.36	3.0	18040	1950	2106.0	
Acciaio inossidabile [Cr-Ni/1.4301]  	2.1	3	60	0.022	0.25	2.1	9095	600	315.0	
	2.2	3	60	0.022	0.26	2.2	8680	575	329.0	
	2.3	3	60	0.022	0.28	2.3	8305	550	354.0	
	2.4	3	60	0.022	0.29	2.4	7960	525	365.5	
	2.5	3	60	0.024	0.30	2.5	7640	550	412.5	
	3.0	3	60	0.030	0.36	3.0	6365	575	621.0	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]  	2.1	3	40	0.020	0.25	2.1	6065	365	191.5	
	2.2	3	40	0.020	0.26	2.2	5790	345	197.5	
	2.3	3	40	0.020	0.28	2.3	5535	330	212.5	
	2.4	3	40	0.020	0.29	2.4	5305	320	222.5	
	2.5	3	40	0.022	0.30	2.5	5095	335	251.5	
	3.0	3	40	0.028	0.36	3.0	4245	355	383.5	

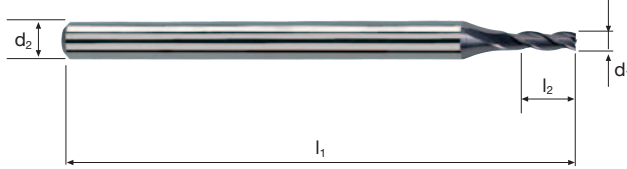
Frese cilindriche Micro C3

Gambo ø 3mm, 3xd



HM λ **30°**
 γ **8°**

90°



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **CuZn Brass** Gold / Platinum Copper

Esempio: N° Ordine		Rivestimento M	Articolo 45713	Codice-ø .143			MICRO	
						45713	M45713	
ø Code	d1 ±0.01	d2 h6	l1	l2	α	z		
.143	2.10	3	40	6.3	3.5°	3	●	●
.146	2.20	3	40	6.6	3.0°	3	●	●
.150	2.30	3	40	6.9	2.5°	3	●	●
.155	2.40	3	40	7.2	2.5°	3	●	●
.160	2.50	3	40	7.5	2.0°	3	●	●
.165	2.60	3	45	7.8	1.5°	3	●	●
.170	2.70	3	45	8.1	1.0°	3	●	●
.172	2.80	3	45	8.4	1.0°	3	●	●
.176	2.90	3	45	8.7	0.5°	3	●	●



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	80	0.010	0.40	0.08	50930	1530	49.0
0.6	3	80	0.012	0.48	0.09	42445	1530	66.0
0.8	3	80	0.016	0.64	0.12	31830	1530	117.5
1.0	3	80	0.020	0.80	0.15	25465	1530	183.5
1.2	3	80	0.024	0.96	0.18	21220	1530	264.5
1.5	3	80	0.030	1.20	0.23	16975	1530	422.5
2.0	3	80	0.040	1.60	0.30	12735	1530	734.5
2.5	3	80	0.050	2.00	0.38	10185	1530	1163.0
3.0	3	80	0.060	2.40	0.45	8490	1530	1652.5

Materiale

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	50	0.008	0.40	0.08	31830	765	24.5
0.6	3	50	0.010	0.48	0.09	26525	795	34.5
0.8	3	50	0.012	0.64	0.12	19895	715	55.0
1.0	3	50	0.016	0.80	0.15	15915	765	92.0
1.2	3	50	0.020	0.96	0.18	13265	795	137.5
1.5	3	50	0.024	1.20	0.23	10610	765	211.0
2.0	3	50	0.032	1.60	0.30	7960	765	367.0
2.5	3	50	0.040	2.00	0.38	6365	765	581.5
3.0	3	50	0.048	2.40	0.45	5305	765	826.0

Materiale

Oro

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	180	0.012	0.40	0.08	60000	2160	69.0
0.6	3	180	0.014	0.48	0.09	60000	2520	109.0
0.8	3	180	0.020	0.64	0.12	60000	3600	276.5
1.0	3	180	0.024	0.80	0.15	57295	4125	495.0
1.2	3	180	0.028	0.96	0.18	47750	4010	693.0
1.5	3	180	0.036	1.20	0.23	38200	4125	1138.5
2.0	3	180	0.048	1.60	0.30	28650	4125	1980.0
2.5	3	180	0.060	2.00	0.38	22920	4125	3135.0
3.0	3	180	0.072	2.40	0.45	19100	4125	4455.0

Materiale

Acciaio
850 - 1300 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	120	0.010	0.40	0.08	60000	1800	57.5
0.6	3	120	0.012	0.48	0.09	60000	2160	93.5
0.8	3	120	0.016	0.64	0.12	47750	2290	176.0
1.0	3	120	0.020	0.80	0.15	38200	2290	275.0
1.2	3	120	0.024	0.96	0.18	31830	2290	395.5
1.5	3	120	0.030	1.20	0.23	25465	2290	632.0
2.0	3	120	0.040	1.60	0.30	19100	2290	1099.0
2.5	3	120	0.050	2.00	0.38	15280	2290	1740.5
3.0	3	120	0.060	2.40	0.45	12735	2290	2473.0



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	60	0.008	0.06	0.5	38200	915	27.5
0.6	3	60	0.008	0.07	0.6	31830	765	32.0
0.8	3	60	0.012	0.10	0.8	23875	860	69.0
1.0	3	60	0.014	0.12	1.0	19100	800	96.0
1.2	3	60	0.018	0.14	1.2	15915	860	144.5
1.5	3	60	0.022	0.18	1.5	12735	840	227.0
2.0	3	60	0.028	0.24	2.0	9550	800	384.0
2.5	3	60	0.036	0.30	2.5	7640	825	619.0
3.0	3	60	0.042	0.36	3.0	6365	800	864.0

Materiale

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	40	0.006	0.06	0.5	25465	460	14.0
0.6	3	40	0.006	0.07	0.6	21220	380	16.0
0.8	3	40	0.010	0.10	0.8	15915	475	38.0
1.0	3	40	0.012	0.12	1.0	12735	460	55.0
1.2	3	40	0.014	0.14	1.2	10610	445	75.0
1.5	3	40	0.018	0.18	1.5	8490	460	124.0
2.0	3	40	0.022	0.24	2.0	6365	420	201.5
2.5	3	40	0.028	0.30	2.5	5095	430	322.5
3.0	3	40	0.034	0.36	3.0	4245	435	470.0

Materiale

Oro

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	160	0.010	0.06	0.5	60000	1800	54.0
0.6	3	160	0.010	0.07	0.6	60000	1800	75.5
0.8	3	160	0.014	0.10	0.8	60000	2520	201.5
1.0	3	160	0.016	0.12	1.0	50930	2445	293.5
1.2	3	160	0.022	0.14	1.2	42445	2800	470.5
1.5	3	160	0.026	0.18	1.5	33955	2650	715.5
2.0	3	160	0.034	0.24	2.0	25465	2595	1245.5
2.5	3	160	0.044	0.30	2.5	20370	2690	2017.5
3.0	3	160	0.050	0.36	3.0	16975	2545	2748.5

Materiale

Acciaio
850 - 1300 N/mm²

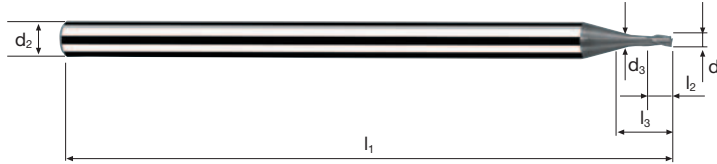
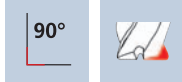
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	100	0.008	0.06	0.5	60000	1440	43.0
0.6	3	100	0.008	0.07	0.6	53055	1275	53.5
0.8	3	100	0.012	0.10	0.8	39790	1430	114.5
1.0	3	100	0.014	0.12	1.0	31830	1335	160.0
1.2	3	100	0.018	0.14	1.2	26525	1430	240.0
1.5	3	100	0.022	0.18	1.5	21220	1400	378.0
2.0	3	100	0.028	0.24	2.0	15915	1335	641.0
2.5	3	100	0.036	0.30	2.5	12735	1375	1031.5
3.0	3	100	0.042	0.36	3.0	10610	1335	1442.0

Frese cilindriche Microcut-C3

Gambo Ø 3 mm, scarico cilindrico, 3xd



HM
XA λ **25°**
 γ **-10°**



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Rm** 1300-1500 **Inox** Stainless **Ti** Titanium **Cobalt-Chrome Gold / Platinum Copper**

									MICRO
Esempio: Rivestimento Articolo Codice-ø									
N° Ordine M 15752 .050									M15752
ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	α	z	
.050	0.5	3	0.45	40	0.60	1.5	11.5°	3	●
.060	0.6	3	0.55	40	0.72	1.8	11.0°	3	●
.080	0.8	3	0.75	40	0.96	2.4	10.0°	3	●
.100	1.0	3	0.95	50	1.20	3.0	8.5°	3	●
.108	1.2	3	1.10	50	1.44	3.6	7.5°	3	●
.120	1.5	3	1.40	60	1.80	4.5	6.0°	3	●
.140	2.0	3	1.90	60	2.40	6.0	4.0°	3	●
.160	2.5	3	2.30	60	3.00	7.5	2.0°	3	●
.180	3.0	3	2.80	60	3.60	9.0	0.0°	3	●



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	2	180	0.012	0.40	0.07	60000	1440	40.5
0.6	2	180	0.014	0.48	0.08	60000	1680	64.5
0.8	2	180	0.018	0.64	0.10	60000	2160	138.0
1.0	2	180	0.022	0.80	0.13	57295	2520	262.0
1.2	2	180	0.026	0.96	0.16	47750	2485	381.5
1.5	2	180	0.034	1.20	0.20	38200	2600	624.0
2.0	2	180	0.044	1.60	0.26	28650	2520	1048.5
2.5	2	180	0.056	2.00	0.33	22920	2565	1693.0
3.0	2	180	0.066	2.40	0.39	19100	2520	2358.5

Acciaio
1100 - 1300 N/mm²

0.5	2	160	0.010	0.40	0.07	60000	1200	33.5
0.6	2	160	0.012	0.48	0.08	60000	1440	55.5
0.8	2	160	0.016	0.64	0.10	60000	1920	123.0
1.0	2	160	0.020	0.80	0.13	50930	2035	211.5
1.2	2	160	0.024	0.96	0.16	42445	2035	312.5
1.5	2	160	0.030	1.20	0.20	33955	2035	488.5
2.0	2	160	0.040	1.60	0.26	25465	2035	846.5
2.5	2	160	0.050	2.00	0.33	20370	2035	1343.0
3.0	2	160	0.060	2.40	0.39	16975	2035	1905.0

Acciaio inossidabile
[Cr-Ni/1.4301]

0.5	2	80	0.010	0.40	0.07	50930	1020	28.5
0.6	2	80	0.012	0.48	0.08	42445	1020	39.0
0.8	2	80	0.014	0.64	0.10	31830	890	57.0
1.0	2	80	0.018	0.80	0.13	25465	915	95.0
1.2	2	80	0.020	0.96	0.16	21220	850	130.5
1.5	2	80	0.028	1.20	0.20	16975	950	228.0
2.0	2	80	0.036	1.60	0.26	12735	915	380.5
2.5	2	80	0.044	2.00	0.33	10185	895	590.5
3.0	2	80	0.052	2.40	0.39	8490	885	828.5

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

0.5	2	60	0.008	0.40	0.07	38200	610	17.0
0.6	2	60	0.010	0.48	0.08	31830	635	24.5
0.8	2	60	0.012	0.64	0.10	23875	575	37.0
1.0	2	60	0.016	0.80	0.13	19100	610	63.5
1.2	2	60	0.018	0.96	0.16	15915	575	88.5
1.5	2	60	0.024	1.20	0.20	12735	610	146.5
2.0	2	60	0.030	1.60	0.26	9550	575	239.0
2.5	2	60	0.040	2.00	0.33	7640	610	402.5
3.0	2	60	0.046	2.40	0.39	6365	585	547.5



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	2	160	0.010	0.06	0.5	60000	1200	36.0
0.6	2	160	0.010	0.07	0.6	60000	1200	50.5
0.8	2	160	0.014	0.09	0.8	60000	1680	121.0
1.0	2	160	0.018	0.11	1.0	50930	1835	202.0
1.2	2	160	0.022	0.13	1.2	42445	1870	291.5
1.5	2	160	0.028	0.17	1.5	33955	1900	484.5
2.0	2	160	0.036	0.22	2.0	25465	1835	807.5
2.5	2	160	0.046	0.28	2.5	20370	1875	1312.5
3.0	2	160	0.054	0.33	3.0	16975	1835	1816.5

Acciaio
1100 - 1300 N/mm²

0.5	2	140	0.010	0.06	0.5	60000	1200	36.0
0.6	2	140	0.010	0.07	0.6	60000	1200	50.5
0.8	2	140	0.014	0.09	0.8	55705	1560	112.5
1.0	2	140	0.018	0.11	1.0	44565	1605	176.5
1.2	2	140	0.020	0.13	1.2	37135	1485	231.5
1.5	2	140	0.026	0.17	1.5	29710	1545	394.0
2.0	2	140	0.034	0.22	2.0	22280	1515	666.5
2.5	2	140	0.044	0.28	2.5	17825	1570	1099.0
3.0	2	140	0.052	0.33	3.0	14855	1545	1529.5

Acciaio inossidabile
[Cr-Ni/1.4301]

0.5	2	70	0.008	0.06	0.5	44565	715	21.5
0.6	2	70	0.008	0.07	0.6	37135	595	25.0
0.8	2	70	0.012	0.09	0.8	27855	670	48.0
1.0	2	70	0.016	0.11	1.0	22280	715	78.5
1.2	2	70	0.020	0.13	1.2	18570	745	116.0
1.5	2	70	0.024	0.17	1.5	14855	715	182.5
2.0	2	70	0.032	0.22	2.0	11140	715	314.5
2.5	2	70	0.040	0.28	2.5	8915	715	500.5
3.0	2	70	0.048	0.33	3.0	7425	715	708.0

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

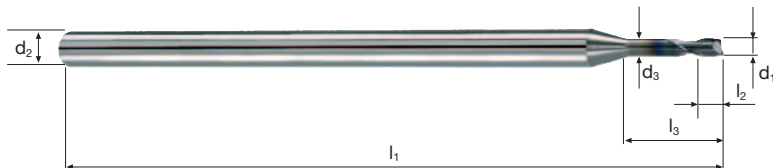
0.5	2	50	0.008	0.06	0.5	31830	510	15.5
0.6	2	50	0.008	0.07	0.6	26525	425	18.0
0.8	2	50	0.012	0.09	0.8	19895	475	34.0
1.0	2	50	0.014	0.11	1.0	15915	445	49.0
1.2	2	50	0.018	0.13	1.2	13265	480	75.0
1.5	2	50	0.022	0.17	1.5	10610	465	118.5
2.0	2	50	0.028	0.22	2.0	7960	445	196.0
2.5	2	50	0.036	0.28	2.5	6365	460	322.0
3.0	2	50	0.044	0.33	3.0	5305	465	460.5

Frese cilindriche Microcut-C5

Gambo Ø 3 mm, scarico cilindrico, 5xd



HM λ 25°
Micro γ 6°



Rm
< 850

Rm
850-1100

Rm
1100-1300

Rm
1300-1500

Rm

Rm

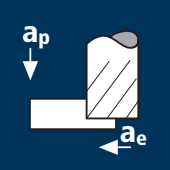




Rm

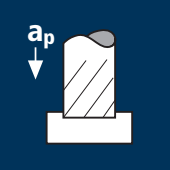




Inox
Stainless

Ti
Titanium

Cobalt-Chrome
Gold / Platinum
Copper

Esempio: N° Ordine										MICRO	
										M	
										5714	
										.050	
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z	M5714	
.050	0.5	3	0.45	40	0.60	2.5	-	10.0°	2	●	
.060	0.6	3	0.55	40	0.72	3.0	-	9.5°	2	●	
.070	0.7	3	0.65	40	0.84	3.5	-	8.5°	2	●	
.080	0.8	3	0.75	40	0.96	4.0	-	8.0°	2	●	
.090	0.9	3	0.85	40	1.08	4.5	-	7.5°	2	●	
.100	1.0	3	0.95	50	1.20	5.0	0.07	7.0°	2	●	
.108	1.2	3	1.10	50	1.44	6.0	0.07	5.5°	2	●	
.120	1.5	3	1.40	50	1.80	7.5	0.07	4.5°	2	●	
.132	1.8	3	1.70	50	2.16	9.0	0.07	3.5°	2	●	
.140	2.0	3	1.90	50	2.40	10.0	0.10	2.5°	2	●	
.152	2.3	3	2.10	50	2.76	11.5	0.10	2.0°	2	●	
.160	2.5	3	2.30	50	3.00	12.5	0.10	1.5°	2	●	
.172	2.8	3	2.60	50	3.36	14.0	0.10	0.5°	2	●	
.180	3.0	3	2.80	50	3.60	15.0	0.10	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	0.5	2	140	0.015	0.03	0.10	60000	1800	5.5
		0.6	2	140	0.015	0.03	0.12	60000	1800	6.5
		0.8	2	140	0.020	0.04	0.16	55705	2230	14.5
		1.0	2	140	0.025	0.05	0.20	44565	2230	22.5
		1.2	2	140	0.030	0.06	0.24	37135	2230	32.0
		1.5	2	140	0.040	0.08	0.30	29710	2375	57.0
		2.0	2	140	0.050	0.10	0.40	22280	2230	89.0
		2.5	2	140	0.065	0.13	0.50	17825	2315	150.5
		3.0	2	140	0.075	0.15	0.60	14855	2230	200.5
			Acciaio da utensile temprato 48 - 52 HRC 	0.5	2	120	0.014	0.03	0.10	60000
0.6	2			120	0.014	0.03	0.12	60000	1680	6.0
0.8	2			120	0.020	0.04	0.16	47750	1910	12.0
1.0	2			120	0.024	0.05	0.20	38200	1835	18.5
1.2	2			120	0.028	0.06	0.24	31830	1780	25.5
1.5	2			120	0.038	0.08	0.30	25465	1935	46.5
2.0	2			120	0.048	0.10	0.40	19100	1835	73.5
2.5	2			120	0.062	0.13	0.50	15280	1895	123.0
3.0	2			120	0.072	0.15	0.60	12735	1835	165.0
	Acciaio da utensile temprato 52 - 56 HRC 			0.5	2	100	0.014	0.03	0.10	60000
		0.6	2	100	0.014	0.03	0.12	53055	1485	5.5
		0.8	2	100	0.018	0.04	0.16	39790	1430	9.0
		1.0	2	100	0.022	0.05	0.20	31830	1400	14.0
		1.2	2	100	0.026	0.06	0.24	26525	1380	20.0
		1.5	2	100	0.036	0.08	0.30	21220	1530	36.5
		2.0	2	100	0.044	0.10	0.40	15915	1400	56.0
		2.5	2	100	0.058	0.13	0.50	12735	1475	96.0
		3.0	2	100	0.066	0.15	0.60	10610	1400	126.0
			Acciaio da utensile temprato 56 - 60 HRC 	0.5	2	60	0.012	0.03	0.10	38200
0.6	2			60	0.012	0.03	0.12	31830	765	3.0
0.8	2			60	0.016	0.04	0.16	23875	765	5.0
1.0	2			60	0.020	0.05	0.20	19100	765	7.5
1.2	2			60	0.024	0.06	0.24	15915	765	11.0
1.5	2			60	0.032	0.08	0.30	12735	815	19.5
2.0	2			60	0.040	0.10	0.40	9550	765	30.5
2.5	2			60	0.052	0.13	0.50	7640	795	51.5
3.0	2			60	0.060	0.15	0.60	6365	765	69.0

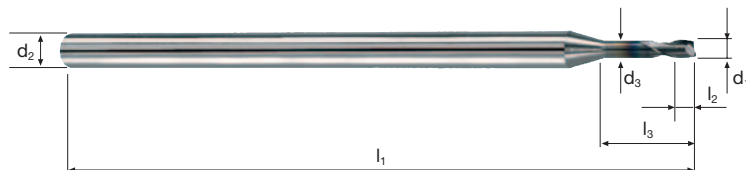
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	0.5	2	120	0.010	0.04	0.5	60000	1200	24.0
		0.6	2	120	0.015	0.04	0.6	60000	1800	43.0
		0.8	2	120	0.020	0.06	0.8	47750	1910	91.5
		1.0	2	120	0.020	0.07	1.0	38200	1530	107.0
		1.2	2	120	0.025	0.08	1.2	31830	1590	152.5
		1.5	2	120	0.035	0.11	1.5	25465	1785	294.5
		2.0	2	120	0.045	0.14	2.0	19100	1720	481.5
		2.5	2	120	0.055	0.18	2.5	15280	1680	756.0
		3.0	2	120	0.065	0.21	3.0	12735	1655	1042.5
			Acciaio da utensile temprato 48 - 52 HRC 	0.5	2	100	0.010	0.04	0.5	60000
0.6	2			100	0.014	0.04	0.6	53055	1485	35.5
0.8	2			100	0.020	0.06	0.8	39790	1590	76.5
1.0	2			100	0.020	0.07	1.0	31830	1275	89.5
1.2	2			100	0.024	0.08	1.2	26525	1275	122.5
1.5	2			100	0.034	0.11	1.5	21220	1445	238.5
2.0	2			100	0.042	0.14	2.0	15915	1335	374.0
2.5	2			100	0.052	0.18	2.5	12735	1325	596.0
3.0	2			100	0.062	0.21	3.0	10610	1315	828.5
	Acciaio da utensile temprato 52 - 56 HRC 			0.5	2	80	0.008	0.04	0.5	50930
		0.6	2	80	0.014	0.04	0.6	42445	1190	28.5
		0.8	2	80	0.018	0.06	0.8	31830	1145	55.0
		1.0	2	80	0.018	0.07	1.0	25465	915	64.0
		1.2	2	80	0.022	0.08	1.2	21220	935	90.0
		1.5	2	80	0.030	0.11	1.5	16975	1020	168.5
		2.0	2	80	0.040	0.14	2.0	12735	1020	285.5
		2.5	2	80	0.048	0.18	2.5	10185	980	441.0
		3.0	2	80	0.058	0.21	3.0	8490	985	620.5
			Acciaio da utensile temprato 56 - 60 HRC 	0.5	2	40	0.008	0.04	0.5	25465
0.6	2			40	0.012	0.04	0.6	21220	510	12.0
0.8	2			40	0.016	0.06	0.8	15915	510	24.5
1.0	2			40	0.016	0.07	1.0	12735	410	28.5
1.2	2			40	0.020	0.08	1.2	10610	425	41.0
1.5	2			40	0.028	0.11	1.5	8490	475	78.5
2.0	2			40	0.036	0.14	2.0	6365	460	129.0
2.5	2			40	0.044	0.18	2.5	5095	450	202.5
3.0	2			40	0.052	0.21	3.0	4245	440	277.0

Frese cilindriche Microcut-C5H

Gambo Ø 3 mm, scarico cilindrico, 5xd



HM λ 25°
XA γ-10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	
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Esempio: N° Ordine										DURO-S
										D5724
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z	
.050	0.5	3	0.45	40	0.60	2.5	-	10.0°	2	●
.060	0.6	3	0.55	40	0.72	3.0	-	9.5°	2	●
.070	0.7	3	0.65	40	0.84	3.5	-	8.5°	2	●
.080	0.8	3	0.75	40	0.96	4.0	-	8.0°	2	●
.090	0.9	3	0.85	40	1.08	4.5	0.07	7.5°	2	●
.100	1.0	3	0.95	50	1.20	5.0	0.07	7.0°	2	●
.108	1.2	3	1.10	50	1.44	6.0	0.07	5.5°	2	●
.120	1.5	3	1.40	50	1.80	7.5	0.07	4.5°	2	●
.132	1.8	3	1.70	50	2.16	9.0	0.07	3.5°	2	●
.140	2.0	3	1.90	50	2.40	10.0	0.10	2.5°	2	●
.152	2.3	3	2.10	50	2.76	11.5	0.10	2.0°	2	●
.160	2.5	3	2.30	50	3.00	12.5	0.10	1.5°	2	●
.172	2.8	3	2.60	50	3.36	14.0	0.10	0.5°	2	●
.180	3.0	3	2.80	50	3.60	15.0	0.10	0.0°	2	●



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	80	0.010	0.40	0.07	50930	1530	43.0
0.6	3	80	0.010	0.48	0.08	42445	1275	49.0
0.8	3	80	0.014	0.64	0.10	31830	1335	85.5
1.0	3	80	0.018	0.80	0.13	25465	1375	143.0
1.2	3	80	0.022	0.96	0.16	21220	1400	215.0
1.5	3	80	0.028	1.20	0.20	16975	1425	342.0
2.0	3	80	0.036	1.60	0.26	12735	1375	572.0
2.5	3	80	0.046	2.00	0.33	10185	1405	927.5
3.0	3	80	0.054	2.40	0.39	8490	1375	1287.0

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

0.5	3	50	0.008	0.40	0.07	31830	765	21.5
0.6	3	50	0.008	0.48	0.08	26525	635	24.5
0.8	3	50	0.012	0.64	0.10	19895	715	46.0
1.0	3	50	0.014	0.80	0.13	15915	670	69.5
1.2	3	50	0.018	0.96	0.16	13265	715	110.0
1.5	3	50	0.022	1.20	0.20	10610	700	168.0
2.0	3	50	0.028	1.60	0.26	7960	670	278.5
2.5	3	50	0.036	2.00	0.33	6365	685	452.0
3.0	3	50	0.044	2.40	0.39	5305	700	655.0

Oro

0.5	3	180	0.012	0.40	0.07	60000	2160	60.5
0.6	3	180	0.012	0.48	0.08	60000	2160	83.0
0.8	3	180	0.016	0.64	0.10	60000	2880	184.5
1.0	3	180	0.022	0.80	0.13	57295	3780	393.0
1.2	3	180	0.026	0.96	0.16	47750	3725	572.0
1.5	3	180	0.034	1.20	0.20	38200	3895	935.0
2.0	3	180	0.044	1.60	0.26	28650	3780	1572.5
2.5	3	180	0.056	2.00	0.33	22920	3850	2541.0
3.0	3	180	0.064	2.40	0.39	19100	3665	3430.5

Acciaio
850 - 1300 N/mm²

0.5	3	120	0.010	0.40	0.07	60000	1800	50.5
0.6	3	120	0.010	0.48	0.08	60000	1800	69.0
0.8	3	120	0.014	0.64	0.10	47750	2005	128.5
1.0	3	120	0.018	0.80	0.13	38200	2065	215.0
1.2	3	120	0.022	0.96	0.16	31830	2100	322.5
1.5	3	120	0.028	1.20	0.20	25465	2140	513.5
2.0	3	120	0.036	1.60	0.26	19100	2065	859.0
2.5	3	120	0.046	2.00	0.33	15280	2110	1392.5
3.0	3	120	0.054	2.40	0.39	12735	2065	1933.0



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	3	60	0.006	0.05	0.5	38200	690	17.5
0.6	3	60	0.008	0.06	0.6	31830	765	27.5
0.8	3	60	0.010	0.08	0.8	23875	715	46.0
1.0	3	60	0.014	0.10	1.0	19100	800	80.0
1.2	3	60	0.016	0.12	1.2	15915	765	110.0
1.5	3	60	0.020	0.15	1.5	12735	765	172.0
2.0	3	60	0.026	0.20	2.0	9550	745	298.0
2.5	3	60	0.034	0.25	2.5	7640	780	487.5
3.0	3	60	0.040	0.30	3.0	6365	765	688.5

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

0.5	3	40	0.004	0.05	0.5	25465	305	7.5
0.6	3	40	0.006	0.06	0.6	21220	380	13.5
0.8	3	40	0.008	0.08	0.8	15915	380	24.5
1.0	3	40	0.012	0.10	1.0	12735	460	46.0
1.2	3	40	0.012	0.12	1.2	10610	380	54.5
1.5	3	40	0.016	0.15	1.5	8490	410	92.0
2.0	3	40	0.020	0.20	2.0	6365	380	152.0
2.5	3	40	0.028	0.25	2.5	5095	430	269.0
3.0	3	40	0.032	0.30	3.0	4245	410	369.0

Oro

0.5	3	160	0.008	0.05	0.5	60000	1440	36.0
0.6	3	160	0.010	0.06	0.6	60000	1800	65.0
0.8	3	160	0.012	0.08	0.8	60000	2160	138.0
1.0	3	160	0.016	0.10	1.0	50930	2445	244.5
1.2	3	160	0.020	0.12	1.2	42445	2545	366.5
1.5	3	160	0.024	0.15	1.5	33955	2445	550.0
2.0	3	160	0.032	0.20	2.0	25465	2445	978.0
2.5	3	160	0.040	0.25	2.5	20370	2445	1528.0
3.0	3	160	0.048	0.30	3.0	16975	2445	2200.5

Acciaio
850 - 1300 N/mm²

0.5	3	100	0.006	0.05	0.5	60000	1080	27.0
0.6	3	100	0.008	0.06	0.6	53055	1275	46.0
0.8	3	100	0.010	0.08	0.8	39790	1195	76.5
1.0	3	100	0.014	0.10	1.0	31830	1335	133.5
1.2	3	100	0.016	0.12	1.2	26525	1275	183.5
1.5	3	100	0.020	0.15	1.5	21220	1275	287.0
2.0	3	100	0.026	0.20	2.0	15915	1240	496.0
2.5	3	100	0.034	0.25	2.5	12735	1300	812.5
3.0	3	100	0.040	0.30	3.0	10610	1275	1147.5

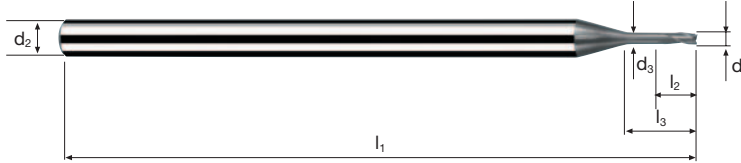
Frese cilindriche Microcut-C5

Gambo Ø 3 mm, scarico cilindrico, 5xd



HM XA λ 25° γ -10°

90°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper
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Esempio: N° Ordine										MICRO
										M15754
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	α	z		
.050	0.5	3	0.45	40	0.60	2.5	10.0°	3		●
.060	0.6	3	0.55	40	0.72	3.0	9.5°	3		●
.080	0.8	3	0.75	40	0.96	4.0	8.0°	3		●
.100	1.0	3	0.95	50	1.20	5.0	7.0°	3		●
.108	1.2	3	1.10	50	1.44	6.0	5.5°	3		●
.120	1.5	3	1.40	60	1.80	7.5	4.5°	3		●
.140	2.0	3	1.90	60	2.40	10.0	2.5°	3		●
.160	2.5	3	2.30	60	3.00	12.5	1.5°	3		●
.180	3.0	3	2.80	60	3.60	15.0	0.0°	3		●



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	2	180	0.012	0.30	0.06	60000	1440	26.0
0.6	2	180	0.014	0.36	0.07	60000	1680	42.5
0.8	2	180	0.018	0.48	0.09	60000	2160	93.5
1.0	2	180	0.022	0.60	0.11	57295	2520	166.5
1.2	2	180	0.026	0.72	0.13	47750	2485	232.5
1.5	2	180	0.034	0.90	0.17	38200	2600	398.0
2.0	2	180	0.044	1.20	0.22	28650	2520	665.5
2.5	2	180	0.056	1.50	0.28	22920	2565	1077.5
3.0	2	180	0.066	1.80	0.33	19100	2520	1497.0

Acciaio
1100 - 1300 N/mm²

0.5	2	160	0.010	0.30	0.06	60000	1200	21.5
0.6	2	160	0.012	0.36	0.07	60000	1440	36.5
0.8	2	160	0.016	0.48	0.09	60000	1920	83.0
1.0	2	160	0.020	0.60	0.11	50930	2035	134.5
1.2	2	160	0.024	0.72	0.13	42445	2035	190.5
1.5	2	160	0.030	0.90	0.17	33955	2035	311.5
2.0	2	160	0.040	1.20	0.22	25465	2035	537.0
2.5	2	160	0.050	1.50	0.28	20370	2035	854.5
3.0	2	160	0.060	1.80	0.33	16975	2035	1209.0

Acciaio inossidabile
[Cr-Ni/1.4301]

0.5	2	80	0.010	0.30	0.06	50930	1020	18.5
0.6	2	80	0.012	0.36	0.07	42445	1020	25.5
0.8	2	80	0.014	0.48	0.09	31830	890	38.5
1.0	2	80	0.018	0.60	0.11	25465	915	60.5
1.2	2	80	0.020	0.72	0.13	21220	850	79.5
1.5	2	80	0.028	0.90	0.17	16975	950	145.5
2.0	2	80	0.036	1.20	0.22	12735	915	241.5
2.5	2	80	0.044	1.50	0.28	10185	895	376.0
3.0	2	80	0.052	1.80	0.33	8490	885	525.5

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

0.5	2	60	0.008	0.30	0.06	38200	610	11.0
0.6	2	60	0.010	0.36	0.07	31830	635	16.0
0.8	2	60	0.012	0.48	0.09	23875	575	25.0
1.0	2	60	0.016	0.60	0.11	19100	610	40.5
1.2	2	60	0.018	0.72	0.13	15915	575	54.0
1.5	2	60	0.024	0.90	0.17	12735	610	93.5
2.0	2	60	0.030	1.20	0.22	9550	575	152.0
2.5	2	60	0.040	1.50	0.28	7640	610	256.0
3.0	2	60	0.046	1.80	0.33	6365	585	347.5



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	2	160	0.010	0.05	0.5	60000	1200	30.0
0.6	2	160	0.010	0.06	0.6	60000	1200	43.0
0.8	2	160	0.014	0.08	0.8	60000	1680	107.5
1.0	2	160	0.018	0.10	1.0	50930	1835	183.5
1.2	2	160	0.022	0.12	1.2	42445	1870	269.5
1.5	2	160	0.028	0.15	1.5	33955	1900	427.5
2.0	2	160	0.036	0.20	2.0	25465	1835	734.0
2.5	2	160	0.046	0.25	2.5	20370	1875	1172.0
3.0	2	160	0.054	0.30	3.0	16975	1835	1651.5

Acciaio
1100 - 1300 N/mm²

0.5	2	140	0.010	0.05	0.5	60000	1200	30.0
0.6	2	140	0.010	0.06	0.6	60000	1200	43.0
0.8	2	140	0.014	0.08	0.8	55705	1560	100.0
1.0	2	140	0.018	0.10	1.0	44565	1605	160.5
1.2	2	140	0.020	0.12	1.2	37135	1485	214.0
1.5	2	140	0.026	0.15	1.5	29710	1545	347.5
2.0	2	140	0.034	0.20	2.0	22280	1515	606.0
2.5	2	140	0.044	0.25	2.5	17825	1570	981.5
3.0	2	140	0.052	0.30	3.0	14855	1545	1390.5

Acciaio inossidabile
[Cr-Ni/1.4301]

0.5	2	70	0.008	0.05	0.5	44565	715	18.0
0.6	2	70	0.008	0.06	0.6	37135	595	21.5
0.8	2	70	0.012	0.08	0.8	27855	670	43.0
1.0	2	70	0.016	0.10	1.0	22280	715	71.5
1.2	2	70	0.020	0.12	1.2	18570	745	107.5
1.5	2	70	0.024	0.15	1.5	14855	715	161.0
2.0	2	70	0.032	0.20	2.0	11140	715	286.0
2.5	2	70	0.040	0.25	2.5	8915	715	447.0
3.0	2	70	0.048	0.30	3.0	7425	715	643.5

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

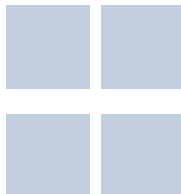
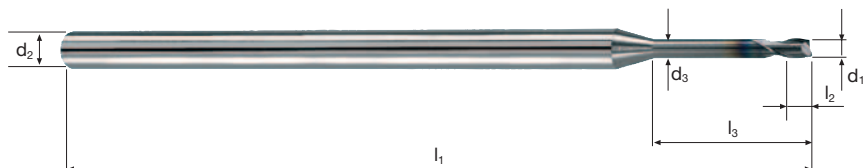
0.5	2	50	0.008	0.05	0.5	31830	510	13.0
0.6	2	50	0.008	0.06	0.6	26525	425	15.5
0.8	2	50	0.012	0.08	0.8	19895	475	30.5
1.0	2	50	0.014	0.10	1.0	15915	445	44.5
1.2	2	50	0.018	0.12	1.2	13265	480	69.0
1.5	2	50	0.022	0.15	1.5	10610	465	104.5
2.0	2	50	0.028	0.20	2.0	7960	445	178.0
2.5	2	50	0.036	0.25	2.5	6365	460	287.5
3.0	2	50	0.044	0.30	3.0	5305	465	418.5

Frese cilindriche Microcut-C8

Gambo Ø 3 mm, scarico cilindrico, 8xd

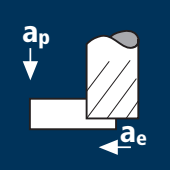






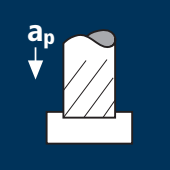




HM λ **25°**
Micro γ **6°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500			Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper
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Esempio: N° Ordine										MICRO	
										M5716	
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z		
.050	0.5	3	0.45	40	0.60	4.0	-	8.5°	2	●	
.060	0.6	3	0.55	40	0.72	4.8	-	7.5°	2	●	
.080	0.8	3	0.75	40	0.96	6.4	-	6.0°	2	●	
.100	1.0	3	0.95	50	1.20	8.0	0.07	5.0°	2	●	
.108	1.2	3	1.10	50	1.44	9.6	0.07	4.0°	2	●	
.120	1.5	3	1.40	60	1.80	12.0	0.07	3.0°	2	●	
.140	2.0	3	1.90	60	2.40	16.0	0.10	2.0°	2	●	
.160	2.5	3	2.30	60	3.00	20.0	0.10	1.0°	2	●	
.180	3.0	3	2.80	60	3.60	24.0	0.10	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	0.5	2	140	0.015	0.02	0.09	60000	1800	3.0
		0.6	2	140	0.015	0.02	0.11	60000	1800	4.0
		0.8	2	140	0.020	0.03	0.14	55705	2230	9.5
		1.0	2	140	0.025	0.04	0.18	44565	2230	16.0
		1.2	2	140	0.030	0.05	0.22	37135	2230	24.5
		1.5	2	140	0.040	0.06	0.27	29710	2375	38.5
		2.0	2	140	0.050	0.08	0.36	22280	2230	64.0
		2.5	2	140	0.065	0.10	0.45	17825	2315	104.0
		3.0	2	140	0.075	0.12	0.54	14855	2230	144.5
			Acciaio da utensile temprato 48 - 52 HRC 	0.5	2	120	0.014	0.02	0.09	60000
0.6	2			120	0.014	0.02	0.11	60000	1680	3.5
0.8	2			120	0.020	0.03	0.14	47750	1910	8.0
1.0	2			120	0.024	0.04	0.18	38200	1835	13.0
1.2	2			120	0.028	0.05	0.22	31830	1780	19.5
1.5	2			120	0.038	0.06	0.27	25465	1935	31.5
2.0	2			120	0.048	0.08	0.36	19100	1835	53.0
2.5	2			120	0.062	0.10	0.45	15280	1895	85.5
3.0	2			120	0.072	0.12	0.54	12735	1835	119.0
	Acciaio da utensile temprato 52 - 56 HRC 			0.5	2	100	0.014	0.02	0.09	60000
		0.6	2	100	0.014	0.02	0.11	53055	1485	3.5
		0.8	2	100	0.018	0.03	0.14	39790	1430	6.0
		1.0	2	100	0.022	0.04	0.18	31830	1400	10.0
		1.2	2	100	0.026	0.05	0.22	26525	1380	15.0
		1.5	2	100	0.036	0.06	0.27	21220	1530	25.0
		2.0	2	100	0.044	0.08	0.36	15915	1400	40.5
		2.5	2	100	0.058	0.10	0.45	12735	1475	66.5
		3.0	2	100	0.066	0.12	0.54	10610	1400	90.5
			Acciaio da utensile temprato 56 - 60 HRC 	0.5	2	60	0.012	0.02	0.09	38200
0.6	2			60	0.012	0.02	0.11	31830	765	1.5
0.8	2			60	0.016	0.03	0.14	23875	765	3.0
1.0	2			60	0.020	0.04	0.18	19100	765	5.5
1.2	2			60	0.024	0.05	0.22	15915	765	8.5
1.5	2			60	0.032	0.06	0.27	12735	815	13.0
2.0	2			60	0.040	0.08	0.36	9550	765	22.0
2.5	2			60	0.052	0.10	0.45	7640	795	36.0
3.0	2			60	0.060	0.12	0.54	6365	765	49.5

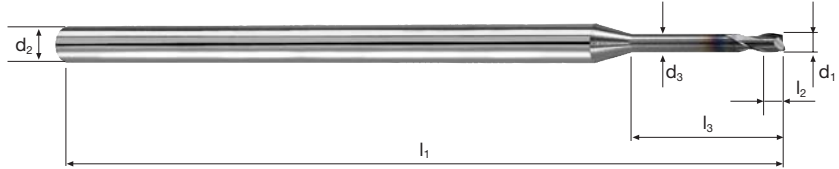
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	0.5	2	120	0.010	0.02	0.5	60000	1200	12.0
		0.6	2	120	0.015	0.02	0.6	60000	1800	21.5
		0.8	2	120	0.020	0.03	0.8	47750	1910	46.0
		1.0	2	120	0.020	0.04	1.0	38200	1530	61.0
		1.2	2	120	0.025	0.05	1.2	31830	1590	95.5
		1.5	2	120	0.035	0.06	1.5	25465	1785	160.5
		2.0	2	120	0.045	0.08	2.0	19100	1720	275.0
		2.5	2	120	0.055	0.10	2.5	15280	1680	420.0
		3.0	2	120	0.065	0.12	3.0	12735	1655	596.0
			Acciaio da utensile temprato 48 - 52 HRC 	0.5	2	100	0.010	0.02	0.5	60000
0.6	2			100	0.014	0.02	0.6	53055	1485	18.0
0.8	2			100	0.020	0.03	0.8	39790	1590	38.0
1.0	2			100	0.020	0.04	1.0	31830	1275	51.0
1.2	2			100	0.024	0.05	1.2	26525	1275	76.5
1.5	2			100	0.034	0.06	1.5	21220	1445	130.0
2.0	2			100	0.042	0.08	2.0	15915	1335	213.5
2.5	2			100	0.052	0.10	2.5	12735	1325	331.5
3.0	2			100	0.062	0.12	3.0	10610	1315	473.5
	Acciaio da utensile temprato 52 - 56 HRC 			0.5	2	80	0.008	0.02	0.5	50930
		0.6	2	80	0.014	0.02	0.6	42445	1190	14.5
		0.8	2	80	0.018	0.03	0.8	31830	1145	27.5
		1.0	2	80	0.018	0.04	1.0	25465	915	36.5
		1.2	2	80	0.022	0.05	1.2	21220	935	56.0
		1.5	2	80	0.030	0.06	1.5	16975	1020	92.0
		2.0	2	80	0.040	0.08	2.0	12735	1020	163.0
		2.5	2	80	0.048	0.10	2.5	10185	980	245.0
		3.0	2	80	0.058	0.12	3.0	8490	985	354.5
			Acciaio da utensile temprato 56 - 60 HRC 	0.5	2	40	0.008	0.02	0.5	25465
0.6	2			40	0.012	0.02	0.6	21220	510	6.0
0.8	2			40	0.016	0.03	0.8	15915	510	12.0
1.0	2			40	0.016	0.04	1.0	12735	410	16.5
1.2	2			40	0.020	0.05	1.2	10610	425	25.5
1.5	2			40	0.028	0.06	1.5	8490	475	43.0
2.0	2			40	0.036	0.08	2.0	6365	460	73.5
2.5	2			40	0.044	0.10	2.5	5095	450	112.5
3.0	2			40	0.052	0.12	3.0	4245	440	158.5

Frese cilindriche Microcut-C8H

Gambo Ø 3 mm, scarico cilindrico, 8xd



HM λ 25°
XA γ -10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	
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		Rivestimento		Articolo		Codice-ø					DURO-S
Esempio: N° Ordine		D		5726		.050					D5726
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z		
.050	0.5	3	0.45	40	0.60	4.0	-	8.5°	2	●	
.060	0.6	3	0.55	40	0.72	4.8	-	7.5°	2	●	
.080	0.8	3	0.75	40	0.96	6.4	-	6.0°	2	●	
.100	1.0	3	0.95	50	1.20	8.0	0.07	5.0°	2	●	
.108	1.2	3	1.10	50	1.44	9.6	0.07	4.0°	2	●	
.120	1.5	3	1.40	60	1.80	12.0	0.07	3.0°	2	●	
.140	2.0	3	1.90	60	2.40	16.0	0.10	2.0°	2	●	
.160	2.5	3	2.30	60	3.00	20.0	0.10	1.0°	2	●	
.180	3.0	3	2.80	60	3.60	24.0	0.10	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]		
	Acciaio 850 - 1100 N/mm ² 	0.5	2	180	0.012	0.25	0.06	60000	1440	21.5		
		0.6	2	180	0.014	0.30	0.07	60000	1680	35.5		
		0.8	2	180	0.018	0.40	0.09	60000	2160	78.0		
		1.0	2	180	0.022	0.50	0.11	57295	2520	138.5		
		1.2	2	180	0.026	0.60	0.13	47750	2485	194.0		
		1.5	2	180	0.034	0.75	0.17	38200	2600	331.5		
		2.0	2	180	0.044	1.00	0.22	28650	2520	554.5		
		2.5	2	180	0.056	1.25	0.28	22920	2565	898.0		
		3.0	2	180	0.066	1.50	0.33	19100	2520	1247.5		
			Acciaio 1100 - 1300 N/mm ² 	0.5	2	160	0.010	0.25	0.06	60000	1200	18.0
				0.6	2	160	0.012	0.30	0.07	60000	1440	30.0
				0.8	2	160	0.016	0.40	0.09	60000	1920	69.0
1.0	2			160	0.020	0.50	0.11	50930	2035	112.0		
1.2	2			160	0.024	0.60	0.13	42445	2035	158.5		
1.5	2			160	0.030	0.75	0.17	33955	2035	259.5		
2.0	2			160	0.040	1.00	0.22	25465	2035	447.5		
2.5	2			160	0.050	1.25	0.28	20370	2035	712.5		
3.0	2			160	0.060	1.50	0.33	16975	2035	1007.5		
	Acciaio inossidabile [Cr-Ni/1.4301] 			0.5	2	80	0.010	0.25	0.06	50930	1020	15.5
				0.6	2	80	0.012	0.30	0.07	42445	1020	21.5
				0.8	2	80	0.014	0.40	0.09	31830	890	32.0
		1.0	2	80	0.018	0.50	0.11	25465	915	50.5		
		1.2	2	80	0.020	0.60	0.13	21220	850	66.5		
		1.5	2	80	0.028	0.75	0.17	16975	950	121.0		
		2.0	2	80	0.036	1.00	0.22	12735	915	201.5		
		2.5	2	80	0.044	1.25	0.28	10185	895	313.5		
		3.0	2	80	0.052	1.50	0.33	8490	885	438.0		
			Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	0.5	2	60	0.008	0.25	0.06	38200	610	9.0
				0.6	2	60	0.010	0.30	0.07	31830	635	13.5
				0.8	2	60	0.012	0.40	0.09	23875	575	20.5
1.0	2			60	0.016	0.50	0.11	19100	610	33.5		
1.2	2			60	0.018	0.60	0.13	15915	575	45.0		
1.5	2			60	0.024	0.75	0.17	12735	610	78.0		
2.0	2			60	0.030	1.00	0.22	9550	575	126.5		
2.5	2			60	0.040	1.25	0.28	7640	610	213.5		
3.0	2			60	0.046	1.50	0.33	6365	585	289.5		

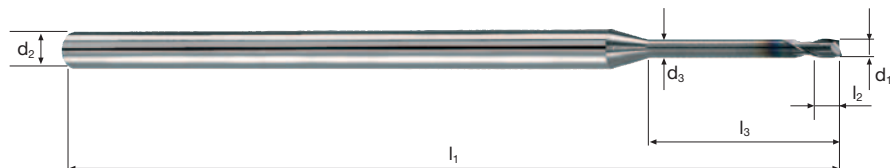
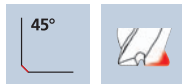
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]		
	Acciaio 850 - 1100 N/mm ² 	0.5	2	160	0.010	0.04	0.5	60000	1200	24.0		
		0.6	2	160	0.010	0.05	0.6	60000	1200	36.0		
		0.8	2	160	0.014	0.06	0.8	60000	1680	80.5		
		1.0	2	160	0.018	0.08	1.0	50930	1835	147.0		
		1.2	2	160	0.022	0.10	1.2	42445	1870	224.5		
		1.5	2	160	0.028	0.12	1.5	33955	1900	342.0		
		2.0	2	160	0.036	0.16	2.0	25465	1835	587.0		
		2.5	2	160	0.046	0.20	2.5	20370	1875	937.5		
		3.0	2	160	0.054	0.24	3.0	16975	1835	1321.0		
			Acciaio 1100 - 1300 N/mm ² 	0.5	2	140	0.010	0.04	0.5	60000	1200	24.0
				0.6	2	140	0.010	0.05	0.6	60000	1200	36.0
				0.8	2	140	0.014	0.06	0.8	55705	1560	75.0
1.0	2			140	0.018	0.08	1.0	44565	1605	128.5		
1.2	2			140	0.020	0.10	1.2	37135	1485	178.0		
1.5	2			140	0.026	0.12	1.5	29710	1545	278.0		
2.0	2			140	0.034	0.16	2.0	22280	1515	485.0		
2.5	2			140	0.044	0.20	2.5	17825	1570	785.0		
3.0	2			140	0.052	0.24	3.0	14855	1545	1112.5		
	Acciaio inossidabile [Cr-Ni/1.4301] 			0.5	2	70	0.008	0.04	0.5	44565	715	14.5
				0.6	2	70	0.008	0.05	0.6	37135	595	18.0
				0.8	2	70	0.012	0.06	0.8	27855	670	32.0
		1.0	2	70	0.016	0.08	1.0	22280	715	57.0		
		1.2	2	70	0.020	0.10	1.2	18570	745	89.5		
		1.5	2	70	0.024	0.12	1.5	14855	715	128.5		
		2.0	2	70	0.032	0.16	2.0	11140	715	229.0		
		2.5	2	70	0.040	0.20	2.5	8915	715	357.5		
		3.0	2	70	0.048	0.24	3.0	7425	715	515.0		
			Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	0.5	2	50	0.008	0.04	0.5	31830	510	10.0
				0.6	2	50	0.008	0.05	0.6	26525	425	13.0
				0.8	2	50	0.012	0.06	0.8	19895	475	23.0
1.0	2			50	0.014	0.08	1.0	15915	445	35.5		
1.2	2			50	0.018	0.10	1.2	13265	480	57.5		
1.5	2			50	0.022	0.12	1.5	10610	465	83.5		
2.0	2			50	0.028	0.16	2.0	7960	445	142.5		
2.5	2			50	0.036	0.20	2.5	6365	460	230.0		
3.0	2			50	0.044	0.24	3.0	5305	465	335.0		

Frese cilindriche Microcut-C10

Gambo Ø 3 mm, scarico cilindrico, 10xd



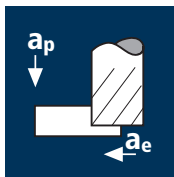
HM λ 25°
Micro γ 6°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500			Inox Stainless	Ti Titanium	Gold / Platinum Copper
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Esempio: N° Ordine		Rivestimento M	Articolo 5717	Codice-ø .050						MICRO
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z	M5717
.050	0.5	3	0.45	40	0.60	5.0	-	7.5°	2	●
.060	0.6	3	0.55	40	0.72	6.0	-	7.0°	2	●
.080	0.8	3	0.75	40	0.96	8.0	-	5.5°	2	●
.100	1.0	3	0.95	50	1.20	10.0	0.07	4.5°	2	●
.108	1.2	3	1.10	50	1.44	12.0	0.07	3.5°	2	●
.120	1.5	3	1.40	60	1.80	15.0	0.07	2.5°	2	●
.140	2.0	3	1.90	60	2.40	20.0	0.10	1.5°	2	●
.160	2.5	3	2.30	60	3.00	25.0	0.10	1.0°	2	●
.180	3.0	3	2.80	60	3.60	30.0	0.10	0.0°	2	●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



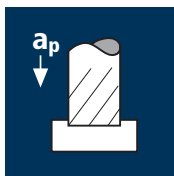
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
1.0	2	180	0.022	0.40	0.09	57295	2520	90.5
1.2	2	180	0.026	0.48	0.11	47750	2485	131.0
1.5	2	180	0.034	0.60	0.14	38200	2600	218.5
2.0	2	180	0.044	0.80	0.18	28650	2520	363.0
2.5	2	180	0.056	1.00	0.23	22920	2565	590.0
3.0	2	180	0.066	1.20	0.27	19100	2520	816.5

1.0	2	160	0.020	0.40	0.09	50930	2035	73.5
1.2	2	160	0.024	0.48	0.11	42445	2035	107.5
1.5	2	160	0.030	0.60	0.14	33955	2035	171.0
2.0	2	160	0.040	0.80	0.18	25465	2035	293.0
2.5	2	160	0.050	1.00	0.23	20370	2035	468.0
3.0	2	160	0.060	1.20	0.27	16975	2035	659.5

1.0	2	80	0.018	0.40	0.09	25465	915	33.0
1.2	2	80	0.020	0.48	0.11	21220	850	45.0
1.5	2	80	0.028	0.60	0.14	16975	950	80.0
2.0	2	80	0.036	0.80	0.18	12735	915	132.0
2.5	2	80	0.044	1.00	0.23	10185	895	206.0
3.0	2	80	0.052	1.20	0.27	8490	885	286.5

1.0	2	60	0.016	0.40	0.09	19100	610	22.0
1.2	2	60	0.018	0.48	0.11	15915	575	30.5
1.5	2	60	0.024	0.60	0.14	12735	610	51.0
2.0	2	60	0.030	0.80	0.18	9550	575	83.0
2.5	2	60	0.040	1.00	0.23	7640	610	140.5
3.0	2	60	0.046	1.20	0.27	6365	585	189.5

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
1.0	2	160	0.018	0.06	1.0	50930	1835	110.0
1.2	2	160	0.022	0.07	1.2	42445	1870	157.0
1.5	2	160	0.028	0.09	1.5	33955	1900	256.5
2.0	2	160	0.036	0.12	2.0	25465	1835	440.5
2.5	2	160	0.046	0.15	2.5	20370	1875	703.0
3.0	2	160	0.054	0.18	3.0	16975	1835	991.0

1.0	2	140	0.018	0.06	1.0	44565	1605	96.5
1.2	2	140	0.020	0.07	1.2	37135	1485	124.5
1.5	2	140	0.026	0.09	1.5	29710	1545	208.5
2.0	2	140	0.034	0.12	2.0	22280	1515	363.5
2.5	2	140	0.044	0.15	2.5	17825	1570	589.0
3.0	2	140	0.052	0.18	3.0	14855	1545	834.5

1.0	2	70	0.016	0.06	1.0	22280	715	43.0
1.2	2	70	0.020	0.07	1.2	18570	745	62.5
1.5	2	70	0.024	0.09	1.5	14855	715	96.5
2.0	2	70	0.032	0.12	2.0	11140	715	171.5
2.5	2	70	0.040	0.15	2.5	8915	715	268.0
3.0	2	70	0.048	0.18	3.0	7425	715	386.0

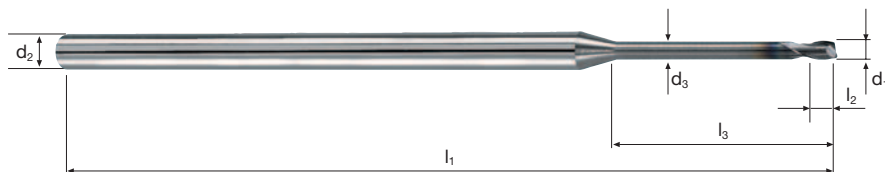
1.0	2	50	0.014	0.06	1.0	15915	445	26.5
1.2	2	50	0.018	0.07	1.2	13265	480	40.5
1.5	2	50	0.022	0.09	1.5	10610	465	63.0
2.0	2	50	0.028	0.12	2.0	7960	445	107.0
2.5	2	50	0.036	0.15	2.5	6365	460	172.5
3.0	2	50	0.044	0.18	3.0	5305	465	251.0

Frese cilindriche Microcut-C12

Gambo Ø 3 mm, scarico cilindrico, 12xd



HM λ **25°**
Micro γ **6°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	Gold / Platinum Copper
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Ø Code	d_1 ± 0.01	d_2 h_6	d_3	l_1	l_2	l_3	45°	α	z	MICRO
										M5721
.100	1.0	3	0.95	50	1.20	12.0	0.07	4.0°	2	●
.108	1.2	3	1.10	60	1.44	14.4	0.07	3.0°	2	●
.120	1.5	3	1.40	60	1.80	18.0	0.07	2.5°	2	●
.140	2.0	3	1.90	60	2.40	24.0	0.10	1.5°	2	●
.160	2.5	3	2.30	70	3.00	30.0	0.10	0.5°	2	●
.180	3.0	3	2.80	70	3.60	36.0	0.10	0.0°	2	●
										●
										●
										●
										●
										●
										●
										●
										●
										●
										●



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
1.0	2	180	0.018	0.30	0.09	57295	2065	56.0
1.2	2	180	0.022	0.36	0.11	47750	2100	83.0
1.5	2	180	0.028	0.45	0.14	38200	2140	135.0
2.0	2	180	0.036	0.60	0.18	28650	2065	223.0
2.5	2	180	0.046	0.75	0.23	22920	2110	364.0
3.0	2	180	0.054	0.90	0.27	19100	2065	502.0

Acciaio
1100 - 1300 N/mm²

1.0	2	160	0.016	0.30	0.09	50930	1630	44.0
1.2	2	160	0.020	0.36	0.11	42445	1700	67.5
1.5	2	160	0.026	0.45	0.14	33955	1765	111.0
2.0	2	160	0.032	0.60	0.18	25465	1630	176.0
2.5	2	160	0.042	0.75	0.23	20370	1710	295.0
3.0	2	160	0.048	0.90	0.27	16975	1630	396.0

Acciaio inossidabile
[Cr-Ni/1.4301]

1.0	2	80	0.014	0.30	0.09	25465	715	19.5
1.2	2	80	0.018	0.36	0.11	21220	765	30.5
1.5	2	80	0.022	0.45	0.14	16975	745	47.0
2.0	2	80	0.028	0.60	0.18	12735	715	77.0
2.5	2	80	0.036	0.75	0.23	10185	735	127.0
3.0	2	80	0.044	0.90	0.27	8490	745	181.0

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

1.0	2	60	0.012	0.30	0.09	19100	460	12.5
1.2	2	60	0.016	0.36	0.11	15915	510	20.0
1.5	2	60	0.020	0.45	0.14	12735	510	32.0
2.0	2	60	0.026	0.60	0.18	9550	495	53.5
2.5	2	60	0.032	0.75	0.23	7640	490	84.5
3.0	2	60	0.038	0.90	0.27	6365	485	118.0



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
1.0	2	160	0.016	0.04	1.0	50930	1630	65.0
1.2	2	160	0.018	0.05	1.2	42445	1530	92.0
1.5	2	160	0.024	0.06	1.5	33955	1630	146.5
2.0	2	160	0.030	0.08	2.0	25465	1530	245.0
2.5	2	160	0.038	0.10	2.5	20370	1550	387.5
3.0	2	160	0.046	0.12	3.0	16975	1560	561.5

Acciaio
1100 - 1300 N/mm²

1.0	2	140	0.016	0.04	1.0	44565	1425	57.0
1.2	2	140	0.018	0.05	1.2	37135	1335	80.0
1.5	2	140	0.022	0.06	1.5	29710	1305	117.5
2.0	2	140	0.028	0.08	2.0	22280	1250	200.0
2.5	2	140	0.036	0.10	2.5	17825	1285	321.5
3.0	2	140	0.044	0.12	3.0	14855	1305	470.0

Acciaio inossidabile
[Cr-Ni/1.4301]

1.0	2	70	0.014	0.04	1.0	22280	625	25.0
1.2	2	70	0.016	0.05	1.2	18570	595	35.5
1.5	2	70	0.022	0.06	1.5	14855	655	59.0
2.0	2	70	0.026	0.08	2.0	11140	580	93.0
2.5	2	70	0.034	0.10	2.5	8915	605	151.5
3.0	2	70	0.040	0.12	3.0	7425	595	214.0

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

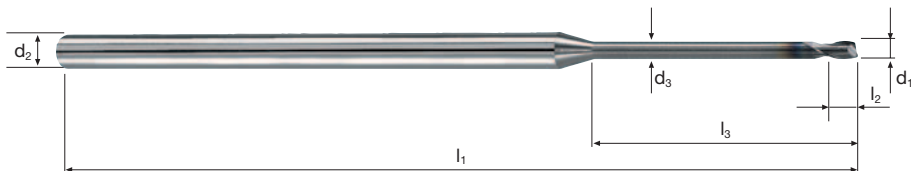
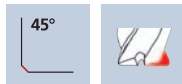
1.0	2	50	0.012	0.04	1.0	15915	380	15.0
1.2	2	50	0.014	0.05	1.2	13265	370	22.0
1.5	2	50	0.020	0.06	1.5	10610	425	38.5
2.0	2	50	0.024	0.08	2.0	7960	380	61.0
2.5	2	50	0.030	0.10	2.5	6365	380	95.0
3.0	2	50	0.036	0.12	3.0	5305	380	137.0

Frese cilindriche Microcut-C15

Gambo Ø 3 mm, scarico cilindrico, 15xd



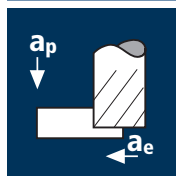
HM λ 25°
Micro γ 6°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	Gold / Platinum Copper
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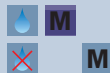
Esempio: N° Ordine										MICRO
										M5723
\emptyset Code	d_1 ± 0.01	d_2 h6	d_3	l_1	l_2	l_3	45°	α	z	
.100	1.0	3	0.95	60	1.20	15.0	0.07	3.5°	2	●
.108	1.2	3	1.10	60	1.44	18.0	0.07	2.5°	2	●
.120	1.5	3	1.40	70	1.80	22.5	0.07	2.0°	2	●
.140	2.0	3	1.90	70	2.40	30.0	0.10	1.0°	2	●
.160	2.5	3	2.30	70	3.00	37.5	0.10	0.5°	2	●
.180	3.0	3	2.80	80	3.60	45.0	0.10	0.0°	2	●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



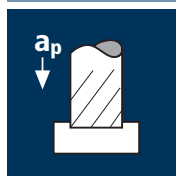
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
1.0	2	180	0.018	0.20	0.07	57295	2065	29.0
1.2	2	180	0.022	0.24	0.08	47750	2100	40.5
1.5	2	180	0.028	0.30	0.11	38200	2140	70.5
2.0	2	180	0.036	0.40	0.14	28650	2065	115.5
2.5	2	180	0.046	0.50	0.18	22920	2110	190.0
3.0	2	180	0.054	0.60	0.21	19100	2065	260.0

1.0	2	160	0.016	0.20	0.07	50930	1630	23.0
1.2	2	160	0.020	0.24	0.08	42445	1700	32.5
1.5	2	160	0.026	0.30	0.11	33955	1765	58.0
2.0	2	160	0.032	0.40	0.14	25465	1630	91.5
2.5	2	160	0.042	0.50	0.18	20370	1710	154.0
3.0	2	160	0.048	0.60	0.21	16975	1630	205.5

1.0	2	80	0.014	0.20	0.07	25465	715	10.0
1.2	2	80	0.018	0.24	0.08	21220	765	14.5
1.5	2	80	0.022	0.30	0.11	16975	745	24.5
2.0	2	80	0.028	0.40	0.14	12735	715	40.0
2.5	2	80	0.036	0.50	0.18	10185	735	66.0
3.0	2	80	0.044	0.60	0.21	8490	745	94.0

1.0	2	60	0.012	0.20	0.07	19100	460	6.5
1.2	2	60	0.016	0.24	0.08	15915	510	10.0
1.5	2	60	0.020	0.30	0.11	12735	510	17.0
2.0	2	60	0.026	0.40	0.14	9550	495	27.5
2.5	2	60	0.032	0.50	0.18	7640	490	44.0
3.0	2	60	0.038	0.60	0.21	6365	485	61.0

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
1.0	2	160	0.016	0.03	1.0	50930	1630	49.0
1.2	2	160	0.018	0.04	1.2	42445	1530	73.5
1.5	2	160	0.024	0.05	1.5	33955	1630	122.5
2.0	2	160	0.030	0.06	2.0	25465	1530	183.5
2.5	2	160	0.038	0.08	2.5	20370	1550	310.0
3.0	2	160	0.046	0.09	3.0	16975	1560	421.0

1.0	2	140	0.016	0.03	1.0	44565	1425	43.0
1.2	2	140	0.018	0.04	1.2	37135	1335	64.0
1.5	2	140	0.022	0.05	1.5	29710	1305	98.0
2.0	2	140	0.028	0.06	2.0	22280	1250	150.0
2.5	2	140	0.036	0.08	2.5	17825	1285	257.0
3.0	2	140	0.044	0.09	3.0	14855	1305	352.5

1.0	2	70	0.014	0.03	1.0	22280	625	19.0
1.2	2	70	0.016	0.04	1.2	18570	595	28.5
1.5	2	70	0.022	0.05	1.5	14855	655	49.0
2.0	2	70	0.026	0.06	2.0	11140	580	69.5
2.5	2	70	0.034	0.08	2.5	8915	605	121.0
3.0	2	70	0.040	0.09	3.0	7425	595	160.5

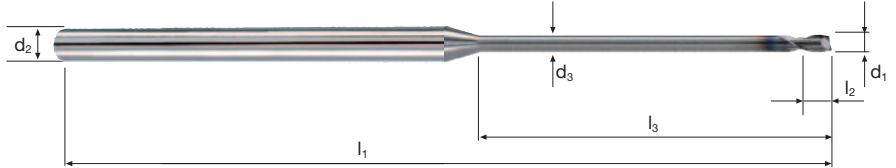
1.0	2	50	0.012	0.03	1.0	15915	380	11.5
1.2	2	50	0.014	0.04	1.2	13265	370	18.0
1.5	2	50	0.020	0.05	1.5	10610	425	32.0
2.0	2	50	0.024	0.06	2.0	7960	380	45.5
2.5	2	50	0.030	0.08	2.5	6365	380	76.0
3.0	2	50	0.036	0.09	3.0	5305	380	102.5

Frese cilindriche Microcut-C20

Gambo Ø 3 mm, scarico cilindrico, 20xd



HM λ 25°
Micro γ 6°



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Gold / Platinum Copper**

Esempio: N° Ordine Rivestimento M Articolo 15725 Codice-ø .100										MICRO
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z	M15725
.100	1.0	3	0.95	60	1.20	20.0	0.07	2.5°	2	●
.108	1.2	3	1.10	60	1.44	24.0	0.07	2.0°	2	●
.120	1.5	3	1.40	70	1.80	30.0	0.07	1.5°	2	●
.140	2.0	3	1.90	80	2.40	40.0	0.10	1.0°	2	●
.160	2.5	3	2.30	80	3.00	50.0	0.10	0.5°	2	●
.180	3.0	3	2.80	90	3.60	60.0	0.10	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	Acciaio < 850 N/mm ² 	2	3	120	0.005	2	0.3	19100	285	
		3	3	120	0.010	3	0.5	12735	380	
		4	3	120	0.015	4	0.6	9550	430	
		5	3	120	0.015	5	0.8	7640	345	
		6	3	120	0.020	6	0.9	6365	380	
		8	3	120	0.025	8	1.2	4775	360	
		10	3	120	0.035	10	1.5	3820	400	
	Acciaio 850 - 1100 N/mm ² 	2	3	75	0.005	2	0.3	11935	180	
		3	3	75	0.010	3	0.5	7960	240	
		4	3	75	0.015	4	0.6	5970	270	
		5	3	75	0.015	5	0.8	4775	215	
		6	3	75	0.020	6	0.9	3980	240	
		8	3	75	0.025	8	1.2	2985	225	
		10	3	75	0.035	10	1.5	2385	250	
	Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	2	3	60	0.005	2	0.3	9550	145	
		3	3	60	0.010	3	0.5	6365	190	
		4	3	60	0.015	4	0.6	4775	215	
		5	3	60	0.015	5	0.8	3820	170	
		6	3	60	0.020	6	0.9	3185	190	
		8	3	60	0.025	8	1.2	2385	180	
		10	3	60	0.035	10	1.5	1910	200	
	Acciaio inossidabile [Cr-Ni/1.4301] 	2	3	80	0.005	2	0.3	12735	190	
		3	3	80	0.010	3	0.5	8490	255	
		4	3	80	0.015	4	0.6	6365	285	
		5	3	80	0.015	5	0.8	5095	230	
		6	3	80	0.020	6	0.9	4245	255	
		8	3	80	0.025	8	1.2	3185	240	
		10	3	80	0.035	10	1.5	2545	265	

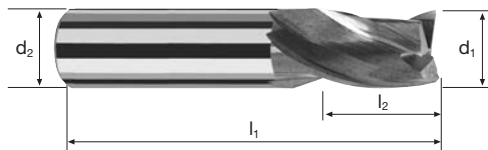
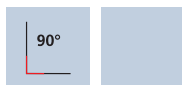
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio < 850 N/mm ² 	2	3	95	0.005	1.6	2	15120	225	0.7	
		3	3	95	0.010	2.4	3	10080	300	2.2	
		4	3	95	0.010	3.2	4	7560	225	2.9	
		5	3	95	0.015	4.0	5	6050	270	5.4	
		6	3	95	0.015	4.8	6	5040	225	6.5	
		8	3	95	0.020	6.4	8	3780	225	11.5	
		10	3	95	0.030	8.0	10	3025	270	21.6	
	Acciaio 850 - 1100 N/mm ² 	2	3	60	0.005	1.6	2	9550	145	0.5	
		3	3	60	0.010	2.4	3	6365	190	1.4	
		4	3	60	0.010	3.2	4	4775	145	1.9	
		5	3	60	0.015	4.0	5	3820	170	3.4	
		6	3	60	0.015	4.8	6	3185	145	4.2	
		8	3	60	0.020	6.4	8	2385	145	7.4	
		10	3	60	0.025	8.0	10	1910	145	11.6	
	Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	2	3	45	0.005	1.6	2	7160	105	0.3	
		3	3	45	0.010	2.4	3	4775	145	1.0	
		4	3	45	0.010	3.2	4	3580	105	1.3	
		5	3	45	0.015	4.0	5	2865	130	2.6	
		6	3	45	0.015	4.8	6	2385	105	3.0	
		8	3	45	0.020	6.4	8	1790	105	5.4	
		10	3	45	0.025	8.0	10	1430	105	8.4	
	Acciaio inossidabile [Cr-Ni/1.4301] 	2	3	55	0.005	1.6	2	8755	130	0.4	
		3	3	55	0.010	2.4	3	5835	175	1.3	
		4	3	55	0.010	3.2	4	4375	130	1.7	
		5	3	55	0.015	4.0	5	3500	160	3.2	
		6	3	55	0.015	4.8	6	2920	130	3.7	
		8	3	55	0.020	6.4	8	2190	130	6.7	
		10	3	55	0.025	8.0	10	1750	130	10.4	

Frese cilindriche Cut-X V

A taglienti lisci, esecuzione a gambo corto



HM
MG10 λ **30°**
 γ **12°**



Sgrossatura

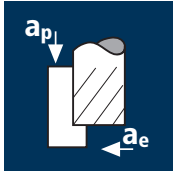















Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	Nickel-Alloys Copper Platinum
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								POLYCHROM	TRIBO
Esempio: N° Ordine									
								P15232	T15232
\emptyset Code	d1 e8	d2 h6	l1	l2	α	z			
.120	1.5	6	38	3	11.5°	3	●	●	
.140	2.0	6	38	3	11.0°	3	●	●	
.160	2.5	6	38	3	10.0°	3	●	●	
.180	3.0	6	38	4	8.0°	3	●	●	
.200	3.5	6	38	4	7.0°	3	●	●	
.220	4.0	6	38	5	5.5°	3	●	●	
.240	4.5	6	38	5	4.5°	3	●	●	
.260	5.0	6	38	6	3.0°	3	●	●	
.300	6.0	6	38	7	0.0°	3	●	●	
.391	8.0	8	41	9	0.0°	3	●	●	
.450	10.0	10	48	11	0.0°	3	●	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ² 	2	3	60	0.005	2	0.2	9550	145
		3	3	60	0.010	3	0.3	6365	190
		4	3	60	0.015	4	0.4	4775	215
		5	3	60	0.015	5	0.5	3820	170
		6	3	60	0.020	6	0.6	3185	190
		8	3	60	0.025	8	0.8	2385	180
		10	3	60	0.035	10	1.0	1910	200
Ottone a truciolo corto CuZn  	2	3	140	0.005	2	0.2	22280	335	
	3	3	140	0.010	3	0.3	14855	445	
	4	3	140	0.020	4	0.4	11140	670	
	5	3	140	0.020	5	0.5	8915	535	
	6	3	140	0.025	6	0.6	7425	555	
	8	3	140	0.030	8	0.8	5570	500	
	10	3	140	0.040	10	1.0	4455	535	
Oro  	2	3	160	0.005	2	0.2	25465	380	
	3	3	160	0.010	3	0.3	16975	510	
	4	3	160	0.020	4	0.4	12735	765	
	5	3	160	0.020	5	0.5	10185	610	
	6	3	160	0.025	6	0.6	8490	635	
	8	3	160	0.030	8	0.8	6365	575	
	10	3	160	0.040	10	1.0	5095	610	
Alluminio malleabile Si < 6% 	2	3	250	0.005	2	0.2	39790	595	
	3	3	250	0.010	3	0.3	26525	795	
	4	3	250	0.015	4	0.4	19895	895	
	5	3	250	0.020	5	0.5	15915	955	
	6	3	250	0.025	6	0.6	13265	995	
	8	3	250	0.030	8	0.8	9945	895	
	10	3	250	0.040	10	1.0	7960	955	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ² 	2	3	45	0.005	1.0	2	7160	105	0.2
		3	3	45	0.010	1.5	3	4775	145	0.7
		4	3	45	0.010	2.0	4	3580	105	0.8
		5	3	45	0.015	2.5	5	2865	130	1.6
		6	3	45	0.015	3.0	6	2385	105	1.9
		8	3	45	0.020	4.0	8	1790	105	3.4
		10	3	45	0.030	5.0	10	1430	130	6.5
Ottone a truciolo corto CuZn  	2	3	120	0.005	1.0	2	19100	285	0.6	
	3	3	120	0.010	1.5	3	12735	380	1.7	
	4	3	120	0.010	2.0	4	9550	285	2.3	
	5	3	120	0.015	2.5	5	7640	345	4.3	
	6	3	120	0.015	3.0	6	6365	285	5.1	
	8	3	120	0.025	4.0	8	4775	360	11.5	
	10	3	120	0.035	5.0	10	3820	400	20.0	
Oro  	2	3	140	0.005	1.0	2	22280	335	0.7	
	3	3	140	0.010	1.5	3	14855	445	2.0	
	4	3	140	0.010	2.0	4	11140	335	2.7	
	5	3	140	0.015	2.5	5	8915	400	5.0	
	6	3	140	0.015	3.0	6	7425	335	6.0	
	8	3	140	0.025	4.0	8	5570	420	13.4	
	10	3	140	0.035	5.0	10	4455	470	23.5	
Alluminio malleabile Si < 6% 	2	3	200	0.005	1.0	2	31830	475	1.0	
	3	3	200	0.010	1.5	3	21220	635	2.9	
	4	3	200	0.010	2.0	4	15915	475	3.8	
	5	3	200	0.015	2.5	5	12735	575	7.2	
	6	3	200	0.015	3.0	6	10610	475	8.6	
	8	3	200	0.025	4.0	8	7960	595	19.0	
	10	3	200	0.035	5.0	10	6365	670	33.5	

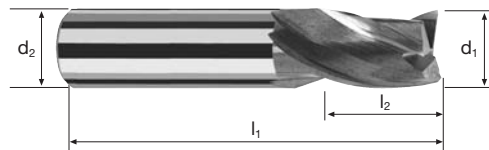
Frese cilindriche Cut-X V

A taglienti lisci, esecuzione a gambo corto

HM
MG10 λ 30°
 γ 12°

90°

Vario



Sgrossatura



Finitura

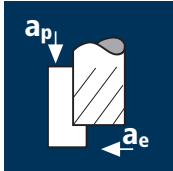

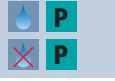

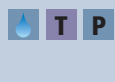






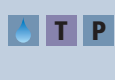
Rm
< 850

Rm
850-1100

Aluminium
Copper / CuZn Brass
Gold

		Rivestimento		Articolo		Codice- ϕ			
Esempio: N° Ordine				15232		.120			
ϕ Code	d1 e8	d2 h6	l1	l2	α	Z	15232		
.120	1.5	6	38	3	11.5°	3	●		
.140	2.0	6	38	3	11.0°	3	●		
.160	2.5	6	38	3	10.0°	3	●		
.180	3.0	6	38	4	8.0°	3	●		
.200	3.5	6	38	4	7.0°	3	●		
.220	4.0	6	38	5	5.5°	3	●		
.240	4.5	6	38	5	4.5°	3	●		
.260	5.0	6	38	6	3.0°	3	●		
.300	6.0	6	38	7	0.0°	3	●		
.391	8.0	8	41	9	0.0°	3	●		
.450	10.0	10	48	11	0.0°	3	●		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	Acciaio < 850 N/mm ² 	2	3	115	0.005	2	0.2	18305	275	
		3	3	115	0.010	3	0.3	12200	365	
		4	3	115	0.015	4	0.4	9150	410	
		5	3	115	0.015	5	0.5	7320	330	
		6	3	115	0.020	6	0.6	6100	365	
		8	3	115	0.025	8	0.8	4575	345	
		10	3	115	0.035	10	1.0	3660	385	
	Acciaio 850 - 1100 N/mm ² 	2	3	75	0.005	2	0.2	11935	180	
		3	3	75	0.010	3	0.3	7960	240	
		4	3	75	0.015	4	0.4	5970	270	
		5	3	75	0.015	5	0.5	4775	215	
		6	3	75	0.020	6	0.6	3980	240	
		8	3	75	0.025	8	0.8	2985	225	
		10	3	75	0.035	10	1.0	2385	250	
	Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	2	3	40	0.005	2	0.2	6365	95	
		3	3	40	0.010	3	0.3	4245	125	
		4	3	40	0.015	4	0.4	3185	145	
		5	3	40	0.015	5	0.5	2545	115	
		6	3	40	0.020	6	0.6	2120	125	
		8	3	40	0.025	8	0.8	1590	120	
		10	3	40	0.035	10	1.0	1275	135	
	Acciaio inossidabile [Cr-Ni/1.4301] 	2	3	80	0.005	2	0.2	12735	190	
		3	3	80	0.010	3	0.3	8490	255	
		4	3	80	0.015	4	0.4	6365	285	
		5	3	80	0.015	5	0.5	5095	230	
		6	3	80	0.020	6	0.6	4245	255	
		8	3	80	0.025	8	0.8	3185	240	
		10	3	80	0.035	10	1.0	2545	265	

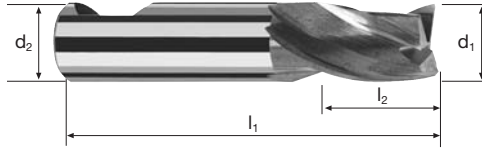
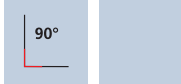
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio < 850 N/mm ² 	2	3	85	0.005	1.0	2	13530	205	0.4	
		3	3	85	0.010	1.5	3	9020	270	1.2	
		4	3	85	0.010	2.0	4	6765	205	1.6	
		5	3	85	0.015	2.5	5	5410	245	3.1	
		6	3	85	0.015	3.0	6	4510	205	3.7	
		8	3	85	0.020	4.0	8	3380	205	6.6	
		10	3	85	0.030	5.0	10	2705	245	12.3	
	Acciaio 850 - 1100 N/mm ² 	2	3	60	0.005	1.0	2	9550	145	0.3	
		3	3	60	0.010	1.5	3	6365	190	0.9	
		4	3	60	0.010	2.0	4	4775	145	1.2	
		5	3	60	0.015	2.5	5	3820	170	2.1	
		6	3	60	0.015	3.0	6	3185	145	2.6	
		8	3	60	0.020	4.0	8	2385	145	4.6	
		10	3	60	0.025	5.0	10	1910	145	7.3	
	Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	2	3	30	0.005	1.0	2	4775	70	0.1	
		3	3	30	0.010	1.5	3	3185	95	0.4	
		4	3	30	0.010	2.0	4	2385	70	0.6	
		5	3	30	0.015	2.5	5	1910	85	1.1	
		6	3	30	0.015	3.0	6	1590	70	1.3	
		8	3	30	0.020	4.0	8	1195	70	2.2	
		10	3	30	0.025	5.0	10	955	70	3.5	
	Acciaio inossidabile [Cr-Ni/1.4301] 	2	3	55	0.005	1.0	2	8755	130	0.3	
		3	3	55	0.010	1.5	3	5835	175	0.8	
		4	3	55	0.010	2.0	4	4375	130	1.0	
		5	3	55	0.015	2.5	5	3500	160	2.0	
		6	3	55	0.015	3.0	6	2920	130	2.3	
		8	3	55	0.020	4.0	8	2190	130	4.2	
		10	3	55	0.025	5.0	10	1750	130	6.5	

Frese cilindriche Cut-X

A taglienti lisci, esecuzione a gambo corto



HM
MG10 λ **30°**
 γ **12°**



Sgrossatura



Finitura



Rm
< 850

Rm
850-1100

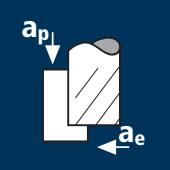
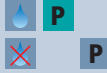



Rm
1100-1300


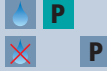



Inox
Stainless

Ti
Titanium

GG(G)
Nickel-Alloys

Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø				POLYCHROM	TRIBO
	P	5336	.120						P5336	T5336
ø Code	d1 e8	d2 h6	l1	l2	α	z				
.120	1.5	6	38	3	11.5°	3			●	●
.140	2.0	6	38	3	11.0°	3			●	●
.160	2.5	6	38	3	10.0°	3			●	●
.180	3.0	6	38	4	8.0°	3			●	●
.200	3.5	6	38	4	7.0°	3			●	●
.220	4.0	6	38	5	5.5°	3			●	●
.240	4.5	6	38	5	4.5°	3			●	●
.260	5.0	6	38	6	3.0°	3			●	●
.300	6.0	6	38	7	0.0°	3			●	●
.331	7.0	8	41	8	2.5°	3			●	●
.391	8.0	8	41	9	0.0°	3			●	●
.420	9.0	10	48	10	2.5°	3			●	●
.450	10.0	10	48	11	0.0°	3			●	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	Acciaio < 850 N/mm ² 	3	3	115	0.010	3	0.3	12200	365	
		4	3	115	0.015	4	0.4	9150	410	
		5	3	115	0.015	5	0.5	7320	330	
		6	3	115	0.020	6	0.6	6100	365	
		8	3	115	0.025	8	0.8	4575	345	
		10	3	115	0.035	10	1.0	3660	385	
	Acciaio 850 - 1100 N/mm ² 	3	3	75	0.010	3	0.3	7960	240	
		4	3	75	0.015	4	0.4	5970	270	
		5	3	75	0.015	5	0.5	4775	215	
		6	3	75	0.020	6	0.6	3980	240	
		8	3	75	0.025	8	0.8	2985	225	
		10	3	75	0.035	10	1.0	2385	250	
	Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	3	3	40	0.010	3	0.3	4245	125	
		4	3	40	0.015	4	0.4	3185	145	
		5	3	40	0.015	5	0.5	2545	115	
		6	3	40	0.020	6	0.6	2120	125	
		8	3	40	0.025	8	0.8	1590	120	
		10	3	40	0.035	10	1.0	1275	135	
	Acciaio inossidabile [Cr-Ni/1.4301] 	3	3	80	0.010	3	0.3	8490	255	
		4	3	80	0.015	4	0.4	6365	285	
		5	3	80	0.015	5	0.5	5095	230	
		6	3	80	0.020	6	0.6	4245	255	
		8	3	80	0.025	8	0.8	3185	240	
		10	3	80	0.035	10	1.0	2545	265	

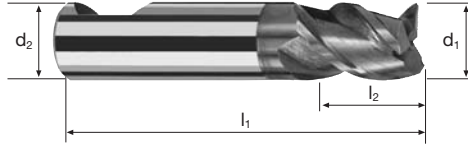
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio < 850 N/mm ² 	3	3	85	0.010	1.5	3	9020	270	1.2	
		4	3	85	0.010	2.0	4	6765	205	1.6	
		5	3	85	0.015	2.5	5	5410	245	3.1	
		6	3	85	0.015	3.0	6	4510	205	3.7	
		8	3	85	0.020	4.0	8	3380	205	6.6	
		10	3	85	0.030	5.0	10	2705	245	12.3	
	Acciaio 850 - 1100 N/mm ² 	3	3	60	0.010	1.5	3	6365	190	0.9	
		4	3	60	0.010	2.0	4	4775	145	1.2	
		5	3	60	0.015	2.5	5	3820	170	2.1	
		6	3	60	0.015	3.0	6	3185	145	2.6	
		8	3	60	0.020	4.0	8	2385	145	4.6	
		10	3	60	0.025	5.0	10	1910	145	7.3	
	Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	3	3	30	0.010	1.5	3	3185	95	0.4	
		4	3	30	0.010	2.0	4	2385	70	0.6	
		5	3	30	0.015	2.5	5	1910	85	1.1	
		6	3	30	0.015	3.0	6	1590	70	1.3	
		8	3	30	0.020	4.0	8	1195	70	2.2	
		10	3	30	0.025	5.0	10	955	70	3.5	
	Acciaio inossidabile [Cr-Ni/1.4301] 	3	3	55	0.010	1.5	3	5835	175	0.8	
		4	3	55	0.010	2.0	4	4375	130	1.0	
		5	3	55	0.015	2.5	5	3500	160	2.0	
		6	3	55	0.015	3.0	6	2920	130	2.3	
		8	3	55	0.020	4.0	8	2190	130	4.2	
		10	3	55	0.025	5.0	10	1750	130	6.5	

Frese cilindriche Cut-X 45

A taglienti lisci, esecuzione a gambo corto



HM
MG10 λ **45°**
 γ **12°**



Sgrossatura



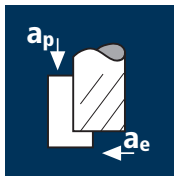
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Nickel-Alloys
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Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø					POLYCHROM	TRIBO
	P	5339	.180					P5339	T5339		
ø Code	d1 e8	d2 h6			l1	l2	45°	α	z		
.180	3	6			38	4	0.10	8.0°	3	●	●
.220	4	6			38	5	0.10	5.5°	3	●	●
.260	5	6			38	6	0.15	3.0°	3	●	●
.300	6	6			38	7	0.15	0.0°	3	●	●
.391	8	8			41	9	0.15	0.0°	3	●	●
.450	10	10			48	11	0.20	0.0°	3	●	●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	3	115	0.005	2	0.2	18305	275
3	3	115	0.010	3	0.3	12200	365
4	3	115	0.015	4	0.4	9150	410
5	3	115	0.015	5	0.5	7320	330
6	3	115	0.020	6	0.6	6100	365
8	3	115	0.025	8	0.8	4575	345
10	3	115	0.035	10	1.0	3660	385

2	3	75	0.005	2	0.2	11935	180
3	3	75	0.010	3	0.3	7960	240
4	3	75	0.015	4	0.4	5970	270
5	3	75	0.015	5	0.5	4775	215
6	3	75	0.020	6	0.6	3980	240
8	3	75	0.025	8	0.8	2985	225
10	3	75	0.035	10	1.0	2385	250

2	3	40	0.005	2	0.2	6365	95
3	3	40	0.010	3	0.3	4245	125
4	3	40	0.015	4	0.4	3185	145
5	3	40	0.015	5	0.5	2545	115
6	3	40	0.020	6	0.6	2120	125
8	3	40	0.025	8	0.8	1590	120
10	3	40	0.035	10	1.0	1275	135

2	3	80	0.005	2	0.2	12735	190
3	3	80	0.010	3	0.3	8490	255
4	3	80	0.015	4	0.4	6365	285
5	3	80	0.015	5	0.5	5095	230
6	3	80	0.020	6	0.6	4245	255
8	3	80	0.025	8	0.8	3185	240
10	3	80	0.035	10	1.0	2545	265

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
2	3	85	0.005	1.0	2	13530	205	0.4
3	3	85	0.010	1.5	3	9020	270	1.2
4	3	85	0.010	2.0	4	6765	205	1.6
5	3	85	0.015	2.5	5	5410	245	3.1
6	3	85	0.015	3.0	6	4510	205	3.7
8	3	85	0.020	4.0	8	3380	205	6.6
10	3	85	0.030	5.0	10	2705	245	12.3

2	3	60	0.005	1.0	2	9550	145	0.3
3	3	60	0.010	1.5	3	6365	190	0.9
4	3	60	0.010	2.0	4	4775	145	1.2
5	3	60	0.015	2.5	5	3820	170	2.1
6	3	60	0.015	3.0	6	3185	145	2.6
8	3	60	0.020	4.0	8	2385	145	4.6
10	3	60	0.025	5.0	10	1910	145	7.3

2	3	30	0.005	1.0	2	4775	70	0.1
3	3	30	0.010	1.5	3	3185	95	0.4
4	3	30	0.010	2.0	4	2385	70	0.6
5	3	30	0.015	2.5	5	1910	85	1.1
6	3	30	0.015	3.0	6	1590	70	1.3
8	3	30	0.020	4.0	8	1195	70	2.2
10	3	30	0.025	5.0	10	955	70	3.5

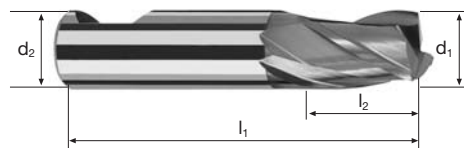
2	3	55	0.005	1.0	2	8755	130	0.3
3	3	55	0.010	1.5	3	5835	175	0.8
4	3	55	0.010	2.0	4	4375	130	1.0
5	3	55	0.015	2.5	5	3500	160	2.0
6	3	55	0.015	3.0	6	2920	130	2.3
8	3	55	0.020	4.0	8	2190	130	4.2
10	3	55	0.025	5.0	10	1750	130	6.5

Frese cilindriche Cut-X

A taglienti lisci, esecuzione a gambo corto



HM
MG10 λ **30°**
 γ **12°**



Sgrossatura

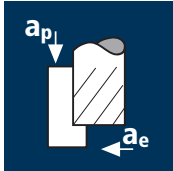























Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Nickel-Alloys
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Esempio: N° Ordine		Rivestimento	Articolo	Codice-Ø				POLYCHROM	TRIBO
		P	5335	.140				P5335	T5335
Ø Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.140	2	6	38	3	0.10	11.0°	3	●	●
.180	3	6	38	4	0.10	8.0°	3	●	●
.220	4	6	38	5	0.10	5.5°	3	●	●
.260	5	6	38	6	0.15	3.0°	3	●	●
.300	6	6	38	7	0.15	0.0°	3	●	●
.391	8	8	41	9	0.15	0.0°	3	●	●
.450	10	10	48	11	0.20	0.0°	3	●	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ²  	2	3	105	0.005	2	0.1	16710	250
		3	3	105	0.010	3	0.2	11140	335
		4	3	105	0.015	4	0.2	8355	375
		5	3	105	0.015	5	0.3	6685	300
		6	3	105	0.020	6	0.3	5570	335
		7	3	105	0.025	7	0.4	4775	360
		8	3	105	0.025	8	0.4	4180	315
		9	3	105	0.030	9	0.5	3715	335
		10	3	105	0.035	10	0.5	3340	350
		Acciaio 850 - 1100 N/mm ²    	2	3	65	0.005	2	0.1	10345
3	3		65	0.010	3	0.2	6895	205	
4	3		65	0.015	4	0.2	5175	235	
5	3		65	0.015	5	0.3	4140	185	
6	3		65	0.020	6	0.3	3450	205	
7	3		65	0.025	7	0.4	2955	220	
8	3		65	0.025	8	0.4	2585	195	
9	3		65	0.030	9	0.5	2300	205	
10	3		65	0.035	10	0.5	2070	215	
Oro  	2		3	160	0.005	2	0.1	25465	380
	3	3	160	0.010	3	0.2	16975	510	
	4	3	160	0.015	4	0.2	12735	575	
	5	3	160	0.015	5	0.3	10185	460	
	6	3	160	0.020	6	0.3	8490	510	
	7	3	160	0.025	7	0.4	7275	545	
	8	3	160	0.025	8	0.4	6365	475	
	9	3	160	0.030	9	0.5	5660	510	
	10	3	160	0.035	10	0.5	5095	535	
	Acciaio inossidabile [Cr-Ni/1.4301]  	2	3	65	0.005	2	0.1	10345	155
3		3	65	0.010	3	0.2	6895	205	
4		3	65	0.015	4	0.2	5175	235	
5		3	65	0.015	5	0.3	4140	185	
6		3	65	0.020	6	0.3	3450	205	
7		3	65	0.025	7	0.4	2955	220	
8		3	65	0.025	8	0.4	2585	195	
9		3	65	0.030	9	0.5	2300	205	
10		3	65	0.035	10	0.5	2070	215	

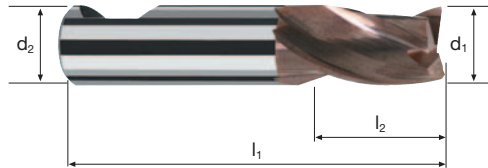
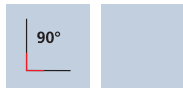
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	2	3	75	0.005	0.8	2	11935	180	0.3
		3	3	75	0.010	1.2	3	7960	240	0.9
		4	3	75	0.010	1.6	4	5970	180	1.2
		5	3	75	0.015	2.0	5	4775	215	2.2
		6	3	75	0.015	2.4	6	3980	180	2.6
		7	3	75	0.020	2.8	7	3410	205	4.0
		8	3	75	0.020	3.2	8	2985	180	4.6
		9	3	75	0.025	3.6	9	2655	200	6.5
		10	3	75	0.030	4.0	10	2385	215	8.6
		Acciaio 850 - 1100 N/mm ²    	2	3	50	0.005	0.8	2	7960	120
3	3		50	0.010	1.2	3	5305	160	0.6	
4	3		50	0.010	1.6	4	3980	120	0.8	
5	3		50	0.015	2.0	5	3185	145	1.5	
6	3		50	0.015	2.4	6	2655	120	1.7	
7	3		50	0.020	2.8	7	2275	135	2.6	
8	3		50	0.020	3.2	8	1990	120	3.1	
9	3		50	0.025	3.6	9	1770	135	4.4	
10	3		50	0.025	4.0	10	1590	120	4.8	
Oro  	2		3	140	0.005	0.8	2	22280	335	0.5
	3	3	140	0.010	1.2	3	14855	445	1.6	
	4	3	140	0.010	1.6	4	11140	335	2.1	
	5	3	140	0.015	2.0	5	8915	400	4.0	
	6	3	140	0.020	2.4	6	7425	445	6.4	
	7	3	140	0.020	2.8	7	6365	380	7.4	
	8	3	140	0.025	3.2	8	5570	420	10.8	
	9	3	140	0.030	3.6	9	4950	445	14.4	
	10	3	140	0.030	4.0	10	4455	400	16.0	
	Acciaio inossidabile [Cr-Ni/1.4301]  	2	3	50	0.005	0.8	2	7960	120	0.2
3		3	50	0.010	1.2	3	5305	160	0.6	
4		3	50	0.010	1.6	4	3980	120	0.8	
5		3	50	0.015	2.0	5	3185	145	1.5	
6		3	50	0.015	2.4	6	2655	120	1.7	
7		3	50	0.020	2.8	7	2275	135	2.6	
8		3	50	0.020	3.2	8	1990	120	3.1	
9		3	50	0.025	3.6	9	1770	135	4.4	
10		3	50	0.025	4.0	10	1590	120	4.8	

Frese cilindriche

A taglienti lisci, esecuzione a gambo corto



HM λ 30°
 γ 12°



Sgrossatura

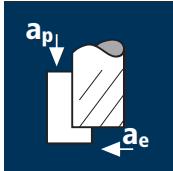























Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		Aluminium Copper Gold / Platinum
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Esempio: N° Ordine		Rivestimento U	Articolo 45336	Codice- ϕ .120				UNICUT-4X
ϕ Code	d1 e8	d2 h6	l1	l2	α	z	5336	U45336
.120	1.5	6	38	3	11.5°	3	●	●
.140	2.0	6	38	3	11.0°	3	●	●
.160	2.5	6	38	3	10.0°	3	●	●
.180	3.0	6	38	4	8.0°	3	●	●
.200	3.5	6	38	4	7.0°	3	●	●
.220	4.0	6	38	5	5.5°	3	●	●
.240	4.5	6	38	5	4.5°	3	●	●
.260	5.0	6	38	6	3.0°	3	●	●
.300	6.0	6	38	7	0.0°	3	●	●
.331	7.0	8	41	8	2.5°	3	●	●
.391	8.0	8	41	9	0.0°	3	●	●
.420	9.0	10	48	10	2.5°	3	●	●
.450	10.0	10	48	11	0.0°	3	●	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ²  	3	3	105	0.010	3	0.2	11140	335
		4	3	105	0.015	4	0.3	8355	375
		5	3	105	0.015	5	0.4	6685	300
		6	3	105	0.020	6	0.5	5570	335
		8	3	105	0.025	8	0.6	4180	315
		10	3	105	0.035	10	0.8	3340	350
Acciaio 850 - 1100 N/mm ²    	3	3	65	0.010	3	0.2	6895	205	
	4	3	65	0.015	4	0.3	5175	235	
	5	3	65	0.015	5	0.4	4140	185	
	6	3	65	0.020	6	0.5	3450	205	
	8	3	65	0.025	8	0.6	2585	195	
	10	3	65	0.035	10	0.8	2070	215	
Rame non legato  	3	3	150	0.010	3	0.2	15915	475	
	4	3	150	0.015	4	0.3	11935	535	
	5	3	150	0.015	5	0.4	9550	430	
	6	3	150	0.020	6	0.5	7960	480	
	8	3	150	0.025	8	0.6	5970	450	
	10	3	150	0.035	10	0.8	4775	500	
Acciaio inossidabile [Cr-Ni/1.4301]  	3	3	65	0.010	3	0.2	6895	205	
	4	3	65	0.015	4	0.3	5175	235	
	5	3	65	0.015	5	0.4	4140	185	
	6	3	65	0.020	6	0.5	3450	205	
	8	3	65	0.025	8	0.6	2585	195	
	10	3	65	0.035	10	0.8	2070	215	

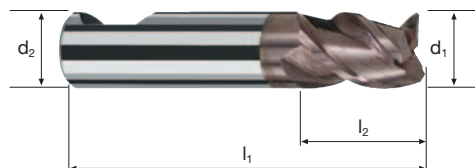
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	3	3	75	0.010	1.4	3	7960	240	1.0
		4	3	75	0.010	1.8	4	5970	180	1.3
		5	3	75	0.015	2.3	5	4775	215	2.5
		6	3	75	0.015	2.7	6	3980	180	2.9
		8	3	75	0.020	3.6	8	2985	180	5.2
		10	3	75	0.030	4.5	10	2385	215	9.7
Acciaio 850 - 1100 N/mm ²    	3	3	50	0.010	1.4	3	5305	160	0.7	
	4	3	50	0.010	1.8	4	3980	120	0.9	
	5	3	50	0.015	2.3	5	3185	145	1.7	
	6	3	50	0.015	2.7	6	2655	120	1.9	
	8	3	50	0.020	3.6	8	1990	120	3.5	
	10	3	50	0.025	4.5	10	1590	120	5.4	
Rame non legato  	3	3	110	0.010	1.4	3	11670	350	1.5	
	4	3	110	0.010	1.8	4	8755	265	1.9	
	5	3	110	0.015	2.3	5	7005	315	3.6	
	6	3	110	0.020	2.7	6	5835	350	5.7	
	8	3	110	0.025	3.6	8	4375	330	9.5	
	10	3	110	0.030	4.5	10	3500	315	14.2	
Acciaio inossidabile [Cr-Ni/1.4301]  	3	3	50	0.010	1.4	3	5305	160	0.7	
	4	3	50	0.010	1.8	4	3980	120	0.9	
	5	3	50	0.015	2.3	5	3185	145	1.7	
	6	3	50	0.015	2.7	6	2655	120	1.9	
	8	3	50	0.020	3.6	8	1990	120	3.5	
	10	3	50	0.025	4.5	10	1590	120	5.4	

Frese cilindriche

A taglienti lisci, esecuzione a gambo corto



HM λ **45°**
 γ **12°**



Sgrossatura

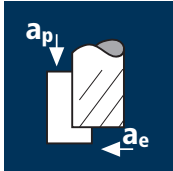























Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300						Inox Stainless		Copper
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Esempio: N° Ordine										UNICUT-4X
										U45339
Rivestimento Articolo Codice-ø										
U 45339 .180										
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z			
.180	3	6	38	4	0.10	8.0°	3		●	
.220	4	6	38	5	0.10	5.5°	3		●	
.260	5	6	38	6	0.15	3.0°	3		●	
.300	6	6	38	7	0.15	0.0°	3		●	
.391	8	8	41	9	0.15	0.0°	3		●	
.450	10	10	48	11	0.20	0.0°	3		●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ²  	2	3	105	0.005	2	0.2	16710	250
		3	3	105	0.010	3	0.2	11140	335
		4	3	105	0.015	4	0.3	8355	375
		5	3	105	0.015	5	0.4	6685	300
		6	3	105	0.020	6	0.5	5570	335
		8	3	105	0.025	8	0.6	4180	315
		10	3	105	0.035	10	0.8	3340	350
Acciaio 850 - 1100 N/mm ²    	2	3	65	0.005	2	0.2	10345	155	
	3	3	65	0.010	3	0.2	6895	205	
	4	3	65	0.015	4	0.3	5175	235	
	5	3	65	0.015	5	0.4	4140	185	
	6	3	65	0.020	6	0.5	3450	205	
	8	3	65	0.025	8	0.6	2585	195	
	10	3	65	0.035	10	0.8	2070	215	
Rame non legato  	2	3	150	0.005	2	0.2	23875	360	
	3	3	150	0.010	3	0.2	15915	475	
	4	3	150	0.015	4	0.3	11935	535	
	5	3	150	0.015	5	0.4	9550	430	
	6	3	150	0.020	6	0.5	7960	480	
	8	3	150	0.025	8	0.6	5970	450	
	10	3	150	0.035	10	0.8	4775	500	
Acciaio inossidabile [Cr-Ni/1.4301]  	2	3	65	0.005	2	0.2	10345	155	
	3	3	65	0.010	3	0.2	6895	205	
	4	3	65	0.015	4	0.3	5175	235	
	5	3	65	0.015	5	0.4	4140	185	
	6	3	65	0.020	6	0.5	3450	205	
	8	3	65	0.025	8	0.6	2585	195	
	10	3	65	0.035	10	0.8	2070	215	

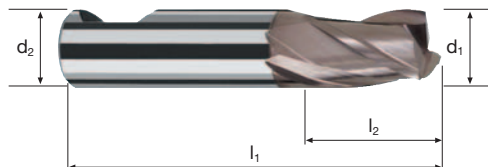
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio < 850 N/mm ²  	2	3	75	0.005	0.9	2	11935	180	0.3	
		3	3	75	0.010	1.4	3	7960	240	1.0	
		4	3	75	0.010	1.8	4	5970	180	1.3	
		5	3	75	0.015	2.3	5	4775	215	2.4	
		6	3	75	0.015	2.7	6	3980	180	2.9	
		8	3	75	0.020	3.6	8	2985	180	5.2	
		10	3	75	0.030	4.5	10	2385	215	9.7	
		Acciaio 850 - 1100 N/mm ²    	2	3	50	0.005	0.9	2	7960	120	0.2
			3	3	50	0.010	1.4	3	5305	160	0.6
			4	3	50	0.010	1.8	4	3980	120	0.9
5	3		50	0.015	2.3	5	3185	145	1.6		
6	3		50	0.015	2.7	6	2655	120	1.9		
8	3		50	0.020	3.6	8	1990	120	3.5		
10	3		50	0.025	4.5	10	1590	120	5.4		
Rame non legato  	2	3	110	0.005	0.9	2	17510	265	0.5		
	3	3	110	0.010	1.4	3	11670	350	1.4		
	4	3	110	0.010	1.8	4	8755	265	1.9		
	5	3	110	0.015	2.3	5	7005	315	3.5		
	6	3	110	0.020	2.7	6	5835	350	5.7		
	8	3	110	0.025	3.6	8	4375	330	9.5		
	10	3	110	0.030	4.5	10	3500	315	14.2		
Acciaio inossidabile [Cr-Ni/1.4301]  	2	3	50	0.005	0.9	2	7960	120	0.2		
	3	3	50	0.010	1.4	3	5305	160	0.6		
	4	3	50	0.010	1.8	4	3980	120	0.9		
	5	3	50	0.015	2.3	5	3185	145	1.6		
	6	3	50	0.015	2.7	6	2655	120	1.9		
	8	3	50	0.020	3.6	8	1990	120	3.5		
	10	3	50	0.025	4.5	10	1590	120	5.4		

Frese cilindriche

A taglienti lisci, esecuzione a gambo corto



HM λ **30°**
 γ **12°**



Sgrossatura

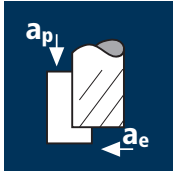



















Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		Copper
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Esempio: N° Ordine		Rivestimento U	Articolo 45335	Codice- ϕ .140				UNICUT-4X	
ϕ Code	d1 e8	d2 h6	l1	l2	45°	α	z		
.140	2	6	38	3	0.10	11.0°	3	●	
.180	3	6	38	4	0.10	8.0°	3	●	
.220	4	6	38	5	0.10	5.5°	3	●	
.260	5	6	38	6	0.15	3.0°	3	●	
.300	6	6	38	7	0.15	0.0°	3	●	
.391	8	8	41	9	0.15	0.0°	3	●	
.450	10	10	48	11	0.20	0.0°	3	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ²  	1.0	3	60	0.005	1.0	0.1	19100	285
		2.0	3	60	0.010	2.0	0.2	9550	285
		2.5	3	60	0.010	2.5	0.3	7640	230
		3.0	3	60	0.010	3.0	0.3	6365	190
		4.0	3	60	0.015	4.0	0.4	4775	215
		5.0	3	60	0.020	5.0	0.5	3820	230
		5.5	3	60	0.020	5.5	0.6	3475	210
		6.0	3	60	0.025	6.0	0.6	3185	240
		7.0	3	60	0.030	7.0	0.7	2730	245
			Acciaio 850 - 1100 N/mm ²  	1.0	3	48	0.005	1.0	0.1
2.0	3			48	0.010	2.0	0.2	7640	230
2.5	3			48	0.010	2.5	0.3	6110	185
3.0	3			48	0.010	3.0	0.3	5095	155
4.0	3			48	0.015	4.0	0.4	3820	170
5.0	3			48	0.020	5.0	0.5	3055	185
5.5	3			48	0.020	5.5	0.6	2780	165
6.0	3			48	0.025	6.0	0.6	2545	190
7.0	3			48	0.030	7.0	0.7	2185	195
	Acciaio inossidabile [Cr-Ni/1.4301]  			1.0	3	25	0.005	1.0	0.1
		2.0	3	25	0.010	2.0	0.2	3980	120
		2.5	3	25	0.010	2.5	0.3	3185	95
		3.0	3	25	0.010	3.0	0.3	2655	80
		4.0	3	25	0.015	4.0	0.4	1990	90
		5.0	3	25	0.020	5.0	0.5	1590	95
		5.5	3	25	0.020	5.5	0.6	1445	85
		6.0	3	25	0.025	6.0	0.6	1325	100
		7.0	3	25	0.030	7.0	0.7	1135	100
			Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]  	1.0	3	22	0.005	1.0	0.1
2.0	3			22	0.010	2.0	0.2	3500	105
2.5	3			22	0.010	2.5	0.3	2800	85
3.0	3			22	0.010	3.0	0.3	2335	70
4.0	3			22	0.015	4.0	0.4	1750	80
5.0	3			22	0.020	5.0	0.5	1400	85
5.5	3			22	0.020	5.5	0.6	1275	75
6.0	3			22	0.025	6.0	0.6	1165	85
7.0	3			22	0.030	7.0	0.7	1000	90

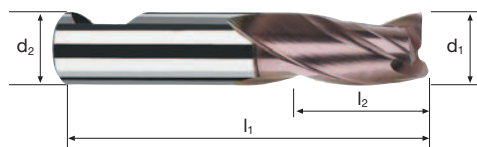
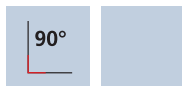
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	1.0	3	55	0.005	0.6	1.0	17510	265	0.2
		2.0	3	55	0.010	1.0	2.0	8755	265	0.5
		2.5	3	55	0.010	1.3	2.5	7005	210	0.5
		3.0	3	55	0.010	1.5	3.0	5835	175	1.0
		4.0	3	55	0.015	2.0	4.0	4375	195	1.5
		5.0	3	55	0.020	2.5	5.0	3500	210	2.5
		5.5	3	55	0.020	2.8	5.5	3185	190	3.0
		6.0	3	55	0.025	3.0	6.0	2920	220	4.0
		7.0	3	55	0.030	3.5	7.0	2500	225	5.5
			Acciaio 850 - 1100 N/mm ²  	1.0	3	45	0.005	0.6	1.0	14325
2.0	3			45	0.010	1.0	2.0	7160	215	0.5
2.5	3			45	0.010	1.3	2.5	5730	170	0.5
3.0	3			45	0.010	1.5	3.0	4775	145	0.5
4.0	3			45	0.015	2.0	4.0	3580	160	1.5
5.0	3			45	0.020	2.5	5.0	2865	170	2.0
5.5	3			45	0.020	2.8	5.5	2605	155	2.5
6.0	3			45	0.025	3.0	6.0	2385	180	3.0
7.0	3			45	0.030	3.5	7.0	2045	185	4.5
	Acciaio inossidabile [Cr-Ni/1.4301]  			1.0	3	22	0.005	0.6	1.0	7005
		2.0	3	22	0.010	1.0	2.0	3500	105	0.2
		2.5	3	22	0.010	1.3	2.5	2800	85	0.5
		3.0	3	22	0.010	1.5	3.0	2335	70	0.5
		4.0	3	22	0.015	2.0	4.0	1750	80	0.5
		5.0	3	22	0.020	2.5	5.0	1400	85	1.0
		5.5	3	22	0.020	2.8	5.5	1275	75	1.0
		6.0	3	22	0.025	3.0	6.0	1165	85	1.5
		7.0	3	22	0.030	3.5	7.0	1000	90	2.0
			Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]  	1.0	3	20	0.005	0.6	1.0	6365
2.0	3			20	0.010	1.0	2.0	3185	95	0.2
2.5	3			20	0.010	1.3	2.5	2545	75	0.2
3.0	3			20	0.010	1.5	3.0	2120	65	0.5
4.0	3			20	0.015	2.0	4.0	1590	70	0.5
5.0	3			20	0.020	2.5	5.0	1275	75	1.0
5.5	3			20	0.020	2.8	5.5	1160	70	1.0
6.0	3			20	0.025	3.0	6.0	1060	80	1.5
7.0	3			20	0.030	3.5	7.0	910	80	2.0

Frese cilindriche

A taglienti lisci, esecuzione a gambo corto



HSS-E
Co8 λ **30°**
 γ **15°**



Sgrossatura



Finitura



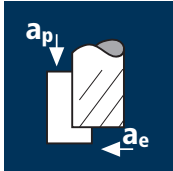








Rm
< 850










Rm
850-1100

Inox
Stainless

Copper

Esempio: N° Ordine		Rivestimento U	Articolo 0400	Codice-ø .100			UNICUT-4X U0400
ø Code	d1 f8	d2 h6	l1	l2	α	z	
.100	1.00	6	34	3	14.0°	3	●
.120	1.50	6	34	3	13.0°	3	●
.130	1.80	6	35	4	11.5°	3	●
.140	2.00	6	35	4	11.0°	3	●
.150	2.30	6	36	5	9.0°	3	●
.160	2.50	6	36	5	8.5°	3	●
.170	2.80	6	36	5	8.0°	3	●
.180	3.00	6	36	5	7.5°	3	●
.190	3.30	6	37	6	6.0°	3	●
.200	3.50	6	37	6	5.5°	3	●
.210	3.80	6	38	7	4.5°	3	●
.220	4.00	6	38	7	4.5°	3	●
.230	4.30	6	38	7	3.5°	3	●
.240	4.50	6	38	7	3.5°	3	●
.250	4.80	6	39	8	2.5°	3	●
.260	5.00	6	39	8	2.0°	3	●
.270	5.30	6	39	8	1.5°	3	●
.280	5.50	6	39	8	1.0°	3	●
.290	5.75	6	39	8	0.0°	3	●
.300	6.00	6	39	8	0.0°	3	●
.311	6.50	8	42	10	2.5°	3	●
.331	7.00	8	42	10	2.0°	3	●
.351	7.50	8	42	10	1.0°	3	●

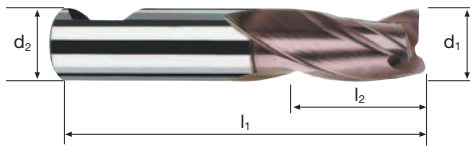
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ²  	8.0	3	60	0.030	8.0	0.8	2385	215
		8.5	3	60	0.035	8.5	0.9	2245	235
		9.0	3	60	0.035	9.0	0.9	2120	225
		9.5	3	60	0.040	9.5	1.0	2010	240
		10.0	3	60	0.040	10.0	1.0	1910	230
		12.0	3	60	0.050	12.0	1.2	1590	240
		16.0	3	60	0.065	16.0	1.6	1195	235
		20.0	3	60	0.080	20.0	2.0	955	230
Acciaio 850 - 1100 N/mm ²  	8.0	3	48	0.030	8.0	0.8	1910	170	
	8.5	3	48	0.035	8.5	0.9	1800	190	
	9.0	3	48	0.035	9.0	0.9	1700	180	
	9.5	3	48	0.040	9.5	1.0	1610	195	
	10.0	3	48	0.040	10.0	1.0	1530	185	
	12.0	3	48	0.050	12.0	1.2	1275	190	
	16.0	3	48	0.065	16.0	1.6	955	185	
	20.0	3	48	0.080	20.0	2.0	765	185	
Acciaio inossidabile [Cr-Ni/1.4301]  	8.0	3	25	0.030	8.0	0.8	995	90	
	8.5	3	25	0.035	8.5	0.9	935	100	
	9.0	3	25	0.035	9.0	0.9	885	95	
	9.5	3	25	0.040	9.5	1.0	840	100	
	10.0	3	25	0.040	10.0	1.0	795	95	
	12.0	3	25	0.050	12.0	1.2	665	100	
	16.0	3	25	0.065	16.0	1.6	495	95	
	20.0	3	25	0.080	20.0	2.0	400	95	
Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]  	8.0	3	22	0.030	8.0	0.8	875	80	
	8.5	3	22	0.035	8.5	0.9	825	85	
	9.0	3	22	0.035	9.0	0.9	780	80	
	9.5	3	22	0.040	9.5	1.0	735	90	
	10.0	3	22	0.040	10.0	1.0	700	85	
	12.0	3	22	0.050	12.0	1.2	585	90	
	16.0	3	22	0.065	16.0	1.6	440	85	
	20.0	3	22	0.080	20.0	2.0	350	85	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	8.0	3	55	0.030	4.0	8.0	2190	195	6.0
		8.5	3	55	0.035	4.3	8.5	2060	215	8.0
		9.0	3	55	0.035	4.5	9.0	1945	205	8.5
		9.5	3	55	0.040	4.8	9.5	1845	220	10.0
		10.0	3	55	0.040	5.0	10.0	1750	210	10.5
		12.0	3	55	0.050	6.0	12.0	1460	220	16.0
		16.0	3	55	0.065	8.0	16.0	1095	215	27.5
		20.0	3	55	0.080	10.0	20.0	875	210	42.0
Acciaio 850 - 1100 N/mm ²  	8.0	3	45	0.030	4.0	8.0	1790	160	5.0	
	8.5	3	45	0.035	4.3	8.5	1685	175	6.5	
	9.0	3	45	0.035	4.5	9.0	1590	165	6.5	
	9.5	3	45	0.040	4.8	9.5	1510	180	8.0	
	10.0	3	45	0.040	5.0	10.0	1430	170	8.5	
	12.0	3	45	0.050	6.0	12.0	1195	180	13.0	
	16.0	3	45	0.065	8.0	16.0	895	175	22.5	
	20.0	3	45	0.080	10.0	20.0	715	170	34.0	
Acciaio inossidabile [Cr-Ni/1.4301]  	8.0	3	22	0.030	4.0	8.0	875	80	2.5	
	8.5	3	22	0.035	4.3	8.5	825	85	3.0	
	9.0	3	22	0.035	4.5	9.0	780	80	3.0	
	9.5	3	22	0.040	4.8	9.5	735	90	4.0	
	10.0	3	22	0.040	5.0	10.0	700	85	4.5	
	12.0	3	22	0.050	6.0	12.0	585	90	6.5	
	16.0	3	22	0.065	8.0	16.0	440	85	11.0	
	20.0	3	22	0.080	10.0	20.0	350	85	17.0	
Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]  	8.0	3	20	0.030	4.0	8.0	795	70	2.2	
	8.5	3	20	0.035	4.3	8.5	750	80	3.0	
	9.0	3	20	0.035	4.5	9.0	705	75	3.0	
	9.5	3	20	0.040	4.8	9.5	670	80	3.5	
	10.0	3	20	0.040	5.0	10.0	635	75	4.0	
	12.0	3	20	0.050	6.0	12.0	530	80	6.0	
	16.0	3	20	0.065	8.0	16.0	400	80	10.0	
	20.0	3	20	0.080	10.0	20.0	320	75	15.0	

Frese cilindriche

A taglienti lisci, esecuzione a gambo corto

HSS-E
Co8 λ 30°
 γ 15°



Sgrossatura



Finitura



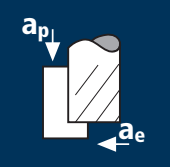








Rm
< 850










Rm
850-1100

Inox
Stainless

Copper

		Rivestimento	Articolo	Codice- ϕ			UNICUT-4X
Esempio: N° Ordine		U	0400	.391			U0400
ϕ Code	d_1 f8	d_2 h6	l_1	l_2	α	Z	
.391	8.00	8	43	11	0.0°	3	●
.410	8.50	10	48	11	2.5°	3	●
.420	9.00	10	48	11	1.5°	3	●
.430	9.50	10	48	11	1.0°	3	●
.450	10.00	10	50	13	0.0°	3	●
.501*	12.00	12	73	16	0.0°	3	●
.610*	16.00	16	79	19	0.0°	3	●
.682*	20.00	20	88	22	0.0°	3	●
* Esecuzione a gambo normale							

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	Acciaio < 850 N/mm ²  	2	3	60	0.005	3	0.2	9550	145
		3	3	60	0.010	5	0.3	6365	190
		5	3	60	0.015	8	0.5	3820	170
		6	3	60	0.020	9	0.6	3185	190
		8	3	60	0.025	12	0.8	2385	180
		10	3	60	0.035	15	1.0	1910	200
		12	3	60	0.040	18	1.2	1590	190
		16	3	60	0.055	24	1.6	1195	195
		20	3	60	0.065	30	2.0	955	185
		Acciaio 850 - 1100 N/mm ²  	2	3	48	0.005	3	0.2	7640
3	3		48	0.010	5	0.3	5095	155	
5	3		48	0.015	8	0.5	3055	135	
6	3		48	0.020	9	0.6	2545	155	
8	3		48	0.025	12	0.8	1910	145	
10	3		48	0.035	15	1.0	1530	160	
12	3		48	0.040	18	1.2	1275	155	
16	3		48	0.055	24	1.6	955	160	
20	3		48	0.065	30	2.0	765	150	
Acciaio inossidabile [Cr-Ni/1.4301]  	2		3	25	0.005	3	0.2	3980	60
	3	3	25	0.010	5	0.3	2655	80	
	5	3	25	0.015	8	0.5	1590	70	
	6	3	25	0.020	9	0.6	1325	80	
	8	3	25	0.025	12	0.8	995	75	
	10	3	25	0.035	15	1.0	795	85	
	12	3	25	0.040	18	1.2	665	80	
	16	3	25	0.055	24	1.6	495	80	
	20	3	25	0.065	30	2.0	400	80	
	Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]  	2	3	22	0.005	3	0.2	3500	55
3		3	22	0.010	5	0.3	2335	70	
5		3	22	0.015	8	0.5	1400	65	
6		3	22	0.020	9	0.6	1165	70	
8		3	22	0.025	12	0.8	875	65	
10		3	22	0.035	15	1.0	700	75	
12		3	22	0.040	18	1.2	585	70	
16		3	22	0.055	24	1.6	440	75	
20		3	22	0.065	30	2.0	350	70	

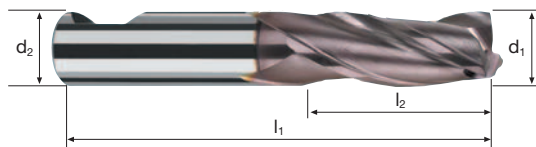
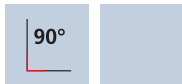
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio < 850 N/mm ²  	2	3	55	0.005	1.0	2	8755	130	0.5
		3	3	55	0.010	1.5	3	5835	175	1.0
		5	3	55	0.015	2.5	5	3500	160	2.0
		6	3	55	0.015	3.0	6	2920	130	2.5
		8	3	55	0.025	4.0	8	2190	165	5.5
		10	3	55	0.030	5.0	10	1750	160	8.0
		12	3	55	0.035	6.0	12	1460	155	11.0
		16	3	55	0.045	8.0	16	1095	150	19.0
		20	3	55	0.055	10.0	20	875	145	29.0
		Acciaio 850 - 1100 N/mm ²  	2	3	45	0.005	1.0	2	7160	105
3	3		45	0.010	1.5	3	4775	145	0.5	
5	3		45	0.015	2.5	5	2865	130	1.5	
6	3		45	0.015	3.0	6	2385	105	2.0	
8	3		45	0.025	4.0	8	1790	135	4.5	
10	3		45	0.030	5.0	10	1430	130	6.5	
12	3		45	0.035	6.0	12	1195	125	9.0	
16	3		45	0.045	8.0	16	895	120	15.5	
20	3		45	0.055	10.0	20	715	120	24.0	
Acciaio inossidabile [Cr-Ni/1.4301]  	2		3	22	0.005	1.0	2	3500	55	0.1
	3	3	22	0.010	1.5	3	2335	70	0.5	
	5	3	22	0.015	2.5	5	1400	65	1.0	
	6	3	22	0.015	3.0	6	1165	50	1.0	
	8	3	22	0.025	4.0	8	875	65	2.0	
	10	3	22	0.030	5.0	10	700	65	3.5	
	12	3	22	0.035	6.0	12	585	60	4.5	
	16	3	22	0.045	8.0	16	440	60	7.5	
	20	3	22	0.055	10.0	20	350	60	12.0	
	Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]  	2	3	20	0.005	1.0	2	3185	50	0.1
3		3	20	0.010	1.5	3	2120	65	0.5	
5		3	20	0.015	2.5	5	1275	55	0.5	
6		3	20	0.015	3.0	6	1060	50	1.0	
8		3	20	0.025	4.0	8	795	60	2.0	
10		3	20	0.030	5.0	10	635	55	3.0	
12		3	20	0.035	6.0	12	530	55	4.0	
16		3	20	0.045	8.0	16	400	55	7.0	
20		3	20	0.055	10.0	20	320	55	11.0	

Frese cilindriche

A taglienti lisci, esecuzione a gambo corto



HSS-E λ **30°**
Co8 γ **15°**



Sgrossatura



Finitura



Rm
< 850

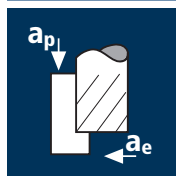
Rm
850-1100

Inox
Stainless

Copper

Esempio: N° Ordine		Rivestimento U	Articolo 0410	Codice- ϕ .140			UNICUT-4X U0410
ϕ Code	d1 f8	d2 h6	l1	l2	α	Z	
.140	2.0	6	38	7	8.5°	3	●
.160	2.5	6	39	8	7.0°	3	●
.180	3.0	6	39	8	6.0°	3	●
.200	3.5	6	41	10	4.5°	3	●
.220	4.0	6	42	11	3.5°	3	●
.240	4.5	6	42	11	2.5°	3	●
.260	5.0	6	44	13	1.5°	3	●
.280	5.5	6	44	13	1.0°	3	●
.300	6.0	6	44	13	0.0°	3	●
.311	6.5	8	48	16	2.0°	3	●
.331	7.0	8	48	16	1.5°	3	●
.351	7.5	8	48	16	1.0°	3	●
.391	8.0	8	51	19	0.0°	3	●
.410	8.5	10	56	19	2.0°	3	●
.420	9.0	10	56	19	1.5°	3	●
.430	9.5	10	56	19	1.0°	3	●
.450	10.0	10	59	22	0.0°	3	●
.501*	12.0	12	83	26	0.0°	3	●
.610*	16.0	16	92	32	0.0°	3	●
.682*	20.0	20	104	38	0.0°	3	●
* Esecuzione a gambo normale							

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Materiale

Ghisa
(grigia / sferoidale)



Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	160	0.010	3	0.2	16975	680
4	4	160	0.010	4	0.2	12735	510
5	4	160	0.015	5	0.3	10185	610
6	6	160	0.015	6	0.3	8490	765
8	6	160	0.025	8	0.4	6365	955
10	6	160	0.030	10	0.5	5095	915

3	4	100	0.010	3	0.2	10610	425
4	4	100	0.010	4	0.2	7960	320
5	4	100	0.015	5	0.3	6365	380
6	6	100	0.015	6	0.3	5305	475
8	6	100	0.025	8	0.4	3980	595
10	6	100	0.030	10	0.5	3185	575

3	4	75	0.010	3	0.2	7960	320
4	4	75	0.010	4	0.2	5970	240
5	4	75	0.015	5	0.3	4775	285
6	6	75	0.015	6	0.3	3980	360
8	6	75	0.025	8	0.4	2985	450
10	6	75	0.030	10	0.5	2385	430

3	4	90	0.010	3	0.2	9550	380
4	4	90	0.010	4	0.2	7160	285
5	4	90	0.015	5	0.3	5730	345
6	6	90	0.015	6	0.3	4775	430
8	6	90	0.025	8	0.4	3580	535
10	6	90	0.030	10	0.5	2865	515

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	120	0.010	3	0.2	12735	510
4	4	120	0.010	4	0.2	9550	380
5	4	120	0.015	5	0.3	7640	460
6	6	120	0.015	6	0.3	6365	575
8	6	120	0.025	8	0.4	4775	715
10	6	120	0.030	10	0.5	3820	690

3	4	65	0.010	3	0.2	6895	275
4	4	65	0.010	4	0.2	5175	205
5	4	65	0.015	5	0.3	4140	250
6	6	65	0.015	6	0.3	3450	310
8	6	65	0.025	8	0.4	2585	390
10	6	65	0.030	10	0.5	2070	375

3	4	95	0.010	3	0.2	10080	405
4	4	95	0.010	4	0.2	7560	300
5	4	95	0.015	5	0.3	6050	365
6	6	95	0.015	6	0.3	5040	455
8	6	95	0.025	8	0.4	3780	565
10	6	95	0.030	10	0.5	3025	545

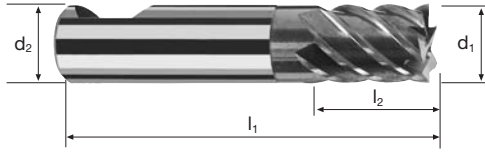
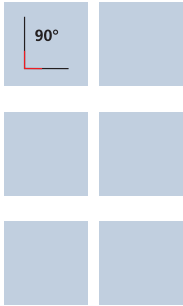
3	4	50	0.010	3	0.2	5305	210
4	4	50	0.010	4	0.2	3980	160
5	4	50	0.015	5	0.3	3185	190
6	6	50	0.015	6	0.3	2655	240
8	6	50	0.025	8	0.4	1990	300
10	6	50	0.030	10	0.5	1590	285

Frese cilindriche Cut-X multi

Finitura, esecuzione a gambo corto



HM
MG10 λ **45°**
 γ **10°**



Sgrossatura



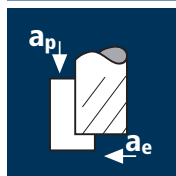
Finitura



Rm < 850	Rm 850-1100	Rm 1100-1300				Inox Stainless	Ti Titanium	GG(G) Tool Steel
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Esempio: N° Ordine	Rivestimento P	Articolo 5337	Codice- ϕ .180			α	Z	POLYCHROM	TRIBO
								P5337	T5337
									T5237
.180	d1 e8 3	d2 h6 6	l1 38	l2 4	8.0°	4	●	●	
.220	4	6	38	5	5.5°	4	●	●	
.260	5	6	38	6	3.0°	4	●	●	
.300	6	6	38	7	0.0°	6	●	●	
.391	8	8	41	9	0.0°	6	●	●	
.450	10	10	48	11	0.0°	6	●	●	

Applicazione



Materiale

Acciaio
< 850 N/mm²



P



P

Acciaio
850 - 1100 N/mm²



P



P

Acciaio
1100 - 1300 N/mm²



P



P

Acciaio inossidabile
[Cr-Ni/1.4301]



T

P

Materiale

Ghisa
(grigia / sferoidale)



P



P

Acciaio per lavorazione
a freddo (12% Cr)
fortemente legati
[1.2379]



P



P

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



T

P

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



T

P

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	160	0.010	3	0.2	16975	680
4	4	160	0.010	4	0.2	12735	510
5	4	160	0.015	5	0.3	10185	610
6	6	160	0.015	6	0.3	8490	765
8	6	160	0.025	8	0.4	6365	955
10	6	160	0.030	10	0.5	5095	915

3	4	100	0.010	3	0.2	10610	425
4	4	100	0.010	4	0.2	7960	320
5	4	100	0.015	5	0.3	6365	380
6	6	100	0.015	6	0.3	5305	475
8	6	100	0.025	8	0.4	3980	595
10	6	100	0.030	10	0.5	3185	575

3	4	75	0.010	3	0.2	7960	320
4	4	75	0.010	4	0.2	5970	240
5	4	75	0.015	5	0.3	4775	285
6	6	75	0.015	6	0.3	3980	360
8	6	75	0.025	8	0.4	2985	450
10	6	75	0.030	10	0.5	2385	430

3	4	90	0.010	3	0.2	9550	380
4	4	90	0.010	4	0.2	7160	285
5	4	90	0.015	5	0.3	5730	345
6	6	90	0.015	6	0.3	4775	430
8	6	90	0.025	8	0.4	3580	535
10	6	90	0.030	10	0.5	2865	515

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	120	0.010	3	0.2	12735	510
4	4	120	0.010	4	0.2	9550	380
5	4	120	0.015	5	0.3	7640	460
6	6	120	0.015	6	0.3	6365	575
8	6	120	0.025	8	0.4	4775	715
10	6	120	0.030	10	0.5	3820	690

3	4	65	0.010	3	0.2	6895	275
4	4	65	0.010	4	0.2	5175	205
5	4	65	0.015	5	0.3	4140	250
6	6	65	0.015	6	0.3	3450	310
8	6	65	0.025	8	0.4	2585	390
10	6	65	0.030	10	0.5	2070	375

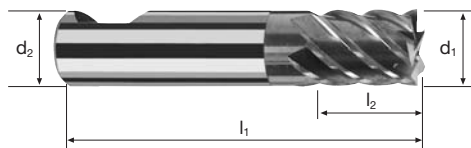
3	4	95	0.010	3	0.2	10080	405
4	4	95	0.010	4	0.2	7560	300
5	4	95	0.015	5	0.3	6050	365
6	6	95	0.015	6	0.3	5040	455
8	6	95	0.025	8	0.4	3780	565
10	6	95	0.030	10	0.5	3025	545

3	4	50	0.010	3	0.2	5305	210
4	4	50	0.010	4	0.2	3980	160
5	4	50	0.015	5	0.3	3185	190
6	6	50	0.015	6	0.3	2655	240
8	6	50	0.025	8	0.4	1990	300
10	6	50	0.030	10	0.5	1590	285

Frese cilindriche Cut-X multi

Finitura, esecuzione a gambo corto

**HM
MG10** λ 45°
 γ 10°



Sgrossatura



Finitura



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **GG(G) Tool Steel**

Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø					POLYCHROM	TRIBO
	P	5338	.180					P5338	T5338		
ø Code	d1 e8	d2 h6	l1	l2	45°	α	z				
.180	3	6	38	4	0.10	8.0°	4	●	●		
.220	4	6	38	5	0.10	5.5°	4	●	●		
.260	5	6	38	6	0.15	3.0°	4	●	●		
.300	6	6	38	7	0.15	0.0°	6	●	●		
.391	8	8	41	9	0.15	0.0°	6	●	●		
.450	10	10	48	11	0.20	0.0°	6	●	●		



Frese per lavorazioni in 3D

Estremità emisferica

Tabella di selezione












Frese con estremità emisferica MD/CBN

338 - 345

Frese toriche MD/CBN




346 - 351



Tolleranza $r \pm 0.005$

N° 7470		Sphero-X new!	X-Generation X	3xd R F	d, 1 - 16	Rm 1300-1500	HRC 48- >60		353
N° 7420		Sphero-XR	X-Generation X	3xd R PF	d, 1 - 12	Rm 1100-1500	HRC 48-60		355
N° 7400		Sphero-XF	X-Generation X	3xd F SF	d, 1 - 12	Rm 1100-1500	HRC 48- >60		357
N° 7460		Sphero-XF Multi	X-Generation X	3xd F SF	d, 6 - 12	Rm 1100-1500	HRC 48- >60		359
N° 7474		Sphero-X new!	X-Generation X	6xd R F	d, 1 - 16	Rm 1300-1500	HRC 48- >60		361
N° 7424		Sphero-XR	X-Generation X	6xd R PF	d, 1 - 12	Rm 1100-1500	HRC 48-60		363
N° 7404		Sphero-XF	X-Generation X	6xd F SF	d, 1 - 12	Rm 1100-1500	HRC 48- >60		365
N° 7464		Sphero-XF Multi	X-Generation X	6xd F SF	d, 6 - 12	Rm 1100-1500	HRC 48- >60		367
N° 7478		Sphero-X new!	X-Generation X	9xd F	d, 1 - 16	Rm 1300-1500	HRC 48- >60		369
N° 7428		Sphero-XR	X-Generation X	9xd PF	d, 1 - 12	Rm 1100-1500	HRC 48-60		371
N° 7408		Sphero-XF	X-Generation X	9xd F SF	d, 1 - 12	Rm 1100-1500	HRC 48- >60		373

Frese per lavorazioni in 3D

Estremità emisferica











Tolleranza r ± 0.01									
N° 7450		Sphero-XR4	X-Generation X	3xd	d ₁ 3 – 12	Rm 1300-1500	HRC 48-60		375
				R	PF				
N° 7454		Sphero-XR4	X-Generation X	6xd	d ₁ 3 – 12	Rm 1300-1500	HRC 48-60		377
				R	PF				
N° 7458		Sphero-XR4	X-Generation X	9xd	d ₁ 3 – 12	Rm 1300-1500	HRC 48-60		379
				PF					

Tolleranza r js8 (\pm)									
N° 5100		HX-S	X-Generation X	3xd	d ₁ 1 – 12	Rm 1300-1500	HRC 48- >60		381
				PF	F				
N° 5140		HX-S4	X-Generation X	3xd	d ₁ 6 – 12	Rm 1300-1500	HRC 48- >60		383
				F	SF				



Frese per lavorazioni in 3D

Estremità emisferica

Tolleranza r f8 (-/-)

N° 5286		Sphericut	Base-X B	3xd	d, 1 – 16	Rm 1100-1500	HRC 48-56		385
				PF F					
N° 5220			Base-X B	3xd	d, 4 – 16	Rm 850-1500			387
				PF F					
N° 7540		Sphero-SB	Base-X B	3xd	d, 1 – 12	Inox Stainless			389
				PF F					
N° 5290		Sphericut-Alu	Base-X B	3xd	d, 2 – 20	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	391
				PF F					
N° 45298			Favora F	3xd	d, 3 – 12	Rm 850-1300			393
				PF F					
N° 5288		Sphericut	Base-X B	3xd	d, 1 – 16	Rm 1100-1500	HRC 48-56		395
				PF F					
N° 5222			Base-X B	3xd	d, 4 – 12	Rm 850-1500			397
				PF F					
N° 7544		Sphero-SB	Base-X B	6xd	d, 1 – 12	Inox Stainless			399
				PF F					
N° 5292		Sphericut-Alu	Base-X B	3xd	d, 3 – 16	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	401
				PF F					
N° 5289		Sphericut	Base-X B	5xd	d, 3 – 12	Rm 1100-1500	HRC 48-56		403
				PF F					

ASR

N° 0830			HSS		d, 1 – 12	Rm <850-1100			405
				R PF					
N° 0800			HSS		d, 3 – 20	Rm <850-1100			407
				R PF					



Frese per lavorazioni in 3D Torico

Tolleranza r 0/+0.015

N° 7100



Toro-X

X-Generation
X

3xd

R

PF

r 0.2, 0.5,
1.0, 2.0

Rm

1300-1500

HRC

48-60

409

N° 7200



XSpeed

X-Generation
X

3xd

PF

F

r 0.5, 1.0

Rm

1100-1500

HRC

48- >60

413

N° 7104



Toro-X

X-Generation
X

6xd

R

PF

r 0.2, 0.5,
1.0, 2.0

Rm

1300-1500

HRC

48-60

417

N° 7204



XSpeed

X-Generation
X

6xd

PF

F

r 0.5, 1.0

Rm

1100-1500

HRC

48- >60

421

Tolleranza r 0/+0.03

N° 5250



Multispeed

X-Generation
X

3xd

PF

F

r 0.5, 0.8,
1.0, 1.5

Rm

<850-1300

Inox

Stainless

425

N° 7340



Toro-SB

Base-X
B

3xd

R

PF

r 0.2, 0.5,
1.0, 1.5,
2.0

Rm

<850

Inox

Stainless

427

N° 5252



Multispeed

X-Generation
X

5xd

PF

F

r 0.8, 1.0,
1.5

Rm

<850-1300

Inox

Stainless

431

N° 7344



Toro-SB

Base-X
B

6xd

R

PF

r 0.2, 0.5,
1.0

Rm






<850

Inox

Stainless

433

Frese per lavorazioni in 3D HFC

Scarico cilindrico									
N° 7600		XFeed	X-Generation X	3xd R	d_1 3 – 16	Rm 850-1500	HRC 48- >60		437
N° 7620		XFeed-R	X-Generation X	3xd R	d_1 6 – 16	Rm 1100-1500	HRC 48-56		439
N° 7604		XFeed	X-Generation X	6xd R	d_1 3 – 16	Rm 850-1500	HRC 48- >60		441
N° 7624		XFeed-R	X-Generation X	6xd R	d_1 6 – 16	Rm 1100-1500	HRC 48-56		443
N° 7608		XFeed	X-Generation X	9xd R	d_1 3 – 16	Rm 850-1500	HRC 48- >60		445

Scarico conico									
N° 7658		XFeed	X-Generation X	9xd R	d_1 3 – 12	Rm 850-1500	HRC 48- >60		447

Frese per lavorazioni in 3D CBN

Estremità emisferica

N° 31700



Sphero-CBN

X-Generation

X

3xd

d, 4 – 12

SF

HRC
56- >60

449

Torico

N° 31420



XSpeed-CBN

X-Generation

X

3xd

r 0.5

SF

HRC
56- >60

451

N° 31410



XSpeed-CBN

X-Generation

X

3xd

r 1.0, 1.25,
1.5, 2.0,
2.5, 3.0









SF

HRC
56- >60

453






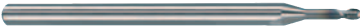






Frese per lavorazioni in 3D

Micro con estremità emisferica

Gambo ø 6mm									
N° 6562		MicroX	X-Generation X	3xd	d_1 0,2 – 3,0	Rm 850-1500	HRC 48-60	Inox Ti	455
N° 6564		MicroX	X-Generation X	5xd	d_1 0,5 – 3,0	Rm 850-1500	HRC 48-60	Inox Ti	457
N° 6566		MicroX	X-Generation X	8xd	d_1 0,5 – 3,0	Rm 850-1500	HRC 48-60	Inox Ti	459
N° 6568		MicroX	X-Generation X	10xd	d_1 0,5 – 3,0	Rm 850-1500	HRC 48-60	Inox Ti	461
N° 6766		MicroX	X-Generation X	8xd	d_1 0,5 – 3,0	Rm 850-1500	HRC 48-60	Inox Ti	463
N° 6768		MicroX	X-Generation X	10xd	d_1 0,5 – 3,0	Rm 850-1500	HRC 48-60	Inox Ti	465
N° 6770		MicroX	X-Generation X	12xd	d_1 0,5 – 3,0	Rm 850-1500	HRC 48-60	Inox Ti	467
N° 6772		MicroX	X-Generation X	15xd	d_1 0,5 – 3,0	Rm 850-1500	HRC 48-60	Inox Ti	469








Frese per lavorazioni in 3D



Micro con estremità emisferica

Gambo ø 3mm									
N° 15781		Microcut-B1H	X-Generation X	1xd	d, 0,2 – 3,0	Rm 1100-1500	HRC 48-60		471
N° 5782		Microcut-B3	Base-X B	3xd	d, 0,2 – 3,0	Rm <850-1300	Inox Stainless	Ti Titanium	473
N° 5792		Microcut-B3H	X-Generation X	3xd	d, 0,5 – 3,0	Rm 1100-1500	HRC 48-60		475
N° 45785			Favora® F	3xd	d, 0,3 – 3,0	Rm <850-1100			477
N° 5784		Microcut-B5	Base-X B	5xd	d, 0,5 – 3,0	Rm <850-1300	Inox Stainless	Ti Titanium	479
N° 5794		Microcut-B5H	X-Generation X	5xd	d, 0,5 – 3,0	Rm 1100-1500	HRC 48-60		481
N° 5786		Microcut-B8	Base-X B	8xd	d, 0,5 – 3,0	Rm <850-1300	Inox Stainless	Ti Titanium	483
N° 5796		Microcut-B8H	X-Generation X	8xd	d, 0,5 – 3,0	Rm 1100-1500	HRC 48-60		485
N° 5787		Microcut-B10	Base-X B	10xd	d, 0,5 – 3,0	Rm <850-1300			487
N° 5791		Microcut-B12	Base-X B	12xd	d, 1,0 – 3,0	Rm <850-1300			489
N° 5793		Microcut-B15	Base-X B	15xd	d, 1,0 – 3,0	Rm <850-1300			491
N° 15795		Microcut-B20	Base-X B	20xd	d, 1,0 – 3,0	Rm <850-1100			493

Frese per lavorazioni in 3D








Micro torico

Gambo ø 6mm									
N° 6532		MicroX	X-Generation X	3xd	r 0.1, 0.2, 0.5	Rm 850-1500	HRC 48-60	Inox Ti	495
N° 6534		MicroX	X-Generation X	5xd	r 0.1, 0.2, 0.5	Rm 850-1500	HRC 48-60	Inox Ti	497
N° 6536		MicroX	X-Generation X	8xd	r 0.1, 0.2, 0.5	Rm 850-1500	HRC 48-60	Inox Ti	499
N° 6736		MicroX	X-Generation X	8xd	r 0.1, 0.2, 0.5	Rm 850-1500	HRC 48-60	Inox Ti	501
N° 6738		MicroX	X-Generation X	10xd	r 0.1, 0.2, 0.5	Rm 850-1500	HRC 48-60	Inox Ti	503
N° 6740		MicroX	X-Generation X	12xd	r 0.1, 0.2, 0.5	Rm 850-1500	HRC 48-60	Inox Ti	505
N° 6742		MicroX	X-Generation X	15xd	r 0.1, 0.2, 0.5	Rm 850-1500	HRC 48-60	Inox Ti	507

Gambo ø 6mm, Z4									
N° 6632		MicroX new!	X-Generation X	3xd	r 0.1, 0.2, 0.5	Rm 1100-1500	HRC 48-60		509
N° 6634		MicroX new!	X-Generation X	5xd	r 0.1, 0.2, 0.5	Rm 1100-1500	HRC 48-60		511

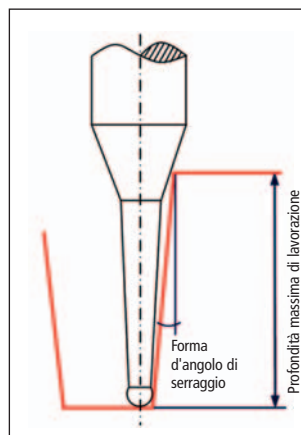
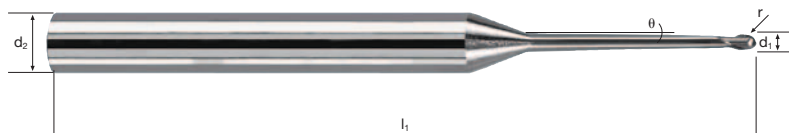
Frese per lavorazioni in 3D

Micro torico

Gambo ø 3mm								
N° 15751		Microcut-T1H	X-Generation X	1xd r 0.2	Rm 1100-1500	HRC 48-60		513
N° 5752		Microcut-T3	Base-X B	3xd r 0.2	Rm <850-1300	Inox Stainless	Ti Titanium	515
N° 5762		Microcut-T3H	X-Generation X	3xd r 0.2	Rm 1100-1500	HRC 48-60		517
N° 5754		Microcut-T5	Base-X B	5xd r 0.2	Rm <850-1300	Inox Stainless	Ti Titanium	519
N° 5764		Microcut-T5H	X-Generation X	5xd r 0.2	Rm 1100-1500	HRC 48-60		521
N° 5756		Microcut-T8	Base-X B	8xd r 0.2	Rm <850-1300	Inox Stainless	Ti Titanium	523
N° 5766		Microcut-T8H	X-Generation X	8xd r 0.2	Rm 1100-1500	HRC 48-60		525

II

Tabella di selezione per frese con estremità emisferica MD/CBN



Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
0.2	3	40	2	0.10	0°	0.14	0.15	0.15	0.16	0.18	D15781020	471
	3	40	2	0.10	0°	0.56	0.59	0.62	0.70	0.79	M5782020	473
	6	57	2	0.10	0°	0.56	0.59	0.62	0.70	0.79	X6562020	455
0.3	3	40	2	0.15	0°	0.26	0.27	0.28	0.29	0.31	D15781030	471
	3	40	2	0.15	0°	0.90	0.94	0.99	1.11	1.26	M45785030	477
	3	40	2	0.15	0°	0.94	0.99	1.04	1.16	1.32	M5782030	473
0.4	6	57	2	0.15	0°	0.94	0.99	1.04	1.16	1.32	X6562030	455
	3	40	2	0.20	0°	0.38	0.39	0.40	0.42	0.45	D15781040	471
	3	40	2	0.20	0°	0.90	0.94	0.99	1.10	1.24	M45785040	477
0.5	3	40	2	0.20	0°	1.24	1.30	1.37	1.53	1.73	M5782040	473
	6	57	2	0.20	0°	1.24	1.30	1.37	1.53	1.73	X6562040	455
	3	40	2	0.25	0°	0.50	0.51	0.53	0.55	0.59	D15781050	471
0.6	3	40	2	0.25	0°	1.40	1.47	1.54	1.71	1.93	M45785050	477
	3	40	2	0.25	0°	1.49	1.54	1.59	1.70	1.82	D5792050	475
	3	40	2	0.25	0°	1.49	1.54	1.59	1.70	1.82	M5782050	473
0.7	6	57	2	0.25	0°	1.49	1.54	1.59	1.70	1.82	X6562050	455
	3	40	2	0.25	0°	2.49	2.57	2.66	2.85	3.07	D5794050	481
	3	40	2	0.25	0°	2.49	2.57	2.66	2.85	3.07	M5784050	479
0.8	6	57	2	0.25	0°	2.49	2.57	2.66	2.85	3.07	X6564050	457
	6	57	2	0.25	0.9°	1.92	3.91	4.04	4.33	4.67	X6766050	463
	3	40	2	0.25	0°	3.99	4.12	4.26	4.57	4.93	D5796050	485
0.9	3	40	2	0.25	0°	3.99	4.12	4.26	4.57	4.93	M5786050	483
	6	57	2	0.25	0°	3.99	4.12	4.26	4.57	4.93	X6566050	459
	6	57	2	0.25	0.9°	1.92	4.17	5.04	5.41	5.84	X6768050	465
1.0	3	40	2	0.25	0°	4.99	5.16	5.33	5.72	6.17	M5787050	487
	6	57	2	0.25	0°	4.99	5.16	5.33	5.72	6.17	X6568050	461
	6	57	2	0.25	0.9°	1.92	4.13	6.05	6.49	7.01	X6770050	467
1.1	6	61	2	0.25	0.9°	1.92	4.13	7.56	8.12	8.77	X6772050	469
	3	40	2	0.30	0°	0.62	0.63	0.65	0.68	0.72	D15781060	471
	3	40	2	0.30	0°	1.40	1.46	1.53	1.70	1.91	M45785060	477
1.2	3	40	2	0.30	0°	1.79	1.85	1.90	2.03	2.18	D5792060	475
	3	40	2	0.30	0°	1.79	1.85	1.90	2.03	2.18	M5782060	473
	6	57	2	0.30	0°	1.79	1.85	1.90	2.03	2.18	X6562060	455
1.3	3	40	2	0.30	0°	2.99	3.09	3.19	3.41	3.67	D5794060	481
	3	40	2	0.30	0°	2.99	3.09	3.19	3.41	3.67	M5784060	479
	6	57	2	0.30	0°	2.99	3.09	3.19	3.41	3.67	X6564060	457
1.4	6	57	2	0.30	0.9°	2.02	4.29	4.85	5.19	5.60	X6766060	463
	3	40	2	0.30	0°	4.79	4.95	5.11	5.48	5.91	D5796060	485

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
0.6	3	40	2	0.30	0°	4.79	4.95	5.11	5.48	5.91	M5786060	483
	6	57	2	0.30	0°	4.79	4.95	5.11	5.48	5.91	X6566060	459
	6	57	2	0.30	0.9°	2.02	4.29	6.05	6.49	7.01	X6768060	465
	3	40	2	0.30	0°	5.99	6.19	6.40	6.86	7.40	M5787060	487
	6	57	2	0.30	0°	5.99	6.19	6.40	6.86	7.40	X6568060	461
0.7	3	40	2	0.35	0°	1.90	1.99	2.08	2.31	2.60	M45785070	477
	3	40	2	0.35	0°	3.49	3.60	3.72	3.98	4.28	D5794070	481
	3	40	2	0.35	0°	3.49	3.60	3.72	3.98	4.28	M5784070	479
0.8	3	40	2	0.40	0°	0.86	0.88	0.90	0.94	1.00	D15781080	471
	3	40	2	0.40	0°	1.90	1.98	2.08	2.30	2.58	M45785080	477
	3	40	2	0.40	0°	2.39	2.46	2.54	2.71	2.91	D5792080	475
	3	40	2	0.40	0°	2.39	2.46	2.54	2.71	2.91	M5782080	473
	6	57	2	0.40	0°	2.39	2.46	2.54	2.71	2.91	X6562080	455
	3	40	2	0.40	0°	3.99	4.12	4.25	4.55	4.89	D5794080	481
	3	40	2	0.40	0°	3.99	4.12	4.25	4.55	4.89	M5784080	479
	6	57	2	0.40	0°	3.99	4.12	4.25	4.55	4.89	X6564080	457
	6	57	2	0.40	0.9°	2.17	4.50	6.46	6.92	7.46	X6766080	463
	3	40	2	0.40	0°	6.39	6.60	6.82	7.31	7.88	D5796080	485
	3	40	2	0.40	0°	6.39	6.60	6.82	7.31	7.88	M5786080	483
	6	57	2	0.40	0°	6.39	6.60	6.82	7.31	7.88	X6566080	459
	6	61	2	0.40	0.9°	2.17	4.50	8.07	8.65	9.33	X6768080	465
	3	40	2	0.40	0°	7.99	8.25	8.53	9.15	9.87	M5787080	487
	6	61	2	0.40	0°	7.99	8.25	8.53	9.15	9.87	X6568080	461
	6	61	2	0.40	0.9°	2.17	4.50	9.68	10.39	11.21	X6770080	467
	6	66	2	0.40	0.9°	2.17	4.50	12.10	12.98	14.01	X6772080	469
0.9	3	40	2	0.45	0°	2.40	2.51	2.63	2.91	3.27	M45785090	477
	3	40	2	0.45	0°	4.49	4.63	4.78	5.12	5.50	D5794090	481
	3	40	2	0.45	0°	4.49	4.63	4.78	5.12	5.50	M5784090	479
1.0	3	40	2	0.50	0°	0.90	0.92	0.93	0.98	1.03	P5286100	385
	3	60	2	0.50	0°	0.90	0.92	0.93	0.98	1.03	P5288100	395
	3	50	2	0.50	0°	1.10	1.12	1.15	1.21	1.27	D15781100	471
	6	57	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	D5100100	381
	3	50	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	D5792100	475
	3	50	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	M5782100	473
	6	57	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	P7540100	389
	6	57	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	X6562100	455
	6	57	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	V7470100	353
	6	57	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	X7400100	357
	6	57	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	X7420100	355
	3	40	2	0.50	0°	2.90	3.03	3.18	3.52	3.96	M45785100	477
	3	50	2	0.50	0°	4.99	5.15	5.31	5.68	6.11	D5794100	481
	3	50	2	0.50	0°	4.99	5.15	5.31	5.68	6.11	M5784100	479
	6	57	2	0.50	0°	4.99	5.15	5.31	5.68	6.11	X6564100	457
	6	66	2	0.50	0°	5.99	6.18	6.38	6.83	7.36	P7544100	399
	6	66	2	0.50	0°	5.99	6.18	6.38	6.83	7.36	V7474100	361
	6	66	2	0.50	0°	5.99	6.18	6.38	6.83	7.36	X7404100	365
	6	66	2	0.50	0°	5.99	6.18	6.38	6.83	7.36	X7424100	363
	6	61	2	0.50	0.9°	2.32	4.71	8.07	8.65	9.32	X6766100	463
	3	50	2	0.50	0°	7.99	8.25	8.52	9.13	9.84	D5796100	485
	3	50	2	0.50	0°	7.99	8.25	8.52	9.13	9.84	M5786100	483
	6	61	2	0.50	0°	7.99	8.25	8.52	9.13	9.84	X6566100	459
	6	69	2	0.50	0°	8.99	9.28	9.59	10.28	11.09	V7478100	369
	6	69	2	0.50	0°	8.99	9.28	9.59	10.28	11.09	X7408100	373
	6	69	2	0.50	0°	8.99	9.28	9.59	10.28	11.09	X7428100	371
	6	61	2	0.50	0.9°	2.32	4.71	10.09	10.81	11.66	X6768100	465
	3	50	2	0.50	0°	9.99	10.32	10.66	11.43	12.33	M5787100	487
	6	61	2	0.50	0°	9.99	10.32	10.66	11.43	12.33	X6568100	461

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni		
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.	
1.0	6	66	2	0.50	0.9°	2.32	4.71	12.10	12.98	14.00	X6770100	467	
	3	50	2	0.50	0°	11.99	12.38	12.80	13.73	14.81	M5791100	489	
	6	66	2	0.50	0.9°	2.32	4.71	15.12	16.23	17.51	X6772100	469	
	3	60	2	0.50	0°	14.99	15.49	16.01	17.18	18.55	M5793100	491	
	3	60	2	0.50	0°	19.99	20.65	21.36	22.93	-	M15795100	493	
1.2	3	50	2	0.60	0°	1.30	1.33	1.36	1.42	1.50	D15781108	471	
	3	50	2	0.60	0°	3.69	3.79	3.91	4.17	4.47	D5792108	475	
	3	50	2	0.60	0°	3.69	3.79	3.91	4.17	4.47	M5782108	473	
	6	57	2	0.60	0°	3.69	3.79	3.91	4.17	4.47	X6562108	455	
	3	40	2	0.60	0°	3.90	4.08	4.27	4.74	5.35	M45785108	477	
	3	50	2	0.60	0°	6.09	6.28	6.48	6.93	7.45	D5794108	481	
	3	50	2	0.60	0°	6.09	6.28	6.48	6.93	7.45	M5784108	479	
	6	57	2	0.60	0°	6.09	6.28	6.48	6.93	7.45	X6564108	457	
	6	61	2	0.60	0.9°	4.13	8.68	9.79	10.49	11.30	X6766108	463	
	3	50	2	0.60	0°	9.69	10.00	10.33	11.07	11.92	D5796108	485	
	3	50	2	0.60	0°	9.69	10.00	10.33	11.07	11.92	M5786108	483	
	6	61	2	0.60	0°	9.69	10.00	10.33	11.07	11.92	X6566108	459	
	6	66	2	0.60	0.9°	4.13	8.67	12.21	13.09	14.11	X6768108	465	
	3	50	2	0.60	0°	12.09	12.48	12.89	13.82	14.91	M5787108	487	
	6	66	2	0.60	0°	12.09	12.48	12.89	13.82	14.91	X6568108	461	
	6	66	2	0.60	0.9°	4.13	8.68	14.62	15.68	16.92	X6770108	467	
	3	60	2	0.60	0°	14.49	14.96	15.46	16.58	-	M5791108	489	
	6	69	2	0.60	0.9°	4.13	8.68	18.25	19.58	21.13	X6772108	469	
	3	60	2	0.60	0°	18.09	18.68	19.31	20.72	-	M5793108	491	
	3	60	2	0.60	0°	24.09	24.88	25.73	-	-	M15795108	493	
	1.5	3	50	2	0.75	0°	1.70	1.74	1.77	1.86	1.96	D15781120	471
		3	40	2	0.75	0°	1.90	1.94	1.99	2.09	2.21	P5286120	385
		3	40	2	0.75	0°	3.90	4.07	4.26	4.71	5.28	M45785120	477
		6	57	2	0.75	0°	4.59	4.72	4.86	5.18	5.55	D5100120	381
		3	50	2	0.75	0°	4.59	4.72	4.86	5.18	5.55	D5792120	475
3		50	2	0.75	0°	4.59	4.72	4.86	5.18	5.55	M5782120	473	
6		57	2	0.75	0°	4.59	4.72	4.86	5.18	5.55	X6562120	455	
3		50	2	0.75	0°	7.59	7.82	8.07	8.63	9.28	D5794120	481	
3		50	2	0.75	0°	7.59	7.82	8.07	8.63	9.28	M5784120	479	
6		61	2	0.75	0°	7.59	7.82	8.07	8.63	9.28	X6564120	457	
6		61	2	0.75	0.9°	4.33	8.94	12.21	13.08	14.09	X6766120	463	
3		60	2	0.75	0°	12.09	12.47	12.88	13.80	14.87	D5796120	485	
3		60	2	0.75	0°	12.09	12.47	12.88	13.80	14.87	M5786120	483	
6		61	2	0.75	0°	12.09	12.47	12.88	13.80	14.87	X6566120	459	
6		66	2	0.75	0.9°	4.33	8.94	15.23	16.33	17.60	X6768120	465	
3		60	2	0.75	0°	15.09	15.57	16.09	17.25	-	M5787120	487	
6		66	2	0.75	0°	15.09	15.57	16.09	17.25	18.60	X6568120	461	
6		69	2	0.75	0.9°	4.33	8.94	18.25	19.57	21.11	X6770120	467	
3		60	2	0.75	0°	18.09	18.67	19.30	20.70	-	M5791120	489	
6		75	2	0.75	0.9°	4.33	8.94	22.78	24.44	26.38	X6772120	469	
3		70	2	0.75	0°	22.59	23.33	24.12	-	-	M5793120	491	
3		70	2	0.75	0°	30.09	31.09	32.14	-	-	M15795120	493	
1.8		3	40	2	0.90	0°	4.90	5.00	5.11	5.34	5.59	M45785130	477
		3	50	2	0.90	0°	9.09	9.37	9.67	10.33	11.11	D5794132	481
		3	50	2	0.90	0°	9.09	9.37	9.67	10.33	11.11	M5784132	479
2.0	3	50	2	1.00	0°	2.30	2.35	2.40	2.51	2.65	D15781140	471	
	3	40	2	1.00	0°	2.40	2.45	2.51	2.63	2.77	P5286138	385	
	3	60	2	1.00	0°	2.40	2.45	2.51	2.63	2.77	P5288138	395	
	3	40	2	1.00	0°	4.90	5.00	5.10	5.33	5.58	M45785140	477	
	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	C5290140	391	
	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	D5100140	381	
3	50	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	D5792140	475		

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
2.0	3	50	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	M5782140	473
	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	P5286140	385
	6	75	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	P5288140	395
	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	P7540140	389
	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	X6562140	455
	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	V7470140	353
	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	X7400140	357
	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	X7420140	355
	3	50	2	1.00	0°	10.09	10.40	10.73	11.47	-	D5794140	481
	3	50	2	1.00	0°	10.09	10.40	10.73	11.47	-	M5784140	479
	6	61	2	1.00	0°	10.09	10.40	10.73	11.47	12.33	X6564140	457
	6	66	2	1.00	0°	12.09	12.46	12.87	13.77	14.81	P7544140	399
	6	66	2	1.00	0°	12.09	12.46	12.87	13.77	14.81	V7474140	361
	6	66	2	1.00	0°	12.09	12.46	12.87	13.77	14.81	X7404140	365
	6	66	2	1.00	0°	12.09	12.46	12.87	13.77	14.81	X7424140	363
	6	66	2	1.00	0.9°	4.73	9.53	16.25	17.40	18.74	X6766140	463
	3	60	2	1.00	0°	16.09	16.60	17.15	-	-	D5796140	485
	3	60	2	1.00	0°	16.09	16.60	17.15	-	-	M5786140	483
6	66	2	1.00	0°	16.09	16.60	17.15	18.37	19.79	X6566140	459	
6	69	2	1.00	0°	18.09	18.67	19.29	20.67	22.27	V7478140	369	
6	69	2	1.00	0°	18.09	18.67	19.29	20.67	22.27	X7408140	373	
6	69	2	1.00	0°	18.09	18.67	19.29	20.67	22.27	X7428140	371	
6	69	2	1.00	0.9°	4.73	9.53	20.27	21.73	23.42	X6768140	465	
3	60	2	1.00	0°	20.09	20.73	21.42	-	-	M5787140	487	
6	69	2	1.00	0°	20.09	20.73	21.42	22.96	24.76	X6568140	461	
6	75	2	1.00	0.9°	4.73	9.53	24.30	26.06	28.10	X6770140	467	
3	60	2	1.00	0°	24.09	24.87	25.70	-	-	M5791140	489	
6	80	2	1.00	0.9°	4.73	9.53	30.34	32.55	35.12	X6772140	469	
3	70	2	1.00	0°	30.09	31.07	-	-	-	M5793140	491	
3	80	2	1.00	0°	40.09	41.41	-	-	-	M15795140	493	
2.3	6	57	2	1.15	0°	7.17	7.38	7.60	8.09	8.67	X6562152	455
	3	50	2	1.15	0°	11.77	12.13	12.52	-	-	D5794152	481
	3	50	2	1.15	0°	11.77	12.13	12.52	-	-	M5784152	479
	6	61	2	1.15	0°	11.77	12.13	12.52	13.38	14.39	X6564152	457
2.5	3	50	2	1.25	0°	2.90	2.96	3.02	3.17	3.33	D15781160	471
	3	40	2	1.25	0°	6.90	7.04	7.19	7.51	-	M45785160	477
	6	57	2	1.25	0°	7.77	8.00	8.24	8.77	9.39	D5100160	381
	3	50	2	1.25	0°	7.77	8.00	8.24	-	-	D5792160	475
	3	50	2	1.25	0°	7.77	8.00	8.24	-	-	M5782160	473
	6	57	2	1.25	0°	7.77	8.00	8.24	8.77	9.39	X6562160	455
	3	50	2	1.25	0°	12.77	13.17	13.58	-	-	D5794160	481
	3	50	2	1.25	0°	12.77	13.17	13.58	-	-	M5784160	479
	6	61	2	1.25	0°	12.77	13.17	13.58	14.52	15.61	X6564160	457
	6	69	2	1.25	0.9°	8.37	17.39	20.48	21.94	23.63	X6766160	463
	6	69	2	1.25	0°	20.27	20.92	21.61	23.14	24.93	X6566160	459
	6	75	2	1.25	0.9°	8.37	17.39	25.52	27.35	29.48	X6768160	465
	6	75	2	1.25	0°	25.27	26.09	26.96	28.89	31.15	X6568160	461
	6	80	2	1.25	0.9°	8.37	17.39	30.55	32.76	35.33	X6770160	467
	6	87	2	1.25	0.9°	8.37	17.39	38.11	40.88	44.11	X6772160	469
	3	60	2	1.25	0°	20.27	20.92	-	-	-	D5796160	485
	3	60	2	1.25	0°	20.27	20.92	-	-	-	M5786160	483
	3	60	2	1.25	0°	25.27	26.09	-	-	-	M5787160	487
3	70	2	1.25	0°	30.27	-	-	-	-	M5791160	489	
3	70	2	1.25	0°	37.77	-	-	-	-	M5793160	491	
3	80	2	1.25	0°	50.27	-	-	-	-	M15795160	493	
2.8	6	57	2	1.40	0°	8.67	8.92	9.19	9.78	10.48	X6562172	455
	6	61	2	1.40	0°	14.27	14.71	15.18	16.22	17.44	X6564172	457

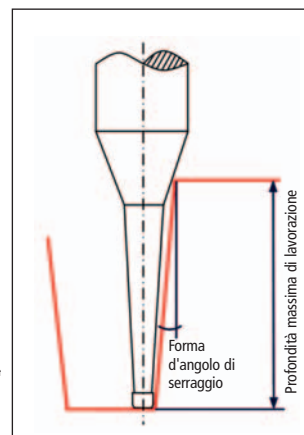
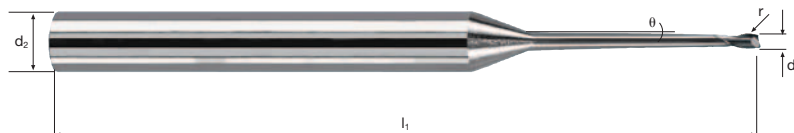
Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
2.8	3	50	2	1.40	0°	14.27	-	-	-	-	D5794172	481
	3	50	2	1.40	0°	14.27	-	-	-	-	M5784172	479
3.0	6	57	2	1.50	0°	3.90	3.98	4.08	4.28	4.52	U45298180	393
	6	75	2	1.50	0°	8.27	8.51	8.75	9.31	9.95	C5292180	401
	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	C5290180	391
	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	D5100180	381
	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	P5286180	385
	6	75	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	P5288180	395
	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	P7540180	389
	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	X6562180	455
	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	V7470180	353
	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	X7400180	357
	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	X7420180	355
	6	57	4	1.50	0°	9.27	9.54	9.82	10.46	11.20	X7450180	375
	4	44	2	1.50	0°	9.90	10.11	10.33	10.81	-	M45785180	477
	6	66	2	1.50	0°	15.27	15.74	16.24	17.36	18.66	X6564180	457
	6	66	2	1.50	0°	18.27	18.84	19.45	20.81	22.39	P7544180	399
	6	66	2	1.50	0°	18.27	18.84	19.45	20.81	22.39	V7474180	361
	6	66	2	1.50	0°	18.27	18.84	19.45	20.81	22.39	X7404180	365
	6	66	2	1.50	0°	18.27	18.84	19.45	20.81	22.39	X7424180	363
	6	66	4	1.50	0°	18.27	18.84	19.45	20.81	22.39	X7454180	377
	6	75	2	1.50	0.9°	8.77	17.98	24.52	26.26	28.28	X6766180	463
	6	90	2	1.50	0°	24.27	25.04	25.87	27.71	29.84	P5289180	403
	6	75	2	1.50	0°	24.27	25.04	25.87	27.71	29.84	X6566180	459
	6	75	2	1.50	0°	27.27	28.14	29.08	31.15	-	V7478180	369
	6	75	2	1.50	0°	27.27	28.14	29.08	31.15	-	X7408180	373
	6	75	2	1.50	0°	27.27	28.14	29.08	31.15	-	X7428180	371
	6	75	4	1.50	0°	27.27	28.14	29.08	31.15	-	X7458180	379
	6	75	2	1.50	0.9°	8.77	17.98	30.56	32.75	-	X6768180	465
	6	80	2	1.50	0°	30.27	31.25	32.29	34.60	-	X6568180	461
	6	87	2	1.50	0.9°	8.77	17.98	36.60	39.25	-	X6770180	467
	6	100	2	1.50	0.9°	8.77	17.98	45.67	-	-	X6772180	469
	3	50	2	1.50	0°	3.50	-	-	-	-	D15781180	471
	3	40	2	1.50	0°	3.90	-	-	-	-	P5286178	385
	3	60	2	1.50	0°	3.90	-	-	-	-	P5288178	395
	3	50	2	1.50	0°	8.90	-	-	-	-	D5792180	475
	3	50	2	1.50	0°	8.90	-	-	-	-	M5782180	473
	3	50	2	1.50	0°	14.90	-	-	-	-	D5794180	481
	3	50	2	1.50	0°	14.90	-	-	-	-	M5784180	479
	3	60	2	1.50	0°	23.90	-	-	-	-	D5796180	485
	3	60	2	1.50	0°	23.90	-	-	-	-	M5786180	483
	3	60	2	1.50	0°	29.90	-	-	-	-	M5787180	487
	3	70	2	1.50	0°	35.90	-	-	-	-	M5791180	489
	3	80	2	1.50	0°	44.90	-	-	-	-	M5793180	491
	3	90	2	1.50	0°	59.90	-	-	-	-	M15795180	493
4.0	6	57	2	2.00	0°	4.90	5.00	5.11	5.35	5.64	U45298220	393
	6	57	2	2.00	0°	12.27	12.62	13.00	13.83	14.81	D5100220	381
	6	75	2	2.00	0°	12.27	12.62	13.00	13.83	14.81	P5222220	397
	6	57	2	2.00	0°	12.27	12.62	13.00	13.83	14.81	P7540220	389
	6	57	2	2.00	0°	12.27	12.62	13.00	13.83	14.81	V7470220	353
	6	57	2	2.00	0°	12.27	12.62	13.00	13.83	14.81	X7400220	357
	6	57	2	2.00	0°	12.27	12.62	13.00	13.83	14.81	X7420220	355
	6	57	4	2.00	0°	12.27	12.62	13.00	13.83	14.81	X7450220	375
	6	80	2	2.00	0°	12.46	12.82	13.20	14.05	15.04	31700220	449
	6	57	2	2.00	0°	12.46	12.82	13.20	14.05	15.04	C5290220	391
	6	75	2	2.00	0°	12.46	12.82	13.20	14.05	15.04	C5292220	401
	6	57	2	2.00	0°	12.46	12.82	13.20	14.05	15.04	P5220220	387

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
4.0	6	57	2	2.00	0°	12.46	12.82	13.20	14.05	15.04	P5286220	385
	6	75	2	2.00	0°	12.46	12.82	13.20	14.05	15.04	P5288220	395
	6	69	2	2.00	0°	24.46	25.22	26.03	27.85	-	P7544220	399
	6	69	2	2.00	0°	24.46	25.22	26.03	27.85	-	V7474220	361
	6	69	2	2.00	0°	24.46	25.22	26.03	27.85	-	X7404220	365
	6	69	2	2.00	0°	24.46	25.22	26.03	27.85	-	X7424220	363
	6	69	4	2.00	0°	24.46	25.22	26.03	27.85	-	X7454220	377
	6	90	2	2.00	0°	27.46	28.32	29.24	-	-	P5289220	403
	6	80	2	2.00	0°	36.46	37.62	38.87	-	-	V7478220	369
	6	80	2	2.00	0°	36.46	37.62	38.87	-	-	X7408220	373
	6	80	2	2.00	0°	36.46	37.62	38.87	-	-	X7428220	371
	6	80	4	2.00	0°	36.46	37.62	38.87	-	-	X7458220	379
5.0	6	57	2	2.50	0°	5.90	6.02	6.15	6.43	6.77	U45298260	393
	6	80	2	2.50	0°	15.65	16.09	16.57	-	-	31700260	449
	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	C5290260	391
	6	80	2	2.50	0°	15.65	16.09	16.57	-	-	C5292260	401
	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	D5100260	381
	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	P5220260	387
	6	80	2	2.50	0°	15.65	16.09	16.57	-	-	P5222260	397
	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	P5286260	385
	6	80	2	2.50	0°	15.65	16.09	16.57	-	-	P5288260	395
	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	P7540260	389
	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	V7470260	353
	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	X7400260	357
	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	X7420260	355
	6	57	4	2.50	0°	15.65	16.09	16.57	-	-	X7450260	375
	6	75	2	2.50	0°	30.65	31.60	-	-	-	P7544260	399
	6	75	2	2.50	0°	30.65	31.60	-	-	-	V7474260	361
	6	75	2	2.50	0°	30.65	31.60	-	-	-	X7404260	365
	6	75	2	2.50	0°	30.65	31.60	-	-	-	X7424260	363
	6	75	4	2.50	0°	30.65	31.60	-	-	-	X7454260	377
	6	110	2	2.50	0°	45.65	47.10	-	-	-	P5289260	403
	6	87	2	2.50	0°	45.65	47.10	-	-	-	V7478260	369
	6	87	2	2.50	0°	45.65	47.10	-	-	-	X7408260	373
	6	87	2	2.50	0°	45.65	47.10	-	-	-	X7428260	371
	6	87	4	2.50	0°	45.65	47.10	-	-	-	X7458260	379
6.0	6	57	2	3.00	0°	6.90	-	-	-	-	U45298300	393
	6	80	2	3.00	0°	19.90	-	-	-	-	31700300	449
	6	57	2	3.00	0°	19.90	-	-	-	-	C5290300	391
	6	80	2	3.00	0°	19.90	-	-	-	-	C5292300	401
	6	57	2	3.00	0°	19.90	-	-	-	-	D5100300	381
	6	80	4	3.00	0°	19.90	-	-	-	-	D5140300	383
	6	57	2	3.00	0°	19.90	-	-	-	-	P5220300	387
	6	80	2	3.00	0°	19.90	-	-	-	-	P5222300	397
	6	57	2	3.00	0°	19.90	-	-	-	-	P5286300	385
	6	80	2	3.00	0°	19.90	-	-	-	-	P5288300	395
	6	57	2	3.00	0°	19.90	-	-	-	-	P7540300	389
	6	57	2	3.00	0°	19.90	-	-	-	-	V7470300	353
	6	57	2	3.00	0°	19.90	-	-	-	-	X7400300	357
	6	57	2	3.00	0°	19.90	-	-	-	-	X7420300	355
	6	57	4	3.00	0°	19.90	-	-	-	-	X7450300	375
	6	57	8	3.00	0°	19.90	-	-	-	-	X7460300	359
	6	80	2	3.00	0°	42.90	-	-	-	-	P7544300	399
	6	80	2	3.00	0°	42.90	-	-	-	-	V7474300	361
	6	80	2	3.00	0°	42.90	-	-	-	-	X7404300	365
	6	80	2	3.00	0°	42.90	-	-	-	-	X7424300	363
	6	80	4	3.00	0°	42.90	-	-	-	-	X7454300	377

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
6.0	6	80	8	3.00	0°	42.90	-	-	-	-	X7464300	367
	6	110	2	3.00	0°	49.90	-	-	-	-	P5289300	403
	6	100	2	3.00	0°	62.90	-	-	-	-	V7478300	369
	6	100	2	3.00	0°	62.90	-	-	-	-	X7408300	373
	6	100	2	3.00	0°	62.90	-	-	-	-	X7428300	371
	6	100	4	3.00	0°	62.90	-	-	-	-	X7458300	379
8.0	8	63	2	4.00	0°	8.90	-	-	-	-	U45298391	393
	8	100	2	4.00	0°	25.90	-	-	-	-	31700391	449
	8	63	2	4.00	0°	25.90	-	-	-	-	C5290391	391
	8	90	2	4.00	0°	25.90	-	-	-	-	C5292391	401
	8	63	2	4.00	0°	25.90	-	-	-	-	D5100391	381
	8	90	4	4.00	0°	25.90	-	-	-	-	D5140391	383
	8	63	2	4.00	0°	25.90	-	-	-	-	P5220391	387
	8	90	2	4.00	0°	25.90	-	-	-	-	P5222391	397
	8	63	2	4.00	0°	25.90	-	-	-	-	P5286391	385
	8	90	2	4.00	0°	25.90	-	-	-	-	P5288391	395
	8	63	2	4.00	0°	25.90	-	-	-	-	P7540391	389
	8	63	2	4.00	0°	25.90	-	-	-	-	V7470391	353
	8	63	2	4.00	0°	25.90	-	-	-	-	X7400391	357
	8	63	2	4.00	0°	25.90	-	-	-	-	X7420391	355
	8	63	4	4.00	0°	25.90	-	-	-	-	X7450391	375
	8	63	10	4.00	0°	25.90	-	-	-	-	X7460391	359
	8	110	2	4.00	0°	45.90	-	-	-	-	P5289391	403
	8	90	2	4.00	0°	52.90	-	-	-	-	P7544391	399
	8	90	2	4.00	0°	52.90	-	-	-	-	V7474391	361
	8	90	2	4.00	0°	52.90	-	-	-	-	X7404391	365
	8	90	2	4.00	0°	52.90	-	-	-	-	X7424391	363
	8	90	4	4.00	0°	52.90	-	-	-	-	X7454391	377
	8	90	10	4.00	0°	52.90	-	-	-	-	X7464391	367
	8	120	2	4.00	0°	82.90	-	-	-	-	V7478391	369
	8	120	2	4.00	0°	82.90	-	-	-	-	X7408391	373
	8	120	2	4.00	0°	82.90	-	-	-	-	X7428391	371
	8	120	4	4.00	0°	82.90	-	-	-	-	X7458391	379
10.0	10	72	2	5.00	0°	10.90	-	-	-	-	U45298450	393
	10	100	2	5.00	0°	30.90	-	-	-	-	31700450	449
	10	72	2	5.00	0°	30.90	-	-	-	-	C5290450	391
	10	100	2	5.00	0°	30.90	-	-	-	-	C5292450	401
	10	72	2	5.00	0°	30.90	-	-	-	-	D5100450	381
	10	100	4	5.00	0°	30.90	-	-	-	-	D5140450	383
	10	72	2	5.00	0°	30.90	-	-	-	-	P5220450	387
	10	100	2	5.00	0°	30.90	-	-	-	-	P5222450	397
	10	72	2	5.00	0°	30.90	-	-	-	-	P5286450	385
	10	100	2	5.00	0°	30.90	-	-	-	-	P5288450	395
	10	72	2	5.00	0°	30.90	-	-	-	-	P7540450	389
	10	72	2	5.00	0°	30.90	-	-	-	-	V7470450	353
	10	72	2	5.00	0°	30.90	-	-	-	-	X7400450	357
	10	72	2	5.00	0°	30.90	-	-	-	-	X7420450	355
	10	72	4	5.00	0°	30.90	-	-	-	-	X7450450	375
	10	72	12	5.00	0°	30.90	-	-	-	-	X7460450	359
	10	130	2	5.00	0°	60.90	-	-	-	-	P5289450	403
	10	105	2	5.00	0°	63.90	-	-	-	-	P7544450	399
	10	105	2	5.00	0°	63.90	-	-	-	-	V7474450	361
	10	105	2	5.00	0°	63.90	-	-	-	-	X7404450	365
	10	105	2	5.00	0°	63.90	-	-	-	-	X7424450	363
	10	105	4	5.00	0°	63.90	-	-	-	-	X7454450	377
	10	105	12	5.00	0°	63.90	-	-	-	-	X7464450	367
	10	135	2	5.00	0°	93.90	-	-	-	-	V7478450	369

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
10.0	10	135	2	5.00	0°	93.90	-	-	-	-	X7408450	373
	10	135	2	5.00	0°	93.90	-	-	-	-	X7428450	371
	10	135	4	5.00	0°	93.90	-	-	-	-	X7458450	379
12.0	12	83	2	6.00	0°	11.90	-	-	-	-	U45298501	393
	12	120	2	6.00	0°	36.90	-	-	-	-	31700501	449
	12	83	2	6.00	0°	36.90	-	-	-	-	C5290501	391
	12	120	2	6.00	0°	36.90	-	-	-	-	C5292501	401
	12	83	2	6.00	0°	36.90	-	-	-	-	D5100501	381
	12	120	4	6.00	0°	36.90	-	-	-	-	D5140501	383
	12	83	2	6.00	0°	36.90	-	-	-	-	P5220501	387
	12	120	2	6.00	0°	36.90	-	-	-	-	P5222501	397
	12	83	2	6.00	0°	36.90	-	-	-	-	P5286501	385
	12	120	2	6.00	0°	36.90	-	-	-	-	P5288501	395
	12	83	2	6.00	0°	36.90	-	-	-	-	P7540501	389
	12	83	2	6.00	0°	36.90	-	-	-	-	V7470501	353
	12	83	2	6.00	0°	36.90	-	-	-	-	X7400501	357
	12	83	2	6.00	0°	36.90	-	-	-	-	X7420501	355
	12	83	4	6.00	0°	36.90	-	-	-	-	X7450501	375
	12	83	16	6.00	0°	36.90	-	-	-	-	X7460501	359
	12	140	2	6.00	0°	56.90	-	-	-	-	P5289501	403
	12	120	2	6.00	0°	73.90	-	-	-	-	P7544501	399
	12	120	2	6.00	0°	73.90	-	-	-	-	V7474501	361
	12	120	2	6.00	0°	73.90	-	-	-	-	X7404501	365
	12	120	2	6.00	0°	73.90	-	-	-	-	X7424501	363
	12	120	4	6.00	0°	73.90	-	-	-	-	X7454501	377
	12	120	16	6.00	0°	73.90	-	-	-	-	X7464501	367
	12	160	2	6.00	0°	113.90	-	-	-	-	V7478501	369
	12	160	2	6.00	0°	113.90	-	-	-	-	X7408501	373
	12	160	2	6.00	0°	113.90	-	-	-	-	X7428501	371
	12	160	4	6.00	0°	113.90	-	-	-	-	X7458501	379
16.0	16	92	2	8.00	0°	42.90	-	-	-	-	C5290610	391
	16	140	2	8.00	0°	42.90	-	-	-	-	C5292610	401
	16	92	2	8.00	0°	42.90	-	-	-	-	P5220610	387
	16	92	2	8.00	0°	42.90	-	-	-	-	P5286610	385
	16	140	2	8.00	0°	42.90	-	-	-	-	P5288610	395
20.0	20	104	2	10.00	0°	52.90	-	-	-	-	C5290682	391

Tabella di selezione per frese toriche MD/CBN



Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
0.5	6	57	2	0.10	0°	1.49	1.54	1.60	1.72	1.86	X6532050	495
	6	57	4	0.10	0°	1.49	1.54	1.60	1.72	1.86	X6632050	509
	6	57	2	0.10	0°	2.49	2.58	2.67	2.87	3.10	X6534050	497
	6	57	4	0.10	0°	2.49	2.58	2.67	2.87	3.10	X6634050	511
	6	57	2	0.10	0.9°	1.92	3.91	4.05	4.35	4.70	X6736050	501
	6	57	2	0.10	0°	3.99	4.13	4.27	4.59	4.97	X6536050	499
	6	57	2	0.10	0.9°	1.92	4.31	5.05	5.43	5.88	X6738050	503
	6	57	2	0.10	0.9°	1.92	4.31	6.06	6.52	7.04	X6740050	505
	6	61	2	0.10	0.9°	1.92	4.31	7.57	8.14	8.80	X6742050	507
	0.8	6	57	2	0.10	0°	2.39	2.47	2.56	2.75	2.98	X6532080
6		57	4	0.10	0°	2.39	2.47	2.56	2.75	2.98	X6632080	509
6		57	2	0.10	0°	3.99	4.13	4.27	4.59	4.97	X6534080	497
6		57	4	0.10	0°	3.99	4.13	4.27	4.59	4.97	X6634080	511
6		57	2	0.10	0.9°	2.17	4.87	6.48	6.97	7.53	X6736080	501
6		57	2	0.10	0°	6.39	6.61	6.84	7.35	7.95	X6536080	499
6		61	2	0.10	0.9°	2.17	4.87	8.09	8.70	9.40	X6738080	503
6		61	2	0.10	0.9°	2.17	4.87	9.70	10.43	11.28	X6740080	505
6		66	2	0.10	0.9°	2.17	4.87	12.12	13.03	14.09	X6742080	507
1.0		3	50	2	0.20	0°	1.10	1.13	1.17	1.25	1.34	D15751100
	3	50	2	0.20	0°	2.99	3.09	3.20	3.43	3.70	D5762100	517
	3	50	2	0.20	0°	2.99	3.09	3.20	3.43	3.70	M5752100	515
	6	57	2	0.20	0°	2.99	3.09	3.20	3.43	3.70	X6532100	495
	6	57	4	0.20	0°	2.99	3.09	3.20	3.43	3.70	X6632100	509
	3	50	2	0.20	0°	4.99	5.16	5.33	5.73	6.18	D5764100	521
	3	50	2	0.20	0°	4.99	5.16	5.33	5.73	6.18	M5754100	519
	6	57	2	0.20	0°	4.99	5.16	5.33	5.73	6.18	X6534100	497
	6	57	4	0.20	0°	4.99	5.16	5.33	5.73	6.18	X6634100	511
	6	61	2	0.20	0.9°	2.32	5.09	8.09	8.69	9.39	X6736100	501
	3	50	2	0.20	0°	7.99	8.26	8.54	9.18	9.91	D5766100	525
	3	50	2	0.20	0°	7.99	8.26	8.54	9.18	9.91	M5756100	523
	6	61	2	0.20	0°	7.99	8.26	8.54	9.18	9.91	X6536100	499
	6	61	2	0.20	0.9°	2.32	5.09	10.11	10.86	11.73	X6738100	503
1.2	6	66	2	0.20	0.9°	2.32	5.09	12.12	13.02	14.07	X6740100	505
	6	66	2	0.20	0.9°	2.32	5.09	15.14	16.27	17.58	X6742100	507
	3	50	2	0.20	0°	1.34	1.38	1.43	1.53	1.64	D15751108	513
	3	50	2	0.20	0°	3.69	3.81	3.94	4.23	4.56	D5762108	517
	3	50	2	0.20	0°	3.69	3.81	3.94	4.23	4.56	M5752108	515
	6	57	2	0.20	0°	3.69	3.81	3.94	4.23	4.56	X6532108	495

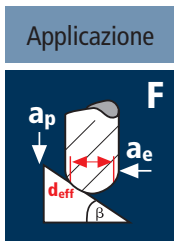
Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
1.2	6	57	4	0.20	0°	3.69	3.81	3.94	4.23	4.56	X6632108	509
	3	50	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	D5764108	521
	3	50	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	M5754108	519
	6	57	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	X6534108	497
	6	57	4	0.20	0°	6.09	6.29	6.50	6.98	7.54	X6634108	511
	6	61	2	0.20	0.9°	4.13	9.17	9.82	10.55	11.40	X6736108	501
	3	50	2	0.20	0°	9.69	10.01	10.36	11.12	12.02	D5766108	525
	3	50	2	0.20	0°	9.69	10.01	10.36	11.12	12.02	M5756108	523
	6	61	2	0.20	0°	9.69	10.01	10.36	11.12	12.02	X6536108	499
	6	66	2	0.20	0.9°	4.13	9.17	12.26	13.15	14.20	X6738108	503
	6	66	2	0.20	0.9°	4.13	9.17	14.65	15.74	17.01	X6740108	505
	6	69	2	0.20	0.9°	4.13	9.17	18.28	19.64	21.23	X6742108	507
1.5	3	50	2	0.20	0°	1.70	1.75	1.81	1.94	2.09	D15751120	513
	3	50	2	0.20	0°	4.59	4.74	4.90	5.26	5.68	D5762120	517
	3	50	2	0.20	0°	4.59	4.74	4.90	5.26	5.68	M5752120	515
	6	57	2	0.20	0°	4.59	4.74	4.90	5.26	5.68	X6532120	495
	6	57	4	0.20	0°	4.59	4.74	4.90	5.26	5.68	X6632120	509
	3	50	2	0.20	0°	7.59	7.84	8.11	8.71	9.41	D5764210	521
	3	50	2	0.20	0°	7.59	7.84	8.11	8.71	9.41	M5754210	519
	6	61	2	0.20	0°	7.59	7.84	8.11	8.71	9.41	X6534210	497
	6	61	4	0.20	0°	7.59	7.84	8.11	8.71	9.41	X6634210	511
	6	61	2	0.20	0.9°	4.33	9.62	12.25	13.16	14.22	X6736210	501
	3	60	2	0.20	0°	12.09	12.49	12.92	13.88	-	D5766210	525
	3	60	2	0.20	0°	12.09	12.49	12.92	13.88	-	M5756210	523
	6	61	2	0.20	0°	12.09	12.49	12.92	13.88	15.00	X6536210	499
	6	66	2	0.20	0.9°	4.33	9.62	15.27	16.41	17.73	X6738210	503
	6	69	2	0.20	0.9°	4.33	9.62	18.29	19.65	21.24	X6740210	505
6	75	2	0.20	0.9°	4.33	9.62	22.82	24.52	26.51	X6742210	507	
2.0	3	50	2	0.20	0°	2.30	2.37	2.45	2.63	2.84	D15751140	513
	6	80	2	0.50	0.9°	4.73	10.15	3.38	32.63	35.24	X6742145	507
	6	57	4	0.50	0°	6.09	6.28	6.48	6.94	7.47	P7340140	427
	6	57	2	0.50	0°	6.09	6.28	6.48	6.94	7.47	X6532145	495
	6	57	4	0.50	0°	6.09	6.28	6.48	6.94	7.47	X6632145	509
	6	57	4	0.50	0°	6.09	6.28	6.48	6.94	7.47	X7100140	409
	6	57	4	0.50	0°	6.09	6.28	6.48	6.94	7.47	X7200140	413
	3	50	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	D5762140	517
	3	50	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	M5752140	515
	6	57	4	0.20	0°	6.09	6.29	6.50	6.98	7.54	P7340138	427
	6	57	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	X6532140	495
	6	57	4	0.20	0°	6.09	6.29	6.50	6.98	7.54	X6632140	509
	6	57	4	0.20	0°	6.09	6.29	6.50	6.98	7.54	X7100138	409
	6	61	2	0.50	0°	10.09	10.41	10.76	11.54	12.45	X6534145	497
	6	61	4	0.50	0°	10.09	10.41	10.76	11.54	12.45	X6634145	511
	3	50	2	0.20	0°	10.09	10.42	10.78	11.58	-	D5764140	521
	3	50	2	0.20	0°	10.09	10.42	10.78	11.58	-	M5754140	519
	6	61	2	0.20	0°	10.09	10.42	10.78	11.58	12.52	X6534140	497
	6	61	4	0.20	0°	10.09	10.42	10.78	11.58	12.52	X6634140	511
	6	66	4	0.50	0°	12.09	12.48	12.90	13.84	14.93	P7344140	433
	6	66	4	0.50	0°	12.09	12.48	12.90	13.84	14.93	X7104140	417
	6	66	4	0.50	0°	12.09	12.48	12.90	13.84	14.93	X7204140	421
	6	66	4	0.20	0°	12.09	12.49	12.92	13.88	15.00	P7344138	433
	6	66	4	0.20	0°	12.09	12.49	12.92	13.88	15.00	X7104138	417
6	66	2	0.50	0.9°	4.73	10.15	16.28	17.47	18.86	X6736145	501	
6	66	2	0.20	0.9°	4.73	10.52	16.30	17.51	18.93	X6736140	501	
6	66	2	0.50	0°	16.09	16.62	17.18	18.44	19.90	X6536145	499	
3	60	2	0.20	0°	16.09	16.63	17.20	-	-	D5766140	525	
3	60	2	0.20	0°	16.09	16.63	17.20	-	-	M5756140	523	

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
2.0	6	66	2	0.20	0°	16.09	16.63	17.20	18.48	19.98	X6536140	499
	6	69	2	0.50	0.9°	4.73	10.15	20.31	21.80	23.54	X6738145	503
	6	69	2	0.20	0.9°	4.73	10.52	20.33	21.85	23.61	X6738140	503
	6	75	2	0.50	0.9°	4.73	10.15	24.34	26.13	28.22	X6740145	505
	6	75	2	0.20	0.9°	4.73	10.52	24.36	26.18	28.29	X6740140	505
2.5	6	80	2	0.20	0.9°	4.73	10.52	30.40	32.67	35.31	X6742140	507
	3	50	2	0.20	0°	2.90	2.99	3.10	3.32	3.58	D15751160	513
	6	57	2	0.50	0°	7.77	8.02	8.29	8.88	9.57	X6532165	495
	6	57	4	0.50	0°	7.77	8.02	8.29	8.88	9.57	X6632165	509
	3	50	2	0.20	0°	7.77	8.03	8.31	-	-	D5762160	517
	3	50	2	0.20	0°	7.77	8.03	8.31	-	-	M5752160	515
	6	57	2	0.20	0°	7.77	8.03	8.31	8.92	9.64	X6532160	495
	6	57	4	0.20	0°	7.77	8.03	8.31	8.92	9.64	X6632160	509
	6	61	2	0.50	0°	12.77	13.19	13.64	14.63	15.79	X6534165	497
	6	61	4	0.50	0°	12.77	13.19	13.64	14.63	15.79	X6634165	511
	3	50	2	0.20	0°	12.77	13.20	13.66	-	-	D5764160	521
	3	50	2	0.20	0°	12.77	13.20	13.66	-	-	M5754160	519
	6	61	2	0.20	0°	12.77	13.20	13.66	14.67	15.86	X6534160	497
	6	61	4	0.20	0°	12.77	13.20	13.66	14.67	15.86	X6634160	511
	6	69	2	0.20	0.9°	8.37	18.70	20.53	22.09	23.88	X6736160	501
	6	69	2	0.50	0.9°	8.37	18.32	20.54	22.05	23.80	X6736165	501
	6	69	2	0.50	0°	20.27	20.94	21.66	23.25	25.11	X6536165	499
	6	69	2	0.20	0°	20.27	20.95	21.68	23.30	25.18	X6536160	499
	6	75	2	0.50	0.9°	8.37	18.32	25.57	27.46	29.66	X6738165	503
	6	75	2	0.20	0.9°	8.37	18.70	25.59	27.50	29.73	X6738160	503
	6	80	2	0.50	0.9°	8.37	18.32	30.60	32.87	35.51	X6740165	505
	6	80	2	0.20	0.9°	8.37	18.70	30.63	32.92	35.58	X6740160	505
	6	87	2	0.50	0.9°	8.37	18.32	38.16	40.99	-	X6742165	507
	6	87	2	0.20	0.9°	8.37	18.70	38.18	41.03	-	X6742160	507
	3	60	2	0.20	0°	20.27	20.95	-	-	-	D5766160	525
	3	60	2	0.20	0°	20.27	20.95	-	-	-	M5756160	523
	3.0	6	57	4	0.50	0°	9.27	9.57	9.89	10.60	11.43	P7340180
6		57	2	0.50	0°	9.27	9.57	9.89	10.60	11.43	X6532185	495
6		57	4	0.50	0°	9.27	9.57	9.89	10.60	11.43	X6632185	509
6		57	4	0.50	0°	9.27	9.57	9.89	10.60	11.43	X7100180	409
6		57	4	0.50	0°	9.27	9.57	9.89	10.60	11.43	X7200180	413
6		57	4	0.20	0°	9.27	9.58	9.91	10.65	11.51	P7340178	427
6		57	2	0.20	0°	9.27	9.58	9.91	10.65	11.51	X6532180	495
6		57	4	0.20	0°	9.27	9.58	9.91	10.65	11.51	X6632180	509
6		57	4	0.20	0°	9.27	9.58	9.91	10.65	11.51	X7100178	409
6		57	4	0.50	0°	14.27	14.74	15.24	16.35	17.65	P5250180	425
6		66	2	0.50	0°	15.27	15.77	16.31	17.50	18.89	X6534185	497
6		66	4	0.50	0°	15.27	15.77	16.31	17.50	18.89	X6634185	511
6		66	2	0.20	0°	15.27	15.78	16.33	17.55	18.96	X6534180	497
6		66	4	0.20	0°	15.27	15.78	16.33	17.55	18.96	X6634180	511
6		66	4	0.50	0°	18.27	18.88	19.52	20.95	22.62	P7344180	433
6		66	4	0.50	0°	18.27	18.88	19.52	20.95	22.62	X7104180	417
6		66	4	0.50	0°	18.27	18.88	19.52	20.95	22.62	X7204180	421
6		66	4	0.20	0°	18.27	18.89	19.54	21.00	22.69	P7344178	433
6		66	4	0.20	0°	18.27	18.89	19.54	21.00	22.69	X7104178	417
6		75	2	0.50	0.9°	8.77	19.22	24.59	26.40	28.51	X6736185	501
6		75	2	0.20	0.9°	8.77	19.60	24.61	26.45	28.59	X6736180	501
6		75	2	0.50	0°	24.27	25.08	25.94	27.85	-	X6536185	499
6		75	2	0.20	0°	24.27	25.09	25.96	28.90	-	X6536180	499
6	75	2	0.50	0.9°	8.77	19.22	30.63	32.90	-	X6738185	503	
6	75	2	0.20	0.9°	8.77	19.60	30.65	32.94	-	X6738180	503	
6	87	2	0.50	0.9°	8.77	19.22	36.67	39.39	-	X6740185	505	

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
3.0	6	87	2	0.20	0.9°	8.77	19.60	36.69	39.44	-	X6740180	505
	6	100	2	0.50	0.9°	8.77	19.22	45.74	-	-	X6742185	507
	6	100	2	0.20	0.9°	8.77	19.60	45.76	-	-	X6742180	507
	3	50	2	0.20	0°	3.50	-	-	-	-	D15751180	513
	3	50	2	0.20	0°	8.90	-	-	-	-	D5762180	517
	3	50	2	0.20	0°	8.90	-	-	-	-	M5752180	515
	3	50	2	0.20	0°	14.90	-	-	-	-	D5764180	521
	3	50	2	0.20	0°	14.90	-	-	-	-	M5754180	519
	3	60	2	0.20	0°	23.90	-	-	-	-	D5766180	525
	3	60	2	0.20	0°	23.90	-	-	-	-	M5756180	523
4.0	6	80	2	1.00	0°	12.46	12.85	13.27	14.20	15.28	31410220	453
	6	57	4	1.00	0°	12.46	12.85	13.27	14.20	15.28	P7340222	429
	6	57	4	1.00	0°	12.46	12.85	13.27	14.20	15.28	X7100222	411
	6	57	4	1.00	0°	12.46	12.85	13.27	14.20	15.28	X7200218	415
	6	80	2	0.50	0°	12.46	12.87	13.30	14.27	15.40	31420220	451
	6	57	4	0.50	0°	12.46	12.87	13.30	14.27	15.40	P7340220	427
	6	57	4	0.50	0°	12.46	12.87	13.30	14.27	15.40	X7100220	409
	6	57	4	0.50	0°	12.46	12.87	13.30	14.27	15.40	X7200220	413
	6	57	4	0.20	0°	12.46	12.88	13.32	14.31	15.47	P7340218	427
	6	57	4	0.20	0°	12.46	12.88	13.32	14.31	15.47	X7100218	409
	6	57	4	0.50	0°	16.46	17.00	17.58	18.87	-	P5250220	425
	6	69	4	1.00	0°	24.46	25.25	26.10	27.99	-	P7344222	435
	6	69	4	1.00	0°	24.46	25.25	26.10	27.99	30.20	X7104222	419
	6	69	4	1.00	0°	24.46	25.25	26.10	27.99	30.20	X7204218	423
	6	69	4	0.50	0°	24.46	25.27	26.14	28.07	-	P7344220	433
	6	69	4	0.50	0°	24.46	25.27	26.14	28.07	-	X7104220	417
	6	69	4	0.50	0°	24.46	25.27	26.14	28.07	-	X7204220	421
	6	69	4	0.20	0°	24.46	25.28	26.16	28.11	-	P7344218	433
	6	69	4	0.20	0°	24.46	25.28	26.16	28.11	-	X7104218	417
5.0	6	80	2	1.25	0°	15.65	16.14	16.66	-	-	31410260	453
	6	57	4	1.00	0°	15.65	16.14	16.67	-	-	P7340262	429
	6	57	4	1.00	0°	15.65	16.14	16.67	17.86	19.24	X7100262	411
	6	57	4	1.00	0°	15.65	16.14	16.67	17.86	19.24	X7200258	415
	6	80	2	0.50	0°	15.65	16.16	16.71	-	-	31420260	451
	6	57	4	0.50	0°	15.65	16.16	16.71	-	-	P7340260	427
	6	57	4	0.50	0°	15.65	16.16	16.71	17.93	19.36	X7100260	409
	6	57	4	0.50	0°	15.65	16.16	16.71	17.93	19.36	X7200260	413
	6	57	4	0.20	0°	15.65	16.17	16.73	-	-	P7340258	427
	6	57	4	0.20	0°	15.65	16.17	16.73	-	-	X7100258	409
	6	57	4	0.50	0°	18.65	19.26	19.92	-	-	P5250260	425
	6	75	4	0.20	0°	30.65	31.68	-	-	-	P7344258	433
	6	75	4	0.50	0°	30.65	31.67	-	-	-	P7344260	433
	6	75	4	1.00	0°	30.65	31.65	-	-	-	P7344262	435
	6	75	4	0.20	0°	30.65	31.68	-	-	-	X7104258	417
	6	75	4	0.50	0°	30.65	31.67	-	-	-	X7104260	417
	6	75	4	1.00	0°	30.65	31.65	-	-	-	X7104262	419
	6	75	4	1.00	0°	30.65	31.65	-	-	-	X7204258	423
	6	75	4	0.50	0°	30.65	31.67	-	-	-	X7204260	421
6.0	6	80	2	1.50	0°	19.90	-	-	-	-	31410300	453
	6	80	2	0.50	0°	19.90	-	-	-	-	31420300	451
	6	57	6	0.50	0°	19.90	-	-	-	-	P5250297	425
	6	57	6	0.80	0°	19.90	-	-	-	-	P5250300	425
	6	57	4	0.20	0°	19.90	-	-	-	-	P7340297	427
	6	57	4	0.50	0°	19.90	-	-	-	-	P7340300	427
	6	57	4	1.00	0°	19.90	-	-	-	-	P7340302	429
	6	57	4	0.20	0°	19.90	-	-	-	-	X7100297	409
	6	57	4	0.50	0°	19.90	-	-	-	-	X7100300	409

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
5.0	6	57	4	1.00	0°	19.90	-	-	-	-	X7100302	411
	6	57	4	1.00	0°	19.90	-	-	-	-	X7200293	415
	6	57	4	0.50	0°	19.90	-	-	-	-	X7200295	413
	6	57	6	1.00	0°	19.90	-	-	-	-	X7200297	415
	6	57	6	0.50	0°	19.90	-	-	-	-	X7200300	413
	6	70	4	0.80	0°	32.90	-	-	-	-	P5252300	431
	6	80	4	0.20	0°	42.90	-	-	-	-	P7344297	433
	6	80	4	0.50	0°	42.90	-	-	-	-	P7344300	433
	6	80	4	1.00	0°	42.90	-	-	-	-	P7344302	435
	6	80	4	0.20	0°	42.90	-	-	-	-	X7104297	417
	6	80	4	0.50	0°	42.90	-	-	-	-	X7104300	417
	6	80	4	1.00	0°	42.90	-	-	-	-	X7104302	419
	6	80	4	1.00	0°	42.90	-	-	-	-	X7204293	423
	6	80	4	0.50	0°	42.90	-	-	-	-	X7204295	421
	6	80	6	1.00	0°	42.90	-	-	-	-	X7204297	423
	6	80	6	0.50	0°	42.90	-	-	-	-	X7204300	421
8.0	8	100	2	2.00	0°	25.90	-	-	-	-	31410391	453
	8	100	2	0.50	0°	25.90	-	-	-	-	31420391	451
	8	63	6	0.50	0°	25.90	-	-	-	-	P5250388	425
	8	63	6	1.00	0°	25.90	-	-	-	-	P5250391	425
	8	63	4	0.20	0°	25.90	-	-	-	-	P7340385	427
	8	63	4	0.50	0°	25.90	-	-	-	-	P7340388	427
	8	63	4	1.00	0°	25.90	-	-	-	-	P7340391	429
	8	63	4	0.20	0°	25.90	-	-	-	-	X7100385	409
	8	63	4	0.50	0°	25.90	-	-	-	-	X7100388	409
	8	63	4	1.00	0°	25.90	-	-	-	-	X7100391	411
	8	63	4	2.00	0°	25.90	-	-	-	-	X7100395	411
	8	63	4	1.00	0°	25.90	-	-	-	-	X7200384	415
	8	63	4	0.50	0°	25.90	-	-	-	-	X7200386	413
	8	63	6	1.00	0°	25.90	-	-	-	-	X7200388	415
	8	63	6	0.50	0°	25.90	-	-	-	-	X7200391	413
	8	80	4	1.00	0°	42.90	-	-	-	-	P5252391	431
	8	90	4	0.20	0°	52.90	-	-	-	-	P7344385	433
	8	90	4	0.50	0°	52.90	-	-	-	-	P7344388	433
	8	90	4	1.00	0°	52.90	-	-	-	-	P7344391	435
	8	90	4	0.20	0°	52.90	-	-	-	-	X7104385	417
	8	90	4	0.50	0°	52.90	-	-	-	-	X7104388	417
	8	90	4	1.00	0°	52.90	-	-	-	-	X7104391	419
	8	90	4	2.00	0°	52.90	-	-	-	-	X7104395	419
	8	90	4	1.00	0°	52.90	-	-	-	-	X7204384	423
	8	90	4	0.50	0°	52.90	-	-	-	-	X7204386	421
	8	90	6	1.00	0°	52.90	-	-	-	-	X7204388	423
	8	90	6	0.50	0°	52.90	-	-	-	-	X7204391	421
10.0	10	100	2	2.50	0°	30.90	-	-	-	-	31410450	453
	10	100	2	0.50	0°	30.90	-	-	-	-	31420450	451
	10	72	6	0.50	0°	30.90	-	-	-	-	P5250445	425
	10	72	6	1.00	0°	30.90	-	-	-	-	P5250450	425
	10	72	4	0.20	0°	30.90	-	-	-	-	P7340445	427
	10	72	4	0.50	0°	30.90	-	-	-	-	P7340448	427
	10	72	4	1.00	0°	30.90	-	-	-	-	P7340450	429
	10	72	4	1.50	0°	30.90	-	-	-	-	P7340453	429
	10	72	4	0.20	0°	30.90	-	-	-	-	X7100445	409
	10	72	4	0.50	0°	30.90	-	-	-	-	X7100448	409
	10	72	4	1.00	0°	30.90	-	-	-	-	X7100450	411
	10	72	4	2.00	0°	30.90	-	-	-	-	X7100455	411
	10	72	4	1.00	0°	30.90	-	-	-	-	X7200435	415
	10	72	4	0.50	0°	30.90	-	-	-	-	X7200440	413

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
10.0	10	72	6	1.00	0°	30.90	-	-	-	-	X7200445	415
	10	72	6	0.50	0°	30.90	-	-	-	-	X7200450	413
	10	84	4	1.00	0°	42.90	-	-	-	-	P5252450	431
	10	105	4	0.20	0°	63.90	-	-	-	-	P7344445	433
	10	105	4	0.50	0°	63.90	-	-	-	-	P7344448	433
	10	105	4	1.00	0°	63.90	-	-	-	-	P7344450	435
	10	105	4	0.20	0°	63.90	-	-	-	-	X7104445	417
	10	105	4	0.50	0°	63.90	-	-	-	-	X7104448	417
	10	105	4	1.00	0°	63.90	-	-	-	-	X7104450	419
	10	105	4	2.00	0°	63.90	-	-	-	-	X7104455	419
	10	105	4	1.00	0°	63.90	-	-	-	-	X7204435	423
	10	105	4	0.50	0°	63.90	-	-	-	-	X7204440	421
	10	105	6	1.00	0°	63.90	-	-	-	-	X7204445	423
	10	105	6	0.50	0°	63.90	-	-	-	-	X7204450	421
12.0	12	120	2	3.00	0°	36.90	-	-	-	-	31410501	453
	12	120	2	0.50	0°	36.90	-	-	-	-	31420501	451
	12	83	6	0.50	0°	36.90	-	-	-	-	P5250496	425
	12	83	6	1.50	0°	36.90	-	-	-	-	P5250501	425
	12	83	4	0.20	0°	36.90	-	-	-	-	P7340496	427
	12	83	4	0.50	0°	36.90	-	-	-	-	P7340498	427
	12	83	4	1.00	0°	36.90	-	-	-	-	P7340501	429
	12	83	4	1.50	0°	36.90	-	-	-	-	P7340503	429
	12	83	4	0.20	0°	36.90	-	-	-	-	X7100496	409
	12	83	4	0.50	0°	36.90	-	-	-	-	X7100498	409
	12	83	4	1.00	0°	36.90	-	-	-	-	X7100501	411
	12	83	4	2.00	0°	36.90	-	-	-	-	X7100505	411
	12	83	4	1.00	0°	36.90	-	-	-	-	X7200486	415
	12	83	4	0.50	0°	36.90	-	-	-	-	X7200491	413
	12	83	6	1.00	0°	36.90	-	-	-	-	X7200496	415
	12	83	6	0.50	0°	36.90	-	-	-	-	X7200501	413
	12	97	6	1.50	0°	50.90	-	-	-	-	P5252501	431
	12	120	4	0.20	0°	73.90	-	-	-	-	P7344496	433
	12	120	4	0.50	0°	73.90	-	-	-	-	P7344498	433
	12	120	4	1.00	0°	73.90	-	-	-	-	P7344501	435
	12	120	4	0.20	0°	73.90	-	-	-	-	X7104496	417
	12	120	4	0.50	0°	73.90	-	-	-	-	X7104498	417
	12	120	4	1.00	0°	73.90	-	-	-	-	X7104501	419
	12	120	4	2.00	0°	73.90	-	-	-	-	X7104505	419
	12	120	4	1.00	0°	73.90	-	-	-	-	X7204486	423
	12	120	4	0.50	0°	73.90	-	-	-	-	X7204491	421
	12	120	6	1.00	0°	73.90	-	-	-	-	X7204496	423
	12	120	6	0.50	0°	73.90	-	-	-	-	X7204501	421
16.0	16	92	6	0.50	0°	42.90	-	-	-	-	X7200606	413
	16	92	6	1.00	0°	42.90	-	-	-	-	X7200608	415
	16	92	6	1.50	0°	42.90	-	-	-	-	P5250610	425
	16	92	4	2.00	0°	42.90	-	-	-	-	P7340611	429
	16	115	6	1.50	0°	65.90	-	-	-	-	P5252610	431
	16	135	6	0.50	0°	85.90	-	-	-	-	X7204606	421
	16	135	6	0.10	0°	85.90	-	-	-	-	X7204608	423



Materiale

Acciaio da utensile temprato 52 - 56 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	200	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	200	0.030	0.07	0.07	1.84	34600	2075	45°
3	2	200	0.035	0.10	0.10	2.74	23235	1625	45°
4	2	200	0.065	0.12	0.12	3.62	17585	2285	45°
5	2	200	0.070	0.15	0.15	4.53	14055	1970	45°
6	2	200	0.075	0.15	0.15	5.36	11880	1780	45°
8	2	200	0.085	0.17	0.17	7.05	9030	1535	45°
10	2	200	0.090	0.20	0.20	8.77	7260	1305	45°
12	2	200	0.095	0.25	0.25	10.56	6030	1145	45°

Acciaio da utensile temprato 56 - 60 HRC

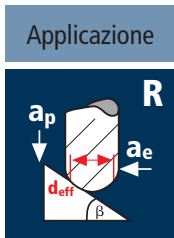
1	2	150	0.025	0.05	0.05	0.94	50795	2540	45°
2	2	150	0.030	0.07	0.07	1.84	29590	1555	45°
3	2	150	0.035	0.10	0.10	2.74	17425	1220	45°
4	2	150	0.060	0.12	0.12	3.62	13190	1585	45°
5	2	150	0.065	0.15	0.15	4.53	10540	1370	45°
6	2	150	0.070	0.15	0.15	5.36	8910	1245	45°
8	2	150	0.080	0.17	0.17	7.05	6775	1085	45°
10	2	150	0.085	0.20	0.20	8.77	5445	925	45°
12	2	150	0.090	0.25	0.25	10.56	4520	815	45°

Acciaio da utensile temprato 60 - 64 HRC

1	2	90	0.020	0.04	0.04	0.93	30805	1230	45°
2	2	90	0.025	0.06	0.06	1.80	15915	795	45°
3	2	90	0.030	0.08	0.08	2.68	10690	640	45°
4	2	90	0.050	0.09	0.09	3.54	8095	810	45°
5	2	90	0.055	0.12	0.12	4.43	6465	710	45°
6	2	90	0.060	0.12	0.12	5.24	5465	655	45°
8	2	90	0.070	0.13	0.13	6.90	4150	580	45°
10	2	90	0.070	0.15	0.15	8.58	3340	470	45°
12	2	90	0.075	0.19	0.19	10.34	2770	415	45°

Acciaio da utensile temprato 64 - 70 HRC

1	2	60	0.015	0.03	0.03	0.89	21460	645	45°
2	2	60	0.020	0.04	0.04	1.74	10975	440	45°
3	2	60	0.020	0.05	0.05	2.59	7375	295	45°
4	2	60	0.035	0.06	0.06	3.43	5570	390	45°
5	2	60	0.040	0.08	0.08	4.29	4450	355	45°
6	2	60	0.040	0.08	0.08	5.08	3760	300	45°
8	2	60	0.050	0.09	0.09	6.70	2850	285	45°
10	2	60	0.050	0.10	0.10	8.34	2290	230	45°
12	2	60	0.055	0.13	0.13	10.03	1905	210	45°



Materiale

Acciaio da utensile temprato 52 - 56 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	130	0.045	0.12	0.12	0.94	44025	3960	30°
2	2	130	0.070	0.24	0.24	1.89	21895	3065	30°
3	2	130	0.075	0.36	0.36	2.83	14620	2195	30°
4	2	130	0.090	0.48	0.48	3.77	10975	1975	30°
5	2	130	0.100	0.60	0.60	4.71	8785	1755	30°
6	2	130	0.110	0.72	0.72	5.66	7310	1610	30°
8	2	130	0.125	0.96	0.96	7.54	5490	1375	30°
10	2	130	0.145	1.10	1.10	9.32	4440	1290	30°
12	2	130	0.155	1.20	1.20	11.04	3750	1165	30°

Acciaio da utensile temprato 56 - 60 HRC

1	2	80	0.025	0.10	0.10	0.92	27680	1385	30°
2	2	80	0.040	0.19	0.19	1.83	13915	1115	30°
3	2	80	0.045	0.29	0.29	2.75	9260	835	30°
4	2	80	0.055	0.38	0.38	3.65	6975	765	30°
5	2	80	0.060	0.48	0.48	4.57	5570	670	30°
6	2	80	0.065	0.58	0.58	5.49	4640	605	30°
8	2	80	0.075	0.77	0.77	7.32	3480	520	30°
10	2	80	0.085	0.88	0.88	9.03	2820	480	30°
12	2	80	0.095	0.96	0.96	10.68	2385	455	30°

Acciaio da utensile temprato 60 - 64 HRC

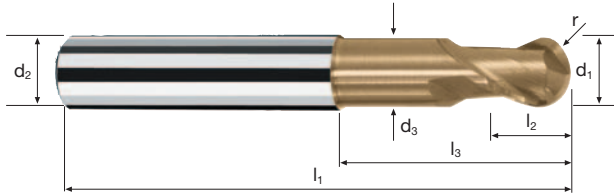
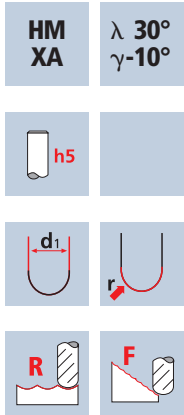
1	2	60	0.020	0.08	0.08	0.89	21460	860	30°
2	2	60	0.030	0.14	0.14	1.74	10975	660	30°
3	2	60	0.035	0.22	0.22	2.63	7260	510	30°
4	2	60	0.040	0.29	0.29	3.51	5440	435	30°
5	2	60	0.045	0.36	0.36	4.38	4360	390	30°
6	2	60	0.050	0.43	0.43	5.25	3640	365	30°
8	2	60	0.055	0.58	0.58	7.01	2725	300	30°
10	2	60	0.065	0.66	0.66	8.64	2210	285	30°
12	2	60	0.070	0.72	0.72	10.22	1870	260	30°

Acciaio da utensile temprato 64 - 70 HRC

1	2	40	0.020	0.08	0.08	0.89	14305	570	30°
2	2	40	0.030	0.14	0.14	1.74	7320	440	30°
3	2	40	0.035	0.22	0.22	2.63	4840	340	30°
4	2	40	0.040	0.29	0.29	3.51	3630	290	30°
5	2	40	0.045	0.36	0.36	4.38	2905	260	30°
6	2	40	0.050	0.43	0.43	5.25	2425	245	30°
8	2	40	0.055	0.58	0.58	7.01	1815	200	30°
10	2	40	0.065	0.66	0.66	8.64	1475	190	30°
12	2	40	0.070	0.72	0.72	10.22	1245	175	30°

Frese con estremità emisferica Sphero-X

Tolleranza r ± 0.005 , 3xd

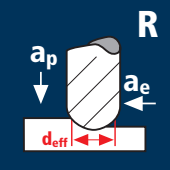
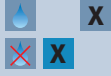





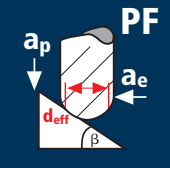




new!



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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Esempio: N° Ordine		Rivestimento V	Articolo 7470	Codice-Ø .100						DURO-V	
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	V7470	
.100	1	6	0.95	57	1.5	3	0.5	11.8°	2	●	
.140	2	6	1.90	57	3.0	6	1.0	9.0°	2	●	
.180	3	6	2.80	57	4.0	9	1.5	6.4°	2	●	
.220	4	6	3.70	57	5.0	12	2.0	4.0°	2	●	
.260	5	6	4.60	57	6.0	15	2.5	2.0°	2	●	
.300	6	6	5.50	57	7.0	20	3.0	0.0°	2	●	
.391	8	8	7.40	63	9.0	26	4.0	0.0°	2	●	
.450	10	10	9.20	72	11.0	31	5.0	0.0°	2	●	
.501	12	12	11.00	83	13.0	37	6.0	0.0°	2	●	
.610	16	16	15.00	92	17.0	43	8.0	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Acciaio da utensile temprato 42 - 48 HRC 	1	2	160	0.040	0.18	0.40	0.77	60000	4800	0.35	
		2	2	160	0.065	0.35	0.80	1.52	33505	4355	1.20	
		3	2	160	0.075	0.53	1.20	2.29	22240	3335	2.10	
		4	2	160	0.090	0.70	1.60	3.04	16755	3015	3.40	
		5	2	160	0.100	0.88	2.00	3.81	13370	2675	4.70	
		6	2	160	0.110	1.26	2.40	4.89	10415	2290	6.90	
		8	2	160	0.125	1.68	3.20	6.52	7810	1955	10.50	
		10	2	160	0.145	2.10	4.00	8.15	6250	1810	15.20	
		12	2	160	0.150	2.52	4.80	9.78	5210	1565	18.95	
		Acciaio da utensile temprato 48 - 52 HRC 	1	2	130	0.035	0.18	0.40	0.77	53740	3760	0.25
			2	2	130	0.060	0.35	0.80	1.52	27225	3265	0.90
			3	2	130	0.070	0.53	1.20	2.29	18070	2530	1.60
4	2		130	0.085	0.70	1.60	3.04	13610	2315	2.60		
5	2		130	0.090	0.88	2.00	3.81	10860	1955	3.45		
6	2		130	0.100	1.26	2.40	4.89	8460	1690	5.10		
8	2		130	0.115	1.68	3.20	6.52	6345	1460	7.85		
10	2		130	0.135	2.10	4.00	8.15	5075	1370	11.50		
12	2		130	0.140	2.52	4.80	9.78	4230	1185	14.35		
Acciaio da utensile temprato 52 - 56 HRC 	1		2	110	0.035	0.18	0.40	0.77	45475	3185	0.25	
	2		2	110	0.055	0.35	0.80	1.52	23035	2535	0.70	
	3		2	110	0.065	0.53	1.20	2.29	15290	1990	1.25	
	4	2	110	0.075	0.70	1.60	3.04	11520	1730	1.95		
	5	2	110	0.085	0.88	2.00	3.81	9190	1560	2.75		
	6	2	110	0.095	1.26	2.40	4.89	7160	1360	4.10		
	8	2	110	0.105	1.68	3.20	6.52	5370	1130	6.05		
	10	2	110	0.125	2.10	4.00	8.15	4295	1075	9.05		
	12	2	110	0.130	2.52	4.80	9.78	3580	930	11.25		
	Acciaio da utensile temprato 56 - 60 HRC 	1	2	50	0.015	0.14	0.30	0.69	23065	690	0.05	
		2	2	50	0.025	0.27	0.60	1.37	11615	580	0.10	
		3	2	50	0.030	0.41	0.90	2.06	7725	465	0.15	
4		2	50	0.035	0.42	0.96	2.45	6495	455	0.20		
5		2	50	0.040	0.53	0.90	3.08	5170	415	0.20		
6		2	50	0.045	0.76	0.72	3.99	3990	360	0.20		
8		2	50	0.050	1.01	0.96	5.31	2995	300	0.30		
10		2	50	0.060	1.26	1.20	6.64	2395	285	0.45		
12		2	50	0.060	1.51	1.44	7.96	2000	240	0.50		

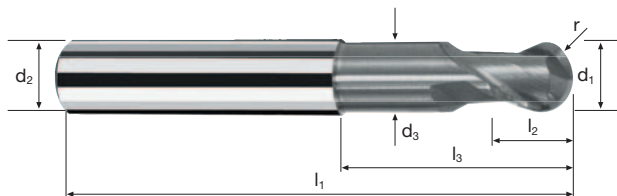
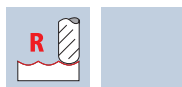
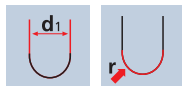
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]	
	Acciaio da utensile temprato 42 - 48 HRC 	1	2	200	0.055	0.12	0.12	1.00	60000	6600	45°	
		2	2	200	0.095	0.24	0.24	1.99	31990	6080	45°	
		3	2	200	0.105	0.36	0.36	2.99	21290	4470	45°	
		4	2	200	0.125	0.48	0.48	3.99	15955	3990	45°	
		5	2	200	0.140	0.60	0.60	4.98	12785	3580	45°	
		6	2	200	0.155	0.72	0.72	5.98	10645	3300	45°	
		8	2	200	0.170	0.96	0.96	7.98	7980	2715	45°	
		10	2	200	0.200	1.20	1.20	9.97	6385	2555	45°	
		12	2	200	0.210	1.44	1.44	11.96	5325	2235	45°	
		Acciaio da utensile temprato 48 - 52 HRC 	1	2	160	0.050	0.12	0.12	1.00	50930	5095	45°
			2	2	160	0.085	0.15	0.15	1.95	26120	4440	45°
			3	2	160	0.095	0.18	0.18	2.87	17745	3370	45°
4	2		160	0.115	0.20	0.20	3.78	13475	3100	45°		
5	2		160	0.130	0.25	0.25	4.72	10790	2805	45°		
6	2		160	0.145	0.30	0.30	5.67	8985	2605	45°		
8	2		160	0.155	0.40	0.40	7.56	6735	2090	45°		
10	2		160	0.185	0.50	0.50	9.45	5390	1995	45°		
12	2		160	0.195	0.60	0.60	11.34	4490	1750	45°		
Acciaio da utensile temprato 52 - 56 HRC 	1		2	120	0.045	0.12	0.12	1.00	38200	3440	45°	
	2		2	120	0.080	0.15	0.15	1.95	19590	3135	45°	
	3		2	120	0.090	0.18	0.18	2.87	13310	2395	45°	
	4	2	120	0.105	0.20	0.20	3.78	11010	2120	45°		
	5	2	120	0.120	0.25	0.25	4.72	8095	1945	45°		
	6	2	120	0.130	0.30	0.30	5.67	6735	1750	45°		
	8	2	120	0.145	0.40	0.40	7.56	5055	1465	45°		
	10	2	120	0.170	0.50	0.50	9.45	4040	1375	45°		
	12	2	120	0.180	0.60	0.60	11.34	3370	1215	45°		
	Acciaio da utensile temprato 56 - 60 HRC 	1	2	90	0.040	0.10	0.10	0.99	28940	2315	45°	
		2	2	90	0.070	0.12	0.12	1.92	14920	2090	45°	
		3	2	90	0.080	0.14	0.14	2.82	10160	1625	45°	
4		2	90	0.095	0.16	0.16	3.71	7720	1465	45°		
5		2	90	0.105	0.20	0.20	4.64	6175	1295	45°		
6		2	90	0.115	0.24	0.24	5.57	5145	1185	45°		
8		2	90	0.130	0.32	0.32	7.42	3860	1005	45°		
10		2	90	0.150	0.40	0.40	9.28	3085	925	45°		
12		2	90	0.160	0.48	0.48	11.13	2575	825	45°		

Frese con estremità emisferica Sphero-XR

Tolleranza r ± 0.005 , 3xd

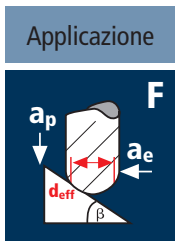


HM
XT λ **30°**
 γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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Esempio: N° Ordine										X-AL
										X7420
										X7420
Ø Code	d1 *	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.100	1	6	0.95	57	1.5	3	0.5	11.8°	2	●
.140	2	6	1.90	57	3.0	6	1.0	9.0°	2	●
.180	3	6	2.80	57	4.0	9	1.5	6.4°	2	●
.220	4	6	3.70	57	5.0	12	2.0	4.0°	2	●
.260	5	6	4.60	57	6.0	15	2.5	2.0°	2	●
.300	6	6	5.50	57	7.0	20	3.0	0.0°	2	●
.391	8	8	7.40	63	9.0	26	4.0	0.0°	2	●
.450	10	10	9.20	72	11.0	31	5.0	0.0°	2	●
.501	12	12	11.00	83	13.0	37	6.0	0.0°	2	●
* Tolleranza diametro del tagliente										
d1	Tolleranza									
< 6	0/-0.010									
≥ 6	0/-0.015									



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	300	0.030	0.05	0.05	0.94	60000	3600	45°
2	2	300	0.035	0.07	0.07	1.84	51900	3635	45°
3	2	300	0.040	0.10	0.10	2.74	34850	2790	45°
4	2	300	0.070	0.12	0.12	3.62	26380	3695	45°
5	2	300	0.080	0.15	0.15	4.53	21080	3375	45°
6	2	300	0.085	0.15	0.15	5.36	17815	3030	45°
8	2	300	0.095	0.17	0.17	7.05	13545	2575	45°
10	2	300	0.100	0.20	0.20	8.77	10890	2180	45°
12	2	300	0.105	0.25	0.25	10.56	9045	1900	45°

Acciaio da utensile temprato 48 - 52 HRC

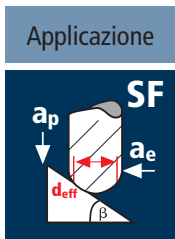
1	2	250	0.030	0.05	0.05	0.94	60000	3600	45°
2	2	250	0.035	0.07	0.07	1.84	43250	3030	45°
3	2	250	0.040	0.10	0.10	2.74	29045	2325	45°
4	2	250	0.065	0.12	0.12	3.62	21985	2860	45°
5	2	250	0.075	0.15	0.15	4.53	17565	2635	45°
6	2	250	0.080	0.15	0.15	5.36	14845	2375	45°
8	2	250	0.090	0.17	0.17	7.05	11290	2030	45°
10	2	250	0.095	0.20	0.20	8.77	9075	1725	45°
12	2	250	0.100	0.25	0.25	10.56	7535	1505	45°

Acciaio da utensile temprato 52 - 56 HRC

1	2	200	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	200	0.030	0.07	0.07	1.84	34600	2075	45°
3	2	200	0.035	0.10	0.10	2.74	23235	1625	45°
4	2	200	0.065	0.12	0.12	3.62	17585	2285	45°
5	2	200	0.070	0.15	0.15	4.53	14055	1970	45°
6	2	200	0.075	0.15	0.15	5.36	11880	1780	45°
8	2	200	0.085	0.17	0.17	7.05	9030	1535	45°
10	2	200	0.090	0.20	0.20	8.77	7260	1305	45°
12	2	200	0.095	0.25	0.25	10.56	6030	1145	45°

Acciaio da utensile temprato 56 - 60 HRC

1	2	150	0.025	0.05	0.05	0.94	50795	2540	45°
2	2	150	0.030	0.07	0.07	1.84	25950	1555	45°
3	2	150	0.035	0.10	0.10	2.74	17425	1220	45°
4	2	150	0.060	0.12	0.12	3.62	13190	1585	45°
5	2	150	0.070	0.15	0.15	4.53	10540	1475	45°
6	2	150	0.070	0.15	0.15	5.36	8910	1245	45°
8	2	150	0.080	0.17	0.17	7.05	6775	1085	45°
10	2	150	0.085	0.20	0.20	8.77	5445	925	45°
12	2	150	0.090	0.25	0.25	10.56	4520	815	45°



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	400	0.025	0.02	0.02	0.88	60000	3000	45°
2	2	400	0.030	0.02	0.02	1.67	60000	3600	45°
3	2	400	0.035	0.03	0.03	2.50	50930	3565	45°
4	2	400	0.050	0.03	0.03	3.27	38940	3895	45°
5	2	400	0.055	0.03	0.03	4.04	31515	3465	45°
6	2	400	0.060	0.03	0.03	4.80	26525	3185	45°
8	2	400	0.065	0.03	0.03	6.31	20180	2625	45°
10	2	400	0.070	0.04	0.04	7.91	16095	2255	45°
12	2	400	0.075	0.04	0.04	9.41	13530	2030	45°

Acciaio da utensile temprato 48 - 52 HRC

1	2	350	0.025	0.02	0.02	0.88	60000	3000	45°
2	2	350	0.030	0.02	0.02	1.67	60000	3600	45°
3	2	350	0.035	0.03	0.03	2.50	44565	3120	45°
4	2	350	0.050	0.03	0.03	3.27	34070	3405	45°
5	2	350	0.050	0.03	0.03	4.04	27575	2760	45°
6	2	350	0.055	0.03	0.03	4.80	23210	2555	45°
8	2	350	0.060	0.03	0.03	6.31	17655	2120	45°
10	2	350	0.065	0.04	0.04	7.91	14085	1830	45°
12	2	350	0.070	0.04	0.04	9.41	11840	1660	45°

Acciaio da utensile temprato 52 - 56 HRC

1	2	280	0.025	0.02	0.02	0.88	60000	3000	45°
2	2	280	0.025	0.02	0.02	1.67	53370	2670	45°
3	2	280	0.030	0.03	0.03	2.50	35650	2140	45°
4	2	280	0.045	0.03	0.03	3.27	27255	2455	45°
5	2	280	0.050	0.03	0.03	4.04	22060	2205	45°
6	2	280	0.055	0.03	0.03	4.80	18570	2045	45°
8	2	280	0.060	0.03	0.03	6.31	14125	1695	45°
10	2	280	0.065	0.04	0.04	7.91	11270	1465	45°
12	2	280	0.070	0.04	0.04	9.41	9470	1325	45°

Acciaio da utensile temprato 56 - 60 HRC

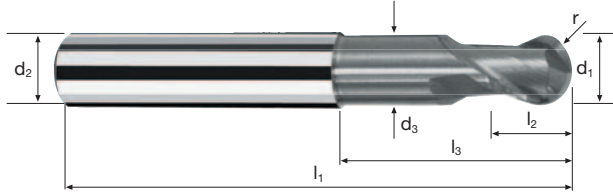
1	2	180	0.020	0.02	0.02	0.88	60000	2400	45°
2	2	180	0.025	0.02	0.02	1.67	34310	1715	45°
3	2	180	0.030	0.03	0.03	2.50	22920	1375	45°
4	2	180	0.045	0.03	0.03	3.27	17520	1575	45°
5	2	180	0.045	0.03	0.03	4.04	14185	1275	45°
6	2	180	0.050	0.03	0.03	4.80	11935	1195	45°
8	2	180	0.055	0.03	0.03	6.31	9080	1000	45°
10	2	180	0.060	0.04	0.04	7.91	7245	870	45°
12	2	180	0.065	0.04	0.04	9.41	6090	790	45°

Frese con estremità emisferica Sphero-XF

Tolleranza r ± 0.005 , 3xd

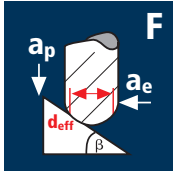






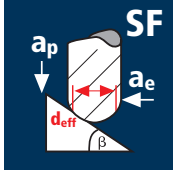




**HM
XA** λ **30°**
 γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	Copper
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Esempio: N° Ordine										Rivestimento		Articolo		Codice-ø		X-AL	
										X		7400		.100		X7400	
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ± 0.005	α	z								
.100	1	6	0.95	57	1.5	3	0.5	11.8°	2								
.140	2	6	1.90	57	3.0	6	1.0	9.0°	2								
.180	3	6	2.80	57	4.0	9	1.5	6.4°	2								
.220	4	6	3.70	57	5.0	12	2.0	4.0°	2								
.260	5	6	4.60	57	6.0	15	2.5	2.0°	2								
.300	6	6	5.50	57	7.0	20	3.0	0.0°	2								
.391	8	8	7.40	63	9.0	26	4.0	0.0°	2								
.450	10	10	9.20	72	11.0	31	5.0	0.0°	2								
.501	12	12	11.00	83	13.0	37	6.0	0.0°	2								

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 42 - 48 HRC    	6	8	300	0.055	0.12	0.12	5.26	18155	7990	45°
		8	10	300	0.060	0.14	0.14	6.94	13760	8255	45°
		10	12	300	0.065	0.16	0.16	8.62	11080	8640	45°
		12	16	300	0.070	0.18	0.18	10.29	9280	10395	45°
		6	8	250	0.050	0.12	0.12	5.26	15130	6050	45°
		8	10	250	0.055	0.14	0.14	6.94	11465	6305	45°
		10	12	250	0.060	0.16	0.16	8.62	9230	6645	45°
		12	16	250	0.065	0.18	0.18	10.29	7735	8045	45°
		6	8	200	0.050	0.12	0.12	5.26	12105	4840	45°
		8	10	200	0.055	0.14	0.14	6.94	9175	5045	45°
		10	12	200	0.060	0.16	0.16	8.62	7385	5315	45°
		12	16	200	0.065	0.18	0.18	10.29	6185	6430	45°
		6	8	150	0.045	0.12	0.12	5.26	9080	3270	45°
		8	10	150	0.050	0.14	0.14	6.94	6880	3440	45°
		10	12	150	0.055	0.16	0.16	8.62	5540	3655	45°
		12	16	150	0.060	0.18	0.18	10.29	4640	4455	45°

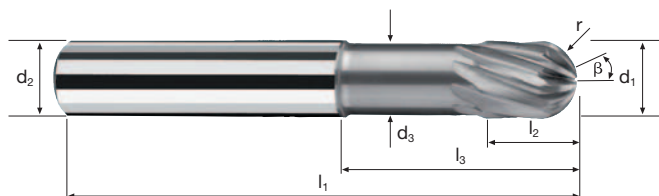
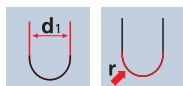
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 42 - 48 HRC    	6	8	400	0.030	0.03	0.03	4.80	26525	6365	45°
		8	10	400	0.035	0.03	0.03	6.31	20180	7065	45°
		10	12	400	0.035	0.04	0.04	7.91	16095	6760	45°
		12	16	400	0.040	0.04	0.04	9.41	13530	8660	45°
		6	8	350	0.030	0.03	0.03	4.80	23210	5570	45°
		8	10	350	0.035	0.03	0.03	6.31	17655	6180	45°
		10	12	350	0.035	0.04	0.04	7.91	14085	5915	45°
		12	16	350	0.040	0.04	0.04	9.41	11840	7580	45°
		6	8	280	0.025	0.03	0.03	4.80	18570	3715	45°
		8	10	280	0.030	0.03	0.03	6.31	14125	4240	45°
		10	12	280	0.030	0.04	0.04	7.91	11270	4055	45°
		12	16	280	0.035	0.04	0.04	9.41	9470	5305	45°
		6	8	180	0.025	0.03	0.03	4.80	11935	2385	45°
		8	10	180	0.030	0.03	0.03	6.31	9080	2725	45°
		10	12	180	0.030	0.04	0.04	7.91	7245	2610	45°
		12	16	180	0.035	0.04	0.04	9.41	6090	3410	45°

Frese con estremità emisferica Sphero-XF Multi

Tolleranza r ± 0.005 , 3xd

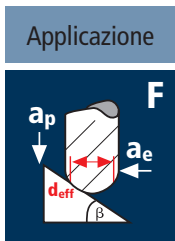


HM λ 30°
XA γ -10°



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	Copper
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Esempio: N° Ordine										X-AL
										X7460
Rivestimento: X Articolo: 7460 Codice-ø: .300										
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	β	z	
.300	6	6	5.5	57	7	20	3.0	25°	8	●
.391	8	8	7.4	63	9	26	4.0	25°	10	●
.450	10	10	9.2	72	11	31	5.0	25°	12	●
.501	12	12	11.0	83	13	37	6.0	25°	16	●



Materiale

Acciaio da utensile temprato 52 - 56 HRC

V

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	200	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	200	0.030	0.07	0.07	1.84	34600	2075	45°
3	2	200	0.035	0.10	0.10	2.74	23235	1625	45°
4	2	200	0.065	0.12	0.12	3.62	17585	2285	45°
5	2	200	0.070	0.15	0.15	4.53	14055	1970	45°
6	2	200	0.075	0.15	0.15	5.36	11880	1780	45°
8	2	200	0.085	0.17	0.17	7.05	9030	1535	45°
10	2	200	0.090	0.20	0.20	8.77	7260	1305	45°
12	2	200	0.095	0.25	0.25	10.56	6030	1145	45°

Acciaio da utensile temprato 56 - 60 HRC

V

1	2	150	0.025	0.05	0.05	0.94	50795	2540	45°
2	2	150	0.030	0.07	0.07	1.84	25950	1555	45°
3	2	150	0.035	0.10	0.10	2.74	17425	1220	45°
4	2	150	0.060	0.12	0.12	3.62	13190	1585	45°
5	2	150	0.065	0.15	0.15	4.53	10540	1370	45°
6	2	150	0.070	0.15	0.15	5.36	8910	1245	45°
8	2	150	0.080	0.17	0.17	7.05	6775	1085	45°
10	2	150	0.085	0.20	0.20	8.77	5445	925	45°
12	2	150	0.090	0.25	0.25	10.56	4520	815	45°

Acciaio da utensile temprato 60 - 64 HRC

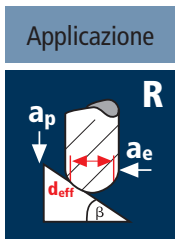
V

1	2	90	0.020	0.04	0.04	0.93	30805	1230	45°
2	2	90	0.025	0.06	0.06	1.80	15915	795	45°
3	2	90	0.030	0.08	0.08	2.68	10690	640	45°
4	2	90	0.050	0.09	0.09	3.54	8095	810	45°
5	2	90	0.055	0.12	0.12	4.43	6465	710	45°
6	2	90	0.060	0.12	0.12	5.24	5465	655	45°
8	2	90	0.070	0.13	0.13	6.90	4150	580	45°
10	2	90	0.070	0.15	0.15	8.58	3340	470	45°
12	2	90	0.075	0.19	0.19	10.34	2770	415	45°

Acciaio da utensile temprato 64 - 70 HRC

V

1	2	60	0.015	0.03	0.03	0.89	21460	645	45°
2	2	60	0.020	0.04	0.04	1.74	10975	440	45°
3	2	60	0.020	0.05	0.05	2.59	7375	295	45°
4	2	60	0.035	0.06	0.06	3.43	5570	390	45°
5	2	60	0.040	0.08	0.08	4.29	4450	355	45°
6	2	60	0.040	0.08	0.08	5.08	3760	300	45°
8	2	60	0.050	0.09	0.09	6.70	2850	285	45°
10	2	60	0.050	0.10	0.10	8.34	2290	230	45°
12	2	60	0.055	0.13	0.13	10.03	1905	210	45°



Materiale

Acciaio da utensile temprato 52 - 56 HRC

V

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	130	0.045	0.10	0.10	0.92	44980	4050	30°
2	2	130	0.070	0.20	0.20	1.84	22490	3150	30°
3	2	130	0.075	0.30	0.30	2.76	14995	2250	30°
4	2	130	0.090	0.40	0.40	3.68	11245	2025	30°
5	2	130	0.100	0.50	0.50	4.60	8995	1800	30°
6	2	130	0.110	0.60	0.60	5.52	7495	1650	30°
8	2	130	0.125	0.80	0.80	7.36	5620	1405	30°
10	2	130	0.145	0.90	0.90	9.06	4565	1325	30°
12	2	130	0.155	0.96	0.96	10.68	3875	1200	30°

Acciaio da utensile temprato 56 - 60 HRC

V

1	2	80	0.025	0.08	0.08	0.89	28615	1430	30°
2	2	80	0.040	0.16	0.16	1.78	14305	1145	30°
3	2	80	0.045	0.24	0.24	2.67	9540	860	30°
4	2	80	0.055	0.32	0.32	3.56	7155	785	30°
5	2	80	0.060	0.40	0.40	4.45	5725	685	30°
6	2	80	0.065	0.48	0.48	5.34	4770	620	30°
8	2	80	0.075	0.64	0.64	7.12	3575	535	30°
10	2	80	0.085	0.72	0.72	8.76	2905	495	30°
12	2	80	0.095	0.77	0.77	10.32	2470	470	30°

Acciaio da utensile temprato 60 - 64 HRC

V

1	2	60	0.020	0.06	0.06	0.85	22470	900	30°
2	2	60	0.030	0.12	0.12	1.70	11235	675	30°
3	2	60	0.035	0.18	0.18	2.55	7490	525	30°
4	2	60	0.040	0.24	0.24	3.41	5600	450	30°
5	2	60	0.045	0.30	0.30	4.26	4485	405	30°
6	2	60	0.050	0.36	0.36	5.11	3740	375	30°
8	2	60	0.055	0.48	0.48	6.81	2805	310	30°
10	2	60	0.065	0.54	0.54	8.37	2280	295	30°
12	2	60	0.070	0.58	0.58	9.88	1935	270	30°

Acciaio da utensile temprato 64 - 70 HRC

V

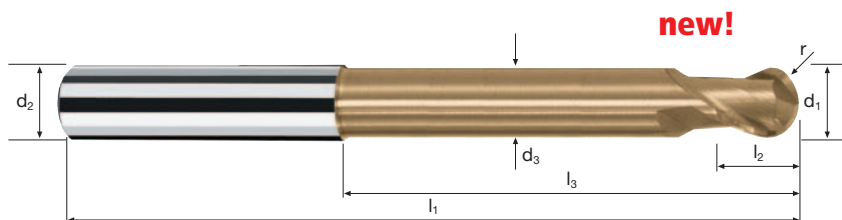
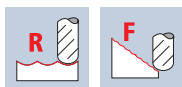
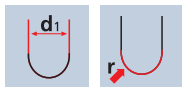
1	2	40	0.020	0.06	0.06	0.85	14980	600	30°
2	2	40	0.030	0.12	0.12	1.70	7490	450	30°
3	2	40	0.035	0.18	0.18	2.55	4995	350	30°
4	2	40	0.040	0.24	0.24	3.41	3735	300	30°
5	2	40	0.045	0.30	0.30	4.26	2990	270	30°
6	2	40	0.050	0.36	0.36	5.11	2490	250	30°
8	2	40	0.055	0.48	0.48	6.81	1870	205	30°
10	2	40	0.065	0.54	0.54	8.37	1520	200	30°
12	2	40	0.070	0.58	0.58	9.88	1290	180	30°

Frese con estremità emisferica Sphero-X

Tolleranza $r \pm 0.005, 6x_d$



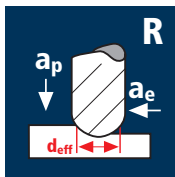
**HM
XA** λ **30°**
 γ **-10°**



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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Esempio: N° Ordine										DURO-V
										V7474
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.100	1	6	0.95	66	1.5	6	0.5	9.5°	2	●
.140	2	6	1.90	66	3.0	12	1.0	6.1°	2	●
.180	3	6	2.80	66	4.0	18	1.5	3.9°	2	●
.220	4	6	3.70	69	5.0	24	2.0	2.2°	2	●
.260	5	6	4.60	75	6.0	30	2.5	1.0°	2	●
.300	6	6	5.50	80	7.0	43	3.0	0.0°	2	●
.391	8	8	7.40	90	9.0	53	4.0	0.0°	2	●
.450	10	10	9.20	105	11.0	64	5.0	0.0°	2	●
.501	12	12	11.00	120	13.0	74	6.0	0.0°	2	●
.610	16	16	15.00	135	17.0	86	8.0	0.0°	2	●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

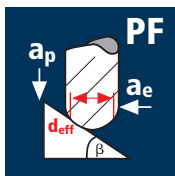
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
1	2	160	0.040	0.13	0.30	0.67	60000	4800	0.20
2	2	160	0.065	0.26	0.60	1.35	37725	4905	0.75
3	2	160	0.075	0.39	0.90	2.02	25215	3780	1.35
4	2	160	0.090	0.52	1.20	2.69	18935	3410	2.15
5	2	160	0.100	0.65	1.50	3.36	15160	3030	2.95
6	2	160	0.110	1.02	1.80	4.51	11295	2485	4.55
8	2	160	0.125	1.36	2.40	6.01	8475	2120	6.90
10	2	160	0.145	1.70	3.00	7.51	6780	1965	10.00
12	2	160	0.150	2.04	3.60	9.02	5645	1695	12.45

1	2	130	0.035	0.13	0.30	0.67	60000	4200	0.15
2	2	130	0.060	0.26	0.60	1.35	30655	3680	0.55
3	2	130	0.070	0.39	0.90	2.02	20485	2870	1.00
4	2	130	0.085	0.52	1.20	2.69	15385	2615	1.65
5	2	130	0.090	0.65	1.50	3.36	12315	2215	2.15
6	2	130	0.100	1.02	1.80	4.51	9175	1835	3.35
8	2	130	0.115	1.36	2.40	6.01	6885	1585	5.15
10	2	130	0.135	1.70	3.00	7.51	5510	1490	7.60
12	2	130	0.140	2.04	3.60	9.02	4590	1285	9.45

1	2	110	0.035	0.13	0.30	0.67	52260	3660	0.15
2	2	110	0.055	0.26	0.60	1.35	25935	2855	0.45
3	2	110	0.065	0.39	0.90	2.02	17335	2255	0.80
4	2	110	0.075	0.52	1.20	2.69	13015	1950	1.20
5	2	110	0.085	0.65	1.50	3.36	10420	1770	1.75
6	2	110	0.095	1.02	1.80	4.51	7765	1475	2.70
8	2	110	0.105	1.36	2.40	6.01	5825	1225	4.00
10	2	110	0.125	1.70	3.00	7.51	4660	1165	5.95
12	2	110	0.130	2.04	3.60	9.02	3880	1010	7.40

1	2	50	0.015	0.10	0.23	0.60	26525	795	0.00
2	2	50	0.025	0.20	0.45	1.20	13265	665	0.05
3	2	50	0.030	0.30	0.68	1.80	8840	530	0.10
4	2	50	0.035	0.31	0.72	2.14	7435	520	0.10
5	2	50	0.040	0.39	0.67	2.68	5940	475	0.10
6	2	50	0.045	0.61	0.54	3.63	4385	395	0.15
8	2	50	0.050	0.82	0.72	4.85	3280	330	0.20
10	2	50	0.060	1.02	0.90	6.05	2630	315	0.30
12	2	50	0.060	1.22	1.08	7.25	2195	265	0.35

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	200	0.055	0.12	0.12	1.00	60000	6600	45°
2	2	200	0.095	0.20	0.20	1.98	32155	6110	45°
3	2	200	0.105	0.30	0.30	2.97	21435	4500	45°
4	2	200	0.125	0.40	0.40	3.96	16075	4020	45°
5	2	200	0.140	0.50	0.50	4.95	12860	3600	45°
6	2	200	0.155	0.60	0.60	5.94	10720	3325	45°
8	2	200	0.170	0.80	0.80	7.92	8040	2735	45°
10	2	200	0.200	1.00	1.00	9.90	6430	2570	45°
12	2	200	0.210	1.20	1.20	11.88	5360	2250	45°

1	2	160	0.050	0.12	0.12	1.00	50930	5095	45°
2	2	160	0.085	0.15	0.15	1.95	26120	4440	45°
3	2	160	0.095	0.18	0.18	2.87	17745	3370	45°
4	2	160	0.115	0.20	0.20	3.78	13475	3100	45°
5	2	160	0.130	0.25	0.25	4.72	10790	2805	45°
6	2	160	0.145	0.30	0.30	5.67	8985	2605	45°
8	2	160	0.155	0.40	0.40	7.56	6735	2090	45°
10	2	160	0.185	0.50	0.50	9.45	5390	1995	45°
12	2	160	0.195	0.60	0.60	11.34	4490	1750	45°

1	2	120	0.045	0.12	0.12	1.00	38200	3440	45°
2	2	120	0.080	0.15	0.15	1.95	19590	3135	45°
3	2	120	0.090	0.18	0.18	2.87	13310	2395	45°
4	2	120	0.105	0.20	0.20	3.78	10105	2120	45°
5	2	120	0.120	0.25	0.25	4.72	8095	1945	45°
6	2	120	0.130	0.30	0.30	5.67	6735	1750	45°
8	2	120	0.145	0.40	0.40	7.56	5055	1465	45°
10	2	120	0.170	0.50	0.50	9.45	4040	1375	45°
12	2	120	0.180	0.60	0.60	11.34	3370	1215	45°

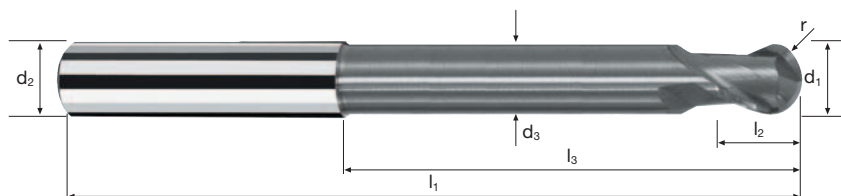
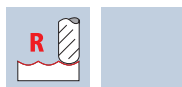
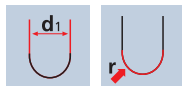
1	2	90	0.040	0.10	0.10	0.99	28940	2315	45°
2	2	90	0.070	0.12	0.12	1.92	14920	2090	45°
3	2	90	0.080	0.14	0.14	2.82	10160	1625	45°
4	2	90	0.095	0.16	0.16	3.71	7720	1465	45°
5	2	90	0.105	0.20	0.20	4.64	6175	1295	45°
6	2	90	0.115	0.24	0.24	5.57	5145	1185	45°
8	2	90	0.130	0.32	0.32	7.42	3860	1005	45°
10	2	90	0.150	0.40	0.40	9.28	3085	925	45°
12	2	90	0.160	0.48	0.48	11.13	2575	825	45°

Frese con estremità emisferica Sphero-XR

Tolleranza r ± 0.005 , 6xd

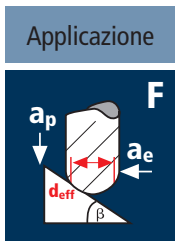


HM
XT λ **30°**
 γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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Esempio: N° Ordine										X-AL
										X7424
Ø Code	d1 *	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.100	1	6	0.95	66	1.5	6	0.5	9.5°	2	●
.140	2	6	1.90	66	3.0	12	1.0	6.1°	2	●
.180	3	6	2.80	66	4.0	18	1.5	3.9°	2	●
.220	4	6	3.70	69	5.0	24	2.0	2.2°	2	●
.260	5	6	4.60	75	6.0	30	2.5	1.0°	2	●
.300	6	6	5.50	80	7.0	43	3.0	0.0°	2	●
.391	8	8	7.40	90	9.0	53	4.0	0.0°	2	●
.450	10	10	9.20	105	11.0	64	5.0	0.0°	2	●
.501	12	12	11.00	120	13.0	74	6.0	0.0°	2	●
* Tolleranza diametro del tagliente										
d1	Tolleranza									
< 6	0/-0.010									
≥ 6	0/-0.015									



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	300	0.030	0.05	0.05	0.94	60000	3600	45°
2	2	300	0.035	0.07	0.07	1.84	51900	3635	45°
3	2	300	0.040	0.10	0.10	2.74	34850	2790	45°
4	2	300	0.070	0.12	0.12	3.62	26380	3695	45°
5	2	300	0.080	0.15	0.15	4.53	21080	3375	45°
6	2	300	0.085	0.15	0.15	5.36	17815	3030	45°
8	2	300	0.095	0.17	0.17	7.05	13545	2575	45°
10	2	300	0.100	0.20	0.20	8.77	10890	2180	45°
12	2	300	0.105	0.25	0.25	10.56	9045	1900	45°

Acciaio da utensile temprato 48 - 52 HRC

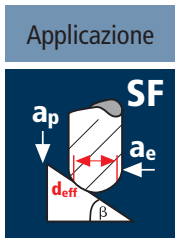
1	2	250	0.030	0.05	0.05	0.94	60000	3600	45°
2	2	250	0.035	0.07	0.07	1.84	43250	3030	45°
3	2	250	0.040	0.10	0.10	2.74	29045	2325	45°
4	2	250	0.065	0.12	0.12	3.62	21985	2860	45°
5	2	250	0.075	0.15	0.15	4.53	17565	2635	45°
6	2	250	0.080	0.15	0.15	5.36	14845	2375	45°
8	2	250	0.090	0.17	0.17	7.05	11290	2030	45°
10	2	250	0.095	0.20	0.20	8.77	9075	1725	45°
12	2	250	0.100	0.25	0.25	10.56	7535	1505	45°

Acciaio da utensile temprato 52 - 56 HRC

1	2	200	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	200	0.030	0.07	0.07	1.84	34600	2075	45°
3	2	200	0.035	0.10	0.10	2.74	23235	1625	45°
4	2	200	0.065	0.12	0.12	3.62	17585	2285	45°
5	2	200	0.070	0.15	0.15	4.53	14055	1970	45°
6	2	200	0.075	0.15	0.15	5.36	11880	1780	45°
8	2	200	0.085	0.17	0.17	7.05	9030	1535	45°
10	2	200	0.090	0.20	0.20	8.77	7260	1305	45°
12	2	200	0.095	0.25	0.25	10.56	6030	1145	45°

Acciaio da utensile temprato 56 - 60 HRC

1	2	150	0.025	0.05	0.05	0.94	50795	2540	45°
2	2	150	0.030	0.07	0.07	1.84	25950	1555	45°
3	2	150	0.035	0.10	0.10	2.74	17425	1220	45°
4	2	150	0.060	0.12	0.12	3.62	13190	1585	45°
5	2	150	0.070	0.15	0.15	4.53	10540	1475	45°
6	2	150	0.070	0.15	0.15	5.36	8910	1245	45°
8	2	150	0.080	0.17	0.17	7.05	6775	1085	45°
10	2	150	0.085	0.20	0.20	8.77	5445	925	45°
12	2	150	0.090	0.25	0.25	10.56	4520	815	45°



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	400	0.025	0.02	0.02	0.88	60000	3000	45°
2	2	400	0.030	0.02	0.02	1.67	60000	3600	45°
3	2	400	0.035	0.03	0.03	2.50	50930	3565	45°
4	2	400	0.050	0.03	0.03	3.27	38940	3895	45°
5	2	400	0.055	0.03	0.03	4.04	31515	3465	45°
6	2	400	0.060	0.03	0.03	4.80	26525	3185	45°
8	2	400	0.065	0.03	0.03	6.31	20180	2625	45°
10	2	400	0.070	0.04	0.04	7.91	16095	2255	45°
12	2	400	0.075	0.04	0.04	9.41	13530	2030	45°

Acciaio da utensile temprato 48 - 52 HRC

1	2	350	0.025	0.02	0.02	0.88	60000	3000	45°
2	2	350	0.030	0.02	0.02	1.67	60000	3600	45°
3	2	350	0.035	0.03	0.03	2.50	44565	3120	45°
4	2	350	0.050	0.03	0.03	3.27	34070	3405	45°
5	2	350	0.050	0.03	0.03	4.04	27575	2760	45°
6	2	350	0.055	0.03	0.03	4.80	23210	2555	45°
8	2	350	0.060	0.03	0.03	6.31	17655	2120	45°
10	2	350	0.065	0.04	0.04	7.91	14085	1830	45°
12	2	350	0.070	0.04	0.04	9.41	11840	1660	45°

Acciaio da utensile temprato 52 - 56 HRC

1	2	280	0.025	0.02	0.02	0.88	60000	3000	45°
2	2	280	0.025	0.02	0.02	1.67	53370	2670	45°
3	2	280	0.030	0.03	0.03	2.50	35650	2140	45°
4	2	280	0.045	0.03	0.03	3.27	27255	2455	45°
5	2	280	0.050	0.03	0.03	4.04	22060	2205	45°
6	2	280	0.055	0.03	0.03	4.80	18570	2045	45°
8	2	280	0.060	0.03	0.03	6.31	14125	1695	45°
10	2	280	0.065	0.04	0.04	7.91	11270	1465	45°
12	2	280	0.070	0.04	0.04	9.41	9470	1325	45°

Acciaio da utensile temprato 56 - 60 HRC

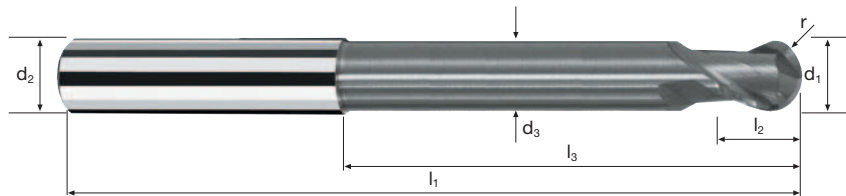
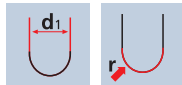
1	2	180	0.020	0.02	0.02	0.88	60000	2400	45°
2	2	180	0.025	0.02	0.02	1.67	34310	1715	45°
3	2	180	0.030	0.03	0.03	2.50	22920	1375	45°
4	2	180	0.045	0.03	0.03	3.27	17520	1575	45°
5	2	180	0.045	0.03	0.03	4.04	14185	1275	45°
6	2	180	0.050	0.03	0.03	4.80	11935	1195	45°
8	2	180	0.055	0.03	0.03	6.31	9080	1000	45°
10	2	180	0.060	0.04	0.04	7.91	7245	870	45°
12	2	180	0.065	0.04	0.04	9.41	6090	790	45°

Frese con estremità emisferica Sphero-XF

Tolleranza r ± 0.005 , 6xd



HM
XA λ **30°**
 γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	Copper
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Esempio: N° Ordine		Rivestimento X	Articolo 7404	Codice- ϕ .100						X-AL
ϕ Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ± 0.005	α	z	X7404
.100	1	6	0.95	66	1.5	6	0.5	9.5°	2	●
.140	2	6	1.90	66	3.0	12	1.0	6.1°	2	●
.180	3	6	2.80	66	4.0	18	1.5	3.9°	2	●
.220	4	6	3.70	69	5.0	24	2.0	2.2°	2	●
.260	5	6	4.60	75	6.0	30	2.5	1.0°	2	●
.300	6	6	5.50	80	7.0	43	3.0	0.0°	2	●
.391	8	8	7.40	90	9.0	53	4.0	0.0°	2	●
.450	10	10	9.20	105	11.0	64	5.0	0.0°	2	●
.501	12	12	11.00	120	13.0	74	6.0	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 42 - 48 HRC 	6	8	300	0.055	0.12	0.12	5.26	18155	7990	45°
		8	10	300	0.060	0.14	0.14	6.94	13760	8255	45°
		10	12	300	0.065	0.16	0.16	8.62	11080	8640	45°
		12	16	300	0.070	0.18	0.18	10.29	9280	10395	45°
		6	8	250	0.050	0.12	0.12	5.26	15130	6050	45°
		8	10	250	0.055	0.14	0.14	6.94	11465	6305	45°
		10	12	250	0.060	0.16	0.16	8.62	9230	6645	45°
		12	16	250	0.065	0.18	0.18	10.29	7735	8045	45°
		6	8	200	0.050	0.12	0.12	5.26	12105	4840	45°
		8	10	200	0.055	0.14	0.14	6.94	9175	5045	45°
		10	12	200	0.060	0.16	0.16	8.62	7385	5315	45°
		12	16	200	0.065	0.18	0.18	10.29	6185	6430	45°
		6	8	150	0.045	0.12	0.12	5.26	9080	3270	45°
		8	10	150	0.050	0.14	0.14	6.94	6880	3440	45°
		10	12	150	0.055	0.16	0.16	8.62	5540	3655	45°
		12	16	150	0.060	0.18	0.18	10.29	4640	4455	45°

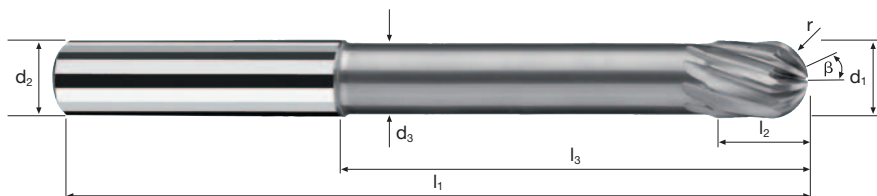
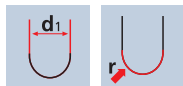
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 42 - 48 HRC 	6	8	400	0.030	0.03	0.03	4.80	26525	6365	45°
		8	10	400	0.035	0.03	0.03	6.31	20180	7065	45°
		10	12	400	0.035	0.04	0.04	7.91	16095	6760	45°
		12	16	400	0.040	0.04	0.04	9.41	13530	8660	45°
		6	8	350	0.030	0.03	0.03	4.80	23210	5570	45°
		8	10	350	0.035	0.03	0.03	6.31	17655	6180	45°
		10	12	350	0.035	0.04	0.04	7.91	14085	5915	45°
		12	16	350	0.040	0.04	0.04	9.41	11840	7580	45°
		6	8	280	0.025	0.03	0.03	4.80	18570	3715	45°
		8	10	280	0.030	0.03	0.03	6.31	14125	4240	45°
		10	12	280	0.030	0.04	0.04	7.91	11270	4055	45°
		12	16	280	0.035	0.04	0.04	9.41	9470	5305	45°
		6	8	180	0.025	0.03	0.03	4.80	11935	2385	45°
		8	10	180	0.030	0.03	0.03	6.31	9080	2725	45°
		10	12	180	0.030	0.04	0.04	7.91	7245	2610	45°
		12	16	180	0.035	0.04	0.04	9.41	6090	3410	45°

Frese con estremità emisferica Sphero-XF Multi

Tolleranza r ± 0.005 , 6xd



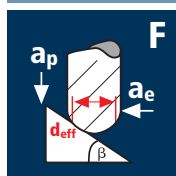
HM
XA λ **30°**
 γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	Copper
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Esempio: N° Ordine										X-AL
										X7464
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	β	z	
.300	6	6	5.5	80	7	43	3.0	25°	8	●
.391	8	8	7.4	90	9	53	4.0	25°	10	●
.450	10	10	9.2	105	11	64	5.0	25°	12	●
.501	12	12	11.0	120	13	74	6.0	25°	16	●

Applicazione



Materiale

Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



Acciaio da
utensile temprato
60 - 64 HRC



Acciaio da
utensile temprato
64 - 70 HRC



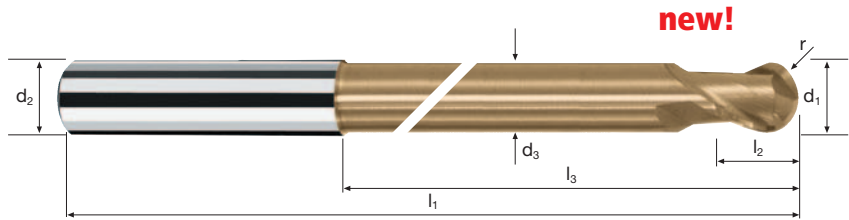
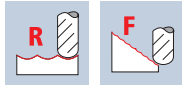
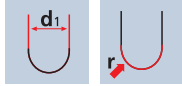
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	140	0.025	0.05	0.05	0.94	47410	2370	45°
2	2	140	0.025	0.07	0.07	1.84	24220	1210	45°
3	2	140	0.030	0.10	0.10	2.74	16265	975	45°
4	2	140	0.055	0.12	0.12	3.62	12310	1355	45°
5	2	140	0.060	0.15	0.15	4.53	9840	1180	45°
6	2	140	0.065	0.15	0.15	5.36	8315	1080	45°
8	2	140	0.070	0.17	0.17	7.05	6320	885	45°
10	2	140	0.075	0.20	0.20	8.77	5080	760	45°
12	2	140	0.080	0.25	0.25	10.56	4220	675	45°
1	2	100	0.025	0.05	0.05	0.94	33865	1695	45°
2	2	100	0.025	0.07	0.07	1.84	17300	865	45°
3	2	100	0.030	0.10	0.10	2.74	11615	695	45°
4	2	100	0.050	0.12	0.12	3.62	8795	880	45°
5	2	100	0.055	0.15	0.15	4.53	7025	775	45°
6	2	100	0.060	0.15	0.15	5.36	5940	715	45°
8	2	100	0.065	0.17	0.17	7.05	4515	585	45°
10	2	100	0.070	0.20	0.20	8.77	3630	510	45°
12	2	100	0.075	0.25	0.25	10.56	3015	450	45°
1	2	70	0.020	0.04	0.04	0.93	23960	960	45°
2	2	70	0.020	0.06	0.06	1.80	12380	495	45°
3	2	70	0.025	0.08	0.08	2.68	8315	415	45°
4	2	70	0.045	0.09	0.09	3.54	6295	565	45°
5	2	70	0.045	0.12	0.12	4.43	5030	455	45°
6	2	70	0.050	0.12	0.12	5.24	4250	425	45°
8	2	70	0.055	0.13	0.13	6.90	3230	355	45°
10	2	70	0.060	0.15	0.15	8.58	2595	310	45°
12	2	70	0.065	0.19	0.19	10.34	2155	280	45°
1	2	45	0.015	0.03	0.03	0.89	16095	485	45°
2	2	45	0.015	0.04	0.04	1.74	8230	245	45°
3	2	45	0.020	0.05	0.05	2.59	5530	220	45°
4	2	45	0.030	0.06	0.06	3.43	4175	250	45°
5	2	45	0.035	0.08	0.08	4.29	3340	235	45°
6	2	45	0.035	0.08	0.08	5.08	2820	195	45°
8	2	45	0.040	0.09	0.09	6.70	2140	170	45°
10	2	45	0.040	0.10	0.10	8.34	1720	140	45°
12	2	45	0.045	0.13	0.13	10.03	1430	130	45°

Frese con estremità emisferica Sphero-X

Tolleranza r ± 0.005 , 9xd



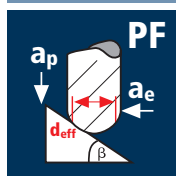
HM
XA λ **30°**
 γ **-10°**



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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Esempio: N° Ordine										DURO-V
										V7478
										V7478
\emptyset Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ± 0.005	α	z	
.100	1	6	0.95	69	1.5	9	0.5	8.0°	2	●
.140	2	6	1.90	69	3.0	18	1.0	4.7°	2	●
.180	3	6	2.80	75	4.0	27	1.5	2.8°	2	●
.220	4	6	3.70	80	5.0	36	2.0	1.5°	2	●
.260	5	6	4.60	87	6.0	45	2.5	0.7°	2	●
.300	6	6	5.50	100	7.0	63	3.0	0.0°	2	●
.391	8	8	7.40	120	9.0	83	4.0	0.0°	2	●
.450	10	10	9.20	135	11.0	94	5.0	0.0°	2	●
.501	12	12	11.00	160	13.0	114	6.0	0.0°	2	●
.610	16	16	15.00	180	17.0	131	8.0	0.0°	2	●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



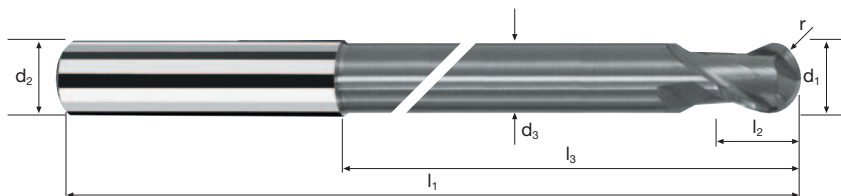
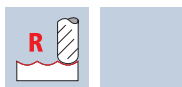
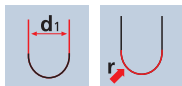
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	160	0.050	0.12	0.12	1.00	50930	5095	45°
2	2	160	0.080	0.16	0.16	1.96	25985	4160	45°
3	2	160	0.090	0.24	0.24	2.93	17385	3130	45°
4	2	160	0.105	0.32	0.32	3.91	13025	2735	45°
5	2	160	0.120	0.40	0.40	4.89	10415	2500	45°
6	2	160	0.130	0.48	0.48	5.87	8675	2255	45°
8	2	160	0.150	0.64	0.64	7.82	6515	1955	45°
10	2	160	0.170	0.80	0.80	9.78	5210	1770	45°
12	2	160	0.180	0.96	0.96	11.73	4340	1560	45°
1	2	120	0.045	0.12	0.12	1.00	38200	3440	45°
2	2	120	0.075	0.15	0.15	1.95	19590	2940	45°
3	2	120	0.085	0.18	0.18	2.87	13310	2265	45°
4	2	120	0.095	0.20	0.20	3.78	10105	1920	45°
5	2	120	0.110	0.25	0.25	4.72	8095	1780	45°
6	2	120	0.120	0.30	0.30	5.67	6735	1615	45°
8	2	120	0.140	0.40	0.40	7.56	5055	1415	45°
10	2	120	0.155	0.50	0.50	9.45	4040	1250	45°
12	2	120	0.165	0.60	0.60	11.34	3370	1110	45°
1	2	100	0.045	0.12	0.12	1.00	31830	2865	45°
2	2	100	0.070	0.15	0.15	1.95	16325	2285	45°
3	2	100	0.075	0.18	0.18	2.87	11090	1665	45°
4	2	100	0.090	0.20	0.20	3.78	8420	1515	45°
5	2	100	0.100	0.25	0.25	4.72	6745	1350	45°
6	2	100	0.110	0.30	0.30	5.67	5615	1235	45°
8	2	100	0.130	0.40	0.40	7.56	4210	1095	45°
10	2	100	0.145	0.50	0.50	9.45	3370	975	45°
12	2	100	0.155	0.60	0.60	11.34	2805	870	45°
1	2	60	0.040	0.10	0.10	0.99	19290	1545	45°
2	2	60	0.060	0.12	0.12	1.92	9945	1195	45°
3	2	60	0.070	0.14	0.14	2.82	6775	950	45°
4	2	60	0.080	0.16	0.16	3.71	5150	825	45°
5	2	60	0.090	0.20	0.20	4.64	4115	740	45°
6	2	60	0.100	0.24	0.24	5.57	3430	685	45°
8	2	60	0.115	0.32	0.32	7.42	2575	590	45°
10	2	60	0.130	0.40	0.40	9.28	2060	535	45°
12	2	60	0.135	0.48	0.48	11.13	1715	465	45°

Frese con estremità emisferica Sphero-XR

Tolleranza r ± 0.005 , 9xd



HM λ **30°**
XT γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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Esempio: N° Ordine										X-AL
										X7428
										X7428
\emptyset Code	d1 *	d2 h5	d3	l1	l2	l3	r ± 0.005	α	z	
.100	1	6	0.95	69	1.5	9	0.5	8.0°	2	●
.140	2	6	1.90	69	3.0	18	1.0	4.7°	2	●
.180	3	6	2.80	75	4.0	27	1.5	2.8°	2	●
.220	4	6	3.70	80	5.0	36	2.0	1.5°	2	●
.260	5	6	4.60	87	6.0	45	2.5	0.7°	2	●
.300	6	6	5.50	100	7.0	63	3.0	0.0°	2	●
.391	8	8	7.40	120	9.0	83	4.0	0.0°	2	●
.450	10	10	9.20	135	11.0	94	5.0	0.0°	2	●
.501	12	12	11.00	160	13.0	114	6.0	0.0°	2	●
* Tolleranza diametro del tagliente										
d1	Tolleranza									
< 6	0/-0.010									
≥ 6	0/-0.015									

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]	
	Acciaio da utensile temprato 42 - 48 HRC 	1	2	220	0.025	0.05	0.05	0.94	60000	3000	45°	
		2	2	220	0.030	0.07	0.07	1.84	38060	2285	45°	
		3	2	220	0.035	0.10	0.10	2.74	25560	1790	45°	
		4	2	220	0.060	0.12	0.12	3.62	19345	2320	45°	
		5	2	220	0.065	0.15	0.15	4.53	15460	2010	45°	
		6	2	220	0.070	0.15	0.15	5.36	13065	1830	45°	
		8	2	220	0.080	0.17	0.17	7.05	9935	1590	45°	
		10	2	220	0.085	0.20	0.20	8.77	7985	1355	45°	
		12	2	220	0.090	0.25	0.25	10.56	6630	1195	45°	
		Acciaio da utensile temprato 48 - 52 HRC 	1	2	180	0.025	0.05	0.05	0.94	60000	3000	45°
			2	2	180	0.030	0.07	0.07	1.84	31140	1870	45°
			3	2	180	0.035	0.10	0.10	2.74	20910	1465	45°
4	2		180	0.055	0.12	0.12	3.62	15830	1740	45°		
5	2		180	0.060	0.15	0.15	4.53	12650	1520	45°		
6	2		180	0.065	0.15	0.15	5.36	10690	1390	45°		
8	2		180	0.075	0.17	0.17	7.05	8125	1220	45°		
10	2		180	0.080	0.20	0.20	8.77	6535	1045	45°		
12	2		180	0.085	0.25	0.25	10.56	5425	920	45°		
Acciaio da utensile temprato 52 - 56 HRC 	1		2	140	0.025	0.05	0.05	0.94	47410	2370	45°	
	2		2	140	0.025	0.07	0.07	1.84	24220	1210	45°	
	3		2	140	0.030	0.10	0.10	2.74	16265	975	45°	
	4	2	140	0.055	0.12	0.12	3.62	12310	1355	45°		
	5	2	140	0.060	0.15	0.15	4.53	9840	1180	45°		
	6	2	140	0.065	0.15	0.15	5.36	8315	1080	45°		
	8	2	140	0.070	0.17	0.17	7.05	6320	885	45°		
	10	2	140	0.075	0.20	0.20	8.77	5080	760	45°		
	12	2	140	0.080	0.25	0.25	10.56	4220	675	45°		
	Acciaio da utensile temprato 56 - 60 HRC 	1	2	100	0.020	0.05	0.05	0.94	33865	1355	45°	
		2	2	100	0.025	0.07	0.07	1.84	17300	865	45°	
		3	2	100	0.030	0.10	0.10	2.74	11615	695	45°	
4		2	100	0.050	0.12	0.12	3.62	8795	880	45°		
5		2	100	0.055	0.15	0.15	4.53	7025	775	45°		
6		2	100	0.060	0.15	0.15	5.36	5940	715	45°		
8		2	100	0.070	0.17	0.17	7.05	4515	630	45°		
10		2	100	0.070	0.20	0.20	8.77	3630	510	45°		
12		2	100	0.075	0.25	0.25	10.56	3015	450	45°		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]	
	Acciaio da utensile temprato 42 - 48 HRC 	1	2	300	0.020	0.02	0.02	0.88	60000	2400	45°	
		2	2	300	0.025	0.02	0.02	1.67	57185	2860	45°	
		3	2	300	0.025	0.03	0.03	2.50	38200	1910	45°	
		4	2	300	0.040	0.03	0.03	3.27	29205	2335	45°	
		5	2	300	0.045	0.03	0.03	4.04	23640	2130	45°	
		6	2	300	0.050	0.03	0.03	4.80	19895	1990	45°	
		8	2	300	0.055	0.03	0.03	6.31	15135	1665	45°	
		10	2	300	0.055	0.04	0.04	7.91	12075	1330	45°	
		12	2	300	0.060	0.04	0.04	9.41	10150	1220	45°	
		Acciaio da utensile temprato 48 - 52 HRC 	1	2	260	0.020	0.02	0.02	0.88	60000	2400	45°
			2	2	260	0.025	0.02	0.02	1.67	49560	2480	45°
			3	2	260	0.025	0.03	0.03	2.50	33105	1655	45°
4	2		260	0.040	0.03	0.03	3.27	25310	2025	45°		
5	2		260	0.045	0.03	0.03	4.04	20485	1845	45°		
6	2		260	0.050	0.03	0.03	4.80	17240	1725	45°		
8	2		260	0.050	0.03	0.03	6.31	13115	1310	45°		
10	2		260	0.050	0.04	0.04	7.91	10465	1045	45°		
12	2		260	0.055	0.04	0.04	9.41	8795	965	45°		
Acciaio da utensile temprato 52 - 56 HRC 	1		2	200	0.020	0.02	0.02	0.88	60000	2400	45°	
	2		2	200	0.025	0.02	0.02	1.67	38120	1905	45°	
	3		2	200	0.025	0.03	0.03	2.50	25465	1275	45°	
	4	2	200	0.035	0.03	0.03	3.27	19470	1365	45°		
	5	2	200	0.040	0.03	0.03	4.04	15760	1260	45°		
	6	2	200	0.045	0.03	0.03	4.80	13265	1195	45°		
	8	2	200	0.050	0.03	0.03	6.31	10090	1010	45°		
	10	2	200	0.050	0.04	0.04	7.91	8050	805	45°		
	12	2	200	0.055	0.04	0.04	9.41	6765	745	45°		
	Acciaio da utensile temprato 56 - 60 HRC 	1	2	120	0.015	0.02	0.02	0.88	43405	1300	45°	
		2	2	120	0.020	0.02	0.02	1.67	22875	915	45°	
		3	2	120	0.020	0.03	0.03	2.50	15280	610	45°	
4		2	120	0.035	0.03	0.03	3.27	11680	820	45°		
5		2	120	0.040	0.03	0.03	4.04	9455	755	45°		
6		2	120	0.045	0.03	0.03	4.80	7960	715	45°		
8		2	120	0.045	0.03	0.03	6.31	6055	545	45°		
10		2	120	0.045	0.04	0.04	7.91	4830	435	45°		
12		2	120	0.050	0.04	0.04	9.41	4060	405	45°		

Frese con estremità emisferica Sphero-XF

Tolleranza r ± 0.005 , 9xd

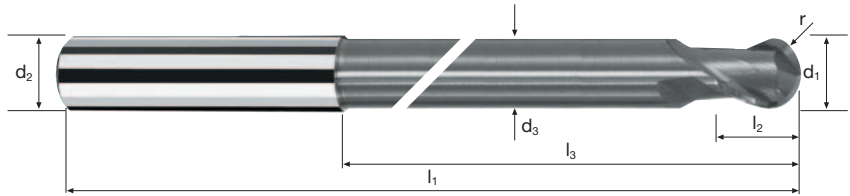


HM XA λ 30° γ -10°

h5

d1 **r**

F



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	Copper
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Esempio: N° Ordine		Rivestimento X	Articolo 7408	Codice- ϕ .100						X-AL	
ϕ Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ± 0.005	α	z	X7408	
.100	1	6	0.95	69	1.5	9	0.5	8.0°	2	●	
.140	2	6	1.90	69	3.0	18	1.0	4.7°	2	●	
.180	3	6	2.80	75	4.0	27	1.5	2.8°	2	●	
.220	4	6	3.70	80	5.0	36	2.0	1.5°	2	●	
.260	5	6	4.60	87	6.0	45	2.5	0.7°	2	●	
.300	6	6	5.50	100	7.0	63	3.0	0.0°	2	●	
.391	8	8	7.40	120	9.0	83	4.0	0.0°	2	●	
.450	10	10	9.20	135	11.0	94	5.0	0.0°	2	●	
.501	12	12	11.00	160	13.0	114	6.0	0.0°	2	●	

Applicazione		Materiale		d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	3	4	160	0.050	0.53	1.20	2.29	22240	4450	2.85		
		4	4	160	0.060	0.70	1.60	3.04	16755	4020	4.50		
		5	4	160	0.065	0.88	2.00	3.81	13370	3475	6.10		
		6	4	160	0.070	1.26	2.40	4.89	10415	2915	8.80		
		8	4	160	0.080	1.68	3.20	6.52	7810	2500	13.45		
		10	4	160	0.095	2.10	4.00	8.15	6250	2375	19.95		
		12	4	160	0.100	2.52	4.80	9.78	5210	2085	25.20		
Acciaio da utensile temprato 48 - 52 HRC 	3	4	130	0.045	0.53	1.20	2.29	18070	3255	2.05			
	4	4	130	0.055	0.70	1.60	3.04	13610	2995	3.35			
	5	4	130	0.060	0.88	2.00	3.81	10860	2605	4.60			
	6	4	130	0.065	1.05	2.40	4.56	9075	2360	5.95			
	8	4	130	0.075	1.40	3.20	6.08	6805	2040	9.15			
	10	4	130	0.085	2.10	4.00	8.15	5075	1725	14.50			
	12	4	130	0.090	2.52	4.80	9.78	4230	1525	18.45			
Acciaio da utensile temprato 52 - 56 HRC 	3	4	110	0.045	0.53	1.20	2.29	15290	2750	1.75			
	4	4	110	0.050	0.70	1.60	3.04	11520	2305	2.60			
	5	4	110	0.055	0.88	2.00	3.81	9190	2020	3.55			
	6	4	110	0.060	1.05	2.40	4.56	7680	1845	4.65			
	8	4	110	0.070	1.40	3.20	6.08	5760	1615	7.25			
	10	4	110	0.080	2.10	4.00	8.15	4295	1375	11.55			
	12	4	110	0.085	2.52	4.80	9.78	3580	1215	14.70			
Acciaio da utensile temprato 56 - 60 HRC 	3	4	50	0.020	0.41	0.90	2.06	7725	620	0.25			
	4	4	50	0.025	0.55	1.20	2.75	5790	580	0.40			
	5	4	50	0.025	0.69	1.50	3.45	4615	460	0.50			
	6	4	50	0.030	0.76	1.44	3.99	3990	480	0.55			
	8	4	50	0.030	1.01	1.44	5.31	2995	360	0.50			
	10	4	50	0.040	1.26	1.20	6.64	2395	385	0.60			
	12	4	50	0.040	1.51	1.44	7.96	2000	320	0.70			

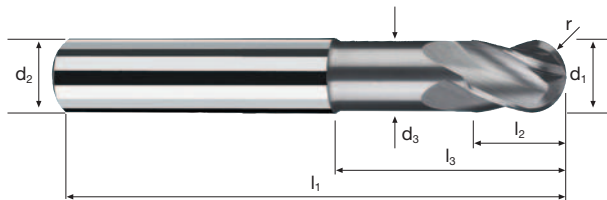
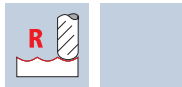
Applicazione		Materiale		d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 42 - 48 HRC 	3	4	200	0.070	0.33	0.33	2.98	21365	5980	45°		
		4	4	200	0.080	0.44	0.44	3.98	15995	5120	45°		
		5	4	200	0.090	0.55	0.55	4.97	12810	4610	45°		
		6	4	200	0.100	0.66	0.66	5.96	10680	4270	45°		
		8	4	200	0.110	0.88	0.88	7.95	8010	3525	45°		
		10	4	200	0.130	1.10	1.10	9.94	6405	3330	45°		
		12	4	200	0.135	1.32	1.32	11.93	5335	2880	45°		
Acciaio da utensile temprato 48 - 52 HRC 	3	4	160	0.065	0.15	0.15	2.83	17995	4680	45°			
	4	4	160	0.075	0.20	0.20	3.78	13475	4045	45°			
	5	4	160	0.085	0.25	0.25	4.72	10790	3670	45°			
	6	4	160	0.090	0.30	0.30	5.67	8985	3235	45°			
	8	4	160	0.100	0.40	0.40	7.56	6735	2695	45°			
	10	4	160	0.120	0.50	0.50	9.45	5390	2585	45°			
	12	4	160	0.125	0.60	0.60	11.34	4490	2245	45°			
Acciaio da utensile temprato 52 - 56 HRC 	3	4	120	0.060	0.15	0.15	2.83	13500	3240	45°			
	4	4	120	0.070	0.20	0.20	3.78	10105	2830	45°			
	5	4	120	0.075	0.25	0.25	4.72	8095	2430	45°			
	6	4	120	0.085	0.30	0.30	5.67	6735	2290	45°			
	8	4	120	0.095	0.40	0.40	7.56	5055	1920	45°			
	10	4	120	0.110	0.50	0.50	9.45	4040	1780	45°			
	12	4	120	0.115	0.60	0.60	11.34	3370	1550	45°			
Acciaio da utensile temprato 56 - 60 HRC 	3	4	90	0.055	0.12	0.12	2.78	10305	2265	45°			
	4	4	90	0.060	0.16	0.16	3.71	7720	1855	45°			
	5	4	90	0.070	0.20	0.20	4.64	6175	1730	45°			
	6	4	90	0.075	0.24	0.24	5.57	5145	1545	45°			
	8	4	90	0.085	0.32	0.32	7.42	3860	1310	45°			
	10	4	90	0.100	0.40	0.40	9.28	3085	1235	45°			
	12	4	90	0.100	0.48	0.48	11.13	2575	1030	45°			

Frese con estremità emisferica Sphero-XR4

Tolleranza r ± 0.01 , 3xd



HM
XT λ **30°**
 γ **-10°**



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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Esempio: N° Ordine										X-AL
										X7450
										X7450
Ø Code	d1 0/-0.02	d2 h5	d3	l1	l2	l3	r ±0.01	α	z	
.180	3	6	2.8	57	4	9	1.5	6.4°	4	●
.220	4	6	3.7	57	5	12	2.0	4.0°	4	●
.260	5	6	4.6	57	6	15	2.5	2.0°	4	●
.300	6	6	5.5	57	7	20	3.0	0.0°	4	●
.391	8	8	7.4	63	9	26	4.0	0.0°	4	●
.450	10	10	9.2	72	11	31	5.0	0.0°	4	●
.501	12	12	11.0	83	13	37	6.0	0.0°	4	●

Applicazione		Materiale		d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	<p>Acciaio da utensile temprato 42 - 48 HRC</p>	3	4	160	0.050	0.39	0.90	2.02	25215	5045	1.75		
		4	4	160	0.060	0.52	1.20	2.69	18935	4545	2.85		
		5	4	160	0.065	0.65	1.50	3.36	15160	3940	3.85		
		6	4	160	0.070	1.02	1.80	4.51	11295	3165	5.80		
		8	4	160	0.080	1.36	2.40	6.01	8475	2710	8.85		
		10	4	160	0.095	1.70	3.00	7.51	6780	2575	13.15		
		12	4	160	0.100	2.04	3.60	9.02	5645	2260	16.60		
		3	4	130	0.045	0.39	0.90	2.02	20485	3685	1.30		
		4	4	130	0.055	0.52	1.20	2.69	15385	3385	2.10		
		5	4	130	0.060	0.65	1.50	3.36	12315	2955	2.90		
		6	4	130	0.065	0.78	1.80	4.04	10245	2665	3.75		
		8	4	130	0.075	1.04	2.40	5.38	7690	2305	5.75		
10	4	130	0.085	1.70	3.00	7.51	5510	1875	9.55				
12	4	130	0.090	2.04	3.60	9.02	4590	1650	12.10				
3	4	110	0.045	0.39	0.90	2.02	17335	3120	1.10				
4	4	110	0.050	0.52	1.20	2.69	13015	2605	1.65				
5	4	110	0.055	0.65	1.50	3.36	10420	2290	2.25				
6	4	110	0.060	0.78	1.80	4.04	8665	2080	2.90				
8	4	110	0.070	1.04	2.40	5.38	6510	1825	4.55				
10	4	110	0.080	1.70	3.00	7.51	4660	1490	7.60				
12	4	110	0.085	2.04	3.60	9.02	3880	1320	9.70				
3	4	50	0.020	0.30	0.68	1.80	8840	705	0.15				
4	4	50	0.025	0.41	0.90	2.43	6550	655	0.25				
5	4	50	0.025	0.51	1.13	3.03	5255	525	0.30				
6	4	50	0.030	0.61	1.08	3.63	4385	525	0.35				
8	4	50	0.030	0.82	1.08	4.85	3280	395	0.35				
10	4	50	0.040	1.02	0.90	6.05	2630	420	0.40				
12	4	50	0.040	1.22	1.08	7.25	2195	350	0.45				

Applicazione		Materiale		d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	<p>Acciaio da utensile temprato 42 - 48 HRC</p>	3	4	200	0.070	0.27	0.27	2.95	21580	6040	45°		
		4	4	200	0.080	0.36	0.36	3.94	16160	5170	45°		
		5	4	200	0.090	0.45	0.45	4.92	12940	4660	45°		
		6	4	200	0.100	0.54	0.54	5.91	10770	4310	45°		
		8	4	200	0.110	0.72	0.72	7.88	8080	3555	45°		
		10	4	200	0.130	0.90	0.90	9.85	6465	3360	45°		
		12	4	200	0.135	1.08	1.08	11.81	5390	2910	45°		
		3	4	160	0.065	0.15	0.15	2.83	17995	4680	45°		
		4	4	160	0.075	0.20	0.20	3.78	13475	4045	45°		
		5	4	160	0.085	0.25	0.25	4.72	10790	3670	45°		
		6	4	160	0.090	0.30	0.30	5.67	8985	3235	45°		
		8	4	160	0.100	0.40	0.40	7.56	6735	2695	45°		
10	4	160	0.120	0.50	0.50	9.45	5390	2585	45°				
12	4	160	0.125	0.60	0.60	11.34	4490	2245	45°				
3	4	120	0.060	0.15	0.15	2.83	13500	3240	45°				
4	4	120	0.070	0.20	0.20	3.78	10105	2830	45°				
5	4	120	0.075	0.25	0.25	4.72	8095	2430	45°				
6	4	120	0.085	0.30	0.30	5.67	6735	2290	45°				
8	4	120	0.095	0.40	0.40	7.56	5055	1920	45°				
10	4	120	0.110	0.50	0.50	9.45	4040	1780	45°				
12	4	120	0.115	0.60	0.60	11.34	3370	1550	45°				
3	4	90	0.055	0.12	0.12	2.78	10305	2265	45°				
4	4	90	0.060	0.16	0.16	3.71	7720	1855	45°				
5	4	90	0.070	0.20	0.20	4.64	6175	1730	45°				
6	4	90	0.075	0.24	0.24	5.57	5145	1545	45°				
8	4	90	0.085	0.32	0.32	7.42	3860	1310	45°				
10	4	90	0.100	0.40	0.40	9.28	3085	1235	45°				
12	4	90	0.100	0.48	0.48	11.13	2575	1030	45°				

Frese con estremità emisferica Sphero-XR4

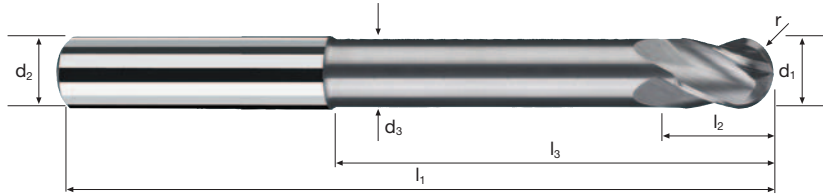
Tolleranza r ±0.01, 6xd



HM
XT λ **30°**
 γ **10°**

h5

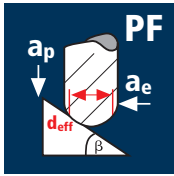
R



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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Esempio: N° Ordine										X-AL
										X7454
Ø	d1	d2	d3	l1	l2	l3	r	α	z	
Code	0/-0.02	h5					±0.01			
.180	3	6	2.8	66	4	18	1.5	3.9°	4	●
.220	4	6	3.7	69	5	24	2.0	2.2°	4	●
.260	5	6	4.6	75	6	30	2.5	1.0°	4	●
.300	6	6	5.5	80	7	43	3.0	0.0°	4	●
.391	8	8	7.4	90	9	53	4.0	0.0°	4	●
.450	10	10	9.2	105	11	64	5.0	0.0°	4	●
.501	12	12	11.0	120	13	74	6.0	0.0°	4	●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



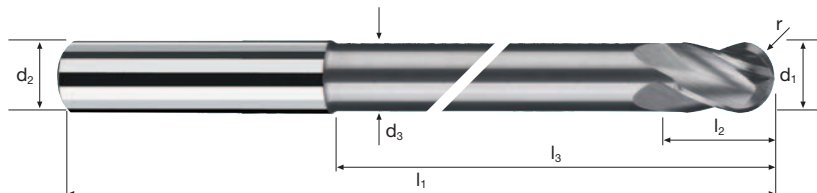
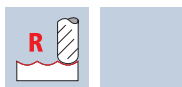
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
3	4	160	0.060	0.21	0.21	2.91	17500	4200	45°
4	4	160	0.070	0.28	0.28	3.88	13125	3675	45°
5	4	160	0.080	0.35	0.35	4.84	10525	3370	45°
6	4	160	0.085	0.42	0.42	5.81	8765	2980	45°
8	4	160	0.095	0.56	0.56	7.75	6570	2495	45°
10	4	160	0.110	0.70	0.70	9.69	5255	2310	45°
12	4	160	0.115	0.84	0.84	11.63	4380	2015	45°
3	4	120	0.055	0.15	0.15	2.83	13500	2970	45°
4	4	120	0.065	0.20	0.20	3.78	10105	2625	45°
5	4	120	0.075	0.25	0.25	4.72	8095	2430	45°
6	4	120	0.080	0.30	0.30	5.67	6735	2155	45°
8	4	120	0.085	0.40	0.40	7.56	5055	1720	45°
10	4	120	0.100	0.50	0.50	9.45	4040	1615	45°
12	4	120	0.105	0.60	0.60	11.34	3370	1415	45°
3	4	100	0.050	0.15	0.15	2.83	11250	2250	45°
4	4	100	0.060	0.20	0.20	3.78	8420	2020	45°
5	4	100	0.070	0.25	0.25	4.72	6745	1890	45°
6	4	100	0.070	0.30	0.30	5.67	5615	1570	45°
8	4	100	0.080	0.40	0.40	7.56	4210	1345	45°
10	4	100	0.095	0.50	0.50	9.45	3370	1280	45°
12	4	100	0.100	0.60	0.60	11.34	2805	1120	45°
3	4	60	0.045	0.12	0.12	2.78	6870	1235	45°
4	4	60	0.055	0.16	0.16	3.71	5150	1135	45°
5	4	60	0.060	0.20	0.20	4.64	4115	990	45°
6	4	60	0.065	0.24	0.24	5.57	3430	890	45°
8	4	60	0.070	0.32	0.32	7.42	2575	720	45°
10	4	60	0.085	0.40	0.40	9.28	2060	700	45°
12	4	60	0.085	0.48	0.48	11.13	1715	585	45°

Frese con estremità emisferica Sphero-XR4

Tolleranza r ± 0.01 , 9xd

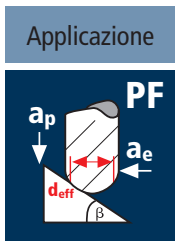


**HM
XT** λ **30°**
 γ **-10°**



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			
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										X-AL
Esempio: N° Ordine										
Rivestimento X Articolo 7458 Codice-ø .180										
										X7458
ø Code	d1 0/-0.02	d2 h5	d3	l1	l2	l3	r ± 0.01	α	z	
.180	3	6	2.8	75	4	27	1.5	2.8°	4	●
.220	4	6	3.7	80	5	36	2.0	1.5°	4	●
.260	5	6	4.6	87	6	45	2.5	0.7°	4	●
.300	6	6	5.5	100	7	63	3.0	0.0°	4	●
.391	8	8	7.4	120	9	83	4.0	0.0°	4	●
.450	10	10	9.2	135	11	94	5.0	0.0°	4	●
.501	12	12	11.0	160	13	114	6.0	0.0°	4	●



Materiale

Acciaio da utensile temprato
42 - 48 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	180	0.040	0.12	0.12	1.00	57295	4585	45°
2	2	180	0.065	0.20	0.20	1.98	28940	3760	45°
3	2	180	0.075	0.30	0.30	2.97	19290	2895	45°
4	2	180	0.090	0.40	0.40	3.96	14470	2605	45°
6	2	180	0.110	0.60	0.60	5.94	9645	2120	45°
8	2	180	0.125	0.80	0.80	7.92	7235	1810	45°
10	2	180	0.145	1.00	1.00	9.90	5790	1680	45°
12	2	180	0.150	1.20	1.20	11.88	4825	1450	45°

Acciaio da utensile temprato
48 - 52 HRC

D

1	2	150	0.035	0.12	0.12	1.00	47750	3345	45°
2	2	150	0.060	0.15	0.15	1.95	24485	2940	45°
3	2	150	0.070	0.18	0.18	2.87	16635	2330	45°
4	2	150	0.085	0.20	0.20	3.78	12630	2145	45°
6	2	150	0.100	0.30	0.30	5.67	8420	1685	45°
8	2	150	0.115	0.40	0.40	7.56	6315	1450	45°
10	2	150	0.135	0.50	0.50	9.45	5055	1365	45°
12	2	150	0.140	0.60	0.60	11.34	4210	1180	45°

Acciaio da utensile temprato
52 - 56 HRC

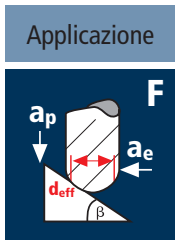
D

1	2	110	0.035	0.12	0.12	1.00	35015	2450	45°
2	2	110	0.055	0.15	0.15	1.95	17955	1975	45°
3	2	110	0.065	0.18	0.18	2.87	12200	1585	45°
4	2	110	0.075	0.20	0.20	3.78	9265	1390	45°
6	2	110	0.095	0.30	0.30	5.67	6175	1175	45°
8	2	110	0.105	0.40	0.40	7.56	4630	970	45°
10	2	110	0.125	0.50	0.50	9.45	3705	925	45°
12	2	110	0.130	0.60	0.60	11.34	3090	805	45°

Acciaio da utensile temprato
56 - 60 HRC

D

1	2	80	0.030	0.10	0.10	0.99	25725	1545	45°
2	2	80	0.050	0.12	0.12	1.92	13265	1325	45°
3	2	80	0.055	0.14	0.14	2.82	9030	995	45°
4	2	80	0.070	0.16	0.16	3.71	6865	960	45°
6	2	80	0.085	0.24	0.24	5.57	4570	775	45°
8	2	80	0.095	0.32	0.32	7.42	3430	650	45°
10	2	80	0.110	0.40	0.40	9.28	2745	605	45°
12	2	80	0.115	0.48	0.48	11.13	2290	525	45°



Materiale

Acciaio da utensile temprato
42 - 48 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	280	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	280	0.030	0.07	0.07	1.84	48440	2905	45°
3	2	280	0.035	0.10	0.10	2.74	32530	2275	45°
4	2	280	0.055	0.12	0.12	3.62	24620	2710	45°
6	2	280	0.065	0.15	0.15	5.36	16630	2160	45°
8	2	280	0.075	0.17	0.17	7.05	12640	1895	45°
10	2	280	0.080	0.20	0.20	8.77	10165	1625	45°
12	2	280	0.085	0.25	0.25	10.56	8440	1435	45°

Acciaio da utensile temprato
48 - 52 HRC

D

1	2	220	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	220	0.030	0.07	0.07	1.84	38060	2285	45°
3	2	220	0.035	0.10	0.10	2.74	25560	1790	45°
4	2	220	0.050	0.12	0.12	3.62	19345	1935	45°
6	2	220	0.060	0.15	0.15	5.36	13065	1570	45°
8	2	220	0.070	0.17	0.17	7.05	9935	1390	45°
10	2	220	0.075	0.20	0.20	8.77	7985	1200	45°
12	2	220	0.080	0.25	0.25	10.56	6630	1060	45°

Acciaio da utensile temprato
52 - 56 HRC

D

1	2	180	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	180	0.025	0.07	0.07	1.84	31140	1555	45°
3	2	180	0.030	0.10	0.10	2.74	20910	1255	45°
4	2	180	0.050	0.12	0.12	3.62	15830	1585	45°
6	2	180	0.060	0.15	0.15	5.36	10690	1285	45°
8	2	180	0.070	0.17	0.17	7.05	8125	1140	45°
10	2	180	0.070	0.20	0.20	8.77	6535	915	45°
12	2	180	0.075	0.25	0.25	10.56	5425	815	45°

Acciaio da utensile temprato
56 - 60 HRC

D

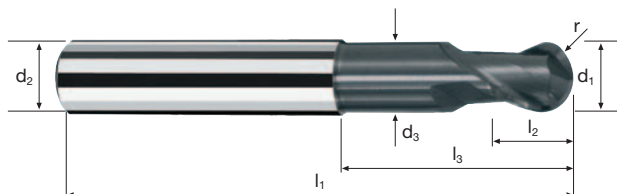
1	2	120	0.020	0.05	0.05	0.94	40635	1625	45°
2	2	120	0.025	0.07	0.07	1.84	20760	1040	45°
3	2	120	0.030	0.10	0.10	2.74	13940	835	45°
4	2	120	0.045	0.12	0.12	3.62	10550	950	45°
6	2	120	0.055	0.15	0.15	5.36	7125	785	45°
8	2	120	0.065	0.17	0.17	7.05	5420	705	45°
10	2	120	0.070	0.20	0.20	8.77	4355	610	45°
12	2	120	0.070	0.25	0.25	10.56	3615	505	45°

Frese con estremità emisferica HX-S

Tolleranza r js8 (±), 3xd



HM	λ 30°
XA	γ -10°



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			GG(G)
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Esempio: N° Ordine										DURO-S
Rivestimento Articolo Codice-ø										DURO-S
D 5100 .100										D5100
ø Code	d1 ±	d2 h6	d3	l1	l2	l3	r js8	α	z	
.100	1.0	6	0.95	57	1.5	3.0	0.50	11.8°	2	●
.120	1.5	6	1.40	57	2.0	4.5	0.75	10.3°	2	●
.140	2.0	6	1.90	57	3.0	6.0	1.00	9.0°	2	●
.160	2.5	6	2.30	57	3.5	7.5	1.25	7.6°	2	●
.180	3.0	6	2.80	57	4.0	9.0	1.50	6.4°	2	●
.220	4.0	6	3.70	57	5.0	12.0	2.00	4.0°	2	●
.260	5.0	6	4.60	57	6.0	15.0	2.50	2.0°	2	●
.300	6.0	6	5.50	57	7.0	20.0	3.00	0.0°	2	●
.391	8.0	8	7.40	63	9.0	26.0	4.00	0.0°	2	●
.450	10.0	10	9.20	72	11.0	31.0	5.00	0.0°	2	●
.501	12.0	12	11.00	83	13.0	37.0	6.00	0.0°	2	●

CNC Raggio R					CNC Raggio R				
Raggio js8					Raggios js8				
d1	r	Minimo	Massimo	R	d1	r	Minimo	Massimo	R
1.0	0.50	0.493	0.507	0.500	6.0	3.00	2.993	3.007	3.000
1.5	0.75	0.743	0.757	0.750	8.0	4.00	3.991	4.009	4.000
2.0	1.00	0.993	1.007	1.000	10.0	5.00	4.991	5.009	5.000
2.5	1.25	1.243	1.257	1.250	12.0	6.00	5.991	6.009	6.000
3.0	1.50	1.493	1.507	1.500					
4.0	2.00	1.993	2.007	2.000					
5.0	2.50	2.493	2.507	2.500					

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 42 - 48 HRC 	6	4	250	0.070	0.15	0.15	5.36	14845	4155	45°
		8	4	250	0.080	0.17	0.17	7.05	11290	3615	45°
		10	4	250	0.085	0.20	0.20	8.77	9075	3085	45°
		12	4	250	0.090	0.25	0.25	10.56	7535	2715	45°
Acciaio da utensile temprato 48 - 52 HRC 	Acciaio da utensile temprato 48 - 52 HRC 	6	4	200	0.065	0.15	0.15	5.36	11880	3090	45°
		8	4	200	0.075	0.17	0.17	7.05	9030	2710	45°
		10	4	200	0.080	0.20	0.20	8.77	7260	2325	45°
		12	4	200	0.085	0.25	0.25	10.56	6030	2050	45°
Acciaio da utensile temprato 52 - 56 HRC 	Acciaio da utensile temprato 52 - 56 HRC 	6	4	160	0.065	0.15	0.15	5.36	9500	2470	45°
		8	4	160	0.070	0.17	0.17	7.05	7225	2025	45°
		10	4	160	0.075	0.20	0.20	8.77	5805	1740	45°
		12	4	160	0.080	0.25	0.25	10.56	4825	1545	45°
Acciaio da utensile temprato 56 - 60 HRC 	Acciaio da utensile temprato 56 - 60 HRC 	6	4	100	0.060	0.15	0.15	5.36	5940	1425	45°
		8	4	100	0.070	0.17	0.17	7.05	4515	1265	45°
		10	4	100	0.070	0.20	0.20	8.77	3630	1015	45°
		12	4	100	0.075	0.25	0.25	10.56	3015	905	45°

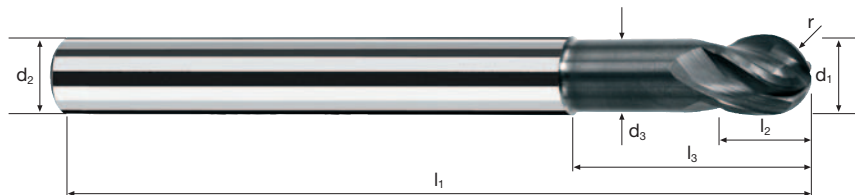
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 42 - 48 HRC 	6	4	350	0.050	0.03	0.03	4.80	23210	4640	45°
		8	4	350	0.055	0.03	0.03	6.31	17655	3885	45°
		10	4	350	0.055	0.04	0.04	7.91	14085	3100	45°
		12	4	350	0.060	0.04	0.04	9.41	11840	2840	45°
Acciaio da utensile temprato 48 - 52 HRC 	Acciaio da utensile temprato 48 - 52 HRC 	6	4	300	0.050	0.03	0.03	4.80	19895	3980	45°
		8	4	300	0.050	0.03	0.03	6.31	15135	3025	45°
		10	4	300	0.050	0.04	0.04	7.91	12075	2415	45°
		12	4	300	0.055	0.04	0.04	9.41	10150	2235	45°
Acciaio da utensile temprato 52 - 56 HRC 	Acciaio da utensile temprato 52 - 56 HRC 	6	4	250	0.045	0.03	0.03	4.80	16580	2985	45°
		8	4	250	0.050	0.03	0.03	6.31	12610	2520	45°
		10	4	250	0.050	0.04	0.04	7.91	10060	2010	45°
		12	4	250	0.055	0.04	0.04	9.41	8455	1860	45°
Acciaio da utensile temprato 56 - 60 HRC 	Acciaio da utensile temprato 56 - 60 HRC 	6	4	150	0.045	0.03	0.03	4.80	9945	1790	45°
		8	4	150	0.045	0.03	0.03	6.31	7565	1360	45°
		10	4	150	0.045	0.04	0.04	7.91	6035	1085	45°
		12	4	150	0.050	0.04	0.04	9.41	5075	1015	45°

Frese con estremità emisferica HX-S4

Tolleranza r js8 (±), 3xd

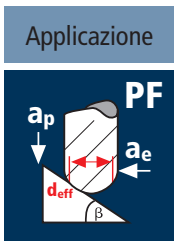


HM λ 30°
XA γ-10°



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			GG(G)
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Esempio: N° Ordine		Rivestimento D	Articolo 5140	Codice-ø .300						DURO-S
Ø Code	d1 ±	d2 h6	d3	l1	l2	l3	r js8	z		D5140
.300	6	6	5.5	80	7	20	3.0	4		●
.391	8	8	7.4	90	9	26	4.0	4		●
.450	10	10	9.2	100	11	31	5.0	4		●
.501	12	12	11.0	120	13	37	6.0	4		●
CNC Raggio R										
	d1	r	Tolleranza js8		Raggio					
					Minimo	Massimo	R			
	6	3.0	-0.007	+0.007	2.993	3.007	3.000			
	8	4.0	-0.009	+0.009	3.991	4.009	4.000			
	10	5.0			4.991	5.009	5.000			
	12	6.0			5.991	6.009	6.000			



Materiale

Acciaio
1100 - 1300 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	180	0.040	0.12	0.12	1.00	57295	4585	45°
2	2	180	0.065	0.20	0.20	1.98	28940	3760	45°
3	2	180	0.075	0.30	0.30	2.97	19290	2895	45°
4	2	180	0.090	0.40	0.40	3.96	14470	2605	45°
6	2	180	0.110	0.60	0.60	5.94	9645	2120	45°
8	2	180	0.125	0.80	0.80	7.92	7235	1810	45°
10	2	180	0.145	1.00	1.00	9.90	5790	1680	45°
12	2	180	0.150	1.20	1.20	11.88	4825	1450	45°
16	2	180	0.180	1.60	1.60	15.84	3615	1300	45°

Acciaio da utensile temprato
42 - 48 HRC

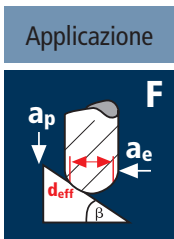
1	2	160	0.035	0.12	0.12	1.00	50930	3565	45°
2	2	160	0.060	0.20	0.20	1.98	25725	3085	45°
3	2	160	0.070	0.30	0.30	2.97	17150	2400	45°
4	2	160	0.085	0.40	0.40	3.96	12860	2185	45°
6	2	160	0.100	0.60	0.60	5.94	8575	1715	45°
8	2	160	0.115	0.80	0.80	7.92	6430	1480	45°
10	2	160	0.135	1.00	1.00	9.90	5145	1390	45°
12	2	160	0.140	1.20	1.20	11.88	4285	1200	45°
16	2	160	0.165	1.60	1.60	15.84	3215	1060	45°

Acciaio da utensile temprato
48 - 52 HRC

1	2	140	0.035	0.12	0.12	1.00	44565	3120	45°
2	2	140	0.055	0.15	0.15	1.95	22855	2515	45°
3	2	140	0.065	0.18	0.18	2.87	15530	2020	45°
4	2	140	0.075	0.20	0.20	3.78	11790	1770	45°
6	2	140	0.095	0.30	0.30	5.67	7860	1495	45°
8	2	140	0.105	0.40	0.40	7.56	5895	1240	45°
10	2	140	0.125	0.50	0.50	9.45	4715	1180	45°
12	2	140	0.130	0.60	0.60	11.34	3930	1020	45°
16	2	140	0.155	0.80	0.80	15.11	2950	915	45°

Acciaio da utensile temprato
52 - 56 HRC

1	2	100	0.030	0.12	0.12	1.00	31830	1910	45°
2	2	100	0.050	0.15	0.15	1.95	16325	1635	45°
3	2	100	0.060	0.18	0.18	2.87	11090	1330	45°
4	2	100	0.070	0.20	0.20	3.78	8420	1180	45°
6	2	100	0.090	0.30	0.30	5.67	5615	1010	45°
8	2	100	0.100	0.40	0.40	7.56	4210	840	45°
10	2	100	0.115	0.50	0.50	9.45	3370	775	45°
12	2	100	0.120	0.60	0.60	11.34	2805	675	45°
16	2	100	0.145	0.80	0.80	15.11	2105	610	45°



Materiale

Acciaio
1100 - 1300 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	280	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	280	0.030	0.07	0.07	1.84	48440	2905	45°
3	2	280	0.035	0.10	0.10	2.74	32530	2275	45°
4	2	280	0.055	0.12	0.12	3.62	24620	2710	45°
6	2	280	0.065	0.15	0.15	5.36	16630	2160	45°
8	2	280	0.075	0.17	0.17	7.05	12640	1895	45°
10	2	280	0.080	0.20	0.20	8.77	10165	1625	45°
12	2	280	0.085	0.25	0.25	10.56	8440	1435	45°
16	2	280	0.100	0.28	0.28	13.88	6420	1285	45°

Acciaio da utensile temprato
42 - 48 HRC

1	2	250	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	250	0.030	0.07	0.07	1.84	43250	2595	45°
3	2	250	0.035	0.10	0.10	2.74	29045	2035	45°
4	2	250	0.050	0.12	0.12	3.62	21985	2200	45°
6	2	250	0.060	0.15	0.15	5.36	14845	1780	45°
8	2	250	0.070	0.17	0.17	7.05	11290	1580	45°
10	2	250	0.075	0.20	0.20	8.77	9075	1360	45°
12	2	250	0.080	0.25	0.25	10.56	7535	1205	45°
16	2	250	0.095	0.28	0.28	13.88	5735	1090	45°

Acciaio da utensile temprato
48 - 52 HRC

1	2	200	0.025	0.05	0.05	0.94	60000	3000	45°
2	2	200	0.025	0.07	0.07	1.84	34600	1730	45°
3	2	200	0.030	0.10	0.10	2.74	23235	1395	45°
4	2	200	0.050	0.12	0.12	3.62	17585	1760	45°
6	2	200	0.060	0.15	0.15	5.36	11880	1425	45°
8	2	200	0.070	0.17	0.17	7.05	9030	1265	45°
10	2	200	0.070	0.20	0.20	8.77	7260	1015	45°
12	2	200	0.075	0.25	0.25	10.56	6030	905	45°
16	2	200	0.090	0.28	0.28	13.88	4585	825	45°

Acciaio da utensile temprato
52 - 56 HRC

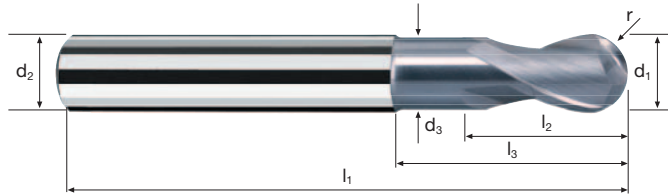
1	2	150	0.020	0.05	0.05	0.94	50795	2030	45°
2	2	150	0.025	0.07	0.07	1.84	25950	1300	45°
3	2	150	0.030	0.10	0.10	2.74	17425	1045	45°
4	2	150	0.045	0.12	0.12	3.62	13190	1185	45°
6	2	150	0.055	0.15	0.15	5.36	8910	980	45°
8	2	150	0.065	0.17	0.17	7.05	6775	880	45°
10	2	150	0.070	0.20	0.20	8.77	5445	760	45°
12	2	150	0.070	0.25	0.25	10.56	4520	635	45°
16	2	150	0.085	0.28	0.28	13.88	3440	585	45°

Frese con estremità emisferica Sphericut

Tolleranza r f8 (-/-), 3xd



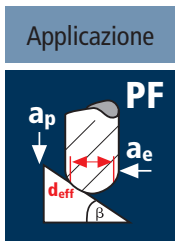
HM Plus	λ 30° γ -10°



	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60			GG(G)
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Esempio: N° Ordine										POLYCHROM	
Rivestimento		Articolo		Codice-ø						P5286	
P		5286		.100							
ø Code	d1 -/-	d2 h6	d3	l1	l2	l3	r f8	α	z		
.100	1.0	3	-	40	1.0	-	0.50	13.2°	2	●	
.120	1.5	3	-	40	2.0	-	0.75	10.4°	2	●	
.138	2.0	3	-	40	2.5	-	1.00	8.3°	2	●	
.140	2.0	6	1.9	57	3.0	6	1.00	9.0°	2	●	
.178	3.0	3	-	40	4.0	-	1.50	0.0°	2	●	
.180	3.0	6	2.8	57	4.0	9	1.50	6.4°	2	●	
.220	4.0	6	3.7	57	5.0	12	2.00	4.0°	2	●	
.260	5.0	6	4.6	57	6.0	15	2.50	2.0°	2	●	
.300	6.0	6	5.5	57	7.0	20	3.00	0.0°	2	●	
.391	8.0	8	7.4	63	9.0	26	4.00	0.0°	2	●	
.450	10.0	10	9.2	72	11.0	31	5.00	0.0°	2	●	
.501	12.0	12	11.0	83	13.0	37	6.00	0.0°	2	●	
.610	16.0	16	15.0	92	17.0	43	8.00	0.0°	2	●	

CNC Raggio R					CNC Raggio R				
Raggio f8					Raggio f8				
d1	r	Minimo	Massimo	R	d1	r	Minimo	Massimo	R
1.0	0.50	0.480	0.494	0.487	6.0	3.00	2.980	2.994	2.987
1.5	0.75	0.730	0.744	0.737	8.0	4.00	3.972	3.990	3.981
2.0	1.00	0.980	0.994	0.987	10.0	5.00	4.972	4.990	4.981
3.0	1.50	1.480	1.494	1.487	12.0	6.00	5.972	5.990	5.981
4.0	2.00	1.980	1.994	1.987	16.0	8.00	7.965	7.987	7.976
5.0	2.50	2.480	2.494	2.487					



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
4	2	220	0.090	0.40	0.40	3.96	17685	3185	45°
5	2	220	0.100	0.50	0.50	4.95	14150	2830	45°
6	2	220	0.110	0.60	0.60	5.94	11790	2595	45°
8	2	220	0.125	0.80	0.80	7.92	8840	2210	45°
10	2	220	0.145	1.00	1.00	9.90	7075	2050	45°
12	2	220	0.150	1.20	1.20	11.88	5895	1770	45°
16	2	220	0.180	1.60	1.60	15.84	4420	1590	45°

Acciaio
1100 - 1300 N/mm²

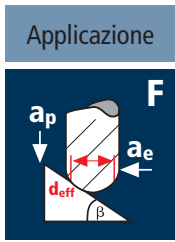
4	2	180	0.085	0.40	0.40	3.96	14470	2460	45°
5	2	180	0.090	0.50	0.50	4.95	11575	2085	45°
6	2	180	0.100	0.60	0.60	5.94	9645	1930	45°
8	2	180	0.115	0.80	0.80	7.92	7235	1665	45°
10	2	180	0.135	1.00	1.00	9.90	5790	1565	45°
12	2	180	0.140	1.20	1.20	11.88	4825	1350	45°
16	2	180	0.165	1.60	1.60	15.84	3615	1195	45°

Acciaio
1300 - 1500 N/mm²

4	2	160	0.075	0.40	0.40	3.96	12860	1930	45°
5	2	160	0.085	0.50	0.50	4.95	10290	1750	45°
6	2	160	0.095	0.60	0.60	5.94	8575	1630	45°
8	2	160	0.105	0.80	0.80	7.92	6430	1350	45°
10	2	160	0.125	1.00	1.00	9.90	5145	1285	45°
12	2	160	0.130	1.20	1.20	11.88	4285	1115	45°
16	2	160	0.155	1.60	1.60	15.84	3215	995	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

4	2	90	0.070	0.32	0.32	3.91	7325	1025	45°
5	2	90	0.080	0.40	0.40	4.89	5860	940	45°
6	2	90	0.090	0.48	0.48	5.87	4880	880	45°
8	2	90	0.100	0.64	0.64	7.82	3665	735	45°
10	2	90	0.115	0.80	0.80	9.78	2930	675	45°
12	2	90	0.120	0.96	0.96	11.73	2440	585	45°
16	2	90	0.145	1.28	1.28	15.64	1830	530	45°



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
4	2	320	0.055	0.12	0.12	3.62	28140	3095	45°
5	2	320	0.060	0.13	0.13	4.48	22735	2730	45°
6	2	320	0.065	0.15	0.15	5.36	19005	2470	45°
8	2	320	0.075	0.17	0.17	7.05	14450	2170	45°
10	2	320	0.080	0.20	0.20	8.77	11615	1860	45°
12	2	320	0.085	0.25	0.25	10.56	9645	1640	45°
16	2	320	0.100	0.28	0.28	13.88	7340	1470	45°

Acciaio
1100 - 1300 N/mm²

4	2	280	0.050	0.12	0.12	3.62	24620	2460	45°
5	2	280	0.055	0.13	0.13	4.48	19895	2190	45°
6	2	280	0.060	0.15	0.15	5.36	16630	1995	45°
8	2	280	0.070	0.17	0.17	7.05	12640	1770	45°
10	2	280	0.075	0.20	0.20	8.77	10165	1525	45°
12	2	280	0.080	0.25	0.25	10.56	8440	1350	45°
16	2	280	0.095	0.28	0.28	13.88	6420	1220	45°

Acciaio
1300 - 1500 N/mm²

4	2	250	0.050	0.12	0.12	3.62	21985	2200	45°
5	2	250	0.055	0.13	0.13	4.48	17765	1955	45°
6	2	250	0.060	0.15	0.15	5.36	14845	1780	45°
8	2	250	0.070	0.17	0.17	7.05	11290	1580	45°
10	2	250	0.070	0.20	0.20	8.77	9075	1270	45°
12	2	250	0.075	0.25	0.25	10.56	7535	1130	45°
16	2	250	0.090	0.28	0.28	13.88	5735	1030	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

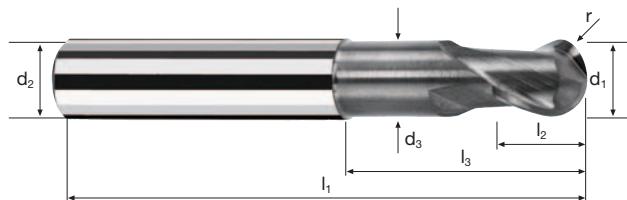
4	2	110	0.045	0.10	0.10	3.57	9810	885	45°
5	2	110	0.050	0.11	0.11	4.42	7920	790	45°
6	2	110	0.055	0.13	0.13	5.29	6620	730	45°
8	2	110	0.065	0.15	0.15	6.98	5015	650	45°
10	2	110	0.070	0.18	0.18	8.70	4025	565	45°
12	2	110	0.070	0.22	0.22	10.45	3350	470	45°
16	2	110	0.085	0.25	0.25	13.77	2545	435	45°

Frese con estremità emisferica

Tolleranza r f8 (-/-), 3xd

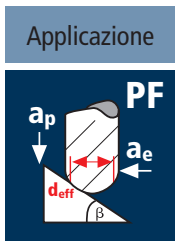


HM
MG10 λ **30°**
 γ **5°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500			Inox Stainless	GG(G)
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Esempio: N° Ordine										POLYCHROM	
										P5220	
										P5220	
Ø Code	d1 -/-	d2 h6	d3	l1	l2	l3	r f8	α	z		
.220	4	6	3.7	57	5	12	2.0	4.0°	2	●	
.260	5	6	4.6	57	6	15	2.5	2.0°	2	●	
.300	6	6	5.5	57	7	20	3.0	0.0°	2	●	
.391	8	8	7.4	63	9	26	4.0	0.0°	2	●	
.450	10	10	9.2	72	11	31	5.0	0.0°	2	●	
.501	12	12	11.0	83	13	37	6.0	0.0°	2	●	
.610	16	16	15.0	92	17	43	8.0	0.0°	2	●	
CNC Raggio R											
		Tolleranza f8		Raggio							
d1	r			Minimo	Massimo	R					
4	2.0	-0.006	-0.020	1.980	1.994	1.987					
5	2.5			2.480	2.494	2.487					
6	3.0			2.980	2.994	2.987					
8	4.0	-0.010	-0.028	3.972	3.990	3.981					
10	5.0			4.972	4.990	4.981					
12	6.0			5.972	5.990	5.981					
16	8.0	-0.013	-0.035	7.965	7.987	7.976					



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
1	2	100	0.030	0.11	0.11	0.99	32155	1930	45°
2	2	100	0.055	0.22	0.22	1.99	15995	1760	45°
3	2	100	0.060	0.33	0.33	2.98	10680	1280	45°
4	2	100	0.070	0.44	0.44	3.98	8000	1120	45°
5	2	100	0.080	0.55	0.55	4.97	6405	1025	45°
6	2	100	0.085	0.66	0.66	5.96	5340	910	45°
8	2	100	0.100	0.88	0.88	7.95	4005	800	45°
10	2	100	0.115	1.10	1.10	9.94	3200	735	45°
12	2	100	0.120	1.32	1.32	11.93	2670	640	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

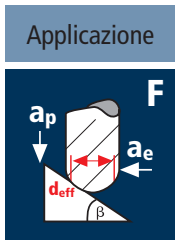
1	2	90	0.030	0.11	0.11	0.99	28940	1735	45°
2	2	90	0.055	0.22	0.22	1.99	14395	1585	45°
3	2	90	0.060	0.33	0.33	2.98	9615	1155	45°
4	2	90	0.070	0.44	0.44	3.98	7200	1010	45°
5	2	90	0.080	0.55	0.55	4.97	5765	920	45°
6	2	90	0.085	0.66	0.66	5.96	4805	815	45°
8	2	90	0.100	0.88	0.88	7.95	3605	720	45°
10	2	90	0.115	1.10	1.10	9.94	2880	660	45°
12	2	90	0.120	1.32	1.32	11.93	2400	575	45°

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

1	2	60	0.025	0.11	0.11	0.99	19290	965	45°
2	2	60	0.045	0.22	0.22	1.99	9600	865	45°
3	2	60	0.050	0.33	0.33	2.98	6410	640	45°
4	2	60	0.060	0.44	0.44	3.98	4800	575	45°
5	2	60	0.070	0.55	0.55	4.97	3845	540	45°
6	2	60	0.070	0.66	0.66	5.96	3205	450	45°
8	2	60	0.085	0.88	0.88	7.95	2400	410	45°
10	2	60	0.100	1.10	1.10	9.94	1920	385	45°
12	2	60	0.100	1.32	1.32	11.93	1600	320	45°

Acciaio < 850 N/mm²

1	2	220	0.040	0.12	0.12	1.00	60000	4800	45°
2	2	220	0.070	0.24	0.24	1.99	35190	4925	45°
3	2	220	0.075	0.36	0.36	2.99	23420	3515	45°
4	2	220	0.090	0.48	0.48	3.99	17550	3160	45°
5	2	220	0.100	0.60	0.60	4.98	14060	2810	45°
6	2	220	0.105	0.72	0.72	5.98	11710	2460	45°
8	2	220	0.125	0.96	0.96	7.98	8775	2195	45°
10	2	220	0.145	1.20	1.20	9.97	7025	2035	45°
12	2	220	0.150	1.44	1.44	11.96	5855	1755	45°



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
1	2	140	0.025	0.05	0.05	0.94	47410	2370	45°
2	2	140	0.030	0.07	0.07	1.84	24220	1455	45°
3	2	140	0.035	0.09	0.09	2.72	16385	1145	45°
4	2	140	0.055	0.11	0.11	3.60	12380	1360	45°
5	2	140	0.060	0.13	0.13	4.48	9945	1195	45°
6	2	140	0.065	0.15	0.15	5.36	8315	1080	45°
8	2	140	0.075	0.17	0.17	7.05	6320	950	45°
10	2	140	0.080	0.20	0.20	8.77	5080	815	45°
12	2	140	0.085	0.25	0.25	10.56	4220	715	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

1	2	125	0.025	0.05	0.05	0.94	42330	2115	45°
2	2	125	0.030	0.07	0.07	1.84	21625	1300	45°
3	2	125	0.035	0.09	0.09	2.72	14630	1025	45°
4	2	125	0.055	0.11	0.11	3.60	11055	1215	45°
5	2	125	0.060	0.13	0.13	4.48	8880	1065	45°
6	2	125	0.065	0.15	0.15	5.36	7425	965	45°
8	2	125	0.075	0.17	0.17	7.05	5645	845	45°
10	2	125	0.080	0.20	0.20	8.77	4535	725	45°
12	2	125	0.085	0.25	0.25	10.56	3770	640	45°

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

1	2	70	0.025	0.05	0.05	0.94	23705	1185	45°
2	2	70	0.025	0.07	0.07	1.84	12110	605	45°
3	2	70	0.030	0.09	0.09	2.72	8190	490	45°
4	2	70	0.050	0.11	0.11	3.60	6190	620	45°
5	2	70	0.055	0.13	0.13	4.48	4975	545	45°
6	2	70	0.060	0.15	0.15	5.36	4155	500	45°
8	2	70	0.070	0.17	0.17	7.05	3160	440	45°
10	2	70	0.070	0.20	0.20	8.77	2540	355	45°
12	2	70	0.075	0.25	0.25	10.56	2110	315	45°

Acciaio < 850 N/mm²

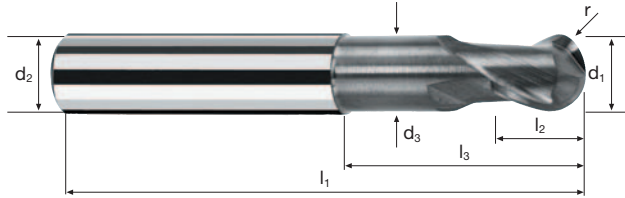
1	2	320	0.030	0.05	0.05	0.94	60000	3600	45°
2	2	320	0.035	0.07	0.07	1.84	55360	3875	45°
3	2	320	0.040	0.09	0.09	2.72	37450	2995	45°
4	2	320	0.065	0.11	0.11	3.60	28295	3680	45°
5	2	320	0.070	0.13	0.13	4.48	22735	3185	45°
6	2	320	0.080	0.15	0.15	5.36	19005	3040	45°
8	2	320	0.090	0.17	0.17	7.05	14450	2600	45°
10	2	320	0.095	0.20	0.20	8.77	11615	2205	45°
12	2	320	0.100	0.25	0.25	10.56	9645	1930	45°

Frese con estremità emisferica Sphero-SB

Tolleranza r f8 (-/-), 3xd



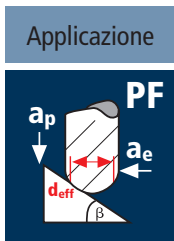
HM λ **30°**
MG10 γ **5°**



Rm < 850 **Rm** 850-1100 **Inox** Stainless **Ti** Titanium **Tool Steel**

Esempio: N° Ordine										POLYCHROM
Rivestimento Articolo Codice-ø										P7540
P 7540 .100										P7540
Ø Code	d1 +/-	d2 h6	d3	l1	l2	l3	r f8	α	z	
.100	1	6	0.95	57	1.5	3	0.5	11.8°	2	●
.140	2	6	1.90	57	3.0	6	1.0	9.0°	2	●
.180	3	6	2.80	57	4.0	9	1.5	6.4°	2	●
.220	4	6	3.70	57	5.0	12	2.0	4.0°	2	●
.260	5	6	4.60	57	6.0	15	2.5	2.0°	2	●
.300	6	6	5.50	57	7.0	20	3.0	0.0°	2	●
.391	8	8	7.40	63	9.0	26	4.0	0.0°	2	●
.450	10	10	9.20	72	11.0	31	5.0	0.0°	2	●
.501	12	12	11.00	83	13.0	37	6.0	0.0°	2	●

CNC Raggio R					CNC Raggio R				
Raggios f8					Raggios f8				
d1	r	Minimo	Massimo	R	d1	r	Minimo	Massimo	R
1	0.5	0.480	0.494	0.487	8	4.0	3.972	3.990	3.981
2	1.0	0.980	0.994	0.987	10	5.0	4.972	4.990	4.981
3	1.5	1.480	1.494	1.487	12	6.0	5.972	5.990	5.981
4	2.0	1.980	1.994	1.987					
5	2.5	2.480	2.494	2.487					
6	3.0	2.980	2.994	2.987					



Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
2	2	650	0.065	0.30	0.30	2.00	60000	7800	45°
3	2	650	0.075	0.45	0.45	3.00	60000	9000	45°
4	2	650	0.090	0.60	0.60	4.00	51725	9310	45°
5	2	650	0.090	0.75	0.75	5.00	41380	7450	45°
6	2	650	0.090	0.90	0.90	6.00	34485	6205	45°
8	2	650	0.115	1.20	1.20	8.00	25865	5950	45°
10	2	650	0.125	1.50	1.50	10.00	20690	5175	45°
12	2	650	0.135	1.80	1.80	12.00	17240	4655	45°
16	2	650	0.160	2.40	2.40	16.00	12930	4140	45°

Rame non legato

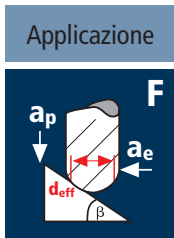
2	2	500	0.060	0.30	0.30	2.00	60000	7200	45°
3	2	500	0.070	0.45	0.45	3.00	53055	7430	45°
4	2	500	0.080	0.60	0.60	4.00	39790	6365	45°
5	2	500	0.080	0.75	0.75	5.00	31830	5095	45°
6	2	500	0.080	0.90	0.90	6.00	26525	4245	45°
8	2	500	0.105	1.20	1.20	8.00	19895	4180	45°
10	2	500	0.115	1.50	1.50	10.00	15915	3660	45°
12	2	500	0.120	1.80	1.80	12.00	13265	3185	45°
16	2	500	0.145	2.40	2.40	16.00	9945	2885	45°

Materiali termoplastici

2	2	1000	0.065	0.30	0.30	2.00	60000	7800	45°
3	2	1000	0.075	0.45	0.45	3.00	60000	9000	45°
4	2	1000	0.090	0.60	0.60	4.00	60000	10800	45°
5	2	1000	0.090	0.75	0.75	5.00	60000	10800	45°
6	2	1000	0.090	0.90	0.90	6.00	53055	9550	45°
8	2	1000	0.115	1.20	1.20	8.00	39790	9150	45°
10	2	1000	0.125	1.50	1.50	10.00	31830	7960	45°
12	2	1000	0.135	1.80	1.80	12.00	26525	7160	45°
16	2	1000	0.160	2.40	2.40	16.00	19895	6365	45°

Getti d'alluminio
Si 6% - 15%

2	2	450	0.045	0.30	0.30	2.00	60000	5400	45°
3	2	450	0.055	0.45	0.45	3.00	47750	5255	45°
4	2	450	0.065	0.60	0.60	4.00	35810	4655	45°
5	2	450	0.065	0.75	0.75	5.00	28650	3725	45°
6	2	450	0.065	0.90	0.90	6.00	23875	3105	45°
8	2	450	0.080	1.20	1.20	8.00	17905	2865	45°
10	2	450	0.090	1.50	1.50	10.00	14325	2580	45°
12	2	450	0.095	1.80	1.80	12.00	11935	2270	45°
16	2	450	0.110	2.40	2.40	16.00	8955	1970	45°



Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
2	2	900	0.035	0.12	0.12	1.92	60000	4200	45°
3	2	900	0.040	0.15	0.15	2.83	60000	4800	45°
4	2	900	0.055	0.17	0.17	3.73	60000	6600	45°
5	2	900	0.055	0.20	0.20	4.64	60000	6600	45°
6	2	900	0.055	0.22	0.22	5.53	51805	5700	45°
8	2	900	0.065	0.24	0.24	7.25	39515	5135	45°
10	2	900	0.070	0.27	0.27	8.98	31905	4465	45°
12	2	900	0.075	0.30	0.30	10.71	26750	4015	45°
16	2	900	0.090	0.34	0.34	14.10	20320	3660	45°

Rame non legato

2	2	650	0.030	0.12	0.12	1.92	60000	3600	45°
3	2	650	0.035	0.15	0.15	2.83	60000	4200	45°
4	2	650	0.050	0.17	0.17	3.73	55470	5545	45°
5	2	650	0.050	0.20	0.20	4.64	44590	4460	45°
6	2	650	0.050	0.22	0.22	5.53	37415	3740	45°
8	2	650	0.060	0.24	0.24	7.25	28540	3425	45°
10	2	650	0.065	0.27	0.27	8.98	23040	2995	45°
12	2	650	0.070	0.30	0.30	10.71	19320	2705	45°
16	2	650	0.080	0.34	0.34	14.10	14675	2350	45°

Materiali termoplastici

2	2	1200	0.035	0.12	0.12	1.92	60000	4200	45°
3	2	1200	0.040	0.15	0.15	2.83	60000	4800	45°
4	2	1200	0.055	0.17	0.17	3.73	60000	6600	45°
5	2	1200	0.055	0.20	0.20	4.64	60000	6600	45°
6	2	1200	0.055	0.22	0.22	5.53	60000	6600	45°
8	2	1200	0.065	0.24	0.24	7.25	52685	6850	45°
10	2	1200	0.070	0.27	0.27	8.98	42535	5955	45°
12	2	1200	0.075	0.30	0.30	10.71	35665	5350	45°
16	2	1200	0.090	0.34	0.34	14.10	27090	4875	45°

Getti d'alluminio
Si 6% - 15%

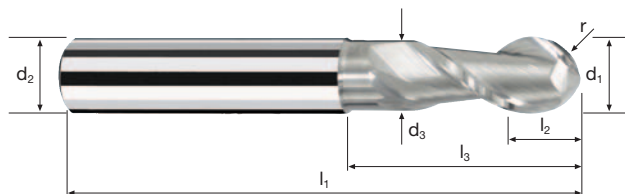
2	2	550	0.025	0.12	0.12	1.92	60000	3000	45°
3	2	550	0.030	0.15	0.15	2.83	60000	3600	45°
4	2	550	0.040	0.17	0.17	3.73	46935	3755	45°
5	2	550	0.040	0.20	0.20	4.64	37730	3020	45°
6	2	550	0.040	0.22	0.22	5.53	31660	2535	45°
8	2	550	0.045	0.24	0.24	7.25	24150	2175	45°
10	2	550	0.050	0.27	0.27	8.98	19495	1950	45°
12	2	550	0.055	0.30	0.30	10.71	16345	1800	45°
16	2	550	0.065	0.34	0.34	14.10	12415	1615	45°

Frese con estremità emisferica Sphericut-Alu

Tolleranza r f8 (-/-), 3xd



HM λ **40°**
MG10 γ **20°**

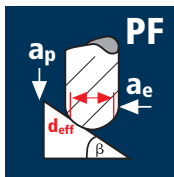


Rm < 850 **Al** Aluminium > 99% **Al** Aluminium Alloy **Al** Aluminium Cast **Cu** Copper **Plastic** Thermoplast

Esempio: N° Ordine										CELERO	
										5290	C5290
Ø Code	d1 -/	d2 h6	d3	l1	l2	l3	r f8	α	z		
.140	2	6	1.9	57	4	6	1.0	9.0°	2	●	●
.180	3	6	2.8	57	6	9	1.5	6.4°	2	●	●
.220	4	6	3.7	57	8	12	2.0	4.0°	2	●	●
.260	5	6	4.6	57	10	15	2.5	1.9°	2	●	●
.300	6	6	5.5	57	12	20	3.0	0.0°	2	●	●
.391	8	8	7.4	63	16	26	4.0	0.0°	2	●	●
.450	10	10	9.2	72	20	31	5.0	0.0°	2	●	●
.501	12	12	11.0	83	24	37	6.0	0.0°	2	●	●
.610	16	16	15.0	92	32	43	8.0	0.0°	2	●	●
.682	20	20	19.0	104	40	53	10.0	0.0°	2	●	●

CNC Raggio R						
d1	r	Tolleranza f8		Raggio		R
		Minimo	Massimo	Minimo	Massimo	
2	1.0	-0.006	-0.020	0.980	0.994	0.987
3	1.5			1.480	1.494	1.487
4	2.0			1.980	1.994	1.987
5	2.5			2.480	2.494	2.487
6	3.0			2.980	2.994	2.987
8	4.0	-0.010	-0.028	3.972	3.990	3.981
10	5.0			4.972	4.990	4.981
12	6.0			5.972	5.990	5.981
16	8.0	-0.013	-0.035	7.965	7.987	7.976
20	10.0			9.965	9.987	9.976

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

Acciaio
1500 - 1800 N/mm²

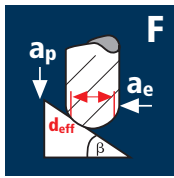
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
3	2	200	0.070	0.24	0.24	2.93	21730	3040	45°
4	2	200	0.080	0.32	0.32	3.91	16280	2605	45°
5	2	200	0.090	0.40	0.40	4.89	13020	2345	45°
6	2	200	0.100	0.48	0.48	5.87	10845	2170	45°
8	2	200	0.110	0.64	0.64	7.82	8140	1790	45°
10	2	200	0.130	0.80	0.80	9.78	6510	1695	45°
12	2	200	0.135	0.96	0.96	11.73	5425	1465	45°

3	2	160	0.065	0.24	0.24	2.93	17385	2260	45°
4	2	160	0.075	0.32	0.32	3.91	13025	1955	45°
5	2	160	0.085	0.40	0.40	4.89	10415	1770	45°
6	2	160	0.090	0.48	0.48	5.87	8675	1560	45°
8	2	160	0.100	0.64	0.64	7.82	6515	1305	45°
10	2	160	0.120	0.80	0.80	9.78	5210	1250	45°
12	2	160	0.125	0.96	0.96	11.73	4340	1085	45°

3	2	140	0.060	0.24	0.24	2.93	15210	1825	45°
4	2	140	0.070	0.32	0.32	3.91	11400	1595	45°
5	2	140	0.075	0.40	0.40	4.89	9115	1365	45°
6	2	140	0.085	0.48	0.48	5.87	7590	1290	45°
8	2	140	0.095	0.64	0.64	7.82	5700	1085	45°
10	2	140	0.110	0.80	0.80	9.78	4555	1000	45°
12	2	140	0.115	0.96	0.96	11.73	3800	875	45°

3	2	80	0.055	0.19	0.19	2.89	8810	970	45°
4	2	80	0.065	0.26	0.26	3.86	6595	855	45°
5	2	80	0.070	0.32	0.32	4.81	5295	740	45°
6	2	80	0.080	0.38	0.38	5.77	4415	705	45°
8	2	80	0.090	0.51	0.51	7.70	3305	595	45°
10	2	80	0.105	0.64	0.64	9.63	2645	555	45°
12	2	80	0.110	0.77	0.77	11.55	2205	485	45°

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

Acciaio
1500 - 1800 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
3	2	300	0.025	0.10	0.10	2.74	34850	1745	45°
4	2	300	0.050	0.12	0.12	3.62	26380	2640	45°
5	2	300	0.055	0.13	0.13	4.48	21315	2345	45°
6	2	300	0.060	0.15	0.15	5.36	17815	2140	45°
8	2	300	0.065	0.17	0.17	7.05	13545	1760	45°
10	2	300	0.070	0.20	0.20	8.77	10890	1525	45°
12	2	300	0.075	0.25	0.25	10.56	9045	1355	45°

3	2	260	0.025	0.10	0.10	2.74	30205	1510	45°
4	2	260	0.050	0.12	0.12	3.62	22865	2285	45°
5	2	260	0.050	0.13	0.13	4.48	18475	1850	45°
6	2	260	0.055	0.15	0.15	5.36	15440	1700	45°
8	2	260	0.060	0.17	0.17	7.05	11740	1410	45°
10	2	260	0.065	0.20	0.20	8.77	9435	1225	45°
12	2	260	0.070	0.25	0.25	10.56	7835	1095	45°

3	2	200	0.025	0.10	0.10	2.74	23235	1160	45°
4	2	200	0.045	0.12	0.12	3.62	17585	1585	45°
5	2	200	0.050	0.13	0.13	4.48	14210	1420	45°
6	2	200	0.055	0.15	0.15	5.36	11880	1305	45°
8	2	200	0.060	0.17	0.17	7.05	9030	1085	45°
10	2	200	0.065	0.20	0.20	8.77	7260	945	45°
12	2	200	0.070	0.25	0.25	10.56	6030	845	45°

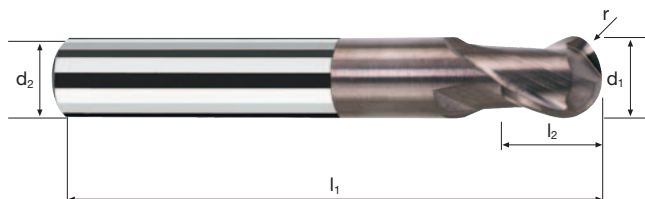
3	2	100	0.020	0.08	0.08	2.69	11835	475	45°
4	2	100	0.045	0.10	0.10	3.57	8915	800	45°
5	2	100	0.045	0.11	0.11	4.42	7200	650	45°
6	2	100	0.050	0.13	0.13	5.29	6015	600	45°
8	2	100	0.055	0.15	0.15	6.98	4560	500	45°
10	2	100	0.060	0.18	0.18	8.70	3660	440	45°
12	2	100	0.065	0.22	0.22	10.45	3045	395	45°

Frese con estremità emisferica

Tolleranza r f8 (-/-), 3xd

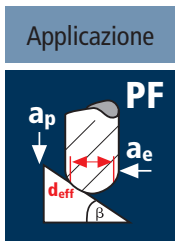


HM	λ 30° γ -10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500						GG(G)
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Esempio: N° Ordine									UNICUT-4X	
Rivestimento Articolo Codice-ø										
U 45298 .180									U45298	
ø Code	d1 e8	d2 h6	l1	l2	r f8	α	z			
.180	3	6	57	4	1.5	10.4°	2		●	
.220	4	6	57	5	2.0	8.3°	2		●	
.260	5	6	57	6	2.5	5.3°	2		●	
.300	6	6	57	7	3.0	0.0°	2		●	
.391	8	8	63	9	4.0	0.0°	2		●	
.450	10	10	72	11	5.0	0.0°	2		●	
.501	12	12	83	12	6.0	0.0°	2		●	
CNC Raggio R										
d1	r	Tolleranza f8		Raggio		R				
				Minimo	Massimo					
3	1.5	-0.006	-0.020	1.480	1.494	1.487				
4	2.0			1.980	1.994	1.987				
5	2.5			2.480	2.494	2.487				
6	3.0			2.980	2.994	2.987				
8	4.0	-0.010	-0.028	3.972	3.990	3.981				
10	5.0			4.972	4.990	4.981				
12	6.0			5.972	5.990	5.981				



Materiale

Acciaio
1100 - 1300 N/mm²

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
1	2	180	0.035	0.08	0.08	0.98	58465	4095	45°
2	2	180	0.060	0.16	0.16	1.96	29235	3510	45°
3	2	180	0.070	0.24	0.24	2.93	19555	2740	45°
4	2	180	0.080	0.32	0.32	3.91	14655	2345	45°
6	2	180	0.100	0.48	0.48	5.87	9760	1950	45°
8	2	180	0.110	0.64	0.64	7.82	7325	1610	45°
10	2	180	0.130	0.80	0.80	9.78	5860	1525	45°
12	2	180	0.135	0.96	0.96	11.73	4885	1320	45°
16	2	180	0.160	1.28	1.28	15.64	3665	1175	45°

Acciaio da utensile temprato
42 - 48 HRC

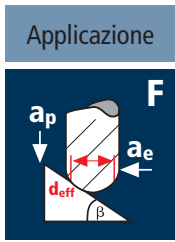
1	2	160	0.030	0.08	0.08	0.98	51970	3120	45°
2	2	160	0.055	0.16	0.16	1.96	25985	2860	45°
3	2	160	0.065	0.24	0.24	2.93	17385	2260	45°
4	2	160	0.075	0.32	0.32	3.91	13025	1955	45°
6	2	160	0.090	0.48	0.48	5.87	8675	1560	45°
8	2	160	0.100	0.64	0.64	7.82	6515	1305	45°
10	2	160	0.120	0.80	0.80	9.78	5210	1250	45°
12	2	160	0.125	0.96	0.96	11.73	4340	1085	45°
16	2	160	0.145	1.28	1.28	15.64	3255	945	45°

Acciaio da utensile temprato
48 - 52 HRC

1	2	140	0.030	0.08	0.08	0.98	45475	2730	45°
2	2	140	0.050	0.12	0.12	1.92	23210	2320	45°
3	2	140	0.060	0.16	0.16	2.85	15635	1875	45°
4	2	140	0.070	0.20	0.20	3.78	11790	1650	45°
6	2	140	0.085	0.30	0.30	5.67	7860	1335	45°
8	2	140	0.095	0.40	0.40	7.56	5895	1120	45°
10	2	140	0.110	0.50	0.50	9.45	4715	1035	45°
12	2	140	0.115	0.60	0.60	11.34	3930	905	45°
16	2	140	0.135	0.80	0.80	15.11	2950	795	45°

Acciaio da utensile temprato
52 - 56 HRC

1	2	100	0.030	0.08	0.08	0.98	32480	1950	45°
2	2	100	0.050	0.12	0.12	1.92	16580	1660	45°
3	2	100	0.055	0.16	0.16	2.85	11170	1230	45°
4	2	100	0.065	0.20	0.20	3.78	8420	1095	45°
6	2	100	0.080	0.30	0.30	5.67	5615	900	45°
8	2	100	0.090	0.40	0.40	7.56	4210	760	45°
10	2	100	0.105	0.50	0.50	9.45	3370	710	45°
12	2	100	0.110	0.60	0.60	11.34	2805	615	45°
16	2	100	0.130	0.80	0.80	15.11	2105	545	45°



Materiale

Acciaio
1100 - 1300 N/mm²

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
1	2	280	0.025	0.04	0.04	0.93	60000	3000	45°
2	2	280	0.030	0.06	0.06	1.81	49245	2955	45°
3	2	280	0.030	0.09	0.09	2.72	32770	1965	45°
4	2	280	0.050	0.11	0.11	3.60	24760	2475	45°
6	2	280	0.060	0.13	0.13	5.29	16850	2020	45°
8	2	280	0.065	0.15	0.15	6.98	12770	1660	45°
10	2	280	0.070	0.18	0.18	8.70	10245	1435	45°
12	2	280	0.075	0.22	0.22	10.45	8530	1280	45°
16	2	280	0.090	0.25	0.25	13.77	6475	1165	45°

Acciaio da utensile temprato
42 - 48 HRC

1	2	250	0.025	0.04	0.04	0.93	60000	3000	45°
2	2	250	0.030	0.06	0.06	1.81	43965	2640	45°
3	2	250	0.030	0.09	0.09	2.72	29255	1755	45°
4	2	250	0.050	0.11	0.11	3.60	22105	2210	45°
6	2	250	0.055	0.13	0.13	5.29	15045	1655	45°
8	2	250	0.060	0.15	0.15	6.98	11400	1370	45°
10	2	250	0.065	0.18	0.18	8.70	9145	1190	45°
12	2	250	0.070	0.22	0.22	10.45	7615	1065	45°
16	2	250	0.085	0.25	0.25	13.77	5780	985	45°

Acciaio da utensile temprato
48 - 52 HRC

1	2	200	0.025	0.04	0.04	0.93	60000	3000	45°
2	2	200	0.025	0.06	0.06	1.81	35175	1760	45°
3	2	200	0.025	0.09	0.09	2.72	23405	1170	45°
4	2	200	0.045	0.11	0.11	3.60	17685	1590	45°
6	2	200	0.055	0.13	0.13	5.29	12035	1325	45°
8	2	200	0.060	0.15	0.15	6.98	9120	1095	45°
10	2	200	0.065	0.18	0.18	8.70	7320	950	45°
12	2	200	0.070	0.22	0.22	10.45	6090	855	45°
16	2	200	0.080	0.25	0.25	13.77	4625	740	45°

Acciaio da utensile temprato
52 - 56 HRC

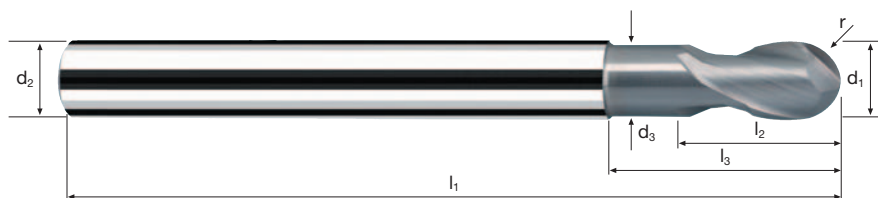
1	2	150	0.020	0.04	0.04	0.93	51340	2055	45°
2	2	150	0.025	0.06	0.06	1.81	26380	1320	45°
3	2	150	0.025	0.09	0.09	2.72	17555	880	45°
4	2	150	0.045	0.11	0.11	3.60	13265	1195	45°
6	2	150	0.050	0.13	0.13	5.29	9025	905	45°
8	2	150	0.055	0.15	0.15	6.98	6840	750	45°
10	2	150	0.060	0.18	0.18	8.70	5490	660	45°
12	2	150	0.065	0.22	0.22	10.45	4570	595	45°
16	2	150	0.075	0.25	0.25	13.77	3470	520	45°

Frese con estremità emisferica Sphericut

Tolleranza r f8 (-/-), 3xd



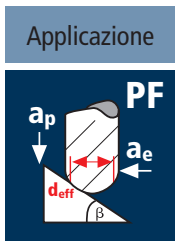
HM Plus	λ 30° γ -10°



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60				GG(G)
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Esempio: N° Ordine										POLYCHROM	
Rivestimento Articolo Codice-ø										P5288	
P 5288 .100											
ø Code	d1 +/-	d2 h6	d3	l1	l2	l3	r f8	α	z		
.100	1	3	-	60	1.0	-	0.5	13.2°	2	●	
.138	2	3	-	60	2.5	-	1.0	8.3°	2	●	
.140	2	6	1.9	75	3.0	6	1.0	9.0°	2	●	
.178	3	3	-	60	4.0	-	1.5	0.0°	2	●	
.180	3	6	2.8	75	4.0	9	1.5	6.4°	2	●	
.220	4	6	3.7	75	5.0	12	2.0	4.0°	2	●	
.260	5	6	4.6	80	6.0	15	2.5	2.0°	2	●	
.300	6	6	5.5	80	7.0	20	3.0	0.0°	2	●	
.391	8	8	7.4	90	9.0	26	4.0	0.0°	2	●	
.450	10	10	9.2	100	11.0	31	5.0	0.0°	2	●	
.501	12	12	11.0	120	13.0	37	6.0	0.0°	2	●	
.610	16	16	15.0	140	17.0	43	8.0	0.0°	2	●	

CNC Raggio R					CNC Raggio R				
Raggio f8					Raggio f8				
d1	r	Minimo	Massimo	R	d1	r	Minimo	Massimo	R
1	0.5	0.480	0.494	0.487	8	4.0	3.972	3.990	3.981
2	1.0	0.980	0.994	0.987	10	5.0	4.972	4.990	4.981
3	1.5	1.480	1.494	1.487	12	6.0	5.972	5.990	5.981
4	2.0	1.980	1.994	1.987	16	8.0	7.965	7.987	7.976
5	2.5	2.480	2.494	2.487					
6	3.0	2.980	2.994	2.987					



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
4	2	220	0.080	0.32	0.32	3.91	17910	2865	45°
5	2	220	0.090	0.40	0.40	4.89	14320	2580	45°
6	2	220	0.100	0.48	0.48	5.87	11930	2385	45°
8	2	220	0.110	0.64	0.64	7.82	8955	1970	45°
10	2	220	0.130	0.80	0.80	9.78	7160	1860	45°
12	2	220	0.135	0.96	0.96	11.73	5970	1610	45°

Acciaio
1100 - 1300 N/mm²

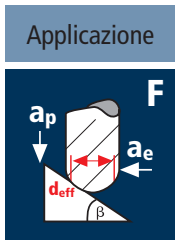
4	2	180	0.075	0.32	0.32	3.91	14655	2200	45°
5	2	180	0.085	0.40	0.40	4.89	11715	1990	45°
6	2	180	0.090	0.48	0.48	5.87	9760	1755	45°
8	2	180	0.100	0.64	0.64	7.82	7325	1465	45°
10	2	180	0.120	0.80	0.80	9.78	5860	1405	45°
12	2	180	0.125	0.96	0.96	11.73	4885	1220	45°

Acciaio
1300 - 1500 N/mm²

4	2	160	0.070	0.32	0.32	3.91	13025	1825	45°
5	2	160	0.075	0.40	0.40	4.89	10415	1560	45°
6	2	160	0.085	0.48	0.48	5.87	8675	1475	45°
8	2	160	0.095	0.64	0.64	7.82	6515	1240	45°
10	2	160	0.110	0.80	0.80	9.78	5210	1145	45°
12	2	160	0.115	0.96	0.96	11.73	4340	1000	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

4	2	90	0.065	0.26	0.26	3.86	7420	965	45°
5	2	90	0.070	0.32	0.32	4.81	5955	835	45°
6	2	90	0.080	0.38	0.38	5.77	4965	795	45°
8	2	90	0.090	0.51	0.51	7.70	3720	670	45°
10	2	90	0.105	0.64	0.64	9.63	2975	625	45°
12	2	90	0.110	0.77	0.77	11.55	2480	545	45°



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
4	2	320	0.050	0.10	0.10	3.57	28535	2855	45°
5	2	320	0.055	0.11	0.11	4.42	23045	2535	45°
6	2	320	0.060	0.13	0.13	5.29	19255	2310	45°
8	2	320	0.065	0.15	0.15	6.98	14595	1895	45°
10	2	320	0.070	0.18	0.18	8.70	11710	1640	45°
12	2	320	0.075	0.22	0.22	10.45	9750	1465	45°

Acciaio
1100 - 1300 N/mm²

4	2	280	0.050	0.10	0.10	3.57	24965	2495	45°
5	2	280	0.050	0.11	0.11	4.42	20165	2015	45°
6	2	280	0.055	0.13	0.13	5.29	16850	1855	45°
8	2	280	0.060	0.15	0.15	6.98	12770	1530	45°
10	2	280	0.065	0.18	0.18	8.70	10245	1330	45°
12	2	280	0.070	0.22	0.22	10.45	8530	1195	45°

Acciaio
1300 - 1500 N/mm²

4	2	250	0.045	0.10	0.10	3.57	22290	2005	45°
5	2	250	0.050	0.11	0.11	4.42	18005	1800	45°
6	2	250	0.055	0.13	0.13	5.29	15045	1655	45°
8	2	250	0.060	0.15	0.15	6.98	11400	1370	45°
10	2	250	0.065	0.18	0.18	8.70	9145	1190	45°
12	2	250	0.070	0.22	0.22	10.45	7615	1065	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

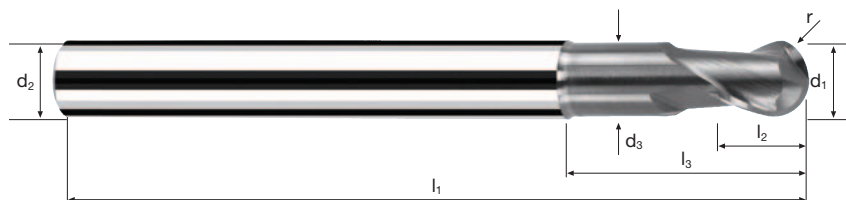
4	2	110	0.045	0.10	0.10	3.57	9810	885	45°
5	2	110	0.045	0.11	0.11	4.42	7920	715	45°
6	2	110	0.050	0.13	0.13	5.29	6620	660	45°
8	2	110	0.055	0.15	0.15	6.98	5015	550	45°
10	2	110	0.060	0.18	0.18	8.70	4025	485	45°
12	2	110	0.065	0.22	0.22	10.45	3350	435	45°

Frese con estremità emisferica

Tolleranza r f8 (-/), 3xd

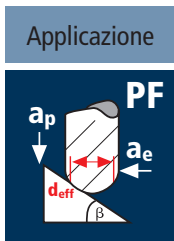


HM λ **30°**
MG10 γ **5°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500			Inox Stainless	GG(G)
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Esempio: N° Ordine										POLYCHROM	
		Rivestimento	Articolo	Codice-ø							
		P	5222	.220						P5222	
Ø Code	d1 -/-	d2 h6	d3	l1	l2	l3	r f8	α	z		
.220	4	6	3.7	75	5	12	2.0	4.0°	2	●	
.260	5	6	4.6	80	6	15	2.5	2.0°	2	●	
.300	6	6	5.5	80	7	20	3.0	0.0°	2	●	
.391	8	8	7.4	90	9	26	4.0	0.0°	2	●	
.450	10	10	9.2	100	11	31	5.0	0.0°	2	●	
.501	12	12	11.0	120	13	37	6.0	0.0°	2	●	
CNC Raggio R											
		Tolleranza f8		Raggio		R					
d1	r			Minimo	Massimo						
4	2.0	-0.006	-0.020	1.980	1.994	1.987					
5	2.5			2.480	2.494	2.487					
6	3.0			2.980	2.994	2.987					
8	4.0	-0.010	-0.028	3.972	3.990	3.981					
10	5.0			4.972	4.990	4.981					
12	6.0			5.972	5.990	5.981					



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
1	2	100	0.030	0.08	0.08	0.98	32480	1950	45°
2	2	100	0.045	0.16	0.16	1.96	16240	1460	45°
3	2	100	0.055	0.24	0.24	2.93	10865	1195	45°
4	2	100	0.060	0.32	0.32	3.91	8140	975	45°
5	2	100	0.070	0.40	0.40	4.89	6510	910	45°
6	2	100	0.075	0.48	0.48	5.87	5425	815	45°
8	2	100	0.085	0.64	0.64	7.82	4070	690	45°
10	2	100	0.100	0.80	0.80	9.78	3255	650	45°
12	2	100	0.105	0.96	0.96	11.73	2715	570	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

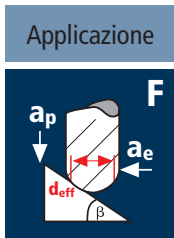
1	2	90	0.030	0.08	0.08	0.98	29235	1755	45°
2	2	90	0.045	0.16	0.16	1.96	14615	1315	45°
3	2	90	0.055	0.24	0.24	2.93	9780	1075	45°
4	2	90	0.060	0.32	0.32	3.91	7325	880	45°
5	2	90	0.070	0.40	0.40	4.89	5860	820	45°
6	2	90	0.075	0.48	0.48	5.87	4880	730	45°
8	2	90	0.085	0.64	0.64	7.82	3665	625	45°
10	2	90	0.100	0.80	0.80	9.78	2930	585	45°
12	2	90	0.105	0.96	0.96	11.73	2440	510	45°

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

1	2	60	0.025	0.08	0.08	0.98	19490	975	45°
2	2	60	0.040	0.16	0.16	1.96	9745	780	45°
3	2	60	0.045	0.24	0.24	2.93	6520	585	45°
4	2	60	0.050	0.32	0.32	3.91	4885	490	45°
5	2	60	0.060	0.40	0.40	4.89	3905	470	45°
6	2	60	0.065	0.48	0.48	5.87	3255	425	45°
8	2	60	0.070	0.64	0.64	7.82	2440	340	45°
10	2	60	0.085	0.80	0.80	9.78	1955	330	45°
12	2	60	0.090	0.96	0.96	11.73	1630	295	45°

Acciaio < 850 N/mm²

1	2	220	0.040	0.09	0.09	0.98	60000	4800	45°
2	2	220	0.055	0.17	0.17	1.96	35730	3930	45°
3	2	220	0.070	0.26	0.26	2.95	23740	3325	45°
4	2	220	0.075	0.35	0.35	3.93	17820	2675	45°
5	2	220	0.090	0.44	0.44	4.92	14235	2560	45°
6	2	220	0.095	0.52	0.52	5.89	11890	2260	45°
8	2	220	0.105	0.70	0.70	7.86	8910	1870	45°
10	2	220	0.125	0.87	0.87	9.83	7125	1780	45°
12	2	220	0.130	1.05	1.05	11.80	5935	1545	45°



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
1	2	140	0.025	0.05	0.05	0.94	47410	2370	45°
2	2	140	0.030	0.07	0.07	1.84	24220	1455	45°
3	2	140	0.030	0.09	0.09	2.72	16385	985	45°
4	2	140	0.050	0.11	0.11	3.60	12380	1240	45°
5	2	140	0.055	0.13	0.13	4.48	9945	1095	45°
6	2	140	0.060	0.15	0.15	5.36	8315	1000	45°
8	2	140	0.065	0.17	0.17	7.05	6320	820	45°
10	2	140	0.070	0.20	0.20	8.77	5080	710	45°
12	2	140	0.075	0.25	0.25	10.56	4220	635	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

1	2	125	0.025	0.05	0.05	0.94	42330	2115	45°
2	2	125	0.030	0.07	0.07	1.84	21625	1300	45°
3	2	125	0.030	0.09	0.09	2.72	14630	880	45°
4	2	125	0.050	0.11	0.11	3.60	11055	1105	45°
5	2	125	0.055	0.13	0.13	4.48	8880	975	45°
6	2	125	0.060	0.15	0.15	5.36	7425	890	45°
8	2	125	0.065	0.17	0.17	7.05	5645	735	45°
10	2	125	0.070	0.20	0.20	8.77	4535	635	45°
12	2	125	0.075	0.25	0.25	10.56	3770	565	45°

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

1	2	70	0.025	0.05	0.05	0.94	23705	1185	45°
2	2	70	0.025	0.07	0.07	1.84	12110	605	45°
3	2	70	0.025	0.09	0.09	2.72	8190	410	45°
4	2	70	0.045	0.11	0.11	3.60	6190	555	45°
5	2	70	0.050	0.13	0.13	4.48	4975	500	45°
6	2	70	0.055	0.15	0.15	5.36	4155	455	45°
8	2	70	0.060	0.17	0.17	7.05	3160	380	45°
10	2	70	0.065	0.20	0.20	8.77	2540	330	45°
12	2	70	0.070	0.25	0.25	10.56	2110	295	45°

Acciaio < 850 N/mm²

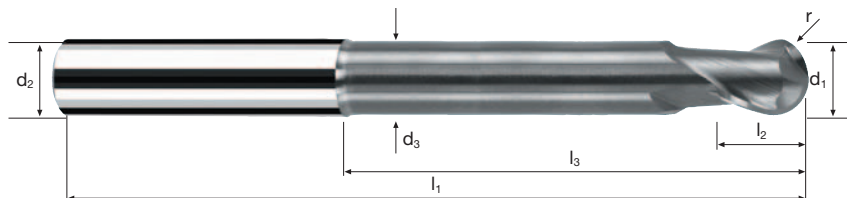
1	2	320	0.030	0.05	0.05	0.94	60000	3600	45°
2	2	320	0.035	0.07	0.07	1.84	55360	3875	45°
3	2	320	0.035	0.09	0.09	2.72	37450	2620	45°
4	2	320	0.060	0.11	0.11	3.60	28295	3395	45°
5	2	320	0.065	0.13	0.13	4.48	22735	2955	45°
6	2	320	0.070	0.15	0.15	5.36	19005	2660	45°
8	2	320	0.080	0.17	0.17	7.05	14450	2310	45°
10	2	320	0.085	0.20	0.20	8.77	11615	1975	45°
12	2	320	0.090	0.25	0.25	10.56	9645	1735	45°

Frese con estremità emisferica Sphero-SB

Tolleranza r f8 (-/-), 6xd



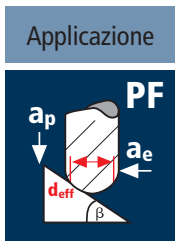
HM λ 30°
MG10 γ 5°



Rm < 850 **Rm** 850-1100 **Inox** Stainless **Ti** Titanium **Tool Steel**

Esempio: N° Ordine										POLYCHROM
		Rivestimento	Articolo		Codice-ø					P7544
		P	7544		.100					
Ø Code	d1 -/	d2 h6	d3	l1	l2	l3	r f8	α	z	
.100	1	6	0.95	66	1.5	6	0.5	9.5°	2	●
.140	2	6	1.90	66	3.0	12	1.0	6.1°	2	●
.180	3	6	2.80	66	4.0	18	1.5	3.9°	2	●
.220	4	6	3.70	69	5.0	24	2.0	2.2°	2	●
.260	5	6	4.60	75	6.0	30	2.5	1.0°	2	●
.300	6	6	5.50	80	7.0	43	3.0	0.0°	2	●
.391	8	8	7.40	90	9.0	53	4.0	0.0°	2	●
.450	10	10	9.20	105	11.0	64	5.0	0.0°	2	●
.501	12	12	11.00	120	13.0	74	6.0	0.0°	2	●

CNC Raggio R					CNC Raggio R				
Raggio f8					Raggio f8				
d1	r	Minimo	Massimo	R	d1	r	Minimo	Massimo	R
1	0.5	0.480	0.494	0.487	8	4.0	3.972	3.990	3.981
2	1.0	0.980	0.994	0.987	10	5.0	4.972	4.990	4.981
3	1.5	1.480	1.494	1.487	12	6.0	5.972	5.990	5.981
4	2.0	1.980	1.994	1.987					
5	2.5	2.480	2.494	2.487					
6	3.0	2.980	2.994	2.987					



Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
3	2	500	0.090	0.36	0.36	2.99	53230	9580	45°
4	2	500	0.090	0.48	0.48	3.99	39890	7180	45°
5	2	500	0.100	0.60	0.60	4.98	31960	6390	45°
6	2	500	0.100	0.72	0.72	5.98	26615	5325	45°
8	2	500	0.110	0.96	0.96	7.98	19945	4390	45°
10	2	500	0.130	1.20	1.20	9.97	15965	4150	45°
12	2	500	0.135	1.44	1.44	11.96	13310	3595	45°
16	2	500	0.160	1.92	1.92	15.95	9980	3195	45°

Rame non legato

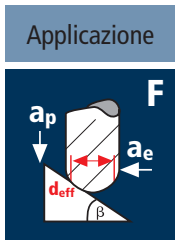
3	2	350	0.080	0.36	0.36	2.99	37260	5960	45°
4	2	350	0.080	0.48	0.48	3.99	27925	4470	45°
5	2	350	0.090	0.60	0.60	4.98	22370	4025	45°
6	2	350	0.090	0.72	0.72	5.98	18630	3355	45°
8	2	350	0.100	0.96	0.96	7.98	13960	2790	45°
10	2	350	0.115	1.20	1.20	9.97	11175	2570	45°
12	2	350	0.120	1.44	1.44	11.96	9315	2235	45°
16	2	350	0.145	1.92	1.92	15.95	6985	2025	45°

Materiale termoplastici

3	2	800	0.090	0.36	0.36	2.99	60000	10800	45°
4	2	800	0.090	0.48	0.48	3.99	60000	10800	45°
5	2	800	0.100	0.60	0.60	4.98	51135	10225	45°
6	2	800	0.100	0.72	0.72	5.98	42585	8515	45°
8	2	800	0.110	0.96	0.96	7.98	31910	7020	45°
10	2	800	0.130	1.20	1.20	9.97	25540	6640	45°
12	2	800	0.135	1.44	1.44	11.96	21290	5750	45°
16	2	800	0.160	1.92	1.92	15.95	15965	5110	45°

Getti d'alluminio
Si 6% - 15%

3	2	300	0.065	0.36	0.36	2.99	31940	4150	45°
4	2	300	0.065	0.48	0.48	3.99	23935	3110	45°
5	2	300	0.070	0.60	0.60	4.98	19175	2685	45°
6	2	300	0.070	0.72	0.72	5.98	15970	2235	45°
8	2	300	0.075	0.96	0.96	7.98	11965	1795	45°
10	2	300	0.090	1.20	1.20	9.97	9580	1725	45°
12	2	300	0.095	1.44	1.44	11.96	7985	1515	45°
16	2	300	0.110	1.92	1.92	15.95	5985	1315	45°



Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
3	2	700	0.050	0.12	0.12	2.78	60000	6000	45°
4	2	700	0.045	0.15	0.15	3.69	60000	5400	45°
5	2	700	0.070	0.17	0.17	4.58	48650	6810	45°
6	2	700	0.065	0.20	0.20	5.48	40660	5285	45°
8	2	700	0.075	0.22	0.22	7.20	30950	4645	45°
10	2	700	0.080	0.24	0.24	8.90	25035	4005	45°
12	2	700	0.085	0.27	0.27	10.62	20980	3565	45°
16	2	700	0.100	0.30	0.30	13.96	15960	3190	45°

Rame non legato

3	2	500	0.045	0.12	0.12	2.78	57250	5155	45°
4	2	500	0.040	0.15	0.15	3.69	43135	3450	45°
5	2	500	0.065	0.17	0.17	4.58	34750	4520	45°
6	2	500	0.060	0.20	0.20	5.48	29045	3485	45°
8	2	500	0.070	0.22	0.22	7.20	22105	3095	45°
10	2	500	0.070	0.24	0.24	8.90	17885	2505	45°
12	2	500	0.075	0.27	0.27	10.62	14985	2250	45°
16	2	500	0.090	0.30	0.30	13.96	11400	2050	45°

Materiale termoplastici

3	2	900	0.050	0.12	0.12	2.78	60000	6000	45°
4	2	900	0.045	0.15	0.15	3.69	60000	5400	45°
5	2	900	0.070	0.17	0.17	4.58	60000	8400	45°
6	2	900	0.065	0.20	0.20	5.48	52280	6795	45°
8	2	900	0.075	0.22	0.22	7.20	39790	5970	45°
10	2	900	0.080	0.24	0.24	8.90	32190	5150	45°
12	2	900	0.085	0.27	0.27	10.62	26975	4585	45°
16	2	900	0.100	0.30	0.30	13.96	20520	4105	45°

Getti d'alluminio
Si 6% - 15%

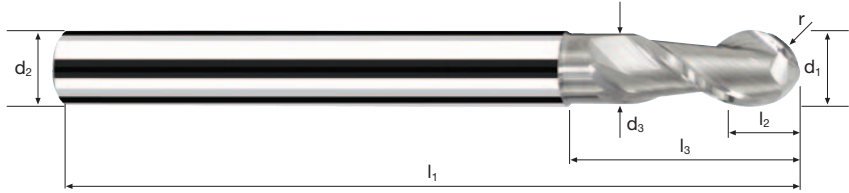
3	2	400	0.035	0.12	0.12	2.78	45800	3205	45°
4	2	400	0.030	0.15	0.15	3.69	34505	2070	45°
5	2	400	0.050	0.17	0.17	4.58	27800	2780	45°
6	2	400	0.045	0.20	0.20	5.48	23235	2090	45°
8	2	400	0.055	0.22	0.22	7.20	17685	1945	45°
10	2	400	0.055	0.24	0.24	8.90	14305	1575	45°
12	2	400	0.060	0.27	0.27	10.62	11990	1440	45°
16	2	400	0.070	0.30	0.30	13.96	9120	1275	45°

Frese con estremità emisferica Sphericut-Alu

Tolleranza r f8 (-/-), 3xd



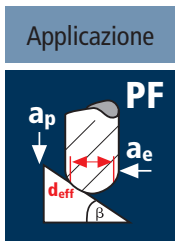
HM	λ 40°
MG10	γ 20°



Rm < 850		Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine										CELERO
Rivestimento C Articolo 5292 Codice-ø .180										C5292
Ø Code	d1 -/-	d2 h6	d3	l1	l2	l3	r f8	α	z	
.180	3	6	2.8	75	6	9	1.5	6.4°	2	●
.220	4	6	3.7	75	8	12	2.0	4.0°	2	●
.260	5	6	4.6	80	10	15	2.5	1.9°	2	●
.300	6	6	5.5	80	12	20	3.0	0.0°	2	●
.391	8	8	7.4	90	16	26	4.0	0.0°	2	●
.450	10	10	9.2	100	20	31	5.0	0.0°	2	●
.501	12	12	11.0	120	24	37	6.0	0.0°	2	●
.610	16	16	15.0	140	32	43	8.0	0.0°	2	●

CNC Raggio R						
d1	r	Tolleranza f8		Raggio		R
		-0.006	-0.020	Minimo	Massimo	
3	1.5			1.480	1.494	1.487
4	2.0			1.980	1.994	1.987
5	2.5			2.480	2.494	2.487
6	3.0			2.980	2.994	2.987
8	4.0	-0.010	-0.028	3.972	3.990	3.981
10	5.0			4.972	4.990	4.981
12	6.0			5.972	5.990	5.981
16	8.0	-0.013	-0.035	7.965	7.987	7.976



Materiale

Acciaio
1100 - 1300 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
3	2	160	0.060	0.18	0.18	2.87	17745	2130	45°
4	2	160	0.070	0.24	0.24	3.83	13300	1860	45°
5	2	160	0.080	0.30	0.30	4.79	10635	1700	45°
6	2	160	0.085	0.36	0.36	5.75	8860	1505	45°
8	2	160	0.100	0.48	0.48	7.66	6650	1330	45°
10	2	160	0.115	0.60	0.60	9.58	5315	1220	45°
12	2	160	0.120	0.72	0.72	11.50	4430	1065	45°

Acciaio da utensile temprato
42 - 48 HRC

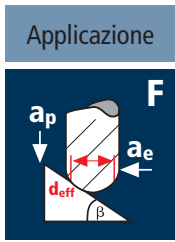
3	2	140	0.055	0.18	0.18	2.87	15530	1710	45°
4	2	140	0.065	0.24	0.24	3.83	11635	1515	45°
5	2	140	0.075	0.30	0.30	4.79	9305	1395	45°
6	2	140	0.080	0.36	0.36	5.75	7750	1240	45°
8	2	140	0.090	0.48	0.48	7.66	5820	1050	45°
10	2	140	0.105	0.60	0.60	9.58	4650	975	45°
12	2	140	0.110	0.72	0.72	11.50	3875	855	45°

Acciaio da utensile temprato
48 - 52 HRC

3	2	120	0.050	0.15	0.15	2.83	13500	1350	45°
4	2	120	0.060	0.20	0.20	3.78	10105	1215	45°
5	2	120	0.070	0.25	0.25	4.72	8095	1135	45°
6	2	120	0.070	0.30	0.30	5.67	6735	945	45°
8	2	120	0.085	0.40	0.40	7.56	5055	860	45°
10	2	120	0.100	0.50	0.50	9.45	4040	810	45°
12	2	120	0.100	0.60	0.60	11.34	3370	675	45°

Acciaio da utensile temprato
52 - 56 HRC

3	2	80	0.050	0.15	0.15	2.83	9000	900	45°
4	2	80	0.055	0.20	0.20	3.78	6735	740	45°
5	2	80	0.065	0.25	0.25	4.72	5395	700	45°
6	2	80	0.070	0.30	0.30	5.67	4490	630	45°
8	2	80	0.080	0.40	0.40	7.56	3370	540	45°
10	2	80	0.090	0.50	0.50	9.45	2695	485	45°
12	2	80	0.095	0.60	0.60	11.34	2245	425	45°



Materiale

Acciaio
1100 - 1300 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
3	2	250	0.025	0.04	0.04	2.55	31210	1560	45°
4	2	250	0.045	0.06	0.06	3.43	23200	2090	45°
5	2	250	0.045	0.09	0.09	4.35	18295	1645	45°
6	2	250	0.045	0.11	0.11	5.23	15215	1370	45°
8	2	250	0.050	0.13	0.13	6.90	11535	1155	45°
10	2	250	0.055	0.15	0.15	8.58	9275	1020	45°
12	2	250	0.060	0.18	0.18	10.29	7735	930	45°

Acciaio da utensile temprato
42 - 48 HRC

3	2	220	0.025	0.04	0.04	2.55	27465	1375	45°
4	2	220	0.045	0.06	0.06	3.43	20415	1835	45°
5	2	220	0.045	0.09	0.09	4.35	16100	1450	45°
6	2	220	0.045	0.11	0.11	5.23	13390	1205	45°
8	2	220	0.050	0.13	0.13	6.90	10150	1015	45°
10	2	220	0.050	0.15	0.15	8.58	8160	815	45°
12	2	220	0.055	0.18	0.18	10.29	6805	750	45°

Acciaio da utensile temprato
48 - 52 HRC

3	2	180	0.025	0.04	0.04	2.55	22470	1125	45°
4	2	180	0.040	0.06	0.06	3.43	16705	1335	45°
5	2	180	0.040	0.09	0.09	4.35	13170	1055	45°
6	2	180	0.040	0.11	0.11	5.23	10955	875	45°
8	2	180	0.045	0.13	0.13	6.90	8305	745	45°
10	2	180	0.050	0.15	0.15	8.58	6680	670	45°
12	2	180	0.055	0.18	0.18	10.29	5570	615	45°

Acciaio da utensile temprato
52 - 56 HRC

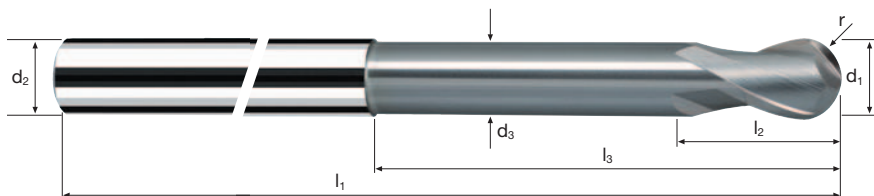
3	2	120	0.020	0.04	0.04	2.55	14980	600	45°
4	2	120	0.040	0.06	0.06	3.43	11135	890	45°
5	2	120	0.040	0.09	0.09	4.35	8780	700	45°
6	2	120	0.040	0.11	0.11	5.23	7305	585	45°
8	2	120	0.045	0.13	0.13	6.90	5535	500	45°
10	2	120	0.045	0.15	0.15	8.58	4450	400	45°
12	2	120	0.050	0.18	0.18	10.29	3710	370	45°

Frese con estremità emisferica Sphericut

Tolleranza r f8 (-/-), 5xd

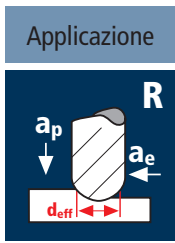


HM λ 30°
MG10 γ-10°





		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60					GG(G)
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Esempio: N° Ordine										POLYCHROM	
		Rivestimento	Articolo	Codice-ø							
		P	5289	.180						P5289	
ø Code	d1 -/-	d2 h6	d3	l1	l2	l3	r f8	α	z		
.180	3	6	2.8	90	4	24	1.5	3.1°	2	●	
.220	4	6	3.7	90	5	27	2.0	2.0°	2	●	
.260	5	6	4.6	110	6	45	2.5	0.7°	2	●	
.300	6	6	5.5	110	7	50	3.0	0.0°	2	●	
.391	8	8	7.4	110	9	46	4.0	0.0°	2	●	
.450	10	10	9.2	130	11	61	5.0	0.0°	2	●	
.501	12	12	11.0	140	13	57	6.0	0.0°	2	●	
CNC Raggio R											
		Tolleranza f8		Raggio							
d1	r			Minimo	Massimo	R					
3	1.5	-0.006	-0.020	1.480	1.494	1.487					
4	2.0			1.980	1.994	1.987					
5	2.5			2.480	2.494	2.487					
6	3.0			2.980	2.994	2.987					
8	4.0	-0.010	-0.028	3.972	3.990	3.981					
10	5.0			4.972	4.990	4.981					
12	6.0			5.972	5.990	5.981					



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
1	2	55	0.025	0.12	0.05	0.65	26935	1345	0.01
2	2	55	0.045	0.24	0.10	1.30	13465	1210	0.03
3	2	55	0.060	0.36	0.15	1.95	8980	1080	0.06
4	2	55	0.075	0.48	0.20	2.60	6735	1010	0.10
6	2	55	0.090	0.72	0.30	3.90	4490	810	0.15
8	2	55	0.115	0.96	0.40	5.20	3365	775	0.30
10	2	55	0.125	1.20	0.50	6.50	2695	675	0.40
12	2	55	0.120	1.44	0.60	7.80	2245	540	0.45

Acciaio
850 - 1100 N/mm²






1	2	42	0.020	0.12	0.05	0.65	20570	825	0.00
2	2	42	0.040	0.24	0.10	1.30	10285	825	0.02
3	2	42	0.050	0.36	0.15	1.95	6855	685	0.04
4	2	42	0.065	0.48	0.20	2.60	5140	670	0.05
6	2	42	0.075	0.72	0.30	3.90	3430	515	0.10
8	2	42	0.100	0.96	0.40	5.20	2570	515	0.20
10	2	42	0.105	1.20	0.50	6.50	2055	430	0.25
12	2	42	0.100	1.44	0.60	7.80	1715	345	0.30

Acciaio
1100 - 1300 N/mm²

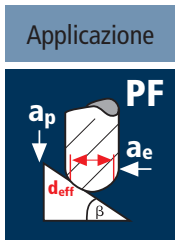



1	2	34	0.020	0.12	0.05	0.65	16650	665	0.00
2	2	34	0.030	0.24	0.10	1.30	8325	500	0.01
3	2	34	0.040	0.36	0.15	1.95	5550	445	0.02
4	2	34	0.055	0.48	0.20	2.60	4165	460	0.05
6	2	34	0.065	0.72	0.30	3.90	2775	360	0.10
8	2	34	0.080	0.96	0.40	5.20	2080	335	0.15
10	2	34	0.090	1.20	0.50	6.50	1665	300	0.20
12	2	34	0.085	1.44	0.60	7.80	1390	235	0.20

Acciaio inossidabile
[Cr-Ni/1.4301]






1	2	25	0.010	0.09	0.08	0.57	13960	280	0.00
2	2	25	0.020	0.19	0.15	1.17	6800	270	0.01
3	2	25	0.025	0.28	0.23	1.75	4545	225	0.01
4	2	25	0.030	0.29	0.24	2.07	3845	230	0.00
6	2	25	0.035	0.43	0.27	3.10	2565	180	0.00
8	2	25	0.045	0.58	0.24	4.15	1920	175	0.00
10	2	25	0.050	0.72	0.30	5.17	1540	155	0.05
12	2	25	0.050	0.86	0.36	6.19	1285	130	0.05





Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1	2	60	0.030	0.05	0.05	0.94	20320	1220	45°
2	2	60	0.045	0.10	0.10	1.89	10105	910	45°
3	2	60	0.055	0.15	0.15	2.83	6750	745	45°
4	2	60	0.060	0.20	0.20	3.78	5055	605	45°
6	2	60	0.085	0.30	0.30	5.67	3370	575	45°
8	2	60	0.100	0.40	0.40	7.56	2525	505	45°
10	2	60	0.110	0.50	0.50	9.45	2020	445	45°
12	2	60	0.120	0.60	0.60	11.34	1685	405	45°

Acciaio
850 - 1100 N/mm²



1	2	48	0.025	0.05	0.05	0.94	16255	815	45°
2	2	48	0.040	0.10	0.10	1.89	8085	645	45°
3	2	48	0.045	0.15	0.15	2.83	5400	485	45°
4	2	48	0.050	0.20	0.20	3.78	4040	405	45°
6	2	48	0.070	0.30	0.30	5.67	2695	375	45°
8	2	48	0.085	0.40	0.40	7.56	2020	345	45°
10	2	48	0.095	0.50	0.50	9.45	1615	305	45°
12	2	48	0.100	0.60	0.60	11.34	1345	270	45°

Acciaio
1100 - 1300 N/mm²




1	2	38	0.025	0.05	0.05	0.94	12870	645	45°
2	2	38	0.035	0.10	0.10	1.89	6400	450	45°
3	2	38	0.040	0.15	0.15	2.83	4275	340	45°
4	2	38	0.045	0.20	0.20	3.78	3200	290	45°
6	2	38	0.065	0.30	0.30	5.67	2135	280	45°
8	2	38	0.075	0.40	0.40	7.56	1600	240	45°
10	2	38	0.085	0.50	0.50	9.45	1280	220	45°
12	2	38	0.090	0.60	0.60	11.34	1065	190	45°

Acciaio inossidabile
[Cr-Ni/1.4301]

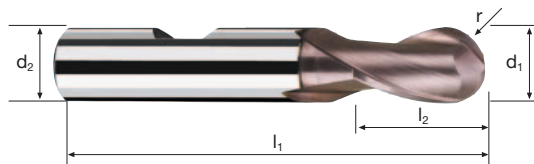



1	2	30	0.015	0.03	0.03	0.91	10495	315	45°
2	2	30	0.025	0.06	0.06	1.81	5275	265	45°
3	2	30	0.030	0.09	0.09	2.72	3510	210	45°
4	2	30	0.030	0.12	0.12	3.62	2640	160	45°
6	2	30	0.045	0.18	0.18	5.44	1755	160	45°
8	2	30	0.050	0.24	0.24	7.25	1315	130	45°
10	2	30	0.055	0.30	0.30	9.06	1055	115	45°
12	2	30	0.060	0.36	0.36	10.87	880	105	45°

Frese con estremità emisferica

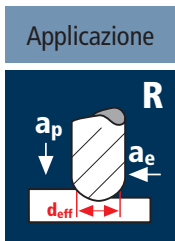
Tolleranza r h9 (0/-)

HSS-E
Co8 λ 35°
 γ 15°



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless		
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Esempio: N° Ordine		Rivestimento U	Articolo 0830	Codice-ø .100						UNICUT-4X U0830
Ø Code	d1 h8	d2 h6	l1	l2	r h9	α	z			
.100	1.0	6	47	3	0.50	14.5°	2	●		
.120	1.5	6	47	3	0.75	14.0°	2	●		
.140	2.0	6	48	4	1.00	12.5°	2	●		
.180	3.0	6	49	5	1.50	8.0°	2	●		
.220	4.0	6	51	7	2.00	5.0°	2	●		
.260	5.0	6	52	8	2.50	2.5°	2	●		
.300	6.0	6	52	8	3.00	0.0°	2	●		
.391	8.0	8	55	11	4.00	0.0°	2	●		
.450	10.0	10	63	13	5.00	0.0°	2	●		
.501	12.0	12	73	16	6.00	0.0°	2	●		



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [cm ³ /min]
3	3	55	0.060	0.30	0.12	1.80	9725	1750	0.06
4	3	55	0.075	0.40	0.16	2.40	7295	1640	0.10
6	4	55	0.090	0.60	0.24	3.60	4865	1750	0.25
8	4	55	0.115	0.80	0.32	4.80	3645	1675	0.45
10	4	55	0.125	1.00	0.40	6.00	2920	1460	0.60
12	4	55	0.120	1.20	0.48	7.20	2430	1165	0.65
16	4	55	0.135	1.60	0.64	9.60	1825	985	1.00
20	4	55	0.145	2.00	0.80	12.00	1460	845	1.35

Acciaio
850 - 1100 N/mm²

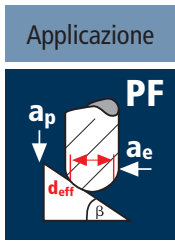
3	3	42	0.050	0.30	0.12	1.80	7425	1115	0.04
4	3	42	0.065	0.40	0.16	2.40	5570	1085	0.07
6	4	42	0.075	0.60	0.24	3.60	3715	1115	0.16
8	4	42	0.100	0.80	0.32	4.80	2785	1115	0.30
10	4	42	0.105	1.00	0.40	6.00	2230	935	0.35
12	4	42	0.100	1.20	0.48	7.20	1855	740	0.45
16	4	42	0.115	1.60	0.64	9.60	1395	640	0.65
20	4	42	0.125	2.00	0.80	12.00	1115	560	0.90

Acciaio
1100 - 1300 N/mm²

3	3	34	0.040	0.30	0.12	1.80	6015	720	0.03
4	3	34	0.055	0.40	0.16	2.40	4510	745	0.05
6	4	34	0.065	0.60	0.24	3.60	3005	780	0.11
8	4	34	0.080	0.80	0.32	4.80	2255	720	0.20
10	4	34	0.090	1.00	0.40	6.00	1805	650	0.25
12	4	34	0.085	1.20	0.48	7.20	1505	510	0.30
16	4	34	0.095	1.60	0.64	9.60	1125	430	0.45
20	4	34	0.100	2.00	0.80	12.00	900	360	0.60

Acciaio inossidabile
[Cr-Ni/1.4301]

3	3	25	0.025	0.23	0.18	1.60	4975	375	0.02
4	3	25	0.030	0.31	0.24	2.14	3720	335	0.02
6	4	25	0.035	0.47	0.36	3.22	2470	345	0.06
8	4	25	0.045	0.48	0.38	3.80	2095	375	0.05
10	4	25	0.050	0.60	0.36	4.75	1675	335	0.05
12	4	25	0.050	0.72	0.29	5.70	1395	280	0.05
16	4	25	0.055	0.96	0.38	7.60	1045	230	0.10
20	4	25	0.060	1.20	0.48	9.50	840	200	0.10



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
3	3	60	0.055	0.11	0.11	2.76	6920	1140	45°
4	3	60	0.060	0.14	0.14	3.67	5205	935	45°
6	4	60	0.085	0.21	0.21	5.51	3465	1180	45°
8	4	60	0.100	0.28	0.28	7.34	2600	1040	45°
10	4	60	0.110	0.35	0.35	9.18	2080	915	45°
12	4	60	0.120	0.42	0.42	11.01	1735	835	45°
16	4	60	0.140	0.56	0.56	14.68	1300	730	45°
20	4	60	0.155	0.70	0.70	18.35	1040	645	45°

Acciaio
850 - 1100 N/mm²

3	3	48	0.045	0.11	0.11	2.76	5535	745	45°
4	3	48	0.050	0.14	0.14	3.67	4165	625	45°
6	4	48	0.070	0.21	0.21	5.51	2775	775	45°
8	4	48	0.085	0.28	0.28	7.34	2080	705	45°
10	4	48	0.095	0.35	0.35	9.18	1665	635	45°
12	4	48	0.100	0.42	0.42	11.01	1390	555	45°
16	4	48	0.120	0.56	0.56	14.68	1040	500	45°
20	4	48	0.130	0.70	0.70	18.35	835	435	45°

Acciaio
1100 - 1300 N/mm²

3	3	38	0.040	0.11	0.11	2.76	4385	525	45°
4	3	38	0.045	0.14	0.14	3.67	3295	445	45°
6	4	38	0.065	0.21	0.21	5.51	2195	570	45°
8	4	38	0.075	0.28	0.28	7.34	1650	495	45°
10	4	38	0.085	0.35	0.35	9.18	1320	450	45°
12	4	38	0.090	0.42	0.42	11.01	1100	395	45°
16	4	38	0.105	0.56	0.56	14.68	825	345	45°
20	4	38	0.115	0.70	0.70	18.35	660	305	45°

Acciaio inossidabile
[Cr-Ni/1.4301]

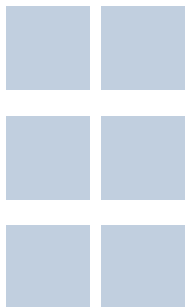
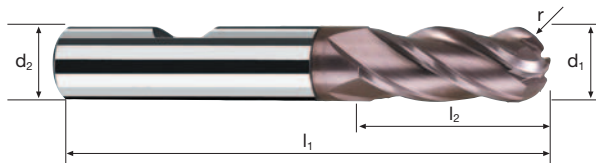
3	3	30	0.030	0.07	0.07	2.66	3590	325	45°
4	3	30	0.030	0.08	0.08	3.51	2720	245	45°
6	4	30	0.045	0.13	0.13	5.29	1805	325	45°
8	4	30	0.050	0.17	0.17	7.05	1355	270	45°
10	4	30	0.055	0.21	0.21	8.80	1085	240	45°
12	4	30	0.060	0.25	0.25	10.56	905	215	45°
16	4	30	0.070	0.34	0.34	14.10	675	190	45°
20	4	30	0.080	0.42	0.42	17.60	545	175	45°

Frese con estremità emisferica

Tolleranza r k8 (0/+)



HSS-E
Co8 λ **35°**
 γ **15°**



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless

Esempio: N° Ordine		Rivestimento U	Articolo 0800	Codice- ϕ .180					UNICUT-4X U0800
ϕ Code	d_1 k8	d_2 h6	l_1	l_2	r k8	α	z		
.180	3	6	52	8	1.5	2.0°	3	●	
.220	4	6	55	11	2.0	1.5°	3	●	
.260	5	6	57	13	2.5	1.0°	3	●	
.300	6	6	57	13	3.0	0.0°	4	●	
.331	7	8	60	16	3.5	1.0°	4	●	
.391	8	8	63	19	4.0	0.0°	4	●	
.450	10	10	72	22	5.0	0.0°	4	●	
.501	12	12	83	26	6.0	0.0°	4	●	
.610	16	16	92	32	8.0	0.0°	4	●	
.682	20	20	104	38	10.0	0.0°	4	●	



Applicazione

Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
2	4	180	0.030	0.60	1.20	28650	3440	r=0.5
3	4	180	0.045	0.60	1.80	19100	3440	r=0.5
4	4	180	0.050	0.60	2.40	14325	2865	r=0.5
5	4	180	0.055	0.60	3.00	11460	2520	r=0.5
6	4	180	0.060	0.60	3.60	9550	2290	r=0.5
8	4	180	0.075	0.60	4.80	7160	2150	r=0.5
10	4	180	0.095	0.60	6.00	5730	2175	r=0.5
12	4	180	0.115	0.60	7.20	4775	2195	r=0.5

Acciaio da utensile temprato 48 - 52 HRC

2	4	140	0.025	0.60	1.20	22280	2230	r=0.5
3	4	140	0.040	0.60	1.80	14855	2375	r=0.5
4	4	140	0.045	0.60	2.40	11140	2005	r=0.5
5	4	140	0.050	0.60	3.00	8915	1785	r=0.5
6	4	140	0.055	0.60	3.60	7425	1635	r=0.5
8	4	140	0.070	0.60	4.80	5570	1560	r=0.5
10	4	140	0.085	0.60	6.00	4455	1515	r=0.5
12	4	140	0.105	0.60	7.20	3715	1560	r=0.5

Acciaio da utensile temprato 52 - 56 HRC

2	4	100	0.025	0.60	1.20	15915	1590	r=0.5
3	4	100	0.035	0.60	1.80	10610	1485	r=0.5
4	4	100	0.040	0.60	2.40	7960	1275	r=0.5
5	4	100	0.045	0.60	3.00	6365	1145	r=0.5
6	4	100	0.050	0.60	3.60	5305	1060	r=0.5
8	4	100	0.060	0.60	4.80	3980	955	r=0.5
10	4	100	0.080	0.60	6.00	3185	1020	r=0.5
12	4	100	0.095	0.60	7.20	2655	1010	r=0.5

Acciaio da utensile temprato 56 - 60 HRC

2	4	70	0.015	0.60	0.80	11140	670	r=0.5
3	4	70	0.025	0.60	1.20	7425	745	r=0.5
4	4	70	0.030	0.60	1.60	5570	670	r=0.5
5	4	70	0.030	0.60	2.00	4455	535	r=0.5
6	4	70	0.035	0.60	2.40	3715	520	r=0.5
8	4	70	0.045	0.60	3.20	2785	500	r=0.5
10	4	70	0.055	0.60	4.00	2230	490	r=0.5
12	4	70	0.065	0.60	4.80	1855	480	r=0.5

Applicazione

Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
2	4	360	0.045	0.10	0.10	1.99	57585	10365	45°
3	4	360	0.065	0.12	0.12	3.00	38200	9930	45°
4	4	360	0.085	0.12	0.12	4.00	28650	9740	45°
5	4	360	0.100	0.16	0.16	5.00	22920	9170	45°
6	4	360	0.135	0.18	0.18	6.00	19100	10315	45°
8	4	360	0.150	0.20	0.20	7.99	14340	8605	45°
10	4	360	0.200	0.24	0.24	9.97	11495	9195	45°
12	4	360	0.170	0.26	0.26	11.96	9580	6515	45°

Acciaio da utensile temprato 48 - 52 HRC

2	4	250	0.045	0.10	0.10	1.99	39990	7200	45°
3	4	250	0.060	0.12	0.12	3.00	26525	6365	45°
4	4	250	0.080	0.12	0.12	4.00	19895	6365	45°
5	4	250	0.095	0.16	0.16	5.00	15915	6050	45°
6	4	250	0.130	0.18	0.18	6.00	13265	6900	45°
8	4	250	0.145	0.20	0.20	7.99	9960	5775	45°
10	4	250	0.190	0.24	0.24	9.97	7980	6065	45°
12	4	250	0.160	0.26	0.26	11.96	6655	4260	45°

Acciaio da utensile temprato 52 - 56 HRC

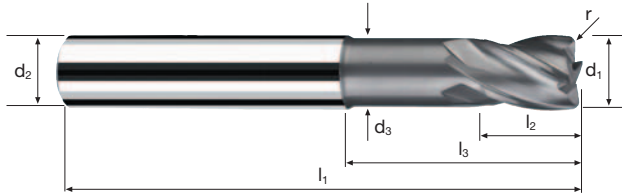
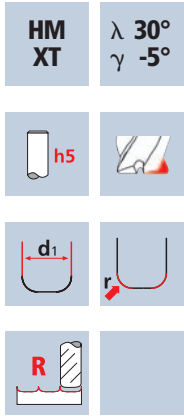
2	4	180	0.040	0.10	0.10	1.99	28795	4605	45°
3	4	180	0.055	0.12	0.12	3.00	19100	4200	45°
4	4	180	0.075	0.12	0.12	4.00	14325	4300	45°
5	4	180	0.085	0.16	0.16	5.00	11460	3895	45°
6	4	180	0.115	0.18	0.18	6.00	9550	4395	45°
8	4	180	0.130	0.20	0.20	7.99	7170	3730	45°
10	4	180	0.170	0.24	0.24	9.97	5745	3905	45°
12	4	180	0.145	0.26	0.26	11.96	4790	2780	45°

Acciaio da utensile temprato 56 - 60 HRC

2	4	100	0.025	0.10	0.10	1.99	15995	1600	45°
3	4	100	0.035	0.12	0.12	3.00	10610	1485	45°
4	4	100	0.045	0.12	0.12	4.00	7960	1435	45°
5	4	100	0.050	0.16	0.16	5.00	6365	1275	45°
6	4	100	0.070	0.18	0.18	6.00	5305	1485	45°
8	4	100	0.075	0.20	0.20	7.99	3985	1195	45°
10	4	100	0.100	0.24	0.24	9.97	3195	1280	45°
12	4	100	0.085	0.26	0.26	11.96	2660	905	45°

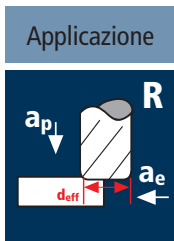
Frese toriche Toro-X

Tolleranza r 0/+0.015, 3xd



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)
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Esempio: N° Ordine										X-AL
										X7100
Ø Code	d1 0/+0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z	
.138	2	6	1.9	57	3	6	0.2	8.5°	4	●
.178	3	6	2.8	57	4	9	0.2	5.8°	4	●
.218	4	6	3.7	57	5	12	0.2	3.6°	4	●
.258	5	6	4.6	57	6	15	0.2	1.7°	4	●
.297	6	6	5.5	57	7	20	0.2	0.0°	4	●
.385	8	8	7.4	63	9	26	0.2	0.0°	4	●
.445	10	10	9.2	72	11	31	0.2	0.0°	4	●
.496	12	12	11.0	83	13	37	0.2	0.0°	4	●
.140	2	6	1.9	57	3	6	0.5	8.7°	4	●
.180	3	6	2.8	57	4	9	0.5	6.0°	4	●
.220	4	6	3.7	57	5	12	0.5	3.7°	4	●
.260	5	6	4.6	57	6	15	0.5	1.7°	4	●
.300	6	6	5.5	57	7	20	0.5	0.0°	4	●
.388	8	8	7.4	63	9	26	0.5	0.0°	4	●
.448	10	10	9.2	72	11	31	0.5	0.0°	4	●
.498	12	12	11.0	83	13	37	0.5	0.0°	4	●



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
4	4	200	0.055	0.60	2.40	3.83	16620	3655	r=1.0
5	4	200	0.060	0.60	3.00	4.83	13180	3165	r=1.0
6	4	200	0.065	0.60	3.60	5.83	10920	2840	r=1.0
8	4	200	0.080	0.60	4.80	7.83	8130	2600	r=1.0
10	4	200	0.105	0.60	6.00	9.83	6475	2720	r=1.0
12	4	200	0.125	0.60	7.20	11.83	5380	2690	r=1.0

Acciaio da utensile temprato 48 - 52 HRC

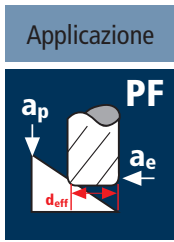
4	4	160	0.050	0.60	2.40	3.83	13300	2660	r=1.0
5	4	160	0.055	0.60	3.00	4.83	10545	2320	r=1.0
6	4	160	0.060	0.60	3.60	5.83	8735	2095	r=1.0
8	4	160	0.070	0.60	4.80	7.83	6505	1820	r=1.0
10	4	160	0.095	0.60	6.00	9.83	5180	1970	r=1.0
12	4	160	0.115	0.60	7.20	11.83	4305	1980	r=1.0

Acciaio da utensile temprato 52 - 56 HRC

4	4	150	0.045	0.60	2.40	3.83	12465	2245	r=1.0
5	4	150	0.050	0.60	3.00	4.83	9885	1975	r=1.0
6	4	150	0.055	0.60	3.60	5.83	8190	1800	r=1.0
8	4	150	0.065	0.60	4.80	7.83	6100	1585	r=1.0
10	4	150	0.085	0.60	6.00	9.83	4855	1650	r=1.0
12	4	150	0.105	0.60	7.20	11.83	4035	1695	r=1.0

Acciaio da utensile temprato 56 - 60 HRC

4	4	70	0.030	0.60	1.60	3.83	5820	700	r=1.0
5	4	70	0.035	0.60	2.00	4.83	4615	645	r=1.0
6	4	70	0.040	0.60	2.40	5.83	3820	610	r=1.0
8	4	70	0.045	0.60	3.20	7.83	2845	510	r=1.0
10	4	70	0.060	0.60	4.00	9.83	2265	545	r=1.0
12	4	70	0.075	0.60	4.80	11.83	1885	565	r=1.0



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
4	4	300	0.065	0.18	0.18	3.97	24055	6255	45°
5	4	300	0.075	0.24	0.24	4.99	19135	5740	45°
6	4	300	0.090	0.27	0.27	6.00	15915	5730	45°
8	4	300	0.125	0.30	0.30	8.00	11935	5970	45°
10	4	300	0.145	0.36	0.36	9.99	9560	5545	45°
12	4	300	0.170	0.39	0.39	11.98	7970	5420	45°

Acciaio da utensile temprato 48 - 52 HRC

4	4	220	0.060	0.18	0.18	3.97	17640	4235	45°
5	4	220	0.070	0.24	0.24	4.99	14035	3930	45°
6	4	220	0.085	0.27	0.27	6.00	11670	3970	45°
8	4	220	0.120	0.30	0.30	8.00	8755	4200	45°
10	4	220	0.140	0.36	0.36	9.99	7010	3925	45°
12	4	220	0.160	0.39	0.39	11.98	5845	3740	45°

Acciaio da utensile temprato 52 - 56 HRC

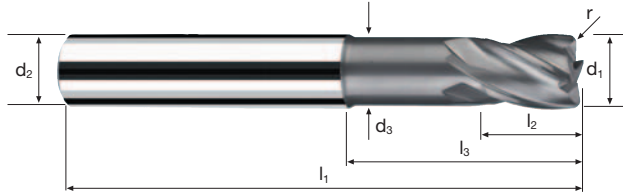
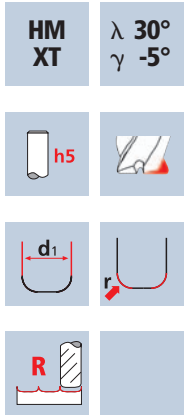
4	4	160	0.055	0.18	0.18	3.97	12830	2825	45°
5	4	160	0.065	0.24	0.24	4.99	10205	2655	45°
6	4	160	0.075	0.27	0.27	6.00	8490	2545	45°
8	4	160	0.110	0.30	0.30	8.00	6365	2800	45°
10	4	160	0.125	0.36	0.36	9.99	5100	2550	45°
12	4	160	0.145	0.39	0.39	11.98	4250	2465	45°

Acciaio da utensile temprato 56 - 60 HRC

4	4	80	0.035	0.18	0.18	3.97	6415	900	45°
5	4	80	0.040	0.24	0.24	4.99	5105	815	45°
6	4	80	0.045	0.27	0.27	6.00	4245	765	45°
8	4	80	0.065	0.30	0.30	8.00	3185	830	45°
10	4	80	0.075	0.36	0.36	9.99	2550	765	45°
12	4	80	0.085	0.39	0.39	11.98	2125	725	45°

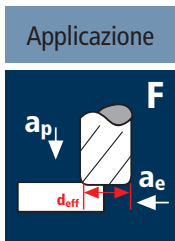
Frese toriche Toro-X

Tolleranza r 0/+0.015, 3xd



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)
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Esempio: N° Ordine										X-AL
										X7100
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z	
.222	4	6	3.7	57	5	12	1.0	3.8°	4	●
.262	5	6	4.6	57	6	15	1.0	1.8°	4	●
.302	6	6	5.5	57	7	20	1.0	0.0°	4	●
.391	8	8	7.4	63	9	26	1.0	0.0°	4	●
.450	10	10	9.2	72	11	31	1.0	0.0°	4	●
.501	12	12	11.0	83	13	37	1.0	0.0°	4	●
.395	8	8	7.4	63	9	26	2.0	0.0°	4	●
.455	10	10	9.2	72	11	31	2.0	0.0°	4	●
.505	12	12	11.0	83	13	37	2.0	0.0°	4	●



Materiale

Acciaio da utensile temprato 48 - 52 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
2	4	150	0.020	0.05	0.70	1.44	33160	2655	r=0.5
3	4	150	0.025	0.05	1.05	2.44	19570	1955	r=0.5
4	4	150	0.030	0.06	1.40	3.47	13760	1650	r=0.5
5	4	150	0.035	0.06	1.75	4.47	10680	1495	r=0.5
6	6	150	0.040	0.08	2.10	5.54	8620	2070	r=0.5
8	6	150	0.045	0.08	2.80	7.54	6335	1710	r=0.5
10	6	150	0.050	0.10	3.50	9.60	4975	1495	r=0.5
12	6	150	0.055	0.10	4.20	11.60	4115	1360	r=0.5
16	6	150	0.065	0.12	5.60	15.65	3050	1190	r=0.5

Acciaio da utensile temprato 52 - 56 HRC

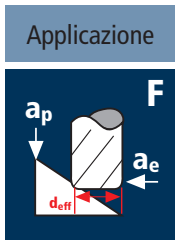
2	4	120	0.020	0.05	0.70	1.44	26525	2120	r=0.5
3	4	120	0.025	0.05	1.05	2.44	15655	1565	r=0.5
4	4	120	0.030	0.06	1.40	3.47	11010	1320	r=0.5
5	4	120	0.035	0.06	1.75	4.47	8545	1195	r=0.5
6	6	120	0.040	0.08	2.10	5.54	6895	1655	r=0.5
8	6	120	0.045	0.08	2.80	7.54	5065	1370	r=0.5
10	6	120	0.050	0.10	3.50	9.60	3980	1195	r=0.5
12	6	120	0.055	0.10	4.20	11.60	3295	1085	r=0.5
16	6	120	0.065	0.12	5.60	15.65	2440	950	r=0.5

Acciaio da utensile temprato 56 - 60 HRC

2	4	80	0.015	0.05	0.70	1.44	17685	1060	r=0.5
3	4	80	0.020	0.05	1.05	2.44	10435	835	r=0.5
4	4	80	0.025	0.06	1.40	3.47	7340	735	r=0.5
5	4	80	0.030	0.06	1.75	4.47	5695	685	r=0.5
6	6	80	0.030	0.08	2.10	5.54	4595	825	r=0.5
8	6	80	0.035	0.08	2.80	7.54	3375	710	r=0.5
10	6	80	0.040	0.10	3.50	9.60	2655	635	r=0.5
12	6	80	0.045	0.10	4.20	11.60	2195	595	r=0.5
16	6	80	0.050	0.12	5.60	15.65	1625	490	r=0.5

Acciaio da utensile temprato > 60 HRC

2	4	40	0.015	0.05	0.70	1.44	8840	530	r=0.5
3	4	40	0.020	0.05	1.05	2.44	5220	420	r=0.5
4	4	40	0.025	0.06	1.40	3.47	3670	365	r=0.5
5	4	40	0.030	0.06	1.75	4.47	2850	340	r=0.5
6	6	40	0.030	0.08	2.10	5.54	2300	415	r=0.5
8	6	40	0.035	0.08	2.80	7.54	1690	355	r=0.5
10	6	40	0.040	0.10	3.50	9.60	1325	320	r=0.5
12	6	40	0.045	0.10	4.20	11.60	1100	295	r=0.5
16	6	40	0.050	0.12	5.60	15.65	815	245	r=0.5



Materiale

Acciaio da utensile temprato 48 - 52 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
2	4	300	0.020	0.05	0.05	1.94	49225	3940	45°
3	4	300	0.025	0.05	0.05	2.94	32480	3250	45°
4	4	300	0.030	0.06	0.06	3.96	24115	2895	45°
5	4	300	0.035	0.06	0.06	4.96	19255	2695	45°
6	6	300	0.040	0.08	0.08	5.98	15970	3835	45°
8	6	300	0.045	0.08	0.08	7.98	11965	3230	45°
10	6	300	0.050	0.10	0.10	9.99	9560	2870	45°
12	6	300	0.055	0.10	0.10	11.99	7965	2630	45°
16	6	300	0.065	0.12	0.12	16.00	5970	2330	45°

Acciaio da utensile temprato 52 - 56 HRC

2	4	250	0.020	0.05	0.05	1.94	41020	3280	45°
3	4	250	0.025	0.05	0.05	2.94	27070	2705	45°
4	4	250	0.030	0.06	0.06	3.96	20095	2410	45°
5	4	250	0.035	0.06	0.06	4.96	16045	2245	45°
6	6	250	0.040	0.08	0.08	5.98	13310	3195	45°
8	6	250	0.045	0.08	0.08	7.98	9970	2690	45°
10	6	250	0.050	0.10	0.10	9.99	7965	2390	45°
12	6	250	0.050	0.10	0.10	11.99	6635	1990	45°
16	6	250	0.060	0.12	0.12	16.00	4975	1790	45°

Acciaio da utensile temprato 56 - 60 HRC

2	4	180	0.015	0.05	0.05	1.94	29535	1770	45°
3	4	180	0.020	0.05	0.05	2.94	19490	1560	45°
4	4	180	0.025	0.06	0.06	3.96	14470	1445	45°
5	4	180	0.030	0.06	0.06	4.96	11550	1385	45°
6	6	180	0.035	0.08	0.08	5.98	9580	2010	45°
8	6	180	0.040	0.08	0.08	7.98	7180	1725	45°
10	6	180	0.045	0.10	0.10	9.99	5735	1550	45°
12	6	180	0.045	0.10	0.10	11.99	4780	1290	45°
16	6	180	0.055	0.12	0.12	16.00	3580	1180	45°

Acciaio da utensile temprato > 60 HRC

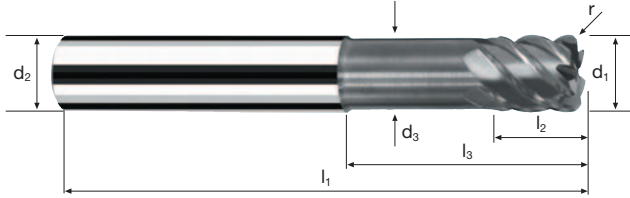
2	4	100	0.010	0.05	0.05	1.94	16410	655	45°
3	4	100	0.015	0.05	0.05	2.94	10825	650	45°
4	4	100	0.015	0.06	0.06	3.96	8040	480	45°
5	4	100	0.020	0.06	0.06	4.96	6420	515	45°
6	6	100	0.020	0.08	0.08	5.98	5325	640	45°
8	6	100	0.025	0.08	0.08	7.98	3990	600	45°
10	6	100	0.025	0.10	0.10	9.99	3185	480	45°
12	6	100	0.030	0.10	0.10	11.99	2655	480	45°
16	6	100	0.035	0.12	0.12	16.00	1990	420	45°

Frese toriche XSpeed

Tolleranza r 0/+0.015, 3xd



HM XT λ 55° γ -10°



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	HSS
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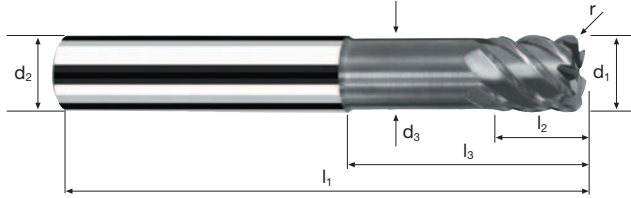
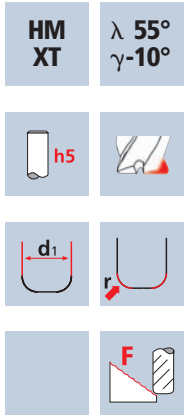
Esempio: N° Ordine										X-AL
Rivestimento										
Articolo										
Codice-ø										
X 7200 .140										X7200
ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z	
.140	2	6	1.9	57	3	6	0.5	8.7°	4	●
.180	3	6	2.8	57	4	9	0.5	6.0°	4	●
.220	4	6	3.7	57	5	12	0.5	3.7°	4	●
.260	5	6	4.6	57	6	15	0.5	1.7°	4	●
.295	6	6	5.5	57	7	20	0.5	0.0°	4	●
.300	6	6	5.5	57	7	20	0.5	0.0°	6	●
.386	8	8	7.4	63	9	26	0.5	0.0°	4	●
.391	8	8	7.4	63	9	26	0.5	0.0°	6	●
.440	10	10	9.2	72	11	31	0.5	0.0°	4	●
.450	10	10	9.2	72	11	31	0.5	0.0°	6	●
.491	12	12	11.0	83	13	37	0.5	0.0°	4	●
.501	12	12	11.0	83	13	37	0.5	0.0°	6	●
new! .606	16	16	15.0	92	17	43	0.5	0.0°	6	●

Applicazione		Materiale		d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
	Acciaio da utensile temprato 48 - 52 HRC 	4	4	150	0.045	0.34	1.40	3.50	13640	2455	r=1.0		
		5	4	150	0.050	0.38	1.75	4.57	10450	2090	r=1.0		
		6	6	150	0.055	0.40	2.10	5.60	8525	2815	r=1.0		
		8	6	150	0.070	0.44	2.80	7.66	6235	2620	r=1.0		
		10	6	150	0.085	0.48	3.50	9.71	4915	2505	r=1.0		
		12	6	150	0.105	0.50	4.20	11.73	4070	2565	r=1.0		
		16	6	150	0.130	0.56	5.60	15.80	3020	2355	r=1.0		
Acciaio da utensile temprato 52 - 56 HRC 	4	4	120	0.040	0.34	1.40	3.50	10915	1745	r=1.0			
	5	4	120	0.045	0.38	1.75	4.57	8360	1505	r=1.0			
	6	6	120	0.050	0.40	2.10	5.60	6820	2045	r=1.0			
	8	6	120	0.065	0.44	2.80	7.66	4985	1945	r=1.0			
	10	6	120	0.075	0.48	3.50	9.71	3935	1770	r=1.0			
	12	6	120	0.095	0.50	4.20	11.73	3255	1855	r=1.0			
	16	6	120	0.115	0.56	5.60	15.80	2420	1670	r=1.0			
Acciaio da utensile temprato 56 - 60 HRC 	4	4	80	0.035	0.34	1.40	3.50	7275	1020	r=1.0			
	5	4	80	0.040	0.38	1.75	4.57	5570	890	r=1.0			
	6	6	80	0.045	0.40	2.10	5.60	4545	1225	r=1.0			
	8	6	80	0.055	0.44	2.80	7.66	3325	1095	r=1.0			
	10	6	80	0.070	0.48	3.50	9.71	2625	1105	r=1.0			
	12	6	80	0.085	0.50	4.20	11.73	2170	1105	r=1.0			
	16	6	80	0.105	0.56	5.60	15.80	1610	1015	r=1.0			
Acciaio da utensile temprato > 60 HRC 	4	4	40	0.025	0.34	1.40	3.50	3640	365	r=1.0			
	5	4	40	0.030	0.38	1.75	4.57	2785	335	r=1.0			
	6	6	40	0.030	0.40	2.10	5.60	2275	410	r=1.0			
	8	6	40	0.040	0.44	2.80	7.66	1660	400	r=1.0			
	10	6	40	0.050	0.48	3.50	9.71	1310	395	r=1.0			
	12	6	40	0.060	0.50	4.20	11.73	1085	390	r=1.0			
	16	6	40	0.075	0.56	5.60	15.80	805	360	r=1.0			

Applicazione		Materiale		d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 48 - 52 HRC 	4	4	300	0.030	0.08	0.08	3.86	24740	2970	45°		
		5	4	300	0.035	0.08	0.08	4.86	19650	2750	45°		
		6	6	300	0.040	0.11	0.11	5.90	16185	3885	45°		
		8	6	300	0.045	0.11	0.11	7.90	12090	3265	45°		
		10	6	300	0.050	0.14	0.14	9.94	9605	2880	45°		
		12	6	300	0.055	0.14	0.14	11.94	8000	2640	45°		
		16	6	300	0.065	0.16	0.16	15.96	5985	2335	45°		
Acciaio da utensile temprato 52 - 56 HRC 	4	4	250	0.030	0.08	0.08	3.86	20615	2475	45°			
	5	4	250	0.035	0.08	0.08	4.86	16375	2295	45°			
	6	6	250	0.040	0.11	0.11	5.90	13490	3240	45°			
	8	6	250	0.045	0.11	0.11	7.90	10075	2720	45°			
	10	6	250	0.050	0.14	0.14	9.94	8005	2400	45°			
	12	6	250	0.050	0.14	0.14	11.94	6665	2000	45°			
	16	6	250	0.060	0.16	0.16	15.96	4985	1795	45°			
Acciaio da utensile temprato 56 - 60 HRC 	4	4	180	0.025	0.08	0.08	3.86	14845	1485	45°			
	5	4	180	0.030	0.08	0.08	4.86	11790	1415	45°			
	6	6	180	0.035	0.11	0.11	5.90	9710	2040	45°			
	8	6	180	0.040	0.11	0.11	7.90	7255	1740	45°			
	10	6	180	0.045	0.14	0.14	9.94	5765	1555	45°			
	12	6	180	0.045	0.14	0.14	11.94	4800	1295	45°			
	16	6	180	0.055	0.16	0.16	15.96	3590	1185	45°			
Acciaio da utensile temprato > 60 HRC 	4	4	100	0.015	0.08	0.08	3.86	8245	495	45°			
	5	4	100	0.020	0.08	0.08	4.86	6550	525	45°			
	6	6	100	0.020	0.11	0.11	5.90	5395	645	45°			
	8	6	100	0.025	0.11	0.11	7.90	4030	605	45°			
	10	6	100	0.025	0.14	0.14	9.94	3200	480	45°			
	12	6	100	0.030	0.14	0.14	11.94	2665	480	45°			
	16	6	100	0.035	0.16	0.16	15.96	1995	420	45°			

Frese toriche XSpeed

Tolleranza r 0/+0.015, 3xd



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	HSS
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Esempio: N° Ordine										X-AL
Rivestimento										X
Articolo										7200
Codice-ø										.218
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z	X7200
.218	4	6	3.7	57	5	12	1.0	3.8°	4	●
.258	5	6	4.6	57	6	15	1.0	1.8°	4	●
.293	6	6	5.5	57	7	20	1.0	0.0°	4	●
.297	6	6	5.5	57	7	20	1.0	0.0°	6	●
.384	8	8	7.4	63	9	26	1.0	0.0°	4	●
.388	8	8	7.4	63	9	26	1.0	0.0°	6	●
.435	10	10	9.2	72	11	31	1.0	0.0°	4	●
.445	10	10	9.2	72	11	31	1.0	0.0°	6	●
.486	12	12	11.0	83	13	37	1.0	0.0°	4	●
.496	12	12	11.0	83	13	37	1.0	0.0°	6	●
new! .608	16	16	15.0	92	17	43	1.0	0.0°	6	●



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
2	4	180	0.025	0.60	0.80	28650	2865	r=0.5
3	4	180	0.035	0.60	1.20	19100	2675	r=0.5
4	4	180	0.045	0.60	1.60	14325	2580	r=0.5
5	4	180	0.045	0.60	2.00	11460	2065	r=0.5
6	4	180	0.050	0.60	2.40	9550	1910	r=0.5
8	4	180	0.060	0.60	3.20	7160	1720	r=0.5
10	4	180	0.080	0.60	4.00	5730	1835	r=0.5
12	4	180	0.095	0.60	4.80	4775	1815	r=0.5

Acciaio da utensile temprato 48 - 52 HRC

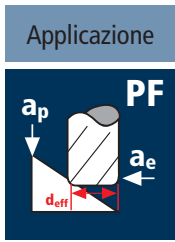
2	4	140	0.025	0.60	0.80	22280	2230	r=0.5
3	4	140	0.030	0.60	1.20	14855	1785	r=0.5
4	4	140	0.040	0.60	1.60	11140	1780	r=0.5
5	4	140	0.040	0.60	2.00	8915	1425	r=0.5
6	4	140	0.045	0.60	2.40	7425	1335	r=0.5
8	4	140	0.055	0.60	3.20	5570	1225	r=0.5
10	4	140	0.070	0.60	4.00	4455	1245	r=0.5
12	4	140	0.085	0.60	4.80	3715	1265	r=0.5

Acciaio da utensile temprato 52 - 56 HRC

2	4	100	0.020	0.60	0.80	15915	1275	r=0.5
3	4	100	0.030	0.60	1.20	10610	1275	r=0.5
4	4	100	0.035	0.60	1.60	7960	1175	r=0.5
5	4	100	0.035	0.60	2.00	6365	890	r=0.5
6	4	100	0.040	0.60	2.40	5305	850	r=0.5
8	4	100	0.050	0.60	3.20	3980	795	r=0.5
10	4	100	0.065	0.60	4.00	3185	830	r=0.5
12	4	100	0.080	0.60	4.80	2655	850	r=0.5

Acciaio da utensile temprato 56 - 60 HRC

2	4	70	0.015	0.60	0.80	11140	670	r=0.5
3	4	70	0.020	0.60	1.20	7425	595	r=0.5
4	4	70	0.025	0.60	1.60	5570	555	r=0.5
5	4	70	0.025	0.60	2.00	4455	445	r=0.5
6	4	70	0.030	0.60	2.40	3715	445	r=0.5
8	4	70	0.035	0.60	3.20	2785	390	r=0.5
10	4	70	0.045	0.60	4.00	2230	400	r=0.5
12	4	70	0.055	0.60	4.80	1855	410	r=0.5



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
2	4	360	0.045	0.10	0.10	1.99	57585	10365	45°
3	4	360	0.065	0.12	0.12	3.00	38200	9930	45°
4	4	360	0.085	0.12	0.12	4.00	28650	9740	45°
5	4	360	0.100	0.16	0.16	5.00	22920	9170	45°
6	4	360	0.135	0.18	0.18	6.00	19100	10315	45°
8	4	360	0.150	0.20	0.20	7.99	14340	8605	45°
10	4	360	0.200	0.24	0.24	9.97	11495	9195	45°
12	4	360	0.170	0.26	0.26	11.96	9580	6515	45°

Acciaio da utensile temprato 48 - 52 HRC

2	4	250	0.045	0.10	0.10	1.99	39990	7200	45°
3	4	250	0.060	0.12	0.12	3.00	26525	6365	45°
4	4	250	0.080	0.12	0.12	4.00	19895	6365	45°
5	4	250	0.095	0.16	0.16	5.00	15915	6050	45°
6	4	250	0.130	0.18	0.18	6.00	13265	6900	45°
8	4	250	0.145	0.20	0.20	7.99	9960	5775	45°
10	4	250	0.190	0.24	0.24	9.97	7980	6065	45°
12	4	250	0.160	0.26	0.26	11.96	6655	4260	45°

Acciaio da utensile temprato 52 - 56 HRC

2	4	180	0.040	0.10	0.10	1.99	28795	4605	45°
3	4	180	0.055	0.12	0.12	3.00	19100	4200	45°
4	4	180	0.075	0.12	0.12	4.00	14325	4300	45°
5	4	180	0.085	0.16	0.16	5.00	11460	3895	45°
6	4	180	0.115	0.18	0.18	6.00	9550	4395	45°
8	4	180	0.130	0.20	0.20	7.99	7170	3730	45°
10	4	180	0.170	0.24	0.24	9.97	5745	3905	45°
12	4	180	0.145	0.26	0.26	11.96	4790	2780	45°

Acciaio da utensile temprato 56 - 60 HRC

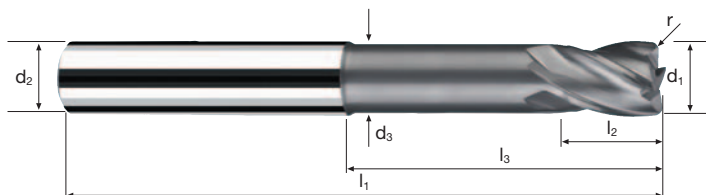
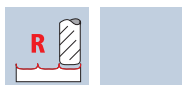
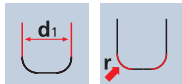
2	4	100	0.025	0.10	0.10	1.99	15995	1600	45°
3	4	100	0.035	0.12	0.12	3.00	10610	1485	45°
4	4	100	0.045	0.12	0.12	4.00	7960	1435	45°
5	4	100	0.050	0.16	0.16	5.00	6365	1275	45°
6	4	100	0.070	0.18	0.18	6.00	5305	1485	45°
8	4	100	0.075	0.20	0.20	7.99	3985	1195	45°
10	4	100	0.100	0.24	0.24	9.97	3195	1280	45°
12	4	100	0.085	0.26	0.26	11.96	2660	905	45°

Frese toriche Toro-X

Tolleranza r 0/+0.015, 6xd

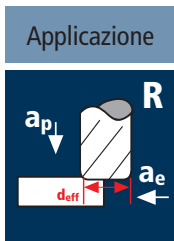


**HM
XT** λ **30°**
 γ **-5°**



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)
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Esempio: N° Ordine										X-AL
Rivestimento X Articolo 7104 Codice-ø .138										X7104
Ø Code	d1 0/+0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z	
.138	2	6	1.9	66	3	12	0.2	5.9°	4	●
.178	3	6	2.8	66	4	18	0.2	3.7°	4	●
.218	4	6	3.7	69	5	24	0.2	2.1°	4	●
.258	5	6	4.6	75	6	30	0.2	0.9°	4	●
.297	6	6	5.5	80	7	43	0.2	0.0°	4	●
.385	8	8	7.4	90	9	53	0.2	0.0°	4	●
.445	10	10	9.2	105	11	64	0.2	0.0°	4	●
.496	12	12	11.0	120	13	74	0.2	0.0°	4	●
.140	2	6	1.9	66	3	12	0.5	6.0°	4	●
.180	3	6	2.8	66	4	18	0.5	3.7°	4	●
.220	4	6	3.7	69	5	24	0.5	2.1°	4	●
.260	5	6	4.6	75	6	30	0.5	0.9°	4	●
.300	6	6	5.5	80	7	43	0.5	0.0°	4	●
.388	8	8	7.4	90	9	53	0.5	0.0°	4	●
.448	10	10	9.2	105	11	64	0.5	0.0°	4	●
.498	12	12	11.0	120	13	74	0.5	0.0°	4	●



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
4	4	200	0.045	0.60	2.40	3.83	16620	2990	r=1.0
5	4	200	0.050	0.60	3.00	4.83	13180	2635	r=1.0
6	4	200	0.055	0.60	3.60	5.83	10920	2400	r=1.0
8	4	200	0.070	0.60	4.80	7.83	8130	2275	r=1.0
10	4	200	0.090	0.60	6.00	9.83	6475	2330	r=1.0
12	4	200	0.105	0.60	7.20	11.83	5380	2260	r=1.0

Acciaio da utensile temprato 48 - 52 HRC

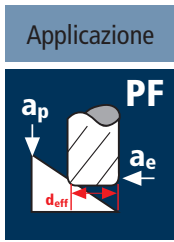
4	4	160	0.040	0.60	2.40	3.83	13300	2130	r=1.0
5	4	160	0.045	0.60	3.00	4.83	10545	1900	r=1.0
6	4	160	0.050	0.60	3.60	5.83	8735	1745	r=1.0
8	4	160	0.065	0.60	4.80	7.83	6505	1690	r=1.0
10	4	160	0.080	0.60	6.00	9.83	5180	1660	r=1.0
12	4	160	0.095	0.60	7.20	11.83	4305	1635	r=1.0

Acciaio da utensile temprato 52 - 56 HRC

4	4	150	0.035	0.60	2.40	3.83	12465	1745	r=1.0
5	4	150	0.040	0.60	3.00	4.83	9885	1580	r=1.0
6	4	150	0.045	0.60	3.60	5.83	8190	1475	r=1.0
8	4	150	0.055	0.60	4.80	7.83	6100	1340	r=1.0
10	4	150	0.075	0.60	6.00	9.83	4855	1455	r=1.0
12	4	150	0.085	0.60	7.20	11.83	4035	1370	r=1.0

Acciaio da utensile temprato 56 - 60 HRC

4	4	70	0.025	0.60	1.60	3.83	5820	580	r=1.0
5	4	70	0.030	0.60	2.00	4.83	4615	555	r=1.0
6	4	70	0.030	0.60	2.40	5.83	3820	460	r=1.0
8	4	70	0.040	0.60	3.20	7.83	2845	455	r=1.0
10	4	70	0.050	0.60	4.00	9.83	2265	455	r=1.0
12	4	70	0.060	0.60	4.80	11.83	1885	450	r=1.0



Materiale

Acciaio da utensile temprato 42 - 48 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
4	4	300	0.065	0.18	0.18	3.97	24055	6255	45°
5	4	300	0.075	0.24	0.24	4.99	19135	5740	45°
6	4	300	0.090	0.27	0.27	6.00	15915	5730	45°
8	4	300	0.125	0.30	0.30	8.00	11935	5970	45°
10	4	300	0.145	0.36	0.36	9.99	9560	5545	45°
12	4	300	0.170	0.39	0.39	11.98	7970	5420	45°

Acciaio da utensile temprato 48 - 52 HRC

4	4	220	0.060	0.18	0.18	3.97	17640	4235	45°
5	4	220	0.070	0.24	0.24	4.99	14035	3930	45°
6	4	220	0.085	0.27	0.27	6.00	11670	3970	45°
8	4	220	0.120	0.30	0.30	8.00	8755	4200	45°
10	4	220	0.140	0.36	0.36	9.99	7010	3925	45°
12	4	220	0.160	0.39	0.39	11.98	5845	3740	45°

Acciaio da utensile temprato 52 - 56 HRC

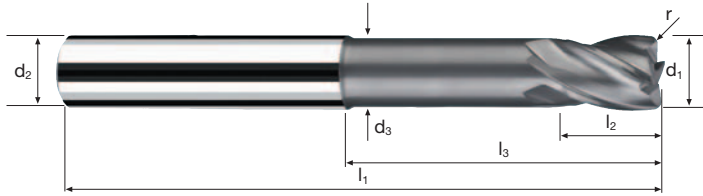
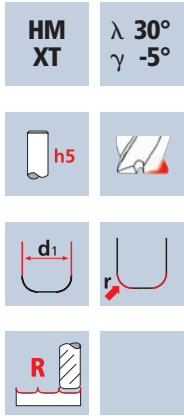
4	4	160	0.055	0.18	0.18	3.97	12830	2825	45°
5	4	160	0.065	0.24	0.24	4.99	10205	2655	45°
6	4	160	0.075	0.27	0.27	6.00	8490	2545	45°
8	4	160	0.110	0.30	0.30	8.00	6365	2800	45°
10	4	160	0.125	0.36	0.36	9.99	5100	2550	45°
12	4	160	0.145	0.39	0.39	11.98	4250	2465	45°

Acciaio da utensile temprato 56 - 60 HRC

4	4	80	0.035	0.18	0.18	3.97	6415	900	45°
5	4	80	0.040	0.24	0.24	4.99	5105	815	45°
6	4	80	0.045	0.27	0.27	6.00	4245	765	45°
8	4	80	0.065	0.30	0.30	8.00	3185	830	45°
10	4	80	0.075	0.36	0.36	9.99	2550	765	45°
12	4	80	0.085	0.39	0.39	11.98	2125	725	45°

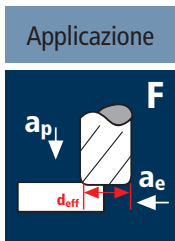
Frese toriche Toro-X

Tolleranza r 0/+0.015, 6xd



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	GG(G)
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Esempio: N° Ordine		Rivestimento X	Articolo 7104	Codice-ø .222						X-AL
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z	X7104
.222	4	6	3.7	69	5	24	1.0	2.1°	4	●
.262	5	6	4.6	75	6	30	1.0	1.0°	4	●
.302	6	6	5.5	80	7	43	1.0	0.0°	4	●
.391	8	8	7.4	90	9	53	1.0	0.0°	4	●
.450	10	10	9.2	105	11	64	1.0	0.0°	4	●
.501	12	12	11.0	120	13	74	1.0	0.0°	4	●
.395	8	8	7.4	90	9	53	2.0	0.0°	4	●
.455	10	10	9.2	105	11	64	2.0	0.0°	4	●
.505	12	12	11.0	120	13	74	2.0	0.0°	4	●



Materiale

Acciaio da utensile temprato 48 - 52 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
2	4	150	0.020	0.05	0.44	1.44	33160	2655	r=0.5
3	4	150	0.025	0.05	0.66	2.44	19570	1955	r=0.5
4	4	150	0.030	0.06	0.88	3.47	13760	1650	r=0.5
5	4	150	0.030	0.06	1.10	4.47	10680	1280	r=0.5
6	6	150	0.035	0.08	1.32	5.54	8620	1810	r=0.5
8	6	150	0.040	0.08	1.76	7.54	6335	1520	r=0.5
10	6	150	0.045	0.10	2.20	9.60	4975	1345	r=0.5
12	6	150	0.050	0.10	2.64	11.60	4115	1235	r=0.5
16	6	150	0.060	0.12	3.52	15.65	3050	1100	r=0.5

Acciaio da utensile temprato 52 - 56 HRC

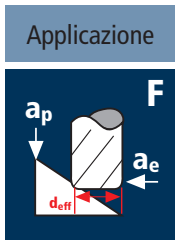
2	4	120	0.020	0.05	0.44	1.44	26525	2120	r=0.5
3	4	120	0.025	0.05	0.66	2.44	15655	1565	r=0.5
4	4	120	0.030	0.06	0.88	3.47	11010	1320	r=0.5
5	4	120	0.030	0.06	1.10	4.47	8545	1025	r=0.5
6	6	120	0.035	0.08	1.32	5.54	6895	1450	r=0.5
8	6	120	0.040	0.08	1.76	7.54	5065	1215	r=0.5
10	6	120	0.045	0.10	2.20	9.60	3980	1075	r=0.5
12	6	120	0.050	0.10	2.64	11.60	3295	990	r=0.5
16	6	120	0.060	0.12	3.52	15.65	2440	880	r=0.5

Acciaio da utensile temprato 56 - 60 HRC

2	4	80	0.015	0.05	0.44	1.44	17685	1060	r=0.5
3	4	80	0.020	0.05	0.66	2.44	10435	835	r=0.5
4	4	80	0.025	0.06	0.88	3.47	7340	735	r=0.5
5	4	80	0.025	0.06	1.10	4.47	5695	570	r=0.5
6	6	80	0.030	0.08	1.32	5.54	4595	825	r=0.5
8	6	80	0.030	0.08	1.76	7.54	3375	610	r=0.5
10	6	80	0.035	0.10	2.20	9.60	2655	560	r=0.5
12	6	80	0.040	0.10	2.64	11.60	2195	525	r=0.5
16	6	80	0.050	0.12	3.52	15.65	1625	490	r=0.5

Acciaio da utensile temprato > 60 HRC

2	4	40	0.015	0.05	0.44	1.44	8840	530	r=0.5
3	4	40	0.020	0.05	0.66	2.44	5220	420	r=0.5
4	4	40	0.025	0.06	0.88	3.47	3670	365	r=0.5
5	4	40	0.025	0.06	1.10	4.47	2850	285	r=0.5
6	6	40	0.030	0.08	1.32	5.54	2300	415	r=0.5
8	6	40	0.030	0.08	1.76	7.54	1690	305	r=0.5
10	6	40	0.035	0.10	2.20	9.60	1325	280	r=0.5
12	6	40	0.040	0.10	2.64	11.60	1100	265	r=0.5
16	6	40	0.050	0.12	3.52	15.65	815	245	r=0.5



Materiale

Acciaio da utensile temprato 48 - 52 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
2	4	300	0.020	0.05	0.05	1.94	49225	3940	45°
3	4	300	0.025	0.05	0.05	2.94	32480	3250	45°
4	4	300	0.030	0.06	0.06	3.96	24115	2895	45°
5	4	300	0.035	0.06	0.06	4.96	19255	2695	45°
6	6	300	0.040	0.08	0.08	5.98	15970	3835	45°
8	6	300	0.045	0.08	0.08	7.98	11965	3230	45°
10	6	300	0.050	0.10	0.10	9.99	9560	2870	45°
12	6	300	0.055	0.10	0.10	11.99	7965	2630	45°
16	6	300	0.065	0.12	0.12	16.00	5970	2330	45°

Acciaio da utensile temprato 52 - 56 HRC

2	4	250	0.020	0.05	0.05	1.94	41020	3280	45°
3	4	250	0.025	0.05	0.05	2.94	27070	2705	45°
4	4	250	0.030	0.06	0.06	3.96	20095	2410	45°
5	4	250	0.035	0.06	0.06	4.96	16045	2245	45°
6	6	250	0.040	0.08	0.08	5.98	13310	3195	45°
8	6	250	0.045	0.08	0.08	7.98	9970	2690	45°
10	6	250	0.050	0.10	0.10	9.99	7965	2390	45°
12	6	250	0.050	0.10	0.10	11.99	6635	1990	45°
16	6	250	0.060	0.12	0.12	16.00	4975	1790	45°

Acciaio da utensile temprato 56 - 60 HRC

2	4	180	0.015	0.05	0.05	1.94	29535	1770	45°
3	4	180	0.020	0.05	0.05	2.94	19490	1560	45°
4	4	180	0.025	0.06	0.06	3.96	14470	1445	45°
5	4	180	0.030	0.06	0.06	4.96	11550	1385	45°
6	6	180	0.035	0.08	0.08	5.98	9580	2010	45°
8	6	180	0.040	0.08	0.08	7.98	7180	1725	45°
10	6	180	0.045	0.10	0.10	9.99	5735	1550	45°
12	6	180	0.045	0.10	0.10	11.99	4780	1290	45°
16	6	180	0.055	0.12	0.12	16.00	3580	1180	45°

Acciaio da utensile temprato > 60 HRC

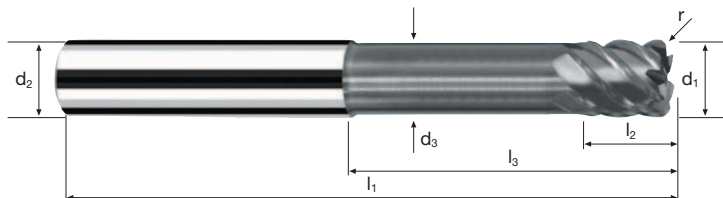
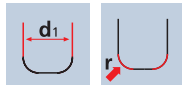
2	4	100	0.010	0.05	0.05	1.94	16410	655	45°
3	4	100	0.015	0.05	0.05	2.94	10825	650	45°
4	4	100	0.015	0.06	0.06	3.96	8040	480	45°
5	4	100	0.020	0.06	0.06	4.96	6420	515	45°
6	6	100	0.020	0.08	0.08	5.98	5325	640	45°
8	6	100	0.025	0.08	0.08	7.98	3990	600	45°
10	6	100	0.025	0.10	0.10	9.99	3185	480	45°
12	6	100	0.030	0.10	0.10	11.99	2655	480	45°
16	6	100	0.035	0.12	0.12	16.00	1990	420	45°

Frese toriche XSpeed

Tolleranza r 0/+0.015, 6xd

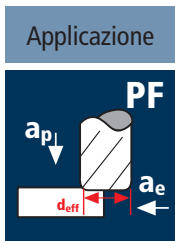


HM
XT λ 55°
 γ -10°



	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	HSS
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Esempio: N° Ordine	Rivestimento			Articolo		Codice-ø					X-AL
	X	7204	.140								X7204
ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	Z		
.140	2	6	1.9	66	3	12	0.5	6.0°	4		●
.180	3	6	2.8	66	4	18	0.5	3.7°	4		●
.220	4	6	3.7	69	5	24	0.5	2.1°	4		●
.260	5	6	4.6	75	6	30	0.5	0.9°	4		●
.295	6	6	5.5	80	7	43	0.5	0.0°	4		●
.300	6	6	5.5	80	7	43	0.5	0.0°	6		●
.386	8	8	7.4	90	9	53	0.5	0.0°	4		●
.391	8	8	7.4	90	9	53	0.5	0.0°	6		●
.440	10	10	9.2	105	11	64	0.5	0.0°	4		●
.450	10	10	9.2	105	11	64	0.5	0.0°	6		●
.491	12	12	11.0	120	13	74	0.5	0.0°	4		●
.501	12	12	11.0	120	13	74	0.5	0.0°	6		●
new! .606	16	16	15.0	135	17	86	0.5	0.0°	6		●



Materiale

Acciaio da utensile temprato 48 - 52 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
4	4	150	0.040	0.18	0.88	3.14	15205	2435	r=1.0
5	4	150	0.045	0.22	1.10	4.25	11235	2020	r=1.0
6	6	150	0.050	0.26	1.32	5.35	8925	2680	r=1.0
8	6	150	0.060	0.32	1.76	7.47	6390	2300	r=1.0
10	6	150	0.080	0.38	2.20	9.57	4990	2395	r=1.0
12	6	150	0.095	0.45	2.64	11.67	4090	2330	r=1.0
16	6	150	0.105	0.50	3.52	15.73	3035	1910	r=1.0

Acciaio da utensile temprato 52 - 56 HRC

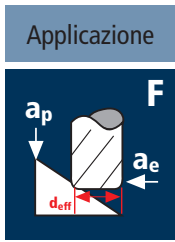
4	4	120	0.035	0.18	0.88	3.14	12165	1705	r=1.0
5	4	120	0.040	0.22	1.10	4.25	8990	1440	r=1.0
6	6	120	0.045	0.26	1.32	5.35	7140	1930	r=1.0
8	6	120	0.055	0.32	1.76	7.47	5115	1690	r=1.0
10	6	120	0.070	0.38	2.20	9.57	3990	1675	r=1.0
12	6	120	0.085	0.45	2.64	11.67	3275	1670	r=1.0
16	6	120	0.095	0.50	3.52	15.73	2430	1385	r=1.0

Acciaio da utensile temprato 56 - 60 HRC

4	4	80	0.035	0.18	0.88	3.14	8110	1135	r=1.0
5	4	80	0.035	0.22	1.10	4.25	5990	840	r=1.0
6	6	80	0.040	0.26	1.32	5.35	4760	1140	r=1.0
8	6	80	0.050	0.32	1.76	7.47	3410	1025	r=1.0
10	6	80	0.065	0.38	2.20	9.57	2660	1035	r=1.0
12	6	80	0.080	0.45	2.64	11.67	2180	1045	r=1.0
16	6	80	0.085	0.50	3.52	15.73	1620	825	r=1.0

Acciaio da utensile temprato > 60 HRC

4	4	40	0.025	0.18	0.88	3.14	4055	405	r=1.0
5	4	40	0.025	0.22	1.10	4.25	2995	300	r=1.0
6	6	40	0.030	0.26	1.32	5.35	2380	430	r=1.0
8	6	40	0.035	0.32	1.76	7.47	1705	360	r=1.0
10	6	40	0.045	0.38	2.20	9.57	1330	360	r=1.0
12	6	40	0.055	0.45	2.64	11.67	1090	360	r=1.0
16	6	40	0.060	0.50	3.52	15.73	810	290	r=1.0



Materiale

Acciaio da utensile temprato 48 - 52 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
4	4	300	0.030	0.08	0.08	3.86	24740	2970	45°
5	4	300	0.035	0.08	0.08	4.86	19650	2750	45°
6	6	300	0.040	0.11	0.11	5.90	16185	3885	45°
8	6	300	0.045	0.11	0.11	7.90	12090	3265	45°
10	6	300	0.050	0.14	0.14	9.94	9605	2880	45°
12	6	300	0.055	0.14	0.14	11.94	8000	2640	45°
16	6	300	0.065	0.16	0.16	15.96	5985	2335	45°

Acciaio da utensile temprato 52 - 56 HRC

4	4	250	0.030	0.08	0.08	3.86	20615	2475	45°
5	4	250	0.035	0.08	0.08	4.86	16375	2295	45°
6	6	250	0.040	0.11	0.11	5.90	13490	3240	45°
8	6	250	0.045	0.11	0.11	7.90	10075	2720	45°
10	6	250	0.050	0.14	0.14	9.94	8005	2400	45°
12	6	250	0.050	0.14	0.14	11.94	6665	2000	45°
16	6	250	0.060	0.16	0.16	15.96	4985	1795	45°

Acciaio da utensile temprato 56 - 60 HRC

4	4	180	0.025	0.08	0.08	3.86	14845	1485	45°
5	4	180	0.030	0.08	0.08	4.86	11790	1415	45°
6	6	180	0.035	0.11	0.11	5.90	9710	2040	45°
8	6	180	0.040	0.11	0.11	7.90	7255	1740	45°
10	6	180	0.045	0.14	0.14	9.94	5765	1555	45°
12	6	180	0.045	0.14	0.14	11.94	4800	1295	45°
16	6	180	0.055	0.16	0.16	15.96	3590	1185	45°

Acciaio da utensile temprato > 60 HRC

4	4	100	0.015	0.08	0.08	3.86	8245	495	45°
5	4	100	0.020	0.08	0.08	4.86	6550	525	45°
6	6	100	0.020	0.11	0.11	5.90	5395	645	45°
8	6	100	0.025	0.11	0.11	7.90	4030	605	45°
10	6	100	0.025	0.14	0.14	9.94	3200	480	45°
12	6	100	0.030	0.14	0.14	11.94	2665	480	45°
16	6	100	0.035	0.16	0.16	15.96	1995	420	45°

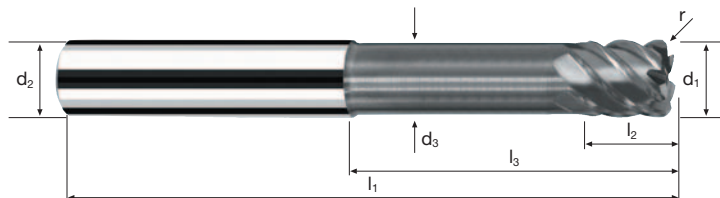
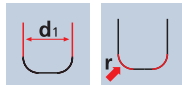
Frese toriche XSpeed

Tolleranza r 0/+0.015, 6xd



HM
XT

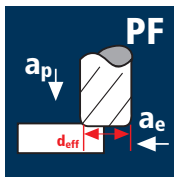
λ **55°**
 γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	HSS
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										X-AL
Esempio: N° Ordine										X7204
	Rivestimento X		Articolo 7204		Codice-ø .218					
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z	
.218	4	6	3.7	69	5	24	1.0	2.1°	4	●
.258	5	6	4.6	75	6	30	1.0	1.0°	4	●
.293	6	6	5.5	80	7	43	1.0	0.0°	4	●
.297	6	6	5.5	80	7	43	1.0	0.0°	6	●
.384	8	8	7.4	90	9	53	1.0	0.0°	4	●
.388	8	8	7.4	90	9	53	1.0	0.0°	6	●
.435	10	10	9.2	105	11	64	1.0	0.0°	4	●
.445	10	10	9.2	105	11	64	1.0	0.0°	6	●
.486	12	12	11.0	120	13	74	1.0	0.0°	4	●
.496	12	12	11.0	120	13	74	1.0	0.0°	6	●
new! .608	16	16	15.0	135	17	86	1.0	0.0°	6	●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

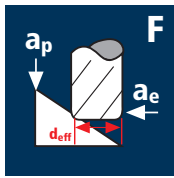
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
3	4	200	0.040	0.15	0.90	2.71	23490	3760	r=0.5
4	4	200	0.050	0.18	1.20	3.77	16885	3375	r=0.5
5	4	200	0.055	0.20	1.50	4.80	13265	2920	r=0.5
6	6	200	0.060	0.22	1.80	5.83	10920	3930	r=0.5
8	6	200	0.075	0.25	2.40	7.87	8090	3640	r=0.5
10	6	200	0.090	0.28	3.00	9.90	6430	3470	r=0.5
12	6	200	0.110	0.30	3.60	11.92	5340	3525	r=0.5
16	6	200	0.120	0.65	4.80	15.47	4115	2965	r=1.5

3	4	180	0.040	0.15	0.90	2.71	21145	3385	r=0.5
4	4	180	0.050	0.18	1.20	3.77	15200	3040	r=0.5
5	4	180	0.050	0.20	1.50	4.80	11935	2385	r=0.5
6	6	180	0.055	0.22	1.80	5.83	9830	3245	r=0.5
8	6	180	0.070	0.25	2.40	7.87	7280	3060	r=0.5
10	6	180	0.085	0.28	3.00	9.90	5790	2955	r=0.5
12	6	180	0.105	0.30	3.60	11.92	4805	3025	r=0.5
16	6	180	0.115	0.65	4.80	15.47	3705	2555	r=1.5

3	4	150	0.035	0.15	0.90	2.71	17620	2465	r=0.5
4	4	150	0.045	0.18	1.20	3.77	12665	2280	r=0.5
5	4	150	0.050	0.20	1.50	4.80	9945	1990	r=0.5
6	6	150	0.055	0.22	1.80	5.83	8190	2705	r=0.5
8	6	150	0.065	0.25	2.40	7.87	6065	2365	r=0.5
10	6	150	0.080	0.28	3.00	9.90	4825	2315	r=0.5
12	6	150	0.095	0.30	3.60	11.92	4005	2285	r=0.5
16	6	150	0.105	0.65	4.80	15.47	3085	1945	r=1.5

3	4	60	0.025	0.15	0.70	2.71	7050	705	r=0.5
4	4	60	0.030	0.18	1.00	3.77	5065	610	r=0.5
5	4	60	0.030	0.20	1.20	4.80	3980	480	r=0.5
6	6	60	0.035	0.22	1.40	5.83	3275	690	r=0.5
8	6	60	0.040	0.25	1.90	7.87	2425	580	r=0.5
10	6	60	0.050	0.28	2.40	9.90	1930	580	r=0.5
12	6	60	0.060	0.30	2.90	11.92	1600	575	r=0.5
16	6	60	0.070	0.65	3.80	15.47	1235	520	r=1.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
3	4	420	0.025	0.05	0.05	2.94	45475	4550	45°
4	4	420	0.030	0.06	0.06	3.96	33760	4050	45°
5	4	420	0.035	0.06	0.06	4.96	26955	3775	45°
6	6	420	0.040	0.08	0.08	5.98	22355	5365	45°
8	6	420	0.045	0.08	0.08	7.98	16755	4525	45°
10	6	420	0.050	0.10	0.10	9.99	13385	4015	45°
12	6	420	0.055	0.10	0.10	11.99	11150	3680	45°
16	6	420	0.065	0.18	0.18	15.87	8425	3285	45°

3	4	360	0.025	0.05	0.05	2.94	38980	3900	45°
4	4	360	0.030	0.06	0.06	3.96	28940	3475	45°
5	4	360	0.035	0.06	0.06	4.96	23105	3235	45°
6	6	360	0.040	0.08	0.08	5.98	19165	4600	45°
8	6	360	0.045	0.08	0.08	7.98	14360	3875	45°
10	6	360	0.050	0.10	0.10	9.99	11470	3440	45°
12	6	360	0.050	0.10	0.10	11.99	9560	2870	45°
16	6	360	0.060	0.18	0.18	15.87	7220	2600	45°

3	4	320	0.020	0.05	0.05	2.94	34645	2770	45°
4	4	320	0.025	0.06	0.06	3.96	25725	2575	45°
5	4	320	0.030	0.06	0.06	4.96	20535	2465	45°
6	6	320	0.035	0.08	0.08	5.98	17035	3575	45°
8	6	320	0.040	0.08	0.08	7.98	12765	3065	45°
10	6	320	0.045	0.10	0.10	9.99	10195	2755	45°
12	6	320	0.050	0.10	0.10	11.99	8495	2550	45°
16	6	320	0.055	0.18	0.18	15.87	6420	2120	45°

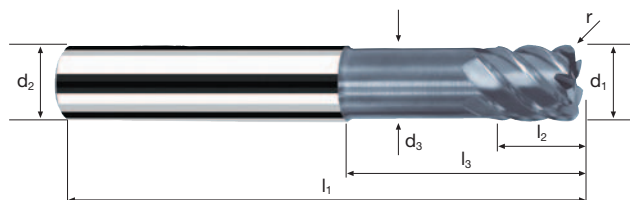
3	4	145	0.020	0.05	0.05	2.94	15700	1255	45°
4	4	145	0.025	0.06	0.06	3.96	11655	1165	45°
5	4	145	0.030	0.06	0.06	4.96	9305	1115	45°
6	6	145	0.030	0.08	0.08	5.98	7720	1390	45°
8	6	145	0.035	0.08	0.08	7.98	5785	1215	45°
10	6	145	0.040	0.10	0.10	9.99	4620	1110	45°
12	6	145	0.045	0.10	0.10	11.99	3850	1040	45°
16	6	145	0.050	0.18	0.18	15.87	2910	875	45°

Frese toriche Multispeed

Tolleranza r $0/+0.03$, 3xd



HM
MG10 λ **45°**
 γ **5°**



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Rm** 1300-1500 **Inox** Stainless **Ti** Titanium **GG(G)**

Esempio: N° Ordine										POLYCHROM	
										P5250	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.180	3	6	2.8	57	4	14	0.5	4.4°	4		●
.220	4	6	3.7	57	5	16	0.5	2.9°	4		●
.260	5	6	4.6	57	6	18	0.5	1.5°	4		●
.297	6	6	5.5	57	7	20	0.5	0.0°	6		●
.388	8	8	7.4	63	9	26	0.5	0.0°	6		●
.445	10	10	9.2	72	11	31	0.5	0.0°	6		●
.496	12	12	11.0	83	13	37	0.5	0.0°	6		●
.300	6	6	5.5	57	7	20	0.8	0.0°	6		●
.391	8	8	7.4	63	9	26	1.0	0.0°	6		●
.450	10	10	9.2	72	11	31	1.0	0.0°	6		●
.501	12	12	11.0	83	13	37	1.5	0.0°	6		●
.610	16	16	15.0	92	17	43	1.5	0.0°	6		●



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
2	4	80	0.015	0.60	1.20	12730	765	r=0.5
3	4	80	0.025	0.60	1.80	8490	850	r=0.5
4	4	80	0.035	0.60	2.40	6365	890	r=0.5
5	4	80	0.040	0.60	3.00	5095	815	r=0.5
6	4	80	0.050	0.60	3.60	4245	850	r=0.5
8	4	80	0.065	0.60	4.80	3185	830	r=0.5
10	4	80	0.085	0.60	6.00	2545	865	r=0.5
12	4	80	0.100	0.60	7.20	2120	850	r=0.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

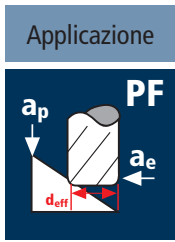
2	4	70	0.015	0.60	1.20	11140	670	r=0.5
3	4	70	0.025	0.60	1.80	7425	745	r=0.5
4	4	70	0.035	0.60	2.40	5570	780	r=0.5
5	4	70	0.040	0.60	3.00	4455	715	r=0.5
6	4	70	0.050	0.60	3.60	3715	745	r=0.5
8	4	70	0.065	0.60	4.80	2785	725	r=0.5
10	4	70	0.085	0.60	6.00	2230	760	r=0.5
12	4	70	0.100	0.60	7.20	1855	740	r=0.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

2	4	50	0.010	0.60	1.20	7960	320	r=0.5
3	4	50	0.020	0.60	1.80	5305	425	r=0.5
4	4	50	0.025	0.60	2.40	3980	400	r=0.5
5	4	50	0.030	0.60	3.00	3185	380	r=0.5
6	4	50	0.035	0.60	3.60	2655	370	r=0.5
8	4	50	0.045	0.60	4.80	1990	360	r=0.5
10	4	50	0.060	0.60	6.00	1590	380	r=0.5
12	4	50	0.070	0.60	7.20	1325	370	r=0.5

Acciaio < 850 N/mm²

2	4	180	0.020	0.60	1.20	28650	2290	r=0.5
3	4	180	0.035	0.60	1.80	19100	2675	r=0.5
4	4	180	0.045	0.60	2.40	14325	2580	r=0.5
5	4	180	0.050	0.60	3.00	11460	2290	r=0.5
6	4	180	0.065	0.60	3.60	9550	2485	r=0.5
8	4	180	0.085	0.60	4.80	7160	2435	r=0.5
10	4	180	0.110	0.60	6.00	5730	2520	r=0.5
12	4	180	0.130	0.60	7.20	4775	2485	r=0.5



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
2	4	160	0.030	0.10	0.10	1.99	25595	3070	45°
3	4	160	0.050	0.12	0.12	3.00	16975	3395	45°
4	4	160	0.070	0.12	0.12	4.00	12735	3565	45°
5	4	160	0.080	0.16	0.16	5.00	10185	3260	45°
6	4	160	0.100	0.18	0.18	6.00	8490	3395	45°
8	4	160	0.130	0.20	0.20	7.99	6375	3315	45°
10	4	160	0.170	0.24	0.24	9.97	5110	3475	45°
12	4	160	0.200	0.26	0.26	11.96	4260	3410	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

2	4	145	0.030	0.10	0.10	1.99	23195	2785	45°
3	4	145	0.050	0.12	0.12	3.00	15385	3075	45°
4	4	145	0.070	0.12	0.12	4.00	11540	3230	45°
5	4	145	0.080	0.16	0.16	5.00	9230	2955	45°
6	4	145	0.100	0.18	0.18	6.00	7695	3080	45°
8	4	145	0.130	0.20	0.20	7.99	5775	3005	45°
10	4	145	0.170	0.24	0.24	9.97	4630	3150	45°
12	4	145	0.200	0.26	0.26	11.96	3860	3090	45°

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

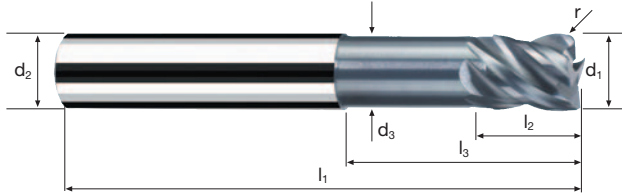
2	4	110	0.020	0.10	0.10	1.99	17595	1410	45°
3	4	110	0.040	0.12	0.12	3.00	11670	1865	45°
4	4	110	0.050	0.12	0.12	4.00	8755	1750	45°
5	4	110	0.060	0.16	0.16	5.00	7005	1680	45°
6	4	110	0.070	0.18	0.18	6.00	5835	1635	45°
8	4	110	0.090	0.20	0.20	7.99	4380	1575	45°
10	4	110	0.120	0.24	0.24	9.97	3510	1685	45°
12	4	110	0.140	0.26	0.26	11.96	2930	1640	45°

Acciaio < 850 N/mm²

2	4	400	0.040	0.10	0.10	1.99	60000	9600	45°
3	4	400	0.070	0.12	0.12	3.00	42445	11885	45°
4	4	400	0.090	0.12	0.12	4.00	31830	11460	45°
5	4	400	0.100	0.16	0.16	5.00	25465	10185	45°
6	4	400	0.130	0.18	0.18	6.00	21220	11035	45°
8	4	400	0.170	0.20	0.20	7.99	15935	10835	45°
10	4	400	0.220	0.24	0.24	9.97	12770	11240	45°
12	4	400	0.260	0.26	0.26	11.96	10645	11070	45°

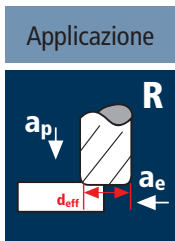
Frese toriche Toro-SB

Tolleranza r $0/+0.03$, 3xd



Rm < 850	Rm 850-1100									Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys
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Esempio: N° Ordine										POLYCHROM	
										P7340	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.138	2	6	1.9	57	3	6	0.2	8.5°	4	●	
.178	3	6	2.8	57	4	9	0.2	5.8°	4	●	
.218	4	6	3.7	57	5	12	0.2	3.6°	4	●	
.258	5	6	4.6	57	6	15	0.2	1.7°	4	●	
.297	6	6	5.5	57	7	20	0.2	0.0°	4	●	
.385	8	8	7.4	63	9	26	0.2	0.0°	4	●	
.445	10	10	9.2	72	11	31	0.2	0.0°	4	●	
.496	12	12	11.0	83	13	37	0.2	0.0°	4	●	
.140	2	6	1.9	57	3	6	0.5	8.7°	4	●	
.180	3	6	2.8	57	4	9	0.5	6.0°	4	●	
.220	4	6	3.7	57	5	12	0.5	3.7°	4	●	
.260	5	6	4.6	57	6	15	0.5	1.7°	4	●	
.300	6	6	5.5	57	7	20	0.5	0.0°	4	●	
.388	8	8	7.4	63	9	26	0.5	0.0°	4	●	
.448	10	10	9.2	72	11	31	0.5	0.0°	4	●	
.498	12	12	11.0	83	13	37	0.5	0.0°	4	●	



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
4	4	100	0.035	0.60	2.40	3.83	8310	1165	r=1.0
5	4	100	0.045	0.60	3.00	4.83	6590	1185	r=1.0
6	4	100	0.055	0.60	3.60	5.83	5460	1200	r=1.0
8	4	100	0.075	0.60	4.80	7.83	4065	1220	r=1.0
10	4	100	0.090	0.60	6.00	9.83	3240	1165	r=1.0
12	4	100	0.110	0.60	7.20	11.83	2690	1185	r=1.0
10	4	100	0.070	0.90	6.00	9.75	3265	915	r=1.5
12	4	100	0.080	0.90	7.20	11.75	2710	865	r=1.5
16	4	100	0.090	1.20	9.60	15.67	2030	730	r=2.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

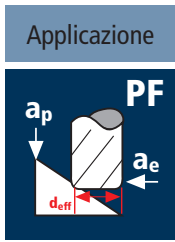
4	4	90	0.035	0.60	2.40	3.83	7480	1045	r=1.0
5	4	90	0.045	0.60	3.00	4.83	5930	1065	r=1.0
6	4	90	0.055	0.60	3.60	5.83	4915	1080	r=1.0
8	4	90	0.075	0.60	4.80	7.83	3660	1100	r=1.0
10	4	90	0.090	0.60	6.00	9.83	2915	1050	r=1.0
12	4	90	0.110	0.60	7.20	11.83	2420	1065	r=1.0
10	4	90	0.070	0.90	6.00	9.75	2940	825	r=1.5
12	4	90	0.080	0.90	7.20	11.75	2440	780	r=1.5
16	4	90	0.090	1.20	9.60	15.67	1830	660	r=2.0

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

4	4	55	0.025	0.60	2.40	3.83	4570	455	r=1.0
5	4	55	0.030	0.60	3.00	4.83	3625	435	r=1.0
6	4	55	0.040	0.60	3.60	5.83	3005	480	r=1.0
8	4	55	0.055	0.60	4.80	7.83	2235	490	r=1.0
10	4	55	0.065	0.60	6.00	9.83	1780	465	r=1.0
12	4	55	0.075	0.60	7.20	11.83	1480	445	r=1.0
10	4	55	0.050	0.90	6.00	9.75	1795	360	r=1.5
12	4	55	0.055	0.90	7.20	11.75	1490	330	r=1.5
16	4	55	0.065	1.20	9.60	15.67	1115	290	r=2.0

Acciaio < 850 N/mm²

4	4	200	0.045	0.60	2.40	3.83	16620	2990	r=1.0
5	4	200	0.060	0.60	3.00	4.83	13180	3165	r=1.0
6	4	200	0.070	0.60	3.60	5.83	10920	3060	r=1.0
8	4	200	0.100	0.60	4.80	7.83	8130	3250	r=1.0
10	4	200	0.115	0.60	6.00	9.83	6475	2980	r=1.0
12	4	200	0.145	0.60	7.20	11.83	5380	3120	r=1.0
10	4	200	0.090	0.90	6.00	9.75	6530	2350	r=1.5
12	4	200	0.105	0.90	7.20	11.75	5420	2275	r=1.5
16	4	200	0.115	1.20	9.60	15.67	4065	1870	r=2.0



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
4	4	160	0.070	0.18	0.18	3.97	12830	3590	45°
5	4	160	0.090	0.24	0.24	4.99	10205	3675	45°
6	4	160	0.110	0.27	0.27	6.00	8490	3735	45°
8	4	160	0.150	0.30	0.30	8.00	6365	3820	45°
10	4	160	0.180	0.36	0.36	9.99	5100	3670	45°
12	4	160	0.220	0.39	0.39	11.98	4250	3740	45°
10	4	160	0.180	0.36	0.36	9.99	5100	3670	45°
12	4	160	0.220	0.39	0.39	12.00	4245	3735	45°
16	4	160	0.250	0.45	0.45	15.98	3185	3185	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

4	4	145	0.070	0.18	0.18	3.97	11625	3255	45°
5	4	145	0.090	0.24	0.24	4.99	9250	3330	45°
6	4	145	0.110	0.27	0.27	6.00	7695	3385	45°
8	4	145	0.150	0.30	0.30	8.00	5770	3460	45°
10	4	145	0.180	0.36	0.36	9.99	4620	3325	45°
12	4	145	0.220	0.39	0.39	11.98	3855	3390	45°
10	4	145	0.180	0.36	0.36	9.99	4620	3325	45°
12	4	145	0.220	0.39	0.39	12.00	3845	3385	45°
16	4	145	0.250	0.45	0.45	15.98	2890	2890	45°

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

4	4	110	0.050	0.18	0.18	3.97	8820	1765	45°
5	4	110	0.060	0.24	0.24	4.99	7015	1685	45°
6	4	110	0.080	0.27	0.27	6.00	5835	1865	45°
8	4	110	0.110	0.30	0.30	8.00	4375	1925	45°
10	4	110	0.130	0.36	0.36	9.99	3505	1825	45°
12	4	110	0.150	0.39	0.39	11.98	2925	1755	45°
10	4	110	0.130	0.36	0.36	9.99	3505	1825	45°
12	4	110	0.150	0.39	0.39	12.00	2920	1750	45°
16	4	110	0.180	0.45	0.45	15.98	2190	1575	45°

Acciaio < 850 N/mm²

4	4	400	0.090	0.18	0.18	3.97	32070	11545	45°
5	4	400	0.120	0.24	0.24	4.99	25515	12245	45°
6	4	400	0.140	0.27	0.27	6.00	21220	11885	45°
8	4	400	0.200	0.30	0.30	8.00	15915	12730	45°
10	4	400	0.230	0.36	0.36	9.99	12745	11725	45°
12	4	400	0.290	0.39	0.39	11.98	10630	12330	45°
10	4	400	0.230	0.36	0.36	9.99	12745	11725	45°
12	4	400	0.290	0.39	0.39	12.00	10610	12310	45°
16	4	400	0.320	0.45	0.45	15.98	7970	10200	45°

Frese toriche Toro-SB

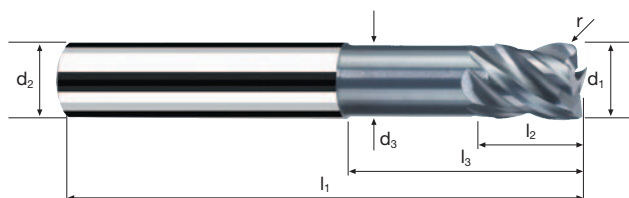
Tolleranza r 0/+0.03, 3xd



HM
MG10 λ 40°
γ 5°



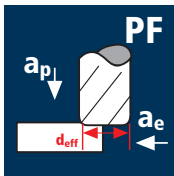
Vario



Rm < 850 Rm 850-1100 Innox Stainless Ti Titanium GG(G) Tool Steel Nickel-Alloys

Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z	POLYCHROM	
										P	7340
.222	4	6	3.7	57	5	12	1.0	3.8°	4		●
.262	5	6	4.6	57	6	15	1.0	1.8°	4		●
.302	6	6	5.5	57	7	20	1.0	0.0°	4		●
.391	8	8	7.4	63	9	26	1.0	0.0°	4		●
.450	10	10	9.2	72	11	31	1.0	0.0°	4		●
.501	12	12	11.0	83	13	37	1.0	0.0°	4		●
new! .453	10	10	9.2	72	11	31	1.5	0.0°	4		●
new! .503	12	12	11.0	83	13	37	1.5	0.0°	4		●
new! .611	16	16	15.0	92	17	43	2.0	0.0°	4		●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

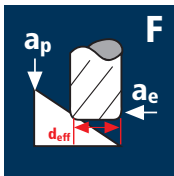
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
6	6	200	0.050	0.15	1.32	5.33	11945	3585	r=0.8
8	6	200	0.065	0.18	1.76	7.14	8915	3475	r=1.0
10	6	200	0.080	0.20	2.20	9.20	6920	3320	r=1.0
12	6	200	0.090	0.22	2.64	10.56	6030	3255	r=1.5
16	6	200	0.115	0.25	3.52	14.66	4345	3000	r=1.5

6	6	180	0.050	0.15	1.32	5.33	10750	3225	r=0.8
8	6	180	0.060	0.18	1.76	7.14	8025	2890	r=1.0
10	6	180	0.075	0.20	2.20	9.20	6230	2805	r=1.0
12	6	180	0.085	0.22	2.64	10.56	5425	2765	r=1.5
16	6	180	0.110	0.25	3.52	14.66	3910	2580	r=1.5

6	6	150	0.045	0.15	1.32	5.33	8960	2420	r=0.8
8	6	150	0.055	0.18	1.76	7.14	6685	2205	r=1.0
10	6	150	0.070	0.20	2.20	9.20	5190	2180	r=1.0
12	6	150	0.080	0.22	2.64	10.56	4520	2170	r=1.5
16	6	150	0.100	0.25	3.52	14.66	3255	1955	r=1.5

6	6	60	0.040	0.12	1.06	5.24	3645	875	r=0.8
8	6	60	0.050	0.14	1.41	7.02	2720	815	r=1.0
10	6	60	0.065	0.16	1.76	9.09	2100	820	r=1.0
12	6	60	0.070	0.18	2.11	10.42	1835	770	r=1.5
16	6	60	0.090	0.20	2.82	14.50	1315	710	r=1.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
6	6	420	0.040	0.10	0.10	5.94	22505	5400	45°
8	6	420	0.045	0.11	0.11	7.90	16925	4570	45°
10	6	420	0.050	0.14	0.14	9.94	13450	4035	45°
12	6	420	0.055	0.17	0.17	11.86	11275	3720	45°
16	6	420	0.065	0.18	0.18	15.87	8425	3285	45°

6	6	360	0.040	0.10	0.10	5.94	19290	4630	45°
8	6	360	0.045	0.11	0.11	7.90	14505	3915	45°
10	6	360	0.050	0.14	0.14	9.94	11530	3460	45°
12	6	360	0.050	0.17	0.17	11.86	9660	2900	45°
16	6	360	0.060	0.18	0.18	15.87	7220	2600	45°

6	6	320	0.035	0.10	0.10	5.94	17150	3600	45°
8	6	320	0.040	0.11	0.11	7.90	12895	3095	45°
10	6	320	0.045	0.14	0.14	9.94	10250	2770	45°
12	6	320	0.050	0.17	0.17	11.86	8590	2575	45°
16	6	320	0.055	0.18	0.18	15.87	6420	2120	45°

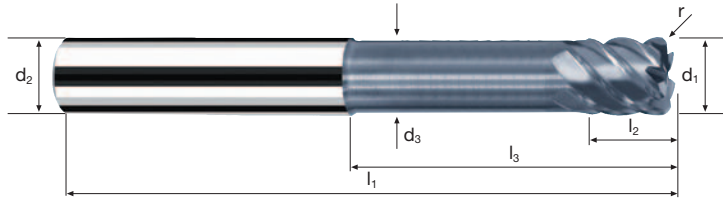
6	6	145	0.030	0.10	0.10	5.94	7770	1400	45°
8	6	145	0.035	0.11	0.11	7.90	5845	1225	45°
10	6	145	0.040	0.14	0.14	9.94	4645	1115	45°
12	6	145	0.045	0.17	0.17	11.86	3890	1050	45°
16	6	145	0.050	0.18	0.18	15.87	2910	875	45°

Frese toriche Multispeed

Tolleranza r 0/+0.03, 5xd



HM	λ 45°
MG10	γ 5°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G)
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Esempio: N° Ordine									POLYCHROM	
									P5252	
									P5252	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	z		
.300	6	6	5.5	70	7	33	0.8	6	●	
.391	8	8	7.4	80	9	43	1.0	6	●	
.450	10	10	9.2	84	11	43	1.0	6	●	
.501	12	12	11.0	97	13	51	1.5	6	●	
.610	16	16	15.0	115	17	66	1.5	6	●	



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
2	4	80	0.015	0.60	0.80	12730	765	r=0.5
3	4	80	0.020	0.60	1.20	8490	680	r=0.5
4	4	80	0.030	0.60	1.60	6365	765	r=0.5
5	4	80	0.035	0.60	2.00	5095	715	r=0.5
6	4	80	0.045	0.60	2.40	4245	765	r=0.5
8	4	80	0.055	0.60	3.20	3185	700	r=0.5
10	4	80	0.070	0.60	4.00	2545	715	r=0.5
12	4	80	0.085	0.60	4.80	2120	720	r=0.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

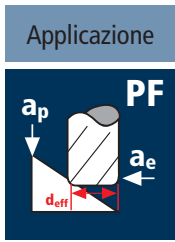
2	4	70	0.015	0.60	0.80	11140	670	r=0.5
3	4	70	0.020	0.60	1.20	7425	595	r=0.5
4	4	70	0.030	0.60	1.60	5570	670	r=0.5
5	4	70	0.035	0.60	2.00	4455	625	r=0.5
6	4	70	0.045	0.60	2.40	3715	670	r=0.5
8	4	70	0.055	0.60	3.20	2785	615	r=0.5
10	4	70	0.070	0.60	4.00	2230	625	r=0.5
12	4	70	0.085	0.60	4.80	1855	630	r=0.5

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

2	4	50	0.010	0.60	0.80	7960	320	r=0.5
3	4	50	0.015	0.60	1.20	5305	320	r=0.5
4	4	50	0.020	0.60	1.60	3980	320	r=0.5
5	4	50	0.025	0.60	2.00	3185	320	r=0.5
6	4	50	0.030	0.60	2.40	2655	320	r=0.5
8	4	50	0.040	0.60	3.20	1990	320	r=0.5
10	4	50	0.050	0.60	4.00	1590	320	r=0.5
12	4	50	0.060	0.60	4.80	1325	320	r=0.5

Acciaio < 850 N/mm²

2	4	180	0.020	0.60	0.80	28650	2290	r=0.5
3	4	180	0.025	0.60	1.20	19100	1910	r=0.5
4	4	180	0.040	0.60	1.60	14325	2290	r=0.5
5	4	180	0.045	0.60	2.00	11460	2065	r=0.5
6	4	180	0.060	0.60	2.40	9550	2290	r=0.5
8	4	180	0.070	0.60	3.20	7160	2005	r=0.5
10	4	180	0.090	0.60	4.00	5730	2065	r=0.5
12	4	180	0.110	0.60	4.80	4775	2100	r=0.5



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
2	4	160	0.030	0.10	0.10	1.99	25595	3070	45°
3	4	160	0.040	0.12	0.12	3.00	16975	2715	45°
4	4	160	0.060	0.12	0.12	4.00	12735	3055	45°
5	4	160	0.070	0.16	0.16	5.00	10185	2850	45°
6	4	160	0.090	0.18	0.18	6.00	8490	3055	45°
8	4	160	0.110	0.20	0.20	7.99	6375	2805	45°
10	4	160	0.140	0.24	0.24	9.97	5110	2860	45°
12	4	160	0.170	0.26	0.26	11.96	4260	2895	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

2	4	145	0.030	0.10	0.10	1.99	23195	2785	45°
3	4	145	0.040	0.12	0.12	3.00	15385	2460	45°
4	4	145	0.060	0.12	0.12	4.00	11540	2770	45°
5	4	145	0.070	0.16	0.16	5.00	9230	2585	45°
6	4	145	0.090	0.18	0.18	6.00	7695	2770	45°
8	4	145	0.110	0.20	0.20	7.99	5775	2540	45°
10	4	145	0.140	0.24	0.24	9.97	4630	2595	45°
12	4	145	0.170	0.26	0.26	11.96	3860	2625	45°

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

2	4	110	0.020	0.10	0.10	1.99	17595	1410	45°
3	4	110	0.030	0.12	0.12	3.00	11670	1400	45°
4	4	110	0.040	0.12	0.12	4.00	8755	1400	45°
5	4	110	0.050	0.16	0.16	5.00	7005	1400	45°
6	4	110	0.060	0.18	0.18	6.00	5835	1400	45°
8	4	110	0.080	0.20	0.20	7.99	4380	1400	45°
10	4	110	0.100	0.24	0.24	9.97	3510	1405	45°
12	4	110	0.120	0.26	0.26	11.96	2930	1405	45°

Acciaio < 850 N/mm²

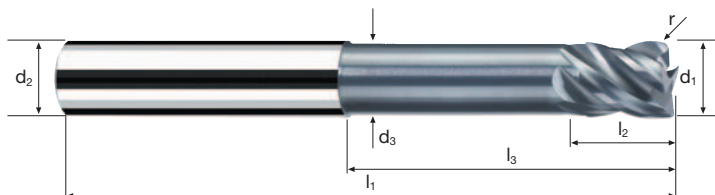
2	4	400	0.040	0.10	0.10	1.99	60000	9600	45°
3	4	400	0.050	0.12	0.12	3.00	42445	8490	45°
4	4	400	0.080	0.12	0.12	4.00	31830	10185	45°
5	4	400	0.090	0.16	0.16	5.00	25465	9165	45°
6	4	400	0.120	0.18	0.18	6.00	21220	10185	45°
8	4	400	0.140	0.20	0.20	7.99	15935	8925	45°
10	4	400	0.180	0.24	0.24	9.97	12770	9195	45°
12	4	400	0.220	0.26	0.26	11.96	10645	9370	45°

Frese toriche Toro-SB

Tolleranza r 0/+0.03, 6xd

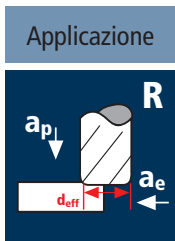


HM
MG10 λ **40°**
 γ **5°**



Rm < 850 **Rm** 850-1100 **Inox** Stainless **Ti** Titanium **GG(G)** Tool Steel Nickel-Alloys

Esempio: N° Ordine										POLYCHROM	
										P7344	
										P7344	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.138	2	6	1.9	66	3	12	0.2	5.9°	4	●	
.178	3	6	2.8	66	4	18	0.2	3.7°	4	●	
.218	4	6	3.7	69	5	24	0.2	2.1°	4	●	
.258	5	6	4.6	75	6	30	0.2	0.9°	4	●	
.297	6	6	5.5	80	7	43	0.2	0.0°	4	●	
.385	8	8	7.4	90	9	53	0.2	0.0°	4	●	
.445	10	10	9.2	105	11	64	0.2	0.0°	4	●	
.496	12	12	11.0	120	13	74	0.2	0.0°	4	●	
.140	2	6	1.9	66	3	12	0.5	6.0°	4	●	
.180	3	6	2.8	66	4	18	0.5	3.7°	4	●	
.220	4	6	3.7	69	5	24	0.5	2.1°	4	●	
.260	5	6	4.6	75	6	30	0.5	0.9°	4	●	
.300	6	6	5.5	80	7	43	0.5	0.0°	4	●	
.388	8	8	7.4	90	9	53	0.5	0.0°	4	●	
.448	10	10	9.2	105	11	64	0.5	0.0°	4	●	
.498	12	12	11.0	120	13	74	0.5	0.0°	4	●	



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
4	4	100	0.030	0.60	1.60	3.83	8310	995	r=1.0
5	4	100	0.040	0.60	2.00	4.83	6590	1055	r=1.0
6	4	100	0.045	0.60	2.40	5.83	5460	985	r=1.0
8	4	100	0.060	0.60	3.20	7.83	4065	975	r=1.0
10	4	100	0.080	0.60	4.00	9.83	3240	1035	r=1.0
12	4	100	0.095	0.60	4.80	11.83	2690	1020	r=1.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

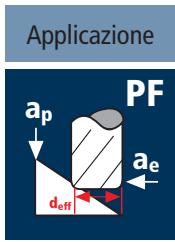
4	4	90	0.030	0.60	1.60	3.83	7480	900	r=1.0
5	4	90	0.040	0.60	2.00	4.83	5930	950	r=1.0
6	4	90	0.045	0.60	2.40	5.83	4915	885	r=1.0
8	4	90	0.060	0.60	3.20	7.83	3660	880	r=1.0
10	4	90	0.080	0.60	4.00	9.83	2915	935	r=1.0
12	4	90	0.095	0.60	4.80	11.83	2420	920	r=1.0

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

4	4	55	0.020	0.60	1.60	3.83	4570	365	r=1.0
5	4	55	0.030	0.60	2.00	4.83	3625	435	r=1.0
6	4	55	0.030	0.60	2.40	5.83	3005	360	r=1.0
8	4	55	0.040	0.60	3.20	7.83	2235	360	r=1.0
10	4	55	0.055	0.60	4.00	9.83	1780	390	r=1.0
12	4	55	0.065	0.60	4.80	11.83	1480	385	r=1.0

Acciaio < 850 N/mm²

4	4	200	0.040	0.60	1.60	3.83	16620	2660	r=1.0
5	4	200	0.050	0.60	2.00	4.83	13180	2635	r=1.0
6	4	200	0.060	0.60	2.40	5.83	10920	2620	r=1.0
8	4	200	0.080	0.60	3.20	7.83	8130	2600	r=1.0
10	4	200	0.105	0.60	4.00	9.83	6475	2720	r=1.0
12	4	200	0.125	0.60	4.80	11.83	5380	2690	r=1.0



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
4	4	160	0.060	0.18	0.18	3.97	12830	3080	45°
5	4	160	0.080	0.24	0.24	4.99	10205	3265	45°
6	4	160	0.090	0.27	0.27	6.00	8490	3055	45°
8	4	160	0.120	0.30	0.30	8.00	6365	3055	45°
10	4	160	0.160	0.36	0.36	9.99	5100	3265	45°
12	4	160	0.190	0.39	0.39	11.98	4250	3230	45°

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

4	4	145	0.060	0.18	0.18	3.97	11625	2790	45°
5	4	145	0.080	0.24	0.24	4.99	9250	2960	45°
6	4	145	0.090	0.27	0.27	6.00	7695	2770	45°
8	4	145	0.120	0.30	0.30	8.00	5770	2770	45°
10	4	145	0.160	0.36	0.36	9.99	4620	2955	45°
12	4	145	0.190	0.39	0.39	11.98	3855	2930	45°

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

4	4	110	0.040	0.18	0.18	3.97	8820	1410	45°
5	4	110	0.060	0.24	0.24	4.99	7015	1685	45°
6	4	110	0.060	0.27	0.27	6.00	5835	1400	45°
8	4	110	0.080	0.30	0.30	8.00	4375	1400	45°
10	4	110	0.110	0.36	0.36	9.99	3505	1540	45°
12	4	110	0.130	0.39	0.39	11.98	2925	1520	45°

Acciaio < 850 N/mm²

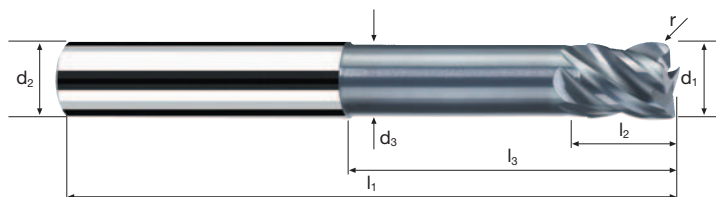
4	4	400	0.080	0.18	0.18	3.97	32070	10260	45°
5	4	400	0.100	0.24	0.24	4.99	25515	10205	45°
6	4	400	0.120	0.27	0.27	6.00	21220	10185	45°
8	4	400	0.160	0.30	0.30	8.00	15915	10185	45°
10	4	400	0.210	0.36	0.36	9.99	12745	10705	45°
12	4	400	0.250	0.39	0.39	11.98	10630	10630	45°

Frese toriche Toro-SB

Tolleranza r $0/+0.03$, 6xd



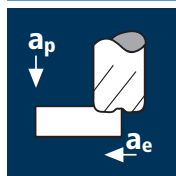
HM
MG10 λ **40°**
 γ **5°**



Rm < 850	Rm 850-1100							Inox Stainless	Ti Titanium	GG(G) Tool Steel Nickel-Alloys
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Esempio: N° Ordine		Rivestimento P	Articolo 7344	Codice-ø .222							POLYCHROM
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		P7344
.222	4	6	3.7	69	5	24	1.0	2.1°	4		●
.262	5	6	4.6	75	6	30	1.0	1.0°	4		●
.302	6	6	5.5	80	7	43	1.0	0.0°	4		●
.391	8	8	7.4	90	9	53	1.0	0.0°	4		●
.450	10	10	9.2	105	11	64	1.0	0.0°	4		●
.501	12	12	11.0	120	13	74	1.0	0.0°	4		●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	250	0.200	0.08	1.80	26525	21220	3.05
4	4	250	0.265	0.12	2.40	19895	21090	6.05
5	4	250	0.335	0.16	3.00	15915	21325	10.25
6	4	250	0.400	0.20	3.60	13265	21225	15.30
8	4	250	0.535	0.25	4.80	9945	21280	25.55
10	4	250	0.665	0.32	6.00	7960	21175	40.65
12	4	250	0.800	0.40	7.20	6630	21215	61.10
16	4	250	1.065	0.48	9.60	4975	21195	97.65

Acciaio
1100 - 1300 N/mm²



3	4	220	0.170	0.08	1.80	23345	15875	2.30
4	4	220	0.225	0.12	2.40	17510	15760	4.55
5	4	220	0.285	0.16	3.00	14005	15965	7.65
6	4	220	0.340	0.20	3.60	11670	15870	11.45
8	4	220	0.455	0.25	4.80	8755	15935	19.10
10	4	220	0.565	0.32	6.00	7005	15830	30.40
12	4	220	0.680	0.40	7.20	5835	15870	45.70
16	4	220	0.905	0.48	9.60	4375	15840	73.00

Acciaio
1300 - 1500 N/mm²



3	4	200	0.155	0.07	1.80	21220	13155	1.65
4	4	200	0.205	0.11	2.40	15915	13050	3.45
5	4	200	0.260	0.14	3.00	12735	13245	5.55
6	4	200	0.310	0.18	3.60	10610	13155	8.50
8	4	200	0.415	0.23	4.80	7960	13215	14.60
10	4	200	0.520	0.29	6.00	6365	13240	23.05
12	4	200	0.625	0.36	7.20	5305	13265	34.40
16	4	200	0.830	0.43	9.60	3980	13215	54.55

Acciaio da
utensile temprato
48 - 52 HRC



3	4	180	0.120	0.06	1.80	19100	9170	1.00
4	4	180	0.160	0.10	2.40	14325	9170	2.20
5	4	180	0.200	0.13	3.00	11460	9170	3.60
6	4	180	0.240	0.16	3.60	9550	9170	5.30
8	4	180	0.320	0.20	4.80	7160	9165	8.80
10	4	180	0.400	0.26	6.00	5730	9170	14.30
12	4	180	0.480	0.32	7.20	4775	9170	21.15
16	4	180	0.640	0.38	9.60	3580	9165	33.45

Materiale

Acciaio da
utensile temprato
52 - 56 HRC



3	4	160	0.090	0.06	1.80	16975	6110	0.65
4	4	160	0.120	0.08	2.40	12735	6115	1.15
5	4	160	0.150	0.11	3.00	10185	6110	2.00
6	4	160	0.180	0.14	3.60	8490	6115	3.10
8	4	160	0.240	0.18	4.80	6365	6110	5.30
10	4	160	0.300	0.22	6.00	5095	6115	8.05
12	4	160	0.360	0.28	7.20	4245	6115	12.35
16	4	160	0.480	0.34	9.60	3185	6115	19.95

Acciaio da
utensile temprato
56 - 60 HRC



3	4	140	0.055	0.05	1.80	14855	3270	0.30
4	4	140	0.075	0.08	2.40	11140	3340	0.65
5	4	140	0.095	0.10	3.00	8915	3390	1.00
6	4	140	0.110	0.13	3.60	7425	3265	1.55
8	4	140	0.150	0.16	4.80	5570	3340	2.55
10	4	140	0.185	0.21	6.00	4455	3295	4.15
12	4	140	0.225	0.26	7.20	3715	3345	6.25
16	4	140	0.300	0.31	9.60	2785	3340	9.95

Acciaio da
utensile temprato
> 60 HRC



3	4	80	0.045	0.05	1.80	8490	1530	0.15
4	4	80	0.060	0.07	2.40	6365	1530	0.25
5	4	80	0.075	0.10	3.00	5095	1530	0.45
6	4	80	0.090	0.12	3.60	4245	1530	0.65
8	4	80	0.120	0.15	4.80	3185	1530	1.10
10	4	80	0.145	0.19	6.00	2545	1475	1.70
12	4	80	0.175	0.24	7.20	2120	1485	2.55
16	4	80	0.235	0.29	9.60	1590	1495	4.15

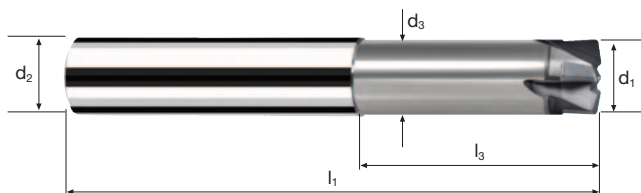
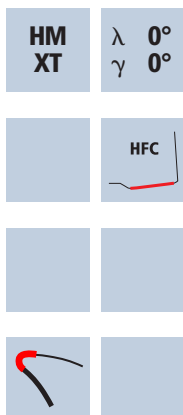
Ghisa
(griglia / sferoidale)



3	4	250	0.200	0.08	1.80	26525	21220	3.05
4	4	250	0.265	0.12	2.40	19895	21090	6.05
5	4	250	0.335	0.16	3.00	15915	21325	10.25
6	4	250	0.400	0.20	3.60	13265	21225	15.30
8	4	250	0.535	0.25	4.80	9945	21280	25.55
10	4	250	0.665	0.32	6.00	7960	21175	40.65
12	4	250	0.800	0.40	7.20	6630	21215	61.10
16	4	250	1.065	0.48	9.60	4975	21195	97.65

Frese ad alto avanzamento XFeed

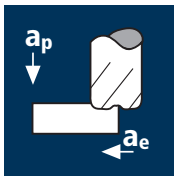
Scarico cilindrico, 3xd



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	HSS GG(G)
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Esempio: N° Ordine										X-AL
										X7600
Ø Code	d1 e8	d2 h6	d3	l1	l3	ap _{max.}	R _{theo.}	α	z	
.180	3	6	2.8	57	9	0.12	0.27	6.0°	4	●
.220	4	6	3.7	57	12	0.16	0.36	3.8°	4	●
.260	5	6	4.6	57	15	0.20	0.45	1.8°	4	●
.300	6	6	5.5	57	20	0.25	0.54	0.0°	4	●
.391	8	8	7.4	63	26	0.33	0.72	0.0°	4	●
.450	10	10	9.2	72	31	0.41	0.90	0.0°	4	●
.501	12	12	11.0	83	37	0.50	1.08	0.0°	4	●
.610	16	16	15.0	92	43	0.69	1.44	0.0°	4	●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

  **X**

  **X**

Acciaio
1100 - 1300 N/mm²

  **X**



  **X**

Acciaio
1300 - 1500 N/mm²

  **X**

  **X**

Acciaio da
utensile temprato
48 - 52 HRC

  **X**

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	250	0.315	0.24	3.60	13265	16715	14.45
8	4	250	0.420	0.32	4.80	9945	16710	25.65
10	4	250	0.525	0.40	6.00	7960	16715	40.10
12	4	250	0.630	0.48	7.20	6630	16710	57.75
16	4	250	0.695	0.56	9.60	4975	13830	74.35



6	4	220	0.270	0.24	3.60	11670	12605	10.90
8	4	220	0.355	0.32	4.80	8755	12430	19.10
10	4	220	0.445	0.40	6.00	7005	12470	29.95
12	4	220	0.535	0.48	7.20	5835	12485	43.15
16	4	220	0.590	0.56	9.60	4375	10325	55.50

6	4	200	0.245	0.22	3.60	10610	10400	8.25
8	4	200	0.330	0.29	4.80	7960	10505	14.60
10	4	200	0.410	0.36	6.00	6365	10440	22.55
12	4	200	0.490	0.43	7.20	5305	10400	32.20
16	4	200	0.540	0.50	9.60	3980	8595	41.25



6	4	180	0.190	0.19	3.60	9550	7260	4.95
8	4	180	0.250	0.26	4.80	7160	7160	8.95
10	4	180	0.315	0.32	6.00	5730	7220	13.85
12	4	180	0.380	0.38	7.20	4775	7260	19.85
16	4	180	0.415	0.45	9.60	3580	5945	25.70

Materiale

Acciaio da
utensile temprato
52 - 56 HRC

  **X**

Acciaio da
utensile temprato
56 - 60 HRC

  **X**

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	160	0.140	0.17	3.60	8490	4755	2.90
8	4	160	0.190	0.22	4.80	6365	4835	5.10
10	4	160	0.235	0.28	6.00	5095	4790	8.05
12	4	160	0.285	0.34	7.20	4245	4840	11.85
16	4	160	0.315	0.39	9.60	3185	4015	15.05

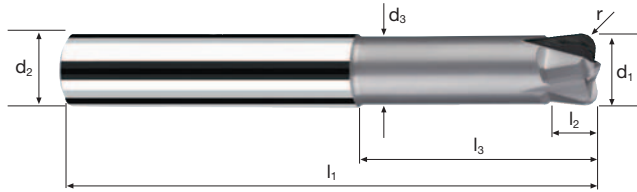
6	4	140	0.090	0.16	3.60	7425	2675	1.55
8	4	140	0.120	0.21	4.80	5570	2675	2.70
10	4	140	0.145	0.26	6.00	4455	2585	4.05
12	4	140	0.175	0.31	7.20	3715	2600	5.80
16	4	140	0.195	0.36	9.60	2785	2170	7.50

Frese ad alto avanzamento XFeed-R

Scarico cilindrico, 3xd



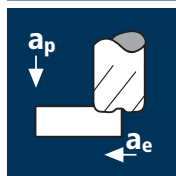
HM
XT λ 0°
 γ -10°



	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			HSS GG(G)
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Esempio: N° Ordine										X-AL	
Rivestimento									Articolo	Codice-Ø	
X									7620	.300	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r	z		X7620	
.300	6	6	5.5	57	3	20	1.0	4		●	
.391	8	8	7.4	63	4	26	1.5	4		●	
.450	10	10	9.2	72	5	31	2.0	4		●	
.501	12	12	11.0	83	6	37	2.5	4		●	
new! .610	16	16	15.0	92	8	43	3.0	4		●	

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Acciaio da
utensile temprato
48 - 52 HRC



Materiale

Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



Acciaio da
utensile temprato
> 60 HRC



Ghisa
(griglia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	250	0.165	0.08	1.20	26525	17505	1.70
4	4	250	0.220	0.12	1.60	19895	17510	3.35
5	4	250	0.280	0.16	2.00	15915	17825	5.70
6	4	250	0.335	0.20	2.40	13265	17775	8.55
8	4	250	0.445	0.25	3.20	9945	17700	14.15
10	4	250	0.555	0.32	4.00	7960	17670	22.60
12	4	250	0.665	0.40	4.80	6630	17635	33.85
16	4	250	0.890	0.48	6.40	4975	17710	54.40

3	4	220	0.140	0.08	1.20	23345	13075	1.25
4	4	220	0.185	0.12	1.60	17510	12955	2.50
5	4	220	0.240	0.16	2.00	14005	13445	4.30
6	4	220	0.285	0.20	2.40	11670	13305	6.40
8	4	220	0.380	0.25	3.20	8755	13310	10.65
10	4	220	0.470	0.32	4.00	7005	13170	16.85
12	4	220	0.565	0.40	4.80	5835	13185	25.30
16	4	220	0.755	0.48	6.40	4375	13215	40.60

3	4	200	0.130	0.07	1.20	21220	11035	0.95
4	4	200	0.170	0.11	1.60	15915	10820	1.90
5	4	200	0.220	0.14	2.00	12735	11205	3.15
6	4	200	0.260	0.18	2.40	10610	11035	4.75
8	4	200	0.345	0.23	3.20	7960	10985	8.10
10	4	200	0.435	0.29	4.00	6365	11075	12.85
12	4	200	0.520	0.36	4.80	5305	11035	19.05
16	4	200	0.695	0.43	6.40	3980	11065	30.45

3	4	180	0.100	0.06	1.20	19100	7640	0.55
4	4	180	0.130	0.10	1.60	14325	7450	1.20
5	4	180	0.170	0.13	2.00	11460	7795	2.05
6	4	180	0.200	0.16	2.40	9550	7640	2.95
8	4	180	0.265	0.20	3.20	7160	7590	4.85
10	4	180	0.335	0.26	4.00	5730	7680	8.00
12	4	180	0.400	0.32	4.80	4775	7640	11.75
16	4	180	0.535	0.38	6.40	3580	7660	18.65

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	160	0.075	0.06	1.20	16975	5095	0.35
4	4	160	0.100	0.08	1.60	12735	5095	0.65
5	4	160	0.125	0.11	2.00	10185	5095	1.10
6	4	160	0.150	0.14	2.40	8490	5095	1.70
8	4	160	0.200	0.18	3.20	6365	5090	2.95
10	4	160	0.250	0.22	4.00	5095	5095	4.50
12	4	160	0.300	0.28	4.80	4245	5095	6.85
16	4	160	0.400	0.34	6.40	3185	5095	11.10

3	4	140	0.045	0.05	1.20	14855	2675	0.15
4	4	140	0.060	0.08	1.60	11140	2675	0.35
5	4	140	0.080	0.10	2.00	8915	2855	0.55
6	4	140	0.095	0.13	2.40	7425	2820	0.90
8	4	140	0.125	0.16	3.20	5570	2785	1.45
10	4	140	0.155	0.21	4.00	4455	2760	2.30
12	4	140	0.185	0.26	4.80	3715	2750	3.45
16	4	140	0.250	0.31	6.40	2785	2785	5.55

3	4	80	0.035	0.05	1.20	8490	1190	0.05
4	4	80	0.050	0.07	1.60	6365	1275	0.15
5	4	80	0.060	0.10	2.00	5095	1225	0.25
6	4	80	0.075	0.12	2.40	4245	1275	0.35
8	4	80	0.100	0.15	3.20	3185	1275	0.60
10	4	80	0.120	0.19	4.00	2545	1220	0.95
12	4	80	0.145	0.24	4.80	2120	1230	1.40
16	4	80	0.195	0.29	6.40	1590	1240	2.30

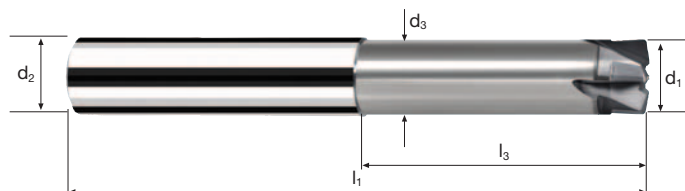
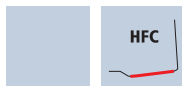
3	4	250	0.165	0.08	1.20	26525	17505	1.70
4	4	250	0.220	0.12	1.60	19895	17510	3.35
5	4	250	0.280	0.16	2.00	15915	17825	5.70
6	4	250	0.335	0.20	2.40	13265	17775	8.55
8	4	250	0.445	0.25	3.20	9945	17700	14.15
10	4	250	0.555	0.32	4.00	7960	17670	22.60
12	4	250	0.665	0.40	4.80	6630	17635	33.85
16	4	250	0.890	0.48	6.40	4975	17710	54.40

Frese ad alto avanzamento XFeed

Scarico cilindrico, 6xd



HM	λ 0°
XT	γ 0°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	HSS GG(G)
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Esempio: N° Ordine X 7604 .180										X-AL
										X7604
\varnothing Code	d1 e8	d2 h6	d3	l1	l3	ap _{max.}	R _{theo.}	α	z	
.180	3	6	2.8	66	18	0.12	0.27	3.7°	4	●
.220	4	6	3.7	69	24	0.16	0.36	2.1°	4	●
.260	5	6	4.6	75	30	0.20	0.45	1.0°	4	●
.300	6	6	5.5	80	43	0.25	0.54	0.0°	4	●
.391	8	8	7.4	90	53	0.33	0.72	0.0°	4	●
.450	10	10	9.2	105	64	0.41	0.90	0.0°	4	●
.501	12	12	11.0	120	74	0.50	1.08	0.0°	4	●
.610	16	16	15.0	135	86	0.69	1.44	0.0°	4	●



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	250	0.260	0.24	2.40	13265	13795	7.95
8	4	250	0.350	0.32	3.20	9945	13925	14.25
10	4	250	0.435	0.40	4.00	7960	13850	22.15
12	4	250	0.520	0.48	4.80	6630	13790	31.75
16	4	250	0.595	0.56	6.40	4975	11840	42.45

Acciaio
1100 - 1300 N/mm²

6	4	220	0.220	0.24	2.40	11670	10270	5.90
8	4	220	0.300	0.32	3.20	8755	10505	10.75
10	4	220	0.370	0.40	4.00	7005	10365	16.60
12	4	220	0.440	0.48	4.80	5835	10270	23.65
16	4	220	0.505	0.56	6.40	4375	8840	31.70

Acciaio
1300 - 1500 N/mm²

6	4	200	0.205	0.22	2.40	10610	8700	4.60
8	4	200	0.275	0.29	3.20	7960	8755	8.10
10	4	200	0.340	0.36	4.00	6365	8655	12.45
12	4	200	0.405	0.43	4.80	5305	8595	17.75
16	4	200	0.465	0.50	6.40	3980	7405	23.70

Acciaio da
utensile temprato
48 - 52 HRC

6	4	180	0.155	0.19	2.40	9550	5920	2.70
8	4	180	0.210	0.26	3.20	7160	6015	5.00
10	4	180	0.260	0.32	4.00	5730	5960	7.65
12	4	180	0.310	0.38	4.80	4775	5920	10.80
16	4	180	0.355	0.45	6.40	3580	5085	14.65

Materiale

Acciaio da
utensile temprato
52 - 56 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	4	160	0.115	0.17	2.40	8490	3905	1.60
8	4	160	0.160	0.22	3.20	6365	4075	2.85
10	4	160	0.195	0.28	4.00	5095	3975	4.45
12	4	160	0.235	0.34	4.80	4245	3990	6.50
16	4	160	0.270	0.39	6.40	3185	3440	8.60

Acciaio da
utensile temprato
56 - 60 HRC

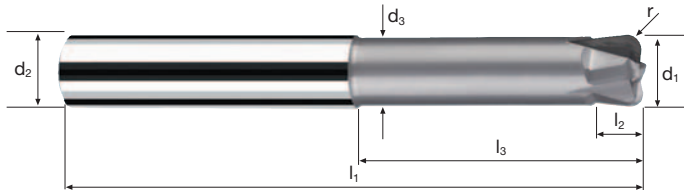
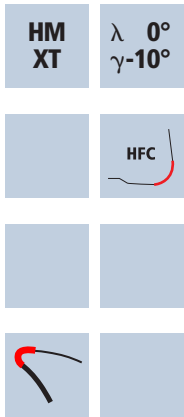
6	4	140	0.075	0.16	2.40	7425	2230	0.85
8	4	140	0.100	0.21	3.20	5570	2230	1.50
10	4	140	0.120	0.26	4.00	4455	2140	2.25
12	4	140	0.145	0.31	4.80	3715	2155	3.20
16	4	140	0.165	0.36	6.40	2785	1840	4.25

Materiale

Materiale

Frese ad alto avanzamento XFeed-R

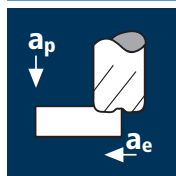
Scarico cilindrico, 6xd



	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			HSS GG(G)
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		Rivestimento		Articolo		Codice-ø				X-AL
Esempio: N° Ordine		X		7624		.300				X7624
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r	z		
.300	6	6	5.5	80	3	43	1.0	4	●	
.391	8	8	7.4	90	4	53	1.5	4	●	
.450	10	10	9.2	105	5	64	2.0	4	●	
.501	12	12	11.0	120	6	74	2.5	4	●	
new! .610	16	16	15.0	135	8	86	3.0	4	●	

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	150	0.135	0.05	0.90	15915	8595	0.40
4	4	150	0.180	0.08	1.20	11935	8595	0.85
5	4	150	0.225	0.10	1.50	9550	8595	1.30
6	4	150	0.275	0.13	1.80	7960	8755	2.05
8	4	150	0.365	0.16	2.40	5970	8715	3.35
10	4	150	0.455	0.21	3.00	4775	8690	5.45
12	4	150	0.545	0.27	3.60	3980	8675	8.45
16	4	150	0.725	0.32	4.80	2985	8655	13.30

Acciaio
1100 - 1300 N/mm²



3	4	140	0.115	0.05	0.90	14855	6835	0.30
4	4	140	0.155	0.08	1.20	11140	6905	0.65
5	4	140	0.190	0.10	1.50	8915	6775	1.00
6	4	140	0.235	0.13	1.80	7425	6980	1.65
8	4	140	0.310	0.16	2.40	5570	6905	2.65
10	4	140	0.385	0.21	3.00	4455	6860	4.30
12	4	140	0.465	0.27	3.60	3715	6910	6.70
16	4	140	0.615	0.32	4.80	2785	6850	10.50

Acciaio
1300 - 1500 N/mm²



3	4	120	0.105	0.05	0.90	12735	5350	0.25
4	4	120	0.140	0.07	1.20	9550	5350	0.45
5	4	120	0.175	0.09	1.50	7640	5350	0.70
6	4	120	0.215	0.12	1.80	6365	5475	1.20
8	4	120	0.285	0.14	2.40	4775	5445	1.85
10	4	120	0.355	0.19	3.00	3820	5425	3.10
12	4	120	0.425	0.24	3.60	3185	5415	4.70
16	4	120	0.565	0.29	4.80	2385	5390	7.50

Acciaio da
utensile temprato
48 - 52 HRC



3	4	90	0.080	0.04	0.90	9550	3055	0.10
4	4	90	0.110	0.06	1.20	7160	3150	0.25
5	4	90	0.135	0.08	1.50	5730	3095	0.35
6	4	90	0.165	0.10	1.80	4775	3150	0.55
8	4	90	0.220	0.13	2.40	3580	3150	1.00
10	4	90	0.275	0.17	3.00	2865	3150	1.60
12	4	90	0.325	0.22	3.60	2385	3100	2.45
16	4	90	0.435	0.26	4.80	1790	3115	3.90

Materiale

Acciaio da
utensile temprato
52 - 56 HRC



3	4	80	0.060	0.04	0.90	8490	2040	0.05
4	4	80	0.080	0.06	1.20	6365	2035	0.15
5	4	80	0.100	0.07	1.50	5095	2040	0.20
6	4	80	0.125	0.09	1.80	4245	2125	0.35
8	4	80	0.165	0.11	2.40	3185	2100	0.55
10	4	80	0.205	0.15	3.00	2545	2085	0.95
12	4	80	0.245	0.19	3.60	2120	2080	1.40
16	4	80	0.325	0.22	4.80	1590	2065	2.20

Acciaio da
utensile temprato
56 - 60 HRC



3	4	60	0.040	0.03	0.90	6365	1020	0.05
4	4	60	0.050	0.05	1.20	4775	955	0.05
5	4	60	0.065	0.07	1.50	3820	995	0.10
6	4	60	0.075	0.08	1.80	3185	955	0.15
8	4	60	0.100	0.10	2.40	2385	955	0.25
10	4	60	0.125	0.14	3.00	1910	955	0.40
12	4	60	0.155	0.18	3.60	1590	985	0.65
16	4	60	0.205	0.21	4.80	1195	980	1.00

Acciaio da
utensile temprato
> 60 HRC



3	4	50	0.030	0.03	0.90	5305	635	0.00
4	4	50	0.040	0.05	1.20	3980	635	0.05
5	4	50	0.050	0.06	1.50	3185	635	0.05
6	4	50	0.060	0.08	1.80	2655	635	0.10
8	4	50	0.080	0.10	2.40	1990	635	0.15
10	4	50	0.100	0.13	3.00	1590	635	0.25
12	4	50	0.120	0.16	3.60	1325	635	0.35
16	4	50	0.160	0.19	4.80	995	635	0.60

Ghisa
(griglia / sferoidale)



3	4	150	0.135	0.05	0.90	15915	8595	0.40
4	4	150	0.180	0.08	1.20	11935	8595	0.85
5	4	150	0.225	0.10	1.50	9550	8595	1.30
6	4	150	0.275	0.13	1.80	7960	8755	2.05
8	4	150	0.365	0.16	2.40	5970	8715	3.35
10	4	150	0.455	0.21	3.00	4775	8690	5.45
12	4	150	0.545	0.27	3.60	3980	8675	8.45
16	4	150	0.725	0.32	4.80	2985	8655	13.30

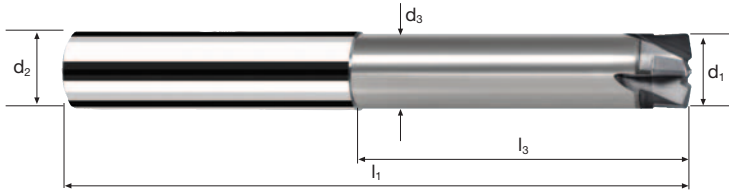
Frese ad alto avanzamento XFeed

Scarico cilindrico, 9xd



HM λ **0°**
XT γ **0°**

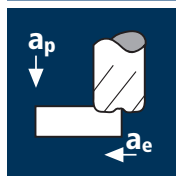
HFC



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	HSS GG(G)
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Esempio: N° Ordine										X-AL
		Rivestimento X	Articolo 7608	Codice-ø .180						X7608
Ø Code	d1 e8	d2 h6	d3	l1	l3	ap _{max.}	R _{theo.}	α	z	
.180	3	6	2.8	75	27	0.12	0.27	2.7°	4	●
.220	4	6	3.7	80	36	0.16	0.36	1.5°	4	●
.260	5	6	4.6	87	45	0.20	0.45	0.7°	4	●
.300	6	6	5.5	100	63	0.25	0.54	0.0°	4	●
.391	8	8	7.4	120	83	0.33	0.72	0.0°	4	●
.450	10	10	9.2	135	94	0.41	0.90	0.0°	4	●
.501	12	12	11.0	160	114	0.50	1.08	0.0°	4	●
.610	16	16	15.0	180	131	0.69	1.44	0.0°	4	●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Acciaio da
utensile temprato
48 - 52 HRC



Materiale

Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



Acciaio da
utensile temprato
> 60 HRC



Ghisa
(griglia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	150	0.135	0.05	0.90	15915	8595	0.40
4	4	150	0.180	0.08	1.20	11935	8595	0.85
5	4	150	0.225	0.10	1.50	9550	8595	1.30
6	4	150	0.275	0.13	1.80	7960	8755	2.05
8	4	150	0.365	0.16	2.40	5970	8715	3.35
10	4	150	0.455	0.21	3.00	4775	8690	5.45
12	4	150	0.545	0.27	3.60	3980	8675	8.45

3	4	140	0.115	0.05	0.90	14855	6835	0.30
4	4	140	0.155	0.08	1.20	11140	6905	0.65
5	4	140	0.190	0.10	1.50	8915	6775	1.00
6	4	140	0.235	0.13	1.80	7425	6980	1.65
8	4	140	0.310	0.16	2.40	5570	6905	2.65
10	4	140	0.385	0.21	3.00	4455	6860	4.30
12	4	140	0.465	0.27	3.60	3715	6910	6.70

3	4	120	0.105	0.05	0.90	12735	5350	0.25
4	4	120	0.140	0.07	1.20	9550	5350	0.45
5	4	120	0.175	0.09	1.50	7640	5350	0.70
6	4	120	0.215	0.12	1.80	6365	5475	1.20
8	4	120	0.285	0.14	2.40	4775	5445	1.85
10	4	120	0.355	0.19	3.00	3820	5425	3.10
12	4	120	0.425	0.24	3.60	3185	5415	4.70

3	4	90	0.080	0.04	0.90	9550	3055	0.10
4	4	90	0.110	0.06	1.20	7160	3150	0.25
5	4	90	0.135	0.08	1.50	5730	3095	0.35
6	4	90	0.165	0.10	1.80	4775	3150	0.55
8	4	90	0.220	0.13	2.40	3580	3150	1.00
10	4	90	0.275	0.17	3.00	2865	3150	1.60
12	4	90	0.325	0.22	3.60	2385	3100	2.45

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	4	80	0.060	0.04	0.90	8490	2040	0.05
4	4	80	0.080	0.06	1.20	6365	2035	0.15
5	4	80	0.100	0.07	1.50	5095	2040	0.20
6	4	80	0.125	0.09	1.80	4245	2125	0.35
8	4	80	0.165	0.11	2.40	3185	2100	0.55
10	4	80	0.205	0.15	3.00	2545	2085	0.95
12	4	80	0.245	0.19	3.60	2120	2080	1.40

3	4	60	0.040	0.03	0.90	6365	1020	0.05
4	4	60	0.050	0.05	1.20	4775	955	0.05
5	4	60	0.065	0.07	1.50	3820	995	0.10
6	4	60	0.075	0.08	1.80	3185	955	0.15
8	4	60	0.100	0.10	2.40	2385	955	0.25
10	4	60	0.125	0.14	3.00	1910	955	0.40
12	4	60	0.155	0.18	3.60	1590	985	0.65

3	4	50	0.030	0.03	0.90	5305	635	0.00
4	4	50	0.040	0.05	1.20	3980	635	0.05
5	4	50	0.050	0.06	1.50	3185	635	0.05
6	4	50	0.060	0.08	1.80	2655	635	0.10
8	4	50	0.080	0.10	2.40	1990	635	0.15
10	4	50	0.100	0.13	3.00	1590	635	0.25
12	4	50	0.120	0.16	3.60	1325	635	0.35

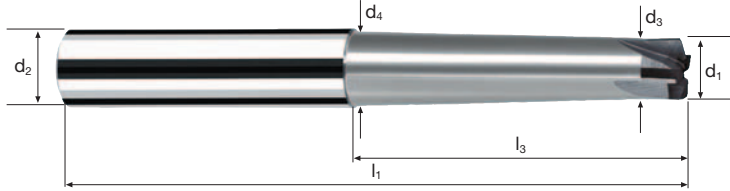
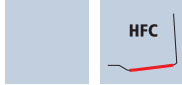
3	4	150	0.135	0.05	0.90	15915	8595	0.40
4	4	150	0.180	0.08	1.20	11935	8595	0.85
5	4	150	0.225	0.10	1.50	9550	8595	1.30
6	4	150	0.275	0.13	1.80	7960	8755	2.05
8	4	150	0.365	0.16	2.40	5970	8715	3.35
10	4	150	0.455	0.21	3.00	4775	8690	5.45
12	4	150	0.545	0.27	3.60	3980	8675	8.45

Frese ad alto avanzamento XFeed

Scarico conico, 9xd



HM λ **0°**
XT γ **0°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	HSS GG(G)
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Esempio: N° Ordine											X-AL
Rivestimento X Articolo 7658 Codice- ϕ .180											X7658
ϕ Code	d1 e8	d2 h6	d3	d4	l1	l3	ap _{max.}	R _{theo.}	α	z	
.180	3	6	2.8	3.7	75	27	0.12	0.27	3.0°	4	●
.220	4	6	3.7	4.9	80	36	0.16	0.36	1.5°	4	●
.260	5	8	4.6	6.1	90	45	0.20	0.45	2.0°	4	●
.300	6	8	5.5	7.6	120	63	0.25	0.54	1.0°	4	●
.391	8	12	7.4	10.2	160	83	0.33	0.72	1.5°	4	●
.450	10	16	9.2	12.3	180	94	0.41	0.90	2.0°	4	●
.501	12	16	11.0	14.8	180	114	0.50	1.08	1.0°	4	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 52 - 56 HRC 	4	2	700	0.020	0.014	0.022	2.40	60000	2400	30°
		5	2	700	0.025	0.016	0.024	2.97	60000	3000	30°
		6	2	700	0.030	0.018	0.026	3.55	60000	3600	30°
		8	2	700	0.040	0.020	0.030	4.67	47715	3815	30°
		10	2	700	0.040	0.022	0.034	5.79	38485	3080	30°
		12	2	700	0.050	0.026	0.038	6.94	32105	3210	30°
Acciaio da utensile temprato 56 - 60 HRC 	4	2	650	0.020	0.014	0.022	2.40	60000	2400	30°	
	5	2	650	0.025	0.016	0.024	2.97	60000	3000	30°	
	6	2	650	0.025	0.018	0.026	3.55	58285	2915	30°	
	8	2	650	0.035	0.020	0.030	4.67	44305	3100	30°	
	10	2	650	0.035	0.022	0.034	5.79	35735	2500	30°	
	12	2	650	0.045	0.026	0.038	6.94	29815	2685	30°	
Acciaio da utensile temprato > 60 HRC 	4	2	600	0.015	0.014	0.022	2.40	60000	1800	30°	
	5	2	600	0.020	0.016	0.024	2.97	60000	2400	30°	
	6	2	600	0.025	0.018	0.026	3.55	53800	2690	30°	
	8	2	600	0.030	0.020	0.030	4.67	40900	2455	30°	
	10	2	600	0.030	0.022	0.034	5.79	32985	1980	30°	
	12	2	600	0.040	0.026	0.038	6.94	27520	2200	30°	

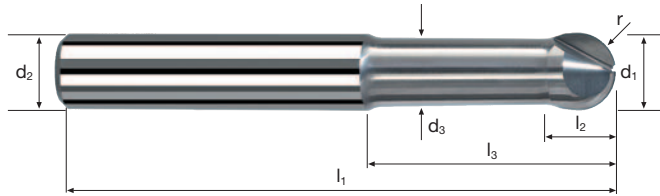
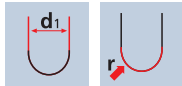
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio da utensile temprato 52 - 56 HRC 	4	2	700	0.020	0.022	0.014	3.72	59900	2395	60°
		5	2	700	0.025	0.024	0.016	4.63	48125	2405	60°
		6	2	700	0.030	0.026	0.018	5.55	40150	2410	60°
		8	2	700	0.040	0.030	0.020	7.37	30235	2420	60°
		10	2	700	0.040	0.034	0.022	9.18	24275	1940	60°
		12	2	700	0.050	0.038	0.026	11.00	20255	2025	60°
Acciaio da utensile temprato 56 - 60 HRC 	4	2	650	0.020	0.022	0.014	3.72	55620	2225	60°	
	5	2	650	0.025	0.024	0.016	4.63	44690	2235	60°	
	6	2	650	0.025	0.026	0.018	5.55	37280	1865	60°	
	8	2	650	0.035	0.030	0.020	7.37	28075	1965	60°	
	10	2	650	0.035	0.034	0.022	9.18	22540	1580	60°	
	12	2	650	0.045	0.038	0.026	11.00	18810	1695	60°	
Acciaio da utensile temprato > 60 HRC 	4	2	600	0.015	0.022	0.014	3.72	51340	1540	60°	
	5	2	600	0.020	0.024	0.016	4.63	41250	1650	60°	
	6	2	600	0.025	0.026	0.018	5.55	34415	1720	60°	
	8	2	600	0.030	0.030	0.020	7.37	25915	1555	60°	
	10	2	600	0.030	0.034	0.022	9.18	20805	1250	60°	
	12	2	600	0.040	0.038	0.026	11.00	17365	1390	60°	

Frese con estremità emisferica Sphero-CBN

Scarico cilindrico, 3xd



CBN λ 0°
 γ 0°



				HRC 48-56	HRC 56-60	HRC > 60				HSS
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Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø								
			31700	.220							31700	
ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z			
.220	4	6	3.7	80	3.2	12	2.0	4.0°	2	●		
.260	5	6	4.6	80	4.0	15	2.5	2.0°	2	●		
.300	6	6	5.5	80	4.8	20	3.0	0.0°	2	●		
.391	8	8	7.4	100	6.4	26	4.0	0.0°	2	●		
.450	10	10	9.2	100	8.0	31	5.0	0.0°	2	●		
.501	12	12	11.0	120	9.6	37	6.0	0.0°	2	●		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]	
	Acciaio da utensile temprato 52 - 56 HRC	4	2	650	0.020	0.020	0.040	3.28	60000	2400	r=0.5	
		5	2	650	0.025	0.026	0.050	4.32	47895	2395	r=0.5	
		6	2	650	0.030	0.030	0.060	5.34	38745	2325	r=0.5	
		8	2	650	0.040	0.040	0.080	7.39	28000	2240	r=0.5	
		10	2	650	0.050	0.030	0.100	9.34	22155	2215	r=0.5	
		12	2	650	0.060	0.036	0.120	11.37	18200	2185	r=0.5	
	Acciaio da utensile temprato 56 - 60 HRC	4	2	620	0.020	0.020	0.040	3.28	60000	2400	r=0.5	
		5	2	620	0.025	0.026	0.050	4.32	45685	2285	r=0.5	
		6	2	620	0.030	0.030	0.060	5.34	36960	2220	r=0.5	
		8	2	620	0.040	0.040	0.080	7.39	26705	2135	r=0.5	
		10	2	620	0.050	0.030	0.100	9.34	21130	2115	r=0.5	
		12	2	620	0.060	0.036	0.120	11.37	17360	2085	r=0.5	
	Acciaio da utensile temprato > 60 HRC	4	2	580	0.020	0.020	0.040	3.28	56290	2250	r=0.5	
		5	2	580	0.025	0.026	0.050	4.32	42735	2135	r=0.5	
		6	2	580	0.030	0.030	0.060	5.34	34575	2075	r=0.5	
		8	2	580	0.040	0.040	0.080	7.39	24985	2000	r=0.5	
		10	2	580	0.050	0.030	0.100	9.34	19765	1975	r=0.5	
		12	2	580	0.060	0.036	0.120	11.37	16240	1950	r=0.5	

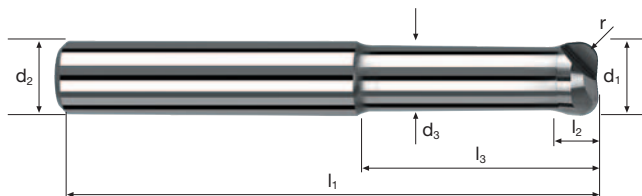
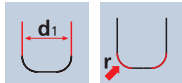
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]	
	Acciaio da utensile temprato 52 - 56 HRC	4	2	700	0.020	0.016	0.016	3.86	57725	2310	45°	
		5	2	700	0.025	0.020	0.020	4.88	45660	2285	45°	
		6	2	700	0.030	0.022	0.022	5.88	37895	2275	45°	
		8	2	700	0.040	0.024	0.024	7.89	28240	2260	45°	
		10	2	700	0.050	0.026	0.026	9.90	22505	2250	45°	
		12	2	700	0.060	0.032	0.032	11.91	18710	2245	45°	
	Acciaio da utensile temprato 56 - 60 HRC	4	2	650	0.020	0.016	0.016	3.86	53605	2145	45°	
		5	2	650	0.025	0.020	0.020	4.88	42400	2120	45°	
		6	2	650	0.030	0.022	0.022	5.88	35190	2110	45°	
		8	2	650	0.040	0.024	0.024	7.89	26225	2100	45°	
		10	2	650	0.050	0.026	0.026	9.90	20900	2090	45°	
		12	2	650	0.060	0.032	0.032	11.91	17375	2085	45°	
	Acciaio da utensile temprato > 60 HRC	4	2	600	0.020	0.016	0.016	3.86	49480	1980	45°	
		5	2	600	0.025	0.020	0.020	4.88	39140	1955	45°	
		6	2	600	0.030	0.022	0.022	5.88	32480	1950	45°	
		8	2	600	0.040	0.024	0.024	7.89	24205	1935	45°	
		10	2	600	0.050	0.026	0.026	9.90	19290	1930	45°	
		12	2	600	0.060	0.032	0.032	11.91	16035	1925	45°	

Frese toriche XSpeed-CBN

Scarico cilindrico, 3xd



CBN λ 0°
 γ 0°



HRC

48-56

HRC

56-60

HRC

> 60

HSS

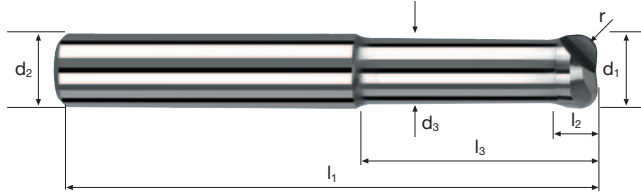
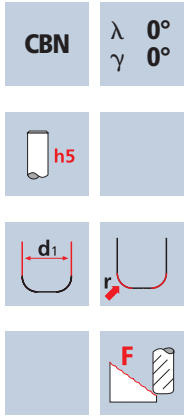
Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø							
		31420		.220							
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z		
.220	4	6	3.7	80	1.9	12	0.5	3.7°	2	•	
.260	5	6	4.6	80	2.5	15	0.5	1.7°	2	•	
.300	6	6	5.5	80	3.0	20	0.5	0.0°	2	•	
.391	8	8	7.4	100	4.0	26	0.5	0.0°	2	•	
.450	10	10	9.2	100	5.0	31	0.5	0.0°	2	•	
.501	12	12	11.0	120	6.0	37	0.5	0.0°	2	•	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]	
	Acciaio da utensile temprato 52 - 56 HRC	4	2	650	0.020	0.020	0.040	2.40	60000	2400	r=1.00	
		5	2	650	0.025	0.026	0.050	3.01	60000	3000	r=1.25	
		6	2	650	0.030	0.030	0.060	3.60	57475	3450	r=1.50	
		8	2	650	0.040	0.040	0.080	4.80	43105	3450	r=2.00	
		10	2	650	0.050	0.030	0.100	5.77	35860	3585	r=2.50	
		12	2	650	0.060	0.036	0.120	6.93	29855	3585	r=3.00	
	Acciaio da utensile temprato 56 - 60 HRC	4	2	620	0.020	0.020	0.040	2.40	60000	2400	r=1.00	
		5	2	620	0.025	0.026	0.050	3.01	60000	3000	r=1.25	
		6	2	620	0.030	0.030	0.060	3.60	54820	3290	r=1.50	
		8	2	620	0.040	0.040	0.080	4.80	41115	3290	r=2.00	
		10	2	620	0.050	0.030	0.100	5.77	34205	3420	r=2.50	
		12	2	620	0.060	0.036	0.120	6.93	28480	3420	r=3.00	
	Acciaio da utensile temprato > 60 HRC	4	2	580	0.020	0.020	0.040	2.40	60000	2400	r=1.00	
		5	2	580	0.025	0.026	0.050	3.01	60000	3000	r=1.25	
		6	2	580	0.030	0.030	0.060	3.60	51285	3075	r=1.50	
		8	2	580	0.040	0.040	0.080	4.80	38465	3075	r=2.00	
		10	2	580	0.050	0.030	0.100	5.77	31995	3200	r=2.50	
		12	2	580	0.060	0.036	0.120	6.93	26640	3195	r=3.00	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]	
	Acciaio da utensile temprato 52 - 56 HRC	4	2	700	0.020	0.016	0.016	3.64	60000	2400	45°	
		5	2	700	0.025	0.020	0.020	4.55	48970	2450	45°	
		6	2	700	0.030	0.022	0.022	5.45	40885	2455	45°	
		8	2	700	0.040	0.024	0.024	7.23	30820	2465	45°	
		10	2	700	0.050	0.026	0.026	9.01	24730	2475	45°	
		12	2	700	0.060	0.032	0.032	10.82	20595	2470	45°	
	Acciaio da utensile temprato 56 - 60 HRC	4	2	650	0.020	0.016	0.016	3.64	56845	2275	45°	
		5	2	650	0.025	0.020	0.020	4.55	45475	2275	45°	
		6	2	650	0.030	0.022	0.022	5.45	37965	2280	45°	
		8	2	650	0.040	0.024	0.024	7.23	28620	2290	45°	
		10	2	650	0.050	0.026	0.026	9.01	22965	2295	45°	
		12	2	650	0.060	0.032	0.032	10.82	19125	2295	45°	
	Acciaio da utensile temprato > 60 HRC	4	2	600	0.020	0.016	0.016	3.64	52470	2100	45°	
		5	2	600	0.025	0.020	0.020	4.55	41975	2100	45°	
		6	2	600	0.030	0.022	0.022	5.45	35045	2105	45°	
		8	2	600	0.040	0.024	0.024	7.23	26415	2115	45°	
		10	2	600	0.050	0.026	0.026	9.01	21200	2120	45°	
		12	2	600	0.060	0.032	0.032	10.82	17650	2120	45°	

Frese toriche XSpeed-CBN

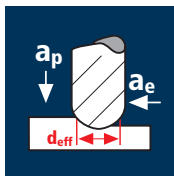
Scarico cilindrico, 3xd



				HRC 48-56	HRC 56-60	HRC > 60				HSS
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Esempio: N° Ordine		Rivestimento		Articolo		Codice-ø					
				31410		.220					
ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.015	α	z		
.220	4	6	3.7	80	1.9	12	1.00	3.8°	2	●	
.260	5	6	4.6	80	2.5	15	1.25	1.8°	2	●	
.300	6	6	5.5	80	3.0	20	1.50	0.0°	2	●	
.391	8	8	7.4	100	4.0	26	2.00	0.0°	2	●	
.450	10	10	9.2	100	5.0	31	2.50	0.0°	2	●	
.501	12	12	11.0	120	6.0	37	3.00	0.0°	2	●	

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

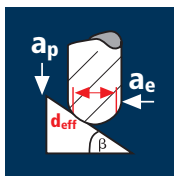
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.016	0.03	0.10	0.24	60000	1920	6.0
0.8	2	140	0.026	0.05	0.16	0.39	60000	3120	25.0
1.0	2	140	0.034	0.06	0.20	0.47	60000	4080	49.0
1.2	2	140	0.040	0.07	0.24	0.56	60000	4800	80.5
1.5	2	140	0.050	0.09	0.30	0.71	60000	6000	162.0
2.0	2	140	0.066	0.12	0.40	0.95	46910	6190	297.0
2.5	2	140	0.084	0.15	0.50	1.19	37450	6290	472.0
2.8	2	140	0.094	0.17	0.56	1.34	33255	6250	595.0
3.0	2	140	0.100	0.18	0.60	1.42	31385	6275	677.5

0.5	2	120	0.016	0.03	0.10	0.24	60000	1920	6.0
0.8	2	120	0.024	0.05	0.16	0.39	60000	2880	23.0
1.0	2	120	0.032	0.06	0.20	0.47	60000	3840	46.0
1.2	2	120	0.038	0.07	0.24	0.56	60000	4560	76.5
1.5	2	120	0.048	0.09	0.30	0.71	53800	5165	139.5
2.0	2	120	0.062	0.12	0.40	0.95	40210	4985	239.5
2.5	2	120	0.080	0.15	0.50	1.19	32100	5135	385.0
2.8	2	120	0.090	0.17	0.56	1.34	28505	5130	488.5
3.0	2	120	0.096	0.18	0.60	1.42	26900	5165	558.0

0.5	2	100	0.014	0.03	0.10	0.24	60000	1680	5.0
0.8	2	100	0.022	0.05	0.16	0.39	60000	2640	21.0
1.0	2	100	0.030	0.06	0.20	0.47	60000	3600	43.0
1.2	2	100	0.036	0.07	0.24	0.56	56845	4095	69.0
1.5	2	100	0.044	0.09	0.30	0.71	44835	3945	106.5
2.0	2	100	0.058	0.12	0.40	0.95	33505	3885	186.5
2.5	2	100	0.074	0.15	0.50	1.19	26750	3960	297.0
2.8	2	100	0.082	0.17	0.56	1.34	23755	3895	371.0
3.0	2	100	0.088	0.18	0.60	1.42	22415	3945	426.0

0.5	2	60	0.012	0.03	0.10	0.24	60000	1440	4.5
0.8	2	60	0.020	0.05	0.16	0.39	48970	1960	15.5
1.0	2	60	0.028	0.06	0.20	0.47	40635	2275	27.5
1.2	2	60	0.032	0.07	0.24	0.56	34105	2185	36.5
1.5	2	60	0.040	0.09	0.30	0.71	26900	2150	58.0
2.0	2	60	0.052	0.12	0.40	0.95	20105	2090	100.5
2.5	2	60	0.068	0.15	0.50	1.19	16050	2185	164.0
2.8	2	60	0.076	0.17	0.56	1.34	14255	2165	206.0
3.0	2	60	0.080	0.18	0.60	1.42	13450	2150	232.0

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.020	0.022	0.022	0.47	60000	2400	45°
0.8	2	300	0.022	0.034	0.034	0.75	60000	2640	45°
1.0	2	300	0.028	0.042	0.042	0.93	60000	3360	45°
1.2	2	300	0.030	0.050	0.050	1.12	60000	3600	45°
1.5	2	300	0.034	0.064	0.064	1.40	60000	4080	45°
2.0	2	300	0.038	0.084	0.084	1.86	51340	3900	45°
2.5	2	300	0.040	0.106	0.106	2.33	40985	3280	45°
2.8	2	300	0.044	0.118	0.118	2.61	36590	3220	45°
3.0	2	300	0.046	0.126	0.126	2.79	34230	3150	45°

0.5	2	250	0.020	0.022	0.022	0.47	60000	2400	45°
0.8	2	250	0.020	0.034	0.034	0.75	60000	2400	45°
1.0	2	250	0.026	0.042	0.042	0.93	60000	3120	45°
1.2	2	250	0.028	0.050	0.050	1.12	60000	3360	45°
1.5	2	250	0.032	0.064	0.064	1.40	56845	3640	45°
2.0	2	250	0.036	0.084	0.084	1.86	42785	3080	45°
2.5	2	250	0.038	0.106	0.106	2.33	34155	2595	45°
2.8	2	250	0.042	0.118	0.118	2.61	30490	2560	45°
3.0	2	250	0.044	0.126	0.126	2.79	28525	2510	45°

0.5	2	200	0.018	0.022	0.022	0.47	60000	2160	45°
0.8	2	200	0.020	0.034	0.034	0.75	60000	2400	45°
1.0	2	200	0.026	0.042	0.042	0.93	60000	3120	45°
1.2	2	200	0.028	0.050	0.050	1.12	56845	3185	45°
1.5	2	200	0.030	0.064	0.064	1.40	45475	2730	45°
2.0	2	200	0.034	0.084	0.084	1.86	34230	2330	45°
2.5	2	200	0.036	0.106	0.106	2.33	27325	1965	45°
2.8	2	200	0.040	0.118	0.118	2.61	24390	1950	45°
3.0	2	200	0.042	0.126	0.126	2.79	22820	1915	45°

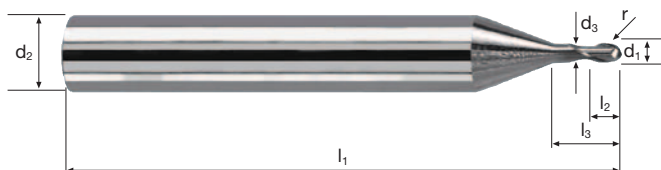
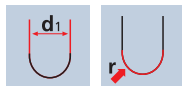
0.5	2	150	0.016	0.022	0.022	0.47	60000	1920	45°
0.8	2	150	0.018	0.034	0.034	0.75	60000	2160	45°
1.0	2	150	0.022	0.042	0.042	0.93	51340	2260	45°
1.2	2	150	0.024	0.050	0.050	1.12	42630	2045	45°
1.5	2	150	0.028	0.064	0.064	1.40	34105	1910	45°
2.0	2	150	0.030	0.084	0.084	1.86	25670	1540	45°
2.5	2	150	0.032	0.106	0.106	2.33	20495	1310	45°
2.8	2	150	0.036	0.118	0.118	2.61	18295	1315	45°
3.0	2	150	0.036	0.126	0.126	2.79	17115	1230	45°

Frese con estremità emisferica MicroX

Gambo Ø 6 mm, scarico cilindrico, 3xd



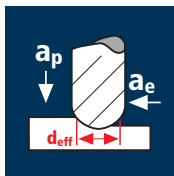
HM λ 30°
XA γ -10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine										X-AL
Rivestimento X Articolo 6562 Codice-ø .020										X6562
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.020	0.2	6	0.18	57	0.2	0.6	0.10	9.7°	2	●
.030	0.3	6	0.25	57	0.3	0.9	0.15	9.5°	2	●
.040	0.4	6	0.35	57	0.4	1.2	0.20	9.4°	2	●
.050	0.5	6	0.45	57	0.5	1.5	0.25	13.3°	2	●
.060	0.6	6	0.55	57	0.6	1.8	0.30	13.0°	2	●
.080	0.8	6	0.75	57	0.8	2.4	0.40	12.4°	2	●
.100	1.0	6	0.95	57	1.0	3.0	0.50	11.8°	2	●
.108	1.2	6	1.10	57	1.2	3.6	0.60	11.2°	2	●
.120	1.5	6	1.40	57	1.5	4.5	0.75	10.3°	2	●
.140	2.0	6	1.90	57	2.0	6.0	1.00	9.0°	2	●
.152	2.3	6	2.10	57	2.3	6.9	1.15	8.1°	2	●
.160	2.5	6	2.30	57	2.5	7.5	1.25	7.6°	2	●
.172	2.8	6	2.60	57	2.8	8.4	1.40	6.8°	2	●
.180	3.0	6	2.80	57	3.0	9.0	1.50	6.4°	2	●

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

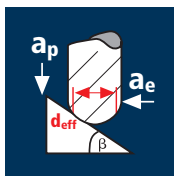
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.016	0.03	0.10	0.24	60000	1920	6.0
0.8	2	140	0.026	0.04	0.16	0.35	60000	3120	20.0
1.0	2	140	0.034	0.05	0.20	0.44	60000	4080	41.0
1.2	2	140	0.040	0.06	0.24	0.52	60000	4800	69.0
1.5	2	140	0.050	0.08	0.30	0.67	60000	6000	144.0
2.0	2	140	0.066	0.10	0.40	0.87	51225	6760	270.5
2.5	2	140	0.084	0.13	0.50	1.11	40150	6745	438.5
2.8	2	140	0.094	0.14	0.56	1.22	36530	6870	538.5
3.0	2	140	0.100	0.15	0.60	1.31	34020	6805	612.5

0.5	2	120	0.016	0.03	0.10	0.24	60000	1920	6.0
0.8	2	120	0.024	0.04	0.16	0.35	60000	2880	18.5
1.0	2	120	0.032	0.05	0.20	0.44	60000	3840	38.5
1.2	2	120	0.038	0.06	0.24	0.52	60000	4560	65.5
1.5	2	120	0.048	0.08	0.30	0.67	57010	5475	131.5
2.0	2	120	0.062	0.10	0.40	0.87	43905	5445	218.0
2.5	2	120	0.080	0.13	0.50	1.11	34415	5505	358.0
2.8	2	120	0.090	0.14	0.56	1.22	31310	5635	442.0
3.0	2	120	0.096	0.15	0.60	1.31	29160	5600	504.0

0.5	2	100	0.014	0.03	0.10	0.24	60000	1680	5.0
0.8	2	100	0.022	0.04	0.16	0.35	60000	2640	17.0
1.0	2	100	0.030	0.05	0.20	0.44	60000	3600	36.0
1.2	2	100	0.036	0.06	0.24	0.52	60000	4320	62.0
1.5	2	100	0.044	0.08	0.30	0.67	47510	4180	100.5
2.0	2	100	0.058	0.10	0.40	0.87	36590	4245	170.0
2.5	2	100	0.074	0.13	0.50	1.11	28675	4245	276.0
2.8	2	100	0.082	0.14	0.56	1.22	26090	4280	335.5
3.0	2	100	0.088	0.15	0.60	1.31	24300	4275	385.0

0.5	2	60	0.012	0.03	0.10	0.24	60000	1440	4.5
0.8	2	60	0.020	0.04	0.16	0.35	54570	2185	14.0
1.0	2	60	0.028	0.05	0.20	0.44	43405	2430	24.5
1.2	2	60	0.032	0.06	0.24	0.52	36730	2350	34.0
1.5	2	60	0.040	0.08	0.30	0.67	28505	2280	54.5
2.0	2	60	0.052	0.10	0.40	0.87	21955	2285	91.5
2.5	2	60	0.068	0.13	0.50	1.11	17205	2340	152.0
2.8	2	60	0.076	0.14	0.56	1.22	15655	2380	186.5
3.0	2	60	0.080	0.15	0.60	1.31	14580	2335	210.0

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.020	0.020	0.020	0.46	60000	2400	45°
0.8	2	300	0.022	0.032	0.032	0.74	60000	2640	45°
1.0	2	300	0.028	0.042	0.042	0.93	60000	3360	45°
1.2	2	300	0.030	0.050	0.050	1.12	60000	3600	45°
1.5	2	300	0.034	0.062	0.062	1.40	60000	4080	45°
2.0	2	300	0.038	0.082	0.082	1.86	51340	3900	45°
2.5	2	300	0.040	0.102	0.102	2.32	41160	3295	45°
2.8	2	300	0.044	0.114	0.114	2.60	36730	3230	45°
3.0	2	300	0.046	0.122	0.122	2.79	34230	3150	45°

0.5	2	250	0.020	0.020	0.020	0.46	60000	2400	45°
0.8	2	250	0.020	0.032	0.032	0.74	60000	2400	45°
1.0	2	250	0.026	0.042	0.042	0.93	60000	3120	45°
1.2	2	250	0.028	0.050	0.050	1.12	60000	3360	45°
1.5	2	250	0.032	0.062	0.062	1.40	56845	3640	45°
2.0	2	250	0.036	0.082	0.082	1.86	42785	3080	45°
2.5	2	250	0.038	0.102	0.102	2.32	34300	2605	45°
2.8	2	250	0.042	0.114	0.114	2.60	30610	2570	45°
3.0	2	250	0.044	0.122	0.122	2.79	28525	2510	45°

0.5	2	200	0.018	0.020	0.020	0.46	60000	2160	45°
0.8	2	200	0.020	0.032	0.032	0.74	60000	2400	45°
1.0	2	200	0.026	0.042	0.042	0.93	60000	3120	45°
1.2	2	200	0.028	0.050	0.050	1.12	56845	3185	45°
1.5	2	200	0.030	0.062	0.062	1.40	45475	2730	45°
2.0	2	200	0.034	0.082	0.082	1.86	34230	2330	45°
2.5	2	200	0.036	0.102	0.102	2.32	27440	1975	45°
2.8	2	200	0.040	0.114	0.114	2.60	24485	1960	45°
3.0	2	200	0.042	0.122	0.122	2.79	22820	1915	45°

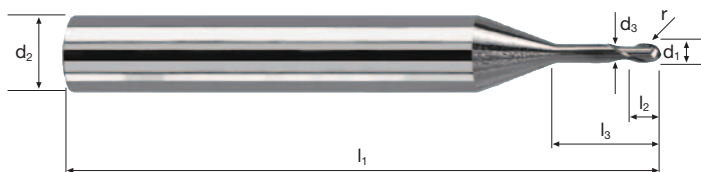
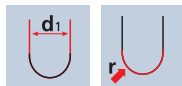
0.5	2	150	0.016	0.020	0.020	0.46	60000	1920	45°
0.8	2	150	0.018	0.032	0.032	0.74	60000	2160	45°
1.0	2	150	0.022	0.042	0.042	0.93	51340	2260	45°
1.2	2	150	0.024	0.050	0.050	1.12	42630	2045	45°
1.5	2	150	0.028	0.062	0.062	1.40	34105	1910	45°
2.0	2	150	0.030	0.082	0.082	1.86	25670	1540	45°
2.5	2	150	0.032	0.102	0.102	2.32	20580	1315	45°
2.8	2	150	0.036	0.114	0.114	2.60	18365	1320	45°
3.0	2	150	0.036	0.122	0.122	2.79	17115	1230	45°

Frese con estremità emisferica MicroX

Gambo Ø 6 mm, scarico cilindrico, 5xd



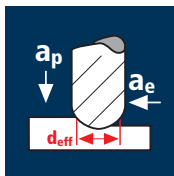
HM λ 30°
XA γ -10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine										X-AL
Rivestimento										X
Articolo										6564
Codice-ø										.050
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	X6564
.050	0.5	6	0.45	57	0.5	2.5	0.25	12.3°	2	●
.060	0.6	6	0.55	57	0.6	3.0	0.30	11.9°	2	●
.080	0.8	6	0.75	57	0.8	4.0	0.40	11.0°	2	●
.100	1.0	6	0.95	57	1.0	5.0	0.50	10.2°	2	●
.108	1.2	6	1.10	57	1.2	6.0	0.60	9.4°	2	●
.120	1.5	6	1.40	61	1.5	7.5	0.75	8.4°	2	●
.140	2.0	6	1.90	61	2.0	10.0	1.00	6.9°	2	●
.152	2.3	6	2.10	61	2.3	11.5	1.15	6.0°	2	●
.160	2.5	6	2.30	61	2.5	12.5	1.25	5.5°	2	●
.172	2.8	6	2.60	61	2.8	14.0	1.40	4.9°	2	●
.180	3.0	6	2.80	66	3.0	15.0	1.50	4.4°	2	●

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

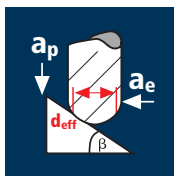
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.016	0.02	0.09	0.20	60000	1920	3.5
0.6	2	140	0.020	0.02	0.11	0.22	60000	2400	5.5
0.8	2	140	0.026	0.03	0.14	0.30	60000	3120	13.0
1.0	2	140	0.034	0.04	0.18	0.39	60000	4080	29.5
1.2	2	140	0.040	0.05	0.22	0.48	60000	4800	53.0
1.5	2	140	0.050	0.06	0.27	0.59	60000	6000	97.0
2.0	2	140	0.066	0.08	0.36	0.78	57135	7540	217.0
2.5	2	140	0.084	0.10	0.45	0.98	45475	7640	344.0
3.0	2	140	0.100	0.12	0.54	1.18	37765	7550	489.5

0.5	2	120	0.016	0.02	0.09	0.20	60000	1920	3.5
0.6	2	120	0.020	0.02	0.11	0.22	60000	2400	5.5
0.8	2	120	0.024	0.03	0.14	0.30	60000	2880	12.0
1.0	2	120	0.032	0.04	0.18	0.39	60000	3840	27.5
1.2	2	120	0.038	0.05	0.22	0.48	60000	4560	50.0
1.5	2	120	0.048	0.06	0.27	0.59	60000	5760	93.5
2.0	2	120	0.062	0.08	0.36	0.78	48970	6070	175.0
2.5	2	120	0.080	0.10	0.45	0.98	38980	6235	280.5
3.0	2	120	0.096	0.12	0.54	1.18	32370	6215	402.5

0.5	2	100	0.014	0.02	0.09	0.20	60000	1680	3.0
0.6	2	100	0.018	0.02	0.11	0.22	60000	2160	5.0
0.8	2	100	0.022	0.03	0.14	0.30	60000	2640	11.0
1.0	2	100	0.030	0.04	0.18	0.39	60000	3600	26.0
1.2	2	100	0.036	0.05	0.22	0.48	60000	4320	47.5
1.5	2	100	0.044	0.06	0.27	0.59	53950	4750	77.0
2.0	2	100	0.058	0.08	0.36	0.78	40810	4735	136.5
2.5	2	100	0.074	0.10	0.45	0.98	32480	4805	216.0
3.0	2	100	0.088	0.12	0.54	1.18	26975	4750	308.0

0.5	2	60	0.012	0.02	0.09	0.20	60000	1440	2.5
0.6	2	60	0.016	0.02	0.11	0.22	60000	1920	4.0
0.8	2	60	0.020	0.03	0.14	0.30	60000	2400	10.0
1.0	2	60	0.028	0.04	0.18	0.39	48970	2740	19.5
1.2	2	60	0.032	0.05	0.22	0.48	39790	2545	28.0
1.5	2	60	0.040	0.06	0.27	0.59	32370	2590	42.0
2.0	2	60	0.052	0.08	0.36	0.78	24485	2545	73.5
2.5	2	60	0.068	0.10	0.45	0.98	19490	2650	119.5
3.0	2	60	0.080	0.12	0.54	1.18	16185	2590	168.0

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.020	0.020	0.020	0.46	60000	2400	45°
0.6	2	300	0.022	0.024	0.024	0.56	60000	2640	45°
0.8	2	300	0.024	0.032	0.032	0.74	60000	2880	45°
1.0	2	300	0.028	0.040	0.040	0.93	60000	3360	45°
1.2	2	300	0.030	0.048	0.048	1.11	60000	3600	45°
1.5	2	300	0.034	0.060	0.060	1.39	60000	4080	45°
2.0	2	300	0.038	0.080	0.080	1.86	51340	3900	45°
2.5	2	300	0.040	0.100	0.100	2.32	41160	3295	45°
3.0	2	300	0.046	0.120	0.120	2.78	34350	3160	45°

0.5	2	250	0.020	0.020	0.020	0.46	60000	2400	45°
0.6	2	250	0.020	0.024	0.024	0.56	60000	2400	45°
0.8	2	250	0.022	0.032	0.032	0.74	60000	2640	45°
1.0	2	250	0.026	0.040	0.040	0.93	60000	3120	45°
1.2	2	250	0.028	0.048	0.048	1.11	60000	3360	45°
1.5	2	250	0.032	0.060	0.060	1.39	57250	3665	45°
2.0	2	250	0.036	0.080	0.080	1.86	42785	3080	45°
2.5	2	250	0.038	0.100	0.100	2.32	34300	2605	45°
3.0	2	250	0.044	0.120	0.120	2.78	28625	2520	45°

0.5	2	200	0.018	0.020	0.020	0.46	60000	2160	45°
0.6	2	200	0.020	0.024	0.024	0.56	60000	2400	45°
0.8	2	200	0.022	0.032	0.032	0.74	60000	2640	45°
1.0	2	200	0.026	0.040	0.040	0.93	60000	3120	45°
1.2	2	200	0.028	0.048	0.048	1.11	57355	3210	45°
1.5	2	200	0.030	0.060	0.060	1.39	45800	2750	45°
2.0	2	200	0.034	0.080	0.080	1.86	34230	2330	45°
2.5	2	200	0.036	0.100	0.100	2.32	27440	1975	45°
3.0	2	200	0.042	0.120	0.120	2.78	22900	1925	45°

0.5	2	150	0.016	0.020	0.020	0.46	60000	1920	45°
0.6	2	150	0.018	0.024	0.024	0.56	60000	2160	45°
0.8	2	150	0.020	0.032	0.032	0.74	60000	2400	45°
1.0	2	150	0.022	0.040	0.040	0.93	51340	2260	45°
1.2	2	150	0.024	0.048	0.048	1.11	43015	2065	45°
1.5	2	150	0.028	0.060	0.060	1.39	34350	1925	45°
2.0	2	150	0.030	0.080	0.080	1.86	25670	1540	45°
2.5	2	150	0.032	0.100	0.100	2.32	20580	1315	45°
3.0	2	150	0.036	0.120	0.120	2.78	17175	1235	45°

Frese con estremità emisferica MicroX

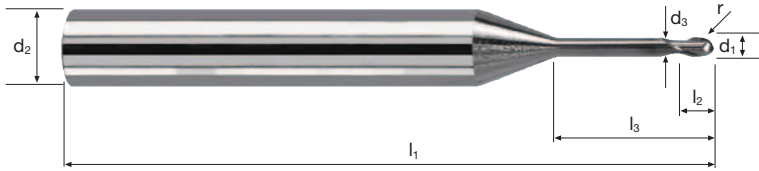
Gambo Ø 6 mm, scarico cilindrico, 8xd



HM XA λ **30°**
γ **-10°**

h5

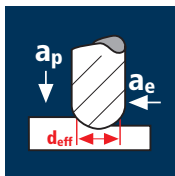
d1 **r**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine		Rivestimento X	Articolo 6566	Codice-Ø .050						X-AL
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	X6566
.050	0.5	6	0.45	57	0.5	4.0	0.25	11.1°	2	●
.060	0.6	6	0.55	57	0.6	4.8	0.30	10.5°	2	●
.080	0.8	6	0.75	57	0.8	6.4	0.40	9.4°	2	●
.100	1.0	6	0.95	61	1.0	8.0	0.50	8.4°	2	●
.108	1.2	6	1.10	61	1.2	9.6	0.60	7.6°	2	●
.120	1.5	6	1.40	61	1.5	12.0	0.75	6.5°	2	●
.140	2.0	6	1.90	66	2.0	16.0	1.00	5.1°	2	●
.160	2.5	6	2.30	69	2.5	20.0	1.25	3.9°	2	●
.180	3.0	6	2.80	75	3.0	24.0	1.50	3.1°	2	●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

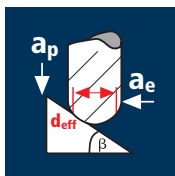
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.016	0.02	0.08	0.20	60000	1920	3.0
0.6	2	140	0.020	0.02	0.10	0.22	60000	2400	5.0
0.8	2	140	0.026	0.03	0.13	0.30	60000	3120	12.0
1.0	2	140	0.034	0.04	0.16	0.39	60000	4080	26.0
1.2	2	140	0.040	0.05	0.19	0.48	60000	4800	45.5
1.5	2	140	0.050	0.06	0.24	0.59	60000	6000	86.5
2.0	2	140	0.066	0.08	0.32	0.78	57135	7540	193.0
2.5	2	140	0.084	0.10	0.40	0.98	45475	7640	305.5
3.0	2	140	0.100	0.12	0.48	1.18	37765	7550	435.0

0.5	2	120	0.016	0.02	0.08	0.20	60000	1920	3.0
0.6	2	120	0.020	0.02	0.10	0.22	60000	2400	5.0
0.8	2	120	0.024	0.03	0.13	0.30	60000	2880	11.0
1.0	2	120	0.032	0.04	0.16	0.39	60000	3840	24.5
1.2	2	120	0.038	0.05	0.19	0.48	60000	4560	43.5
1.5	2	120	0.048	0.06	0.24	0.59	60000	5760	83.0
2.0	2	120	0.062	0.08	0.32	0.78	48970	6070	155.5
2.5	2	120	0.080	0.10	0.40	0.98	38980	6235	249.5
3.0	2	120	0.096	0.12	0.48	1.18	32370	6215	358.0

0.5	2	100	0.014	0.02	0.08	0.20	60000	1680	2.5
0.6	2	100	0.018	0.02	0.10	0.22	60000	2160	4.5
0.8	2	100	0.022	0.03	0.13	0.30	60000	2640	10.5
1.0	2	100	0.030	0.04	0.16	0.39	60000	3600	23.0
1.2	2	100	0.036	0.05	0.19	0.48	60000	4320	41.0
1.5	2	100	0.044	0.06	0.24	0.59	53950	4750	68.5
2.0	2	100	0.058	0.08	0.32	0.78	40810	4735	121.0
2.5	2	100	0.074	0.10	0.40	0.98	32480	4805	192.0
3.0	2	100	0.088	0.12	0.48	1.18	26975	4750	273.5

0.5	2	60	0.012	0.02	0.08	0.20	60000	1440	2.5
0.6	2	60	0.016	0.02	0.10	0.22	60000	1920	4.0
0.8	2	60	0.020	0.03	0.13	0.30	60000	2400	9.5
1.0	2	60	0.028	0.04	0.16	0.39	48970	2740	17.5
1.2	2	60	0.032	0.05	0.19	0.48	39790	2545	24.0
1.5	2	60	0.040	0.06	0.24	0.59	32370	2590	37.5
2.0	2	60	0.052	0.08	0.32	0.78	24485	2545	65.0
2.5	2	60	0.068	0.10	0.40	0.98	19490	2650	106.0
3.0	2	60	0.080	0.12	0.48	1.18	16185	2590	149.0

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.018	0.018	0.018	0.46	60000	2160	45°
0.6	2	300	0.020	0.022	0.022	0.55	60000	2400	45°
0.8	2	300	0.022	0.028	0.028	0.73	60000	2640	45°
1.0	2	300	0.026	0.036	0.036	0.92	60000	3120	45°
1.2	2	300	0.028	0.042	0.042	1.10	60000	3360	45°
1.5	2	300	0.030	0.052	0.052	1.38	60000	3600	45°
2.0	2	300	0.034	0.070	0.070	1.84	51900	3530	45°
2.5	2	300	0.036	0.088	0.088	2.29	41700	3000	45°
3.0	2	300	0.042	0.106	0.106	2.75	34725	2915	45°

0.5	2	250	0.018	0.018	0.018	0.46	60000	2160	45°
0.6	2	250	0.020	0.022	0.022	0.55	60000	2400	45°
0.8	2	250	0.020	0.028	0.028	0.73	60000	2400	45°
1.0	2	250	0.024	0.036	0.036	0.92	60000	2880	45°
1.2	2	250	0.026	0.042	0.042	1.10	60000	3120	45°
1.5	2	250	0.028	0.052	0.052	1.38	57665	3230	45°
2.0	2	250	0.032	0.070	0.070	1.84	43250	2770	45°
2.5	2	250	0.034	0.088	0.088	2.29	34750	2365	45°
3.0	2	250	0.040	0.106	0.106	2.75	28940	2315	45°

0.5	2	200	0.016	0.018	0.018	0.46	60000	1920	45°
0.6	2	200	0.018	0.022	0.022	0.55	60000	2160	45°
0.8	2	200	0.020	0.028	0.028	0.73	60000	2400	45°
1.0	2	200	0.024	0.036	0.036	0.92	60000	2880	45°
1.2	2	200	0.026	0.042	0.042	1.10	57875	3010	45°
1.5	2	200	0.028	0.052	0.052	1.38	46135	2585	45°
2.0	2	200	0.030	0.070	0.070	1.84	34600	2075	45°
2.5	2	200	0.032	0.088	0.088	2.29	27800	1780	45°
3.0	2	200	0.038	0.106	0.106	2.75	23150	1760	45°

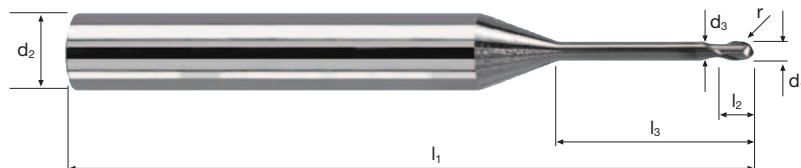
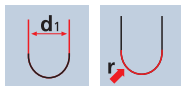
0.5	2	150	0.014	0.018	0.018	0.46	60000	1680	45°
0.6	2	150	0.016	0.022	0.022	0.55	60000	1920	45°
0.8	2	150	0.018	0.028	0.028	0.73	60000	2160	45°
1.0	2	150	0.020	0.036	0.036	0.92	51900	2075	45°
1.2	2	150	0.022	0.042	0.042	1.10	43405	1910	45°
1.5	2	150	0.024	0.052	0.052	1.38	34600	1660	45°
2.0	2	150	0.028	0.070	0.070	1.84	25950	1455	45°
2.5	2	150	0.028	0.088	0.088	2.29	20850	1170	45°
3.0	2	150	0.034	0.106	0.106	2.75	17365	1180	45°

Frese con estremità emisferica MicroX

Gambo Ø 6 mm, scarico cilindrico, 10xd



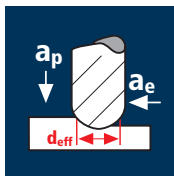
**HM
XA** λ 30°
 γ -10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine										X-AL
										X6568
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.050	0.5	6	0.45	57	0.5	5.0	0.25	10.3°	2	●
.060	0.6	6	0.55	57	0.6	6.0	0.30	9.7°	2	●
.080	0.8	6	0.75	61	0.8	8.0	0.40	8.5°	2	●
.100	1.0	6	0.95	61	1.0	10.0	0.50	7.6°	2	●
.108	1.2	6	1.10	66	1.2	12.0	0.60	6.7°	2	●
.120	1.5	6	1.40	66	1.5	15.0	0.75	5.7°	2	●
.140	2.0	6	1.90	69	2.0	20.0	1.00	4.3°	2	●
.160	2.5	6	2.30	75	2.5	25.0	1.25	3.3°	2	●
.180	3.0	6	2.80	80	3.0	30.0	1.50	2.5°	2	●

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

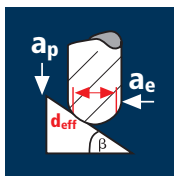
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.020	0.02	0.09	0.20	60000	2400	4.5
0.6	2	140	0.024	0.02	0.11	0.22	60000	2880	6.5
0.8	2	140	0.032	0.03	0.14	0.30	60000	3840	16.0
1.0	2	140	0.040	0.04	0.18	0.39	60000	4800	34.5
1.2	2	140	0.048	0.05	0.22	0.48	60000	5760	63.5
1.5	2	140	0.060	0.06	0.27	0.59	60000	7200	116.5
2.0	2	140	0.080	0.08	0.36	0.78	57135	9140	263.0
2.5	2	140	0.100	0.10	0.45	0.98	45475	9095	409.5
3.0	2	140	0.120	0.12	0.54	1.18	37765	9065	587.5

0.5	2	120	0.020	0.02	0.09	0.20	60000	2400	4.5
0.6	2	120	0.022	0.02	0.11	0.22	60000	2640	6.0
0.8	2	120	0.030	0.03	0.14	0.30	60000	3600	15.0
1.0	2	120	0.038	0.04	0.18	0.39	60000	4560	33.0
1.2	2	120	0.046	0.05	0.22	0.48	60000	5520	60.5
1.5	2	120	0.058	0.06	0.27	0.59	60000	6960	113.0
2.0	2	120	0.076	0.08	0.36	0.78	48970	7445	214.5
2.5	2	120	0.096	0.10	0.45	0.98	38980	7485	337.0
3.0	2	120	0.114	0.12	0.54	1.18	32370	7380	478.0

0.5	2	100	0.018	0.02	0.09	0.20	60000	2160	4.0
0.6	2	100	0.022	0.02	0.11	0.22	60000	2640	6.0
0.8	2	100	0.028	0.03	0.14	0.30	60000	3360	14.0
1.0	2	100	0.036	0.04	0.18	0.39	60000	4320	31.0
1.2	2	100	0.042	0.05	0.22	0.48	60000	5040	55.5
1.5	2	100	0.052	0.06	0.27	0.59	53950	5610	91.0
2.0	2	100	0.070	0.08	0.36	0.78	40810	5715	164.5
2.5	2	100	0.088	0.10	0.45	0.98	32480	5715	257.0
3.0	2	100	0.106	0.12	0.54	1.18	26975	5720	370.5

0.5	2	60	0.016	0.02	0.09	0.20	60000	1920	3.5
0.6	2	60	0.020	0.02	0.11	0.22	60000	2400	5.5
0.8	2	60	0.026	0.03	0.14	0.30	60000	3120	13.0
1.0	2	60	0.032	0.04	0.18	0.39	48970	3135	22.5
1.2	2	60	0.038	0.05	0.22	0.48	39790	3025	33.5
1.5	2	60	0.048	0.06	0.27	0.59	32370	3110	50.5
2.0	2	60	0.064	0.08	0.36	0.78	24485	3135	90.5
2.5	2	60	0.080	0.10	0.45	0.98	19490	3120	140.5
3.0	2	60	0.096	0.12	0.54	1.18	16185	3110	201.5

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.024	0.020	0.020	0.46	60000	2880	45°
0.6	2	300	0.026	0.024	0.024	0.56	60000	3120	45°
0.8	2	300	0.030	0.032	0.032	0.74	60000	3600	45°
1.0	2	300	0.034	0.040	0.040	0.93	60000	4080	45°
1.2	2	300	0.036	0.048	0.048	1.11	60000	4320	45°
1.5	2	300	0.040	0.060	0.060	1.39	60000	4800	45°
2.0	2	300	0.046	0.080	0.080	1.86	51340	4725	45°
2.5	2	300	0.048	0.100	0.100	2.32	41160	3950	45°
3.0	2	300	0.056	0.120	0.120	2.78	34350	3845	45°

0.5	2	250	0.022	0.020	0.020	0.46	60000	2640	45°
0.6	2	250	0.024	0.024	0.024	0.56	60000	2880	45°
0.8	2	250	0.028	0.032	0.032	0.74	60000	3360	45°
1.0	2	250	0.032	0.040	0.040	0.93	60000	3840	45°
1.2	2	250	0.034	0.048	0.048	1.11	60000	4080	45°
1.5	2	250	0.038	0.060	0.060	1.39	57250	4350	45°
2.0	2	250	0.044	0.080	0.080	1.86	42785	3765	45°
2.5	2	250	0.046	0.100	0.100	2.32	34300	3155	45°
3.0	2	250	0.054	0.120	0.120	2.78	28625	3090	45°

0.5	2	200	0.022	0.020	0.020	0.46	60000	2640	45°
0.6	2	200	0.024	0.024	0.024	0.56	60000	2880	45°
0.8	2	200	0.028	0.032	0.032	0.74	60000	3360	45°
1.0	2	200	0.030	0.040	0.040	0.93	60000	3600	45°
1.2	2	200	0.032	0.048	0.048	1.11	57355	3670	45°
1.5	2	200	0.036	0.060	0.060	1.39	45800	3300	45°
2.0	2	200	0.042	0.080	0.080	1.86	34230	2875	45°
2.5	2	200	0.044	0.100	0.100	2.32	27440	2415	45°
3.0	2	200	0.050	0.120	0.120	2.78	22900	2290	45°

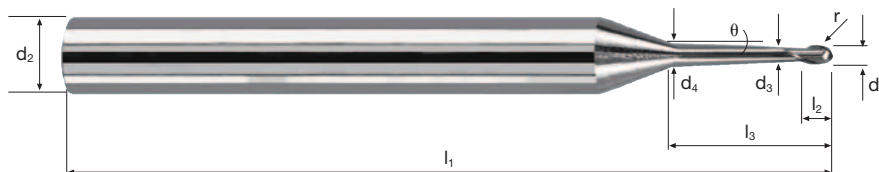
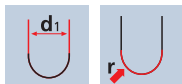
0.5	2	150	0.020	0.020	0.020	0.46	60000	2400	45°
0.6	2	150	0.020	0.024	0.024	0.56	60000	2400	45°
0.8	2	150	0.024	0.032	0.032	0.74	60000	2880	45°
1.0	2	150	0.028	0.040	0.040	0.93	51340	2875	45°
1.2	2	150	0.028	0.048	0.048	1.11	43015	2410	45°
1.5	2	150	0.032	0.060	0.060	1.39	34350	2200	45°
2.0	2	150	0.036	0.080	0.080	1.86	25670	1850	45°
2.5	2	150	0.038	0.100	0.100	2.32	20580	1565	45°
3.0	2	150	0.044	0.120	0.120	2.78	17175	1510	45°

Frese con estremità emisferica MicroX

Gambo Ø 6 mm, scarico conico 0.9°, 8xd



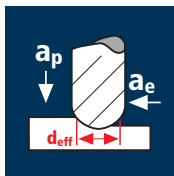
HM
XA λ 30°
 γ 10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Ø Code	d1 0/-0.01	d2 h5	d3	d4	l1	l2	l3	θ	r ±0.005	α	z	X-AL
												X6766
.050	0.5	6	0.45	0.56	57	0.40	4.0	0.9°	0.25	11.1°	2	•
.060	0.6	6	0.55	0.68	57	0.50	4.8	0.9°	0.30	10.5°	2	•
.080	0.8	6	0.75	0.93	57	0.65	6.4	0.9°	0.40	9.4°	2	•
.100	1.0	6	0.95	1.18	61	0.80	8.0	0.9°	0.50	8.4°	2	•
.108	1.2	6	1.10	1.42	61	1.00	9.6	0.9°	0.60	7.6°	2	•
.120	1.5	6	1.40	1.79	61	1.20	12.0	0.9°	0.75	6.5°	2	•
.140	2.0	6	1.90	2.41	66	1.60	16.0	0.9°	1.00	5.1°	2	•
.160	2.5	6	2.30	3.03	69	2.00	20.0	0.9°	1.25	3.9°	2	•
.180	3.0	6	2.80	3.64	75	2.40	24.0	0.9°	1.50	3.1°	2	•

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

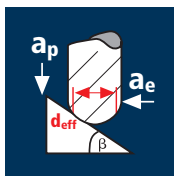
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.020	0.02	0.08	0.20	60000	2400	4.0
0.6	2	140	0.024	0.02	0.10	0.22	60000	2880	6.0
0.8	2	140	0.032	0.03	0.13	0.30	60000	3840	15.0
1.0	2	140	0.040	0.04	0.16	0.39	60000	4800	30.5
1.2	2	140	0.048	0.05	0.19	0.48	60000	5760	54.5
1.5	2	140	0.060	0.06	0.24	0.59	60000	7200	103.5
2.0	2	140	0.080	0.08	0.32	0.78	57135	9140	234.0
2.5	2	140	0.100	0.10	0.40	0.98	45475	9095	364.0
3.0	2	140	0.120	0.12	0.48	1.18	37765	9065	522.0

0.5	2	120	0.020	0.02	0.08	0.20	60000	2400	4.0
0.6	2	120	0.022	0.02	0.10	0.22	60000	2640	5.5
0.8	2	120	0.030	0.03	0.13	0.30	60000	3600	14.0
1.0	2	120	0.038	0.04	0.16	0.39	60000	4560	29.0
1.2	2	120	0.046	0.05	0.19	0.48	60000	5520	52.5
1.5	2	120	0.058	0.06	0.24	0.59	60000	6960	100.0
2.0	2	120	0.076	0.08	0.32	0.78	48970	7445	190.5
2.5	2	120	0.096	0.10	0.40	0.98	38980	7485	299.5
3.0	2	120	0.114	0.12	0.48	1.18	32370	7380	425.0

0.5	2	100	0.018	0.02	0.08	0.20	60000	2160	3.5
0.6	2	100	0.022	0.02	0.10	0.22	60000	2640	5.5
0.8	2	100	0.028	0.03	0.13	0.30	60000	3360	13.0
1.0	2	100	0.036	0.04	0.16	0.39	60000	4320	27.5
1.2	2	100	0.042	0.05	0.19	0.48	60000	5040	48.0
1.5	2	100	0.052	0.06	0.24	0.59	53950	5610	81.0
2.0	2	100	0.070	0.08	0.32	0.78	40810	5715	146.5
2.5	2	100	0.088	0.10	0.40	0.98	32480	5715	228.5
3.0	2	100	0.106	0.12	0.48	1.18	26975	5720	329.5

0.5	2	60	0.016	0.02	0.08	0.20	60000	1920	3.0
0.6	2	60	0.020	0.02	0.10	0.22	60000	2400	5.0
0.8	2	60	0.026	0.03	0.13	0.30	60000	3120	12.0
1.0	2	60	0.032	0.04	0.16	0.39	48970	3135	20.0
1.2	2	60	0.038	0.05	0.19	0.48	39790	3025	28.5
1.5	2	60	0.048	0.06	0.24	0.59	32370	3110	45.0
2.0	2	60	0.064	0.08	0.32	0.78	24485	3135	80.5
2.5	2	60	0.080	0.10	0.40	0.98	19490	3120	125.0
3.0	2	60	0.096	0.12	0.48	1.18	16185	3110	179.0

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.022	0.018	0.018	0.46	60000	2640	45°
0.6	2	300	0.024	0.022	0.022	0.55	60000	2880	45°
0.8	2	300	0.026	0.028	0.028	0.73	60000	3120	45°
1.0	2	300	0.032	0.036	0.036	0.92	60000	3840	45°
1.2	2	300	0.034	0.042	0.042	1.10	60000	4080	45°
1.5	2	300	0.038	0.052	0.052	1.38	60000	4560	45°
2.0	2	300	0.042	0.070	0.070	1.84	51900	4360	45°
2.5	2	300	0.044	0.088	0.088	2.29	41700	3670	45°
3.0	2	300	0.050	0.106	0.106	2.75	34725	3475	45°

0.5	2	250	0.020	0.018	0.018	0.46	60000	2400	45°
0.6	2	250	0.022	0.022	0.022	0.55	60000	2640	45°
0.8	2	250	0.024	0.028	0.028	0.73	60000	2880	45°
1.0	2	250	0.030	0.036	0.036	0.92	60000	3600	45°
1.2	2	250	0.032	0.042	0.042	1.10	60000	3840	45°
1.5	2	250	0.036	0.052	0.052	1.38	57665	4150	45°
2.0	2	250	0.040	0.070	0.070	1.84	43250	3460	45°
2.5	2	250	0.042	0.088	0.088	2.29	34750	2920	45°
3.0	2	250	0.048	0.106	0.106	2.75	28940	2780	45°

0.5	2	200	0.020	0.018	0.018	0.46	60000	2400	45°
0.6	2	200	0.022	0.022	0.022	0.55	60000	2640	45°
0.8	2	200	0.024	0.028	0.028	0.73	60000	2880	45°
1.0	2	200	0.028	0.036	0.036	0.92	60000	3360	45°
1.2	2	200	0.030	0.042	0.042	1.10	57875	3475	45°
1.5	2	200	0.034	0.052	0.052	1.38	46135	3135	45°
2.0	2	200	0.038	0.070	0.070	1.84	34600	2630	45°
2.5	2	200	0.040	0.088	0.088	2.29	27800	2225	45°
3.0	2	200	0.046	0.106	0.106	2.75	23150	2130	45°

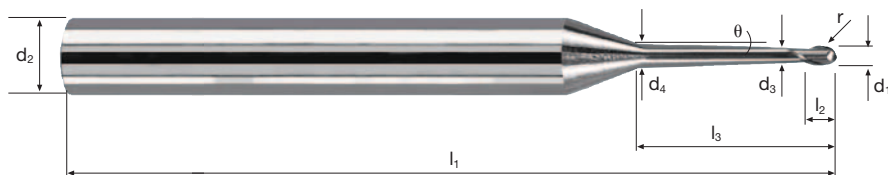
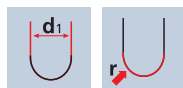
0.5	2	150	0.018	0.018	0.018	0.46	60000	2160	45°
0.6	2	150	0.020	0.022	0.022	0.55	60000	2400	45°
0.8	2	150	0.020	0.028	0.028	0.73	60000	2400	45°
1.0	2	150	0.026	0.036	0.036	0.92	51900	2700	45°
1.2	2	150	0.028	0.042	0.042	1.10	43405	2430	45°
1.5	2	150	0.030	0.052	0.052	1.38	34600	2075	45°
2.0	2	150	0.034	0.070	0.070	1.84	25950	1765	45°
2.5	2	150	0.036	0.088	0.088	2.29	20850	1500	45°
3.0	2	150	0.040	0.106	0.106	2.75	17365	1390	45°

Frese con estremità emisferica MicroX

Gambo Ø 6 mm, scarico conico 0.9°, 10xd



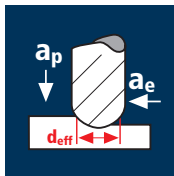
HM
XA λ **30°**
 γ **10°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine												X-AL
												X6768
Ø	d1	d2	d3	d4	l1	l2	l3	θ	r	α	z	
Code	0/-0.01	h5							±0.005			
.050	0.5	6	0.45	0.60	57	0.40	5.0	0.9°	0.25	10.3°	2	●
.060	0.6	6	0.55	0.73	57	0.50	6.0	0.9°	0.30	9.7°	2	●
.080	0.8	6	0.75	0.99	61	0.65	8.0	0.9°	0.40	8.5°	2	●
.100	1.0	6	0.95	1.25	61	0.80	10.0	0.9°	0.50	7.6°	2	●
.108	1.2	6	1.10	1.51	66	1.00	12.0	0.9°	0.60	6.7°	2	●
.120	1.5	6	1.40	1.90	66	1.20	15.0	0.9°	0.75	5.7°	2	●
.140	2.0	6	1.90	2.55	69	1.60	20.0	0.9°	1.00	4.3°	2	●
.160	2.5	6	2.30	3.19	75	2.00	25.0	0.9°	1.25	3.3°	2	●
.180	3.0	6	2.80	3.84	75	2.40	30.0	0.9°	1.50	2.5°	2	●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

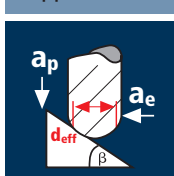
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.015	0.02	0.07	0.20	60000	1800	2.5
0.8	2	140	0.025	0.02	0.11	0.25	60000	3000	6.5
1.0	2	140	0.030	0.03	0.14	0.34	60000	3600	15.0
1.2	2	140	0.035	0.04	0.17	0.43	60000	4200	28.5
1.5	2	140	0.045	0.05	0.21	0.54	60000	5400	56.5
2.0	2	140	0.055	0.06	0.28	0.68	60000	6600	111.0
2.5	2	140	0.070	0.08	0.35	0.88	50640	7090	198.5
3.0	2	140	0.085	0.09	0.42	1.02	43690	7425	280.5

0.5	2	120	0.014	0.02	0.07	0.20	60000	1680	2.5
0.8	2	120	0.024	0.02	0.11	0.25	60000	2880	6.5
1.0	2	120	0.028	0.03	0.14	0.34	60000	3360	14.0
1.2	2	120	0.034	0.04	0.17	0.43	60000	4080	27.5
1.5	2	120	0.042	0.05	0.21	0.54	60000	5040	53.0
2.0	2	120	0.052	0.06	0.28	0.68	56175	5840	98.0
2.5	2	120	0.066	0.08	0.35	0.88	43405	5730	160.5
3.0	2	120	0.080	0.09	0.42	1.02	37450	5990	226.5

0.5	2	100	0.014	0.02	0.07	0.20	60000	1680	2.5
0.8	2	100	0.022	0.02	0.11	0.25	60000	2640	6.0
1.0	2	100	0.026	0.03	0.14	0.34	60000	3120	13.0
1.2	2	100	0.030	0.04	0.17	0.43	60000	3600	24.5
1.5	2	100	0.040	0.05	0.21	0.54	58950	4715	49.5
2.0	2	100	0.048	0.06	0.28	0.68	46810	4495	75.5
2.5	2	100	0.062	0.08	0.35	0.88	36175	4485	125.5
3.0	2	100	0.074	0.09	0.42	1.02	31210	4620	174.5

0.5	2	60	0.012	0.02	0.07	0.20	60000	1440	2.0
0.8	2	60	0.020	0.02	0.11	0.25	60000	2400	5.5
1.0	2	60	0.024	0.03	0.14	0.34	56175	2695	11.5
1.2	2	60	0.028	0.04	0.17	0.43	44415	2485	17.0
1.5	2	60	0.036	0.05	0.21	0.54	35370	2545	26.5
2.0	2	60	0.044	0.06	0.28	0.68	28085	2470	41.5
2.5	2	60	0.056	0.08	0.35	0.88	21705	2430	68.0
3.0	2	60	0.068	0.09	0.42	1.02	18725	2545	96.0

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.018	0.016	0.016	0.46	60000	2160	45°
0.8	2	300	0.020	0.024	0.024	0.72	60000	2400	45°
1.0	2	300	0.026	0.030	0.030	0.91	60000	3120	45°
1.2	2	300	0.028	0.036	0.036	1.09	60000	3360	45°
1.5	2	300	0.030	0.046	0.046	1.36	60000	3600	45°
2.0	2	300	0.034	0.060	0.060	1.81	52760	3590	45°
2.5	2	300	0.036	0.076	0.076	2.27	42070	3030	45°
3.0	2	300	0.042	0.090	0.090	2.72	35110	2950	45°

0.5	2	250	0.018	0.016	0.016	0.46	60000	2160	45°
0.8	2	250	0.020	0.024	0.024	0.72	60000	2400	45°
1.0	2	250	0.024	0.030	0.030	0.91	60000	2880	45°
1.2	2	250	0.026	0.036	0.036	1.09	60000	3120	45°
1.5	2	250	0.028	0.046	0.046	1.36	58515	3275	45°
2.0	2	250	0.032	0.060	0.060	1.81	43965	2815	45°
2.5	2	250	0.034	0.076	0.076	2.27	35055	2385	45°
3.0	2	250	0.040	0.090	0.090	2.72	29255	2340	45°

0.5	2	200	0.016	0.016	0.016	0.46	60000	1920	45°
0.8	2	200	0.018	0.024	0.024	0.72	60000	2160	45°
1.0	2	200	0.024	0.030	0.030	0.91	60000	2880	45°
1.2	2	200	0.026	0.036	0.036	1.09	58405	3035	45°
1.5	2	200	0.028	0.046	0.046	1.36	46810	2620	45°
2.0	2	200	0.030	0.060	0.060	1.81	35175	2110	45°
2.5	2	200	0.032	0.076	0.076	2.27	28045	1795	45°
3.0	2	200	0.038	0.090	0.090	2.72	23405	1780	45°

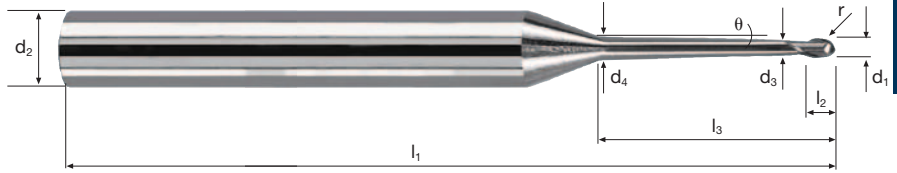
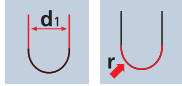
0.5	2	150	0.014	0.016	0.016	0.46	60000	1680	45°
0.8	2	150	0.016	0.024	0.024	0.72	60000	1920	45°
1.0	2	150	0.020	0.030	0.030	0.91	52470	2100	45°
1.2	2	150	0.022	0.036	0.036	1.09	43805	1925	45°
1.5	2	150	0.024	0.046	0.046	1.36	35110	1685	45°
2.0	2	150	0.028	0.060	0.060	1.81	26380	1475	45°
2.5	2	150	0.028	0.076	0.076	2.27	21035	1180	45°
3.0	2	150	0.034	0.090	0.090	2.72	17555	1195	45°

Frese con estremità emisferica MicroX

Gambo Ø 6 mm, scarico conico 0.9°, 12xd



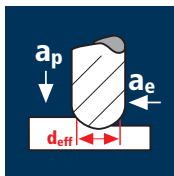
HM λ **30°**
XA γ **-10°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine												X-AL
												X6770
												X6770
Ø Code	d1 0/-0.01	d2 h5	d3	d4	l1	l2	l3	θ	r ±0.005	α	z	
.050	0.5	6	0.45	0.62	57	0.40	6.0	0.9°	0.25	9.9°	2	●
.080	0.8	6	0.75	1.03	61	0.65	9.6	0.9°	0.40	8.0°	2	●
.100	1.0	6	0.95	1.30	66	0.80	12.0	0.9°	0.50	7.0°	2	●
.108	1.2	6	1.10	1.57	66	1.00	14.4	0.9°	0.60	6.1°	2	●
.120	1.5	6	1.40	1.98	69	1.20	18.0	0.9°	0.75	5.1°	2	●
.140	2.0	6	1.90	2.66	75	1.60	24.0	0.9°	1.00	3.9°	2	●
.160	2.5	6	2.30	3.34	80	2.00	30.0	0.9°	1.25	2.9°	2	●
.180	3.0	6	2.80	4.02	87	2.40	36.0	0.9°	1.50	2.2°	2	●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

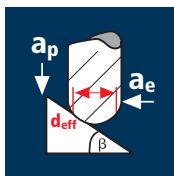
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.015	0.02	0.06	0.20	60000	1800	2.0
0.8	2	140	0.025	0.02	0.10	0.25	60000	3000	6.0
1.0	2	140	0.030	0.03	0.12	0.34	60000	3600	13.0
1.2	2	140	0.035	0.04	0.14	0.43	60000	4200	23.5
1.5	2	140	0.045	0.05	0.18	0.54	60000	5400	48.5
2.0	2	140	0.055	0.06	0.24	0.68	60000	6600	95.0
2.5	2	140	0.070	0.08	0.30	0.88	50640	7090	170.0
3.0	2	140	0.085	0.09	0.36	1.02	43690	7425	240.5

0.5	2	120	0.014	0.02	0.06	0.20	60000	1680	2.0
0.8	2	120	0.024	0.02	0.10	0.25	60000	2880	6.0
1.0	2	120	0.028	0.03	0.12	0.34	60000	3360	12.0
1.2	2	120	0.034	0.04	0.14	0.43	60000	4080	23.0
1.5	2	120	0.042	0.05	0.18	0.54	60000	5040	45.5
2.0	2	120	0.052	0.06	0.24	0.68	56175	5840	84.0
2.5	2	120	0.066	0.08	0.30	0.88	43405	5730	137.5
3.0	2	120	0.080	0.09	0.36	1.02	37450	5990	194.0

0.5	2	100	0.014	0.02	0.06	0.20	60000	1680	2.0
0.8	2	100	0.022	0.02	0.10	0.25	60000	2640	5.5
1.0	2	100	0.026	0.03	0.12	0.34	60000	3120	11.0
1.2	2	100	0.030	0.04	0.14	0.43	60000	3600	20.0
1.5	2	100	0.040	0.05	0.18	0.54	58950	4715	42.5
2.0	2	100	0.048	0.06	0.24	0.68	46810	4495	64.5
2.5	2	100	0.062	0.08	0.30	0.88	36175	4485	107.5
3.0	2	100	0.074	0.09	0.36	1.02	31210	4620	149.5

0.5	2	60	0.012	0.02	0.06	0.20	60000	1440	1.5
0.8	2	60	0.020	0.02	0.10	0.25	60000	2400	5.0
1.0	2	60	0.024	0.03	0.12	0.34	56175	2695	9.5
1.2	2	60	0.028	0.04	0.14	0.43	44415	2485	14.0
1.5	2	60	0.036	0.05	0.18	0.54	35370	2545	23.0
2.0	2	60	0.044	0.06	0.24	0.68	28085	2470	35.5
2.5	2	60	0.056	0.08	0.30	0.88	21705	2430	58.5
3.0	2	60	0.068	0.09	0.36	1.02	18725	2545	82.5

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.018	0.012	0.012	0.44	60000	2160	45°
0.8	2	300	0.020	0.020	0.020	0.71	60000	2400	45°
1.0	2	300	0.026	0.026	0.026	0.90	60000	3120	45°
1.2	2	300	0.028	0.030	0.030	1.07	60000	3360	45°
1.5	2	300	0.030	0.038	0.038	1.34	60000	3600	45°
2.0	2	300	0.034	0.050	0.050	1.79	53350	3630	45°
2.5	2	300	0.036	0.062	0.062	2.23	42825	3085	45°
3.0	2	300	0.042	0.076	0.076	2.68	35635	2995	45°

0.5	2	250	0.018	0.012	0.012	0.44	60000	2160	45°
0.8	2	250	0.020	0.020	0.020	0.71	60000	2400	45°
1.0	2	250	0.024	0.026	0.026	0.90	60000	2880	45°
1.2	2	250	0.026	0.030	0.030	1.07	60000	3120	45°
1.5	2	250	0.028	0.038	0.038	1.34	59390	3325	45°
2.0	2	250	0.032	0.050	0.050	1.79	44460	2845	45°
2.5	2	250	0.034	0.062	0.062	2.23	35685	2425	45°
3.0	2	250	0.040	0.076	0.076	2.68	29695	2375	45°

0.5	2	200	0.016	0.012	0.012	0.44	60000	1920	45°
0.8	2	200	0.018	0.020	0.020	0.71	60000	2160	45°
1.0	2	200	0.024	0.026	0.026	0.90	60000	2880	45°
1.2	2	200	0.026	0.030	0.030	1.07	59500	3095	45°
1.5	2	200	0.028	0.038	0.038	1.34	47510	2660	45°
2.0	2	200	0.030	0.050	0.050	1.79	35565	2135	45°
2.5	2	200	0.032	0.062	0.062	2.23	28550	1825	45°
3.0	2	200	0.038	0.076	0.076	2.68	23755	1805	45°

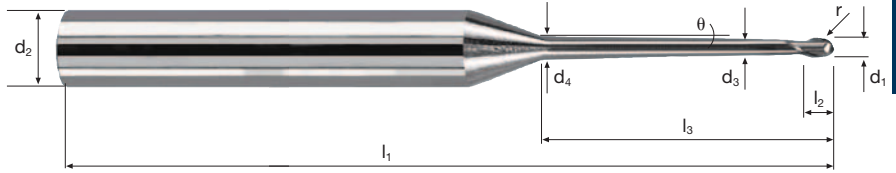
0.5	2	150	0.014	0.012	0.012	0.44	60000	1680	45°
0.8	2	150	0.016	0.020	0.020	0.71	60000	1920	45°
1.0	2	150	0.020	0.026	0.026	0.90	53055	2120	45°
1.2	2	150	0.022	0.030	0.030	1.07	44625	1965	45°
1.5	2	150	0.024	0.038	0.038	1.34	35635	1710	45°
2.0	2	150	0.028	0.050	0.050	1.79	26675	1495	45°
2.5	2	150	0.028	0.062	0.062	2.23	21410	1200	45°
3.0	2	150	0.034	0.076	0.076	2.68	17815	1210	45°

Frese con estremità emisferica MicroX

Gambo Ø 6 mm, scarico conico 0.9°, 15xd



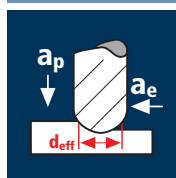
HM λ 30°
XA γ-10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine												X-AL
												X6772
Ø Code	d1 0/-0.01	d2 h5	d3	d4	l1	l2	l3	θ	r ±0.005	α	z	
.050	0.5	6	0.45	0.67	61	0.40	7.5	0.9°	0.25	9.1°	2	●
.080	0.8	6	0.75	1.11	66	0.65	12.0	0.9°	0.40	7.1°	2	●
.100	1.0	6	0.95	1.40	66	0.80	15.0	0.9°	0.50	6.1°	2	●
.108	1.2	6	1.10	1.69	69	1.00	18.0	0.9°	0.60	5.3°	2	●
.120	1.5	6	1.40	2.12	75	1.20	22.5	0.9°	0.75	4.5°	2	●
.140	2.0	6	1.90	2.85	80	1.60	30.0	0.9°	1.00	3.3°	2	●
.160	2.5	6	2.30	3.58	87	2.00	37.5	0.9°	1.25	2.4°	2	●
.180	3.0	6	2.80	4.30	100	2.40	45.0	0.9°	1.50	1.8°	2	●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



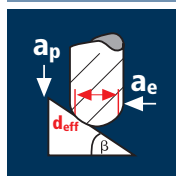
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.2	2	140	0.006	0.01	0.04	0.09	60000	720	0.5
0.5	2	140	0.012	0.04	0.10	0.27	60000	1440	6.0
0.8	2	140	0.020	0.06	0.16	0.42	60000	2400	23.0
1.0	2	140	0.026	0.07	0.20	0.51	60000	3120	43.5
1.2	2	140	0.030	0.08	0.24	0.60	60000	3600	69.0
1.5	2	140	0.038	0.11	0.30	0.78	57135	4340	143.0
2.0	2	140	0.050	0.14	0.40	1.02	43690	4370	244.5
2.5	2	140	0.062	0.18	0.50	1.29	34545	4285	385.5
3.0	2	140	0.076	0.21	0.60	1.53	29125	4425	557.5

0.2	2	120	0.006	0.01	0.04	0.09	60000	720	0.5
0.5	2	120	0.012	0.04	0.10	0.27	60000	1440	6.0
0.8	2	120	0.020	0.06	0.16	0.42	60000	2400	23.0
1.0	2	120	0.024	0.07	0.20	0.51	60000	2880	40.5
1.2	2	120	0.028	0.08	0.24	0.60	60000	3360	64.5
1.5	2	120	0.036	0.11	0.30	0.78	48970	3525	116.5
2.0	2	120	0.048	0.14	0.40	1.02	37450	3595	201.5
2.5	2	120	0.058	0.18	0.50	1.29	29610	3435	309.0
3.0	2	120	0.072	0.21	0.60	1.53	24965	3595	453.0

0.2	2	100	0.006	0.01	0.04	0.09	60000	720	0.5
0.5	2	100	0.010	0.04	0.10	0.27	60000	1200	5.0
0.8	2	100	0.018	0.06	0.16	0.42	60000	2160	20.5
1.0	2	100	0.022	0.07	0.20	0.51	60000	2640	37.0
1.2	2	100	0.026	0.08	0.24	0.60	53055	2760	53.0
1.5	2	100	0.034	0.11	0.30	0.78	40810	2775	91.5
2.0	2	100	0.044	0.14	0.40	1.02	31210	2745	153.5
2.5	2	100	0.054	0.18	0.50	1.29	24675	2665	240.0
3.0	2	100	0.066	0.21	0.60	1.53	20805	2745	346.0

0.2	2	60	0.004	0.01	0.04	0.09	60000	480	0.0
0.5	2	60	0.010	0.04	0.10	0.27	60000	1200	5.0
0.8	2	60	0.016	0.06	0.16	0.42	45475	1455	14.0
1.0	2	60	0.020	0.07	0.20	0.51	37450	1500	21.0
1.2	2	60	0.024	0.08	0.24	0.60	31830	1530	29.5
1.5	2	60	0.030	0.11	0.30	0.78	24485	1470	48.5
2.0	2	60	0.040	0.14	0.40	1.02	18725	1500	84.0
2.5	2	60	0.050	0.18	0.50	1.29	14805	1480	133.0
3.0	2	60	0.060	0.21	0.60	1.53	12485	1500	189.0

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.2	2	300	0.008	0.008	0.008	0.19	60000	960	45°
0.5	2	300	0.016	0.022	0.022	0.47	60000	1920	45°
0.8	2	300	0.018	0.034	0.034	0.75	60000	2160	45°
1.0	2	300	0.022	0.044	0.044	0.93	60000	2640	45°
1.2	2	300	0.024	0.052	0.052	1.12	60000	2880	45°
1.5	2	300	0.028	0.064	0.064	1.40	60000	3360	45°
2.0	2	300	0.030	0.086	0.086	1.87	51065	3065	45°
2.5	2	300	0.032	0.108	0.108	2.33	40985	2625	45°
3.0	2	300	0.036	0.128	0.128	2.80	34105	2455	45°

0.2	2	250	0.008	0.008	0.008	0.19	60000	960	45°
0.5	2	250	0.016	0.022	0.022	0.47	60000	1920	45°
0.8	2	250	0.018	0.034	0.034	0.75	60000	2160	45°
1.0	2	250	0.020	0.044	0.044	0.93	60000	2400	45°
1.2	2	250	0.022	0.052	0.052	1.12	60000	2640	45°
1.5	2	250	0.026	0.064	0.064	1.40	56845	2955	45°
2.0	2	250	0.028	0.086	0.086	1.87	42555	2385	45°
2.5	2	250	0.030	0.108	0.108	2.33	34155	2050	45°
3.0	2	250	0.034	0.128	0.128	2.80	28420	1935	45°

0.2	2	200	0.008	0.008	0.008	0.19	60000	960	45°
0.5	2	200	0.014	0.022	0.022	0.47	60000	1680	45°
0.8	2	200	0.016	0.034	0.034	0.75	60000	1920	45°
1.0	2	200	0.020	0.044	0.044	0.93	60000	2400	45°
1.2	2	200	0.022	0.052	0.052	1.12	56845	2500	45°
1.5	2	200	0.026	0.064	0.064	1.40	45475	2365	45°
2.0	2	200	0.028	0.086	0.086	1.87	34045	1905	45°
2.5	2	200	0.028	0.108	0.108	2.33	27325	1530	45°
3.0	2	200	0.032	0.128	0.128	2.80	22735	1455	45°

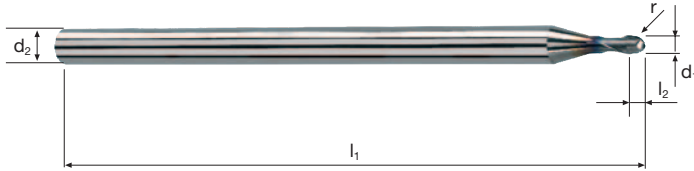
0.2	2	150	0.006	0.008	0.008	0.19	60000	720	45°
0.5	2	150	0.012	0.022	0.022	0.47	60000	1440	45°
0.8	2	150	0.014	0.034	0.034	0.75	60000	1680	45°
1.0	2	150	0.018	0.044	0.044	0.93	51340	1850	45°
1.2	2	150	0.020	0.052	0.052	1.12	42630	1705	45°
1.5	2	150	0.022	0.064	0.064	1.40	34105	1500	45°
2.0	2	150	0.024	0.086	0.086	1.87	25535	1225	45°
2.5	2	150	0.026	0.108	0.108	2.33	20495	1065	45°
3.0	2	150	0.028	0.128	0.128	2.80	17055	955	45°

Frese con estremità emisferica Microcut-B1H

Gambo Ø 3 mm, 1xd



**HM
XA** λ **30°**
γ **-10°**



Rm
850-1100

Rm
1100-1300

Rm
1300-1500

HRC
48-56

HRC
56-60

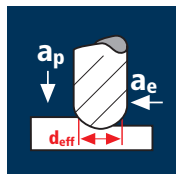
HRC
> 60

Inox
Stainless

Ti
Titanium

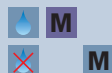
Esempio: N° Ordine		Rivestimento D	Articolo 15781	Codice-ø .020					DURO-S
Ø Code	d1 0/-0.01	d2 h5	l1	l2	r ±0.005	α	z	D15781	
.020	0.2	3	40	0.24	0.10	14.7°	2	●	
.030	0.3	3	40	0.36	0.15	14.3°	2	●	
.040	0.4	3	40	0.48	0.20	14.1°	2	●	
.050	0.5	3	40	0.60	0.25	14.0°	2	●	
.060	0.6	3	40	0.72	0.30	13.8°	2	●	
.080	0.8	3	40	0.96	0.40	13.1°	2	●	
.100	1.0	3	50	1.20	0.50	12.6°	2	●	
.108	1.2	3	50	1.40	0.60	12.1°	2	●	
.120	1.5	3	50	1.80	0.75	10.9°	2	●	
.140	2.0	3	50	2.40	1.00	8.6°	2	●	
.160	2.5	3	50	3.00	1.25	5.3°	2	●	
.180	3.0	3	50	3.60	1.50	0.0°	2	●	

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.2	2	180	0.008	0.02	0.04	0.12	60000	960	1.0
0.5	2	180	0.018	0.04	0.10	0.27	60000	2160	8.5
0.8	2	180	0.028	0.06	0.16	0.42	60000	3360	32.5
1.0	2	180	0.036	0.08	0.20	0.54	60000	4320	69.0
1.2	2	180	0.042	0.10	0.24	0.66	60000	5040	121.0
1.5	2	180	0.054	0.12	0.30	0.81	60000	6480	233.5
2.0	2	180	0.072	0.16	0.40	1.09	52565	7570	484.5
2.5	2	180	0.090	0.20	0.50	1.36	42130	7585	758.5
3.0	2	180	0.108	0.24	0.60	1.63	35150	7590	1093.0

Acciaio
1100 - 1300 N/mm²



0.2	2	160	0.008	0.02	0.04	0.12	60000	960	1.0
0.5	2	160	0.016	0.04	0.10	0.27	60000	1920	7.5
0.8	2	160	0.026	0.06	0.16	0.42	60000	3120	30.0
1.0	2	160	0.032	0.08	0.20	0.54	60000	3840	61.5
1.2	2	160	0.038	0.10	0.24	0.66	60000	4560	109.5
1.5	2	160	0.048	0.12	0.30	0.81	60000	5760	207.5
2.0	2	160	0.064	0.16	0.40	1.09	46725	5980	382.5
2.5	2	160	0.082	0.20	0.50	1.36	37450	6140	614.0
3.0	2	160	0.098	0.24	0.60	1.63	31245	6125	882.0

Acciaio inossidabile
[Cr-Ni/1.4301]



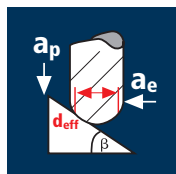
0.2	2	80	0.008	0.02	0.04	0.12	60000	960	1.0
0.5	2	80	0.016	0.04	0.10	0.27	60000	1920	7.5
0.8	2	80	0.026	0.06	0.16	0.42	60000	3120	30.0
1.0	2	80	0.032	0.08	0.20	0.54	47160	3020	48.5
1.2	2	80	0.038	0.10	0.24	0.66	38585	2930	70.5
1.5	2	80	0.048	0.12	0.30	0.81	31440	3020	108.5
2.0	2	80	0.064	0.16	0.40	1.09	23365	2990	191.5
2.5	2	80	0.082	0.20	0.50	1.36	18725	3070	307.0
3.0	2	80	0.098	0.24	0.60	1.63	15625	3065	441.5

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



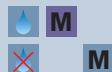
0.2	2	60	0.006	0.02	0.04	0.12	60000	720	0.5
0.5	2	60	0.012	0.04	0.10	0.27	60000	1440	6.0
0.8	2	60	0.020	0.06	0.16	0.42	45475	1820	17.5
1.0	2	60	0.026	0.08	0.20	0.54	35370	1840	29.5
1.2	2	60	0.030	0.10	0.24	0.66	28940	1735	41.5
1.5	2	60	0.038	0.12	0.30	0.81	23580	1790	64.5
2.0	2	60	0.050	0.16	0.40	1.09	17520	1750	112.0
2.5	2	60	0.064	0.20	0.50	1.36	14045	1800	180.0
3.0	2	60	0.076	0.24	0.60	1.63	11715	1780	256.5

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.2	2	300	0.010	0.008	0.008	0.19	60000	1200	45°
0.5	2	300	0.020	0.022	0.022	0.47	60000	2400	45°
0.8	2	300	0.022	0.034	0.034	0.75	60000	2640	45°
1.0	2	300	0.028	0.042	0.042	0.93	60000	3360	45°
1.2	2	300	0.030	0.050	0.050	1.12	60000	3600	45°
1.5	2	300	0.034	0.064	0.064	1.40	60000	4080	45°
2.0	2	300	0.038	0.084	0.084	1.86	51340	3900	45°
2.5	2	300	0.040	0.106	0.106	2.33	40985	3280	45°
3.0	2	300	0.046	0.126	0.126	2.79	34230	3150	45°

Acciaio
1100 - 1300 N/mm²



0.2	2	250	0.010	0.008	0.008	0.19	60000	1200	45°
0.5	2	250	0.018	0.022	0.022	0.47	60000	2160	45°
0.8	2	250	0.020	0.034	0.034	0.75	60000	2400	45°
1.0	2	250	0.026	0.042	0.042	0.93	60000	3120	45°
1.2	2	250	0.028	0.050	0.050	1.12	60000	3360	45°
1.5	2	250	0.030	0.064	0.064	1.40	56845	3410	45°
2.0	2	250	0.034	0.084	0.084	1.86	42785	2910	45°
2.5	2	250	0.036	0.106	0.106	2.33	34155	2460	45°
3.0	2	250	0.042	0.126	0.126	2.79	28525	2395	45°

Acciaio inossidabile
[Cr-Ni/1.4301]



0.2	2	120	0.008	0.008	0.008	0.19	60000	960	45°
0.5	2	120	0.016	0.022	0.022	0.47	60000	1920	45°
0.8	2	120	0.018	0.034	0.034	0.75	50930	1835	45°
1.0	2	120	0.022	0.042	0.042	0.93	41075	1805	45°
1.2	2	120	0.024	0.050	0.050	1.12	34105	1635	45°
1.5	2	120	0.028	0.064	0.064	1.40	27285	1530	45°
2.0	2	120	0.030	0.084	0.084	1.86	20535	1230	45°
2.5	2	120	0.032	0.106	0.106	2.33	16395	1050	45°
3.0	2	120	0.036	0.126	0.126	2.79	13690	985	45°

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



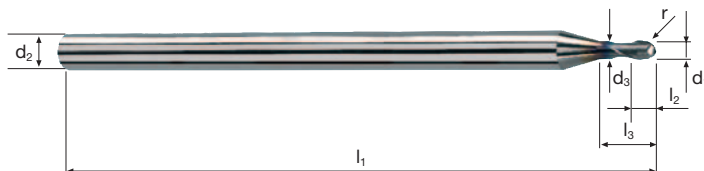
0.2	2	100	0.008	0.008	0.008	0.19	60000	960	45°
0.5	2	100	0.014	0.022	0.022	0.47	60000	1680	45°
0.8	2	100	0.016	0.034	0.034	0.75	42445	1360	45°
1.0	2	100	0.020	0.042	0.042	0.93	34230	1370	45°
1.2	2	100	0.022	0.050	0.050	1.12	28420	1250	45°
1.5	2	100	0.024	0.064	0.064	1.40	22735	1090	45°
2.0	2	100	0.026	0.084	0.084	1.86	17115	890	45°
2.5	2	100	0.028	0.106	0.106	2.33	13660	765	45°
3.0	2	100	0.032	0.126	0.126	2.79	11410	730	45°

Frese con estremità emisferica Microcut-B3

Gambo Ø 3 mm, scarico cilindrico, 3xd



HM λ 30°
Micro γ 5°



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Rm** 1300-1500 **Inox** Stainless **Ti** Titanium **Cobalt-Chrome Gold / Platinum Copper**

Esempio: N° Ordine										MICRO
Rivestimento Articolo Codice-ø										
M 5782 .020										M5782
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z	
.020	0.2	3	0.18	40	0.24	0.6	0.10	9.4°	2	●
.030	0.3	3	0.25	40	0.36	0.9	0.15	9.0°	2	●
.040	0.4	3	0.35	40	0.48	1.2	0.20	8.7°	2	●
.050	0.5	3	0.45	40	0.60	1.5	0.25	11.8°	2	●
.060	0.6	3	0.55	40	0.72	1.8	0.30	11.2°	2	●
.080	0.8	3	0.75	40	0.96	2.4	0.40	10.1°	2	●
.100	1.0	3	0.95	50	1.20	3.0	0.50	9.0°	2	●
.108	1.2	3	1.10	50	1.44	3.6	0.60	7.9°	2	●
.120	1.5	3	1.40	50	1.80	4.5	0.75	6.5°	2	●
.140	2.0	3	1.90	50	2.40	6.0	1.00	4.1°	2	●
.160	2.5	3	2.30	50	3.00	7.5	1.25	2.0°	2	●
.180	3.0	3	2.80	50	3.60	9.0	1.50	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]	
	Acciaio da utensile temprato 42 - 48 HRC	0.5	2	140	0.012	0.03	0.10	0.24	60000	1440	4.5	
		0.6	2	140	0.016	0.04	0.12	0.30	60000	1920	9.0	
		0.8	2	140	0.020	0.05	0.16	0.39	60000	2400	19.0	
		1.0	2	140	0.026	0.06	0.20	0.47	60000	3120	37.5	
		1.2	2	140	0.030	0.07	0.24	0.56	60000	3600	60.5	
		1.5	2	140	0.038	0.09	0.30	0.71	60000	4560	123.0	
		2.0	2	140	0.050	0.12	0.40	0.95	46910	4690	225.0	
		2.5	2	140	0.062	0.15	0.50	1.19	37450	4645	348.5	
		3.0	2	140	0.076	0.18	0.60	1.42	31385	4770	515.0	
		Acciaio da utensile temprato 48 - 52 HRC	0.5	2	120	0.012	0.03	0.10	0.24	60000	1440	4.5
			0.6	2	120	0.016	0.04	0.12	0.30	60000	1920	9.0
			0.8	2	120	0.020	0.05	0.16	0.39	60000	2400	19.0
		1.0	2	120	0.024	0.06	0.20	0.47	60000	2880	34.5	
		1.2	2	120	0.028	0.07	0.24	0.56	60000	3360	56.5	
		1.5	2	120	0.036	0.09	0.30	0.71	53800	3875	104.5	
		2.0	2	120	0.048	0.12	0.40	0.95	40210	3860	185.5	
		2.5	2	120	0.058	0.15	0.50	1.19	32100	3725	279.5	
		3.0	2	120	0.072	0.18	0.60	1.42	26900	3875	418.5	
	Acciaio da utensile temprato 52 - 56 HRC	0.5	2	100	0.010	0.03	0.10	0.24	60000	1200	3.5	
		0.6	2	100	0.014	0.04	0.12	0.30	60000	1680	8.0	
		0.8	2	100	0.018	0.05	0.16	0.39	60000	2160	17.5	
		1.0	2	100	0.022	0.06	0.20	0.47	60000	2640	31.5	
		1.2	2	100	0.026	0.07	0.24	0.56	56845	2955	49.5	
		1.5	2	100	0.034	0.09	0.30	0.71	44835	3050	82.5	
		2.0	2	100	0.044	0.12	0.40	0.95	33505	2950	141.5	
		2.5	2	100	0.054	0.15	0.50	1.19	26750	2890	217.0	
		3.0	2	100	0.066	0.18	0.60	1.42	22415	2960	319.5	
	Acciaio da utensile temprato 56 - 60 HRC	0.5	2	60	0.010	0.03	0.10	0.24	60000	1200	3.5	
		0.6	2	60	0.012	0.04	0.12	0.30	60000	1440	7.0	
		0.8	2	60	0.016	0.05	0.16	0.39	48970	1565	12.5	
		1.0	2	60	0.020	0.06	0.20	0.47	40635	1625	19.5	
		1.2	2	60	0.024	0.07	0.24	0.56	34105	1635	27.5	
		1.5	2	60	0.030	0.09	0.30	0.71	26900	1615	43.5	
		2.0	2	60	0.040	0.12	0.40	0.95	20105	1610	77.5	
		2.5	2	60	0.050	0.15	0.50	1.19	16050	1605	120.5	
		3.0	2	60	0.060	0.18	0.60	1.42	13450	1615	174.5	

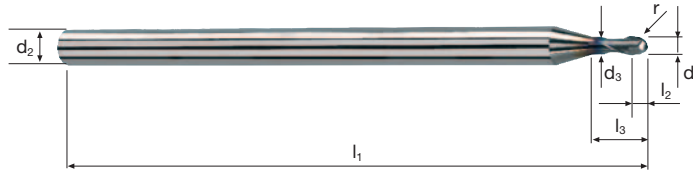
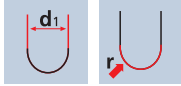
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]	
	Acciaio da utensile temprato 42 - 48 HRC	0.5	2	300	0.016	0.020	0.020	0.46	60000	1920	45°	
		0.6	2	300	0.018	0.024	0.024	0.56	60000	2160	45°	
		0.8	2	300	0.020	0.032	0.032	0.74	60000	2400	45°	
		1.0	2	300	0.022	0.042	0.042	0.93	60000	2640	45°	
		1.2	2	300	0.024	0.050	0.050	1.12	60000	2880	45°	
		1.5	2	300	0.028	0.062	0.062	1.40	60000	3360	45°	
		2.0	2	300	0.030	0.082	0.082	1.86	51340	3080	45°	
		2.5	2	300	0.032	0.102	0.102	2.32	41160	2635	45°	
		3.0	2	300	0.036	0.122	0.122	2.79	34230	2465	45°	
		Acciaio da utensile temprato 48 - 52 HRC	0.5	2	250	0.016	0.020	0.020	0.46	60000	1920	45°
			0.6	2	250	0.018	0.024	0.024	0.56	60000	2160	45°
			0.8	2	250	0.020	0.032	0.032	0.74	60000	2400	45°
		1.0	2	250	0.020	0.042	0.042	0.93	60000	2400	45°	
		1.2	2	250	0.022	0.050	0.050	1.12	60000	2640	45°	
		1.5	2	250	0.026	0.062	0.062	1.40	56845	2955	45°	
		2.0	2	250	0.028	0.082	0.082	1.86	42785	2395	45°	
		2.5	2	250	0.030	0.102	0.102	2.32	34300	2060	45°	
		3.0	2	250	0.034	0.122	0.122	2.79	28525	1940	45°	
	Acciaio da utensile temprato 52 - 56 HRC	0.5	2	200	0.014	0.020	0.020	0.46	60000	1680	45°	
		0.6	2	200	0.016	0.024	0.024	0.56	60000	1920	45°	
		0.8	2	200	0.018	0.032	0.032	0.74	60000	2160	45°	
		1.0	2	200	0.020	0.042	0.042	0.93	60000	2400	45°	
		1.2	2	200	0.022	0.050	0.050	1.12	56845	2500	45°	
		1.5	2	200	0.026	0.062	0.062	1.40	45475	2365	45°	
		2.0	2	200	0.028	0.082	0.082	1.86	34230	1915	45°	
		2.5	2	200	0.028	0.102	0.102	2.32	27440	1535	45°	
		3.0	2	200	0.032	0.122	0.122	2.79	22820	1460	45°	
	Acciaio da utensile temprato 56 - 60 HRC	0.5	2	150	0.012	0.020	0.020	0.46	60000	1440	45°	
		0.6	2	150	0.014	0.024	0.024	0.56	60000	1680	45°	
		0.8	2	150	0.016	0.032	0.032	0.74	60000	1920	45°	
		1.0	2	150	0.018	0.042	0.042	0.93	51340	1850	45°	
		1.2	2	150	0.020	0.050	0.050	1.12	42630	1705	45°	
		1.5	2	150	0.022	0.062	0.062	1.40	34105	1500	45°	
		2.0	2	150	0.024	0.082	0.082	1.86	25670	1230	45°	
		2.5	2	150	0.026	0.102	0.102	2.32	20580	1070	45°	
		3.0	2	150	0.028	0.122	0.122	2.79	17115	960	45°	

Frese con estremità emisferica Microcut-B3H

Gambo Ø 3 mm, scarico cilindrico, 3xd



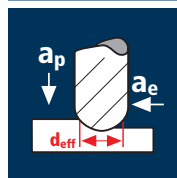
HM λ 30°
XA γ-10°



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium
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Esempio: N° Ordine										DURO-S
										D5792
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.050	0.5	3	0.45	40	0.60	1.5	0.25	11.8°	2	●
.060	0.6	3	0.55	40	0.72	1.8	0.30	11.2°	2	●
.080	0.8	3	0.75	40	0.96	2.4	0.40	10.1°	2	●
.100	1.0	3	0.95	50	1.20	3.0	0.50	9.0°	2	●
.108	1.2	3	1.10	50	1.44	3.6	0.60	7.9°	2	●
.120	1.5	3	1.40	50	1.80	4.5	0.75	6.5°	2	●
.140	2.0	3	1.90	50	2.40	6.0	1.00	4.1°	2	●
.160	2.5	3	2.30	50	3.00	7.5	1.25	2.0°	2	●
.180	3.0	3	2.80	50	3.60	9.0	1.50	0.0°	2	●

Applicazione

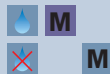


Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Rame non legato



Alluminio malleabile
Si < 6%



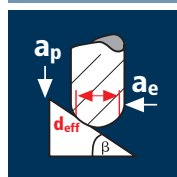
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
0.5	2	120	0.014	0.03	0.10	0.24	60000	1680	5.0
0.6	2	120	0.018	0.04	0.12	0.30	60000	2160	10.5
0.8	2	120	0.022	0.05	0.16	0.39	60000	2640	21.0
1.0	2	120	0.028	0.06	0.20	0.47	60000	3360	40.5
1.2	2	120	0.034	0.07	0.24	0.56	60000	4080	68.5
1.5	2	120	0.042	0.09	0.30	0.71	53800	4520	122.0
2.0	2	120	0.058	0.12	0.40	0.95	40210	4665	224.0
2.5	2	120	0.072	0.15	0.50	1.19	32100	4620	346.5
3.0	2	120	0.086	0.18	0.60	1.42	26900	4625	499.5

0.5	2	80	0.012	0.03	0.10	0.24	60000	1440	4.5
0.6	2	80	0.016	0.04	0.12	0.30	60000	1920	9.0
0.8	2	80	0.020	0.05	0.16	0.39	60000	2400	19.0
1.0	2	80	0.026	0.06	0.20	0.47	54180	2815	34.0
1.2	2	80	0.030	0.07	0.24	0.56	45475	2730	46.0
1.5	2	80	0.038	0.09	0.30	0.71	35865	2725	73.5
2.0	2	80	0.052	0.12	0.40	0.95	26805	2790	134.0
2.5	2	80	0.064	0.15	0.50	1.19	21400	2740	205.5
3.0	2	80	0.078	0.18	0.60	1.42	17935	2800	302.5

0.5	2	230	0.016	0.03	0.10	0.24	60000	1920	6.0
0.6	2	230	0.020	0.04	0.12	0.30	60000	2400	11.5
0.8	2	230	0.024	0.05	0.16	0.39	60000	2880	23.0
1.0	2	230	0.030	0.06	0.20	0.47	60000	3600	43.0
1.2	2	230	0.038	0.07	0.24	0.56	60000	4560	76.5
1.5	2	230	0.046	0.09	0.30	0.71	60000	5520	149.0
2.0	2	230	0.064	0.12	0.40	0.95	60000	7680	368.5
2.5	2	230	0.080	0.15	0.50	1.19	60000	9600	720.0
3.0	2	230	0.094	0.18	0.60	1.42	51560	9695	1047.0

0.5	2	480	0.016	0.03	0.10	0.24	60000	1920	6.0
0.6	2	480	0.020	0.04	0.12	0.30	60000	2400	11.5
0.8	2	480	0.024	0.05	0.16	0.39	60000	2880	23.0
1.0	2	480	0.030	0.06	0.20	0.47	60000	3600	43.0
1.2	2	480	0.038	0.07	0.24	0.56	60000	4560	76.5
1.5	2	480	0.046	0.09	0.30	0.71	60000	5520	149.0
2.0	2	480	0.064	0.12	0.40	0.95	60000	7680	368.5
2.5	2	480	0.080	0.15	0.50	1.19	60000	9600	720.0
3.0	2	480	0.094	0.18	0.60	1.42	60000	11280	1218.0

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Rame non legato



Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	220	0.016	0.020	0.020	0.46	60000	1920	45°
0.6	2	220	0.018	0.024	0.024	0.56	60000	2160	45°
0.8	2	220	0.022	0.032	0.032	0.74	60000	2400	45°
1.0	2	220	0.022	0.040	0.040	0.93	60000	2640	45°
1.2	2	220	0.024	0.048	0.048	1.11	60000	2880	45°
1.5	2	220	0.028	0.060	0.060	1.39	50380	2820	45°
2.0	2	220	0.030	0.080	0.080	1.86	37650	2260	45°
2.5	2	220	0.032	0.100	0.100	2.32	30185	1930	45°
3.0	2	220	0.036	0.120	0.120	2.78	25190	1815	45°

0.5	2	150	0.014	0.020	0.020	0.46	60000	1680	45°
0.6	2	150	0.016	0.024	0.024	0.56	60000	1920	45°
0.8	2	150	0.018	0.032	0.032	0.74	60000	2160	45°
1.0	2	150	0.020	0.040	0.040	0.93	51340	2055	45°
1.2	2	150	0.022	0.048	0.048	1.11	43015	1895	45°
1.5	2	150	0.026	0.060	0.060	1.39	34350	1785	45°
2.0	2	150	0.028	0.080	0.080	1.86	25670	1440	45°
2.5	2	150	0.028	0.100	0.100	2.32	20580	1150	45°
3.0	2	150	0.032	0.120	0.120	2.78	17175	1100	45°

0.5	2	400	0.018	0.020	0.020	0.46	60000	2160	45°
0.6	2	400	0.020	0.024	0.024	0.56	60000	2400	45°
0.8	2	400	0.022	0.032	0.032	0.74	60000	2640	45°
1.0	2	400	0.024	0.040	0.040	0.93	60000	2880	45°
1.2	2	400	0.026	0.048	0.048	1.11	60000	3120	45°
1.5	2	400	0.030	0.060	0.060	1.39	60000	3600	45°
2.0	2	400	0.034	0.080	0.080	1.86	60000	4080	45°
2.5	2	400	0.036	0.100	0.100	2.32	54885	3950	45°
3.0	2	400	0.040	0.120	0.120	2.78	45800	3665	45°

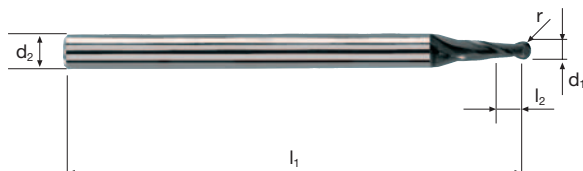
0.5	2	650	0.018	0.020	0.020	0.46	60000	2160	45°
0.6	2	650	0.020	0.024	0.024	0.56	60000	2400	45°
0.8	2	650	0.022	0.032	0.032	0.74	60000	2640	45°
1.0	2	650	0.024	0.040	0.040	0.93	60000	2880	45°
1.2	2	650	0.026	0.048	0.048	1.11	60000	3120	45°
1.5	2	650	0.030	0.060	0.060	1.39	60000	3600	45°
2.0	2	650	0.034	0.080	0.080	1.86	60000	4080	45°
2.5	2	650	0.036	0.100	0.100	2.32	60000	4320	45°
3.0	2	650	0.040	0.120	0.120	2.78	60000	4800	45°

Frese con estremità emisferica

Gambo Ø 3 mm, 3xd



HM λ 30°
γ 10°



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	Copper Aluminium
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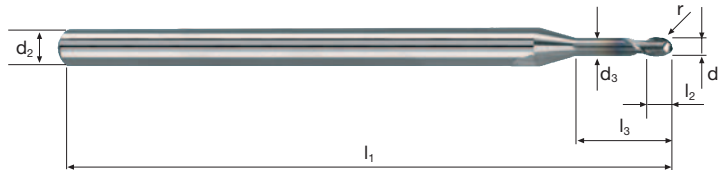
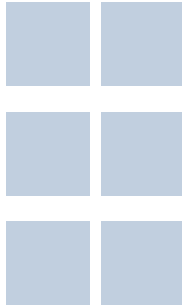
Esempio: N° Ordine										MICRO			
										5785	M45785		
Ø Code	d1 ±0.01	d2 h6	l1	l2	r ±0.01	α	z	Rivestimento M		Articolo 45785		Codice-ø .030	
.030	0.3	3	40	1.0	0.15	9.0°	2					●	●
.040	0.4	3	40	1.0	0.20	8.9°	2					●	●
.050	0.5	3	40	1.5	0.25	8.4°	2					●	●
.060	0.6	3	40	1.5	0.30	8.3°	2					●	●
.070	0.7	3	40	2.0	0.35	7.8°	2					●	●
.080	0.8	3	40	2.0	0.40	7.7°	2					●	●
.090	0.9	3	40	2.5	0.45	7.2°	2					●	●
.100	1.0	3	40	3.0	0.50	6.7°	2					●	●
.108	1.2	3	40	4.0	0.60	5.7°	2					●	●
.120	1.5	3	40	4.0	0.75	5.3°	2					●	●
.130	1.8	3	40	5.0	0.90	5.2°	2					●	●
.140	2.0	3	40	5.0	1.00	4.6°	2					●	●
.160	2.5	3	40	7.0	1.25	2.0°	2					●	●
.180	3.0	4	44	10.0	1.50	2.6°	2					●	●

Frese con estremità emisferica Microcut-B5

Gambo Ø 3 mm, scarico cilindrico, 5xd



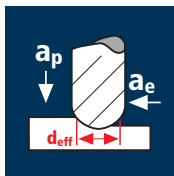
HM	λ 30°
Micro	γ 5°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper
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Esempio: N° Ordine											MICRO
		M	5784	.050							M5784
\emptyset Code	d1 ± 0.01	d2 h6	d3	l1	l2	l3	r ± 0.01	α	z		
.050	0.5	3	0.45	40	0.60	2.5	0.25	10.1°	2		●
.060	0.6	3	0.55	40	0.72	3.0	0.30	9.4°	2		●
.070	0.7	3	0.65	40	0.84	3.5	0.35	8.7°	2		●
.080	0.8	3	0.75	40	0.96	4.0	0.40	8.0°	2		●
.090	0.9	3	0.85	40	1.08	4.5	0.45	7.4°	2		●
.100	1.0	3	0.95	50	1.20	5.0	0.50	6.9°	2		●
.108	1.2	3	1.10	50	1.44	6.0	0.60	5.8°	2		●
.120	1.5	3	1.40	50	1.80	7.5	0.75	4.4°	2		●
.132	1.8	3	1.70	50	2.16	9.0	0.90	3.3°	2		●
.140	2.0	3	1.90	50	2.40	10.0	1.00	2.6°	2		●
.152	2.3	3	2.10	50	2.76	11.5	1.15	1.7°	2		●
.160	2.5	3	2.30	50	3.00	12.5	1.25	1.2°	2		●
.172	2.8	3	2.60	50	3.36	14.0	1.40	0.5°	2		●
.180	3.0	3	2.80	50	3.60	15.0	1.50	0.0°	2		●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.012	0.03	0.10	0.24	60000	1440	4.5
0.6	2	140	0.016	0.03	0.12	0.26	60000	1920	7.0
0.8	2	140	0.020	0.04	0.16	0.35	60000	2400	15.5
1.0	2	140	0.026	0.05	0.20	0.44	60000	3120	31.0
1.2	2	140	0.030	0.06	0.24	0.52	60000	3600	52.0
1.5	2	140	0.038	0.08	0.30	0.67	60000	4560	109.5
2.0	2	140	0.050	0.10	0.40	0.87	51225	5125	205.0
2.5	2	140	0.062	0.13	0.50	1.11	40150	4980	323.5
3.0	2	140	0.076	0.15	0.60	1.31	34020	5170	465.5

Acciaio da
utensile temprato
48 - 52 HRC



0.5	2	120	0.012	0.03	0.10	0.24	60000	1440	4.5
0.6	2	120	0.016	0.03	0.12	0.26	60000	1920	7.0
0.8	2	120	0.020	0.04	0.16	0.35	60000	2400	15.5
1.0	2	120	0.024	0.05	0.20	0.44	60000	2880	29.0
1.2	2	120	0.028	0.06	0.24	0.52	60000	3360	48.5
1.5	2	120	0.036	0.08	0.30	0.67	57010	4105	98.5
2.0	2	120	0.048	0.10	0.40	0.87	43905	4215	168.5
2.5	2	120	0.058	0.13	0.50	1.11	34415	3990	259.5
3.0	2	120	0.072	0.15	0.60	1.31	29160	4200	378.0

Acciaio da
utensile temprato
52 - 56 HRC



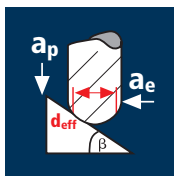
0.5	2	100	0.010	0.03	0.10	0.24	60000	1200	3.5
0.6	2	100	0.014	0.03	0.12	0.26	60000	1680	6.0
0.8	2	100	0.018	0.04	0.16	0.35	60000	2160	14.0
1.0	2	100	0.022	0.05	0.20	0.44	60000	2640	26.5
1.2	2	100	0.026	0.06	0.24	0.52	60000	3120	45.0
1.5	2	100	0.034	0.08	0.30	0.67	47510	3230	77.5
2.0	2	100	0.044	0.10	0.40	0.87	36590	3220	129.0
2.5	2	100	0.054	0.13	0.50	1.11	28675	3095	201.0
3.0	2	100	0.066	0.15	0.60	1.31	24300	3210	289.0

Acciaio da
utensile temprato
56 - 60 HRC



0.5	2	60	0.010	0.03	0.10	0.24	60000	1200	3.5
0.6	2	60	0.012	0.03	0.12	0.26	60000	1440	5.0
0.8	2	60	0.016	0.04	0.16	0.35	54570	1745	11.0
1.0	2	60	0.020	0.05	0.20	0.44	43405	1735	17.5
1.2	2	60	0.024	0.06	0.24	0.52	36730	1765	25.5
1.5	2	60	0.030	0.08	0.30	0.67	28505	1710	41.0
2.0	2	60	0.040	0.10	0.40	0.87	21955	1755	70.0
2.5	2	60	0.050	0.13	0.50	1.11	17205	1720	112.0
3.0	2	60	0.060	0.15	0.60	1.31	14580	1750	157.5

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.016	0.020	0.020	0.46	60000	1920	45°
0.6	2	300	0.018	0.024	0.024	0.56	60000	2160	45°
0.8	2	300	0.020	0.032	0.032	0.74	60000	2400	45°
1.0	2	300	0.022	0.040	0.040	0.93	60000	2640	45°
1.2	2	300	0.024	0.048	0.048	1.11	60000	2880	45°
1.5	2	300	0.028	0.060	0.060	1.39	60000	3360	45°
2.0	2	300	0.030	0.080	0.080	1.86	51340	3080	45°
2.5	2	300	0.032	0.100	0.100	2.32	41160	2635	45°
3.0	2	300	0.036	0.120	0.120	2.78	34350	2475	45°

Acciaio da
utensile temprato
48 - 52 HRC



0.5	2	250	0.016	0.020	0.020	0.46	60000	1920	45°
0.6	2	250	0.018	0.024	0.024	0.56	60000	2160	45°
0.8	2	250	0.020	0.032	0.032	0.74	60000	2400	45°
1.0	2	250	0.020	0.040	0.040	0.93	60000	2400	45°
1.2	2	250	0.022	0.048	0.048	1.11	60000	2640	45°
1.5	2	250	0.026	0.060	0.060	1.39	57250	2975	45°
2.0	2	250	0.028	0.080	0.080	1.86	42785	2395	45°
2.5	2	250	0.030	0.100	0.100	2.32	34300	2060	45°
3.0	2	250	0.034	0.120	0.120	2.78	28625	1945	45°

Acciaio da
utensile temprato
52 - 56 HRC



0.5	2	200	0.014	0.020	0.020	0.46	60000	1680	45°
0.6	2	200	0.016	0.024	0.024	0.56	60000	1920	45°
0.8	2	200	0.018	0.032	0.032	0.74	60000	2160	45°
1.0	2	200	0.020	0.040	0.040	0.93	60000	2400	45°
1.2	2	200	0.022	0.048	0.048	1.11	57355	2525	45°
1.5	2	200	0.026	0.060	0.060	1.39	45800	2380	45°
2.0	2	200	0.028	0.080	0.080	1.86	34230	1915	45°
2.5	2	200	0.028	0.100	0.100	2.32	27440	1535	45°
3.0	2	200	0.032	0.120	0.120	2.78	22900	1465	45°

Acciaio da
utensile temprato
56 - 60 HRC



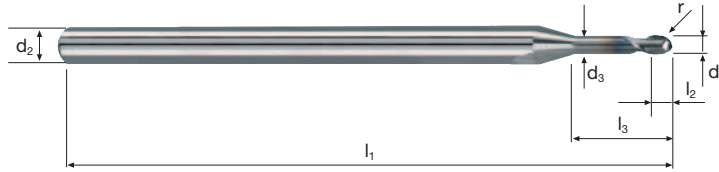
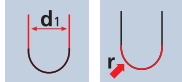
0.5	2	150	0.012	0.020	0.020	0.46	60000	1440	45°
0.6	2	150	0.014	0.024	0.024	0.56	60000	1680	45°
0.8	2	150	0.016	0.032	0.032	0.74	60000	1920	45°
1.0	2	150	0.018	0.040	0.040	0.93	51340	1850	45°
1.2	2	150	0.020	0.048	0.048	1.11	43015	1720	45°
1.5	2	150	0.022	0.060	0.060	1.39	34350	1510	45°
2.0	2	150	0.024	0.080	0.080	1.86	25670	1230	45°
2.5	2	150	0.026	0.100	0.100	2.32	20580	1070	45°
3.0	2	150	0.028	0.120	0.120	2.78	17175	960	45°

Frese con estremità emisferica Microcut-B5H

Gambo Ø 3 mm, scarico cilindrico, 5xd



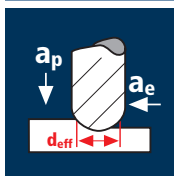
HM λ 30°
XA γ-10°



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium
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Esempio: N° Ordine										DURO-S	
										D5794	
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z		
.050	0.5	3	0.45	40	0.60	2.5	0.25	10.1°	2	●	
.060	0.6	3	0.55	40	0.72	3.0	0.30	9.4°	2	●	
.070	0.7	3	0.65	40	0.84	3.5	0.35	8.7°	2	●	
.080	0.8	3	0.75	40	0.96	4.0	0.40	8.0°	2	●	
.090	0.9	3	0.85	40	1.08	4.5	0.45	7.4°	2	●	
.100	1.0	3	0.95	50	1.20	5.0	0.50	6.9°	2	●	
.108	1.2	3	1.10	50	1.44	6.0	0.60	5.8°	2	●	
.120	1.5	3	1.40	50	1.80	7.5	0.75	4.4°	2	●	
.132	1.8	3	1.70	50	2.16	9.0	0.90	3.3°	2	●	
.140	2.0	3	1.90	50	2.40	10.0	1.00	2.6°	2	●	
.152	2.3	3	2.10	50	2.76	11.5	1.15	1.7°	2	●	
.160	2.5	3	2.30	50	3.00	12.5	1.25	1.2°	2	●	
.172	2.8	3	2.60	50	3.36	14.0	1.40	0.5°	2	●	
.180	3.0	3	2.80	50	3.60	15.0	1.50	0.0°	2	●	

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

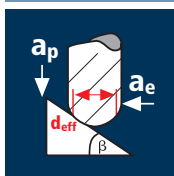
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	180	0.018	0.03	0.10	0.24	60000	2160	6.5
0.6	2	180	0.022	0.03	0.12	0.26	60000	2640	9.5
0.8	2	180	0.028	0.04	0.16	0.35	60000	3360	21.5
1.0	2	180	0.036	0.05	0.20	0.44	60000	4320	43.0
1.2	2	180	0.042	0.06	0.24	0.52	60000	5040	72.5
1.5	2	180	0.054	0.08	0.30	0.67	60000	6480	155.5
2.0	2	180	0.072	0.10	0.40	0.87	60000	8640	345.5
2.5	2	180	0.090	0.13	0.50	1.11	51620	9290	604.0
3.0	2	180	0.108	0.15	0.60	1.31	43740	9450	850.5

0.5	2	160	0.016	0.03	0.10	0.24	60000	1920	6.0
0.6	2	160	0.020	0.03	0.12	0.26	60000	2400	8.5
0.8	2	160	0.026	0.04	0.16	0.35	60000	3120	20.0
1.0	2	160	0.032	0.05	0.20	0.44	60000	3840	38.5
1.2	2	160	0.038	0.06	0.24	0.52	60000	4560	65.5
1.5	2	160	0.048	0.08	0.30	0.67	60000	5760	138.0
2.0	2	160	0.064	0.10	0.40	0.87	58540	7495	300.0
2.5	2	160	0.082	0.13	0.50	1.11	45885	7525	489.0
3.0	2	160	0.098	0.15	0.60	1.31	38880	7620	686.0

0.5	2	80	0.016	0.03	0.10	0.24	60000	1920	6.0
0.6	2	80	0.020	0.03	0.12	0.26	60000	2400	8.5
0.8	2	80	0.026	0.04	0.16	0.35	60000	3120	20.0
1.0	2	80	0.032	0.05	0.20	0.44	57875	3705	37.0
1.2	2	80	0.038	0.06	0.24	0.52	48970	3720	53.5
1.5	2	80	0.048	0.08	0.30	0.67	38010	3650	87.5
2.0	2	80	0.064	0.10	0.40	0.87	29270	3745	150.0
2.5	2	80	0.082	0.13	0.50	1.11	22940	3760	244.5
3.0	2	80	0.098	0.15	0.60	1.31	19440	3810	343.0

0.5	2	60	0.012	0.03	0.10	0.24	60000	1440	4.5
0.6	2	60	0.016	0.03	0.12	0.26	60000	1920	7.0
0.8	2	60	0.020	0.04	0.16	0.35	54570	2185	14.0
1.0	2	60	0.026	0.05	0.20	0.44	43405	2255	22.5
1.2	2	60	0.030	0.06	0.24	0.52	36730	2205	32.0
1.5	2	60	0.038	0.08	0.30	0.67	28505	2165	52.0
2.0	2	60	0.050	0.10	0.40	0.87	21955	2195	88.0
2.5	2	60	0.064	0.13	0.50	1.11	17205	2200	143.0
3.0	2	60	0.076	0.15	0.60	1.31	14580	2215	199.5

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.014	0.020	0.020	0.46	60000	1680	45°
0.6	2	300	0.016	0.022	0.022	0.55	60000	1920	45°
0.8	2	300	0.018	0.030	0.030	0.74	60000	2160	45°
1.0	2	300	0.022	0.038	0.038	0.92	60000	2640	45°
1.2	2	300	0.024	0.046	0.046	1.11	60000	2880	45°
1.5	2	300	0.028	0.058	0.058	1.39	60000	3360	45°
2.0	2	300	0.030	0.076	0.076	1.85	51620	3095	45°
2.5	2	300	0.032	0.096	0.096	2.31	41340	2645	45°
3.0	2	300	0.036	0.114	0.114	2.77	34475	2480	45°

0.5	2	250	0.012	0.020	0.020	0.46	60000	1440	45°
0.6	2	250	0.014	0.022	0.022	0.55	60000	1680	45°
0.8	2	250	0.016	0.030	0.030	0.74	60000	1920	45°
1.0	2	250	0.020	0.038	0.038	0.92	60000	2400	45°
1.2	2	250	0.022	0.046	0.046	1.11	60000	2640	45°
1.5	2	250	0.026	0.058	0.058	1.39	57250	2975	45°
2.0	2	250	0.028	0.076	0.076	1.85	43015	2410	45°
2.5	2	250	0.028	0.096	0.096	2.31	34450	1930	45°
3.0	2	250	0.032	0.114	0.114	2.77	28730	1840	45°

0.5	2	120	0.012	0.020	0.020	0.46	60000	1440	45°
0.6	2	120	0.012	0.022	0.022	0.55	60000	1440	45°
0.8	2	120	0.014	0.030	0.030	0.74	51620	1445	45°
1.0	2	120	0.018	0.038	0.038	0.92	41520	1495	45°
1.2	2	120	0.020	0.046	0.046	1.11	34415	1375	45°
1.5	2	120	0.022	0.058	0.058	1.39	27480	1210	45°
2.0	2	120	0.024	0.076	0.076	1.85	20650	990	45°
2.5	2	120	0.026	0.096	0.096	2.31	16535	860	45°
3.0	2	120	0.028	0.114	0.114	2.77	13790	770	45°

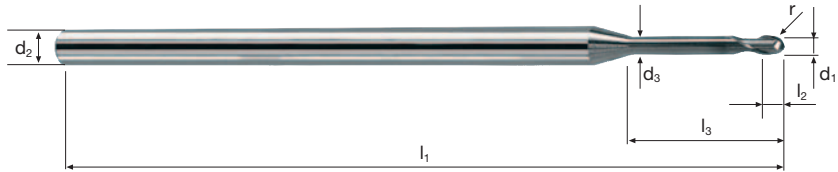
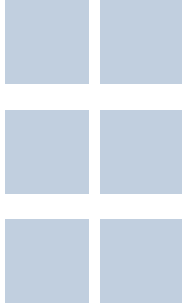
0.5	2	100	0.010	0.020	0.020	0.46	60000	1200	45°
0.6	2	100	0.012	0.022	0.022	0.55	57875	1390	45°
0.8	2	100	0.012	0.030	0.030	0.74	43015	1030	45°
1.0	2	100	0.016	0.038	0.038	0.92	34600	1105	45°
1.2	2	100	0.016	0.046	0.046	1.11	28675	920	45°
1.5	2	100	0.020	0.058	0.058	1.39	22900	915	45°
2.0	2	100	0.022	0.076	0.076	1.85	17205	755	45°
2.5	2	100	0.022	0.096	0.096	2.31	13780	605	45°
3.0	2	100	0.026	0.114	0.114	2.77	11490	595	45°

Frese con estremità emisferica Microcut-B8

Gambo Ø 3 mm, scarico cilindrico, 8xd



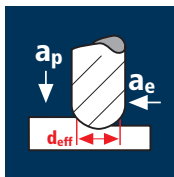
HM λ **30°**
Micro γ **5°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	Cobalt-Chrome Gold / Platinum Copper
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Esempio: N° Ordine										MICRO
										M5786
	Rivestimento M		Articolo 5786		Codice-ø .050					
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z	
.050	0.5	3	0.45	40	0.60	4.0	0.25	8.4°	2	●
.060	0.6	3	0.55	40	0.72	4.8	0.30	7.6°	2	●
.080	0.8	3	0.75	40	0.96	6.4	0.40	6.2°	2	●
.100	1.0	3	0.95	50	1.20	8.0	0.50	5.1°	2	●
.108	1.2	3	1.10	50	1.44	9.6	0.60	4.2°	2	●
.120	1.5	3	1.40	60	1.80	12.0	0.75	3.1°	2	●
.140	2.0	3	1.90	60	2.40	16.0	1.00	1.7°	2	●
.160	2.5	3	2.30	60	3.00	20.0	1.25	0.8°	2	●
.180	3.0	3	2.80	60	3.60	24.0	1.50	0.0°	2	●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

D

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	140	0.012	0.02	0.09	0.20	60000	1440	2.5
0.6	2	140	0.016	0.02	0.11	0.22	60000	1920	4.0
0.8	2	140	0.020	0.03	0.14	0.30	60000	2400	10.0
1.0	2	140	0.026	0.04	0.18	0.39	60000	3120	22.5
1.2	2	140	0.030	0.05	0.22	0.48	60000	3600	39.5
1.5	2	140	0.038	0.06	0.27	0.59	60000	4560	74.0
2.0	2	140	0.050	0.08	0.36	0.78	57135	5715	164.5
2.5	2	140	0.062	0.10	0.45	0.98	45475	5640	254.0
3.0	2	140	0.076	0.12	0.54	1.18	37765	5740	372.0

Acciaio da utensile temprato
48 - 52 HRC

D

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	120	0.012	0.02	0.09	0.20	60000	1440	2.5
0.6	2	120	0.016	0.02	0.11	0.22	60000	1920	4.0
0.8	2	120	0.020	0.03	0.14	0.30	60000	2400	10.0
1.0	2	120	0.024	0.04	0.18	0.39	60000	2880	20.5
1.2	2	120	0.028	0.05	0.22	0.48	60000	3360	37.0
1.5	2	120	0.036	0.06	0.27	0.59	60000	4320	70.0
2.0	2	120	0.048	0.08	0.36	0.78	48970	4700	135.5
2.5	2	120	0.058	0.10	0.45	0.98	38980	4520	203.5
3.0	2	120	0.072	0.12	0.54	1.18	32370	4660	302.0

Acciaio da utensile temprato
52 - 56 HRC

D

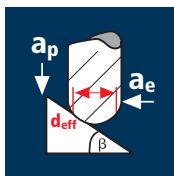
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	100	0.010	0.02	0.09	0.20	60000	1200	2.0
0.6	2	100	0.014	0.02	0.11	0.22	60000	1680	3.5
0.8	2	100	0.018	0.03	0.14	0.30	60000	2160	9.0
1.0	2	100	0.022	0.04	0.18	0.39	60000	2640	19.0
1.2	2	100	0.026	0.05	0.22	0.48	60000	3120	34.5
1.5	2	100	0.034	0.06	0.27	0.59	53950	3670	59.5
2.0	2	100	0.044	0.08	0.36	0.78	40810	3590	103.5
2.5	2	100	0.054	0.10	0.45	0.98	32480	3510	158.0
3.0	2	100	0.066	0.12	0.54	1.18	26975	3560	230.5

Acciaio da utensile temprato
56 - 60 HRC

D

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	60	0.010	0.02	0.09	0.20	60000	1200	2.0
0.6	2	60	0.012	0.02	0.11	0.22	60000	1440	3.0
0.8	2	60	0.016	0.03	0.14	0.30	60000	1920	8.0
1.0	2	60	0.020	0.04	0.18	0.39	48970	1960	14.0
1.2	2	60	0.024	0.05	0.22	0.48	39790	1910	21.0
1.5	2	60	0.030	0.06	0.27	0.59	32370	1940	31.5
2.0	2	60	0.040	0.08	0.36	0.78	24485	1960	56.5
2.5	2	60	0.050	0.10	0.45	0.98	19490	1950	88.0
3.0	2	60	0.060	0.12	0.54	1.18	16185	1940	125.5

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

D

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.016	0.020	0.020	0.46	60000	1920	45°
0.6	2	300	0.018	0.022	0.022	0.55	60000	2160	45°
0.8	2	300	0.020	0.030	0.030	0.74	60000	2400	45°
1.0	2	300	0.022	0.038	0.038	0.92	60000	2640	45°
1.2	2	300	0.024	0.046	0.046	1.11	60000	2880	45°
1.5	2	300	0.028	0.058	0.058	1.39	60000	3360	45°
2.0	2	300	0.030	0.076	0.076	1.85	51620	3095	45°
2.5	2	300	0.032	0.096	0.096	2.31	41340	2645	45°
3.0	2	300	0.036	0.114	0.114	2.77	34475	2480	45°

Acciaio da utensile temprato
48 - 52 HRC

D

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	250	0.016	0.020	0.020	0.46	60000	1920	45°
0.6	2	250	0.018	0.022	0.022	0.55	60000	2160	45°
0.8	2	250	0.020	0.030	0.030	0.74	60000	2400	45°
1.0	2	250	0.020	0.038	0.038	0.92	60000	2400	45°
1.2	2	250	0.022	0.046	0.046	1.11	60000	2640	45°
1.5	2	250	0.026	0.058	0.058	1.39	57250	2975	45°
2.0	2	250	0.028	0.076	0.076	1.85	43015	2410	45°
2.5	2	250	0.030	0.096	0.096	2.31	34450	2065	45°
3.0	2	250	0.034	0.114	0.114	2.77	28730	1955	45°

Acciaio da utensile temprato
52 - 56 HRC

D

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	200	0.014	0.020	0.020	0.46	60000	1680	45°
0.6	2	200	0.016	0.022	0.022	0.55	60000	1920	45°
0.8	2	200	0.018	0.030	0.030	0.74	60000	2160	45°
1.0	2	200	0.020	0.038	0.038	0.92	60000	2400	45°
1.2	2	200	0.022	0.046	0.046	1.11	57355	2525	45°
1.5	2	200	0.026	0.058	0.058	1.39	45800	2380	45°
2.0	2	200	0.028	0.076	0.076	1.85	34415	1925	45°
2.5	2	200	0.028	0.096	0.096	2.31	27560	1545	45°
3.0	2	200	0.032	0.114	0.114	2.77	22985	1470	45°

Acciaio da utensile temprato
56 - 60 HRC

D

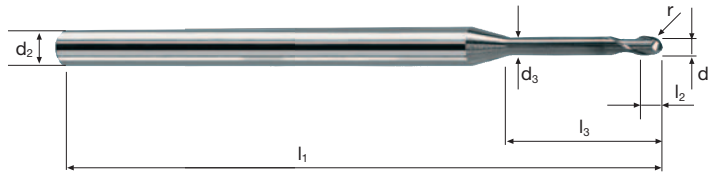
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d _{eff} [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	150	0.012	0.020	0.020	0.46	60000	1440	45°
0.6	2	150	0.014	0.022	0.022	0.55	60000	1680	45°
0.8	2	150	0.016	0.030	0.030	0.74	60000	1920	45°
1.0	2	150	0.018	0.038	0.038	0.92	51900	1870	45°
1.2	2	150	0.020	0.046	0.046	1.11	43015	1720	45°
1.5	2	150	0.022	0.058	0.058	1.39	34350	1510	45°
2.0	2	150	0.024	0.076	0.076	1.85	25810	1240	45°
2.5	2	150	0.026	0.096	0.096	2.31	20670	1075	45°
3.0	2	150	0.028	0.114	0.114	2.77	17240	965	45°

Frese con estremità emisferica Microcut-B8H

Gambo Ø 3 mm, scarico cilindrico, 8xd



HM XA λ 30°
γ-10°



Rm
850-1100

Rm
1100-1300

Rm
1300-1500

HRC
48-56

HRC
56-60

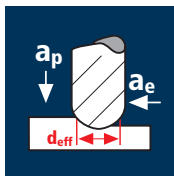
HRC
> 60

Inox
Stainless

Ti
Titanium

Esempio: N° Ordine		Rivestimento D	Articolo 5796	Codice-ø .050						DURO-S	
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	D5796	
.050	0.5	3	0.45	40	0.60	4.0	0.25	8.4°	2	●	
.060	0.6	3	0.55	40	0.72	4.8	0.30	7.6°	2	●	
.080	0.8	3	0.75	40	0.96	6.4	0.40	6.2°	2	●	
.100	1.0	3	0.95	50	1.20	8.0	0.50	5.1°	2	●	
.108	1.2	3	1.10	50	1.44	9.6	0.60	4.2°	2	●	
.120	1.5	3	1.40	60	1.80	12.0	0.75	3.1°	2	●	
.140	2.0	3	1.90	60	2.40	16.0	1.00	1.7°	2	●	
.160	2.5	3	2.30	60	3.00	20.0	1.25	0.8°	2	●	
.180	3.0	3	2.80	60	3.60	24.0	1.50	0.0°	2	●	

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

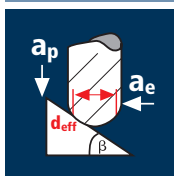
d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	Q [mm ³ /min]
0.5	2	180	0.018	0.02	0.08	0.20	60000	2160	3.5
0.6	2	180	0.022	0.02	0.09	0.22	60000	2640	5.0
0.8	2	180	0.028	0.03	0.12	0.30	60000	3360	12.0
1.0	2	180	0.036	0.04	0.15	0.39	60000	4320	26.0
1.2	2	180	0.042	0.05	0.18	0.48	60000	5040	45.5
1.5	2	180	0.054	0.06	0.23	0.59	60000	6480	89.5
2.0	2	180	0.072	0.08	0.30	0.78	60000	8640	207.5
2.5	2	180	0.090	0.10	0.38	0.98	58465	10525	400.0
3.0	2	180	0.108	0.12	0.45	1.18	48555	10490	566.5

0.5	2	160	0.016	0.02	0.08	0.20	60000	1920	3.0
0.6	2	160	0.020	0.02	0.09	0.22	60000	2400	4.5
0.8	2	160	0.026	0.03	0.12	0.30	60000	3120	11.0
1.0	2	160	0.032	0.04	0.15	0.39	60000	3840	23.0
1.2	2	160	0.038	0.05	0.18	0.48	60000	4560	41.0
1.5	2	160	0.048	0.06	0.23	0.59	60000	5760	79.5
2.0	2	160	0.064	0.08	0.30	0.78	60000	7680	184.5
2.5	2	160	0.082	0.10	0.38	0.98	51970	8525	324.0
3.0	2	160	0.098	0.12	0.45	1.18	43160	8460	457.0

0.5	2	80	0.016	0.02	0.08	0.20	60000	1920	3.0
0.6	2	80	0.020	0.02	0.09	0.22	60000	2400	4.5
0.8	2	80	0.026	0.03	0.12	0.30	60000	3120	11.0
1.0	2	80	0.032	0.04	0.15	0.39	60000	3840	23.0
1.2	2	80	0.038	0.05	0.18	0.48	53055	4030	36.5
1.5	2	80	0.048	0.06	0.23	0.59	43160	4145	57.0
2.0	2	80	0.064	0.08	0.30	0.78	32650	4180	100.5
2.5	2	80	0.082	0.10	0.38	0.98	25985	4260	162.0
3.0	2	80	0.098	0.12	0.45	1.18	21580	4230	228.5

0.5	2	60	0.012	0.02	0.08	0.20	60000	1440	2.5
0.6	2	60	0.016	0.02	0.09	0.22	60000	1920	3.5
0.8	2	60	0.020	0.03	0.12	0.30	60000	2400	8.5
1.0	2	60	0.026	0.04	0.15	0.39	48970	2545	15.5
1.2	2	60	0.030	0.05	0.18	0.48	39790	2385	21.5
1.5	2	60	0.038	0.06	0.23	0.59	32370	2460	34.0
2.0	2	60	0.050	0.08	0.30	0.78	24485	2450	59.0
2.5	2	60	0.064	0.10	0.38	0.98	19490	2495	95.0
3.0	2	60	0.076	0.12	0.45	1.18	16185	2460	133.0

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	deff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
0.5	2	300	0.012	0.018	0.018	0.46	60000	1440	45°
0.6	2	300	0.014	0.022	0.022	0.55	60000	1680	45°
0.8	2	300	0.016	0.028	0.028	0.73	60000	1920	45°
1.0	2	300	0.020	0.036	0.036	0.92	60000	2400	45°
1.2	2	300	0.022	0.042	0.042	1.10	60000	2640	45°
1.5	2	300	0.024	0.052	0.052	1.38	60000	2880	45°
2.0	2	300	0.026	0.070	0.070	1.84	51900	2700	45°
2.5	2	300	0.028	0.088	0.088	2.29	41700	2335	45°
3.0	2	300	0.032	0.106	0.106	2.75	34725	2220	45°

0.2	2	250	0.010	0.008	0.008	0.19	60000	1200	45°
0.5	2	250	0.012	0.018	0.018	0.46	60000	1440	45°
0.8	2	250	0.014	0.028	0.028	0.73	60000	1680	45°
1.0	2	250	0.018	0.036	0.036	0.92	60000	2160	45°
1.2	2	250	0.020	0.042	0.042	1.10	60000	2400	45°
1.5	2	250	0.022	0.052	0.052	1.38	57665	2535	45°
2.0	2	250	0.024	0.070	0.070	1.84	43250	2075	45°
2.5	2	250	0.026	0.088	0.088	2.29	34750	1805	45°
3.0	2	250	0.028	0.106	0.106	2.75	28940	1620	45°

0.2	2	120	0.010	0.008	0.008	0.19	60000	1200	45°
0.5	2	120	0.012	0.018	0.018	0.46	60000	1440	45°
0.8	2	120	0.012	0.028	0.028	0.73	52325	1255	45°
1.0	2	120	0.016	0.036	0.036	0.92	41520	1330	45°
1.2	2	120	0.018	0.042	0.042	1.10	34725	1250	45°
1.5	2	120	0.020	0.052	0.052	1.38	27680	1105	45°
2.0	2	120	0.020	0.070	0.070	1.84	20760	830	45°
2.5	2	120	0.022	0.088	0.088	2.29	16680	735	45°
3.0	2	120	0.026	0.106	0.106	2.75	13890	720	45°

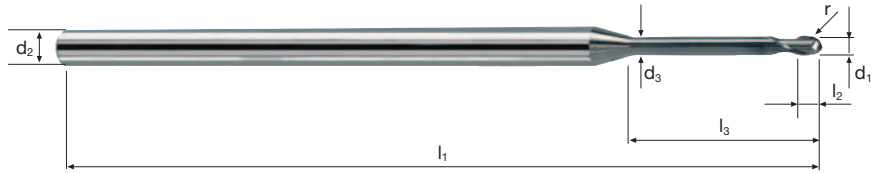
0.2	2	100	0.008	0.008	0.008	0.19	60000	960	45°
0.5	2	100	0.010	0.018	0.018	0.46	60000	1200	45°
0.8	2	100	0.012	0.028	0.028	0.73	43605	1045	45°
1.0	2	100	0.014	0.036	0.036	0.92	34600	970	45°
1.2	2	100	0.016	0.042	0.042	1.10	28940	925	45°
1.5	2	100	0.016	0.052	0.052	1.38	23065	740	45°
2.0	2	100	0.018	0.070	0.070	1.84	17300	625	45°
2.5	2	100	0.020	0.088	0.088	2.29	13900	555	45°
3.0	2	100	0.022	0.106	0.106	2.75	11575	510	45°

Frese con estremità emisferica Microcut-B10

Gambo Ø 3 mm, scarico cilindrico, 10xd



HM	λ 30°
Micro	γ 5°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	Gold / Platinum Copper
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Esempio: N° Ordine		Rivestimento M	Articolo 5787	Codice-Ø .050								MICRO
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z			M5787
.050	0.5	3	0.45	40	0.60	5.0	0.25	7.5°	2			●
.060	0.6	3	0.55	40	0.72	6.0	0.30	6.7°	2			●
.080	0.8	3	0.75	40	0.96	8.0	0.40	5.4°	2			●
.100	1.0	3	0.95	50	1.20	10.0	0.50	4.3°	2			●
.108	1.2	3	1.10	50	1.44	12.0	0.60	3.5°	2			●
.120	1.5	3	1.40	60	1.80	15.0	0.75	2.6°	2			●
.140	2.0	3	1.90	60	2.40	20.0	1.00	1.4°	2			●
.160	2.5	3	2.30	60	3.00	25.0	1.25	0.6°	2			●
.180	3.0	3	2.80	60	3.60	30.0	1.50	0.0°	2			●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	180	0.028	0.03	0.12	0.34	60000	3360	12.0
		1.2	2	180	0.034	0.04	0.14	0.43	60000	4080	23.0
		1.5	2	180	0.042	0.05	0.18	0.54	60000	5040	45.5
		2.0	2	180	0.058	0.06	0.24	0.68	60000	6960	100.0
		2.5	2	180	0.072	0.08	0.30	0.88	60000	8640	207.5
		3.0	2	180	0.086	0.09	0.36	1.02	56175	9660	313.0
Acciaio 1100 - 1300 N/mm ² 	1.0	2	160	0.026	0.03	0.12	0.34	60000	3120	11.0	
	1.2	2	160	0.030	0.04	0.14	0.43	60000	3600	20.0	
	1.5	2	160	0.038	0.05	0.18	0.54	60000	4560	41.0	
	2.0	2	160	0.052	0.06	0.24	0.68	60000	6240	90.0	
	2.5	2	160	0.064	0.08	0.30	0.88	57875	7410	178.0	
	3.0	2	160	0.078	0.09	0.36	1.02	49930	7790	252.5	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	80	0.022	0.03	0.12	0.34	60000	2640	9.5	
	1.2	2	80	0.028	0.04	0.14	0.43	59220	3315	18.5	
	1.5	2	80	0.034	0.05	0.18	0.54	47160	3205	29.0	
	2.0	2	80	0.046	0.06	0.24	0.68	37450	3445	49.5	
	2.5	2	80	0.058	0.08	0.30	0.88	28940	3355	80.5	
	3.0	2	80	0.068	0.09	0.36	1.02	24965	3395	110.0	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	60	0.020	0.03	0.12	0.34	56175	2245	8.0	
	1.2	2	60	0.024	0.04	0.14	0.43	44415	2130	12.0	
	1.5	2	60	0.030	0.05	0.18	0.54	35370	2120	19.0	
	2.0	2	60	0.040	0.06	0.24	0.68	28085	2245	32.5	
	2.5	2	60	0.050	0.08	0.30	0.88	21705	2170	52.0	
	3.0	2	60	0.060	0.09	0.36	1.02	18725	2245	72.5	

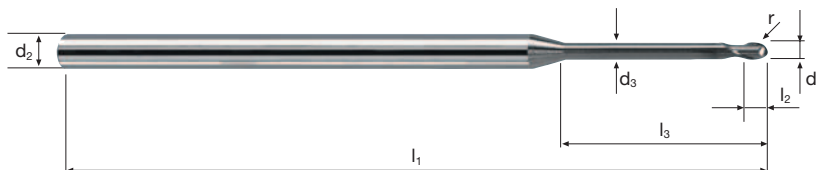
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	300	0.020	0.028	0.028	0.90	60000	2400	45°
		1.2	2	300	0.022	0.034	0.034	1.08	60000	2640	45°
		1.5	2	300	0.024	0.042	0.042	1.35	60000	2880	45°
		2.0	2	300	0.026	0.056	0.056	1.80	53055	2760	45°
		2.5	2	300	0.028	0.070	0.070	2.25	42445	2375	45°
		3.0	2	300	0.032	0.084	0.084	2.70	35370	2265	45°
Acciaio 1100 - 1300 N/mm ² 	1.0	2	250	0.018	0.028	0.028	0.90	60000	2160	45°	
	1.2	2	250	0.020	0.034	0.034	1.08	60000	2400	45°	
	1.5	2	250	0.022	0.042	0.042	1.35	58950	2595	45°	
	2.0	2	250	0.024	0.056	0.056	1.80	44210	2120	45°	
	2.5	2	250	0.026	0.070	0.070	2.25	35370	1840	45°	
	3.0	2	250	0.028	0.084	0.084	2.70	29475	1650	45°	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	120	0.016	0.028	0.028	0.90	42445	1360	45°	
	1.2	2	120	0.018	0.034	0.034	1.08	35370	1275	45°	
	1.5	2	120	0.020	0.042	0.042	1.35	28295	1130	45°	
	2.0	2	120	0.020	0.056	0.056	1.80	21220	850	45°	
	2.5	2	120	0.022	0.070	0.070	2.25	16975	745	45°	
	3.0	2	120	0.026	0.084	0.084	2.70	14150	735	45°	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	100	0.014	0.028	0.028	0.90	35370	990	45°	
	1.2	2	100	0.016	0.034	0.034	1.08	29475	945	45°	
	1.5	2	100	0.016	0.042	0.042	1.35	23580	755	45°	
	2.0	2	100	0.018	0.056	0.056	1.80	17685	635	45°	
	2.5	2	100	0.020	0.070	0.070	2.25	14150	565	45°	
	3.0	2	100	0.022	0.084	0.084	2.70	11790	520	45°	

Frese con estremità emisferica Microcut-B12

Gambo Ø 3 mm, scarico cilindrico, 12xd



HM λ **30°**
Micro γ **5°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	Gold / Platinum Copper
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Esempio: N° Ordine										MICRO
										M5791
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z	
.100	1.0	3	0.95	50	1.20	12.0	0.50	3.8°	2	●
.108	1.2	3	1.10	60	1.44	14.4	0.60	3.0°	2	●
.120	1.5	3	1.40	60	1.80	18.0	0.75	2.2°	2	●
.140	2.0	3	1.90	60	2.40	24.0	1.00	1.2°	2	●
.160	2.5	3	2.30	70	3.00	30.0	1.25	0.5°	2	●
.180	3.0	3	2.80	70	3.60	36.0	1.50	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	150	0.028	0.03	0.10	0.34	60000	3360	10.0
		1.2	2	150	0.034	0.04	0.12	0.43	60000	4080	19.5
		1.5	2	150	0.042	0.05	0.15	0.54	60000	5040	38.0
		2.0	2	150	0.058	0.06	0.20	0.68	60000	6960	83.5
		2.5	2	150	0.072	0.08	0.25	0.88	54260	7815	156.5
		3.0	2	150	0.086	0.09	0.30	1.02	46810	8050	217.5
Acciaio 1100 - 1300 N/mm ² 	1.0	2	120	0.026	0.03	0.10	0.34	60000	3120	9.5	
	1.2	2	120	0.030	0.04	0.12	0.43	60000	3600	17.5	
	1.5	2	120	0.038	0.05	0.15	0.54	60000	4560	34.0	
	2.0	2	120	0.052	0.06	0.20	0.68	56175	5840	70.0	
	2.5	2	120	0.064	0.08	0.25	0.88	43405	5555	111.0	
	3.0	2	120	0.078	0.09	0.30	1.02	37450	5840	157.5	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	70	0.022	0.03	0.10	0.34	60000	2640	8.0	
	1.2	2	70	0.028	0.04	0.12	0.43	51820	2900	14.0	
	1.5	2	70	0.034	0.05	0.15	0.54	41265	2805	21.0	
	2.0	2	70	0.046	0.06	0.20	0.68	32770	3015	36.0	
	2.5	2	70	0.058	0.08	0.25	0.88	25320	2935	58.5	
	3.0	2	70	0.068	0.09	0.30	1.02	21845	2970	80.0	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	50	0.020	0.03	0.10	0.34	46810	1870	5.5	
	1.2	2	50	0.024	0.04	0.12	0.43	37015	1775	8.5	
	1.5	2	50	0.030	0.05	0.15	0.54	29475	1770	13.5	
	2.0	2	50	0.040	0.06	0.20	0.68	23405	1870	22.5	
	2.5	2	50	0.050	0.08	0.25	0.88	18085	1810	36.0	
	3.0	2	50	0.060	0.09	0.30	1.02	15605	1875	50.5	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	250	0.020	0.026	0.026	0.90	60000	2400	45°
		1.2	2	250	0.022	0.032	0.032	1.08	60000	2640	45°
		1.5	2	250	0.024	0.040	0.040	1.35	58950	2830	45°
		2.0	2	250	0.026	0.052	0.052	1.79	44460	2310	45°
		2.5	2	250	0.028	0.066	0.066	2.24	35525	1990	45°
		3.0	2	250	0.032	0.078	0.078	2.69	29585	1895	45°
Acciaio 1100 - 1300 N/mm ² 	1.0	2	200	0.018	0.026	0.026	0.90	60000	2160	45°	
	1.2	2	200	0.020	0.032	0.032	1.08	58950	2360	45°	
	1.5	2	200	0.022	0.040	0.040	1.35	47160	2075	45°	
	2.0	2	200	0.024	0.052	0.052	1.79	35565	1705	45°	
	2.5	2	200	0.026	0.066	0.066	2.24	28420	1480	45°	
	3.0	2	200	0.028	0.078	0.078	2.69	23665	1325	45°	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	100	0.016	0.026	0.026	0.90	35370	1130	45°	
	1.2	2	100	0.018	0.032	0.032	1.08	29475	1060	45°	
	1.5	2	100	0.020	0.040	0.040	1.35	23580	945	45°	
	2.0	2	100	0.020	0.052	0.052	1.79	17785	710	45°	
	2.5	2	100	0.022	0.066	0.066	2.24	14210	625	45°	
	3.0	2	100	0.026	0.078	0.078	2.69	11835	615	45°	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	80	0.014	0.026	0.026	0.90	28295	790	45°	
	1.2	2	80	0.016	0.032	0.032	1.08	23580	755	45°	
	1.5	2	80	0.016	0.040	0.040	1.35	18865	605	45°	
	2.0	2	80	0.018	0.052	0.052	1.79	14225	510	45°	
	2.5	2	80	0.020	0.066	0.066	2.24	11370	455	45°	
	3.0	2	80	0.022	0.078	0.078	2.69	9465	415	45°	

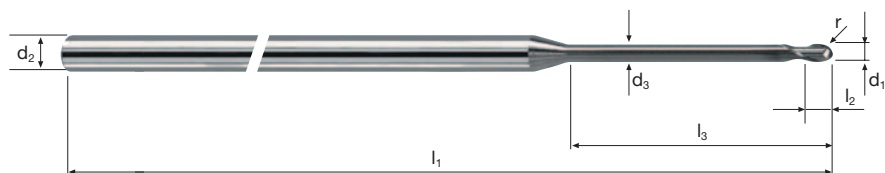
Frese con estremità emisferica Microcut-B15

Gambo Ø 3 mm, scarico cilindrico, 15xd



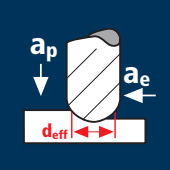
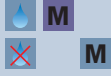



HM
Micro

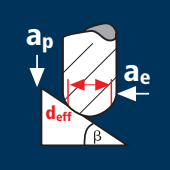
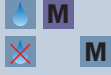



λ **30°**
 γ **5°**



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	Gold / Platinum Copper
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Esempio: N° Ordine										MICRO	
	Rivestimento		Articolo		Codice-ø						
	M		5793		.100						M5793
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z		
.100	1.0	3	0.95	60	1.20	15.0	0.50	3.2°	2	●	
.108	1.2	3	1.10	60	1.44	18.0	0.60	2.5°	2	●	
.120	1.5	3	1.40	70	1.80	22.5	0.75	1.8°	2	●	
.140	2.0	3	1.90	70	2.40	30.0	1.00	1.0°	2	●	
.160	2.5	3	2.30	70	3.00	37.5	1.25	0.4°	2	●	
.180	3.0	3	2.80	80	3.60	45.0	1.50	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	Q [mm ³ /min]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	150	0.028	0.03	0.08	0.34	60000	3360	8.0
		1.2	2	150	0.034	0.04	0.10	0.43	60000	4080	16.5
		1.5	2	150	0.042	0.05	0.12	0.54	60000	5040	30.0
		2.0	2	150	0.058	0.06	0.16	0.68	60000	6960	67.0
		2.5	2	150	0.072	0.08	0.20	0.88	54260	7815	125.0
		3.0	2	150	0.086	0.09	0.24	1.02	46810	8050	174.0
Acciaio 1100 - 1300 N/mm ² 	1.0	2	120	0.026	0.03	0.08	0.34	60000	3120	7.5	
	1.2	2	120	0.030	0.04	0.10	0.43	60000	3600	14.5	
	1.5	2	120	0.038	0.05	0.12	0.54	60000	4560	27.5	
	2.0	2	120	0.052	0.06	0.16	0.68	56175	5840	56.0	
	2.5	2	120	0.064	0.08	0.20	0.88	43405	5555	89.0	
	3.0	2	120	0.078	0.09	0.24	1.02	37450	5840	126.0	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	70	0.022	0.03	0.08	0.34	60000	2640	6.5	
	1.2	2	70	0.028	0.04	0.10	0.43	51820	2900	11.5	
	1.5	2	70	0.034	0.05	0.12	0.54	41265	2805	17.0	
	2.0	2	70	0.046	0.06	0.16	0.68	32770	3015	29.0	
	2.5	2	70	0.058	0.08	0.20	0.88	25320	2935	47.0	
	3.0	2	70	0.068	0.09	0.24	1.02	21845	2970	64.0	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	50	0.020	0.03	0.08	0.34	46810	1870	4.5	
	1.2	2	50	0.024	0.04	0.10	0.43	37015	1775	7.0	
	1.5	2	50	0.030	0.05	0.12	0.54	29475	1770	10.5	
	2.0	2	50	0.040	0.06	0.16	0.68	23405	1870	18.0	
	2.5	2	50	0.050	0.08	0.20	0.88	18085	1810	29.0	
	3.0	2	50	0.060	0.09	0.24	1.02	15605	1875	40.5	

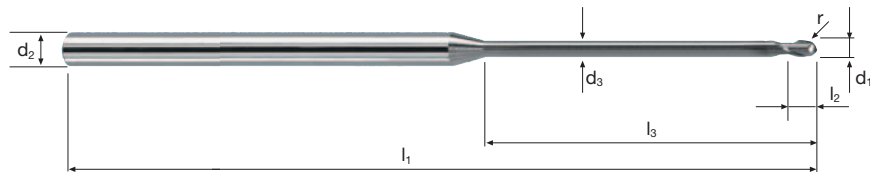
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	250	0.020	0.022	0.022	0.88	60000	2400	45°
		1.2	2	250	0.022	0.026	0.026	1.06	60000	2640	45°
		1.5	2	250	0.024	0.034	0.034	1.33	59835	2870	45°
		2.0	2	250	0.026	0.044	0.044	1.77	44960	2340	45°
		2.5	2	250	0.028	0.056	0.056	2.21	36010	2015	45°
		3.0	2	250	0.032	0.066	0.066	2.65	30030	1920	45°
Acciaio 1100 - 1300 N/mm ² 	1.0	2	200	0.018	0.022	0.022	0.88	60000	2160	45°	
	1.2	2	200	0.020	0.026	0.026	1.06	60000	2400	45°	
	1.5	2	200	0.022	0.034	0.034	1.33	47870	2105	45°	
	2.0	2	200	0.024	0.044	0.044	1.77	35970	1725	45°	
	2.5	2	200	0.026	0.056	0.056	2.21	28805	1500	45°	
	3.0	2	200	0.028	0.066	0.066	2.65	24025	1345	45°	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	100	0.016	0.022	0.022	0.88	36175	1160	45°	
	1.2	2	100	0.018	0.026	0.026	1.06	30030	1080	45°	
	1.5	2	100	0.020	0.034	0.034	1.33	23935	955	45°	
	2.0	2	100	0.020	0.044	0.044	1.77	17985	720	45°	
	2.5	2	100	0.022	0.056	0.056	2.21	14405	635	45°	
	3.0	2	100	0.026	0.066	0.066	2.65	12010	625	45°	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	80	0.014	0.022	0.022	0.88	28940	810	45°	
	1.2	2	80	0.016	0.026	0.026	1.06	24025	770	45°	
	1.5	2	80	0.016	0.034	0.034	1.33	19145	615	45°	
	2.0	2	80	0.018	0.044	0.044	1.77	14385	520	45°	
	2.5	2	80	0.020	0.056	0.056	2.21	11525	460	45°	
	3.0	2	80	0.022	0.066	0.066	2.65	9610	425	45°	

Frese con estremità emisferica Microcut-B20

Gambo Ø 3 mm, scarico cilindrico, 20xd



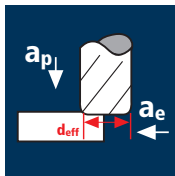
HM λ 30°
Micro γ 5°



Rm < 850	Rm 850-1100	Rm 1100-1300								Gold / Platinum Copper
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Esempio: N° Ordine										MICRO	
		Rivestimento	Articolo	Codice-ø							
		M	15795	.100							M15795
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z		
.100	1.0	3	0.95	60	1.20	20	0.50	2.5°	2	●	
.108	1.2	3	1.10	60	1.44	24	0.60	2.0°	2	●	
.120	1.5	3	1.40	70	1.80	30	0.75	1.4°	2	●	
.140	2.0	3	1.90	80	2.40	40	1.00	0.8°	2	●	
.160	2.5	3	2.30	80	3.00	50	1.25	0.3°	2	●	
.180	3.0	3	2.80	90	3.60	60	1.50	0.0°	2	●	

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

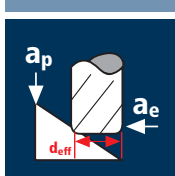
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	140	0.016	0.03	0.10	0.44	60000	1920	r=0.1
0.8	2	140	0.026	0.05	0.16	0.77	57875	3010	r=0.1
1.0	2	140	0.034	0.06	0.20	0.89	50075	3405	r=0.2
1.2	2	140	0.040	0.07	0.24	1.10	40515	3240	r=0.2
1.5	2	140	0.050	0.09	0.30	1.43	31165	3115	r=0.2
2.0	2	140	0.066	0.12	0.40	1.97	22620	2985	r=0.2
2.5	2	140	0.084	0.15	0.50	2.49	17895	3005	r=0.2
3.0	2	140	0.100	0.18	0.60	3.00	14855	2970	r=0.2

0.5	2	120	0.016	0.03	0.10	0.44	60000	1920	r=0.1
0.8	2	120	0.024	0.05	0.16	0.77	49610	2380	r=0.1
1.0	2	120	0.032	0.06	0.20	0.89	42920	2745	r=0.2
1.2	2	120	0.038	0.07	0.24	1.10	34725	2640	r=0.2
1.5	2	120	0.048	0.09	0.30	1.43	26710	2565	r=0.2
2.0	2	120	0.062	0.12	0.40	1.97	19390	2405	r=0.2
2.5	2	120	0.080	0.15	0.50	2.49	15340	2455	r=0.2
3.0	2	120	0.096	0.18	0.60	3.00	12735	2445	r=0.2

0.5	2	100	0.014	0.03	0.10	0.44	60000	1680	r=0.1
0.8	2	100	0.022	0.05	0.16	0.77	41340	1820	r=0.1
1.0	2	100	0.030	0.06	0.20	0.89	35765	2145	r=0.2
1.2	2	100	0.036	0.07	0.24	1.10	28940	2085	r=0.2
1.5	2	100	0.044	0.09	0.30	1.43	22260	1960	r=0.2
2.0	2	100	0.058	0.12	0.40	1.97	16160	1875	r=0.2
2.5	2	100	0.074	0.15	0.50	2.49	12785	1890	r=0.2
3.0	2	100	0.088	0.18	0.60	3.00	10610	1865	r=0.2

0.5	2	60	0.012	0.03	0.10	0.44	43405	1040	r=0.1
0.8	2	60	0.020	0.05	0.16	0.77	24805	990	r=0.1
1.0	2	60	0.028	0.06	0.20	0.89	21460	1200	r=0.2
1.2	2	60	0.032	0.07	0.24	1.10	17365	1110	r=0.2
1.5	2	60	0.040	0.09	0.30	1.43	13355	1070	r=0.2
2.0	2	60	0.052	0.12	0.40	1.97	9695	1010	r=0.2
2.5	2	60	0.068	0.15	0.50	2.49	7670	1045	r=0.2
3.0	2	60	0.080	0.18	0.60	3.00	6365	1020	r=0.2

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	300	0.020	0.022	0.022	0.50	60000	2400	45°
0.8	2	300	0.022	0.034	0.034	0.80	60000	2640	45°
1.0	2	300	0.028	0.042	0.042	1.00	60000	3360	45°
1.2	2	300	0.030	0.050	0.050	1.20	60000	3600	45°
1.5	2	300	0.034	0.064	0.064	1.50	60000	4080	45°
2.0	2	300	0.038	0.084	0.084	1.99	47990	3645	45°
2.5	2	300	0.040	0.106	0.106	2.48	38505	3080	45°
3.0	2	300	0.046	0.126	0.126	2.97	32155	2960	45°

0.5	2	250	0.020	0.022	0.022	0.50	60000	2400	45°
0.8	2	250	0.020	0.034	0.034	0.80	60000	2400	45°
1.0	2	250	0.026	0.042	0.042	1.00	60000	3120	45°
1.2	2	250	0.028	0.050	0.050	1.20	60000	3360	45°
1.5	2	250	0.032	0.064	0.064	1.50	53055	3395	45°
2.0	2	250	0.036	0.084	0.084	1.99	39990	2880	45°
2.5	2	250	0.038	0.106	0.106	2.48	32090	2440	45°
3.0	2	250	0.044	0.126	0.126	2.97	26795	2360	45°

0.5	2	200	0.018	0.022	0.022	0.50	60000	2160	45°
0.8	2	200	0.020	0.034	0.034	0.80	60000	2400	45°
1.0	2	200	0.026	0.042	0.042	1.00	60000	3120	45°
1.2	2	200	0.028	0.050	0.050	1.20	53055	2970	45°
1.5	2	200	0.030	0.064	0.064	1.50	42445	2545	45°
2.0	2	200	0.034	0.084	0.084	1.99	31990	2175	45°
2.5	2	200	0.036	0.106	0.106	2.48	25670	1850	45°
3.0	2	200	0.042	0.126	0.126	2.97	21435	1800	45°

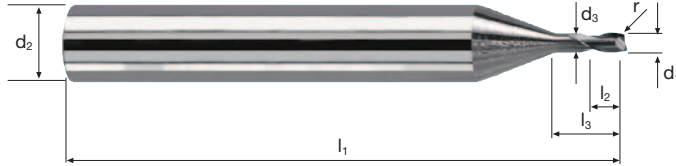
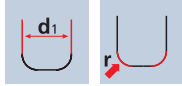
0.5	2	150	0.016	0.022	0.022	0.50	60000	1920	45°
0.8	2	150	0.018	0.034	0.034	0.80	59685	2150	45°
1.0	2	150	0.022	0.042	0.042	1.00	47750	2100	45°
1.2	2	150	0.024	0.050	0.050	1.20	39790	1910	45°
1.5	2	150	0.028	0.064	0.064	1.50	31830	1780	45°
2.0	2	150	0.030	0.084	0.084	1.99	23995	1440	45°
2.5	2	150	0.032	0.106	0.106	2.48	19255	1230	45°
3.0	2	150	0.036	0.126	0.126	2.97	16075	1155	45°

Frese toriche MicroX

Gambo Ø 6 mm, scarico cilindrico, 3xd



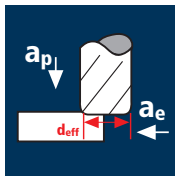
**HM
XA** λ **25°**
 γ **-10°**



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Rm** 1300-1500 **HRC** 48-56 **HRC** 56-60 **HRC** > 60 **Inox** Stainless **Ti** Titanium **Cobalt-Chrome Copper**





Esempio: N° Ordine										X-AL
Rivestimento: X Articolo: 6532 Codice-ø: .050										X6532
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.01	α	z	
.050	0.5	6	0.45	57	0.5	1.5	0.10	13.2°	2	●
.080	0.8	6	0.75	57	0.8	2.4	0.10	12.2°	2	●
.100	1.0	6	0.95	57	1.0	3.0	0.20	11.6°	2	●
.108	1.2	6	1.10	57	1.2	3.6	0.20	10.9°	2	●
.120	1.5	6	1.40	57	1.5	4.5	0.20	10.0°	2	●
.140	2.0	6	1.90	57	2.0	6.0	0.20	8.6°	2	●
.160	2.5	6	2.30	57	2.5	7.5	0.20	7.2°	2	●
.180	3.0	6	2.80	57	3.0	9.0	0.20	6.0°	2	●
.145	2.0	6	1.90	57	2.0	6.0	0.50	8.7°	2	●
.165	2.5	6	2.30	57	2.5	7.5	0.50	7.3°	2	●
.185	3.0	6	2.80	57	3.0	9.0	0.50	6.1°	2	●

Applicazione







Materiale





Acciaio da utensile temprato
42 - 48 HRC





Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

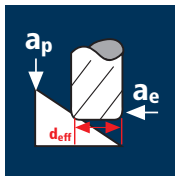
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	140	0.016	0.03	0.10	0.44	60000	1920	r=0.1
0.8	2	140	0.026	0.04	0.16	0.76	58640	3050	r=0.1
1.0	2	140	0.034	0.05	0.20	0.86	51820	3525	r=0.2
1.2	2	140	0.040	0.06	0.24	1.09	40885	3270	r=0.2
1.5	2	140	0.050	0.08	0.30	1.42	31385	3140	r=0.2
2.0	2	140	0.066	0.10	0.40	1.95	22855	3015	r=0.2
2.5	2	140	0.084	0.13	0.50	2.47	18040	3030	r=0.2
3.0	2	140	0.100	0.15	0.60	2.99	14905	2980	r=0.2

0.5	2	120	0.016	0.03	0.10	0.44	60000	1920	r=0.1
0.8	2	120	0.024	0.04	0.16	0.76	50260	2410	r=0.1
1.0	2	120	0.032	0.05	0.20	0.86	44415	2845	r=0.2
1.2	2	120	0.038	0.06	0.24	1.09	35045	2665	r=0.2
1.5	2	120	0.048	0.08	0.30	1.42	26900	2580	r=0.2
2.0	2	120	0.062	0.10	0.40	1.95	19590	2430	r=0.2
2.5	2	120	0.080	0.13	0.50	2.47	15465	2475	r=0.2
3.0	2	120	0.096	0.15	0.60	2.99	12775	2455	r=0.2

0.5	2	100	0.014	0.03	0.10	0.44	60000	1680	r=0.1
0.8	2	100	0.022	0.04	0.16	0.76	41885	1845	r=0.1
1.0	2	100	0.030	0.05	0.20	0.86	37015	2220	r=0.2
1.2	2	100	0.036	0.06	0.24	1.09	29205	2105	r=0.2
1.5	2	100	0.044	0.08	0.30	1.42	22415	1975	r=0.2
2.0	2	100	0.058	0.10	0.40	1.95	16325	1895	r=0.2
2.5	2	100	0.074	0.13	0.50	2.47	12885	1905	r=0.2
3.0	2	100	0.088	0.15	0.60	2.99	10645	1875	r=0.2




0.5	2	60	0.012	0.03	0.10	0.44	43405	1040	r=0.1
0.8	2	60	0.020	0.04	0.16	0.76	25130	1005	r=0.1
1.0	2	60	0.028	0.05	0.20	0.86	22210	1245	r=0.2
1.2	2	60	0.032	0.06	0.24	1.09	17520	1120	r=0.2
1.5	2	60	0.040	0.08	0.30	1.42	13450	1075	r=0.2
2.0	2	60	0.052	0.10	0.40	1.95	9795	1020	r=0.2
2.5	2	60	0.068	0.13	0.50	2.47	7730	1050	r=0.2
3.0	2	60	0.080	0.15	0.60	2.99	6390	1020	r=0.2

Applicazione







Materiale





Acciaio da utensile temprato
42 - 48 HRC





Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	300	0.020	0.020	0.020	0.50	60000	2400	45°
0.8	2	300	0.022	0.032	0.032	0.80	60000	2640	45°
1.0	2	300	0.028	0.042	0.042	1.00	60000	3360	45°
1.2	2	300	0.030	0.050	0.050	1.20	60000	3600	45°
1.5	2	300	0.034	0.062	0.062	1.50	60000	4080	45°
2.0	2	300	0.038	0.082	0.082	2.00	47750	3630	45°
2.5	2	300	0.040	0.102	0.102	2.49	38350	3070	45°
3.0	2	300	0.046	0.122	0.122	2.97	32155	2960	45°

0.5	2	250	0.020	0.020	0.020	0.50	60000	2400	45°
0.8	2	250	0.020	0.032	0.032	0.80	60000	2400	45°
1.0	2	250	0.026	0.042	0.042	1.00	60000	3120	45°
1.2	2	250	0.028	0.050	0.050	1.20	60000	3360	45°
1.5	2	250	0.032	0.062	0.062	1.50	53055	3395	45°
2.0	2	250	0.036	0.082	0.082	2.00	39790	2865	45°
2.5	2	250	0.038	0.102	0.102	2.49	31960	2430	45°
3.0	2	250	0.044	0.122	0.122	2.97	26795	2360	45°

0.5	2	200	0.018	0.020	0.020	0.50	60000	2160	45°
0.8	2	200	0.020	0.032	0.032	0.80	60000	2400	45°
1.0	2	200	0.026	0.042	0.042	1.00	60000	3120	45°
1.2	2	200	0.028	0.050	0.050	1.20	53055	2970	45°
1.5	2	200	0.030	0.062	0.062	1.50	42445	2545	45°
2.0	2	200	0.034	0.082	0.082	2.00	31830	2165	45°
2.5	2	200	0.036	0.102	0.102	2.49	25570	1840	45°
3.0	2	200	0.042	0.122	0.122	2.97	21435	1800	45°

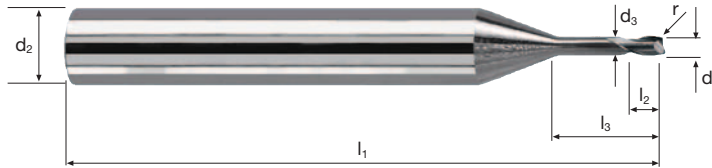
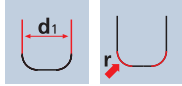
0.5	2	150	0.016	0.020	0.020	0.50	60000	1920	45°
0.8	2	150	0.018	0.032	0.032	0.80	59685	2150	45°
1.0	2	150	0.022	0.042	0.042	1.00	47750	2100	45°
1.2	2	150	0.024	0.050	0.050	1.20	39790	1910	45°
1.5	2	150	0.028	0.062	0.062	1.50	31830	1780	45°
2.0	2	150	0.030	0.082	0.082	2.00	23875	1435	45°
2.5	2	150	0.032	0.102	0.102	2.49	19175	1225	45°
3.0	2	150	0.036	0.122	0.122	2.97	16075	1155	45°

Frese toriche MicroX

Gambo Ø 6 mm, scarico cilindrico, 5xd



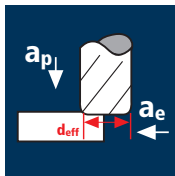
HM
XA λ 25°
γ-10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine										X-AL
		Rivestimento	Articolo	Codice-ø						X6534
		X	6534	.050						
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.01	α	z	
.050	0.5	6	0.45	57	0.5	2.5	0.10	12.2°	2	●
.080	0.8	6	0.75	57	0.8	4.0	0.10	10.8°	2	●
.100	1.0	6	0.95	57	1.0	5.0	0.20	9.9°	2	●
.108	1.2	6	1.10	57	1.2	6.0	0.20	9.2°	2	●
.120	1.5	6	1.40	61	1.5	7.5	0.20	8.1°	2	●
.140	2.0	6	1.90	61	2.0	10.0	0.20	6.6°	2	●
.160	2.5	6	2.30	61	2.5	12.5	0.20	5.3°	2	●
.180	3.0	6	2.80	66	3.0	15.0	0.20	4.2°	2	●
.145	2.0	6	1.90	61	2.0	10.0	0.50	6.7°	2	●
.165	2.5	6	2.30	61	2.5	12.5	0.50	5.4°	2	●
.185	3.0	6	2.80	66	3.0	15.0	0.50	4.3°	2	●



Applicazione





Materiale

Acciaio da utensile temprato
42 - 48 HRC



 



Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

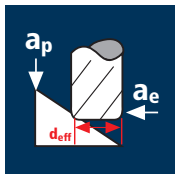
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	140	0.016	0.02	0.09	0.42	60000	1920	r=0.1
0.8	2	140	0.026	0.03	0.14	0.74	60000	3120	r=0.1
1.0	2	140	0.034	0.04	0.18	0.84	53055	3610	r=0.2
1.2	2	140	0.040	0.05	0.22	1.06	42040	3365	r=0.2
1.5	2	140	0.050	0.06	0.27	1.39	32060	3205	r=0.2
2.0	2	140	0.066	0.08	0.36	1.92	23210	3065	r=0.2
2.5	2	140	0.084	0.10	0.45	2.45	18190	3055	r=0.2
3.0	2	140	0.100	0.12	0.54	2.97	15005	3000	r=0.2

0.5	2	120	0.016	0.02	0.09	0.42	60000	1920	r=0.1
0.8	2	120	0.024	0.03	0.14	0.74	51620	2480	r=0.1
1.0	2	120	0.032	0.04	0.18	0.84	45475	2910	r=0.2
1.2	2	120	0.038	0.05	0.22	1.06	36035	2740	r=0.2
1.5	2	120	0.048	0.06	0.27	1.39	27480	2640	r=0.2
2.0	2	120	0.062	0.08	0.36	1.92	19895	2465	r=0.2
2.5	2	120	0.080	0.10	0.45	2.45	15590	2495	r=0.2
3.0	2	120	0.096	0.12	0.54	2.97	12860	2470	r=0.2

0.5	2	100	0.014	0.02	0.09	0.42	60000	1680	r=0.1
0.8	2	100	0.022	0.03	0.14	0.74	43015	1895	r=0.1
1.0	2	100	0.030	0.04	0.18	0.84	37895	2275	r=0.2
1.2	2	100	0.036	0.05	0.22	1.06	30030	2160	r=0.2
1.5	2	100	0.044	0.06	0.27	1.39	22900	2015	r=0.2
2.0	2	100	0.058	0.08	0.36	1.92	16580	1925	r=0.2
2.5	2	100	0.074	0.10	0.45	2.45	12995	1925	r=0.2
3.0	2	100	0.088	0.12	0.54	2.97	10720	1885	r=0.2



0.5	2	60	0.012	0.02	0.09	0.42	45475	1090	r=0.1
0.8	2	60	0.020	0.03	0.14	0.74	25810	1030	r=0.1
1.0	2	60	0.028	0.04	0.18	0.84	22735	1275	r=0.2
1.2	2	60	0.032	0.05	0.22	1.06	18020	1155	r=0.2
1.5	2	60	0.040	0.06	0.27	1.39	13740	1100	r=0.2
2.0	2	60	0.052	0.08	0.36	1.92	9945	1035	r=0.2
2.5	2	60	0.068	0.10	0.45	2.45	7795	1060	r=0.2
3.0	2	60	0.080	0.12	0.54	2.97	6430	1030	r=0.2



Applicazione





Materiale

Acciaio da utensile temprato
42 - 48 HRC



 



Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	300	0.020	0.020	0.020	0.50	60000	2400	45°
0.8	2	300	0.022	0.032	0.032	0.80	60000	2640	45°
1.0	2	300	0.028	0.040	0.040	1.00	60000	3360	45°
1.2	2	300	0.030	0.048	0.048	1.20	60000	3600	45°
1.5	2	300	0.034	0.060	0.060	1.50	60000	4080	45°
2.0	2	300	0.038	0.080	0.080	2.00	47750	3630	45°
2.5	2	300	0.040	0.100	0.100	2.49	38350	3070	45°
3.0	2	300	0.046	0.120	0.120	2.97	32155	2960	45°

0.5	2	250	0.020	0.020	0.020	0.50	60000	2400	45°
0.8	2	250	0.020	0.032	0.032	0.80	60000	2400	45°
1.0	2	250	0.026	0.040	0.040	1.00	60000	3120	45°
1.2	2	250	0.028	0.048	0.048	1.20	60000	3360	45°
1.5	2	250	0.032	0.060	0.060	1.50	53055	3395	45°
2.0	2	250	0.036	0.080	0.080	2.00	39790	2865	45°
2.5	2	250	0.038	0.100	0.100	2.49	31960	2430	45°
3.0	2	250	0.044	0.120	0.120	2.97	26795	2360	45°

0.5	2	200	0.018	0.020	0.020	0.50	60000	2160	45°
0.8	2	200	0.020	0.032	0.032	0.80	60000	2400	45°
1.0	2	200	0.026	0.040	0.040	1.00	60000	3120	45°
1.2	2	200	0.028	0.048	0.048	1.20	53055	2970	45°
1.5	2	200	0.030	0.060	0.060	1.50	42445	2545	45°
2.0	2	200	0.034	0.080	0.080	2.00	31830	2165	45°
2.5	2	200	0.036	0.100	0.100	2.49	25570	1840	45°
3.0	2	200	0.042	0.120	0.120	2.97	21435	1800	45°

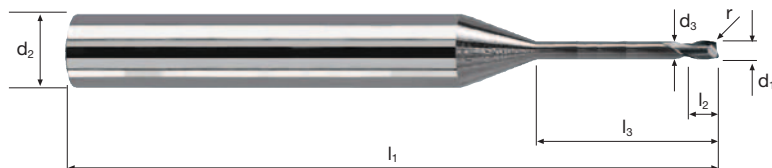
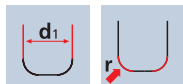
0.5	2	150	0.016	0.020	0.020	0.50	60000	1920	45°
0.8	2	150	0.018	0.032	0.032	0.80	59685	2150	45°
1.0	2	150	0.022	0.040	0.040	1.00	47750	2100	45°
1.2	2	150	0.024	0.048	0.048	1.20	39790	1910	45°
1.5	2	150	0.028	0.060	0.060	1.50	31830	1780	45°
2.0	2	150	0.030	0.080	0.080	2.00	23875	1435	45°
2.5	2	150	0.032	0.100	0.100	2.49	19175	1225	45°
3.0	2	150	0.036	0.120	0.120	2.97	16075	1155	45°

Frese toriche MicroX

Gambo Ø 6 mm, scarico cilindrico, 8xd



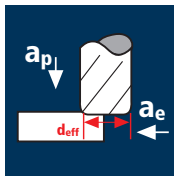
HM λ 25°
XA γ-10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine										X-AL
										X6536
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.01	α	z	
Rivestimento: X Articolo: 6536 Codice-Ø: .050										
.050	0.5	6	0.45	57	0.5	4.0	0.10	11.1°	2	●
.080	0.8	6	0.75	57	0.8	6.4	0.10	9.2°	2	●
.100	1.0	6	0.95	61	1.0	8.0	0.20	8.3°	2	●
.108	1.2	6	1.10	61	1.2	9.6	0.20	7.3°	2	●
.120	1.5	6	1.40	61	1.5	12.0	0.20	6.4°	2	●
.140	2.0	6	1.90	66	2.0	16.0	0.20	4.9°	2	●
.160	2.5	6	2.30	69	2.5	20.0	0.20	3.8°	2	●
.180	3.0	6	2.80	75	3.0	24.0	0.20	2.9°	2	●
.145	2.0	6	1.90	66	2.0	16.0	0.50	5.0°	2	●
.165	2.5	6	2.30	69	2.5	20.0	0.50	3.9°	2	●
.185	3.0	6	2.80	75	3.0	24.0	0.50	3.0°	2	●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

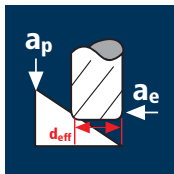
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	140	0.020	0.02	0.09	0.42	60000	2400	r=0.1
0.8	2	140	0.032	0.03	0.14	0.74	60000	3840	r=0.1
1.0	2	140	0.040	0.04	0.18	0.84	53055	4245	r=0.2
1.2	2	140	0.048	0.05	0.22	1.06	42040	4035	r=0.2
1.5	2	140	0.060	0.06	0.27	1.39	32060	3845	r=0.2
2.0	2	140	0.080	0.08	0.36	1.92	23210	3715	r=0.2
2.5	2	140	0.100	0.10	0.45	2.45	18190	3640	r=0.2
3.0	2	140	0.120	0.12	0.54	2.97	15005	3600	r=0.2

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	120	0.020	0.02	0.09	0.42	60000	2400	r=0.1
0.8	2	120	0.030	0.03	0.14	0.74	51620	3095	r=0.1
1.0	2	120	0.038	0.04	0.18	0.84	45475	3455	r=0.2
1.2	2	120	0.046	0.05	0.22	1.06	36035	3315	r=0.2
1.5	2	120	0.058	0.06	0.27	1.39	27480	3190	r=0.2
2.0	2	120	0.076	0.08	0.36	1.92	19895	3025	r=0.2
2.5	2	120	0.096	0.10	0.45	2.45	15590	2995	r=0.2
3.0	2	120	0.114	0.12	0.54	2.97	12860	2930	r=0.2

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	100	0.018	0.02	0.09	0.42	60000	2160	r=0.1
0.8	2	100	0.028	0.03	0.14	0.74	43015	2410	r=0.1
1.0	2	100	0.036	0.04	0.18	0.84	37895	2730	r=0.2
1.2	2	100	0.042	0.05	0.22	1.06	30030	2525	r=0.2
1.5	2	100	0.052	0.06	0.27	1.39	22900	2380	r=0.2
2.0	2	100	0.070	0.08	0.36	1.92	16580	2320	r=0.2
2.5	2	100	0.088	0.10	0.45	2.45	12995	2285	r=0.2
3.0	2	100	0.106	0.12	0.54	2.97	10720	2275	r=0.2

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	60	0.016	0.02	0.09	0.42	45475	1455	r=0.1
0.8	2	60	0.026	0.03	0.14	0.74	25810	1340	r=0.1
1.0	2	60	0.032	0.04	0.18	0.84	22735	1455	r=0.2
1.2	2	60	0.038	0.05	0.22	1.06	18020	1370	r=0.2
1.5	2	60	0.048	0.06	0.27	1.39	13740	1320	r=0.2
2.0	2	60	0.064	0.08	0.36	1.92	9945	1275	r=0.2
2.5	2	60	0.080	0.10	0.45	2.45	7795	1245	r=0.2
3.0	2	60	0.096	0.12	0.54	2.97	6430	1235	r=0.2

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	300	0.024	0.020	0.020	0.50	60000	2880	45°
0.8	2	300	0.028	0.032	0.032	0.80	60000	3360	45°
1.0	2	300	0.034	0.040	0.040	1.00	60000	4080	45°
1.2	2	300	0.036	0.048	0.048	1.20	60000	4320	45°
1.5	2	300	0.040	0.060	0.060	1.50	60000	4800	45°
2.0	2	300	0.046	0.080	0.080	2.00	47750	4395	45°
2.5	2	300	0.048	0.100	0.100	2.49	38350	3680	45°
3.0	2	300	0.056	0.120	0.120	2.97	32155	3600	45°

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	250	0.022	0.020	0.020	0.50	60000	2640	45°
0.8	2	250	0.026	0.032	0.032	0.80	60000	3120	45°
1.0	2	250	0.032	0.040	0.040	1.00	60000	3840	45°
1.2	2	250	0.034	0.048	0.048	1.20	60000	4080	45°
1.5	2	250	0.038	0.060	0.060	1.50	53055	4030	45°
2.0	2	250	0.044	0.080	0.080	2.00	39790	3500	45°
2.5	2	250	0.046	0.100	0.100	2.49	31960	2940	45°
3.0	2	250	0.054	0.120	0.120	2.97	26795	2895	45°

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	200	0.022	0.020	0.020	0.50	60000	2640	45°
0.8	2	200	0.026	0.032	0.032	0.80	60000	3120	45°
1.0	2	200	0.030	0.040	0.040	1.00	60000	3600	45°
1.2	2	200	0.032	0.048	0.048	1.20	53055	3395	45°
1.5	2	200	0.036	0.060	0.060	1.50	42445	3055	45°
2.0	2	200	0.042	0.080	0.080	2.00	31830	2675	45°
2.5	2	200	0.044	0.100	0.100	2.49	25570	2250	45°
3.0	2	200	0.050	0.120	0.120	2.97	21435	2145	45°

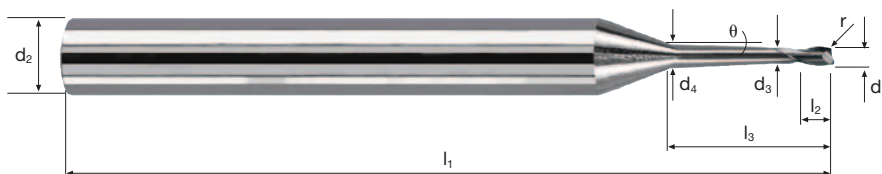
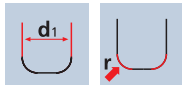
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	150	0.020	0.020	0.020	0.50	60000	2400	45°
0.8	2	150	0.022	0.032	0.032	0.80	59685	2625	45°
1.0	2	150	0.028	0.040	0.040	1.00	47750	2675	45°
1.2	2	150	0.028	0.048	0.048	1.20	39790	2230	45°
1.5	2	150	0.032	0.060	0.060	1.50	31830	2035	45°
2.0	2	150	0.036	0.080	0.080	2.00	23875	1720	45°
2.5	2	150	0.038	0.100	0.100	2.49	19175	1455	45°
3.0	2	150	0.044	0.120	0.120	2.97	16075	1415	45°

Frese toriche MicroX

Gambo Ø 6 mm, scarico conico 0.9°, 8xd



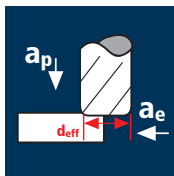
HM λ 25°
XA γ-10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine												X-AL	
												X6736	
Ø Code	d1 0/-0.01	d2 h5	d3	d4	l1	l2	l3	θ	r 0/+0.01	α	z		
.050	0.5	6	0.45	0.56	57	0.40	4.0	0.9°	0.10	11.1°	2	●	
.080	0.8	6	0.75	0.93	57	0.65	6.4	0.9°	0.10	9.2°	2	●	
.100	1.0	6	0.95	1.18	61	0.80	8.0	0.9°	0.20	8.3°	2	●	
.108	1.2	6	1.10	1.42	61	1.00	9.6	0.9°	0.20	7.3°	2	●	
.120	1.5	6	1.40	1.79	61	1.20	12.0	0.9°	0.20	6.4°	2	●	
.140	2.0	6	1.90	2.41	66	1.60	16.0	0.9°	0.20	4.9°	2	●	
.160	2.5	6	2.30	3.03	69	2.00	20.0	0.9°	0.20	3.8°	2	●	
.180	3.0	6	2.80	3.64	75	2.40	24.0	0.9°	0.20	2.9°	2	●	
.145	2.0	6	1.90	2.41	66	1.60	16.0	0.9°	0.50	5.0°	2	●	
.165	2.5	6	2.30	3.03	69	2.00	20.0	0.9°	0.50	3.9°	2	●	
.185	3.0	6	2.80	3.64	75	2.40	24.0	0.9°	0.50	3.0°	2	●	

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC



Acciaio da utensile temprato
48 - 52 HRC



Acciaio da utensile temprato
52 - 56 HRC



Acciaio da utensile temprato
56 - 60 HRC



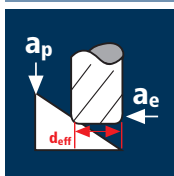
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	140	0.020	0.02	0.08	0.42	60000	2400	r=0.1
0.8	2	140	0.032	0.03	0.13	0.74	60000	3840	r=0.1
1.0	2	140	0.040	0.04	0.16	0.84	53055	4245	r=0.2
1.2	2	140	0.048	0.05	0.19	1.06	42040	4035	r=0.2
1.5	2	140	0.060	0.06	0.24	1.39	32060	3845	r=0.2
2.0	2	140	0.080	0.08	0.32	1.92	23210	3715	r=0.2
2.5	2	140	0.100	0.10	0.40	2.45	18190	3640	r=0.2
3.0	2	140	0.120	0.12	0.48	2.97	15005	3600	r=0.2

0.5	2	120	0.020	0.02	0.08	0.42	60000	2400	r=0.1
0.8	2	120	0.030	0.03	0.13	0.74	51620	3095	r=0.1
1.0	2	120	0.038	0.04	0.16	0.84	45475	3455	r=0.2
1.2	2	120	0.046	0.05	0.19	1.06	36035	3315	r=0.2
1.5	2	120	0.058	0.06	0.24	1.39	27480	3190	r=0.2
2.0	2	120	0.076	0.08	0.32	1.92	19895	3025	r=0.2
2.5	2	120	0.096	0.10	0.40	2.45	15590	2995	r=0.2
3.0	2	120	0.114	0.12	0.48	2.97	12860	2930	r=0.2

0.5	2	100	0.018	0.02	0.08	0.42	60000	2160	r=0.1
0.8	2	100	0.028	0.03	0.13	0.74	43015	2410	r=0.1
1.0	2	100	0.036	0.04	0.16	0.84	37895	2730	r=0.2
1.2	2	100	0.042	0.05	0.19	1.06	30030	2525	r=0.2
1.5	2	100	0.052	0.06	0.24	1.39	22900	2380	r=0.2
2.0	2	100	0.070	0.08	0.32	1.92	16580	2320	r=0.2
2.5	2	100	0.088	0.10	0.40	2.45	12995	2285	r=0.2
3.0	2	100	0.106	0.12	0.48	2.97	10720	2275	r=0.2

0.5	2	60	0.016	0.02	0.08	0.42	45475	1455	r=0.1
0.8	2	60	0.026	0.03	0.13	0.74	25810	1340	r=0.1
1.0	2	60	0.032	0.04	0.16	0.84	22735	1455	r=0.2
1.2	2	60	0.038	0.05	0.19	1.06	18020	1370	r=0.2
1.5	2	60	0.048	0.06	0.24	1.39	13740	1320	r=0.2
2.0	2	60	0.064	0.08	0.32	1.92	9945	1275	r=0.2
2.5	2	60	0.080	0.10	0.40	2.45	7795	1245	r=0.2
3.0	2	60	0.096	0.12	0.48	2.97	6430	1235	r=0.2

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC



Acciaio da utensile temprato
48 - 52 HRC



Acciaio da utensile temprato
52 - 56 HRC



Acciaio da utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	300	0.022	0.018	0.018	0.50	60000	2640	45°
0.8	2	300	0.026	0.028	0.028	0.80	60000	3120	45°
1.0	2	300	0.032	0.036	0.036	0.99	60000	3840	45°
1.2	2	300	0.034	0.042	0.042	1.20	60000	4080	45°
1.5	2	300	0.038	0.052	0.052	1.50	60000	4560	45°
2.0	2	300	0.042	0.070	0.070	2.00	47750	4010	45°
2.5	2	300	0.044	0.088	0.088	2.49	38350	3375	45°
3.0	2	300	0.050	0.106	0.106	2.98	32045	3205	45°

0.5	2	250	0.020	0.018	0.018	0.50	60000	2400	45°
0.8	2	250	0.024	0.028	0.028	0.80	60000	2880	45°
1.0	2	250	0.030	0.036	0.036	0.99	60000	3600	45°
1.2	2	250	0.032	0.042	0.042	1.20	60000	3840	45°
1.5	2	250	0.036	0.052	0.052	1.50	53055	3820	45°
2.0	2	250	0.040	0.070	0.070	2.00	39790	3185	45°
2.5	2	250	0.042	0.088	0.088	2.49	31960	2685	45°
3.0	2	250	0.048	0.106	0.106	2.98	26705	2565	45°

0.5	2	200	0.020	0.018	0.018	0.50	60000	2400	45°
0.8	2	200	0.024	0.028	0.028	0.80	60000	2880	45°
1.0	2	200	0.028	0.036	0.036	0.99	60000	3360	45°
1.2	2	200	0.030	0.042	0.042	1.20	53055	3185	45°
1.5	2	200	0.034	0.052	0.052	1.50	42445	2885	45°
2.0	2	200	0.038	0.070	0.070	2.00	31830	2420	45°
2.5	2	200	0.040	0.088	0.088	2.49	25570	2045	45°
3.0	2	200	0.046	0.106	0.106	2.98	21365	1965	45°

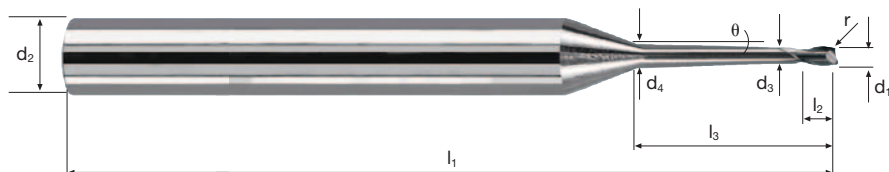
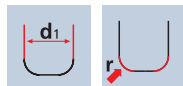
0.5	2	150	0.018	0.018	0.018	0.50	60000	2160	45°
0.8	2	150	0.020	0.028	0.028	0.80	59685	2385	45°
1.0	2	150	0.026	0.036	0.036	0.99	48230	2510	45°
1.2	2	150	0.028	0.042	0.042	1.20	39790	2230	45°
1.5	2	150	0.030	0.052	0.052	1.50	31830	1910	45°
2.0	2	150	0.034	0.070	0.070	2.00	23875	1625	45°
2.5	2	150	0.036	0.088	0.088	2.49	19175	1380	45°
3.0	2	150	0.040	0.106	0.106	2.98	16025	1280	45°

Frese toriche MicroX

Gambo Ø 6 mm, scarico conico 0.9°, 10xd



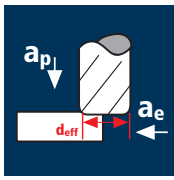
HM λ 25°
XA γ-10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine											X-AL	
											X6738	
Ø Code	d1 0/-0.01	d2 h5	d3	d4	l1	l2	l3	θ	r 0/+0.01	α	z	
Rivestimento: X Articolo: 6738 Codice-Ø: .050												
.050	0.5	6	0.45	0.60	57	0.40	5.0	0.9°	0.10	10.4°	2	●
.080	0.8	6	0.75	0.99	61	0.65	8.0	0.9°	0.10	8.6°	2	●
.100	1.0	6	0.95	1.25	61	0.80	10.0	0.9°	0.20	7.6°	2	●
.108	1.2	6	1.10	1.51	66	1.00	12.0	0.9°	0.20	6.8°	2	●
.120	1.5	6	1.40	1.90	66	1.20	15.0	0.9°	0.20	5.8°	2	●
.140	2.0	6	1.90	2.55	69	1.60	20.0	0.9°	0.20	4.4°	2	●
.160	2.5	6	2.30	3.19	75	2.00	25.0	0.9°	0.20	3.4°	2	●
.180	3.0	6	2.80	3.84	75	2.40	30.0	0.9°	0.20	2.6°	2	●
.145	2.0	6	1.90	2.55	69	1.60	20.0	0.9°	0.50	4.4°	2	●
.165	2.5	6	2.30	3.19	75	2.00	25.0	0.9°	0.50	3.4°	2	●
.185	3.0	6	2.80	3.84	75	2.40	30.0	0.9°	0.50	2.6°	2	●

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

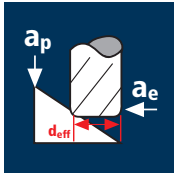
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	140	0.020	0.02	0.07	0.42	60000	2400	r=0.1
0.8	2	140	0.032	0.02	0.11	0.72	60000	3840	r=0.1
1.0	2	140	0.040	0.03	0.14	0.81	55020	4400	r=0.2
1.2	2	140	0.048	0.04	0.17	1.04	42850	4115	r=0.2
1.5	2	140	0.060	0.05	0.21	1.36	32770	3930	r=0.2
2.0	2	140	0.080	0.06	0.28	1.89	23580	3775	r=0.2
2.5	2	140	0.100	0.08	0.35	2.42	18415	3685	r=0.2
3.0	2	140	0.120	0.09	0.42	2.93	15210	3650	r=0.2

0.5	2	120	0.020	0.02	0.07	0.42	60000	2400	r=0.1
0.8	2	120	0.030	0.02	0.11	0.72	53055	3185	r=0.1
1.0	2	120	0.038	0.03	0.14	0.81	47160	3585	r=0.2
1.2	2	120	0.046	0.04	0.17	1.04	36730	3380	r=0.2
1.5	2	120	0.058	0.05	0.21	1.36	28085	3260	r=0.2
2.0	2	120	0.076	0.06	0.28	1.89	20210	3070	r=0.2
2.5	2	120	0.096	0.08	0.35	2.42	15785	3030	r=0.2
3.0	2	120	0.114	0.09	0.42	2.93	13035	2970	r=0.2

0.5	2	100	0.018	0.02	0.07	0.42	60000	2160	r=0.1
0.8	2	100	0.028	0.02	0.11	0.72	44210	2475	r=0.1
1.0	2	100	0.036	0.03	0.14	0.81	39300	2830	r=0.2
1.2	2	100	0.042	0.04	0.17	1.04	30610	2570	r=0.2
1.5	2	100	0.052	0.05	0.21	1.36	23405	2435	r=0.2
2.0	2	100	0.070	0.06	0.28	1.89	16840	2360	r=0.2
2.5	2	100	0.088	0.08	0.35	2.42	13155	2315	r=0.2
3.0	2	100	0.106	0.09	0.42	2.93	10865	2305	r=0.2

0.5	2	60	0.016	0.02	0.07	0.42	45475	1455	r=0.1
0.8	2	60	0.026	0.02	0.11	0.72	26525	1380	r=0.1
1.0	2	60	0.032	0.03	0.14	0.81	23580	1510	r=0.2
1.2	2	60	0.038	0.04	0.17	1.04	18365	1395	r=0.2
1.5	2	60	0.048	0.05	0.21	1.36	14045	1350	r=0.2
2.0	2	60	0.064	0.06	0.28	1.89	10105	1295	r=0.2
2.5	2	60	0.080	0.08	0.35	2.42	7890	1260	r=0.2
3.0	2	60	0.096	0.09	0.42	2.93	6520	1250	r=0.2

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	300	0.018	0.016	0.016	0.50	60000	2160	45°
0.8	2	300	0.020	0.024	0.024	0.80	60000	2400	45°
1.0	2	300	0.026	0.030	0.030	0.99	60000	3120	45°
1.2	2	300	0.028	0.036	0.036	1.19	60000	3360	45°
1.5	2	300	0.030	0.046	0.046	1.50	60000	3600	45°
2.0	2	300	0.034	0.060	0.060	2.00	47750	3245	45°
2.5	2	300	0.036	0.076	0.076	2.50	38200	2750	45°
3.0	2	300	0.042	0.090	0.090	2.99	31940	2685	45°

0.5	2	250	0.018	0.016	0.016	0.50	60000	2160	45°
0.8	2	250	0.020	0.024	0.024	0.80	60000	2400	45°
1.0	2	250	0.024	0.030	0.030	0.99	60000	2880	45°
1.2	2	250	0.026	0.036	0.036	1.19	60000	3120	45°
1.5	2	250	0.028	0.046	0.046	1.50	53055	2970	45°
2.0	2	250	0.032	0.060	0.060	2.00	39790	2545	45°
2.5	2	250	0.034	0.076	0.076	2.50	31830	2165	45°
3.0	2	250	0.040	0.090	0.090	2.99	26615	2130	45°

0.5	2	200	0.016	0.016	0.016	0.50	60000	1920	45°
0.8	2	200	0.018	0.024	0.024	0.80	60000	2160	45°
1.0	2	200	0.024	0.030	0.030	0.99	60000	2880	45°
1.2	2	200	0.026	0.036	0.036	1.19	53500	2780	45°
1.5	2	200	0.028	0.046	0.046	1.50	42445	2375	45°
2.0	2	200	0.030	0.060	0.060	2.00	31830	1910	45°
2.5	2	200	0.032	0.076	0.076	2.50	25465	1630	45°
3.0	2	200	0.038	0.090	0.090	2.99	21290	1620	45°

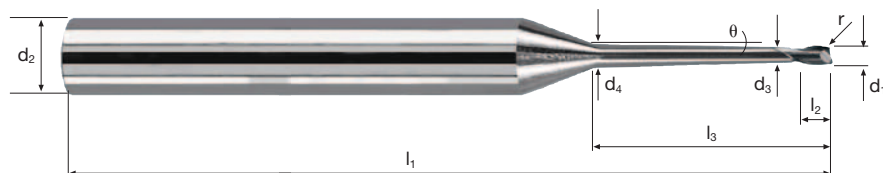
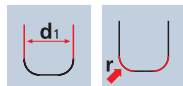
0.5	2	150	0.014	0.016	0.016	0.50	60000	1680	45°
0.8	2	150	0.016	0.024	0.024	0.80	59685	1910	45°
1.0	2	150	0.020	0.030	0.030	0.99	48230	1930	45°
1.2	2	150	0.022	0.036	0.036	1.19	40125	1765	45°
1.5	2	150	0.024	0.046	0.046	1.50	31830	1530	45°
2.0	2	150	0.028	0.060	0.060	2.00	23875	1335	45°
2.5	2	150	0.028	0.076	0.076	2.50	19100	1070	45°
3.0	2	150	0.034	0.090	0.090	2.99	15970	1085	45°

Frese toriche MicroX

Gambo Ø 6 mm, scarico conico 0.9°, 12xd



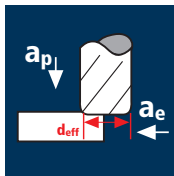
HM λ 25°
XA γ -10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine		Rivestimento X	Articolo 6740	Codice-Ø .050								X-AL
Ø Code	d1 0/-0.01	d2 h5	d3	d4	l1	l2	l3	θ	r 0/+0.01	α	z	X6740
.050	0.5	6	0.45	0.62	57	0.40	6.0	0.9°	0.10	9.9°	2	●
.080	0.8	6	0.75	1.03	61	0.65	9.6	0.9°	0.10	7.9°	2	●
.100	1.0	6	0.95	1.30	66	0.80	12.0	0.9°	0.20	7.0°	2	●
.108	1.2	6	1.10	1.57	66	1.00	14.4	0.9°	0.20	6.2°	2	●
.120	1.5	6	1.40	1.98	69	1.20	18.0	0.9°	0.20	5.1°	2	●
.140	2.0	6	1.90	2.66	75	1.60	24.0	0.9°	0.20	3.9°	2	●
.160	2.5	6	2.30	3.34	80	2.00	30.0	0.9°	0.20	2.9°	2	●
.180	3.0	6	2.80	4.02	87	2.40	36.0	0.9°	0.20	2.2°	2	●
.145	2.0	6	1.90	2.66	75	1.60	24.0	0.9°	0.50	3.9°	2	●
.165	2.5	6	2.30	3.34	80	2.00	30.0	0.9°	0.50	2.9°	2	●
.185	3.0	6	2.80	4.02	87	2.40	36.0	0.9°	0.50	2.2°	2	●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

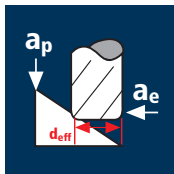
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	2	140	0.020	0.02	0.06	0.42	60000	2400	r=0.1
0.8	2	140	0.032	0.02	0.10	0.72	60000	3840	r=0.1
1.0	2	140	0.040	0.03	0.12	0.81	55020	4400	r=0.2
1.2	2	140	0.048	0.04	0.14	1.04	42850	4115	r=0.2
1.5	2	140	0.060	0.05	0.18	1.36	32770	3930	r=0.2
2.0	2	140	0.080	0.06	0.24	1.89	23580	3775	r=0.2
2.5	2	140	0.100	0.08	0.30	2.42	18415	3685	r=0.2
3.0	2	140	0.120	0.09	0.36	2.93	15210	3650	r=0.2

0.5	2	120	0.020	0.02	0.06	0.42	60000	2400	r=0.1
0.8	2	120	0.030	0.02	0.10	0.72	53055	3185	r=0.1
1.0	2	120	0.038	0.03	0.12	0.81	47160	3585	r=0.2
1.2	2	120	0.046	0.04	0.14	1.04	36730	3380	r=0.2
1.5	2	120	0.058	0.05	0.18	1.36	28085	3260	r=0.2
2.0	2	120	0.076	0.06	0.24	1.89	20210	3070	r=0.2
2.5	2	120	0.096	0.08	0.30	2.42	15785	3030	r=0.2
3.0	2	120	0.114	0.09	0.36	2.93	13035	2970	r=0.2

0.5	2	100	0.018	0.02	0.06	0.42	60000	2160	r=0.1
0.8	2	100	0.028	0.02	0.10	0.72	44210	2475	r=0.1
1.0	2	100	0.036	0.03	0.12	0.81	39300	2830	r=0.2
1.2	2	100	0.042	0.04	0.14	1.04	30610	2570	r=0.2
1.5	2	100	0.052	0.05	0.18	1.36	23405	2435	r=0.2
2.0	2	100	0.070	0.06	0.24	1.89	16840	2360	r=0.2
2.5	2	100	0.088	0.08	0.30	2.42	13155	2315	r=0.2
3.0	2	100	0.106	0.09	0.36	2.93	10865	2305	r=0.2

0.5	2	60	0.016	0.02	0.06	0.42	45475	1455	r=0.1
0.8	2	60	0.026	0.02	0.10	0.72	26525	1380	r=0.1
1.0	2	60	0.032	0.03	0.12	0.81	23580	1510	r=0.2
1.2	2	60	0.038	0.04	0.14	1.04	18365	1395	r=0.2
1.5	2	60	0.048	0.05	0.18	1.36	14045	1350	r=0.2
2.0	2	60	0.064	0.06	0.24	1.89	10105	1295	r=0.2
2.5	2	60	0.080	0.08	0.30	2.42	7890	1260	r=0.2
3.0	2	60	0.096	0.09	0.36	2.93	6520	1250	r=0.2

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	2	300	0.018	0.012	0.012	0.49	60000	2160	45°
0.8	2	300	0.020	0.020	0.020	0.80	60000	2400	45°
1.0	2	300	0.026	0.026	0.026	0.99	60000	3120	45°
1.2	2	300	0.028	0.030	0.030	1.19	60000	3360	45°
1.5	2	300	0.030	0.038	0.038	1.49	60000	3600	45°
2.0	2	300	0.034	0.050	0.050	2.00	47750	3245	45°
2.5	2	300	0.036	0.062	0.062	2.50	38200	2750	45°
3.0	2	300	0.042	0.076	0.076	3.00	31830	2675	45°

0.5	2	250	0.018	0.012	0.012	0.49	60000	2160	45°
0.8	2	250	0.020	0.020	0.020	0.80	60000	2400	45°
1.0	2	250	0.024	0.026	0.026	0.99	60000	2880	45°
1.2	2	250	0.026	0.030	0.030	1.19	60000	3120	45°
1.5	2	250	0.028	0.038	0.038	1.49	53410	2990	45°
2.0	2	250	0.032	0.050	0.050	2.00	39790	2545	45°
2.5	2	250	0.034	0.062	0.062	2.50	31830	2165	45°
3.0	2	250	0.040	0.076	0.076	3.00	26525	2120	45°

0.5	2	200	0.016	0.012	0.012	0.49	60000	1920	45°
0.8	2	200	0.018	0.020	0.020	0.80	60000	2160	45°
1.0	2	200	0.024	0.026	0.026	0.99	60000	2880	45°
1.2	2	200	0.026	0.030	0.030	1.19	53500	2780	45°
1.5	2	200	0.028	0.038	0.038	1.49	42725	2395	45°
2.0	2	200	0.030	0.050	0.050	2.00	31830	1910	45°
2.5	2	200	0.032	0.062	0.062	2.50	25465	1630	45°
3.0	2	200	0.038	0.076	0.076	3.00	21220	1615	45°

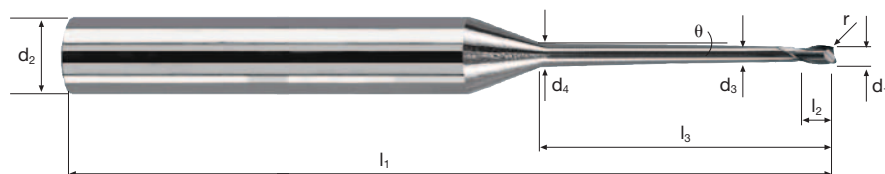
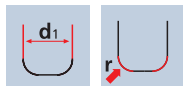
0.5	2	150	0.014	0.012	0.012	0.49	60000	1680	45°
0.8	2	150	0.016	0.020	0.020	0.80	59685	1910	45°
1.0	2	150	0.020	0.026	0.026	0.99	48230	1930	45°
1.2	2	150	0.022	0.030	0.030	1.19	40125	1765	45°
1.5	2	150	0.024	0.038	0.038	1.49	32045	1540	45°
2.0	2	150	0.028	0.050	0.050	2.00	23875	1335	45°
2.5	2	150	0.028	0.062	0.062	2.50	19100	1070	45°
3.0	2	150	0.034	0.076	0.076	3.00	15915	1080	45°

Frese toriche MicroX

Gambo Ø 6 mm, scarico conico 0.9°, 15xd



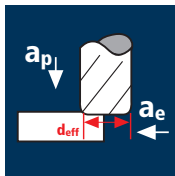
HM λ 25°
XA γ-10°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	Cobalt-Chrome Copper
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Esempio: N° Ordine												Rivestimento X		Articolo 6742		Codice-ø .050		X-AL	
																X6742			
Ø Code	d1 0/-0.01	d2 h5	d3	d4	l1	l2	l3	θ	r 0/+0.01	α	z								
.050	0.5	6	0.45	0.67	61	0.40	7.5	0.9°	0.10	9.1°	2			●					
.080	0.8	6	0.75	1.11	66	0.65	12.0	0.9°	0.10	7.1°	2			●					
.100	1.0	6	0.95	1.40	66	0.80	15.0	0.9°	0.20	6.1°	2			●					
.108	1.2	6	1.10	1.69	69	1.00	18.0	0.9°	0.20	5.3°	2			●					
.120	1.5	6	1.40	2.12	75	1.20	22.5	0.9°	0.20	4.4°	2			●					
.140	2.0	6	1.90	2.85	80	1.60	30.0	0.9°	0.20	3.3°	2			●					
.160	2.5	6	2.30	3.58	87	2.00	37.5	0.9°	0.20	2.4°	2			●					
.180	3.0	6	2.80	4.30	100	2.40	45.0	0.9°	0.20	1.8°	2			●					
.145	2.0	6	1.90	2.85	80	1.60	30.0	0.9°	0.50	3.3°	2			●					
.165	2.5	6	2.30	3.58	87	2.00	37.5	0.9°	0.50	2.4°	2			●					
.185	3.0	6	2.80	4.30	100	2.40	45.0	0.9°	0.50	1.8°	2			●					

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

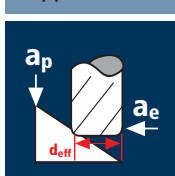
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	4	140	0.016	0.03	0.10	0.44	60000	3840	r=0.1
0.8	4	140	0.026	0.05	0.16	0.77	57875	6020	r=0.1
1.0	4	140	0.034	0.06	0.20	0.89	50075	6810	r=0.2
1.2	4	140	0.040	0.07	0.24	1.10	40515	6480	r=0.2
1.5	4	140	0.050	0.09	0.30	1.43	31165	6235	r=0.2
2.0	4	140	0.066	0.12	0.40	1.97	22620	5970	r=0.2
2.5	4	140	0.084	0.15	0.50	2.49	17895	6015	r=0.2
3.0	4	140	0.100	0.18	0.60	3.00	14855	5940	r=0.2
3.0	4	140	0.086	0.22	0.60	2.83	15745	5415	r=0.5

0.5	4	120	0.016	0.03	0.10	0.44	60000	3840	r=0.1
0.8	4	120	0.024	0.05	0.16	0.77	49610	4765	r=0.1
1.0	4	120	0.032	0.06	0.20	0.89	42920	5495	r=0.2
1.2	4	120	0.038	0.07	0.24	1.10	34725	5280	r=0.2
1.5	4	120	0.048	0.09	0.30	1.43	26710	5130	r=0.2
2.0	4	120	0.062	0.12	0.40	1.97	19390	4810	r=0.2
2.5	4	120	0.080	0.15	0.50	2.49	15340	4910	r=0.2
3.0	4	120	0.096	0.18	0.60	3.00	12735	4890	r=0.2
3.0	4	120	0.082	0.22	0.60	2.83	13500	4430	r=0.5

0.5	4	100	0.014	0.03	0.10	0.44	60000	3360	r=0.1
0.8	4	100	0.022	0.05	0.16	0.77	41340	3640	r=0.1
1.0	4	100	0.030	0.06	0.20	0.89	35765	4290	r=0.2
1.2	4	100	0.036	0.07	0.24	1.10	28940	4165	r=0.2
1.5	4	100	0.044	0.09	0.30	1.43	22260	3920	r=0.2
2.0	4	100	0.058	0.12	0.40	1.97	16160	3750	r=0.2
2.5	4	100	0.074	0.15	0.50	2.49	12785	3785	r=0.2
3.0	4	100	0.088	0.18	0.60	3.00	10610	3735	r=0.2
3.0	4	100	0.076	0.22	0.60	2.83	11250	3420	r=0.5

0.5	4	60	0.012	0.03	0.10	0.44	43405	2085	r=0.1
0.8	4	60	0.020	0.05	0.16	0.77	24805	1985	r=0.1
1.0	4	60	0.028	0.06	0.20	0.89	21460	2405	r=0.2
1.2	4	60	0.032	0.07	0.24	1.10	17365	2225	r=0.2
1.5	4	60	0.040	0.09	0.30	1.43	13355	2135	r=0.2
2.0	4	60	0.052	0.12	0.40	1.97	9695	2015	r=0.2
2.5	4	60	0.068	0.15	0.50	2.49	7670	2085	r=0.2
3.0	4	60	0.080	0.18	0.60	3.00	6365	2035	r=0.2
3.0	4	60	0.068	0.22	0.60	2.83	6750	1835	r=0.5

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	4	300	0.020	0.022	0.022	0.50	60000	4800	45°
0.8	4	300	0.022	0.034	0.034	0.80	60000	5280	45°
1.0	4	300	0.028	0.042	0.042	1.00	60000	6720	45°
1.2	4	300	0.030	0.050	0.050	1.20	60000	7200	45°
1.5	4	300	0.034	0.064	0.064	1.50	60000	8160	45°
2.0	4	300	0.038	0.084	0.084	1.99	47990	7295	45°
2.5	4	300	0.040	0.106	0.106	2.48	38505	6160	45°
3.0	4	300	0.046	0.126	0.126	2.97	32155	5915	45°

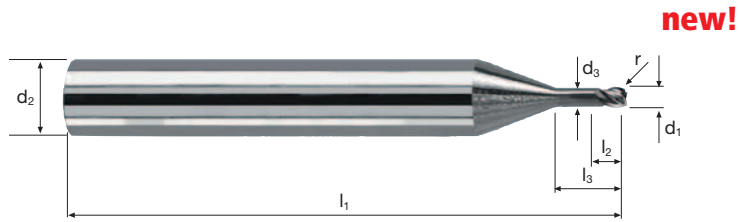
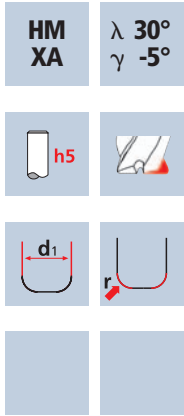
0.5	4	250	0.020	0.022	0.022	0.50	60000	4800	45°
0.8	4	250	0.020	0.034	0.034	0.80	60000	4800	45°
1.0	4	250	0.026	0.042	0.042	1.00	60000	6240	45°
1.2	4	250	0.028	0.050	0.050	1.20	60000	6720	45°
1.5	4	250	0.032	0.064	0.064	1.50	53055	6790	45°
2.0	4	250	0.036	0.084	0.084	1.99	39990	5760	45°
2.5	4	250	0.038	0.106	0.106	2.48	32090	4880	45°
3.0	4	250	0.044	0.126	0.126	2.97	26795	4715	45°

0.5	4	200	0.018	0.022	0.022	0.50	60000	4320	45°
0.8	4	200	0.020	0.034	0.034	0.80	60000	4800	45°
1.0	4	200	0.026	0.042	0.042	1.00	60000	6240	45°
1.2	4	200	0.028	0.050	0.050	1.20	53055	5940	45°
1.5	4	200	0.030	0.064	0.064	1.50	42445	5095	45°
2.0	4	200	0.034	0.084	0.084	1.99	31990	4350	45°
2.5	4	200	0.036	0.106	0.106	2.48	25670	3695	45°
3.0	4	200	0.042	0.126	0.126	2.97	21435	3600	45°

0.5	4	150	0.016	0.022	0.022	0.50	60000	3840	45°
0.8	4	150	0.018	0.034	0.034	0.80	59685	4295	45°
1.0	4	150	0.022	0.042	0.042	1.00	47750	4200	45°
1.2	4	150	0.024	0.050	0.050	1.20	39790	3820	45°
1.5	4	150	0.028	0.064	0.064	1.50	31830	3565	45°
2.0	4	150	0.030	0.084	0.084	1.99	23995	2880	45°
2.5	4	150	0.032	0.106	0.106	2.48	19255	2465	45°
3.0	4	150	0.036	0.126	0.126	2.97	16075	2315	45°

Frese toriche MicroX

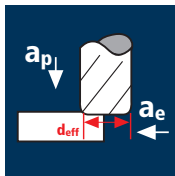
Gambo Ø 6 mm, scarico cilindrico, 3xd



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	GG(G)
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Esempio: N° Ordine		Rivestimento X	Articolo 6632	Codice-Ø .050							X-AL
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.01	α	z	X6632	
.050	0.5	6	0.45	57	0.5	1.5	0.10	13.2°	4	●	
.080	0.8	6	0.75	57	0.8	2.4	0.10	12.2°	4	●	
.100	1.0	6	0.95	57	1.0	3.0	0.20	11.6°	4	●	
.108	1.2	6	1.10	57	1.2	3.6	0.20	10.9°	4	●	
.120	1.5	6	1.40	57	1.5	4.5	0.20	10.0°	4	●	
.140	2.0	6	1.90	57	2.0	6.0	0.20	8.6°	4	●	
.160	2.5	6	2.30	57	2.5	7.5	0.20	7.2°	4	●	
.180	3.0	6	2.80	57	3.0	9.0	0.20	6.0°	4	●	
.145	2.0	6	1.90	57	2.0	6.0	0.50	8.7°	4	●	
.165	2.5	6	2.30	57	2.5	7.5	0.50	7.3°	4	●	
.185	3.0	6	2.80	57	3.0	9.0	0.50	6.1°	4	●	

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

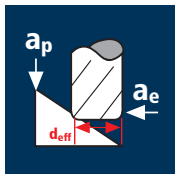
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
0.5	4	140	0.016	0.03	0.10	0.44	60000	3840	r=0.1
0.8	4	140	0.026	0.04	0.16	0.76	58640	6100	r=0.1
1.0	4	140	0.034	0.05	0.20	0.86	51820	7050	r=0.2
1.2	4	140	0.040	0.06	0.24	1.09	40885	6540	r=0.2
1.5	4	140	0.050	0.08	0.30	1.42	31385	6275	r=0.2
2.0	4	140	0.066	0.10	0.40	1.95	22855	6035	r=0.2
2.5	4	140	0.084	0.13	0.50	2.47	18040	6060	r=0.2
3.0	4	140	0.100	0.15	0.60	2.99	14905	5960	r=0.2
3.0	4	140	0.086	0.18	0.60	2.77	16090	5535	r=0.5

0.5	4	120	0.016	0.03	0.10	0.44	60000	3840	r=0.1
0.8	4	120	0.024	0.04	0.16	0.76	50260	4825	r=0.1
1.0	4	120	0.032	0.05	0.20	0.86	44415	5685	r=0.2
1.2	4	120	0.038	0.06	0.24	1.09	35045	5325	r=0.2
1.5	4	120	0.048	0.08	0.30	1.42	26900	5165	r=0.2
2.0	4	120	0.062	0.10	0.40	1.95	19590	4860	r=0.2
2.5	4	120	0.080	0.13	0.50	2.47	15465	4950	r=0.2
3.0	4	120	0.096	0.15	0.60	2.99	12775	4905	r=0.2
3.0	4	120	0.082	0.18	0.60	2.77	13790	4525	r=0.5

0.5	4	100	0.014	0.03	0.10	0.44	60000	3360	r=0.1
0.8	4	100	0.022	0.04	0.16	0.76	41885	3685	r=0.1
1.0	4	100	0.030	0.05	0.20	0.86	37015	4440	r=0.2
1.2	4	100	0.036	0.06	0.24	1.09	29205	4205	r=0.2
1.5	4	100	0.044	0.08	0.30	1.42	22415	3945	r=0.2
2.0	4	100	0.058	0.10	0.40	1.95	16325	3785	r=0.2
2.5	4	100	0.074	0.13	0.50	2.47	12885	3815	r=0.2
3.0	4	100	0.088	0.15	0.60	2.99	10645	3745	r=0.2
3.0	4	100	0.076	0.18	0.60	2.77	11490	3495	r=0.5

0.5	4	60	0.012	0.03	0.10	0.44	43405	2085	r=0.1
0.8	4	60	0.020	0.04	0.16	0.76	25130	2010	r=0.1
1.0	4	60	0.028	0.05	0.20	0.86	22210	2490	r=0.2
1.2	4	60	0.032	0.06	0.24	1.09	17520	2245	r=0.2
1.5	4	60	0.040	0.08	0.30	1.42	13450	2150	r=0.2
2.0	4	60	0.052	0.10	0.40	1.95	9795	2035	r=0.2
2.5	4	60	0.068	0.13	0.50	2.47	7730	2105	r=0.2
3.0	4	60	0.080	0.15	0.60	2.99	6390	2045	r=0.2
3.0	4	60	0.068	0.18	0.60	2.77	6895	1875	r=0.5

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

Acciaio da utensile temprato 48 - 52 HRC

Acciaio da utensile temprato 52 - 56 HRC

Acciaio da utensile temprato 56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
0.5	4	300	0.020	0.020	0.020	0.50	60000	4800	45°
0.8	4	300	0.022	0.032	0.032	0.80	60000	5280	45°
1.0	4	300	0.028	0.042	0.042	1.00	60000	6720	45°
1.2	4	300	0.030	0.050	0.050	1.20	60000	7200	45°
1.5	4	300	0.034	0.062	0.062	1.50	60000	8160	45°
2.0	4	300	0.038	0.082	0.082	2.00	47750	7260	45°
2.5	4	300	0.040	0.102	0.102	2.49	38350	6135	45°
3.0	4	300	0.046	0.122	0.122	2.97	32155	5915	45°

0.5	4	250	0.020	0.020	0.020	0.50	60000	4800	45°
0.8	4	250	0.020	0.032	0.032	0.80	60000	4800	45°
1.0	4	250	0.026	0.042	0.042	1.00	60000	6240	45°
1.2	4	250	0.028	0.050	0.050	1.20	60000	6720	45°
1.5	4	250	0.032	0.062	0.062	1.50	53055	6790	45°
2.0	4	250	0.036	0.082	0.082	2.00	39790	5730	45°
2.5	4	250	0.038	0.102	0.102	2.49	31960	4860	45°
3.0	4	250	0.044	0.122	0.122	2.97	26795	4715	45°

0.5	4	200	0.018	0.020	0.020	0.50	60000	4320	45°
0.8	4	200	0.020	0.032	0.032	0.80	60000	4800	45°
1.0	4	200	0.026	0.042	0.042	1.00	60000	6240	45°
1.2	4	200	0.028	0.050	0.050	1.20	53055	5940	45°
1.5	4	200	0.030	0.062	0.062	1.50	42445	5095	45°
2.0	4	200	0.034	0.082	0.082	2.00	31830	4330	45°
2.5	4	200	0.036	0.102	0.102	2.49	25570	3680	45°
3.0	4	200	0.042	0.122	0.122	2.97	21435	3600	45°

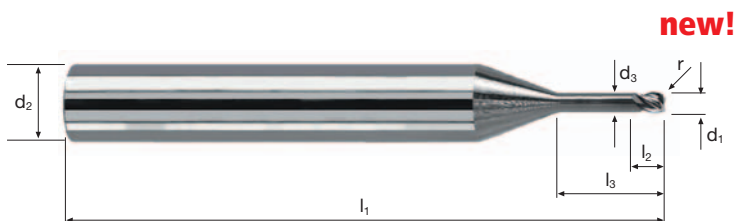
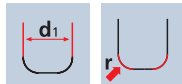
0.5	4	150	0.016	0.020	0.020	0.50	60000	3840	45°
0.8	4	150	0.018	0.032	0.032	0.80	59685	4295	45°
1.0	4	150	0.022	0.042	0.042	1.00	47750	4200	45°
1.2	4	150	0.024	0.050	0.050	1.20	39790	3820	45°
1.5	4	150	0.028	0.062	0.062	1.50	31830	3565	45°
2.0	4	150	0.030	0.082	0.082	2.00	23875	2865	45°
2.5	4	150	0.032	0.102	0.102	2.49	19175	2455	45°
3.0	4	150	0.036	0.122	0.122	2.97	16075	2315	45°

Frese toriche MicroX

Gambo Ø 6 mm, scarico cilindrico, 5xd



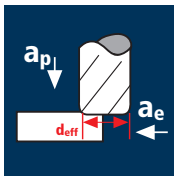
HM XA	λ 30° γ -5°
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Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	GG(G)
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Esempio: N° Ordine		Rivestimento X	Articolo 6634	Codice-ø .050								X-AL
ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r 0/+0.01	α	z			X6634
.050	0.5	6	0.45	57	0.5	2.5	0.10	12.2°	4			●
.080	0.8	6	0.75	57	0.8	4.0	0.10	10.8°	4			●
.100	1.0	6	0.95	57	1.0	5.0	0.20	9.9°	4			●
.108	1.2	6	1.10	57	1.2	6.0	0.20	9.2°	4			●
.120	1.5	6	1.40	61	1.5	7.5	0.20	8.1°	4			●
.140	2.0	6	1.90	61	2.0	10.0	0.20	6.6°	4			●
.160	2.5	6	2.30	61	2.5	12.5	0.20	5.3°	4			●
.180	3.0	6	2.80	66	3.0	15.0	0.20	4.2°	4			●
.145	2.0	6	1.90	61	2.0	10.0	0.50	6.7°	4			●
.165	2.5	6	2.30	61	2.5	12.5	0.50	5.4°	4			●
.185	3.0	6	2.80	66	3.0	15.0	0.50	4.3°	4			●

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	140	0.026	0.07	0.20	0.90	49515	2575	r=0.2
1.2	2	140	0.030	0.08	0.24	1.12	39790	2385	r=0.2
1.5	2	140	0.038	0.11	0.30	1.46	30525	2320	r=0.2
2.0	2	140	0.050	0.14	0.40	1.98	22505	2250	r=0.2
2.5	2	140	0.062	0.18	0.50	2.50	17825	2210	r=0.2
3.0	2	140	0.076	0.21	0.60	3.00	14855	2260	r=0.2

Acciaio da utensile temprato 48 - 52 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	120	0.024	0.07	0.20	0.90	42445	2035	r=0.2
1.2	2	120	0.028	0.08	0.24	1.12	34105	1910	r=0.2
1.5	2	120	0.036	0.11	0.30	1.46	26165	1885	r=0.2
2.0	2	120	0.048	0.14	0.40	1.98	19290	1850	r=0.2
2.5	2	120	0.058	0.18	0.50	2.50	15280	1770	r=0.2
3.0	2	120	0.072	0.21	0.60	3.00	12735	1835	r=0.2

Acciaio da utensile temprato 52 - 56 HRC

D

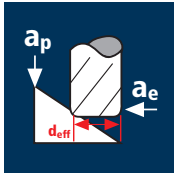
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	100	0.022	0.07	0.20	0.90	35370	1555	r=0.2
1.2	2	100	0.026	0.08	0.24	1.12	28420	1480	r=0.2
1.5	2	100	0.034	0.11	0.30	1.46	21805	1485	r=0.2
2.0	2	100	0.044	0.14	0.40	1.98	16075	1415	r=0.2
2.5	2	100	0.054	0.18	0.50	2.50	12735	1375	r=0.2
3.0	2	100	0.066	0.21	0.60	3.00	10610	1400	r=0.2

Acciaio da utensile temprato 56 - 60 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	60	0.020	0.07	0.20	0.90	21220	850	r=0.2
1.2	2	60	0.024	0.08	0.24	1.12	17055	820	r=0.2
1.5	2	60	0.030	0.11	0.30	1.46	13080	785	r=0.2
2.0	2	60	0.040	0.14	0.40	1.98	9645	770	r=0.2
2.5	2	60	0.050	0.18	0.50	2.50	7640	765	r=0.2
3.0	2	60	0.060	0.21	0.60	3.00	6365	765	r=0.2

Applicazione



Materiale

Acciaio da utensile temprato 42 - 48 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	300	0.022	0.044	0.044	1.00	60000	2640	45°
1.2	2	300	0.024	0.052	0.052	1.20	60000	2880	45°
1.5	2	300	0.028	0.064	0.064	1.50	60000	3360	45°
2.0	2	300	0.030	0.086	0.086	1.99	47990	2880	45°
2.5	2	300	0.032	0.108	0.108	2.48	38505	2465	45°
3.0	2	300	0.036	0.128	0.128	2.97	32155	2315	45°

Acciaio da utensile temprato 48 - 52 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	250	0.020	0.044	0.044	1.00	60000	2400	45°
1.2	2	250	0.022	0.052	0.052	1.20	60000	2640	45°
1.5	2	250	0.026	0.064	0.064	1.50	53055	2760	45°
2.0	2	250	0.028	0.086	0.086	1.99	39990	2240	45°
2.5	2	250	0.030	0.108	0.108	2.48	32090	1925	45°
3.0	2	250	0.034	0.128	0.128	2.97	26795	1820	45°

Acciaio da utensile temprato 52 - 56 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	200	0.020	0.044	0.044	1.00	60000	2400	45°
1.2	2	200	0.022	0.052	0.052	1.20	53055	2335	45°
1.5	2	200	0.026	0.064	0.064	1.50	42445	2205	45°
2.0	2	200	0.028	0.086	0.086	1.99	31990	1790	45°
2.5	2	200	0.028	0.108	0.108	2.48	25670	1440	45°
3.0	2	200	0.032	0.128	0.128	2.97	21435	1370	45°

Acciaio da utensile temprato 56 - 60 HRC

D

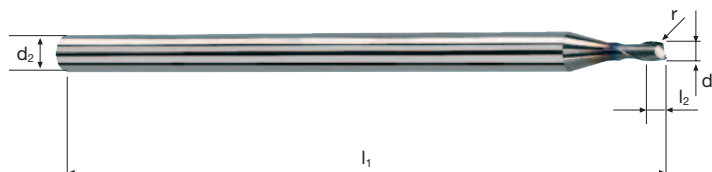
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	150	0.018	0.044	0.044	1.00	47750	1720	45°
1.2	2	150	0.020	0.052	0.052	1.20	39790	1590	45°
1.5	2	150	0.022	0.064	0.064	1.50	31830	1400	45°
2.0	2	150	0.024	0.086	0.086	1.99	23995	1150	45°
2.5	2	150	0.026	0.108	0.108	2.48	19255	1000	45°
3.0	2	150	0.028	0.128	0.128	2.97	16075	900	45°

Frese toriche Microcut-T1H

Gambo Ø 3 mm, 1xd

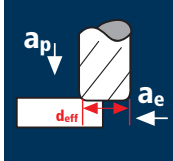
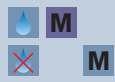





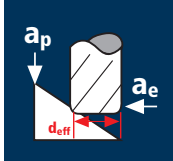
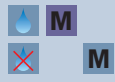



**HM
XA** λ **25°**
 γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	
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Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø						DURO-S
		D	15751	.100						D15751
ø Code	d1 ±0.01	d2 h6	l1	l2	r 0/+0.03	α	z			
.100	1.0	3	50	1.20	0.20	11.4°	2	●		
.108	1.2	3	50	1.44	0.20	10.5°	2	●		
.120	1.5	3	50	1.80	0.20	9.1°	2	●		
.140	2.0	3	50	2.40	0.20	6.6°	2	●		
.160	2.5	3	50	3.00	0.20	3.6°	2	●		
.180	3.0	3	50	3.60	0.20	0.0°	2	●		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	180	0.036	0.08	0.20	0.92	60000	4320	r=0.2
		1.2	2	180	0.042	0.10	0.24	1.15	49825	4185	r=0.2
		1.5	2	180	0.054	0.12	0.30	1.47	38980	4210	r=0.2
		2.0	2	180	0.072	0.16	0.40	1.99	28795	4145	r=0.2
		2.5	2	180	0.090	0.20	0.50	2.50	22920	4125	r=0.2
		3.0	2	180	0.108	0.24	0.60	2.99	19165	4140	r=0.2
Acciaio 1100 - 1300 N/mm ² 	1.0	2	160	0.032	0.08	0.20	0.92	55360	3545	r=0.2	
	1.2	2	160	0.038	0.10	0.24	1.15	44290	3365	r=0.2	
	1.5	2	160	0.048	0.12	0.30	1.47	34645	3325	r=0.2	
	2.0	2	160	0.064	0.16	0.40	1.99	25595	3275	r=0.2	
	2.5	2	160	0.082	0.20	0.50	2.50	20370	3340	r=0.2	
	3.0	2	160	0.098	0.24	0.60	2.99	17035	3340	r=0.2	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	80	0.032	0.08	0.20	0.92	27680	1770	r=0.2	
	1.2	2	80	0.038	0.10	0.24	1.15	22145	1685	r=0.2	
	1.5	2	80	0.048	0.12	0.30	1.47	17325	1665	r=0.2	
	2.0	2	80	0.064	0.16	0.40	1.99	12795	1640	r=0.2	
	2.5	2	80	0.082	0.20	0.50	2.50	10185	1670	r=0.2	
	3.0	2	80	0.098	0.24	0.60	2.99	8515	1670	r=0.2	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	60	0.026	0.08	0.20	0.92	20760	1080	r=0.2	
	1.2	2	60	0.030	0.10	0.24	1.15	16610	995	r=0.2	
	1.5	2	60	0.038	0.12	0.30	1.47	12995	990	r=0.2	
	2.0	2	60	0.050	0.16	0.40	1.99	9600	960	r=0.2	
	2.5	2	60	0.064	0.20	0.50	2.50	7640	980	r=0.2	
	3.0	2	60	0.076	0.24	0.60	2.99	6390	970	r=0.2	

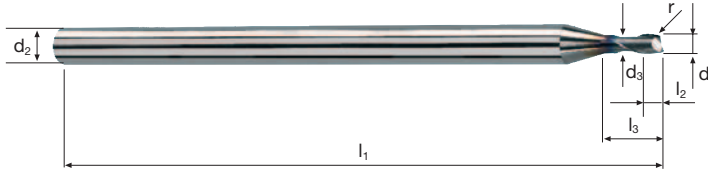
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	300	0.028	0.042	0.042	1.00	60000	3360	45°
		1.2	2	300	0.030	0.050	0.050	1.20	60000	3600	45°
		1.5	2	300	0.034	0.064	0.064	1.50	60000	4080	45°
		2.0	2	300	0.038	0.084	0.084	1.99	47990	3645	45°
		2.5	2	300	0.040	0.106	0.106	2.48	38505	3080	45°
		3.0	2	300	0.046	0.126	0.126	2.97	32155	2960	45°
Acciaio 1100 - 1300 N/mm ² 	1.0	2	250	0.026	0.042	0.042	1.00	60000	3120	45°	
	1.2	2	250	0.028	0.050	0.050	1.20	60000	3360	45°	
	1.5	2	250	0.030	0.064	0.064	1.50	53055	3185	45°	
	2.0	2	250	0.034	0.084	0.084	1.99	39990	2720	45°	
	2.5	2	250	0.036	0.106	0.106	2.48	32090	2310	45°	
	3.0	2	250	0.042	0.126	0.126	2.97	26795	2250	45°	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	120	0.022	0.042	0.042	1.00	38200	1680	45°	
	1.2	2	120	0.024	0.050	0.050	1.20	31830	1530	45°	
	1.5	2	120	0.028	0.064	0.064	1.50	25465	1425	45°	
	2.0	2	120	0.030	0.084	0.084	1.99	19195	1150	45°	
	2.5	2	120	0.032	0.106	0.106	2.48	15405	985	45°	
	3.0	2	120	0.036	0.126	0.126	2.97	12860	925	45°	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	100	0.020	0.042	0.042	1.00	31830	1275	45°	
	1.2	2	100	0.022	0.050	0.050	1.20	26525	1165	45°	
	1.5	2	100	0.024	0.064	0.064	1.50	21220	1020	45°	
	2.0	2	100	0.026	0.084	0.084	1.99	15995	830	45°	
	2.5	2	100	0.028	0.106	0.106	2.48	12835	720	45°	
	3.0	2	100	0.032	0.126	0.126	2.97	10720	685	45°	

Frese toriche Microcut-T3

Gambo Ø 3 mm, scarico cilindrico, 3xd



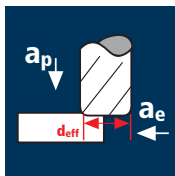
HM
Micro λ 25°
 γ 6°



Rm < 850 Rm 850-1100 Rm 1100-1300 Rm 1300-1500 Inox Stainless Ti Titanium Cobalt-Chrome Gold / Platinum Copper

Esempio: N° Ordine		Rivestimento M	Articolo 5752	Codice-Ø .100							MICRO
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		M5752
.100	1.0	3	0.95	50	1.20	3.0	0.20	8.5°	2		●
.108	1.2	3	1.10	50	1.44	3.6	0.20	7.4°	2		●
.120	1.5	3	1.40	50	1.80	4.5	0.20	5.9°	2		●
.140	2.0	3	1.90	50	2.40	6.0	0.20	3.7°	2		●
.160	2.5	3	2.30	50	3.00	7.5	0.20	1.7°	2		●
.180	3.0	3	2.80	50	3.60	9.0	0.20	0.0°	2		●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	140	0.026	0.06	0.20	0.89	50075	2605	r=0.2
1.2	2	140	0.030	0.07	0.24	1.10	40515	2430	r=0.2
1.5	2	140	0.038	0.09	0.30	1.43	31165	2370	r=0.2
2.0	2	140	0.050	0.12	0.40	1.97	22620	2260	r=0.2
2.5	2	140	0.062	0.15	0.50	2.49	17895	2220	r=0.2
3.0	2	140	0.076	0.18	0.60	3.00	14855	2260	r=0.2

Acciaio da
utensile temprato
48 - 52 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	120	0.024	0.06	0.20	0.89	42920	2060	r=0.2
1.2	2	120	0.028	0.07	0.24	1.10	34725	1945	r=0.2
1.5	2	120	0.036	0.09	0.30	1.43	26710	1925	r=0.2
2.0	2	120	0.048	0.12	0.40	1.97	19390	1860	r=0.2
2.5	2	120	0.058	0.15	0.50	2.49	15340	1780	r=0.2
3.0	2	120	0.072	0.18	0.60	3.00	12735	1835	r=0.2

Acciaio da
utensile temprato
52 - 56 HRC



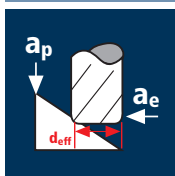
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	100	0.022	0.06	0.20	0.89	35765	1575	r=0.2
1.2	2	100	0.026	0.07	0.24	1.10	28940	1505	r=0.2
1.5	2	100	0.034	0.09	0.30	1.43	22260	1515	r=0.2
2.0	2	100	0.044	0.12	0.40	1.97	16160	1420	r=0.2
2.5	2	100	0.054	0.15	0.50	2.49	12785	1380	r=0.2
3.0	2	100	0.066	0.18	0.60	3.00	10610	1400	r=0.2

Acciaio da
utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	60	0.020	0.06	0.20	0.89	21460	860	r=0.2
1.2	2	60	0.024	0.07	0.24	1.10	17365	835	r=0.2
1.5	2	60	0.030	0.09	0.30	1.43	13355	800	r=0.2
2.0	2	60	0.040	0.12	0.40	1.97	9695	775	r=0.2
2.5	2	60	0.050	0.15	0.50	2.49	7670	765	r=0.2
3.0	2	60	0.060	0.18	0.60	3.00	6365	765	r=0.2

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	300	0.022	0.042	0.042	1.00	60000	2640	45°
1.2	2	300	0.024	0.050	0.050	1.20	60000	2880	45°
1.5	2	300	0.028	0.062	0.062	1.50	60000	3360	45°
2.0	2	300	0.030	0.082	0.082	2.00	47750	2865	45°
2.5	2	300	0.032	0.102	0.102	2.49	38350	2455	45°
3.0	2	300	0.036	0.122	0.122	2.97	32155	2315	45°

Acciaio da
utensile temprato
48 - 52 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	250	0.020	0.042	0.042	1.00	60000	2400	45°
1.2	2	250	0.022	0.050	0.050	1.20	60000	2640	45°
1.5	2	250	0.026	0.062	0.062	1.50	53055	2760	45°
2.0	2	250	0.028	0.082	0.082	2.00	39790	2230	45°
2.5	2	250	0.030	0.102	0.102	2.49	31960	1920	45°
3.0	2	250	0.034	0.122	0.122	2.97	26795	1820	45°

Acciaio da
utensile temprato
52 - 56 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	200	0.020	0.042	0.042	1.00	60000	2400	45°
1.2	2	200	0.022	0.050	0.050	1.20	53055	2335	45°
1.5	2	200	0.026	0.062	0.062	1.50	42445	2205	45°
2.0	2	200	0.028	0.082	0.082	2.00	31830	1780	45°
2.5	2	200	0.028	0.102	0.102	2.49	25570	1430	45°
3.0	2	200	0.032	0.122	0.122	2.97	21435	1370	45°

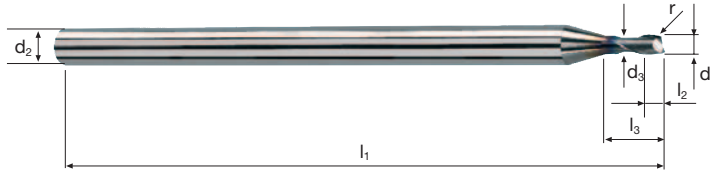
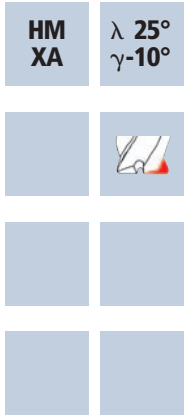
Acciaio da
utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	150	0.018	0.042	0.042	1.00	47750	1720	45°
1.2	2	150	0.020	0.050	0.050	1.20	39790	1590	45°
1.5	2	150	0.022	0.062	0.062	1.50	31830	1400	45°
2.0	2	150	0.024	0.082	0.082	2.00	23875	1145	45°
2.5	2	150	0.026	0.102	0.102	2.49	19175	995	45°
3.0	2	150	0.028	0.122	0.122	2.97	16075	900	45°

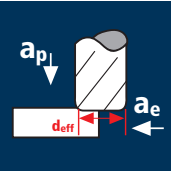
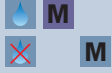



Frese toriche Microcut-T3H

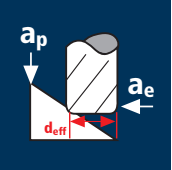
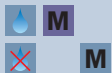



Gambo Ø 3 mm, scarico cilindrico, 3xd



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium
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Esempio: N° Ordine										DURO-S
										D5762
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z	
.100	1.0	3	0.95	50	1.20	3.0	0.20	8.5°	2	●
.108	1.2	3	1.10	50	1.44	3.6	0.20	7.4°	2	●
.120	1.5	3	1.40	50	1.80	4.5	0.20	5.9°	2	●
.140	2.0	3	1.90	50	2.40	6.0	0.20	3.7°	2	●
.160	2.5	3	2.30	50	3.00	7.5	0.20	1.7°	2	●
.180	3.0	3	2.80	50	3.60	9.0	0.20	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	180	0.036	0.07	0.20	0.90	60000	4320	r=0.2
		1.2	2	180	0.042	0.08	0.24	1.12	51160	4295	r=0.2
		1.5	2	180	0.054	0.11	0.30	1.46	39245	4240	r=0.2
		2.0	2	180	0.072	0.14	0.40	1.98	28940	4165	r=0.2
		2.5	2	180	0.090	0.18	0.50	2.50	22920	4125	r=0.2
		3.0	2	180	0.108	0.21	0.60	3.00	19100	4125	r=0.2
Acciaio 1100 - 1300 N/mm ² 	1.0	2	160	0.032	0.07	0.20	0.90	56590	3620	r=0.2	
	1.2	2	160	0.038	0.08	0.24	1.12	45475	3455	r=0.2	
	1.5	2	160	0.048	0.11	0.30	1.46	34885	3350	r=0.2	
	2.0	2	160	0.064	0.14	0.40	1.98	25725	3295	r=0.2	
	2.5	2	160	0.082	0.18	0.50	2.50	20370	3340	r=0.2	
	3.0	2	160	0.098	0.21	0.60	3.00	16975	3325	r=0.2	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	80	0.032	0.07	0.20	0.90	28295	1810	r=0.2	
	1.2	2	80	0.038	0.08	0.24	1.12	22735	1730	r=0.2	
	1.5	2	80	0.048	0.11	0.30	1.46	17440	1670	r=0.2	
	2.0	2	80	0.064	0.14	0.40	1.98	12860	1645	r=0.2	
	2.5	2	80	0.082	0.18	0.50	2.50	10185	1670	r=0.2	
	3.0	2	80	0.098	0.21	0.60	3.00	8490	1665	r=0.2	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	60	0.026	0.07	0.20	0.90	21220	1105	r=0.2	
	1.2	2	60	0.030	0.08	0.24	1.12	17055	1025	r=0.2	
	1.5	2	60	0.038	0.11	0.30	1.46	13080	995	r=0.2	
	2.0	2	60	0.050	0.14	0.40	1.98	9645	965	r=0.2	
	2.5	2	60	0.064	0.18	0.50	2.50	7640	980	r=0.2	
	3.0	2	60	0.076	0.21	0.60	3.00	6365	965	r=0.2	

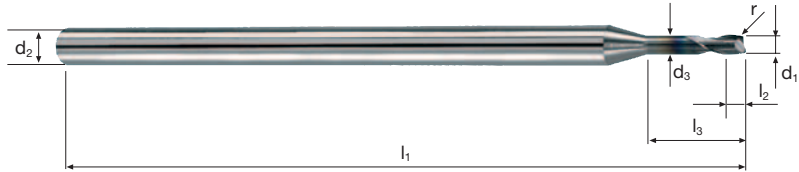
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Acciaio 850 - 1100 N/mm ² 	1.0	2	300	0.022	0.040	0.040	1.00	60000	2640	45°
		1.2	2	300	0.024	0.048	0.048	1.20	60000	2880	45°
		1.5	2	300	0.028	0.060	0.060	1.50	60000	3360	45°
		2.0	2	300	0.030	0.080	0.080	2.00	47750	2865	45°
		2.5	2	300	0.032	0.100	0.100	2.49	38350	2455	45°
		3.0	2	300	0.036	0.120	0.120	2.97	32155	2315	45°
Acciaio 1100 - 1300 N/mm ² 	1.0	2	250	0.020	0.040	0.040	1.00	60000	2400	45°	
	1.2	2	250	0.022	0.048	0.048	1.20	60000	2640	45°	
	1.5	2	250	0.026	0.060	0.060	1.50	53055	2760	45°	
	2.0	2	250	0.028	0.080	0.080	2.00	39790	2230	45°	
	2.5	2	250	0.028	0.100	0.100	2.49	31960	1790	45°	
	3.0	2	250	0.032	0.120	0.120	2.97	26795	1715	45°	
Acciaio inossidabile [Cr-Ni/1.4301] 	1.0	2	120	0.018	0.040	0.040	1.00	38200	1375	45°	
	1.2	2	120	0.020	0.048	0.048	1.20	31830	1275	45°	
	1.5	2	120	0.022	0.060	0.060	1.50	25465	1120	45°	
	2.0	2	120	0.024	0.080	0.080	2.00	19100	915	45°	
	2.5	2	120	0.026	0.100	0.100	2.49	15340	800	45°	
	3.0	2	120	0.028	0.120	0.120	2.97	12860	720	45°	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn] 	1.0	2	100	0.016	0.040	0.040	1.00	31830	1020	45°	
	1.2	2	100	0.016	0.048	0.048	1.20	26525	850	45°	
	1.5	2	100	0.020	0.060	0.060	1.50	21220	850	45°	
	2.0	2	100	0.022	0.080	0.080	2.00	15915	700	45°	
	2.5	2	100	0.022	0.100	0.100	2.49	12785	565	45°	
	3.0	2	100	0.026	0.120	0.120	2.97	10720	555	45°	

Frese toriche Microcut-T5

Gambo Ø 3 mm, scarico cilindrico, 5xd



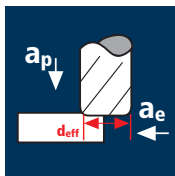
HM Micro λ 25° γ 6°



Rm < 850
Rm 850-1100
Rm 1100-1300
Rm 1300-1500
Inox Stainless
Ti Titanium
Cobalt-Chrome Gold / Platinum Copper

Esempio: N° Ordine										MICRO
Rivestimento M Articolo 5754 Codice-ø .100										M5754
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z	
.100	1.0	3	0.95	50	1.20	5.0	0.20	6.6°	2	●
.108	1.2	3	1.10	50	1.44	6.0	0.20	5.5°	2	●
.120	1.5	3	1.40	50	1.80	7.5	0.20	4.2°	2	●
.140	2.0	3	1.90	50	2.40	10.0	0.20	2.5°	2	●
.160	2.5	3	2.30	50	3.00	12.5	0.20	1.1°	2	●
.180	3.0	3	2.80	50	3.60	15.0	0.20	0.0°	2	●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	140	0.026	0.05	0.20	0.86	51820	2695	r=0.2
1.2	2	140	0.030	0.06	0.24	1.09	40885	2455	r=0.2
1.5	2	140	0.038	0.08	0.30	1.42	31385	2385	r=0.2
2.0	2	140	0.050	0.10	0.40	1.95	22855	2285	r=0.2
2.5	2	140	0.062	0.13	0.50	2.47	18040	2235	r=0.2
3.0	2	140	0.076	0.15	0.60	2.99	14905	2265	r=0.2

Acciaio da
utensile temprato
48 - 52 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	120	0.024	0.05	0.20	0.86	44415	2130	r=0.2
1.2	2	120	0.028	0.06	0.24	1.09	35045	1965	r=0.2
1.5	2	120	0.036	0.08	0.30	1.42	26900	1935	r=0.2
2.0	2	120	0.048	0.10	0.40	1.95	19590	1880	r=0.2
2.5	2	120	0.058	0.13	0.50	2.47	15465	1795	r=0.2
3.0	2	120	0.072	0.15	0.60	2.99	12775	1840	r=0.2

Acciaio da
utensile temprato
52 - 56 HRC



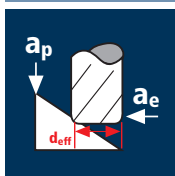
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	100	0.022	0.05	0.20	0.86	37015	1630	r=0.2
1.2	2	100	0.026	0.06	0.24	1.09	29205	1520	r=0.2
1.5	2	100	0.034	0.08	0.30	1.42	22415	1525	r=0.2
2.0	2	100	0.044	0.10	0.40	1.95	16325	1435	r=0.2
2.5	2	100	0.054	0.13	0.50	2.47	12885	1390	r=0.2
3.0	2	100	0.066	0.15	0.60	2.99	10645	1405	r=0.2

Acciaio da
utensile temprato
56 - 60 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	60	0.020	0.05	0.20	0.86	22210	890	r=0.2
1.2	2	60	0.024	0.06	0.24	1.09	17520	840	r=0.2
1.5	2	60	0.030	0.08	0.30	1.42	13450	805	r=0.2
2.0	2	60	0.040	0.10	0.40	1.95	9795	785	r=0.2
2.5	2	60	0.050	0.13	0.50	2.47	7730	775	r=0.2
3.0	2	60	0.060	0.15	0.60	2.99	6390	765	r=0.2

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	300	0.022	0.040	0.040	1.00	60000	2640	45°
1.2	2	300	0.024	0.048	0.048	1.20	60000	2880	45°
1.5	2	300	0.028	0.060	0.060	1.50	60000	3360	45°
2.0	2	300	0.030	0.080	0.080	2.00	47750	2865	45°
2.5	2	300	0.032	0.100	0.100	2.49	38350	2455	45°
3.0	2	300	0.036	0.120	0.120	2.97	32155	2315	45°

Acciaio da
utensile temprato
48 - 52 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	250	0.020	0.040	0.040	1.00	60000	2400	45°
1.2	2	250	0.022	0.048	0.048	1.20	60000	2640	45°
1.5	2	250	0.026	0.060	0.060	1.50	53055	2760	45°
2.0	2	250	0.028	0.080	0.080	2.00	39790	2230	45°
2.5	2	250	0.030	0.100	0.100	2.49	31960	1920	45°
3.0	2	250	0.034	0.120	0.120	2.97	26795	1820	45°

Acciaio da
utensile temprato
52 - 56 HRC



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	200	0.020	0.040	0.040	1.00	60000	2400	45°
1.2	2	200	0.022	0.048	0.048	1.20	53055	2335	45°
1.5	2	200	0.026	0.060	0.060	1.50	42445	2205	45°
2.0	2	200	0.028	0.080	0.080	2.00	31830	1780	45°
2.5	2	200	0.028	0.100	0.100	2.49	25570	1430	45°
3.0	2	200	0.032	0.120	0.120	2.97	21435	1370	45°

Acciaio da
utensile temprato
56 - 60 HRC



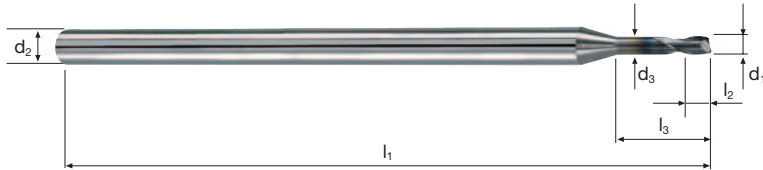
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	150	0.018	0.040	0.040	1.00	47750	1720	45°
1.2	2	150	0.020	0.048	0.048	1.20	39790	1590	45°
1.5	2	150	0.022	0.060	0.060	1.50	31830	1400	45°
2.0	2	150	0.024	0.080	0.080	2.00	23875	1145	45°
2.5	2	150	0.026	0.100	0.100	2.49	19175	995	45°
3.0	2	150	0.028	0.120	0.120	2.97	16075	900	45°

Frese toriche Microcut-T5H

Gambo Ø 3 mm, scarico cilindrico, 5xd



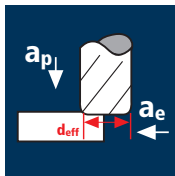
HM
XA λ **25°**
 γ **-10°**



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium
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Esempio: N° Ordine										DURO-S
										D5764
Rivestimento Articolo Codice-ø										
D 5764 .100										
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z	
.100	1.0	3	0.95	50	1.20	5.0	0.20	6.6°	2	●
.108	1.2	3	1.10	50	1.44	6.0	0.20	5.5°	2	●
.120	1.5	3	1.40	50	1.80	7.5	0.20	4.2°	2	●
.140	2.0	3	1.90	50	2.40	10.0	0.20	2.5°	2	●
.160	2.5	3	2.30	50	3.00	12.5	0.20	1.1°	2	●
.180	3.0	3	2.80	50	3.60	15.0	0.20	0.0°	2	●

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

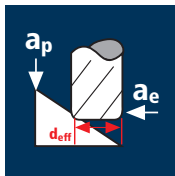
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	180	0.036	0.05	0.20	0.86	60000	4320	r=0.2
1.2	2	180	0.042	0.06	0.24	1.09	52565	4415	r=0.2
1.5	2	180	0.054	0.08	0.30	1.42	40350	4360	r=0.2
2.0	2	180	0.072	0.10	0.40	1.95	29385	4230	r=0.2
2.5	2	180	0.090	0.13	0.50	2.47	23195	4175	r=0.2
3.0	2	180	0.108	0.15	0.60	2.99	19165	4140	r=0.2

1.0	2	160	0.032	0.05	0.20	0.86	59220	3790	r=0.2
1.2	2	160	0.038	0.06	0.24	1.09	46725	3550	r=0.2
1.5	2	160	0.048	0.08	0.30	1.42	35865	3445	r=0.2
2.0	2	160	0.064	0.10	0.40	1.95	26120	3345	r=0.2
2.5	2	160	0.082	0.13	0.50	2.47	20620	3380	r=0.2
3.0	2	160	0.098	0.15	0.60	2.99	17035	3340	r=0.2

1.0	2	80	0.032	0.05	0.20	0.86	29610	1895	r=0.2
1.2	2	80	0.038	0.06	0.24	1.09	23365	1775	r=0.2
1.5	2	80	0.048	0.08	0.30	1.42	17935	1720	r=0.2
2.0	2	80	0.064	0.10	0.40	1.95	13060	1670	r=0.2
2.5	2	80	0.082	0.13	0.50	2.47	10310	1690	r=0.2
3.0	2	80	0.098	0.15	0.60	2.99	8515	1670	r=0.2

1.0	2	60	0.026	0.05	0.20	0.86	22210	1155	r=0.2
1.2	2	60	0.030	0.06	0.24	1.09	17520	1050	r=0.2
1.5	2	60	0.038	0.08	0.30	1.42	13450	1020	r=0.2
2.0	2	60	0.050	0.10	0.40	1.95	9795	980	r=0.2
2.5	2	60	0.064	0.13	0.50	2.47	7730	990	r=0.2
3.0	2	60	0.076	0.15	0.60	2.99	6390	970	r=0.2

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio inossidabile
[Cr-Ni/1.4301]

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	300	0.022	0.038	0.038	0.99	60000	2640	45°
1.2	2	300	0.024	0.046	0.046	1.20	60000	2880	45°
1.5	2	300	0.028	0.058	0.058	1.50	60000	3360	45°
2.0	2	300	0.030	0.076	0.076	2.00	47750	2865	45°
2.5	2	300	0.032	0.096	0.096	2.49	38350	2455	45°
3.0	2	300	0.036	0.114	0.114	2.98	32045	2305	45°

1.0	2	250	0.020	0.038	0.038	0.99	60000	2400	45°
1.2	2	250	0.022	0.046	0.046	1.20	60000	2640	45°
1.5	2	250	0.026	0.058	0.058	1.50	53055	2760	45°
2.0	2	250	0.028	0.076	0.076	2.00	39790	2230	45°
2.5	2	250	0.028	0.096	0.096	2.49	31960	1790	45°
3.0	2	250	0.032	0.114	0.114	2.98	26705	1710	45°

1.0	2	120	0.018	0.038	0.038	0.99	38585	1390	45°
1.2	2	120	0.020	0.046	0.046	1.20	31830	1275	45°
1.5	2	120	0.022	0.058	0.058	1.50	25465	1120	45°
2.0	2	120	0.024	0.076	0.076	2.00	19100	915	45°
2.5	2	120	0.026	0.096	0.096	2.49	15340	800	45°
3.0	2	120	0.028	0.114	0.114	2.98	12820	720	45°

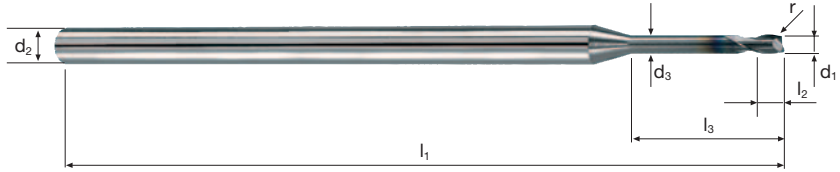
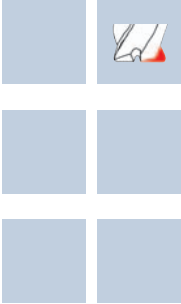
1.0	2	100	0.016	0.038	0.038	0.99	32155	1030	45°
1.2	2	100	0.016	0.046	0.046	1.20	26525	850	45°
1.5	2	100	0.020	0.058	0.058	1.50	21220	850	45°
2.0	2	100	0.022	0.076	0.076	2.00	15915	700	45°
2.5	2	100	0.022	0.096	0.096	2.49	12785	565	45°
3.0	2	100	0.026	0.114	0.114	2.98	10680	555	45°

Frese toriche Microcut-T8

Gambo Ø 3 mm, scarico cilindrico, 8xd



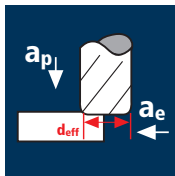
HM
Micro λ **25°**
γ **6°**



- Rm**
< 850
- Rm**
850-1100
- Rm**
1100-1300
- Rm**
1300-1500
-
-
- Inox**
Stainless
- Ti**
Titanium
- Cobalt-Chrome**
Gold / Platinum
Copper

											MICRO
											M5756
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.100	1.0	3	0.95	50	1.20	8.0	0.20	4.9°	2		●
.108	1.2	3	1.10	50	1.44	9.6	0.20	4.0°	2		●
.120	1.5	3	1.40	60	1.80	12.0	0.20	3.0°	2		●
.140	2.0	3	1.90	60	2.40	16.0	0.20	1.7°	2		●
.160	2.5	3	2.30	60	3.00	20.0	0.20	0.7°	2		●
.180	3.0	3	2.80	60	3.60	24.0	0.20	0.0°	2		●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

D

Acciaio da utensile temprato
48 - 52 HRC

D

Acciaio da utensile temprato
52 - 56 HRC

D

Acciaio da utensile temprato
56 - 60 HRC

D

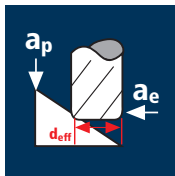
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	r [mm]
1.0	2	140	0.026	0.04	0.18	0.84	53055	2760	r=0.2
1.2	2	140	0.030	0.05	0.22	1.06	42040	2520	r=0.2
1.5	2	140	0.038	0.06	0.27	1.39	32060	2435	r=0.2
2.0	2	140	0.050	0.08	0.36	1.92	23210	2320	r=0.2
2.5	2	140	0.062	0.10	0.45	2.45	18190	2255	r=0.2
3.0	2	140	0.076	0.12	0.54	2.97	15005	2280	r=0.2

1.0	2	120	0.024	0.04	0.18	0.84	45475	2185	r=0.2
1.2	2	120	0.028	0.05	0.22	1.06	36035	2020	r=0.2
1.5	2	120	0.036	0.06	0.27	1.39	27480	1980	r=0.2
2.0	2	120	0.048	0.08	0.36	1.92	19895	1910	r=0.2
2.5	2	120	0.058	0.10	0.45	2.45	15590	1810	r=0.2
3.0	2	120	0.072	0.12	0.54	2.97	12860	1850	r=0.2

1.0	2	100	0.022	0.04	0.18	0.84	37895	1665	r=0.2
1.2	2	100	0.026	0.05	0.22	1.06	30030	1560	r=0.2
1.5	2	100	0.034	0.06	0.27	1.39	22900	1555	r=0.2
2.0	2	100	0.044	0.08	0.36	1.92	16580	1460	r=0.2
2.5	2	100	0.054	0.10	0.45	2.45	12995	1405	r=0.2
3.0	2	100	0.066	0.12	0.54	2.97	10720	1415	r=0.2

1.0	2	60	0.020	0.04	0.18	0.84	22735	910	r=0.2
1.2	2	60	0.024	0.05	0.22	1.06	18020	865	r=0.2
1.5	2	60	0.030	0.06	0.27	1.39	13740	825	r=0.2
2.0	2	60	0.040	0.08	0.36	1.92	9945	795	r=0.2
2.5	2	60	0.050	0.10	0.45	2.45	7795	780	r=0.2
3.0	2	60	0.060	0.12	0.54	2.97	6430	770	r=0.2

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

D

Acciaio da utensile temprato
48 - 52 HRC

D

Acciaio da utensile temprato
52 - 56 HRC

D

Acciaio da utensile temprato
56 - 60 HRC

D

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
1.0	2	300	0.022	0.038	0.038	0.99	60000	2640	45°
1.2	2	300	0.024	0.046	0.046	1.20	60000	2880	45°
1.5	2	300	0.028	0.058	0.058	1.50	60000	3360	45°
2.0	2	300	0.030	0.076	0.076	2.00	47750	2865	45°
2.5	2	300	0.032	0.096	0.096	2.49	38350	2455	45°
3.0	2	300	0.036	0.114	0.114	2.98	32045	2305	45°

1.0	2	250	0.020	0.038	0.038	0.99	60000	2400	45°
1.2	2	250	0.022	0.046	0.046	1.20	60000	2640	45°
1.5	2	250	0.026	0.058	0.058	1.50	53055	2760	45°
2.0	2	250	0.028	0.076	0.076	2.00	39790	2230	45°
2.5	2	250	0.030	0.096	0.096	2.49	31960	1920	45°
3.0	2	250	0.034	0.114	0.114	2.98	26705	1815	45°

1.0	2	200	0.020	0.038	0.038	0.99	60000	2400	45°
1.2	2	200	0.022	0.046	0.046	1.20	53055	2335	45°
1.5	2	200	0.026	0.058	0.058	1.50	42445	2205	45°
2.0	2	200	0.028	0.076	0.076	2.00	31830	1780	45°
2.5	2	200	0.028	0.096	0.096	2.49	25570	1430	45°
3.0	2	200	0.032	0.114	0.114	2.98	21365	1365	45°

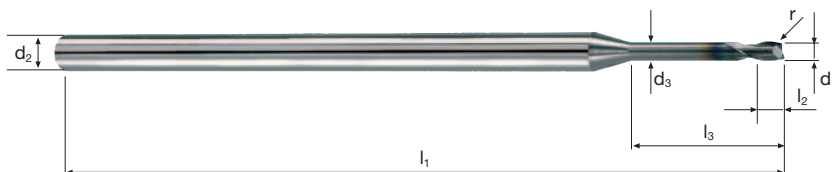
1.0	2	150	0.018	0.038	0.038	0.99	48230	1735	45°
1.2	2	150	0.020	0.046	0.046	1.20	39790	1590	45°
1.5	2	150	0.022	0.058	0.058	1.50	31830	1400	45°
2.0	2	150	0.024	0.076	0.076	2.00	23875	1145	45°
2.5	2	150	0.026	0.096	0.096	2.49	19175	995	45°
3.0	2	150	0.028	0.114	0.114	2.98	16025	895	45°

Frese toriche Microcut-T8H

Gambo Ø 3 mm, scarico cilindrico, 8xd



**HM
XA** λ 25°
 γ -10°



Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium
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Esempio: N° Ordine										DURO-S
Rivestimento D Articolo 5766 Codice-ø .100										D5766
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z	
.100	1.0	3	0.95	50	1.20	8.0	0.20	4.9°	2	●
.108	1.2	3	1.10	50	1.44	9.6	0.20	4.0°	2	●
.120	1.5	3	1.40	60	1.80	12.0	0.20	3.0°	2	●
.140	2.0	3	1.90	60	2.40	16.0	0.20	1.7°	2	●
.160	2.5	3	2.30	60	3.00	20.0	0.20	0.7°	2	●
.180	3.0	3	2.80	60	3.60	24.0	0.20	0.0°	2	●






Frese per alluminio e rame

A taglienti lisci, cilindrico



Esecuzione normale

N° 15520 / 15620		AX-NV2	X-Generation X	Sgrossatura Finitura	d, 2 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	533
N° 15525 / 15625		AX-NV2	X-Generation X	Sgrossatura Finitura	d, 6 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	535
N° 15530 / 15630		AX-NV3	X-Generation X	Sgrossatura Finitura	d, 3 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	537
N° 15535 / 15635		AX-NV3	X-Generation X	Sgrossatura Finitura	d, 6 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	539
N° 5272 / 5500		Alucut	Favara® F	Sgrossatura Finitura	d, 2 – 20 45°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	541

Esecuzione medio-lunga

N° 15550 / 15650		AX-NV2	X-Generation X	Sgrossatura Finitura	d, 3 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	543
N° 15557 / 15657		AX-NV3	X-Generation X	Sgrossatura Finitura	d, 3 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	545
N° 15560 / 15660		AX-NV3	X-Generation X	Sgrossatura Finitura	d, 3 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	547

Esecuzione lunga









N° 15559 / 15659		AX-NV3	X-Generation X	Sgrossatura Finitura	d, 6 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	549
N° 15561 / 15661		AX-V3	X-Generation X	Sgrossatura Finitura	d, 6 – 20 90°	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast	551






Frese per alluminio e rame

A taglienti lisci, torico

Esecuzione 2xd – 5xd

N° 15572		AX-RV2	X-Generation X	Sgrossatura Finitura	r 1.5, 2.5, 4.0	Al Aluminium Alloy				553
N° 15573		AX-RV2	X-Generation X	Sgrossatura Finitura	r 0.5, 1.0, 1.5, 2.0, 2.5, 4.0	Al Aluminium Alloy				555
N° 15574		AX-RV2	X-Generation X	Sgrossatura Finitura	r 1.0, 1.5, 2.0, 2.5, 4.0	Al Aluminium Alloy				559
N° 15575		AX-RV2	X-Generation X	Sgrossatura Finitura	r 1.0, 2.5, 4.0	Al Aluminium Alloy				563
N° 15582		AX-RV3	X-Generation X	Sgrossatura Finitura	r 2.5, 4.0	Al Aluminium Alloy				565
N° 15583		AX-RV3	X-Generation X	Sgrossatura Finitura	r 0.5, 1.0, 1.5, 2.0, 2.5, 4.0	Al Aluminium Alloy				567
N° 15584		AX-RV3	X-Generation X	Sgrossatura Finitura	r 1.0, 2.5, 4.0	Al Aluminium Alloy				571
N° 15585		AX-RV3	X-Generation X	Sgrossatura Finitura	r 1.0, 2.5, 4.0	Al Aluminium Alloy				573

Esecuzione normale

N° 5275		AluSpeed	Base-X B	Sgrossatura Finitura	r 0.5, 1.0, 1.5, 2.0, 2.5	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast		575
N° 5271		AB-R	Base-X B	Sgrossatura Finitura	r 1.5, 2.0, 2.5, 4.0	Al Aluminium Alloy				577
N° 5276		AB-R3	Base-X B	Sgrossatura Finitura	r 1.0, 1.5, 2.0, 2.5	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast		579

Esecuzione medio-lunga

N° 5277		AluSpeed	Base-X B	Sgrossatura Finitura	r 1.0, 1.5, 2.0	Al Aluminium Alloy	Cu Copper	Plastic Thermoplast		581
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Frese per alluminio e rame Profilata

Esecuzione normale, cilindrica

N° 5297 / 5397



AX-FP

X-Generation
X

Sgrossatura d_1 6 – 20



Al
Aluminium
Alloy

Cu
Copper

583

N° 0391



HSS

Sgrossatura d_1 6 – 25



Al
Aluminium
Alloy

Cu
Copper

585

Esecuzione medio-lunga, cilindrica

N° 15297 / 15397



AX-FP

X-Generation
X

Sgrossatura d_1 6 – 20



Al
Aluminium
Alloy

Cu
Copper

587

N° 15298 / 15398



AX-FP

X-Generation
X

Sgrossatura d_1 6 – 25



Al
Aluminium
Alloy

Cu
Copper

589

N° 0393



HSS

Sgrossatura d_1 10 – 25



Al
Aluminium
Alloy

Cu
Copper

591

Frese per alluminio e rame

Finitura

Esecuzione normale

N° 15589



Multicut XA
new!



Sgrossatura



d, 6 – 20

Finitura



r

Al
Aluminium
Alloy

593

Esecuzione medio-lunga

N° 15590



Multicut XA
new!



Sgrossatura



d, 6 – 20

Finitura



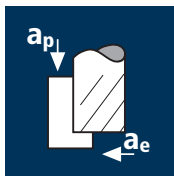
r

Al
Aluminium
Alloy

595

III

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	2	550	0.055	4.5	1.8	58360	6420	52.0
4	2	550	0.075	6.0	2.4	43770	6565	94.5
5	2	550	0.090	7.5	3.0	35015	6305	142.0
6	2	550	0.120	9.0	3.6	29180	7005	227.0
8	2	550	0.160	12.0	4.8	21885	7005	403.5
10	2	550	0.200	15.0	6.0	17510	7005	630.5
12	2	550	0.220	18.0	7.2	14590	6420	832.0
16	2	550	0.245	24.0	9.6	10940	5360	1235.0
20	2	550	0.285	30.0	12.0	8755	4990	1796.5

Rame non legato



3	2	400	0.045	4.5	1.8	42445	3820	31.0
4	2	400	0.060	6.0	2.4	31830	3820	55.0
5	2	400	0.070	7.5	3.0	25465	3565	80.0
6	2	400	0.095	9.0	3.6	21220	4030	130.5
8	2	400	0.130	12.0	4.8	15915	4140	238.5
10	2	400	0.160	15.0	6.0	12735	4075	367.0
12	2	400	0.175	18.0	7.2	10610	3715	481.5
16	2	400	0.195	24.0	9.6	7960	3105	715.5
20	2	400	0.230	30.0	12.0	6365	2930	1055.0

Materiali termoplastici



3	2	1000	0.055	4.5	1.8	60000	6600	53.5
4	2	1000	0.075	6.0	2.4	60000	9000	129.5
5	2	1000	0.090	7.5	3.0	60000	10800	243.0
6	2	1000	0.120	9.0	3.6	53055	12735	412.5
8	2	1000	0.160	12.0	4.8	39790	12735	733.5
10	2	1000	0.200	15.0	6.0	31830	12730	1145.5
12	2	1000	0.220	18.0	7.2	26525	11670	1512.5
16	2	1000	0.245	24.0	9.6	19895	9750	2246.5
20	2	1000	0.285	30.0	12.0	15915	9070	3265.0

Getti d'alluminio
Si 6% - 15%



3	2	350	0.040	4.5	1.8	37135	2970	24.0
4	2	350	0.055	6.0	2.4	27855	3065	44.0
5	2	350	0.065	7.5	3.0	22280	2895	65.0
6	2	350	0.085	9.0	3.6	18570	3155	102.0
8	2	350	0.110	12.0	4.8	13925	3065	176.5
10	2	350	0.140	15.0	6.0	11140	3120	281.0
12	2	350	0.155	18.0	7.2	9285	2880	373.0
16	2	350	0.170	24.0	9.6	6965	2370	546.0
20	2	350	0.200	30.0	12.0	5570	2230	803.0

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	2	450	0.040	3.0	3	47750	3820	34.5
4	2	450	0.055	4.0	4	35810	3940	63.0
5	2	450	0.065	5.0	5	28650	3725	93.0
6	2	450	0.085	6.0	6	23875	4060	146.0
8	2	450	0.110	8.0	8	17905	3940	252.0
10	2	450	0.140	10.0	10	14325	4010	401.0
12	2	450	0.155	12.0	12	11935	3700	533.0
16	2	450	0.170	16.0	16	8955	3045	779.5
20	2	450	0.200	20.0	20	7160	2865	1146.0

Rame non legato



3	2	350	0.030	3.0	3	37135	2230	20.0
4	2	350	0.045	4.0	4	27855	2505	40.0
5	2	350	0.050	5.0	5	22280	2230	56.0
6	2	350	0.070	6.0	6	18570	2600	93.5
8	2	350	0.090	8.0	8	13925	2505	160.5
10	2	350	0.110	10.0	10	11140	2450	245.0
12	2	350	0.125	12.0	12	9285	2320	334.0
16	2	350	0.135	16.0	16	6965	1880	481.5
20	2	350	0.160	20.0	20	5570	1780	712.0

Materiali termoplastici



3	2	800	0.040	3.0	3	60000	4800	43.0
4	2	800	0.055	4.0	4	60000	6600	105.5
5	2	800	0.065	5.0	5	50930	6620	165.5
6	2	800	0.085	6.0	6	42445	7215	259.5
8	2	800	0.110	8.0	8	31830	7005	448.5
10	2	800	0.140	10.0	10	25465	7130	713.0
12	2	800	0.155	12.0	12	21220	6580	947.5
16	2	800	0.170	16.0	16	15915	5410	1385.0
20	2	800	0.200	20.0	20	12735	5095	2038.0

Getti d'alluminio
Si 6% - 15%



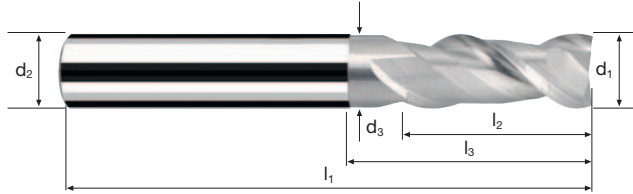
3	2	300	0.030	3.0	3	31830	1910	17.0
4	2	300	0.040	4.0	4	23875	1910	30.5
5	2	300	0.045	5.0	5	19100	1720	43.0
6	2	300	0.060	6.0	6	15915	1910	69.0
8	2	300	0.075	8.0	8	11935	1790	114.5
10	2	300	0.100	10.0	10	9550	1910	191.0
12	2	300	0.110	12.0	12	7960	1750	252.0
16	2	300	0.120	16.0	16	5970	1435	367.5
20	2	300	0.140	20.0	20	4775	1335	534.0

Frese cilindriche AX-NV2

A taglienti lisci, esecuzione normale con scarico corto



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura

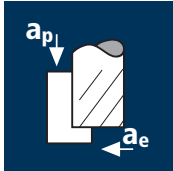











Finitura



Rm < 850		Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø				CELERO	
	C	15520	.140						15620	C15620
									15520	C15520
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	α	z		
.140	2	6	1.9	57	7	10	7.0°	2	●	●
.180	3	6	2.8	57	8	14	4.5°	2	●	●
.220	4	6	3.7	57	11	16	3.0°	2	●	●
.260	5	6	4.6	57	13	18	1.5°	2	●	●
.300	6	6	5.5	57	13	20	0.0°	2	●	●
.391	8	8	7.4	63	19	26	0.0°	2	●	●
.450	10	10	9.2	72	22	31	0.0°	2	●	●
.501	12	12	11.0	83	26	37	0.0°	2	●	●
.610	16	16	15.0	92	32	43	0.0°	2	●	●
.682	20	20	19.0	104	38	53	0.0°	2	●	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	6	2	650	0.065	9.0	3.3	34485	4485	133.0
		8	2	650	0.090	12.0	4.4	25865	4655	246.0
		10	2	650	0.110	15.0	5.5	20690	4550	375.5
		12	2	650	0.120	18.0	6.6	17240	4140	492.0
		16	2	650	0.135	24.0	8.8	12930	3490	737.0
		20	2	650	0.155	30.0	11.0	10345	3205	1057.5
Rame non legato		6	2	500	0.050	9.0	3.3	26525	2655	79.0
		8	2	500	0.070	12.0	4.4	19895	2785	147.0
		10	2	500	0.090	15.0	5.5	15915	2865	236.5
		12	2	500	0.095	18.0	6.6	13265	2520	299.5
		16	2	500	0.105	24.0	8.8	9945	2090	441.5
		20	2	500	0.125	30.0	11.0	7960	1990	656.5
Materiali termoplastici		6	2	1200	0.065	9.0	3.3	60000	7800	231.5
		8	2	1200	0.090	12.0	4.4	47750	8595	454.0
		10	2	1200	0.110	15.0	5.5	38200	8405	693.5
		12	2	1200	0.120	18.0	6.6	31830	7640	907.5
		16	2	1200	0.135	24.0	8.8	23875	6445	1361.0
		20	2	1200	0.155	30.0	11.0	19100	5920	1953.5
Getti d'alluminio Si 6% - 15%		6	2	450	0.045	9.0	3.3	23875	2150	64.0
		8	2	450	0.060	12.0	4.4	17905	2150	113.5
		10	2	450	0.075	15.0	5.5	14325	2150	177.5
		12	2	450	0.085	18.0	6.6	11935	2030	241.0
		16	2	450	0.095	24.0	8.8	8955	1700	359.0
		20	2	450	0.110	30.0	11.0	7160	1575	520.0

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	6	2	550	0.045	5.4	6	29180	2625	85.0
		8	2	550	0.060	7.2	8	21885	2625	151.0
		10	2	550	0.075	9.0	10	17510	2625	236.5
		12	2	550	0.085	10.8	12	14590	2480	321.5
		16	2	550	0.095	14.4	16	10940	2080	479.0
		20	2	550	0.110	18.0	20	8755	1925	693.0
Rame non legato		6	2	450	0.040	5.4	6	23875	1910	62.0
		8	2	450	0.050	7.2	8	17905	1790	103.0
		10	2	450	0.060	9.0	10	14325	1720	155.0
		12	2	450	0.070	10.8	12	11935	1670	216.5
		16	2	450	0.075	14.4	16	8955	1345	310.0
		20	2	450	0.090	18.0	20	7160	1290	464.5
Materiali termoplastici		6	2	1000	0.045	5.4	6	53055	4775	154.5
		8	2	1000	0.060	7.2	8	39790	4775	275.0
		10	2	1000	0.075	9.0	10	31830	4775	430.0
		12	2	1000	0.085	10.8	12	26525	4510	584.5
		16	2	1000	0.095	14.4	16	19895	3780	871.0
		20	2	1000	0.110	18.0	20	15915	3500	1260.0
Getti d'alluminio Si 6% - 15%		6	2	400	0.035	5.4	6	21220	1485	48.0
		8	2	400	0.040	7.2	8	15915	1275	73.5
		10	2	400	0.055	9.0	10	12735	1400	126.0
		12	2	400	0.060	10.8	12	10610	1275	165.0
		16	2	400	0.065	14.4	16	7960	1035	238.5
		20	2	400	0.075	18.0	20	6365	955	344.0

Frese cilindriche AX-NV2

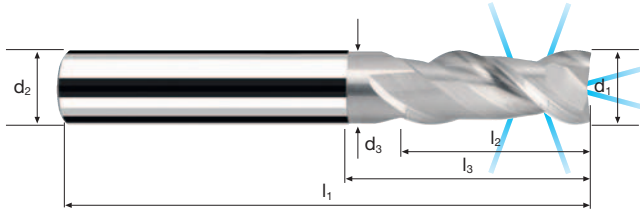
A taglienti lisci, esecuzione normale con scarico corto, con canale di raffreddamento integrato



HM MG10 λ **40°**
 γ **20°**

90°

Vario



Sgrossatura



Finitura



Rm < 850

Al Aluminium > 99%

Al Aluminium Alloy

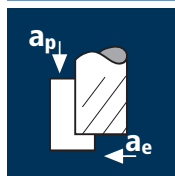
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Esempio: N° Ordine		Rivestimento C	Articolo 15525	Codice- ϕ .300					CELERO
								15625	C15625
								15525	C15525
ϕ Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	z		
.300	6	6	5.5	57	13	20	2	●	●
.391	8	8	7.4	63	19	26	2	●	●
.450	10	10	9.2	72	22	31	2	●	●
.501	12	12	11.0	83	26	37	2	●	●
.610	16	16	15.0	92	32	43	2	●	●
.682	20	20	19.0	104	38	53	2	●	●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	550	0.050	4.5	1.4	58360	8755	55.0
4	3	550	0.065	6.0	1.8	43770	8535	92.0
5	3	550	0.085	7.5	2.3	35015	8930	154.0
6	3	550	0.110	9.0	2.7	29180	9630	234.0
8	3	550	0.135	12.0	3.6	21885	8865	383.0
10	3	550	0.165	15.0	4.5	17510	8665	585.0
12	3	550	0.200	18.0	5.4	14590	8755	851.0
16	3	550	0.215	24.0	7.2	10940	7055	1219.0
20	3	550	0.250	30.0	9.0	8755	6565	1772.5

Rame non legato



3	3	400	0.040	4.5	1.4	42445	5095	31.0
4	3	400	0.050	6.0	1.8	31830	4775	51.5
5	3	400	0.070	7.5	2.3	25465	5350	90.5
6	3	400	0.090	9.0	2.7	21220	5730	139.0
8	3	400	0.110	12.0	3.6	15915	5250	227.0
10	3	400	0.130	15.0	4.5	12735	4965	335.0
12	3	400	0.160	18.0	5.4	10610	5095	495.0
16	3	400	0.170	24.0	7.2	7960	4060	701.5
20	3	400	0.200	30.0	9.0	6365	3820	1031.5

Materiali termoplastici



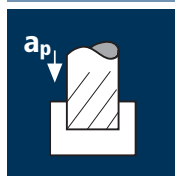
3	3	1000	0.050	4.5	1.4	60000	9000	54.5
4	3	1000	0.065	6.0	1.8	60000	11700	126.5
5	3	1000	0.085	7.5	2.3	60000	15300	258.0
6	3	1000	0.110	9.0	2.7	53055	17510	425.5
8	3	1000	0.135	12.0	3.6	39790	16115	696.0
10	3	1000	0.165	15.0	4.5	31830	15755	1063.5
12	3	1000	0.200	18.0	5.4	26525	15915	1547.0
16	3	1000	0.215	24.0	7.2	19895	12830	2217.0
20	3	1000	0.250	30.0	9.0	15915	11935	3222.5

Getti d'alluminio
Si 6% - 15%



3	3	350	0.035	4.5	1.4	37135	3900	23.5
4	3	350	0.045	6.0	1.8	27855	3760	40.5
5	3	350	0.060	7.5	2.3	22280	4010	67.5
6	3	350	0.075	9.0	2.7	18570	4180	101.5
8	3	350	0.095	12.0	3.6	13925	3970	171.5
10	3	350	0.115	15.0	4.5	11140	3845	259.5
12	3	350	0.140	18.0	5.4	9285	3900	379.0
16	3	350	0.150	24.0	7.2	6965	3135	541.5
20	3	350	0.175	30.0	9.0	5570	2925	790.0

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	450	0.035	1.8	3	47750	5015	27.0
4	3	450	0.045	2.4	4	35810	4835	46.5
5	3	450	0.060	3.0	5	28650	5155	77.5
6	3	450	0.075	3.6	6	23875	5370	116.0
8	3	450	0.095	4.8	8	17905	5105	196.0
10	3	450	0.115	6.0	10	14325	4940	296.5
12	3	450	0.140	7.2	12	11935	5015	433.5
16	3	450	0.150	9.6	16	8955	4030	619.0
20	3	450	0.175	12.0	20	7160	3760	902.5

Rame non legato



3	3	350	0.030	1.8	3	37135	3340	18.0
4	3	350	0.035	2.4	4	27855	2925	28.0
5	3	350	0.050	3.0	5	22280	3340	50.0
6	3	350	0.060	3.6	6	18570	3345	72.5
8	3	350	0.075	4.8	8	13925	3135	120.5
10	3	350	0.090	6.0	10	11140	3010	180.5
12	3	350	0.110	7.2	12	9285	3065	265.0
16	3	350	0.120	9.6	16	6965	2505	385.0
20	3	350	0.140	12.0	20	5570	2340	561.5

Materiali termoplastici



3	3	800	0.035	1.8	3	60000	6300	34.0
4	3	800	0.045	2.4	4	60000	8100	78.0
5	3	800	0.060	3.0	5	50930	9165	137.5
6	3	800	0.075	3.6	6	42445	9550	206.5
8	3	800	0.095	4.8	8	31830	9070	348.5
10	3	800	0.115	6.0	10	25465	8785	527.0
12	3	800	0.140	7.2	12	21220	8910	770.0
16	3	800	0.150	9.6	16	15915	7160	1100.0
20	3	800	0.175	12.0	20	12735	6685	1604.5

Getti d'alluminio
Si 6% - 15%



3	3	300	0.025	1.8	3	31830	2385	13.0
4	3	300	0.030	2.4	4	23875	2150	20.5
5	3	300	0.040	3.0	5	19100	2290	34.5
6	3	300	0.055	3.6	6	15915	2625	56.5
8	3	300	0.065	4.8	8	11935	2325	89.5
10	3	300	0.080	6.0	10	9550	2290	137.5
12	3	300	0.100	7.2	12	7960	2390	206.5
16	3	300	0.105	9.6	16	5970	1880	289.0
20	3	300	0.125	12.0	20	4775	1790	429.5

Frese cilindriche AX-NV3

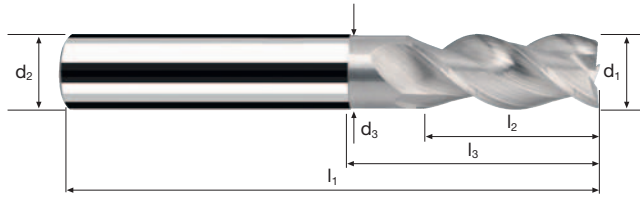
A taglienti lisci, esecuzione normale con scarico corto



HM MG10 λ **40°**
 γ **20°**

90°

Vario



Sgrossatura



Finitura



Rm < 850

Al Aluminium > 99%

Al Aluminium Alloy

Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Esempio: N° Ordine	Rivestimento			Articolo			Codice-ø				CELERO	
	C	15530	.180							15630	C15630	
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	α	z				
.180	3	6	2.8	57	8	14	4.5°	3	●	●	●	●
.220	4	6	3.7	57	11	16	3.0°	3	●	●	●	●
.260	5	6	4.6	57	13	18	1.5°	3	●	●	●	●
.300	6	6	5.5	57	13	20	0.0°	3	●	●	●	●
.391	8	8	7.4	63	19	26	0.0°	3	●	●	●	●
.450	10	10	9.2	72	22	31	0.0°	3	●	●	●	●
.501	12	12	11.0	83	26	37	0.0°	3	●	●	●	●
.610	16	16	15.0	92	32	43	0.0°	3	●	●	●	●
.682	20	20	19.0	104	38	53	0.0°	3	●	●	●	●

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	650	0.060	9.0	2.4	34485	6205	134.0
8	3	650	0.075	12.0	3.2	25865	5820	223.5
10	3	650	0.090	15.0	4.0	20690	5585	335.0
12	3	650	0.110	18.0	4.8	17240	5690	491.5
16	3	650	0.120	24.0	6.4	12930	4655	715.0
20	3	650	0.140	30.0	8.0	10345	4345	1043.0

Rame non legato

6	3	500	0.050	9.0	2.4	26525	3980	86.0
8	3	500	0.060	12.0	3.2	19895	3580	137.5
10	3	500	0.070	15.0	4.0	15915	3340	200.5
12	3	500	0.090	18.0	4.8	13265	3580	309.5
16	3	500	0.095	24.0	6.4	9945	2835	435.5
20	3	500	0.110	30.0	8.0	7960	2625	630.0

Materiali termoplastici

6	3	1200	0.060	9.0	2.4	60000	10800	233.5
8	3	1200	0.075	12.0	3.2	47750	10745	412.5
10	3	1200	0.090	15.0	4.0	38200	10315	619.0
12	3	1200	0.110	18.0	4.8	31830	10505	907.5
16	3	1200	0.120	24.0	6.4	23875	8595	1320.0
20	3	1200	0.140	30.0	8.0	19100	8020	1925.0

Getti d'alluminio
Si 6% - 15%

6	3	450	0.040	9.0	2.4	23875	2865	62.0
8	3	450	0.050	12.0	3.2	17905	2685	103.0
10	3	450	0.065	15.0	4.0	14325	2795	167.5
12	3	450	0.075	18.0	4.8	11935	2685	232.0
16	3	450	0.085	24.0	6.4	8955	2285	351.0
20	3	450	0.095	30.0	8.0	7160	2040	489.5

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	550	0.040	3.0	6	29180	3500	63.0
8	3	550	0.050	4.0	8	21885	3285	105.0
10	3	550	0.065	5.0	10	17510	3415	171.0
12	3	550	0.075	6.0	12	14590	3285	236.5
16	3	550	0.085	8.0	16	10940	2790	357.0
20	3	550	0.095	10.0	20	8755	2495	499.0

Rame non legato

6	3	450	0.035	3.0	6	23875	2505	45.0
8	3	450	0.040	4.0	8	17905	2150	69.0
10	3	450	0.050	5.0	10	14325	2150	107.5
12	3	450	0.060	6.0	12	11935	2150	155.0
16	3	450	0.065	8.0	16	8955	1745	223.5
20	3	450	0.075	10.0	20	7160	1610	322.0

Materiali termoplastici

6	3	1000	0.040	3.0	6	53055	6365	114.5
8	3	1000	0.050	4.0	8	39790	5970	191.0
10	3	1000	0.065	5.0	10	31830	6205	310.5
12	3	1000	0.075	6.0	12	26525	5970	430.0
16	3	1000	0.085	8.0	16	19895	5075	649.5
20	3	1000	0.095	10.0	20	15915	4535	907.0

Getti d'alluminio
Si 6% - 15%

6	3	400	0.030	3.0	6	21220	1910	34.5
8	3	400	0.035	4.0	8	15915	1670	53.5
10	3	400	0.045	5.0	10	12735	1720	86.0
12	3	400	0.055	6.0	12	10610	1750	126.0
16	3	400	0.060	8.0	16	7960	1435	183.5
20	3	400	0.070	10.0	20	6365	1335	267.0

Frese cilindriche AX-NV3

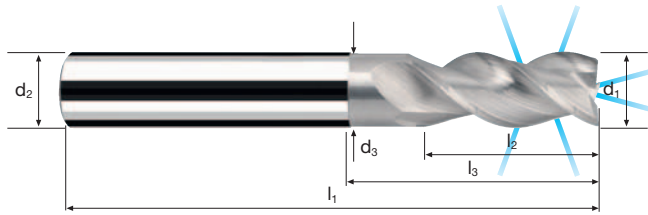
A taglienti lisci, esecuzione normale con scarico corto, con canale di raffreddamento integrato



HM λ 40°
MG10 γ 20°

90°

Vario



Sgrossatura



Finitura



Rm < 850

Al Aluminium > 99%

Al Aluminium Alloy

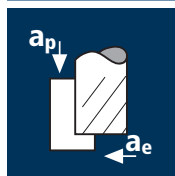
Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø					CELERO
		C	15535	.300				15635	C15635
								15535	C15535
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	z		
.300	6	6	5.5	57	13	20	3	●	●
.391	8	8	7.4	63	19	26	3	●	●
.450	10	10	9.2	72	22	31	3	●	●
.501	12	12	11.0	83	26	37	3	●	●
.610	16	16	15.0	92	32	43	3	●	●
.682	20	20	19.0	104	38	53	3	●	●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	2	550	0.040	4.5	1.4	58360	4670	29.5
4	2	550	0.055	6.0	1.8	43770	4815	52.0
5	2	550	0.070	7.5	2.3	35015	4900	84.5
6	2	550	0.090	9.0	2.7	29180	5250	127.5
8	2	550	0.120	12.0	3.6	21885	5250	227.0
10	2	550	0.150	15.0	4.5	17510	5255	354.5
12	2	550	0.165	18.0	5.4	14590	4815	468.0
16	2	550	0.185	24.0	7.2	10940	4050	700.0
20	2	550	0.215	30.0	9.0	8755	3765	1016.5

Rame non legato



3	2	400	0.030	4.5	1.4	42445	2545	15.5
4	2	400	0.045	6.0	1.8	31830	2865	31.0
5	2	400	0.055	7.5	2.3	25465	2800	47.5
6	2	400	0.070	9.0	2.7	21220	2970	72.0
8	2	400	0.095	12.0	3.6	15915	3025	130.5
10	2	400	0.120	15.0	4.5	12735	3055	206.0
12	2	400	0.130	18.0	5.4	10610	2760	268.5
16	2	400	0.150	24.0	7.2	7960	2390	413.0
20	2	400	0.170	30.0	9.0	6365	2165	584.5

Materiali termoplastici



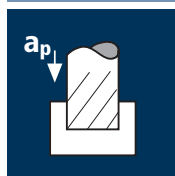
3	2	1000	0.040	4.5	1.4	60000	4800	29.0
4	2	1000	0.055	6.0	1.8	60000	6600	71.5
5	2	1000	0.070	7.5	2.3	60000	8400	142.0
6	2	1000	0.090	9.0	2.7	53055	9550	232.0
8	2	1000	0.120	12.0	3.6	39790	9550	412.5
10	2	1000	0.150	15.0	4.5	31830	9550	644.5
12	2	1000	0.165	18.0	5.4	26525	8755	851.0
16	2	1000	0.185	24.0	7.2	19895	7360	1272.0
20	2	1000	0.215	30.0	9.0	15915	6845	1848.0

Getti d'alluminio
Si 6% - 15%



3	2	350	0.030	4.5	1.4	37135	2230	13.5
4	2	350	0.040	6.0	1.8	27855	2230	24.0
5	2	350	0.050	7.5	2.3	22280	2230	37.5
6	2	350	0.065	9.0	2.7	18570	2415	58.5
8	2	350	0.085	12.0	3.6	13925	2365	102.0
10	2	350	0.105	15.0	4.5	11140	2340	158.0
12	2	350	0.115	18.0	5.4	9285	2135	207.5
16	2	350	0.130	24.0	7.2	6965	1810	313.0
20	2	350	0.150	30.0	9.0	5570	1670	451.0

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	2	450	0.030	1.5	3	47750	2865	13.0
4	2	450	0.040	2.0	4	35810	2865	23.0
5	2	450	0.050	2.5	5	28650	2865	36.0
6	2	450	0.065	3.0	6	23875	3105	56.0
8	2	450	0.085	4.0	8	17905	3045	97.5
10	2	450	0.105	5.0	10	14325	3010	150.5
12	2	450	0.115	6.0	12	11935	2745	197.5
16	2	450	0.130	8.0	16	8955	2330	298.0
20	2	450	0.150	10.0	20	7160	2150	430.0

Rame non legato



3	2	350	0.025	1.5	3	37135	1855	8.5
4	2	350	0.030	2.0	4	27855	1670	13.5
5	2	350	0.040	2.5	5	22280	1780	22.5
6	2	350	0.050	3.0	6	18570	1855	33.5
8	2	350	0.070	4.0	8	13925	1950	62.5
10	2	350	0.085	5.0	10	11140	1895	95.0
12	2	350	0.090	6.0	12	9285	1670	120.0
16	2	350	0.105	8.0	16	6965	1465	187.5
20	2	350	0.120	10.0	20	5570	1335	267.0

Materiali termoplastici



3	2	800	0.030	1.5	3	60000	3600	16.0
4	2	800	0.040	2.0	4	60000	4800	38.5
5	2	800	0.050	2.5	5	50930	5095	63.5
6	2	800	0.065	3.0	6	42445	5520	99.5
8	2	800	0.085	4.0	8	31830	5410	173.0
10	2	800	0.105	5.0	10	25465	5350	267.5
12	2	800	0.115	6.0	12	21220	4880	351.5
16	2	800	0.130	8.0	16	15915	4140	530.0
20	2	800	0.150	10.0	20	12735	3820	764.0

Getti d'alluminio
Si 6% - 15%



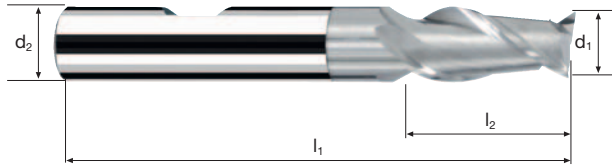
3	2	300	0.020	1.5	3	31830	1275	5.5
4	2	300	0.030	2.0	4	23875	1435	11.5
5	2	300	0.035	2.5	5	19100	1335	16.5
6	2	300	0.045	3.0	6	15915	1430	25.5
8	2	300	0.060	4.0	8	11935	1430	46.0
10	2	300	0.075	5.0	10	9550	1435	72.0
12	2	300	0.080	6.0	12	7960	1275	92.0
16	2	300	0.090	8.0	16	5970	1075	137.5
20	2	300	0.105	10.0	20	4775	1005	201.0

Frese cilindriche Alucut

A taglienti lisci, esecuzione normale



HM
MG10 λ **40°**
 γ **18°**



Sgrossatura



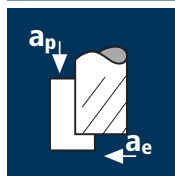
Finitura



Rm < 850		Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine		Rivestimento C	Articolo 5500	Codice- ϕ .140						CELERO
ϕ Code	d1 e8	d2 h6	l1	l2	45°	α	z			
.140	2	6	54	6	0.10	8.0°	2			●
.180	3	6	57	7	0.10	6.0°	2			●
.220	4	6	57	8	0.10	4.5°	2			●
.260	5	6	57	10	0.15	2.5°	2			●
.300	6	6	57	10	0.15	0.0°	2			●
.391	8	8	63	16	0.15	0.0°	2			●
.450	10	10	72	19	0.20	0.0°	2			●
.501	12	12	83	22	0.20	0.0°	2			●
.610	16	16	92	26	0.20	0.0°	2			●
.682	20	20	104	32	0.20	0.0°	2			●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	2	550	0.050	4.5	1.2	58360	5835	31.5
4	2	550	0.065	6.0	1.6	43770	5690	54.5
5	2	550	0.080	7.5	2.0	35015	5600	84.0
6	2	550	0.110	9.0	2.4	29180	6420	138.5
8	2	550	0.145	12.0	3.2	21885	6345	243.5
10	2	550	0.180	15.0	4.0	17510	6305	378.5
12	2	550	0.195	18.0	4.8	14590	5690	491.5
16	2	550	0.220	24.0	6.4	10940	4815	739.5
20	2	550	0.255	30.0	8.0	8755	4465	1071.5

Rame non legato



3	2	400	0.040	4.5	1.2	42445	3395	18.5
4	2	400	0.050	6.0	1.6	31830	3185	30.5
5	2	400	0.065	7.5	2.0	25465	3310	49.5
6	2	400	0.090	9.0	2.4	21220	3820	82.5
8	2	400	0.115	12.0	3.2	15915	3660	140.5
10	2	400	0.145	15.0	4.0	12735	3695	221.5
12	2	400	0.155	18.0	4.8	10610	3290	284.5
16	2	400	0.175	24.0	6.4	7960	2785	428.0
20	2	400	0.205	30.0	8.0	6365	2610	626.5

Materiali termoplastici



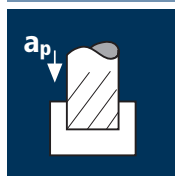
3	2	1000	0.050	4.5	1.2	60000	6000	32.5
4	2	1000	0.065	6.0	1.6	60000	7800	75.0
5	2	1000	0.080	7.5	2.0	60000	9600	144.0
6	2	1000	0.110	9.0	2.4	53055	11670	252.0
8	2	1000	0.145	12.0	3.2	39790	11540	443.0
10	2	1000	0.180	15.0	4.0	31830	11460	687.5
12	2	1000	0.195	18.0	4.8	26525	10345	894.0
16	2	1000	0.220	24.0	6.4	19895	8755	1345.0
20	2	1000	0.255	30.0	8.0	15915	8115	1947.5

Getti d'alluminio
Si 6% - 15%



3	2	350	0.035	4.5	1.2	37135	2600	14.0
4	2	350	0.045	6.0	1.6	27855	2505	24.0
5	2	350	0.055	7.5	2.0	22280	2450	37.0
6	2	350	0.075	9.0	2.4	18570	2785	60.0
8	2	350	0.100	12.0	3.2	13925	2785	107.0
10	2	350	0.125	15.0	4.0	11140	2785	167.0
12	2	350	0.135	18.0	4.8	9285	2505	216.5
16	2	350	0.155	24.0	6.4	6965	2160	332.0
20	2	350	0.180	30.0	8.0	5570	2005	481.0

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	2	450	0.035	2.1	3	47750	3345	21.0
4	2	450	0.045	2.8	4	35810	3225	36.0
5	2	450	0.055	3.5	5	28650	3150	55.0
6	2	450	0.075	4.2	6	23875	3580	90.0
8	2	450	0.100	5.6	8	17905	3580	160.5
10	2	450	0.125	7.0	10	14325	3580	250.5
12	2	450	0.135	8.4	12	11935	3220	324.5
16	2	450	0.155	11.2	16	8955	2775	497.5
20	2	450	0.180	14.0	20	7160	2580	722.5

Rame non legato



3	2	350	0.030	2.1	3	37135	2230	14.0
4	2	350	0.035	2.8	4	27855	1950	22.0
5	2	350	0.045	3.5	5	22280	2005	35.0
6	2	350	0.060	4.2	6	18570	2230	56.0
8	2	350	0.080	5.6	8	13925	2230	100.0
10	2	350	0.100	7.0	10	11140	2230	156.0
12	2	350	0.110	8.4	12	9285	2045	206.0
16	2	350	0.125	11.2	16	6965	1740	312.0
20	2	350	0.145	14.0	20	5570	1615	452.0

Materiali termoplastici



3	2	800	0.035	2.1	3	60000	4200	26.5
4	2	800	0.045	2.8	4	60000	5400	60.5
5	2	800	0.055	3.5	5	50930	5600	98.0
6	2	800	0.075	4.2	6	42445	6365	160.5
8	2	800	0.100	5.6	8	31830	6365	285.0
10	2	800	0.125	7.0	10	25465	6365	445.5
12	2	800	0.135	8.4	12	21220	5730	577.5
16	2	800	0.155	11.2	16	15915	4935	884.5
20	2	800	0.180	14.0	20	12735	4585	1284.0

Getti d'alluminio
Si 6% - 15%



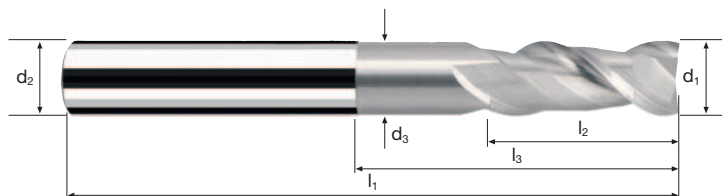
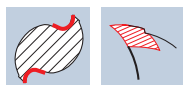
3	2	300	0.025	2.1	3	31830	1590	10.0
4	2	300	0.030	2.8	4	23875	1435	16.0
5	2	300	0.040	3.5	5	19100	1530	27.0
6	2	300	0.055	4.2	6	15915	1750	44.0
8	2	300	0.070	5.6	8	11935	1670	75.0
10	2	300	0.090	7.0	10	9550	1720	120.5
12	2	300	0.095	8.4	12	7960	1510	152.0
16	2	300	0.110	11.2	16	5970	1315	235.5
20	2	300	0.125	14.0	20	4775	1195	334.5

Frese cilindriche AX-NV2

A taglienti lisci, esecuzione medio-lunga con scarico



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura



Finitura



Rm
< 850

Al
Aluminium
> 99%

Al
Aluminium
Alloy

Al
Aluminium
Cast

Cu
Copper

Plastic
Thermoplast

Esempio: N° Ordine		Rivestimento C	Articolo 15550	Codice-Ø .180					CELERO	
								15650	C15650	
								15550	C15550	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	α	z		
.180	3	6	2.8	63	8	20	3.5°	2	●	●
.220	4	6	3.7	63	11	22	2.5°	2	●	●
.260	5	6	4.6	63	13	24	1.5°	2	●	●
.300	6	6	5.5	63	13	26	0.0°	2	●	●
.391	8	8	7.4	72	19	35	0.0°	2	●	●
.450	10	10	9.2	84	22	43	0.0°	2	●	●
.501	12	12	11.0	97	26	51	0.0°	2	●	●
.610	16	16	15.0	108	32	59	0.0°	2	●	●
.682	20	20	19.0	122	38	71	0.0°	2	●	●

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	550	0.045	4.5	0.9	58360	7880	32.0
4	3	550	0.060	6.0	1.2	43770	7880	56.5
5	3	550	0.075	7.5	1.5	35015	7880	88.5
6	3	550	0.100	9.0	1.8	29180	8755	142.0
8	3	550	0.120	12.0	2.4	21885	7880	227.0
10	3	550	0.150	15.0	3.0	17510	7880	354.5
12	3	550	0.180	18.0	3.6	14590	7880	510.5
16	3	550	0.190	24.0	4.8	10940	6235	718.5
20	3	550	0.225	30.0	6.0	8755	5910	1064.0

Rame non legato

3	3	400	0.035	4.5	0.9	42445	4455	18.0
4	3	400	0.050	6.0	1.2	31830	4775	34.5
5	3	400	0.060	7.5	1.5	25465	4585	51.5
6	3	400	0.080	9.0	1.8	21220	5095	82.5
8	3	400	0.095	12.0	2.4	15915	4535	130.5
10	3	400	0.120	15.0	3.0	12735	4585	206.5
12	3	400	0.145	18.0	3.6	10610	4615	299.0
16	3	400	0.150	24.0	4.8	7960	3580	412.5
20	3	400	0.180	30.0	6.0	6365	3435	618.5

Materiali termoplastici

3	3	1000	0.045	4.5	0.9	60000	8100	33.0
4	3	1000	0.060	6.0	1.2	60000	10800	78.0
5	3	1000	0.075	7.5	1.5	60000	13500	152.0
6	3	1000	0.100	9.0	1.8	53055	15915	258.0
8	3	1000	0.120	12.0	2.4	39790	14325	412.5
10	3	1000	0.150	15.0	3.0	31830	14325	644.5
12	3	1000	0.180	18.0	3.6	26525	14325	928.5
16	3	1000	0.190	24.0	4.8	19895	11340	1306.5
20	3	1000	0.225	30.0	6.0	15915	10745	1934.0

Getti d'alluminio
Si 6% - 15%

3	3	350	0.030	4.5	0.9	37135	3340	13.5
4	3	350	0.040	6.0	1.2	27855	3345	24.0
5	3	350	0.055	7.5	1.5	22280	3675	41.5
6	3	350	0.070	9.0	1.8	18570	3900	63.0
8	3	350	0.085	12.0	2.4	13925	3550	102.0
10	3	350	0.105	15.0	3.0	11140	3510	158.0
12	3	350	0.125	18.0	3.6	9285	3480	225.5
16	3	350	0.135	24.0	4.8	6965	2820	325.0
20	3	350	0.160	30.0	6.0	5570	2675	481.5

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	450	0.030	1.4	3	47750	4300	17.5
4	3	450	0.040	1.8	4	35810	4295	31.0
5	3	450	0.055	2.3	5	28650	4725	53.0
6	3	450	0.070	2.7	6	23875	5015	81.0
8	3	450	0.085	3.6	8	17905	4565	131.5
10	3	450	0.105	4.5	10	14325	4510	203.0
12	3	450	0.125	5.4	12	11935	4475	290.0
16	3	450	0.135	7.2	16	8955	3625	417.5
20	3	450	0.160	9.0	20	7160	3435	618.5

Rame non legato

3	3	350	0.025	1.4	3	37135	2785	11.5
4	3	350	0.030	1.8	4	27855	2505	18.0
5	3	350	0.045	2.3	5	22280	3010	34.0
6	3	350	0.055	2.7	6	18570	3065	49.5
8	3	350	0.070	3.6	8	13925	2925	84.0
10	3	350	0.085	4.5	10	11140	2840	128.0
12	3	350	0.100	5.4	12	9285	2785	180.5
16	3	350	0.110	7.2	16	6965	2300	265.0
20	3	350	0.130	9.0	20	5570	2170	390.5

Materiali termoplastici

3	3	800	0.030	1.4	3	60000	5400	22.0
4	3	800	0.040	1.8	4	60000	7200	52.0
5	3	800	0.055	2.3	5	50930	8405	94.5
6	3	800	0.070	2.7	6	42445	8915	144.5
8	3	800	0.085	3.6	8	31830	8115	233.5
10	3	800	0.105	4.5	10	25465	8020	361.0
12	3	800	0.125	5.4	12	21220	7960	516.0
16	3	800	0.135	7.2	16	15915	6445	742.5
20	3	800	0.160	9.0	20	12735	6115	1100.5

Getti d'alluminio
Si 6% - 15%

3	3	300	0.020	1.4	3	31830	1910	7.5
4	3	300	0.030	1.8	4	23875	2150	15.5
5	3	300	0.040	2.3	5	19100	2290	26.0
6	3	300	0.050	2.7	6	15915	2385	38.5
8	3	300	0.060	3.6	8	11935	2150	62.0
10	3	300	0.075	4.5	10	9550	2150	97.0
12	3	300	0.090	5.4	12	7960	2150	139.5
16	3	300	0.095	7.2	16	5970	1700	196.0
20	3	300	0.110	9.0	20	4775	1575	283.5

Frese cilindriche AX-NV3

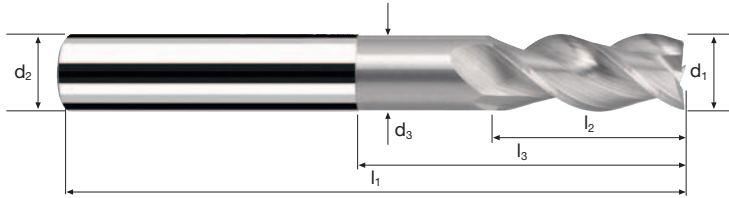
A taglienti lisci, esecuzione medio-lunga con scarico



HM MG10 λ 40°
 γ 20°

90°

Vario



Sgrossatura



Finitura



Rm < 850

Al Aluminium > 99%

Al Aluminium Alloy

Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Esempio: N° Ordine		Rivestimento C	Articolo 15557	Codice- ϕ .180						CELERO
									15657	C15657
									15557	C15557
ϕ Code	d1 e8	d2 h6	d3	l1	l2	l3	α	z		
.180	3	6	2.8	63	8	20	3.5°	3	●	●
.220	4	6	3.7	63	11	22	2.5°	3	●	●
.260	5	6	4.6	63	13	24	1.5°	3	●	●
.300	6	6	5.5	63	13	26	0.0°	3	●	●
.391	8	8	7.4	72	19	35	0.0°	3	●	●
.450	10	10	9.2	84	22	43	0.0°	3	●	●
.501	12	12	11.0	97	26	51	0.0°	3	●	●
.610	16	16	15.0	108	32	59	0.0°	3	●	●
.682	20	20	19.0	122	38	71	0.0°	3	●	●

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	550	0.035	7.5	0.6	58360	6130	27.5
4	3	550	0.045	10.0	0.8	43770	5910	47.5
5	3	550	0.060	12.5	1.0	35015	6305	79.0
6	3	550	0.075	15.0	1.2	29180	6565	118.0
8	3	550	0.095	20.0	1.6	21885	6235	199.5
10	3	550	0.115	25.0	2.0	17510	6040	302.0
12	3	550	0.140	30.0	2.4	14590	6130	441.5
16	3	550	0.150	40.0	3.2	10940	4925	630.5
20	3	550	0.175	50.0	4.0	8755	4595	919.0

Rame non legato

3	3	400	0.030	7.5	0.6	42445	3820	17.0
4	3	400	0.035	10.0	0.8	31830	3340	26.5
5	3	400	0.050	12.5	1.0	25465	3820	48.0
6	3	400	0.060	15.0	1.2	21220	3820	69.0
8	3	400	0.075	20.0	1.6	15915	3580	114.5
10	3	400	0.090	25.0	2.0	12735	3440	172.0
12	3	400	0.110	30.0	2.4	10610	3500	252.0
16	3	400	0.120	40.0	3.2	7960	2865	366.5
20	3	400	0.140	50.0	4.0	6365	2675	535.0

Materiali termoplastici

3	3	1000	0.035	7.5	0.6	60000	6300	28.5
4	3	1000	0.045	10.0	0.8	60000	8100	65.0
5	3	1000	0.060	12.5	1.0	60000	10800	135.0
6	3	1000	0.075	15.0	1.2	53055	11935	215.0
8	3	1000	0.095	20.0	1.6	39790	11340	363.0
10	3	1000	0.115	25.0	2.0	31830	10980	549.0
12	3	1000	0.140	30.0	2.4	26525	11140	802.0
16	3	1000	0.150	40.0	3.2	19895	8955	1146.0
20	3	1000	0.175	50.0	4.0	15915	8355	1671.0

Getti d'alluminio
Si 6% - 15%

3	3	350	0.025	7.5	0.6	37135	2785	12.5
4	3	350	0.030	10.0	0.8	27855	2505	20.0
5	3	350	0.040	12.5	1.0	22280	2675	33.5
6	3	350	0.055	15.0	1.2	18570	3065	55.0
8	3	350	0.065	20.0	1.6	13925	2715	87.0
10	3	350	0.080	25.0	2.0	11140	2675	134.0
12	3	350	0.100	30.0	2.4	9285	2785	200.5
16	3	350	0.105	40.0	3.2	6965	2195	281.0
20	3	350	0.125	50.0	4.0	5570	2090	418.0

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
3	3	450	0.025	1.2	3	47750	3580	13.0
4	3	450	0.030	1.6	4	35810	3225	20.5
5	3	450	0.040	2.0	5	28650	3440	34.5
6	3	450	0.055	2.4	6	23875	3940	56.5
8	3	450	0.065	3.2	8	17905	3490	89.5
10	3	450	0.080	4.0	10	14325	3440	137.5
12	3	450	0.100	4.8	12	11935	3580	206.0
16	3	450	0.105	6.4	16	8955	2820	289.0
20	3	450	0.125	8.0	20	7160	2685	429.5

Rame non legato

3	3	350	0.020	1.2	3	37135	2230	8.0
4	3	350	0.025	1.6	4	27855	2090	13.5
5	3	350	0.030	2.0	5	22280	2005	20.0
6	3	350	0.045	2.4	6	18570	2505	36.0
8	3	350	0.050	3.2	8	13925	2090	53.5
10	3	350	0.065	4.0	10	11140	2170	87.0
12	3	350	0.080	4.8	12	9285	2230	128.5
16	3	350	0.085	6.4	16	6965	1775	182.0
20	3	350	0.100	8.0	20	5570	1670	267.0

Materiali termoplastici

3	3	800	0.025	1.2	3	60000	4500	16.0
4	3	800	0.030	1.6	4	60000	5400	34.5
5	3	800	0.040	2.0	5	50930	6110	61.0
6	3	800	0.055	2.4	6	42445	7005	101.0
8	3	800	0.065	3.2	8	31830	6205	159.0
10	3	800	0.080	4.0	10	25465	6110	244.5
12	3	800	0.100	4.8	12	21220	6365	366.5
16	3	800	0.105	6.4	16	15915	5015	513.5
20	3	800	0.125	8.0	20	12735	4775	764.0

Getti d'alluminio
Si 6% - 15%

3	3	300	0.020	1.2	3	31830	1910	7.0
4	3	300	0.020	1.6	4	23875	1435	9.0
5	3	300	0.030	2.0	5	19100	1720	17.0
6	3	300	0.040	2.4	6	15915	1910	27.5
8	3	300	0.045	3.2	8	11935	1610	41.0
10	3	300	0.055	4.0	10	9550	1575	63.0
12	3	300	0.070	4.8	12	7960	1670	96.0
16	3	300	0.075	6.4	16	5970	1345	137.5
20	3	300	0.090	8.0	20	4775	1290	206.5

Frese cilindriche AX-NV3

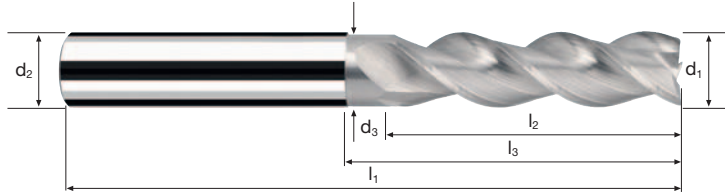
A taglienti lisci, esecuzione medio-lunga con scarico corto



HM MG10 λ 40°
 γ 20°

90°

Vario



Sgrossatura



Finitura



Rm < 850

Al Aluminium > 99%

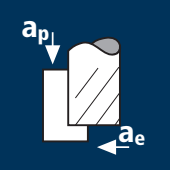




Al Aluminium Alloy






Al Aluminium Cast

Cu Copper

Plastic Thermoplast

Esempio: N° Ordine		Rivestimento C	Articolo 15560	Codice-Ø .180					CELERO	
								15660	C15660	
								15560	C15560	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	α	z		
.180	3	6	2.8	63	14	20	3.5°	3	●	●
.220	4	6	3.7	63	17	22	2.5°	3	●	●
.260	5	6	4.6	63	19	24	1.5°	3	●	●
.300	6	6	5.5	63	19	26	0.0°	3	●	●
.391	8	8	7.4	72	28	35	0.0°	3	●	●
.450	10	10	9.2	84	34	43	0.0°	3	●	●
.501	12	12	11.0	97	40	51	0.0°	3	●	●
.610	16	16	15.0	108	48	59	0.0°	3	●	●
.682	20	20	19.0	122	56	71	0.0°	3	●	●

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	6	3	550	0.085	9.0	1.5	29180	7440	100.5
		8	3	550	0.105	12.0	2.0	21885	6895	165.5
		10	3	550	0.135	15.0	2.5	17510	7090	266.0
		12	3	550	0.160	18.0	3.0	14590	7005	378.5
		16	3	550	0.170	24.0	4.0	10940	5580	535.5
		20	3	550	0.200	30.0	5.0	8755	5255	788.5
Rame non legato		6	3	400	0.070	9.0	1.5	21220	4455	60.0
		8	3	400	0.085	12.0	2.0	15915	4060	97.5
		10	3	400	0.110	15.0	2.5	12735	4205	157.5
		12	3	400	0.130	18.0	3.0	10610	4140	223.5
		16	3	400	0.135	24.0	4.0	7960	3225	309.5
		20	3	400	0.160	30.0	5.0	6365	3055	458.5
Materiali termoplastici		6	3	1000	0.085	9.0	1.5	53055	13530	182.5
		8	3	1000	0.105	12.0	2.0	39790	12535	301.0
		10	3	1000	0.135	15.0	2.5	31830	12890	483.5
		12	3	1000	0.160	18.0	3.0	26525	12730	687.5
		16	3	1000	0.170	24.0	4.0	19895	10145	974.0
		20	3	1000	0.200	30.0	5.0	15915	9550	1432.5
Getti d'alluminio Si 6% - 15%		6	3	350	0.060	9.0	1.5	18570	3345	45.0
		8	3	350	0.075	12.0	2.0	13925	3135	75.0
		10	3	350	0.095	15.0	2.5	11140	3175	119.0
		12	3	350	0.110	18.0	3.0	9285	3065	165.5
		16	3	350	0.120	24.0	4.0	6965	2505	240.5
		20	3	350	0.140	30.0	5.0	5570	2340	351.0

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	6	3	450	0.060	2.1	6	23875	4300	54.0
		8	3	450	0.075	2.8	8	17905	4030	90.5
		10	3	450	0.095	3.5	10	14325	4085	143.0
		12	3	450	0.110	4.2	12	11935	3940	198.5
		16	3	450	0.120	5.6	16	8955	3225	289.0
		20	3	450	0.140	7.0	20	7160	3005	420.5
Rame non legato		6	3	350	0.050	2.1	6	18570	2785	35.0
		8	3	350	0.060	2.8	8	13925	2505	56.0
		10	3	350	0.075	3.5	10	11140	2505	87.5
		12	3	350	0.090	4.2	12	9285	2505	126.5
		16	3	350	0.095	5.6	16	6965	1985	178.0
		20	3	350	0.110	7.0	20	5570	1840	257.5
Materiali termoplastici		6	3	800	0.060	2.1	6	42445	7640	96.5
		8	3	800	0.075	2.8	8	31830	7160	160.5
		10	3	800	0.095	3.5	10	25465	7260	254.0
		12	3	800	0.110	4.2	12	21220	7005	353.0
		16	3	800	0.120	5.6	16	15915	5730	513.5
		20	3	800	0.140	7.0	20	12735	5350	749.0
Getti d'alluminio Si 6% - 15%		6	3	300	0.040	2.1	6	15915	1910	24.0
		8	3	300	0.055	2.8	8	11935	1970	44.0
		10	3	300	0.065	3.5	10	9550	1860	65.0
		12	3	300	0.075	4.2	12	7960	1790	90.0
		16	3	300	0.085	5.6	16	5970	1520	136.0
		20	3	300	0.100	7.0	20	4775	1435	201.0

Frese cilindriche AX-V3

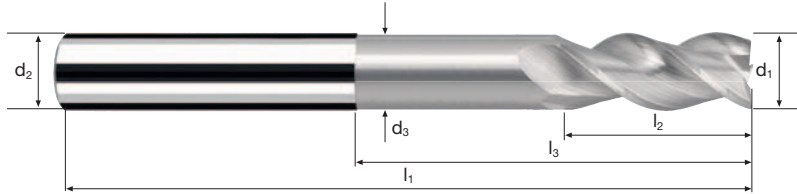
A taglienti lisci, esecuzione lunga



HM MG10 λ **40°**
 γ **20°**

90°

Vario



Sgrossatura



Finitura



Rm < 850

Al Aluminium > 99%

Al Aluminium Alloy

Al Aluminium Cast

Cu Copper

Plastic Thermoplast

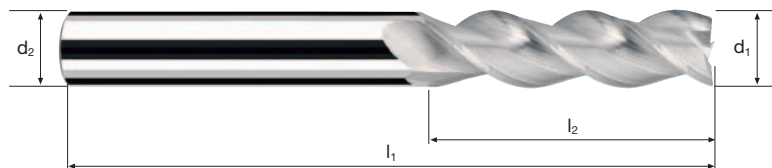
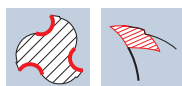
Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø		z	CELERO	
	C	15559	.300			15659		C15659	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3			
.300	6	6	5.5	70	13	33	3	●	●
.391	8	8	7.4	80	19	43	3	●	●
.450	10	10	9.2	100	22	59	3	●	●
.501	12	12	11.0	110	26	64	3	●	●
.610	16	16	15.0	123	32	74	3	●	●
.682	20	20	19.0	141	38	90	3	●	●

Frese cilindriche AX-V3

A taglienti lisci, esecuzione lunga



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura

Finitura

Rm
< 850

Al
Aluminium
> 99%

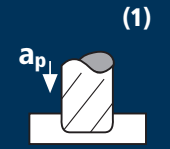
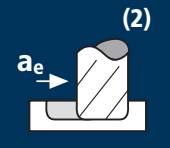
Al
Aluminium
Alloy

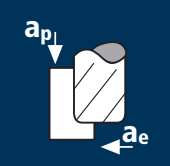
Al
Aluminium
Cast


Cu
Copper

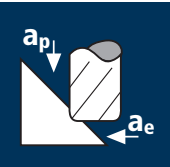
Plastic
Thermoplast

Esempio: N° Ordine		Rivestimento		Articolo		Codice-ø		CELERO	
		C		15561		.300		15661	C15661
ø Code	d1 e8	d2 h6	l1	l2	z				
.300	6	6	70	26	3	●	●	●	●
.391	8	8	80	36	3	●	●	●	●
.450	10	10	100	45	3	●	●	●	●
.501	12	12	110	53	3	●	●	●	●
.610	16	16	123	63	3	●	●	●	●
.682	20	20	141	75	3	●	●	●	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
(1) 	Costruzione integrale Al Aeronautica [AlMg15SiCu / 6061] [AlCu4MgSi / 2017] [AlCu2Mg1,5Ni / 2618] [AlZn5,5MgCu / 7175] [AlZn6CuMgZr / 7150] [AlCu4Mg1 / 2124]	10	2	0.175	6.0	10.0	3500	5250	7000	10500
		12	2	0.210	6.5	12.0	4200	6300	8400	12600
(2) 	Alluminio malleabile [AlMgSi1 / 6082] Legia per fonderia Al [G-AlSi11Mg]	16	2	0.225	7.0	16.0	4500	6750	9000	13500
		20	2	0.240	7.0	20.0	4800	7200	9600	14400
		25	2	0.250	7.0	25.0	5000	7500	10000	15000
		10	2	0.175	6.0	8.0	3500	5250	7000	10500
		12	2	0.210	6.5	9.6	4200	6300	8400	12600
		16	2	0.225	7.0	12.8	4500	6750	9000	13500
		20	2	0.240	7.0	16.0	4800	7200	9600	14400
		25	2	0.250	7.0	20.0	5000	7500	10000	15000

	Costruzione integrale Al [AlZn5,5MgCu / 7175] Alluminio malleabile [AlMgSi1 / 6082] Legia per fonderia Al [G-AlSi11Mg]	10	2	0.175	9.0	6.0	3500	5250	7000	10500
		12	2	0.210	9.8	7.2	4200	6300	8400	12600
		16	2	0.225	10.5	9.6	4500	6750	9000	13500
		20	2	0.240	10.5	12.0	4800	7200	9600	14400
		25	2	0.250	10.5	15.0	5000	7500	10000	15000

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	Costruzione integrale Al [AlZn5,5MgCu / 7175] Alluminio malleabile [AlMgSi1 / 6082] Legia per fonderia Al [G-AlSi11Mg]	10	2	0.055	*	0.30	1100	1650	2200	3300
		12	2	0.065	*	0.35	1300	1950	2600	3900
		16	2	0.070	*	0.50	1400	2100	2800	4200
		20	2	0.070	*	0.60	1400	2100	2800	4200
		25	2	0.075	*	0.75	1500	2250	3000	4500
		*ap _{im} si vede pagina 921								

	Costruzione integrale Al [AlZn5,5MgCu / 7175] Alluminio malleabile [AlMgSi1 / 6082] Legia per fonderia Al [G-AlSi11Mg]	10	2	0.385	0.50	0.50	7700	11550	15400	23100
		12	2	0.460	0.60	0.60	9200	13800	18400	27600
		16	2	0.495	0.75	0.75	9900	14850	19800	29700
		20	2	0.530	1.00	1.00	10600	15900	21200	31800
		25	2	0.550	1.20	1.20	11000	16500	22000	33000

Frese toriche AX-RV2

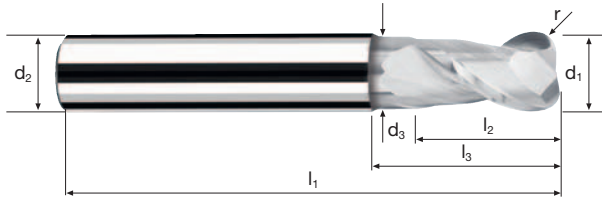
A taglienti lisci, esecuzione 2xd con scarico



HM MG10 λ 40°
 γ 20°

G2.5

Vario



Sgrossatura



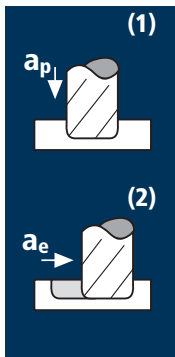
Finitura



Aluminium > 99% Al Aluminium Alloy Al Aluminium Cast Cu Copper Plastic Thermoplast

Esempio: N° Ordine										CELERO	
										15572	C15572
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	z		
.610	16	16	15.0	82	18	32	2.0	1.5	2	●	—
.457	10	10	9.2	63	11	20	2.0	2.5	2	●	●
.506	12	12	11.0	73	13	24	2.0	2.5	2	●	●
.612	16	16	15.0	82	18	32	2.0	2.5	2	●	●
.684	20	20	19.0	92	22	40	2.0	2.5	2	●	●
.774	25	25	24.0	107	27	50	2.0	2.5	2	●	●
.508	12	12	11.0	73	13	24	2.0	4.0	2	●	●
.614	16	16	15.0	82	18	32	2.0	4.0	2	●	●
.686	20	20	19.0	92	22	40	2.0	4.0	2	●	●
.776	25	25	24.0	107	27	50	2.0	4.0	2	●	●

Applicazione



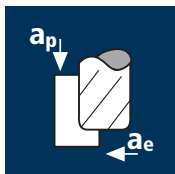
Materiale

Costruzione integrale Al
Aeronautica
[AlMg15SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

Alluminio malleabile
[AlMgSi1 / 6082]

Legia per fonderia Al
[G-AlSi11Mg]

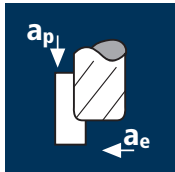
d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
3	2	0.050	2.0	3.0	1000	1500	2000	3000
4	2	0.065	3.0	4.0	1300	1950	2600	3900
6	2	0.100	4.0	6.0	2000	3000	4000	6000
8	2	0.130	5.0	8.0	2600	3900	5200	7800
10	2	0.165	5.5	10.0	3300	4950	6600	9900
12	2	0.195	6.0	12.0	3900	5850	7800	11700
16	2	0.210	6.5	16.0	4200	6300	8400	12600
20	2	0.220	7.0	20.0	4400	6600	8800	13200
25	2	0.230	7.0	25.0	4600	6900	9200	13800



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]

3	2	0.050	3.0	1.8	1000	1500	2000	3000
4	2	0.065	4.5	2.4	1300	1950	2600	3900
6	2	0.100	6.0	3.6	2000	3000	4000	6000
8	2	0.130	7.5	4.8	2600	3900	5200	7800
10	2	0.165	8.3	6.0	3300	4950	6600	9900
12	2	0.195	9.0	7.2	3900	5850	7800	11700
16	2	0.210	9.8	9.6	4200	6300	8400	12600
20	2	0.220	10.5	12.0	4400	6600	8800	13200
25	2	0.230	10.5	15.0	4600	6900	9200	13800

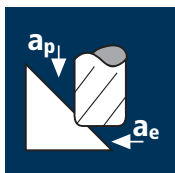
Applicazione



Materiale

Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
3	2	0.015	*	0.10	300	450	600	900
4	2	0.020	*	0.10	400	600	800	1200
6	2	0.030	*	0.20	600	900	1200	1800
8	2	0.040	*	0.25	800	1200	1600	2400
10	2	0.050	*	0.30	1000	1500	2000	3000
12	2	0.060	*	0.35	1200	1800	2400	3600
16	2	0.065	*	0.50	1300	1950	2600	3900
20	2	0.065	*	0.60	1300	1950	2600	3900
25	2	0.070	*	0.75	1400	2100	2800	4200



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]

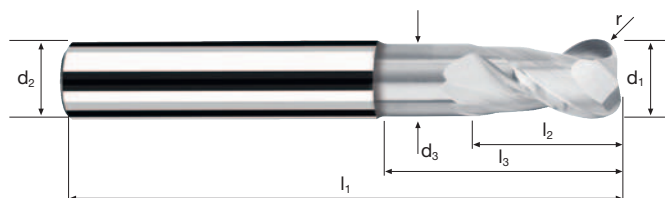
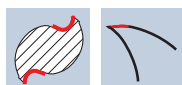
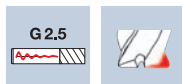
*ap _m si vede pagina 921								
3	2	0.110	0.30	0.30	2200	3300	4400	6600
4	2	0.145	0.35	0.35	2900	4350	5800	8700
6	2	0.220	0.40	0.40	4400	6600	8800	13200
8	2	0.285	0.45	0.45	5700	8550	11400	17100
10	2	0.365	0.50	0.50	7300	10950	14600	21900
12	2	0.430	0.60	0.60	8600	12900	17200	25800
16	2	0.460	0.75	0.75	9200	13800	18400	27600
20	2	0.485	1.00	1.00	9700	14550	19400	29100
25	2	0.505	1.20	1.20	10100	15150	20200	30300

Frese toriche AX-RV2

A taglienti lisci, esecuzione 3xd con scarico



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura

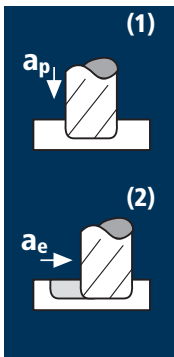


Finitura



Esempio: N° Ordine		Rivestimento C	Articolo 15573	Codice-ø .180								CELERO	
												15573	C15573
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	α	z			
.180	3	6	2.8	54	4	9	3.0	0.5	5.9°	2	●	●	
.220	4	6	3.7	54	5	12	3.0	0.5	3.7°	2	●	●	
.260	5	6	4.6	54	6	15	3.0	0.5	1.7°	2	●	●	
.300	6	6	5.5	54	7	18	3.0	0.5	0.0°	2	●	●	
.302	6	6	5.5	54	7	18	3.0	1.0	0.0°	2	●	●	
.391	8	8	7.4	63	9	24	3.0	1.0	0.0°	2	●	●	
.450	10	10	9.2	72	11	30	3.0	1.0	0.0°	2	●	●	
.501	12	12	11.0	83	13	36	3.0	1.0	0.0°	2	●	●	
.608	16	16	15.0	97	18	48	3.0	1.0	0.0°	2	●	●	
.680	20	20	19.0	111	22	60	3.0	1.0	0.0°	2	●	●	
.770	25	25	24.0	132	27	75	3.0	1.0	0.0°	2	●	●	
new! .453	10	10	9.2	72	11	30	3.0	1.5	0.0°	2	●	—	
new! .503	12	12	11.0	83	13	36	3.0	1.5	0.0°	2	●	—	
new! .611	16	16	15.0	97	18	48	3.0	2.0	0.0°	2	●	—	
new! .683	20	20	19.0	111	22	60	3.0	2.0	0.0°	2	●	—	

Applicazione



Materiale

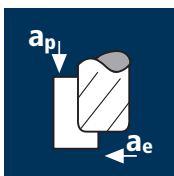
Costruzione integrale Al
Aeronautica
[AlMg15SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.100	4.0	6.0	2000	3000	4000	6000
8	2	0.130	5.0	8.0	2600	3900	5200	7800
10	2	0.165	5.5	10.0	3300	4950	6600	9900
12	2	0.195	6.0	12.0	3900	5850	7800	11700
16	2	0.210	6.5	16.0	4200	6300	8400	12600
20	2	0.220	7.0	20.0	4400	6600	8800	13200
25	2	0.230	7.0	25.0	4600	6900	9200	13800

6	2	0.100	4.0	4.8	2000	3000	4000	6000
8	2	0.130	5.0	6.4	2600	3900	5200	7800
10	2	0.165	5.5	8.0	3300	4950	6600	9900
12	2	0.195	6.0	9.6	3900	5850	7800	11700
16	2	0.210	6.5	12.8	4200	6300	8400	12600
20	2	0.220	7.0	16.0	4400	6600	8800	13200
25	2	0.230	7.0	20.0	4600	6900	9200	13800

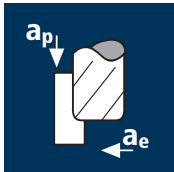


Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



6	2	0.100	6.0	3.6	2000	3000	4000	6000
8	2	0.130	7.5	4.8	2600	3900	5200	7800
10	2	0.165	8.3	6.0	3300	4950	6600	9900
12	2	0.195	9.0	7.2	3900	5850	7800	11700
16	2	0.210	9.8	9.6	4200	6300	8400	12600
20	2	0.220	10.5	12.0	4400	6600	8800	13200
25	2	0.230	10.5	15.0	4600	6900	9200	13800

Applicazione



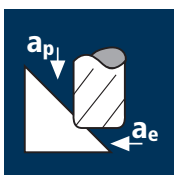
Materiale

Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.030	*	0.20	600	900	1200	1800
8	2	0.040	*	0.25	800	1200	1600	2400
10	2	0.050	*	0.30	1000	1500	2000	3000
12	2	0.060	*	0.35	1200	1800	2400	3600
16	2	0.065	*	0.50	1300	1950	2600	3900
20	2	0.065	*	0.60	1300	1950	2600	3900
25	2	0.070	*	0.75	1400	2100	2800	4200

*ap_{im} si vede pagina 921



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



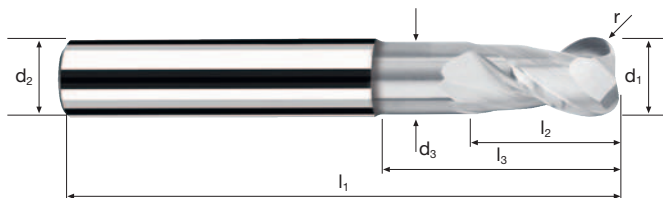
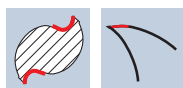
6	2	0.220	0.40	0.40	4400	6600	8800	13200
8	2	0.285	0.45	0.45	5700	8550	11400	17100
10	2	0.365	0.50	0.50	7300	10950	14600	21900
12	2	0.430	0.60	0.60	8600	12900	17200	25800
16	2	0.460	0.75	0.75	9200	13800	18400	27600
20	2	0.485	1.00	1.00	9700	14550	19400	29100
25	2	0.505	1.20	1.20	10100	15150	20200	30300

Frese toriche AX-RV2

A taglienti lisci, esecuzione 3xd con scarico



**HM
MG10** λ **40°**
 γ **20°**



Sgrossatura

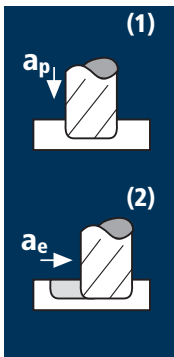


Finitura



Esempio: N° Ordine		Rivestimento C	Articolo 15573	Codice-ø .307								CELERO	
		<input type="text"/>										15573	C15573
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	α	z			
.307	6	6	5.5	54	7	18	3.0	2.5	0.0°	2	●	●	
.397	8	8	7.4	63	9	24	3.0	2.5	0.0°	2	●	●	
.457	10	10	9.2	72	11	30	3.0	2.5	0.0°	2	●	●	
.506	12	12	11.0	83	13	36	3.0	2.5	0.0°	2	●	●	
.612	16	16	15.0	97	18	48	3.0	2.5	0.0°	2	●	●	
.684	20	20	19.0	111	22	60	3.0	2.5	0.0°	2	●	●	
.774	25	25	24.0	132	27	75	3.0	2.5	0.0°	2	●	●	
.459	10	10	9.2	72	11	30	3.0	4.0	0.0°	2	●	●	
.508	12	12	11.0	83	13	36	3.0	4.0	0.0°	2	●	●	
.614	16	16	15.0	97	18	48	3.0	4.0	0.0°	2	●	●	
.686	20	20	19.0	111	22	60	3.0	4.0	0.0°	2	●	●	
.776	25	25	24.0	132	27	75	3.0	4.0	0.0°	2	●	●	

Applicazione



Materiale

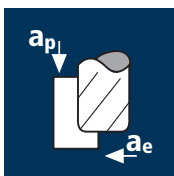
Costruzione integrale Al
Aeronautica
[AlMg15SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.090	3.5	6.0	1800	2700	3600	5400
8	2	0.120	4.5	8.0	2400	3600	4800	7200
10	2	0.150	5.0	10.0	3000	4500	6000	9000
12	2	0.180	5.5	12.0	3600	5400	7200	10800
16	2	0.190	6.0	16.0	3800	5700	7600	11400
20	2	0.205	6.5	20.0	4100	6150	8200	12300
25	2	0.215	6.5	25.0	4300	6450	8600	12900

6	2	0.090	3.5	3.6	1800	2700	3600	5400
8	2	0.120	4.5	4.8	2400	3600	4800	7200
10	2	0.150	5.0	6.0	3000	4500	6000	9000
12	2	0.180	5.5	7.2	3600	5400	7200	10800
16	2	0.190	6.0	9.6	3800	5700	7600	11400
20	2	0.205	6.5	12.0	4100	6150	8200	12300
25	2	0.215	6.5	15.0	4300	6450	8600	12900

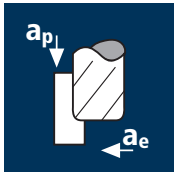


Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



6	2	0.090	5.3	3.6	1800	2700	3600	5400
8	2	0.120	6.8	4.8	2400	3600	4800	7200
10	2	0.150	7.5	6.0	3000	4500	6000	9000
12	2	0.180	8.3	7.2	3600	5400	7200	10800
16	2	0.190	9.0	9.6	3800	5700	7600	11400
20	2	0.205	9.8	12.0	4100	6150	8200	12300
25	2	0.215	9.8	15.0	4300	6450	8600	12900

Applicazione



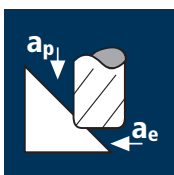
Materiale

Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.025	*	0.20	500	750	1000	1500
8	2	0.035	*	0.25	700	1050	1400	2100
10	2	0.045	*	0.30	900	1350	1800	2700
12	2	0.055	*	0.35	1100	1650	2200	3300
16	2	0.055	*	0.50	1100	1650	2200	3300
20	2	0.060	*	0.60	1200	1800	2400	3600
25	2	0.065	*	0.75	1300	1950	2600	3900

*ap_{im} si vede pagina 921



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



6	2	0.200	0.40	0.40	4000	6000	8000	12000
8	2	0.265	0.45	0.45	5300	7950	10600	15900
10	2	0.330	0.50	0.50	6600	9900	13200	19800
12	2	0.395	0.60	0.60	7900	11850	15800	23700
16	2	0.420	0.75	0.75	8400	12600	16800	25200
20	2	0.450	1.00	1.00	9000	13500	18000	27000
25	2	0.475	1.20	1.20	9500	14250	19000	28500

Frese toriche AX-RV2

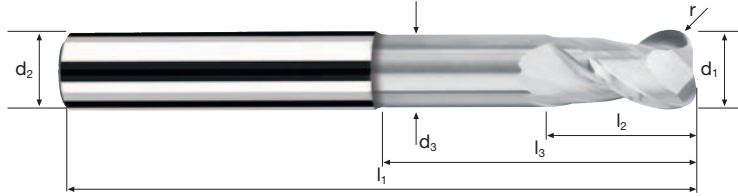
A taglienti lisci, esecuzione 4xd con scarico



HM MG10 λ 40°
 γ 20°

G2.5

Vario

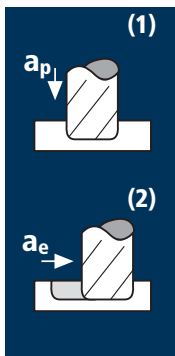


Sgrossatura **Finitura**

Aluminium > 99% Al Aluminium Alloy Al Aluminium Cast Cu Copper Plastic Thermoplast

Esempio: N° Ordine										CELERO	
Rivestimento Articolo Codice-ø											
C 15574 .302											
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	z	15574	C15574
.302	6	6	5.5	60	7	24	4.0	1.0	2	●	●
.391	8	8	7.4	68	9	32	4.0	1.0	2	●	●
.450	10	10	9.2	84	11	40	4.0	1.0	2	●	●
.501	12	12	11.0	97	13	48	4.0	1.0	2	●	●
.608	16	16	15.0	115	18	64	4.0	1.0	2	●	●
.680	20	20	19.0	130	22	80	4.0	1.0	2	●	●
.770	25	25	24.0	157	27	100	4.0	1.0	2	●	●
new! .453	10	10	9.2	84	11	40	4.0	1.5	2	●	—
new! .503	12	12	11.0	97	13	48	4.0	1.5	2	●	—
new! .611	16	16	15.0	115	18	64	4.0	2.0	2	●	—
new! .683	20	20	19.0	130	22	80	4.0	2.0	2	●	—
.307	6	6	5.5	60	7	24	4.0	2.5	2	●	●
.397	8	8	7.4	68	9	32	4.0	2.5	2	●	●
.457	10	10	9.2	84	11	40	4.0	2.5	2	●	●
.506	12	12	11.0	97	13	48	4.0	2.5	2	●	●
.612	16	16	15.0	115	18	64	4.0	2.5	2	●	●
.684	20	20	19.0	130	22	80	4.0	2.5	2	●	●
.774	25	25	24.0	157	27	100	4.0	2.5	2	●	●

Applicazione



Materiale

Costruzione integrale Al
Aeronautica
[AlMg15SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

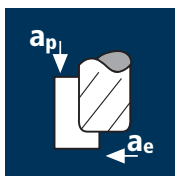
Alluminio malleabile
[AlMgSi1 / 6082]

Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
10	2	0.150	5.0	10.0	3000	4500	6000	9000
12	2	0.180	5.5	12.0	3600	5400	7200	10800
16	2	0.190	6.0	16.0	3800	5700	7600	11400
20	2	0.205	6.5	20.0	4100	6150	8200	12300
25	2	0.215	6.5	25.0	4300	6450	8600	12900

10	2	0.150	5.0	6.0	3000	4500	6000	9000
12	2	0.180	5.5	7.2	3600	5400	7200	10800
16	2	0.190	6.0	9.6	3800	5700	7600	11400
20	2	0.205	6.5	12.0	4100	6150	8200	12300
25	2	0.215	6.5	15.0	4300	6450	8600	12900

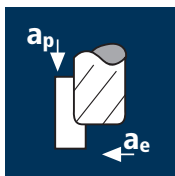


Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



10	2	0.150	7.5	6.0	3000	4500	6000	9000
12	2	0.180	8.3	7.2	3600	5400	7200	10800
16	2	0.190	9.0	9.6	3800	5700	7600	11400
20	2	0.205	9.8	12.0	4100	6150	8200	12300
25	2	0.215	9.8	15.0	4300	6450	8600	12900

Applicazione



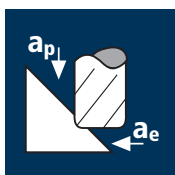
Materiale

Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
10	2	0.045	*	0.30	900	1350	1800	2700
12	2	0.055	*	0.35	1100	1650	2200	3300
16	2	0.055	*	0.50	1100	1650	2200	3300
20	2	0.060	*	0.60	1200	1800	2400	3600
25	2	0.065	*	0.75	1300	1950	2600	3900

*ap_{im} si vede pagina 921



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



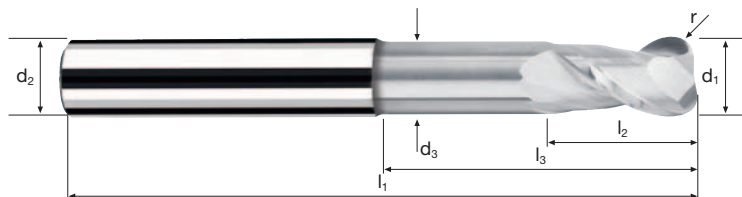
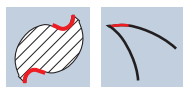
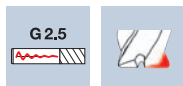
10	2	0.330	0.50	0.50	6600	9900	13200	19800
12	2	0.395	0.60	0.60	7900	11850	15800	23700
16	2	0.420	0.75	0.75	8400	12600	16800	25200
20	2	0.450	1.00	1.00	9000	13500	18000	27000
25	2	0.475	1.20	1.20	9500	14250	19000	28500

Frese toriche AX-RV2

A taglienti lisci, esecuzione 4xd con scarico



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura



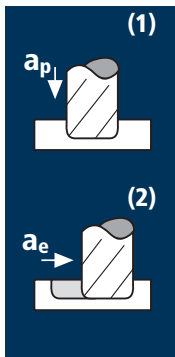
Finitura



		Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
--	--	--------------------------	--------------------------	-------------------------	--	--------------	------------------------	--

										CELERO	
Esempio: N° Ordine										15574	C15574
										Rivestimento Articolo Codice-ø C 15574 .459	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	z		
.459	10	10	9.2	84	11	40	4.0	4.0	2	●	●
.508	12	12	11.0	97	13	48	4.0	4.0	2	●	●
.614	16	16	15.0	115	18	64	4.0	4.0	2	●	●
.686	20	20	19.0	130	22	80	4.0	4.0	2	●	●
.776	25	25	24.0	157	27	100	4.0	4.0	2	●	●

Applicazione



Materiale

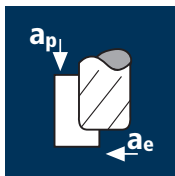
Costruzione integrale Al
Aeronautica
[AlMg15SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.065	4.0	6.0	1300	1950	2600	3900
8	2	0.085	4.5	8.0	1700	2550	3400	5100
10	2	0.110	5.0	10.0	2200	3300	4400	6600
12	2	0.120	5.0	12.0	2400	3600	4800	7200
16	2	0.150	5.0	16.0	3000	4500	6000	9000
20	2	0.180	5.0	20.0	3600	5400	7200	10800
25	2	0.200	5.0	25.0	4000	6000	8000	12000

6	2	0.065	4.0	3.6	1300	1950	2600	3900
8	2	0.085	4.5	4.8	1700	2550	3400	5100
10	2	0.110	5.0	6.0	2200	3300	4400	6600
12	2	0.120	5.0	7.2	2400	3600	4800	7200
16	2	0.150	5.0	9.6	3000	4500	6000	9000
20	2	0.180	5.0	12.0	3600	5400	7200	10800
25	2	0.200	5.0	15.0	4000	6000	8000	12000

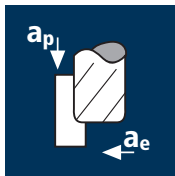


Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



6	2	0.065	6.0	3.6	1300	1950	2600	3900
8	2	0.085	6.8	4.8	1700	2550	3400	5100
10	2	0.110	7.5	6.0	2200	3300	4400	6600
12	2	0.120	7.5	7.2	2400	3600	4800	7200
16	2	0.150	7.5	9.6	3000	4500	6000	9000
20	2	0.180	7.5	12.0	3600	5400	7200	10800
25	2	0.200	7.5	15.0	4000	6000	8000	12000

Applicazione



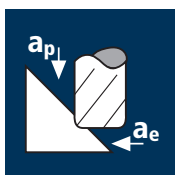
Materiale

Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.020	*	0.20	400	600	800	1200
8	2	0.025	*	0.25	500	750	1000	1500
10	2	0.035	*	0.30	700	1050	1400	2100
12	2	0.035	*	0.35	700	1050	1400	2100
16	2	0.045	*	0.50	900	1350	1800	2700
20	2	0.055	*	0.60	1100	1650	2200	3300
25	2	0.060	*	0.75	1200	1800	2400	3600

*ap_m si vede pagina 921



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



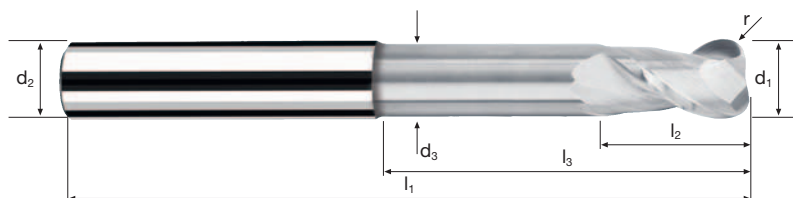
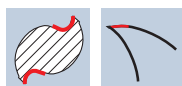
6	2	0.145	0.35	0.35	2900	4350	5800	8700
8	2	0.185	0.40	0.40	3700	5550	7400	11100
10	2	0.240	0.45	0.45	4800	7200	9600	14400
12	2	0.265	0.50	0.50	5300	7950	10600	15900
16	2	0.330	0.60	0.60	6600	9900	13200	19800
20	2	0.395	0.75	0.75	7900	11850	15800	23700
25	2	0.440	0.80	0.80	8800	13200	17600	26400

Frese toriche AX-RV2

A taglienti lisci, esecuzione 5xd con scarico



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura

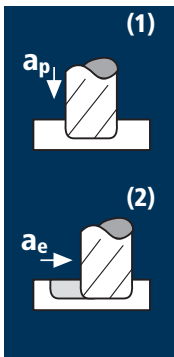


Finitura



Esempio: N° Ordine										CELERO	
										15575	C15575
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	z		
.302	6	6	5.5	66	7	30	5.0	1.0	2	●	—
.391	8	8	7.4	76	9	40	5.0	1.0	2	●	—
.450	10	10	9.2	91	11	50	5.0	1.0	2	●	●
.501	12	12	11.0	106	13	60	5.0	1.0	2	●	●
.608	16	16	15.0	129	18	80	5.0	1.0	2	●	●
.680	20	20	19.0	151	22	100	5.0	1.0	2	●	●
.770	25	25	24.0	182	27	125	5.0	1.0	2	●	●
.307	6	6	5.5	66	7	30	5.0	2.5	2	●	●
.397	8	8	7.4	76	9	40	5.0	2.5	2	●	●
.457	10	10	9.2	91	11	50	5.0	2.5	2	●	●
.506	12	12	11.0	106	13	60	5.0	2.5	2	●	●
.612	16	16	15.0	129	18	80	5.0	2.5	2	●	●
.684	20	20	19.0	151	22	100	5.0	2.5	2	●	●
.774	25	25	24.0	182	27	125	5.0	2.5	2	●	●
.459	10	10	9.2	91	11	50	5.0	4.0	2	●	●
.508	12	12	11.0	106	13	60	5.0	4.0	2	●	●
.614	16	16	15.0	129	18	80	5.0	4.0	2	●	●
.686	20	20	19.0	151	22	100	5.0	4.0	2	●	●
.776	25	25	24.0	182	27	125	5.0	4.0	2	●	●

Applicazione



Materiale

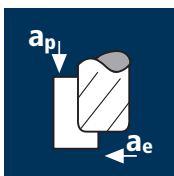
Costruzione integrale Al
Aeronautica
[AlMg1SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
10	3	0.115	6.0	10.0	3450	5175	6900	10350
12	3	0.135	6.5	12.0	4050	6075	8100	12150
16	3	0.145	7.0	16.0	4350	6525	8700	13050
20	3	0.155	7.0	20.0	4650	6975	9300	13950
25	3	0.160	7.0	25.0	4800	7200	9600	14400

10	3	0.115	6.0	8.0	3450	5175	6900	10350
12	3	0.135	6.5	9.6	4050	6075	8100	12150
16	3	0.145	7.0	12.8	4350	6525	8700	13050
20	3	0.155	7.0	16.0	4650	6975	9300	13950
25	3	0.160	7.0	20.0	4800	7200	9600	14400

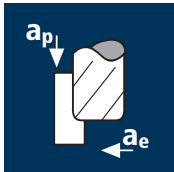


Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



10	3	0.115	9.0	6.0	3450	5175	6900	10350
12	3	0.135	9.8	7.2	4050	6075	8100	12150
16	3	0.145	10.5	9.6	4350	6525	8700	13050
20	3	0.155	10.5	12.0	4650	6975	9300	13950
25	3	0.160	10.5	15.0	4800	7200	9600	14400

Applicazione



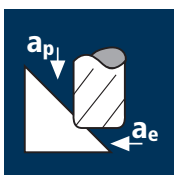
Materiale

Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
10	3	0.035	*	0.30	1050	1575	2100	3150
12	3	0.040	*	0.35	1200	1800	2400	3600
16	3	0.045	*	0.50	1350	2025	2700	4050
20	3	0.045	*	0.60	1350	2025	2700	4050
25	3	0.050	*	0.75	1500	2250	3000	4500

*ap_{im} si vede pagina 921



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



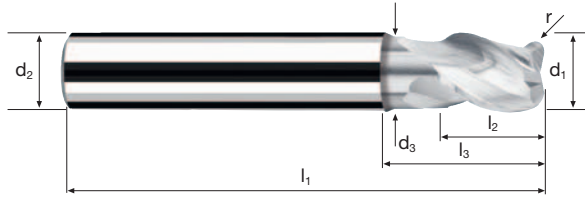
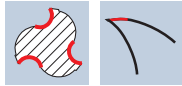
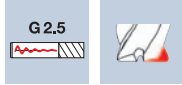
10	3	0.255	0.50	0.50	7650	11475	15300	22950
12	3	0.295	0.60	0.60	8850	13275	17700	26550
16	3	0.320	0.75	0.75	9600	14400	19200	28800
20	3	0.340	1.00	1.00	10200	15300	20400	30600
25	3	0.350	1.20	1.20	10500	15750	21000	31500

Frese toriche AX-RV3

A taglienti lisci, esecuzione 2xd con scarico



**HM
MG10** λ **40°**
 γ **20°**



Sgrossatura






Finitura




			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine										CELERO	
										15582	C15582
										15582	C15582
\emptyset Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	z		
.457	10	10	9.2	63	11	20	2.0	2.5	3	●	●
.506	12	12	11.0	73	13	24	2.0	2.5	3	●	●
.612	16	16	15.0	82	18	32	2.0	2.5	3	●	●
.684	20	20	19.0	92	22	40	2.0	2.5	3	●	●
.774	25	25	24.0	107	27	50	2.0	2.5	3	●	●
.508	12	12	11.0	73	13	24	2.0	4.0	3	●	●
.614	16	16	15.0	82	18	32	2.0	4.0	3	●	●
.686	20	20	19.0	92	22	40	2.0	4.0	3	●	●
.776	25	25	24.0	107	27	50	2.0	4.0	3	●	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
(1) 	Costruzione integrale Al Aeronautica [AlMg15SiCu / 6061] [AlCu4MgSi / 2017] [AlCu2Mg1,5Ni / 2618] [AlZn5,5MgCu / 7175] [AlZn6CuMgZr / 7150] [AlCu4Mg1 / 2124]	3	3	0.030	2.0	3.0	900	1350	1800	2700
		4	3	0.040	3.0	4.0	1200	1800	2400	3600
(2) 	Alluminio malleabile [AlMgSi1 / 6082] Legia per fonderia Al [G-AlSi11Mg]	6	3	0.060	4.0	6.0	1800	2700	3600	5400
		8	3	0.085	5.0	8.0	2550	3825	5100	7650
		10	3	0.105	5.5	10.0	3150	4725	6300	9450
		12	3	0.125	6.0	12.0	3750	5625	7500	11250
		16	3	0.135	6.5	16.0	4050	6075	8100	12150
		20	3	0.140	7.0	20.0	4200	6300	8400	12600
		25	3	0.150	7.0	25.0	4500	6750	9000	13500

	Costruzione integrale Al [AlZn5,5MgCu / 7175] Alluminio malleabile [AlMgSi1 / 6082] Legia per fonderia Al [G-AlSi11Mg]	3	3	0.030	3.0	1.8	900	1350	1800	2700
		4	3	0.040	4.5	2.4	1200	1800	2400	3600
		6	3	0.060	6.0	3.6	1800	2700	3600	5400
		8	3	0.085	7.5	4.8	2550	3825	5100	7650
		10	3	0.105	8.3	6.0	3150	4725	6300	9450
		12	3	0.125	9.0	7.2	3750	5625	7500	11250
		16	3	0.135	9.8	9.6	4050	6075	8100	12150
		20	3	0.140	10.5	12.0	4200	6300	8400	12600
		25	3	0.150	10.5	15.0	4500	6750	9000	13500

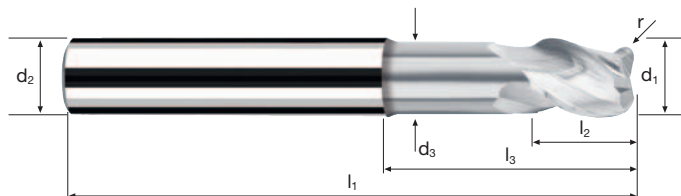
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	Costruzione integrale Al [AlZn5,5MgCu / 7175] Alluminio malleabile [AlMgSi1 / 6082] Legia per fonderia Al [G-AlSi11Mg]	3	3	0.010	*	0.10	300	450	600	900
		4	3	0.010	*	0.10	300	450	600	900
		6	3	0.020	*	0.20	600	900	1200	1800
		8	3	0.025	*	0.25	750	1125	1500	2250
		10	3	0.030	*	0.30	900	1350	1800	2700
		12	3	0.040	*	0.35	1200	1800	2400	3600
		16	3	0.040	*	0.50	1200	1800	2400	3600
		20	3	0.040	*	0.60	1200	1800	2400	3600
		25	3	0.045	*	0.75	1350	2025	2700	4050

Frese toriche AX-RV3

A taglienti lisci, esecuzione 3xd con scarico



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura



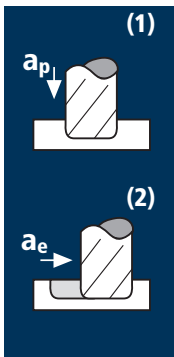
Finitura



			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine											CELERO			
											15583		C15583	
											15583		C15583	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	α	z				
.180	3	6	2.8	54	4	9	3.0	0.5	5.9°	3	●	●		
.220	4	6	3.7	54	5	12	3.0	0.5	3.7°	3	●	●		
.260	5	6	4.6	54	6	15	3.0	0.5	1.7°	3	●	●		
.300	6	6	5.5	54	7	18	3.0	0.5	0.0°	3	●	●		
.302	6	6	5.5	54	7	18	3.0	1.0	0.0°	3	●	●		
.391	8	8	7.4	63	9	24	3.0	1.0	0.0°	3	●	●		
.450	10	10	9.2	72	11	30	3.0	1.0	0.0°	3	●	●		
.501	12	12	11.0	83	13	36	3.0	1.0	0.0°	3	●	●		
.608	16	16	15.0	97	18	48	3.0	1.0	0.0°	3	●	●		
.680	20	20	19.0	111	22	60	3.0	1.0	0.0°	3	●	●		
.770	25	25	24.0	132	27	75	3.0	1.0	0.0°	3	●	●		
new! .453	10	10	9.2	72	11	30	3.0	1.5	0.0°	3	●	—		
new! .503	12	12	11.0	83	13	36	3.0	1.5	0.0°	3	●	—		
new! .611	16	16	15.0	97	18	48	3.0	2.0	0.0°	3	●	—		
new! .683	20	20	19.0	111	22	60	3.0	2.0	0.0°	3	●	—		

Applicazione



Materiale

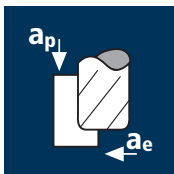
Costruzione integrale Al
Aeronautica
[AlMg15SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	3	0.060	4.0	6.0	1800	2700	3600	5400
8	3	0.085	5.0	8.0	2550	3825	5100	7650
10	3	0.105	5.5	10.0	3150	4725	6300	9450
12	3	0.125	6.0	12.0	3750	5625	7500	11250
16	3	0.135	6.5	16.0	4050	6075	8100	12150
20	3	0.140	7.0	20.0	4200	6300	8400	12600
25	3	0.150	7.0	25.0	4500	6750	9000	13500

6	3	0.060	4.0	4.8	1800	2700	3600	5400
8	3	0.085	5.0	6.4	2550	3825	5100	7650
10	3	0.105	5.5	8.0	3150	4725	6300	9450
12	3	0.125	6.0	9.6	3750	5625	7500	11250
16	3	0.135	6.5	12.8	4050	6075	8100	12150
20	3	0.140	7.0	16.0	4200	6300	8400	12600
25	3	0.150	7.0	20.0	4500	6750	9000	13500



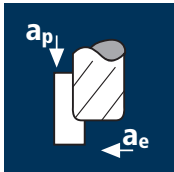
Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



6	3	0.060	6.0	3.6	1800	2700	3600	5400
8	3	0.085	7.5	4.8	2550	3825	5100	7650
10	3	0.105	8.3	6.0	3150	4725	6300	9450
12	3	0.125	9.0	7.2	3750	5625	7500	11250
16	3	0.135	9.8	9.6	4050	6075	8100	12150
20	3	0.140	10.5	12.0	4200	6300	8400	12600
25	3	0.150	10.5	15.0	4500	6750	9000	13500

6	3	0.060	6.0	3.6	1800	2700	3600	5400
8	3	0.085	7.5	4.8	2550	3825	5100	7650
10	3	0.105	8.3	6.0	3150	4725	6300	9450
12	3	0.125	9.0	7.2	3750	5625	7500	11250
16	3	0.135	9.8	9.6	4050	6075	8100	12150
20	3	0.140	10.5	12.0	4200	6300	8400	12600
25	3	0.150	10.5	15.0	4500	6750	9000	13500

Applicazione



Materiale

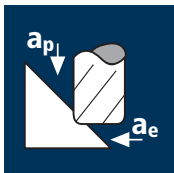
Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	3	0.020	*	0.20	600	900	1200	1800
8	3	0.025	*	0.25	750	1125	1500	2250
10	3	0.030	*	0.30	900	1350	1800	2700
12	3	0.040	*	0.35	1200	1800	2400	3600
16	3	0.040	*	0.50	1200	1800	2400	3600
20	3	0.040	*	0.60	1200	1800	2400	3600
25	3	0.045	*	0.75	1350	2025	2700	4050

*ap_{im} si vede pagina 921

6	3	0.020	*	0.20	600	900	1200	1800
8	3	0.025	*	0.25	750	1125	1500	2250
10	3	0.030	*	0.30	900	1350	1800	2700
12	3	0.040	*	0.35	1200	1800	2400	3600
16	3	0.040	*	0.50	1200	1800	2400	3600
20	3	0.040	*	0.60	1200	1800	2400	3600
25	3	0.045	*	0.75	1350	2025	2700	4050



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



6	3	0.130	0.40	0.40	3900	5850	7800	11700
8	3	0.185	0.45	0.45	5550	8325	11100	16650
10	3	0.230	0.50	0.50	6900	10350	13800	20700
12	3	0.275	0.60	0.60	8250	12375	16500	24750
16	3	0.295	0.75	0.75	8850	13275	17700	26550
20	3	0.310	1.00	1.00	9300	13950	18600	27900
25	3	0.330	1.20	1.20	9900	14850	19800	29700

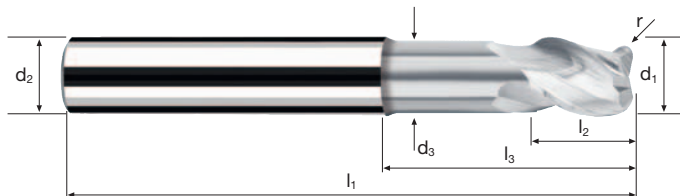
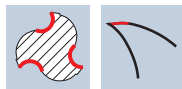
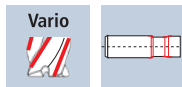
6	3	0.130	0.40	0.40	3900	5850	7800	11700
8	3	0.185	0.45	0.45	5550	8325	11100	16650
10	3	0.230	0.50	0.50	6900	10350	13800	20700
12	3	0.275	0.60	0.60	8250	12375	16500	24750
16	3	0.295	0.75	0.75	8850	13275	17700	26550
20	3	0.310	1.00	1.00	9300	13950	18600	27900
25	3	0.330	1.20	1.20	9900	14850	19800	29700

Frese toriche AX-RV3

A taglienti lisci, esecuzione 3xd con scarico



HM
MG10 λ 40°
 γ 20°



Sgrossatura



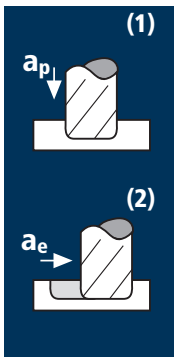
Finitura



			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine		Rivestimento C	Articolo 15583	Codice-ø .307									CELERO
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	α	z	15583	C15583	
.307	6	6	5.5	54	7	18	3.0	2.5	0.0°	3	●	●	
.397	8	8	7.4	63	9	24	3.0	2.5	0.0°	3	●	●	
.457	10	10	9.2	72	11	30	3.0	2.5	0.0°	3	●	●	
.506	12	12	11.0	83	13	36	3.0	2.5	0.0°	3	●	●	
.612	16	16	15.0	97	18	48	3.0	2.5	0.0°	3	●	●	
.684	20	20	19.0	111	22	60	3.0	2.5	0.0°	3	●	●	
.774	25	25	24.0	132	27	75	3.0	2.5	0.0°	3	●	●	
.459	10	10	9.2	72	11	30	3.0	4.0	0.0°	3	●	●	
.508	12	12	11.0	83	13	36	3.0	4.0	0.0°	3	●	●	
.614	16	16	15.0	97	18	48	3.0	4.0	0.0°	3	●	●	
.686	20	20	19.0	111	22	60	3.0	4.0	0.0°	3	●	●	
.776	25	25	24.0	132	27	75	3.0	4.0	0.0°	3	●	●	

Applicazione



Materiale

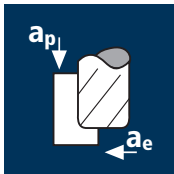
Costruzione integrale Al
Aeronautica
[AlMg15SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	3	0.060	3.5	6.0	1800	2700	3600	5400
8	3	0.075	4.5	8.0	2250	3375	4500	6750
10	3	0.095	5.0	10.0	2850	4275	5700	8550
12	3	0.115	5.5	12.0	3450	5175	6900	10350
16	3	0.125	6.0	16.0	3750	5625	7500	11250
20	3	0.130	6.5	20.0	3900	5850	7800	11700
25	3	0.140	6.5	25.0	4200	6300	8400	12600

6	3	0.060	3.5	3.6	1800	2700	3600	5400
8	3	0.075	4.5	4.8	2250	3375	4500	6750
10	3	0.095	5.0	6.0	2850	4275	5700	8550
12	3	0.115	5.5	7.2	3450	5175	6900	10350
16	3	0.125	6.0	9.6	3750	5625	7500	11250
20	3	0.130	6.5	12.0	3900	5850	7800	11700
25	3	0.140	6.5	15.0	4200	6300	8400	12600

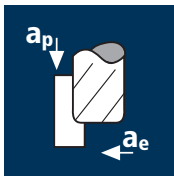


Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



6	3	0.060	5.3	3.6	1800	2700	3600	5400
8	3	0.075	6.8	4.8	2250	3375	4500	6750
10	3	0.095	7.5	6.0	2850	4275	5700	8550
12	3	0.115	8.3	7.2	3450	5175	6900	10350
16	3	0.125	9.0	9.6	3750	5625	7500	11250
20	3	0.130	9.8	12.0	3900	5850	7800	11700
25	3	0.140	9.8	15.0	4200	6300	8400	12600

Applicazione



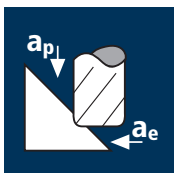
Materiale

Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	3	0.020	*	0.20	600	900	1200	1800
8	3	0.025	*	0.25	750	1125	1500	2250
10	3	0.030	*	0.30	900	1350	1800	2700
12	3	0.035	*	0.35	1050	1575	2100	3150
16	3	0.040	*	0.50	1200	1800	2400	3600
20	3	0.040	*	0.60	1200	1800	2400	3600
25	3	0.040	*	0.75	1200	1800	2400	3600

*ap_m si vede pagina 921



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



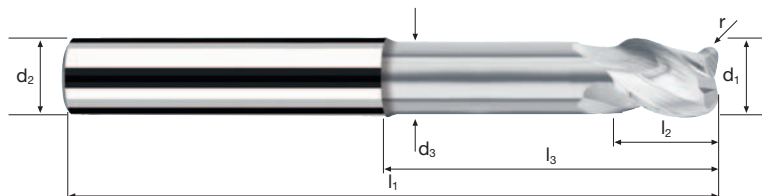
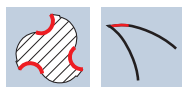
6	3	0.130	0.35	0.35	3900	5850	7800	11700
8	3	0.165	0.40	0.40	4950	7425	9900	14850
10	3	0.210	0.45	0.45	6300	9450	12600	18900
12	3	0.255	0.50	0.50	7650	11475	15300	22950
16	3	0.275	0.60	0.60	8250	12375	16500	24750
20	3	0.285	0.75	0.75	8550	12825	17100	25650
25	3	0.310	0.80	0.80	9300	13950	18600	27900

Frese toriche AX-RV3

A taglienti lisci, esecuzione 4xd con scarico



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura

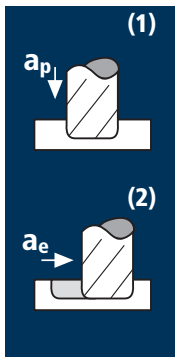


Finitura



Esempio: N° Ordine										CELERO	
Rivestimento Articolo Codice-ø											
C 15584 .302											
ø Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	z	15584	C15584
.302	6	6	5.5	60	7	24	4.0	1.0	3	●	●
.391	8	8	7.4	68	9	32	4.0	1.0	3	●	●
.450	10	10	9.2	84	11	40	4.0	1.0	3	●	●
.501	12	12	11.0	97	13	48	4.0	1.0	3	●	●
.608	16	16	15.0	115	18	64	4.0	1.0	3	●	●
.680	20	20	19.0	130	22	80	4.0	1.0	3	●	●
.770	25	25	24.0	157	27	100	4.0	1.0	3	●	●
.307	6	6	5.5	60	7	24	4.0	2.5	3	●	●
.397	8	8	7.4	68	9	32	4.0	2.5	3	●	●
.457	10	10	9.2	84	11	40	4.0	2.5	3	●	●
.506	12	12	11.0	97	13	48	4.0	2.5	3	●	●
.612	16	16	15.0	115	18	64	4.0	2.5	3	●	●
.684	20	20	19.0	130	22	80	4.0	2.5	3	●	●
.774	25	25	24.0	157	27	100	4.0	2.5	3	●	●
.459	10	10	9.2	84	11	40	4.0	4.0	3	●	●
.508	12	12	11.0	97	13	48	4.0	4.0	3	●	●
.614	16	16	15.0	115	18	64	4.0	4.0	3	●	●
.686	20	20	19.0	130	22	80	4.0	4.0	3	●	●
.776	25	25	24.0	157	27	100	4.0	4.0	3	●	●

Applicazione



Materiale

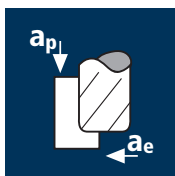
Costruzione integrale Al
Aeronautica
[AlMg15SiCu / 6061]
[AlCu4MgSi / 2017]
[AlCu2Mg1,5Ni / 2618]
[AlZn5,5MgCu / 7175]
[AlZn6CuMgZr / 7150]
[AlCu4Mg1 / 2124]

Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	3	0.040	4.0	6.0	1200	1800	2400	3600
8	3	0.055	4.5	8.0	1650	2475	3300	4950
10	3	0.070	5.0	10.0	2100	3150	4200	6300
12	3	0.075	5.0	12.0	2250	3375	4500	6750
16	3	0.095	5.0	16.0	2850	4275	5700	8550
20	3	0.115	5.0	20.0	3450	5175	6900	10350
25	3	0.130	5.0	25.0	3900	5850	7800	11700

6	3	0.040	4.0	3.6	1200	1800	2400	3600
8	3	0.055	4.5	4.8	1650	2475	3300	4950
10	3	0.070	5.0	6.0	2100	3150	4200	6300
12	3	0.075	5.0	7.2	2250	3375	4500	6750
16	3	0.095	5.0	9.6	2850	4275	5700	8550
20	3	0.115	5.0	12.0	3450	5175	6900	10350
25	3	0.130	5.0	15.0	3900	5850	7800	11700

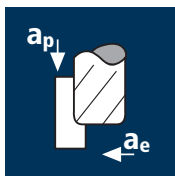


Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



6	3	0.040	6.0	3.6	1200	1800	2400	3600
8	3	0.055	6.8	4.8	1650	2475	3300	4950
10	3	0.070	7.5	6.0	2100	3150	4200	6300
12	3	0.075	7.5	7.2	2250	3375	4500	6750
16	3	0.095	7.5	9.6	2850	4275	5700	8550
20	3	0.115	7.5	12.0	3450	5175	6900	10350
25	3	0.130	7.5	15.0	3900	5850	7800	11700

Applicazione



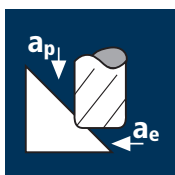
Materiale

Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	3	0.010	*	0.20	300	450	600	900
8	3	0.015	*	0.25	450	675	900	1350
10	3	0.020	*	0.30	600	900	1200	1800
12	3	0.025	*	0.35	750	1125	1500	2250
16	3	0.030	*	0.50	900	1350	1800	2700
20	3	0.035	*	0.60	1050	1575	2100	3150
25	3	0.040	*	0.75	1200	1800	2400	3600

*ap_{im} si vede pagina 921



Costruzione integrale Al
[AlZn5,5MgCu / 7175]
Alluminio malleabile
[AlMgSi1 / 6082]
Legia per fonderia Al
[G-AlSi11Mg]



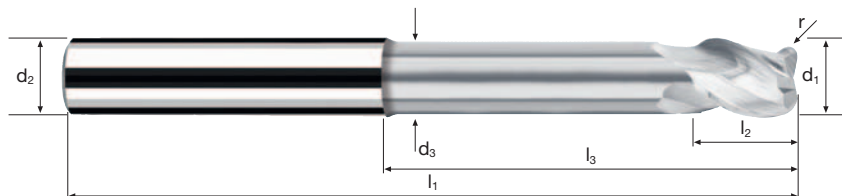
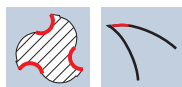
6	3	0.090	0.45	0.45	2700	4050	5400	8100
8	3	0.120	0.50	0.50	3600	5400	7200	10800
10	3	0.155	0.45	0.45	4650	6975	9300	13950
12	3	0.165	0.50	0.50	4950	7425	9900	14850
16	3	0.210	0.60	0.60	6300	9450	12600	18900
20	3	0.255	0.75	0.75	7650	11475	15300	22950
25	3	0.285	0.80	0.80	8550	12825	17100	25650

Frese toriche AX-RV3

A taglienti lisci, esecuzione 5xd con scarico



HM
MG10 λ **40°**
 γ **20°**



Sgrossatura

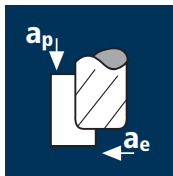


Finitura



Esempio: N° Ordine										CELERO	
										15585	C15585
										15585	C15585
\emptyset Code	d1 e8	d2 h6	d3	l1	l2	l3	l3/d1	r 0/+0.03	z		
.450	10	10	9.2	91	11	50	5.0	1.0	3	●	●
.501	12	12	11.0	106	13	60	5.0	1.0	3	●	●
.608	16	16	15.0	129	18	80	5.0	1.0	3	●	●
.680	20	20	19.0	151	22	100	5.0	1.0	3	●	●
.770	25	25	24.0	182	27	125	5.0	1.0	3	●	●
.307	6	6	5.5	66	7	30	5.0	2.5	3	●	●
.397	8	8	7.4	76	9	40	5.0	2.5	3	●	●
.457	10	10	9.2	91	11	50	5.0	2.5	3	●	●
.506	12	12	11.0	106	13	60	5.0	2.5	3	●	●
.612	16	16	15.0	129	18	80	5.0	2.5	3	●	●
.684	20	20	19.0	151	22	100	5.0	2.5	3	●	●
.774	25	25	24.0	182	27	125	5.0	2.5	3	●	●
.459	10	10	9.2	91	11	50	5.0	4.0	3	●	●
.508	12	12	11.0	106	13	60	5.0	4.0	3	●	●
.614	16	16	15.0	129	18	80	5.0	4.0	3	●	●
.686	20	20	19.0	151	22	100	5.0	4.0	3	●	●
.776	25	25	24.0	182	27	125	5.0	4.0	3	●	●

Applicazione



Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	n [min ⁻¹]	vf [mm/min]	Q [cm ³ /min]
3	2	450	0.045	2.4	1.4	47745	4295	14.5
4	2	450	0.060	3.2	1.8	35810	4295	24.5
5	2	450	0.075	4.0	2.3	28650	4300	39.5
6	2	450	0.095	4.8	2.7	23875	4535	59.0
8	2	450	0.130	6.4	3.6	17905	4655	107.5
10	2	450	0.160	8.0	4.5	14325	4585	165.0
12	2	450	0.175	9.6	5.4	11935	4175	216.5
16	2	450	0.195	12.8	7.2	8950	3490	321.5
20	2	450	0.230	16.0	9.0	7160	3295	474.5

Rame non legato

3	2	350	0.035	2.4	1.4	37135	2600	8.5
4	2	350	0.050	3.2	1.8	27850	2785	16.0
5	2	350	0.060	4.0	2.3	22280	2675	24.0
6	2	350	0.075	4.8	2.7	18570	2785	36.0
8	2	350	0.105	6.4	3.6	13925	2925	67.5
10	2	350	0.130	8.0	4.5	11140	2895	104.0
12	2	350	0.140	9.6	5.4	9285	2600	135.0
16	2	350	0.155	12.8	7.2	6965	2160	199.0
20	2	350	0.185	16.0	9.0	5570	2060	296.5

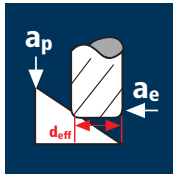
Materiali termoplastici

3	2	800	0.045	2.4	1.4	60000	5400	17.5
4	2	800	0.060	3.2	1.8	60000	7200	41.5
5	2	800	0.075	4.0	2.3	50930	7640	69.0
6	2	800	0.095	4.8	2.7	42440	8065	104.5
8	2	800	0.130	6.4	3.6	31830	8275	190.5
10	2	800	0.160	8.0	4.5	25465	8150	293.5
12	2	800	0.175	9.6	5.4	21220	7425	385.0
16	2	800	0.195	12.8	7.2	15915	6205	572.0
20	2	800	0.230	16.0	9.0	12730	5855	843.0

Getti d'alluminio
Si 6% - 15%

3	2	300	0.030	2.4	1.4	31830	1910	6.0
4	2	300	0.040	3.2	1.8	23875	1910	11.0
5	2	300	0.055	4.0	2.3	19100	2100	19.0
6	2	300	0.065	4.8	2.7	15915	2070	27.0
8	2	300	0.090	6.4	3.6	11935	2150	49.5
10	2	300	0.110	8.0	4.5	9550	2100	75.5
12	2	300	0.125	9.6	5.4	7960	1990	103.0
16	2	300	0.135	12.8	7.2	5970	1610	148.5
20	2	300	0.160	16.0	9.0	4775	1530	220.5

Applicazione



Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	vc [m/min]	fz [mm]	ap [mm]	ae [mm]	d_eff [mm]	n [min ⁻¹]	vf [mm/min]	β [°]
3	2	600	0.055	0.25	0.25	2.97	60000	6600	45°
4	2	600	0.075	0.30	0.30	3.93	48600	7290	45°
5	2	600	0.090	0.35	0.35	4.89	39060	7030	45°
6	2	600	0.120	0.40	0.40	5.98	31940	7665	45°
8	2	600	0.160	0.45	0.45	7.96	23995	7680	45°
10	2	600	0.200	0.50	0.50	10.00	19100	7640	45°
12	2	600	0.220	0.60	0.60	11.97	15955	7020	45°
16	2	600	0.245	0.75	0.75	15.98	11950	5855	45°
20	2	600	0.285	1.00	1.00	19.86	9615	5480	45°

Rame non legato

3	2	450	0.045	0.25	0.25	2.97	48230	4340	45°
4	2	450	0.060	0.30	0.30	3.93	36450	4375	45°
5	2	450	0.070	0.35	0.35	4.89	29295	4100	45°
6	2	450	0.095	0.40	0.40	5.98	23955	4550	45°
8	2	450	0.130	0.45	0.45	7.96	17995	4680	45°
10	2	450	0.160	0.50	0.50	10.00	14325	4585	45°
12	2	450	0.175	0.60	0.60	11.97	11965	4190	45°
16	2	450	0.195	0.75	0.75	15.98	8965	3495	45°
20	2	450	0.230	1.00	1.00	19.86	7215	3320	45°

Materiali termoplastici

3	2	1000	0.055	0.25	0.25	2.97	60000	6600	45°
4	2	1000	0.075	0.30	0.30	3.93	60000	9000	45°
5	2	1000	0.090	0.35	0.35	4.89	60000	10800	45°
6	2	1000	0.120	0.40	0.40	5.98	53230	12775	45°
8	2	1000	0.160	0.45	0.45	7.96	39990	12795	45°
10	2	1000	0.200	0.50	0.50	10.00	31830	12730	45°
12	2	1000	0.220	0.60	0.60	11.97	26595	11700	45°
16	2	1000	0.245	0.75	0.75	15.98	19920	9760	45°
20	2	1000	0.285	1.00	1.00	19.86	16030	9135	45°

Getti d'alluminio
Si 6% - 15%

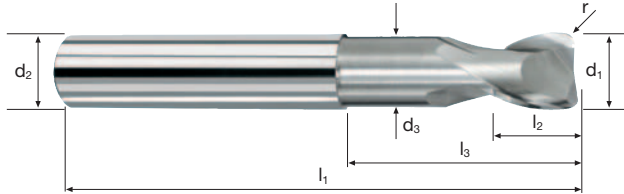
3	2	400	0.040	0.25	0.25	2.97	42870	3430	45°
4	2	400	0.055	0.30	0.30	3.93	32400	3565	45°
5	2	400	0.065	0.35	0.35	4.89	26040	3385	45°
6	2	400	0.085	0.40	0.40	5.98	21290	3620	45°
8	2	400	0.110	0.45	0.45	7.96	15995	3520	45°
10	2	400	0.140	0.50	0.50	10.00	12735	3565	45°
12	2	400	0.155	0.60	0.60	11.97	10635	3295	45°
16	2	400	0.170	0.75	0.75	15.98	7970	2710	45°
20	2	400	0.200	1.00	1.00	19.86	6410	2565	45°

Frese toriche AluSpeed

A taglienti lisci, esecuzione normale



HM	λ 30°
MG10	γ 15°



Sgrossatura



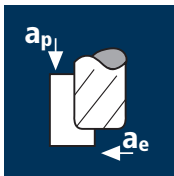
Finitura



Rm < 850		Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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										CELERO	
Esempio: N° Ordine										5275	C5275
\emptyset Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.180	3	6	2.8	57	4	9	0.5	5.9°	2	●	●
.220	4	6	3.7	57	5	12	0.5	3.7°	2	●	●
.260	5	6	4.6	57	6	15	0.5	1.7°	2	●	●
.300	6	6	5.5	57	7	20	1.0	0.0°	2	●	●
.391	8	8	7.4	63	9	26	1.0	0.0°	2	●	●
.450	10	10	9.2	72	11	31	1.5	0.0°	2	●	●
.501	12	12	11.0	83	13	37	1.5	0.0°	2	●	●
.610	16	16	15.0	92	17	43	2.0	0.0°	2	●	●
.682	20	20	19.0	104	21	53	2.0	0.0°	2	●	●
.772	25	25	24.0	121	26	64	2.5	0.0°	2	●	●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
10	2	300	0.145	8.0	4.5	9550	2770	99.5
12	2	300	0.175	9.6	5.4	7960	2785	144.5
16	2	300	0.235	12.8	7.2	5970	2805	258.5
20	2	300	0.320	16.0	9.0	4775	3055	440.0
25	2	300	0.400	20.0	11.3	3820	3055	690.5

Rame non legato



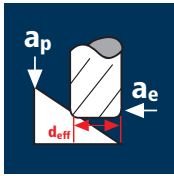
10	2	200	0.115	8.0	4.5	6365	1465	52.5
12	2	200	0.140	9.6	5.4	5305	1485	77.0
16	2	200	0.190	12.8	7.2	3980	1510	139.0
20	2	200	0.255	16.0	9.0	3185	1625	234.0
25	2	200	0.320	20.0	11.3	2545	1630	367.0

Materiali termoplastici




10	2	600	0.145	8.0	4.5	19100	5540	199.5
12	2	600	0.175	9.6	5.4	15915	5570	288.5
16	2	600	0.235	12.8	7.2	11935	5610	517.0
20	2	600	0.320	16.0	9.0	9550	6110	880.0
25	2	600	0.400	20.0	11.3	7640	6110	1375.0

Applicazione



Materiale

Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
10	2	350	0.180	0.50	0.50	10.00	11140	4010	45°
12	2	350	0.220	0.60	0.60	11.97	9310	4095	45°
16	2	350	0.290	0.75	0.75	15.98	6970	4045	45°
20	2	350	0.400	1.00	1.00	19.95	5585	4470	45°
25	2	350	0.500	1.80	1.80	24.84	4485	4485	45°

Rame non legato



10	2	300	0.145	0.50	0.50	10.00	9550	2770	45°
12	2	300	0.175	0.60	0.60	11.97	7980	2795	45°
16	2	300	0.230	0.75	0.75	15.98	5975	2750	45°
20	2	300	0.320	1.00	1.00	19.95	4785	3060	45°
25	2	300	0.400	1.80	1.80	24.84	3845	3075	45°

Materiali termoplastici



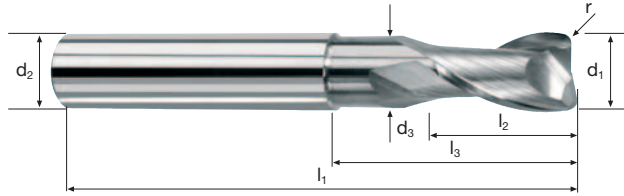
10	2	700	0.180	0.50	0.50	10.00	22280	8020	45°
12	2	700	0.220	0.60	0.60	11.97	18615	8190	45°
16	2	700	0.290	0.75	0.75	15.98	13945	8090	45°
20	2	700	0.400	1.00	1.00	19.95	11170	8935	45°
25	2	700	0.500	1.80	1.80	24.84	8970	8970	45°

Frese toriche AB-R

A taglienti lisci, esecuzione normale



HM	λ 30°
MG10	γ 15°



Sgrossatura

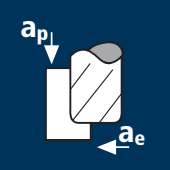









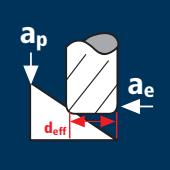







Finitura



			Al Aluminium > 99%	Al Aluminium Alloy			Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine											
									Rivestimento	Articolo	Codice-ø
										5271	.450
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	z			
.450	10	10	9.2	72	16	31	1.5	2	●		
.501	12	12	11.0	83	19	37	1.5	2	●		
.610	16	16	15.0	92	25	43	2.0	2	●		
.682	20	20	19.0	104	31	53	2.0	2	●		
.503	12	12	11.0	83	19	37	2.5	2	●		
.612	16	16	15.0	92	25	43	2.5	2	●		
.684	20	20	19.0	104	31	53	2.5	2	●		
.774	25	25	24.0	121	39	64	2.5	2	●		
.614	16	16	15.0	92	25	43	4.0	2	●		
.686	20	20	19.0	104	31	53	4.0	2	●		
.776	25	25	24.0	121	39	64	4.0	2	●		

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6%  	6	3	450	0.085	5.4	2.1	23875	6090	69.0
		8	3	450	0.110	7.2	2.8	17905	5910	119.0
		10	3	450	0.140	9.0	3.5	14325	6015	189.5
		12	3	450	0.155	10.8	4.2	11935	5550	251.5
		16	3	450	0.170	14.4	5.6	8950	4565	368.0
		20	3	450	0.185	18.0	7.0	7160	3975	501.0
		25	3	450	0.205	22.5	8.8	5730	3525	698.0
Rame non legato  	6	3	350	0.070	5.4	2.1	18570	3900	44.0	
	8	3	350	0.090	7.2	2.8	13925	3760	76.0	
	10	3	350	0.110	9.0	3.5	11140	3675	116.0	
	12	3	350	0.125	10.8	4.2	9285	3480	158.0	
	16	3	350	0.135	14.4	5.6	6965	2820	227.5	
	20	3	350	0.150	18.0	7.0	5570	2505	315.5	
	25	3	350	0.165	22.5	8.8	4455	2205	434.0	
Materiali termoplastici 	6	3	800	0.085	5.4	2.1	42440	10820	122.5	
	8	3	800	0.110	7.2	2.8	31830	10505	212.0	
	10	3	800	0.140	9.0	3.5	25465	10695	337.0	
	12	3	800	0.155	10.8	4.2	21220	9865	447.5	
	16	3	800	0.170	14.4	5.6	15915	8115	654.5	
	20	3	800	0.185	18.0	7.0	12730	7065	890.0	
	25	3	800	0.205	22.5	8.8	10185	6265	1233.5	
Getti d'alluminio Si 6% - 15%  	6	3	300	0.060	5.4	2.1	15915	2865	32.5	
	8	3	300	0.075	7.2	2.8	11935	2685	54.0	
	10	3	300	0.100	9.0	3.5	9550	2865	90.0	
	12	3	300	0.110	10.8	4.2	7960	2625	119.0	
	16	3	300	0.120	14.4	5.6	5970	2150	173.5	
	20	3	300	0.130	18.0	7.0	4775	1860	234.5	
	25	3	300	0.145	22.5	8.8	3820	1660	327.0	

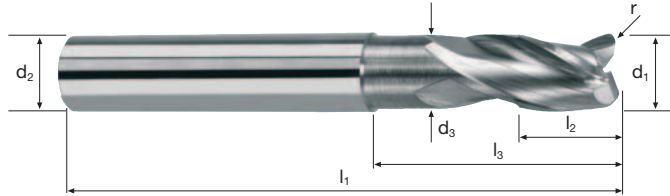
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Alluminio malleabile Si < 6%  	6	3	600	0.110	0.40	0.40	5.98	31940	10540	45°
		8	3	600	0.145	0.45	0.45	7.96	23995	10440	45°
		10	3	600	0.180	0.50	0.50	10.00	19100	10315	45°
		12	3	600	0.195	0.60	0.60	11.97	15955	9335	45°
		16	3	600	0.220	0.75	0.75	15.98	11950	7885	45°
		20	3	600	0.240	1.00	1.00	19.86	9615	6925	45°
		25	3	600	0.265	1.50	1.50	24.65	7750	6160	45°
Rame non legato  	6	3	450	0.090	0.40	0.40	5.98	23955	6470	45°	
	8	3	450	0.115	0.45	0.45	7.96	17995	6210	45°	
	10	3	450	0.145	0.50	0.50	10.00	14325	6230	45°	
	12	3	450	0.155	0.60	0.60	11.97	11965	5565	45°	
	16	3	450	0.175	0.75	0.75	15.98	8965	4705	45°	
	20	3	450	0.190	1.00	1.00	19.86	7215	4115	45°	
	25	3	450	0.210	1.50	1.50	24.65	5810	3660	45°	
Materiali termoplastici 	6	3	1000	0.110	0.40	0.40	5.98	53230	17565	45°	
	8	3	1000	0.145	0.45	0.45	7.96	39990	17395	45°	
	10	3	1000	0.180	0.50	0.50	10.00	31830	17190	45°	
	12	3	1000	0.195	0.60	0.60	11.97	26595	15560	45°	
	16	3	1000	0.220	0.75	0.75	15.98	19920	13145	45°	
	20	3	1000	0.240	1.00	1.00	19.86	16030	11540	45°	
	25	3	1000	0.265	1.50	1.50	24.65	12915	10265	45°	
Getti d'alluminio Si 6% - 15%  	6	3	400	0.075	0.40	0.40	5.98	21290	4790	45°	
	8	3	400	0.100	0.45	0.45	7.96	15995	4800	45°	
	10	3	400	0.125	0.50	0.50	10.00	12735	4775	45°	
	12	3	400	0.135	0.60	0.60	11.97	10635	4305	45°	
	16	3	400	0.155	0.75	0.75	15.98	7970	3705	45°	
	20	3	400	0.170	1.00	1.00	19.86	6410	3270	45°	
	25	3	400	0.185	1.50	1.50	24.65	5165	2865	45°	

Frese toriche AB-R3

A taglienti lisci, esecuzione normale



HM
MG10 λ **30°**
 γ **15°**



Sgrossatura

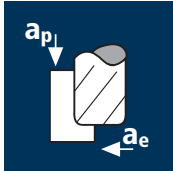









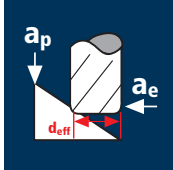







Finitura



Rm < 850			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine		Rivestimento		Articolo		Codice-ø				CELERO	
		C	5276	.300					5276	C5276	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	z			
.300	6	6	5.5	57	7	20	1.0	3	•		•
.391	8	8	7.4	63	9	26	1.0	3	•		•
.450	10	10	9.2	72	11	31	1.5	3	•		•
.501	12	12	11.0	83	13	37	1.5	3	•		•
.610	16	16	15.0	92	17	43	2.0	3	•		•
.682	20	20	19.0	104	21	53	2.0	3	•		•
.772	25	25	24.0	121	26	64	2.5	3	•		•

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6%  	6	2	400	0.095	3.6	1.5	21220	4030	22.0
		8	2	400	0.130	4.8	2.0	15915	4140	39.5
		10	2	400	0.160	6.0	2.5	12730	4075	61.0
		12	2	400	0.175	7.2	3.0	10610	3715	80.0
		16	2	400	0.195	9.6	4.0	7960	3105	119.0
		20	2	400	0.230	12.0	5.0	6365	2930	176.0
Rame non legato	 	6	2	300	0.075	3.6	1.5	15915	2385	13.0
		8	2	300	0.105	4.8	2.0	11935	2505	24.0
		10	2	300	0.130	6.0	2.5	9550	2485	37.5
		12	2	300	0.140	7.2	3.0	7960	2230	48.0
		16	2	300	0.155	9.6	4.0	5970	1850	71.0
		20	2	300	0.185	12.0	5.0	4775	1765	106.0
Materiali termoplastici		6	2	700	0.095	3.6	1.5	37135	7055	38.0
		8	2	700	0.130	4.8	2.0	27850	7240	69.5
		10	2	700	0.160	6.0	2.5	22280	7130	107.0
		12	2	700	0.175	7.2	3.0	18570	6500	140.5
		16	2	700	0.195	9.6	4.0	13925	5430	208.5
		20	2	700	0.230	12.0	5.0	11140	5125	307.5
Getti d'alluminio Si 6% - 15%	 	6	2	250	0.065	3.6	1.5	13265	1725	9.5
		8	2	250	0.090	4.8	2.0	9945	1790	17.0
		10	2	250	0.110	6.0	2.5	7960	1750	26.5
		12	2	250	0.125	7.2	3.0	6630	1660	36.0
		16	2	250	0.135	9.6	4.0	4975	1345	51.5
		20	2	250	0.160	12.0	5.0	3980	1275	76.5

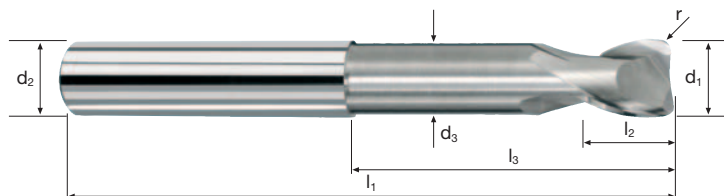
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	d _{eff} [mm]	n [min ⁻¹]	v _f [mm/min]	β [°]
	Alluminio malleabile Si < 6%  	6	2	500	0.110	0.35	0.35	5.99	26570	5845	45°
		8	2	500	0.145	0.40	0.40	7.98	19945	5785	45°
		10	2	500	0.180	0.45	0.45	10.00	15915	5730	45°
		12	2	500	0.240	0.50	0.50	12.00	13265	6365	45°
		16	2	500	0.320	0.60	0.60	16.00	9945	6365	45°
		20	2	500	0.400	0.75	0.75	19.98	7965	6370	45°
Rame non legato	 	6	2	400	0.090	0.35	0.35	5.99	21255	3825	45°
		8	2	400	0.115	0.40	0.40	7.98	15955	3670	45°
		10	2	400	0.145	0.45	0.45	10.00	12735	3695	45°
		12	2	400	0.190	0.50	0.50	12.00	10610	4030	45°
		16	2	400	0.255	0.60	0.60	16.00	7960	4060	45°
		20	2	400	0.320	0.75	0.75	19.98	6375	4080	45°
Materiali termoplastici		6	2	800	0.110	0.35	0.35	5.99	42515	9355	45°
		8	2	800	0.145	0.40	0.40	7.98	31910	9255	45°
		10	2	800	0.180	0.45	0.45	10.00	25465	9165	45°
		12	2	800	0.240	0.50	0.50	12.00	21220	10185	45°
		16	2	800	0.320	0.60	0.60	16.00	15915	10185	45°
		20	2	800	0.400	0.75	0.75	19.98	12745	10195	45°
Getti d'alluminio Si 6% - 15%	 	6	2	300	0.075	0.35	0.35	5.99	15945	2390	45°
		8	2	300	0.100	0.40	0.40	7.98	11965	2395	45°
		10	2	300	0.125	0.45	0.45	10.00	9550	2390	45°
		12	2	300	0.170	0.50	0.50	12.00	7960	2705	45°
		16	2	300	0.225	0.60	0.60	16.00	5970	2685	45°
		20	2	300	0.280	0.75	0.75	19.98	4780	2675	45°

Frese toriche AluSpeed

A taglienti lisci, esecuzione medio-lunga



HM
MG10 λ **30°**
 γ **15°**



Sgrossatura



Finitura



Rm < 850			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine									CELERO	
									5277	C5277
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	z		
.300	6	6	5.5	70	7	33	1.0	2	●	●
.391	8	8	7.4	80	9	43	1.0	2	●	●
.450	10	10	9.2	84	11	43	1.5	2	●	●
.501	12	12	11.0	97	13	51	1.5	2	●	●
.610	16	16	15.0	115	17	66	2.0	2	●	●
.682	20	20	19.0	130	21	79	2.0	2	●	●

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	600	0.065	9	3.6	31830	6205	201.0
8	3	600	0.090	12	4.8	23875	6445	371.0
10	3	600	0.110	15	6.0	19100	6305	567.5
12	3	600	0.135	18	7.2	15915	6445	835.5
16	3	600	0.180	24	9.6	11935	6445	1485.0
20	3	600	0.220	30	12.0	9550	6305	2270.0

Rame non legato

6	3	400	0.065	9	3.6	21220	4140	134.0
8	3	400	0.090	12	4.8	15915	4295	247.5
10	3	400	0.110	15	6.0	12735	4205	378.5
12	3	400	0.135	18	7.2	10610	4295	556.5
16	3	400	0.180	24	9.6	7960	4300	990.5
20	3	400	0.220	30	12.0	6365	4200	1512.0

Materiali termoplastici

6	3	800	0.065	9	3.6	42445	8275	268.0
8	3	800	0.090	12	4.8	31830	8595	495.0
10	3	800	0.110	15	6.0	25465	8405	756.5
12	3	800	0.135	18	7.2	21220	8595	1114.0
16	3	800	0.180	24	9.6	15915	8595	1980.5
20	3	800	0.220	30	12.0	12735	8405	3026.0

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	500	0.060	9.0	6	26525	4775	258.0
8	3	500	0.080	12.0	8	19895	4775	458.5
10	3	500	0.100	15.0	10	15915	4775	716.5
12	3	500	0.120	18.0	12	13265	4775	1031.5
16	3	500	0.160	24.0	16	9945	4775	1833.5
20	3	500	0.200	30.0	20	7960	4775	2865.0

Rame non legato

6	3	270	0.060	9.0	6	14325	2580	139.5
8	3	270	0.080	12.0	8	10745	2580	247.5
10	3	270	0.100	15.0	10	8595	2580	387.0
12	3	270	0.120	18.0	12	7160	2580	557.5
16	3	270	0.160	24.0	16	5370	2580	990.5
20	3	270	0.200	30.0	20	4295	2575	1545.0

Materiali termoplastici

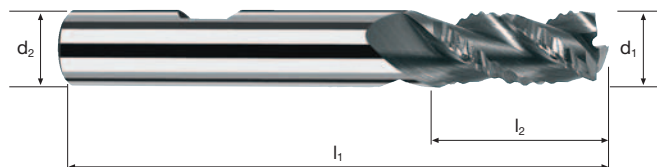
6	3	800	0.060	9.0	6	42445	7640	412.5
8	3	800	0.080	12.0	8	31830	7640	733.5
10	3	800	0.100	15.0	10	25465	7640	1146.0
12	3	800	0.120	18.0	12	21220	7640	1650.0
16	3	800	0.160	24.0	16	15915	7640	2934.0
20	3	800	0.200	30.0	20	12735	7640	4584.0

Frese cilindriche AX-FP

Profilata, esecuzione normale



HM MG10 λ 40° γ 18°



Sgrossatura



Finitura



Rm < 850 Al Aluminium > 99% Al Aluminium Alloy Al Aluminium Cast Cu Copper Plastic Thermoplast

Esempio: N° Ordine							CELERO
		Rivestimento C	Articolo 5397	Codice-ø .300			C5397
ø Code	d1 e8	d2 h6	l1	l2	45°	z	C5297
.300	6	6	57	13	0.40	3	•
.391	8	8	63	19	0.40	3	•
.450	10	10	72	22	0.40	3	•
.501	12	12	83	26	0.40	3	•
.610	16	16	92	32	0.50	3	•
.682	20	20	104	38	0.50	3	•

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	345	0.055	9	2.4	18305	3020	65.0
8	3	345	0.070	12	3.2	13730	2885	111.0
10	3	345	0.090	15	4.0	10980	2965	178.0
12	3	345	0.125	18	4.8	9150	3430	296.5
16	3	345	0.170	24	6.4	6865	3500	537.5
20	3	345	0.210	30	8.0	5490	3460	830.5
25	3	345	0.265	38	10.0	4395	3495	1310.5

Rame non legato

6	3	147	0.055	9	2.4	7800	1285	28.0
8	3	147	0.070	12	3.2	5850	1230	47.0
10	3	147	0.090	15	4.0	4680	1265	76.0
12	3	147	0.125	18	4.8	3900	1465	126.5
16	3	147	0.170	24	6.4	2925	1490	229.0
20	3	147	0.210	30	8.0	2340	1475	354.0
25	3	147	0.265	38	10.0	1870	1485	557.0

Materiali termoplastici

6	3	360	0.055	9	2.4	19100	3150	68.0
8	3	360	0.070	12	3.2	14325	3010	115.5
10	3	360	0.090	15	4.0	11460	3095	185.5
12	3	360	0.125	18	4.8	9550	3580	309.5
16	3	360	0.170	24	6.4	7160	3650	560.5
20	3	360	0.210	30	8.0	5730	3610	866.5
25	3	360	0.265	38	10.0	4585	3645	1367.0

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	315	0.045	6	6	16710	2255	81.0
8	3	315	0.055	8	8	12535	2070	132.5
10	3	315	0.070	10	10	10025	2105	210.5
12	3	315	0.100	12	12	8355	2505	360.5
16	3	315	0.135	16	16	6265	2535	649.0
20	3	315	0.170	20	20	5015	2560	1024.0
25	3	315	0.210	25	25	4010	2525	1578.0

Rame non legato

6	3	136	0.045	6	6	7215	975	35.0
8	3	136	0.055	8	8	5410	895	57.5
10	3	136	0.070	10	10	4330	910	91.0
12	3	136	0.100	12	12	3610	1085	156.0
16	3	136	0.135	16	16	2705	1095	280.5
20	3	136	0.170	20	20	2165	1105	442.0
25	3	136	0.210	25	25	1730	1090	681.5

Materiali termoplastici

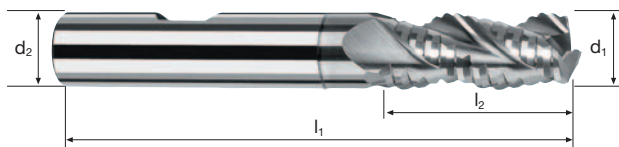
6	3	335	0.045	6	6	17775	2400	86.5
8	3	335	0.055	8	8	13330	2200	141.0
10	3	335	0.070	10	10	10665	2240	224.0
12	3	335	0.100	12	12	8885	2665	384.0
16	3	335	0.135	16	16	6665	2700	691.0
20	3	335	0.170	20	20	5330	2720	1088.0
25	3	335	0.210	25	25	4265	2685	1678.0

Frese cilindriche

Profilata, esecuzione normale



HSS-E
Co8 λ 40°
 γ 18°



Sgrossatura



Finitura



Rm
< 850

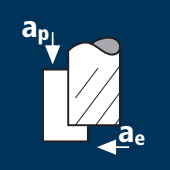





Al
Aluminium
> 99%







Al
Aluminium
Alloy

Cu
Copper

Plastic
Thermoplast

									CELERO
Esempio: N° Ordine		Rivestimento C	Articolo 0391	Codice-φ .300				C0391	
Ø Code	d1 k8	d2 h6	l1	l2	45°	α	z		
.300	6	6	57	13	0.4	0.0°	3	●	
.402	8	10	69	19	0.4	2.5°	3	●	
.450	10	10	72	22	0.4	0.0°	3	●	
.501	12	12	83	26	0.4	0.0°	3	●	
.610	16	16	92	32	0.5	0.0°	3	●	
.682	20	20	104	38	0.5	0.0°	3	●	
.772	25	25	121	45	0.7	0.0°	3	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	6	3	600	0.065	12	1.8	31830	6205	134.0
		8	3	600	0.090	16	2.4	23875	6445	247.5
		10	3	600	0.110	20	3.0	19100	6305	378.5
		12	3	600	0.135	24	3.6	15915	6445	557.0
		16	3	600	0.180	32	4.8	11935	6445	990.0
		20	3	600	0.220	40	6.0	9550	6305	1513.0
Rame non legato 	Rame non legato 	6	3	400	0.065	12	1.8	21220	4140	89.5
		8	3	400	0.090	16	2.4	15915	4295	165.0
		10	3	400	0.110	20	3.0	12735	4205	252.5
		12	3	400	0.135	24	3.6	10610	4295	371.0
		16	3	400	0.180	32	4.8	7960	4300	660.5
		20	3	400	0.220	40	6.0	6365	4200	1008.0
Materiali termoplastici 	Materiali termoplastici 	6	3	800	0.065	12	1.8	42445	8275	178.5
		8	3	800	0.090	16	2.4	31830	8595	330.0
		10	3	800	0.110	20	3.0	25465	8405	504.5
		12	3	800	0.135	24	3.6	21220	8595	742.5
		16	3	800	0.180	32	4.8	15915	8595	1320.0
		20	3	800	0.220	40	6.0	12735	8405	2017.0

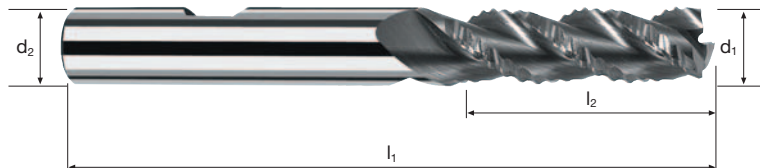
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	6	3	500	0.060	4.2	6	26525	4775	120.5
		8	3	500	0.080	5.6	8	19895	4775	214.0
		10	3	500	0.100	7.0	10	15915	4775	334.5
		12	3	500	0.120	8.4	12	13265	4775	481.5
		16	3	500	0.160	11.2	16	9945	4775	855.5
		20	3	500	0.200	14.0	20	7960	4775	1337.0
Rame non legato 	Rame non legato 	6	3	270	0.060	4.2	6	14325	2580	65.0
		8	3	270	0.080	5.6	8	10745	2580	115.5
		10	3	270	0.100	7.0	10	8595	2580	180.5
		12	3	270	0.120	8.4	12	7160	2580	260.0
		16	3	270	0.160	11.2	16	5370	2580	462.5
		20	3	270	0.200	14.0	20	4295	2575	721.0
Materiali termoplastici 	Materiali termoplastici 	6	3	800	0.060	4.2	6	42445	7640	192.5
		8	3	800	0.080	5.6	8	31830	7640	342.5
		10	3	800	0.100	7.0	10	25465	7640	535.0
		12	3	800	0.120	8.4	12	21220	7640	770.0
		16	3	800	0.160	11.2	16	15915	7640	1369.0
		20	3	800	0.200	14.0	20	12735	7640	2139.0

Frese cilindriche AX-FP

Profilata, esecuzione medio-lunga



HM
MG10 λ **40°**
 γ **18°**



Sgrossatura



Finitura



Rm < 850			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine		Rivestimento C	Articolo 15397	Codice-ø .300				CELERO
ø Code	d1 e8	d2 h6	l1	l2	45°	z		
.300	6	6	63	19	0.40	3		●
.391	8	8	72	28	0.40	3		●
.450	10	10	84	34	0.40	3		●
.501	12	12	97	40	0.40	3		●
.610	16	16	108	48	0.50	3		●
.682	20	20	122	56	0.50	3		●

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	600	0.065	9	2.4	31830	6205	134.0
8	3	600	0.090	12	3.2	23875	6445	247.5
10	3	600	0.110	15	4.0	19100	6305	378.5
12	3	600	0.135	18	4.8	15915	6445	557.0
16	3	600	0.180	24	6.4	11935	6445	990.0
20	3	600	0.220	30	8.0	9550	6305	1513.0
25	3	600	0.280	38	10.0	7640	6420	2407.5

Rame non legato

6	3	400	0.065	9	2.4	21220	4140	89.5
8	3	400	0.090	12	3.2	15915	4295	165.0
10	3	400	0.110	15	4.0	12735	4205	252.5
12	3	400	0.135	18	4.8	10610	4295	371.0
16	3	400	0.180	24	6.4	7960	4300	660.5
20	3	400	0.220	30	8.0	6365	4200	1008.0
25	3	400	0.280	38	10.0	5095	4280	1605.0

Materiali termoplastici

6	3	800	0.065	9	2.4	42445	8275	178.5
8	3	800	0.090	12	3.2	31830	8595	330.0
10	3	800	0.110	15	4.0	25465	8405	504.5
12	3	800	0.135	18	4.8	21220	8595	742.5
16	3	800	0.180	24	6.4	15915	8595	1320.0
20	3	800	0.220	30	8.0	12735	8405	2017.0
25	3	800	0.280	38	10.0	10185	8555	3208.0

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
6	3	500	0.060	4.8	6	26525	4775	137.5
8	3	500	0.080	6.4	8	19895	4775	244.5
10	3	500	0.100	8.0	10	15915	4775	382.0
12	3	500	0.120	9.6	12	13265	4775	550.0
16	3	500	0.160	12.8	16	9945	4775	978.0
20	3	500	0.200	16.0	20	7960	4775	1528.0
25	3	500	0.250	20.0	25	6365	4775	2387.5

Rame non legato

6	3	270	0.060	4.8	6	14325	2580	74.5
8	3	270	0.080	6.4	8	10745	2580	132.0
10	3	270	0.100	8.0	10	8595	2580	206.5
12	3	270	0.120	9.6	12	7160	2580	297.0
16	3	270	0.160	12.8	16	5370	2580	528.5
20	3	270	0.200	16.0	20	4295	2575	824.0
25	3	270	0.250	20.0	25	3440	2580	1290.0

Materiali termoplastici

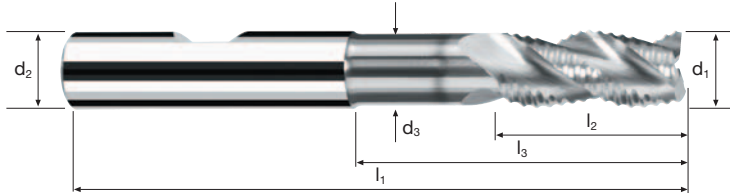
6	3	800	0.060	4.8	6	42445	7640	220.0
8	3	800	0.080	6.4	8	31830	7640	391.0
10	3	800	0.100	8.0	10	25465	7640	611.0
12	3	800	0.120	9.6	12	21220	7640	880.0
16	3	800	0.160	12.8	16	15915	7640	1564.5
20	3	800	0.200	16.0	20	12735	7640	2445.0
25	3	800	0.250	20.0	25	10185	7640	3820.0

Frese cilindriche AX-FP

Profilata, esecuzione medio-lunga con scarico



HM
MG10 λ **40°**
 γ **18°**



Sgrossatura

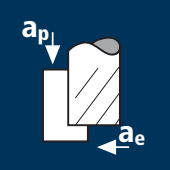













Finitura



Rm < 850			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Esempio: N° Ordine									CELERO	
									C15398	
									C15298	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	45°	z		
.300	6	6	5.5	63	13	26	0.40	3	●	
.391	8	8	7.4	72	19	35	0.40	3	●	
.450	10	10	9.2	84	22	43	0.40	3	●	
.501	12	12	11.0	97	26	51	0.40	3	●	
.610	16	16	15.0	108	32	59	0.50	3	●	
.682	20	20	19.0	122	38	71	0.50	3	●	
.772	25	25	24.0	144	45	87	0.70	3	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Alluminio malleabile Si < 6%  	10	3	173	0.060	30	2.0	5505	990	59.5	
		12	3	173	0.090	36	2.4	4590	1240	107.0	
		16	3	173	0.120	48	3.2	3440	1240	190.5	
		20	3	173	0.145	60	4.0	2755	1200	288.0	
		25	3	173	0.185	75	5.0	2205	1225	459.5	
	Rame non legato  	10	3	73	0.060	30	2.0	2325	420	25.0	
		12	3	73	0.090	36	2.4	1935	520	45.0	
		16	3	73	0.120	48	3.2	1450	520	80.0	
		20	3	73	0.145	60	4.0	1160	505	121.0	
		25	3	73	0.185	75	5.0	930	515	193.0	
	Materiali termoplastici 	10	3	183	0.060	30	2.0	5825	1050	63.0	
		12	3	183	0.090	36	2.4	4855	1310	113.0	
		16	3	183	0.120	48	3.2	3640	1310	201.0	
		20	3	183	0.145	60	4.0	2915	1270	305.0	
		25	3	183	0.185	75	5.0	2330	1295	485.5	

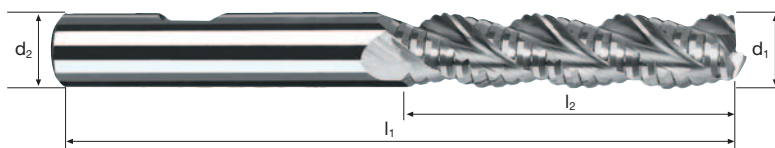
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Alluminio malleabile Si < 6%  	10	3	157	0.050	5	10	5000	750	37.5	
		12	3	157	0.070	6.0	12	4165	875	63.0	
		16	3	157	0.095	8.0	16	3125	890	114.0	
		20	3	157	0.120	10.0	20	2500	900	180.0	
		25	3	157	0.145	12.5	25	2000	870	272.0	
	Rame non legato  	10	3	68	0.050	5.0	10	2165	325	16.5	
		12	3	68	0.070	6.0	12	1805	380	27.5	
		16	3	68	0.095	8.0	16	1355	385	49.5	
		20	3	68	0.120	10.0	20	1080	390	78.0	
		25	3	68	0.145	12.5	25	865	375	117.0	
	Materiali termoplastici 	10	3	168	0.050	5.0	10	5350	805	40.5	
		12	3	168	0.070	6.0	12	4455	935	67.5	
		16	3	168	0.095	8.0	16	3340	950	121.5	
		20	3	168	0.120	10.0	20	2675	965	193.0	
		25	3	168	0.145	12.5	25	2140	930	290.5	

Frese cilindriche

Profilata, esecuzione medio-lunga



HSS-E Co8 λ **40°**
 γ **18°**



Sgrossatura



Finitura



Rm
< 850

Al
Aluminium
> 99%

Al
Aluminium
Alloy

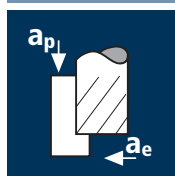
Cu
Copper

Plastic
Thermoplast

Esempio: N° Ordine		Rivestimento C	Articolo 0393	Codice-ø .450			CELERO
ø Code	d1 k8	d2 h6	l1	l2	45°	z	C0393
.450	10	10	95	45	0.4	3	●
.501	12	12	110	53	0.4	3	●
.610	16	16	123	63	0.5	3	●
.682	20	20	141	75	0.5	3	●
.772	25	25	166	90	0.7	3	●

Applicazione

Materiale



Alluminio malleabile
Si < 6%



Rame non legato



Materiali termoplastici



Getti d'alluminio
Si 6% - 15%



d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	6	0.020	9.0	0.10	1200	1800	2400	3600
8	6	0.020	12.0	0.10	1200	1800	2400	3600
10	6	0.025	15.0	0.15	1500	2250	3000	4500
12	6	0.025	18.0	0.20	1500	2250	3000	4500
16	6	0.030	24.0	0.25	1800	2700	3600	
20	6	0.030	30.0	0.30	1800	2700	3600	
6	6	0.020	9.0	0.10	1200	1800	2400	3600
8	6	0.020	12.0	0.10	1200	1800	2400	3600
10	6	0.025	15.0	0.15	1500	2250	3000	4500
12	6	0.025	18.0	0.20	1500	2250	3000	4500
16	6	0.030	24.0	0.25	1800	2700	3600	
20	6	0.030	30.0	0.30	1800	2700	3600	
6	6	0.020	9.0	0.10	1200	1800	2400	3600
8	6	0.020	12.0	0.10	1200	1800	2400	3600
10	6	0.025	15.0	0.15	1500	2250	3000	4500
12	6	0.025	18.0	0.20	1500	2250	3000	4500
16	6	0.030	24.0	0.25	1800	2700	3600	
20	6	0.030	30.0	0.30	1800	2700	3600	

Frese cilindriche Multicut XA

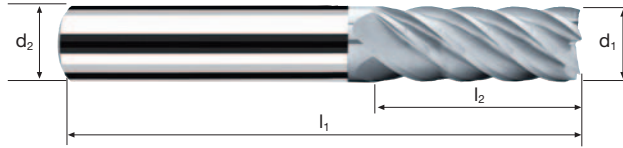
Finitura, esecuzione normale



HM
MG10 λ **40°**
 γ **20°**

r
G **2.5**

Vario



new!

Sgrossatura



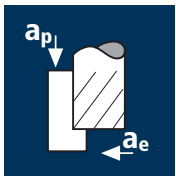
Finitura




			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
--	--	--	---------------------------------	---------------------------------	--------------------------------	--	---------------------	-------------------------------	--

Esempio: N° Ordine		Rivestimento C	Articolo 15589	Codice-ø .300				CELERO
							15589	C15589
ø Code	d1 e8	d2 h6	l1	l2	r	z		
.300	6	6	57	13	0.15	6	●	●
.391	8	8	63	19	0.15	6	●	●
.450	10	10	72	22	0.20	6	●	●
.501	12	12	83	26	0.20	6	●	●
.610	16	16	92	32	0.20	6	●	●
.682	20	20	104	40	0.20	6	●	●

Applicazione



Materiale

Alluminio malleabile
Si < 6%


Rame non legato


Materiali termoplastici


Getti d'alluminio
Si 6% - 15%


d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	6	0.020	15.0	0.10	1200	1800	2400	3600
8	6	0.020	20.0	0.10	1200	1800	2400	3600
10	6	0.025	25.0	0.15	1500	2250	3000	4500
12	6	0.025	30.0	0.20	1500	2250	3000	4500
16	6	0.030	40.0	0.25	1800	2700	3600	
20	6	0.030	50.0	0.30	1800	2700	3600	

Frese cilindriche Multicut XA

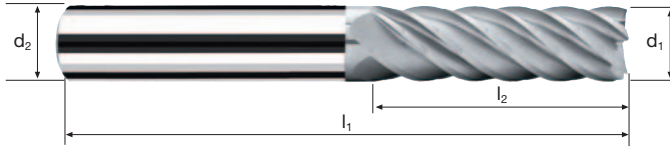
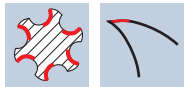
Finitura, esecuzione medio-lunga



HM
MG10 λ **40°**
 γ **20°**

r
G2.5

Vario



new!

Sgrossatura



Finitura



Material compatibility: **Al** Aluminium > 99%, **Al** Aluminium Alloy, **Al** Aluminium Cast, **Cu** Copper, **Plastic** Thermoplast

Esempio: N° Ordine		Rivestimento C	Articolo 15590	Codice-ø .300			CELERO		
								15590	C15590
Ø Code	d1 e8	d2 h6	l1	l2	r	z			
.300	6	6	63	18	0.15	6	●	●	
.391	8	8	72	24	0.15	6	●	●	
.450	10	10	84	30	0.20	6	●	●	
.501	12	12	97	36	0.20	6	●	●	
.610	16	16	108	48	0.20	6	●	●	
.682	20	20	122	60	0.20	6	●	●	



Frese per grafite

Micro con estremità emisferica

Tabella di selezione

Frese con estremità emisferica

602 - 604






Frese toriche

605 - 607

Frese cilindriche








608 - 609

Gambo ø 6mm, tolleranza r ±0.005

N° 6062		MicrospheroXG	X-Generation	X	3xd	d, 1.5 – 6.0	C Graphite			611
					R	F				
N° 6064		MicrospheroXG	X-Generation	X	5xd	d, 0.2 – 6.0	C Graphite			613
					R	F				
N° 6066		MicrospheroXG	X-Generation	X	8xd	d, 0.2 – 6.0	C Graphite			615
					R	F				
N° 6068		MicrospheroXG	X-Generation	X	10xd	d, 0.4 – 6.0	C Graphite			617
					R	F				
N° 6070		MicrospheroXG	X-Generation	X	12xd	d, 0.4 – 2.0	C Graphite			619
					R	F				






IV




Gambo ø 3mm, tolleranza r ±0.01

N° 5782		Microcut-B3	Base-X	B	3xd	d, 0.2 – 3.0	C Graphite			621
					R	F				
N° 5784		Microcut-B5	Base-X	B	5xd	d, 0.5 – 3.0	C Graphite			623
					R	F				
N° 5786		Microcut-B8	Base-X	B	8xd	d, 0.5 – 3.0	C Graphite			625
					R	F				
N° 5787		Microcut-B10	Base-X	B	10xd	d, 0.5 – 3.0	C Graphite			627
					R	F				
N° 5791		Microcut-B12	Base-X	B	12xd	d, 1.0 – 3.0	C Graphite			629
					R	F				
N° 5793		Microcut-B15	Base-X	B	15xd	d, 1.0 – 3.0	C Graphite			631
					R	F				
N° 15795		Microcut-B20	Base-X	B	20xd	d, 1.0 – 3.0	C Graphite			633
					R	F				

Frese per grafite





Micro torico

Gambo ø 6mm, tolleranza r ±0.005							
N° 6032		MicrotoroXG	X-Generation X	3xd	r 0,2, 0,5	C Graphite	635
				R F			
N° 6034		MicrotoroXG	X-Generation X	5xd	r 0,05, 0,1, 0,2, 0,5	C Graphite	637
				R F			
N° 6036		MicrotoroXG	X-Generation X	8xd	r 0,05, 0,1, 0,2, 0,5	C Graphite	639
				R F			
N° 6038		MicrotoroXG	X-Generation X	10xd	r 0,05, 0,1, 0,2, r 0,5	C Graphite	641
				R F			
N° 6040		MicrotoroXG	X-Generation X	12xd	r 0,05, 0,1, 0,2	C Graphite	643
				R F			

Gambo ø 3mm, tolleranza r 0/+0.03							
N° 5752		Microcut-T3	Base-X B	3xd	r 0,2	C Graphite	645
				R F			
N° 5754		Microcut-T5	Base-X B	5xd	r 0,2	C Graphite	647
				R F			
N° 5756		Microcut-T8	Base-X B	8xd	r 0,2	C Graphite	649
				R F			




Frese per grafite

Micro, cilindrico

Gambo ø 3mm								
N° 5712		Microcut-C3	Base-X B	3xd	d ₁ 0,2 – 3,0	C Graphite		651
				R F	45°			
N° 5714		Microcut-C5	Base-X B	5xd	d ₁ 0,5 – 3,0	C Graphite		653
				R F	45°			
N° 5716		Microcut-C8	Base-X B	8xd	d ₁ 0,5 – 3,0	C Graphite		655
				R F	45°			
N° 5717		Microcut-C10	Base-X B	10xd	d ₁ 0,5 – 3,0	C Graphite		657
				R F	45°			

Frese per grafite

Estremità emisferica

Tolleranza r ±0.005							
N° 7480		SpheroXG	X-Generation X	3xd	d ₁ 6 – 12	C Graphite	659
N° 7484		SpheroXG	X-Generation X	6xd	d ₁ 6 – 12	C Graphite	661
N° 7488		SpheroXG	X-Generation X	9xd	d ₁ 6 – 12	C Graphite	663

Frese per grafite Torico

Tolleranza r ± 0.005

N° 7284



ToroXG

X-Generation

X

6xd

r 0.5, 1.0

C

Graphite

665

N° 7288



ToroXG

X-Generation

X

9xd

r 0.5, 1.0

C

Graphite

667

Tolleranza r 0/+0.03

N° 5630



Base-X

B

r 1.0, 1.5

C

Graphite

669

N° 5640



Base-X

B

r 0.15, 0.2, 0.3, 0.5

C

Graphite

671

N° 5645



Base-X

B

r 0.15, 0.2, 0.3, 0.5

C

Graphite

673

N° 5650



Base-X

B

r 0.5

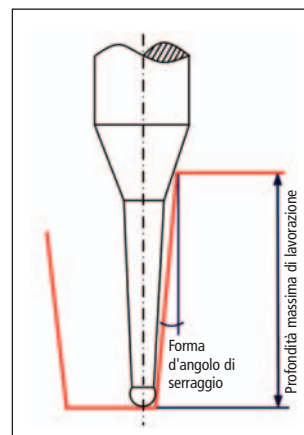
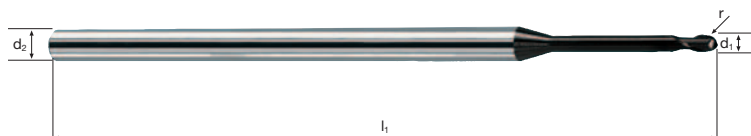
C

Graphite

675

IV

Tabella di selezione per frese con estremità emisferica



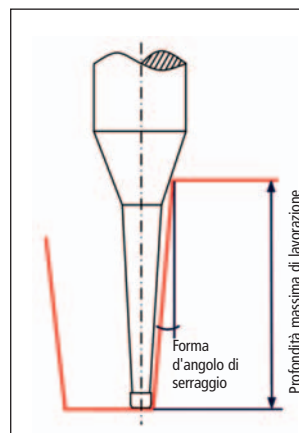
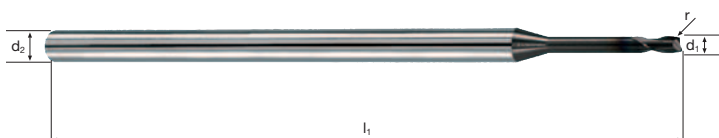
Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
0.2	3	40	2	0.10	0°	0.56	0.59	0.62	0.70	0.79	B5782020	621
	6	57	2	0.10	0°	0.96	1.01	1.06	1.19	1.36	B6064020	613
0.3	6	57	2	0.10	0°	1.56	1.64	1.73	1.94	2.22	B6066020	615
	3	40	2	0.15	0°	0.94	0.99	1.04	1.16	1.32	B5782030	621
0.4	6	57	2	0.15	0°	1.54	1.62	1.71	1.91	2.17	B6064030	613
	6	57	2	0.15	0°	2.44	2.57	2.71	3.03	3.46	B6066030	615
	3	40	2	0.20	0°	1.24	1.30	1.37	1.53	1.73	B5782040	621
	6	57	2	0.20	0°	2.04	2.14	2.26	2.52	2.87	B6064040	613
0.5	6	57	2	0.20	0°	3.24	3.41	3.59	4.02	4.57	B6066040	615
	6	57	2	0.20	0°	4.04	4.25	4.48	5.02	5.71	B6068040	617
	6	57	2	0.20	0°	4.84	5.09	5.36	6.01	6.85	B6070040	619
	3	40	2	0.25	0°	1.49	1.54	1.59	1.70	1.82	B5782050	621
0.6	6	57	2	0.25	0°	2.49	2.57	2.66	2.85	3.07	B6064050	613
	3	40	2	0.25	0°	2.49	2.57	2.66	2.85	3.07	B5784050	623
	6	57	2	0.25	0°	3.99	4.12	4.26	4.57	4.93	B6066050	615
	3	40	2	0.25	0°	3.99	4.12	4.26	4.57	4.93	B5786050	625
	6	57	2	0.25	0°	4.99	5.16	5.33	5.72	6.17	B6068050	617
	3	40	2	0.25	0°	4.99	5.16	5.33	5.72	6.17	B5787050	627
0.7	6	57	2	0.25	0°	5.99	6.19	6.40	6.87	7.42	B6070050	619
	3	40	2	0.30	0°	1.79	1.85	1.90	2.03	2.18	B5782060	621
	6	57	2	0.30	0°	2.99	3.09	3.19	3.41	3.67	B6064060	613
	3	40	2	0.30	0°	2.99	3.09	3.19	3.41	3.67	B5784060	623
	6	57	2	0.30	0°	4.79	4.95	5.11	5.48	5.91	B6066060	615
	3	40	2	0.30	0°	4.79	4.95	5.11	5.48	5.91	B5786060	625
0.8	6	57	2	0.30	0°	5.99	6.19	6.40	6.86	7.40	B6068060	617
	3	40	2	0.30	0°	5.99	6.19	6.40	6.86	7.40	B5787060	627
	6	57	2	0.30	0°	7.19	7.43	7.68	8.24	8.90	B6070060	619
	3	40	2	0.35	0°	3.49	3.60	3.72	3.98	4.28	B5784070	623
0.9	3	40	2	0.40	0°	2.39	2.46	2.54	2.71	2.91	B5782080	621
	6	57	2	0.40	0°	3.99	4.12	4.25	4.55	4.89	B6064080	613
	3	40	2	0.40	0°	3.99	4.12	4.25	4.55	4.89	B5784080	623
	6	57	2	0.40	0°	6.39	6.60	6.82	7.31	7.88	B6066080	615
	3	40	2	0.40	0°	6.39	6.60	6.82	7.31	7.88	B5786080	625
	6	57	2	0.40	0°	7.99	8.25	8.53	9.15	9.87	B6068080	617
0.9	3	40	2	0.40	0°	7.99	8.25	8.53	9.15	9.87	B5787080	627
	6	57	2	0.40	0°	9.59	9.91	10.24	10.99	11.86	B6070080	619
	3	40	2	0.45	0°	4.49	4.67	4.78	5.12	5.50	B5784090	623

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
1.0	3	50	2	0.50	0°	2.99	3.08	3.17	3.38	3.63	B5782100	621
	6	57	2	0.50	0°	4.99	5.15	5.31	5.68	6.11	B6064100	613
	3	50	2	0.50	0°	4.99	2.15	5.31	5.68	6.11	B5784100	623
	6	57	2	0.50	0°	7.99	8.25	8.52	9.13	9.84	B6066100	615
	3	50	2	0.50	0°	7.99	8.25	8.52	9.13	9.84	B5786100	625
	6	57	2	0.50	0°	9.99	10.32	10.66	11.43	12.33	B6068100	617
	3	50	2	0.50	0°	9.99	10.32	10.66	11.43	12.33	B5787100	627
	6	61	2	0.50	0°	11.99	12.38	12.80	13.73	14.81	B6070100	619
	3	50	2	0.50	0°	11.99	12.38	12.80	13.73	14.81	B5791100	629
	3	60	2	0.50	0°	14.99	15.49	16.01	17.18	18.55	B5793100	631
3	60	2	0.50	0°	19.99	20.65	21.36	22.93	-	B15795100	633	
1.2	3	50	2	0.60	0°	3.69	3.79	3.91	4.17	4.47	B5782108	621
	3	50	2	0.60	0°	6.09	6.28	6.48	6.93	7.45	B5784108	623
	3	50	2	0.60	0°	9.69	10.00	10.33	11.07	11.92	B5786108	625
	3	50	2	0.60	0°	12.09	12.48	12.89	13.82	14.91	B5787108	627
	3	60	2	0.60	0°	14.49	14.96	15.46	16.58	-	B5791108	629
	3	60	2	0.60	0°	18.09	18.68	19.31	20.72	-	B5793108	631
	3	60	2	0.60	0°	24.09	24.88	25.73	-	-	B15795108	633
	1.5	6	57	2	0.75	0°	4.59	4.72	4.86	5.18	5.55	B6062120
3		50	2	0.75	0°	4.59	4.72	4.86	5.18	5.55	B5782120	621
6		57	2	0.75	0°	7.59	7.82	8.07	8.63	9.28	B6064120	613
3		50	2	0.75	0°	7.59	7.82	8.07	8.63	9.28	B5784120	623
6		57	2	0.75	0°	12.09	12.47	12.88	13.80	14.87	B6066120	615
3		60	2	0.75	0°	12.09	12.47	12.88	13.80	14.87	B5786120	625
6		61	2	0.75	0°	15.09	15.57	16.09	17.25	18.60	B6068120	617
3		60	2	0.75	0°	15.09	15.57	16.09	17.25	-	B5787120	627
6		66	2	0.75	0°	18.09	18.67	19.30	20.70	22.33	B6070120	619
3		60	2	0.75	0°	18.09	18.67	19.30	20.70	-	B5791120	629
3		70	2	0.75	0°	22.59	23.33	24.12	-	-	B5793120	631
3		70	2	0.75	0°	30.09	31.08	32.14	-	-	B15795120	633
1.8	3	50	2	0.90	0°	9.09	9.37	9.67	10.33	11.11	B5784132	623
2.0	6	57	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	B6062140	611
	3	50	2	1.00	0°	6.09	6.26	6.45	6.87	7.35	B5782140	621
	6	57	2	1.00	0°	10.09	10.40	10.73	11.47	12.33	B6064140	613
	3	50	2	1.00	0°	10.09	10.40	10.73	11.47	-	B5784140	623
	6	61	2	1.00	0°	16.09	16.60	17.15	18.37	19.79	B6066140	615
	3	60	2	1.00	0°	16.09	16.60	17.15	-	-	B5786140	625
	6	66	2	1.00	0°	20.09	20.73	21.42	22.96	24.76	B6068140	617
	3	60	2	1.00	0°	20.09	20.73	21.42	-	-	B5787140	627
	6	69	2	1.00	0°	24.09	24.87	25.70	27.56	39.73	B6070140	619
	3	60	2	1.00	0°	24.09	24.87	25.70	-	-	B5791140	629
3	70	2	1.00	0°	30.09	31.07	-	-	-	B5793140	631	
3	80	2	1.00	0°	40.09	41.41	-	-	-	B15795140	633	
2.3	3	50	2	1.15	0°	11.77	12.13	12.52	13.38	14.39	B5784152	623
2.5	3	50	2	1.25	0°	7.77	8.00	8.24	-	-	B5782160	621
	3	50	2	1.25	0°	12.77	13.17	13.58	-	-	B5784160	623
	3	60	2	1.25	0°	20.27	20.92	-	-	-	B5786160	625
	3	60	2	1.25	0°	25.27	26.09	-	-	-	B5787160	627
	3	70	2	1.25	0°	30.27	-	-	-	-	B5791160	629
	3	70	2	1.25	0°	37.77	-	-	-	-	B5793160	631
	3	80	2	1.25	0°	50.27	-	-	-	-	B15795160	633
	2.8	3	50	2	1.40	0°	14.27	-	-	-	-	B5784172
3.0	6	57	2	1.50	0°	9.27	9.54	9.82	10.46	11.20	B6062180	611
	6	57	2	1.50	0°	15.27	15.74	16.24	17.36	18.66	B6064180	613
	6	61	2	1.50	0°	18.27	18.84	19.45	20.81	22.39	B6064182	613



Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
3.0	6	66	2	1.50	0°	24.27	25.04	25.87	27.71	29.84	B6066180	615
	6	75	2	1.50	0°	30.27	31.25	32.29	34.60	-	B6068180	617
	3	50	2	1.50	0°	8.90	-	-	-	-	B5782180	621
	3	50	2	1.50	0°	14.90	-	-	-	-	B5784180	623
	3	60	2	1.50	0°	23.90	-	-	-	-	B5786180	625
	3	60	2	1.50	0°	29.90	-	-	-	-	B5787180	627
	3	70	2	1.50	0°	35.90	-	-	-	-	B5791180	629
	3	80	2	1.50	0°	44.90	-	-	-	-	B5793180	631
	3	90	2	1.50	0°	59.90	-	-	-	-	B15795180	633
4.0	6	57	2	2.00	0°	12.46	12.82	13.20	14.05	15.04	B6062220	611
	6	61	2	2.00	0°	20.46	21.09	21.75	23.25	-	B6064220	613
	6	66	2	2.00	0°	25.46	26.25	27.10	29.00	-	B6064222	613
	6	75	2	2.00	0°	32.46	33.49	34.59	-	-	B6066220	615
	6	80	2	2.00	0°	40.46	41.76	43.15	-	-	B6068220	617
5.0	6	57	2	2.50	0°	15.65	16.09	16.57	-	-	B6062260	611
	6	66	2	2.50	0°	25.65	26.43	27.27	-	-	B6064260	613
	6	80	2	2.50	0°	40.65	41.93	-	-	-	B6066260	615
	6	100	2	2.50	0°	50.65	52.27	-	-	-	B6068260	617
6.0	6	57	2	3.00	0°	17.90	-	-	-	-	B6062300	611
	6	69	2	3.00	0°	29.90	-	-	-	-	B6064300	613
	6	87	2	3.00	0°	47.90	-	-	-	-	B6066300	615
	6	100	2	3.00	0°	59.90	-	-	-	-	B6068300	617
	6	57	2	3.00	0°	19.90	-	-	-	-	B7480300	659
	6	80	2	3.00	0°	42.90	-	-	-	-	B7484300	661
	6	100	2	3.00	0°	62.90	-	-	-	-	B7488300	663
8.0	8	63	2	4.00	0°	25.90	-	-	-	-	B7480391	659
	8	90	2	4.00	0°	52.90	-	-	-	-	B7484391	661
	8	120	2	4.00	0°	82.90	-	-	-	-	B7488391	663
10.0	10	72	2	5.00	0°	30.90	-	-	-	-	B7480450	659
	10	105	2	5.00	0°	63.90	-	-	-	-	B7484450	661
	10	135	2	5.00	0°	93.90	-	-	-	-	B7488450	663
12.0	12	83	2	6.00	0°	36.90	-	-	-	-	B7480501	659
	12	120	2	6.00	0°	73.90	-	-	-	-	B7484501	661
	12	160	2	6.00	0°	113.90	-	-	-	-	B7488501	663

Tabella di selezione per frese toriche



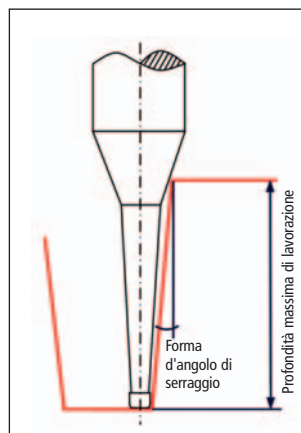
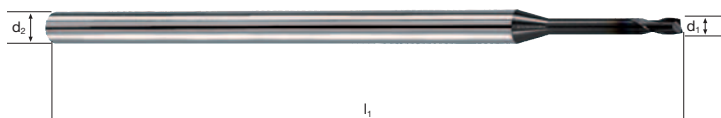
Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
0.2	6	57	2	-	0°	0.96	1.01	1.07	1.22	1.40	B6034020	637
	6	57	2	-	0°	1.56	1.64	1.74	1.97	2.26	B6036020	639
0.3	6	57	2	-	0°	1.54	1.63	1.72	1.95	2.24	B6034030	637
	6	57	2	-	0°	2.44	2.57	2.72	3.07	3.52	B6036030	639
0.4	6	57	2	0.05	0°	2.04	2.15	2.27	2.56	2.93	B6034040	637
	6	57	2	0.05	0°	3.24	3.41	3.60	4.06	4.63	B6036040	639
	6	57	2	0.05	0°	4.04	4.26	4.49	5.05	5.77	B6038040	641
	6	57	2	0.05	0°	4.84	5.10	5.38	6.05	6.91	B6040040	643
0.5	6	57	2	0.05	0°	2.49	2.58	2.67	2.88	3.11	B6034048	637
	6	57	2	0.10	0°	2.49	2.58	2.67	2.87	3.10	B6034050	637
	6	57	2	0.10	0°	3.99	4.13	4.27	4.59	4.97	B6036050	639
	6	57	2	0.05	0°	3.99	4.13	4.28	4.60	4.98	B6036048	639
	6	57	2	0.10	0°	4.99	5.16	5.34	5.74	6.21	B6038050	641
	6	57	2	0.05	0°	4.99	5.16	5.35	5.75	6.22	B6038048	641
0.6	6	57	2	0.05	0°	5.99	6.20	6.41	6.90	7.46	B6040048	643
	6	57	2	0.10	0°	5.99	6.20	6.41	6.89	7.45	B6040050	643
	6	57	2	0.10	0°	2.99	3.09	3.20	3.44	3.72	B6034060	637
	6	57	2	0.10	0°	4.79	4.95	5.13	5.51	5.96	B6036060	639
	6	57	2	0.10	0°	5.99	6.20	6.41	6.89	7.45	B6038060	641
	6	57	2	0.10	0°	7.19	7.44	7.70	8.27	8.94	B6040060	643
0.8	6	57	2	0.10	0°	3.99	4.13	4.27	4.59	4.97	B6034080	637
	6	57	2	0.10	0°	6.39	6.61	6.84	7.35	7.95	B6036080	639
	6	57	2	0.10	0°	7.99	8.26	8.55	9.19	9.94	B6038080	641
	6	57	2	0.10	0°	9.59	9.92	10.26	11.03	11.93	B6040080	643
1.0	3	50	2	0.20	0°	2.99	3.09	3.20	3.43	3.70	B5752100	645
	6	57	2	0.20	0°	4.99	5.16	5.33	5.73	6.18	B6034100	637
	3	50	2	0.20	0°	4.99	5.16	5.33	5.73	6.18	B5754100	647
	6	57	2	0.10	0°	4.99	5.16	5.34	5.74	6.21	B6034098	637
	6	57	2	0.20	0°	7.99	8.26	8.54	9.18	9.91	B6036100	639
	3	50	2	0.20	0°	7.99	8.26	8.54	9.18	9.91	B5756100	649
	6	57	2	0.10	0°	7.99	8.26	8.55	9.19	9.94	B6036098	639
	6	57	2	0.20	0°	9.99	10.33	10.68	11.48	12.40	B6038100	641
1.2	6	57	2	0.10	0°	9.99	10.33	10.69	11.49	12.42	B6038098	641
	6	61	2	0.20	0°	11.99	12.39	12.82	13.78	14.89	B6040100	643
	6	61	2	0.10	0°	11.99	12.40	12.83	13.79	14.91	B6040098	643
	3	50	2	0.20	0°	3.69	3.81	3.94	4.23	4.56	B5752108	645
	3	50	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	B5754108	647



Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
1.2	3	50	2	0.20	0°	9.69	10.01	10.36	11.12	12.02	B5756108	649
1.5	6	57	2	0.20	0°	4.59	4.74	4.90	5.26	5.68	B6032120	635
	3	50	2	0.20	0°	4.59	4.74	4.90	5.26	5.68	B5752120	645
	6	57	2	0.20	0°	7.59	7.84	8.11	8.71	9.41	B6034120	637
	3	50	2	0.20	0°	7.59	7.84	8.11	8.71	9.41	B5754120	647
	6	57	2	0.20	0°	12.09	12.49	12.92	13.88	15.00	B6036120	639
	3	60	2	0.20	0°	12.09	12.49	12.92	13.88	-	B5756120	649
	6	61	2	0.20	0°	15.09	15.59	16.13	17.33	18.73	B6038120	641
	6	66	2	0.20	0°	18.09	18.69	19.34	20.78	22.46	B6040120	643
2.0	3	40	3	0.15	0°	5.90	6.10	6.31	6.78	7.32	B5640140	671
	6	57	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	B6032140	635
	3	50	2	0.20	0°	6.09	6.29	6.50	6.98	7.54	B5752140	645
	3	60	3	0.15	0°	8.90	9.20	9.52	10.23	-	B5645140	673
	6	57	2	0.20	0°	10.09	10.42	10.78	11.58	12.52	B6034140	637
	3	50	2	0.20	0°	10.09	10.42	10.78	11.78	-	B5754140	647
	6	61	2	0.20	0°	16.09	16.63	17.20	18.48	19.98	B6036140	639
	3	60	2	0.20	0°	16.09	16.63	17.20	-	-	B5756140	649
	6	66	2	0.20	0°	20.09	20.76	21.48	23.08	24.95	B6038140	641
	6	69	2	0.20	0°	24.09	24.89	25.76	27.68	29.92	B6040140	643
2.5	3	50	2	0.20	0°	7.77	8.03	8.31	-	-	B5752160	645
	3	50	2	0.20	0°	12.77	13.20	13.66	-	-	B5754160	647
	3	60	2	0.20	0°	20.27	20.95	-	-	-	B5756160	649
3.0	6	57	2	0.20	0°	9.27	9.58	9.91	10.65	11.51	B6032180	635
	6	57	2	0.20	0°	15.27	15.78	16.33	17.55	18.96	B6034180	637
	6	61	2	0.20	0°	18.27	18.89	19.54	21.00	22.69	B6034182	637
	6	66	2	0.20	0°	24.27	25.09	25.96	27.90	-	B6036180	639
	6	75	2	0.20	0°	30.27	31.29	32.38	34.80	-	B6038180	641
	3	50	2	0.20	0°	8.90	-	-	-	-	B5752180	645
	3	50	2	0.20	0°	14.90	-	-	-	-	B5754180	647
	3	60	2	0.20	0°	23.90	-	-	-	-	B5756180	649
	3	40	3	0.15	0°	11.90	-	-	-	-	B5640180	671
	3	60	3	0.15	0°	29.90	-	-	-	-	B5645180	673
4.0	6	57	2	0.50	0°	12.46	12.87	13.30	14.27	15.40	B6032220	635
	6	57	2	0.20	0°	12.46	12.88	13.32	14.31	15.47	B6032215	635
	6	61	2	0.50	0°	20.46	21.14	21.86	23.47	-	B6034220	637
	6	61	2	0.20	0°	20.46	21.15	21.88	23.51	-	B6034215	637
	6	66	2	0.50	0°	25.46	26.30	27.21	-	-	B6034222	637
	6	66	2	0.20	0°	25.46	26.31	27.23	-	-	B6034217	637
	6	75	2	0.50	0°	32.46	33.54	34.69	-	-	B6036220	639
	6	75	2	0.20	0°	32.46	33.55	34.71	-	-	B6036215	639
	6	80	2	0.50	0°	40.46	41.81	43.25	-	-	B6038220	641
	6	80	2	0.20	0°	40.46	41.82	43.27	-	-	B6038215	641
	4	50	3	0.20	0°	13.90	-	-	-	-	B5640220	671
	4	60	3	0.20	0°	29.90	-	-	-	-	B5645220	673
5.0	6	57	2	0.50	0°	15.65	16.16	16.71	-	-	B6032260	635
	6	57	2	0.20	0°	15.65	16.17	16.73	-	-	B6032255	635
	6	66	2	0.50	0°	25.65	26.50	27.41	-	-	B6034260	637
	6	66	2	0.20	0°	25.65	26.51	27.43	-	-	B6034255	637
	6	80	2	0.20	0°	40.65	42.01	-	-	-	B6036255	639
	6	80	2	0.50	0°	40.65	42.00	-	-	-	B6036260	639
	6	100	2	0.20	0°	50.65	52.35	-	-	-	B6038255	641
	6	100	2	0.50	0°	50.65	52.34	-	-	-	B6038260	641
	5	50	3	0.30	0°	15.90	-	-	-	-	B5640260	671
	5	70	3	0.30	0°	34.90	-	-	-	-	B5645260	673

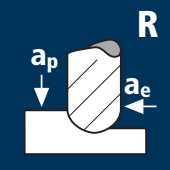
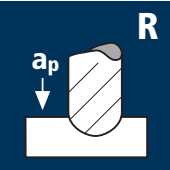
Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	r	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
6.0	6	57	2	0.20	0°	17.90	-	-	-	-	B6032295	635
	6	57	2	0.50	0°	17.90	-	-	-	-	B6032300	635
	6	69	2	0.20	0°	29.90	-	-	-	-	B6034295	637
	6	69	2	0.50	0°	29.90	-	-	-	-	B6034300	637
	6	87	2	0.20	0°	47.90	-	-	-	-	B6036295	639
	6	87	2	0.50	0°	47.90	-	-	-	-	B6036300	639
	6	100	2	0.20	0°	59.90	-	-	-	-	B6038295	641
	6	100	2	0.50	0°	59.90	-	-	-	-	B6038300	641
	6	80	2	0.50	0°	42.90	-	-	-	-	B7284300	665
	6	80	2	1.00	0°	42.90	-	-	-	-	B7284297	665
	6	100	2	0.50	0°	62.90	-	-	-	-	B7288300	667
	6	100	2	1.00	0°	62.90	-	-	-	-	B7288297	667
	6	70	2	1.00	0°	32.90	-	-	-	-	B5630300	669
	6	63	3	0.30	0°	18.90	-	-	-	-	B5640300	671
	6	100	3	0.30	0°	39.90	-	-	-	-	B5645300	673
8.0	8	90	2	0.50	0°	52.90	-	-	-	-	B7284391	665
	8	90	2	1.00	0°	52.90	-	-	-	-	B7284388	665
	8	120	2	0.50	0°	82.90	-	-	-	-	B7288391	667
	8	120	2	1.00	0°	82.90	-	-	-	-	B7288388	667
	8	80	2	1.00	0°	42.90	-	-	-	-	B5630391	669
	8	63	3	0.50	0°	18.90	-	-	-	-	B5640391	671
	8	100	3	0.50	0°	39.90	-	-	-	-	B5645391	673
10.0	10	105	2	0.50	0°	63.90	-	-	-	-	B7284450	665
	10	105	2	1.00	0°	63.90	-	-	-	-	B7284445	665
	10	135	2	0.50	0°	93.90	-	-	-	-	B7288450	667
	10	135	2	1.00	0°	93.90	-	-	-	-	B7288445	667
	10	84	2	1.50	0°	42.90	-	-	-	-	B5630450	669
	10	72	3	0.50	0°	21.90	-	-	-	-	B5640450	671
	10	100	3	0.50	0°	39.90	-	-	-	-	B5645450	673
	10	125	3	0.50	0°	54.90	-	-	-	-	B5650450	675
12.0	12	120	2	0.50	0°	73.90	-	-	-	-	B7284501	665
	12	120	2	1.00	0°	73.90	-	-	-	-	B7284496	665
	12	160	2	0.50	0°	113.90	-	-	-	-	B7288501	667
	12	160	2	1.00	0°	113.90	-	-	-	-	B7288496	667
	12	97	2	1.50	0°	50.90	-	-	-	-	B5630501	669
	12	75	3	0.50	0°	24.90	-	-	-	-	B5640501	671
	12	97	3	0.50	0°	41.90	-	-	-	-	B5645501	673
	12	125	3	0.50	0°	54.90	-	-	-	-	B5650501	675

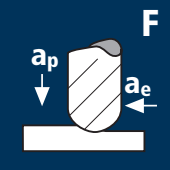
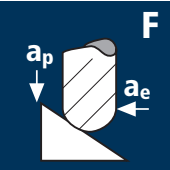
Tabella di selezione per frese cilindriche



Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio - = Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	45°	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
0.2	3	40	2	-	0°	0.56	0.59	0.63	0.72	0.83	B5712020	651
0.3	3	40	2	-	0°	0.94	1.00	1.06	1.20	1.38	B5712030	651
0.4	3	40	2	-	0°	1.24	1.31	1.39	1.57	1.81	B5712040	651
0.5	3	40	2	-	0°	1.49	1.55	1.60	1.73	1.88	B5712050	651
	3	40	2	-	0°	2.49	2.58	2.67	2.88	3.12	B5714050	653
	3	40	2	-	0°	3.99	4.13	4.28	4.61	4.99	B5716050	655
	3	40	2	-	0°	4.99	5.17	5.35	5.76	6.23	B5717050	657
0.6	3	40	2	-	0°	1.79	1.86	1.93	2.08	2.25	B5712060	651
	3	40	2	-	0°	2.99	3.10	3.21	3.46	3.75	B5714060	653
	3	40	2	-	0°	4.79	4.96	5.13	5.53	5.98	B5716060	655
	3	40	2	-	0°	5.99	6.20	6.42	6.91	7.48	B5717060	657
0.7	3	40	2	-	0°	3.49	3.61	3.74	4.03	4.37	B5714070	653
0.8	3	40	2	-	0°	2.39	2.48	2.57	2.77	3.00	B5712080	651
	3	40	2	-	0°	3.99	4.13	4.28	4.61	4.99	B5714080	653
	3	40	2	-	0°	6.39	6.61	6.85	7.37	7.97	B5716080	655
	3	40	2	-	0°	7.99	8.27	8.56	9.21	9.96	B5717080	657
0.9	3	40	2	-	0°	4.49	4.65	4.81	5.18	5.61	B5714090	653
1.0	3	50	2	0.07	0°	2.99	3.10	3.21	3.46	3.75	B5712100	651
	3	50	2	0.07	0°	4.99	5.17	5.35	5.76	6.23	B5714100	653
	3	50	2	0.07	0°	7.99	8.27	8.56	9.21	9.96	B5716100	655
	3	50	2	0.07	0°	9.99	10.33	10.70	11.51	12.45	B5717100	657
1.2	3	50	2	0.07	0°	3.69	3.81	3.95	4.25	4.61	B5712108	651
	3	50	2	0.07	0°	6.09	6.30	6.52	7.01	7.59	B5714108	653
	3	50	2	0.07	0°	9.69	10.02	10.37	11.15	12.07	B5716108	655
	3	50	2	0.07	0°	12.09	12.50	12.94	13.91	15.05	B5717108	657
1.5	3	50	2	0.07	0°	4.59	4.74	4.91	5.29	5.73	B5712120	651
	3	50	2	0.07	0°	7.59	7.85	8.12	8.74	9.46	B5714120	653
	3	60	2	0.07	0°	12.09	12.50	12.94	13.91	-	B5716120	655
	3	60	2	0.07	0°	15.09	15.60	16.15	17.36	-	B5717120	657
1.8	3	50	2	0.07	0°	9.09	9.40	9.73	10.46	11.32	B5714132	653
2.0	3	50	2	0.10	0°	6.09	6.30	6.52	7.01	7.59	B5712140	651
	3	50	2	0.10	0°	10.09	10.43	10.80	11.61	-	B5714140	653
	3	60	2	0.10	0°	16.09	16.63	17.22	-	-	B5716140	655
	3	60	2	0.10	0°	20.09	20.77	21.49	-	-	B5717140	657
2.3	3	50	2	0.10	0°	11.77	12.17	12.60	-	-	B5714152	653
2.5	3	50	2	0.10	0°	7.77	8.04	8.32	-	-	B5712160	651
	3	50	2	0.10	0°	12.77	13.21	13.67	-	-	B5714160	653

Dimensioni						Profondità massima di lavorazione in mm con l'apposita forma d'angolo di serraggio -- Contorno del pezzo di lavorazione è al di fuori del settore di collisione con l'utensile					Identificazioni	
d1	d2	l1	z	45°	θ	0°	0.5°	1°	2°	3°	N° Ordine	Pag.
2.5	3	60	2	0.10	0°	20.27	20.96	-	-	-	B5716160	655
	3	60	2	0.10	0°	25.27	26.13	-	-	-	B5717160	657
2.8	3	50	2	0.10	0°	14.27	-	-	-	-	B5714172	653
3.0	3	50	2	0.10	0°	8.90	-	-	-	-	B5712180	651
	3	50	2	0.10	0°	14.90	-	-	-	-	B5714180	653
	3	60	2	0.10	0°	23.90	-	-	-	-	B5716180	655
	3	60	2	0.10	0°	29.90	-	-	-	-	B5717180	657

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.5	2	0.018	0.75	0.90	540	900	1080	1620
		2.0	2	0.024	1.00	1.20	720	1200	1440	2160
		3.0	2	0.035	1.50	1.80	1050	1750	2100	3150
		4.0	2	0.047	2.00	2.40	1410	2350	2820	4230
		5.0	2	0.059	2.50	3.00	1770	2950	3540	5310
		6.0	2	0.071	3.00	3.60	2130	3550	4260	6390
	Grafite	1.5	2	0.014	0.75	1.50	420	700	840	1260
		2.0	2	0.018	1.00	2.00	540	900	1080	1620
		3.0	2	0.027	1.50	3.00	810	1350	1620	2430
		4.0	2	0.036	2.00	4.00	1080	1800	2160	3240
		5.0	2	0.045	2.50	5.00	1350	2250	2700	4050
		6.0	2	0.055	3.00	6.00	1650	2750	3300	4950

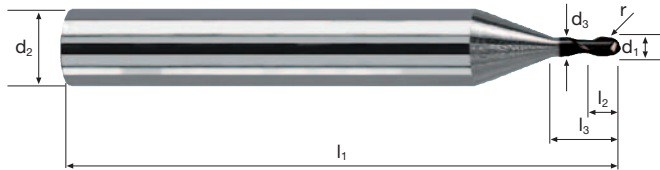
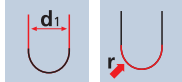
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.5	2	0.020	0.23	0.30	600	1000	1200	1800
		2.0	2	0.027	0.30	0.40	810	1350	1620	2430
		3.0	2	0.040	0.45	0.60	1200	2000	2400	3600
		4.0	2	0.053	0.60	0.80	1590	2650	3180	4770
		5.0	2	0.067	0.75	1.00	2010	3350	4020	6030
		6.0	2	0.080	0.90	1.20	2400	4000	4800	7200
	Grafite	1.5	2	0.020	0.30	0.30	600	1000	1200	1800
		2.0	2	0.027	0.40	0.40	810	1350	1620	2430
		3.0	2	0.040	0.60	0.60	1200	2000	2400	3600
		4.0	2	0.053	0.80	0.80	1590	2650	3180	4770
		5.0	2	0.067	1.00	1.00	2010	3350	4020	6030
		6.0	2	0.080	1.20	1.20	2400	4000	4800	7200

Frese con estremità emisferica MicrospheroXG

Gambo Ø 6mm, scarico cilindrico, 3xd



**HM
XA** λ **30°**
 γ **15°**



				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

										DIAPLUS
Esempio: N° Ordine B 6062 .120										
										B6062
\emptyset Code	d_1 0/-0.01	d_2 h5	d_3	l_1	l_2	l_3	r ± 0.005	α	z	
.120	1.5	6	1.4	57	1.5	4.5	0.75	10.3°	2	●
.140	2.0	6	1.9	57	2.0	6.0	1.00	9.0°	2	●
.180	3.0	6	2.8	57	3.0	9.0	1.50	6.4°	2	●
.220	4.0	6	3.7	57	4.0	12.0	2.00	4.1°	2	●
.260	5.0	6	4.6	57	5.0	15.0	2.50	2.0°	2	●
.300	6.0	6	5.5	57	6.0	18.0	3.00	0.0°	2	●



Materiale

Grafite

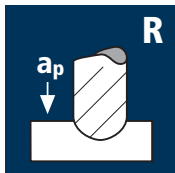
B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.2	2	0.002	0.10	0.10	60	100	120	180
0.3	2	0.004	0.15	0.20	120	200	240	360
0.4	2	0.005	0.20	0.25	150	250	300	450
0.5	2	0.006	0.25	0.30	180	300	360	540
0.6	2	0.007	0.25	0.35	210	350	420	630
0.8	2	0.009	0.35	0.50	270	450	540	810
1.0	2	0.012	0.45	0.60	360	600	720	1080
1.5	2	0.018	0.70	0.90	540	900	1080	1620
2.0	2	0.024	0.90	1.20	720	1200	1440	2160

Grafite

B

3.0	2	0.035	1.35	1.80	1050	1750	2100	3150
4.0	2	0.047	1.80	2.40	1410	2350	2820	4230
5.0	2	0.059	2.25	3.00	1770	2950	3540	5310
6.0	2	0.071	2.70	3.60	2130	3550	4260	6390



Grafite

B

0.2	2	0.002	0.10	0.20	60	100	120	180
0.3	2	0.003	0.15	0.30	90	150	180	270
0.4	2	0.004	0.20	0.40	120	200	240	360
0.5	2	0.005	0.25	0.50	150	250	300	450
0.6	2	0.005	0.25	0.60	150	250	300	450
0.8	2	0.007	0.35	0.80	210	350	420	630
1.0	2	0.009	0.45	1.00	270	450	540	810
1.5	2	0.014	0.70	1.50	420	700	840	1260
2.0	2	0.018	0.90	2.00	540	900	1080	1620

Grafite

B

3.0	2	0.027	1.35	3.00	810	1350	1620	2430
4.0	2	0.036	1.80	4.00	1080	1800	2160	3240
5.0	2	0.045	2.25	5.00	1350	2250	2700	4050
6.0	2	0.055	2.70	6.00	1650	2750	3300	4950



Materiale

Grafite

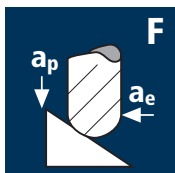
B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.2	2	0.003	0.03	0.04	90	150	180	270
0.3	2	0.004	0.04	0.06	120	200	240	360
0.4	2	0.005	0.06	0.08	150	250	300	450
0.5	2	0.007	0.07	0.10	210	350	420	630
0.6	2	0.008	0.08	0.12	240	400	480	720
0.8	2	0.011	0.11	0.16	330	550	660	990
1.0	2	0.013	0.14	0.20	390	650	780	1170
1.5	2	0.020	0.21	0.30	600	1000	1200	1800
2.0	2	0.027	0.28	0.40	810	1350	1620	2430

Grafite

B

3.0	2	0.040	0.42	0.60	1200	2000	2400	3600
4.0	2	0.053	0.56	0.80	1590	2650	3180	4770
5.0	2	0.067	0.70	1.00	2010	3350	4020	6030
6.0	2	0.080	0.84	1.20	2400	4000	4800	7200



Materiale

Grafite

B

0.2	2	0.003	0.04	0.04	90	150	180	270
0.3	2	0.004	0.05	0.05	120	200	240	360
0.4	2	0.005	0.07	0.07	150	250	300	450
0.5	2	0.007	0.09	0.09	210	350	420	630
0.6	2	0.008	0.11	0.11	240	400	480	720
0.8	2	0.011	0.14	0.14	330	550	660	990
1.0	2	0.013	0.18	0.18	390	650	780	1170
1.5	2	0.020	0.27	0.27	600	1000	1200	1800
2.0	2	0.027	0.36	0.36	810	1350	1620	2430

Grafite

B

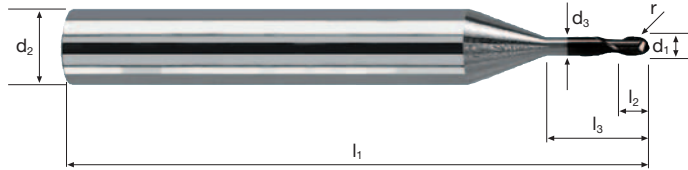
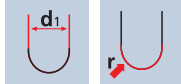
3.0	2	0.040	0.54	0.54	1200	2000	2400	3600
4.0	2	0.053	0.72	0.72	1590	2650	3180	4770
5.0	2	0.067	0.90	0.90	2010	3350	4020	6030
6.0	2	0.080	1.08	1.08	2400	4000	4800	7200

Frese con estremità emisferica MicrospheroXG

Gambo Ø 6mm, scarico cilindrico, 5xd



HM λ 30°
XA γ 15°



				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAPLUS
										B6064
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.020	0.2	6	0.18	57	0.2	1.0	0.10	9.5°	2	●
.030	0.3	6	0.25	57	0.3	1.5	0.15	9.3°	2	●
.040	0.4	6	0.35	57	0.4	2.0	0.20	9.1°	2	●
.050	0.5	6	0.45	57	0.5	2.5	0.25	12.3°	2	●
.060	0.6	6	0.55	57	0.6	3.0	0.30	11.9°	2	●
.080	0.8	6	0.75	57	0.8	4.0	0.40	11.0°	2	●
.100	1.0	6	0.95	57	1.0	5.0	0.50	10.2°	2	●
.120	1.5	6	1.40	57	1.5	7.5	0.75	8.4°	2	●
.140	2.0	6	1.90	57	2.0	10.0	1.00	6.9°	2	●
.180	3.0	6	2.80	57	3.0	15.0	1.50	4.4°	2	●
.182	3.0	6	2.80	61	3.0	18.0	1.50	3.9°	2	●
.220	4.0	6	3.70	61	4.0	20.0	2.00	2.6°	2	●
.222	4.0	6	3.70	66	4.0	25.0	2.00	2.2°	2	●
.260	5.0	6	4.60	66	5.0	25.0	2.50	1.2°	2	●
.300	6.0	6	5.50	69	6.0	30.0	3.00	0.0°	2	●



Materiale

Grafite

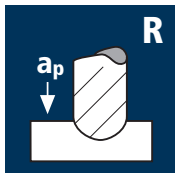
B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.2	2	0.002	0.10	0.10	60	100	120	180
0.3	2	0.004	0.10	0.20	120	200	240	360
0.4	2	0.005	0.15	0.25	150	250	300	450
0.5	2	0.006	0.20	0.30	180	300	360	540
0.6	2	0.007	0.25	0.35	210	350	420	630
0.8	2	0.009	0.30	0.50	270	450	540	810
1.0	2	0.012	0.40	0.60	360	600	720	1080
1.5	2	0.018	0.60	0.90	540	900	1080	1620
2.0	2	0.024	0.80	1.20	720	1200	1440	2160

Grafite

B

3.0	2	0.035	1.20	1.80	1050	1750	2100	3150
4.0	2	0.047	1.60	2.40	1410	2350	2820	4230
5.0	2	0.059	2.00	3.00	1770	2950	3540	5310
6.0	2	0.071	2.40	3.60	2130	3550	4260	6390



Grafite

B

0.2	2	0.002	0.10	0.20	60	100	120	180
0.3	2	0.003	0.10	0.30	90	150	180	270
0.4	2	0.004	0.15	0.40	120	200	240	360
0.5	2	0.005	0.20	0.50	150	250	300	450
0.6	2	0.005	0.25	0.60	150	250	300	450
0.8	2	0.007	0.30	0.80	210	350	420	630
1.0	2	0.009	0.40	1.00	270	450	540	810
1.5	2	0.014	0.60	1.50	420	700	840	1260
2.0	2	0.018	0.80	2.00	540	900	1080	1620

Grafite

B

3.0	2	0.027	1.20	3.00	810	1350	1620	2430
4.0	2	0.036	1.60	4.00	1080	1800	2160	3240
5.0	2	0.045	2.00	5.00	1350	2250	2700	4050
6.0	2	0.055	2.40	6.00	1650	2750	3300	4950



Materiale

Grafite

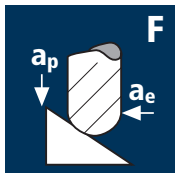
B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.2	2	0.003	0.02	0.04	90	150	180	270
0.3	2	0.004	0.04	0.05	120	200	240	360
0.4	2	0.005	0.05	0.07	150	250	300	450
0.5	2	0.007	0.06	0.09	210	350	420	630
0.6	2	0.008	0.07	0.11	240	400	480	720
0.8	2	0.011	0.10	0.14	330	550	660	990
1.0	2	0.013	0.12	0.18	390	650	780	1170
1.5	2	0.020	0.18	0.27	600	1000	1200	1800
2.0	2	0.027	0.24	0.36	810	1350	1620	2430

Grafite

B

3.0	2	0.040	0.36	0.54	1200	2000	2400	3600
4.0	2	0.053	0.48	0.72	1590	2650	3180	4770
5.0	2	0.067	0.60	0.90	2010	3350	4020	6030
6.0	2	0.080	0.72	1.08	2400	4000	4800	7200



Grafite

B

0.2	2	0.003	0.03	0.03	90	150	180	270
0.3	2	0.004	0.05	0.05	120	200	240	360
0.4	2	0.005	0.06	0.06	150	250	300	450
0.5	2	0.007	0.08	0.08	210	350	420	630
0.6	2	0.008	0.10	0.10	240	400	480	720
0.8	2	0.011	0.13	0.13	330	550	660	990
1.0	2	0.013	0.16	0.16	390	650	780	1170
1.5	2	0.020	0.24	0.24	600	1000	1200	1800
2.0	2	0.027	0.32	0.32	810	1350	1620	2430

Grafite

B

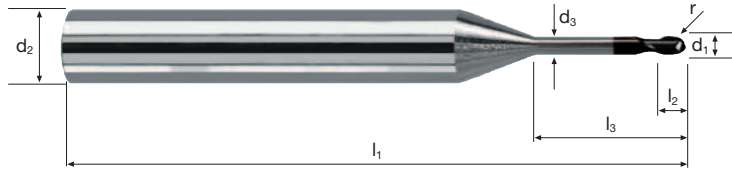
3.0	2	0.040	0.48	0.48	1200	2000	2400	3600
4.0	2	0.053	0.64	0.64	1590	2650	3180	4770
5.0	2	0.067	0.80	0.80	2010	3350	4020	6030
6.0	2	0.080	0.96	0.96	2400	4000	4800	7200

Frese con estremità emisferica MicrospheroXG

Gambo Ø 6mm, scarico cilindrico, 8xd



HM λ 30°
XA γ 15°



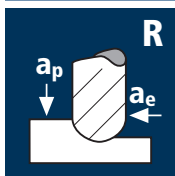
C
Graphite

CF/GF
Fiber Reinforced Plastics

IV

Esempio: Rivestimento Articolo Codice-ø										DIAPLUS
N° Ordine B 6066 .020										B6066
ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.020	0.2	6	0.18	57	0.2	1.6	0.10	9.3°	2	●
.030	0.3	6	0.25	57	0.3	2.4	0.15	9.0°	2	●
.040	0.4	6	0.35	57	0.4	3.2	0.20	8.5°	2	●
.050	0.5	6	0.45	57	0.5	4.0	0.25	11.1°	2	●
.060	0.6	6	0.55	57	0.6	4.8	0.30	10.5°	2	●
.080	0.8	6	0.75	57	0.8	6.4	0.40	9.4°	2	●
.100	1.0	6	0.95	57	1.0	8.0	0.50	8.4°	2	●
.120	1.5	6	1.40	57	1.5	12.0	0.75	6.5°	2	●
.140	2.0	6	1.90	61	2.0	16.0	1.00	5.1°	2	●
.180	3.0	6	2.80	66	3.0	24.0	1.50	3.1°	2	●
.220	4.0	6	3.70	75	4.0	32.0	2.00	1.7°	2	●
.260	5.0	6	4.60	80	5.0	40.0	2.50	0.8°	2	●
.300	6.0	6	5.50	87	6.0	48.0	3.00	0.0°	2	●

Applicazione



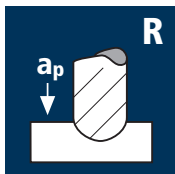
Materiale

Grafite
 ~~X~~ **B**

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
					vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
0.4	2	0.005	0.15	0.15	150	250	300	450
0.5	2	0.006	0.20	0.20	180	300	360	540
0.6	2	0.007	0.25	0.25	210	350	420	630
0.8	2	0.009	0.30	0.30	270	450	540	810
1.0	2	0.012	0.40	0.40	360	600	720	1080
1.5	2	0.018	0.60	0.60	540	900	1080	1620
2.0	2	0.024	0.80	0.80	720	1200	1440	2160
3.0	2	0.035	1.20	1.20	1050	1750	2100	3150
4.0	2	0.047	1.60	1.60	1410	2350	2820	4230

Grafite
 ~~X~~ **B**

5.0	2	0.059	2.00	2.00	1770	2950	3540	5310
6.0	2	0.071	2.40	2.40	2130	3550	4260	6390



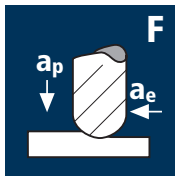
Grafite
 ~~X~~ **B**

0.4	2	0.003	0.10	0.40	90	150	180	270
0.5	2	0.004	0.15	0.50	120	200	240	360
0.6	2	0.004	0.20	0.60	120	200	240	360
0.8	2	0.006	0.25	0.80	180	300	360	540
1.0	2	0.007	0.30	1.00	210	350	420	630
1.5	2	0.011	0.45	1.50	330	550	660	990
2.0	2	0.015	0.60	2.00	450	750	900	1350
3.0	2	0.022	0.90	3.00	660	1100	1320	1980
4.0	2	0.029	1.20	4.00	870	1450	1740	2610

Grafite
 ~~X~~ **B**

5.0	2	0.036	1.50	5.00	1080	1800	2160	3240
6.0	2	0.044	1.80	6.00	1320	2200	2640	3960

Applicazione



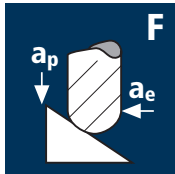
Materiale

Grafite
 ~~X~~ **B**

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
					vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
0.4	2	0.005	0.04	0.06	150	250	300	450
0.5	2	0.007	0.05	0.08	210	350	420	630
0.6	2	0.008	0.06	0.10	240	400	480	720
0.8	2	0.011	0.08	0.13	330	550	660	990
1.0	2	0.013	0.10	0.16	390	650	780	1170
1.5	2	0.020	0.15	0.24	600	1000	1200	1800
2.0	2	0.027	0.20	0.32	810	1350	1620	2430
3.0	2	0.040	0.30	0.48	1200	2000	2400	3600
4.0	2	0.053	0.40	0.64	1590	2650	3180	4770

Grafite
 ~~X~~ **B**

5.0	2	0.067	0.50	0.80	2010	3350	4020	6030
6.0	2	0.080	0.60	0.96	2400	4000	4800	7200



Grafite
 ~~X~~ **B**

0.4	2	0.005	0.06	0.06	150	250	300	450
0.5	2	0.007	0.07	0.07	210	350	420	630
0.6	2	0.008	0.08	0.08	240	400	480	720
0.8	2	0.011	0.11	0.11	330	550	660	990
1.0	2	0.013	0.14	0.14	390	650	780	1170
1.5	2	0.020	0.21	0.21	600	1000	1200	1800
2.0	2	0.027	0.28	0.28	810	1350	1620	2430
3.0	2	0.040	0.42	0.42	1200	2000	2400	3600
4.0	2	0.053	0.56	0.56	1590	2650	3180	4770

Grafite
 ~~X~~ **B**

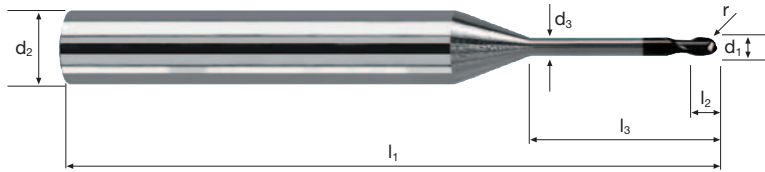
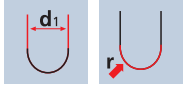
5.0	2	0.067	0.70	0.70	2010	3350	4020	6030
6.0	2	0.080	0.84	0.84	2400	4000	4800	7200

Frese con estremità emisferica MicrospheroXG

Gambo Ø 6mm, scarico cilindrico, 10xd



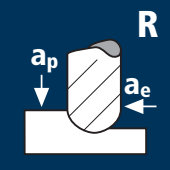
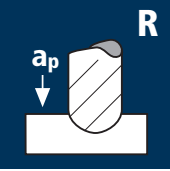
HM λ **30°**
XA γ **15°**

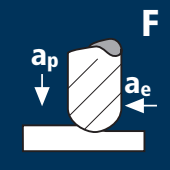
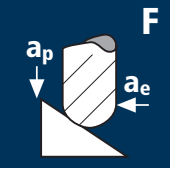


				C Graphite				CF/GF Fiber Reinforced Plastics		
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IV

Esempio: N° Ordine		Rivestimento B	Articolo 6068	Codice- ϕ .040							DIAPLUS
\emptyset Code	d_1 0/-0.01	d_2 h5	d_3	l_1	l_2	l_3	r ± 0.005	α	z	B6068	
.040	0.4	6	0.35	57	0.4	4.0	0.20	8.3°	2	●	
.050	0.5	6	0.45	57	0.5	5.0	0.25	10.3°	2	●	
.060	0.6	6	0.55	57	0.6	6.0	0.30	9.7°	2	●	
.080	0.8	6	0.75	57	0.8	8.0	0.40	8.5°	2	●	
.100	1.0	6	0.95	57	1.0	10.0	0.50	7.6°	2	●	
.120	1.5	6	1.40	61	1.5	15.0	0.75	5.7°	2	●	
.140	2.0	6	1.90	66	2.0	20.0	1.00	4.3°	2	●	
.180	3.0	6	2.80	75	3.0	30.0	1.50	2.5°	2	●	
.220	4.0	6	3.70	80	4.0	40.0	2.00	1.4°	2	●	
.260	5.0	6	4.60	100	5.0	50.0	2.50	0.6°	2	●	
.300	6.0	6	5.50	100	6.0	60.0	3.00	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	0.4	2	0.004	0.10	0.15	120	200	240	360
		0.5	2	0.005	0.15	0.20	150	250	300	450
		0.6	2	0.006	0.20	0.25	180	300	360	540
		0.8	2	0.008	0.25	0.30	240	400	480	720
		1.0	2	0.009	0.30	0.40	270	450	540	810
		1.5	2	0.014	0.45	0.60	420	700	840	1260
		2.0	2	0.019	0.60	0.80	570	950	1140	1710
	Grafite	0.4	2	0.003	0.10	0.40	90	150	180	270
		0.5	2	0.004	0.10	0.50	120	200	240	360
		0.6	2	0.004	0.10	0.60	120	200	240	360
		0.8	2	0.006	0.15	0.80	180	300	360	540
		1.0	2	0.007	0.20	1.00	210	350	420	630
		1.5	2	0.011	0.30	1.50	330	550	660	990
		2.0	2	0.015	0.40	2.00	450	750	900	1350

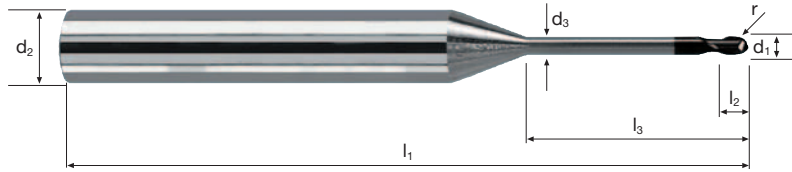
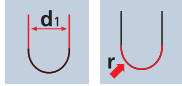
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	0.4	2	0.004	0.04	0.06	120	200	240	360
		0.5	2	0.005	0.05	0.07	150	250	300	450
		0.6	2	0.006	0.06	0.08	180	300	360	540
		0.8	2	0.009	0.08	0.11	270	450	540	810
		1.0	2	0.011	0.10	0.14	330	550	660	990
		1.5	2	0.016	0.15	0.21	480	800	960	1440
		2.0	2	0.021	0.20	0.28	630	1050	1260	1890
	Grafite	0.4	2	0.004	0.04	0.04	120	200	240	360
		0.5	2	0.005	0.05	0.05	150	250	300	450
		0.6	2	0.006	0.06	0.06	180	300	360	540
		0.8	2	0.009	0.08	0.08	270	450	540	810
		1.0	2	0.011	0.10	0.10	330	550	660	990
		1.5	2	0.016	0.15	0.15	480	800	960	1440
		2.0	2	0.021	0.20	0.20	630	1050	1260	1890

Frese con estremità emisferica MicrospheroXG

Gambo Ø 6mm, scarico cilindrico, 12xd



HM λ 30°
XA γ 15°



				C Graphite					CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine		Rivestimento B	Articolo 6070	Codice-Ø .040						DIAPLUS
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	B6070
.040	0.4	6	0.35	57	0.4	4.8	0.20	8.0°	2	●
.050	0.5	6	0.45	57	0.5	6.0	0.25	9.9°	2	●
.060	0.6	6	0.55	57	0.6	7.2	0.30	9.2°	2	●
.080	0.8	6	0.75	57	0.8	9.6	0.40	8.0°	2	●
.100	1.0	6	0.95	61	1.0	12.0	0.50	7.0°	2	●
.120	1.5	6	1.40	66	1.5	18.0	0.75	5.1°	2	●
.140	2.0	6	1.90	69	2.0	24.0	1.00	3.9°	2	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite	0.2	2	0.002	0.10	0.10	60	100	120	180	
		0.3	2	0.003	0.15	0.20	90	150	180	270	
		0.4	2	0.004	0.20	0.25	120	200	240	360	
		0.5	2	0.005	0.25	0.30	150	250	300	450	
		0.6	2	0.006	0.30	0.35	180	300	360	540	
		0.8	2	0.008	0.40	0.50	240	400	480	720	
		1.0	2	0.009	0.50	0.60	270	450	540	810	
		1.2	2	0.011	0.60	0.70	330	550	660	990	
		1.5	2	0.014	0.75	0.90	420	700	840	1260	
		Grafite	2.0	2	0.019	1.00	1.20	570	950	1140	1710
			2.5	2	0.024	1.25	1.50	720	1200	1440	2160
			3.0	2	0.028	1.50	1.80	840	1400	1680	2520
	Grafite	0.2	2	0.001	0.10	0.20	30	50	60	90	
		0.3	2	0.002	0.15	0.30	60	100	120	180	
		0.4	2	0.003	0.20	0.40	90	150	180	270	
		0.5	2	0.004	0.25	0.50	120	200	240	360	
		0.6	2	0.004	0.30	0.60	120	200	240	360	
		0.8	2	0.006	0.40	0.80	180	300	360	540	
		1.0	2	0.007	0.50	1.00	210	350	420	630	
		1.2	2	0.009	0.60	1.20	270	450	540	810	
		1.5	2	0.011	0.75	1.50	330	550	660	990	
		Grafite	2.0	2	0.015	1.00	2.00	450	750	900	1350
			2.5	2	0.018	1.25	2.50	540	900	1080	1620
			3.0	2	0.022	1.50	3.00	660	1100	1320	1980

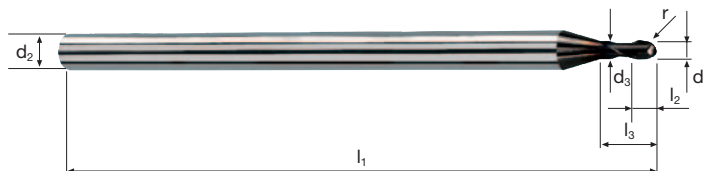
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite	0.2	2	0.002	0.03	0.04	60	100	120	180	
		0.3	2	0.003	0.05	0.06	90	150	180	270	
		0.4	2	0.004	0.06	0.08	120	200	240	360	
		0.5	2	0.005	0.08	0.10	150	250	300	450	
		0.6	2	0.006	0.09	0.12	180	300	360	540	
		0.8	2	0.009	0.12	0.16	270	450	540	810	
		1.0	2	0.011	0.15	0.20	330	550	660	990	
		1.2	2	0.013	0.18	0.24	390	650	780	1170	
		1.5	2	0.016	0.23	0.30	480	800	960	1440	
		Grafite	2.0	2	0.021	0.30	0.40	630	1050	1260	1890
			2.5	2	0.027	0.38	0.50	810	1350	1620	2430
			3.0	2	0.032	0.45	0.60	960	1600	1920	2880
	Grafite	0.2	2	0.002	0.04	0.04	60	100	120	180	
		0.3	2	0.003	0.06	0.06	90	150	180	270	
		0.4	2	0.004	0.08	0.08	120	200	240	360	
		0.5	2	0.005	0.10	0.10	150	250	300	450	
		0.6	2	0.006	0.12	0.12	180	300	360	540	
		0.8	2	0.009	0.16	0.16	270	450	540	810	
		1.0	2	0.011	0.20	0.20	330	550	660	990	
		1.2	2	0.013	0.24	0.24	390	650	780	1170	
		1.5	2	0.016	0.30	0.30	480	800	960	1440	
		Grafite	2.0	2	0.021	0.40	0.40	630	1050	1260	1890
			2.5	2	0.027	0.50	0.50	810	1350	1620	2430
			3.0	2	0.032	0.60	0.60	960	1600	1920	2880

Frese con estremità emisferica Microcut-B3

Gambo Ø 3mm, scarico cilindrico, 3xd



HM λ 30°
Micro γ 5°



				C Graphite					CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAMANT
										B5782
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z	
.020	0.2	3	0.18	40	0.24	0.6	0.10	9.4°	2	●
.030	0.3	3	0.25	40	0.36	0.9	0.15	9.0°	2	●
.040	0.4	3	0.35	40	0.48	1.2	0.20	8.7°	2	●
.050	0.5	3	0.45	40	0.60	1.5	0.25	11.8°	2	●
.060	0.6	3	0.55	40	0.72	1.8	0.30	11.2°	2	●
.080	0.8	3	0.75	40	0.96	2.4	0.40	10.1°	2	●
.100	1.0	3	0.95	50	1.20	3.0	0.50	9.0°	2	●
.108	1.2	3	1.10	50	1.44	3.6	0.60	7.9°	2	●
.120	1.5	3	1.40	50	1.80	4.5	0.75	6.5°	2	●
.140	2.0	3	1.90	50	2.40	6.0	1.00	4.1°	2	●
.160	2.5	3	2.30	50	3.00	7.5	1.25	2.0°	2	●
.180	3.0	3	2.80	50	3.60	9.0	1.50	0.0°	2	●



Materiale

Grafito

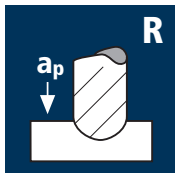
B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.5	2	0.005	0.25	0.30	150	250	300	450
0.6	2	0.006	0.25	0.35	180	300	360	540
0.7	2	0.007	0.30	0.40	210	350	420	630
0.8	2	0.008	0.35	0.50	240	400	480	720
0.9	2	0.008	0.40	0.55	240	400	480	720
1.0	2	0.009	0.45	0.60	270	450	540	810
1.2	2	0.011	0.55	0.70	330	550	660	990
1.5	2	0.014	0.70	0.90	420	700	840	1260
1.8	2	0.017	0.80	1.10	510	850	1020	1530

Grafito

B

2.0	2	0.019	0.90	1.20	570	950	1140	1710
2.3	2	0.022	1.05	1.40	660	1100	1320	1980
2.5	2	0.024	1.15	1.50	720	1200	1440	2160
2.8	2	0.026	1.25	1.70	780	1300	1560	2340
3.0	2	0.028	1.35	1.80	840	1400	1680	2520



Materiale

Grafito

B

0.5	2	0.004	0.25	0.50	120	200	240	360
0.6	2	0.004	0.25	0.60	120	200	240	360
0.7	2	0.005	0.30	0.70	150	250	300	450
0.8	2	0.006	0.35	0.80	180	300	360	540
0.9	2	0.007	0.40	0.90	210	350	420	630
1.0	2	0.007	0.45	1.00	210	350	420	630
1.2	2	0.009	0.55	1.20	270	450	540	810
1.5	2	0.011	0.70	1.50	330	550	660	990
1.8	2	0.013	0.80	1.80	390	650	780	1170

Grafito

B

2.0	2	0.015	0.90	2.00	450	750	900	1350
2.3	2	0.017	1.05	2.30	510	850	1020	1530
2.5	2	0.018	1.15	2.50	540	900	1080	1620
2.8	2	0.020	1.25	2.80	600	1000	1200	1800
3.0	2	0.022	1.35	3.00	660	1100	1320	1980



Materiale

Grafito

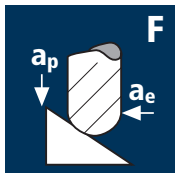
B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.5	2	0.005	0.07	0.10	150	250	300	450
0.6	2	0.006	0.08	0.12	180	300	360	540
0.7	2	0.007	0.10	0.14	210	350	420	630
0.8	2	0.009	0.11	0.16	270	450	540	810
0.9	2	0.010	0.13	0.18	300	500	600	900
1.0	2	0.011	0.14	0.20	330	550	660	990
1.2	2	0.013	0.17	0.24	390	650	780	1170
1.5	2	0.016	0.21	0.30	480	800	960	1440
1.8	2	0.019	0.25	0.36	570	950	1140	1710

Grafito

B

2.0	2	0.021	0.28	0.40	630	1050	1260	1890
2.3	2	0.025	0.32	0.46	750	1250	1500	2250
2.5	2	0.027	0.35	0.50	810	1350	1620	2430
2.8	2	0.030	0.39	0.56	900	1500	1800	2700
3.0	2	0.032	0.42	0.60	960	1600	1920	2880



Materiale

Grafito

B

0.5	2	0.005	0.09	0.09	150	250	300	450
0.6	2	0.006	0.11	0.11	180	300	360	540
0.7	2	0.007	0.13	0.13	210	350	420	630
0.8	2	0.009	0.14	0.14	270	450	540	810
0.9	2	0.010	0.16	0.16	300	500	600	900
1.0	2	0.011	0.18	0.18	330	550	660	990
1.2	2	0.013	0.22	0.22	390	650	780	1170
1.5	2	0.016	0.27	0.27	480	800	960	1440
1.8	2	0.019	0.32	0.32	570	950	1140	1710

Grafito

B

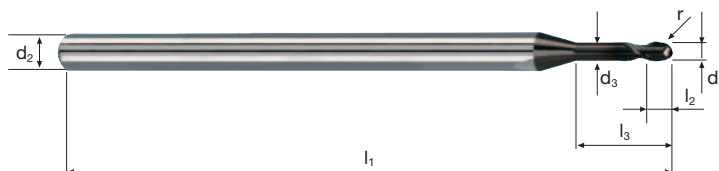
2.0	2	0.021	0.36	0.36	630	1050	1260	1890
2.3	2	0.025	0.41	0.41	750	1250	1500	2250
2.5	2	0.027	0.45	0.45	810	1350	1620	2430
2.8	2	0.030	0.50	0.50	900	1500	1800	2700
3.0	2	0.032	0.54	0.54	960	1600	1920	2880

Frese con estremità emisferica Microcut-B5

Gambo Ø 3mm, scarico cilindrico, 5xd



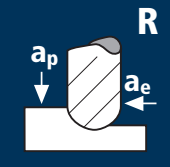

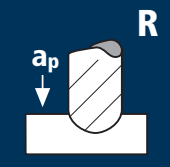

HM λ 30°
Micro γ 5°

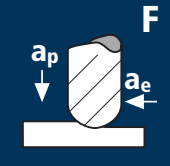

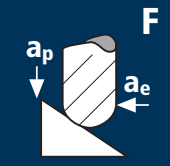



				C Graphite					CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAMANT	
										B5784	
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z		
.050	0.5	3	0.45	40	0.60	2.5	0.25	10.1°	2		●
.060	0.6	3	0.55	40	0.72	3.0	0.30	9.4°	2		●
.070	0.7	3	0.65	40	0.84	3.5	0.35	8.7°	2		●
.080	0.8	3	0.75	40	0.96	4.0	0.40	8.1°	2		●
.090	0.9	3	0.85	40	1.08	4.5	0.45	7.4°	2		●
.100	1.0	3	0.95	50	1.20	5.0	0.50	6.9°	2		●
.108	1.2	3	1.10	50	1.44	6.0	0.60	5.8°	2		●
.120	1.5	3	1.40	50	1.80	7.5	0.75	4.5°	2		●
.132	1.8	3	1.70	50	2.16	9.0	0.90	3.3°	2		●
.140	2.0	3	1.90	50	2.40	10.0	1.00	2.7°	2		●
.152	2.3	3	2.10	50	2.76	11.5	1.15	1.8°	2		●
.160	2.5	3	2.30	50	3.00	12.5	1.25	1.2°	2		●
.172	2.8	3	2.60	50	3.36	14.0	1.40	0.5°	2		●
.180	3.0	3	2.80	50	3.60	15.0	1.50	0.0°	2		●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite  B	0.5	2	0.005	0.20	0.30	150	250	300	450	
		0.6	2	0.006	0.25	0.35	180	300	360	540	
		0.8	2	0.008	0.30	0.50	240	400	480	720	
		1.0	2	0.009	0.40	0.60	270	450	540	810	
		1.2	2	0.011	0.50	0.70	330	550	660	990	
		1.5	2	0.014	0.60	0.90	420	700	840	1260	
		2.0	2	0.019	0.80	1.20	570	950	1140	1710	
		2.5	2	0.024	1.00	1.50	720	1200	1440	2160	
		3.0	2	0.028	1.20	1.80	840	1400	1680	2520	
	Grafite  B	0.5	2	0.004	0.20	0.50	120	200	240	360	
		0.6	2	0.004	0.25	0.60	120	200	240	360	
		0.8	2	0.006	0.30	0.80	180	300	360	540	
		1.0	2	0.007	0.40	1.00	210	350	420	630	
		1.2	2	0.009	0.50	1.20	270	450	540	810	
		1.5	2	0.011	0.60	1.50	330	550	660	990	
		2.0	2	0.015	0.80	2.00	450	750	900	1350	
		2.5	2	0.018	1.00	2.50	540	900	1080	1620	
		3.0	2	0.022	1.20	3.00	660	1100	1320	1980	

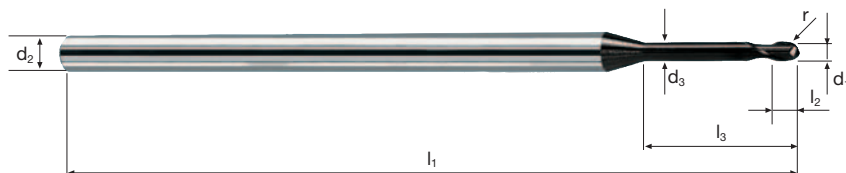
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite  B	0.5	2	0.005	0.06	0.09	150	250	300	450	
		0.6	2	0.006	0.07	0.11	180	300	360	540	
		0.8	2	0.009	0.10	0.14	270	450	540	810	
		1.0	2	0.011	0.12	0.18	330	550	660	990	
		1.2	2	0.013	0.14	0.22	390	650	780	1170	
		1.5	2	0.016	0.18	0.27	480	800	960	1440	
		2.0	2	0.021	0.24	0.36	630	1050	1260	1890	
		2.5	2	0.027	0.30	0.45	810	1350	1620	2430	
		3.0	2	0.032	0.36	0.54	960	1600	1920	2880	
	Grafite  B	0.5	2	0.005	0.08	0.08	150	250	300	450	
		0.6	2	0.006	0.10	0.10	180	300	360	540	
		0.8	2	0.009	0.13	0.13	270	450	540	810	
		1.0	2	0.011	0.16	0.16	330	550	660	990	
		1.2	2	0.013	0.19	0.19	390	650	780	1170	
		1.5	2	0.016	0.24	0.24	480	800	960	1440	
		2.0	2	0.021	0.32	0.32	630	1050	1260	1890	
		2.5	2	0.027	0.40	0.40	810	1350	1620	2430	
		3.0	2	0.032	0.48	0.48	960	1600	1920	2880	

Frese con estremità emisferica Microcut-B8

Gambo Ø 3mm, scarico cilindrico, 8xd



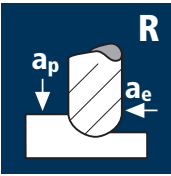

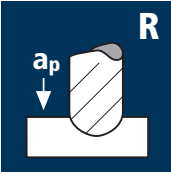

HM λ **30°**
Micro γ **5°**

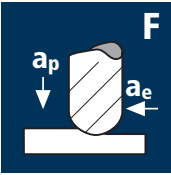

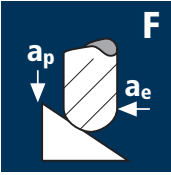



C Graphite **CF/GF** Fiber Reinforced Plastics

IV

										DIAMANT
Esempio: N° Ordine										B5786
										B5786
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z	
.050	0.5	3	0.45	40	0.60	4.0	0.25	8.4°	2	●
.060	0.6	3	0.55	40	0.72	4.8	0.30	7.6°	2	●
.080	0.8	3	0.75	40	0.96	6.4	0.40	6.2°	2	●
.100	1.0	3	0.95	50	1.20	8.0	0.50	5.1°	2	●
.108	1.2	3	1.10	50	1.44	9.6	0.60	4.2°	2	●
.120	1.5	3	1.40	60	1.80	12.0	0.75	3.1°	2	●
.140	2.0	3	1.90	60	2.40	16.0	1.00	1.7°	2	●
.160	2.5	3	2.30	60	3.00	20.0	1.25	0.8°	2	●
.180	3.0	3	2.80	60	3.60	24.0	1.50	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite 	0.5	2	0.005	0.20	0.20	150	250	300	450	
		0.6	2	0.006	0.25	0.25	180	300	360	540	
		0.8	2	0.008	0.30	0.30	240	400	480	720	
		1.0	2	0.009	0.40	0.40	270	450	540	810	
		1.2	2	0.011	0.50	0.50	330	550	660	990	
		1.5	2	0.014	0.60	0.60	420	700	840	1260	
		2.0	2	0.019	0.80	0.80	570	950	1140	1710	
		2.5	2	0.024	1.00	1.00	720	1200	1440	2160	
		3.0	2	0.028	1.20	1.20	840	1400	1680	2520	
	Grafite 	0.5	2	0.003	0.15	0.50	90	150	180	270	
		0.6	2	0.003	0.20	0.60	90	150	180	270	
		0.8	2	0.004	0.25	0.80	120	200	240	360	
		1.0	2	0.005	0.30	1.00	150	250	300	450	
		1.2	2	0.007	0.35	1.20	210	350	420	630	
		1.5	2	0.008	0.45	1.50	240	400	480	720	
		2.0	2	0.011	0.60	2.00	330	550	660	990	
		2.5	2	0.014	0.75	2.50	420	700	840	1260	
		3.0	2	0.016	0.90	3.00	480	800	960	1440	

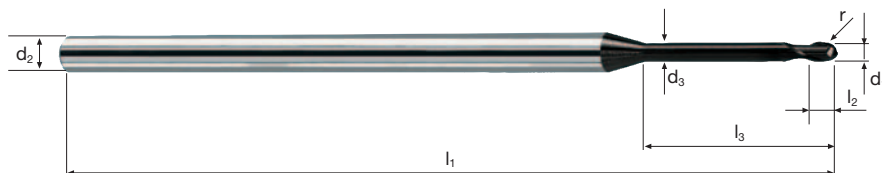
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite 	0.5	2	0.005	0.05	0.08	150	250	300	450	
		0.6	2	0.006	0.06	0.10	180	300	360	540	
		0.8	2	0.009	0.08	0.13	270	450	540	810	
		1.0	2	0.011	0.10	0.16	330	550	660	990	
		1.2	2	0.013	0.12	0.19	390	650	780	1170	
		1.5	2	0.016	0.15	0.24	480	800	960	1440	
		2.0	2	0.021	0.20	0.32	630	1050	1260	1890	
		2.5	2	0.027	0.25	0.40	810	1350	1620	2430	
		3.0	2	0.032	0.30	0.48	960	1600	1920	2880	
	Grafite 	0.5	2	0.005	0.07	0.07	150	250	300	450	
		0.6	2	0.006	0.08	0.08	180	300	360	540	
		0.8	2	0.009	0.11	0.11	270	450	540	810	
		1.0	2	0.011	0.14	0.14	330	550	660	990	
		1.2	2	0.013	0.17	0.17	390	650	780	1170	
		1.5	2	0.016	0.21	0.21	480	800	960	1440	
		2.0	2	0.021	0.28	0.28	630	1050	1260	1890	
		2.5	2	0.027	0.35	0.35	810	1350	1620	2430	
		3.0	2	0.032	0.42	0.42	960	1600	1920	2880	

Frese con estremità emisferica Microcut-B10

Gambo Ø 3mm, scarico cilindrico, 10xd



HM	λ 30°
Micro	γ 5°



					C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAMANT	
										B5787	
										B5787	
\emptyset Code	d_1 ± 0.01	d_2 h6	d_3	l_1	l_2	l_3	r ± 0.01	α	z		
.050	0.5	3	0.45	40	0.60	5.0	0.25	7.5°	2		●
.060	0.6	3	0.55	40	0.72	6.0	0.30	6.7°	2		●
.080	0.8	3	0.75	40	0.96	8.0	0.40	5.4°	2		●
.100	1.0	3	0.95	50	1.20	10.0	0.50	4.3°	2		●
.108	1.2	3	1.10	50	1.44	12.0	0.60	3.5°	2		●
.120	1.5	3	1.40	60	1.80	15.0	0.75	2.6°	2		●
.140	2.0	3	1.90	60	2.40	20.0	1.00	1.4°	2		●
.160	2.5	3	2.30	60	3.00	25.0	1.25	0.6°	2		●
.180	3.0	3	2.80	60	3.60	30.0	1.50	0.0°	2		●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.0	2	0.007	0.30	0.40	210	350	420	630
		1.2	2	0.008	0.35	0.50	240	400	480	720
		1.5	2	0.011	0.45	0.60	330	550	660	990
		2.0	2	0.014	0.60	0.80	420	700	840	1260
		2.5	2	0.018	0.75	1.00	540	900	1080	1620
		3.0	2	0.021	0.90	1.20	630	1050	1260	1890
	Grafite	1.0	2	0.005	0.20	1.00	150	250	300	450
		1.2	2	0.007	0.25	1.20	210	350	420	630
		1.5	2	0.008	0.30	1.50	240	400	480	720
		2.0	2	0.011	0.40	2.00	330	550	660	990
		2.5	2	0.014	0.50	2.50	420	700	840	1260
		3.0	2	0.016	0.60	3.00	480	800	960	1440

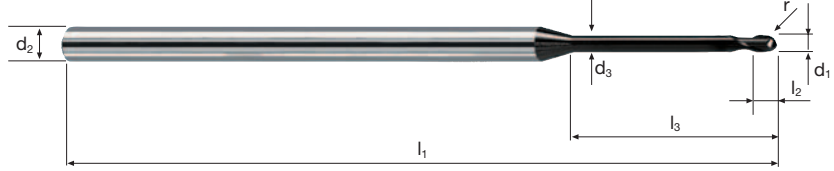
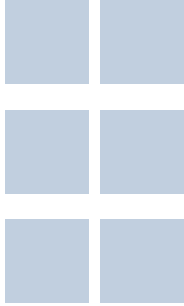
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.0	2	0.008	0.10	0.14	240	400	480	720
		1.2	2	0.010	0.12	0.17	300	500	600	900
		1.5	2	0.012	0.15	0.21	360	600	720	1080
		2.0	2	0.016	0.20	0.28	480	800	960	1440
		2.5	2	0.020	0.25	0.35	600	1000	1200	1800
		3.0	2	0.024	0.30	0.42	720	1200	1440	2160
	Grafite	1.0	2	0.008	0.10	0.10	240	400	480	720
		1.2	2	0.010	0.12	0.12	300	500	600	900
		1.5	2	0.012	0.15	0.15	360	600	720	1080
		2.0	2	0.016	0.20	0.20	480	800	960	1440
		2.5	2	0.020	0.25	0.25	600	1000	1200	1800
		3.0	2	0.024	0.30	0.30	720	1200	1440	2160

Frese con estremità emisferica Microcut-B12

Gambo Ø 3mm, scarico cilindrico, 12xd



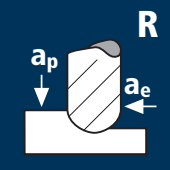
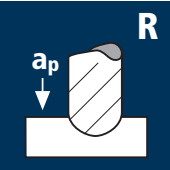
HM	λ 30°
Micro	γ 5°

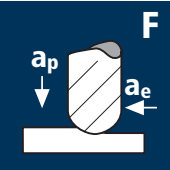
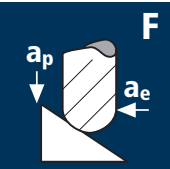


				C Graphite					CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAMANT
										B5791
\varnothing Code	d_1 ± 0.01	d_2 h6	d_3	l_1	l_2	l_3	r ± 0.01	α	z	
.100	1.0	3	0.95	50	1.20	12.0	0.50	3.8°	2	●
.108	1.2	3	1.10	60	1.44	14.4	0.60	3.0°	2	●
.120	1.5	3	1.40	60	1.80	18.0	0.75	2.2°	2	●
.140	2.0	3	1.90	60	2.40	24.0	1.00	1.2°	2	●
.160	2.5	3	2.30	70	3.00	30.0	1.25	0.5°	2	●
.180	3.0	3	2.80	70	3.60	36.0	1.50	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.0	2	0.007	0.20	0.30	210	350	420	630
		1.2	2	0.008	0.25	0.35	240	400	480	720
		1.5	2	0.011	0.30	0.45	330	550	660	990
		2.0	2	0.014	0.40	0.60	420	700	840	1260
		2.5	2	0.018	0.50	0.75	540	900	1080	1620
		3.0	2	0.021	0.60	0.90	630	1050	1260	1890
	Grafite	1.0	2	0.005	0.10	1.00	150	250	300	450
		1.2	2	0.007	0.10	1.20	210	350	420	630
		1.5	2	0.008	0.15	1.50	240	400	480	720
		2.0	2	0.011	0.20	2.00	330	550	660	990
		2.5	2	0.014	0.25	2.50	420	700	840	1260
		3.0	2	0.016	0.30	3.00	480	800	960	1440

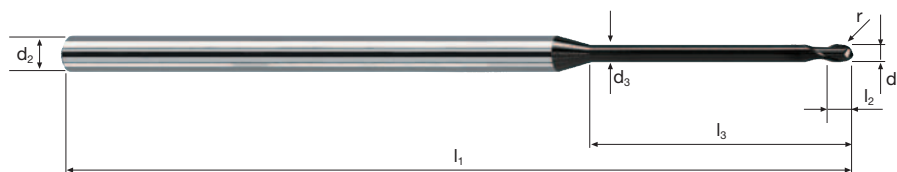
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.0	2	0.008	0.08	0.10	240	400	480	720
		1.2	2	0.010	0.10	0.12	300	500	600	900
		1.5	2	0.012	0.12	0.15	360	600	720	1080
		2.0	2	0.016	0.16	0.20	480	800	960	1440
		2.5	2	0.020	0.20	0.25	600	1000	1200	1800
		3.0	2	0.024	0.24	0.30	720	1200	1440	2160
	Grafite	1.0	2	0.008	0.08	0.08	240	400	480	720
		1.2	2	0.010	0.10	0.10	300	500	600	900
		1.5	2	0.012	0.12	0.12	360	600	720	1080
		2.0	2	0.016	0.16	0.16	480	800	960	1440
		2.5	2	0.020	0.20	0.20	600	1000	1200	1800
		3.0	2	0.024	0.24	0.24	720	1200	1440	2160

Frese con estremità emisferica Microcut-B15

Gambo Ø 3mm, scarico cilindrico, 15xd



HM	λ 30°
Micro	γ 5°



				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

										DIAMANT
Esempio: N° Ordine										
										B5793
\emptyset Code	d_1 ± 0.01	d_2 h6	d_3	l_1	l_2	l_3	r ± 0.01	α	z	
.100	1.0	3	0.95	60	1.20	15.0	0.50	3.2°	2	●
.108	1.2	3	1.10	60	1.44	18.0	0.60	2.5°	2	●
.120	1.5	3	1.40	70	1.80	22.5	0.75	1.8°	2	●
.140	2.0	3	1.90	70	2.40	30.0	1.00	1.0°	2	●
.160	2.5	3	2.30	70	3.00	37.5	1.25	0.4°	2	●
.180	3.0	3	2.80	80	3.60	45.0	1.50	0.0°	2	●

Applicazione

Materiale

Grafite

✗ **B**

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
1.0	2	0.007	0.15	0.20	210	350	420	630
1.2	2	0.008	0.20	0.25	240	400	480	720
1.5	2	0.011	0.25	0.30	330	550	660	990
2.0	2	0.014	0.30	0.40	420	700	840	1260
2.5	2	0.018	0.40	0.50	540	900	1080	1620
3.0	2	0.021	0.45	0.60	630	1050	1260	1890

Applicazione

Materiale

Grafite

✗ **B**

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
1.0	2	0.008	0.06	0.08	240	400	480	720
1.2	2	0.010	0.07	0.10	300	500	600	900
1.5	2	0.012	0.09	0.12	360	600	720	1080
2.0	2	0.016	0.12	0.16	480	800	960	1440
2.5	2	0.020	0.15	0.20	600	1000	1200	1800
3.0	2	0.024	0.18	0.24	720	1200	1440	2160

Applicazione

Materiale

Grafite

✗ **B**

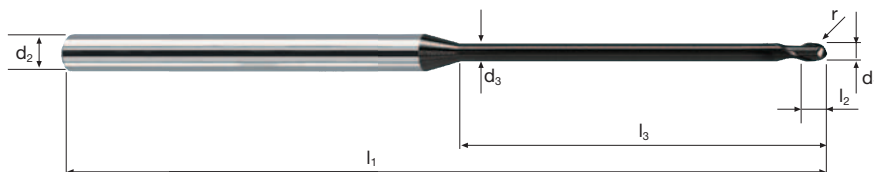
d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
1.0	2	0.008	0.06	0.06	240	400	480	720
1.2	2	0.010	0.07	0.07	300	500	600	900
1.5	2	0.012	0.09	0.09	360	600	720	1080
2.0	2	0.016	0.12	0.12	480	800	960	1440
2.5	2	0.020	0.15	0.15	600	1000	1200	1800
3.0	2	0.024	0.18	0.18	720	1200	1440	2160

Frese con estremità emisferica Microcut-B20

Gambo Ø 3mm, scarico cilindrico, 20xd



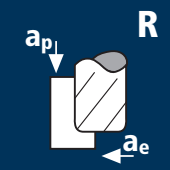
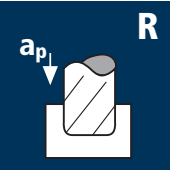
HM λ 30°
Micro γ 5°

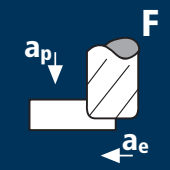
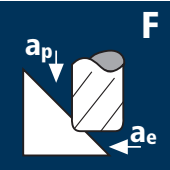


				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAMANT
										B15795
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r ±0.01	α	z	
.100	1.0	3	0.95	60	1.20	20.0	0.50	2.5°	2	●
.108	1.2	3	1.10	60	1.44	24.0	0.60	2.0°	2	●
.120	1.5	3	1.40	70	1.80	30.0	0.75	1.4°	2	●
.140	2.0	3	1.90	80	2.40	40.0	1.00	0.8°	2	●
.160	2.5	3	2.30	80	3.00	50.0	1.25	0.3°	2	●
.180	3.0	3	2.80	90	3.60	60.0	1.50	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.5	2	0.018	0.75	0.90	540	900	1080	1620
		2.0	2	0.024	1.00	1.20	720	1200	1440	2160
		3.0	2	0.035	1.50	1.80	1050	1750	2100	3150
		4.0	2	0.047	2.00	2.40	1410	2350	2820	4230
		5.0	2	0.059	2.50	3.00	1770	2950	3540	5310
		6.0	2	0.071	3.00	3.60	2130	3550	4260	6390
	Grafite	1.5	2	0.014	0.75	1.50	420	700	840	1260
		2.0	2	0.018	1.00	2.00	540	900	1080	1620
		3.0	2	0.027	1.50	3.00	810	1350	1620	2430
		4.0	2	0.036	2.00	4.00	1080	1800	2160	3240
		5.0	2	0.045	2.50	5.00	1350	2250	2700	4050
		6.0	2	0.055	3.00	6.00	1650	2750	3300	4950

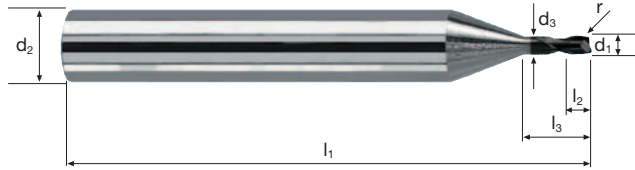
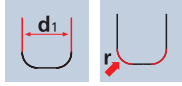
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.5	2	0.020	0.23	0.30	600	1000	1200	1800
		2.0	2	0.027	0.30	0.40	810	1350	1620	2430
		3.0	2	0.040	0.45	0.60	1200	2000	2400	3600
		4.0	2	0.053	0.60	0.80	1590	2650	3180	4770
		5.0	2	0.067	0.75	1.00	2010	3350	4020	6030
		6.0	2	0.080	0.90	1.20	2400	4000	4800	7200
	Grafite	1.5	2	0.020	0.30	0.30	600	1000	1200	1800
		2.0	2	0.027	0.40	0.40	810	1350	1620	2430
		3.0	2	0.040	0.60	0.60	1200	2000	2400	3600
		4.0	2	0.053	0.80	0.80	1590	2650	3180	4770
		5.0	2	0.067	1.00	1.00	2010	3350	4020	6030
		6.0	2	0.080	1.20	1.20	2400	4000	4800	7200

Frese toriche MicrotoroXG

Gambo Ø 6mm, scarico cilindrico, 3xd



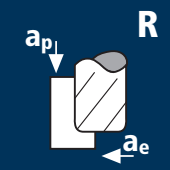


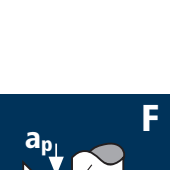
HM
XA λ 30°
 γ 15°

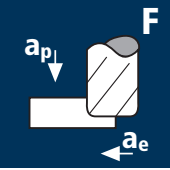
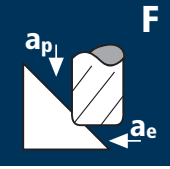



C Graphite CF/GF Fiber Reinforced Plastics

IV

Esempio: N° Ordine										DIAPLUS
Rivestimento Articolo Codice-ø										B6032
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.120	1.5	6	1.40	57	1.5	4.5	0.20	10.0°	2	●
.140	2.0	6	1.90	57	2.0	6.0	0.20	8.6°	2	●
.180	3.0	6	2.80	57	3.0	9.0	0.20	6.0°	2	●
.215	4.0	6	3.70	57	4.0	12.0	0.20	3.7°	2	●
.220	4.0	6	3.70	57	4.0	12.0	0.50	3.7°	2	●
.255	5.0	6	4.60	57	5.0	15.0	0.20	1.8°	2	●
.260	5.0	6	4.60	57	5.0	15.0	0.50	2.0°	2	●
.295	6.0	6	5.50	57	6.0	18.0	0.20	0.0°	2	●
.300	6.0	6	5.50	57	6.0	18.0	0.50	0.0°	2	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite	0.2	2	0.002	0.10	0.10	60	100	120	180	
		0.3	2	0.004	0.15	0.20	120	200	240	360	
		0.4	2	0.005	0.20	0.25	150	250	300	450	
		0.5	2	0.006	0.25	0.30	180	300	360	540	
		0.6	2	0.007	0.25	0.35	210	350	420	630	
		0.8	2	0.009	0.35	0.50	270	450	540	810	
		1.0	2	0.012	0.45	0.60	360	600	720	1080	
		1.5	2	0.018	0.70	0.90	540	900	1080	1620	
		2.0	2	0.024	0.90	1.20	720	1200	1440	2160	
	Grafite	3.0	2	0.035	1.35	1.80	1050	1750	2100	3150	
		4.0	2	0.047	1.80	2.40	1410	2350	2820	4230	
		5.0	2	0.059	2.25	3.00	1770	2950	3540	5310	
		6.0	2	0.071	2.70	3.60	2130	3550	4260	6390	
	Grafite	0.2	2	0.002	0.10	0.20	60	100	120	180	
		0.3	2	0.003	0.15	0.30	90	150	180	270	
		0.4	2	0.004	0.20	0.40	120	200	240	360	
		0.5	2	0.005	0.25	0.50	150	250	300	450	
		0.6	2	0.005	0.25	0.60	150	250	300	450	
		0.8	2	0.007	0.35	0.80	210	350	420	630	
		1.0	2	0.009	0.45	1.00	270	450	540	810	
		1.5	2	0.014	0.70	1.50	420	700	840	1260	
		2.0	2	0.018	0.90	2.00	540	900	1080	1620	
	Grafite	3.0	2	0.027	1.35	3.00	810	1350	1620	2430	
		4.0	2	0.036	1.80	4.00	1080	1800	2160	3240	
		5.0	2	0.045	2.25	5.00	1350	2250	2700	4050	
		6.0	2	0.055	2.70	6.00	1650	2750	3300	4950	

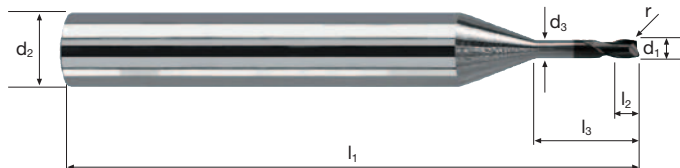
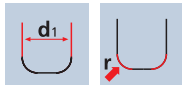
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite	0.2	2	0.003	0.03	0.04	90	150	180	270	
		0.3	2	0.004	0.04	0.06	120	200	240	360	
		0.4	2	0.005	0.06	0.08	150	250	300	450	
		0.5	2	0.007	0.07	0.10	210	350	420	630	
		0.6	2	0.008	0.08	0.12	240	400	480	720	
		0.8	2	0.011	0.11	0.16	330	550	660	990	
		1.0	2	0.013	0.14	0.20	390	650	780	1170	
		1.5	2	0.020	0.21	0.30	600	1000	1200	1800	
		2.0	2	0.027	0.28	0.40	810	1350	1620	2430	
	Grafite	3.0	2	0.040	0.42	0.60	1200	2000	2400	3600	
		4.0	2	0.053	0.56	0.80	1590	2650	3180	4770	
		5.0	2	0.067	0.70	1.00	2010	3350	4020	6030	
		6.0	2	0.080	0.84	1.20	2400	4000	4800	7200	
	Grafite	0.2	2	0.003	0.04	0.04	90	150	180	270	
		0.3	2	0.004	0.05	0.05	120	200	240	360	
		0.4	2	0.005	0.07	0.07	150	250	300	450	
		0.5	2	0.007	0.09	0.09	210	350	420	630	
		0.6	2	0.008	0.11	0.11	240	400	480	720	
		0.8	2	0.011	0.14	0.14	330	550	660	990	
		1.0	2	0.013	0.18	0.18	390	650	780	1170	
		1.5	2	0.020	0.27	0.27	600	1000	1200	1800	
		2.0	2	0.027	0.36	0.36	810	1350	1620	2430	
	Grafite	3.0	2	0.040	0.54	0.54	1200	2000	2400	3600	
		4.0	2	0.053	0.72	0.72	1590	2650	3180	4770	
		5.0	2	0.067	0.90	0.90	2010	3350	4020	6030	
		6.0	2	0.080	1.08	1.08	2400	4000	4800	7200	

Frese toriche MicrotoroXG

Gambo Ø 6mm, scarico cilindrico, 5xd



HM λ 30°
XA γ 15°

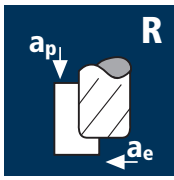


				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAPLUS
Rivestimento B Articolo 6034 Codice-ø .020										B6034
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.020	0.2	6	0.18	57	0.2	1.0	-	9.5°	2	●
.030	0.3	6	0.25	57	0.3	1.5	-	9.2°	2	●
.040	0.4	6	0.35	57	0.4	2.0	0.05	9.0°	2	●
.048	0.5	6	0.45	57	0.5	2.5	0.05	12.2°	2	●
.050	0.5	6	0.45	57	0.5	2.5	0.10	12.2°	2	●
.060	0.6	6	0.55	57	0.6	3.0	0.10	11.7°	2	●
.080	0.8	6	0.75	57	0.8	4.0	0.10	10.8°	2	●
.098	1.0	6	0.95	57	1.0	5.0	0.10	9.9°	2	●
.100	1.0	6	0.95	57	1.0	5.0	0.20	9.9°	2	●
.120	1.5	6	1.40	57	1.5	7.5	0.20	8.1°	2	●
.140	2.0	6	1.90	57	2.0	10.0	0.20	6.6°	2	●
.180	3.0	6	2.80	57	3.0	15.0	0.20	4.2°	2	●
.182	3.0	6	2.80	61	3.0	18.0	0.20	3.7°	2	●
.215	4.0	6	3.70	61	4.0	20.0	0.20	2.5°	2	●
.217	4.0	6	3.70	66	4.0	25.0	0.20	2.0°	2	●
.220	4.0	6	3.70	61	4.0	20.0	0.50	2.6°	2	●
.222	4.0	6	3.70	66	4.0	25.0	0.50	2.1°	2	●
.255	5.0	6	4.60	66	5.0	25.0	0.20	1.1°	2	●
.260	5.0	6	4.60	66	5.0	25.0	0.50	1.1°	2	●
.295	6.0	6	5.50	69	6.0	30.0	0.20	0.0°	2	●
.300	6.0	6	5.50	69	6.0	30.0	0.50	0.0°	2	●

Applicazione



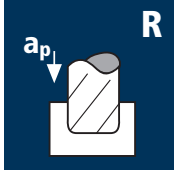
Materiale

Grafito

B

Grafito

B



Grafito

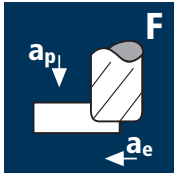
B

Grafito

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
					vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
0.2	2	0.002	0.10	0.10	60	100	120	180
0.3	2	0.004	0.10	0.20	120	200	240	360
0.4	2	0.005	0.15	0.25	150	250	300	450
0.5	2	0.006	0.20	0.30	180	300	360	540
0.6	2	0.007	0.25	0.35	210	350	420	630
0.8	2	0.009	0.30	0.50	270	450	540	810
1.0	2	0.012	0.40	0.60	360	600	720	1080
1.5	2	0.018	0.60	0.90	540	900	1080	1620
2.0	2	0.024	0.80	1.20	720	1200	1440	2160
3.0	2	0.035	1.20	1.80	1050	1750	2100	3150
4.0	2	0.047	1.60	2.40	1410	2350	2820	4230
5.0	2	0.059	2.00	3.00	1770	2950	3540	5310
6.0	2	0.071	2.40	3.60	2130	3550	4260	6390
0.2	2	0.002	0.10	0.20	60	100	120	180
0.3	2	0.003	0.10	0.30	90	150	180	270
0.4	2	0.004	0.15	0.40	120	200	240	360
0.5	2	0.005	0.20	0.50	150	250	300	450
0.6	2	0.005	0.25	0.60	150	250	300	450
0.8	2	0.007	0.30	0.80	210	350	420	630
1.0	2	0.009	0.40	1.00	270	450	540	810
1.5	2	0.014	0.60	1.50	420	700	840	1260
2.0	2	0.018	0.80	2.00	540	900	1080	1620
3.0	2	0.027	1.20	3.00	810	1350	1620	2430
4.0	2	0.036	1.60	4.00	1080	1800	2160	3240
5.0	2	0.045	2.00	5.00	1350	2250	2700	4050
6.0	2	0.055	2.40	6.00	1650	2750	3300	4950

Applicazione



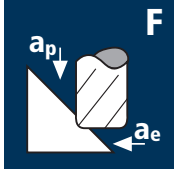
Materiale

Grafito

B

Grafito

B



Grafito

B

Grafito

B

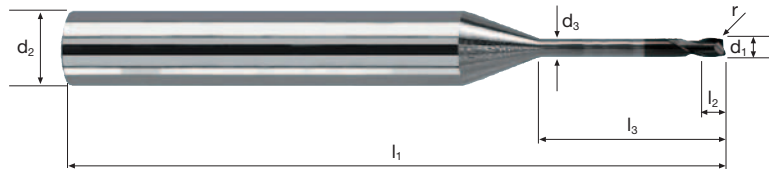
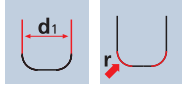
d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
					vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
0.2	2	0.003	0.02	0.04	90	150	180	270
0.3	2	0.004	0.04	0.05	120	200	240	360
0.4	2	0.005	0.05	0.07	150	250	300	450
0.5	2	0.007	0.06	0.09	210	350	420	630
0.6	2	0.008	0.07	0.11	240	400	480	720
0.8	2	0.011	0.10	0.14	330	550	660	990
1.0	2	0.013	0.12	0.18	390	650	780	1170
1.5	2	0.020	0.18	0.27	600	1000	1200	1800
2.0	2	0.027	0.24	0.36	810	1350	1620	2430
3.0	2	0.040	0.36	0.54	1200	2000	2400	3600
4.0	2	0.053	0.48	0.72	1590	2650	3180	4770
5.0	2	0.067	0.60	0.90	2010	3350	4020	6030
6.0	2	0.080	0.72	1.08	2400	4000	4800	7200
0.2	2	0.003	0.03	0.03	90	150	180	270
0.3	2	0.004	0.05	0.05	120	200	240	360
0.4	2	0.005	0.06	0.06	150	250	300	450
0.5	2	0.007	0.08	0.08	210	350	420	630
0.6	2	0.008	0.10	0.10	240	400	480	720
0.8	2	0.011	0.13	0.13	330	550	660	990
1.0	2	0.013	0.16	0.16	390	650	780	1170
1.5	2	0.020	0.24	0.24	600	1000	1200	1800
2.0	2	0.027	0.32	0.32	810	1350	1620	2430
3.0	2	0.040	0.48	0.48	1200	2000	2400	3600
4.0	2	0.053	0.64	0.64	1590	2650	3180	4770
5.0	2	0.067	0.80	0.80	2010	3350	4020	6030
6.0	2	0.080	0.96	0.96	2400	4000	4800	7200

Frese toriche MicrotoroXG

Gambo Ø 6mm, scarico cilindrico, 8xd



HM λ 30°
XA γ 15°



				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAPLUS
Rivestimento B Articolo 6036 Codice-ø .020										B6036
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.020	0.2	6	0.18	57	0.2	1.6	-	9.2°	2	●
.030	0.3	6	0.25	57	0.3	2.4	-	8.8°	2	●
.040	0.4	6	0.35	57	0.4	3.2	0.05	8.4°	2	●
.048	0.5	6	0.45	57	0.5	4.0	0.05	11.0°	2	●
.050	0.5	6	0.45	57	0.5	4.0	0.10	11.0°	2	●
.060	0.6	6	0.55	57	0.6	4.8	0.10	10.3°	2	●
.080	0.8	6	0.75	57	0.8	6.4	0.10	9.2°	2	●
.098	1.0	6	0.95	57	1.0	8.0	0.10	8.2°	2	●
.100	1.0	6	0.95	57	1.0	8.0	0.20	8.3°	2	●
.120	1.5	6	1.40	57	1.5	12.0	0.20	6.4°	2	●
.140	2.0	6	1.90	61	2.0	16.0	0.20	4.9°	2	●
.180	3.0	6	2.80	66	3.0	24.0	0.20	2.9°	2	●
.215	4.0	6	3.70	75	4.0	32.0	0.20	1.7°	2	●
.220	4.0	6	3.70	75	4.0	32.0	0.50	1.7°	2	●
.255	5.0	6	4.60	80	5.0	40.0	0.20	0.7°	2	●
.260	5.0	6	4.60	80	5.0	40.0	0.50	0.7°	2	●
.295	6.0	6	5.50	87	6.0	48.0	0.20	0.0°	2	●
.300	6.0	6	5.50	87	6.0	48.0	0.50	0.0°	2	●

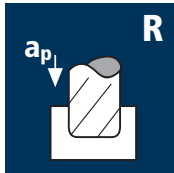


Materiale

Grafite

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.4	2	0.005	0.15	0.15	150	250	300	450
0.5	2	0.006	0.20	0.20	180	300	360	540
0.6	2	0.007	0.25	0.25	210	350	420	630
0.8	2	0.009	0.30	0.30	270	450	540	810
1.0	2	0.012	0.40	0.40	360	600	720	1080
1.5	2	0.018	0.60	0.60	540	900	1080	1620
2.0	2	0.024	0.80	0.80	720	1200	1440	2160
3.0	2	0.035	1.20	1.20	1050	1750	2100	3150
4.0	2	0.047	1.60	1.60	1410	2350	2820	4230



Materiale

Grafite

B

5.0	2	0.059	2.00	2.00	1770	2950	3540	5310
6.0	2	0.071	2.40	2.40	2130	3550	4260	6390

Materiale

Grafite

B

0.4	2	0.004	0.10	0.40	120	200	240	360
0.5	2	0.005	0.15	0.50	150	250	300	450
0.6	2	0.005	0.20	0.60	150	250	300	450
0.8	2	0.007	0.25	0.80	210	350	420	630
1.0	2	0.009	0.30	1.00	270	450	540	810
1.5	2	0.014	0.45	1.50	420	700	840	1260
2.0	2	0.018	0.60	2.00	540	900	1080	1620
3.0	2	0.027	0.90	3.00	810	1350	1620	2430
4.0	2	0.036	1.20	4.00	1080	1800	2160	3240



Materiale

Grafite

B

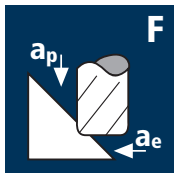
d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.4	2	0.005	0.04	0.06	150	250	300	450
0.5	2	0.007	0.05	0.08	210	350	420	630
0.6	2	0.008	0.06	0.10	240	400	480	720
0.8	2	0.011	0.08	0.13	330	550	660	990
1.0	2	0.013	0.10	0.16	390	650	780	1170
1.5	2	0.020	0.15	0.24	600	1000	1200	1800
2.0	2	0.027	0.20	0.32	810	1350	1620	2430
3.0	2	0.040	0.30	0.48	1200	2000	2400	3600
4.0	2	0.053	0.40	0.64	1590	2650	3180	4770

Materiale

Grafite

B

5.0	2	0.067	0.50	0.80	2010	3350	4020	6030
6.0	2	0.080	0.60	0.96	2400	4000	4800	7200



Materiale

Grafite

B

0.4	2	0.005	0.06	0.06	150	250	300	450
0.5	2	0.007	0.07	0.07	210	350	420	630
0.6	2	0.008	0.08	0.08	240	400	480	720
0.8	2	0.011	0.11	0.11	330	550	660	990
1.0	2	0.013	0.14	0.14	390	650	780	1170
1.5	2	0.020	0.21	0.21	600	1000	1200	1800
2.0	2	0.027	0.28	0.28	810	1350	1620	2430
3.0	2	0.040	0.42	0.42	1200	2000	2400	3600
4.0	2	0.053	0.56	0.56	1590	2650	3180	4770

Materiale

Grafite

B

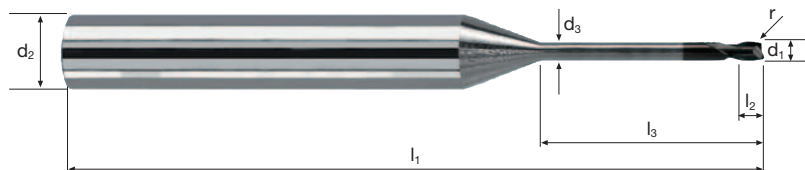
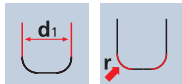
5.0	2	0.067	0.70	0.70	2010	3350	4020	6030
6.0	2	0.080	0.84	0.84	2400	4000	4800	7200

Frese toriche MicrotoroXG

Gambo Ø 6mm, scarico cilindrico, 10xd



HM λ **30°**
XA γ **15°**

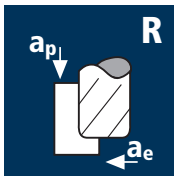


				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAPLUS
										B6038
\emptyset Code	d_1 0/-0.01	d_2 h5	d_3	l_1	l_2	l_3	r ± 0.005	α	z	
.040	0.4	6	0.35	57	0.4	4.0	0.05	8.1°	2	●
.048	0.5	6	0.45	57	0.5	5.0	0.05	10.3°	2	●
.050	0.5	6	0.45	57	0.5	5.0	0.10	10.4°	2	●
.060	0.6	6	0.55	57	0.6	6.0	0.10	9.6°	2	●
.080	0.8	6	0.75	57	0.8	8.0	0.10	8.4°	2	●
.098	1.0	6	0.95	57	1.0	10.0	0.10	7.4°	2	●
.100	1.0	6	0.95	57	1.0	10.0	0.20	7.4°	2	●
.120	1.5	6	1.40	61	1.5	15.0	0.20	5.5°	2	●
.140	2.0	6	1.90	66	2.0	20.0	0.20	4.2°	2	●
.180	3.0	6	2.80	75	3.0	30.0	0.20	2.5°	2	●
.215	4.0	6	3.70	80	4.0	40.0	0.20	1.4°	2	●
.220	4.0	6	3.70	80	4.0	40.0	0.50	1.4°	2	●
.255	5.0	6	4.60	100	5.0	50.0	0.20	0.6°	2	●
.260	5.0	6	4.60	100	5.0	50.0	0.50	0.6°	2	●
.295	6.0	6	5.50	100	6.0	60.0	0.20	0.0°	2	●
.300	6.0	6	5.50	100	6.0	60.0	0.50	0.0°	2	●

Applicazione

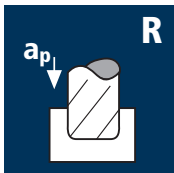


Materiale

Grafite

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.4	2	0.004	0.10	0.15	120	200	240	360
0.5	2	0.005	0.15	0.20	150	250	300	450
0.6	2	0.006	0.20	0.25	180	300	360	540
0.8	2	0.008	0.25	0.30	240	400	480	720
1.0	2	0.009	0.30	0.40	270	450	540	810
1.5	2	0.014	0.45	0.60	420	700	840	1260
2.0	2	0.019	0.60	0.80	570	950	1140	1710

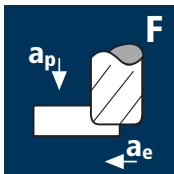


Grafite

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.4	2	0.003	0.10	0.40	90	150	180	270
0.5	2	0.004	0.10	0.50	120	200	240	360
0.6	2	0.004	0.10	0.60	120	200	240	360
0.8	2	0.006	0.15	0.80	180	300	360	540
1.0	2	0.007	0.20	1.00	210	350	420	630
1.5	2	0.011	0.30	1.50	330	550	660	990
2.0	2	0.015	0.40	2.00	450	750	900	1350

Applicazione

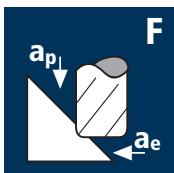


Materiale

Grafite

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.4	2	0.004	0.04	0.06	120	200	240	360
0.5	2	0.005	0.05	0.07	150	250	300	450
0.6	2	0.006	0.06	0.08	180	300	360	540
0.8	2	0.009	0.08	0.11	270	450	540	810
1.0	2	0.011	0.10	0.14	330	550	660	990
1.5	2	0.016	0.15	0.21	480	800	960	1440
2.0	2	0.021	0.20	0.28	630	1050	1260	1890



Grafite

B

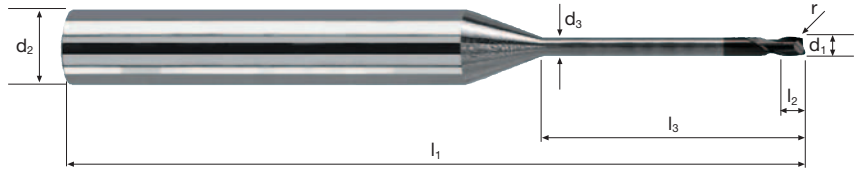
d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.4	2	0.004	0.04	0.04	120	200	240	360
0.5	2	0.005	0.05	0.05	150	250	300	450
0.6	2	0.006	0.06	0.06	180	300	360	540
0.8	2	0.009	0.08	0.08	270	450	540	810
1.0	2	0.011	0.10	0.10	330	550	660	990
1.5	2	0.016	0.15	0.15	480	800	960	1440
2.0	2	0.021	0.20	0.20	630	1050	1260	1890

Frese toriche MicrotoroXG

Gambo Ø 6mm, scarico cilindrico, 12xd



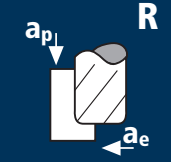

HM XA	λ 30° γ 15°

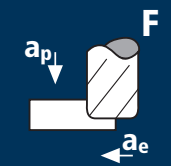
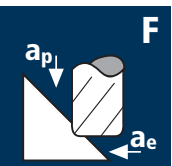


				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAPLUS
										B6040
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	α	z	
.040	0.4	6	0.35	57	0.4	4.8	0.05	7.8°	2	●
.048	0.5	6	0.45	57	0.5	6.0	0.05	9.6°	2	●
.050	0.5	6	0.45	57	0.5	6.0	0.10	9.7°	2	●
.060	0.6	6	0.55	57	0.6	7.2	0.10	8.9°	2	●
.080	0.8	6	0.75	57	0.8	9.6	0.10	7.7°	2	●
.098	1.0	6	0.95	61	1.0	12.0	0.10	6.7°	2	●
.100	1.0	6	0.95	61	1.0	12.0	0.20	6.7°	2	●
.120	1.5	6	1.40	66	1.5	18.0	0.20	4.9°	2	●
.140	2.0	6	1.90	69	2.0	24.0	0.20	3.7°	2	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
							vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
	Grafite	1.0	2	0.009	0.50	0.60	270	450	540	810
		1.2	2	0.011	0.60	0.70	330	550	660	990
		1.5	2	0.014	0.75	0.90	420	700	840	1260
		2.0	2	0.019	1.00	1.20	570	950	1140	1710
		2.5	2	0.024	1.25	1.50	720	1200	1440	2160
		3.0	2	0.028	1.50	1.80	840	1400	1680	2520
	Grafite	1.0	2	0.007	0.50	1.00	210	350	420	630
		1.2	2	0.009	0.60	1.20	270	450	540	810
		1.5	2	0.011	0.75	1.50	330	550	660	990
		2.0	2	0.015	1.00	2.00	450	750	900	1350
		2.5	2	0.018	1.25	2.50	540	900	1080	1620
		3.0	2	0.022	1.50	3.00	660	1100	1320	1980

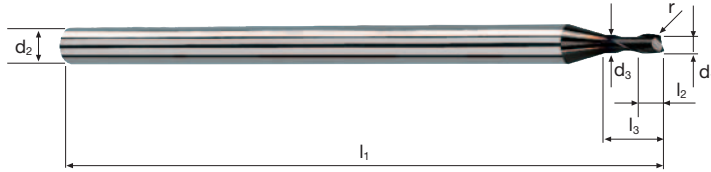
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
							vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
	Grafite	1.0	2	0.011	0.15	0.20	330	550	660	990
		1.2	2	0.013	0.18	0.24	390	650	780	1170
		1.5	2	0.016	0.23	0.30	480	800	960	1440
		2.0	2	0.021	0.30	0.40	630	1050	1260	1890
		2.5	2	0.027	0.38	0.50	810	1350	1620	2430
		3.0	2	0.032	0.45	0.60	960	1600	1920	2880
	Grafite	1.0	2	0.011	0.20	0.20	330	550	660	990
		1.2	2	0.013	0.24	0.24	390	650	780	1170
		1.5	2	0.016	0.30	0.30	480	800	960	1440
		2.0	2	0.021	0.40	0.40	630	1050	1260	1890
		2.5	2	0.027	0.50	0.50	810	1350	1620	2430
		3.0	2	0.032	0.60	0.60	960	1600	1920	2880

Frese toriche Microcut-T3

Gambo Ø 3mm, scarico cilindrico, 3xd



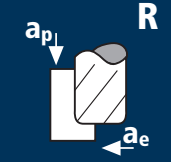

HM λ **25°**
Micro γ **6°**

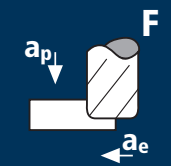



				C Graphite					CF/GF Fiber Reinforced Plastics
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IV

										DIAMANT	
Esempio: N° Ordine		Rivestimento B	Articolo 5752		Codice-ø .100						B5752
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.100	1.0	3	0.95	50	1.20	3.0	0.20	8.5°	2	●	
.108	1.2	3	1.10	50	1.44	3.6	0.20	7.4°	2	●	
.120	1.5	3	1.40	50	1.80	4.5	0.20	5.9°	2	●	
.140	2.0	3	1.90	50	2.40	6.0	0.20	3.7°	2	●	
.160	2.5	3	2.30	50	3.00	7.5	0.20	1.7°	2	●	
.180	3.0	3	2.80	50	3.60	9.0	0.20	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.0	2	0.009	0.45	0.60	270	450	540	810
		1.2	2	0.011	0.55	0.70	330	550	660	990
		1.5	2	0.014	0.70	0.90	420	700	840	1260
		2.0	2	0.019	0.90	1.20	570	950	1140	1710
		2.5	2	0.024	1.15	1.50	720	1200	1440	2160
		3.0	2	0.028	1.35	1.80	840	1400	1680	2520
	Grafite	1.0	2	0.007	0.45	1.00	210	350	420	630
		1.2	2	0.009	0.55	1.20	270	450	540	810
		1.5	2	0.011	0.70	1.50	330	550	660	990
		2.0	2	0.015	0.90	2.00	450	750	900	1350
		2.5	2	0.018	1.15	2.50	540	900	1080	1620
		3.0	2	0.022	1.35	3.00	660	1100	1320	1980

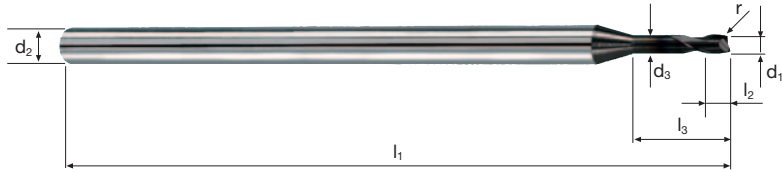
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.0	2	0.011	0.14	0.20	330	550	660	990
		1.2	2	0.013	0.17	0.24	390	650	780	1170
		1.5	2	0.016	0.21	0.30	480	800	960	1440
		2.0	2	0.021	0.28	0.40	630	1050	1260	1890
		2.5	2	0.027	0.35	0.50	810	1350	1620	2430
		3.0	2	0.032	0.42	0.60	960	1600	1920	2880
	Grafite	1.0	2	0.011	0.18	0.18	330	550	660	990
		1.2	2	0.013	0.22	0.22	390	650	780	1170
		1.5	2	0.016	0.27	0.27	480	800	960	1440
		2.0	2	0.021	0.36	0.36	630	1050	1260	1890
		2.5	2	0.027	0.45	0.45	810	1350	1620	2430
		3.0	2	0.032	0.54	0.54	960	1600	1920	2880

Frese toriche Microcut-T5

Gambo Ø 3mm, scarico cilindrico, 5xd



HM λ 25°
Micro γ 6°



C Graphite
CF/GF Fiber Reinforced Plastics

IV

Esempio: N° Ordine										DIAMANT	
										B5754	
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	r 0/+0.03	α	z		
.100	1.0	3	0.95	50	1.20	5.0	0.20	6.6°	2	●	
.108	1.2	3	1.10	50	1.44	6.0	0.20	5.5°	2	●	
.120	1.5	3	1.40	50	1.80	7.5	0.20	4.2°	2	●	
.140	2.0	3	1.90	50	2.40	10.0	0.20	2.5°	2	●	
.160	2.5	3	2.30	50	3.00	12.5	0.20	1.1°	2	●	
.180	3.0	3	2.80	50	3.60	15.0	0.20	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.0	2	0.009	0.40	0.60	270	450	540	810
		1.2	2	0.011	0.50	0.70	330	550	660	990
		1.5	2	0.014	0.60	0.90	420	700	840	1260
		2.0	2	0.019	0.80	1.20	570	950	1140	1710
		2.5	2	0.024	1.00	1.50	720	1200	1440	2160
		3.0	2	0.028	1.20	1.80	840	1400	1680	2520
	Grafite	1.0	2	0.007	0.40	1.00	210	350	420	630
		1.2	2	0.009	0.50	1.20	270	450	540	810
		1.5	2	0.011	0.60	1.50	330	550	660	990
		2.0	2	0.015	0.80	2.00	450	750	900	1350
		2.5	2	0.018	1.00	2.50	540	900	1080	1620
		3.0	2	0.022	1.20	3.00	660	1100	1320	1980

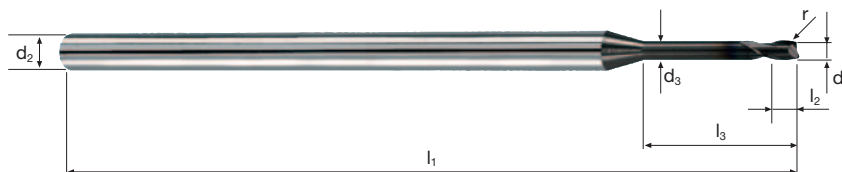
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
	Grafite	1.0	2	0.011	0.12	0.18	330	550	660	990
		1.2	2	0.013	0.14	0.22	390	650	780	1170
		1.5	2	0.016	0.18	0.27	480	800	960	1440
		2.0	2	0.021	0.24	0.36	630	1050	1260	1890
		2.5	2	0.027	0.30	0.45	810	1350	1620	2430
		3.0	2	0.032	0.36	0.54	960	1600	1920	2880
	Grafite	1.0	2	0.011	0.16	0.16	330	550	660	990
		1.2	2	0.013	0.19	0.19	390	650	780	1170
		1.5	2	0.016	0.24	0.24	480	800	960	1440
		2.0	2	0.021	0.32	0.32	630	1050	1260	1890
		2.5	2	0.027	0.40	0.40	810	1350	1620	2430
		3.0	2	0.032	0.48	0.48	960	1600	1920	2880

Frese toriche Microcut-T8

Gambo Ø 3mm, scarico cilindrico, 8xd



HM Micro λ **25°**
 γ **6°**

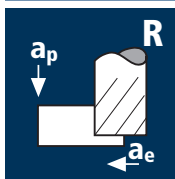


			C Graphite							CF/GF Fiber Reinforced Plastics
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IV

										DIAMANT
Esempio: N° Ordine										B5756
										B
										5756
										.100
\emptyset Code	d_1 ± 0.01	d_2 h6	d_3	l_1	l_2	l_3	r 0/+0.03	α	z	
.100	1.0	3	0.95	50	1.20	8.0	0.20	4.9°	2	●
.108	1.2	3	1.10	50	1.44	9.6	0.20	4.0°	2	●
.120	1.5	3	1.40	60	1.80	12.0	0.20	3.0°	2	●
.140	2.0	3	1.90	60	2.40	16.0	0.20	1.7°	2	●
.160	2.5	3	2.30	60	3.00	20.0	0.20	0.7°	2	●
.180	3.0	3	2.80	60	3.60	24.0	0.20	0.0°	2	●

Applicazione



Materiale

Grafite

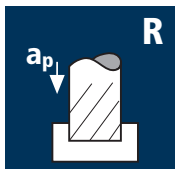
B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.2	2	0.002	0.10	0.10	60	100	120	180
0.3	2	0.003	0.15	0.20	90	150	180	270
0.4	2	0.004	0.20	0.25	120	200	240	360
0.5	2	0.005	0.25	0.30	150	250	300	450
0.6	2	0.006	0.25	0.35	180	300	360	540
0.8	2	0.008	0.35	0.50	240	400	480	720
1.0	2	0.009	0.45	0.60	270	450	540	810
1.2	2	0.011	0.55	0.70	330	550	660	990
1.5	2	0.014	0.70	0.90	420	700	840	1260

Grafite

B

2.0	2	0.019	0.90	1.20	570	950	1140	1710
2.5	2	0.024	1.15	1.50	720	1200	1440	2160
3.0	2	0.028	1.35	1.80	840	1400	1680	2520



Grafite

B

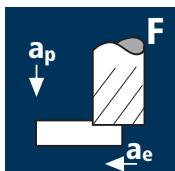
0.2	2	0.001	0.10	0.20	30	50	60	90
0.3	2	0.002	0.15	0.30	60	100	120	180
0.4	2	0.003	0.20	0.40	90	150	180	270
0.5	2	0.004	0.25	0.50	120	200	240	360
0.6	2	0.004	0.25	0.60	120	200	240	360
0.8	2	0.006	0.35	0.80	180	300	360	540
1.0	2	0.007	0.45	1.00	210	350	420	630
1.2	2	0.009	0.55	1.20	270	450	540	810
1.5	2	0.011	0.70	1.50	330	550	660	990

Grafite

B

2.0	2	0.015	0.90	2.00	450	750	900	1350
2.5	2	0.018	1.15	2.50	540	900	1080	1620
3.0	2	0.022	1.35	3.00	660	1100	1320	1980

Applicazione



Materiale

Grafite

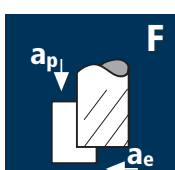
B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.2	2	0.002	0.03	0.04	60	100	120	180
0.3	2	0.003	0.04	0.06	90	150	180	270
0.4	2	0.004	0.06	0.08	120	200	240	360
0.5	2	0.005	0.07	0.10	150	250	300	450
0.6	2	0.006	0.08	0.12	180	300	360	540
0.8	2	0.009	0.11	0.16	270	450	540	810
1.0	2	0.011	0.14	0.20	330	550	660	990
1.2	2	0.013	0.17	0.24	390	650	780	1170
1.5	2	0.016	0.21	0.30	480	800	960	1440

Grafite

B

2.0	2	0.021	0.28	0.40	630	1050	1260	1890
2.5	2	0.027	0.35	0.50	810	1350	1620	2430
3.0	2	0.032	0.42	0.60	960	1600	1920	2880



Grafite

B

0.2	2	0.002	0.04	0.04	60	100	120	180
0.3	2	0.003	0.05	0.05	90	150	180	270
0.4	2	0.004	0.07	0.07	120	200	240	360
0.5	2	0.005	0.09	0.09	150	250	300	450
0.6	2	0.006	0.11	0.11	180	300	360	540
0.8	2	0.009	0.14	0.14	270	450	540	810
1.0	2	0.011	0.18	0.18	330	550	660	990
1.2	2	0.013	0.22	0.22	390	650	780	1170
1.5	2	0.016	0.27	0.27	480	800	960	1440

Grafite

B

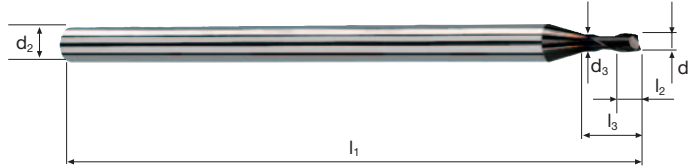
2.0	2	0.021	0.36	0.36	630	1050	1260	1890
2.5	2	0.027	0.45	0.45	810	1350	1620	2430
3.0	2	0.032	0.54	0.54	960	1600	1920	2880

Frese cilindriche Microcut-C3

Gambo Ø 3mm, scarico cilindrico, 3xd



HM λ 25°
Micro γ 6°

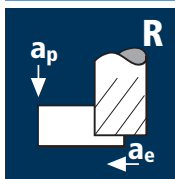


				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAMANT	
										B5712	
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z		
.020	0.2	3	0.18	40	0.24	0.6	-	9.4°	2		●
.030	0.3	3	0.25	40	0.36	0.9	-	9.0°	2		●
.040	0.4	3	0.35	40	0.48	1.2	-	8.5°	2		●
.050	0.5	3	0.45	40	0.60	1.5	-	11.5°	2		●
.060	0.6	3	0.55	40	0.72	1.8	-	11.9°	2		●
.080	0.8	3	0.75	40	0.96	2.4	-	9.6°	2		●
.100	1.0	3	0.95	50	1.20	3.0	0.07	8.5°	2		●
.108	1.2	3	1.10	50	1.44	3.6	0.07	7.4°	2		●
.120	1.5	3	1.40	50	1.80	4.5	0.07	5.9°	2		●
.140	2.0	3	1.90	50	2.40	6.0	0.10	3.7°	2		●
.160	2.5	3	2.30	50	3.00	7.5	0.10	1.7°	2		●
.180	3.0	3	2.80	50	3.60	9.0	0.10	0.0°	2		●

Applicazione



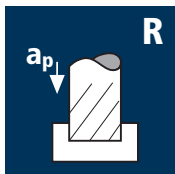
Materiale

Grafite

B

Grafite

B



Grafite

B

Grafite

B

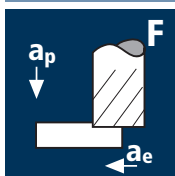
d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.5	2	0.005	0.25	0.30	150	250	300	450
0.6	2	0.006	0.25	0.35	180	300	360	540
0.7	2	0.007	0.30	0.40	210	350	420	630
0.8	2	0.008	0.35	0.50	240	400	480	720
0.9	2	0.008	0.40	0.55	240	400	480	720
1.0	2	0.009	0.45	0.60	270	450	540	810
1.2	2	0.011	0.55	0.70	330	550	660	990
1.5	2	0.014	0.70	0.90	420	700	840	1260
1.8	2	0.017	0.80	1.10	510	850	1020	1530

2.0	2	0.019	0.90	1.20	570	950	1140	1710
2.3	2	0.022	1.05	1.40	660	1100	1320	1980
2.5	2	0.024	1.15	1.50	720	1200	1440	2160
2.8	2	0.026	1.25	1.70	780	1300	1560	2340
3.0	2	0.028	1.35	1.80	840	1400	1680	2520

0.5	2	0.004	0.25	0.50	120	200	240	360
0.6	2	0.004	0.25	0.60	120	200	240	360
0.7	2	0.005	0.30	0.70	150	250	300	450
0.8	2	0.006	0.35	0.80	180	300	360	540
0.9	2	0.007	0.40	0.90	210	350	420	630
1.0	2	0.007	0.45	1.00	210	350	420	630
1.2	2	0.009	0.55	1.20	270	450	540	810
1.5	2	0.011	0.70	1.50	330	550	660	990
1.8	2	0.013	0.80	1.80	390	650	780	1170

2.0	2	0.015	0.90	2.00	450	750	900	1350
2.3	2	0.017	1.05	2.30	510	850	1020	1530
2.5	2	0.018	1.15	2.50	540	900	1080	1620
2.8	2	0.020	1.25	2.80	600	1000	1200	1800
3.0	2	0.022	1.35	3.00	660	1100	1320	1980

Applicazione



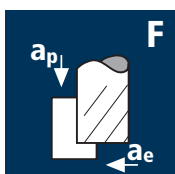
Materiale

Grafite

B

Grafite

B



Grafite

B

Grafite

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]
0.5	2	0.005	0.07	0.10	150	250	300	450
0.6	2	0.006	0.08	0.12	180	300	360	540
0.7	2	0.007	0.10	0.14	210	350	420	630
0.8	2	0.009	0.11	0.16	270	450	540	810
0.9	2	0.010	0.13	0.18	300	500	600	900
1.0	2	0.011	0.14	0.20	330	550	660	990
1.2	2	0.013	0.17	0.24	390	650	780	1170
1.5	2	0.016	0.21	0.30	480	800	960	1440
1.8	2	0.019	0.25	0.36	570	950	1140	1710

2.0	2	0.021	0.28	0.40	630	1050	1260	1890
2.3	2	0.025	0.32	0.46	750	1250	1500	2250
2.5	2	0.027	0.35	0.50	810	1350	1620	2430
2.8	2	0.030	0.39	0.56	900	1500	1800	2700
3.0	2	0.032	0.42	0.60	960	1600	1920	2880

0.5	2	0.005	0.09	0.09	150	250	300	450
0.6	2	0.006	0.11	0.11	180	300	360	540
0.7	2	0.007	0.13	0.13	210	350	420	630
0.8	2	0.009	0.14	0.14	270	450	540	810
0.9	2	0.010	0.16	0.16	300	500	600	900
1.0	2	0.011	0.18	0.18	330	550	660	990
1.2	2	0.013	0.22	0.22	390	650	780	1170
1.5	2	0.016	0.27	0.27	480	800	960	1440
1.8	2	0.019	0.32	0.32	570	950	1140	1710

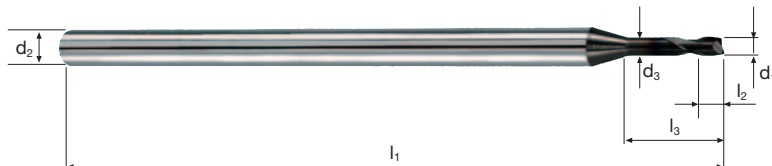
2.0	2	0.021	0.36	0.36	630	1050	1260	1890
2.3	2	0.025	0.41	0.41	750	1250	1500	2250
2.5	2	0.027	0.45	0.45	810	1350	1620	2430
2.8	2	0.030	0.50	0.50	900	1500	1800	2700
3.0	2	0.032	0.54	0.54	960	1600	1920	2880

Frese cilindriche Microcut-C5

Gambo Ø 3mm, scarico cilindrico, 5xd



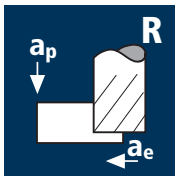

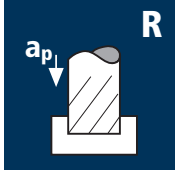

HM λ 25°
Micro γ 6°

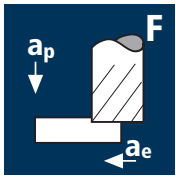

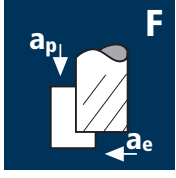



				C Graphite						CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine										DIAMANT	
										B5714	
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z		
.050	0.5	3	0.45	40	0.60	2.5	-	9.9°	2	●	
.060	0.6	3	0.55	40	0.72	3.0	-	9.2°	2	●	
.070	0.7	3	0.65	40	0.84	3.5	-	8.4°	2	●	
.080	0.8	3	0.75	40	0.96	4.0	-	7.8°	2	●	
.090	0.9	3	0.85	40	1.08	4.5	-	7.2°	2	●	
.100	1.0	3	0.95	50	1.20	5.0	0.07	6.6°	2	●	
.108	1.2	3	1.10	50	1.44	6.0	0.07	5.5°	2	●	
.120	1.5	3	1.40	50	1.80	7.5	0.07	4.2°	2	●	
.132	1.8	3	1.70	50	2.16	9.0	0.07	3.1°	2	●	
.140	2.0	3	1.90	50	2.40	10.0	0.10	2.4°	2	●	
.152	2.3	3	2.10	50	2.76	11.5	0.10	1.6°	2	●	
.160	2.5	3	2.30	50	3.00	12.5	0.10	1.1°	2	●	
.172	2.8	3	2.60	50	3.36	14.0	0.10	0.5°	2	●	
.180	3.0	3	2.80	50	3.60	15.0	0.10	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite 	0.5	2	0.005	0.20	0.30	150	250	300	450	
		0.6	2	0.006	0.25	0.35	180	300	360	540	
		0.8	2	0.008	0.30	0.50	240	400	480	720	
		1.0	2	0.009	0.40	0.60	270	450	540	810	
		1.2	2	0.011	0.50	0.70	330	550	660	990	
		1.5	2	0.014	0.60	0.90	420	700	840	1260	
		2.0	2	0.019	0.80	1.20	570	950	1140	1710	
		2.5	2	0.024	1.00	1.50	720	1200	1440	2160	
		3.0	2	0.028	1.20	1.80	840	1400	1680	2520	
	Grafite 	0.5	2	0.004	0.20	0.50	120	200	240	360	
		0.6	2	0.004	0.25	0.60	120	200	240	360	
		0.8	2	0.006	0.30	0.80	180	300	360	540	
		1.0	2	0.007	0.40	1.00	210	350	420	630	
		1.2	2	0.009	0.50	1.20	270	450	540	810	
		1.5	2	0.011	0.60	1.50	330	550	660	990	
		2.0	2	0.015	0.80	2.00	450	750	900	1350	
		2.5	2	0.018	1.00	2.50	540	900	1080	1620	
		3.0	2	0.022	1.20	3.00	660	1100	1320	1980	

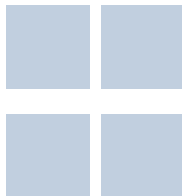
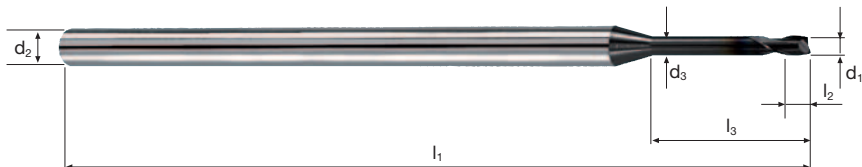
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹ vf [mm/min]	n=25000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	n=45000 min ⁻¹ vf [mm/min]	
	Grafite 	0.5	2	0.005	0.06	0.09	150	250	300	450	
		0.6	2	0.006	0.07	0.11	180	300	360	540	
		0.8	2	0.009	0.10	0.14	270	450	540	810	
		1.0	2	0.011	0.12	0.18	330	550	660	990	
		1.2	2	0.013	0.14	0.22	390	650	780	1170	
		1.5	2	0.016	0.18	0.27	480	800	960	1440	
		2.0	2	0.021	0.24	0.36	630	1050	1260	1890	
		2.5	2	0.027	0.30	0.45	810	1350	1620	2430	
		3.0	2	0.032	0.36	0.54	960	1600	1920	2880	
	Grafite 	0.5	2	0.005	0.08	0.08	150	250	300	450	
		0.6	2	0.006	0.10	0.10	180	300	360	540	
		0.8	2	0.009	0.13	0.13	270	450	540	810	
		1.0	2	0.011	0.16	0.16	330	550	660	990	
		1.2	2	0.013	0.19	0.19	390	650	780	1170	
		1.5	2	0.016	0.24	0.24	480	800	960	1440	
		2.0	2	0.021	0.32	0.32	630	1050	1260	1890	
		2.5	2	0.027	0.40	0.40	810	1350	1620	2430	
		3.0	2	0.032	0.48	0.48	960	1600	1920	2880	

Frese cilindriche Microcut-C8

Gambo Ø 3mm, scarico cilindrico, 8xd



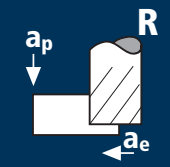
HM λ 25°
Micro γ 6°




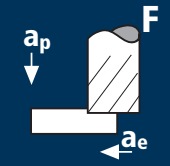
				C Graphite						CF/GF Fiber Reinforced Plastics
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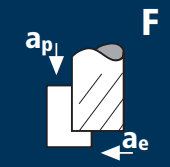
IV

										DIAMANT	
Esempio: N° Ordine											
										B5716	
\emptyset Code	d_1 ± 0.01	d_2 h6	d_3	l_1	l_2	l_3	45°	α	z		
.050	0.5	3	0.45	40	0.60	4.0	-	8.3°	2		●
.060	0.6	3	0.55	40	0.72	4.8	-	7.4°	2		●
.080	0.8	3	0.75	40	0.96	6.4	-	6.0°	2		●
.100	1.0	3	0.95	50	1.20	8.0	0.07	4.9°	2		●
.108	1.2	3	1.10	50	1.44	9.6	0.07	4.0°	2		●
.120	1.5	3	1.40	60	1.80	12.0	0.07	3.0°	2		●
.140	2.0	3	1.90	60	2.40	16.0	0.10	1.7°	2		●
.160	2.5	3	2.30	60	3.00	20.0	0.10	0.7°	2		●
.180	3.0	3	2.80	60	3.60	24.0	0.10	0.0°	2		●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
							vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
	Grafite	0.5	2	0.005	0.20	0.20	150	250	300	450
		0.6	2	0.006	0.25	0.25	180	300	360	540
		0.8	2	0.008	0.30	0.30	240	400	480	720
		1.0	2	0.009	0.40	0.40	270	450	540	810
		1.2	2	0.011	0.50	0.50	330	550	660	990
		1.5	2	0.014	0.60	0.60	420	700	840	1260
		2.0	2	0.019	0.80	0.80	570	950	1140	1710
		2.5	2	0.024	1.00	1.00	720	1200	1440	2160
		3.0	2	0.028	1.20	1.20	840	1400	1680	2520

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
							vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
	Grafite	0.5	2	0.003	0.15	0.50	90	150	180	270
		0.6	2	0.003	0.20	0.60	90	150	180	270
		0.8	2	0.004	0.25	0.80	120	200	240	360
		1.0	2	0.005	0.30	1.00	150	250	300	450
		1.2	2	0.007	0.35	1.20	210	350	420	630
		1.5	2	0.008	0.45	1.50	240	400	480	720
		2.0	2	0.011	0.60	2.00	330	550	660	990
		2.5	2	0.014	0.75	2.50	420	700	840	1260
		3.0	2	0.016	0.90	3.00	480	800	960	1440

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
							vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
	Grafite	0.5	2	0.005	0.05	0.08	150	250	300	450
		0.6	2	0.006	0.06	0.09	180	300	360	540
		0.8	2	0.009	0.08	0.12	270	450	540	810
		1.0	2	0.011	0.10	0.15	330	550	660	990
		1.2	2	0.013	0.12	0.18	390	650	780	1170
		1.5	2	0.016	0.15	0.23	480	800	960	1440
		2.0	2	0.021	0.20	0.30	630	1050	1260	1890
		2.5	2	0.027	0.25	0.38	810	1350	1620	2430
		3.0	2	0.032	0.30	0.45	960	1600	1920	2880

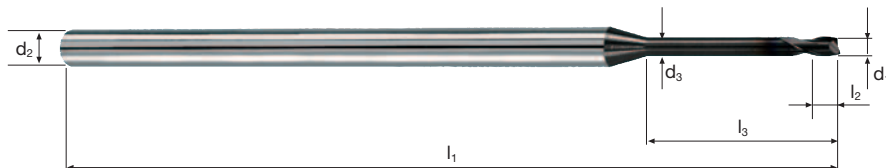
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=15000 min ⁻¹	n=25000 min ⁻¹	n=30000 min ⁻¹	n=45000 min ⁻¹
							vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
	Grafite	0.5	2	0.005	0.07	0.07	150	250	300	450
		0.6	2	0.006	0.08	0.08	180	300	360	540
		0.8	2	0.009	0.11	0.11	270	450	540	810
		1.0	2	0.011	0.14	0.14	330	550	660	990
		1.2	2	0.013	0.17	0.17	390	650	780	1170
		1.5	2	0.016	0.21	0.21	480	800	960	1440
		2.0	2	0.021	0.28	0.28	630	1050	1260	1890
		2.5	2	0.027	0.35	0.35	810	1350	1620	2430
		3.0	2	0.032	0.42	0.42	960	1600	1920	2880

Frese cilindriche Microcut-C10

Gambo Ø 3mm, scarico cilindrico, 10xd



HM λ 25°
Micro γ 6°



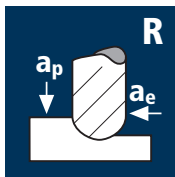
C
Graphite

CF/GF
Fiber Reinforced Plastics

IV

										DIAMANT	
Esempio: N° Ordine										B5717	
										B5717	
Ø Code	d1 ±0.01	d2 h6	d3	l1	l2	l3	45°	α	z		
.050	0.5	3	0.45	40	0.60	5.0	-	7.4°	2	●	
.060	0.6	3	0.55	40	0.72	6.0	-	6.6°	2	●	
.080	0.8	3	0.75	40	0.96	8.0	-	5.2°	2	●	
.100	1.0	3	0.95	50	1.20	10.0	0.07	4.2°	2	●	
.108	1.2	3	1.10	50	1.44	12.0	0.07	3.4°	2	●	
.120	1.5	3	1.40	60	1.80	15.0	0.07	2.5°	2	●	
.140	2.0	3	1.90	60	2.40	20.0	0.10	1.4°	2	●	
.160	2.5	3	2.30	60	3.00	25.0	0.10	0.6°	2	●	
.180	3.0	3	2.80	60	3.60	30.0	0.10	0.0°	2	●	

Applicazione

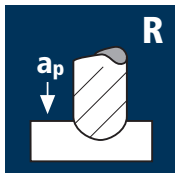


Materiale

Grafite

B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.071	3.00	3.60	1420	2130	2840	4260
8	2	0.094	4.00	4.80	1880	2820	3760	5640
10	2	0.118	5.00	6.00	2360	3540	4720	7080
12	2	0.141	6.00	7.20	2820	4230	5640	8460

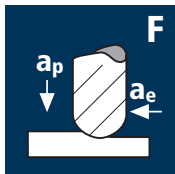


Grafite

B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.055	3.00	6.0	1100	1650	2200	3300
8	2	0.073	4.00	8.0	1460	2190	2920	4380
10	2	0.091	5.00	10.0	1820	2730	3640	5460
12	2	0.109	6.00	12.0	2180	3270	4360	6540

Applicazione

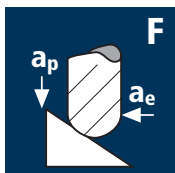


Materiale

Grafite

B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.080	0.90	1.20	1600	2400	3200	4800
8	2	0.107	1.20	1.60	2140	3210	4280	6420
10	2	0.133	1.50	2.00	2660	3990	5320	7980
12	2	0.160	1.80	2.40	3200	4800	6400	9600



Grafite

B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.080	1.20	0.40	1600	2400	3200	4800
8	2	0.107	1.60	0.40	2140	3210	4280	6420
10	2	0.133	2.00	0.40	2660	3990	5320	7980
12	2	0.160	2.40	0.40	3200	4800	6400	9600

Frese con estremità emisferica SpheroXG

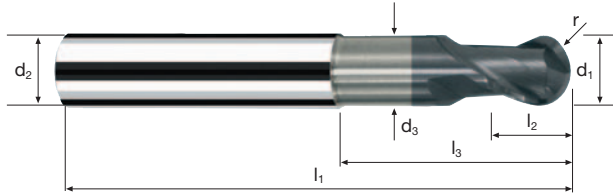
Tolleranza r ± 0.005 , 3xd



HM λ 30°
XA γ 15°

d_2
 h_5

d_1
 r



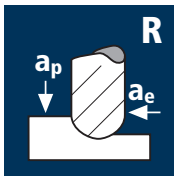
C
Graphite

CF/GF
Fiber Reinforced Plastics

IV

Esempio: N° Ordine		Rivestimento B	Articolo 7480	Codice- ϕ .300					DIAPLUS
ϕ Code	d_1 0/-0.01	d_2 h5	d_3	l_1	l_2	l_3	r ± 0.005	Z	B7480
.300	6	6	5.5	57	7	20	3.0	2	●
.391	8	8	7.4	63	9	26	4.0	2	●
.450	10	10	9.2	72	11	31	5.0	2	●
.501	12	12	11.0	83	13	37	6.0	2	●

Applicazione

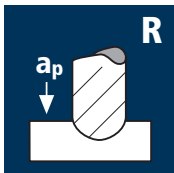


Materiale

Grafite

B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.071	2.70	3.60	1420	2130	2840	4260
8	2	0.094	3.60	4.80	1880	2820	3760	5640
10	2	0.118	4.50	6.00	2360	3540	4720	7080
12	2	0.141	5.40	7.20	2820	4230	5640	8460

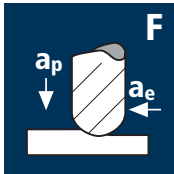


Grafite

B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.055	2.70	6.0	1100	1650	2200	3300
8	2	0.073	3.60	8.0	1460	2190	2920	4380
10	2	0.091	4.50	10.0	1820	2730	3640	5460
12	2	0.109	5.40	12.0	2180	3270	4360	6540

Applicazione

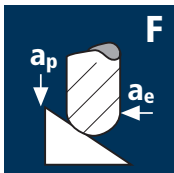


Materiale

Grafite

B

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.080	0.85	1.20	1600	2400	3200	4800
8	2	0.107	1.10	1.60	2140	3210	4280	6420
10	2	0.133	1.40	2.00	2660	3990	5320	7980
12	2	0.160	1.70	2.40	3200	4800	6400	9600



Grafite

B

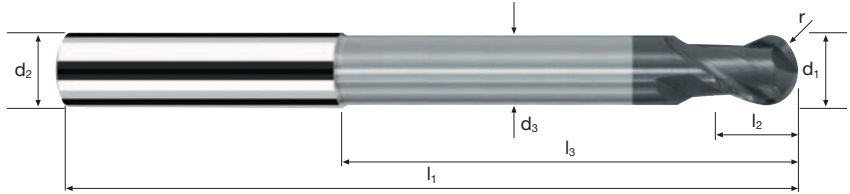
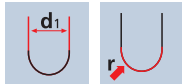
d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.080	1.10	0.35	1600	2400	3200	4800
8	2	0.107	1.45	0.35	2140	3210	4280	6420
10	2	0.133	1.80	0.35	2660	3990	5320	7980
12	2	0.160	2.15	0.35	3200	4800	6400	9600

Frese con estremità emisferica SpheroXG

Tolleranza r ±0.005, 6xd



HM λ 30°
XA γ 15°



				C Graphite					CF/GF Fiber Reinforced Plastics
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IV

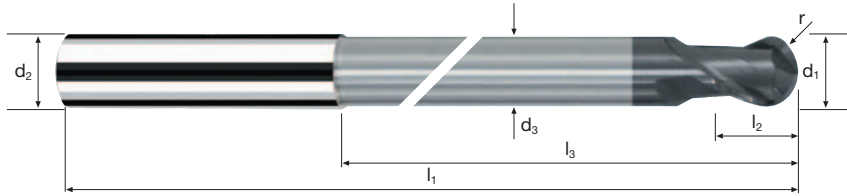
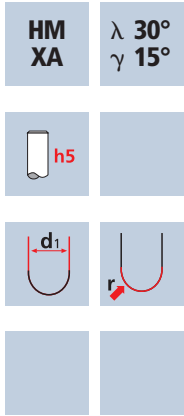
Esempio: N° Ordine		Rivestimento B	Articolo 7484	Codice-ø .300					DIAPLUS	
									B7484	
ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	z		
.300	6	6	5.5	80	7	43	3.0	2	●	
.391	8	8	7.4	90	9	53	4.0	2	●	
.450	10	10	9.2	105	11	64	5.0	2	●	
.501	12	12	11.0	120	13	74	6.0	2	●	

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	Grafite	6	2	0.071	2.40	2.40	1420	2130	2840	4260
		8	2	0.094	3.20	3.20	1880	2820	3760	5640
		10	2	0.118	4.00	4.00	2360	3540	4720	7080
		12	2	0.141	4.80	4.80	2820	4230	5640	8460
	Grafite	6	2	0.044	1.80	6.0	880	1320	1760	2640
		8	2	0.058	2.40	8.0	1160	1740	2320	3480
		10	2	0.073	3.00	10.0	1460	2190	2920	4380
		12	2	0.087	3.60	12.0	1740	2610	3480	5220

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	Grafite	6	2	0.080	0.60	0.95	1600	2400	3200	4800
		8	2	0.107	0.80	1.30	2140	3210	4280	6420
		10	2	0.133	1.00	1.60	2660	3990	5320	7980
		12	2	0.160	1.20	1.90	3200	4800	6400	9600
	Grafite	6	2	0.080	0.85	0.30	1600	2400	3200	4800
		8	2	0.107	1.10	0.30	2140	3210	4280	6420
		10	2	0.133	1.40	0.30	2660	3990	5320	7980
		12	2	0.160	1.70	0.30	3200	4800	6400	9600

Frese con estremità emisferica SpheroXG

Tolleranza r ± 0.005 , 9xd



IV

Esempio: N° Ordine									DIAPLUS
		Rivestimento	Articolo	Codice-ø					
		B	7488	.300					B7488
ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	z	
.300	6	6	5.5	100	7	63	3.0	2	●
.391	8	8	7.4	120	9	83	4.0	2	●
.450	10	10	9.2	135	11	94	5.0	2	●
.501	12	12	11.0	160	13	114	6.0	2	●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	Grafite	6	2	0.056	4.80	2.40	1120	1680	2240	3360
		8	2	0.075	6.40	3.20	1500	2250	3000	4500
		10	2	0.094	8.00	4.00	1880	2820	3760	5640
		12	2	0.113	9.60	4.80	2260	3390	4520	6780
	Grafite	6	2	0.044	3.0	6.0	880	1320	1760	2640
		8	2	0.058	4.0	8.0	1160	1740	2320	3480
		10	2	0.073	5.0	10.0	1460	2190	2920	4380
		12	2	0.087	6.0	12.0	1740	2610	3480	5220

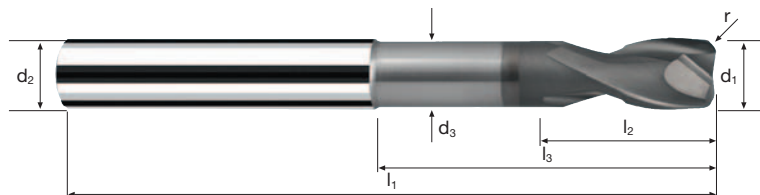
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	Grafite	6	2	0.080	0.48	2.70	1600	2400	3200	4800
		8	2	0.107	0.64	3.60	2140	3210	4280	6420
		10	2	0.133	0.80	4.50	2660	3990	5320	7980
		12	2	0.160	0.96	5.40	3200	4800	6400	9600
	Grafite	6	2	0.080	0.90	0.90	1600	2400	3200	4800
		8	2	0.107	1.20	1.20	2140	3210	4280	6420
		10	2	0.133	1.50	1.50	2660	3990	5320	7980
		12	2	0.160	1.80	1.80	3200	4800	6400	9600

Frese toriche ToroXG

Tolleranza r ± 0.005 , 6xd



HM λ 30°
XA γ 15°

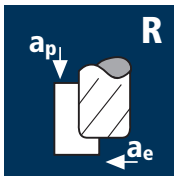


C Graphite
 CF/GF Fiber Reinforced Plastics

IV

Esempio: N° Ordine								DIAPLUS
								B7284
\emptyset Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ± 0.005	z
.300	6	6	5.5	80	7	43	0.5	2
.297	6	6	5.5	80	7	43	1.0	2
.391	8	8	7.4	90	9	53	0.5	2
.388	8	8	7.4	90	9	53	1.0	2
.450	10	10	9.2	105	11	64	0.5	2
.445	10	10	9.2	105	11	64	1.0	2
.501	12	12	11.0	120	13	74	0.5	2
.496	12	12	11.0	120	13	74	1.0	2

Applicazione

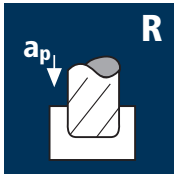


Materiale

Grafite

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.056	4.80	1.20	1120	1680	2240	3360
8	2	0.075	6.40	1.60	1500	2250	3000	4500
10	2	0.094	8.00	2.00	1880	2820	3760	5640
12	2	0.113	9.60	2.40	2260	3390	4520	6780

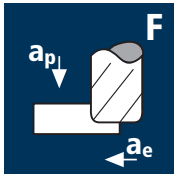


Grafite

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.044	2.10	6.0	880	1320	1760	2640
8	2	0.058	2.80	8.0	1160	1740	2320	3480
10	2	0.073	3.50	10.0	1460	2190	2920	4380
12	2	0.087	4.20	12.0	1740	2610	3480	5220

Applicazione

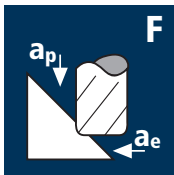


Materiale

Grafite

B

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.080	0.36	1.50	1600	2400	3200	4800
8	2	0.107	0.48	2.00	2140	3210	4280	6420
10	2	0.133	0.60	2.50	2660	3990	5320	7980
12	2	0.160	0.72	3.00	3200	4800	6400	9600



Grafite

B

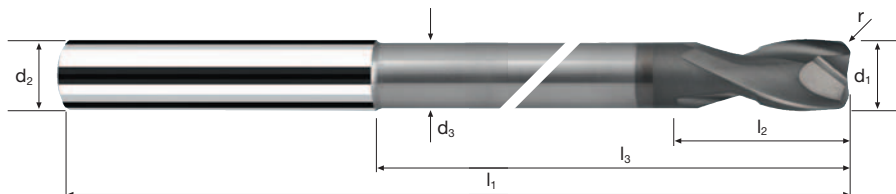
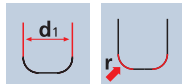
d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
6	2	0.080	0.84	0.84	1600	2400	3200	4800
8	2	0.107	1.12	1.12	2140	3210	4280	6420
10	2	0.133	1.40	1.40	2660	3990	5320	7980
12	2	0.160	1.68	1.68	3200	4800	6400	9600

Frese toriche ToroXG

Tolleranza r ±0.005, 9xd



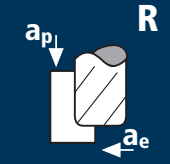
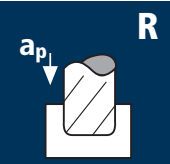
HM λ 30°
XA γ 15°

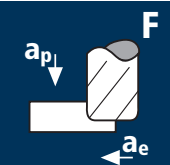
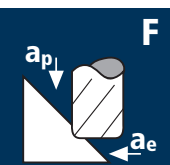


				C Graphite					CF/GF Fiber Reinforced Plastics
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IV

Esempio: N° Ordine									DIAPLUS	
									B7288	
Ø Code	d1 0/-0.01	d2 h5	d3	l1	l2	l3	r ±0.005	z		
.300	6	6	5.5	100	7	63	0.5	2		●
.297	6	6	5.5	100	7	63	1.0	2		●
.391	8	8	7.4	120	9	83	0.5	2		●
.388	8	8	7.4	120	9	83	1.0	2		●
.450	10	10	9.2	135	11	94	0.5	2		●
.445	10	10	9.2	135	11	94	1.0	2		●
.501	12	12	11.0	160	13	114	0.5	2		●
.496	12	12	11.0	160	13	114	1.0	2		●

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	Grafite	6	2	0.071	4.80	2.40	1420	2130	2840	4260
		8	2	0.094	6.40	3.20	1880	2820	3760	5640
		10	2	0.118	8.00	4.00	2360	3540	4720	7080
		12	2	0.141	9.60	4.80	2820	4230	5640	8460
	Grafite	6	2	0.055	3.0	6.0	1100	1650	2200	3300
		8	2	0.073	4.0	8.0	1460	2190	2920	4380
		10	2	0.091	5.0	10.0	1820	2730	3640	5460
		12	2	0.109	6.0	12.0	2180	3270	4360	6540

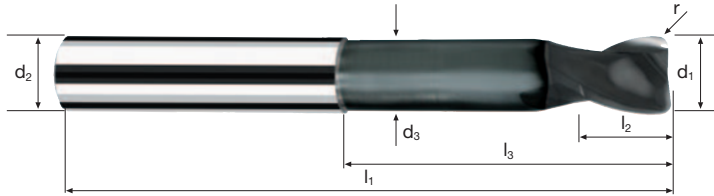
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	Grafite	6	2	0.080	0.60	2.70	1600	2400	3200	4800
		8	2	0.107	0.80	3.60	2140	3210	4280	6420
		10	2	0.133	1.00	4.50	2660	3990	5320	7980
		12	2	0.160	1.20	5.40	3200	4800	6400	9600
	Grafite	6	2	0.080	1.08	1.08	1600	2400	3200	4800
		8	2	0.107	1.44	1.44	2140	3210	4280	6420
		10	2	0.133	1.80	1.80	2660	3990	5320	7980
		12	2	0.160	2.16	2.16	3200	4800	6400	9600

Frese toriche

Tolleranza r 0/+0.03



**HM
XA** λ **30°**
 γ **15°**



C
Graphite

CF/GF
Fiber Reinforced Plastics

IV

Esempio: N° Ordine									DIAMANT	
									B5630	
Ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r 0/+0.03	z	Rivestimento Articolo Codice-Ø	
									B 5630 .300	
.300	6	6	5.5	70	7	33	1.0	2		
.391	8	8	7.4	80	9	43	1.0	2		
.450	10	10	9.2	84	11	43	1.5	2		
.501	12	12	11.0	97	13	51	1.5	2		
CNC Diametro D										
Diametro										
d1	Tolleranza e8		Minimo		Massimo		D			
6	-0.038	-0.020	5.962	5.980	5.971					
8	-0.047	-0.025	7.953	7.975	7.964					
10			9.953	9.975	9.964					
12	-0.059	-0.032	11.941	11.968	11.955					

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	
	Grafite 	2	3	0.024	4.0	0.50	720	1080	1440	2160	
		3	3	0.035	6.0	0.75	1050	1575	2100	3150	
		4	3	0.047	8.0	1.00	1410	2115	2820	4230	
		5	3	0.059	10.0	1.25	1770	2655	3540	5310	
		6	3	0.071	12.0	1.50	2130	3195	4260	6390	
		8	3	0.094	16.0	2.00	2820	4230	5640	8460	
		10	3	0.118	20.0	2.50	3540	5310	7080	10620	
		12	3	0.141	24.0	3.00	4230	6345	8460	12690	
	Grafite 	2	3	0.018	0.60	2.0	540	810	1080	1620	
		3	3	0.027	0.90	3.0	810	1215	1620	2430	
		4	3	0.036	1.20	4.0	1080	1620	2160	3240	
		5	3	0.045	1.50	5.0	1350	2025	2700	4050	
		6	3	0.055	1.80	6.0	1650	2475	3300	4950	
		8	3	0.073	2.40	8.0	2190	3285	4380	6570	
		10	3	0.091	3.00	10.0	2730	4095	5460	8190	
		12	3	0.109	3.60	12.0	3270	4905	6540	9810	

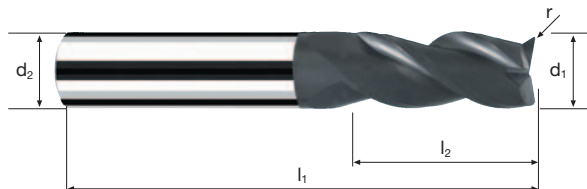
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	
	Grafite 	2	3	0.027	0.20	0.80	810	1215	1620	2430	
		3	3	0.040	0.30	1.20	1200	1800	2400	3600	
		4	3	0.053	0.40	1.60	1590	2385	3180	4770	
		5	3	0.067	0.50	2.00	2010	3015	4020	6030	
		6	3	0.080	0.60	2.40	2400	3600	4800	7200	
		8	3	0.107	0.80	3.20	3210	4815	6420	9630	
		10	3	0.133	1.00	4.00	3990	5985	7980	11970	
		12	3	0.160	1.20	4.80	4800	7200	9600	14400	
	Grafite 	2	3	0.027	4.0	0.30	810	1215	1620	2430	
		3	3	0.040	6.0	0.45	1200	1800	2400	3600	
		4	3	0.053	8.0	0.60	1590	2385	3180	4770	
		5	3	0.067	10.0	0.75	2010	3015	4020	6030	
		6	3	0.080	12.0	0.90	2400	3600	4800	7200	
		8	3	0.107	16.0	1.20	3210	4815	6420	9630	
		10	3	0.133	20.0	1.50	3990	5985	7980	11970	
		12	3	0.160	24.0	1.80	4800	7200	9600	14400	

Frese toriche

Tolleranza r 0/+0.03



**HM
XA** λ 40°
 γ 15°



			C Graphite					CF/GF Fiber Reinforced Plastics
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IV

								DIAMANT
Esempio: N° Ordine B 5640 .140								B5640
\emptyset Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	α	z	
.140	2	3	40	6	0.15	3.4°	3	●
.180	3	3	40	12	0.15	0.0°	3	●
.220	4	4	50	14	0.20	0.0°	3	●
.260	5	5	50	16	0.30	0.0°	3	●
.300	6	6	63	19	0.30	0.0°	3	●
.391	8	8	63	19	0.50	0.0°	3	●
.450	10	10	72	22	0.50	0.0°	3	●
.501	12	12	75	25	0.50	0.0°	3	●
CNC Diametro D								
						Diametro		
	d1	Tolleranza e8		Minimo	Massimo	D		
	2	-0.028	-0.014	1.972	1.986	1.979		
	3			2.972	2.986	2.979		
	4	-0.038	-0.020	3.962	3.980	3.971		
	5			4.962	4.980	4.971		
	6			5.962	5.980	5.971		
	8	-0.047	-0.025	7.953	7.975	7.964		
	10			9.953	9.975	9.964		
	12	-0.059	-0.032	11.941	11.968	11.955		

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	
	Grafite 	2	3	0.019	6.0	0.40	570	855	1140	1710	
		3	3	0.028	9.0	0.60	840	1260	1680	2520	
		4	3	0.038	12.0	0.80	1140	1710	2280	3420	
		5	3	0.047	15.0	1.00	1410	2115	2820	4230	
		6	3	0.056	18.0	1.20	1680	2520	3360	5040	
		8	3	0.075	24.0	1.60	2250	3375	4500	6750	
		10	3	0.094	30.0	2.00	2820	4230	5640	8460	
		12	3	0.113	36.0	2.40	3390	5085	6780	10170	

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	
	Grafite 	2	3	0.021	0.20	0.70	630	945	1260	1890	
		3	3	0.032	0.30	1.05	960	1440	1920	2880	
		4	3	0.043	0.40	1.40	1290	1935	2580	3870	
		5	3	0.053	0.50	1.75	1590	2385	3180	4770	
		6	3	0.064	0.60	2.10	1920	2880	3840	5760	
		8	3	0.085	0.80	2.80	2550	3825	5100	7650	
		10	3	0.107	1.00	3.50	3210	4815	6420	9630	
		12	3	0.128	1.20	4.20	3840	5760	7680	11520	

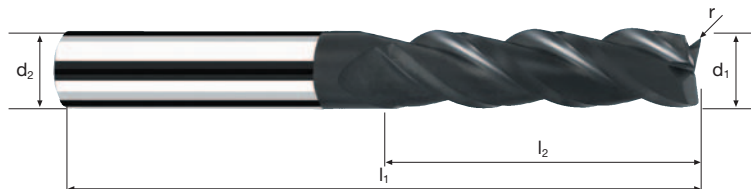
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]	
	Grafite 	2	3	0.021	6.0	0.30	630	945	1260	1890	
		3	3	0.032	9.0	0.45	960	1440	1920	2880	
		4	3	0.043	12.0	0.60	1290	1935	2580	3870	
		5	3	0.053	15.0	0.75	1590	2385	3180	4770	
		6	3	0.064	18.0	0.90	1920	2880	3840	5760	
		8	3	0.085	24.0	1.20	2550	3825	5100	7650	
		10	3	0.107	30.0	1.50	3210	4815	6420	9630	
		12	3	0.128	36.0	1.80	3840	5760	7680	11520	

Frese toriche

Tolleranza r 0/+0.03



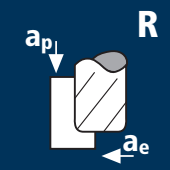
HM λ 40°
XA γ 15°

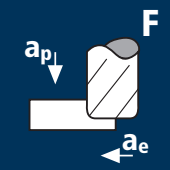


C Graphite **CF/GF** Fiber Reinforced Plastics

IV

Esempio: N° Ordine								Rivestimento		Articolo		Codice-ø		DIAMANT	
								B		5645		.140		B5645	
ø Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	α	Z								
.140	2	3	60	9	0.15	2.5°	3	●							
.180	3	3	60	30	0.15	0.0°	3	●							
.220	4	4	60	30	0.20	0.0°	3	●							
.260	5	5	70	35	0.30	0.0°	3	●							
.300	6	6	100	40	0.30	0.0°	3	●							
.391	8	8	100	40	0.50	0.0°	3	●							
.450	10	10	100	40	0.50	0.0°	3	●							
.501	12	12	97	42	0.50	0.0°	3	●							
CNC Diametro D															
Diametro															
d1	Tolleranza e8		Minimo		Massimo		D								
2	-0.028	-0.014	1.972	1.986	1.979										
3			2.972	2.986	2.979										
4	-0.038	-0.020	3.962	3.980	3.971										
5			4.962	4.980	4.971										
6			5.962	5.980	5.971										
8	-0.047	-0.025	7.953	7.975	7.964										
10			9.953	9.975	9.964										
12	-0.059	-0.032	11.941	11.968	11.955										

Applicazione	Materiale	d1	z	f _z	a _p	a _e	n=10000 min ⁻¹	n=15000 min ⁻¹	n=20000 min ⁻¹	n=30000 min ⁻¹
		[mm]		[mm]	[mm]	[mm]	vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
	Grafite	10	3	0.071	40	1.5	2130	3195	4260	6390
		12	3	0.085	48	1.8	2550	3825	5100	7650

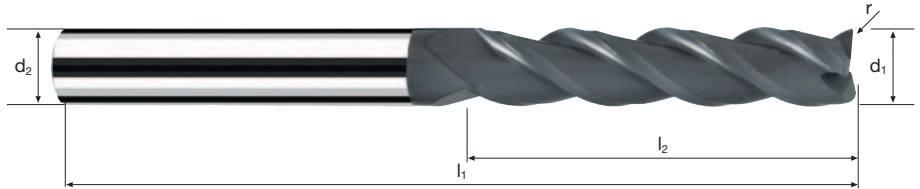
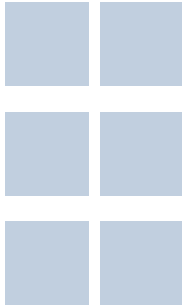
Applicazione	Materiale	d1	z	f _z	a _p	a _e	n=10000 min ⁻¹	n=15000 min ⁻¹	n=20000 min ⁻¹	n=30000 min ⁻¹
		[mm]		[mm]	[mm]	[mm]	vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]
	Grafite	10	3	0.080	1.0	3.0	2400	3600	4800	7200
		12	3	0.096	1.2	3.6	2880	4320	5760	8640

Frese toriche

Tolleranza r 0/+0.03



HM λ 40°
XA γ 15°



C Graphite **CF/GF** Fiber Reinforced Plastics

IV

							DIAMANT	
Esempio: N° Ordine		Rivestimento B	Articolo 5650	Codice-ø .450				B5650
Ø Code	d1 e8	d2 h6	l1	l2	r 0/+0.03	z		
.450	10	10	125	55	0.5	3	•	
.501	12	12	125	55	0.5	3	•	

CNC Diametro D					
d1	Tolleranza e8		Diametro		D
	Minimo	Massimo	Minimo	Massimo	
10	-0.047	-0.025	9.953	9.975	9.964
12	-0.059	-0.032	11.941	11.968	11.955



Frese per CFC

Cilindrico CVD

N° 25000



X-Generation	X	Resistenza all'usura	d, 4 - 12	CFK GFK I	CFK GFK II	CFK III	681
	X	Resistenza all'usura	d, 2 - 12	CFK GFK I	CFK GFK II	CFK III	683
	X	Resistenza all'usura	d, 8 - 12	CFK GFK I	CFK GFK II	CFK III	685

N° 25004



N° 25010



Cilindrico MD

N° 20020



N° 20025



N° 20030



N° 20060



N° 20040



N° 20360



N° 20340



Base-X	B	Resistenza all'usura	d, 4 - 12	CFK GFK I	CFK GFK II		687
	B	Resistenza all'usura	d, 4 - 12	CFK GFK I	CFK GFK II		689
	B	Resistenza all'usura	d, 4 - 12	CFK GFK I	CFK GFK II		691
	B	Resistenza all'usura	d, 4 - 10	CFK GFK I			693
	B	Resistenza all'usura	d, 4 - 10	CFK GFK I			695
	B	Resistenza all'usura	d, 4 - 10	CFK GFK I			697
	B	Resistenza all'usura	d, 4 - 10	CFK GFK I			699

V



Frese per CFC

Torico CVD

N° 25404



X-Generation

X

Resistenza all'usura r 0.2, 0.5, 1.0



**CFK
GFK
I**

**CFK
GFK
II**

**CFK
III**

701

Estremità emisferica CVD

N° 25704



X-Generation

X

Resistenza all'usura d, 2 – 12



**CFK
GFK
I**

**CFK
GFK
II**

**CFK
III**

703

N° 25700



X-Generation

X

Resistenza all'usura d, 2 – 12



**CFK
GFK
I**

**CFK
GFK
II**

**CFK
III**

705

Estremità emisferica MD

N° 20760



Base-X

B

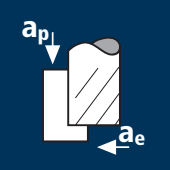






Resistenza all'usura d, 4 – 10










**CFK
GFK
I**

707

V

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	CFC  	4	2	0.045	6.0	1.0	900	1350	1800	2700
		6	2	0.070	8.0	1.5	1400	2100	2800	4200
		8	2	0.095	9.0	2.0	1900	2850	3800	5700
		10	2	0.120	9.0	2.5	2400	3600	4800	7200
		12	2	0.135	9.0	3.0	2700	4050	5400	
PRFV 	4	2	0.040	6.0	1.0	800	1200	1600	2400	
	6	2	0.060	8.0	1.5	1200	1800	2400	3600	
	8	2	0.080	9.0	2.0	1600	2400	3200	4800	
	10	2	0.100	9.0	2.5	2000	3000	4000	6000	
	12	2	0.115	9.0	3.0	2300	3450	4600		
Alluminio Si > 6%  	4	2	0.035	4.0	1.0	700	1050	1400	2100	
	6	2	0.055	6.0	1.5	1100	1650	2200	3300	
	8	2	0.070	7.0	2.0	1400	2100	2800	4200	
	10	2	0.090	7.0	2.5	1800	2700	3600	5400	
	12	2	0.105	7.0	3.0	2100	3150	4200		
Grafite 	4	2	0.040	6.0	1.0	800	1200	1600	2400	
	6	2	0.060	8.0	1.5	1200	1800	2400	3600	
	8	2	0.080	9.0	2.0	1600	2400	3200	4800	
	10	2	0.100	9.0	2.5	2000	3000	4000	6000	
	12	2	0.115	9.0	3.0	2300	3450	4600		

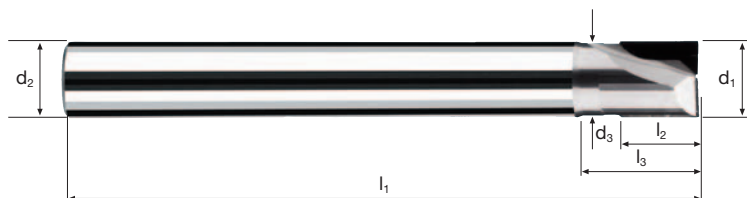
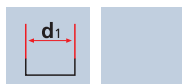
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
	CFC  	4	2	0.035	2.4	4	700	1050	1400	2100
		6	2	0.055	3.6	6	1100	1650	2200	3300
		8	2	0.075	4.8	8	1500	2250	3000	4500
		10	2	0.095	6.0	10	1900	2850	3800	5700
		12	2	0.110	7.2	12	2200	3300	4400	
PRFV 	4	2	0.030	2.4	4	600	900	1200	1800	
	6	2	0.050	3.6	6	1000	1500	2000	3000	
	8	2	0.065	4.8	8	1300	1950	2600	3900	
	10	2	0.080	6.0	10	1600	2400	3200	4800	
	12	2	0.090	7.2	12	1800	2700	3600		
Alluminio Si > 6%  	4	2	0.030	2.0	4	600	900	1200	1800	
	6	2	0.045	3.0	6	900	1350	1800	2700	
	8	2	0.055	4.0	8	1100	1650	2200	3300	
	10	2	0.070	5.0	10	1400	2100	2800	4200	
	12	2	0.085	6.0	12	1700	2550	3400		
Grafite 	4	2	0.030	2.4	4	600	900	1200	1800	
	6	2	0.050	3.6	6	1000	1500	2000	3000	
	8	2	0.065	4.8	8	1300	1950	2600	3900	
	10	2	0.080	6.0	10	1600	2400	3200	4800	
	12	2	0.090	7.2	12	1800	2700	3600		

Frese cilindriche CVD

Esecuzione medio-lunga con scarico corto, tagliante diritto



CVD λ 0°
 γ 0°

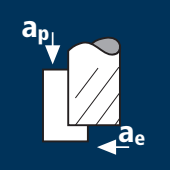













Resistenza all'usura



Al Aluminium Cast	Cu Copper	CuZn Brass	C Graphite	CFK GFK I	CFK GFK II	CFK III	CFK/Al
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Esempio: N° Ordine		Rivestimento		Articolo			Codice-ø				
				25000			.220				
										<input type="text" value="25000"/>	
Ø Code	d1 h7	d2 h6	d3	l1	l2	l3	45°	α	z		
.220	4	6	3.8	60	8	10	0.1	4.1°	2	●	
.222	4	6	3.8	60	15	20	0.1	2.4°	2	●	
.300	6	6	5.8	65	10	15	0.1	0.0°	2	●	
.304	6	6	5.8	65	20	25	0.1	0.0°	2	●	
.391	8	8	7.6	70	10	15	0.1	0.0°	2	●	
.395	8	8	7.6	70	20	30	0.1	0.0°	2	●	
.450	10	10	9.6	85	10	15	0.1	0.0°	2	●	
.455	10	10	9.6	85	20	30	0.1	0.0°	2	●	
.501	12	12	11.6	92	10	15	0.1	0.0°	2	●	
.505	12	12	11.6	92	20	30	0.1	0.0°	2	●	

Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹	n=15000 min ⁻¹	n=20000 min ⁻¹	n=30000 min ⁻¹	
							vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]	
	CFC	2	2	0.020	1.2	1.0	400	600	800	1200	
		3	2	0.030	1.8	1.5	600	900	1200	1800	
		4	2	0.040	2.4	2.0	800	1200	1600	2400	
		6	2	0.065	3.6	3.0	1300	1950	2600	3900	
		8	2	0.085	4.8	4.0	1700	2550	3400	5100	
		10	2	0.105	6.0	5.0	2100	3150	4200	6300	
		12	2	0.120	7.2	6.0	2400	3600	4800		
 	PRFV	2	2	0.015	1.2	1.0	300	450	600	900	
		3	2	0.025	1.8	1.5	500	750	1000	1500	
		4	2	0.035	2.4	2.0	700	1050	1400	2100	
		6	2	0.055	3.6	3.0	1100	1650	2200	3300	
		8	2	0.070	4.8	4.0	1400	2100	2800	4200	
		10	2	0.090	6.0	5.0	1800	2700	3600	5400	
		12	2	0.100	7.2	6.0	2000	3000	4000		
 	Alluminio Si > 6%	2	2	0.015	1.0	1.0	300	450	600	900	
		3	2	0.025	1.5	1.5	500	750	1000	1500	
		4	2	0.030	2.0	2.0	600	900	1200	1800	
		6	2	0.050	3.0	3.0	1000	1500	2000	3000	
		8	2	0.065	4.0	4.0	1300	1950	2600	3900	
		10	2	0.080	5.0	5.0	1600	2400	3200	4800	
		12	2	0.090	6.0	6.0	1800	2700	3600		
	Grafite	2	2	0.015	1.2	1.0	300	450	600	900	
		3	2	0.025	1.8	1.5	500	750	1000	1500	
		4	2	0.035	2.4	2.0	700	1050	1400	2100	
		6	2	0.055	3.6	3.0	1100	1650	2200	3300	
		8	2	0.070	4.8	4.0	1400	2100	2800	4200	
		10	2	0.090	6.0	5.0	1800	2700	3600	5400	
		12	2	0.100	7.2	6.0	2000	3000	4000		

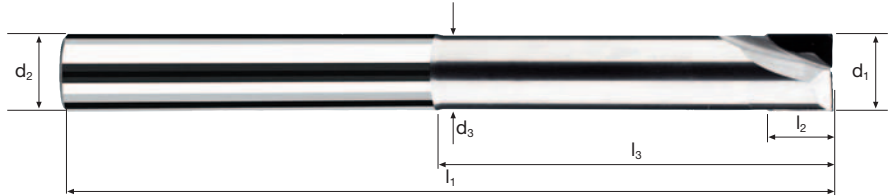
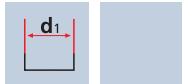
Applicazione	Materiale	d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹	n=15000 min ⁻¹	n=20000 min ⁻¹	n=30000 min ⁻¹	
							vf [mm/min]	vf [mm/min]	vf [mm/min]	vf [mm/min]	
	CFC	2	2	0.015	1.0	2	300	450	600	900	
		3	2	0.020	1.5	3	400	600	800	1200	
		4	2	0.030	2.0	4	600	900	1200	1800	
		6	2	0.045	3.0	6	900	1350	1800	2700	
		8	2	0.060	4.0	8	1200	1800	2400	3600	
		10	2	0.075	5.0	10	1500	2250	3000	4500	
		12	2	0.085	6.0	12	1700	2550	3400		
 	PRFV	2	2	0.010	1.0	2	200	300	400	600	
		3	2	0.020	1.5	3	400	600	800	1200	
		4	2	0.025	2.0	4	500	750	1000	1500	
		6	2	0.040	3.0	6	800	1200	1600	2400	
		8	2	0.050	4.0	8	1000	1500	2000	3000	
		10	2	0.065	5.0	10	1300	1950	2600	3900	
		12	2	0.070	6.0	12	1400	2100	2800		
 	Alluminio Si > 6%	2	2	0.010	0.8	2	200	300	400	600	
		3	2	0.020	1.2	3	400	600	800	1200	
		4	2	0.020	1.6	4	400	600	800	1200	
		6	2	0.035	2.4	6	700	1050	1400	2100	
		8	2	0.045	3.2	8	900	1350	1800	2700	
		10	2	0.055	4.0	10	1100	1650	2200	3300	
		12	2	0.065	4.8	12	1300	1950	2600		
	Grafite	2	2	0.010	1.0	2	200	300	400	600	
		3	2	0.020	1.5	3	400	600	800	1200	
		4	2	0.025	2.0	4	500	750	1000	1500	
		6	2	0.040	3.0	6	800	1200	1600	2400	
		8	2	0.050	4.0	8	1000	1500	2000	3000	
		10	2	0.065	5.0	10	1300	1950	2600	3900	
		12	2	0.070	6.0	12	1400	2100	2800		

Frese cilindriche CVD

Esecuzione lunga con scarico, tagliente diritto



CVD λ 0°
 γ 0°



Resistenza all'usura



Al Aluminium Cast	Cu Copper	CuZn Brass	C Graphite	CFK GFK I	CFK GFK II	CFK III	CFK/Al
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Esempio: N° Ordine		Rivestimento		Articolo		Codice-ø					
				25004		.140					25004
Ø Code	d1 h7	d2 h6	d3	l1	l2	l3	45°	α	z		
.140	2	6	1.9	55	2.5	10	0.1	6.5°	2	●	
.180	3	6	2.8	75	2.5	20	0.1	3.3°	2	●	
.220	4	6	3.8	75	2.5	30	0.1	1.7°	2	●	
.300	6	6	5.6	100	6.0	40	0.1	0.0°	2	●	
.391	8	8	7.4	100	7.0	40	0.1	0.0°	2	●	
.450	10	10	9.6	100	8.0	50	0.1	0.0°	2	●	
.501	12	12	11.6	105	9.0	60	0.1	0.0°	2	●	

V

Applicazione

Materiale

CFC

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
8	5	0.075	8.0	4.0	3750	5625	7500	11250
10	5	0.095	10.0	5.0	4750	7125	9500	14250
12	7	0.110	12.0	6.0	7700	11550	15400	

PRFV

8	5	0.065	8.0	4.0	3250	4875	6500	9750
10	5	0.080	10.0	5.0	4000	6000	8000	12000
12	7	0.095	12.0	6.0	6650	9975	13300	

Alluminio
Si > 6%

8	5	0.060	6.4	4.0	3000	4500	6000	9000
10	5	0.070	8.0	5.0	3500	5250	7000	10500
12	7	0.085	9.6	6.0	5950	8925	11900	

Grafite

8	5	0.065	8.0	4.0	3250	4875	6500	9750
10	5	0.080	10.0	5.0	4000	6000	8000	12000
12	7	0.095	12.0	6.0	6650	9975	13300	

Applicazione

Materiale

CFC

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
8	5	0.045	8.0	8	2250	3375	4500	6750
10	5	0.055	10.0	10	2750	4125	5500	8250
12	7	0.065	12.0	12	4550	6825	9100	

PRFV

8	5	0.040	8.0	8	2000	3000	4000	6000
10	5	0.050	10.0	10	2500	3750	5000	7500
12	7	0.055	12.0	12	3850	5775	7700	

Alluminio
Si > 6%

8	5	0.035	6.4	8	1750	2625	3500	5250
10	5	0.040	8.0	10	2000	3000	4000	6000
12	7	0.050	9.6	12	3500	5250	7000	

Grafite

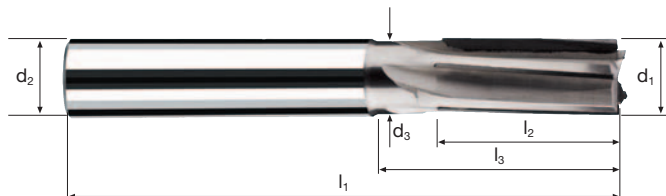
8	5	0.040	8.0	8	2000	3000	4000	6000
10	5	0.050	10.0	10	2500	3750	5000	7500
12	7	0.055	12.0	12	3850	5775	7700	

Frese cilindriche CVD

Esecuzione normale con scarico corto, tagliente diritto



CVD λ **4°**
γ **0°**



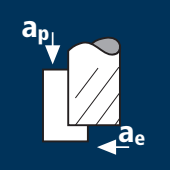
Resistenza all'usura




- Al Aluminium Cast
- Cu Copper
- CuZn Brass
- C Graphite
- CFK GFK I
- CFK GFK II
- CFK III
- CFK/Al

Esempio: N° Ordine											
		Rivestimento		Articolo		Codice-ø					
				25010		.391				25010	
ø Code	d1 h8	d2 h6	d3	l1	l2	l3	45°	z			
.391	8	8	7.4	55	10	18	0.1	5	●		
.395	8	8	7.4	65	20	28	0.1	5	●		
.450	10	10	9.4	62	12	21	0.1	5	●		
.455	10	10	9.4	72	22	31	0.1	5	●		
.501	12	12	11.4	70	15	24	0.1	7	●		
.505	12	12	11.4	80	24	34	0.1	7	●		

V

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	CFC	4	8	200	0.025	7.2	1.6	15915	3185
		5	8	200	0.030	9.0	2.0	12735	3055
		6	8	200	0.040	10.8	2.4	10610	3395
		8	8	200	0.045	14.4	3.2	7960	2865
		10	8	200	0.050	18.0	4.0	6365	2545
		12	8	200	0.060	21.6	4.8	5305	2545
	PRFV	4	8	150	0.030	7.2	1.6	11935	2865
		5	8	150	0.035	9.0	2.0	9550	2675
		6	8	150	0.040	10.8	2.4	7960	2545
		8	8	150	0.050	14.4	3.2	5970	2390
		10	8	150	0.055	18.0	4.0	4775	2100
		12	8	150	0.065	21.6	4.8	3980	2070

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	CFC	4	8	150	0.020	3.2	4	11935	1910
		5	8	150	0.025	4.0	5	9550	1910
		6	8	150	0.030	4.8	6	7960	1910
		8	8	150	0.035	6.4	8	5970	1670
		10	8	150	0.040	8.0	10	4775	1530
		12	8	150	0.050	9.6	12	3980	1590
	PRFV	4	8	100	0.025	3.2	4	7960	1590
		5	8	100	0.030	4.0	5	6365	1530
		6	8	100	0.030	4.8	6	5305	1275
		8	8	100	0.040	6.4	8	3980	1275
		10	8	100	0.045	8.0	10	3185	1145
		12	8	100	0.050	9.6	12	2655	1060

Attenersi alle avvertenze tecniche per l'applicazione a pag. 921!

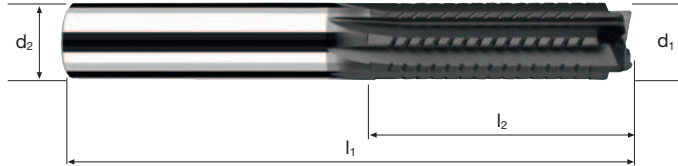
Frese cilindriche

Esecuzione normale, tagliente diritto



HM
MG6

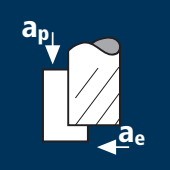
λ **0°**
 γ **18°**




Resistenza all'usura



Esempio: N° Ordine		Rivestimento B	Articolo 20020	Codice- ϕ .220					DIAMANT
ϕ Code	d_1 h10	d_2 h6	l_1	l_2	45°	α	z	B20020	
.220	4	6	60	16	0.1	2.9°	8	●	
.260	5	6	60	18	0.1	1.4°	8	●	
.300	6	6	60	20	0.1	0.0°	8	●	
.302	6	6	65	25	0.1	0.0°	8	●	
.304	6	6	75	28	0.1	0.0°	8	●	
.391	8	8	63	22	0.2	0.0°	8	●	
.393	8	8	75	32	0.2	0.0°	8	●	
.450	10	10	72	32	0.2	0.0°	8	●	
.501	12	12	83	32	0.2	0.0°	8	●	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	CFC	4	8	200	0.025	7.2	1.6	15915	3185
		5	8	200	0.030	9.0	2.0	12735	3055
		6	8	200	0.040	10.8	2.4	10610	3395
		8	8	200	0.045	14.4	3.2	7960	2865
		10	8	200	0.050	18.0	4.0	6365	2545
		12	8	200	0.060	21.6	4.8	5305	2545
	PRFV	4	8	150	0.030	7.2	1.6	11935	2865
		5	8	150	0.035	9.0	2.0	9550	2675
		6	8	150	0.040	10.8	2.4	7960	2545
		8	8	150	0.050	14.4	3.2	5970	2390
		10	8	150	0.055	18.0	4.0	4775	2100
		12	8	150	0.065	21.6	4.8	3980	2070

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	CFC	4	8	150	0.020	3.2	4	11935	1910
		5	8	150	0.025	4.0	5	9550	1910
		6	8	150	0.030	4.8	6	7960	1910
		8	8	150	0.035	6.4	8	5970	1670
		10	8	150	0.040	8.0	10	4775	1530
		12	8	150	0.050	9.6	12	3980	1590
	PRFV	4	8	100	0.025	3.2	4	7960	1590
		5	8	100	0.030	4.0	5	6365	1530
		6	8	100	0.030	4.8	6	5305	1275
		8	8	100	0.040	6.4	8	3980	1275
		10	8	100	0.045	8.0	10	3185	1145
		12	8	100	0.050	9.6	12	2655	1060

Attenersi alle avvertenze tecniche per l'applicazione a pag. 921!

Frese cilindriche

Esecuzione normale, tagliente a trazione



HM
MG6 λ **8°**
 γ **18°**



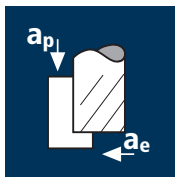
Resistenza all'usura



Esempio: N° Ordine		Rivestimento B	Articolo 20025	Codice-ø .220					DIAMANT
ø Code	d1 h10	d2 h6	l1	l2	45°	α	z		B20025
.220	4	6	60	16	0.1	2.9°	8		●
.260	5	6	60	18	0.1	1.4°	8		●
.300	6	6	60	20	0.1	0.0°	8		●
.302	6	6	65	25	0.1	0.0°	8		●
.304	6	6	75	28	0.1	0.0°	8		●
.391	8	8	63	22	0.2	0.0°	8		●
.393	8	8	75	32	0.2	0.0°	8		●
.450	10	10	72	32	0.2	0.0°	8		●
.501	12	12	83	32	0.2	0.0°	8		●



Applicazione



Materiale

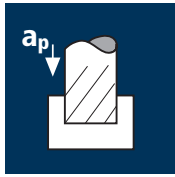
CFC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
4	8	200	0.025	7.2	1.6	15915	3185
5	8	200	0.030	9.0	2.0	12735	3055
6	8	200	0.040	10.8	2.4	10610	3395
8	8	200	0.045	14.4	3.2	7960	2865
10	8	200	0.050	18.0	4.0	6365	2545
12	8	200	0.060	21.6	4.8	5305	2545

PRFV

4	8	150	0.030	7.2	1.6	11935	2865
5	8	150	0.035	9.0	2.0	9550	2675
6	8	150	0.040	10.8	2.4	7960	2545
8	8	150	0.050	14.4	3.2	5970	2390
10	8	150	0.055	18.0	4.0	4775	2100
12	8	150	0.065	21.6	4.8	3980	2070

Applicazione



Materiale

CFC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
4	8	150	0.020	3.2	4	11935	1910
5	8	150	0.025	4.0	5	9550	1910
6	8	150	0.030	4.8	6	7960	1910
8	8	150	0.035	6.4	8	5970	1670
10	8	150	0.040	8.0	10	4775	1530
12	8	150	0.050	9.6	12	3980	1590

PRFV

4	8	100	0.025	3.2	4	7960	1590
5	8	100	0.030	4.0	5	6365	1530
6	8	100	0.030	4.8	6	5305	1275
8	8	100	0.040	6.4	8	3980	1275
10	8	100	0.045	8.0	10	3185	1145
12	8	100	0.050	9.6	12	2655	1060

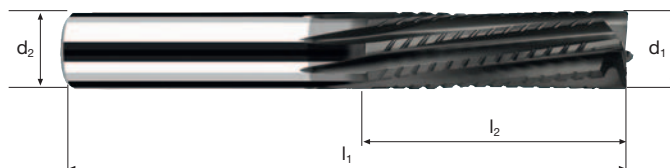
Attenersi alle avvertenze tecniche per l'applicazione a pag. 921!

Frese cilindriche

Esecuzione normale, tagliente a spinta



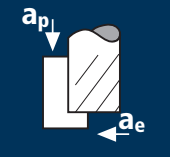
HM $\lambda -8^\circ$
MG6 $\gamma 18^\circ$





Resistenza all'usura



Esempio: N° Ordine		Rivestimento B	Articolo 20030	Codice-ø .220					DIAMANT
ø Code	d1 h10	d2 h6	l1	l2	45°	α	z	B20030	
.220	4	6	60	16	0.1	2.9°	8	●	
.260	5	6	60	18	0.1	1.4°	8	●	
.300	6	6	60	20	0.1	0.0°	8	●	
.302	6	6	65	25	0.1	0.0°	8	●	
.304	6	6	75	28	0.1	0.0°	8	●	
.391	8	8	63	22	0.2	0.0°	8	●	
.393	8	8	75	32	0.2	0.0°	8	●	
.450	10	10	72	32	0.2	0.0°	8	●	
.501	12	12	83	32	0.2	0.0°	8	●	

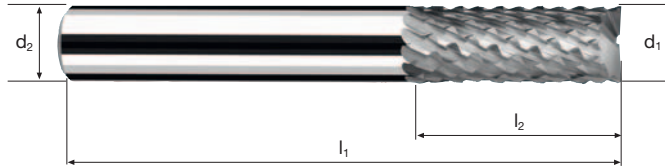
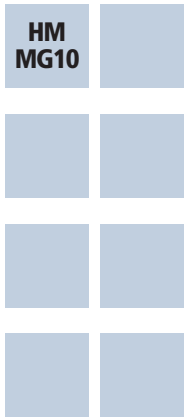
Applicazione	Materiale	d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	CFC	4	160	0.100	8.0	1.6	12735	1275	
		5	160	0.140	10.0	2.0	10185	1425	
		6	160	0.190	12.0	2.4	8490	1615	
		8	160	0.285	16.0	3.2	6365	1815	
		10	160	0.385	20.0	4.0	5095	1960	
	PRFV	4	100	0.100	8.0	1.6	7960	795	
		5	100	0.140	10.0	2.0	6365	890	
		6	100	0.190	12.0	2.4	5305	1010	
		8	100	0.285	16.0	3.2	3980	1135	
		10	100	0.385	20.0	4.0	3185	1225	

Applicazione	Materiale	d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	CFC	4	100	0.070	4.0	4	7960	555	
		5	100	0.100	5.0	5	6365	635	
		6	100	0.135	6.0	6	5305	715	
		8	100	0.200	8.0	8	3980	795	
		10	100	0.270	10.0	10	3185	860	
	PRFV	4	60	0.070	4.0	4	4775	335	
		5	60	0.100	5.0	5	3820	380	
		6	60	0.135	6.0	6	3185	430	
		8	60	0.200	8.0	8	2385	475	
		10	60	0.270	10.0	10	1910	515	
	CFC	4	100	0.035	2.0	4	7960	280	
		5	100	0.050	2.5	5	6365	320	
		6	100	0.065	3.0	6	5305	345	
		8	100	0.100	4.0	8	3980	400	
		10	100	0.135	5.0	10	3185	430	
	PRFV	4	60	0.035	2.0	4	4775	165	
		5	60	0.050	2.5	5	3820	190	
		6	60	0.065	3.0	6	3185	205	
		8	60	0.100	4.0	8	2385	240	
		10	60	0.135	5.0	10	1910	260	

Attenersi alle avvertenze tecniche per l'applicazione a pag. 921!

Frese cilindriche

Esecuzione normale, dentellatura media, tagliente a trazione

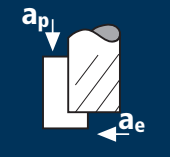



Resistenza all'usura



Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø		
		20060		.220		
					20060	
Ø Code	d1 h11	d2 h6	l1	l2		
.220	4	4	50	16	●	
.260	5	5	50	16	●	
.300	6	6	60	19	●	
.302	6	6	75	30	●	
.391	8	8	63	25	●	
.393	8	8	75	35	●	
.450	10	10	72	25	●	



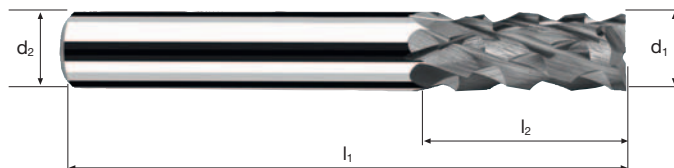
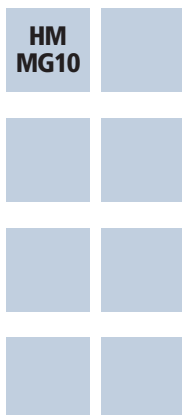
Applicazione	Materiale	d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	CFC	4	160	0.090	8.0	1.6	12735	1145
		5	160	0.125	10.0	2.0	10185	1275
		6	160	0.170	12.0	2.4	8490	1445
		8	160	0.255	16.0	3.2	6365	1625
		10	160	0.345	20.0	4.0	5095	1760
	PRFV	4	100	0.090	8.0	1.6	7960	715
		5	100	0.125	10.0	2.0	6365	795
		6	100	0.170	12.0	2.4	5305	900
		8	100	0.255	16.0	3.2	3980	1015
		10	100	0.345	20.0	4.0	3185	1100

Applicazione	Materiale	d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
	CFC	4	100	0.065	4.0	4	7960	515
		5	100	0.090	5.0	5	6365	575
		6	100	0.120	6.0	6	5305	635
		8	100	0.180	8.0	8	3980	715
		10	100	0.240	10.0	10	3185	765
	PRFV	4	60	0.065	4.0	4	4775	310
		5	60	0.090	5.0	5	3820	345
		6	60	0.120	6.0	6	3185	380
		8	60	0.180	8.0	8	2385	430
		10	60	0.240	10.0	10	1910	460
	CFC	4	100	0.030	2.0	4	7960	240
		5	100	0.045	2.5	5	6365	285
		6	100	0.060	3.0	6	5305	320
		8	100	0.090	4.0	8	3980	360
		10	100	0.120	5.0	10	3185	380
	PRFV	4	60	0.030	2.0	4	4775	145
		5	60	0.045	2.5	5	3820	170
		6	60	0.060	3.0	6	3185	190
		8	60	0.090	4.0	8	2385	215
		10	60	0.120	5.0	10	1910	230

Attenersi alle avvertenze tecniche per l'applicazione a pag. 921!

Frese cilindriche

Esecuzione normale, dentellatura grossa, tagliente a trazione

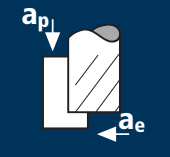



Resistenza all'usura



Esempio: N° Ordine					Rivestimento		Articolo		Codice-ø	
					20040		.220		20040	
ø Code	d1 h11	d2 h6	l1	l2						
.220	4	4	50	16					●	
.260	5	5	50	16					●	
.300	6	6	60	19					●	
.302	6	6	75	30					●	
.391	8	8	63	25					●	
.393	8	8	75	35					●	
.450	10	10	72	25					●	



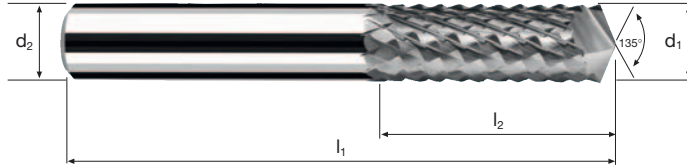
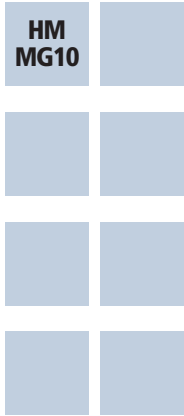
Applicazione	Materiale	d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	CFC	4	160	0.100	8.0	1.6	12735	1275	
		5	160	0.140	10.0	2.0	10185	1425	
		6	160	0.190	12.0	2.4	8490	1615	
		8	160	0.285	16.0	3.2	6365	1815	
		10	160	0.385	20.0	4.0	5095	1960	
	PRFV	4	100	0.100	8.0	1.6	7960	795	
		5	100	0.140	10.0	2.0	6365	890	
		6	100	0.190	12.0	2.4	5305	1010	
		8	100	0.285	16.0	3.2	3980	1135	
		10	100	0.385	20.0	4.0	3185	1225	

Applicazione	Materiale	d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	CFC	4	100	0.070	4.0	4	7960	555	
		5	100	0.100	5.0	5	6365	635	
		6	100	0.135	6.0	6	5305	715	
		8	100	0.200	8.0	8	3980	795	
		10	100	0.270	10.0	10	3185	860	
	PRFV	4	60	0.070	4.0	4	4775	335	
		5	60	0.100	5.0	5	3820	380	
		6	60	0.135	6.0	6	3185	430	
		8	60	0.200	8.0	8	2385	475	
		10	60	0.270	10.0	10	1910	515	

Attenersi alle avvertenze tecniche per l'applicazione a pag. 921!

Frese cilindriche

Esecuzione normale con punta perforante, dentellatura media, tagliente a trazione

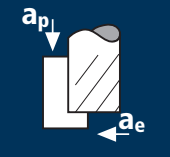



Resistenza all'usura



Esempio: N° Ordine		Rivestimento	Articolo	Codice-Ø		
			20360	.220		20360
Ø Code	d1 h11	d2 h6	l1	l2		
.220	4	4	50	16	●	
.260	5	5	50	16	●	
.300	6	6	60	19	●	
.302	6	6	75	30	●	
.391	8	8	60	25	●	
.393	8	8	75	35	●	
.450	10	10	72	30	●	



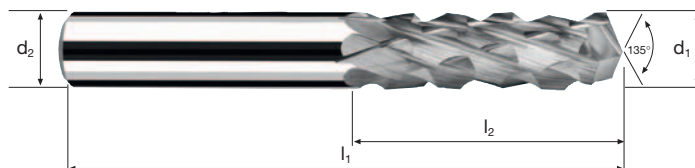
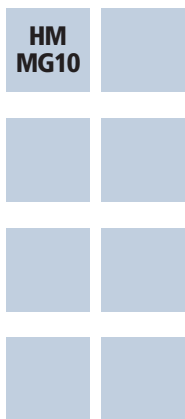
Applicazione	Materiale	d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	CFC	4	160	0.090	8.0	1.6	12735	1145	
		5	160	0.125	10.0	2.0	10185	1275	
		6	160	0.170	12.0	2.4	8490	1445	
		8	160	0.255	16.0	3.2	6365	1625	
		10	160	0.345	20.0	4.0	5095	1760	
	PRFV	4	100	0.090	8.0	1.6	7960	715	
		5	100	0.125	10.0	2.0	6365	795	
		6	100	0.170	12.0	2.4	5305	900	
		8	100	0.255	16.0	3.2	3980	1015	
		10	100	0.345	20.0	4.0	3185	1100	

Applicazione	Materiale	d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	
	CFC	4	100	0.065	4.0	4	7960	515	
		5	100	0.090	5.0	5	6365	575	
		6	100	0.120	6.0	6	5305	635	
		8	100	0.180	8.0	8	3980	715	
		10	100	0.240	10.0	10	3185	765	
	PRFV	4	60	0.065	4.0	4	4775	310	
		5	60	0.090	5.0	5	3820	345	
		6	60	0.120	6.0	6	3185	380	
		8	60	0.180	8.0	8	2385	430	
		10	60	0.240	10.0	10	1910	460	

Attenersi alle avvertenze tecniche per l'applicazione a pag. 921!

Frese cilindriche

Esecuzione normale con punta perforante, dentellatura grossa, tagliente a trazione



Resistenza all'usura



Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø		
		20340		.220	20340	
ø Code	d1 h11	d2 h6	l1	l2		
.220	4	4	50	16	•	
.260	5	5	50	16	•	
.300	6	6	60	19	•	
.302	6	6	75	30	•	
.391	8	8	60	25	•	
.393	8	8	75	35	•	
.450	10	10	72	30	•	



Materiale

CFC

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
2	2	0.020	1.2	1.0	400	600	800	1200
3	2	0.030	1.8	1.5	600	900	1200	1800
4	2	0.040	2.4	2.0	800	1200	1600	2400
6	2	0.065	3.6	3.0	1300	1950	2600	3900
8	2	0.085	4.8	4.0	1700	2550	3400	5100
10	2	0.105	6.0	5.0	2100	3150	4200	6300
12	2	0.120	7.2	6.0	2400	3600	4800	

PRFV

2	2	0.015	1.2	1.0	300	450	600	900
3	2	0.025	1.8	1.5	500	750	1000	1500
4	2	0.035	2.4	2.0	700	1050	1400	2100
6	2	0.055	3.6	3.0	1100	1650	2200	3300
8	2	0.070	4.8	4.0	1400	2100	2800	4200
10	2	0.090	6.0	5.0	1800	2700	3600	5400
12	2	0.100	7.2	6.0	2000	3000	4000	

Alluminio
Si > 6%

2	2	0.015	1.0	1.0	300	450	600	900
3	2	0.025	1.5	1.5	500	750	1000	1500
4	2	0.030	2.0	2.0	600	900	1200	1800
6	2	0.050	3.0	3.0	1000	1500	2000	3000
8	2	0.065	4.0	4.0	1300	1950	2600	3900
10	2	0.080	5.0	5.0	1600	2400	3200	4800
12	2	0.090	6.0	6.0	1800	2700	3600	

Grafite

2	2	0.015	1.2	1.0	300	450	600	900
3	2	0.025	1.8	1.5	500	750	1000	1500
4	2	0.035	2.4	2.0	700	1050	1400	2100
6	2	0.055	3.6	3.0	1100	1650	2200	3300
8	2	0.070	4.8	4.0	1400	2100	2800	4200
10	2	0.090	6.0	5.0	1800	2700	3600	5400
12	2	0.100	7.2	6.0	2000	3000	4000	



Materiale

CFC

d1 [mm]	z	f _z [mm]	a _p [mm]	a _e [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
2	2	0.015	1.2	2	300	450	600	900
3	2	0.020	1.8	3	400	600	800	1200
4	2	0.030	2.4	4	600	900	1200	1800
6	2	0.045	3.6	6	900	1350	1800	2700
8	2	0.060	4.8	8	1200	1800	2400	3600
10	2	0.075	6.0	10	1500	2250	3000	4500
12	2	0.085	7.2	12	1700	2550	3400	

PRFV

2	2	0.010	1.2	2	200	300	400	600
3	2	0.020	1.8	3	400	600	800	1200
4	2	0.025	2.4	4	500	750	1000	1500
6	2	0.040	3.6	6	800	1200	1600	2400
8	2	0.050	4.8	8	1000	1500	2000	3000
10	2	0.065	6.0	10	1300	1950	2600	3900
12	2	0.070	7.2	12	1400	2100	2800	

Alluminio
Si > 6%

2	2	0.010	1.0	2	200	300	400	600
3	2	0.020	1.5	3	400	600	800	1200
4	2	0.020	2.0	4	400	600	800	1200
6	2	0.035	3.0	6	700	1050	1400	2100
8	2	0.045	4.0	8	900	1350	1800	2700
10	2	0.055	5.0	10	1100	1650	2200	3300
12	2	0.065	6.0	12	1300	1950	2600	

Grafite

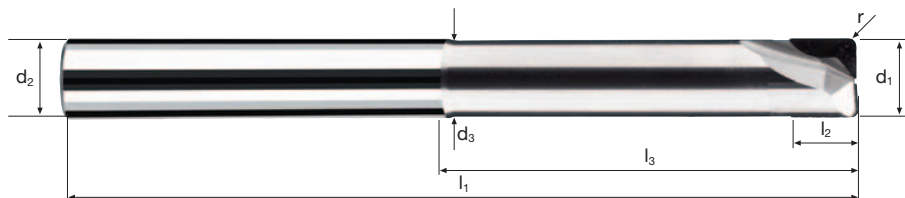
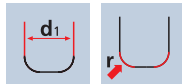
2	2	0.010	1.2	2	200	300	400	600
3	2	0.020	1.8	3	400	600	800	1200
4	2	0.025	2.4	4	500	750	1000	1500
6	2	0.040	3.6	6	800	1200	1600	2400
8	2	0.050	4.8	8	1000	1500	2000	3000
10	2	0.065	6.0	10	1300	1950	2600	3900
12	2	0.070	7.2	12	1400	2100	2800	

Frese toriche CVD

Esecuzione lunga con scarico, tagliente diritto



CVD λ 0°
 γ 0°



Resistenza all'usura



Al Aluminium Cast	Cu Copper	CuZn Brass		C Graphite	CFK GFK I	CFK GFK II	CFK III	CFK/Al	
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Esempio: N° Ordine		Rivestimento		Articolo		Codice-ø							
				25404		.138							
												25404	
ø Code	d1 h7	d2 h6	d3	l1	l2	l3	r ±0.01	α	z				
.138	2	6	1.9	55	2.5	10	0.2	6.6°	2	●			
.178	3	6	2.8	75	2.5	20	0.2	3.3°	2	●			
.218	4	6	3.8	75	2.5	30	0.2	1.7°	2	●			
.300	6	6	5.6	100	6.0	40	0.5	0.0°	2	●			
.388	8	8	7.6	100	7.0	40	0.5	0.0°	2	●			
.448	10	10	9.6	100	8.0	50	0.5	0.0°	2	●			
.498	12	12	11.6	107	9.0	60	0.5	0.0°	2	●			
.302	6	6	5.6	100	6.0	40	1.0	0.0°	2	●			
.391	8	8	7.6	100	7.0	40	1.0	0.0°	2	●			
.450	10	10	9.6	100	8.0	50	1.0	0.0°	2	●			
.501	12	12	11.6	107	9.0	60	1.0	0.0°	2	●			



Applicazione

Materiale

CFC

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
2	2	0.020	1.1	0.90	400	600	800	1200
3	2	0.030	1.7	1.35	600	900	1200	1800
4	2	0.040	2.2	1.80	800	1200	1600	2400
6	2	0.065	3.3	2.70	1300	1950	2600	3900
8	2	0.085	4.4	3.60	1700	2550	3400	5100
10	2	0.105	5.5	4.50	2100	3150	4200	6300
12	2	0.120	6.6	5.40	2400	3600	4800	

PRFV

2	2	0.015	1.1	0.90	300	450	600	900
3	2	0.025	1.7	1.35	500	750	1000	1500
4	2	0.035	2.2	1.80	700	1050	1400	2100
6	2	0.055	3.3	2.70	1100	1650	2200	3300
8	2	0.070	4.4	3.60	1400	2100	2800	4200
10	2	0.090	5.5	4.50	1800	2700	3600	5400
12	2	0.100	6.6	5.40	2000	3000	4000	

Alluminio
Si > 6%

2	2	0.015	1.1	0.90	300	450	600	900
3	2	0.025	1.7	1.35	500	750	1000	1500
4	2	0.030	2.2	1.80	600	900	1200	1800
6	2	0.050	3.3	2.70	1000	1500	2000	3000
8	2	0.065	4.4	3.60	1300	1950	2600	3900
10	2	0.080	5.5	4.50	1600	2400	3200	4800
12	2	0.090	6.6	5.40	1800	2700	3600	

Grafite

2	2	0.015	1.1	0.90	300	450	600	900
3	2	0.025	1.7	1.35	500	750	1000	1500
4	2	0.035	2.2	1.80	700	1050	1400	2100
6	2	0.055	3.3	2.70	1100	1650	2200	3300
8	2	0.070	4.4	3.60	1400	2100	2800	4200
10	2	0.090	5.5	4.50	1800	2700	3600	5400
12	2	0.100	6.6	5.40	2000	3000	4000	

Applicazione

Materiale

CFC

d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
2	2	0.020	0.20	0.20	400	600	800	1200
3	2	0.030	0.30	0.30	600	900	1200	1800
4	2	0.040	0.40	0.40	800	1200	1600	2400
6	2	0.065	0.60	0.60	1300	1950	2600	3900
8	2	0.085	0.80	0.80	1700	2550	3400	5100
10	2	0.105	1.00	1.00	2100	3150	4200	6300
12	2	0.120	1.20	1.20	2400	3600	4800	

PRFV

2	2	0.015	0.20	0.20	300	450	600	900
3	2	0.025	0.30	0.30	500	750	1000	1500
4	2	0.035	0.40	0.40	700	1050	1400	2100
6	2	0.055	0.60	0.60	1100	1650	2200	3300
8	2	0.070	0.80	0.80	1400	2100	2800	4200
10	2	0.090	1.00	1.00	1800	2700	3600	5400
12	2	0.100	1.20	1.20	2000	3000	4000	

Alluminio
Si > 6%

2	2	0.015	0.20	0.20	300	450	600	900
3	2	0.025	0.30	0.30	500	750	1000	1500
4	2	0.030	0.40	0.40	600	900	1200	1800
6	2	0.050	0.60	0.60	1000	1500	2000	3000
8	2	0.065	0.80	0.80	1300	1950	2600	3900
10	2	0.080	1.00	1.00	1600	2400	3200	4800
12	2	0.090	1.20	1.20	1800	2700	3600	

Grafite

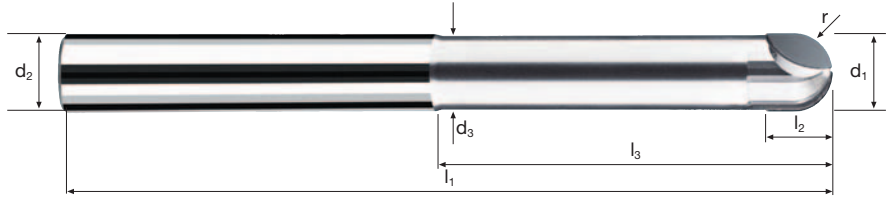
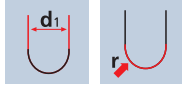
2	2	0.015	0.20	0.20	300	450	600	900
3	2	0.025	0.30	0.30	500	750	1000	1500
4	2	0.035	0.40	0.40	700	1050	1400	2100
6	2	0.055	0.60	0.60	1100	1650	2200	3300
8	2	0.070	0.80	0.80	1400	2100	2800	4200
10	2	0.090	1.00	1.00	1800	2700	3600	5400
12	2	0.100	1.20	1.20	2000	3000	4000	

Frese con estremità emisferica CVD

Esecuzione lunga, tagliente diritto



CVD λ **0°**
 γ **0°**



Resistenza all'usura

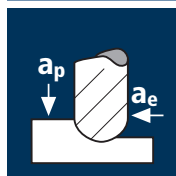


Al Aluminium Cast	Cu Copper	CuZn Brass	C Graphite	CFK GFK I	CFK GFK II	CFK III	CFK/Al
-------------------------	--------------	---------------	---------------	-----------------	------------------	------------	--------

Esempio: N° Ordine		Rivestimento		Articolo		Codice-ø					
				25704		.140					
											25704
Ø Code	d1 h7	d2 h6	d3	l1	l2	l3	r ±0.005	α	z		
.140	2	6	1.9	55	2.5	10	1.0	6.8°	2	●	
.180	3	6	2.8	75	2.5	20	1.5	3.5°	2	●	
.220	4	6	3.8	75	2.5	30	2.0	1.8°	2	●	
.300	6	6	5.6	100	6.0	40	3.0	0.0°	2	●	
.391	8	8	7.6	100	7.0	40	4.0	0.0°	2	●	
.450	10	10	9.6	100	8.0	50	5.0	0.0°	2	●	
.501	12	12	11.6	107	9.0	60	6.0	0.0°	2	●	



V

Applicazione




Materiale



CFC

PRFV



Alluminio
Si > 6%

Grafite



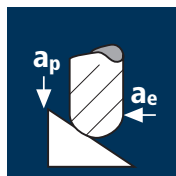
d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
2	2	0.025	1.2	0.90	500	750	1000	1500
3	2	0.035	1.8	1.35	700	1050	1400	2100
4	2	0.045	2.4	1.80	900	1350	1800	2700
6	2	0.070	3.6	2.70	1400	2100	2800	4200
8	2	0.095	4.8	3.60	1900	2850	3800	5700
10	2	0.120	6.0	4.50	2400	3600	4800	7200
12	2	0.135	7.2	5.40	2700	4050	5400	

2	2	0.020	1.2	0.90	400	600	800	1200
3	2	0.030	1.8	1.35	600	900	1200	1800
4	2	0.040	2.4	1.80	800	1200	1600	2400
6	2	0.060	3.6	2.70	1200	1800	2400	3600
8	2	0.080	4.8	3.60	1600	2400	3200	4800
10	2	0.100	6.0	4.50	2000	3000	4000	6000
12	2	0.115	7.2	5.40	2300	3450	4600	

2	2	0.020	1.2	0.90	400	600	800	1200
3	2	0.025	1.8	1.35	500	750	1000	1500
4	2	0.035	2.4	1.80	700	1050	1400	2100
6	2	0.055	3.6	2.70	1100	1650	2200	3300
8	2	0.070	4.8	3.60	1400	2100	2800	4200
10	2	0.090	6.0	4.50	1800	2700	3600	5400
12	2	0.105	7.2	5.40	2100	3150	4200	



2	2	0.020	1.2	0.90	400	600	800	1200
3	2	0.030	1.8	1.35	600	900	1200	1800
4	2	0.040	2.4	1.80	800	1200	1600	2400
6	2	0.060	3.6	2.70	1200	1800	2400	3600
8	2	0.080	4.8	3.60	1600	2400	3200	4800
10	2	0.100	6.0	4.50	2000	3000	4000	6000
12	2	0.115	7.2	5.40	2300	3450	4600	

Applicazione




Materiale



CFC

PRFV



Alluminio
Si > 6%

Grafite



d1 [mm]	z	fz [mm]	ap [mm]	ae [mm]	n=10000 min ⁻¹ vf [mm/min]	n=15000 min ⁻¹ vf [mm/min]	n=20000 min ⁻¹ vf [mm/min]	n=30000 min ⁻¹ vf [mm/min]
2	2	0.025	0.20	0.20	500	750	1000	1500
3	2	0.035	0.30	0.30	700	1050	1400	2100
4	2	0.045	0.40	0.40	900	1350	1800	2700
6	2	0.070	0.60	0.60	1400	2100	2800	4200
8	2	0.095	0.80	0.80	1900	2850	3800	5700
10	2	0.120	1.00	1.00	2400	3600	4800	7200
12	2	0.135	1.20	1.20	2700	4050	5400	

2	2	0.020	0.20	0.20	400	600	800	1200
3	2	0.030	0.30	0.30	600	900	1200	1800
4	2	0.040	0.40	0.40	800	1200	1600	2400
6	2	0.060	0.60	0.60	1200	1800	2400	3600
8	2	0.080	0.80	0.80	1600	2400	3200	4800
10	2	0.100	1.00	1.00	2000	3000	4000	6000
12	2	0.115	1.20	1.20	2300	3450	4600	

2	2	0.020	0.20	0.20	400	600	800	1200
3	2	0.025	0.30	0.30	500	750	1000	1500
4	2	0.035	0.40	0.40	700	1050	1400	2100
6	2	0.055	0.60	0.60	1100	1650	2200	3300
8	2	0.070	0.80	0.80	1400	2100	2800	4200
10	2	0.090	1.00	1.00	1800	2700	3600	5400
12	2	0.105	1.20	1.20	2100	3150	4200	

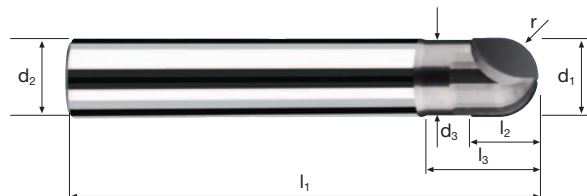
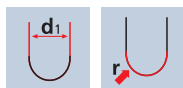
2	2	0.020	0.20	0.20	400	600	800	1200
3	2	0.030	0.30	0.30	600	900	1200	1800
4	2	0.040	0.40	0.40	800	1200	1600	2400
6	2	0.060	0.60	0.60	1200	1800	2400	3600
8	2	0.080	0.80	0.80	1600	2400	3200	4800
10	2	0.100	1.00	1.00	2000	3000	4000	6000
12	2	0.115	1.20	1.20	2300	3450	4600	

Frese con estremità emisferica CVD

Esecuzione corta, tagliente diritto



CVD	λ 0°
	γ 0°



Resistenza all'usura

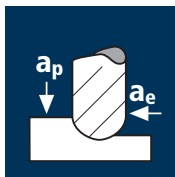


Al Aluminium Cast	Cu Copper	CuZn Brass		C Graphite	CFK GFK I	CFK GFK II	CFK III	CFK/Al	
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Esempio: N° Ordine	Rivestimento		Articolo		Codice-ø						
	25700		.140							25700	
Ø Code	d1 h7	d2 h6	d3	l1	l2	l3	r ±0.005	α	z		
.140	2	6	1.9	50	2.5	4	1.0	10.6°	2	●	
.180	3	6	2.8	50	2.5	4	1.5	9.9°	2	●	
.220	4	6	3.8	50	2.5	6	2.0	6.9°	2	●	
.300	6	6	5.6	50	6.0	9	3.0	0.0°	2	●	
.391	8	8	7.6	60	7.0	12	4.0	0.0°	2	●	
.450	10	10	9.6	60	8.0	14	5.0	0.0°	2	●	
.501	12	12	11.6	65	9.0	14	6.0	0.0°	2	●	



Applicazione



Materiale

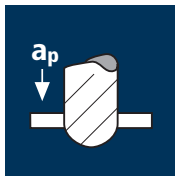
CFC

PRFV

d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
4	160	0.100	8.0	1.6	12735	1275
5	160	0.140	10.0	2.0	10185	1425
6	160	0.190	12.0	2.4	8490	1615
8	160	0.285	16.0	3.2	6365	1815
10	160	0.385	20.0	4.0	5095	1960

4	100	0.100	8.0	1.6	7960	795
5	100	0.140	10.0	2.0	6365	890
6	100	0.190	12.0	2.4	5305	1010
8	100	0.285	16.0	3.2	3980	1135
10	100	0.385	20.0	4.0	3185	1225

Applicazione



Materiale

CFC

PRFV

d1 [mm]	v _c [m/min]	f [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
4	100	0.070	4.0	4	7960	555
5	100	0.100	5.0	5	6365	635
6	100	0.135	6.0	6	5305	715
8	100	0.200	8.0	8	3980	795
10	100	0.270	10.0	10	3185	860

4	60	0.070	4.0	4	4775	335
5	60	0.100	5.0	5	3820	380
6	60	0.135	6.0	6	3185	430
8	60	0.200	8.0	8	2385	475
10	60	0.270	10.0	10	1910	515

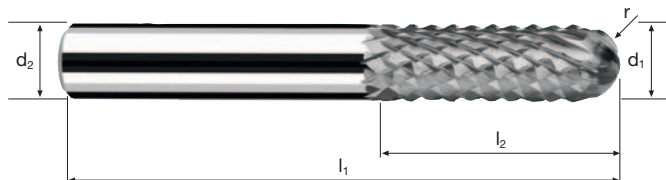
Attenersi alle avvertenze tecniche per l'applicazione a pag. 921!

Frese con estremità emisferica

Esecuzione normale, dentellatura media, tagliente a trazione



HM
MG10



Resistenza all'usura



CFK
GFK
I

Esempio: N° Ordine		Rivestimento	Articolo	Codice-ø			
			20760	.220			
						<input type="text"/>	20760
ø Code	d1 h10	d2 h6	l1	l2	r		
.220	4	4	50	19	2.0	●	
.260	5	5	50	19	2.5	●	
.300	6	6	60	22	3.0	●	
.391	8	8	63	29	4.0	●	
.450	10	10	72	30	5.0	●	

V



Frese per forme speciali

Frese a forma

N° 7920



Base-X	B		Rm <850-1300			713
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N° 0920



HSS			Rm <850-1100			715
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N° 0915



HSS			Rm <850-1100			717
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N° 0910



HSS			Rm <850-1100			719
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N° 0905



HSS			Rm <850-1100			721
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N° 0890



HSS			Rm <850-1100			725
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Frese per forme speciali

Frese per sbavatura

N° 7930



Base-X	B		Rm			727
			<850-1100			

N° 7940



Base-X	B		Rm			729
			<850-1100			

N° 7942



Base-X	B		Rm			731
			<850-1100			

Multifrese

N° 7960



Base-X	B		Rm			733
			<850-1100			

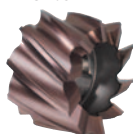
Frese cilindriche frontali

N° 3490



HSS			Rm			735
			<850-1100			

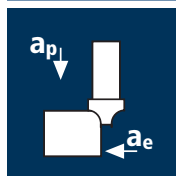
N° 3209



HSS			Rm			737
			850-1300			

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



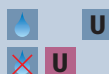
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	120	0.025	0.50	0.50	6365	635
6	4	120	0.025	0.75	0.75	6365	635
8	4	120	0.030	1.00	1.00	4775	575
8	4	120	0.030	1.25	1.25	4775	575
8	4	120	0.030	1.50	1.50	4775	575
10	4	120	0.040	2.00	2.00	3820	610
10	4	120	0.040	2.50	2.50	3820	610
12	4	120	0.050	3.00	3.00	3185	635

Acciaio
850 - 1100 N/mm²



6	4	100	0.020	0.50	0.50	5305	425
6	4	100	0.020	0.75	0.75	5305	425
8	4	100	0.025	1.00	1.00	3980	400
8	4	100	0.025	1.25	1.25	3980	400
8	4	100	0.025	1.50	1.50	3980	400
10	4	100	0.035	2.00	2.00	3185	445
10	4	100	0.035	2.50	2.50	3185	445
12	4	100	0.040	3.00	3.00	2655	425

Acciaio
1100 - 1300 N/mm²



6	4	60	0.015	0.50	0.50	3185	190
6	4	60	0.015	0.75	0.75	3185	190
8	4	60	0.025	1.00	1.00	2385	240
8	4	60	0.025	1.25	1.25	2385	240
8	4	60	0.025	1.50	1.50	2385	240
10	4	60	0.030	2.00	2.00	1910	230
10	4	60	0.030	2.50	2.50	1910	230
12	4	60	0.035	3.00	3.00	1590	225

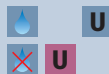
Acciaio inossidabile
[Cr-Ni/1.4301]



6	4	50	0.015	0.50	0.50	2655	160
6	4	50	0.015	0.75	0.75	2655	160
8	4	50	0.025	1.00	1.00	1990	200
8	4	50	0.025	1.25	1.25	1990	200
8	4	50	0.025	1.50	1.50	1990	200
10	4	50	0.030	2.00	2.00	1590	190
10	4	50	0.030	2.50	2.50	1590	190
12	4	50	0.035	3.00	3.00	1325	185

Materiale

Ghisa
(grigia / sferoidale)



6	4	140	0.025	0.50	0.50	7425	745
6	4	140	0.025	0.75	0.75	7425	745
8	4	140	0.030	1.00	1.00	5570	670
8	4	140	0.030	1.25	1.25	5570	670
8	4	140	0.030	1.50	1.50	5570	670
10	4	140	0.040	2.00	2.00	4455	715
10	4	140	0.040	2.50	2.50	4455	715
12	4	140	0.050	3.00	3.00	3715	745

Rame non legato



6	4	160	0.020	0.50	0.50	8490	680
6	4	160	0.020	0.75	0.75	8490	680
8	4	160	0.025	1.00	1.00	6365	635
8	4	160	0.025	1.25	1.25	6365	635
8	4	160	0.025	1.50	1.50	6365	635
10	4	160	0.035	2.00	2.00	5095	715
10	4	160	0.035	2.50	2.50	5095	715
12	4	160	0.040	3.00	3.00	4245	680

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



6	4	60	0.015	0.50	0.50	3185	190
6	4	60	0.015	0.75	0.75	3185	190
8	4	60	0.025	1.00	1.00	2385	240
8	4	60	0.025	1.25	1.25	2385	240
8	4	60	0.025	1.50	1.50	2385	240
10	4	60	0.030	2.00	2.00	1910	230
10	4	60	0.030	2.50	2.50	1910	230
12	4	60	0.035	3.00	3.00	1590	225

Alluminio malleabile
Si < 6%

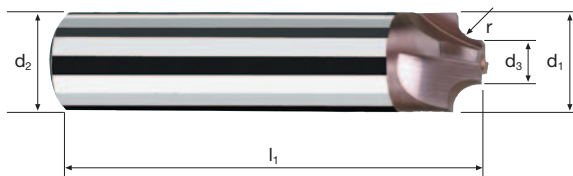


6	4	180	0.025	0.50	0.50	9550	955
6	4	180	0.025	0.75	0.75	9550	955
8	4	180	0.030	1.00	1.00	7160	860
8	4	180	0.030	1.25	1.25	7160	860
8	4	180	0.030	1.50	1.50	7160	860
10	4	180	0.040	2.00	2.00	5730	915
10	4	180	0.040	2.50	2.50	5730	915
12	4	180	0.050	3.00	3.00	4775	955

Frese a quarto di cerchio



HM λ **0°**
MG10 γ **0°**

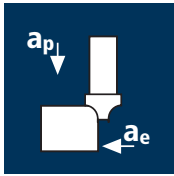


Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500				Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine									UNICUT-4X
									U7920
Ø Code	d1	d2 h6	d3 ±0.1	l1	r JS10		Z		
.300	6	6	4.5	57	0.50		4		●
.303	6	6	4.0	57	0.75		4		●
.391	8	8	5.5	63	1.00		4		●
.394	8	8	5.0	63	1.25		4		●
.397	8	8	4.5	63	1.50		4		●
.450	10	10	5.0	72	2.00		4		●
.453	10	10	4.5	72	2.50		4		●
.501	12	12	5.0	83	3.00		4		●

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
10	4	55	0.010	2.0	2.0	1750	70
12	4	55	0.010	2.5	2.5	1460	60
16	4	55	0.025	4.0	4.0	1095	110
20	4	55	0.030	5.0	5.0	875	105
22	4	55	0.035	6.0	6.0	795	110
24	5	55	0.040	7.0	7.0	730	145
28	5	55	0.045	8.0	8.0	625	140
32	5	55	0.050	10.0	10.0	545	135
38	6	55	0.060	12.0	12.0	460	165

Acciaio
850 - 1100 N/mm²



10	4	45	0.010	2.0	2.0	1430	55
12	4	45	0.010	2.5	2.5	1195	50
16	4	45	0.025	4.0	4.0	895	90
20	4	45	0.030	5.0	5.0	715	85
22	4	45	0.035	6.0	6.0	650	90
24	5	45	0.040	7.0	7.0	595	120
28	5	45	0.045	8.0	8.0	510	115
32	5	45	0.050	10.0	10.0	450	115
38	6	45	0.060	12.0	12.0	375	135

Acciaio
1100 - 1300 N/mm²



10	4	34	0.010	2.0	2.0	1080	45
12	4	34	0.010	2.5	2.5	900	35
16	4	34	0.025	4.0	4.0	675	70
20	4	34	0.030	5.0	5.0	540	65
22	4	34	0.035	6.0	6.0	490	70
24	5	34	0.040	7.0	7.0	450	90
28	5	34	0.045	8.0	8.0	385	85
32	5	34	0.050	10.0	10.0	340	85
38	6	34	0.060	12.0	12.0	285	105

Acciaio inossidabile
[Cr-Ni/1.4301]



10	4	21	0.010	2.0	2.0	670	25
12	4	21	0.010	2.5	2.5	555	20
16	4	21	0.025	4.0	4.0	420	40
20	4	21	0.030	5.0	5.0	335	40
22	4	21	0.035	6.0	6.0	305	45
24	5	21	0.040	7.0	7.0	280	55
28	5	21	0.045	8.0	8.0	240	55
32	5	21	0.050	10.0	10.0	210	55
38	6	21	0.060	12.0	12.0	175	65

Materiale

Ghisa
(grigia / sferoidale)



10	4	42	0.010	2.0	2.0	1335	55
12	4	42	0.010	2.5	2.5	1115	45
16	4	42	0.025	4.0	4.0	835	85
20	4	42	0.030	5.0	5.0	670	80
22	4	42	0.035	6.0	6.0	610	85
24	5	42	0.040	7.0	7.0	555	110
28	5	42	0.045	8.0	8.0	475	105
32	5	42	0.050	10.0	10.0	420	105
38	6	42	0.060	12.0	12.0	350	125

Rame non legato



10	4	65	0.010	2.0	2.0	2070	85
12	4	65	0.010	2.5	2.5	1725	70
16	4	65	0.025	4.0	4.0	1295	130
20	4	65	0.030	5.0	5.0	1035	125
22	4	65	0.035	6.0	6.0	940	130
24	5	65	0.040	7.0	7.0	860	170
28	5	65	0.045	8.0	8.0	740	165
32	5	65	0.050	10.0	10.0	645	160
38	6	65	0.060	12.0	12.0	545	195

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



10	4	23	0.010	2.0	2.0	730	30
12	4	23	0.010	2.5	2.5	610	25
16	4	23	0.025	4.0	4.0	460	45
20	4	23	0.030	5.0	5.0	365	45
22	4	23	0.035	6.0	6.0	335	45
24	5	23	0.040	7.0	7.0	305	60
28	5	23	0.045	8.0	8.0	260	60
32	5	23	0.050	10.0	10.0	230	60
38	6	23	0.060	12.0	12.0	195	70

Alluminio malleabile
Si < 6%

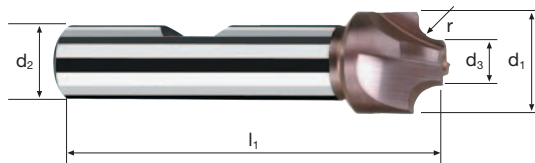


10	4	80	0.010	2.0	2.0	2545	100
12	4	80	0.010	2.5	2.5	2120	85
16	4	80	0.025	4.0	4.0	1590	160
20	4	80	0.030	5.0	5.0	1275	155
22	4	80	0.035	6.0	6.0	1160	160
24	5	80	0.040	7.0	7.0	1060	210
28	5	80	0.045	8.0	8.0	910	205
32	5	80	0.050	10.0	10.0	795	200
38	6	80	0.060	12.0	12.0	670	240

Frese a quarto di cerchio



HSS-E λ **8°**
Co8 γ **0°**

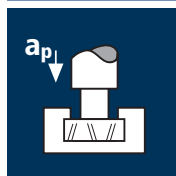


Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine								Rivestimento		Articolo		Codice-ø		UNICUT-4X	
								U		0920		.080		U0920	
ø Code	d1	d2 h6	d3 0/+0.1	l1	r H11	z									
.080	8	10	5.3	56	1.0	4						●			
.090	9	10	5.3	56	1.5	4						●			
.100	10	10	5.1	56	2.0	4						●			
.120	12	12	6.1	63	2.5	4						●			
.140	14	12	7.1	63	3.0	4						●			
.160	16	12	7.1	63	4.0	4						●			
.200	20	16	8.7	70	5.0	4						●			
.220	22	16	8.7	70	6.0	4						●			
.240	24	16	8.7	70	7.0	5						●			
.280	28	16	10.2	70	8.0	5						●			
.320	32	16	10.2	75	10.0	5						●			
.380	38	20	11.7	80	12.0	6						●			
.460	46	25	14.0	94	15.0	6						●			
.580	58	25	15.0	100	20.0	6						●			

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
16	6	55	0.020	8	16	1095	130
18	6	55	0.020	8	18	975	115
21	6	55	0.030	9	21	835	150
25	6	55	0.040	11	25	700	170
28	6	55	0.040	12	28	625	150
32	6	55	0.050	14	32	545	165
40	8	55	0.060	18	40	440	210

Acciaio
850 - 1100 N/mm²



16	6	45	0.020	8	16	895	105
18	6	45	0.020	8	18	795	95
21	6	45	0.030	9	21	680	120
25	6	45	0.040	11	25	575	140
28	6	45	0.040	12	28	510	120
32	6	45	0.050	14	32	450	135
40	8	45	0.060	18	40	360	175

Acciaio
1100 - 1300 N/mm²



16	6	34	0.020	8	16	675	80
18	6	34	0.020	8	18	600	70
21	6	34	0.030	9	21	515	95
25	6	34	0.040	11	25	435	105
28	6	34	0.040	12	28	385	90
32	6	34	0.050	14	32	340	100
40	8	34	0.060	18	40	270	130

Acciaio inossidabile
[Cr-Ni/1.4301]



16	6	21	0.020	8	16	420	50
18	6	21	0.020	8	18	370	45
21	6	21	0.030	9	21	320	60
25	6	21	0.040	11	25	265	65
28	6	21	0.040	12	28	240	60
32	6	21	0.050	14	32	210	65
40	8	21	0.060	18	40	165	80

Materiale

Ghisa
(grigia / sferoidale)



16	6	42	0.020	8	16	835	100
18	6	42	0.020	8	18	745	90
21	6	42	0.030	9	21	635	115
25	6	42	0.040	11	25	535	130
28	6	42	0.040	12	28	475	115
32	6	42	0.050	14	32	420	125
40	8	42	0.060	18	40	335	160

Rame non legato



16	6	65	0.020	8	16	1295	155
18	6	65	0.020	8	18	1150	140
21	6	65	0.030	9	21	985	175
25	6	65	0.040	11	25	830	200
28	6	65	0.040	12	28	740	180
32	6	65	0.050	14	32	645	195
40	8	65	0.060	18	40	515	245

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



16	6	23	0.020	8	16	460	55
18	6	23	0.020	8	18	405	50
21	6	23	0.030	9	21	350	65
25	6	23	0.040	11	25	295	70
28	6	23	0.040	12	28	260	60
32	6	23	0.050	14	32	230	70
40	8	23	0.060	18	40	185	90

Alluminio malleabile
Si < 6%

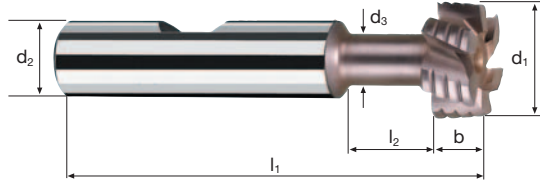


16	6	80	0.020	8	16	1590	190
18	6	80	0.020	8	18	1415	170
21	6	80	0.030	9	21	1215	220
25	6	80	0.040	11	25	1020	245
28	6	80	0.040	12	28	910	220
32	6	80	0.050	14	32	795	240
40	8	80	0.060	18	40	635	305

Frese per cave a T



HSS-E Co8	λ 7° γ 10°

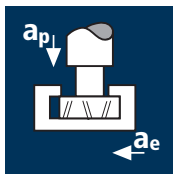


Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine									UNICUT-4X
Rivestimento		Articolo		Codice-ø					
U		0915		.140					
ø Code	d1 d11	d2 h6	d3 h12	l1	l2	b d11	z		
.140	16	10	7	62	12	8.0	6	●	
.160	18	12	8	70	14	8.0	6	●	
.180	21	12	10	74	18	9.0	6	●	
.200	25	16	12	82	20	11.0	6	●	
.220	28	16	12	83	21	12.0	6	●	
.240	32	16	15	90	27	14.0	6	●	
.260	40	25	19	108	31	18.0	8	●	

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	4	55	0.010	4	1.1	1590	65
12.5	4	55	0.010	6	1.3	1400	55
16.0	4	55	0.025	8	1.6	1095	110
18.0	6	55	0.025	8	1.8	975	145
21.0	6	55	0.040	9	2.1	835	200
25.0	6	55	0.045	11	2.5	700	190
32.0	6	55	0.060	14	3.2	545	195
40.0	8	55	0.070	18	4.0	440	245
50.0	8	55	0.090	22	5.0	350	250

Acciaio
850 - 1100 N/mm²



11.0	4	45	0.010	4	1.1	1300	50
12.5	4	45	0.010	6	1.3	1145	45
16.0	4	45	0.025	8	1.6	895	90
18.0	6	45	0.025	8	1.8	795	120
21.0	6	45	0.040	9	2.1	680	165
25.0	6	45	0.045	11	2.5	575	155
32.0	6	45	0.060	14	3.2	450	160
40.0	8	45	0.070	18	4.0	360	200
50.0	8	45	0.090	22	5.0	285	205

Acciaio
1100 - 1300 N/mm²



11.0	4	34	0.010	4	1.1	985	40
12.5	4	34	0.010	6	1.3	865	35
16.0	4	34	0.025	8	1.6	675	70
18.0	6	34	0.025	8	1.8	600	90
21.0	6	34	0.040	9	2.1	515	125
25.0	6	34	0.045	11	2.5	435	115
32.0	6	34	0.060	14	3.2	340	120
40.0	8	34	0.070	18	4.0	270	150
50.0	8	34	0.090	22	5.0	215	155

Acciaio inossidabile
[Cr-Ni/1.4301]



11.0	4	21	0.010	4	1.1	610	25
12.5	4	21	0.010	6	1.3	535	20
16.0	4	21	0.025	8	1.6	420	40
18.0	6	21	0.025	8	1.8	370	55
21.0	6	21	0.040	9	2.1	320	75
25.0	6	21	0.045	11	2.5	265	70
32.0	6	21	0.060	14	3.2	210	75
40.0	8	21	0.070	18	4.0	165	90
50.0	8	21	0.090	22	5.0	135	95

Materiale

Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
11.0	4	42	0.010	4	1.1	1215	50
12.5	4	42	0.010	6	1.3	1070	45
16.0	4	42	0.025	8	1.6	835	85
18.0	6	42	0.025	8	1.8	745	110
21.0	6	42	0.040	9	2.1	635	150
25.0	6	42	0.045	11	2.5	535	145
32.0	6	42	0.060	14	3.2	420	150
40.0	8	42	0.070	18	4.0	335	190
50.0	8	42	0.090	22	5.0	265	190

Rame non legato



11.0	4	65	0.010	4	1.1	1880	75
12.5	4	65	0.010	6	1.3	1655	65
16.0	4	65	0.025	8	1.6	1295	130
18.0	6	65	0.025	8	1.8	1150	175
21.0	6	65	0.040	9	2.1	985	235
25.0	6	65	0.045	11	2.5	830	225
32.0	6	65	0.060	14	3.2	645	230
40.0	8	65	0.070	18	4.0	515	290
50.0	8	65	0.090	22	5.0	415	300

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



11.0	4	23	0.010	4	1.1	665	25
12.5	4	23	0.010	6	1.3	585	25
16.0	4	23	0.025	8	1.6	460	45
18.0	6	23	0.025	8	1.8	405	60
21.0	6	23	0.040	9	2.1	350	85
25.0	6	23	0.045	11	2.5	295	80
32.0	6	23	0.060	14	3.2	230	85
40.0	8	23	0.070	18	4.0	185	105
50.0	8	23	0.090	22	5.0	145	105

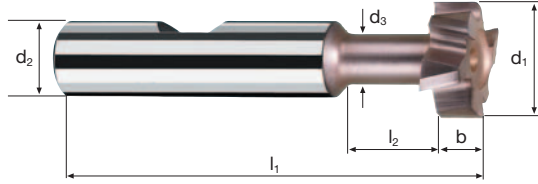
Alluminio malleabile
Si < 6%



11.0	4	80	0.010	4	1.1	2315	95
12.5	4	80	0.010	6	1.3	2035	80
16.0	4	80	0.025	8	1.6	1590	160
18.0	6	80	0.025	8	1.8	1415	210
21.0	6	80	0.040	9	2.1	1215	290
25.0	6	80	0.045	11	2.5	1020	275
32.0	6	80	0.060	14	3.2	795	285
40.0	8	80	0.070	18	4.0	635	355
50.0	8	80	0.090	22	5.0	510	365

Frese per cave a T

HSS-E λ 12°
Co8 γ 12°

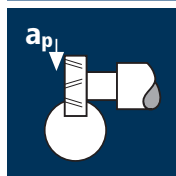


Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine									UNICUT-4X
Rivestimento U Articolo 0910 Codice-ø .100									U0910
ø Code	d1 d11	d2 h6	d3 h12	l1	l2	b d11	z		
.100	11.0	10	4	53.5	8	4.0	4		●
.120	12.5	10	5	57.0	9	6.0	4		●
.140	16.0	10	7	62.0	12	8.0	4		●
.160	18.0	12	8	70.0	15	8.0	6		●
.180	21.0	12	10	74.0	19	9.0	6		●
.200	25.0	16	12	82.0	21	11.0	6		●
.220	32.0	16	15	90.0	27	14.0	6		●
.240	40.0	25	19	108.0	30	18.0	8		●
.260	50.0	32	25	124.0	40	22.0	8		●
						b			
						k11			
.500*	12.0	8	5	54.0	14	2.5	8		●
.520*	16.0	8	6	56.0	16	3.0	8		●
.540*	20.0	10	8	62.0	17	4.0	8		●
.560*	25.0	10	9	65.0	19	5.0	10		●
.580*	32.0	12	10	73.0	21	6.0	12		●
.600*	40.0	12	11	77.0	23	8.0	12		●
.620*	50.0	16	14	84.0	25	10.0	14		●
* Scarico conico									

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
7.5	8	55	0.005	2.0	2.0	2335	95
10.5	8	55	0.010	2.9	2.5	1665	135
13.5	8	55	0.010	3.8	3.0	1295	105
16.5	8	55	0.025	5.0	4.0	1060	210
19.5	10	55	0.035	5.5	5.0	900	315
22.5	10	55	0.040	6.6	6.0	780	310
25.5	12	55	0.045	7.5	6.0	685	370

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
7.5	8	45	0.005	2.0	2.0	1910	75
10.5	8	45	0.010	2.9	2.5	1365	110
13.5	8	45	0.010	3.8	3.0	1060	85
16.5	8	45	0.025	5.0	4.0	870	175
19.5	10	45	0.035	5.5	5.0	735	255
22.5	10	45	0.040	6.6	6.0	635	255
25.5	12	45	0.045	7.5	6.0	560	300

Acciaio
1100 - 1300 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
7.5	8	34	0.005	2.0	2.0	1445	60
10.5	8	34	0.010	2.9	2.5	1030	80
13.5	8	34	0.010	3.8	3.0	800	65
16.5	8	34	0.025	5.0	4.0	655	130
19.5	10	34	0.035	5.5	5.0	555	195
22.5	10	34	0.040	6.6	6.0	480	190
25.5	12	34	0.045	7.5	6.0	425	230

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
7.5	8	21	0.005	2.0	2.0	890	35
10.5	8	21	0.010	2.9	2.5	635	50
13.5	8	21	0.010	3.8	3.0	495	40
16.5	8	21	0.025	5.0	4.0	405	80
19.5	10	21	0.035	5.5	5.0	345	120
22.5	10	21	0.040	6.6	6.0	295	120
25.5	12	21	0.045	7.5	6.0	260	140

Materiale

Ghisa
(grigia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
7.5	8	42	0.005	2.0	2.0	1785	70
10.5	8	42	0.010	2.9	2.5	1275	100
13.5	8	42	0.010	3.8	3.0	990	80
16.5	8	42	0.025	5.0	4.0	810	160
19.5	10	42	0.035	5.5	5.0	685	240
22.5	10	42	0.040	6.6	6.0	595	240
25.5	12	42	0.045	7.5	6.0	525	285

Rame non legato



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
7.5	8	65	0.005	2.0	2.0	2760	110
10.5	8	65	0.010	2.9	2.5	1970	160
13.5	8	65	0.010	3.8	3.0	1535	125
16.5	8	65	0.025	5.0	4.0	1255	250
19.5	10	65	0.035	5.5	5.0	1060	370
22.5	10	65	0.040	6.6	6.0	920	370
25.5	12	65	0.045	7.5	6.0	810	435

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
7.5	8	23	0.005	2.0	2.0	975	40
10.5	8	23	0.010	2.9	2.5	695	55
13.5	8	23	0.010	3.8	3.0	540	45
16.5	8	23	0.025	5.0	4.0	445	90
19.5	10	23	0.035	5.5	5.0	375	130
22.5	10	23	0.040	6.6	6.0	325	130
25.5	12	23	0.045	7.5	6.0	285	155

Alluminio malleabile
Si < 6%

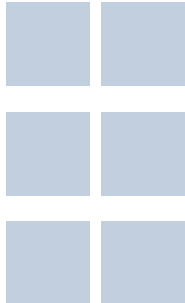
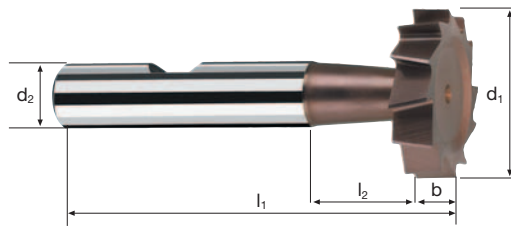


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
7.5	8	80	0.005	2.0	2.0	3395	135
10.5	8	80	0.010	2.9	2.5	2425	195
13.5	8	80	0.010	3.8	3.0	1885	150
16.5	8	80	0.025	5.0	4.0	1545	310
19.5	10	80	0.035	5.5	5.0	1305	455
22.5	10	80	0.040	6.6	6.0	1130	450
25.5	12	80	0.045	7.5	6.0	1000	540

Frese per cave



HSS-E λ 10°
Co8 γ 8°

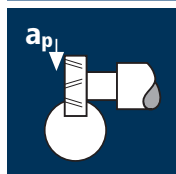


Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine								UNICUT-4X	
								U0905	
								U0905	
\emptyset Code	d1 h11	d2 h6	l1	l2	b e8	z			
.100	4.5	6	50	12	1.0	8			●
.150	7.5	6	50	11	1.5	8			●
.160	7.5	6	50	10	2.0	8			●
.200	10.5	6	50	11	2.0	8			●
.210	10.5	6	50	10	2.5	8			●
.220	10.5	6	50	9	3.0	8			●
.310	13.5	10	56	13	2.5	8			●
.320	13.5	10	56	12	3.0	8			●
.330	13.5	10	56	11	4.0	8			●
.360	16.5	10	56	12	3.0	8			●
.370	16.5	10	56	11	4.0	8			●
.380	16.5	10	56	10	5.0	8			●
.410	19.5	10	63	18	3.0	10			●
.420	19.5	10	63	17	4.0	10			●
.430	19.5	10	63	16	5.0	10			●
.440	19.5	10	63	15	6.0	10			●
.500	22.5	10	63	17	4.0	10			●
.510	22.5	10	63	16	5.0	10			●
.520	22.5	10	63	15	6.0	10			●
.540	22.5	10	63	14	8.0	10			●
.600	25.5	10	63	16	5.0	12			●
.610	25.5	10	63	15	6.0	12			●

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Materiale

Ghisa
(grigia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Alluminio malleabile
Si < 6%

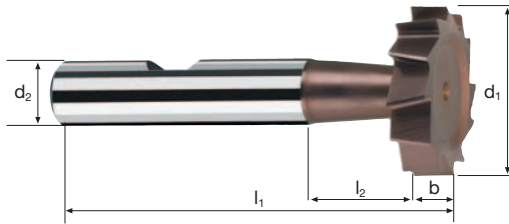


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
28.5	12	55	0.050	8.2	8.0	615	370
32.5	12	55	0.060	9.8	10.0	540	390
45.5	14	55	0.080	12.0	10.0	385	430
28.5	12	45	0.050	8.2	8.0	505	305
32.5	12	45	0.060	9.8	10.0	440	315
45.5	14	45	0.080	12.0	10.0	315	355
28.5	12	34	0.050	8.2	8.0	380	230
32.5	12	34	0.060	9.8	10.0	335	240
45.5	14	34	0.080	12.0	10.0	240	270
28.5	12	21	0.050	8.2	8.0	235	140
32.5	12	21	0.060	9.8	10.0	205	150
45.5	14	21	0.080	12.0	10.0	145	160

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
28.5	12	42	0.050	8.2	8.0	470	280
32.5	12	42	0.060	9.8	10.0	410	295
45.5	14	42	0.080	12.0	10.0	295	330
28.5	12	65	0.050	8.2	8.0	725	435
32.5	12	65	0.060	9.8	10.0	635	455
45.5	14	65	0.080	12.0	10.0	455	510
28.5	12	23	0.050	8.2	8.0	255	155
32.5	12	23	0.060	9.8	10.0	225	160
45.5	14	23	0.080	12.0	10.0	160	180
28.5	12	80	0.050	8.2	8.0	895	535
32.5	12	80	0.060	9.8	10.0	785	565
45.5	14	80	0.080	12.0	10.0	560	625

Frese per cave

HSS-E λ 10°
Co8 γ 8°

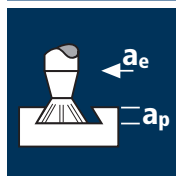


Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **GG(G)** Aluminium Copper

		Rivestimento			Articolo		Codice-ø		UNICUT-4X	
Esempio: N° Ordine		U			0905		.650		U0905	
ø Code	d1 h11	d2 h6	l1	l2	b e8	z				
.650	28.5	10	63	14	6.0	12	●			
.660	28.5	10	63	13	8.0	12	●			
.700	28.5	12	71	14	10.0	12	●			
.750	32.5	12	71	18	6.0	12	●			
.760	32.5	12	71	17	7.0	12	●			
.770	32.5	12	71	16	8.0	12	●			
.800	32.5	12	71	15	10.0	12	●			
.900	45.5	12	71	14	10.0	14	●			

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
8	7	55	0.005	2.5	1.5	2190	75
12	8	55	0.010	3.0	2.0	1460	115
16	10	55	0.015	4.0	2.2	1095	165
20	12	55	0.018	6.0	2.4	875	190
25	14	55	0.020	8.0	2.6	700	195
32	16	55	0.025	10.0	3.0	545	220

Acciaio
850 - 1100 N/mm²



8	7	45	0.005	2.5	1.5	1790	65
12	8	45	0.010	3.0	2.0	1195	95
16	10	45	0.015	4.0	2.2	895	135
20	12	45	0.018	6.0	2.4	715	155
25	14	45	0.020	8.0	2.6	575	160
32	16	45	0.025	10.0	3.0	450	180

Acciaio
1100 - 1300 N/mm²



8	7	34	0.005	2.5	1.5	1355	45
12	8	34	0.010	3.0	2.0	900	70
16	10	34	0.015	4.0	2.2	675	100
20	12	34	0.018	6.0	2.4	540	115
25	14	34	0.020	8.0	2.6	435	120
32	16	34	0.025	10.0	3.0	340	135

Acciaio inossidabile
[Cr-Ni/1.4301]



8	7	21	0.005	2.5	1.5	835	30
12	8	21	0.010	3.0	2.0	555	45
16	10	21	0.015	4.0	2.2	420	65
20	12	21	0.018	6.0	2.4	335	70
25	14	21	0.020	8.0	2.6	265	75
32	16	21	0.025	10.0	3.0	210	85

Materiale

Ghisa
(grigia / sferoidale)



8	7	42	0.005	2.5	1.5	1670	60
12	8	42	0.010	3.0	2.0	1115	90
16	10	42	0.015	4.0	2.2	835	125
20	12	42	0.018	6.0	2.4	670	145
25	14	42	0.020	8.0	2.6	535	150
32	16	42	0.025	10.0	3.0	420	170

Rame non legato



8	7	65	0.005	2.5	1.5	2585	90
12	8	65	0.010	3.0	2.0	1725	140
16	10	65	0.015	4.0	2.2	1295	195
20	12	65	0.018	6.0	2.4	1035	225
25	14	65	0.020	8.0	2.6	830	230
32	16	65	0.025	10.0	3.0	645	260

Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



8	7	23	0.005	2.5	1.5	915	30
12	8	23	0.010	3.0	2.0	610	50
16	10	23	0.015	4.0	2.2	460	70
20	12	23	0.018	6.0	2.4	365	80
25	14	23	0.020	8.0	2.6	295	85
32	16	23	0.025	10.0	3.0	230	90

Alluminio malleabile
Si < 6%

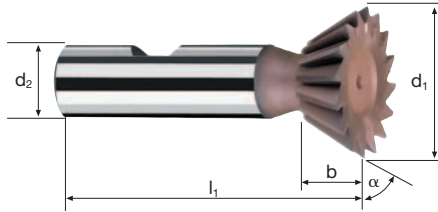


8	7	80	0.005	2.5	1.5	3185	110
12	8	80	0.010	3.0	2.0	2120	170
16	10	80	0.015	4.0	2.2	1590	240
20	12	80	0.018	6.0	2.4	1275	275
25	14	80	0.020	8.0	2.6	1020	285
32	16	80	0.025	10.0	3.0	795	320

Frese ad angolo



HSS-E λ 0°
Co8 γ 0°

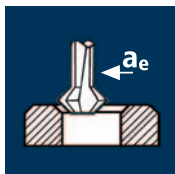


Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine								UNICUT-4X
								U0890
\emptyset Code	d1 js12	d2 h6	l1	b	α ($\pm 20'$)	z		
.100	12	10	54	3.0	45°	8		●
.120	16	12	60	4.0	45°	10		●
.140	20	12	63	5.0	45°	12		●
.160	25	12	67	6.3	45°	14		●
.180	32	16	71	8.0	45°	16		●
.300	8	6	49	3.0	60°	7		●
.320	12	10	54	4.0	60°	8		●
.340	16	12	60	6.3	60°	10		●
.360	20	12	63	8.0	60°	12		●
.380	25	12	67	10.0	60°	14		●
.400	32	16	71	12.5	60°	16		●

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



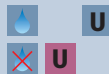
Acciaio
850 - 1100 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Ghisa
(griglia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	150	0.008	0.15	15915	510
4	4	150	0.012	0.20	11935	575
5	4	150	0.014	0.25	9550	535
6	4	150	0.018	0.25	7960	575
8	4	150	0.022	0.30	5970	525
10	4	150	0.028	0.40	4775	535
12	4	150	0.034	0.50	3980	540

3	4	120	0.008	0.15	12735	410
4	4	120	0.012	0.20	9550	460
5	4	120	0.014	0.25	7640	430
6	4	120	0.018	0.25	6365	460
8	4	120	0.022	0.30	4775	420
10	4	120	0.028	0.40	3820	430
12	4	120	0.034	0.50	3185	435

3	4	50	0.008	0.15	5305	170
4	4	50	0.012	0.20	3980	190
5	4	50	0.014	0.25	3185	180
6	4	50	0.018	0.25	2655	190
8	4	50	0.022	0.30	1990	175
10	4	50	0.028	0.40	1590	180
12	4	50	0.034	0.50	1325	180

3	4	180	0.008	0.15	19100	610
4	4	180	0.012	0.20	14325	690
5	4	180	0.014	0.25	11460	640
6	4	180	0.018	0.25	9550	690
8	4	180	0.022	0.30	7160	630
10	4	180	0.028	0.40	5730	640
12	4	180	0.034	0.50	4775	650

Applicazione



Materiale

Acciaio
< 850 N/mm²



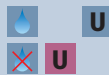
Acciaio
850 - 1100 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Ghisa
(griglia / sferoidale)



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	4	150	0.008	0.15	15915	510
4	4	150	0.012	0.20	11935	575
5	4	150	0.014	0.25	9550	535
6	4	150	0.018	0.25	7960	575
8	4	150	0.022	0.30	5970	525
10	4	150	0.028	0.40	4775	535
12	4	150	0.034	0.50	3980	540

3	4	120	0.008	0.15	12735	410
4	4	120	0.012	0.20	9550	460
5	4	120	0.014	0.25	7640	430
6	4	120	0.018	0.25	6365	460
8	4	120	0.022	0.30	4775	420
10	4	120	0.028	0.40	3820	430
12	4	120	0.034	0.50	3185	435

3	4	50	0.008	0.15	5305	170
4	4	50	0.012	0.20	3980	190
5	4	50	0.014	0.25	3185	180
6	4	50	0.018	0.25	2655	190
8	4	50	0.022	0.30	1990	175
10	4	50	0.028	0.40	1590	180
12	4	50	0.034	0.50	1325	180

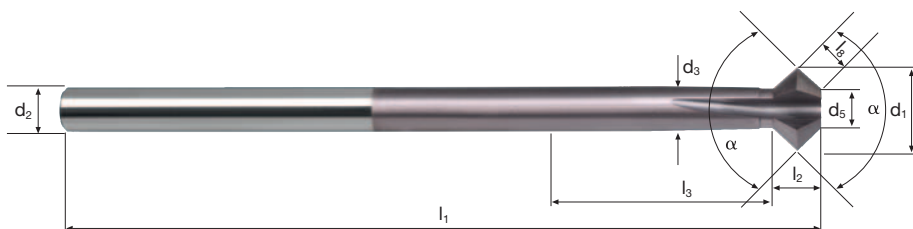
3	4	180	0.008	0.15	19100	610
4	4	180	0.012	0.20	14325	690
5	4	180	0.014	0.25	11460	640
6	4	180	0.018	0.25	9550	690
8	4	180	0.022	0.30	7160	630
10	4	180	0.028	0.40	5730	640
12	4	180	0.034	0.50	4775	650

Frese per sbavatura avanti-indietro

Smussatura a 45°



HM	λ 0° γ 8°

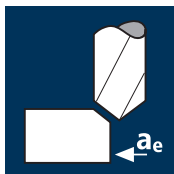


Rm < 850	Rm 850-1100	Rm 1100-1300				Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine											UNICUT-4X	
Rivestimento U Articolo 7930 Codice-ø .180											U7930	
Ø Code	d1 *	d2 h6	d3	d5	l1	l2	l3	l8	α	z		
.180	3	6	2.2	1.2	100	1.30	10	2.5	90°	4		●
.220	4	6	2.9	1.6	100	1.75	12	3.4	90°	4		●
.260	5	6	3.4	2.0	100	2.30	15	4.2	90°	4		●
.300	6	6	3.8	2.4	100	2.90	18	5.1	90°	4		●
.391	8	6	4.9	4.9	100	3.10	35	4.4	90°	4		●
.450	10	6	5.9	5.9	100	4.10	35	5.8	90°	4		●
.501	12	6	5.9	5.9	100	6.10	35	8.6	90°	4		●
* Tolleranza diametro del tagliente												
d1	Tolleranza											
< 6	0/-0.05											
≥ 6	0/-0.15											

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Materiale

Ghisa
(griglia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	150	0.020	0.20	0.20	7960	635
8	4	150	0.025	0.25	0.25	5970	595
10	4	150	0.030	0.30	0.30	4775	575
12	4	150	0.035	0.40	0.40	3980	555

6	4	120	0.020	0.20	0.20	6365	510
8	4	120	0.025	0.25	0.25	4775	480
10	4	120	0.030	0.30	0.30	3820	460
12	4	120	0.035	0.40	0.40	3185	445

6	4	70	0.020	0.20	0.20	3715	295
8	4	70	0.025	0.25	0.25	2785	280
10	4	70	0.030	0.30	0.30	2230	270
12	4	70	0.035	0.40	0.40	1855	260

6	4	60	0.020	0.20	0.20	3185	255
8	4	60	0.025	0.25	0.25	2385	240
10	4	60	0.030	0.30	0.30	1910	230
12	4	60	0.035	0.40	0.40	1590	225

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
6	4	160	0.020	0.20	0.20	8490	680
8	4	160	0.025	0.25	0.25	6365	635
10	4	160	0.030	0.30	0.30	5095	610
12	4	160	0.035	0.40	0.40	4245	595

6	4	180	0.020	0.20	0.20	9550	765
8	4	180	0.025	0.25	0.25	7160	715
10	4	180	0.030	0.30	0.30	5730	690
12	4	180	0.035	0.40	0.40	4775	670

6	4	70	0.020	0.20	0.20	3715	295
8	4	70	0.025	0.25	0.25	2785	280
10	4	70	0.030	0.30	0.30	2230	270
12	4	70	0.035	0.40	0.40	1855	260

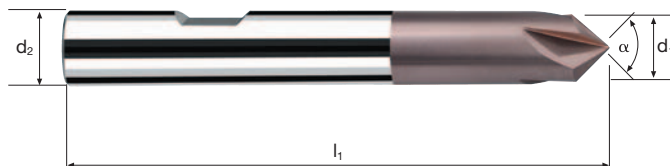
6	4	200	0.020	0.20	0.20	10610	850
8	4	200	0.025	0.25	0.25	7960	795
10	4	200	0.030	0.30	0.30	6365	765
12	4	200	0.035	0.40	0.40	5305	745

Frese per sbavatura


Smussatura a 45°



HM	λ 0° γ 0°
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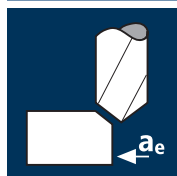


Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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						UNICUT-4X
Esempio: N° Ordine						U7940
		Rivestimento	Articolo	Codice-ø		
		U	7940	.300		
Ø Code	d1 h6	d2 h6	l1	α	Z	
.300	6	6	57	90°	4	●
.391	8	8	63	90°	4	●
.450	10	10	72	90°	4	●
.501	12	12	83	90°	4	●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●
						●

VI

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio inossidabile
[Cr-Ni/1.4301]



Materiale

Ghisa
(griglia / sferoidale)



Rame non legato



Leghe di titanio
fino a 300 HB
[Ti5Al2.5Sn]



Alluminio malleabile
Si < 6%



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	3	150	0.005	0.05	0.05	23875	360
3	3	150	0.010	0.10	0.10	15915	475
4	3	150	0.015	0.15	0.15	11935	535
6	3	150	0.020	0.20	0.20	7960	480

2	3	120	0.005	0.05	0.05	19100	285
3	3	120	0.010	0.10	0.10	12735	380
4	3	120	0.015	0.15	0.15	9550	430
6	3	120	0.020	0.20	0.20	6365	380

2	3	70	0.005	0.05	0.05	11140	165
3	3	70	0.010	0.10	0.10	7425	225
4	3	70	0.015	0.15	0.15	5570	250
6	3	70	0.020	0.20	0.20	3715	225

2	3	60	0.005	0.05	0.05	9550	145
3	3	60	0.010	0.10	0.10	6365	190
4	3	60	0.015	0.15	0.15	4775	215
6	3	60	0.020	0.20	0.20	3185	190

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
2	3	160	0.005	0.05	0.05	25465	380
3	3	160	0.010	0.10	0.10	16975	510
4	3	160	0.015	0.15	0.15	12735	575
6	3	160	0.020	0.20	0.20	8490	510

2	3	180	0.005	0.05	0.05	28650	430
3	3	180	0.010	0.10	0.10	19100	575
4	3	180	0.015	0.15	0.15	14325	645
6	3	180	0.020	0.20	0.20	9550	575

2	3	70	0.005	0.05	0.05	11140	165
3	3	70	0.010	0.10	0.10	7425	225
4	3	70	0.015	0.15	0.15	5570	250
6	3	70	0.020	0.20	0.20	3715	225

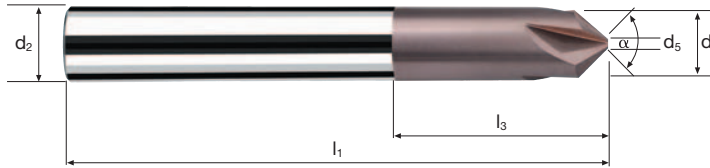
2	3	200	0.005	0.05	0.05	31830	475
3	3	200	0.010	0.10	0.10	21220	635
4	3	200	0.015	0.15	0.15	15915	715
6	3	200	0.020	0.20	0.20	10610	635

Frese per sbavatura

Smussatura a 45°



HM	λ 0°
	γ 0°



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine								Rivestimento		Articolo		Codice-ø		UNICUT-4X
								U		7942		.140		
ø Code	d1 h6	d2 h6	d5 ±0.05	l1	l3	α	z							
.140	2	3	0.20	38	7.2	90°	3						●	
.180	3	3	0.30	38	-	90°	3						●	
.220	4	4	0.40	50	-	90°	3						●	
.300	6	6	0.60	57	-	90°	3						●	

VI

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	2	120	0.008	0.10	0.10	12735	205
4	2	120	0.012	0.15	0.15	9550	230
5	2	120	0.014	0.20	0.20	7640	215
6	2	120	0.018	0.20	0.20	6365	230
8	2	120	0.022	0.25	0.25	4775	210
10	2	120	0.028	0.35	0.35	3820	215
12	2	120	0.034	0.45	0.45	3185	215

Acciaio
850 - 1100 N/mm²

3	2	100	0.008	0.10	0.10	10610	170
4	2	100	0.012	0.15	0.15	7960	190
5	2	100	0.014	0.20	0.20	6365	180
6	2	100	0.018	0.20	0.20	5305	190
8	2	100	0.022	0.25	0.25	3980	175
10	2	100	0.028	0.35	0.35	3185	180
12	2	100	0.034	0.45	0.45	2655	180

Acciaio inossidabile
[Cr-Ni/1.4301]

3	2	50	0.008	0.10	0.10	5305	85
4	2	50	0.012	0.15	0.15	3980	95
5	2	50	0.014	0.20	0.20	3185	90
6	2	50	0.018	0.20	0.20	2655	95
8	2	50	0.022	0.25	0.25	1990	90
10	2	50	0.028	0.35	0.35	1590	90
12	2	50	0.034	0.45	0.45	1325	90

Ghisa
(grigia / sferoidale)

3	2	140	0.008	0.10	0.10	14855	240
4	2	140	0.012	0.15	0.15	11140	265
5	2	140	0.014	0.20	0.20	8915	250
6	2	140	0.018	0.20	0.20	7425	265
8	2	140	0.022	0.25	0.25	5570	245
10	2	140	0.028	0.35	0.35	4455	250
12	2	140	0.034	0.45	0.45	3715	255

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]
3	2	100	0.008	3	0.15	10610	170
4	2	100	0.012	4	0.15	7960	190
5	2	100	0.014	5	0.20	6365	180
6	2	100	0.018	6	0.20	5305	190
8	2	100	0.022	8	0.25	3980	175
10	2	100	0.028	10	0.25	3185	180
12	2	100	0.034	12	0.30	2655	180

Acciaio
850 - 1100 N/mm²

3	2	80	0.008	3	0.15	8490	135
4	2	80	0.012	4	0.15	6365	155
5	2	80	0.014	5	0.20	5095	145
6	2	80	0.018	6	0.20	4245	155
8	2	80	0.022	8	0.25	3185	140
10	2	80	0.028	10	0.25	2545	145
12	2	80	0.034	12	0.30	2120	145

Acciaio inossidabile
[Cr-Ni/1.4301]

3	2	45	0.008	3	0.15	4775	75
4	2	45	0.012	4	0.15	3580	85
5	2	45	0.014	5	0.20	2865	80
6	2	45	0.018	6	0.20	2385	85
8	2	45	0.022	8	0.25	1790	80
10	2	45	0.028	10	0.25	1430	80
12	2	45	0.034	12	0.30	1195	80

Ghisa
(grigia / sferoidale)

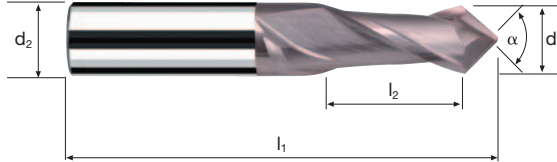
3	2	120	0.008	3	0.15	12735	205
4	2	120	0.012	4	0.15	9550	230
5	2	120	0.014	5	0.20	7640	215
6	2	120	0.018	6	0.20	6365	230
8	2	120	0.022	8	0.25	4775	210
10	2	120	0.028	10	0.25	3820	215
12	2	120	0.034	12	0.30	3185	215

Multifrese

Fresatura, smussatura, foratura, maschiatura



HM λ 30°
 γ 12°



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **GG(G)** Aluminium Copper

Esempio: N° Ordine		Rivestimento U	Articolo 7960	Codice-ø .180			UNICUT-4X
ø Code	d1 *	d2 h6	l1	l2	α	z	U7960
.180	3	4	50	6	90°	2	●
.220	4	5	50	8	90°	2	●
.260	5	6	50	10	90°	2	●
.300	6	8	60	12	90°	2	●
.391	8	10	70	16	90°	2	●
.450	10	12	70	18	90°	2	●
.501	12	12	70	20	90°	2	●
* Tolleranza diametro del tagliente							
d1 Tolleranza							
< 12 h9							
≥ 12 h11							

VI

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
32	6	65	0.060	6.4	24.0	645	230	35.5
40	8	65	0.080	8.0	30.0	515	330	79.0
50	8	65	0.100	10.0	37.5	415	330	124.0
63	10	65	0.120	12.6	47.3	330	395	235.0
80	10	65	0.120	16.0	60.0	260	310	297.5

Acciaio
850 - 1100 N/mm²

32	6	48	0.060	6.4	24.0	475	170	26.0
40	8	48	0.080	8.0	30.0	380	245	59.0
50	8	48	0.100	10.0	37.5	305	245	92.0
63	10	48	0.120	12.6	47.3	245	295	175.5
80	10	48	0.120	16.0	60.0	190	230	221.0

Acciaio
1100 - 1300 N/mm²

32	6	35	0.060	6.4	24.0	350	125	19.0
40	8	35	0.080	8.0	30.0	280	180	43.0
50	8	35	0.100	10.0	37.5	225	180	67.5
63	10	35	0.120	12.6	47.3	175	210	125.0
80	10	35	0.120	16.0	60.0	140	170	163.0

Acciaio inossidabile
[Cr-Ni/1.4301]

32	6	26	0.060	6.4	24.0	260	95	14.5
40	8	26	0.080	8.0	30.0	205	130	31.0
50	8	26	0.100	10.0	37.5	165	130	49.0
63	10	26	0.120	12.6	47.3	130	155	92.5
80	10	26	0.120	16.0	60.0	105	125	120.0

Applicazione

Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
32	6	68	0.070	6.4	9.6	675	285	17.5
40	8	68	0.090	8.0	12.0	540	390	37.5
50	8	68	0.110	10.0	15.0	435	385	58.0
63	10	68	0.125	12.6	18.9	345	430	102.5
80	10	68	0.145	16.0	24.0	270	390	150.0

Acciaio
850 - 1100 N/mm²

32	6	55	0.070	6.4	9.6	545	230	14.0
40	8	55	0.090	8.0	12.0	440	315	30.0
50	8	55	0.110	10.0	15.0	350	310	46.5
63	10	55	0.125	12.6	18.9	280	350	83.5
80	10	55	0.145	16.0	24.0	220	320	123.0

Acciaio
1100 - 1300 N/mm²

32	6	40	0.070	6.4	9.6	400	170	10.5
40	8	40	0.090	8.0	12.0	320	230	22.0
50	8	40	0.110	10.0	15.0	255	225	34.0
63	10	40	0.125	12.6	18.9	200	250	59.5
80	10	40	0.145	16.0	24.0	160	230	88.5

Acciaio inossidabile
[Cr-Ni/1.4301]

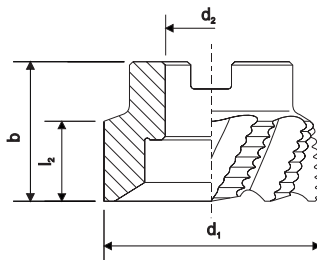
32	6	29	0.070	6.4	9.6	290	120	7.5
40	8	29	0.090	8.0	12.0	230	165	16.0
50	8	29	0.110	10.0	15.0	185	165	25.0
63	10	29	0.125	12.6	18.9	145	180	43.0
80	10	29	0.145	16.0	24.0	115	165	63.5

Frese cilindriche frontali

Profilata



HSS-E
Co8 λ 25°
 γ 10°



Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Aluminium Copper
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Esempio: N° Ordine								Rivestimento Articolo Codice-ø		UNICUT-4X	
								U 3490 .100		U3490	
ø Code	d1 k9	d2 H7	l2	b k13	45°	z					
.100	32	13	15	28	0.7	6			●		
.110	40	16	18	32	0.9	8			●		
.130	50	22	20	36	0.9	8			●		
.160	63	27	22	40	1.2	10			●		
.180	80	27	25	45	1.2	10			●		





Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	8	45	0.065	2.0	30.0	360	185	11.0
50	8	45	0.080	2.5	37.5	285	180	17.0
63	10	45	0.080	3.2	47.3	225	180	27.0
80	12	45	0.100	4.0	60.0	180	215	51.5

Acciaio
1100 - 1300 N/mm²

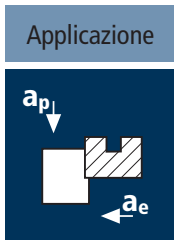
40	8	30	0.065	2.0	30.0	240	125	7.5
50	8	30	0.080	2.5	37.5	190	120	11.5
63	10	30	0.080	3.2	47.3	150	120	18.0
80	12	30	0.100	4.0	60.0	120	145	35.0

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

40	8	20	0.065	2.0	30.0	160	85	5.0
50	8	20	0.080	2.5	37.5	125	80	7.5
63	10	20	0.080	3.2	47.3	100	80	12.0
80	12	20	0.100	4.0	60.0	80	95	23.0

Ghisa (grigia / sferoidale)

40	8	42	0.065	2.0	30.0	335	175	10.5
50	8	42	0.080	2.5	37.5	265	170	16.0
63	10	42	0.080	3.2	47.3	210	170	25.5
80	12	42	0.100	4.0	60.0	165	200	48.0



Materiale

Acciaio
850 - 1100 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	8	50	0.065	20.0	1.0	400	210	4.0
50	8	50	0.080	25.0	1.3	320	205	6.5
63	10	50	0.080	31.5	1.6	255	205	10.0
80	12	50	0.100	40.0	2.0	200	240	19.0

Acciaio
1100 - 1300 N/mm²

40	8	35	0.065	20.0	1.0	280	145	3.0
50	8	35	0.080	25.0	1.3	225	145	4.5
63	10	35	0.080	31.5	1.6	175	140	7.0
80	12	35	0.100	40.0	2.0	140	170	13.5

Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]

40	8	25	0.065	20.0	1.0	200	105	2.0
50	8	25	0.080	25.0	1.3	160	100	3.0
63	10	25	0.080	31.5	1.6	125	100	5.0
80	12	25	0.100	40.0	2.0	100	120	9.5

Ghisa (grigia / sferoidale)

40	8	45	0.065	20.0	1.0	360	185	3.5
50	8	45	0.080	25.0	1.3	285	180	5.5
63	10	45	0.080	31.5	1.6	225	180	9.0
80	12	45	0.100	40.0	2.0	180	215	17.0



Frese con inserti circolari

741 – 803

Frese con inserti HFC

805 – 843

Frese con inserti a spianare

845 – 861

Frese con inserti ad angolo/per scanalature

863 – 905

Accessori

906 – 907



Frese con inserti circolari

Frese a spianare circolari per inserti 10mm

N° W03140



N° W03185



NX	λ 5°	d, 20 – 32	Rm 850-1500			745
	γ 15°					
SX	λ 5°	d, 20 – 32	Inox Stainless	Rm <850		747
	γ 20°					
HX	λ 5°	d, 20 – 32	Rm 1300-1500	HRC 48-60		749
	γ -4°					
ZX	λ 5°	d, 20 – 32	Ni Alloys	Inox Stainless	Rm <850	751
	γ 14°					
AX	λ 5°	d, 20 – 32	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	753
	γ 21°					

Frese a spianare circolari per inserti 12mm

N° W03150



N° W03195



NX	λ 0°	d, 25 – 32	Rm 850-1500			755
	γ 14°					
SX	λ 0°	d, 25 – 32	Inox Stainless	Rm <850		757
	γ 19°					
HX	λ 0°	d, 25 – 32	Rm 1300-1500	HRC 48-60		759
	γ -4°					
ZX	λ 0°	d, 25 – 32	Ni Alloys	Inox Stainless	Rm <850	761
	γ 13°					
AX	λ 0°	d, 25 – 32	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	763
	γ 20°					

Frese con inserti circolari

Frese a spianare circolari per inserti 10mm

N° W03410



NX	λ 5°	d_1 40 – 52	Rm 850-1500			765
	γ 15°					
SX	λ 5°	d_1 40 – 52	Inox Stainless	Rm <850		767
	γ 20°					
HX	λ 5°	d_1 40 – 52	Rm 1300-1500	HRC 48-60		769
	γ -4°					
ZX	λ 5°	d_1 40 – 52	Ni Alloys	Inox Stainless	Rm <850	771
	γ 14°					
AX	λ 5°	d_1 40 – 52	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	773
	γ 21°					

Frese a spianare circolari per inserti 12mm

N° W03412



NX	λ 5°	d_1 40 – 100	Rm 850-1500			775
	γ 15°					
SX	λ 5°	d_1 40 – 100	Inox Stainless	Rm <850		777
	γ 20°					
HX	λ 5°	d_1 40 – 100	Rm 1300-1500	HRC 48-60		779
	γ -4°					
ZX	λ 5°	d_1 40 – 100	Ni Alloys	Inox Stainless	Rm <850	781
	γ 14°					
AX	λ 5°	d_1 40 – 100	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	783
	γ 21°					

Frese con inserti circolari

Frese a spianare circolari per inserti 10mm

N° W03210



NX	λ 5°	d, 25 – 35	Rm 850-1500			785
	γ 15°					
SX	λ 5°	d, 25 – 35	Inox Stainless	Rm <850		787
	γ 20°					
HX	λ 5°	d, 25 – 35	Rm 1300-1500	HRC 48-60		789
	γ -4°					
ZX	λ 5°	d, 25 – 35	Ni Alloys	Inox Stainless	Rm <850	791
	γ 14°					
AX	λ 5°	d, 25 – 35	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	793
	γ 21°					

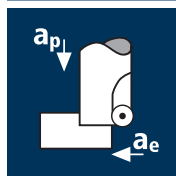
Frese a spianare circolari per inserti 12mm

N° W03212



NX	λ 5°	d, 35 – 42	Rm 850-1500			795
	γ 15°					
SX	λ 5°	d, 35 – 42	Inox Stainless	Rm <850		797
	γ 20°					
HX	λ 5°	d, 35 – 42	Rm 1300-1500	HRC 48-60		799
	γ -4°					
ZX	λ 5°	d, 35 – 42	Ni Alloys	Inox Stainless	Rm <850	801
	γ 14°					
AX	λ 5°	d, 35 – 42	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	803
	γ 21°					

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Materiale

Acciaio
1500 - 1800 N/mm²



Ghisa
(grigia / sferoidale)



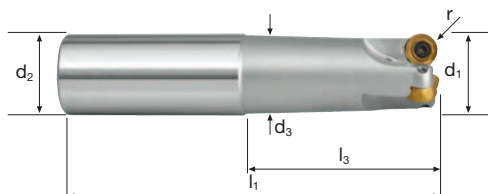
Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	20	2	220	0.500	1.33	12.0	3500	3500	56.0
	25	3	220	0.500	1.33	15.0	2800	4200	84.0
	32	4	220	0.500	1.33	19.2	2190	4380	112.0
XL	20	2	180	0.480	1.22	8.0	2865	2750	27.0
	25	3	180	0.480	1.22	10.0	2290	3300	40.5
	32	4	180	0.480	1.22	12.8	1790	3435	53.5
M	20	2	200	0.400	1.20	12.0	3185	2550	36.5
	25	3	200	0.400	1.20	15.0	2545	3055	55.0
	32	4	200	0.400	1.20	19.2	1990	3185	73.5
XL	20	2	160	0.385	1.10	8.0	2545	1960	17.0
	25	3	160	0.385	1.10	10.0	2035	2350	26.0
	32	4	160	0.385	1.10	12.8	1590	2450	34.5
M	20	2	180	0.350	1.13	12.0	2865	2005	27.0
	25	3	180	0.350	1.13	15.0	2290	2405	41.0
	32	4	180	0.350	1.13	19.2	1790	2505	54.5
XL	20	2	140	0.335	1.04	8.0	2230	1495	12.5
	25	3	140	0.335	1.04	10.0	1785	1795	18.5
	32	4	140	0.335	1.04	12.8	1395	1870	25.0
M	20	2	120	0.300	1.06	12.0	1910	1145	14.5
	25	3	120	0.300	1.06	15.0	1530	1375	22.0
	32	4	120	0.300	1.06	19.2	1195	1435	29.0
XL	20	2	100	0.290	0.98	8.0	1590	920	7.0
	25	3	100	0.290	0.98	10.0	1275	1110	11.0
	32	4	100	0.290	0.98	12.8	995	1155	14.5

Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	20	2	100	0.250	1.00	12.0	1590	795	9.5
	25	3	100	0.250	1.00	15.0	1275	955	14.5
	32	4	100	0.250	1.00	19.2	995	995	19.0
XL	20	2	80	0.240	0.92	8.0	1275	610	4.5
	25	3	80	0.240	0.92	10.0	1020	735	7.0
	32	4	80	0.240	0.92	12.8	795	765	9.0
M	20	2	180	0.500	1.33	12.0	2865	2865	45.5
	25	3	180	0.500	1.33	15.0	2290	3435	68.5
	32	4	180	0.500	1.33	19.2	1790	3580	91.5
XL	20	2	140	0.480	1.22	8.0	2230	2140	21.0
	25	3	140	0.480	1.22	10.0	1785	2570	31.5
	32	4	140	0.480	1.22	12.8	1395	2680	42.0

Frese a spianare circolari NX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 15°



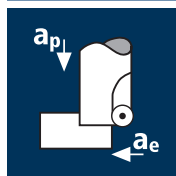
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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Frese a spianare circolari									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W03140.202	20	20	19	110	57	1.4	2	M	●	
W03185.202	20	20	19	185	57	1.4	2	XL	●	
W03140.253	25	25	24	124	65	1.4	3	M	●	
W03185.253	25	25	24	210	65	1.4	3	XL	●	
W03140.324	32	32	31	144	81	1.4	4	M	●	
W03185.324	32	32	31	250	81	1.4	4	XL	●	

Inserti NX 10mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	D1	r	D		
W53110.010	10.0	5.0	4.0	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10	●	
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10	●	
W93100.010	Cacciavite Torx TX 10	●	
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3	●	

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



Materiale

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Acciaio
< 850 N/mm²



Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	20	2	160	0.360	0.91	12.0	2545	1830	20.0
	25	3	160	0.360	0.91	15.0	2035	2200	30.0
	32	4	160	0.360	0.91	19.2	1590	2290	40.0
XL	20	2	140	0.340	0.69	8.0	2230	1515	8.5
	25	3	140	0.340	0.69	10.0	1785	1820	12.5
	32	4	140	0.340	0.69	12.8	1395	1895	16.5

M	20	2	120	0.325	0.82	12.0	1910	1240	12.0
	25	3	120	0.325	0.82	15.0	1530	1490	18.5
	32	4	120	0.325	0.82	19.2	1195	1555	24.5
XL	20	2	100	0.305	0.62	8.0	1590	970	5.0
	25	3	100	0.305	0.62	10.0	1275	1165	7.0
	32	4	100	0.305	0.62	12.8	995	1215	9.5

M	20	2	130	0.290	0.82	12.0	2070	1200	12.0
	25	3	130	0.290	0.82	15.0	1655	1440	17.5
	32	4	130	0.290	0.82	19.2	1295	1500	23.5
XL	20	2	110	0.270	0.62	8.0	1750	945	4.5
	25	3	110	0.270	0.62	10.0	1400	1135	7.0
	32	4	110	0.270	0.62	12.8	1095	1185	9.5

M	20	2	100	0.215	0.64	12.0	1590	685	5.5
	25	3	100	0.215	0.64	15.0	1275	820	8.0
	32	4	100	0.215	0.64	19.2	995	855	10.5
XL	20	2	80	0.205	0.48	8.0	1275	525	2.0
	25	3	80	0.205	0.48	10.0	1020	625	3.0
	32	4	80	0.205	0.48	12.8	795	650	4.0

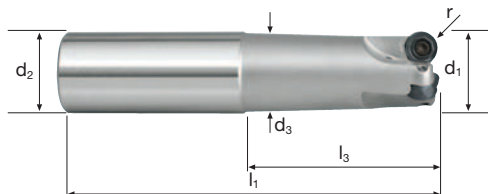
Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	20	2	55	0.200	0.59	12.0	875	350	2.5
	25	3	55	0.200	0.59	15.0	700	420	3.5
	32	4	55	0.200	0.59	19.2	545	435	5.0
XL	25	3	45	0.185	0.45	10.0	575	320	1.5
	25	3	45	0.185	0.45	10.0	575	320	1.5
	25	3	45	0.185	0.45	10.0	575	320	1.5

M	20	2	220	0.450	1.23	12.0	3500	3150	46.5
	25	3	220	0.450	1.23	15.0	2800	3780	69.5
	32	4	220	0.450	1.23	19.2	2190	3940	93.0
XL	20	2	180	0.425	1.13	8.0	2865	2435	22.0
	25	3	180	0.425	1.13	10.0	2290	2920	33.0
	32	4	180	0.425	1.13	12.8	1790	3045	44.0

Frese a spianare circolari SX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 20°



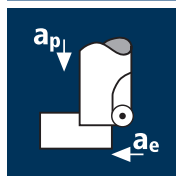
Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Frese a spianare circolari									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W03140.202	20	20	19	110	57	1.4	2	M		●
W03185.202	20	20	19	185	57	1.4	2	XL		●
W03140.253	25	25	24	124	65	1.4	3	M		●
W03185.253	25	25	24	210	65	1.4	3	XL		●
W03140.324	32	32	31	144	81	1.4	4	M		●
W03185.324	32	32	31	250	81	1.4	4	XL		●

Inserti SX 10mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	D1	r	D		
W53310.010	10.0	5.0	4.0		●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10		●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10		●
W93100.010	Cacciavite Torx TX 10		●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3		●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC

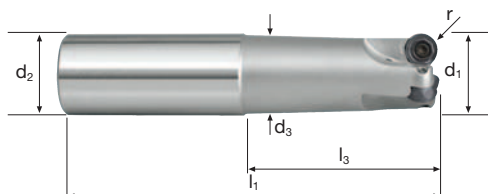
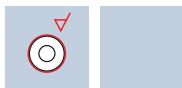


Tipo-L [mm]	d1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
M	20	2	100	0.350	1.00	12.0	1590	1115	13.5
	25	3	100	0.350	1.00	15.0	1275	1340	20.0
	32	4	100	0.350	1.00	19.2	995	1395	27.0
XL	20	2	90	0.320	0.76	8.0	1430	915	5.5
	25	3	90	0.320	0.76	10.0	1145	1100	8.5
	32	4	90	0.320	0.76	12.8	895	1145	11.0
M	20	2	80	0.330	0.95	12.0	1275	840	9.5
	25	3	80	0.330	0.95	15.0	1020	1010	14.5
	32	4	80	0.330	0.95	19.2	795	1050	19.0
XL	20	2	70	0.305	0.72	8.0	1115	680	4.0
	25	3	70	0.305	0.72	10.0	890	815	6.0
	32	4	70	0.305	0.72	12.8	695	850	8.0
M	20	2	50	0.315	0.90	12.0	795	500	5.5
	25	3	50	0.315	0.90	15.0	635	600	8.0
	32	4	50	0.315	0.90	19.2	495	625	11.0
XL	20	2	40	0.290	0.68	8.0	635	370	2.0
	25	3	40	0.290	0.68	10.0	510	445	3.0
	32	4	40	0.290	0.68	12.8	400	465	4.0
M	20	2	30	0.225	0.70	12.0	475	215	2.0
	25	3	30	0.225	0.70	15.0	380	255	2.5
	32	4	30	0.225	0.70	19.2	300	270	3.5
XL	20	2	25	0.210	0.53	8.0	400	170	0.5
	25	3	25	0.210	0.53	10.0	320	200	1.0
	32	4	25	0.210	0.53	12.8	250	210	1.5

Frese a spianare circolari HX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ -4°
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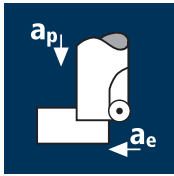
		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			GG(G)
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W03140.202	20	20	19	110	57	1.4	2	M	●
W03185.202	20	20	19	185	57	1.4	2	XL	●
W03140.253	25	25	24	124	65	1.4	3	M	●
W03185.253	25	25	24	210	65	1.4	3	XL	●
W03140.324	32	32	31	144	81	1.4	4	M	●
W03185.324	32	32	31	250	81	1.4	4	XL	●

Inserti HX 10mm		Composizione fornitura: Confezione minima: 10 pezzi			
N° Ordine	D1	r	D		
W53210.010	10.0	5.0	4.0		●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10			●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10			●
W93100.010	Cacciavite Torx TX 10			●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3			●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	20	2	130	0.340	0.80	12.0	2070	1410	13.5
	25	3	130	0.340	0.80	15.0	1655	1690	20.5
	32	4	130	0.340	0.80	19.2	1295	1760	27.0
XL	20	2	110	0.320	0.60	8.0	1750	1120	5.5
	25	3	110	0.320	0.60	10.0	1400	1345	8.0
	32	4	110	0.320	0.60	12.8	1095	1400	11.0

M	20	2	140	0.305	0.80	12.0	2230	1360	13.0
	25	3	140	0.305	0.80	15.0	1785	1635	19.5
	32	4	140	0.305	0.80	19.2	1395	1700	26.0
XL	20	2	120	0.290	0.60	8.0	1910	1110	5.5
	25	3	120	0.290	0.60	10.0	1530	1330	8.0
	32	4	120	0.290	0.60	12.8	1195	1385	10.5

M	20	2	110	0.220	0.64	12.0	1750	770	6.0
	25	3	110	0.220	0.64	15.0	1400	925	9.0
	32	4	110	0.220	0.64	19.2	1095	965	12.0
XL	20	2	100	0.210	0.48	8.0	1590	670	2.5
	25	3	100	0.210	0.48	10.0	1275	805	4.0
	32	4	100	0.210	0.48	12.8	995	835	5.0

M	20	2	60	0.205	0.60	12.0	955	390	3.0
	25	3	60	0.205	0.60	15.0	765	470	4.0
	32	4	60	0.205	0.60	19.2	595	490	5.5
XL	20	2	50	0.190	0.45	8.0	795	300	1.0
	25	3	50	0.190	0.45	10.0	635	360	1.5
	32	4	50	0.190	0.45	12.8	495	375	2.0

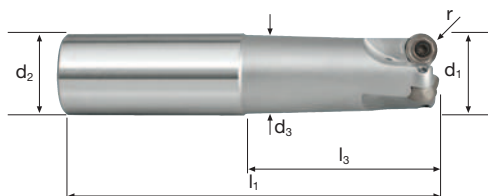
Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	20	2	80	0.240	0.72	12.0	1275	610	5.5
	25	3	80	0.240	0.72	15.0	1020	735	8.0
	32	4	80	0.240	0.72	19.2	795	765	10.5
XL	20	2	70	0.225	0.54	8.0	1115	500	2.0
	25	3	70	0.225	0.54	10.0	890	600	3.0
	32	4	70	0.225	0.54	12.8	695	625	4.5

M	20	2	35	0.135	0.64	8.0	555	150	1.0
	25	3	35	0.135	0.64	10.0	445	180	1.0
	32	4	35	0.135	0.64	12.8	350	190	1.5
XL	20	2	30	0.130	0.48	8.0	475	125	0.5
	25	3	30	0.130	0.48	10.0	380	150	0.5
	32	4	30	0.130	0.48	12.8	300	155	1.0

Frese a spianare circolari ZX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 14°
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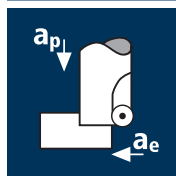
Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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Frese a spianare circolari									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W03140.202	20	20	19	110	57	1.4	2	M		●
W03185.202	20	20	19	185	57	1.4	2	XL		●
W03140.253	25	25	24	124	65	1.4	3	M		●
W03185.253	25	25	24	210	65	1.4	3	XL		●
W03140.324	32	32	31	144	81	1.4	4	M		●
W03185.324	32	32	31	250	81	1.4	4	XL		●

Inserti ZX 10mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	D1	r	D		
W53410.010	10.0	5.0	4.0		●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10		●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10		●
W93100.010	Cacciavite Torx TX 10		●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3		●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



Getti d'alluminio
Si 6%-15%



Rame non legato



Materiali termoplastici

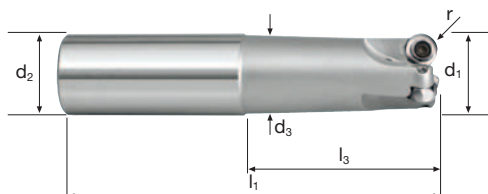
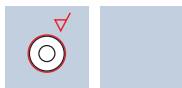


Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	20	2	700	0.400	1.20	12.0	11140	8910	128.5
	25	3	650	0.400	1.20	15.0	8275	9930	178.5
	32	4	550	0.400	1.20	19.2	5470	8750	201.5
XL	20	2	650	0.380	1.10	8.0	10345	7860	69.0
	25	3	600	0.380	1.10	10.0	7640	8710	96.0
	32	4	500	0.380	1.10	12.8	4975	7560	106.5
M	20	2	550	0.350	1.20	12.0	8755	6130	88.5
	25	3	500	0.350	1.20	15.0	6365	6685	120.5
	32	4	450	0.350	1.20	19.2	4475	6265	144.5
XL	20	2	500	0.330	1.10	8.0	7960	5255	46.0
	25	3	450	0.330	1.10	10.0	5730	5675	62.5
	32	4	400	0.330	1.10	12.8	3980	5255	74.0
M	20	2	500	0.350	1.20	12.0	7960	5570	80.0
	25	3	450	0.350	1.20	15.0	5730	6015	108.5
	32	4	400	0.350	1.20	19.2	3980	5570	128.5
XL	20	2	450	0.330	1.10	8.0	7160	4725	41.5
	25	3	400	0.330	1.10	10.0	5095	5045	55.5
	32	4	400	0.330	1.10	12.8	3980	5255	74.0
M	20	2	700	0.400	1.20	12.0	11140	8910	128.5
	25	3	650	0.400	1.20	15.0	8275	9930	178.5
	32	4	550	0.400	1.20	19.2	5470	8750	201.5
XL	20	2	650	0.380	1.10	8.0	10345	7860	69.0
	25	3	600	0.380	1.10	10.0	7640	8710	96.0
	32	4	500	0.380	1.10	12.8	4975	7560	106.5

Frese a spianare circolari AX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM λ 5°
 γ 21°



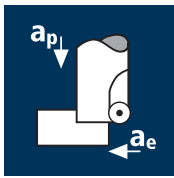
			Al Aluminum > 99%	Al Aluminum Alloy	Al Aluminum Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF/GF Fiber Reinforced Plastics
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W03140.202	20	20	19	110	57	1.4	2	M	●
W03185.202	20	20	19	185	57	1.4	2	XL	●
W03140.253	25	25	24	124	65	1.4	3	M	●
W03185.253	25	25	24	210	65	1.4	3	XL	●
W03140.324	32	32	31	144	81	1.4	4	M	●
W03185.324	32	32	31	250	81	1.4	4	XL	●

Inserti AX 10mm		Composizione fornitura: Confezione minima: 10 pezzi			
N° Ordine	D1	r	D		
W53510.010	10.0	5.0	4.0	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10			●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10			●
W93100.010	Cacciavite Torx TX 10			●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3			●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Materiale

Acciaio
1500 - 1800 N/mm²



Ghisa
(grigia / sferoidale)



Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	2	220	0.500	1.67	15.0	2800	2800	70.0
	32	3	220	0.500	1.67	19.2	2190	3285	105.5
XL	25	2	180	0.480	1.50	10.0	2290	2200	33.0
	32	3	180	0.480	1.50	12.8	1790	2580	49.5

M	25	2	200	0.400	1.50	15.0	2545	2035	46.0
	32	3	200	0.400	1.50	19.2	1990	2390	69.0
XL	25	2	160	0.385	1.40	10.0	2035	1565	22.0
	32	3	160	0.385	1.40	12.8	1590	1835	33.0

M	25	2	180	0.350	1.42	15.0	2290	1605	34.0
	32	3	180	0.350	1.42	19.2	1790	1880	51.5
XL	25	2	140	0.335	1.27	10.0	1785	1195	15.0
	32	3	140	0.335	1.27	12.8	1395	1400	23.0

M	25	2	120	0.300	1.34	15.0	1530	920	18.5
	32	3	120	0.300	1.34	19.2	1195	1075	27.5
XL	25	2	100	0.290	1.20	10.0	1275	740	9.0
	32	3	100	0.290	1.20	12.8	995	865	13.5

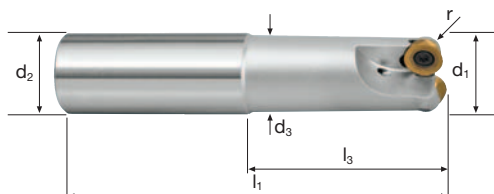
Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	2	100	0.250	1.25	15.0	1275	640	12.0
	32	3	100	0.250	1.25	19.2	995	745	18.0
XL	25	2	80	0.240	1.13	10.0	1020	490	5.5
	32	3	80	0.240	1.13	12.8	795	570	8.0

M	25	2	180	0.500	1.67	15.0	2290	2290	57.5
	32	3	180	0.500	1.67	19.2	1790	2685	86.0
XL	25	2	140	0.480	1.50	10.0	1785	1715	25.5
	32	3	140	0.480	1.50	12.8	1395	2010	38.5

Frese a spianare circolari NX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 0° γ 14°



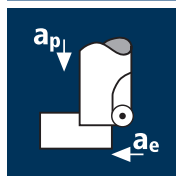
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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Frese a spianare circolari									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W03150.252	25	25	24	124	65	1.7	2	M	●	
W03195.252	25	25	24	210	65	1.7	2	XL	●	
W03150.323	32	32	31	144	81	1.7	3	M	●	
W03195.323	32	32	31	250	81	1.7	3	XL	●	

Inserti NX 12mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	D1	r	D		
W53110.012	12.0	6.0	4.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15	●	
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●	
W90100.013	Cacciavite Torx TX 15	●	
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5	●	

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



Materiale

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Acciaio
< 850 N/mm²



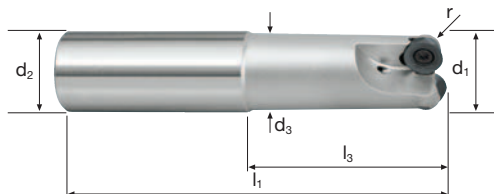
Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	2	160	0.380	1.14	15.0	2035	1545	26.5
	32	3	160	0.380	1.14	19.2	1590	1815	39.5
XL	25	2	140	0.360	0.90	10.0	1785	1285	11.5
	32	3	140	0.360	0.90	12.8	1395	1505	17.5
M	25	2	120	0.340	1.03	15.0	1530	1040	16.0
	32	3	120	0.340	1.03	19.2	1195	1220	24.0
XL	25	2	100	0.325	0.81	10.0	1275	830	6.5
	32	3	100	0.325	0.81	12.8	995	970	10.0
M	25	2	130	0.305	1.03	15.0	1655	1010	15.5
	32	3	130	0.305	1.03	19.2	1295	1185	23.5
XL	25	2	110	0.290	0.81	10.0	1400	810	6.5
	32	3	110	0.290	0.81	12.8	1095	955	10.0
M	25	2	100	0.230	0.80	15.0	1275	585	7.0
	32	3	100	0.230	0.80	19.2	995	685	10.5
XL	25	2	80	0.215	0.63	10.0	1020	440	3.0
	32	3	80	0.215	0.63	12.8	795	515	4.0

Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	2	55	0.210	0.74	15.0	700	295	3.5
	32	3	55	0.210	0.74	19.2	545	345	5.0
XL	25	2	45	0.200	0.59	10.0	575	230	1.5
	32	3	45	0.200	0.59	12.8	450	270	2.0
M	25	2	220	0.475	1.54	15.0	2800	2660	61.5
	32	3	220	0.475	1.54	19.2	2190	3120	92.5
XL	25	2	180	0.450	1.42	10.0	2290	2060	29.5
	32	3	180	0.450	1.42	12.8	1790	2415	44.0

Frese a spianare circolari SX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 0° γ 19°



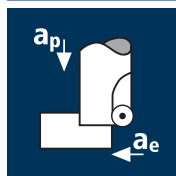
Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Tool Steel
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Frese a spianare circolari									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W03150.252	25	25	24	124	65	1.7	2	M		●
W03195.252	25	25	24	210	65	1.7	2	XL		●
W03150.323	32	32	31	144	81	1.7	3	M		●
W03195.323	32	32	31	250	81	1.7	3	XL		●

Inserti SX 12mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	D1	r	D		
W53310.012	12.0	6.0	4.8		●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5		●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC

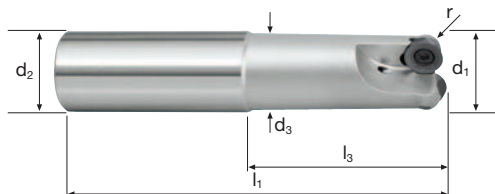


Tipo-L [mm]	d1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
M	25	2	100	0.350	1.44	15.0	1275	895	19.5
	32	3	100	0.350	1.44	19.2	995	1045	29.0
XL	25	2	90	0.320	1.11	10.0	1145	735	8.0
	32	3	90	0.320	1.11	12.8	895	860	12.0
M	25	2	80	0.330	1.37	15.0	1020	675	14.0
	32	3	80	0.330	1.37	19.2	795	785	20.5
XL	25	2	70	0.305	1.05	10.0	890	545	5.5
	32	3	70	0.305	1.05	12.8	695	635	8.5
M	25	2	50	0.315	1.30	15.0	635	400	8.0
	32	3	50	0.315	1.30	19.2	495	470	11.5
XL	25	2	40	0.290	1.00	10.0	510	295	3.0
	32	3	40	0.290	1.00	12.8	400	350	4.5
M	25	2	30	0.225	1.01	15.0	380	170	2.5
	32	3	30	0.225	1.01	19.2	300	205	4.0
XL	25	2	25	0.210	0.78	10.0	320	135	1.0
	32	3	25	0.210	0.78	12.8	250	160	1.5

Frese a spianare circolari HX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 0° γ -4°
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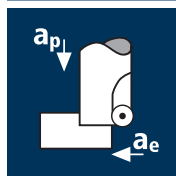
		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			GG(G)
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W03150.252	25	25	24	124	65	1.7	2	M	●
W03195.252	25	25	24	210	65	1.7	2	XL	●
W03150.323	32	32	31	144	81	1.7	3	M	●
W03195.323	32	32	31	250	81	1.7	3	XL	●

Inserti HX 12mm		Composizione fornitura: Confezione minima: 10 pezzi			
N° Ordine	D1	r	D		
W53210.012	12.0	6.0	4.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15			●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15			●
W90100.013	Cacciavite Torx TX 15			●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5			●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	2	130	0.360	1.00	15.0	1655	1190	18.0
	32	3	130	0.360	1.00	19.2	1295	1400	27.0
XL	25	2	110	0.340	0.80	10.0	1400	950	7.5
	32	3	110	0.340	0.80	12.8	1095	1115	11.5

M	25	2	140	0.325	1.00	15.0	1785	1160	17.5
	32	3	140	0.325	1.00	19.2	1395	1360	26.0
XL	25	2	120	0.305	0.80	10.0	1530	935	7.5
	32	3	120	0.305	0.80	12.8	1195	1095	11.0

M	25	2	110	0.235	0.80	15.0	1400	660	8.0
	32	3	110	0.235	0.80	19.2	1095	770	12.0
XL	25	2	100	0.220	0.64	10.0	1275	560	3.5
	32	3	100	0.220	0.64	12.8	995	655	5.5

M	25	2	60	0.215	0.75	15.0	765	330	3.5
	32	3	60	0.215	0.75	19.2	595	385	5.5
XL	25	2	50	0.205	0.60	10.0	635	260	1.5
	32	3	50	0.205	0.60	12.8	495	305	2.5

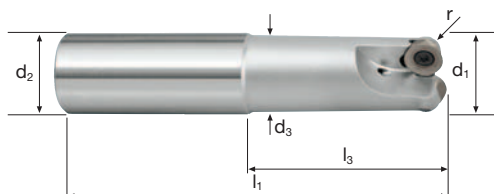
Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	2	80	0.250	0.90	15.0	1020	510	7.0
	32	3	80	0.250	0.90	19.2	795	595	10.5
XL	25	2	70	0.240	0.72	10.0	890	425	3.0
	32	3	70	0.240	0.72	12.8	695	500	4.5

M	25	2	35	0.145	0.80	10.0	445	130	1.0
	32	3	35	0.145	0.80	12.8	350	150	1.5
XL	25	2	30	0.135	0.64	10.0	380	105	0.5
	32	3	30	0.135	0.64	12.8	300	120	1.0

Frese a spianare circolari ZX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM λ 0°
 γ 13°



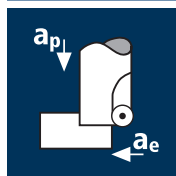
Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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Frese a spianare circolari									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W03150.252	25	25	24	124	65	1.7	2	M	●
W03195.252	25	25	24	210	65	1.7	2	XL	●
W03150.323	32	32	31	144	81	1.7	3	M	●
W03195.323	32	32	31	250	81	1.7	3	XL	●

Inserti ZX 12mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53410.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5	●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



Getti d'alluminio
Si 6%-15%



Rame non legato



Materiali termoplastici

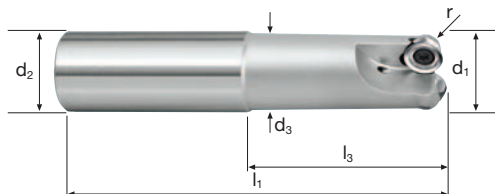


Tipo-L [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	3	650	0.450	1.50	15.0	8275	11170	251.5
	32	4	550	0.450	1.50	19.2	5470	9845	283.5
XL	25	3	600	0.430	1.40	10.0	7640	9855	138.0
	32	4	500	0.430	1.40	12.8	4975	8555	153.5
M	25	3	500	0.400	1.50	15.0	6365	7640	172.0
	32	4	450	0.400	1.50	19.2	4475	7160	206.0
XL	25	3	450	0.380	1.40	10.0	5730	6530	91.5
	32	4	400	0.380	1.40	12.8	3980	6050	108.5
M	25	3	450	0.400	1.50	15.0	5730	6875	154.5
	32	4	400	0.400	1.50	19.2	3980	6370	183.5
XL	25	3	400	0.380	1.40	10.0	5095	5810	81.5
	32	4	400	0.380	1.40	12.8	3980	6050	108.5
M	25	3	650	0.450	1.50	15.0	8275	11170	251.5
	32	4	550	0.450	1.50	19.2	5470	9845	283.5
XL	25	3	600	0.430	1.40	10.0	7640	9855	138.0
	32	4	500	0.430	1.40	12.8	4975	8555	153.5

Frese a spianare circolari AX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM λ 0°
 γ 20°



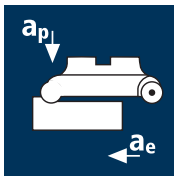
			Al Aluminum > 99%	Al Aluminum Alloy	Al Aluminum Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF/GF Fiber Reinforced Plastics
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W03150.252	25	25	24	124	65	1.7	2	M	●
W03195.252	25	25	24	210	65	1.7	2	XL	●
W03150.323	32	32	31	144	81	1.7	3	M	●
W03195.323	32	32	31	250	81	1.7	3	XL	●

Inserti AX 12mm		Composizione fornitura: Confezione minima: 10 pezzi			
N° Ordine	D1	r	D		
W53510.012	12.0	6.0	4.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15			●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15			●
W90100.013	Cacciavite Torx TX 15			●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5			●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	220	0.500	1.28	24.0	1750	3500	107.50
42	4	220	0.500	1.28	25.2	1665	3330	107.40
50	5	220	0.500	1.28	30.0	1400	3500	134.40
52	5	220	0.500	1.28	31.2	1345	3365	134.40

40	4	200	0.400	1.15	24.0	1590	2545	70.25
42	4	200	0.400	1.15	25.2	1515	2425	70.30
50	5	200	0.400	1.15	30.0	1275	2550	88.00
52	5	200	0.400	1.15	31.2	1225	2450	87.90

40	4	180	0.350	1.09	24.0	1430	2000	52.30
42	4	180	0.350	1.09	25.2	1365	1910	52.45
50	5	180	0.350	1.09	30.0	1145	2005	65.55
52	5	180	0.350	1.09	31.2	1100	1925	65.45

40	4	120	0.300	1.02	24.0	955	1145	28.05
42	4	120	0.300	1.02	25.2	910	1090	28.00
50	5	120	0.300	1.02	30.0	765	1150	35.20
52	5	120	0.300	1.02	31.2	735	1105	35.15

Materiale

Acciaio
1500 - 1800 N/mm²

Ghisa
(griglia / sferoidale)

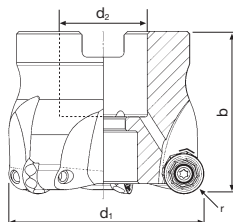
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	100	0.250	0.96	24.0	795	795	18.30
42	4	100	0.250	0.96	25.2	760	760	18.40
50	5	100	0.250	0.96	30.0	635	795	22.90
52	5	100	0.250	0.96	31.2	610	765	22.90

40	4	180	0.500	1.28	24.0	1430	2860	87.85
42	4	180	0.500	1.28	25.2	1365	2730	88.05
50	5	180	0.500	1.28	30.0	1145	2865	110.00
52	5	180	0.500	1.28	31.2	1100	2750	109.80

Frese a spianare circolari NX

Inseri 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 15°
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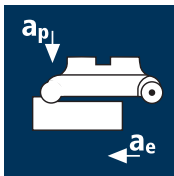
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03410.404*	40	16	40	1.4	4	●
W03410.424*	42	16	40	1.4	4	●
W03410.505	50	22	40	1.4	5	●
W03410.525	52	22	40	1.4	5	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm) Composizione fornitura con Power-Vite					●

Inseri NX 10mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53110.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10	●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10	●
W93100.010	Cacciavite Torx TX 10	●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3	●

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico

Acciaio inossidabile
[Cr-Ni/1.4301]

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

Acciaio resistente
al calore
[17-4 PH]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	160	0.380	0.95	24.0	1275	1940	44.25
42	4	160	0.380	0.95	25.2	1215	1845	44.15
50	5	160	0.380	0.95	30.0	1020	1940	55.30
52	5	160	0.380	0.95	31.2	980	1860	55.15

40	4	120	0.340	0.86	24.0	955	1300	26.85
42	4	120	0.340	0.86	25.2	910	1240	26.85
50	5	120	0.340	0.86	30.0	765	1300	33.55
52	5	120	0.340	0.86	31.2	735	1250	33.55

40	4	130	0.305	0.86	24.0	1035	1265	26.10
42	4	130	0.305	0.86	25.2	985	1200	26.00
50	5	130	0.305	0.86	30.0	830	1265	32.65
52	5	130	0.305	0.86	31.2	795	1210	32.45

40	4	100	0.230	0.66	24.0	795	730	11.55
42	4	100	0.230	0.66	25.2	760	700	11.65
50	5	100	0.230	0.66	30.0	635	730	14.45
52	5	100	0.230	0.66	31.2	610	700	14.40

Materiale

Leghe di titanio indurite
>300 HB
[Ti6Al4V]

Acciaio
< 850 N/mm²

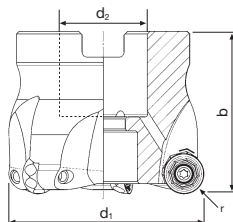
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	55	0.210	0.62	24.0	440	370	5.50
42	4	55	0.210	0.62	25.2	415	350	5.45
50	5	55	0.210	0.62	30.0	350	370	6.90
52	5	55	0.210	0.62	31.2	335	350	6.75

40	4	220	0.475	1.23	24.0	1750	3325	98.15
42	4	220	0.475	1.23	25.2	1665	3165	98.10
50	5	220	0.475	1.23	30.0	1400	3325	122.70
52	5	220	0.475	1.23	31.2	1345	3195	122.60

Frese a spianare circolari SX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 20°
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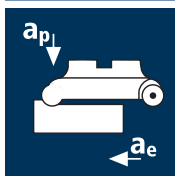
Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03410.404*	40	16	40	1.4	4	●
W03410.424*	42	16	40	1.4	4	●
W03410.505	50	22	40	1.4	5	●
W03410.525	52	22	40	1.4	5	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm) Composizione fornitura con Power-Vite					●

Inserti SX 10mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53310.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10	●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10	●
W93100.010	Cacciavite Torx TX 10	●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3	●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC

Acciaio da
utensile temprato
48 - 52 HRC

Acciaio da
utensile temprato
52 - 56 HRC

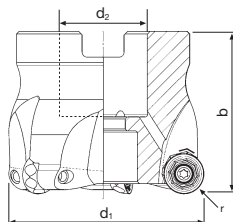
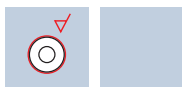
Acciaio da
utensile temprato
56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	100	0.350	1.22	24.0	795	1115	32.65
42	4	100	0.350	1.22	25.2	760	1065	32.75
50	5	100	0.350	1.22	30.0	635	1110	40.65
52	5	100	0.350	1.22	31.2	610	1070	40.75
40	4	80	0.330	1.16	24.0	635	840	23.40
42	4	80	0.330	1.16	25.2	605	800	23.40
50	5	80	0.330	1.16	30.0	510	840	29.25
52	5	80	0.330	1.16	31.2	490	810	29.30
40	4	50	0.320	1.10	24.0	400	510	13.45
42	4	50	0.320	1.10	25.2	380	485	13.45
50	5	50	0.320	1.10	30.0	320	510	16.85
52	5	50	0.320	1.10	31.2	305	490	16.80
40	4	30	0.230	0.85	24.0	240	220	4.50
42	4	30	0.230	0.85	25.2	225	205	4.40
50	5	30	0.230	0.85	30.0	190	220	5.60
52	5	30	0.230	0.85	31.2	185	215	5.70

Frese a spianare circolari HX

Inseri 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ -4°
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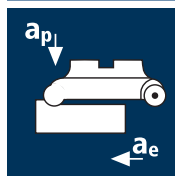
		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			GG(G)
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03410.404*	40	16	40	1.4	4	●
W03410.424*	42	16	40	1.4	4	●
W03410.505	50	22	40	1.4	5	●
W03410.525	52	22	40	1.4	5	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm) Composizione fornitura con Power-Vite					●

Inseri NX 10mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53210.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10	●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10	●
W93100.010	Cacciavite Torx TX 10	●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3	●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



Acciaio
< 850 N/mm²



Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	130	0.360	0.85	24.0	1035	1490	30.40
42	4	130	0.360	0.85	25.2	985	1420	30.40
50	5	130	0.360	0.85	30.0	830	1495	38.10
52	5	130	0.360	0.85	31.2	795	1430	37.90

40	4	140	0.325	0.85	24.0	1115	1450	29.60
42	4	140	0.325	0.85	25.2	1060	1380	29.55
50	5	140	0.325	0.85	30.0	890	1445	36.85
52	5	140	0.325	0.85	31.2	855	1390	36.85

40	4	110	0.235	0.68	24.0	875	825	13.45
42	4	110	0.235	0.68	25.2	835	785	13.45
50	5	110	0.235	0.68	30.0	700	825	16.85
52	5	110	0.235	0.68	31.2	675	795	16.85

40	4	60	0.215	0.64	24.0	475	410	6.30
42	4	60	0.215	0.64	25.2	455	390	6.30
50	5	60	0.215	0.64	30.0	380	410	7.85
52	5	60	0.215	0.64	31.2	365	390	7.80

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	80	0.250	0.77	24.0	635	635	11.75
42	4	80	0.250	0.77	25.2	605	605	11.75
50	5	80	0.250	0.77	30.0	510	640	14.80
52	5	80	0.250	0.77	31.2	490	615	14.75

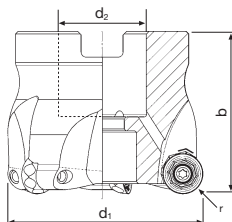
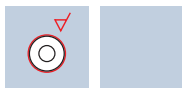
40	4	220	0.470	1.19	24.0	1750	3290	93.95
42	4	220	0.470	1.19	25.2	1665	3130	93.85
50	5	220	0.470	1.19	30.0	1400	3290	117.45
52	5	220	0.470	1.19	31.2	1345	3160	117.30

40	4	35	0.145	0.89	16.0	280	160	2.30
42	4	35	0.145	0.89	16.8	265	155	2.30
50	5	35	0.145	0.89	20.0	225	165	2.95
52	5	35	0.145	0.89	20.8	215	155	2.85

Frese a spianare circolari ZX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 14°
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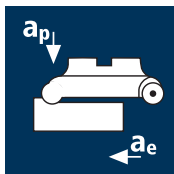
Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03410.404*	40	16	40	1.4	4	●
W03410.424*	42	16	40	1.4	4	●
W03410.505	50	22	40	1.4	5	●
W03410.525	52	22	40	1.4	5	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm) Composizione fornitura con Power-Vite					●

Inserti ZX 10mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53410.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10	●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10	●
W93100.010	Cacciavite Torx TX 10	●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3	●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



Getti d'alluminio
Si 6%-15%



Rame non legato



Materiali termoplastici

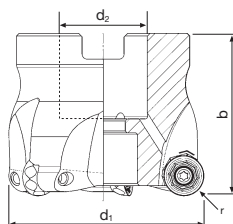
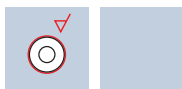


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	600	0.400	1.20	24.0	4775	7640	220.05
42	4	600	0.400	1.20	25.2	4545	7270	219.85
50	5	550	0.400	1.20	30.0	3500	7000	252.00
52	5	550	0.400	1.20	31.2	3365	6730	251.95
40	4	500	0.350	1.20	24.0	3980	5570	160.40
42	4	500	0.350	1.20	25.2	3790	5305	160.40
50	5	450	0.350	1.20	30.0	2865	5015	180.55
52	5	450	0.350	1.20	31.2	2755	4820	180.45
40	4	400	0.350	1.20	24.0	3185	4460	128.45
42	4	400	0.350	1.20	25.2	3030	4240	128.20
50	5	350	0.350	1.20	30.0	2230	3905	140.60
52	5	350	0.350	1.20	31.2	2145	3755	140.60
40	4	600	0.400	1.20	24.0	4775	7640	220.05
42	4	600	0.400	1.20	25.2	4545	7270	219.85
50	5	550	0.400	1.20	30.0	3500	7000	252.00
52	5	550	0.400	1.20	31.2	3365	6730	251.95

Frese a spianare circolari AX

Inseri 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 21°
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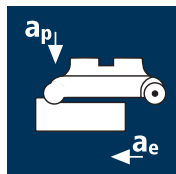
			Al Aluminum > 99%	Al Aluminum Alloy	Al Aluminum Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF/GF Fiber Reinforced Plastics
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03410.404*	40	16	40	1.4	4	●
W03410.424*	42	16	40	1.4	4	●
W03410.505	50	22	40	1.4	5	●
W03410.525	52	22	40	1.4	5	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm) Composizione fornitura con Power-Vite					●

Inseri AX 10mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53510.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10	●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10	●
W93100.010	Cacciavite Torx TX 10	●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3	●

Applicazione



Materiale

Acciaio
< 850 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	220	0.500	1.67	24.0	1750	3500	140.30
42	4	220	0.500	1.67	25.2	1665	3330	140.15
50	5	220	0.500	1.67	30.0	1400	3500	175.35
52	5	220	0.500	1.67	31.2	1345	3365	175.35
63	6	200	0.500	1.67	37.8	1010	3030	191.25
66	6	200	0.500	1.67	39.6	965	2895	191.45
80	8	180	0.500	1.67	48.0	715	2860	229.25
100	10	180	0.500	1.67	60.0	575	2875	288.05

Acciaio
850 - 1100 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	200	0.400	1.50	24.0	1590	2545	91.60
42	4	200	0.400	1.50	25.2	1515	2425	91.65
50	5	200	0.400	1.50	30.0	1275	2550	114.75
52	5	200	0.400	1.50	31.2	1225	2450	114.65
63	6	180	0.400	1.50	37.8	910	2185	123.90
66	6	180	0.400	1.50	39.6	870	2090	124.15
80	8	160	0.400	1.50	48.0	635	2030	146.15
100	10	160	0.400	1.50	60.0	510	2040	183.60

Acciaio
1100 - 1300 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	180	0.350	1.42	24.0	1430	2000	68.15
42	4	180	0.350	1.42	25.2	1365	1910	68.35
50	5	180	0.350	1.42	30.0	1145	2005	85.40
52	5	180	0.350	1.42	31.2	1100	1925	85.30
63	6	160	0.350	1.42	37.8	810	1700	91.25
66	6	160	0.350	1.42	39.6	770	1615	90.80
80	8	140	0.350	1.42	48.0	555	1555	106.00
100	10	140	0.350	1.42	60.0	445	1560	132.90

Acciaio
1300 - 1500 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	120	0.300	1.34	24.0	955	1145	36.80
42	4	120	0.300	1.34	25.2	910	1090	36.80
50	5	120	0.300	1.34	30.0	765	1150	46.25
52	5	120	0.300	1.34	31.2	735	1105	46.20
63	6	100	0.300	1.34	37.8	505	910	46.10
66	6	100	0.300	1.34	39.6	480	865	45.90
80	8	80	0.300	1.34	48.0	320	770	49.55
100	10	80	0.300	1.34	60.0	255	765	61.50

Materiale

Acciaio
1500 - 1800 N/mm²



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	100	0.250	1.25	24.0	795	795	23.85
42	4	100	0.250	1.25	25.2	760	760	23.95
50	5	100	0.250	1.25	30.0	635	795	29.80
52	5	100	0.250	1.25	31.2	610	765	29.85
63	6	80	0.250	1.25	37.8	405	610	28.80
66	6	80	0.250	1.25	39.6	385	580	28.70
80	8	70	0.250	1.25	48.0	280	560	33.60
100	10	70	0.250	1.25	60.0	225	565	42.40

Ghisa
(grigia / sferoidale)

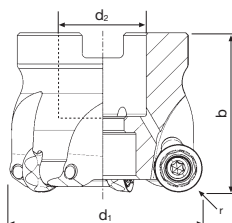


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	180	0.500	1.67	24.0	1430	2860	114.65
42	4	180	0.500	1.67	25.2	1365	2730	114.90
50	5	180	0.500	1.67	30.0	1145	2865	143.55
52	5	180	0.500	1.67	31.2	1100	2750	143.30
63	6	160	0.500	1.67	37.8	810	2430	153.40
66	6	160	0.500	1.67	39.6	770	2310	152.75
80	8	140	0.500	1.67	48.0	555	2220	177.95
100	10	140	0.500	1.67	60.0	445	2225	222.95

Frese a spianare circolari NX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 15°
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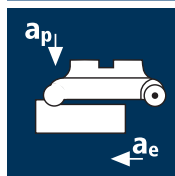
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03412.404*	40	16	40	1.7	4	●
W03412.424*	42	16	40	1.7	4	●
W03412.505	50	22	40	1.7	5	●
W03412.525	52	22	40	1.7	5	●
W03412.636	63	22	40	1.7	6	●
W03412.666	66	22	40	1.7	6	●
W03412.808	80	27	50	1.7	8	●
W03412.100	100	32	50	1.7	10	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm)					●
	Composizione fornitura con Power-Vite					

Inserti NX 12mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53110.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5	●

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	160	0.400	1.20	24.0	1275	2040	58.75
42	4	160	0.400	1.20	25.2	1215	1945	58.80
50	5	160	0.400	1.20	30.0	1020	2040	73.45
52	5	160	0.400	1.20	31.2	980	1960	73.40
63	6	140	0.400	1.20	37.8	705	1690	76.65
66	6	140	0.400	1.20	39.6	675	1620	77.00
80	8	120	0.400	1.20	48.0	475	1520	87.55
100	10	120	0.400	1.20	60.0	380	1520	109.45

Acciaio inossidabile
[Cr-Ni/1.4301]



40	4	120	0.360	1.08	24.0	955	1375	35.65
42	4	120	0.360	1.08	25.2	910	1310	35.65
50	5	120	0.360	1.08	30.0	765	1375	44.55
52	5	120	0.360	1.08	31.2	735	1325	44.65
63	6	100	0.360	1.08	37.8	505	1090	44.50
66	6	100	0.360	1.08	39.6	480	1035	44.25
80	8	80	0.360	1.08	48.0	320	920	47.70
100	10	80	0.360	1.08	60.0	255	920	59.60

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



40	4	130	0.320	1.08	24.0	1035	1325	34.35
42	4	130	0.320	1.08	25.2	985	1260	34.30
50	5	130	0.320	1.08	30.0	830	1330	43.10
52	5	130	0.320	1.08	31.2	795	1270	42.80
63	6	110	0.320	1.08	37.8	555	1065	43.50
66	6	110	0.320	1.08	39.6	530	1020	43.60
80	8	90	0.320	1.08	48.0	360	920	47.70
100	10	90	0.320	1.08	60.0	285	910	58.95

Acciaio resistente
al calore
[17-4 PH]



40	4	100	0.240	0.84	24.0	795	765	15.40
42	4	100	0.240	0.84	25.2	760	730	15.45
50	5	100	0.240	0.84	30.0	635	760	19.15
52	5	100	0.240	0.84	31.2	610	730	19.15
63	6	80	0.240	0.84	37.8	405	585	18.55
66	6	80	0.240	0.84	39.6	385	555	18.45
80	8	70	0.240	0.84	48.0	280	540	21.75
100	10	70	0.240	0.84	60.0	225	540	27.20

Materiale

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	55	0.220	0.78	24.0	440	385	7.20
42	4	55	0.220	0.78	25.2	415	365	7.15
50	5	55	0.220	0.78	30.0	350	385	9.00
52	5	55	0.220	0.78	31.2	335	370	9.00
63	6	45	0.220	0.78	37.8	225	295	8.70
66	6	45	0.220	0.78	39.6	215	285	8.80
80	8	40	0.220	0.78	48.0	160	280	10.50
100	10	40	0.220	0.78	60.0	125	275	12.85

Acciaio
< 850 N/mm²

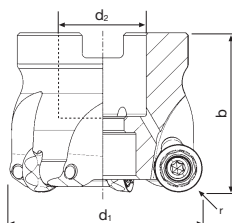


40	4	220	0.500	1.56	24.0	1750	3500	131.05
42	4	220	0.500	1.56	25.2	1665	3330	130.90
50	5	220	0.500	1.56	30.0	1400	3500	163.80
52	5	220	0.500	1.56	31.2	1345	3365	163.80
63	6	180	0.500	1.56	37.8	910	2730	161.00
66	6	180	0.500	1.56	39.6	870	2610	161.25
80	8	160	0.500	1.56	48.0	635	2540	190.20
100	10	160	0.500	1.56	60.0	510	2550	238.70

Frese a spianare circolari SX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 20°
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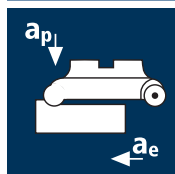
Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03412.404*	40	16	40	1.7	4	●
W03412.424*	42	16	40	1.7	4	●
W03412.505	50	22	40	1.7	5	●
W03412.525	52	22	40	1.7	5	●
W03412.636	63	22	40	1.7	6	●
W03412.666	66	22	40	1.7	6	●
W03412.808	80	27	50	1.7	8	●
W03412.100	100	32	50	1.7	10	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm)					●
	Composizione fornitura con Power-Vite					

Inserti SX 12mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53310.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5	●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC

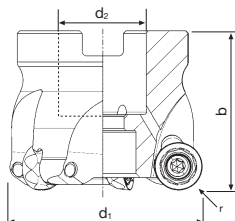
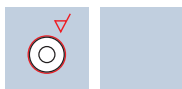


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	100	0.350	1.61	24.0	795	1115	43.10
42	4	100	0.350	1.61	25.2	760	1065	43.20
50	5	100	0.350	1.61	30.0	635	1110	53.60
52	5	100	0.350	1.61	31.2	610	1070	53.75
63	6	90	0.350	1.61	37.8	455	955	58.10
66	6	90	0.350	1.61	39.6	435	915	58.35
80	8	80	0.350	1.61	48.0	320	895	69.15
100	10	80	0.350	1.61	60.0	255	895	86.45
40	4	80	0.330	1.53	24.0	635	840	30.85
42	4	80	0.330	1.53	25.2	605	800	30.85
50	5	80	0.330	1.53	30.0	510	840	38.55
52	5	80	0.330	1.53	31.2	490	810	38.65
63	6	70	0.330	1.53	37.8	355	705	40.75
66	6	70	0.330	1.53	39.6	340	675	40.90
80	8	60	0.330	1.53	48.0	240	635	46.65
100	10	60	0.330	1.53	60.0	190	625	57.40
40	4	50	0.320	1.45	24.0	400	510	17.75
42	4	50	0.320	1.45	25.2	380	485	17.70
50	5	50	0.320	1.45	30.0	320	510	22.20
52	5	50	0.320	1.45	31.2	305	490	22.15
63	6	45	0.320	1.45	37.8	225	430	23.55
66	6	45	0.320	1.45	39.6	215	415	23.85
80	8	40	0.320	1.45	48.0	160	410	28.55
100	10	40	0.320	1.45	60.0	125	400	34.80
40	4	30	0.230	1.13	24.0	240	220	5.95
42	4	30	0.230	1.13	25.2	225	205	5.85
50	5	30	0.230	1.13	30.0	190	220	7.45
52	5	30	0.230	1.13	31.2	185	215	7.60
63	6	25	0.230	1.13	37.8	125	175	7.45
66	6	25	0.230	1.13	39.6	120	165	7.40
80	8	20	0.230	1.13	48.0	80	145	7.85
100	10	20	0.230	1.13	60.0	65	150	10.15

Frese a spianare circolari HX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ -4°
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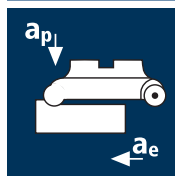
		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			GG(G)
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03412.404*	40	16	40	1.7	4	●
W03412.424*	42	16	40	1.7	4	●
W03412.505	50	22	40	1.7	5	●
W03412.525	52	22	40	1.7	5	●
W03412.636	63	22	40	1.7	6	●
W03412.666	66	22	40	1.7	6	●
W03412.808	80	27	50	1.7	8	●
W03412.100	100	32	50	1.7	10	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm)					●
	Composizione fornitura con Power-Vite					

Inserti HX 12mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53210.012	12.0	6.0	4.8	●

Accessori			Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5		●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	130	0.380	1.06	24.0	1035	1575	40.05
42	4	130	0.380	1.06	25.2	985	1495	39.95
50	5	130	0.380	1.06	30.0	830	1575	50.10
52	5	130	0.380	1.06	31.2	795	1510	49.95
63	6	110	0.380	1.06	37.8	555	1265	50.70
66	6	110	0.380	1.06	39.6	530	1210	50.80
80	8	90	0.380	1.06	48.0	360	1095	55.70
100	10	90	0.380	1.06	60.0	285	1085	69.00

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



40	4	140	0.340	1.06	24.0	1115	1515	38.55
42	4	140	0.340	1.06	25.2	1060	1440	38.45
50	5	140	0.340	1.06	30.0	890	1515	48.20
52	5	140	0.340	1.06	31.2	855	1455	48.10
63	6	120	0.340	1.06	37.8	605	1235	49.50
66	6	120	0.340	1.06	39.6	580	1185	49.75
80	8	100	0.340	1.06	48.0	400	1090	55.45
100	10	100	0.340	1.06	60.0	320	1090	69.30

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



40	4	110	0.245	0.85	24.0	875	860	17.55
42	4	110	0.245	0.85	25.2	835	820	17.55
50	5	110	0.245	0.85	30.0	700	860	21.95
52	5	110	0.245	0.85	31.2	675	825	21.90
63	6	90	0.245	0.85	37.8	455	670	21.55
66	6	90	0.245	0.85	39.6	435	640	21.55
80	8	70	0.245	0.85	48.0	280	550	22.45
100	10	70	0.245	0.85	60.0	225	550	28.05

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



40	4	60	0.230	0.80	24.0	475	435	8.35
42	4	60	0.230	0.80	25.2	455	420	8.45
50	5	60	0.230	0.80	30.0	380	435	10.45
52	5	50	0.230	0.80	31.2	305	350	8.75
63	6	50	0.230	0.80	37.8	255	350	10.60
66	6	50	0.230	0.80	39.6	240	330	10.45
80	8	45	0.230	0.80	48.0	180	330	12.65
100	10	45	0.230	0.80	60.0	145	335	16.10

Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



40	4	80	0.265	0.95	24.0	635	675	15.40
42	4	80	0.265	0.95	25.2	605	640	15.30
50	5	80	0.265	0.95	30.0	510	675	19.25
52	5	80	0.265	0.95	31.2	490	650	19.25
63	6	60	0.265	0.95	37.8	305	485	17.40
66	6	60	0.265	0.95	39.6	290	460	17.30
80	8	50	0.265	0.95	48.0	200	425	19.40
100	10	50	0.265	0.95	60.0	160	425	24.25

Acciaio
< 850 N/mm²



40	4	220	0.495	1.48	24.0	1750	3465	123.10
42	4	220	0.495	1.48	25.2	1665	3295	122.90
50	5	220	0.495	1.48	30.0	1400	3465	153.85
52	5	220	0.495	1.48	31.2	1345	3330	153.75
63	6	180	0.495	1.48	37.8	910	2705	151.35
66	6	180	0.495	1.48	39.6	870	2585	151.50
80	8	160	0.495	1.48	48.0	635	2515	178.65
100	10	160	0.495	1.48	60.0	510	2525	224.20

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]

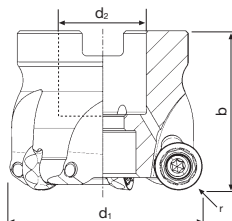
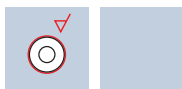


40	4	35	0.150	1.11	16.0	280	170	3.00
42	4	35	0.150	1.11	16.8	265	160	3.00
50	5	35	0.150	1.11	20.0	225	170	3.75
52	5	35	0.150	1.11	20.8	215	160	3.70
63	6	30	0.150	1.11	25.2	150	135	3.80
66	6	30	0.150	1.11	26.4	145	130	3.80
80	8	25	0.150	1.11	32.0	100	120	4.25
100	10	25	0.150	1.11	40.0	80	120	5.35

Frese a spianare circolari ZX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 14°
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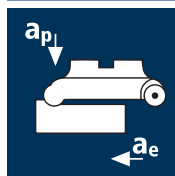
Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03412.404*	40	16	40	1.7	4	●
W03412.424*	42	16	40	1.7	4	●
W03412.505	50	22	40	1.7	5	●
W03412.525	52	22	40	1.7	5	●
W03412.636	63	22	40	1.7	6	●
W03412.666	66	22	40	1.7	6	●
W03412.808	80	27	50	1.7	8	●
W03412.100	100	32	50	1.7	10	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm)					●
	Composizione fornitura con Power-Vite					

Inserti ZX 12mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53410.012	12.0	6.0	4.8	●

Accessori			Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5		●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



Getti d'alluminio
Si 6%-15%



Rame non legato



Materiali termoplastici

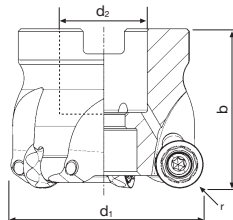


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	600	0.450	1.50	24.0	4775	8595	309.40
42	4	600	0.450	1.50	25.2	4545	8180	309.20
50	5	550	0.450	1.50	30.0	3500	7875	354.40
52	5	550	0.450	1.50	31.2	3365	7570	354.30
63	6	500	0.450	1.50	37.8	2525	6820	386.70
66	6	500	0.450	1.50	39.6	2410	6505	386.40
80	8	400	0.450	1.50	48.0	1590	5725	412.20
100	10	400	0.450	1.50	60.0	1275	5740	516.60
40	4	500	0.400	1.50	24.0	3980	6370	229.30
42	4	500	0.400	1.50	25.2	3790	6065	229.25
50	5	450	0.400	1.50	30.0	2865	5730	257.85
52	5	450	0.400	1.50	31.2	2755	5510	257.85
63	6	400	0.400	1.50	37.8	2020	4850	275.00
66	6	400	0.400	1.50	39.6	1930	4630	275.00
80	8	350	0.400	1.50	48.0	1395	4465	321.50
100	10	350	0.400	1.50	60.0	1115	4460	401.40
40	4	400	0.400	1.50	24.0	3185	5095	183.40
42	4	400	0.400	1.50	25.2	3030	4850	183.35
50	5	350	0.400	1.50	30.0	2230	4460	200.70
52	5	350	0.400	1.50	31.2	2145	4290	200.75
63	6	350	0.400	1.50	37.8	1770	4250	241.00
66	6	350	0.400	1.50	39.6	1690	4055	240.85
80	8	300	0.400	1.50	48.0	1195	3825	275.40
100	10	300	0.400	1.50	60.0	955	3820	343.80
40	4	600	0.450	1.50	24.0	4775	8595	309.40
42	4	600	0.450	1.50	25.2	4545	8180	309.20
50	5	550	0.450	1.50	30.0	3500	7875	354.40
52	5	550	0.450	1.50	31.2	3365	7570	354.30
63	6	500	0.450	1.50	37.8	2525	6820	386.70
66	6	500	0.450	1.50	39.6	2410	6505	386.40
80	8	400	0.450	1.50	48.0	1590	5725	412.20
100	10	400	0.450	1.50	60.0	1275	5740	516.60

Frese a spianare circolari AX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM λ 5°
 γ 21°



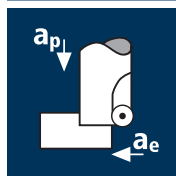
			Al Aluminum > 99%	Al Aluminum Alloy	Al Aluminum Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF/GF Fiber Reinforced Plastics
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Frese a spianare circolari						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W03412.404*	40	16	40	1.7	4	●
W03412.424*	42	16	40	1.7	4	●
W03412.505	50	22	40	1.7	5	●
W03412.525	52	22	40	1.7	5	●
W03412.636	63	22	40	1.7	6	●
W03412.666	66	22	40	1.7	6	●
W03412.808	80	27	50	1.7	8	●
W03412.100	100	32	50	1.7	10	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm)					●
	Composizione fornitura con Power-Vite					

Inserti AX 12mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	D1	r	D	
W53510.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5	●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Materiale

Acciaio
1500 - 1800 N/mm²



Ghisa
(grigia / sferoidale)



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
<100	25	3	250	0.520	1.33	15.0	3185	4970	99.0
	35	4	250	0.520	1.33	21.0	2275	4730	132.0
100-160	25	3	220	0.500	1.22	15.0	2800	4200	77.0
	35	4	220	0.500	1.22	21.0	2000	4000	102.5
160-250	25	3	180	0.480	0.92	10.0	2290	3300	30.5
	35	4	180	0.480	0.92	14.0	1635	3140	40.5

<100	25	3	220	0.415	1.20	15.0	2800	3485	62.5
	35	4	220	0.415	1.20	21.0	2000	3320	83.5
100-160	25	3	200	0.400	1.10	15.0	2545	3055	50.5
	35	4	200	0.400	1.10	21.0	1820	2910	67.0
160-250	25	3	160	0.385	0.83	10.0	2035	2350	19.5
	35	4	160	0.385	0.83	14.0	1455	2240	26.0

<100	25	3	200	0.365	1.13	15.0	2545	2785	47.0
	35	4	200	0.365	1.13	21.0	1820	2655	63.0
100-160	25	3	180	0.350	1.04	15.0	2290	2405	37.5
	35	4	180	0.350	1.04	21.0	1635	2290	50.0
160-250	25	3	140	0.335	0.78	10.0	1785	1795	14.0
	35	4	140	0.335	0.78	14.0	1275	1710	18.5

<100	25	3	140	0.310	1.06	15.0	1785	1660	26.5
	35	4	140	0.310	1.06	21.0	1275	1580	35.0
100-160	25	3	120	0.300	0.98	15.0	1530	1375	20.0
	35	4	120	0.300	0.98	21.0	1090	1310	27.0
160-250	25	3	100	0.290	0.74	10.0	1275	1110	8.0
	35	4	100	0.290	0.74	14.0	910	1055	11.0

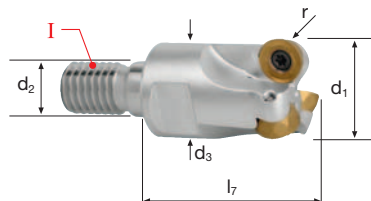
L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
<100	25	3	120	0.260	1.00	15.0	1530	1195	18.0
	35	4	120	0.260	1.00	21.0	1090	1135	24.0
100-160	25	3	100	0.250	0.92	15.0	1275	955	13.0
	35	4	100	0.250	0.92	21.0	910	910	17.5
160-250	25	3	80	0.240	0.69	10.0	1020	735	5.0
	35	4	80	0.240	0.69	14.0	730	700	7.0

<100	25	3	200	0.520	1.33	15.0	2545	3970	79.0
	35	4	200	0.520	1.33	21.0	1820	3785	105.5
100-160	25	3	180	0.500	1.22	15.0	2290	3435	63.0
	35	4	180	0.500	1.22	21.0	1635	3270	84.0
160-250	25	3	140	0.480	0.92	10.0	1785	2570	23.5
	35	4	140	0.480	0.92	14.0	1275	2450	31.5

Frese a spianare circolari NX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 15°
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Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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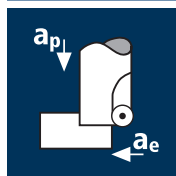
Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03210.253	25	12.5	21	35	1.4	3	17	M12	●
W03210.354	35	17.0	29	35	1.4	4	24	M16	●

Inserti NX 10mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53110.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10		●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10		●
W93100.010	Cacciavite Torx TX 10		●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3		●

VII

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
<100	25	3	180	0.380	1.01	15.0	2290	2610	39.5
	35	4	180	0.380	1.01	21.0	1635	2485	52.5
100-160	25	3	160	0.360	0.91	15.0	2035	2200	30.0
	35	4	160	0.360	0.91	21.0	1455	2095	40.0
160-250	25	3	140	0.340	0.69	10.0	1785	1820	12.5
	35	4	140	0.340	0.69	14.0	1275	1735	17.0

<100	25	3	140	0.340	0.91	15.0	1785	1820	25.0
	35	4	140	0.340	0.91	21.0	1275	1735	33.0
100-160	25	3	120	0.325	0.82	15.0	1530	1490	18.5
	35	4	120	0.325	0.82	21.0	1090	1415	24.5
160-250	25	3	100	0.305	0.62	10.0	1275	1165	7.0
	35	4	100	0.305	0.62	14.0	910	1110	9.5

<100	25	3	150	0.305	0.91	15.0	1910	1750	24.0
	35	4	150	0.305	0.91	21.0	1365	1665	32.0
100-160	25	3	130	0.290	0.82	15.0	1655	1440	17.5
	35	4	130	0.290	0.82	21.0	1180	1370	23.5
160-250	25	3	110	0.270	0.62	10.0	1400	1135	7.0
	35	4	110	0.270	0.62	14.0	1000	1080	9.5

<100	25	3	120	0.230	0.71	15.0	1530	1055	11.0
	35	4	120	0.230	0.71	21.0	1090	1005	15.0
100-160	25	3	100	0.215	0.64	15.0	1275	820	8.0
	35	4	100	0.215	0.64	21.0	910	785	10.5
160-250	25	3	80	0.205	0.48	10.0	1020	625	3.0
	35	4	80	0.205	0.48	14.0	730	600	4.0

Materiale

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Acciaio
< 850 N/mm²



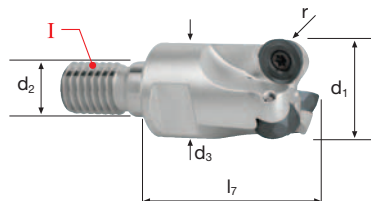
L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
<100	25	3	60	0.210	0.66	15.0	765	480	5.0
	35	4	60	0.210	0.66	21.0	545	460	6.5
100-160	25	3	55	0.200	0.59	15.0	700	420	3.5
	35	4	55	0.200	0.59	21.0	500	400	5.0
160-250	25	3	45	0.185	0.45	10.0	575	320	1.5
	35	4	45	0.185	0.45	14.0	410	305	2.0

<100	25	3	250	0.495	1.31	15.0	3185	4730	93.0
	35	4	250	0.495	1.31	21.0	2275	4505	124.0
100-160	25	3	220	0.470	1.18	15.0	2800	3950	70.0
	35	4	220	0.470	1.18	21.0	2000	3760	93.0
160-250	25	3	180	0.440	0.90	10.0	2290	3025	27.0
	35	4	180	0.440	0.90	14.0	1635	2880	36.5

Frese a spianare circolari SX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 20°
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Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Tool Steel
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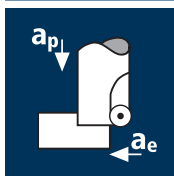
Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto								
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I		
W03210.253	25	12.5	21	35	1.4	3	17	M12	●	
W03210.354	35	17.0	29	35	1.4	4	24	M16	●	

Inserti SX 10mm		Composizione fornitura: Confezione minima: 10 pezzi			
N° Ordine	D1	r	D		
W53310.010	10.0	5.0	4.0	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10			●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10			●
W93100.010	Cacciavite Torx TX 10			●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3			●

VII

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC

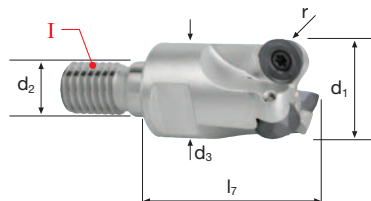
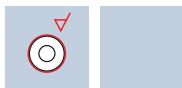


L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
<100	25	3	120	0.380	1.10	15.0	1530	1745	29.0
	35	4	120	0.380	1.10	21.0	1090	1655	38.0
100-160	25	3	100	0.350	1.00	15.0	1275	1340	20.0
	35	4	100	0.350	1.00	21.0	910	1275	27.0
160-250	25	3	90	0.320	0.76	10.0	1145	1100	8.5
	35	4	90	0.320	0.76	14.0	820	1050	11.0
<100	25	3	100	0.360	1.04	15.0	1275	1375	21.5
	35	4	100	0.360	1.04	21.0	910	1310	28.5
100-160	25	3	80	0.330	0.95	15.0	1020	1010	14.5
	35	4	80	0.330	0.95	21.0	730	965	19.5
160-250	25	3	70	0.305	0.72	10.0	890	815	6.0
	35	4	70	0.305	0.72	14.0	635	775	8.0
<100	25	3	60	0.340	0.99	15.0	765	780	11.5
	35	4	60	0.340	0.99	21.0	545	740	15.5
100-160	25	3	50	0.315	0.90	15.0	635	600	8.0
	35	4	50	0.315	0.90	21.0	455	575	11.0
160-250	25	3	40	0.290	0.68	10.0	510	445	3.0
	35	4	40	0.290	0.68	14.0	365	425	4.0
<100	25	3	35	0.245	0.77	15.0	445	325	4.0
	35	4	35	0.245	0.77	21.0	320	315	5.0
100-160	25	3	30	0.225	0.70	15.0	380	255	2.5
	35	4	30	0.225	0.70	21.0	275	250	3.5
160-250	25	3	25	0.210	0.53	10.0	320	200	1.0
	35	4	25	0.210	0.53	14.0	225	190	1.5

Frese a spianare circolari HX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ -4°
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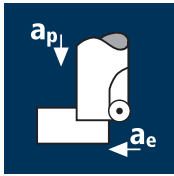
		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			GG(G)
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03210.253	25	12.5	21	35	1.4	3	17	M12	●
W03210.354	35	17.0	29	35	1.4	4	24	M16	●

Inserti HX 10mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53210.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10		●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10		●
W93100.010	Cacciavite Torx TX 10		●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3		●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
<100	25	3	150	0.360	0.89	15.0	1910	2065	27.5
	35	4	150	0.360	0.89	21.0	1365	1965	36.5
100-160	25	3	130	0.340	0.80	15.0	1655	1690	20.5
	35	4	130	0.340	0.80	21.0	1180	1605	27.0
160-250	25	3	110	0.320	0.60	10.0	1400	1345	8.0
	35	4	110	0.320	0.60	14.0	1000	1280	11.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



<100	25	3	160	0.325	0.89	15.0	2035	1985	26.5
	35	4	160	0.325	0.89	21.0	1455	1890	35.5
100-160	25	3	140	0.305	0.80	15.0	1785	1635	19.5
	35	4	140	0.305	0.80	21.0	1275	1555	26.0
160-250	25	3	120	0.290	0.60	10.0	1530	1330	8.0
	35	4	120	0.290	0.60	14.0	1090	1265	10.5

Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



<100	25	3	130	0.235	0.71	15.0	1655	1165	12.5
	35	4	130	0.235	0.71	21.0	1180	1110	16.5
100-160	25	3	110	0.220	0.64	15.0	1400	925	9.0
	35	4	110	0.220	0.64	21.0	1000	880	12.0
160-250	25	3	90	0.210	0.48	10.0	1145	720	3.5
	35	4	90	0.210	0.48	14.0	820	690	4.5

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



<100	25	3	65	0.215	0.67	15.0	830	535	5.5
	35	4	65	0.215	0.67	21.0	590	505	7.0
100-160	25	3	60	0.205	0.60	15.0	765	470	4.0
	35	4	60	0.205	0.60	21.0	545	445	5.5
160-250	25	3	50	0.190	0.45	10.0	635	360	1.5
	35	4	50	0.190	0.45	14.0	455	345	2.0

Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
<100	25	3	90	0.250	0.80	15.0	1145	860	10.5
	35	4	90	0.250	0.80	21.0	820	820	14.0
100-160	25	3	80	0.240	0.72	15.0	1020	735	8.0
	35	4	80	0.240	0.72	21.0	730	700	10.5
160-250	25	3	70	0.225	0.54	10.0	890	600	3.0
	35	4	70	0.225	0.54	14.0	635	570	4.5

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]

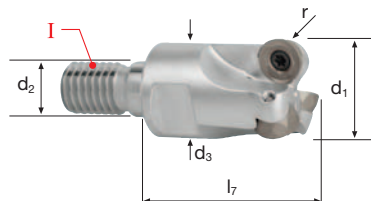
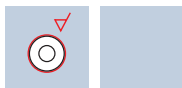


<100	25	3	40	0.145	0.71	10.0	510	220	1.5
	35	4	40	0.145	0.71	14.0	365	210	2.0
100-160	25	3	35	0.135	0.64	10.0	445	180	1.0
	35	4	35	0.135	0.64	14.0	320	175	1.5
160-250	25	3	30	0.130	0.48	10.0	380	150	0.5
	35	4	30	0.130	0.48	14.0	275	145	1.0

Frese a spianare circolari ZX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 14°
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Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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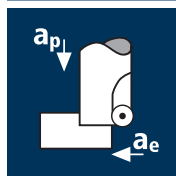
Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03210.253	25	12.5	21	35	1.4	3	17	M12	●
W03210.354	35	17.0	29	35	1.4	4	24	M16	●

Inserti ZX 10mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53410.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10		●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10		●
W93100.010	Cacciavite Torx TX 10		●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3		●

VII

Applicazione



Materiale

Alluminio malleabile
Si < 6%



Getti d'alluminio
Si 6%-15%



Rame non legato



Materiali termoplastici

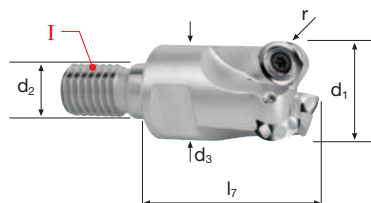
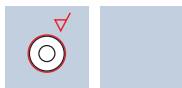


L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
<100	25	3	700	0.420	1.30	15.0	8915	11235	219.0
	35	4	600	0.420	1.30	21.0	5455	9165	250.0
100-160	25	3	650	0.400	1.20	15.0	8275	9930	178.5
	35	4	550	0.400	1.20	21.0	5000	8000	201.5
160-250	25	3	600	0.380	1.10	10.0	7640	8710	96.0
	35	4	500	0.380	1.10	14.0	4545	6910	106.5
<100	25	3	550	0.370	1.30	15.0	7005	7775	151.5
	35	4	500	0.370	1.30	21.0	4545	6725	183.5
100-160	25	3	500	0.350	1.20	15.0	6365	6685	120.5
	35	4	450	0.350	1.20	21.0	4095	5735	144.5
160-250	25	3	450	0.330	1.10	10.0	5730	5675	62.5
	35	4	400	0.330	1.10	14.0	3640	4805	74.0
<100	25	3	500	0.370	1.30	15.0	6365	7065	138.0
	35	4	450	0.370	1.30	21.0	4095	6060	165.5
100-160	25	3	450	0.350	1.20	15.0	5730	6015	108.5
	35	4	400	0.350	1.20	21.0	3640	5095	128.5
160-250	25	3	400	0.330	1.10	10.0	5095	5045	55.5
	35	4	400	0.330	1.10	14.0	3640	4805	74.0
<100	25	3	700	0.420	1.30	15.0	8915	11235	219.0
	35	4	600	0.420	1.30	21.0	5455	9165	250.0
100-160	25	3	650	0.400	1.20	15.0	8275	9930	178.5
	35	4	550	0.400	1.20	21.0	5000	8000	201.5
160-250	25	3	600	0.380	1.10	10.0	7640	8710	96.0
	35	4	500	0.380	1.10	14.0	4545	6910	106.5

Frese a spianare circolari AX

Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 21°
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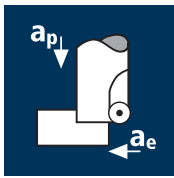
			Al Aluminum > 99%	Al Aluminum Alloy	Al Aluminum Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF/GF Fiber Reinforced Plastics
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03210.253	25	12.5	21	35	1.4	3	17	M12	●
W03210.354	35	17.0	29	35	1.4	4	24	M16	●

Inserti AX 10mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53510.010	10.0	5.0	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.010	Cacciavite dinamometrico 2.0 Nm con stelo Torx TX 10		●
W93111.010	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 10		●
W93100.010	Cacciavite Torx TX 10		●
W93500.010	Vite di fissaggio per l'inserto Torx TX 10 / M 3 x 7.3		●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Materiale

Acciaio
1500 - 1800 N/mm²



Ghisa
(grigia / sferoidale)



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
<100	35	3	250	0.520	1.67	21.0	2275	3550	124.5
	42	4	250	0.520	1.67	25.2	1895	3940	166.0
100-180	35	3	220	0.500	1.55	21.0	2000	3000	97.5
	42	4	220	0.500	1.55	25.2	1665	3330	130.0
180-260	35	3	180	0.480	1.22	14.0	1635	2355	40.0
	42	4	180	0.480	1.22	16.8	1365	2620	53.5

<100	35	3	220	0.415	1.50	21.0	2000	2490	78.5
	42	4	220	0.415	1.50	25.2	1665	2765	104.5
100-180	35	3	200	0.400	1.40	21.0	1820	2185	64.0
	42	4	200	0.400	1.40	25.2	1515	2425	85.5
180-260	35	3	160	0.385	1.10	14.0	1455	1680	26.0
	42	4	160	0.385	1.10	16.8	1215	1870	34.5

<100	35	3	200	0.365	1.42	21.0	1820	1995	59.5
	42	4	200	0.365	1.42	25.2	1515	2210	79.0
100-180	35	3	180	0.350	1.32	21.0	1635	1715	47.5
	42	4	180	0.350	1.32	25.2	1365	1910	63.5
180-260	35	3	140	0.335	1.04	14.0	1275	1280	18.5
	42	4	140	0.335	1.04	16.8	1060	1420	25.0

<100	35	3	140	0.310	1.34	21.0	1275	1185	33.5
	42	4	140	0.310	1.34	25.2	1060	1315	44.5
100-180	35	3	120	0.300	1.24	21.0	1090	980	25.5
	42	4	120	0.300	1.24	25.2	910	1090	34.0
180-260	35	3	100	0.290	0.98	14.0	910	790	11.0
	42	4	100	0.290	0.98	16.8	760	880	14.5

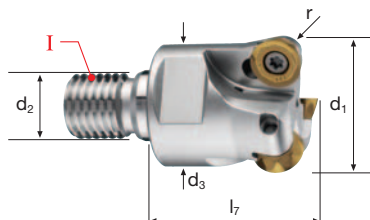
L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
<100	35	3	120	0.260	1.25	21.0	1090	850	22.5
	42	4	120	0.260	1.25	25.2	910	945	30.0
100-180	35	3	100	0.250	1.16	21.0	910	685	16.5
	42	4	100	0.250	1.16	25.2	760	760	22.0
180-260	35	3	80	0.240	0.92	14.0	730	525	7.0
	42	4	80	0.240	0.92	16.8	605	580	9.0

<100	35	3	200	0.520	1.67	21.0	1820	2840	99.5
	42	4	200	0.520	1.67	25.2	1515	3150	132.5
100-180	35	3	180	0.500	1.55	21.0	1635	2455	80.0
	42	4	180	0.500	1.55	25.2	1365	2730	106.5
180-260	35	3	140	0.480	1.22	14.0	1275	1835	31.5
	42	4	140	0.480	1.22	16.8	1060	2035	41.5

Frese a spianare circolari NX

Inseri 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 15°
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Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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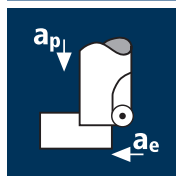
Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03212.353	35	17.0	29	35	1.7	3	24	M16	●
W03212.424	42	17.0	31	40	1.7	4	24	M16	●

Inseri NX 12mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53110.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5		●

VII

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



Materiale

Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Acciaio
< 850 N/mm²



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
<100	35	3	180	0.400	1.25	21.0	1635	1960	51.5
	42	4	180	0.400	1.25	25.2	1365	2185	69.0
100-180	35	3	160	0.380	1.14	21.0	1455	1660	39.5
	42	4	160	0.380	1.14	25.2	1215	1845	53.0
180-260	35	3	140	0.360	0.90	14.0	1275	1375	17.5
	42	4	140	0.360	0.90	16.8	1060	1525	23.0

<100	35	3	140	0.360	1.13	21.0	1275	1375	32.5
	42	4	140	0.360	1.13	25.2	1060	1525	43.5
100-180	35	3	120	0.340	1.03	21.0	1090	1110	24.0
	42	4	120	0.340	1.03	25.2	910	1240	32.0
180-260	35	3	100	0.325	0.81	14.0	910	885	10.0
	42	4	100	0.325	0.81	16.8	760	990	13.5

<100	35	3	150	0.320	1.13	21.0	1365	1310	31.0
	42	4	150	0.320	1.13	25.2	1135	1455	41.5
100-180	35	3	130	0.305	1.03	21.0	1180	1080	23.5
	42	4	130	0.305	1.03	25.2	985	1200	31.0
180-260	35	3	110	0.290	0.81	14.0	1000	870	10.0
	42	4	110	0.290	0.81	16.8	835	970	13.0

<100	35	3	120	0.240	0.88	21.0	1090	785	14.5
	42	4	120	0.240	0.88	25.2	910	875	19.5
100-180	35	3	100	0.230	0.80	21.0	910	630	10.5
	42	4	100	0.230	0.80	25.2	760	700	14.0
180-260	35	3	80	0.215	0.63	14.0	730	470	4.0
	42	4	80	0.215	0.63	16.8	605	520	5.5

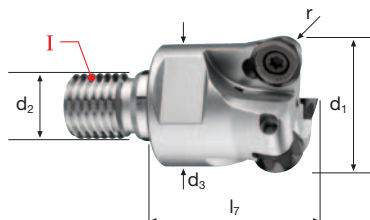
L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
<100	35	3	60	0.220	0.81	21.0	545	360	6.0
	42	4	60	0.220	0.81	25.2	455	400	8.0
100-180	35	3	55	0.210	0.74	21.0	500	315	5.0
	42	4	55	0.210	0.74	25.2	415	350	6.5
180-260	35	3	45	0.200	0.59	14.0	410	245	2.0
	42	4	45	0.200	0.59	16.8	340	270	2.5

<100	35	3	250	0.500	1.63	21.0	2275	3415	117.0
	42	4	250	0.500	1.63	25.2	1895	3790	155.5
100-180	35	3	220	0.475	1.48	21.0	2000	2850	88.5
	42	4	220	0.475	1.48	25.2	1665	3165	118.0
180-260	35	3	180	0.450	1.17	14.0	1635	2205	36.0
	42	4	180	0.450	1.17	16.8	1365	2455	48.5

Frese a spianare circolari SX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 20°
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Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Tool Steel
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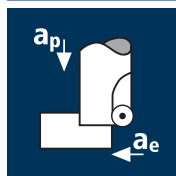
Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03212.353	35	17.0	29	35	1.7	3	24	M16	●
W03212.424	42	17.0	31	40	1.7	4	24	M16	●

Inserti SX 12mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53310.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5		●

VII

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC

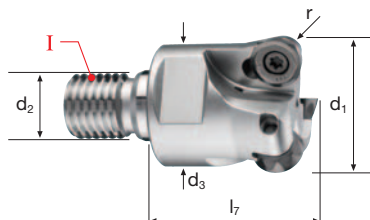
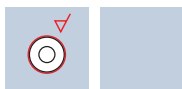


L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
<100	35	3	120	0.380	1.61	21.0	1090	1245	42.0
	42	4	120	0.380	1.61	25.2	910	1385	56.0
100-180	35	3	100	0.350	1.44	21.0	910	955	29.0
	42	4	100	0.350	1.44	25.2	760	1065	38.5
180-260	35	3	90	0.320	1.11	14.0	820	785	12.0
	42	4	90	0.320	1.11	16.8	680	870	16.0
<100	35	3	100	0.360	1.53	21.0	910	985	31.5
	42	4	100	0.360	1.53	25.2	760	1095	42.0
100-180	35	3	80	0.330	1.37	21.0	730	725	21.0
	42	4	80	0.330	1.37	25.2	605	800	27.5
180-260	35	3	70	0.305	1.05	14.0	635	580	8.5
	42	4	70	0.305	1.05	16.8	530	645	11.5
<100	35	3	60	0.340	1.45	21.0	545	555	17.0
	42	4	60	0.340	1.45	25.2	455	620	22.5
100-180	35	3	50	0.315	1.30	21.0	455	430	11.5
	42	4	50	0.315	1.30	25.2	380	480	15.5
180-260	35	3	40	0.290	1.00	14.0	365	320	4.5
	42	4	40	0.290	1.00	16.8	305	355	6.0
<100	35	3	35	0.245	1.13	21.0	320	235	5.5
	42	4	35	0.245	1.13	25.2	265	260	7.5
100-180	35	3	30	0.225	1.01	21.0	275	185	4.0
	42	4	30	0.225	1.01	25.2	225	205	5.0
180-260	35	3	25	0.210	0.78	14.0	225	140	1.5
	42	4	25	0.210	0.78	16.8	190	160	2.0

Frese a spianare circolari HX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ -4°
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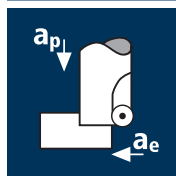
		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60			GG(G)
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03212.353	35	17.0	29	35	1.7	3	24	M16	●
W03212.424	42	17.0	31	40	1.7	4	24	M16	●

Inserti HX 12mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53210.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5		●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
<100	35	3	150	0.380	1.11	21.0	1365	1555	36.0
	42	4	150	0.380	1.11	25.2	1135	1725	48.5
100-180	35	3	130	0.360	1.00	21.0	1180	1275	27.0
	42	4	130	0.360	1.00	25.2	985	1420	36.0
180-260	35	3	110	0.340	0.80	14.0	1000	1020	11.5
	42	4	110	0.340	0.80	16.8	835	1135	15.5

<100	35	3	160	0.340	1.11	21.0	1455	1485	34.5
	42	4	160	0.340	1.11	25.2	1215	1650	46.0
100-180	35	3	140	0.325	1.00	21.0	1275	1245	26.0
	42	4	140	0.325	1.00	25.2	1060	1380	35.0
180-260	35	3	120	0.305	0.80	14.0	1090	995	11.0
	42	4	120	0.305	0.80	16.8	910	1110	15.0

<100	35	3	130	0.245	0.89	21.0	1180	865	16.0
	42	4	130	0.245	0.89	25.2	985	965	21.5
100-180	35	3	110	0.235	0.80	21.0	1000	705	12.0
	42	4	110	0.235	0.80	25.2	835	785	16.0
180-260	35	3	90	0.220	0.64	14.0	820	540	5.0
	42	4	90	0.220	0.64	16.8	680	600	6.5

<100	35	3	65	0.230	0.83	21.0	590	405	7.0
	42	4	65	0.230	0.83	25.2	495	455	9.5
100-180	35	3	60	0.215	0.75	21.0	545	350	5.5
	42	4	60	0.215	0.75	25.2	455	390	7.5
180-260	35	3	50	0.205	0.60	14.0	455	280	2.5
	42	4	50	0.205	0.60	16.8	380	310	3.0

Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



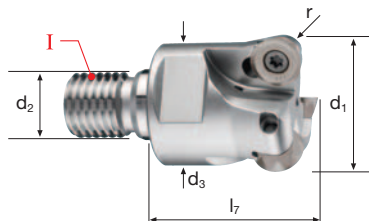
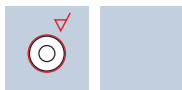
L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
<100	35	3	90	0.265	1.00	21.0	820	650	13.5
	42	4	90	0.265	1.00	25.2	680	720	18.0
100-180	35	3	80	0.250	0.90	21.0	730	550	10.5
	42	4	80	0.250	0.90	25.2	605	605	13.5
180-260	35	3	70	0.240	0.72	14.0	635	455	4.5
	42	4	70	0.240	0.72	16.8	530	510	6.0

<100	35	3	40	0.150	0.89	14.0	365	165	2.0
	42	4	40	0.150	0.89	16.8	305	185	3.0
100-180	35	3	35	0.145	0.80	14.0	320	140	1.5
	42	4	35	0.145	0.80	16.8	265	155	2.0
180-260	35	3	30	0.135	0.64	14.0	275	110	1.0
	42	4	30	0.135	0.64	16.8	225	120	1.5

Frese a spianare circolari ZX

Inserti 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 14°
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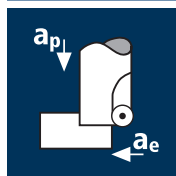
Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03212.353	35	17.0	29	35	1.7	3	24	M16	●
W03212.424	42	17.0	31	40	1.7	4	24	M16	●

Inserti ZX 12mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53410.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5		●

Applicazione



Materiale

Alluminio malleabile
Si < 6%



Getti d'alluminio
Si 6%-15%



Rame non legato



Materiali termoplastici

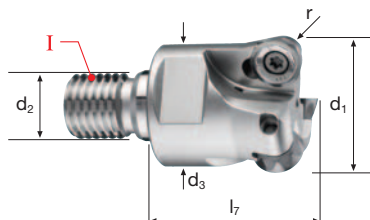
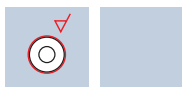


L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
<100	35	3	600	0.470	1.60	21.0	5455	7690	258.5
	42	4	550	0.470	1.60	25.2	4170	7840	316.0
100-180	35	3	550	0.450	1.50	21.0	5000	6750	212.5
	42	4	500	0.450	1.50	25.2	3790	6820	258.0
180-260	35	3	500	0.430	1.40	14.0	4545	5865	115.0
	42	4	450	0.430	1.40	16.8	3410	5865	138.0
<100	35	3	500	0.420	1.60	21.0	4545	5725	192.5
	42	4	450	0.420	1.60	25.2	3410	5730	231.0
100-180	35	3	450	0.400	1.50	21.0	4095	4915	155.0
	42	4	400	0.400	1.50	25.2	3030	4850	183.5
180-260	35	3	400	0.380	1.40	14.0	3640	4150	81.5
	42	4	350	0.380	1.40	16.8	2655	4035	95.0
<100	35	3	500	0.420	1.60	21.0	4545	5725	192.5
	42	4	450	0.420	1.60	25.2	3410	5730	231.0
100-180	35	3	450	0.400	1.50	21.0	4095	4915	155.0
	42	4	400	0.400	1.50	25.2	3030	4850	183.5
180-260	35	3	400	0.380	1.40	14.0	3640	4150	81.5
	42	4	350	0.380	1.40	16.8	2655	4035	95.0
<100	35	3	600	0.470	1.60	21.0	5455	7690	258.5
	42	4	550	0.470	1.60	25.2	4170	7840	316.0
100-180	35	3	550	0.450	1.50	21.0	5000	6750	212.5
	42	4	500	0.450	1.50	25.2	3790	6820	258.0
180-260	35	3	500	0.430	1.40	14.0	4545	5865	115.0
	42	4	450	0.430	1.40	16.8	3410	5865	138.0

Frese a spianare circolari AX

Inseri 12mm, con canale di aerazione/raffreddamento integrato

HM	λ 5° γ 21°
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			Al Aluminum > 99%	Al Aluminum Alloy	Al Aluminum Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF/GF Fiber Reinforced Plastics
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Frese a spianare circolari		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W03212.353	35	17.0	29	35	1.7	3	24	M16	●
W03212.424	42	17.0	31	40	1.7	4	24	M16	●

Inserti AX 12mm		Composizione fornitura: Confezione minima: 10 pezzi		
N° Ordine	D1	r	D	
W53510.012	12.0	6.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W93110.012	Cacciavite dinamometrico 4.25 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W93500.012	Vite di fissaggio per l'inserto Torx TX 15 / M 4 x 8.5		●



Inserti - Utensili frese HFC

Frese ad alto avanzamento per inserti 10mm

N° W02140



NX	λ 2°	d, 25	Rm 850-1500			809
	γ 14°					
SX	λ 2°	d, 25	Inox Stainless	Rm <850		811
	γ 15°					
ZX	λ 2°	d, 25	Ni Alloys	Inox Stainless	Rm <850	813
	γ 15°					

N° W02180



Frese ad alto avanzamento per inserti 13mm

N° W02150



NX	λ 0°	d, 35	Rm 850-1500			815
	γ 12°					
SX	λ 0°	d, 35	Inox Stainless	Rm <850		817
	γ 13°					
ZX	λ 0°	d, 35	Ni Alloys	Inox Stainless	Rm <850	819
	γ 13°					

N° W02190



Frese ad alto avanzamento per inserti 10mm

N° W02400



NX	λ 4°	d, 40 – 63	Rm 850-1500			821
	γ 16°					
SX	λ 4°	d, 40 – 63	Inox Stainless	Rm <850		823
	γ 17°					
ZX	λ 4°	d, 40 – 63	Ni Alloys	Inox Stainless	Rm <850	825
	γ 17°					

Frese ad alto avanzamento per inserti 13mm

N° W02410



NX	λ 4°	d, 50 – 80	Rm 850-1500			827
	γ 16°					
SX	λ 4°	d, 50 – 80	Inox Stainless	Rm <850		829
	γ 17°					
ZX	λ 4°	d, 50 – 80	Ni Alloys	Inox Stainless	Rm <850	831
	γ 17°					

VII



Inserti - Utensili frese HFC

Frese ad alto avanzamento per inserti 10mm

N° W02200



NX	λ 2°	$d, 25$	Rm 850-1500			833
	γ 14°					
SX	λ 2°	$d, 25$	Inox Stainless	Rm <850		835
	γ 15°					
ZX	λ 2°	$d, 25$	Ni Alloys	Inox Stainless	Rm <850	837
	γ 15°					

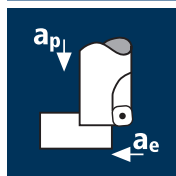
Frese ad alto avanzamento per inserti 13mm

N° W02210



NX	λ 0°	$d, 35$	Rm 850-1500			839
	γ 12°					
SX	λ 0°	$d, 35$	Inox Stainless	Rm <850		841
	γ 13°					
ZX	λ 0°	$d, 35$	Ni Alloys	Inox Stainless	Rm <850	843
	γ 13°					

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Materiale

Acciaio
1500 - 1800 N/mm²



Ghisa
(grigia / sferoidale)



Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	3	200	1.000	0.70	15.0	2545	7635	80.0
XL	25	3	160	0.800	0.65	10.0	2035	4885	32.0

M	25	3	180	0.800	0.63	15.0	2290	5495	52.0
XL	25	3	140	0.640	0.59	10.0	1785	3425	20.0

M	25	3	160	0.650	0.56	15.0	2035	3970	33.5
XL	25	3	120	0.520	0.52	10.0	1530	2385	12.5

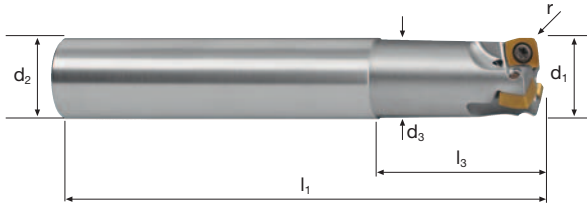
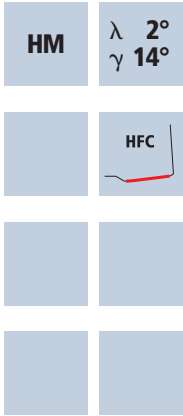
M	25	3	120	0.550	0.49	15.0	1530	2525	18.5
XL	25	3	100	0.440	0.45	10.0	1275	1685	7.5

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	3	100	0.350	0.45	15.0	1275	1340	9.0
XL	25	3	80	0.280	0.42	10.0	1020	855	3.5

M	25	3	160	1.000	0.70	15.0	2035	6105	64.0
XL	25	3	120	0.800	0.65	10.0	1530	3670	24.0

Frese ad alto avanzamento NX

Inseri 10mm, con canale di aerazione/raffreddamento integrato



Rm	Rm	Rm	Rm	HRC					GG(G)
< 850	850-1100	1100-1300	1300-1500	48-56					

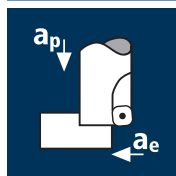
Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W02140.253*	25	25	24	125	65	1.0	3	M	●
W02180.253	25	25	24	225	50	1.0	3	XL	●
* Con weldon									

Inseri NX 10mm		Composizione fornitura: Confezione minima: 10 pezzi					
N° Ordine	H	B	D	r	R _{theo.}		
W52110.010	10.2	10.0	4.0	0.8	2.0	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2		●



Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



Materiale

Leghe di titanio indurite
> 300 HB
[Ti6Al4V]



Acciaio
< 850 N/mm²



Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	3	180	1.000	0.70	15.0	2290	6870	72.0
XL	25	3	140	0.800	0.65	10.0	1785	4285	28.0

M	25	3	120	0.900	0.63	15.0	1530	4130	39.0
XL	25	3	100	0.720	0.59	10.0	1275	2755	16.5

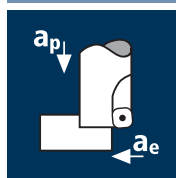
M	25	3	150	0.800	0.63	15.0	1910	4585	43.5
XL	25	3	120	0.640	0.59	10.0	1530	2940	17.5

M	25	3	100	0.600	0.49	15.0	1275	2295	17.0
XL	25	3	80	0.480	0.45	10.0	1020	1470	6.5

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	3	50	0.650	0.49	15.0	635	1240	9.0
XL	25	3	40	0.520	0.45	10.0	510	795	3.5

M	25	3	180	1.000	0.70	15.0	2290	6870	72.0
XL	25	3	140	0.800	0.65	10.0	1785	4285	28.0

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	3	130	0.970	0.63	15.0	1655	4815	45.5
XL	25	3	110	0.810	0.59	10.0	1400	3400	20.0

M	25	3	160	0.870	0.63	15.0	2035	5310	50.0
XL	25	3	130	0.725	0.59	10.0	1655	3600	21.0

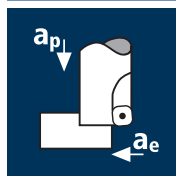
M	25	3	110	0.645	0.48	15.0	1400	2710	19.5
XL	25	3	90	0.540	0.45	10.0	1145	1855	8.5

M	25	3	60	0.590	0.48	15.0	765	1355	10.0
XL	25	3	50	0.495	0.45	10.0	635	945	4.5

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	25	3	80	0.670	0.57	15.0	1020	2050	17.5
XL	25	3	60	0.560	0.53	10.0	765	1285	7.0

M	25	3	40	0.325	0.44	15.0	510	495	3.5
XL	25	3	35	0.270	0.41	10.0	445	360	1.5

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Materiale

Acciaio
1500 - 1800 N/mm²



Ghisa
(grigia / sferoidale)



Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	35	3	200	1.200	1.20	21.0	1820	6550	165.0
XL	35	3	160	1.000	1.00	14.0	1455	4365	61.0

M	35	3	180	0.960	1.08	21.0	1635	4710	107.0
XL	35	3	140	0.800	0.90	14.0	1275	3060	38.5

M	35	3	160	0.780	0.96	21.0	1455	3405	68.5
XL	35	3	120	0.650	0.80	14.0	1090	2125	24.0

M	35	3	120	0.660	0.84	21.0	1090	2160	38.0
XL	35	3	100	0.550	0.70	14.0	910	1500	14.5

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	35	3	100	0.420	0.78	21.0	910	1145	19.0
XL	35	3	80	0.350	0.65	14.0	730	765	7.0

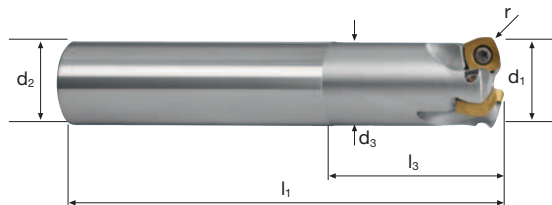
M	35	3	160	1.200	1.20	21.0	1455	5240	132.0
XL	35	3	120	1.000	1.00	14.0	1090	3270	46.0

Frese ad alto avanzamento NX

Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM λ 0°
 γ 12°

HFC



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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Frese ad alto avanzamento			Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W02150.353*	35	32	31.4	144	63	2.0	3	M	●	
W02190.353	35	32	31.4	250	63	2.0	3	XL	●	

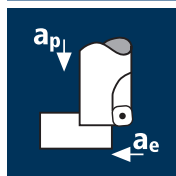
* Con weldon

Inserti NX 13mm			Composizione fornitura: Confezione minima: 10 pezzi						
N° Ordine	H	B	D	r			R _{theo.}		
W52110.013	13.6	13.1	4.8	1.0			3.0	●	

Accessori			Viti per serraggio inserti, confezione da 10 pezzi						
N° Ordine									
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20							●	
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20							●	
W91100.013	Cacciavite Torx TX 20							●	
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5							●	

VII

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



Materiale

Leghe di titanio indurite
> 300 HB
[Ti6Al4V]



Acciaio
< 850 N/mm²



Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	35	3	180	1.200	1.20	21.0	1635	5885	148.5
XL	35	3	140	1.000	1.00	14.0	1275	3825	53.5

M	35	3	120	1.080	1.08	21.0	1090	3530	80.0
XL	35	3	100	0.900	0.90	14.0	910	2455	31.0

M	35	3	150	0.960	1.08	21.0	1365	3930	89.0
XL	35	3	120	0.800	0.90	14.0	1090	2615	33.0

M	35	3	100	0.720	0.84	21.0	910	1965	34.5
XL	35	3	80	0.600	0.70	14.0	730	1315	13.0

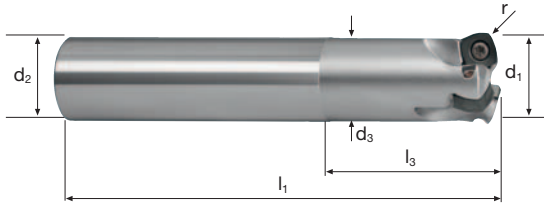
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	35	3	50	0.780	0.84	21.0	455	1065	19.0
XL	35	3	40	0.650	0.70	14.0	365	710	7.0

M	35	3	180	1.200	1.20	21.0	1635	5885	148.5
XL	35	3	140	1.000	1.00	14.0	1275	3825	53.5

Frese ad alto avanzamento SX

Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 0° γ 13°
	HFC



Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Tool Steel
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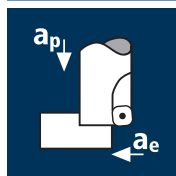
Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto								
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W02150.353*	35	32	31.4	144	63	2.0	3	M	●	
W02190.353	35	32	31.4	250	63	2.0	3	XL	●	

* Con weldon

Inserti SX 13mm		Composizione fornitura: Confezione minima: 10 pezzi					
N° Ordine	H	B	D	r		R _{theo.}	
W52310.013	13.6	13.1	4.8	1.0		3.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20		●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20		●
W91100.013	Cacciavite Torx TX 20		●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5		●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	35	3	130	1.130	1.08	21.0	1180	4000	90.5
XL	35	3	110	0.950	0.90	14.0	1000	2850	36.0

M	35	3	160	1.010	1.08	21.0	1455	4410	100.0
XL	35	3	140	0.850	0.90	14.0	1275	3250	41.0

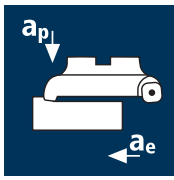
M	35	3	110	0.750	0.82	21.0	1000	2250	38.5
XL	35	3	90	0.630	0.68	14.0	820	1550	15.0

M	35	3	60	0.690	0.82	21.0	545	1130	19.5
XL	35	3	50	0.580	0.68	14.0	455	790	7.5

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
M	35	3	80	0.780	0.97	21.0	730	1710	35.0
XL	35	3	60	0.655	0.81	14.0	545	1070	12.0

M	35	3	35	0.380	0.76	21.0	320	365	6.0
XL	35	3	25	0.320	0.63	14.0	225	215	2.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	200	1.200	0.75	24.0	1590	7630	137.35
50	5	200	1.300	0.75	30.0	1275	8290	186.55
63	6	180	1.400	0.75	37.8	910	7645	216.75

40	4	180	0.960	0.68	24.0	1430	5490	89.60
50	5	180	1.040	0.68	30.0	1145	5955	121.50
63	6	160	1.120	0.68	37.8	810	5445	139.95

40	4	160	0.780	0.60	24.0	1275	3980	57.30
50	5	160	0.845	0.60	30.0	1020	4310	77.60
63	6	140	0.910	0.60	37.8	705	3850	87.30

40	4	120	0.660	0.52	24.0	955	2520	31.45
50	5	120	0.715	0.52	30.0	765	2735	42.65
63	6	100	0.770	0.52	37.8	505	2335	45.90

Materiale

Acciaio
1500 - 1800 N/mm²

Ghisa
(grigia / sferoidale)

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	100	0.420	0.49	24.0	795	1335	15.70
50	5	100	0.455	0.49	30.0	635	1445	21.25
63	6	80	0.490	0.49	37.8	405	1190	22.05

40	4	160	1.200	0.75	24.0	1275	6120	110.15
50	5	160	1.300	0.75	30.0	1020	6630	149.20
63	6	140	1.400	0.75	37.8	705	5920	167.85

Frese ad alto avanzamento NX

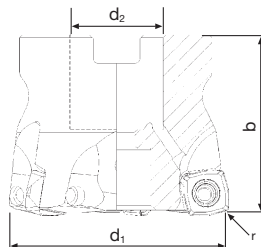
Inseri 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 4° γ 16°
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	HFC
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Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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Frese ad alto avanzamento						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W02400.404*	40	16	40	1.0	4	●
W02400.505	50	22	40	1.0	5	●
W02400.636	63	22	40	1.0	6	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm)					●
	Composizione fornitura con Power-Vite					

Inseri NX 10mm							Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	R _{theo.}		
W52110.010	10.2	10.0	4.0	0.8	2.0		●

Accessori							Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine							
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15						●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15						●
W90100.013	Cacciavite Torx TX 15						●
W92500.010	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 8.6						●



Materiale

Acciaio inossidabile ferritico/martensitico

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	180	1.200	0.75	24.0	1430	6865	123.55
50	5	180	1.300	0.75	30.0	1145	7445	167.50
63	6	140	1.400	0.75	37.8	705	5920	167.85

Acciaio inossidabile [Cr-Ni/1.4301]

40	4	120	1.080	0.68	24.0	955	4125	67.30
50	5	120	1.170	0.68	30.0	765	4475	91.30
63	6	100	1.260	0.68	37.8	505	3820	98.20

Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]

40	4	150	0.960	0.68	24.0	1195	4590	74.90
50	5	150	1.040	0.68	30.0	955	4965	101.30
63	6	120	1.120	0.68	37.8	605	4065	104.50

Acciaio resistente al calore [17-4 PH]

40	4	100	0.720	0.52	24.0	795	2290	28.60
50	5	100	0.780	0.52	30.0	635	2475	38.60
63	6	80	0.840	0.52	37.8	405	2040	40.10

Materiale

Leghe di titanio indurite > 300 HB [Ti6Al4V]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	55	0.650	0.49	24.0	440	1145	13.45
50	5	55	0.700	0.49	30.0	350	1225	18.00
63	6	45	0.755	0.49	37.8	225	1020	18.90

Acciaio < 850 N/mm²

40	4	180	1.200	0.75	24.0	1430	6865	123.55
50	5	180	1.300	0.75	30.0	1145	7445	167.50
63	6	140	1.400	0.75	37.8	705	5920	167.85

Frese ad alto avanzamento SX

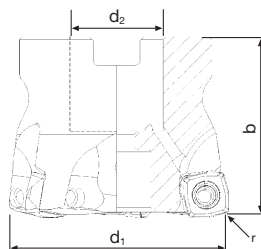
Inseri 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 4° γ 17°
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	HFC
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Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto				
N° Ordine	d1	d2	b	ap _{max.}	z	
W02400.404*	40	16	40	1.0	4	●
W02400.505	50	22	40	1.0	5	●
W02400.636	63	22	40	1.0	6	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm)					●
	Composizione fornitura con Power-Vite					

Inseri SX 10mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r	R _{theo.}	
W52310.010	10.2	10.0	4.0	0.8	2.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15			●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15			●
W90100.013	Cacciavite Torx TX 15			●
W92500.010	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 8.6			●



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	130	1.135	0.68	24.0	1035	4700	76.70
50	5	130	1.230	0.68	30.0	830	5105	104.15
63	6	110	1.325	0.68	37.8	555	4410	113.35

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

40	4	160	1.010	0.68	24.0	1275	5150	84.05
50	5	160	1.095	0.68	30.0	1020	5585	113.95
63	6	130	1.180	0.68	37.8	655	4635	119.15

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

40	4	110	0.755	0.52	24.0	875	2645	33.00
50	5	110	0.820	0.52	30.0	700	2870	44.75
63	6	90	0.880	0.52	37.8	455	2400	47.15

Leghe di titanio indurite >300 HB [Ti6Al4V]

40	4	60	0.690	0.52	24.0	475	1310	16.35
50	5	60	0.750	0.52	30.0	380	1425	22.25
63	6	50	0.810	0.52	37.8	255	1240	24.35

Materiale

Acciaio rapido PM ricotto [Böhler S390] [ASP 2023]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	80	0.785	0.61	24.0	635	1995	29.20
50	5	80	0.850	0.61	30.0	510	2170	39.70
63	6	60	0.915	0.61	37.8	305	1675	38.60

Acciaio < 850 N/mm²

40	4	190	1.225	0.75	24.0	1510	7400	133.20
50	5	180	1.330	0.75	30.0	1145	7615	171.35
63	6	160	1.430	0.75	37.8	810	6950	197.05

Leg. a base di nichel [Inconel 718] [Hastelloy B-3] [Nimonic 90]

40	4	40	0.380	0.48	24.0	320	485	5.60
50	5	35	0.410	0.48	30.0	225	460	6.60
63	6	30	0.445	0.48	37.8	150	400	7.25

Frese ad alto avanzamento ZX

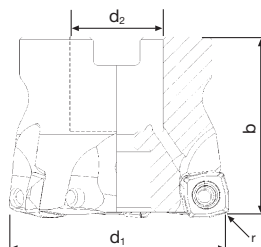
Inseri 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 4° γ 17°
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	HFC
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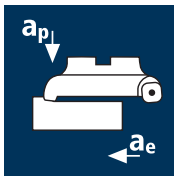
Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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Frese ad alto avanzamento						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W02400.404*	40	16	40	1.0	4	●
W02400.505	50	22	40	1.0	5	●
W02400.636	63	22	40	1.0	6	●
W99510.010*	Power-Vite M8.0 x 30.0 (Momento di serraggio 15.0 Nm)					●
	Composizione fornitura con Power-Vite					

Inseri ZX 10mm						Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	R _{theo.}	
W52410.010	10.2	10.0	4.0	0.8	2.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W92500.010	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 8.6	●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
50	4	200	1.400	1.40	30.0	1275	7140	299.90
63	5	180	1.500	1.40	37.8	910	6825	361.20
80	7	160	1.600	1.40	48.0	635	7110	477.80

50	4	180	1.120	1.26	30.0	1145	5130	193.90
63	5	160	1.200	1.26	37.8	810	4860	231.45
80	7	140	1.280	1.26	48.0	555	4975	300.90

50	4	160	0.910	1.12	30.0	1020	3715	124.80
63	5	140	0.975	1.12	37.8	705	3435	145.40
80	7	120	1.040	1.12	48.0	475	3460	186.00

50	4	120	0.770	0.98	30.0	765	2355	69.25
63	5	100	0.825	0.98	37.8	505	2085	77.25
80	7	80	0.880	0.98	48.0	320	1970	92.65

Materiale

Acciaio
1500 - 1800 N/mm²

Ghisa
(grigia / sferoidale)

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
50	4	100	0.490	0.91	30.0	635	1245	34.00
63	5	80	0.525	0.91	37.8	405	1065	36.65
80	7	70	0.560	0.91	48.0	280	1100	48.05

50	4	160	1.400	1.40	30.0	1020	5710	239.80
63	5	140	1.500	1.40	37.8	705	5290	279.95
80	7	120	1.600	1.40	48.0	475	5320	357.50

Frese ad alto avanzamento NX

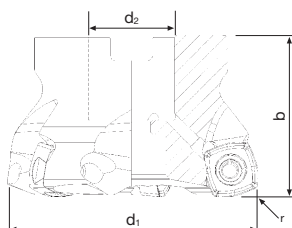
Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 4° γ 16°
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	HFC
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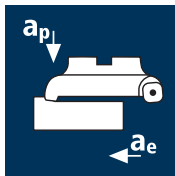
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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Frese ad alto avanzamento			Composizione fornitura: Corpo fresa comprese viti per serraggio inserto				
N° Ordine	d1	d2	b	ap _{max.}	z		
W02410.504	50	22	40	2.0	4	●	
W02410.635	63	22	40	2.0	5	●	
W02410.807	80	27	50	2.0	7	●	

Inserti NX 13mm		Composizione fornitura: Confezione minima: 10 pezzi					
N° Ordine	H	B	D	r	R _{theo.}		
W52110.013	13.6	13.1	4.8	1.0	3.0	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20			●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20			●
W91100.013	Cacciavite Torx TX 20			●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5			●

Applicazione



Materiale

Acciaio inossidabile ferritico/martensitico

Acciaio inossidabile [Cr-Ni/1.4301]

Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]

Acciaio resistente al calore [17-4 PH]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
50	4	180	1.400	1.40	30.0	1145	6410	269.20
63	5	140	1.500	1.40	37.8	705	5290	279.95
80	7	120	1.600	1.40	48.0	475	5320	357.50

50	4	120	1.260	1.26	30.0	765	3855	145.70
63	5	100	1.350	1.26	37.8	505	3410	162.40
80	7	80	1.440	1.26	48.0	320	3225	195.05

50	4	150	1.120	1.26	30.0	955	4280	161.80
63	5	120	1.200	1.26	37.8	605	3630	172.90
80	7	100	1.280	1.26	48.0	400	3585	216.80

50	4	100	0.840	0.98	30.0	635	2135	62.75
63	5	80	0.900	0.98	37.8	405	1825	67.60
80	7	70	0.960	0.98	48.0	280	1880	88.45

Materiale

Leghe di titanio indurite > 300 HB [Ti6Al4V]

Acciaio < 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
50	4	55	0.755	0.91	30.0	350	1055	28.80
63	5	45	0.810	0.91	37.8	225	910	31.30
80	7	40	0.865	0.91	48.0	160	970	42.35

50	4	180	1.400	1.40	30.0	1145	6410	269.20
63	5	140	1.500	1.40	37.8	705	5290	279.95
80	7	120	1.600	1.40	48.0	475	5320	357.50

Frese ad alto avanzamento SX

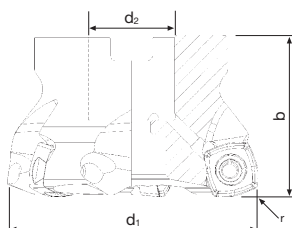
Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 4° γ 17°
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	HFC
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Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Frese ad alto avanzamento						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W02410.504	50	22	40	2.0	4	●
W02410.635	63	22	40	2.0	5	●
W02410.807	80	27	50	2.0	7	●

Inseri SX 13mm						Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	R _{theo.}	
W52310.013	13.6	13.1	4.8	1.0	3.0	●

Accessori			Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine			
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20		●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20		●
W91100.013	Cacciavite Torx TX 20		●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5		●

VII



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
50	4	130	1.325	1.26	30.0	830	4400	166.30
63	5	110	1.425	1.26	37.8	555	3955	188.35
80	7	90	1.485	1.26	48.0	360	3740	226.20

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

50	4	160	1.180	1.26	30.0	1020	4815	182.00
63	5	130	1.270	1.26	37.8	655	4160	198.15
80	7	110	1.320	1.26	48.0	440	4065	245.85

Acciaio resistente al calore
Acciaio duplex [1.4462] [17-4 PH]

50	4	110	0.880	0.96	30.0	700	2465	71.00
63	5	90	0.950	0.96	37.8	455	2160	78.40
80	7	70	0.990	0.96	48.0	280	1940	89.40

Leghe di titanio indurite >300 HB [Ti6Al4V]

50	4	60	0.810	0.96	30.0	380	1230	35.40
63	5	50	0.870	0.96	37.8	255	1110	40.30
80	7	45	0.905	0.96	48.0	180	1140	52.55

Materiale

Acciaio rapido PM ricotto [Böhler S390] [ASP 2023]

50	4	80	0.915	1.13	30.0	510	1865	63.20
63	5	60	0.985	1.13	37.8	305	1500	64.05
80	7	50	1.025	1.13	48.0	200	1435	77.85

Acciaio < 850 N/mm²

50	4	180	1.430	1.40	30.0	1145	6550	275.10
63	5	160	1.540	1.40	37.8	810	6235	329.95
80	7	130	1.605	1.40	48.0	515	5785	388.75

Leg. a base di nichel [Inconel 718] [Hastelloy B-3] [Nimonic 90]

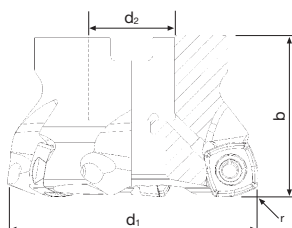
50	4	35	0.445	0.88	30.0	225	400	10.55
63	5	30	0.475	0.88	37.8	150	355	11.80
80	7	25	0.495	0.88	48.0	100	345	14.55

Frese ad alto avanzamento ZX

Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 4° γ 17°
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	HFC
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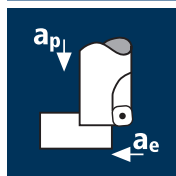
Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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Frese ad alto avanzamento						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W02410.504	50	22	40	2.0	4	●
W02410.635	63	22	40	2.0	5	●
W02410.807	80	27	50	2.0	7	●

Inserti ZX 13mm						Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	R _{theo.}	
W52410.013	13.6	13.1	4.8	1.0	3.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20	●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20	●
W91100.013	Cacciavite Torx TX 20	●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5	●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



Materiale

Acciaio
1500 - 1800 N/mm²



Ghisa
(grigia / sferoidale)



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
< 100	25	3	250	1.200	0.75	15.0	3185	11465	129.0
100-160	25	3	200	1.000	0.70	15.0	2545	7635	80.0
160-250	25	3	160	0.800	0.65	10.0	2035	4885	32.0

< 100	25	3	220	0.960	0.68	15.0	2800	8065	82.5
100-160	25	3	180	0.800	0.63	15.0	2290	5495	52.0
160-250	25	3	140	0.640	0.59	10.0	1785	3425	20.0

< 100	25	3	200	0.780	0.60	15.0	2545	5955	53.5
100-160	25	3	160	0.650	0.56	15.0	2035	3970	33.5
160-250	25	3	120	0.520	0.52	10.0	1530	2385	12.5

< 100	25	3	160	0.660	0.52	15.0	2035	4030	31.5
100-160	25	3	120	0.550	0.49	15.0	1530	2525	18.5
160-250	25	3	100	0.440	0.45	10.0	1275	1685	7.5

L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
< 100	25	3	140	0.420	0.49	15.0	1785	2250	16.5
100-160	25	3	100	0.350	0.45	15.0	1275	1340	9.0
160-250	25	3	80	0.280	0.42	10.0	1020	855	3.5

< 100	25	3	200	1.200	0.75	15.0	2545	9160	103.0
100-160	25	3	160	1.000	0.70	15.0	2035	6105	64.0
160-250	25	3	120	0.800	0.65	10.0	1530	3670	24.0

Frese ad alto avanzamento NX

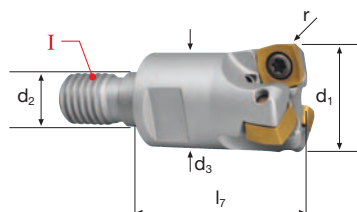
Inseri 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 2° γ 14°
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HFC	
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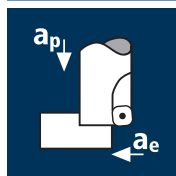
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto								
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I		
W02200.253	25	12.5	21	35	1.0	3	17	M12	●	

Inseri NX 10mm		Composizione fornitura: Confezione minima: 10 pezzi					
N° Ordine	H	B	D	r	R _{theo.}		
W52110.010	10.2	10.0	4.0	0.8	2.0	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2		●

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



Materiale

Leghe di titanio indurite
> 300 HB
[Ti6Al4V]



Acciaio
< 850 N/mm²



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
< 100	25	3	200	1.200	0.75	15.0	2545	9160	103.0
100-160	25	3	180	1.000	0.70	15.0	2290	6870	72.0
160-250	25	3	140	0.800	0.65	10.0	1785	4285	28.0

< 100	25	3	140	1.080	0.68	15.0	1785	5785	59.0
100-160	25	3	120	0.900	0.63	15.0	1530	4130	39.0
160-250	25	3	100	0.720	0.59	10.0	1275	2755	16.5

< 100	25	3	180	0.960	0.68	15.0	2290	6595	67.5
100-160	25	3	150	0.800	0.63	15.0	1910	4585	43.5
160-250	25	3	120	0.640	0.59	10.0	1530	2940	17.5

< 100	25	3	120	0.720	0.52	15.0	1530	3305	26.0
100-160	25	3	100	0.600	0.49	15.0	1275	2295	17.0
160-250	25	3	80	0.480	0.45	10.0	1020	1470	6.5

L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
< 100	25	3	50	0.780	0.52	15.0	635	1485	11.5
100-160	25	3	45	0.650	0.49	15.0	575	1120	8.0
160-250	25	3	40	0.520	0.45	10.0	510	795	3.5

< 100	25	3	220	1.200	0.75	15.0	2800	10080	113.5
100-160	25	3	180	1.000	0.70	15.0	2290	6870	72.0
160-250	25	3	140	0.800	0.65	10.0	1785	4285	28.0

Frese ad alto avanzamento SX

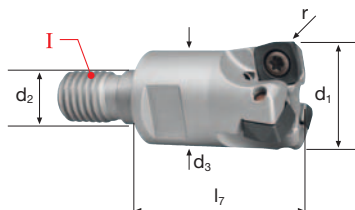
Inseri 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 2° γ 15°
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	HFC
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Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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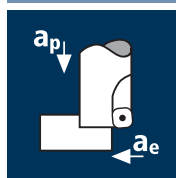
Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W02200.253	25	12.5	21	35	1.0	3	17	M12	●

Inserti SX 10mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r	R _{theo.}	
W52310.010	10.2	10.0	4.0	0.8	2.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2	●

VII

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
< 100	25	3	150	1.135	0.68	15.0	1910	6505	66.5
100-160	25	3	130	0.970	0.63	15.0	1655	4815	45.5
160-250	25	3	110	0.810	0.59	10.0	1400	3400	20.0

< 100	25	3	180	1.010	0.68	15.0	2290	6940	71.0
100-160	25	3	160	0.870	0.63	15.0	2035	5310	50.0
160-250	25	3	130	0.725	0.59	10.0	1655	3600	21.0

< 100	25	3	130	0.755	0.52	15.0	1655	3750	29.5
100-160	25	3	110	0.645	0.48	15.0	1400	2710	19.5
160-250	25	3	90	0.540	0.45	10.0	1145	1855	8.5

< 100	25	3	70	0.690	0.52	15.0	890	1840	14.5
100-160	25	3	60	0.590	0.48	15.0	765	1355	10.0
160-250	25	3	50	0.495	0.45	10.0	635	945	4.5


L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
< 100	25	3	100	0.785	0.61	15.0	1275	3005	27.5
100-160	25	3	80	0.670	0.57	15.0	1020	2050	17.5
160-250	25	3	60	0.560	0.53	10.0	765	1285	7.0

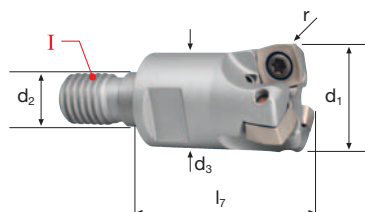
< 100	25	3	45	0.380	0.48	15.0	575	655	4.5
100-160	25	3	40	0.325	0.44	15.0	510	495	3.5
160-250	25	3	35	0.270	0.41	10.0	445	360	1.5

Frese ad alto avanzamento ZX


Inserti 10mm, con canale di aerazione/raffreddamento integrato

HM	λ 2° γ 15°
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HFC	
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Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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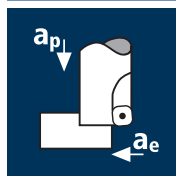
Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W02200.253	25	12.5	21	35	1.0	3	17	M12	●

Inserti ZX 10mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r	R _{theo.}	
W52410.010	10.2	10.0	4.0	0.8	2.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2	●

VII

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
< 100	35	3	250	1.400	1.40	21.0	2275	9555	281.0
100-180	35	3	200	1.200	1.20	21.0	1820	6550	165.0
180-260	35	3	160	1.000	1.00	14.0	1455	4365	61.0

< 100	35	3	220	1.120	1.26	21.0	2000	6720	178.0
100-180	35	3	180	0.960	1.08	21.0	1635	4710	107.0
180-260	35	3	140	0.800	0.90	14.0	1275	3060	38.5

< 100	35	3	200	0.910	1.12	21.0	1820	4970	117.0
100-180	35	3	160	0.780	0.96	21.0	1455	3405	68.5
180-260	35	3	120	0.650	0.80	14.0	1090	2125	24.0

< 100	35	3	160	0.770	0.98	21.0	1455	3360	69.0
100-180	35	3	120	0.660	0.84	21.0	1090	2160	38.0
180-260	35	3	100	0.550	0.70	14.0	910	1500	14.5

Materiale

Acciaio
1500 - 1800 N/mm²



Ghisa
(grigia / sferoidale)



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
< 100	35	3	140	0.490	0.91	21.0	1275	1875	36.0
100-180	35	3	100	0.420	0.78	21.0	910	1145	19.0
180-260	35	3	80	0.350	0.65	14.0	730	765	7.0

< 100	35	3	200	1.400	1.40	21.0	1820	7645	225.0
100-180	35	3	160	1.200	1.20	21.0	1455	5240	132.0
180-260	35	3	120	1.000	1.00	14.0	1090	3270	46.0

Frese ad alto avanzamento NX

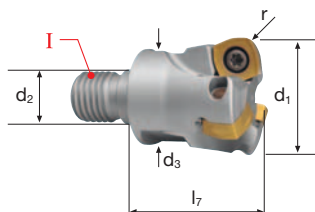
Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 0° γ 12°
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HFC	
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Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56					GG(G)
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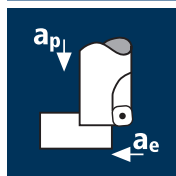
Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W02210.353	35	17	29	35	2.0	3	24	M16	●

Inseri NX 13mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r	R _{theo.}	
W52110.013	13.6	13.1	4.8	1.0	3.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20		●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20		●
W91100.013	Cacciavite Torx TX 20		●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5		●

VII

Applicazione



Materiale

Acciaio inossidabile
ferritico/martensitico



Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



Materiale

Leghe di titanio indurite
> 300 HB
[Ti6Al4V]



Acciaio
< 850 N/mm²



L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
< 100	35	3	200	1.400	1.40	21.0	1820	7645	225.0
100-180	35	3	180	1.200	1.20	21.0	1635	5885	148.5
180-260	35	3	140	1.000	1.00	14.0	1275	3825	53.5

< 100	35	3	140	1.260	1.26	21.0	1275	4820	127.5
100-180	35	3	120	1.080	1.08	21.0	1090	3530	80.0
180-260	35	3	100	0.900	0.90	14.0	910	2455	31.0

< 100	35	3	180	1.120	1.26	21.0	1635	5495	145.5
100-180	35	3	150	0.960	1.08	21.0	1365	3930	89.0
180-260	35	3	120	0.800	0.90	14.0	1090	2615	33.0

< 100	35	3	120	0.840	0.98	21.0	1090	2745	56.5
100-180	35	3	100	0.720	0.84	21.0	910	1965	34.5
180-260	35	3	80	0.600	0.70	14.0	730	1315	13.0


L _A [mm]	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
< 100	35	3	50	0.910	0.98	21.0	455	1240	25.5
100-180	35	3	45	0.780	0.84	21.0	410	960	17.0
180-260	35	3	40	0.650	0.70	14.0	365	710	7.0

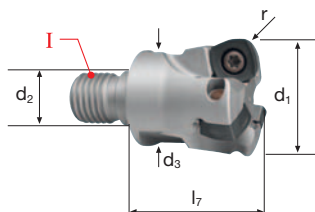
< 100	35	3	220	1.400	1.40	21.0	2000	8400	247.0
100-180	35	3	180	1.200	1.20	21.0	1635	5885	148.5
180-260	35	3	140	1.000	1.00	14.0	1275	3825	53.5

Frese ad alto avanzamento SX


Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 0° γ 13°
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HFC	
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Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Tool Steel
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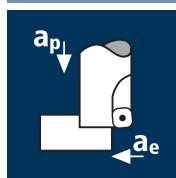
Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W02210.353	35	17	29	35	2.0	3	24	M16	●

Inserti SX 13mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r	R _{theo.}	
W52310.013	13.6	13.1	4.8	1.0	3.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20	●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20	●
W91100.013	Cacciavite Torx TX 20	●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5	●

VII

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Leghe di titanio indurite
>300 HB
[Ti6Al4V]



Materiale

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
< 100	35	3	150	1.325	1.26	21.0	1365	5425	143.5
100-180	35	3	130	1.130	1.08	21.0	1180	4000	90.5
180-260	35	3	110	0.950	0.90	14.0	1000	2850	36.0

< 100	35	3	180	1.185	1.26	21.0	1635	5810	153.5
100-180	35	3	160	1.010	1.08	21.0	1455	4410	100.0
180-260	35	3	140	0.850	0.90	14.0	1275	3250	41.0

< 100	35	3	130	0.880	0.96	21.0	1180	3115	63.0
100-180	35	3	110	0.750	0.82	21.0	1000	2250	38.5
180-260	35	3	90	0.630	0.68	14.0	820	1550	15.0

< 100	35	3	70	0.810	0.96	21.0	635	1545	31.0
100-180	35	3	60	0.690	0.82	21.0	545	1130	19.5
180-260	35	3	50	0.580	0.68	14.0	455	790	7.5

L_A [mm]	$d1$ [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min ⁻¹]	v_f [mm/min]	Q [cm ³ /min]
< 100	35	3	100	0.915	1.13	21.0	910	2500	59.5
100-180	35	3	80	0.780	0.97	21.0	730	1710	35.0
180-260	35	3	60	0.655	0.81	14.0	545	1070	12.0

< 100	35	3	45	0.445	0.88	21.0	410	545	10.0
100-180	35	3	35	0.380	0.76	21.0	320	365	6.0
180-260	35	3	25	0.320	0.63	14.0	225	215	2.0

Frese ad alto avanzamento ZX

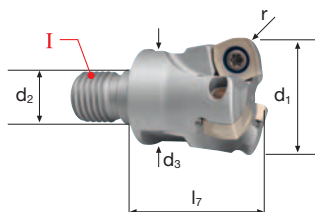
Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 0° γ 13°
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	HFC
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Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys HSS
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Frese ad alto avanzamento		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto							
N° Ordine	d1	d2	d3	l7	ap _{max.}	z		I	
W02210.353	35	17	29	35	2.0	3	24	M16	●

Inserti ZX 13mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r	R _{theo.}	
W52410.013	13.6	13.1	4.8	1.0	3.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20		●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20		●
W91100.013	Cacciavite Torx TX 20		●
W91500.013	Vite di fissaggio per l'insertos Torx TX 20 / M 4.5 x 10.5		●

VII



Frese con inserti a spianare

Frese per spianatura 45° per inserti 9mm

N° W01400



NX	λ 12°	d, 40 – 125	Rm 850-1300			847
	γ -6°					
SX	λ 12°	d, 40 – 125	Inox Stainless	Rm <850		849
	γ -6°					
ZX	λ 12°	d, 40 – 125	Ni-/Mn- Alloys	Inox Stainless	Rm <850	851
	γ -6°					
AX	λ 12°	d, 40 – 125	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	853
	γ 15°					

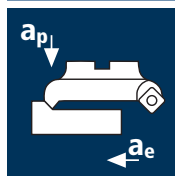
Frese per spianatura 45° per inserti 13mm

N° W01410



NX	λ 13°	d, 40 – 125	Rm 850-1300			855
	γ -6°					
SX	λ 13°	d, 40 – 125	Inox Stainless	Rm <850		857
	γ -6°					
ZX	λ 13°	d, 40 – 125	Ni-/Mn- Alloys	Inox Stainless	Rm <850	859
	γ -6°					
AX	λ 13°	d, 40 – 125	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	861
	γ 13°					

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

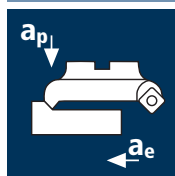
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	6	220	0.220	2.5	30.0	1750	2310	173.5
50	7	220	0.220	2.5	37.5	1400	2155	202.0
63	8	200	0.220	2.5	47.3	1010	1780	210.5
80	9	200	0.220	2.5	60.0	795	1575	236.5
100	11	180	0.220	2.5	75.0	575	1390	260.5
125	12	180	0.220	2.5	93.8	460	1215	285.0

40	6	200	0.220	2.5	30.0	1590	2100	157.5
50	7	200	0.220	2.5	37.5	1275	1965	184.0
63	8	180	0.220	2.5	47.3	910	1600	189.0
80	9	180	0.220	2.5	60.0	715	1415	212.5
100	11	160	0.220	2.5	75.0	510	1235	231.5
125	12	160	0.220	2.5	93.8	405	1070	251.0

40	6	160	0.195	2.5	30.0	1275	1490	112.0
50	7	160	0.195	2.5	37.5	1020	1390	130.5
63	8	140	0.195	2.5	47.3	705	1100	130.0
80	9	140	0.195	2.5	60.0	555	975	146.5
100	11	120	0.195	2.5	75.0	380	815	153.0
125	12	120	0.195	2.5	93.8	305	715	167.5

40	6	120	0.175	2.5	30.0	955	1005	75.5
50	7	120	0.175	2.5	37.5	765	935	87.5
63	8	100	0.175	2.5	47.3	505	705	83.5
80	9	100	0.175	2.5	60.0	400	630	94.5
100	11	80	0.175	2.5	75.0	255	490	92.0
125	12	80	0.175	2.5	93.8	205	430	101.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	6	220	0.165	0.5	30.0	1750	1735	26.0
50	7	220	0.165	0.5	37.5	1400	1615	30.5
63	8	200	0.165	0.5	47.3	1010	1335	31.5
80	9	200	0.165	0.5	60.0	795	1180	35.5
100	11	180	0.165	0.5	75.0	575	1045	39.0
125	12	180	0.165	0.5	93.8	460	910	42.5

40	6	200	0.165	0.5	30.0	1590	1575	23.5
50	7	200	0.165	0.5	37.5	1275	1475	27.5
63	8	180	0.165	0.5	47.3	910	1200	28.5
80	9	180	0.165	0.5	60.0	715	1060	32.0
100	11	160	0.165	0.5	75.0	510	925	34.5
125	12	160	0.165	0.5	93.8	405	800	37.5

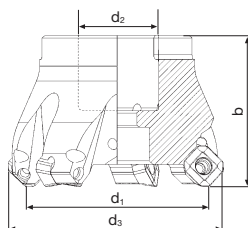
40	6	160	0.145	0.5	30.0	1275	1110	16.5
50	7	160	0.145	0.5	37.5	1020	1035	19.5
63	8	140	0.145	0.5	47.3	705	820	19.5
80	9	140	0.145	0.5	60.0	555	725	22.0
100	11	120	0.145	0.5	75.0	380	605	22.5
125	12	120	0.145	0.5	93.8	305	530	25.0

40	6	120	0.130	0.5	30.0	955	745	11.0
50	7	120	0.130	0.5	37.5	765	695	13.0
63	8	100	0.130	0.5	47.3	505	525	12.5
80	9	100	0.130	0.5	60.0	400	470	14.0
100	11	80	0.130	0.5	75.0	255	365	13.5
125	12	80	0.130	0.5	93.8	205	320	15.0

Frese per spianatura 45° NX

Inseri 9mm, con canale di aerazione/raffreddamento integrato

HM	λ 12° γ -6°



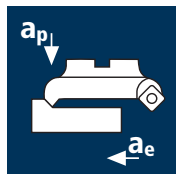
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500							GG(G)
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Frese per spianatura 45°							Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2	d3	b	ap _{max.}	z		
W01400.406	40	16	48.4	40	4.0	6	●	
W01400.507	50	22	58.4	40	4.0	7	●	
W01400.638	63	22	71.4	40	4.0	8	●	
W01400.809	80	27	88.4	50	4.0	9	●	
W01400.100	100	32	108.4	50	4.0	11	●	
W01400.125	125	40	133.4	63	4.0	12	●	

Inserti NX 9mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D		
W51110.009	9.5	9.5	4.0	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08		●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08		●
W90100.008	Cacciavite Torx TX 08		●
W91500.009	Vite di fissaggio per l'inserto Torx TX 08 / M 3.0 x 7.3		●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]

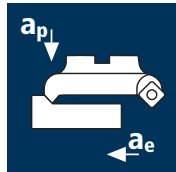


d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	6	130	0.120	2.5	30.0	1035	745	56.0
50	7	130	0.120	2.5	37.5	830	695	65.0
63	8	110	0.120	2.5	47.3	555	535	63.5
80	9	110	0.120	2.5	60.0	440	475	71.5
100	11	90	0.120	2.5	75.0	285	375	70.5
125	12	90	0.120	2.5	93.8	230	330	77.5

40	6	200	0.120	2.5	30.0	1590	1145	86.0
50	7	200	0.120	2.5	37.5	1275	1070	100.5
63	8	180	0.120	2.5	47.3	910	875	103.5
80	9	180	0.120	2.5	60.0	715	770	115.5
100	11	160	0.120	2.5	75.0	510	675	126.5
125	12	160	0.120	2.5	93.8	405	585	137.0

40	6	100	0.120	2.5	30.0	795	570	43.0
50	7	100	0.120	2.5	37.5	635	535	50.0
63	8	80	0.120	2.5	47.3	405	390	46.0
80	9	80	0.120	2.5	60.0	320	345	52.0
100	11	60	0.120	2.5	75.0	190	250	47.0
125	12	60	0.120	2.5	93.8	155	225	53.0

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	6	130	0.080	0.5	30.0	1035	495	7.5
50	7	130	0.080	0.5	37.5	830	465	8.5
63	8	110	0.080	0.5	47.3	555	355	8.5
80	9	110	0.080	0.5	60.0	440	315	9.5
100	11	90	0.080	0.5	75.0	285	250	9.5
125	12	90	0.080	0.5	93.8	230	220	10.5

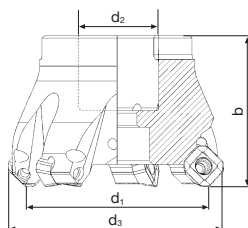
40	6	200	0.080	0.5	30.0	1590	765	11.5
50	7	200	0.080	0.5	37.5	1275	715	13.5
63	8	180	0.080	0.5	47.3	910	580	13.5
80	9	180	0.080	0.5	60.0	715	515	15.5
100	11	160	0.080	0.5	75.0	510	450	17.0
125	12	160	0.080	0.5	93.8	405	390	18.5

40	6	100	0.080	0.5	30.0	795	380	5.5
50	7	100	0.080	0.5	37.5	635	355	6.5
63	8	80	0.080	0.5	47.3	405	260	6.0
80	9	80	0.080	0.5	60.0	320	230	7.0
100	11	60	0.080	0.5	75.0	190	165	6.0
125	12	60	0.080	0.5	93.8	155	150	7.0

Frese per spianatura 45° SX

Inseri 9mm, con canale di aerazione/raffreddamento integrato

HM	λ 12° γ -6°



Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Tool Steel
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Frese per spianatura 45°							Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	d3	b	ap _{max.}	z	
W01400.406	40	16	48.4	40	4.0	6	●
W01400.507	50	22	58.4	40	4.0	7	●
W01400.638	63	22	71.4	40	4.0	8	●
W01400.809	80	27	88.4	50	4.0	9	●
W01400.100	100	32	108.4	50	4.0	11	●
W01400.125	125	40	133.4	63	4.0	12	●

Inseri SX 9mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	
W51310.009	9.5	9.5	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W91500.009	Vite di fissaggio per l'inserto Torx TX 08 / M 3.0 x 7.3	●

Applicazione

Materiale

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	6	40	0.060	2.0	30.0	320	115	7.0
50	7	40	0.060	2.0	37.5	255	105	8.0
63	8	30	0.060	2.0	47.3	150	70	6.5
80	9	30	0.060	2.0	60.0	120	65	8.0
100	11	20	0.060	2.0	75.0	65	45	7.0
125	12	20	0.060	2.0	93.8	50	35	6.5

Acciaio al manganese
Mn > 5%
[1.3964 / Nitronic]

40	6	100	0.060	2.0	30.0	795	285	17.0
50	7	100	0.060	2.0	37.5	635	265	20.0
63	8	90	0.060	2.0	47.3	455	220	21.0
80	9	90	0.060	2.0	60.0	360	195	23.5
100	11	80	0.060	2.0	75.0	255	170	25.5
125	12	80	0.060	2.0	93.8	205	150	28.0

Acciaio resistente al calore
Acciaio duplex
[1.4462]
[17-4 PH]

40	6	140	0.120	2.5	30.0	1115	805	60.5
50	7	140	0.120	2.5	37.5	890	750	70.5
63	8	120	0.120	2.5	47.3	605	580	68.5
80	9	120	0.120	2.5	60.0	475	515	77.5
100	11	100	0.120	2.5	75.0	320	420	79.0
125	12	100	0.120	2.5	93.8	255	365	85.5

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]

40	6	120	0.100	2.5	30.0	955	575	43.0
50	7	120	0.100	2.5	37.5	765	535	50.0
63	8	100	0.100	2.5	47.3	505	405	48.0
80	9	100	0.100	2.5	60.0	400	360	54.0
100	11	80	0.100	2.5	75.0	255	280	52.5
125	12	80	0.100	2.5	93.8	205	245	57.5

Applicazione

Materiale

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	6	40	0.080	0.5	30.0	320	155	2.5
50	7	40	0.080	0.5	37.5	255	145	2.5
63	8	30	0.080	0.5	47.3	150	95	2.0
80	9	30	0.080	0.5	60.0	120	85	2.5
100	11	20	0.080	0.5	75.0	65	55	2.0
125	12	20	0.080	0.5	93.8	50	50	2.5

Acciaio al manganese
Mn > 5%
[1.3964 / Nitronic]

40	6	100	0.080	0.5	30.0	795	380	5.5
50	7	100	0.080	0.5	37.5	635	355	6.5
63	8	90	0.080	0.5	47.3	455	290	7.0
80	9	90	0.080	0.5	60.0	360	260	8.0
100	11	80	0.080	0.5	75.0	255	225	8.5
125	12	80	0.080	0.5	93.8	205	195	9.0

Acciaio resistente al calore
Acciaio duplex
[1.4462]
[17-4 PH]

40	6	150	0.080	0.5	30.0	1195	575	8.5
50	7	150	0.080	0.5	37.5	955	535	10.0
63	8	140	0.080	0.5	47.3	705	450	10.5
80	9	140	0.080	0.5	60.0	555	400	12.0
100	11	120	0.080	0.5	75.0	380	335	12.5
125	12	120	0.080	0.5	93.8	305	295	14.0

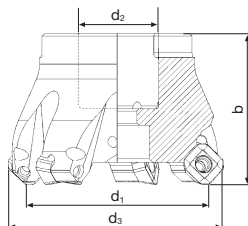
Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]

40	6	120	0.080	0.5	30.0	955	460	7.0
50	7	120	0.080	0.5	37.5	765	430	8.0
63	8	100	0.080	0.5	47.3	505	325	7.5
80	9	100	0.080	0.5	60.0	400	290	8.5
100	11	80	0.080	0.5	75.0	255	225	8.5
125	12	80	0.080	0.5	93.8	205	195	9.0

Frese per spianatura 45° ZX

Inseri 9mm, con canale di aerazione/raffreddamento integrato

HM	λ 12° γ -6°



Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys Mangan-Steels HSS
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Frese per spianatura 45°							Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	d3	b	ap _{max.}	z	
W01400.406	40	16	48.4	40	4.0	6	●
W01400.507	50	22	58.4	40	4.0	7	●
W01400.638	63	22	71.4	40	4.0	8	●
W01400.809	80	27	88.4	50	4.0	9	●
W01400.100	100	32	108.4	50	4.0	11	●
W01400.125	125	40	133.4	63	4.0	12	●

Inserti ZX 9mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	
W51410.009	9.5	9.5	4.0	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W91500.009	Vite di fissaggio per l'inserto Torx TX 08 / M 3.0 x 7.3	●



Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	6	800	0.300	2.5	30.0	6365	11455	859.0
50	7	800	0.300	2.5	37.5	5095	10700	1003.0
63	8	700	0.300	2.5	47.3	3535	8485	1003.5
80	9	700	0.300	2.5	60.0	2785	7520	1128.0
100	11	600	0.300	2.5	75.0	1910	6305	1182.0
125	12	600	0.300	2.5	93.8	1530	5510	1292.0

Getti d'alluminio
Si 6% - 15%

40	6	600	0.220	2.5	30.0	4775	6305	473.0
50	7	600	0.220	2.5	37.5	3820	5885	551.5
63	8	550	0.220	2.5	47.3	2780	4895	579.0
80	9	550	0.220	2.5	60.0	2190	4335	650.5
100	11	500	0.220	2.5	75.0	1590	3850	722.0
125	12	500	0.220	2.5	93.8	1275	3365	789.0

Rame non legato

40	6	500	0.220	2.5	30.0	3980	5255	394.0
50	7	500	0.220	2.5	37.5	3185	4905	460.0
63	8	450	0.220	2.5	47.3	2275	4005	473.5
80	9	450	0.220	2.5	60.0	1790	3545	532.0
100	11	400	0.220	2.5	75.0	1275	3085	578.5
125	12	400	0.220	2.5	93.8	1020	2695	632.0

Materiali termoplastici

40	6	800	0.300	2.5	30.0	6365	11455	859.0
50	7	800	0.300	2.5	37.5	5095	10700	1003.0
63	8	700	0.300	2.5	47.3	3535	8485	1003.5
80	9	700	0.300	2.5	60.0	2785	7520	1128.0
100	11	600	0.300	2.5	75.0	1910	6305	1182.0
125	12	600	0.300	2.5	93.8	1530	5510	1292.0



Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	6	900	0.100	0.5	30.0	7160	4295	64.5
50	7	900	0.110	0.5	37.5	5730	4410	82.5
63	8	800	0.125	0.5	47.3	4040	4040	95.5
80	9	800	0.140	0.5	60.0	3185	4015	120.5
100	11	700	0.155	0.5	75.0	2230	3800	142.5
125	12	700	0.175	0.5	93.8	1785	3750	176.0

Getti d'alluminio
Si 6% - 15%

40	6	700	0.075	0.5	30.0	5570	2505	37.5
50	7	700	0.085	0.5	37.5	4455	2650	49.5
63	8	650	0.095	0.5	47.3	3285	2495	59.0
80	9	650	0.105	0.5	60.0	2585	2445	73.5
100	11	600	0.115	0.5	75.0	1910	2415	90.5
125	12	600	0.130	0.5	93.8	1530	2385	112.0

Rame non legato

40	6	600	0.075	0.5	30.0	4775	2150	32.5
50	7	600	0.085	0.5	37.5	3820	2275	42.5
63	8	550	0.095	0.5	47.3	2780	2115	50.0
80	9	550	0.105	0.5	60.0	2190	2070	62.0
100	11	500	0.115	0.5	75.0	1590	2010	75.5
125	12	500	0.130	0.5	93.8	1275	1990	93.5

Materiali termoplastici

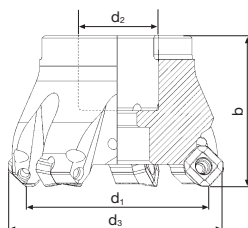
40	6	900	0.100	0.5	30.0	7160	4295	64.5
50	7	900	0.110	0.5	37.5	5730	4410	82.5
63	8	800	0.125	0.5	47.3	4040	4040	95.5
80	9	800	0.140	0.5	60.0	3185	4015	120.5
100	11	700	0.155	0.5	75.0	2230	3800	142.5
125	12	700	0.175	0.5	93.8	1785	3750	176.0

Dati di taglio per lavorazione di finitura

Frese per spianatura 45° AX

Inseri 9mm, con canale di aerazione/raffreddamento integrato

HM	λ 12° γ 15°
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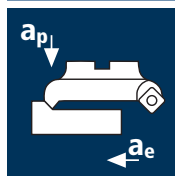
			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF / GF Fiber Reinforced Plastics
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Frese per spianatura 45°							Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2	d3	b	ap _{max.}	z		
W01400.406	40	16	48.4	40	4.0	6	●	
W01400.507	50	22	58.4	40	4.0	7	●	
W01400.638	63	22	71.4	40	4.0	8	●	
W01400.809	80	27	88.4	50	4.0	9	●	
W01400.100	100	32	108.4	50	4.0	11	●	
W01400.125	125	40	133.4	63	4.0	12	●	

Inseri AX 9mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D		
W51510.009	9.5	9.5	4.0	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08		●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08		●
W90100.008	Cacciavite Torx TX 08		●
W91500.009	Vite di fissaggio per l'inserto Torx TX 08 / M 3.0 x 7.3		●

Applicazione



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	3	220	0.250	4.0	30.0	1750	1315	158.0
50	4	220	0.250	4.0	37.5	1400	1400	210.0
63	5	200	0.250	4.0	47.3	1010	1265	239.5
80	6	200	0.250	4.0	60.0	795	1195	287.0
100	7	180	0.250	4.0	75.0	575	1005	301.5
125	8	180	0.250	4.0	93.8	460	920	345.0

Acciaio
850 - 1100 N/mm²

40	3	200	0.250	4.0	30.0	1590	1195	143.5
50	4	200	0.250	4.0	37.5	1275	1275	191.5
63	5	180	0.250	4.0	47.3	910	1140	215.5
80	6	180	0.250	4.0	60.0	715	1075	258.0
100	7	160	0.250	4.0	75.0	510	895	268.5
125	8	160	0.250	4.0	93.8	405	810	304.0

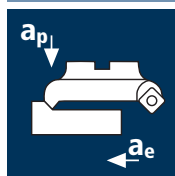
Acciaio
1100 - 1300 N/mm²

40	3	160	0.220	4.0	30.0	1275	840	101.0
50	4	160	0.220	4.0	37.5	1020	900	135.0
63	5	140	0.220	4.0	47.3	705	775	146.5
80	6	140	0.220	4.0	60.0	555	735	176.5
100	7	120	0.220	4.0	75.0	380	585	175.5
125	8	120	0.220	4.0	93.8	305	535	200.5

Acciaio
1300 - 1500 N/mm²

40	3	120	0.200	4.0	30.0	955	575	69.0
50	4	120	0.200	4.0	37.5	765	610	91.5
63	5	100	0.200	4.0	47.3	505	505	95.5
80	6	100	0.200	4.0	60.0	400	480	115.0
100	7	80	0.200	4.0	75.0	255	355	106.5
125	8	80	0.200	4.0	93.8	205	330	124.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	3	220	0.165	0.5	30.0	1750	865	13.0
50	4	220	0.165	0.5	37.5	1400	925	17.5
63	5	200	0.165	0.5	47.3	1010	835	19.5
80	6	200	0.165	0.5	60.0	795	785	23.5
100	7	180	0.165	0.5	75.0	575	665	25.0
125	8	180	0.165	0.5	93.8	460	605	28.5

Acciaio
850 - 1100 N/mm²

40	3	200	0.165	0.5	30.0	1590	785	12.0
50	4	200	0.165	0.5	37.5	1275	840	16.0
63	5	180	0.165	0.5	47.3	910	750	17.5
80	6	180	0.165	0.5	60.0	715	710	21.5
100	7	160	0.165	0.5	75.0	510	590	22.0
125	8	160	0.165	0.5	93.8	405	535	25.0

Acciaio
1100 - 1300 N/mm²

40	3	160	0.145	0.5	30.0	1275	555	8.5
50	4	160	0.145	0.5	37.5	1020	590	11.0
63	5	140	0.145	0.5	47.3	705	510	12.0
80	6	140	0.145	0.5	60.0	555	485	14.5
100	7	120	0.145	0.5	75.0	380	385	14.5
125	8	120	0.145	0.5	93.8	305	355	16.5

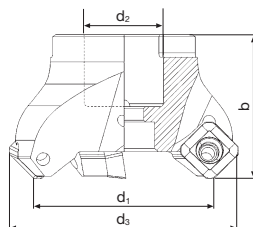
Acciaio
1300 - 1500 N/mm²

40	3	120	0.130	0.5	30.0	955	370	5.5
50	4	120	0.130	0.5	37.5	765	400	7.5
63	5	100	0.130	0.5	47.3	505	330	8.0
80	6	100	0.130	0.5	60.0	400	310	9.5
100	7	80	0.130	0.5	75.0	255	230	8.5
125	8	80	0.130	0.5	93.8	205	215	10.0

Frese per spianatura 45° NX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 13° γ -6°



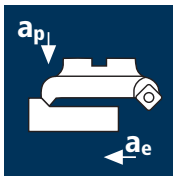
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500							GG(G)
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Frese per spianatura 45°							Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	d3	b	ap _{max.}	z	
W01410.403	40	16	54.0	40	6.0	3	●
W01410.504	50	22	63.9	40	6.0	4	●
W01410.635	63	22	76.9	40	6.0	5	●
W01410.806	80	27	93.9	50	6.0	6	●
W01410.100	100	32	113.9	50	6.0	7	●
W01410.125	125	40	138.9	63	6.0	8	●

Inseri NX 13mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	
W51110.013	13.0	13.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20	●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20	●
W91100.013	Cacciavite Torx TX 20	●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5	●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	3	130	0.120	4.0	30.0	1035	375	45.0
50	4	130	0.120	4.0	37.5	830	400	60.0
63	5	110	0.120	4.0	47.3	555	335	63.5
80	6	110	0.120	4.0	60.0	440	315	75.5
100	7	90	0.120	4.0	75.0	285	240	72.0
125	8	90	0.120	4.0	93.8	230	220	82.5

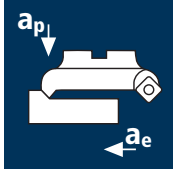
Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

40	3	200	0.120	4.0	30.0	1590	570	68.5
50	4	200	0.120	4.0	37.5	1275	610	91.5
63	5	180	0.120	4.0	47.3	910	545	103.0
80	6	180	0.120	4.0	60.0	715	515	123.5
100	7	160	0.120	4.0	75.0	510	430	129.0
125	8	160	0.120	4.0	93.8	405	390	146.5

Acciaio resistente
al calore
[17-4 PH]

40	3	100	0.120	4.0	30.0	795	285	34.0
50	4	100	0.120	4.0	37.5	635	305	46.0
63	5	80	0.120	4.0	47.3	405	245	46.5
80	6	80	0.120	4.0	60.0	320	230	55.0
100	7	60	0.120	4.0	75.0	190	160	48.0
125	8	60	0.120	4.0	93.8	155	150	56.5

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	3	130	0.080	0.5	30.0	1035	250	4.0
50	4	130	0.080	0.5	37.5	830	265	5.0
63	5	110	0.080	0.5	47.3	555	220	5.0
80	6	110	0.080	0.5	60.0	440	210	6.5
100	7	90	0.080	0.5	75.0	285	160	6.0
125	8	90	0.080	0.5	93.8	230	145	7.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

40	3	200	0.080	0.5	30.0	1590	380	5.5
50	4	200	0.080	0.5	37.5	1275	410	7.5
63	5	180	0.080	0.5	47.3	910	365	8.5
80	6	180	0.080	0.5	60.0	715	345	10.5
100	7	160	0.080	0.5	75.0	510	285	10.5
125	8	160	0.080	0.5	93.8	405	260	12.0

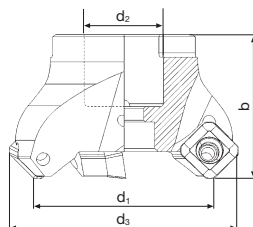
Acciaio resistente
al calore
[17-4 PH]

40	3	100	0.080	0.5	30.0	795	190	3.0
50	4	100	0.080	0.5	37.5	635	205	4.0
63	5	80	0.080	0.5	47.3	405	160	4.0
80	6	80	0.080	0.5	60.0	320	155	4.5
100	7	60	0.080	0.5	75.0	190	105	4.0
125	8	60	0.080	0.5	93.8	155	100	4.5

Frese per spianatura 45° SX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 13° γ -6°



Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Tool Steel
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Frese per spianatura 45°							Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2	d3	b	ap _{max.}	z		
W01410.403	40	16	54.0	40	6.0	3	●	
W01410.504	50	22	63.9	40	6.0	4	●	
W01410.635	63	22	76.9	40	6.0	5	●	
W01410.806	80	27	93.9	50	6.0	6	●	
W01410.100	100	32	113.9	50	6.0	7	●	
W01410.125	125	40	138.9	63	6.0	8	●	

Inseri SX 13mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D		
W51310.013	13.0	13.0	4.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20	●	
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20	●	
W91100.013	Cacciavite Torx TX 20	●	
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5	●	



Materiale

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	3	40	0.060	3.0	30.0	320	60	5.5
50	4	40	0.060	3.0	37.5	255	60	7.0
63	5	30	0.060	3.0	47.3	150	45	6.5
80	6	30	0.060	3.0	60.0	120	45	8.0
100	7	20	0.060	3.0	75.0	65	25	5.5
125	8	20	0.060	3.0	93.8	50	25	7.0

Acciaio al manganese
Mn > 5%
[1.3964 / Nitronic]

40	3	100	0.060	3.0	30.0	795	145	13.0
50	4	100	0.060	3.0	37.5	635	150	17.0
63	5	90	0.060	3.0	47.3	455	135	19.0
80	6	90	0.060	3.0	60.0	360	130	23.5
100	7	80	0.060	3.0	75.0	255	105	23.5
125	8	80	0.060	3.0	93.8	205	100	28.0

Acciaio resistente al calore
Acciaio duplex
[1.4462]
[17-4 PH]

40	3	150	0.120	4.0	30.0	1195	430	51.5
50	4	150	0.120	4.0	37.5	955	460	69.0
63	5	140	0.120	4.0	47.3	705	425	80.5
80	6	140	0.120	4.0	60.0	555	400	96.0
100	7	120	0.120	4.0	75.0	380	320	96.0
125	8	120	0.120	4.0	93.8	305	295	110.5

Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]

40	3	120	0.100	4.0	30.0	955	285	34.0
50	4	120	0.100	4.0	37.5	765	305	46.0
63	5	100	0.100	4.0	47.3	505	255	48.0
80	6	100	0.100	4.0	60.0	400	240	57.5
100	7	80	0.100	4.0	75.0	255	180	54.0
125	8	80	0.100	4.0	93.8	205	165	62.0



Materiale

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	3	40	0.080	0.5	30.0	320	75	1.0
50	4	40	0.080	0.5	37.5	255	80	1.5
63	5	30	0.080	0.5	47.3	150	60	1.5
80	6	30	0.080	0.5	60.0	120	60	2.0
100	7	20	0.080	0.5	75.0	65	35	1.5
125	8	20	0.080	0.5	93.8	50	30	1.5

Acciaio al manganese
Mn > 5%
[1.3964 / Nitronic]

40	3	100	0.080	0.5	30.0	795	190	3.0
50	4	100	0.080	0.5	37.5	635	205	4.0
63	5	90	0.080	0.5	47.3	455	180	4.5
80	6	90	0.080	0.5	60.0	360	175	5.5
100	7	80	0.080	0.5	75.0	255	145	5.5
125	8	80	0.080	0.5	93.8	205	130	6.0

Acciaio resistente al calore
Acciaio duplex
[1.4462]
[17-4 PH]

40	3	150	0.080	0.5	30.0	1195	285	4.5
50	4	150	0.080	0.5	37.5	955	305	5.5
63	5	140	0.080	0.5	47.3	705	280	6.5
80	6	140	0.080	0.5	60.0	555	265	8.0
100	7	120	0.080	0.5	75.0	380	215	8.0
125	8	120	0.080	0.5	93.8	305	195	9.0

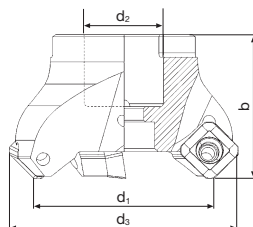
Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]

40	3	120	0.080	0.5	30.0	955	230	3.5
50	4	120	0.080	0.5	37.5	765	245	4.5
63	5	100	0.080	0.5	47.3	505	200	4.5
80	6	100	0.080	0.5	60.0	400	190	5.5
100	7	80	0.080	0.5	75.0	255	145	5.5
125	8	80	0.080	0.5	93.8	205	130	6.0

Frese per spianatura 45° ZX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 13° γ -6°



Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys Mangan-Steels HSS
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Frese per spianatura 45°							Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	d3	b	ap _{max.}	z	
W01410.403	40	16	54.0	40	6.0	3	●
W01410.504	50	22	63.9	40	6.0	4	●
W01410.635	63	22	76.9	40	6.0	5	●
W01410.806	80	27	93.9	50	6.0	6	●
W01410.100	100	32	113.9	50	6.0	7	●
W01410.125	125	40	138.9	63	6.0	8	●

Inseri ZX 13mm				Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	
W51410.013	13.0	13.0	4.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20	●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20	●
W91100.013	Cacciavite Torx TX 20	●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5	●

VII

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	3	800	0.300	4.0	30.0	6365	5730	687.5
50	4	800	0.300	4.0	37.5	5095	6115	917.5
63	5	700	0.300	4.0	47.3	3535	5305	1003.5
80	6	700	0.300	4.0	60.0	2785	5015	1203.5
100	7	600	0.300	4.0	75.0	1910	4010	1203.0
125	8	600	0.300	4.0	93.8	1530	3670	1377.0

Getti d'alluminio
Si 6% - 15%

40	3	600	0.220	4.0	30.0	4775	3150	378.0
50	4	600	0.220	4.0	37.5	3820	3360	504.0
63	5	550	0.220	4.0	47.3	2780	3060	579.0
80	6	550	0.220	4.0	60.0	2190	2890	693.5
100	7	500	0.220	4.0	75.0	1590	2450	735.0
125	8	500	0.220	4.0	93.8	1275	2245	842.5

Rame non legato

40	3	500	0.220	4.0	30.0	3980	2625	315.0
50	4	500	0.220	4.0	37.5	3185	2805	421.0
63	5	450	0.220	4.0	47.3	2275	2505	474.0
80	6	450	0.220	4.0	60.0	1790	2365	567.5
100	7	400	0.220	4.0	75.0	1275	1965	589.5
125	8	400	0.220	4.0	93.8	1020	1795	673.5

Materiali termoplastici

40	3	800	0.300	4.0	30.0	6365	5730	687.5
50	4	800	0.300	4.0	37.5	5095	6115	917.5
63	5	700	0.300	4.0	47.3	3535	5305	1003.5
80	6	700	0.300	4.0	60.0	2785	5015	1203.5
100	7	600	0.300	4.0	75.0	1910	4010	1203.0
125	8	600	0.300	4.0	93.8	1530	3670	1377.0

Applicazione

Materiale

Alluminio malleabile
Si < 6%

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	3	900	0.100	0.5	30.0	7160	2150	32.5
50	4	900	0.110	0.5	37.5	5730	2520	47.5
63	5	800	0.125	0.5	47.3	4040	2525	59.5
80	6	800	0.140	0.5	60.0	3185	2675	80.5
100	7	700	0.155	0.5	75.0	2230	2420	91.0
125	8	700	0.175	0.5	93.8	1785	2500	117.5

Getti d'alluminio
Si 6% - 15%

40	3	700	0.075	0.5	30.0	5570	1255	19.0
50	4	700	0.085	0.5	37.5	4455	1515	28.5
63	5	650	0.095	0.5	47.3	3285	1560	37.0
80	6	650	0.105	0.5	60.0	2585	1630	49.0
100	7	600	0.115	0.5	75.0	1910	1540	58.0
125	8	600	0.130	0.5	93.8	1530	1590	74.5

Rame non legato

40	3	600	0.075	0.5	30.0	4775	1075	16.0
50	4	600	0.085	0.5	37.5	3820	1300	24.5
63	5	550	0.095	0.5	47.3	2780	1320	31.0
80	6	550	0.105	0.5	60.0	2190	1380	41.5
100	7	500	0.115	0.5	75.0	1590	1280	48.0
125	8	500	0.130	0.5	93.8	1275	1325	62.0

Materiali termoplastici

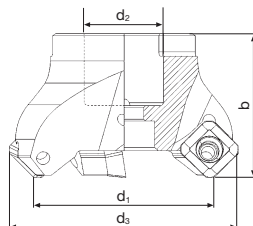
40	3	900	0.100	0.5	30.0	7160	2150	32.5
50	4	900	0.110	0.5	37.5	5730	2520	47.5
63	5	800	0.125	0.5	47.3	4040	2525	59.5
80	6	800	0.140	0.5	60.0	3185	2675	80.5
100	7	700	0.155	0.5	75.0	2230	2420	91.0
125	8	700	0.175	0.5	93.8	1785	2500	117.5

Dati di taglio per lavorazione di finitura

Frese per spianatura 45° AX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM λ 13°
 γ 13°



			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF / GF Fiber Reinforced Plastics
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Frese per spianatura 45°							Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2	d3	b	ap _{max.}	z		
W01410.403	40	16	54.0	40	6.0	3	●	
W01410.504	50	22	63.9	40	6.0	4	●	
W01410.635	63	22	76.9	40	6.0	5	●	
W01410.806	80	27	93.9	50	6.0	6	●	
W01410.100	100	32	113.9	50	6.0	7	●	
W01410.125	125	40	138.9	63	6.0	8	●	

Inseri AX 13mm				Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D		
W51510.013	12.7	12.7	4.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W91110.013	Cacciavite dinamometrico 5.0 Nm con stelo Torx TX 20		●
W91111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 20		●
W91100.013	Cacciavite Torx TX 20		●
W91500.013	Vite di fissaggio per l'inserto Torx TX 20 / M 4.5 x 10.5		●



Frese con inserti ad angolo/per scanalature

Frese ad angolo/Frese per scanalature 90° per inserti 8mm

N° W00100



NX	λ 8°	d, 16 – 32	Rm 850-1300			867
	γ 0°					
SX	λ 8°	d, 16 – 32	Inox Stainless	Rm <850		869
	γ 0°					
HX	λ 8°	d, 16 – 32	Rm 1300-1500	HRC 48-60		871
	γ -8°					
ZX	λ 8°	d, 16 – 32	Ni-/Mn- Alloys	Inox Stainless	Rm <850	873
	γ 0°					
AX	λ 8°	d, 16 – 32	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	875
	γ 20°					

N° W00140



N° W00180



Frese ad angolo/Frese per scanalature 90° per inserti 13mm

N° W00110



N° W00150



N° W00190



NX	λ 8°	d, 25 – 32	Rm 850-1300			877
	γ 6°					
SX	λ 8°	d, 25 – 32	Inox Stainless	Rm <850		879
	γ 6°					
HX	λ 8°	d, 25 – 32	Rm 1300-1500	HRC 48-60		881
	γ -10°					
ZX	λ 8°	d, 25 – 32	Ni-/Mn- Alloys	Inox Stainless	Rm <850	883
	γ 6°					
AX	λ 8°	d, 25 – 32	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	885
	γ 20°					



Frese con inserti ad angolo/per scanalature

Frese ad angolo 90° per inserti 8mm

N° W00400



NX	λ 8°	d, 40 – 80	Rm 850-1300			887
	γ 0°					
SX	λ 8°	d, 40 – 80	Inox Stainless	Rm <850		889
	γ 0°					
HX	λ 8°	d, 40 – 80	Rm 1300-1500	HRC 48-60		891
	γ -8°					
ZX	λ 8°	d, 40 – 80	Ni-/Mn- Alloys	Inox Stainless	Rm <850	893
	γ 0°					
AX	λ 8°	d, 40 – 80	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	895
	γ 20°					

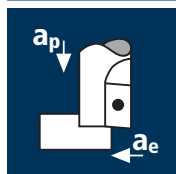
Frese ad angolo 90° per inserti 13mm

N° W00410



NX	λ 8°	d, 40 – 80	Rm 850-1300			897
	γ 6°					
SX	λ 8°	d, 40 – 80	Inox Stainless	Rm <850		899
	γ 6°					
HX	λ 8°	d, 40 – 80	Rm 1300-1500	HRC 48-60		901
	γ -10°					
ZX	λ 8°	d, 40 – 80	Ni-/Mn- Alloys	Inox Stainless	Rm <850	903
	γ 6°					
AX	λ 8°	d, 40 – 80	Al Aluminium Alloy	Al Aluminium Cast	Cu Copper	905
	γ 20°					

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



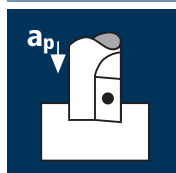
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	16	2	250	0.100	3.0	12.8	4975	995	38.0
	20	3	250	0.100	3.0	16.0	3980	1195	57.5
	25	4	250	0.100	3.0	20.0	3185	1275	76.5
	32	5	250	0.100	3.0	25.6	2485	1245	95.5
M	16	2	220	0.100	3.0	12.8	4375	875	33.5
	20	3	220	0.100	3.0	16.0	3500	1050	50.5
	25	4	220	0.100	3.0	20.0	2800	1120	67.0
	32	5	220	0.100	3.0	25.6	2190	1095	84.0
L	16	2	220	0.100	3.0	6.4	4375	875	17.0
	20	3	220	0.100	3.0	8.0	3500	1050	25.0
	25	4	220	0.100	3.0	10.0	2800	1120	33.5
	32	5	220	0.100	3.0	12.8	2190	1095	42.0

K	16	2	220	0.100	3.0	12.8	4375	875	33.5
	20	3	220	0.100	3.0	16.0	3500	1050	50.5
	25	4	220	0.100	3.0	20.0	2800	1120	67.0
	32	5	220	0.100	3.0	25.6	2190	1095	84.0
M	16	2	180	0.100	3.0	12.8	3580	715	27.5
	20	3	180	0.100	3.0	16.0	2865	860	41.5
	25	4	180	0.100	3.0	20.0	2290	915	55.0
	32	5	180	0.100	3.0	25.6	1790	895	68.5
L	16	2	180	0.100	3.0	6.4	3580	715	13.5
	20	3	180	0.100	3.0	8.0	2865	860	20.5
	25	4	180	0.100	3.0	10.0	2290	915	27.5
	32	5	180	0.100	3.0	12.8	1790	895	34.5

K	16	2	180	0.080	3.0	12.8	3580	575	22.0
	20	3	180	0.080	3.0	16.0	2865	690	33.0
	25	4	180	0.080	3.0	20.0	2290	735	44.0
	32	5	180	0.080	3.0	25.6	1790	715	55.0
M	16	2	150	0.080	3.0	12.8	2985	480	18.5
	20	3	150	0.080	3.0	16.0	2385	570	27.5
	25	4	150	0.080	3.0	20.0	1910	610	36.5
	32	5	150	0.080	3.0	25.6	1490	595	45.5
L	16	2	140	0.080	3.0	6.4	2785	445	8.5
	20	3	140	0.080	3.0	8.0	2230	535	13.0
	25	4	140	0.080	3.0	10.0	1785	570	17.0
	32	5	140	0.080	3.0	12.8	1395	560	21.5

K	16	2	150	0.050	3.0	12.8	2985	300	11.5
	20	3	150	0.050	3.0	16.0	2385	360	17.5
	25	4	150	0.050	3.0	20.0	1910	380	23.0
	32	5	150	0.050	3.0	25.6	1490	375	29.0
M	16	2	120	0.050	3.0	12.8	2385	240	9.0
	20	3	120	0.050	3.0	16.0	1910	285	13.5
	25	4	120	0.050	3.0	20.0	1530	305	18.5
	32	5	120	0.050	3.0	25.6	1195	300	23.0
L	16	2	100	0.050	3.0	6.4	1990	200	4.0
	20	3	100	0.050	3.0	8.0	1590	240	6.0
	25	4	100	0.050	3.0	10.0	1275	255	7.5
	32	5	100	0.050	3.0	12.8	995	250	9.5

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



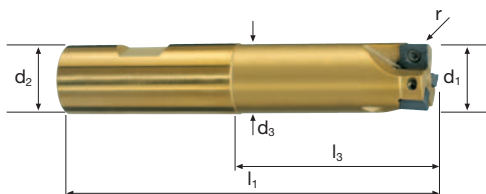
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	16	2	180	0.100	2.4	16.0	3580	715	27.5
	20	3	180	0.100	2.4	20.0	2865	860	41.5
	25	4	180	0.100	2.4	25.0	2290	915	55.0
	32	5	180	0.100	2.4	32.0	1790	895	68.5
M	16	2	160	0.100	2.4	16.0	3185	635	24.5
	20	3	160	0.100	2.4	20.0	2545	765	36.5
	25	4	160	0.100	2.4	25.0	2035	815	49.0
	32	5	160	0.100	2.4	32.0	1590	795	61.0

K	16	2	150	0.080	2.4	16.0	2985	480	18.5
	20	3	150	0.080	2.4	20.0	2385	570	27.5
	25	4	150	0.080	2.4	25.0	1910	610	36.5
	32	5	150	0.080	2.4	32.0	1490	595	45.5
M	16	2	120	0.080	2.4	16.0	2385	380	14.5
	20	3	120	0.080	2.4	20.0	1910	460	22.0
	25	4	120	0.080	2.4	25.0	1530	490	29.5
	32	5	120	0.080	2.4	32.0	1195	480	37.0

Frese ad angolo/Frese per scanalature 90° NX

Inserti 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 0°



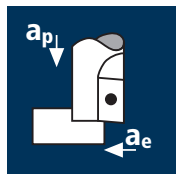
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500						GG(G)
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W00100.162	16	16	15.4	75	25	7.5	2	K	●
W00140.162	16	16	15.0	102	51	7.5	2	M	●
W00180.162	16	16	15.0	129	78	7.5	2	L	●
W00100.203	20	20	19.4	77	25	7.5	3	K	●
W00140.203	20	20	19.4	110	57	7.5	3	M	●
W00180.203	20	20	19.4	140	87	7.5	3	L	●
W00100.254	25	25	24.0	90	32	7.5	4	K	●
W00140.254	25	25	24.0	124	65	7.5	4	M	●
W00180.254	25	25	24.0	158	99	7.5	4	L	●
W00100.325	32	32	31.0	102	40	7.5	5	K	●
W00140.325	32	32	31.0	144	81	7.5	5	M	●
W00180.325	32	32	31.0	186	123	7.5	5	L	●

Inserti NX 8mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50111.008	8.4	6.4	3.4	0.6	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0	●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]



Acciaio resistente
al calore
[17-4 PH]



Leg. a base di nichel
[Inconel 718]



Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	16	2	150	0.050	3.0	12.8	2985	300	11.5
	20	3	150	0.050	3.0	16.0	2385	360	17.5
	25	4	150	0.050	3.0	20.0	1910	380	23.0
	32	5	150	0.050	3.0	25.6	1490	375	29.0
M	16	2	150	0.040	3.0	9.6	2985	240	7.0
	20	3	150	0.040	3.0	12.0	2385	285	10.5
	25	4	150	0.040	3.0	15.0	1910	305	13.5
	32	5	150	0.040	3.0	19.2	1490	300	17.5
L	16	2	150	0.050	3.0	6.4	2985	300	6.0
	20	3	150	0.050	3.0	8.0	2385	360	8.5
	25	4	150	0.050	3.0	10.0	1910	380	11.5
	32	5	150	0.050	3.0	12.8	1490	375	14.5
K	16	2	250	0.050	3.0	12.8	4975	500	19.0
	20	3	250	0.050	3.0	16.0	3980	595	28.5
	25	4	250	0.050	3.0	20.0	3185	635	38.0
	32	5	250	0.050	3.0	25.6	2485	620	47.5
M	16	2	250	0.040	3.0	9.6	4975	400	11.5
	20	3	250	0.040	3.0	12.0	3980	480	17.5
	25	4	250	0.040	3.0	15.0	3185	510	23.0
	32	5	250	0.040	3.0	19.2	2485	495	28.5
L	16	2	220	0.040	3.0	6.4	4375	350	6.5
	20	3	220	0.040	3.0	8.0	3500	420	10.0
	25	4	220	0.040	3.0	10.0	2800	450	13.5
	32	5	220	0.040	3.0	12.8	2190	440	17.0
K	16	2	120	0.050	3.0	12.8	2385	240	9.0
	20	3	120	0.050	3.0	16.0	1910	285	13.5
	25	4	120	0.050	3.0	20.0	1530	305	18.5
	32	5	120	0.050	3.0	25.6	1195	300	23.0
M	16	2	120	0.040	3.0	9.6	2385	190	5.5
	20	3	120	0.040	3.0	12.0	1910	230	8.5
	25	4	120	0.040	3.0	15.0	1530	245	11.0
	32	5	120	0.040	3.0	19.2	1195	240	14.0
L	16	2	120	0.040	3.0	6.4	2385	190	3.5
	20	3	120	0.040	3.0	8.0	1910	230	5.5
	25	4	120	0.040	3.0	10.0	1530	245	7.5
	32	5	120	0.040	3.0	12.8	1195	240	9.0
K	16	2	20	0.030	3.0	4.8	400	25	0.5
	20	3	20	0.030	3.0	6.0	320	30	0.5
	25	4	20	0.030	3.0	7.5	255	30	0.5
	32	5	20	0.030	3.0	9.6	200	30	1.0
M	16	2	20	0.020	3.0	1.6	400	15	0.1
	20	3	20	0.020	3.0	2.0	320	20	0.1
	25	4	20	0.020	3.0	2.5	255	20	0.2
	32	5	20	0.020	3.0	3.2	200	20	0.2
L									

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]



Acciaio resistente
al calore
[17-4 PH]

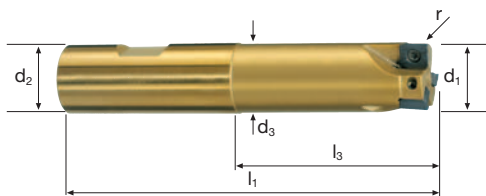


Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	16	2	120	0.050	2.4	16.0	2385	240	9.0
	20	3	120	0.050	2.4	20.0	1910	285	13.5
	25	4	120	0.050	2.4	25.0	1530	305	18.5
	32	5	120	0.050	2.4	32.0	1195	300	23.0
M	16	2	120	0.070	1.5	16.0	2385	335	8.0
	20	3	120	0.070	1.5	20.0	1910	400	12.0
	25	4	120	0.070	1.5	25.0	1530	430	16.0
	32	5	120	0.070	1.5	32.0	1195	420	20.0
K	16	2	100	0.050	2.4	16.0	1990	200	7.5
	20	3	100	0.050	2.4	20.0	1590	240	11.5
	25	4	100	0.050	2.4	25.0	1275	255	15.5
	32	5	100	0.050	2.4	32.0	995	250	19.0
M	16	2	100	0.070	1.5	16.0	1990	280	6.5
	20	3	100	0.070	1.5	20.0	1590	335	10.0
	25	4	100	0.070	1.5	25.0	1275	355	13.5
	32	5	100	0.070	1.5	32.0	995	350	17.0
L									

Frese ad angolo/Frese per scanalature 90° SX

Inserti 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 0°



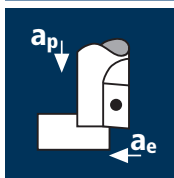
Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys Tool Steel
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W00100.162	16	16	15.4	75	25	7.5	2	K	●
W00140.162	16	16	15.0	102	51	7.5	2	M	●
W00180.162	16	16	15.0	129	78	7.5	2	L	●
W00100.203	20	20	19.4	77	25	7.5	3	K	●
W00140.203	20	20	19.4	110	57	7.5	3	M	●
W00180.203	20	20	19.4	140	87	7.5	3	L	●
W00100.254	25	25	24.0	90	32	7.5	4	K	●
W00140.254	25	25	24.0	124	65	7.5	4	M	●
W00180.254	25	25	24.0	158	99	7.5	4	L	●
W00100.325	32	32	31.0	102	40	7.5	5	K	●
W00140.325	32	32	31.0	144	81	7.5	5	M	●
W00180.325	32	32	31.0	186	123	7.5	5	L	●

Inserti SX 8mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50310.008	8.4	6.4	3.4	0.6	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0	●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



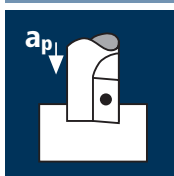
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	16	2	150	0.050	3.0	12.8	2985	300	11.5
	20	3	150	0.050	3.0	16.0	2385	360	17.5
	25	4	150	0.050	3.0	20.0	1910	380	23.0
	32	5	150	0.050	3.0	25.6	1490	375	29.0
M	16	2	120	0.070	3.0	9.6	2385	335	9.5
	20	3	120	0.070	3.0	12.0	1910	400	14.5
	25	4	120	0.070	3.0	15.0	1530	430	19.5
	32	5	120	0.070	3.0	19.2	1195	420	24.0
L	16	2	120	0.070	3.0	3.2	2385	335	3.0
	20	3	120	0.070	3.0	4.0	1910	400	5.0
	25	4	120	0.070	3.0	5.0	1530	430	6.5
	32	5	120	0.070	3.0	6.4	1195	420	8.0

K	16	2	120	0.050	3.0	12.8	2385	240	9.0
	20	3	120	0.050	3.0	16.0	1910	285	13.5
	25	4	120	0.050	3.0	20.0	1530	305	18.5
	32	5	120	0.050	3.0	25.6	1195	300	23.0
M	16	2	100	0.070	3.0	9.6	1990	280	8.0
	20	3	100	0.070	3.0	12.0	1590	335	12.0
	25	4	100	0.070	3.0	15.0	1275	355	16.0
	32	5	100	0.070	3.0	19.2	995	350	20.0
L	16	2	100	0.070	3.0	3.2	1990	280	2.5
	20	3	100	0.070	3.0	4.0	1590	335	4.0
	25	4	100	0.070	3.0	5.0	1275	355	5.5
	32	5	100	0.070	3.0	6.4	995	350	6.5

K	16	2	100	0.050	3.0	12.8	1990	200	7.5
	20	3	100	0.050	3.0	16.0	1590	240	11.5
	25	4	100	0.050	3.0	20.0	1275	255	15.5
	32	5	100	0.050	3.0	25.6	995	250	19.0
M	16	2	80	0.070	3.0	9.6	1590	225	6.5
	20	3	80	0.070	3.0	12.0	1275	270	9.5
	25	4	80	0.070	3.0	15.0	1020	285	13.0
	32	5	80	0.070	3.0	19.2	795	280	16.0
L	16	2	80	0.070	3.0	3.2	1590	225	2.0
	20	3	80	0.070	3.0	4.0	1275	270	3.0
	25	4	80	0.070	3.0	5.0	1020	285	4.5
	32	5	80	0.070	3.0	6.4	795	280	5.5

K	16	2	40	0.020	3.0	4.8	795	30	0.5
	20	3	40	0.020	3.0	6.0	635	40	0.5
	25	4	40	0.020	3.0	7.5	510	40	1.0
	32	5	40	0.020	3.0	9.6	400	40	1.0
M	16	2	25	0.020	3.0	1.6	495	20	0.1
	20	3	25	0.020	3.0	2.0	400	25	0.2
	25	4	25	0.020	3.0	2.5	320	25	0.2
	32	5	25	0.020	3.0	3.2	250	25	0.2
L									

Applicazione



Materiale

Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



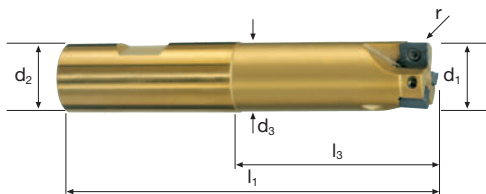
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	16	2	100	0.050	2.4	16.0	1990	200	7.5
	20	3	100	0.050	2.4	20.0	1590	240	11.5
	25	4	100	0.050	2.4	25.0	1275	255	15.5
	32	5	100	0.050	2.4	32.0	995	250	19.0
M	16	2	80	0.070	1.5	16.0	1590	225	5.5
	20	3	80	0.070	1.5	20.0	1275	270	8.0
	25	4	80	0.070	1.5	25.0	1020	285	10.5
	32	5	80	0.070	1.5	32.0	795	280	13.5
L									

K	16	2	80	0.050	2.4	16.0	1590	160	6.0
	20	3	80	0.050	2.4	20.0	1275	190	9.0
	25	4	80	0.050	2.4	25.0	1020	205	12.5
	32	5	80	0.050	2.4	32.0	795	200	15.5
M	16	2	60	0.070	1.5	16.0	1195	165	4.0
	20	3	60	0.070	1.5	20.0	955	200	6.0
	25	4	60	0.070	1.5	25.0	765	215	8.0
	32	5	60	0.070	1.5	32.0	595	210	10.0
L									

Frese ad angolo/Frese per scanalature 90° HX

Inserti 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8° γ -8°



		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W00100.162	16	16	15.4	75	25	7.5	2	K	●	
W00140.162	16	16	15.0	102	51	7.5	2	M	●	
W00180.162	16	16	15.0	129	78	7.5	2	L	●	
W00100.203	20	20	19.4	77	25	7.5	3	K	●	
W00140.203	20	20	19.4	110	57	7.5	3	M	●	
W00180.203	20	20	19.4	140	87	7.5	3	L	●	
W00100.254	25	25	24.0	90	32	7.5	4	K	●	
W00140.254	25	25	24.0	124	65	7.5	4	M	●	
W00180.254	25	25	24.0	158	99	7.5	4	L	●	
W00100.325	32	32	31.0	102	40	7.5	5	K	●	
W00140.325	32	32	31.0	144	81	7.5	5	M	●	
W00180.325	32	32	31.0	186	123	7.5	5	L	●	

Inserti HX 8mm					Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D	r		
W50210.008	8.5	6.4	3.5	0.6		●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08		●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08		●
W90100.008	Cacciavite Torx TX 08		●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0		●

Applicazione	Materiale	Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Leg. a base di nichel [Inconel 718] [Hastelloy B-3] [Nimonic 90]	K	16	2	40	0.040	3.0	4.8	795	65	1.0
			20	3	40	0.040	3.0	6.0	635	75	1.5
			25	4	40	0.040	3.0	7.5	510	80	2.0
			32	5	40	0.040	3.0	9.6	400	80	2.5
		M	16	2	30	0.030	3.0	2.4	595	35	0.5
			20	3	30	0.030	3.0	3.0	475	45	0.5
			25	4	30	0.030	3.0	3.8	380	45	0.5
			32	5	30	0.030	3.0	4.8	300	45	0.5
		L	16	2	20	0.020	3.0	2.4	400	15	0.1
			20	3	20	0.020	3.0	3.0	320	20	0.2
			25	4	20	0.020	3.0	3.8	255	20	0.2
			32	5	20	0.020	3.0	4.8	200	20	0.3



Acciaio al manganese
Mn >5%
[1.3964 / Nitronic]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



K	16	2	100	0.040	3.0	5.6	1990	160	2.5
	20	3	100	0.040	3.0	7.0	1590	190	4.0
	25	4	100	0.040	3.0	8.8	1275	205	5.5
	32	5	100	0.040	3.0	11.2	995	200	6.5
M	16	2	90	0.030	3.0	4.0	1790	105	1.5
	20	3	90	0.030	3.0	5.0	1430	130	2.0
	25	4	90	0.030	3.0	6.3	1145	135	2.5
	32	5	90	0.030	3.0	8.0	895	135	3.0
L	16	2	80	0.020	3.0	2.4	1590	65	0.5
	20	3	80	0.020	3.0	3.0	1275	75	0.5
	25	4	80	0.020	3.0	3.8	1020	80	1.0
	32	5	80	0.020	3.0	4.8	795	80	1.0

K	16	2	150	0.050	3.0	12.8	2985	300	11.5
	20	3	150	0.050	3.0	16.0	2385	360	17.5
	25	4	150	0.050	3.0	20.0	1910	380	23.0
	32	5	150	0.050	3.0	25.6	1490	375	29.0
M	16	2	140	0.040	3.0	9.6	2785	225	6.5
	20	3	140	0.040	3.0	12.0	2230	270	9.5
	25	4	140	0.040	3.0	15.0	1785	285	13.0
	32	5	140	0.040	3.0	19.2	1395	280	16.0
L	16	2	120	0.040	3.0	6.4	2385	190	3.5
	20	3	120	0.040	3.0	8.0	1910	230	5.5
	25	4	120	0.040	3.0	10.0	1530	245	7.5
	32	5	120	0.040	3.0	12.8	1195	240	9.0

K	16	2	120	0.050	3.0	5.6	2385	240	4.0
	20	3	120	0.050	3.0	7.0	1910	285	6.0
	25	4	120	0.050	3.0	8.8	1530	305	8.0
	32	5	120	0.050	3.0	11.2	1195	300	10.0
M	16	2	100	0.050	3.0	4.0	1990	200	2.4
	20	3	100	0.050	3.0	5.0	1590	240	3.6
	25	4	100	0.050	3.0	6.3	1275	255	4.8
	32	5	100	0.050	3.0	8.0	995	250	6.0
L	16	2	80	0.040	3.0	2.4	1590	125	1.0
	20	3	80	0.040	3.0	3.0	1275	155	1.5
	25	4	80	0.040	3.0	3.8	1020	165	2.0
	32	5	80	0.040	3.0	4.8	795	160	2.5

Applicazione	Materiale	Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]		
	Acciaio al manganese Mn >5% [1.3964 / Nitronic]	K	16	2	80	0.040	1.0	16.0	1590	125	2.0		
			20	3	80	0.040	1.0	20.0	1275	155	3.0		
			25	4	80	0.040	1.0	25.0	1020	165	4.0		
			32	5	80	0.040	1.0	32.0	795	160	5.0		
		M	16	2	60	0.030	1.0	16.0	1195	70	1.0		
			20	3	60	0.030	1.0	20.0	955	85	1.5		
			25	4	60	0.030	1.0	25.0	765	90	2.5		
			32	5	60	0.030	1.0	32.0	595	90	3.0		



Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]

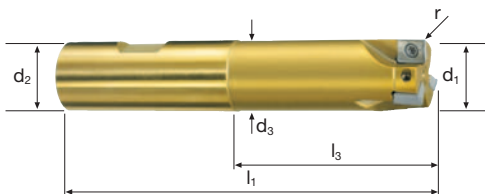


K	16	2	100	0.050	1.5	16.0	1990	200	5.0		
	20	3	100	0.050	1.5	20.0	1590	240	7.0		
	25	4	100	0.050	1.5	25.0	1275	255	9.5		
	32	5	100	0.050	1.5	32.0	995	250	12.0		
M	16	2	80	0.040	1.0	16.0	1590	125	2.0		
	20	3	80	0.040	1.0	20.0	1275	155	3.0		
	25	4	80	0.040	1.0	25.0	1020	165	4.0		
	32	5	80	0.040	1.0	32.0	795	160	5.0		

Frese ad angolo/Frese per scanalature 90° ZX

Inserti 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 0°



Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys Mangan-Steels HSS
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W00100.162	16	16	15.4	75	25	7.5	2	K	●
W00140.162	16	16	15.0	102	51	7.5	2	M	●
W00180.162	16	16	15.0	129	78	7.5	2	L	●
W00100.203	20	20	19.4	77	25	7.5	3	K	●
W00140.203	20	20	19.4	110	57	7.5	3	M	●
W00180.203	20	20	19.4	140	87	7.5	3	L	●
W00100.254	25	25	24.0	90	32	7.5	4	K	●
W00140.254	25	25	24.0	124	65	7.5	4	M	●
W00180.254	25	25	24.0	158	99	7.5	4	L	●
W00100.325	32	32	31.0	102	40	7.5	5	K	●
W00140.325	32	32	31.0	144	81	7.5	5	M	●
W00180.325	32	32	31.0	186	123	7.5	5	L	●

Inserti ZX 8mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50410.008	8.4	6.4	3.4	0.6	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0	●



Materiale

Alluminio malleabile
Si < 6%

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	16	2	800	0.120	3.0	12.8	15915	3820	146.5
	20	3	700	0.120	3.0	16.0	11140	4010	192.5
	25	4	500	0.120	3.0	20.0	6365	3055	183.5
	32	5	400	0.120	3.0	25.6	3980	2390	183.5
M	16	2	600	0.120	3.0	12.8	11935	2865	110.0
	20	3	550	0.120	3.0	16.0	8755	3150	151.0
	25	4	450	0.120	3.0	20.0	5730	2750	165.0
	32	5	400	0.120	3.0	25.6	3980	2390	183.5
L	16	2	600	0.120	3.0	6.4	11935	2865	55.0
	20	3	550	0.120	3.0	8.0	8755	3150	75.5
	25	4	450	0.120	3.0	10.0	5730	2750	82.5
	32	5	400	0.120	3.0	12.8	3980	2390	92.0

Getti d'alluminio
Si 6% - 15%

K	16	2	600	0.080	3.0	12.8	11935	1910	73.5
	20	3	550	0.080	3.0	16.0	8755	2100	101.0
	25	4	450	0.080	3.0	20.0	5730	1835	110.0
	32	5	400	0.080	3.0	25.6	3980	1590	122.0
M	16	2	500	0.080	3.0	12.8	9945	1590	61.0
	20	3	500	0.080	3.0	16.0	7960	1910	91.5
	25	4	450	0.080	3.0	20.0	5730	1835	110.0
	32	5	400	0.080	3.0	25.6	3980	1590	122.0
L	16	2	500	0.080	3.0	6.4	9945	1590	30.5
	20	3	500	0.080	3.0	8.0	7960	1910	46.0
	25	4	450	0.080	3.0	10.0	5730	1835	55.0
	32	5	400	0.080	3.0	12.8	3980	1590	61.0

Rame non legato

K	16	2	500	0.080	3.0	12.8	9945	1590	61.0
	20	3	500	0.080	3.0	16.0	7960	1910	91.5
	25	4	450	0.080	3.0	20.0	5730	1835	110.0
	32	5	400	0.080	3.0	25.6	3980	1590	122.0
M	16	2	450	0.080	3.0	12.8	8955	1435	55.0
	20	3	450	0.080	3.0	16.0	7160	1720	82.5
	25	4	400	0.080	3.0	20.0	5095	1630	98.0
	32	5	400	0.080	3.0	25.6	3980	1590	122.0
L	16	2	400	0.080	3.0	6.4	7960	1275	24.5
	20	3	400	0.080	3.0	8.0	6365	1530	36.5
	25	4	400	0.080	3.0	10.0	5095	1630	49.0
	32	5	400	0.080	3.0	12.8	3980	1590	61.0

Materiali termoplastici

K	16	2	800	0.120	3.0	12.8	15915	3820	146.5
	20	3	700	0.120	3.0	16.0	11140	4010	192.5
	25	4	500	0.120	3.0	20.0	6365	3055	183.5
	32	5	400	0.120	3.0	25.6	3980	2390	183.5
M	16	2	700	0.120	3.0	12.8	13925	3340	128.5
	20	3	650	0.120	3.0	16.0	10345	3725	179.0
	25	4	500	0.120	3.0	20.0	6365	3055	183.5
	32	5	400	0.120	3.0	25.6	3980	2390	183.5
L	16	2	700	0.120	3.0	6.4	13925	3340	64.0
	20	3	650	0.120	3.0	8.0	10345	3725	89.5
	25	4	500	0.120	3.0	10.0	6365	3055	91.5
	32	5	400	0.120	3.0	12.8	3980	2390	92.0

v_c può essere aumentata però occorre una equilibratura



Materiale

Alluminio malleabile
Si < 6%

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	16	2	600	0.100	2.4	16.0	11935	2385	91.5
	20	3	600	0.100	2.4	20.0	9550	2865	137.5
	25	4	500	0.100	2.4	25.0	6365	2545	152.5
	32	5	400	0.100	2.4	32.0	3980	1990	153.0
M	16	2	500	0.100	2.4	16.0	9945	1990	76.5
	20	3	500	0.100	2.4	20.0	7960	2390	114.5
	25	4	450	0.100	2.4	25.0	5730	2290	137.5
	32	5	400	0.100	2.4	32.0	3980	1990	153.0

Getti d'alluminio
Si 6% - 15%

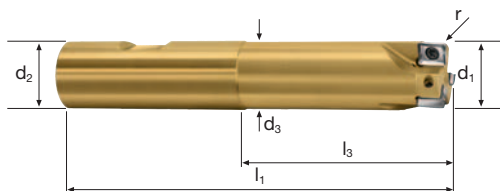
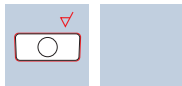
K	16	2	500	0.060	2.4	16.0	9945	1195	46.0
	20	3	500	0.060	2.4	20.0	7960	1435	69.0
	25	4	450	0.060	2.4	25.0	5730	1375	82.5
	32	5	400	0.060	2.4	32.0	3980	1195	92.0
M	16	2	400	0.060	2.4	16.0	7960	955	36.5
	20	3	400	0.060	2.4	20.0	6365	1145	55.0
	25	4	400	0.060	2.4	25.0	5095	1225	73.5
	32	5	400	0.060	2.4	32.0	3980	1195	92.0

v_c può essere aumentata però occorre una equilibratura

Frese ad angolo/Frese per scanalature 90° AX

Inserti 8mm, con canale di aerazione/raffreddamento integrato

HM λ 8°
 γ 20°



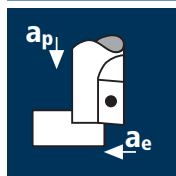
			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF / GF Fiber Reinforced Plastics
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L	
W00100.162	16	16	15.4	75	25	7.5	2	K	●
W00140.162	16	16	15.0	102	51	7.5	2	M	●
W00180.162	16	16	15.0	129	78	7.5	2	L	●
W00100.203	20	20	19.4	77	25	7.5	3	K	●
W00140.203	20	20	19.4	110	57	7.5	3	M	●
W00180.203	20	20	19.4	140	87	7.5	3	L	●
W00100.254	25	25	24.0	90	32	7.5	4	K	●
W00140.254	25	25	24.0	124	65	7.5	4	M	●
W00180.254	25	25	24.0	158	99	7.5	4	L	●
W00100.325	32	32	31.0	102	40	7.5	5	K	●
W00140.325	32	32	31.0	144	81	7.5	5	M	●
W00180.325	32	32	31.0	186	123	7.5	5	L	●

Inserti AX 8mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50510.008	8.3	6.4	3.4	0.6	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0	●

Applicazione



Materiale

Acciaio
< 850 N/mm²



Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



Acciaio
1300 - 1500 N/mm²



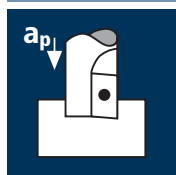
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	250	0.100	4.5	20.0	3185	955	86.0
	32	4	250	0.100	4.5	25.6	2485	995	114.5
M	25	3	220	0.100	4.5	20.0	2800	840	75.5
	32	4	220	0.100	4.5	25.6	2190	875	101.0
L	25	3	220	0.100	4.0	10.0	2800	840	33.5
	32	4	220	0.100	4.0	12.8	2190	875	45.0

K	25	3	220	0.100	4.5	20.0	2800	840	75.5
	32	4	220	0.100	4.5	25.6	2190	875	101.0
M	25	3	180	0.100	4.5	20.0	2290	685	61.5
	32	4	180	0.100	4.5	25.6	1790	715	82.5
L	25	3	180	0.100	4.0	10.0	2290	685	27.5
	32	4	180	0.100	4.0	12.8	1790	715	36.5

K	25	3	180	0.080	4.5	20.0	2290	550	49.5
	32	4	180	0.080	4.5	25.6	1790	575	66.0
M	25	3	150	0.080	4.5	20.0	1910	460	41.5
	32	4	150	0.080	4.5	25.6	1490	475	54.5
L	25	3	140	0.080	4.0	10.0	1785	430	17.0
	32	4	140	0.080	4.0	12.8	1395	445	23.0

K	25	3	150	0.050	4.5	7.5	1910	285	9.5
	32	4	150	0.050	4.5	9.6	1490	300	13.0
M	25	3	120	0.050	4.5	7.5	1530	230	8.0
	32	4	120	0.050	4.5	9.6	1195	240	10.5
L	25	3	100	0.050	4.0	10.0	1275	190	7.5
	32	4	100	0.050	4.0	12.8	995	200	10.0

Applicazione



Materiale

Acciaio
850 - 1100 N/mm²



Acciaio
1100 - 1300 N/mm²



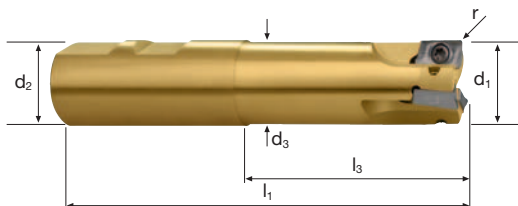
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	180	0.100	3.6	25.0	2290	685	61.5
	32	4	180	0.100	3.6	32.0	1790	715	82.5
M	25	3	160	0.100	3.6	25.0	2035	610	55.0
	32	4	160	0.100	3.6	32.0	1590	635	73.0

K	25	3	150	0.080	3.6	25.0	1910	460	41.5
	32	4	150	0.080	3.6	32.0	1490	475	54.5
M	25	3	120	0.080	3.6	25.0	1530	365	33.0
	32	4	120	0.080	3.6	32.0	1195	380	44.0

Frese ad angolo/Frese per scanalature 90° NX

Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 6°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500						GG(G)
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W00110.253	25	25	24.0	90	32	12.5	3	K	●	
W00150.253	25	25	24.0	124	65	12.5	3	M	●	
W00190.253	25	25	24.0	158	99	12.5	3	L	●	
W00110.324	32	32	31.0	102	40	12.5	4	K	●	
W00150.324	32	32	31.0	144	81	12.5	4	M	●	
W00190.324	32	32	31.0	186	123	12.5	4	L	●	

Inserti NX 13mm					Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D	r		
W50111.013	14.8	8.1	4.7	0.8		●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2		●



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	150	0.050	4.5	20.0	1910	285	25.5
	32	4	150	0.050	4.5	25.6	1490	300	34.5
M	25	3	150	0.040	4.5	15.0	1910	230	15.5
	32	4	150	0.040	4.5	19.2	1490	240	20.5
L	25	3	150	0.050	4.0	10.0	1910	285	11.5
	32	4	150	0.050	4.0	12.8	1490	300	15.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

K	25	3	250	0.050	4.5	20.0	3185	480	43.0
	32	4	250	0.050	4.5	25.6	2485	495	57.0
M	25	3	250	0.040	4.5	15.0	3185	380	25.5
	32	4	250	0.040	4.5	19.2	2485	400	34.5
L	25	3	220	0.040	4.0	10.0	2800	335	13.5
	32	4	220	0.040	4.0	12.8	2190	350	18.0

Acciaio resistente al calore
[17-4 PH]

K	25	3	120	0.050	4.5	20.0	1530	230	20.5
	32	4	120	0.050	4.5	25.6	1195	240	27.5
M	25	3	120	0.040	4.5	15.0	1530	185	12.5
	32	4	120	0.040	4.5	19.2	1195	190	16.5
L	25	3	120	0.040	4.0	10.0	1530	185	7.5
	32	4	120	0.040	4.0	12.8	1195	190	9.5

Leg. a base di nichel
[Inconel 718]

K	25	3	20	0.030	4.5	7.5	255	25	1.0
	32	4	20	0.030	4.5	9.6	200	25	1.0
M	25	3	20	0.020	4.5	2.5	255	15	0.2
	32	4	20	0.020	4.5	3.2	200	15	0.2
L									



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	120	0.050	3.6	25.0	1530	230	20.5
	32	4	120	0.050	3.6	32.0	1195	240	27.5
M	25	3	120	0.070	2.5	25.0	1530	320	20.0
	32	4	120	0.070	2.5	32.0	1195	335	27.0

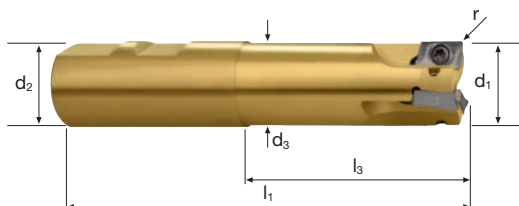
Acciaio resistente al calore
[17-4 PH]

K	25	3	100	0.050	3.6	25.0	1275	190	17.0
	32	4	100	0.050	3.6	32.0	995	200	23.0
M	25	3	100	0.070	2.5	25.0	1275	270	17.0
	32	4	100	0.070	2.5	32.0	995	280	22.5

Frese ad angolo/Frese per scanalature 90° SX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 6°



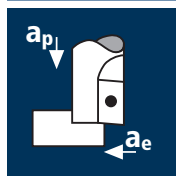
Rm < 850	Rm 850-1100						Inox Stainless	Ti Titanium	Nickel-Alloys Tool Steel
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W00110.253	25	25	24.0	90	32	12.5	3	K	●	
W00150.253	25	25	24.0	124	65	12.5	3	M	●	
W00190.253	25	25	24.0	158	99	12.5	3	L	●	
W00110.324	32	32	31.0	102	40	12.5	4	K	●	
W00150.324	32	32	31.0	144	81	12.5	4	M	●	
W00190.324	32	32	31.0	186	123	12.5	4	L	●	

Inseri SX 13mm					Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D	r		
W50310.013	14.8	8.1	4.7	0.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2		●

Applicazione



Materiale

Acciaio da
utensile temprato
42 - 48 HRC



Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



Acciaio da
utensile temprato
56 - 60 HRC



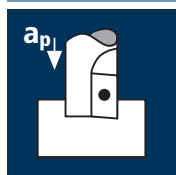
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	150	0.050	4.5	20.0	1910	285	25.5
	32	4	150	0.050	4.5	25.6	1490	300	34.5
M	25	3	120	0.070	4.5	15.0	1530	320	21.5
	32	4	120	0.070	4.5	19.2	1195	335	29.0
L	25	3	120	0.070	4.0	5.0	1530	320	6.5
	32	4	120	0.070	4.0	6.4	1195	335	8.5

K	25	3	120	0.050	4.5	20.0	1530	230	20.5
	32	4	120	0.050	4.5	25.6	1195	240	27.5
M	25	3	100	0.070	4.5	15.0	1275	270	18.0
	32	4	100	0.070	4.5	19.2	995	280	24.0
L	25	3	100	0.070	4.0	5.0	1275	270	5.5
	32	4	100	0.070	4.0	6.4	995	280	7.0

K	25	3	100	0.050	4.5	20.0	1275	190	17.0
	32	4	100	0.050	4.5	25.6	995	200	23.0
M	25	3	80	0.070	4.5	15.0	1020	215	14.5
	32	4	80	0.070	4.5	19.2	795	225	19.5
L	25	3	80	0.070	4.0	5.0	1020	215	4.5
	32	4	80	0.070	4.0	6.4	795	225	6.0

K	25	3	40	0.020	4.5	7.5	510	30	1.0
	32	4	40	0.020	4.5	9.6	400	30	1.5
M	25	3	25	0.020	4.5	2.5	320	20	0.0
	32	4	25	0.020	4.5	3.2	250	20	0.5
L	25	3							
	32	4							

Applicazione



Materiale

Acciaio da
utensile temprato
48 - 52 HRC



Acciaio da
utensile temprato
52 - 56 HRC



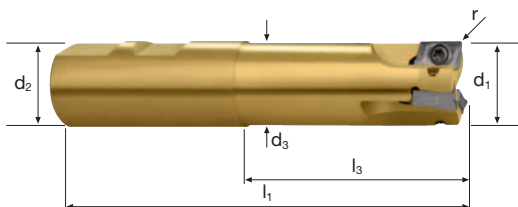
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	100	0.050	3.6	25.0	1275	190	17.0
	32	4	100	0.050	3.6	32.0	995	200	23.0
M	25	3	80	0.070	3.0	25.0	1020	215	16.0
	32	4	80	0.070	3.0	32.0	795	225	21.5
L	25	3							
	32	4							

K	25	3	80	0.050	3.6	25.0	1020	155	14.0
	32	4	80	0.050	3.6	32.0	795	160	18.5
M	25	3	60	0.070	3.0	25.0	765	160	12.0
	32	4	60	0.070	3.0	32.0	595	165	16.0
L	25	3							
	32	4							

Frese ad angolo/Frese per scanalature 90° HX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8° γ -10°



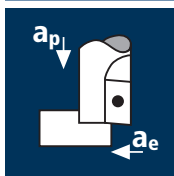
		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60		Ti Titanium	GG(G)
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W00110.253	25	25	24.0	90	32	12.5	3	K	●	
W00150.253	25	25	24.0	124	65	12.5	3	M	●	
W00190.253	25	25	24.0	158	99	12.5	3	L	●	
W00110.324	32	32	31.0	102	40	12.5	4	K	●	
W00150.324	32	32	31.0	144	81	12.5	4	M	●	
W00190.324	32	32	31.0	186	123	12.5	4	L	●	

Inserti HX 13mm					Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D	r		
W50210.013	14.7	8.1	4.7	0.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2		●

Applicazione



Materiale

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]



Acciaio al manganese
Mn > 5 %
[1.3964 / Nitronic]



Acciaio resistente
al calore
Acciaio duplex
[1.4462]
[17-4 PH]



Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



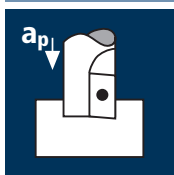
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	40	0.040	4.5	7.5	510	60	2.0
	32	4	40	0.040	4.5	9.6	400	65	3.0
M	25	3	30	0.030	4.5	5.0	380	35	1.0
	32	4	30	0.030	4.5	6.4	300	35	1.0
L	25	3	20	0.020	4.5	3.8	255	15	0.5
	32	4	20	0.020	4.5	4.8	200	15	0.5

K	25	3	100	0.040	4.5	7.5	1275	155	5.0
	32	4	100	0.040	4.5	9.6	995	160	7.0
M	25	3	90	0.030	4.5	5.0	1145	105	2.5
	32	4	90	0.030	4.5	6.4	895	105	3.0
L	25	3	80	0.020	4.5	3.8	1020	60	1.0
	32	4	80	0.020	4.5	4.8	795	65	1.5

K	25	3	150	0.050	4.5	20.0	1910	285	25.5
	32	4	150	0.050	4.5	25.6	1490	300	34.5
M	25	3	140	0.040	4.5	15.0	1785	215	14.5
	32	4	140	0.040	4.5	19.2	1395	225	19.5
L	25	3	120	0.040	4.0	10.0	1530	185	7.5
	32	4	120	0.040	4.0	12.8	1195	190	9.5

K	25	3	120	0.050	4.5	7.5	1530	230	8.0
	32	4	120	0.050	4.5	9.6	1195	240	10.5
M	25	3	100	0.050	4.5	5.0	1275	190	4.5
	32	4	100	0.050	4.5	6.4	995	200	6.0
L	25	3	80	0.040	4.5	3.8	1020	120	2.0
	32	4	80	0.040	4.5	4.8	795	125	2.5

Applicazione



Materiale

Acciaio al manganese
Mn > 5 %
[1.3964 / Nitronic]



Acciaio rapido PM
ricotto
[Böhler S390]
[ASP 2023]



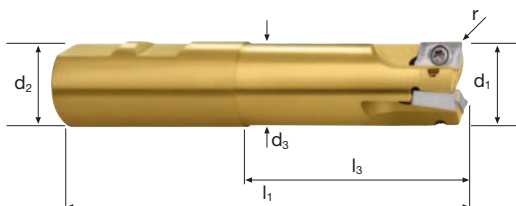
Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	80	0.040	1.5	25.0	1020	120	4.5
	32	4	80	0.040	1.5	32.0	795	125	6.0
M	25	3	60	0.030	1.0	25.0	765	70	2.0
	32	4	60	0.030	1.0	32.0	595	70	2.0

K	25	3	100	0.050	2.0	25.0	1275	190	9.5
	32	4	100	0.050	2.0	32.0	995	200	13.0
M	25	3	80	0.040	1.5	25.0	1020	120	4.5
	32	4	80	0.040	1.5	32.0	795	125	6.0

Frese ad angolo/Frese per scanalature 90° ZX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 6°

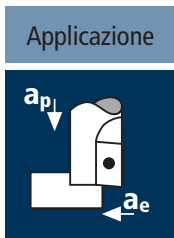


Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys Mangan-Steels HSS
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W00110.253	25	25	24.0	90	32	12.5	3	K	●	
W00150.253	25	25	24.0	124	65	12.5	3	M	●	
W00190.253	25	25	24.0	158	99	12.5	3	L	●	
W00110.324	32	32	31.0	102	40	12.5	4	K	●	
W00150.324	32	32	31.0	144	81	12.5	4	M	●	
W00190.324	32	32	31.0	186	123	12.5	4	L	●	

Inseri ZX 13mm					Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D	r		
W50410.013	14.8	8.1	4.7	0.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2		●



Materiale

Alluminio malleabile
Si < 6%

Getti d'alluminio
Si 6% - 15%

Rame non legato

Materiali termoplastici

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	500	0.120	4.5	20.0	6365	2290	206.0
	32	4	400	0.120	4.5	25.6	3980	1910	220.0
M	25	3	450	0.100	4.5	20.0	5730	1720	155.0
	32	4	400	0.100	4.5	25.6	3980	1590	183.0
L	25	3	450	0.100	4.0	10.0	5730	1720	69.0
	32	4	400	0.100	4.0	12.8	3980	1590	81.5

K	25	3	450	0.080	4.5	20.0	5730	1375	124.0
	32	4	400	0.080	4.5	25.6	3980	1275	147.0
M	25	3	450	0.080	4.5	20.0	5730	1375	124.0
	32	4	400	0.080	4.5	25.6	3980	1275	147.0
L	25	3	450	0.080	4.0	10.0	5730	1375	55.0
	32	4	400	0.080	4.0	12.8	3980	1275	65.5

K	25	3	450	0.080	4.5	20.0	5730	1375	124.0
	32	4	400	0.080	4.5	25.6	3980	1275	147.0
M	25	3	400	0.080	4.5	20.0	5095	1225	110.5
	32	4	400	0.080	4.5	25.6	3980	1275	147.0
L	25	3	400	0.080	4.0	10.0	5095	1225	49.0
	32	4	400	0.080	4.0	12.8	3980	1275	65.5

K	25	3	500	0.120	4.5	20.0	6365	2290	206.0
	32	4	400	0.120	4.5	25.6	3980	1910	220.0
M	25	3	500	0.100	4.5	20.0	6365	1910	172.0
	32	4	400	0.100	4.5	25.6	3980	1590	183.0
L	25	3	500	0.100	4.0	10.0	6365	1910	76.5
	32	4	400	0.100	4.0	12.8	3980	1590	81.5

v_c può essere aumentata però occorre una equilibratura



Materiale

Alluminio malleabile
Si < 6%

Getti d'alluminio
Si 6% - 15%

Tipo-L	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
K	25	3	500	0.100	3.6	25.0	6365	1910	172.0
	32	4	400	0.100	3.6	32.0	3980	1590	183.0
M	25	3	450	0.100	3.6	25.0	5730	1720	155.0
	32	4	400	0.100	3.6	32.0	3980	1590	183.0

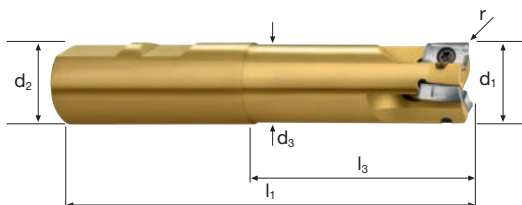
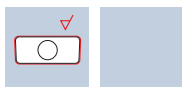
K	25	3	450	0.060	3.6	25.0	5730	1030	92.5
	32	4	400	0.060	3.6	32.0	3980	955	110.0
M	25	3	400	0.060	3.6	25.0	5095	915	82.5
	32	4	400	0.060	3.6	32.0	3980	955	110.0

v_c può essere aumentata però occorre una equilibratura

Frese ad angolo/Frese per scanalature 90° AX

Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM λ 8°
 γ 20°



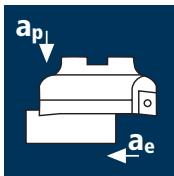
			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF / GF Fiber Reinforced Plastics
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Frese ad angolo/Frese per scanalature 90°									Composizione fornitura: Corpo fresa comprese viti per serraggio inserto	
N° Ordine	d1	d2 h6	d3	l1	l3	ap _{max.}	z	Tipo-L		
W00110.253	25	25	24	90	32	12.5	3	K		●
W00150.253	25	25	24	124	65	12.5	3	M		●
W00190.253	25	25	24	158	99	12.5	3	L		●
W00110.324	32	32	31	102	40	12.5	4	K		●
W00150.324	32	32	31	144	81	12.5	4	M		●
W00190.324	32	32	31	186	123	12.5	4	L		●

Inserti AX 13mm					Composizione fornitura: Confezione minima: 10 pezzi	
N° Ordine	H	B	D	r		
W50510.013	14.7	8.0	4.5	0.8		●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi	
N° Ordine			
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15		●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15		●
W90100.013	Cacciavite Torx TX 15		●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2		●

Applicazione



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	5	220	0.100	1.5	30.0	1750	875	39.5
50	6	220	0.100	1.5	37.5	1400	840	47.5
63	7	200	0.100	1.5	47.3	1010	705	50.0
80	10	200	0.100	1.5	60.0	795	795	71.5

Acciaio
850 - 1100 N/mm²

40	5	200	0.100	1.5	30.0	1590	795	36.0
50	6	200	0.100	1.5	37.5	1275	765	43.0
63	7	180	0.100	1.5	47.3	910	635	45.0
80	10	180	0.100	1.5	60.0	715	715	64.5

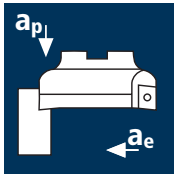
Acciaio
1100 - 1300 N/mm²

40	5	180	0.080	1.5	30.0	1430	570	25.5
50	6	180	0.080	1.5	37.5	1145	550	31.0
63	7	150	0.080	1.5	47.3	760	425	30.0
80	10	150	0.080	1.5	60.0	595	475	43.0

Acciaio
1300 - 1500 N/mm²

40	5	150	0.050	1.0	30.0	1195	300	9.0
50	6	150	0.050	1.0	37.5	955	285	10.5
63	7	120	0.050	1.0	47.3	605	210	10.0
80	10	120	0.050	1.0	60.0	475	240	14.5

Applicazione



Materiale

Acciaio
< 850 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	5	220	0.120	5	6	1750	1050	31.5
50	6	220	0.120	5	6	1400	1010	30.5
63	7	200	0.120	5	6	1010	850	25.5
80	10	200	0.120	5	6	795	955	28.5

Acciaio
850 - 1100 N/mm²

40	5	200	0.100	5	6	1590	795	24.0
50	6	200	0.100	5	6	1275	765	23.0
63	7	180	0.100	5	6	910	635	19.0
80	10	180	0.100	5	6	715	715	21.5

Acciaio
1100 - 1300 N/mm²

40	5	180	0.080	5	6	1430	570	17.0
50	6	180	0.080	5	6	1145	550	16.5
63	7	150	0.080	5	6	760	425	13.0
80	10	150	0.080	5	6	595	475	14.5

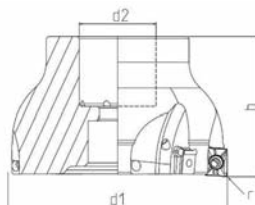
Acciaio
1300 - 1500 N/mm²

40	5	150	0.050	5	6	1195	300	9.0
50	6	150	0.050	5	6	955	285	8.5
63	7	120	0.050	5	6	605	210	6.5
80	10	120	0.050	5	6	475	240	7.0

Frese ad angolo 90° NX

Inseri 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 0°



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500							GG(G)
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Frese ad angolo 90°						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W00400.405	40	16	40	7.5	5	●
W00400.506	50	22	40	7.5	6	●
W00400.637	63	22	40	7.5	7	●
W00400.801	80	27	50	7.5	10	●

Inseri NX 8mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50111.008	8.4	6.4	3.4	0.6	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0	●

Applicazione

Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	5	120	0.080	1.5	30.0	955	380	17.0
50	6	120	0.080	1.5	37.5	765	365	20.5
63	7	100	0.080	1.5	47.3	505	285	20.0
80	10	100	0.080	1.5	50.0	400	320	24.0

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

40	5	150	0.080	1.5	30.0	1195	480	21.5
50	6	150	0.080	1.5	37.5	955	460	26.0
63	7	120	0.080	1.5	47.3	605	340	24.0
80	10	120	0.080	1.5	50.0	475	380	28.5

Acciaio resistente
al calore
[17-4 PH]

40	5	100	0.080	1.5	30.0	795	320	14.5
50	6	100	0.080	1.5	37.5	635	305	17.0
63	7	70	0.080	1.5	47.3	355	200	14.0
80	10	70	0.080	1.5	50.0	280	225	17.0

Applicazione

Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	5	110	0.060	5	6	875	265	8.0
50	6	110	0.060	5	6	700	250	7.5
63	7	80	0.060	5	6	405	170	5.0
80	10	80	0.060	5	6	320	190	5.5

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

40	5	150	0.060	5	6	1195	360	11.0
50	6	150	0.060	5	6	955	345	10.5
63	7	120	0.060	5	6	605	255	7.5
80	10	120	0.060	5	6	475	285	8.5

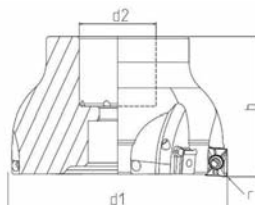
Acciaio resistente
al calore
[17-4 PH]

40	5	100	0.060	5	6	795	240	7.0
50	6	100	0.060	5	6	635	230	7.0
63	7	70	0.060	5	6	355	150	4.5
80	10	70	0.060	5	6	280	170	5.0

Frese ad angolo 90° SX

Inseri 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 0°



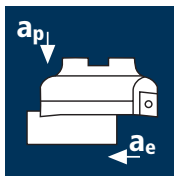
Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Frese ad angolo 90°						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W00400.405	40	16	40	7.5	5	●
W00400.506	50	22	40	7.5	6	●
W00400.637	63	22	40	7.5	7	●
W00400.801	80	27	50	7.5	10	●

Inseri SX 8mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50310.008	8.4	6.4	3.4	0.6	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0	●

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

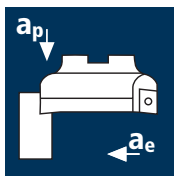
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	5	160	0.050	1.5	30.0	1275	320	14.5
50	6	160	0.050	1.5	37.5	1020	305	17.0
63	7	130	0.050	1.5	47.3	655	230	16.5
80	10	130	0.050	1.5	60.0	515	260	23.5

40	5	120	0.050	1.5	30.0	955	240	11.0
50	6	120	0.050	1.5	37.5	765	230	13.0
63	7	100	0.050	1.5	47.3	505	175	12.5
80	10	100	0.050	1.5	60.0	400	200	18.0

40	5	80	0.050	1.5	30.0	635	160	7.0
50	6	80	0.050	1.5	37.5	510	155	8.5
63	7	60	0.050	1.5	47.3	305	105	7.5
80	10	60	0.050	1.5	60.0	240	120	11.0

40	5	40	0.020	1.0	30.0	320	30	1.0
50	6	40	0.020	1.0	37.5	255	30	1.0
63	7	30	0.020	1.0	47.3	150	20	1.0
80	10	30	0.020	1.0	60.0	120	25	1.5

Applicazione



Materiale

Acciaio da utensile temprato
42 - 48 HRC

Acciaio da utensile temprato
48 - 52 HRC

Acciaio da utensile temprato
52 - 56 HRC

Acciaio da utensile temprato
56 - 60 HRC

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	5	160	0.050	5	6	1275	320	9.5
50	6	160	0.050	5	6	1020	305	9.0
63	7	130	0.050	5	6	655	230	7.0
80	10	130	0.050	5	6	515	260	8.0

40	5	120	0.050	5	6	955	240	7.0
50	6	120	0.050	5	6	765	230	7.0
63	7	100	0.050	5	6	505	175	5.5
80	10	100	0.050	5	6	400	200	6.0

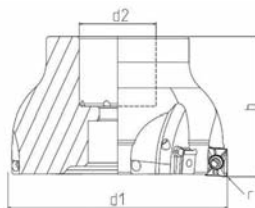
40	5	100	0.050	5	6	795	200	6.0
50	6	100	0.050	5	6	635	190	5.5
63	7	80	0.050	5	6	405	140	4.0
80	10	80	0.050	5	6	320	160	5.0

40	5	40	0.020	5	6	320	30	1.0
50	6	40	0.020	5	6	255	30	1.0
63	7	30	0.020	5	6	150	20	0.5
80	10	30	0.020	5	6	120	25	1.0

Frese ad angolo 90° HX

Inseri 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8° γ -8°
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		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	GG(G)
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Frese ad angolo 90°		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto					
N° Ordine	d1	d2	b	ap _{max.}	z		
W00400.405	40	16	40	7.5	5	●	
W00400.506	50	22	40	7.5	6	●	
W00400.637	63	22	40	7.5	7	●	
W00400.801	80	27	50	7.5	10	●	

Inseri HX 8mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r		
W50210.008	8.5	6.4	3.5	0.6	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08			●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08			●
W90100.008	Cacciavite Torx TX 08			●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0			●

Applicazione

Materiale

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	5	40	0.040	1.5	30.0	320	65	3.0
50	6	40	0.040	1.5	37.5	255	60	3.5
63	7	30	0.040	1.5	47.3	150	40	3.0
80	10	30	0.040	1.5	50.0	120	50	4.0

Acciaio al manganese
Mn > 5%
[1.3964 / Nitronic]

40	5	100	0.040	1.5	30.0	795	160	7.0
50	6	100	0.040	1.5	37.5	635	150	8.5
63	7	80	0.040	1.5	47.3	405	115	8.0
80	10	80	0.040	1.5	50.0	320	130	10.0

Acciaio resistente al calore
Acciaio duplex
[1.4462]
[17-4 PH]

40	5	150	0.080	1.5	30.0	1195	480	21.5
50	6	150	0.080	1.5	37.5	955	460	26.0
63	7	120	0.080	1.5	47.3	605	340	24.0
80	10	120	0.080	1.5	50.0	475	380	28.5

Acciaio rapido PM ricotto
[Böhler S390]
[ASP 2023]

40	5	120	0.050	1.5	30.0	955	240	11.0
50	6	120	0.050	1.5	37.5	765	230	13.0
63	7	100	0.050	1.5	47.3	505	175	12.5
80	10	100	0.050	1.5	50.0	400	200	15.0

Applicazione

Materiale

Leg. a base di nichel
[Inconel 718]
[Hastelloy B-3]
[Nimonic 90]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	5	40	0.050	5	3	320	80	1.0
50	6	40	0.050	5	3	255	75	1.0
63	7	40	0.050	5	3	200	70	1.0
80	10	40	0.050	5	3	160	80	1.0

Acciaio al manganese
Mn > 5%
[1.3964 / Nitronic]

40	5	100	0.060	5	6	795	240	7.0
50	6	100	0.060	5	6	635	230	7.0
63	7	100	0.060	5	6	505	210	6.5
80	10	100	0.060	5	6	400	240	7.0

Acciaio resistente al calore
Acciaio duplex
[1.4462]
[17-4 PH]

40	5	150	0.060	5	6	1195	360	11.0
50	6	150	0.060	5	6	955	345	10.5
63	7	150	0.060	5	6	760	320	9.5
80	10	150	0.060	5	6	595	355	10.5

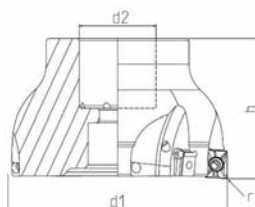
Acciaio rapido PM ricotto
[Böhler S390]
[ASP 2023]

40	5	120	0.060	5	6	955	285	8.5
50	6	120	0.060	5	6	765	275	8.5
63	7	120	0.060	5	6	605	255	7.5
80	10	120	0.060	5	6	475	285	8.5

Frese ad angolo 90° ZX

Inserti 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 0°

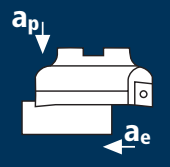






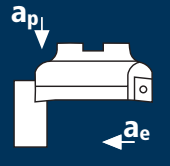




Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys Mangan-Steels HSS
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Frese ad angolo 90°						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W00400.405	40	16	40	7.5	5	●
W00400.506	50	22	40	7.5	6	●
W00400.637	63	22	40	7.5	7	●
W00400.801	80	27	50	7.5	10	●

Inserti ZX 8mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50410.008	8.4	6.4	3.4	0.6	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0	●

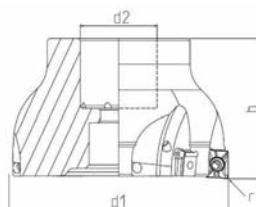
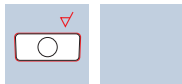
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	40	5	600	0.120	1.5	30.0	4775	2865	129.0
		50	6	600	0.120	1.5	37.5	3820	2750	154.5
		63	7	500	0.120	1.5	47.3	2525	2120	150.5
		80	10	500	0.120	1.5	60.0	1990	2390	215.0
Getti d'alluminio Si 6% - 15% 	40	5	500	0.100	1.5	30.0	3980	1990	89.5	
		50	6	500	0.100	1.5	37.5	3185	1910	107.5
		63	7	400	0.100	1.5	47.3	2020	1415	100.5
		80	10	400	0.100	1.5	60.0	1590	1590	143.0
Rame non legato 	40	5	400	0.080	1.5	30.0	3185	1275	57.5	
		50	6	400	0.080	1.5	37.5	2545	1220	68.5
		63	7	350	0.080	1.5	47.3	1770	990	70.0
		80	10	350	0.080	1.5	60.0	1395	1115	100.5
Materiali termoplastici 	40	5	600	0.120	1.5	30.0	4775	2865	129.0	
		50	6	600	0.120	1.5	37.5	3820	2750	154.5
		63	7	500	0.120	1.5	47.3	2525	2120	150.5
		80	10	500	0.120	1.5	60.0	1990	2390	215.0

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	40	5	600	0.120	5	6	4775	2865	86.0
		50	6	600	0.120	5	6	3820	2750	82.5
		63	7	500	0.120	5	6	2525	2120	63.5
		80	10	500	0.120	5	6	1990	2390	71.5
Getti d'alluminio Si 6% - 15% 	40	5	500	0.100	5	6	3980	1990	59.5	
		50	6	500	0.100	5	6	3185	1910	57.5
		63	7	400	0.100	5	6	2020	1415	42.5
		80	10	400	0.100	5	6	1590	1590	47.5
Rame non legato 	40	5	400	0.080	5	6	3185	1275	38.5	
		50	6	400	0.080	5	6	2545	1220	36.5
		63	7	350	0.080	5	6	1770	990	29.5
		80	10	350	0.080	5	6	1395	1115	33.5
Materiali termoplastici 	40	5	600	0.120	5	6	4775	2865	86.0	
		50	6	600	0.120	5	6	3820	2750	82.5
		63	7	500	0.120	5	6	2525	2120	63.5
		80	10	500	0.120	5	6	1990	2390	71.5

Frese ad angolo 90° AX

Inseri 8mm, con canale di aerazione/raffreddamento integrato

HM	λ 8° γ 20°
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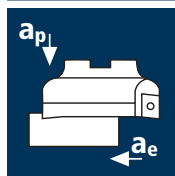
			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF / GF Fiber Reinforced Plastics
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Frese ad angolo 90°						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W00400.405	40	16	40	7.5	5	●
W00400.506	50	22	40	7.5	6	●
W00400.637	63	22	40	7.5	7	●
W00400.801	80	27	50	7.5	10	●

Inseri AX 8mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50510.008	8.3	6.4	3.4	0.6	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.008	Cacciavite dinamometrico 1.2 Nm con stelo Torx TX 08	●
W90111.008	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 08	●
W90100.008	Cacciavite Torx TX 08	●
W90500.008	Vite di fissaggio per l'inserto Torx TX 08 / M 2.5 x 5.0	●

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

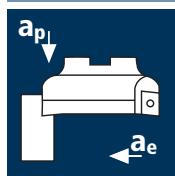
d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	220	0.100	2	30.0	1750	700	42.0
50	5	220	0.100	2	37.5	1400	700	52.5
63	6	200	0.100	2	47.3	1010	605	57.0
80	8	200	0.100	2	60.0	795	635	76.0

40	4	200	0.100	2	30.0	1590	635	38.0
50	5	200	0.100	2	37.5	1275	640	48.0
63	6	180	0.100	2	47.3	910	545	51.5
80	8	180	0.100	2	60.0	715	570	68.5

40	4	180	0.080	2	30.0	1430	460	27.5
50	5	180	0.080	2	37.5	1145	460	34.5
63	6	150	0.080	2	47.3	760	365	34.5
80	8	150	0.080	2	60.0	595	380	45.5

40	4	150	0.050	2	30.0	1195	240	14.5
50	5	150	0.050	2	37.5	955	240	18.0
63	6	120	0.050	2	47.3	605	180	17.0
80	8	120	0.050	2	60.0	475	190	23.0

Applicazione



Materiale

Acciaio
< 850 N/mm²

Acciaio
850 - 1100 N/mm²

Acciaio
1100 - 1300 N/mm²

Acciaio
1300 - 1500 N/mm²

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	220	0.120	10	8	1750	840	67.0
50	5	220	0.120	10	8	1400	840	67.0
63	6	200	0.120	10	8	1010	725	58.0
80	8	200	0.120	10	8	795	765	61.0

40	4	200	0.100	10	8	1590	635	51.0
50	5	200	0.100	10	8	1275	640	51.0
63	6	180	0.100	10	8	910	545	43.5
80	8	180	0.100	10	8	715	570	45.5

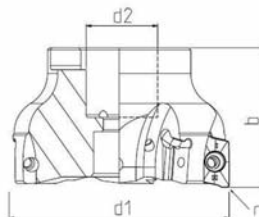
40	4	180	0.080	10	8	1430	460	37.0
50	5	180	0.080	10	8	1145	460	37.0
63	6	150	0.080	10	8	760	365	29.0
80	8	150	0.080	10	8	595	380	30.5

40	4	150	0.050	10	8	1195	240	19.0
50	5	150	0.050	10	8	955	240	19.0
63	6	120	0.050	10	8	605	180	14.5
80	8	120	0.050	10	8	475	190	15.0

Frese ad angolo 90° NX

Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 6°



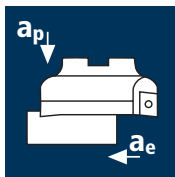
Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500						GG(G)
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Frese ad angolo 90°						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W00410.404	40	16	40	12.5	4	●
W00410.505	50	22	40	12.5	5	●
W00410.636	63	22	40	12.5	6	●
W00410.808	80	27	50	12.5	8	●

Inserti NX 13mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50111.013	14.8	8.1	4.7	0.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2	●

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

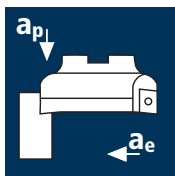
Acciaio resistente
al calore
[17-4 PH]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	120	0.080	2	30.0	955	305	18.5
50	5	120	0.080	2	37.5	765	305	23.0
63	6	100	0.080	2	47.3	505	240	22.5
80	8	100	0.080	2	50.0	400	255	25.5

40	4	150	0.080	2	30.0	1195	380	23.0
50	5	150	0.080	2	37.5	955	380	28.5
63	6	120	0.080	2	47.3	605	290	27.5
80	8	120	0.080	2	50.0	475	305	30.5

40	4	100	0.080	2	30.0	795	255	15.5
50	5	100	0.080	2	37.5	635	255	19.0
63	6	70	0.080	2	47.3	355	170	16.0
80	8	70	0.080	2	50.0	280	180	18.0

Applicazione



Materiale

Acciaio inossidabile
[Cr-Ni/1.4301]

Acciaio inossidabile
[Cr-Ni-Mo-.../1.4571]

Acciaio resistente
al calore
[17-4 PH]

d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
40	4	110	0.060	10	8	875	210	17.0
50	5	110	0.060	10	8	700	210	17.0
63	6	80	0.060	10	8	405	145	11.5
80	8	80	0.060	10	8	320	155	12.5

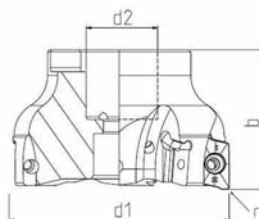
40	4	150	0.060	10	8	1195	285	23.0
50	5	150	0.060	10	8	955	285	23.0
63	6	120	0.060	10	8	605	220	17.5
80	8	120	0.060	10	8	475	230	18.5

40	4	100	0.060	10	8	795	190	15.0
50	5	100	0.060	10	8	635	190	15.0
63	6	70	0.060	10	8	355	130	10.5
80	8	70	0.060	10	8	280	135	11.0

Frese ad angolo 90° SX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 6°

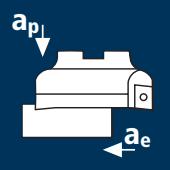









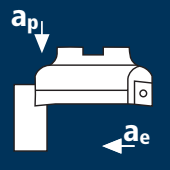







Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Tool Steel
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Frese ad angolo 90°		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto				
N° Ordine	d1	d2	b	ap _{max.}	z	
W00410.404	40	16	40	12.5	4	●
W00410.505	50	22	40	12.5	5	●
W00410.636	63	22	40	12.5	6	●
W00410.808	80	27	50	12.5	8	●

Inseri SX 13mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r		
W50310.013	14.8	8.1	4.7	0.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15			●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15			●
W90100.013	Cacciavite Torx TX 15			●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2			●

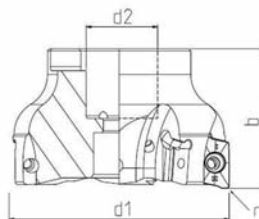
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	40	4	160	0.050	2	30.0	1275	255	15.5
		50	5	160	0.050	2	37.5	1020	255	19.0
		63	6	130	0.050	2	47.3	655	195	18.5
		80	8	130	0.050	2	60.0	515	205	24.5
	Acciaio da utensile temprato 48 - 52 HRC 	40	4	120	0.050	2	30.0	955	190	11.5
		50	5	120	0.050	2	37.5	765	190	14.5
		63	6	100	0.050	2	47.3	505	150	14.0
		80	8	100	0.050	2	60.0	400	160	19.0
	Acciaio da utensile temprato 52 - 56 HRC 	40	4	80	0.050	2	30.0	635	125	7.5
		50	5	80	0.050	2	37.5	510	130	10.0
		63	6	60	0.050	2	47.3	305	90	8.5
		80	8	60	0.050	2	60.0	240	95	11.5
	Acciaio da utensile temprato 56 - 60 HRC 	40	4	40	0.020	2	30.0	320	25	1.5
		50	5	40	0.020	2	37.5	255	25	2.0
		63	6	30	0.020	2	47.3	150	20	2.0
		80	8	30	0.020	2	60.0	120	20	2.5

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Acciaio da utensile temprato 42 - 48 HRC 	40	4	160	0.050	10	8	1275	255	20.5
		50	5	160	0.050	10	8	1020	255	20.5
		63	6	130	0.050	10	8	655	195	15.5
		80	8	130	0.050	10	8	515	205	16.5
	Acciaio da utensile temprato 48 - 52 HRC 	40	4	120	0.050	10	8	955	190	15.0
		50	5	120	0.050	10	8	765	190	15.0
		63	6	100	0.050	10	8	505	150	12.0
		80	8	100	0.050	10	8	400	160	13.0
	Acciaio da utensile temprato 52 - 56 HRC 	40	4	100	0.050	10	8	795	160	13.0
		50	5	100	0.050	10	8	635	160	13.0
		63	6	80	0.050	10	8	405	120	9.5
		80	8	80	0.050	10	8	320	130	10.5
	Acciaio da utensile temprato 56 - 60 HRC 	40	4	40	0.020	10	8	320	25	2.0
		50	5	40	0.020	10	8	255	25	2.0
		63	6	30	0.020	10	8	150	20	1.5
		80	8	30	0.020	10	8	120	20	1.5

Frese ad angolo 90° HX

Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8° γ -10°

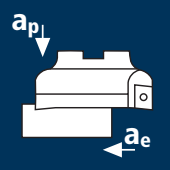






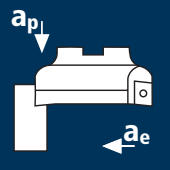




		Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Ti Titanium	GG(G)
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Frese ad angolo 90°		Composizione fornitura: Corpo fresa comprese viti per serraggio inserto					
N° Ordine	d1	d2	b	ap _{max.}	z		
W00410.404	40	16	40	12.5	4	●	
W00410.505	50	22	40	12.5	5	●	
W00410.636	63	22	40	12.5	6	●	
W00410.808	80	27	50	12.5	8	●	

Inserti HX 13mm		Composizione fornitura: Confezione minima: 10 pezzi				
N° Ordine	H	B	D	r		
W50210.013	14.7	8.1	4.7	0.8	●	

Accessori		Viti per serraggio inserti, confezione da 10 pezzi		
N° Ordine				
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15			●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15			●
W90100.013	Cacciavite Torx TX 15			●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2			●

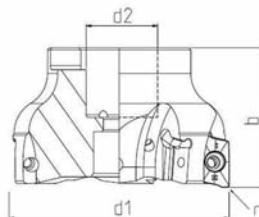
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Leg. a base di nichel [Inconel 718] [Hastelloy B-3] [Nimonic 90]	40	4	40	0.040	2	30.0	320	50	3.0	
		50	5	40	0.040	2	37.5	255	50	4.0	
		63	6	30	0.040	2	47.3	150	35	3.5	
		80	8	30	0.040	2	50.0	120	40	4.0	
											
	Acciaio al manganese Mn > 5% [1.3964 / Nitronic]	40	4	100	0.040	2	30.0	795	125	7.5	
		50	5	100	0.040	2	37.5	635	125	9.5	
		63	6	80	0.040	2	47.3	405	95	9.0	
		80	8	80	0.040	2	50.0	320	100	10.0	
											
	Acciaio resistente al calore Acciaio duplex [1.4462] [17-4 PH]	40	4	150	0.080	2	30.0	1195	380	23.0	
		50	5	150	0.080	2	37.5	955	380	28.5	
		63	6	120	0.080	2	47.3	605	290	27.5	
		80	8	120	0.080	2	50.0	475	305	30.5	
											
	Acciaio rapido PM ricotto [Böhler S390] [ASP 2023]	40	4	120	0.050	2	30.0	955	190	11.5	
		50	5	120	0.050	2	37.5	765	190	14.5	
		63	6	100	0.050	2	47.3	505	150	14.0	
		80	8	100	0.050	2	50.0	400	160	16.0	
											

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]	
	Leg. a base di nichel [Inconel 718] [Hastelloy B-3] [Nimonic 90]	40	4	40	0.050	10	4	320	65	2.5	
		50	5	40	0.050	10	4	255	65	2.5	
		63	6	40	0.050	10	4	200	60	2.5	
		80	8	40	0.050	10	4	160	65	2.5	
											
	Acciaio al manganese Mn > 5% [1.3964 / Nitronic]	40	4	100	0.060	10	8	795	190	15.0	
		50	5	100	0.060	10	8	635	190	15.0	
		63	6	100	0.060	10	8	505	180	14.5	
		80	8	100	0.060	10	8	400	190	15.0	
											
	Acciaio resistente al calore Acciaio duplex [1.4462] [17-4 PH]	40	4	150	0.060	10	8	1195	285	23.0	
		50	5	150	0.060	10	8	955	285	23.0	
		63	6	150	0.060	10	8	760	275	22.0	
		80	8	150	0.060	10	8	595	285	23.0	
											
	Acciaio rapido PM ricotto [Böhler S390] [ASP 2023]	40	4	120	0.060	10	8	955	230	18.5	
		50	5	120	0.060	10	8	765	230	18.5	
		63	6	120	0.060	10	8	605	220	17.5	
		80	8	120	0.060	10	8	475	230	18.5	
											

Frese ad angolo 90° ZX

Inserti 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8°
	γ 6°

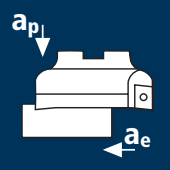






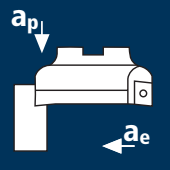




Rm < 850	Rm 850-1100					Inox Stainless	Ti Titanium	Nickel-Alloys Mangan-Steels HSS
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Frese ad angolo 90°						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W00410.404	40	16	40	12.5	4	●
W00410.505	50	22	40	12.5	5	●
W00410.636	63	22	40	12.5	6	●
W00410.808	80	27	50	12.5	8	●

Inserti ZX 13mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50410.013	14.8	8.1	4.7	0.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2	●

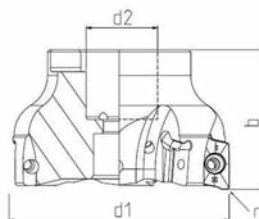
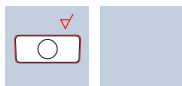
Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	40	4	600	0.120	2	30.0	4775	2290	137.5
		50	5	600	0.120	2	37.5	3820	2290	172.0
		63	6	500	0.120	2	47.3	2525	1820	172.0
		80	8	500	0.120	2	60.0	1990	1910	229.0
Getti d'alluminio Si 6% - 15% 	40	4	500	0.100	2	30.0	3980	1590	95.5	
	50	5	500	0.100	2	37.5	3185	1595	119.5	
	63	6	400	0.100	2	47.3	2020	1210	114.5	
	80	8	400	0.100	2	60.0	1590	1270	152.5	
Rame non legato 	40	4	400	0.080	2	30.0	3185	1020	61.0	
	50	5	400	0.080	2	37.5	2545	1020	76.5	
	63	6	350	0.080	2	47.3	1770	850	80.5	
	80	8	350	0.080	2	60.0	1395	895	107.5	
Materiali termoplastici 	40	4	600	0.120	2	30.0	4775	2290	137.5	
	50	5	600	0.120	2	37.5	3820	2290	172.0	
	63	6	500	0.120	2	47.3	2525	1820	172.0	
	80	8	500	0.120	2	60.0	1990	1910	229.0	

Applicazione	Materiale	d1 [mm]	z	v _c [m/min]	f _z [mm]	a _p [mm]	a _e [mm]	n [min ⁻¹]	v _f [mm/min]	Q [cm ³ /min]
	Alluminio malleabile Si < 6% 	40	4	600	0.120	10	8	4775	2290	183.0
		50	5	600	0.120	10	8	3820	2290	183.0
		63	6	500	0.120	10	8	2525	1820	145.5
		80	8	500	0.120	10	8	1990	1910	153.0
Getti d'alluminio Si 6% - 15% 	40	4	500	0.100	10	8	3980	1590	127.0	
	50	5	500	0.100	10	8	3185	1595	127.5	
	63	6	400	0.100	10	8	2020	1210	97.0	
	80	8	400	0.100	10	8	1590	1270	101.5	
Rame non legato 	40	4	400	0.080	10	8	3185	1020	81.5	
	50	5	400	0.080	10	8	2545	1020	81.5	
	63	6	350	0.080	10	8	1770	850	68.0	
	80	8	350	0.080	10	8	1395	895	71.5	
Materiali termoplastici 	40	4	600	0.120	10	8	4775	2290	183.0	
	50	5	600	0.120	10	8	3820	2290	183.0	
	63	6	500	0.120	10	8	2525	1820	145.5	
	80	8	500	0.120	10	8	1990	1910	153.0	

Frese ad angolo 90° AX

Inseri 13mm, con canale di aerazione/raffreddamento integrato

HM	λ 8° γ 20°
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			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	CuZn Brass CF / GF Fiber Reinforced Plastics
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Frese ad angolo 90°						Composizione fornitura: Corpo fresa comprese viti per serraggio inserto
N° Ordine	d1	d2	b	ap _{max.}	z	
W00410.404	40	16	40	12.5	4	●
W00410.505	50	22	40	12.5	5	●
W00410.636	63	22	40	12.5	6	●
W00410.808	80	27	50	12.5	8	●

Inseri AX 13mm					Composizione fornitura: Confezione minima: 10 pezzi
N° Ordine	H	B	D	r	
W50510.013	14.7	8.0	4.5	0.8	●

Accessori		Viti per serraggio inserti, confezione da 10 pezzi
N° Ordine		
W90110.013	Cacciavite dinamometrico 3.2 Nm con stelo Torx TX 15	●
W90111.013	Stelo intercambiabile di ricambio per cacciavite dinamometrico Torx TX 15	●
W90100.013	Cacciavite Torx TX 15	●
W90500.013	Vite di fissaggio per l'inserto Torx TX 15 / M 3.5 x 7.2	●

Accessori

Cacciavite dinamometrico Torx con stelo

Momento torcente preregolato fisso secondo la tabella



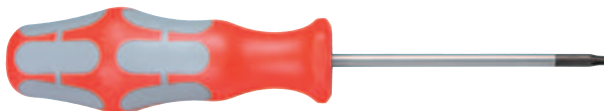
N° Ordine	Dimensione Torx	Momento di serraggio	
W90110.008	TX 08	1.2 Nm	●
W93110.010	TX 10	2.0 Nm	●
W90110.013	TX 15	3.2 Nm	●
W93110.012	TX 15	4.25 Nm	●
W91110.013	TX 20	5.0 Nm	●

Stelo intercambiabile di ricambio per cacciavite dinamometrico




















N° Ordine	Dimensione Torx		
W90111.008	TX 08		●
W93111.010	TX 10		●
W90111.013	TX 15		●
W91111.013	TX 20		●

Cacciavite Torx



N° Ordine	Dimensione Torx		
W90100.008	TX 08		●
W93100.010	TX 10		●
W90100.013	TX 15		●
W91100.013	TX 20		●

Marcatura e montaggio degli inserti

Tipo	Frese ad angolo	Frese per spianatura	Frese ad alto avanzamento	Frese a spianare circolari*
NX Acciaio •	 <p>N° Ordine W50111.008 W50111.013</p>	 <p>N° Ordine W51110.009 W51110.013</p>	 <p>N° Ordine W52110.010 W52110.013</p>	 <p>N° Ordine W53110.010 W53110.012</p>
SX Inox ••	 <p>N° Ordine W50310.008 W50310.013</p>	 <p>N° Ordine W51310.009 W51310.013</p>	 <p>N° Ordine W52310.010 W52310.013</p>	 <p>N° Ordine W53310.010 W53310.012</p>
HX Acciaio temprato •••	 <p>N° Ordine W50210.008 W50210.013</p>			 <p>N° Ordine W53210.010 W53210.012</p>
ZX Materiali difficilmente trucioliabili ••••	 <p>N° Ordine W50410.008 W50410.013</p>	 <p>N° Ordine W51410.009 W51410.013</p>	 <p>N° Ordine W52410.010 W52410.013</p>	 <p>N° Ordine W53410.010 W53410.012</p>
AX Alluminio •••• •	 <p>N° Ordine W50510.008 W50510.013</p>	 <p>N° Ordine W51510.009 W51510.013</p>		 <p>N° Ordine W53510.010 W53510.012</p>

- Prima di eseguire il montaggio, pulire accuratamente le sedi degli inserti
- Assicurarsi che le marcature degli inserti abbiano lo stesso orientamento
- Serrare le viti con il cacciavite dinamometrico
- Quando si serrano le viti, badare che gli inserti siano posizionati in modo preciso

* Gli inserti tondi possono essere utilizzati su 8 superfici di posizionamento. Per passare alla superficie successiva non occorre rimuovere completamente la vite. Durante la fase di serraggio, l'inserto tondo deve essere posizionato in modo preciso sulla superficie per non danneggiare la sede dell'inserto.





FRAISA vi offre dei prodotti altamente innovativi. Prodotti che sono sempre all'altezza degli sviluppi tecnologici e spesso ne rappresentano addirittura la massima espressione.

Con «**i suggerimenti di ToolSchool**» vogliamo illustrarvi le tecnologie di volta in volta più aggiornate comprese nel nostro catalogo e naturalmente i loro vantaggi.

«**I suggerimenti di ToolSchool**» vi dimostreranno con chiarezza come passare da prodotti finora impiegati a nuove soluzioni. Nel catalogo, con il logo  contrassegniamo prodotti selezionati per i quali proporre un upgrade tra le tecnologie già esistenti a quelle tecnologicamente più avanzate.

Il passaggio da «già esistente» a «nuovo» vi consentirà di incrementare la produttività e ridurre i costi assicurandovi più vantaggi sul mercato nei confronti della concorrenza.

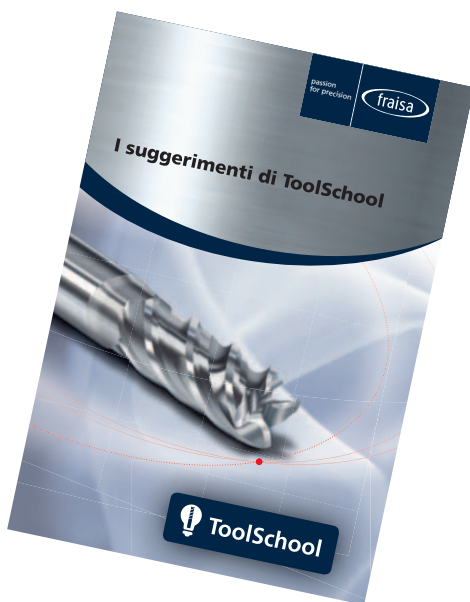
Grazie a ToolSchool potrete contare sempre sulle più aggiornate tecnologie. Questo vi permetterà di rafforzare la vostra posizione rispetto alla concorrenza.

In FRAISA, ToolSchool è sinonimo di esperienza pluriennale ampiamente collaudata e di grande perizia in fase di applicazione ma ToolSchool significa anche fondato know-how applicativo e vantaggi per il cliente. Su questo potete avere assoluta certezza.

La più aggiornata tecnologia FRAISA per:

- più efficienza
- meno costi
- migliore competitività sul mercato

A questo catalogo si aggiunge un opuscolo presenta in modo chiaro i suggerimenti di ToolSchool sulla base di una panoramica degli utensili.





Legenda riguardante la pagina dei prodotti

Classi di prestazione



Prodotti ad **alto grado di specializzazione** per applicazioni (eXtra!) che vadano oltre le applicazioni e i requisiti di prestazione generici.



Prodotti ad **ampio campo applicativo** nell'ambito delle applicazioni generiche e **con requisiti di prestazione elevati o molto elevati**.



Prodotti **a campo applicativo molto ampio, con requisiti di prestazione di medio livello e rapporto qualità-prezzo favorevole**.



Prodotti in acciaio rapido ad alte prestazioni per **applicazioni semplici** e/o requisiti di prestazione limitati a seconda della macchina.



Fraisa si avvale della sigla **KS** per specificare innovazioni straordinarie. Essa ricorda il leggendario direttore del reparto produzione sviluppo, il signor Konrad Schmid, il quale ha plasmato il marchio Fraisa dal 1969 al 2000.

Prestazione

Sgrossatura



Finitura



Questo indice descrive il rendimento degli utensili rispetto ad altri prodotti nel relativo capitolo. Più le caselle sono riempite, più l'utensile è appropriato relativo all'operazione. Troverete un indice per la lavorazione di sgrossatura e finitura.

Resistenza all'usura



Questo indice descrive la resistenza degli utensili all'usura al capitolo CFC. Quanto maggiore è il numero di campi compilati, tanto maggiore è la resistenza dell'utensile all'usura, caratteristica che risulta decisiva per la lavorazione di materiali abrasivi compositi.

Legenda riguardante la pagina dei prodotti

Tecnologie degli utensili



- Frese con angolo dell'elica variabile
- Riduzione al minimo di oscillazioni e vibrazioni
 - Volumi di truciolatura e durata d'uso maggiori



- Fresa con angolo di spoglia irregolare e variabile
- Smorzamento delle vibrazioni assiali e radiali e taglio dolce e regolare
 - Miglioramento delle superfici dei pezzi e minore rumorosità
 - Minore sollecitazione del mandrino e consumo di energia inferiore nonostante l'elevato volume di asportazione



- Geometria frontale per fresature in penetrazione ad alto rendimento
- Geometria frontale per fresature in penetrazione ad alto rendimento a taglio facile per angoli di penetrazione elevati
 - Maggior rendimento, durata e sicurezza del processo nei lavori di fresatura in penetrazione
 - Elevata funzionalità con i dati di taglio ToolExpert-HelixRamp



- Fresa con cava a gradini
- Vano di truciolatura maggiore
 - Asporto dei trucioli ottimizzata
 - Possibilità di avanzamenti assiali e radiali elevati



- Fresa con speciale geometria della cava
- Geometria del vano/della cava ottimizzata per uno scarico dei trucioli migliore
 - Progettazione ottimizzata dello spazio tra diametro del nucleo e vano per un'elevata stabilità degli utensili



- Fresa con rettifica denti
- Rinforzo delle punte del tagliente esposte
 - Implementazione di una forza di taglio maggiore



- Fresa con speciale smusso di protezione
- Rinforzo del cuneo tagliente principale per evitare distacchi
 - Possibilità di avanzamento dei denti elevato per utensili a taglienti lisci
 - Possibilità di avanzamenti assiali e radiali elevati per utensili profilati



- Fresa con condizionamento del tagliente speciale
- Condizionamento del tagliente principale per una maggiore stabilità del tagliente
 - Aumento del carico meccanico e termico sul tagliente
 - Incremento generale della durata d'uso



- Fascetta frontale
- Sostegno dell'utensile in direzione radiale e assiale
 - Vibrazioni ridotte
 - Migliore finitura superficiale del lato frontale e del lato laterale



- Preparazione bordo
- Sostegno dell'utensile in direzione radiale e assiale
 - Vibrazioni ridotte e maggiore rendimento
 - Migliore qualità della superficie grazie alla maggiore tranquillità di funzionamento



- Fresa con superficie di spoglia di forma speciale
- Rafforzamento significativo del cuneo tagliente
 - Maggiore potenza, meno vibrazioni e miglioramento della qualità del pezzo
 - Maggiore durata e affidabilità, dunque maggiori possibilità di automazione

Legenda riguardante la pagina dei prodotti

Tecnologie degli utensili



Utensili equilibrati con precisione

- Utensili equilibrati con precisione, minimo G2,5 a $n=20'000$ giri/min o squilibrio residuo ammesso <1 gmm
- Riduzione o aumento dell'equilibratura per mezzi di bloccaggio equilibrati con precisione
- Migliore qualità della superficie grazie alla maggiore tranquillità di funzionamento e alle minori vibrazioni
- Prolungamento della vita utile del mandrino macchina



Passaggi dolci

- I passaggi gambo-scarico-tagliente sono provvisti di salienti e raggi dolci
- Rigidità dell'utensile migliorata e dunque minore deviazione radiale
- Formazione minima di gradini in caso di approcci progressivi in profondità
- Maggiore carico meccanico e dunque maggiore rendimento



Utensile fresa con diametro del nocciolo crescente

- Miglioramento della rigidità dell'utensile, dunque minore escursione dell'utensile
- Maggiore rendimento nella zona degli accostamenti ap, ae e dell'avanzamento fz
- Migliore precisione del pezzo grazie alla minore escursione dell'utensile



Fresa con gambo di presa in qualità h5

- Elevata precisione di concentricità ed eccentricità
- Ottima per le moderne attrezzature di serraggio di precisione



Fresa con estremità emisferica con condizionamento del tagliente speciale per lavori di sgrossatura

- Condizionamento del tagliente principale per una maggiore stabilità del tagliente
- Aumento significativo dei volumi di truciatura rispetto alle frese con estremità emisferica tradizionali
- Incremento generale della durata d'uso



Fresa con estremità emisferica con condizionamento del tagliente speciale per lavori di finitura

- Condizionamento e lucidatura del tagliente principale
- Precisione dei profili duratura e qualità delle superfici
- Incremento generale della durata d'uso



Fresa torica con condizionatura speciale del bordo per la sgrossatura

- Condizionatura del tagliente principale per una maggiore stabilità del bordo di taglio
- Significativo aumento del volume di truciolo nell'unità tempo rispetto alle comuni frese toriche
- Miglioramento generale in fatto di durata



Fresa torica con condizionatura speciale del bordo per la finitura

- Condizionatura e levigatura del tagliente principale
- Duratura precisione del contorno e qualità della superficie
- Miglioramento generale in fatto di durata



Inserto

- Con rettifica perimetrale, in parte con petti levigati su tutti i lati
- Rendimento migliorato

Legenda riguardante la pagina dei prodotti

Tecnologie degli utensili



Fresa con estremità emisferica con tolleranza del diametro ad alta precisione

- Le tolleranze impostate in modo speciale semplificano la programmazione e il completamento sicuro del contorno
- Campo di tolleranza decisamente preciso per un'elevata accuratezza delle forme



Fresa con estremità emisferica con tolleranza del raggio ad alta precisione

- Le tolleranze impostate in modo speciale semplificano la programmazione e il completamento sicuro del contorno
- Campo di tolleranza decisamente preciso per un'elevata accuratezza delle forme



Frese toriche con tolleranza del diametro ad alta precisione

- Le tolleranze impostate in modo speciale semplificano la programmazione e il completamento sicuro del contorno
- Campo di tolleranza decisamente preciso per un'elevata accuratezza delle forme



Frese toriche con tolleranza del raggio ad alta precisione

- Le tolleranze impostate in modo speciale semplificano la programmazione e il completamento sicuro del contorno
- Campo di tolleranza decisamente preciso per un'elevata accuratezza delle forme



Frese cilindriche con tolleranza del diametro ad alta precisione

- Le tolleranze impostate in modo speciale semplificano la programmazione e il completamento sicuro del contorno
- Campo di tolleranza decisamente preciso per un'elevata accuratezza delle forme

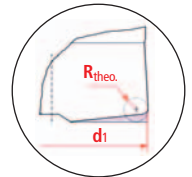


HFC

Frese ad alto avanzamento (HFC)

- Utensile con una geometria del tagliente speciale per le lavorazioni ad alto avanzamento
- Possibilità di avanzamento elevato grazie alla distribuzione delle sezioni dei trucioli
- Vano maggiore per una rimozione rapida e semplice dei trucioli
- Elevati volumi di asporto con una buona approssimazione dei contorni

La fresa HFC è caratterizzata da un raggio di programmazione teorico (R_{theo}). Questo valore è indicato per ogni diametro nella tabella dei dati della pagina del catalogo ed è specificato per la programmazione CNC/CAM come raggio dell'utensile. Durante la lavorazione si genera comunque del materiale residuo a causa della differenza tra R_{theo} e l'effettivo contorno dell'utensile.



Legenda riguardante la pagina dei prodotti

Materiali per utensili

**HM
XT**

Metallo duro micrograna. Durezza 1900 HV. Contenuto di cobalto 9%. Si distingue particolarmente per l'elevata tenacità (Toughness).

**HM
XA**

Metallo duro micrograna. Durezza 1950 HV. Contenuto di cobalto 8%. Si distingue particolarmente per l'elevata resistenza all'usura (Abrasion).

**HM
XR**

Metallo duro micrograna. Durezza 1590 HV. Contenuto di cobalto 10%. Si distingue particolarmente per l'elevata tenacità.

**HM
X10**

Metallo duro micrograna. Durezza >1600 HV. Contenuto di cobalto 10%. Si distingue particolarmente per l'elevata tenacità e resistenza all'usura.

**HM
UT**

Metallo duro micrograna. Durezza 1680 HV. Contenuto di cobalto 12%. Si distingue particolarmente per l'elevata tenacità (Toughness).

**HM
MG10**

Metallo duro micrograna. Durezza 1600 HV. Contenuto di cobalto 10%.

**HM
MG6**

Metallo duro micrograna. Durezza 1800 HV. Contenuto di cobalto 6%.

**HM
Plus**

Metallo duro a grana ultrafine. Durezza 1800 HV. Contenuto di cobalto 12%.

**HM
Micro**

Metallo duro a grana ultrafine. Durezza 1680 HV. Contenuto di cobalto 10%.

HM

Metallo duro micrograno, universale.

i

Legenda riguardante la pagina dei prodotti

Materiali per utensili

CVD

Diamante puro prodotto mediante deposizione chimica nella fase gassosa (CVD). Si caratterizza per l'ottimale tenacità alla rottura presso la tagliente e l'elevata conducibilità termica.

CBN

Nitruro di boro cubico cristallino (CBN). Durezza 4700 HV. Si distingue particolarmente per l'elevata resistenza all'usura (Abrasion).

HSS PM/F

ASR di alta resa per utensili, da metallurgia delle polveri.

HSS-E Co8

ASR di alta resa.

Legenda riguardante la pagina dei prodotti

Forma dello spigolo dei taglienti



L'angolo tra il tagliente frontale e il tagliente periferico è dotato di uno smusso di protezione di 45°. La dimensione dello smusso di protezione è indicata per ogni diametro nella tabella dei dati della pagina del catalogo.



L'utensile è torico. Il valore del raggio è indicato nella tabella-dati in funzione del diametro.



Utensili con estremità emisferica.



Lo spigolo tra tagliente frontale e tagliente periferico è vivo.



Fresa ad alto avanzamento (HFC). Utensile con una geometria del tagliente speciale per le lavorazioni ad alto avanzamento.



Fresa ad alto avanzamento (HFC) con raggio angolare. Utensile con speciale geometria del tagliente per la lavorazione ad avanzamento rapido.

Legenda riguardante la pagina dei prodotti

Idoneità alla lavorazione



Lo sfondo blu indica l'eccezionale adeguatezza dell'utensile a questo materiale.



Lo sfondo azzurro indica un'adeguatezza da buona a sufficiente dell'utensile a questo materiale.

Capitolo: Acciaio, acciaio inox e titanio / Lavorazione in 3D di acciaio/ Forme speciali

Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56	HRC 56-60	HRC > 60	Inox Stainless	Ti Titanium	
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Capitolo: Alluminio e rame

Rm < 850			Al Aluminium > 99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
--------------------	--	--	---------------------------------	---------------------------------	--------------------------------	--	---------------------	-------------------------------	--

Nel campo aggiuntivo sono indicati gli altri materiali che è possibile lavorare

Capitolo: CFC

Al Aluminium Cast	Cu Copper	CuZn Brass		C Graphite	CFK GFK I	CFK GFK II	CFK III	CFK/Al	
--------------------------------	---------------------	----------------------	--	----------------------	--------------------------------------	---------------------------------------	--------------------------	---------------	--



Gruppo I: plastiche tecniche fibrorinforzate e materiali plastici composti con percentuale di fibra fino al 30%



Gruppo II: materiali plastici composti fibrorinforzati e abrasivi con percentuale di fibra fino al 60%









Gruppo III: materiali plastici composti ad alte prestazioni, rinforzati con fibra di carbonio e molto abrasivi, con percentuale di fibra superiore al 60%

È possibile assegnare i materiali composti fibrorinforzati ai 3 gruppi di truciolatura in funzione della combinazione dei seguenti fattori di influenza (la descrizione di cui sopra funge da aiuto semplificato):



- Matrice (legante)
- Tipo di fibra (materiale)
- Forma della fibra (corta, lunga, infinita, tessuto)
- Percentuale di fibra
- Struttura della fibra (orientamento)
- Procedimento di produzione

Legenda riguardante la pagina dei prodotti


Forma del gambo / Esecuzioni del gambo

-  Utensili per metallo duro con gambo cilindrico: esecuzione gambo ai sensi della norma DIN 6535 HA
-  Utensili per metallo duro con gambo cilindrico e superficie di serraggio laterale: esecuzione gambo ai sensi della norma DIN 6535 HB
-  Utensili a gambo corto: il gambo corrisponde alla classificazione e alla tolleranza del diametro della norma DIN 6535 HB. La sezione dietro alla superficie di serraggio è ridotta.
-  Utensili HSS con gambo cilindrico e superficie di serraggio laterale: esecuzione gambo ai sensi della norma DIN 1835 B
-  Materiale del gambo in metallo duro riciclato di grande qualità
- 


Inserti - Utensili frese

-  Esecuzione gambo ai sensi della norma DIN 1835 B
-  Attacco femmina con cava trasversale DIN 138

Angolo d'elica e angolo di spoglia interna

-  Angolo d'elica e angolo di spoglia interna sono elementi di speciale importanza delle frese. Per questa ragione angolo d'elica λ e angolo di spoglia interna γ sono indicati per ciascun utensile. I valori precisi possono variare col diametro.

Angolo di collisione α

-  Gli utensili aventi diametro di taglienti inferiore al diametro del gambo esigono speciali cure nell'impiego. Le collisioni sono evitate con sicurezza se le superfici laterali di delimitazione sono inclinate con un angolo minimo (angolo di collisione α) rispetto alla verticale. L'angolo di collisione è indicato per ogni diametro nella tabella dei dati della pagina del catalogo.

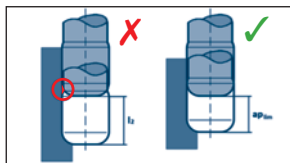
Legenda riguardante la pagina dei prodotti

Abbreviazioni

d₁	Diametro dei taglienti [mm]
d₂	Diametro gambo o foro [mm]
d₃	Diametro di scarico o esterno (fresa per spianatura) [mm]
d₄	Diametro di scarico prima del passaggio scarico-gambo [mm]
d₅	Diametro superficie frontale [mm]
l₁	Lunghezza totale dell'utensile [mm]
l₂	Lunghezza di taglio [mm]
l₃	Distanza della parte frontale dell'utensile dalla fine del scarico [mm]
l₅	Distanza della parte frontale del gambo dalla fine del scarico [mm]
l₆	Lunghezza gambo [mm]
l₇	Lunghezza testa [mm]
Θ	Angolo di serraggio «Teta» tra d ₃ e d ₄ [° - DEG]
45°	Dimensione dello smusso di protezione tra tagliente frontale e tagliente periferico [mm]
r	Torico [mm]
α	Angolo di collisione «Alfa» [° - DEG]
β	Angolo di registrazione minimo «Beta» [° - DEG]
z	Numero dei taglienti
R_{theo.}	Raggio di programmazione teorico (R _{theo.}) per utensili HFC [mm] Prestare attenzione alle indicazioni sulla tecnologia degli utensili HFC
ap_{max}	Massimo avanzamento assiale [mm]
ap_{lim}	Approccio assiale limitato dal caso di applicazione o dalla geometria dell'utensile [mm]
b	Altezza utensile per frese cilindriche frontali [mm]
φ_{max}	Angolo di penetrazione
H	Altezza del inserto
B	Larghezza del inserto
D	Spessore del inserto
D₁	Diametro dell'inserto
L-Typ	Esecuzione: C = Corta; N = Normale; M = Medio-lunga; L = Lunga; XL = Extralunga
I	Interface: parametro interfaccia

Avvertenze tecniche per l'applicazione

Utensili AX-RV:



Con gli utensili AX-RV è possibile ottenere passaggi puliti durante la rifinitura con approcci gradualmente in profondità. In questo caso di applicazione è tuttavia importante un corretto approccio in profondità. A causa della geometria dell'utensile con raggio frontale, l'approccio assiale limitato (ap_{lim}) è determinato nelle seguenti tabelle:

Profondità dell'approccio assiale ap_{lim} per passaggio piano in parete con AX-RV2 e AX-RV3

d_1	l_2	Raggio r	ap_{lim}	Raggio r	ap_{lim}	Raggio r	ap_{lim}	Raggio r	ap_{lim}	Raggio r	ap_{lim}	Raggio r	ap_{lim}
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
3	4	0.5	2.5										
4	5	0.5	3.5										
5	6	0.5	4.5										
6	7	0.5	5.5	1.0	5.0					2.5	3.5		
8	9			1.0	7.0					2.5	5.5		
10	11			1.0	9.0	1.5	8.5			2.5	7.5	4.0	6.0
12	13			1.0	11.0	1.5	10.5			2.5	9.5	4.0	8.0
16	18			1.0	16.0	1.5	15.5	2.0	15.0	2.5	14.5	4.0	13.0
20	22			1.0	20.0	1.5	19.5	2.0	19.0	2.5	18.5	4.0	17.0
25	27			1.0	25.0	1.5	24.5			2.5	23.5	4.0	22.0

Lavorazione CFC/PRFV:

Lavorazione raccomandata:

Rotazione invertita

- Il calore viene condotto via dall'elemento costruttivo
- Migliore qualità della superficie
- Minore danneggiamento cumulativo (danneggiamento meccanico)
- La polvere viene asportata

Fresatrice cilindrica con rivestimento in DIAMANTE:

Lavorazione di sgrossatura e finitura di CFC in una sola passata.



Tagliente retta per l'impiego neutro con qualità di serraggio e spessore della parete medi.

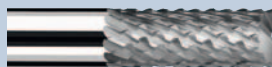


Tagliente a trazione per l'impiego normale con buon serraggio e asportazione di polvere/truciolini.



Tagliente a spinta per l'impiego in materiali sottili, poiché il materiale viene premuto contro la base.

Fresatrice cilindrica lucida:



Dentellatura media per CFC/PRFV, percentuale di fibra > 40% con tagliente a trazione, soprattutto per la sgrossatura di materiali sottili.

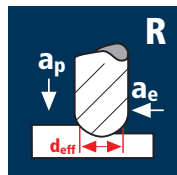


Dentellatura grossa per CFC/PRFV, percentuale di fibra > 40% con tagliente a trazione, soprattutto per la sgrossatura di materiali spessi.

Avvertenze tecniche per l'applicazione

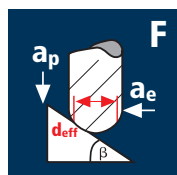
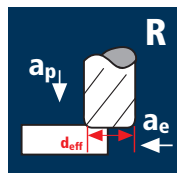
Indicazioni sull'applicazione nel capitolo Lavorazione in 3D

I simboli di applicazione sono mostrati sul lato sinistro dei parametri di taglio. La lettera in alto a destra indica la strategia per i parametri di taglio indicati.



R sta per «Roughing»: processo di sgrossatura che richiede una macchina e un serraggio con prestazioni e stabilità sufficienti.

Sgrossatura planare: I parametri di taglio indicati in catalogo sono specifici per l'asportazione a strati. In tal caso l'asse macchina assiale ha un avanzamento costante e non si modifica mai. Per tale ragione si sconsiglia l'esecuzione di tagli ad estrusione e a percussione!

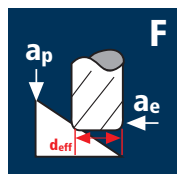


PF sta per «Pre-Finishing»: pre finitura

F sta per «Finishing»: finitura

SF sta per «Super-Finishing»: super finitura

I parametri di taglio indicati in catalogo sono specifici per l'asportazione in piano e parallelamente alla forma del pezzo. È ammessa l'esecuzione di tagli ad estrusione e a percussione, fermo restando che il taglio a percussione crea condizioni operative sfavorevoli riducendo la durata utile dell'utensile.



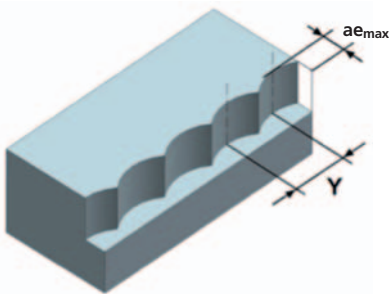
Avvertenze tecniche per l'applicazione

Frese con inserti:

Profondità di accostamento radiale a_e per superfici piane con utensili frese con inserti HFC

d_1	Dimensioni inserto	a_e
[mm]	[mm]	[mm]
25	10	13.6
35	13	18.8
40	10	28.6
50	10	38.6
63	10	51.6
50	13	33.8
63	13	46.8
80	13	63.8

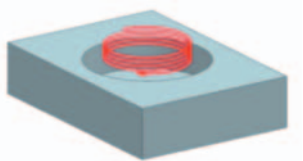
Fresatura a tuffo con utensili frese con inserti HFC



Dimensioni inserto	$a_{e_{max}}$	f_z	Y_{max}
[mm]	[mm]	[mm]	[mm]
10	8	0.15	$< 0.7 \times d_1$
13	10.5	0.20	$< 0.7 \times d_1$

Avvertenze tecniche per l'applicazione

Fresatura a perforazione/tuffo circolare con utensili frese con inserti HFC e inserti tondi



Diametro di foratura minimo e massimo

d₁ [mm]	Inserti HFC 10mm		Inserti HFC 13mm	
	D_{max} [mm]	D_{min} [mm]	D_{max} [mm]	D_{min} [mm]
25	48	35	–	–
35	–	–	68	50
40	78	65	–	–
50	98	85	98	80
63	124	111	124	106
80	–	–	158	140

d₁ [mm]	Inserti tondi 10mm		Inserti tondi 12mm	
	D_{max} [mm]	D_{min} [mm]	D_{max} [mm]	D_{min} [mm]
20	40	24	–	–
25	50	32	–	–
32	64	46	–	–
35	70	52	70	48
40	80	62	80	58
42	84	66	84	62
50	100	82	100	78
52	104	86	104	82
63	–	–	126	104
66	–	–	132	110
80	–	–	160	138
100	–	–	200	178

Informazioni riguardanti i parametri di taglio

Angolo di penetrazione per frese integrali

Capitolo: Acciaio, acciaio inox, titanio e nichel												
Gruppo materiale	Rm 850-1500			HRC 48 - 60			Inox Stainless			Ti Titanium		
Versione	N	M	L	N	M	L	N	M	L	N	M	L
Avanzamento vf [%]	100%			100%			80%			80%		
z = 2	2.50°	1.80°	1.00°	1.50°	1.00°	0.60°	2.50°	1.80°	1.00°	2.50°	1.80°	1.00°
z = 3	2.00°	1.20°	0.80°	1.00°	0.65°	0.40°	2.00°	1.20°	0.80°	2.00°	1.20°	0.80°
z = 4	1.00°	0.65°	0.40°	0.50°	0.35°	0.20°	1.00°	0.65°	0.40°	1.00°	0.65°	0.40°
z > 4	0.40°	0.30°	0.20°	0.20°	0.15°	0.10°	0.40°	0.30°	0.20°	0.40°	0.30°	0.20°

Capitolo: Lavorazione in 3D												
Gruppo materiale	Rm 850-1500			HRC 48 - 60			Inox Stainless			Ti Titanium		
Versione	N	M	L	N	M	L	N	M	L	N	M	L
Avanzamento vf [%]	100%			100%			80%			80%		
z = 2	0.50°	0.35°	0.25°	0.25°	0.20°	0.10°	0.50°	0.35°	0.25°	0.50°	0.35°	0.25°
z = 4	0.30°	0.25°	0.15°	0.20°	0.15°	0.10°	0.30°	0.25°	0.15°	0.30°	0.25°	0.15°
z > 4	0.20°	0.15°	0.10°	0.15°	0.10°	0.10°	0.20°	0.15°	0.10°	0.20°	0.15°	0.10°
HFC	0.50°	0.35°	0.25°	0.40°	0.30°	0.20°	0.50°	0.35°	0.25°	0.50°	0.35°	0.25°

Capitolo: Alluminio e rame												
Gruppo materiale	Al Aluminium Alloy						Cu Copper					
Versione	N	M	2xd	3xd	4xd	5xd	N	M	2xd	3xd	4xd	5xd
Avanzamento vf [%]	100%						100%					
z = 2	5.00°	4.00°	6.00°	5.00°	4.00°	2.50°	4.00°	3.00°	5.00°	4.00°	3.00°	2.00°
z = 3	4.50°	3.50°	5.00°	4.50°	3.50°	2.00°	3.50°	2.50°	4.00°	3.50°	2.50°	1.50°

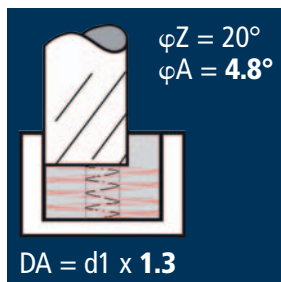
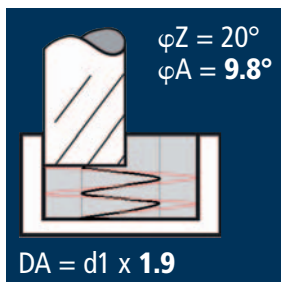
Informazioni riguardanti i parametri di taglio

Angolo di penetrazione per frese ad inserti

Gruppo materiale		Rm 850-1500			HRC 48 - 60			Inox Stainless		Ti Titanium	Al Aluminium Alloy		
Versione		K	M	L/XL	K	M	L/XL	K	M	L/XL	K	M	L/XL
Avanzamento vf [%]		100%			100%			80%			100%		
	d ₁												
Frese ad angolo/Frese per scanalature 8mm	16	1.00°	0.80°	0.60°	0.70°	0.55°	0.40°	1.00°	0.80°	0.60°	1.30°	1.10°	0.80°
Frese ad angolo/Frese per scanalature 8mm	20	0.75°	0.60°	0.45°	0.55°	0.40°	0.30°	0.75°	0.60°	0.45°	1.00°	0.80°	0.60°
Frese ad angolo/Frese per scanalature 8mm	25	0.75°	0.60°	0.45°	0.55°	0.40°	0.30°	0.75°	0.60°	0.45°	1.00°	0.80°	0.60°
Frese ad angolo/Frese per scanalature 8mm	32	0.50°	0.40°	0.30°	0.35°	0.30°	0.20°	0.50°	0.40°	0.30°	0.65°	0.50°	0.40°
Frese ad angolo/Frese per scanalature 13mm	25	2.00°	1.60°	1.20°	1.40°	1.10°	0.85°	2.00°	1.60°	1.20°	2.50°	2.00°	1.50°
Frese ad angolo/Frese per scanalature 13mm	32	1.60°	1.30°	0.95°	1.10°	0.90°	0.65°	1.60°	1.30°	0.95°	2.00°	1.60°	1.20°
Frese ad angolo 8mm	40 ; 50	0.20°			0.20°			0.20°			0.25°		
Frese ad angolo 8mm	63 ; 80	0.10°			0.10°			0.10°			0.15°		
Frese ad angolo 13mm	40 ; 50	0.40°			0.40°			0.40°			0.45°		
Frese ad angolo 13mm	63 ; 80	0.20°			0.20°			0.20°			0.25°		
Frese per spianatura	40 ; 50	0.15°			X			0.15°			0.20°		
Frese per spianatura	63 ; 80	0.10°			X			0.10°			0.15°		
Frese per spianatura	100 ; 125	X			X			X			X		
Frese ad alto avanzamento	25 ; 35	0.60°	0.40°	0.20°	0.50°	0.30°	0.15°	0.60°	0.40°	0.20°	X		
Frese ad alto avanzamento	40 ; 50	0.40°			0.30°			0.40°			X		
Frese ad alto avanzamento	63 ; 80	0.20°			0.15°			0.20°			X		
Frese a spianare circolari	20 ; 25	0.60°	0.40°	0.20°	0.50°	0.30°	0.15°	0.60°	0.40°	0.20°	0.80°	0.50°	0.25°
Frese a spianare circolari	32 ; 35	0.60°	0.40°	0.20°	0.50°	0.30°	0.15°	0.60°	0.40°	0.20°	0.80°	0.50°	0.25°
Frese a spianare circolari	40 ; 42	0.50°			0.40°			0.50°			0.60°		
Frese a spianare circolari	50 ; 52	0.40°			0.30°			0.40°			0.50°		
Frese a spianare circolari	63 ; 66	0.25°			0.20°			0.25°			0.35°		
Frese a spianare circolari	80 ; 100	0.10°			0.10°			0.10°			0.20°		

Informazioni riguardanti i parametri di taglio

Angolo di penetrazione (Helix) per fresi ad alto rendimento NVDS-NVS



Programmare correttamente l'angolo di penetrazione φZ o φA !

Tabella di conversione φZ in φA , con corrispondente diametro del foro											
Angolo di penetrazione φZ [°]	20°	18°	17.5°	16°	15°	13°	12°	10°	9°	8°	7°
Il diametro del foro DA											
	Angolo di penetrazione φA [°]										
DA = d1 x 1.3 [mm]	4.8°	4.3°	4.2°	3.8°	3.5°	3.0	2.8°	2.3°	2.1°	1.9°	1.6°
DA = d1 x 1.5 [mm]	6.9°	6.2°	6.0°	5.5°	5.1°	4.4°	4.1°	3.4°	3.0°	2.7°	2.3°
DA = d1 x 1.7 [mm]	8.5°	7.6°	7.4°	6.7°	6.3°	5.4°	5.0°	4.2°	3.7°	3.3°	2.9°
DA = d1 x 1.9 [mm]	9.8°	8.7°	8.5°	7.7°	7.2°	6.2°	5.7°	4.8°	4.3°	3.8°	3.3°

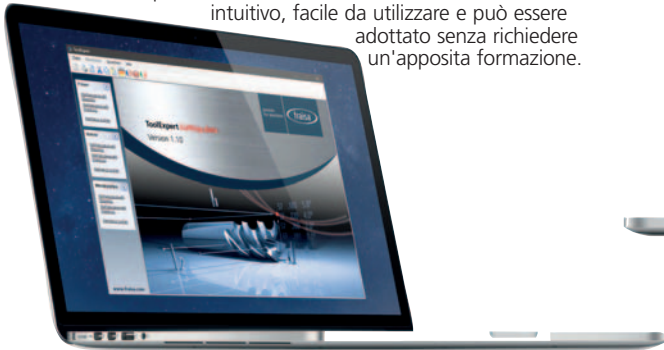
Suggerimento FRAISA

Utilizzare il ToolExpert Helixramp

Informazioni riguardanti i parametri di taglio

Software per dati di taglio FRAISA, per un impiego sicuro degli utensili

Il software per i dati di taglio **ToolExpert** viene continuamente esteso ai nuovi prodotti ed ambiti di applicazione. Il database con i materiali ed i relativi parametri di applicazione è talmente ampio che non manca praticamente nessun materiale. Il software è intuitivo, facile da utilizzare e può essere adottato senza richiedere un'apposita formazione.



Il nuovo strumento online per il calcolo dei dati di taglio ToolExpert HDC – High Dynamic Cutting

Mettete in pratica una strategia di sgrossatura ad alte prestazioni HDC (fresatura trocoidale).

La fresatura HDC (High Dynamic Cutting), detta anche fresatura trocoidale, è una strategia di sgrossatura ad alte prestazioni che si caratterizza per le condizioni di taglio costanti. Con questa caratteristica è possibile aumentare in modo significativo il volume di truciolatura nell'unità di tempo e la sicurezza del processo, aumentando allo stesso tempo la durata degli utensili.

I sistemi CAM consentono di attuare questa strategia. Finora mancavano però i corrispondenti dati di taglio. Questa lacuna è colmata dal nuovo ToolExpert HDC di Fraisa.

Avvaletevi dello strumento online per il calcolo dei dati di taglio ToolExpert HDC senza scaricare alcun software!



Il nuovo strumento online per il calcolo dei dati di taglio ToolExpert HelixRamp

Con il loro nuovo frontale per fresature a immersione ad alto rendimento, i modelli NX-NVDS e NB-NVDS raggiungono un livello prestazionale tale da ottenere massima produttività e sicurezza del processo in 7 dimensioni!

Con questa innovazione FRAISA, gli utensili NVDS aprono la via a una nuova gamma prestazionale!

Lo sviluppo del nuovo frontale per fresature a immersione ad alto rendimento permette alla FRAISA di avvalersi del termine fresatura a immersione ad alto rendimento. Il nuovo frontale per fresature a immersione ad alto rendimento taglia più facilmente il materiale ed elimina i trucioli in un processo sicuro.

In aggiunta ai nuovi utensili ad alto rendimento è stato sviluppato il software dei dati di taglio ToolExpert HelixRamp. Il software può comodamente essere avviato dal sito Web. Con pochi clic potete definire il materiale, gli utensili e la strategia di penetrazione, ottenendo i parametri per programmare il controllo della vostra macchina o il CAM.



Avvaletevi dello strumento online per il calcolo dei dati di taglio ToolExpert HelixRamp senza scaricare alcun software!

Formule di calcolo per i parametri di taglio

Formule

d₁	Diametro dei taglienti [mm]
z	Numero dei taglienti
a_p	Profondità di avanzamento assiale [mm]
a_e	Profondità di avanzamento radiale [mm]
v_c	Velocità di taglio [m/min]
f_z	Avanzamento per dente e torsione [mm]
n	Velocità di rotazione [min ⁻¹]
v_f	Velocità di avanzamento [mm/min]
f	Avanzamento per giro [mm]
Q	Volume di truciolatura [cm ³ /min]
d_{eff}	Diametro d'intervento effettivo [mm]
β	Angolo di penetrazione «Beta» [° - DEG]
•	Nessun impiego consigliato per il tipo L corrispondente
L_A	Lunghezza totale dal naso mandrino

Velocità di rotazione

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \left[\frac{1}{\text{min}} \right]$$

Velocità di taglio

$$v_c = \frac{d_1 \cdot n \cdot \pi}{1000} \left[\frac{\text{m}}{\text{min}} \right]$$

Velocità di avanzamento

$$v_f = f_z \cdot z \cdot n \left[\frac{\text{mm}}{\text{min}} \right]$$

Avanzamento per dente

$$f_z = \frac{v_f}{z \cdot n} \text{ [mm]}$$

Avanzamento per giro

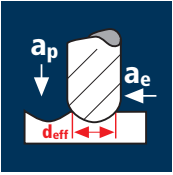
$$f = f_z \cdot z \text{ [mm]}$$

Volume di truciolatura

$$Q = \frac{a_p \cdot a_e \cdot v_f}{1000} \left[\frac{\text{cm}^3}{\text{min}} \right]$$

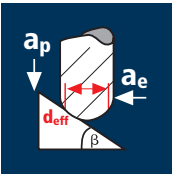
Formule di calcolo per i parametri di taglio

Diametro effettivo per frese con estremità emisferica con angolo di penetrazione $\beta = 0^\circ$



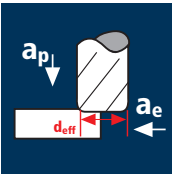
$$d_{\text{eff}} = 2 \cdot \sqrt{d_1 \cdot a_p - a_p^2} \quad [\text{mm}]$$

Diametro effettivo per frese con estremità emisferica con angolo di penetrazione $0 < \beta < 90^\circ$
 Impostazione della calcolatrice tascabile in [° - DEG]; inserimento β in [° - DEG]

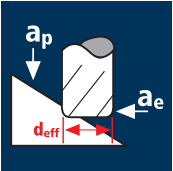


$$d_{\text{eff}} = d_1 \cdot \sin \left[\beta + \cos^{-1} \left(\frac{d_1 - 2 \cdot a_p}{d_1} \right) \right] \quad [\text{mm}]$$

Diametro effettivo per frese toriche con angolo di penetrazione $0 \leq \beta < 90^\circ$
 Impostazione della calcolatrice tascabile in [° - DEG]; inserimento β in [° - DEG]



$$d_{\text{eff}} = d_1 - 2 \cdot r + 2 \cdot r \cdot \sin \left[\beta + \cos^{-1} \left(1 - \frac{a_p}{r} \right) \right] \quad [\text{mm}]$$



Formule di calcolo per i parametri di taglio

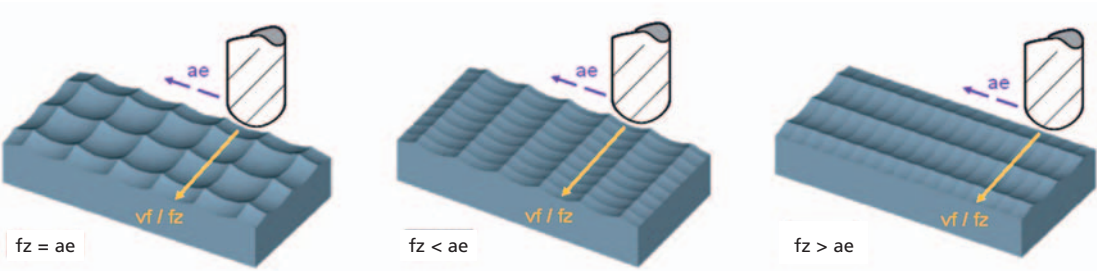
Profondità teorica e qualità superfici

Profondità in direzione
avanzamento vf

$$R_{th,vf} = \left(\frac{d_1}{2} - \sqrt{\frac{d_1^2 - f_z^2}{4}} \right) \cdot 1000 \text{ } [\mu\text{m}]$$

Profondità in direzione
avanzamento ae

$$R_{th,ae} = \left(\frac{d_1}{2} - \sqrt{\frac{d_1^2 - ae^2}{4}} \right) \cdot 1000 \text{ } [\mu\text{m}]$$



Qualità superficie

Valori ruvidità massimi Ra in μm ; 1 μm = 0.001 mm					
3.2	1.6	0.8	0.4	0.2	0.1
Classi di ruvidità					
N8	N7	N6	N5	N4	N3

Tabella di confronto delle durezza ($R_m \rightarrow HV10 \rightarrow HB \rightarrow HRC$)

R_m [N/mm ²]	HV 10	HB	HRC	R_m [N/mm ²]	HV 10	HB	HRC
240	75	71		920	287	273	28
255	80	76		940	293	278	29
270	85	81		970	302	287	30
285	90	86		995	310	295	31
305	95	90		1020	317	301	32
320	100	95		1050	327	311	33
335	105	100		1080	336	319	34
350	110	105		1110	345	328	35
370	115	109		1140	355	337	36
385	120	114		1170	364	346	37
400	125	119		1200	373	354	38
415	130	124		1230	382	363	39
430	135	128		1260	392	372	40
450	140	133		1300	403	383	41
465	145	138		1330	413	393	42
480	150	143		1360	423	402	43
495	155	147		1400	434	413	44
510	160	152		1440	446	424	45
530	165	157		1480	458	435	46
545	170	162		1530	473	449	47
560	175	166		1570	484	460	48
575	180	171		1620	497	472	49
595	185	176		1680	514	488	50
610	190	181		1730	527	501	51
625	195	185		1790	544	517	52
640	200	190		1845	560	532	53
660	205	195		1910	578	549	54
675	210	199		1980	596	567	55
690	215	204		2050	615	584	56
705	220	209		2140	639	607	57
720	225	214			655	622	58
740	230	219			675		59
755	235	223			698		60
770	240	228			720		61
785	245	233			745		62
800	250	238	22		773		63
820	255	242	23		800		64
835	260	247	24		829		65
860	268	255	25		864		66
870	272	258	26		900		67
900	280	266	27		940		68

Idoneità strato per frese

Idoneità strato nella lavorazione sull'asciutto e/o sul bagnato



- A: Il rivestimento A è eccellente per la lavorazione a umido.
 B: Nella lavorazione a umido il rivestimento B da risultati da sufficienti a buoni.
 C: Il rivestimento C è eccellente per la lavorazione a secco.
 D: Nella lavorazione a secco il rivestimento D offre risultati da sufficienti a buoni.

Idoneità strato per frese nella corrispondente classe di materiale

1 = Massimo livello di idoneità 2 = Livello di idoneità da sufficiente a buono	<u>U</u> UNICUT-4X	<u>P</u> POLYCHROM	<u>D</u> DURO-S	<u>V</u> DURO-V	<u>X</u> X-AL	<u>M</u> MICRO	<u>C</u> CELERO	
Classi di materiale								
Acciaio < 500 N/mm ²	1 X	1 X	X X	2 X	1 X	1 X	1 X	
Acciaio 500 - 850 N/mm ²	1 X	1 X	X X	2 X	1 X	1 X	X X	
Acciaio 850 - 1100 N/mm ²	1 X	1 1	X X	2 1	1 1	1 X	X X	
Acciaio 1100 - 1300 N/mm ²	2 2	2 1	X X	2 1	2 1	1 X	X X	
Acciaio 1300 - 1500 N/mm ²	2 2	2 1	X 2	2 1	2 1	2 1	X X	
Acciaio da utensile temprato 48-52 HRC	X 2	X 1	X 2	X 1	X 1	X 1	X X	
Acciaio da utensile temprato 52-56 HRC	X X	X 1	X 1	X 1	X 1	X 1	X X	
Acciaio da utensile temprato 56-60 HRC	X X	X 1	X 1	X 1	X 1	X 1	X X	
Acciaio da utensile temprato >60 HRC	X X	X 2	X 1	X 1	X 1	X X	X X	
Acciaio per lavorazione a freddo (12% Cr) fortemente legati [1.2379]	2 2	2 1	X 1	2 1	2 1	X X	X X	
Acciaio per lavorazione a freddo debolmente legati [1.2067]	2 2	2 1	X 1	2 1	2 1	X X	X X	
Acciaio inossidabili ferritico/martensitico	1 X	1 X	X X	2 X	1 X	1 X	X X	
Acciaio inossidabile [Cr-Ni/1.4301]	1 X	1 X	X X	2 X	1 X	1 X	2 X	
Acciaio inossidabile [Cr-Ni-Mo-.../1.4571]	1 X	1 X	X X	2 X	1 X	1 X	X X	
Acciaio resistente al calore [17-4 PH]	1 X	1 X	X X	2 X	2 X	1 X	X X	
Leg. a base di nichel indurite [Inconel 718]	1 X	1 X	X X	2 X	2 X	1 X	X X	
Ghisa (grigia / sferoidale)	2 2	2 1	X 1	2 1	2 1	2 1	X X	
Leghe di titanio fino a 300 HB [Ti5Al2.5Sn]	1 X	1 X	2 X	2 X	2 X	1 X	2 X	
Leghe di titanio > 300 HB [Ti6Al4V]	1 X	1 X	1 X	2 X	2 X	1 X	X X	
Alluminio non legato	X X	X X	X X	X X	X X	X X	1 X	
Alluminio malleabile Si <6%	2 X	2 X	X X	X X	X X	1 X	1 X	
Rame non legato	2 X	2 X	X X	2 X	2 X	1 X	1 X	
Rame malleabile Bronzo	2 2	2 1	X 2	2 1	2 1	2 1	X X	
Ottonea truciolo corto [Ms58]	2 2	2 1	X 2	2 1	2 1	2 1	X X	
Thermoplastics	2 X	2 X	X X	X X	X X	2 X	2 X	
Acciaio rapido temperato	X X	X X	X 1	X 1	X 2	X X	X X	

Condizioni generali

1. Generali

- 1.1 Il contratto viene stipulato attraverso la conferma per iscritto (conferma d'ordine) di Fraisa SA o di una società collegata (di seguito definite «Fornitore») che l'ordine è stato accettato.
- 1.2 Le modifiche all'ordine d'acquisto riportate nella conferma d'ordine divengono valide solo se l'Acquirente non le rifiuta entro 5 giorni lavorativi dalla ricezione della conferma d'ordine. Le offerte, in particolare quelle nei listini prezzi, nelle brochure ecc., che non contengono termini di accettazione non sono vincolanti.
- 1.3 Le presenti condizioni di fornitura sono vincolanti se vengono dichiarate applicabili nell'offerta o nella conferma d'ordine. Le condizioni diverse richieste dall'Acquirente hanno validità solo se sono accettate esplicitamente e per iscritto dal Fornitore.
- 1.4 Tutti gli accordi e le dichiarazioni di rilevanza legale tra le Parti devono essere in forma scritta per essere considerate valide.
- 1.5 Se una o più disposizioni di queste condizioni di fornitura dovessero risultare parzialmente o completamente inefficaci, le Parti si impegnano a stipulare un accordo sostitutivo che si avvicina il più possibile all'effetto legale ed economico della disposizione eliminata.

2. Volume della fornitura e dei servizi

Le forniture e prestazioni del Fornitore figurano in modo esaustivo sulla conferma d'ordine e sugli eventuali allegati. Il Fornitore è autorizzato ad apportare modifiche di miglioria, purché queste non comportino aumenti di prezzo.

3. Brochure, cataloghi e documentazione tecnica

Le brochure e i cataloghi non sono vincolanti se non diversamente stabilito in altri accordi. Le indicazioni fornite nella documentazione tecnica sono da considerarsi vincolanti solo se ciò è espressamente garantito.

4. Prezzi

- 4.1 Tutti i prezzi sono da intendersi, ove non diversamente concordato, al netto, franco fabbrica, imballaggio escluso, in franchi svizzeri o nella valuta del Paese della società collegata a Fraisa, esclusa ogni qualsivoglia deduzione.
- 4.2 Tutti i costi accessori quali p.es. nolo, assicurazioni, permessi d'esportazione, d'importazione e simili, come pure i costi di certificazione, sono a carico dell'Acquirente.
- 4.3 L'Acquirente è tenuto a sostenere anche tutti i tipi di oneri fiscali (in particolare l'IVA), contributi, imposte, dazi doganali e simili legati al contratto oppure a rimborsare tali esborsi al Fornitore (che ne deve dimostrare l'avvenuto versamento) nel caso questi sia stato obbligato ad anticiparli.

5. Condizioni di pagamento

- 5.1 I pagamenti devono essere effettuati dall'Acquirente nel Paese del Fornitore specificato nelle condizioni di pagamento contrattuali, al netto, senza deduzione di sconti, spese, tasse, contributi imposte, tasse doganali e simili. L'obbligo di pagamento è adempiuto quando nel Paese del Fornitore è reso disponibile la somma concordata. Il termine di pagamento è 30 giorni dalla data di fattura.
- 5.2 Il termine di pagamento o le varie scadenze di pagamento concordate devono essere rispettati anche quando il trasporto, la consegna o la ricezione dei prodotti sono rimandati per motivi indipendenti dal Fornitore o quando alla fornitura mancano parti poco significative o quando si rendono necessarie delle rielaborazioni che non impediscono l'utilizzo della fornitura stessa.
- 5.3 Se l'Acquirente non rispetta il termine di pagamento o le varie scadenze concordate, è tenuto a versare, dalla scadenza in poi e senza alcun sollecito, un interesse conforme alle norme sugli interessi vigenti nel Paese dell'Acquirente e che sia tuttavia almeno maggiore del 4% rispetto al tasso di sconto della Banca Nazionale Svizzera. È fatto salvo il risarcimento per eventuali danni ulteriori.

6. Riserva di proprietà

- 6.1 Il Fornitore resta proprietario del totale della fornitura fino al ricevimento del pagamento totale concordato nel contratto.
- 6.2 L'Acquirente è tenuto a operare quanto necessario per proteggere la proprietà del Fornitore; in particolare autorizza il Fornitore alla chiusura del contratto di vendita a iscrivere, a spese dell'Acquirente, la riserva di proprietà negli appositi registri pubblici, documenti ufficiali o testi corrispondenti ai sensi della legge nazionale vigente e ad assolvere tutte le formalità rilevanti.
- 6.3 Durante la riserva di proprietà l'Acquirente s'impegna a custodire a sue spese i beni forniti, provvedendo ad assicurarli a favore del Fornitore contro furto, rottura, incendio, danni causati dall'acqua ed altri rischi. L'Acquirente prenderà tutte le misure necessarie affinché il diritto di proprietà del Fornitore non venga leso né annullato.

7. Termine di fornitura

- 7.1 Il Fornitore si impegna a rispettare il termine di fornitura stabilito nella conferma d'ordine. Il termine di fornitura è rispettato quando la notifica della spedizione è stata inviata all'Acquirente entro il suddetto termine.
- 7.2 Il rispetto del termine di fornitura presuppone l'adempimento di tutti gli obblighi contrattuali da parte dell'Acquirente.
- 7.3 Il termine di consegna si prolunga in misura adeguata quando si verificano eventi avversi che il Fornitore non riesce a evitare nonostante l'adozione delle opportu-

- ne precauzioni, indipendentemente dal fatto che tali eventi si verifichino presso il Fornitore, l'Acquirente o presso terzi. Tali eventi avversi possono includere, a mero titolo esemplificativo, epidemie, mobilitazioni, guerre, tumulti, interruzioni dell'esercizio, incidenti, conflitti lavorativi, fornitura in ritardo o errata di materie prime e prodotti semilavorati indispensabili, misure od omissioni delle autorità nonché eventi naturali.
- 7.4 Se in alternativa a un termine di consegna viene concordata una precisa scadenza, tale scadenza è da considerarsi applicabile e valida in modo analogo al precedente termine di consegna, come descritto nei punti da 7.1 a 7.3.
- 7.5 Il ritardo nella consegna non conferisce all'Acquirente alcun diritto a un rimborso dei danni o ad altre prestazioni, eccezione fatta per quanto specificato nel punto 7 o in un accordo separato. Tale limitazione non vale nel caso di atto illecito o colpa grave del Fornitore.
- 8. Resi**
Per la restituzione di merci disponibili sul mercato fino a CHF 1000.- dobbiamo calcolare una riduzione del 10% del valore della merce, in ogni caso non meno di CHF 30.- per la spesa di controllo che dobbiamo eseguire. Per resi di valore maggiore è necessario trovare un accordo con FRAISA SA. La restituzione di esecuzioni specifiche per il cliente e prodotti speciali non è prevista.
- 9. Imballaggio**
L'imballaggio è specificato come voce separata nella fattura dal Fornitore e non viene preso indietro.
- 10. Trasferimento dei benefici e dei rischi**
10.1 Vantaggi e rischi vengono assunti dall'Acquirente al più tardi all'uscita del materiale dalla fabbrica.
10.2 Se la spedizione subisce un ritardo per desiderio dell'Acquirente o per altri motivi indipendenti dal Fornitore, la responsabilità dei rischi viene assunta dall'Acquirente a partire dal momento concordato originariamente per l'uscita della fornitura dalla fabbrica. A partire da quel momento le forniture sono stoccate e assicurate a carico e rischio dell'Acquirente.
- 11. Spedizione, trasporto e assicurazione**
11.1 Richieste speciali sulla spedizione, il trasporto e l'assicurazione devono essere rese note in modo tempestivo al Fornitore. Il trasporto avviene a carico e rischio dell'Acquirente.
11.2 Le contestazioni relative alla spedizione o al trasporto devono essere rivolte immediatamente dall'Acquirente all'ultimo trasportatore non appena riceve la fornitura o i documenti di nolo.
11.3 L'assicurazione contro danni di qualsiasi genere è a carico dell'Acquirente.
- 12. Controllo e accettazione della fornitura**
12.1 L'Acquirente deve controllare le forniture e comunicare eventuali difetti per iscritto al Fornitore entro 8 giorni dalla ricezione. Trascorso tale termine la fornitura viene considerata accettata.
12.2 Il Fornitore è tenuto a correggere il prima possibile il difetto segnalato ai sensi del punto 12.1 oppure, a sua discrezione, a sostituire la merce difettosa.
12.3 Gli eventuali difetti nella fornitura non danno all'Acquirente alcun diritto, eccetto quelli espressamente citati nel punto 12 e 13 (garanzia, responsabilità per difetti).
- 13. Garanzia, responsabilità per difetti**
13.1 La durata della garanzia è di 6 mesi a decorrere dall'uscita del materiale dalla fabbrica. Per la merce sostituita o riparata la durata della garanzia ricomincia da capo e dura 6 mesi dal momento della spedizione del ricambio da parte del Fornitore. La garanzia cessa prima se l'Acquirente o una terza parte esegue delle modifiche o delle riparazioni inappropriate oppure se l'Acquirente, in caso di difetto della fornitura, non intraprende tutte le misure necessarie per contenere il danno e non dà al Fornitore l'opportunità di correggere il difetto.
13.2 Sono esclusi dalla garanzia e dalla responsabilità del Fornitore i danni che non possono essere imputati a scarsa qualità del materiale, costruzione errata o esecuzione difettosa, ad esempio i danni conseguenti alla naturale usura, a una manutenzione carente, alla mancata osservanza delle istruzioni di utilizzo, a un carico eccessivo del prodotto, a utensili d'esercizio inadeguati, a eventi chimici o elettrolitici ma anche danni generati da altre cause che sono indipendenti dal Fornitore.
13.3 L'Acquirente ha diritto esclusivamente alla sostituzione o alla riparazione della merce difettosa. L'Acquirente non vanta altri diritti, in particolare quelli relativi al rimborso di danni o di danni conseguenti. In nessun caso l'Acquirente ha diritto al rimborso di danni che non sono stati causati dalla fornitura, come interruzione della produzione, perdita di profitti, perdita di ordini, o altri danni diretti o indiretti. Tale esclusione di responsabilità non vale nel caso di atto illecito o colpa grave del Fornitore. Inoltre l'esclusione non è applicabile qualora in contrasto con una perentoria disposizione di legge.
- 14. Foro competente e diritto applicabile**
14.1 Il foro competente per l'Acquirente e il Fornitore è quello della sede del Fornitore. Il Fornitore ha comunque il diritto di perseguire l'Acquirente presso la sua sede.
14.2 Il rapporto giuridico è sottoposto esclusivamente al diritto nazionale del Fornitore. È esclusa l'applicazione della convenzione del diritto commerciale ONU (Convenzione delle Nazioni Unite sui contratti di compravendita internazionale di merci).

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INDEX			POLYCHROM	UNICUT-4X	DURO-S	DURO-V	X-AL	MICRO	CELERO	TRIBO	DIAMANT	DIAPLUS
Composizione chimica			TiAlCrN	TiAlCN	AlTiN	AlTiSiN	TiAlN/ AlCrN	TiAlN	TiB2	AlTiN + MoS2	C	C
Durezza [HV]			3000	3200	3600	4400	3300	3000	4000	3600	10000	10000
max. Temp [°C]			1000	650	880	1100	1100	800	700	880	600	600
_ 0110	79			●								
_ 0190	113			●								
_ 0200	133			●								
_ 0270	135			●								
_ 0391	585								●			
_ 0393	591								●			
_ 0400	317			●								
_ 0410	321			●								
_ 0540	203	●										
_ 0580	103			●								
_ 0609	209			●								
_ 0610	205			●								
_ 0619	201			●								
_ 0621	237			●								
_ 0640	231			●								
_ 0650	219			●								
_ 0659	217			●								
_ 0665	235			●								
_ 0695	211			●								
_ 0700	151			●								
_ 0770	87			●								
_ 0780	83			●								
_ 0800	407			●								
_ 0830	405			●								
_ 0890	725			●								
_ 0905	721			●								
_ 0910	719			●								
_ 0915	717			●								
_ 0920	715			●								
_ 3209	737			●								
_ 3490	735			●								
_ 5026	147									●		
_ 5036	147	●								●		
_ 5100	381				●							
_ 5140	383				●							
_ 5173	213	●										
_ 5174	221	●										
_ 5176	227	●										

Articolo		Rivestimento										
INDEX		senza	P	U	D	V	X	M	C	T	B	B
			POLYCHROM	UNICUT-4X	DURO-S	DURO-V	X-AL	MICRO	CELERO	TRIBO	DIAMANT	DIAPLUS
- 5200	69		●									
- 5213	143		●									
- 5214	39		●									
- 5215	97		●									
- 5218	95		●									
- 5219	119		●									
- 5220	387		●									
- 5222	397		●									
- 5225	99		●									
- 5227	47		●									
- 5229	145		●									
- 5230	63	●	●									
- 5231	67		●									
- 5234	173		●									
- 5236	305									●		
- 5236	311	●										
- 5237	323									●		
- 5240	55		●									
- 5244	93				●							
- 5248	91		●		●							
- 5249	141		●		●							
- 5250	425		●									
- 5251	117		●		●							
- 5252	431		●									
- 5253	181		●		●							
- 5254	183				●							
- 5255	57		●							●		
- 5256	185				●							
- 5257	187		●		●							
- 5258	37		●		●							
- 5259	163		●		●							
- 5260	243		●									
- 5265	251		●									
- 5266	241				●							
- 5268	255		●									
- 5271	577	●										
- 5272	541								●			
- 5275	575	●							●			
- 5276	579	●							●			
- 5277	581	●							●			
- 5279	189		●									
- 5286	385		●									
- 5288	395		●									
- 5289	403		●									
- 5290	391	●							●			
- 5292	401								●			
- 5297	583								●			
- 5299	149		●									
- 5300	69		●									
- 5313	143		●									
- 5314	39		●									
- 5315	97		●									
- 5318	95		●									
- 5319	119		●									
- 5325	99		●									
- 5327	47		●									
- 5329	145		●									
- 5330	63	●	●									
- 5331	67		●									
- 5332	111	●	●									
- 5333	129	●	●									
- 5334	173		●									
- 5335	309		●							●		
- 5336	305		●							●		
- 5336	311	●										

Articolo		Rivestimento										
INDEX		senza	P	U	D	V	X	M	C	T	B	B
			POLYCHROM	UNICUT-4X	DURO-S	DURO-V	X-AL	MICRO	CELERO	TRIBO	DIAMANT	DIAPLUS
_ 5337	323		●							●		
_ 5338	325		●							●		
_ 5339	307		●							●		
_ 5340	55		●									
_ 5344	93				●							
_ 5348	91		●		●							
_ 5349	141		●		●							
_ 5351	117		●		●							
_ 5353	181		●		●							
_ 5354	183				●							
_ 5355	57		●							●		
_ 5356	185				●							
_ 5357	187		●		●							
_ 5358	37		●		●							
_ 5359	163		●		●							
_ 5360	243		●									
_ 5366	241				●							
_ 5379	189		●									
_ 5393	137		●									
_ 5397	583								●			
_ 5400	149		●									
_ 5500	541								●			
_ 5630	669										●	
_ 5640	671										●	
_ 5645	673										●	
_ 5650	675										●	
_ 5710	273	●										
_ 5712	269							●				
_ 5712	651										●	
_ 5714	283							●				
_ 5714	653										●	
_ 5716	289							●				
_ 5716	655										●	
_ 5717	293							●				
_ 5717	657										●	
_ 5721	295							●				
_ 5722	271			●								
_ 5723	297							●				
_ 5724	285			●								
_ 5726	291			●								
_ 5752	515							●				
_ 5752	645										●	
_ 5754	519							●				
_ 5754	647										●	
_ 5756	523							●				
_ 5756	649										●	
_ 5762	517			●								
_ 5764	521			●								
_ 5766	525			●								
_ 5782	473							●				
_ 5782	621										●	
_ 5784	479							●				
_ 5784	623										●	
_ 5785	477	●										
_ 5786	483							●				
_ 5786	625										●	
_ 5787	487							●				
_ 5787	627										●	
_ 5791	489							●				
_ 5791	629										●	
_ 5792	475			●								
_ 5793	491							●				
_ 5793	631										●	
_ 5794	481			●								
_ 5796	485			●								

Articolo		Rivestimento										
INDEX		senza	P	U	D	V	X	M	C	T	B	B
			POLYCHROM	UNICUT-4X	DURO-S	DURO-V	X-AL	MICRO	CELERO	TRIBO	DIAMANT	DIAPLUS
- 6032	635											●
- 6034	637											●
- 6036	639											●
- 6038	641											●
- 6040	643											●
- 6062	611											●
- 6064	613											●
- 6066	615											●
- 6068	617											●
- 6070	619											●
- 6502	257							●				
- 6504	259							●				
- 6506	261							●				
- 6532	495							●				
- 6534	497							●				
- 6536	499							●				
- 6562	455							●				
- 6564	457							●				
- 6566	459							●				
- 6568	461							●				
- 6632	509							●				
- 6634	511							●				
- 6736	501							●				
- 6738	503							●				
- 6740	505							●				
- 6742	507							●				
- 6766	463							●				
- 6768	465							●				
- 6770	467							●				
- 6772	469							●				
- 7100	409							●				
- 7104	417							●				
- 7200	413							●				
- 7204	421							●				
- 7284	665											●
- 7288	667											●
- 7340	427		●									
- 7344	433		●									
- 7400	357							●				
- 7404	365							●				
- 7408	373							●				
- 7420	355							●				
- 7424	363							●				
- 7428	371							●				
- 7450	375							●				
- 7454	377							●				
- 7458	379							●				
- 7460	359							●				
- 7464	367							●				
- 7470	353					●						
- 7474	361					●						
- 7478	369					●						
- 7480	659											●
- 7484	661											●
- 7488	663											●
- 7540	389		●									
- 7544	399		●									
- 7600	437							●				
- 7604	441							●				
- 7608	445							●				
- 7620	439							●				
- 7624	443							●				
- 7658	447							●				
- 7920	713			●								
- 7930	727			●								

Articolo		Rivestimento										
INDEX		senza	P	U	D	V	X	M	C	T	B	B
			POLYCHROM	UNICUT-4X	DURO-S	DURO-V	X-AL	MICRO	CELERO	TRIBO	DIAMANT	DIAPLUS
- 7940	729			●								
- 7942	731			●								
- 7960	733			●								
- 8100	41		●									
- 8200	41		●									
- 8304	43		●									
- 8404	43		●									
- 8500	29		●									
- 8600	29		●									
- 8700	33		●									
- 8705	35		●									
- 8720	159		●									
- 8800	33		●									
- 8805	35		●									
- 8820	159		●									
- 15200	53		●									
- 15205	51		●									
- 15207	45		●									
- 15208	107		●									
- 15212	167		●									
- 15222	31		●									
- 15223	105		●									
- 15225	121		●									
- 15226	169		●									
- 15227	49		●									
- 15232	301	●	●							●		
- 15233	59		●									
- 15234	61		●									
- 15236	197		●									
- 15238	215		●									
- 15239	225		●									
- 15242	89		●									
- 15243	109		●									
- 15245	131		●									
- 15247	139		●									
- 15248	233		●									
- 15250	239		●									
- 15251	247		●									
- 15252	101		●									
- 15253	123		●									
- 15257	165		●									
- 15259	115		●									
- 15260	229		●									
- 15266	249		●									
- 15268	155		●									
- 15294	127		●									
- 15297	587								●			
- 15298	589								●			
- 15299	125		●									
- 15300	53		●									
- 15304	223		●									
- 15305	51		●									
- 15307	45		●									
- 15308	107		●									
- 15309	195		●									
- 15312	167		●									
- 15322	31		●									
- 15323	105		●									
- 15325	121		●									
- 15326	169		●									
- 15327	49		●									
- 15331	193		●									
- 15333	59		●									
- 15334	61		●									
- 15336	197		●									

Articolo		Rivestimento										
INDEX		senza	P	U	D	V	X	M	C	T	B	B
			POLYCHROM	UNICUT-4X	DURO-S	DURO-V	X-AL	MICRO	CELERO	TRIBO	DIAMANT	DIAPLUS
- 15338	215		●									
- 15339	225		●									
- 15342	89		●									
- 15343	109		●									
- 15345	131		●									
- 15347	139		●									
- 15348	233		●									
- 15352	101		●									
- 15353	123		●									
- 15357	165		●									
- 15359	115		●									
- 15360	229		●									
- 15366	249		●									
- 15368	155		●									
- 15379	191		●									
- 15394	127		●									
- 15397	587								●			
- 15398	589								●			
- 15399	125		●									
- 15520	533	●							●			
- 15525	535	●							●			
- 15530	537	●							●			
- 15535	539	●							●			
- 15550	543	●							●			
- 15557	545	●							●			
- 15559	549	●							●			
- 15560	547	●							●			
- 15561	551	●							●			
- 15572	553	●							●			
- 15573	555	●							●			
- 15574	559	●							●			
- 15575	563	●							●			
- 15582	565	●							●			
- 15583	567	●							●			
- 15584	571	●							●			
- 15585	573	●							●			
- 15589	593	●							●			
- 15590	595	●							●			
- 15620	533	●							●			
- 15625	535	●							●			
- 15630	537	●							●			
- 15635	539	●							●			
- 15650	543	●							●			
- 15657	545	●							●			
- 15659	549	●							●			
- 15660	547	●							●			
- 15661	551	●							●			
- 15711	263				●							
- 15725	299							●				
- 15751	513				●							
- 15752	281							●				
- 15754	287							●				
- 15781	471				●							
- 15795	493							●				
- 15795	633										●	
- 20020	687										●	
- 20025	689										●	
- 20030	691										●	
- 20040	695	●										
- 20060	693	●										
- 20340	699	●										
- 20360	697	●										
- 20760	707	●										
- 25000	681	●										
- 25004	683	●										

