made in Italy

Catalogo Generale

2017

FUTURA CARBIDE

FUTURA CARBIDE

frese in metallo duro
punte in metallo duro
frese ad inserti

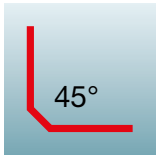
solid carbide end mills
solid carbide drills
milling tools

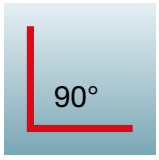
Ricerca veloce delle frese
Fast search of end mills

Indice Per Lavorazioni
Index By Processing

Indice Per Forma della Testa
Index By Head Shape

PIANA / *SQUARE*





TORICA / *CORNER RADIUS*

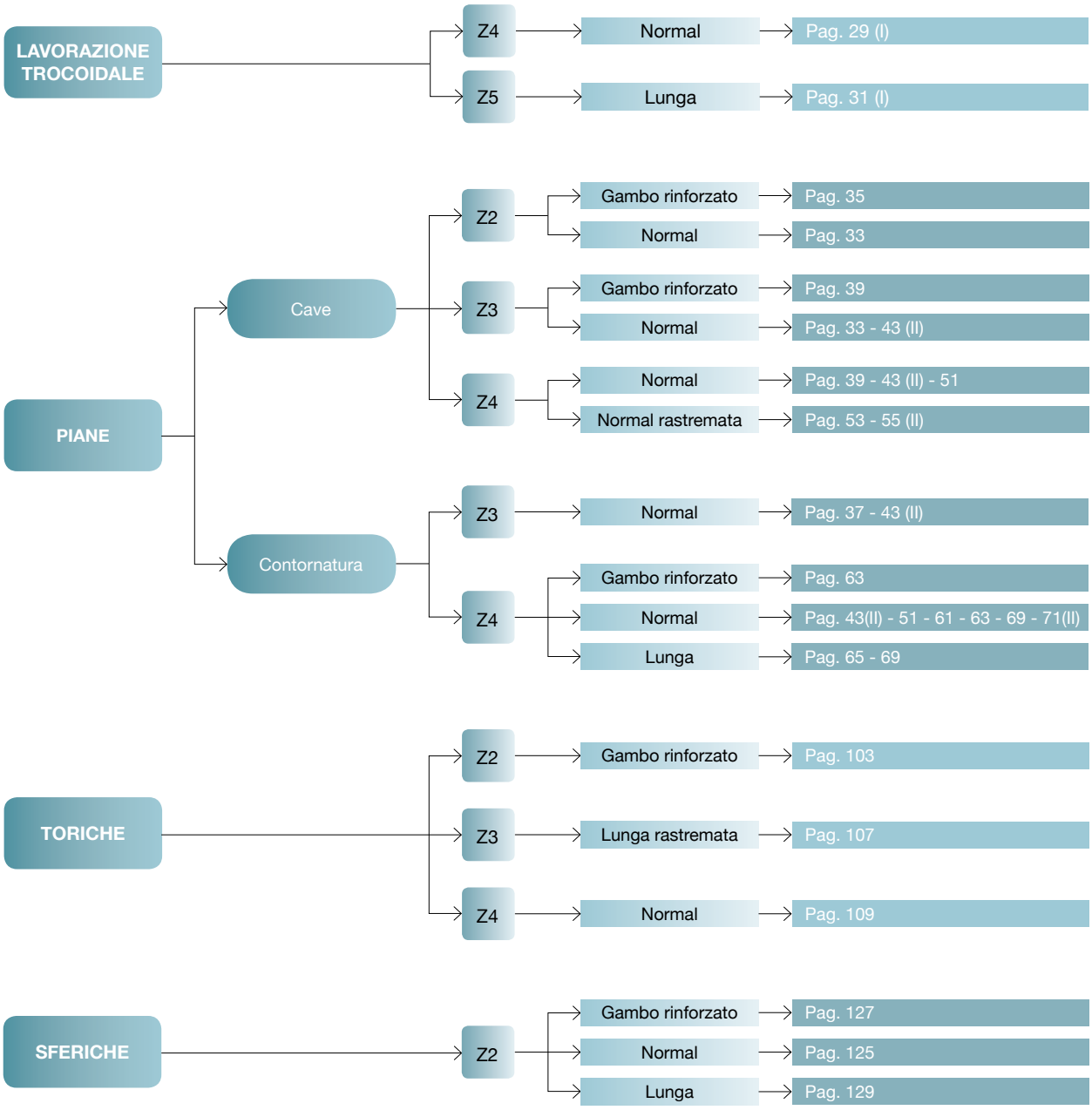
SEMISFERICA / *BALL NOSE*

Legenda dei Simboli e della Pagina degli Utensili
Key of Symbols and Product Page

Qualità HM / *HM Quality*

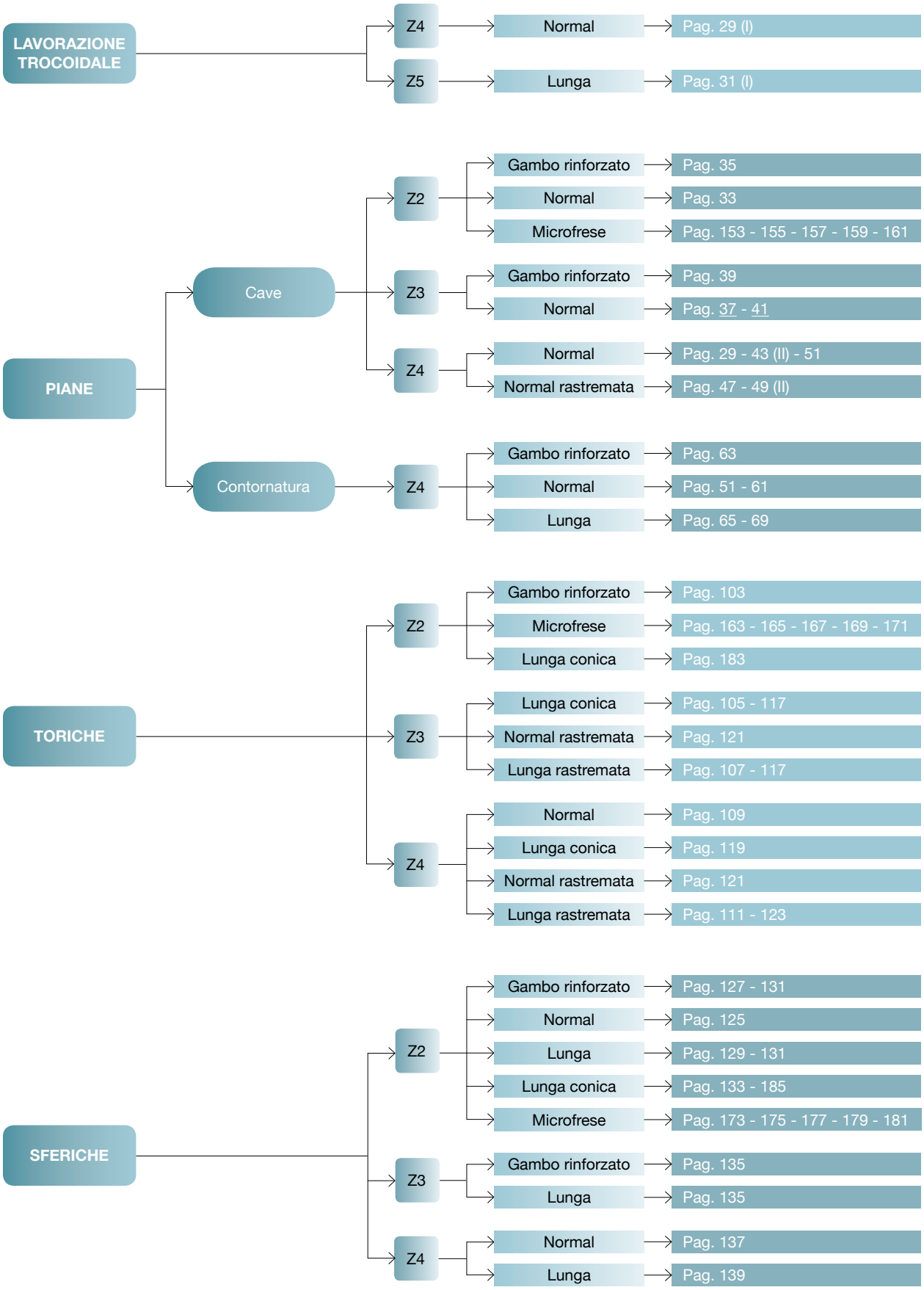
RICERCA VELOCE DELLE FRESE / *FAST SEARCH OF END MILLS*

ACCIAIO
N/mm^2 <850



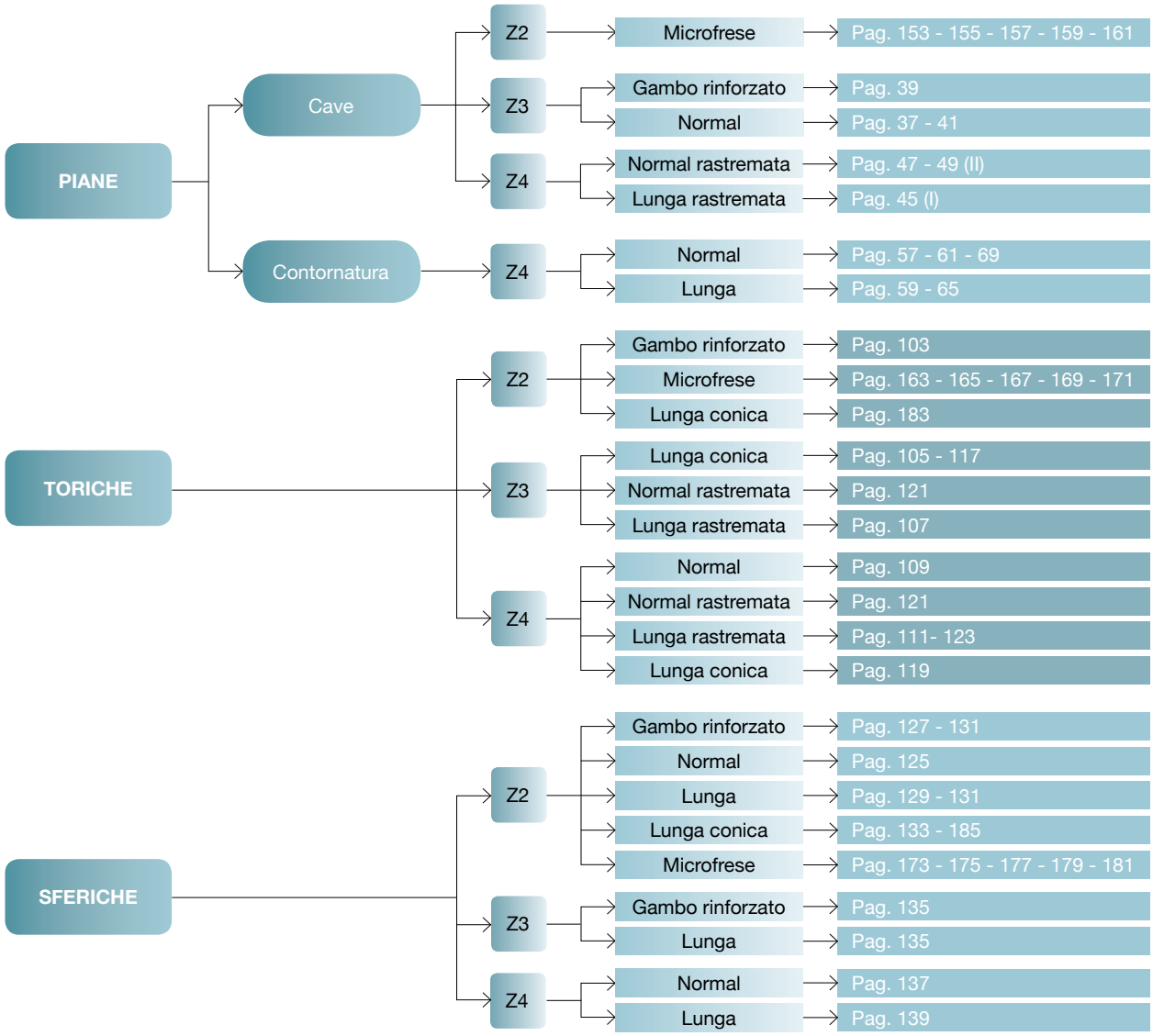
(I) Fresa con piccolo smusso di protezione degli spigoli.
(II) Fresa con piccolo raggio di protezione degli spigoli.

ACCIAIO - GHISA
N/mm^2 850-1200

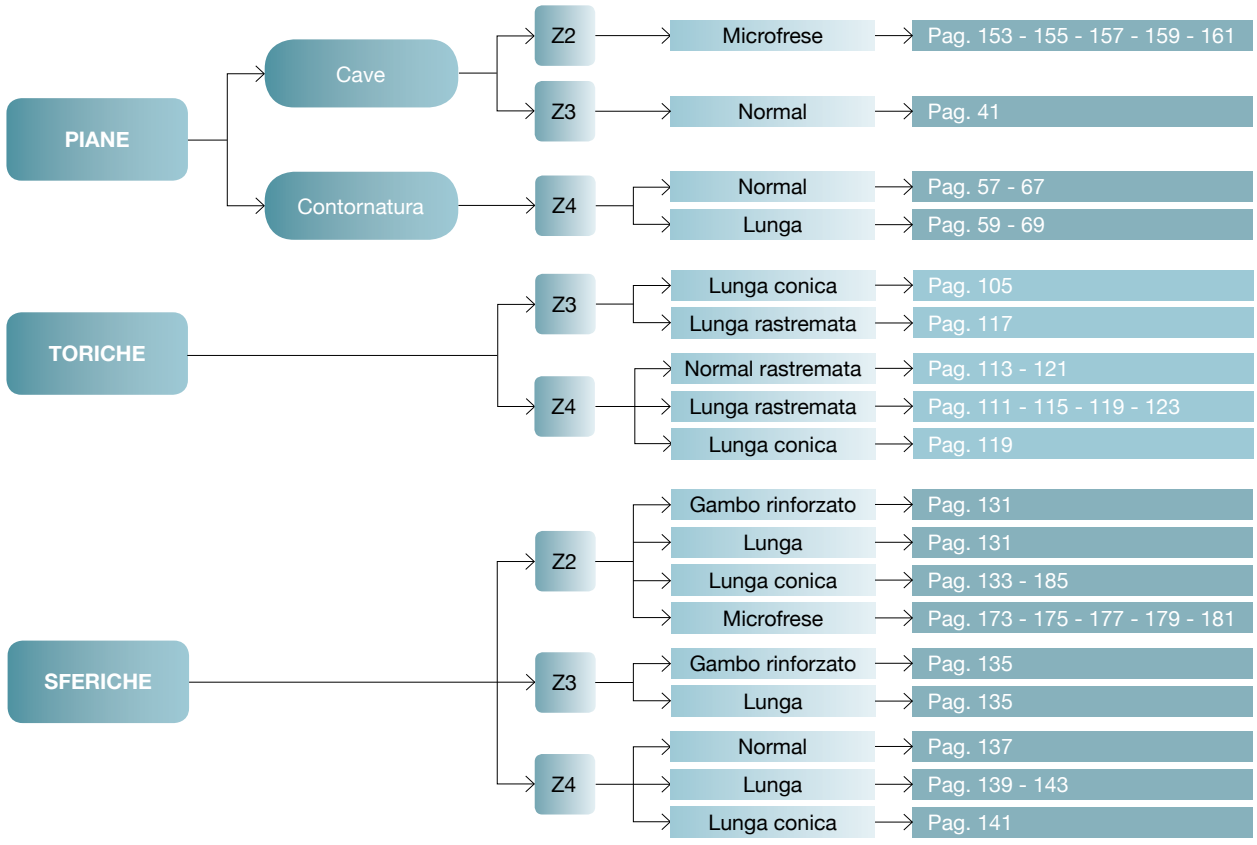


(I) Fresa con piccolo smusso di protezione degli spigoli.
(II) Fresa con piccolo raggio di protezione degli spigoli.

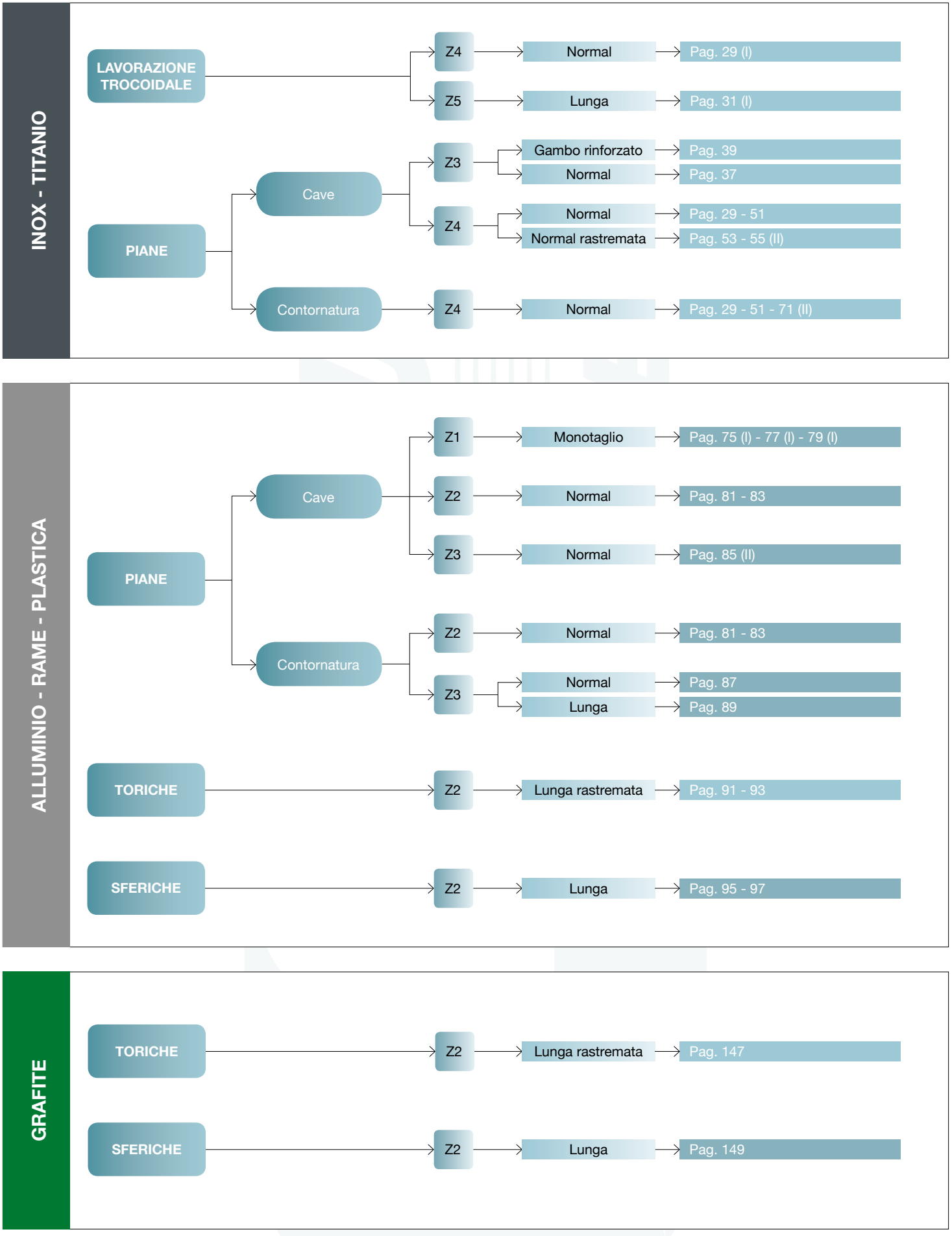
ACCIAI TEMPRATI 30-48 HRC



ACCIAI TEMPRATI 48-60 HRC

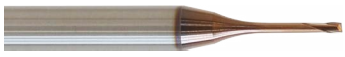


(I) Fresa con piccolo smusso di protezione degli spigoli.
(II) Fresa con piccolo raggio di protezione degli spigoli.



(I) Fresa con piccolo smusso di protezione degli spigoli.
(II) Fresa con piccolo raggio di protezione degli spigoli.

FRESE CON TESTA PIANA / *SQUARE END MILLS*

differenziato Z4	variabile	45°			FC 498 00 ..	RD100		Ø 6 ÷ 16	pag. 29
differenziato Z5	variabile	45°			FC 599 00 ..	X9000		Ø 6 ÷ 16	pag. 31
Z1	HM MICRO GRAIN	23°			FC X02 00 ..	AL11 DIAL55		Ø 3 ÷ 12	pag. 75
Z1	HM MICRO GRAIN	23°			FC X02 10 ..	AL11 DIAL55		Ø 3 ÷ 6	pag. 77
Z1	HM MICRO GRAIN	23°			FC X02 40 ..	AL11 DIAL55		Ø 8 ÷ 10	pag. 79
Z2	HM MICRO GRAIN	30°			FC 201 00 ..	BLACK		Ø 2 ÷ 16	pag. 33
Z2	HM MICRO GRAIN	30°			FC 201 10 ..	BLACK		Ø 2 ÷ 5,5	pag. 35
Z2	HM ULTRA FINE	20°			FC 201 51 ..	SM 500	3 x Ø codolo Ø 4	Ø 0,5 ÷ 2	pag. 153
Z2	HM ULTRA FINE	20°			FC 201 52 ..	SM 500	5 x Ø codolo Ø 4	Ø 0,5 ÷ 2	pag. 155
Z2	HM ULTRA FINE	20°			FC 201 53 ..	SM 500	7 x Ø codolo Ø 4	Ø 0,5 ÷ 2	pag. 157
Z2	HM ULTRA FINE	20°			FC 201 54 ..	SM 500	10 x Ø codolo Ø 6	Ø 0,8 ÷ 2	pag. 159
Z2	HM ULTRA FINE	20°			FC 201 55 ..	SM 500	15 x Ø codolo Ø 6	Ø 1 ÷ 2	pag. 161
Z2	HM MICRO GRAIN	50°			FC 202 00 ..	AL11 DIAL55		Ø 3 ÷ 16	pag. 81
Z2	HM MICRO GRAIN	25°			FC 203 00 ..	AL11 DIAL55		Ø 3 ÷ 16	pag. 83
Z3	HM MICRO GRAIN	40°			FC 301 00 ..	BLACK		Ø 3 ÷ 16	pag. 37
Z3	HM MICRO GRAIN	40°			FC 301 10 ..	BLACK		Ø 3 ÷ 5	pag. 39
Z3	HM MICRO GRAIN	25°			FC 302 00 ..	AL11 DIAL55		Ø 4 ÷ 20	pag. 87

N/mm2 <850	N/mm2 850-1200	CAST IRON	HRC 30-42	HRC 42-48	HRC 48-52	HRC 52-60	INOX STAINLESS	ALU COPPER	Ti Titanium	GRAPHITE	PLASTIC
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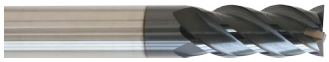
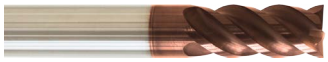
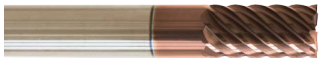
FRESE CON TESTA PIANA / *SQUARE END MILLS*

Z3	HM MICRO GRAIN	40°			FC 342 20 ..	AL11 DIAL55		Ø 8 ÷ 20	pag. 89
Z3	HM ULTRA FINE	42°			FC 303 00 ..	X9000		Ø 4 ÷ 16	pag. 41
differenziato Z4	HM MICRO GRAIN	40°			FC 401 00 ..	BLACK		Ø 4 ÷ 20	pag. 61
differenziato Z4	HM MICRO GRAIN	40°			FC 401 10 ..	BLACK		Ø 3 ÷ 5	pag. 63
Z4	HM ULTRA FINE	42°			FC 403 00 ..	X9000		Ø 4 ÷ 18	pag. 67
differenziato Z4	HM MICRO GRAIN	40°			FC 440 20 ..	BLACK		Ø 6 ÷ 20	pag. 65
differenziato Z4	HM MICRO GRAIN	40°			FC 440 21 ..	BLACK		Ø 20	pag. 65
Z4	HM ULTRA FINE	55°			FC 450 40 ..	HS 700		Ø 4 ÷ 12	pag. 45
differenziato Z4	HM ULTRA FINE	40°			FC 490 00 ..	X9000	differential pitch	Ø 4 ÷ 20	pag. 69
differenziato Z4	HM ULTRA FINE	40°			FC 491 40 ..	HS 700	differential pitch	Ø 4 ÷ 16	pag. 47
differenziato Z4	HM MICRO GRAIN	45°			FC 493 00 ..	ZR 800	differential pitch	Ø 4 ÷ 20	pag. 51
differenziato Z4	HM MICRO GRAIN	40°			FC 495 40 ..	XO 300	differential pitch	Ø 4 ÷ 16	pag. 53
	HM ULTRA FINE	45°			FC 101 00 ..	X9000		Ø 6 ÷ 20	pag. 57
	HM ULTRA FINE	45°			FC 140 20 ..	X9000		Ø 8 ÷ 20	pag. 59

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N/mm2 <850	N/mm2 850-1200	CAST IRON	HRC 30-42	HRC 42-48	HRC 48-52	HRC 52-60	INOX STAINLESS	ALU COPPER	Ti Titanium	GRAPHITE	PLASTIC
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FRESE CON TESTA TORICA / *CORNER RADIUS END MILLS*

Z2	HM ULTRA FINE	20°			FC 204 31 ..	SM 500	angle 0,9° codolo Ø 6	Ø 1 ÷ 2 r 0,2	pag. 183
Z2	HM ULTRA FINE	20°			FC 204 32 ..	SM 500	angle 0,9° codolo Ø 6	Ø 1 ÷ 2 r 0,2	pag. 183
Z2	HM ULTRA FINE	20°			FC 204 33 ..	SM 500	angle 0,9° codolo Ø 6	Ø 1 ÷ 2 r 0,2	pag. 183
Z2	HM ULTRA FINE	20°			FC 204 51 ..	SM 500	3 x Ø codolo Ø 4	Ø 0,5 ÷ 2 r 0,2	pag. 163
Z2	HM ULTRA FINE	20°			FC 204 52 ..	SM 500	5 x Ø codolo Ø 4	Ø 0,5 ÷ 2 r 0,2	pag. 165
Z2	HM ULTRA FINE	20°			FC 204 53 ..	SM 500	7 x Ø codolo Ø 4	Ø 0,5 ÷ 2 r 0,2	pag. 167
Z2	HM ULTRA FINE	20°			FC 204 54 ..	SM 500	10 x Ø codolo Ø 6	Ø 0,8 ÷ 2 r 0,2	pag. 169
Z2	HM ULTRA FINE	20°			FC 204 55 ..	SM 500	15 x Ø codolo Ø 6	Ø 1 ÷ 2 r 0,2	pag. 171
Z2	HM MICRO GRAIN	30°			FC 205 10 ..	BK 500		Ø 2 ÷ 5 r 0,5	pag. 103
Z2	HM MICRO GRAIN	30°			FC 205 40 ..	RA15 DIAL900		Ø 2 ÷ 12 r 0,5	pag. 91
Z2	HM MICRO GRAIN	30°			FC 205 40 ..	DG300		Ø 2 ÷ 12 r 0,5	pag. 147
Z2	HM MICRO GRAIN	45°			FC 270 40 ..	AL11 DIAL55		Ø 3 ÷ 16 r 0,5 ÷ 3	pag. 93
Z3	HM MICRO GRAIN	30°			FC 330 40 ..	AL11 DIAL55		Ø 6 ÷ 20 r 0,5 ÷ 1	pag. 85
Z3	HM MICRO GRAIN	30°			FC 330 00 ..	BLACK		Ø 5 ÷ 7 r 0,5	pag. 43
Z3	HM ULTRA FINE	40°			FC 305 30 ..	SM 500	codolo Ø 6	Ø 2 ÷ 5 r 0,5	pag. 105
Z3	HM MICRO GRAIN	40°			FC 305 40 ..	BK 500		Ø 3 ÷ 10 r 0,5	pag. 107
Z3	HM MICRO GRAIN	40°			FC 310 40 ..	BK 500		Ø 6 ÷ 12 r 1,0	pag. 107

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N/mm2 <850	N/mm2 850-1200	CAST IRON	HRC 30-42	HRC 42-48	HRC 48-52	HRC 52-60	INOX STAINLESS	ALU COPPER	Ti Titanium	GRAPHITE	PLASTIC
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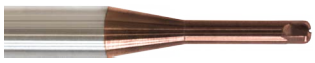
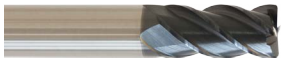
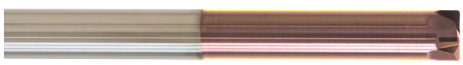
FRESE CON TESTA TORICA / *CORNER RADIUS END MILLS*

Z3	HM ULTRA FINE	0°			FC 363 40 ..	X9000	codolo Ø 4	Ø 2 ÷ 3 r0,2 ÷ 0,5	pag. 113
Z3	HM ULTRA FINE	15°			FC 370 30 ..	X9000	angle 0,9° codolo Ø 6	Ø 2 ÷ 4 r0,2 ÷ 0,5	pag. 117
Z3	HM ULTRA FINE	15°			FC 370 31 ..	X9000	angle 0,9° codolo Ø 6	Ø 2 ÷ 4 r0,2 ÷ 0,5	pag. 117
Z3	HM ULTRA FINE	15°			FC 370 32 ..	X9000	angle 0,9° codolo Ø 6	Ø 2 ÷ 4 r0,2 ÷ 0,5	pag. 117
Z3	HM ULTRA FINE	15°			FC 375 30 ..	X9000	angle 0,9° codolo Ø 6	Ø 4 r 1,0	pag. 117
Z3	HM ULTRA FINE	15°			FC 375 31 ..	X9000	angle 0,9° codolo Ø 6	Ø 4 r 1,0	pag. 117
Z3	HM ULTRA FINE	15°			FC 375 32 ..	X9000	angle 0,9° codolo Ø 6	Ø 4 r 1,0	pag. 117
Z3	HM ULTRA FINE	15°			FC 370 40 ..	X9000	codolo Ø 4	Ø 2 ÷ 4 r0,2 ÷ 0,5	pag. 121
Z4	HM MICRO GRAIN	40°			FC 405 00 ..	BK 500		Ø 4 ÷ 10 r 0,5	pag. 109
Z4	HM MICRO GRAIN	40°			FC 410 00 ..	BK 500		Ø 6 ÷ 12 r 1,0	pag. 109
Z4	HM ULTRA FINE	55°			FC 405 40 ..	XT 900		Ø 3 ÷ 12 r 0,5	pag. 111
Z4	HM ULTRA FINE	55°			FC 410 40 ..	XT 900		Ø 6 ÷ 12 r 1,0	pag. 111
Z4	HM ULTRA FINE	0°			FC 463 40 ..	X9000		Ø 4 ÷ 8 r 0,5	pag. 113
Z4	HM ULTRA FINE	0°			FC 465 40 ..	X9000		Ø 6 ÷ 10 r 1,0	pag. 113
Z4	HM ULTRA FINE	0°			FC 467 40 ..	X9000		Ø 10÷12 r 1,5	pag. 113
Z4	HM ULTRA FINE	0°			FC 463 45 ..	X9000		Ø 6 ÷ 8 r 0,5	pag. 115
Z4	HM ULTRA FINE	0°			FC 465 45 ..	X9000		Ø 6 ÷ 10 r 1,0	pag. 115

N/mm2 <850	N/mm2 850-1200	CAST IRON	HRC 30-42	HRC 42-48	HRC 48-52	HRC 52-60	INOX STAINLESS	ALU COPPER	Ti Titanium	GRAPHITE	PLASTIC
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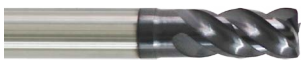
FRESE CON TESTA TORICA / *CORNER RADIUS END MILLS*

Z4	HM ULTRA FINE	40°			FC 470 30 ..	X9000	angle 0,9° codolo Ø 6	Ø 5 r 0,5	pag. 119
Z4	HM ULTRA FINE	40°			FC 470 31 ..	X9000	angle 0,9° codolo Ø 6	Ø 5 r 0,5	pag. 119
Z4	HM ULTRA FINE	15°			FC 475 30 ..	X9000	angle 0,9° codolo Ø 6	Ø 5 r 1,0	pag. 119
Z4	HM ULTRA FINE	15°			FC 475 31 ..	X9000	angle 0,9° codolo Ø 6	Ø 5 r 1,0	pag. 119
Z4	HM ULTRA FINE	15°			FC 470 40 ..	X9000		Ø 5 ÷ 10 r 0,5	pag. 121
Z4	HM ULTRA FINE	15°			FC 475 40 ..	X9000		Ø 6 ÷ 12 r 1,0	pag. 121
Z4	HM ULTRA FINE	15°			FC 477 40 ..	X9000		Ø 6 ÷ 12 r1,5 ÷ 2,0	pag. 121
Z4	HM ULTRA FINE	15°			FC 470 45 ..	X9000		Ø 6 ÷ 10 r 0,5	pag. 123
Z4	HM ULTRA FINE	15°			FC 475 45 ..	X9000		Ø 6 ÷ 12 r 1,0	pag. 123
Z4	HM ULTRA FINE	15°			FC 477 45 ..	X9000		Ø 6 ÷ 12 r1,5 ÷ 2,0	pag. 123
Z4	HM MICRO GRAIN	30°			FC 430 00 ..	BLACK		Ø 8 ÷ 20 r1,0 ÷ 1,5	pag. 43
differenziato Z4	HM ULTRA FINE	40°			FC 492 40 ..	HS 700	differential pitch	Ø 4 ÷ 20 r 0,5	pag. 49
differenziato Z4	HM ULTRA FINE	40°			FC 496 40 ..	XO 300	differential pitch	Ø 4 ÷ 20 r0,5 ÷ 0,8	pag. 55
differenziato Z4	HM ULTRA FINE	30°			FC 497 00 ..	XO 300	differential pitch	Ø 4 ÷ 20 r0,5 ÷ 0,8	pag. 71

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N/mm2 <850	N/mm2 850-1200	CAST IRON	HRC 30-42	HRC 42-48	HRC 48-52	HRC 52-60	INOX STAINLESS	ALU COPPER	Ti Titanium	GRAPHITE	PLASTIC
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FRESE CON TESTA SEMISFERICA / *BALL NOSE END MILLS*

Z2	HM MICRO GRAIN	30°			FC 220 00 ..	BK 500		Ø 2 ÷ 12	pag. 125
Z2	HM MICRO GRAIN	30°			FC 220 10 ..	BK 500		Ø 2 ÷ 5	pag. 127
Z2	HM MICRO GRAIN	30°			FC 220 20 ..	BK 500		Ø 3 ÷ 12	pag. 129
Z2	HM ULTRA FINE	30°			FC 220 20 ..	X9000		Ø 6 ÷ 12	pag. 131
Z2	HM ULTRA FINE	30°			FC 220 21 ..	X9000		Ø 2 ÷ 5	pag. 131
Z2	HM ULTRA FINE	30°			FC 220 22 ..	X9000		Ø 2 ÷ 4	pag. 131
Z2	HM ULTRA FINE	30°			FC 220 23 ..	X9000		Ø 2 ÷ 4	pag. 131
Z2	HM ULTRA FINE	30°			FC 220 24 ..	X9000		Ø 2 ÷ 4	pag. 131
Z2	HM MICRO GRAIN	30°			FC 220 20 ..	DG 300		Ø 1 ÷ 12	pag. 149
Z2	HM MICRO GRAIN	30°			FC 220 20 ..	RA15 DIAL900		Ø 2 ÷ 12	pag. 95
Z2	HM MICRO GRAIN	30°			FC 280 20 ..	AL11 DIAL55		Ø 3 ÷ 16	pag. 97
Z2	HM ULTRA FINE	30°			FC 220 30 ..	SM 500	codolo Ø 6	Ø 2 ÷ 5	pag. 133
Z2	HM ULTRA FINE	20°			FC 220 31 ..	SM 500	angle 0,9° codolo Ø 6	Ø 1 ÷ 2	pag. 185
Z2	HM ULTRA FINE	20°			FC 220 32 ..	SM 500	angle 0,9° codolo Ø 6	Ø 1 ÷ 2	pag. 185
Z2	HM ULTRA FINE	30°			FC 220 33 ..	SM 500	angle 0,9° codolo Ø 6	Ø 1 ÷ 2	pag. 185

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N/mm2 <850	N/mm2 850-1200	CAST IRON	HRC 30-42	HRC 42-48	HRC 48-52	HRC 52-60	INOX STAINLESS	ALU COPPER	Ti Titanium	GRAPHITE	PLASTIC
●●	●●●	●	●●●	●●●					●		
●●	●●●	●	●●●	●●●					●		
●●	●●●	●	●●●	●●●					●		
	●●●		●●●	●●●	●●●						
	●●●		●●●	●●●	●●●						
	●●●		●●●	●●●	●●●						
	●●●		●●●	●●●	●●●						
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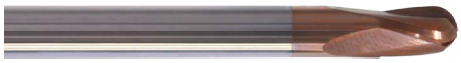
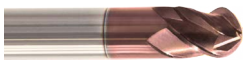
										●●●	
								●●●			
								●●●			●●●
	●●●	●	●●●	●●●	●●●	●●●	●		●		
	●●●	●	●●●	●●●	●●●	●●●	●		●		
	●●●	●	●●●	●●●	●●●	●●●	●		●		
	●●●	●	●●●	●●●	●●●	●●●	●		●		

FRESE CON TESTA SEMISFERICA / *BALL NOSE END MILLS*

Z2	HM ULTRA FINE	20°			FC 220 51 ..	SM 500	3 x Ø codolo Ø 4	Ø 0,5 ÷ 2	pag. 173
Z2	HM ULTRA FINE	20°			FC 220 52 ..	SM 500	5 x Ø codolo Ø 4	Ø 0,5 ÷ 2	pag. 175
Z2	HM ULTRA FINE	20°			FC 220 53 ..	SM 500	7 x Ø codolo Ø 4	Ø 0,5 ÷ 2	pag. 177
Z2	HM ULTRA FINE	20°			FC 220 54 ..	SM 500	10 x Ø codolo Ø 6	Ø 0,8 ÷ 2	pag. 179
Z2	HM ULTRA FINE	20°			FC 220 55 ..	SM 500	15 x Ø codolo Ø 6	Ø 1 ÷ 2	pag. 181
Z3	HM ULTRA FINE	15°			FC 320 19 ..	X9000		Ø 2 ÷ 5	pag. 135
Z3	HM ULTRA FINE	15°			FC 320 20 ..	X9000		Ø 3 ÷ 10	pag. 135
Z3	HM ULTRA FINE	15°			FC 320 21 ..	X9000		Ø 3 ÷ 5	pag. 135
Z4	HM ULTRA FINE	40°			FC 420 00 ..	X9000		Ø 4 ÷ 10	pag. 137
Z4	HM ULTRA FINE	40°			FC 420 20 ..	X9000		Ø 4 ÷ 10	pag. 139
Z4	HM ULTRA FINE	0°			FC 452 30 ..	X9000		Ø 2 ÷ 4	pag. 141
Z4	HM ULTRA FINE	0°			FC 453 40 ..	X9000		Ø 6 ÷ 12	pag. 143

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N/mm2 <850	N/mm2 850-1200	CAST IRON	HRC 30-42	HRC 42-48	HRC 48-52	HRC 52-60	INOX STAINLESS	ALU COPPER	Ti Titanium	GRAPHITE	PLASTIC
	●●●	●	●●●	●●●	●●●	●●●	●		●		
	●●●	●	●●●	●●●	●●●	●●●	●		●		
	●●●	●	●●●	●●●	●●●	●●●	●		●		
	●●●	●	●●●	●●●	●●●	●●●	●		●		
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	●●●	●	●●●	●●●	●●●						
					●●●	●●●					
					●●●	●●●					

LEGENDA DEI SIMBOLI / *KEY OF SYMBOLS*

Monotaglio Z1
One tooth end mill

Due taglienti Z2 con 1 tagliente al centro
Two tooth with center cutting

Due taglienti Z2 con 2 taglienti al centro
Two tooth with double center cutting

Tre taglienti Z3 con 1 tagliente al centro
Three tooth with center cutting

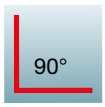
Quattro taglienti Z4 con 2 taglienti al centro
Four tooth with double center cutting

Quattro taglienti Z4 con passo differenziato dell'elica
Four tooth with differential pitch cutters

Cinque taglienti Z5 con passo differenziato dell'elica
Five tooth with differential pitch cutters

Multitaglio Z6 - Z8 - Z10
Multi tooth Z6 - Z8 - Z10 end mill

Elica variabile
rregular helix

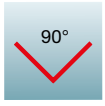


Fresa con tagliente a spigolo vivo
Square end mill

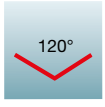
Fresa con tagliente smussato a 45°
Tooth chamfer end mill

Fresa con testa torica
Corner radius end mill

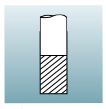
Fresa con testa semisferica
Ball nose end mill



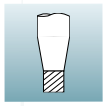
Fresa con angolo a 90°
Angular 90° end mill



Fresa con angolo a 120°
Angular 120° end mill



Codolo cilindrico
Cylindrical shank



Codolo rinforzato
Reinforced shank

Codolo rastremato
Tapered shank

Serie normale
Normal series

Serie lunga
Long series

Serie extra lunga
Extra-long series

HM MICRO GRAIN

Metallo duro micrograna
Micro grain carbide

HM ULTRA FINE

Metallo duro ultrafine
Ultra finest-grain carbide

3 x Ø

Lunghezza utile di lavoro 3 x diametro
Utility lenght 3 x diameter

5 x Ø

Lunghezza utile di lavoro 5 x diametro
Utility lenght 5 x diameter

7 x Ø

Lunghezza utile di lavoro 7 x diametro
Utility lenght 7 x diameter

10 x Ø

Lunghezza utile di lavoro 10 x diametro
Utility lenght 10 x diameter

15 x Ø

Lunghezza utile di lavoro 15 x diametro
Utility lenght 15 x diameter

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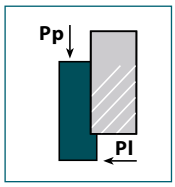
LEGENDA DELLA PAGINA DEGLI UTENSILI / *KEY OF PRODUCTS PAGE*

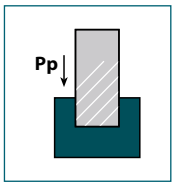
N/mm2 <850	Acciai a basso, medio e alto tenore di carbonio *Low, medium e high carbon steel*
N/mm2 850-1200	Acciai debolmente legati ; acciai legati; acciai da utensili *Low alloy steel; Alloy steel; tool and high alloy steel*
CAST IRON	Ghisa grigia; ghisa sferoidale *Grey cast iron; nodular cast iron*
HRC 30-42	Acciai temprati *Hardned steel*
HRC 42-48	Acciai temprati *Hardned steel*
HRC 48-52	Acciai temprati *Hardned steel*
HRC 52-60	Acciai temprati *Hardned steel*
INOX STAINLESS	Acciai inossidabili martensitici e austenitici; duplex *Martensitic and austenitic stainless steel; duplex*
COPPER	Rame *Copper*
Ti Titanium	Leghe di titanio *Titanium alloys*
GRAPHITE	Grafite *Graphite*
PLASTIC	Plastica; plastica caricata vetro *Plastic; plastic glass fiber*
ALUMINIUM	Alluminio laminato; alluminio pressofuso *Wrought and rolled aluminium; die-cast aluminium*

D	Diametro del tagliente (mm) *Diameter of the cutting edge (mm)*
d	Diametro del codolo (mm) *Diameter of the shank (mm)*
b	Diametro dello scarico (mm) *Diameter of the shank tapered (mm)*
L	Lunghezza totale dell'utensile (mm) *Total length of the tool (mm)*
t	Lunghezza del tagliente (mm) *Length of the cutting edge (mm)*
a	Lunghezza utile Utility length
Helix	Angolo dell'elica *Tool angle*
Rf8	Raggio dell'utensile semisferico *Total radius*
radius	Raggio dell'utensile torico *Corner radius*
∝	Raccordo diametro fresa con codolo espresso in gradi *Interferance angle*
code	Codice di ordinazione *Order code*

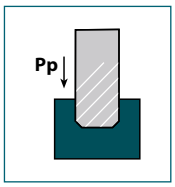
LEGENDA DELLA PAGINA DEGLI UTENSILI / *KEY OF PRODUCTS PAGE*



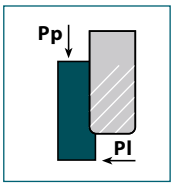
Lavorazioni di contornatura con utensile a testa piana
Profailing with square end mills



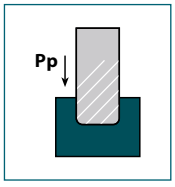
Lavorazioni di cave con utensile a testa piana
Pocket milling with square end mills



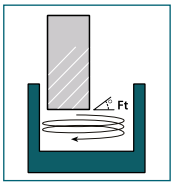
Lavorazioni di cave con utensile con tagliente smussato
Pocket milling with tooth chamfer end mills



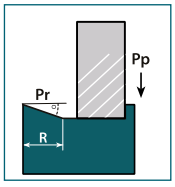
Lavorazioni di contornatura con utensile a testa torica
Profiling with corner radius end mills



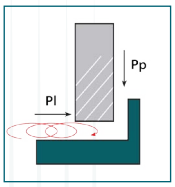
Lavorazioni di cave con utensile a testa torica
Pocket milling with corner radius end mills



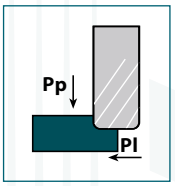
Lavorazioni di foratura
Drilling



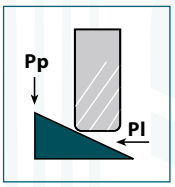
Lavorazioni in rampa
Ramping



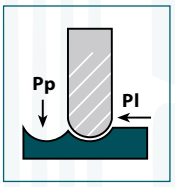
Lavorazioni trocoidali
Trochoidal end mills



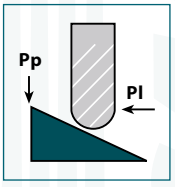
Lavorazioni 3D in sgrossatura con utensile a testa torica
Roughing 3D with corner radius end mills



Lavorazioni 3D in finitura con utensile a testa torica
Finishing 3D with corner radius end mills



Lavorazioni 3D in sgrossatura con utensile a testa semisferica
Roughing 3D with ball nose end mills



Lavorazioni 3D in finitura con utensile a testa semisferica
Finishing 3D with ball nose end mills

Lavorazioni consigliate con utilizzo di refrigerante / *Processing with the use of coolant*

Lavorazioni consigliate senza utilizzo di refrigerante / *Processing without the use of coolant*

Lavorazioni consigliate con utilizzo di aria / *Processing with the use of air*

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QUALITÀ HM / *HM QUALITY*

Qualità HM	Grado HM	Durezza HM	Co% HM	Tipo Rivestimento
RA15	micro grain	1790 HV	6%	
AL11	micro grain	1600 HV	10%	
DG300	micro grain	1790 HV	6%	Diamond CVD
DIAL55	micro grain	1600 HV	10%	Diamond PVD
DIAL900	micro grain	1790 HV	6%	Diamond PVD
BLACK	micro grain	1600 HV	10%	AlTiN PVD
BK 500	micro grain	1600 HV	10%	AlTiN PVD
RD 100	micro grain	1600 HV	10%	AlTiSiN PVD
XT 900	ultra fine	1720 HV	12%	AlTiSiN PVD
XO 300	micro grain	1600 HV	10%	TiCN PVD
SM 500	ultra fine	1720 HV	12%	AlTiSiN PVD
HS 700	ultra fine	1950 HV	9%	AlTiN PVD
ZR 800	micro grain	1550 HV	9%	AlTiSiN PVD
X9000	ultra fine	1950 HV	9%	AlTiSiN PVD

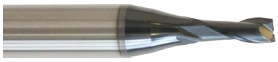
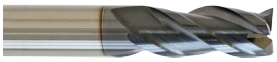
Frese per lavorazioni di cave, foratura, contornatura e in rampa
Pocket milling - drilling - profailing and ramping

	FC 498 00 .. RD100	differenziato Z4	variabile	45°		Ø 6 ÷ 16	N/mm2 <850-1100	INOX Titanium	pag. 29

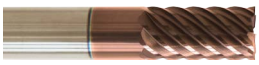
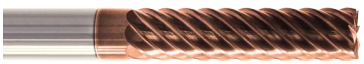
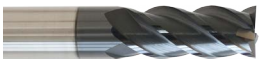
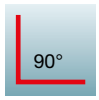
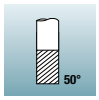
Frese per lavorazioni trocoidali - *Trochoidal end mills*

	FC 599 00 .. X9000	differenziato Z5	variabile	45°		Ø 6 ÷ 16	N/mm2 <850-1100	INOX Titanium	pag. 31

Frese per lavorazioni di cave - *Pocket milling*

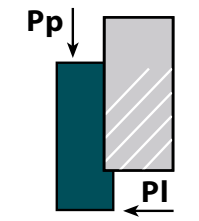
	FC 201 00 .. BLACK	Z2	90°	30°		Ø 3 ÷ 12	N/mm2 <850-1200	HRC 30-42	pag. 33
	FC 201 10 .. BLACK	Z2	90°	30°		Ø 3 ÷ 5	N/mm2 <850-1200	HRC 30-42	pag. 35
	FC 301 00 .. BLACK	Z3	90°	40°		Ø 3 ÷ 16	N/mm2 <850-1200	HRC 30-48	pag. 37
	FC 301 10 .. BLACK	Z3	90°	40°		Ø 3 ÷ 5	N/mm2 <850-1200	HRC 30-48	pag. 39
	FC 303 00 .. X9000	Z3	90°	42°		Ø 4 ÷ 16	CAST IRON	HRC 48-60	pag. 41
	FC 330 00 .. BLACK	Z3	R	30°		Ø 5 ÷ 7 r 0,5	N/mm2 <850-1200	HRC 30-42	pag. 43
	FC 430 00 .. BLACK	Z4	R	30°		Ø 4 ÷ 20 r 1,0 ÷1,5	N/mm2 <850-1200	HRC 30-42	pag. 43
	FC 450 40 .. HS 700	Z4	45°	55°		Ø 4 ÷ 12	CAST IRON	HRC 42-60	pag. 45
	FC 491 40 .. HS 700	differenziato Z4	90°	40°		Ø 4 ÷ 16	N/mm2 <850	N/mm2 850-1200	pag. 47
	FC 492 40 .. HS 700	differenziato Z4	R	40°		Ø 4 ÷ 20 r 0,5	N/mm2 <850	N/mm2 850-1200	pag. 49
	FC 493 00 .. ZR 800	differenziato Z4	90°	45°		Ø 4 ÷ 20	N/mm2 <850	N/mm2 850-1200	pag. 51
	FC 495 40 .. XO 300	differenziato Z4	90°	40°		Ø 4 ÷ 16	INOX Stainless	TITANIUM	pag. 53
	FC 496 40 .. XO 300	differenziato Z4	R	40°		Ø 4 ÷ 20 r 0,5	INOX Stainless	TITANIUM	pag. 55

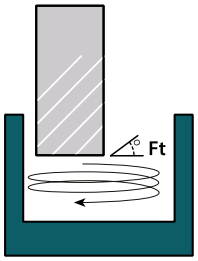
Frese per contornatura - *Profailing*

	FC 101 00 .. X9000					Ø 6 ÷ 20	HRC 30-48	HRC 42-60	pag. 57
	FC 140 20 .. X9000					Ø 8 ÷ 20	HRC 30-48	HRC 42-60	pag. 59
	FC 401 00 .. BLACK					Ø 4 ÷ 20	N/mm2 <850-1200	HRC 30-48	pag. 61
	FC 401 10 .. BLACK					Ø 3 ÷ 5	N/mm2 <850-1200	HRC 30-48	pag. 63
	FC 440 20 .. BLACK					Ø 8 ÷ 20	N/mm2 <850-1200	HRC 30-48	pag. 65
	FC 440 21 .. BLACK					Ø 20	N/mm2 <850-1200	HRC 30-48	pag. 65
	FC 330 00 .. BLACK					Ø 5 ÷ 7 r 0,5	N/mm2 <850-1200	HRC 30-42	pag. 43
	FC 430 00 .. BLACK					Ø 4 ÷ 20 r 1,0 ÷1,5	N/mm2 <850-1200	HRC 30-42	pag. 43
	FC 403 00 .. X9000					Ø 4 ÷ 18	CAST IRON	HRC 48-60	pag. 67
	FC 490 00 .. X9000					Ø 4 ÷ 20	N/mm2 <850-1200	HRC 30-52	pag. 69
	FC 493 00 .. ZR 800					Ø 4 ÷ 20	N/mm2 <850	N/mm2 850-1200	pag. 51
	FC 497 00 .. XO 300					Ø 4 ÷ 20 r 0,5	INOX Stainless	TITANIUM	pag. 71

FC 498 00 ..

RD 100



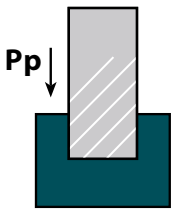


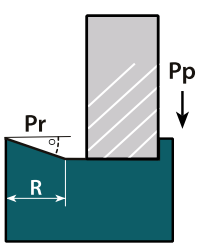
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min	Ft	Fr
N/mm2 <850	6	4	160	0,050	12	1,2	8.493	1.699	22°	VEDI TABELLA CALCOLO DELL'ANGOLO DI FORATURA
	8	4	160	0,060	18	1,6	6.369	1.529	22°	
	10	4	160	0,080	22	2,0	5.096	1.631	22°	
	12	4	160	0,090	24	2,4	4.246	1.529	22°	
	14	4	160	0,100	29	2,8	3.640	1456	22°	
	16	4	160	0,110	32	3,2	3.185	1.401	22°	
	20	4	160	0,130	38	4,0	2.548	1.325	22°	
N/mm2 850-1100	6	4	130	0,040	12	1,2	6.900	1.104	20°	
	8	4	130	0,050	18	1,6	5.175	1.035	20°	
	10	4	130	0,065	22	2,0	4.140	1.076	20°	
	12	4	130	0,070	24	2,4	3.450	966	20°	
	14	4	130	0,080	29	2,8	2.957	946	20°	
	16	4	130	0,090	32	3,2	2.588	932	20°	
	20	4	130	0,100	38	4,0	2.070	828	20°	
INOX STAINLESS	6	4	80	0,030	12	1,2	4.246	510	14°	
	8	4	80	0,040	18	1,6	3.185	510	14°	
	10	4	80	0,050	22	2,0	2.548	510	14°	
	12	4	80	0,060	24	2,4	2.123	510	14°	
	14	4	80	0,065	29	2,8	1.820	473	14°	
	16	4	80	0,070	32	3,2	1.592	446	14°	
	20	4	80	0,080	38	4,0	1.274	408	14°	
LEGHE DI TITANIO	6	4	45	0,030	12	1,2	2.389	287	14°	
	8	4	45	0,040	18	1,6	1.791	287	14°	
	10	4	45	0,050	22	2,0	1.433	287	14°	
	12	4	45	0,060	24	2,4	1.194	287	14°	
	14	4	45	0,065	29	2,8	1.024	266	14°	
	16	4	45	0,070	32	3,2	896	251	14°	
	20	4	45	0,080	38	4,0	717	229	14°	

CALCOLO DELL'ANGOLO REALE DI FORATURA

Angolo di foratura teorico Ø foro	22°	20°	14°	14°
	Angolo di foratura reale Fr			
Ø foro(mm) = Ø fresa x 1,2	5,2°	4,7°	3,2°	3,2°
Ø foro(mm) = Ø fresa x 1,4	7,3°	6,7°	4,7°	4,7°
Ø foro(mm) = Ø fresa x 1,6	9,2°	8,4°	5,8°	5,8°
Ø foro(mm) = Ø fresa x 1,8	10,6°	9,6°	6,6°	6,6°

RD 100

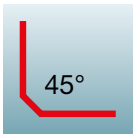




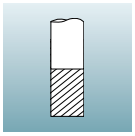
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min	Pr max	R min mm
N/mm2 <850	6	4	130	0,030	6	6	6.900	828	40°	18
	8	4	130	0,035	8	8	5.175	725	40°	24
	10	4	130	0,045	10	10	4.140	745	40°	30
	12	4	130	0,055	12	12	3.450	759	40°	36
	14	4	130	0,057	14	14	2.957	674	40°	42
	16	4	130	0,060	16	16	2.588	621	40°	48
	20	4	130	0,065	20	20	2.070	538	40°	60
N/mm2 850-1100	6	4	105	0,020	6	6	5.573	446	35°	21
	8	4	105	0,030	8	8	4.180	502	35°	28
	10	4	105	0,040	10	10	3.344	535	35°	35
	12	4	105	0,050	12	12	2.787	557	35°	42
	14	4	105	0,052	14	14	2.389	497	35°	48
	16	4	105	0,055	16	16	2.090	460	35°	56
	20	4	105	0,060	20	20	1.672	401	35°	60
INOX STAINLESS	6	4	65	0,020	6	6	3.450	276	12°	30
	8	4	65	0,025	8	8	2.588	259	12°	40
	10	4	65	0,030	10	10	2.070	248	12°	50
	12	4	65	0,040	12	12	1.725	276	12°	60
	14	4	65	0,045	14	14	1.479	266	12°	70
	16	4	65	0,050	16	16	1.294	259	12°	80
	20	4	65	0,055	20	20	1.035	228	12°	100
LEGHE DI TITANIO	6	4	35	0,010	6	6	1.858	74	12°	30
	8	4	35	0,015	8	8	1.393	84	12°	40
	10	4	35	0,015	10	10	1.115	67	12°	50
	12	4	35	0,020	12	12	929	74	12°	60
	14	4	35	0,022	14	14	796	70	12°	70
	16	4	35	0,025	16	16	697	70	12°	80
	20	4	35	0,030	20	20	557	67	12°	100

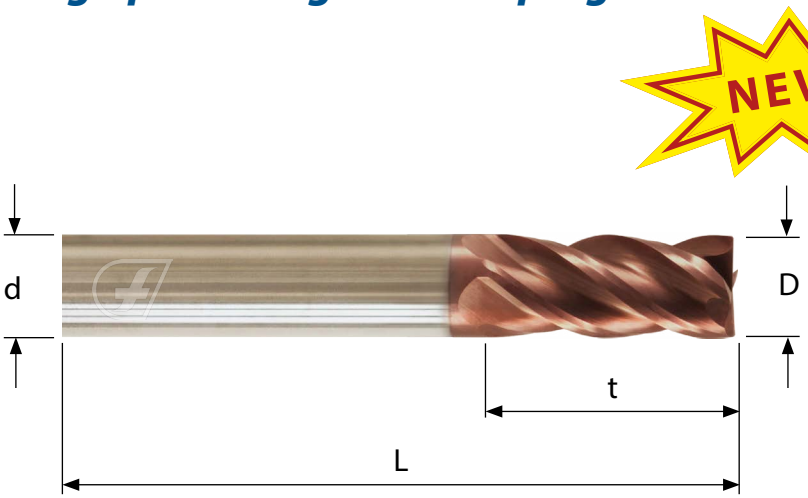
Frese per lavorazioni di cave, foratura, contornatura e in rampa

Pocket milling - drilling - profailing and ramping



HM MICRO GRAIN





NEW

Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1100

INOX STAINLESS

Ti Titanium

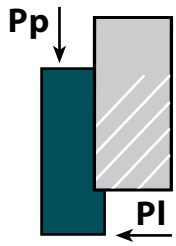
dimensions mm									*quality*	
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	RD 100	
6	51	17	6	-	-	32°	-	FC 498 00 06	★	
8	64	22	8	-	-	32°	-	FC 498 00 08	★	
10	64	24	10	-	-	32°	-	FC 498 00 10	★	
12	80	28	12	-	-	32°	-	FC 498 00 12	★	
14	80	32	14	-	-	32°	-	FC 498 00 14	★	
16	97	37	16	-	-	32°	-	FC 498 00 16	★	
20	97	41	20	-	-	32°	-	FC 498 00 20	★	

Qualità HM
HM Quality
pag. 25

★ **Pronto**
Ready

FC 599 00 ..

X9000

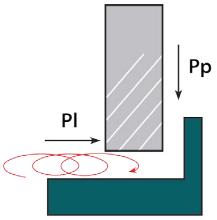


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	8	5	210	0,040	24	0,4	8.360	1.672
	10	5	210	0,050	29	0,5	6.688	1.672
	12	5	210	0,060	37	0,6	5.573	1.672
	16	5	210	0,070	43	0,9	4.180	1.463
	20	5	210	0,090	50	1,0	3.344	1.505
N/mm2 850-1100	8	5	160	0,040	24	0,4	6.369	1.274
	10	5	160	0,050	29	0,5	5.096	1.274
	12	5	160	0,060	37	0,6	4.246	1.274
	16	5	160	0,070	43	0,9	3.185	1.115
	20	5	160	0,090	50	1,0	2.548	1.146
INOX STAINLESS	8	5	80	0,030	24	0,4	3.185	478
	10	5	80	0,040	29	0,5	2.548	510
	12	5	80	0,050	37	0,6	2.123	531
	16	5	80	0,060	43	0,9	1.592	478
	20	5	80	0,075	50	1,0	1.274	478
LEGHE DI TITANIO	8	5	45	0,030	24	0,4	1.791	269
	10	5	45	0,035	29	0,5	1.433	251
	12	5	45	0,040	37	0,6	1.194	239
	16	5	45	0,055	43	0,9	896	246
	20	5	45	0,070	50	1,0	717	251

LAVORAZIONE TROCOIDALE

- Produzione di cave in elevata velocità
- Ridotta forza di taglio radiale che richiede meno stabilità e consente elevate profondità di taglio
- La divisione dei taglienti e il passo variabile dell'elica riduce al minimo le vibrazioni
- Riduce il calore nell'area di taglio grazie al breve tempo di contatto
- Genera trucioli di spessore contenuto, ma un elevato avanzamento
- Maggiore versatilità in quanto lo stesso utensile può lavorare cave di dimensioni diverse

X9000

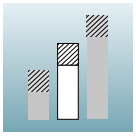


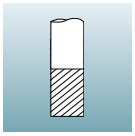
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	8	5	190	0,045	24	0,5	7.564	1.702
	10	5	190	0,060	29	0,6	6.051	1.815
	12	5	190	0,070	37	0,8	5.042	1.765
	16	5	190	0,090	43	1,1	3.782	1.702
	20	5	190	0,110	50	1,3	3.025	1.664
N/mm2 850-1100	8	5	140	0,045	24	0,5	5.573	1.254
	10	5	140	0,060	29	0,6	4.459	1.338
	12	5	140	0,070	37	0,8	3.715	1.300
	16	5	140	0,090	43	1,1	2.787	1.254
	20	5	140	0,110	50	1,3	2.229	1.226
INOX STAINLESS	8	5	90	0,040	24	0,5	3.583	717
	10	5	90	0,050	29	0,6	2.866	717
	12	5	90	0,060	37	0,8	2.389	717
	16	5	90	0,080	43	1,1	1.791	717
	20	5	90	0,100	50	1,3	1.433	717
LEGHE DI TITANIO	8	5	50	0,030	24	0,5	1.990	299
	10	5	50	0,035	29	0,6	1.592	279
	12	5	50	0,040	37	0,8	1.327	265
	16	5	50	0,055	43	1,1	995	274
	20	5	50	0,070	50	1,3	796	279

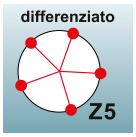
Frese per lavorazioni trocoidali

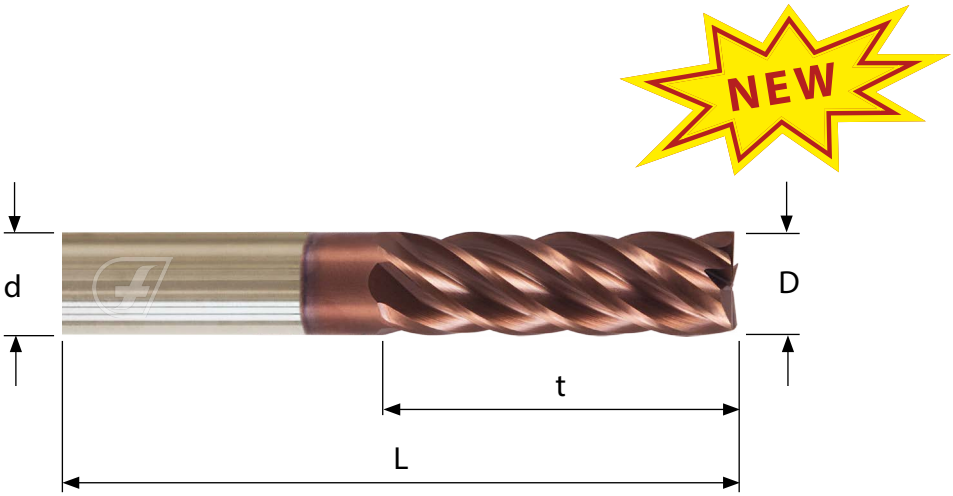
Trochoidal end mills

HM ULTRA FINE









Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1100

INOX STAINLESS

Ti Titanium

dimensions mm									*quality*	
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	X9000	
8	80	27	8	-	-	40°	-	FC 599 00 08	★	
10	80	32	10	-	-	40°	-	FC 599 00 10	★	
12	95	40	12	-	-	40°	-	FC 599 00 12	★	
16	97	48	16	-	-	40°	-	FC 599 00 16	★	
20	108	54	20	-	-	40°	-	FC 599 00 20	★	

Qualità HM
HM Quality
pag. 25

★ **Pronto**
Ready

FC 201 00 ..

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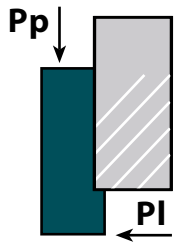

Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	2	120	0,010	3	1,3	12.739	255
	4	2	120	0,016	4	1,7	9.554	306
	5	2	120	0,020	5	2,2	7.643	306
	6	2	120	0,025	6	2,6	6.369	318
	8	2	120	0,030	8	3,6	4.777	287
	10	2	120	0,040	10	4,5	3.822	306
	12	2	120	0,050	12	5,2	3.185	318
	14	2	120	0,055	14	6,3	2.730	300
	16	2	120	0,060	16	7,0	2.389	287
N/mm2 850-1200	3	2	80	0,010	3	1,3	8.493	170
	4	2	80	0,016	4	1,7	6.369	204
	5	2	80	0,020	5	2,2	5.096	204
	6	2	80	0,020	6	2,6	4.246	170
	8	2	80	0,024	8	3,6	3.185	153
	10	2	80	0,034	10	4,5	2.548	173
	12	2	80	0,045	12	5,2	2.123	191
	14	2	80	0,049	14	6,3	1.820	178
	16	2	80	0,055	16	7,0	1.592	175
HRC 30-42	3	2	60	0,010	3	0,8	6.369	127
	4	2	60	0,016	4	1,0	4.777	153
	5	2	60	0,020	5	1,3	3.822	153
	6	2	60	0,020	6	1,5	3.185	127
	8	2	60	0,024	8	2,0	2.389	115
	10	2	60	0,034	10	2,5	1.911	130
	12	2	60	0,045	12	3,0	1.592	143
	14	2	60	0,049	14	3,5	1.365	134
	16	2	60	0,055	16	4,0	1.194	131
CAST IRON	3	2	160	0,010	3	1,3	16.985	340
	4	2	160	0,016	4	1,7	12.739	408
	5	2	160	0,020	5	2,2	10.191	408
	6	2	160	0,025	6	2,6	8.493	425
	8	2	160	0,030	8	3,6	6.369	382
	10	2	160	0,040	10	4,5	5.096	408
	12	2	160	0,050	12	5,2	4.246	425
	14	2	160	0,055	14	6,3	3.640	400
	16	2	160	0,060	16	7,0	3.185	382
INOX STAINLESS	3	2	60	0,010	3	1,3	6.369	127
	4	2	60	0,016	4	1,7	4.777	153
	5	2	60	0,020	5	2,2	3.822	153
	6	2	60	0,025	6	2,6	3.185	159
	8	2	60	0,030	8	3,6	2.389	143
	10	2	60	0,040	10	4,5	1.911	153
	12	2	60	0,050	12	5,2	1.592	159
	14	2	60	0,055	14	6,3	1.365	150
	16	2	60	0,060	16	7,0	1.194	143

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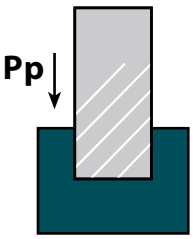


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	2	100	0,010	1,5	3	10.616	212
	4	2	100	0,010	2,0	4	7.962	159
	5	2	100	0,016	2,5	5	6.369	204
	6	2	100	0,016	3,0	6	5.308	170
	8	2	100	0,020	4,0	8	3.981	159
	10	2	100	0,030	5,0	10	3.185	191
	12	2	100	0,036	6,0	12	2.654	191
	14	2	100	0,040	7,0	14	2.275	182
	16	2	100	0,050	8,0	16	1.990	199
N/mm2 850-1200	3	2	70	0,010	1,5	3	7.431	149
	4	2	70	0,010	2,0	4	5.573	111
	5	2	70	0,016	2,5	5	4.459	143
	6	2	70	0,016	3,0	6	3.715	119
	8	2	70	0,020	4,0	8	2.787	111
	10	2	70	0,025	5,0	10	2.229	111
	12	2	70	0,030	6,0	12	1.858	111
	14	2	70	0,035	7,0	14	1.592	111
	16	2	70	0,040	8,0	16	1.393	111
HRC 30-42	3	2	50	0,010	1,5	3	5.308	106
	4	2	50	0,010	2,0	4	3.981	80
	5	2	50	0,016	2,5	5	3.185	102
	6	2	50	0,016	3,0	6	2.654	85
	8	2	50	0,020	4,0	8	1.990	80
	10	2	50	0,025	5,0	10	1.592	80
	12	2	50	0,030	6,0	12	1.327	80
	14	2	50	0,035	7,0	14	1.137	80
	16	2	50	0,040	8,0	16	995	80
CAST IRON	3	2	120	0,010	1,5	3	12.739	255
	4	2	120	0,010	2,0	4	9.554	191
	5	2	120	0,020	2,5	5	7.643	306
	6	2	120	0,020	3,0	6	6.369	255
	8	2	120	0,030	4,0	8	4.777	287
	10	2	120	0,040	5,0	10	3.822	306
	12	2	120	0,045	6,0	12	3.185	287
	14	2	120	0,050	7,0	14	2.730	273
	16	2	120	0,060	8,0	16	2.389	287
INOX STAINLESS	3	2	40	0,010	1,5	3	4.246	85
	4	2	40	0,010	2,0	4	3.185	64
	5	2	40	0,016	2,5	5	2.548	82
	6	2	40	0,016	3,0	6	2.123	68
	8	2	40	0,020	4,0	8	1.592	64
	10	2	40	0,025	5,0	10	1.274	64
	12	2	40	0,030	6,0	12	1.062	64
	14	2	40	0,035	7,0	14	910	64
	16	2	40	0,040	8,0	16	796	64

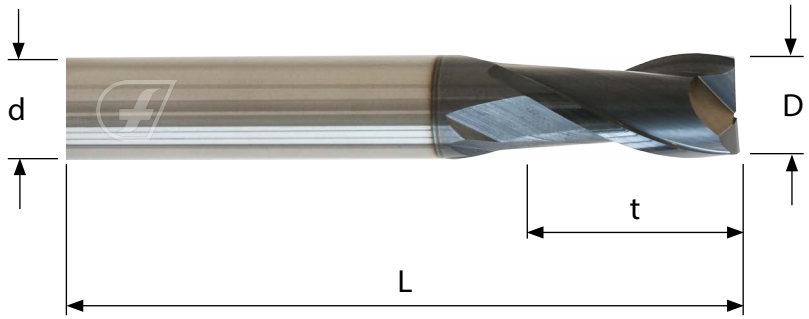
Frese per lavorazioni di cave

Pocket milling

90°

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

INOX STAINLESS

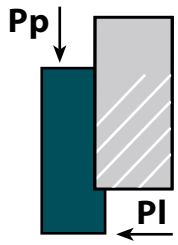
dimensions mm								code	quality
Dh10	L	t	dh6	a	b	*Helix*	*radius*		BLACK
2	40	6	2	-	-	30°	-	FC 201 00 02	★
3	40	8	3	-	-	30°	-	FC 201 00 03	★
4	51	10	4	-	-	30°	-	FC 201 00 04	★
5	51	12	5	-	-	30°	-	FC 201 00 05	★
6	51	14	6	-	-	30°	-	FC 201 00 06	★
6,5	64	14	7	-	-	30°	-	FC 201 00 6,5	★
7	64	15	7	-	-	30°	-	FC 201 00 07	★
7,5	64	15	8	-	-	30°	-	FC 201 00 7,5	★
8	64	16	8	-	-	30°	-	FC 201 00 08	★
8,5	64	16	9	-	-	30°	-	FC 201 00 8,5	★
9	64	18	9	-	-	30°	-	FC 201 00 09	★
9,5	64	18	10	-	-	30°	-	FC 201 00 9,5	★
10	64	20	10	-	-	30°	-	FC 201 00 10	★
10,5	64	20	11	-	-	30°	-	FC 201 00 10,5	★
11	64	21	11	-	-	30°	-	FC 201 00 11	★
11,5	80	21	12	-	-	30°	-	FC 201 00 11,5	★
12	80	22	12	-	-	30°	-	FC 201 00 12	★
13	80	25	13	-	-	30°	-	FC 201 00 13	★
14	80	27	14	-	-	30°	-	FC 201 00 14	★
16	97	32	16	-	-	30°	-	FC 201 00 16	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 201 10 ..

BLACK



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	2	2	120	0,006	2	0,8	19.108	229
	2,5	2	120	0,008	2,5	1,0	15.287	245
	3	2	120	0,010	3	1,2	12.739	255
	3,5	2	120	0,015	3,5	1,4	10.919	328
	4	2	120	0,020	4	1,6	9.554	382
	4,5	2	120	0,020	4,5	1,8	8.493	340
	5	2	120	0,020	5	2,0	7.643	306
	5,5	2	120	0,025	5,5	2,2	6.948	347
N/mm2 850-1200	2	2	80	0,006	2	0,8	12.739	153
	2,5	2	80	0,008	2,5	1,0	10.191	163
	3	2	80	0,010	3	1,2	8.493	170
	3,5	2	80	0,016	3,5	1,4	7.279	233
	4	2	80	0,016	4	1,6	6.369	204
	4,5	2	80	0,017	4,5	1,8	5.662	192
	5	2	80	0,017	5	2,0	5.096	173
	5,5	2	80	0,020	5,5	2,2	4.632	185
HRC 30-42	2	2	60	0,006	2	0,8	9.554	115
	2,5	2	60	0,008	2,5	1,0	7.643	122
	3	2	60	0,010	3	1,2	6.369	127
	3,5	2	60	0,016	3,5	1,4	5.460	175
	4	2	60	0,016	4	1,6	4.777	153
	4,5	2	60	0,017	4,5	1,8	4.246	144
	5	2	60	0,017	5	2,0	3.822	130
	5,5	2	60	0,020	5,5	2,2	3.474	139
CAST IRON	2	2	160	0,006	2	0,8	25.478	306
	2,5	2	160	0,008	2,5	1,0	20.382	326
	3	2	160	0,010	3	1,2	16.985	340
	3,5	2	160	0,015	3,5	1,4	14.559	437
	4	2	160	0,020	4	1,6	12.739	510
	4,5	2	160	0,020	4,5	1,8	11.323	453
	5	2	160	0,020	5	2,0	10.191	408
	5,5	2	160	0,025	5,5	2,2	9.265	463
INOX STAINLESS	2	2	60	0,006	2	0,8	9.554	115
	2,5	2	60	0,008	2,5	1,0	7.643	122
	3	2	60	0,010	3	1,2	6.369	127
	3,5	2	60	0,015	3,5	1,4	5.460	164
	4	2	60	0,020	4	1,6	4.777	191
	4,5	2	60	0,020	4,5	1,8	4.246	170
	5	2	60	0,020	5	2,0	3.822	153
	5,5	2	60	0,025	5,5	2,2	3.474	174

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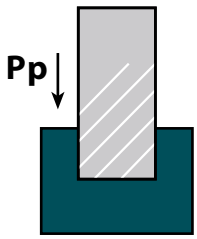


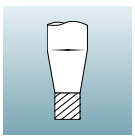
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	2	2	100	0,006	1,0	2,0	15.924	191
	2,5	2	100	0,008	1,3	2,5	12.739	204
	3	2	100	0,010	1,5	3,0	10.616	212
	3,5	2	100	0,015	1,8	3,5	9.099	273
	4	2	100	0,020	2,0	4,0	7.962	318
	4,5	2	100	0,020	2,3	4,5	7.077	283
	5	2	100	0,020	2,5	5,0	6.369	255
	5,5	2	100	0,025	2,8	5,5	5.790	290
N/mm2 850-1200	2	2	70	0,004	1,0	2,0	11.146	89
	2,5	2	70	0,006	1,3	2,5	8.917	107
	3	2	70	0,008	1,5	3,0	7.431	119
	3,5	2	70	0,010	1,8	3,5	6.369	127
	4	2	70	0,010	2,0	4,0	5.573	111
	4,5	2	70	0,012	2,3	4,5	4.954	119
	5	2	70	0,015	2,5	5,0	4.459	134
	5,5	2	70	0,015	2,8	5,5	4.053	122
HRC 30-42	2	2	50	0,006	1,0	2,0	7.962	96
	2,5	2	50	0,008	1,3	2,5	6.369	102
	3	2	50	0,010	1,5	3,0	5.308	106
	3,5	2	50	0,016	1,8	3,5	4.550	146
	4	2	50	0,016	2,0	4,0	3.981	127
	4,5	2	50	0,017	2,3	4,5	3.539	120
	5	2	50	0,017	2,5	5,0	3.185	108
	5,5	2	50	0,020	2,8	5,5	2.895	116
CAST IRON	2	2	120	0,006	1,0	2,0	19.108	229
	2,5	2	120	0,008	1,3	2,5	15.287	245
	3	2	120	0,010	1,5	3,0	12.739	255
	3,5	2	120	0,015	1,8	3,5	10.919	328
	4	2	120	0,020	2,0	4,0	9.554	382
	4,5	2	120	0,020	2,3	4,5	8.493	340
	5	2	120	0,020	2,5	5,0	7.643	306
	5,5	2	120	0,025	2,8	5,5	6.948	347
INOX STAINLESS	2	2	40	0,004	1,0	2,0	6.369	51
	2,5	2	40	0,006	1,3	2,5	5.096	61
	3	2	40	0,008	1,5	3,0	4.246	68
	3,5	2	40	0,010	1,8	3,5	3.640	73
	4	2	40	0,010	2,0	4,0	3.185	64
	4,5	2	40	0,012	2,3	4,5	2.831	68
	5	2	40	0,015	2,5	5,0	2.548	76
	5,5	2	40	0,015	2,8	5,5	2.316	69

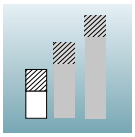
Se si utilizzano frese Futura Carbide Silver diminuire i parametri del 20/40% - *When using Futura Carbide Silver end mills, decrease the parameters by* 20/40%

Frese per lavorazioni di cave

Pocket milling

HM MICRO GRAIN





Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

INOX STAINLESS

dimensions mm								code	quality
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	BLACK
2	51	5	4	-	-	30°	-	FC 201 10 02	★
2,5	51	6	4	-	-	30°	-	FC 201 10 2,5	★
3	51	7	6	-	-	30°	-	FC 201 10 03	★
3,5	51	8	6	-	-	30°	-	FC 201 10 3,5	★
4	51	9	6	-	-	30°	-	FC 201 10 04	★
4,5	51	10	6	-	-	30°	-	FC 201 10 4,5	★
5	51	11	6	-	-	30°	-	FC 201 10 05	★
5,5	51	12	6	-	-	30°	-	FC 201 10 5,5	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 301 00 ..

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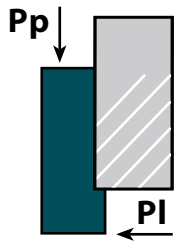

Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	3	120	0,010	4,5	0,6	12.739	382
	4	3	120	0,016	6,0	0,8	9.554	459
	5	3	120	0,020	7,5	1,0	7.643	459
	6	3	120	0,025	9,0	1,2	6.369	478
	8	3	120	0,030	12,0	1,6	4.777	430
	10	3	120	0,040	15,0	2,0	3.822	459
	12	3	120	0,050	18,0	2,4	3.185	478
	14	3	120	0,055	21,0	2,8	2.730	450
	16	3	120	0,060	24,0	3,2	2.389	430
N/mm2 850-1200	3	3	80	0,010	4,5	0,6	8.493	255
	4	3	80	0,016	6,0	0,8	6.369	306
	5	3	80	0,020	7,5	1,0	5.096	306
	6	3	80	0,020	9,0	1,2	4.246	255
	8	3	80	0,024	12,0	1,6	3.185	229
	10	3	80	0,034	15,0	2,0	2.548	260
	12	3	80	0,045	18,0	2,4	2.123	287
	14	3	80	0,049	21,0	2,8	1.820	268
	16	3	80	0,055	24,0	3,2	1.592	263
HRC 30-42	3	3	60	0,010	4,5	0,6	6.369	191
	4	3	60	0,016	6,0	0,8	4.777	229
	5	3	60	0,020	7,5	1,0	3.822	229
	6	3	60	0,020	9,0	1,2	3.185	191
	8	3	60	0,024	12,0	1,6	2.389	172
	10	3	60	0,034	15,0	2,0	1.911	195
	12	3	60	0,045	18,0	2,4	1.592	215
	14	3	60	0,049	21,0	2,8	1.365	201
	16	3	60	0,055	24,0	3,2	1.194	197
HRC 42-48	3	3	50	0,010	4,5	0,3	5.308	159
	4	3	50	0,016	6,0	0,4	3.981	191
	5	3	50	0,020	7,5	0,5	3.185	191
	6	3	50	0,020	9,0	0,6	2.654	159
	8	3	50	0,024	12,0	0,8	1.990	143
	10	3	50	0,034	15,0	1,0	1.592	162
	12	3	50	0,045	18,0	1,2	1.327	179
	14	3	50	0,049	21,0	1,4	1.137	167
	16	3	50	0,055	24,0	1,6	995	164
INOX STAINLESS	3	3	60	0,010	4,5	0,6	6.369	191
	4	3	60	0,016	6,0	0,8	4.777	229
	5	3	60	0,020	7,5	1,0	3.822	229
	6	3	60	0,025	9,0	1,2	3.185	239
	8	3	60	0,030	12,0	1,6	2.389	215
	10	3	60	0,040	15,0	2,0	1.911	229
	12	3	60	0,050	18,0	2,4	1.592	239
	14	3	60	0,055	21,0	2,8	1.365	225
	16	3	60	0,060	24,0	3,2	1.194	215

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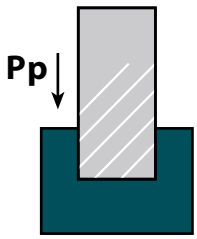
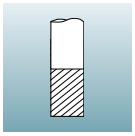


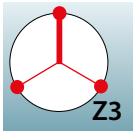
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	3	100	0,010	0,6	3	10.616	318
	4	3	100	0,010	0,8	4	7.962	239
	5	3	100	0,016	1,0	5	6.369	306
	6	3	100	0,016	1,2	6	5.308	255
	8	3	100	0,020	1,6	8	3.981	239
	10	3	100	0,030	2,0	10	3.185	287
	12	3	100	0,036	2,4	12	2.654	287
	14	3	100	0,040	2,8	14	2.275	273
	16	3	100	0,050	3,2	16	1.990	299
N/mm2 850-1200	3	3	70	0,010	0,6	3	7.431	223
	4	3	70	0,010	0,8	4	5.573	167
	5	3	70	0,016	1,0	5	4.459	214
	6	3	70	0,016	1,2	6	3.715	178
	8	3	70	0,020	1,6	8	2.787	167
	10	3	70	0,025	2,0	10	2.229	167
	12	3	70	0,030	2,4	12	1.858	167
	14	3	70	0,035	2,8	14	1.592	167
	16	3	70	0,040	3,2	16	1.393	167
HRC 30-42	3	3	50	0,010	0,6	3	5.308	159
	4	3	50	0,010	0,8	4	3.981	119
	5	3	50	0,016	1,0	5	3.185	153
	6	3	50	0,016	1,2	6	2.654	127
	8	3	50	0,020	1,6	8	1.990	119
	10	3	50	0,025	2,0	10	1.592	119
	12	3	50	0,030	2,4	12	1.327	119
	14	3	50	0,035	2,8	14	1.137	119
	16	3	50	0,040	3,2	16	995	119
HRC 42-48	3	3	40	0,010	0,3	3	4.246	127
	4	3	40	0,010	0,4	4	3.185	96
	5	3	40	0,016	0,5	5	2.548	122
	6	3	40	0,016	0,6	6	2.123	102
	8	3	40	0,020	0,8	8	1.592	96
	10	3	40	0,025	1,0	10	1.274	96
	12	3	40	0,030	1,2	12	1.062	96
	14	3	40	0,035	1,4	14	910	96
	16	3	40	0,040	1,6	16	796	96
INOX STAINLESS	3	3	40	0,010	0,6	3	4.246	127
	4	3	40	0,010	0,8	4	3.185	96
	5	3	40	0,016	1,0	5	2.548	122
	6	3	40	0,016	1,2	6	2.123	102
	8	3	40	0,020	1,6	8	1.592	96
	10	3	40	0,025	2,0	10	1.274	96
	12	3	40	0,030	2,4	12	1.062	96
	14	3	40	0,035	2,8	14	910	96
	16	3	40	0,040	3,2	16	796	96

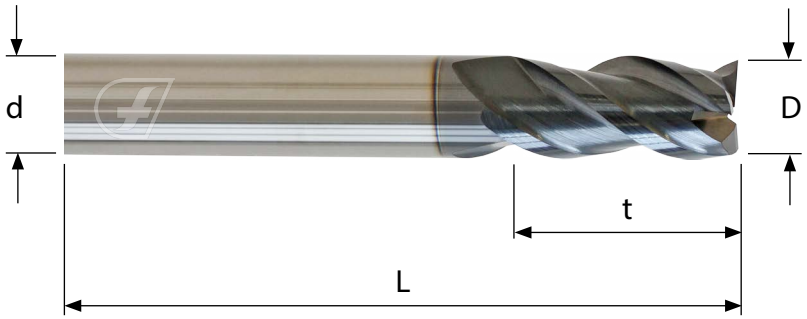
Frese per lavorazioni di cave

Pocket milling

HM MICRO GRAIN







Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

HRC 42-48

INOX STAINLESS

dimensions mm								*code*	*quality*
Dh10	L	t	dh6	a	b	*Helix*	*radius*		BLACK
3	40	8	3	-	-	40°	-	FC 301 00 03	★
4	51	10	4	-	-	40°	-	FC 301 00 04	★
5	51	12	5	-	-	40°	-	FC 301 00 05	★
6	51	15	6	-	-	40°	-	FC 301 00 06	★
8	64	18	8	-	-	40°	-	FC 301 00 08	★
10	64	22	10	-	-	40°	-	FC 301 00 10	★
12	80	25	12	-	-	40°	-	FC 301 00 12	★
14	80	28	14	-	-	40°	-	FC 301 00 14	★
16	97	32	16	-	-	40°	-	FC 301 00 16	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 301 10 ..

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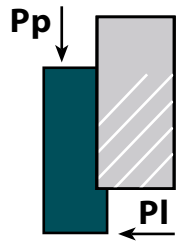

Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	3	120	0,010	4,5	0,6	12.739	382
	4	3	120	0,016	6,0	0,8	9.554	459
	5	3	120	0,020	7,5	1,0	7.643	459
N/mm2 850-1200	3	3	80	0,010	4,5	0,6	8.493	255
	4	3	80	0,016	6,0	0,8	6.369	306
	5	3	80	0,020	7,5	1,0	5.096	306
HRC 30-42	3	3	60	0,010	4,5	0,6	6.369	191
	4	3	60	0,016	6,0	0,8	4.777	229
	5	3	60	0,020	7,5	1,0	3.822	229
HRC 42-48	3	3	50	0,010	4,5	0,3	5.308	159
	4	3	50	0,016	6,0	0,4	3.981	191
	5	3	50	0,020	7,5	0,5	3.185	191
INOX STAINLESS	3	3	60	0,010	4,5	0,6	6.369	191
	4	3	60	0,016	6,0	0,8	4.777	229
	5	3	60	0,020	7,5	1,0	3.822	229

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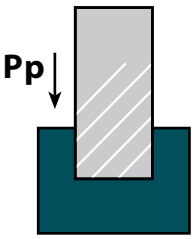


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	3	100	0,010	0,6	3	10.616	318
	4	3	100	0,010	0,8	4	7.962	239
	5	3	100	0,016	1,0	5	6.369	306
N/mm2 850-1200	3	3	70	0,010	0,6	3	7.431	223
	4	3	70	0,010	0,8	4	5.573	167
	5	3	70	0,016	1,0	5	4.459	214
HRC 30-42	3	3	50	0,010	0,6	3	5.308	159
	4	3	50	0,010	0,8	4	3.981	119
	5	3	50	0,016	1,0	5	3.185	153
HRC 42-48	3	3	40	0,010	0,3	3	4.246	127
	4	3	40	0,010	0,4	4	3.185	96
	5	3	40	0,016	0,5	5	2.548	122
INOX STAINLESS	3	3	40	0,010	0,6	3	4.246	127
	4	3	40	0,010	0,8	4	3.185	96
	5	3	40	0,016	1,0	5	2.548	122

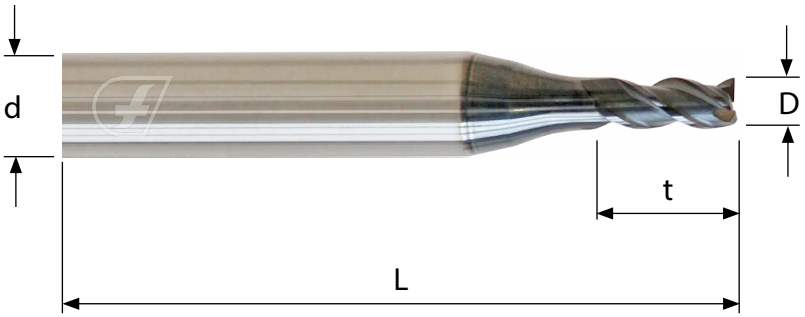
Frese per lavorazioni di cave

Pocket milling

90°

HM MICRO GRAIN

Z3



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

HRC 42-48

INOX STAINLESS

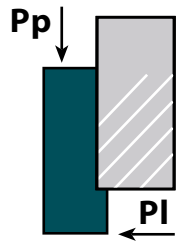
dimensions mm								*code*	*quality* BLACK
Dh10	L	t	dh6	a	b	*Helix*	*radius*		
3	51	7	6	-	-	40°	-	FC 301 10 03	★
4	51	9	6	-	-	40°	-	FC 301 10 04	★
5	51	11	6	-	-	40°	-	FC 301 10 05	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

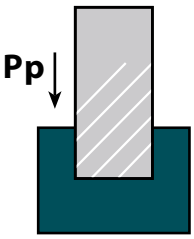
FC 303 00 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
CAST IRON	4	3	160	0,030	4	1,0	12.739	1.146
	5	3	160	0,040	5	1,2	10.191	1.223
	6	3	160	0,050	6	1,5	8.493	1.274
	8	3	160	0,070	8	2,0	6.369	1.338
	10	3	160	0,090	10	2,5	5.096	1.376
	12	3	160	0,110	12	3,0	4.246	1.401
	16	3	160	0,130	16	4,0	3.185	1.242
HRC 42-48	4	3	120	0,030	4	1,0	9.554	860
	5	3	120	0,040	5	1,2	7.643	917
	6	3	120	0,050	6	1,5	6.369	955
	8	3	120	0,070	8	2,0	4.777	1.003
	10	3	120	0,090	10	2,5	3.822	1.032
	12	3	120	0,110	12	3,0	3.185	1.051
	16	3	120	0,130	16	4,0	2.389	932
HRC 48-52	4	3	80	0,020	4	1,0	6.369	382
	5	3	80	0,030	5	1,2	5.096	459
	6	3	80	0,035	6	1,5	4.246	446
	8	3	80	0,050	8	2,0	3.185	478
	10	3	80	0,060	10	2,5	2.548	459
	12	3	80	0,070	12	3,0	2.123	446
	16	3	80	0,090	16	4,0	1.592	430
HRC 52-60	4	3	45	0,015	4	1,0	3.583	161
	5	3	45	0,020	5	1,2	2.866	172
	6	3	45	0,025	6	1,5	2.389	179
	8	3	45	0,030	8	2,0	1.791	161
	10	3	45	0,040	10	2,5	1.433	172
	12	3	45	0,050	12	3,0	1.194	179
	16	3	45	0,065	16	4,0	896	175

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
CAST IRON	4	3	120	0,030	1,2	4	9.554	860
	5	3	120	0,040	1,5	5	7.643	917
	6	3	120	0,050	1,8	6	6.369	955
	8	3	120	0,070	2,4	8	4.777	1.003
	10	3	120	0,090	3,0	10	3.822	1.032
	12	3	120	0,110	3,6	12	3.185	1.051
	16	3	120	0,130	4,8	16	2.389	932
HRC 42-48	4	3	100	0,030	1,0	4	7.962	717
	5	3	100	0,040	1,2	5	6.369	764
	6	3	100	0,050	1,5	6	5.308	796
	8	3	100	0,060	2,0	8	3.981	717
	10	3	100	0,070	2,5	10	3.185	669
	12	3	100	0,085	3,0	12	2.654	677
	16	3	100	0,100	4,0	16	1.990	597
HRC 48-52	4	3	60	0,020	1,0	4	4.777	287
	5	3	60	0,025	1,2	5	3.822	287
	6	3	60	0,030	1,5	6	3.185	287
	8	3	60	0,040	2,0	8	2.389	287
	10	3	60	0,050	2,5	10	1.911	287
	12	3	60	0,060	3,0	12	1.592	287
	16	3	60	0,075	4,0	16	1.194	269
HRC 52-60	4	3	30	0,010	1,0	4	2.389	72
	5	3	30	0,015	1,2	5	1.911	86
	6	3	30	0,020	1,5	6	1.592	96
	8	3	30	0,025	2,0	8	1.194	90
	10	3	30	0,030	2,5	10	955	86
	12	3	30	0,035	3,0	12	796	84
	16	3	30	0,040	4,0	16	597	72

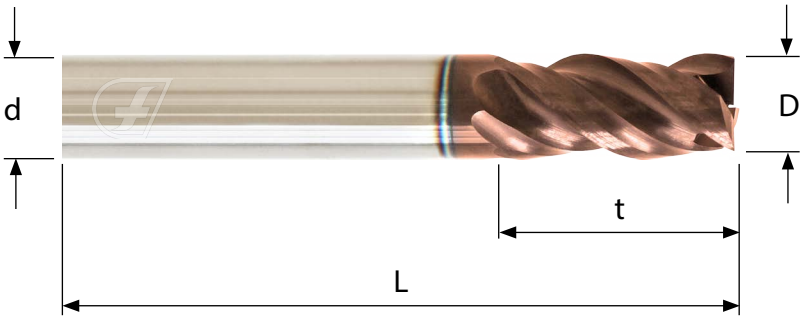
Frese per lavorazioni di cave

Pocket milling

90°

HM ULTRA FINE

Z3



Sgrossatura

Finitura

CAST IRON

HRC 42-48

HRC 48-52

HRC 52-60

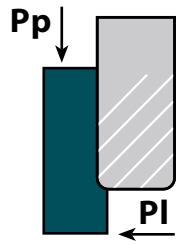
dimensions mm								code	quality
Dh10	L	t	dh6	a	b	*Helix*	*radius*		X9000
4	51	9	4	-	-	42°	-	FC 303 00 04	★
5	51	12	5	-	-	42°	-	FC 303 00 05	★
6	51	17	6	-	-	42°	-	FC 303 00 06	★
8	64	20	8	-	-	42°	-	FC 303 00 08	★
10	64	22	10	-	-	42°	-	FC 303 00 10	★
12	80	25	12	-	-	42°	-	FC 303 00 12	★
16	97	32	16	-	-	42°	-	FC 303 00 16	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

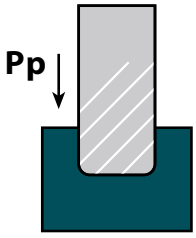
FC 330 00 .. FC 430 00 ..

BLACK



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	5	3	120	0,015	5	1,2	7.643	344
	6	3	120	0,020	6	1,5	6.369	382
	7	3	120	0,020	7	2,0	5.460	328
	8	4	120	0,025	8	2,5	4.777	478
	9	4	120	0,030	9	2,3	4.246	510
	10	4	120	0,035	10	3,0	3.822	535
	11	4	120	0,035	11	3,3	3.474	486
	12	4	120	0,040	12	3,6	3.185	510
	14	4	120	0,050	14	4,3	2.730	546
	16	4	120	0,060	16	5,0	2.389	573
	20	4	120	0,070	20	6,0	1.911	535
N/mm2 850-1200	5	3	80	0,015	5	1,2	5.096	229
	6	3	80	0,020	6	1,5	4.246	255
	7	3	80	0,020	7	2,0	3.640	218
	8	4	80	0,025	8	2,5	3.185	318
	9	4	80	0,025	9	2,3	2.831	283
	10	4	80	0,030	10	3,0	2.548	306
	11	4	80	0,030	11	3,3	2.316	278
	12	4	80	0,030	12	3,6	2.123	255
	14	4	80	0,040	14	4,3	1.820	291
	16	4	80	0,050	16	5,0	1.592	318
	20	4	80	0,060	20	6,0	1.274	306
CAST IRON	5	3	160	0,015	5	1,2	10.191	459
	6	3	160	0,020	6	1,5	8.493	510
	7	3	160	0,020	7	2,0	7.279	437
	8	4	160	0,025	8	2,5	6.369	637
	9	4	160	0,030	9	2,3	5.662	679
	10	4	160	0,035	10	3,0	5.096	713
	11	4	160	0,035	11	3,3	4.632	649
	12	4	160	0,040	12	3,6	4.246	679
	14	4	160	0,050	14	4,3	3.640	728
	16	4	160	0,060	16	5,0	3.185	764
	20	4	160	0,070	20	6,0	2.548	713
HRC 30-42	5	3	70	0,015	5	1,2	4.459	201
	6	3	70	0,020	6	1,5	3.715	223
	7	3	70	0,020	7	2,0	3.185	191
	8	4	70	0,025	8	2,5	2.787	279
	9	4	70	0,025	9	2,3	2.477	248
	10	4	70	0,030	10	3,0	2.229	268
	11	4	70	0,030	11	3,3	2.027	243
	12	4	70	0,030	12	3,6	1.858	223
	14	4	70	0,040	14	4,3	1.592	255
	16	4	70	0,050	16	5,0	1.393	279
	20	4	70	0,060	20	6,0	1.115	268

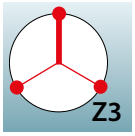
BLACK



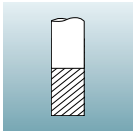
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	5	3	100	0,015	2,5	5	6.369	287
	6	3	100	0,020	3,0	6	5.308	318
	7	3	100	0,020	3,5	7	4.550	273
	8	4	100	0,025	4,0	8	3.981	398
	9	4	100	0,025	4,5	9	3.539	354
	10	4	100	0,030	5,0	10	3.185	382
	11	4	100	0,030	5,5	11	2.895	347
	12	4	100	0,030	6,0	12	2.654	318
	14	4	100	0,040	7,0	14	2.275	364
	16	4	100	0,050	8,0	16	1.990	398
	20	4	100	0,060	10,0	20	1.592	382
N/mm2 850-1200	5	3	70	0,015	2,5	5	4.459	201
	6	3	70	0,020	3,0	6	3.715	223
	7	3	70	0,020	3,5	7	3.185	191
	8	4	70	0,025	4,0	8	2.787	279
	9	4	70	0,025	4,5	9	2.477	248
	10	4	70	0,030	5,0	10	2.229	268
	11	4	70	0,030	5,5	11	2.027	243
	12	4	70	0,030	6,0	12	1.858	223
	14	4	70	0,040	7,0	14	1.592	255
	16	4	70	0,050	8,0	16	1.393	279
	20	4	70	0,060	10,0	20	1.115	268
CAST IRON	5	3	120	0,015	2,5	5	7.643	344
	6	3	120	0,020	3,0	6	6.369	382
	7	3	120	0,020	3,5	7	5.460	328
	8	4	120	0,025	4,0	8	4.777	478
	9	4	120	0,025	4,5	9	4.246	425
	10	4	120	0,030	5,0	10	3.822	459
	11	4	120	0,030	5,5	11	3.474	417
	12	4	120	0,030	6,0	12	3.185	382
	14	4	120	0,040	7,0	14	2.730	437
	16	4	120	0,050	8,0	16	2.389	478
	20	4	120	0,060	10,0	20	1.911	459
HRC 30-42	5	3	60	0,015	2,5	5	3.822	172
	6	3	60	0,020	3,0	6	3.185	191
	7	3	60	0,020	3,5	7	2.730	164
	8	4	60	0,025	4,0	8	2.389	239
	9	4	60	0,025	4,5	9	2.123	212
	10	4	60	0,030	5,0	10	1.911	229
	11	4	60	0,030	5,5	11	1.737	208
	12	4	60	0,030	6,0	12	1.592	191
	14	4	60	0,040	7,0	14	1.365	218
	16	4	60	0,050	8,0	16	1.194	239
	20	4	60	0,060	10,0	20	955	229

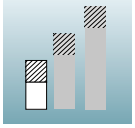
Frese per lavorazioni di cave e contornatura

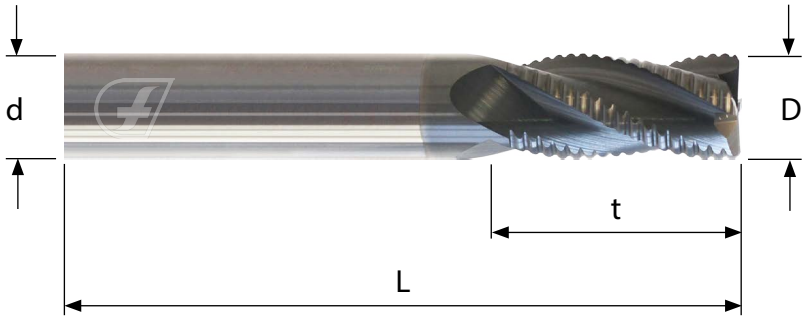
Pocket milling - profailing



HM MICRO GRAIN







Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

FC 330 00 ..

dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	BLACK	
5	51	12	5	-	-	30°	**0,5**	FC 330 00 05	★	
6	51	15	6	-	-	30°	**0,5**	FC 330 00 06	★	
7	64	16	7	-	-	30°	**0,5**	FC 330 00 07	★	

FC 430 00 ..

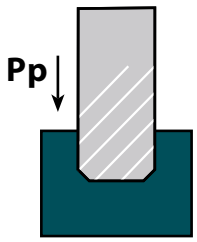
8	64	18	8	-	-	30°	**1,0**	FC 430 00 08	★	
9	64	18	9	-	-	30°	**1,0**	FC 430 00 09	★	
10	64	22	10	-	-	30°	**1,0**	FC 430 00 10	★	
11	64	22	11	-	-	30°	**1,0**	FC 430 00 11	★	
12	80	25	12	-	-	30°	**1,0**	FC 430 00 12	★	
14	80	27	14	-	-	30°	**1,0**	FC 430 00 14	★	
16	97	32	16	-	-	30°	**1,0**	FC 430 00 16	★	
20	97	38	20	-	-	30°	**1,5**	FC 430 00 20	★	

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 450 40 ..

HS 700



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
CAST IRON	4	4	160	0,030	1,5	4	12.739	1.529
	6	4	160	0,050	2	6	8.493	1.699
	8	4	160	0,070	3	8	6.369	1.783
	10	4	160	0,090	4	10	5.096	1.834
	12	4	160	0,110	5	12	4.246	1.868
HRC 42-48	4	4	110	0,020	1,5	4	8.758	701
	6	4	110	0,035	2	6	5.839	817
	8	4	110	0,050	3	8	4.379	876
	10	4	110	0,060	4	10	3.503	841
	12	4	110	0,075	5	12	2.919	876
HRC 48-52	4	4	70	0,020	1,5	4	5.573	446
	6	4	70	0,030	2	6	3.715	446
	8	4	70	0,040	3	8	2.787	446
	10	4	70	0,050	4	10	2.229	446
	12	4	70	0,060	5	12	1.858	446
HRC 52-60	4	4	30	0,015	1,5	4	2.389	143
	6	4	30	0,020	2	6	1.592	127
	8	4	30	0,025	3	8	1.194	119
	10	4	30	0,030	4	10	955	115
	12	4	30	0,040	5	12	796	127

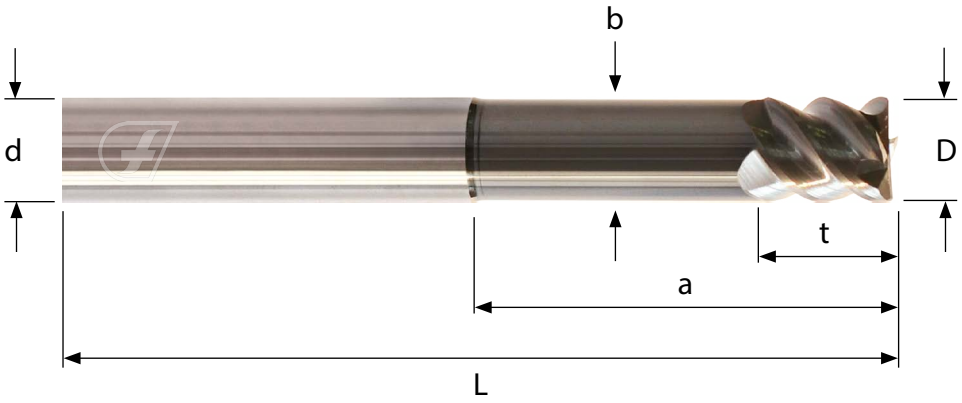
Frese per lavorazioni di cave

Pocket milling

45°

HM ULTRA FINE

Z4



Sgrossatura

Finitura

CAST IRON

HRC 42-48

HRC 48-52

HRC 52-60

dimensions mm								*code*	*quality*
Dh10	L	t	dh6	a	b	*Helix*	*radius*		HS 700
4	60	6	4	20	3,8	55°	-	FC 450 40 04	★
6	80	8	6	30	5,6	55°	-	FC 450 40 06	★
8	100	10	8	40	7,6	55°	-	FC 450 40 08	★
10	100	12	10	40	9,5	55°	-	FC 450 40 10	★
12	108	14	12	45	11,5	55°	-	FC 450 40 12	★

Qualità HM
HM Quality
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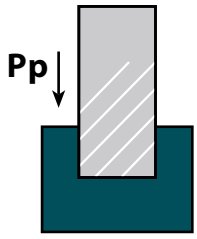
★ Pronto
Ready

FC 491 40 ..

HS 700



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	170	0,030	3	4	13.535	1.624
	6	4	170	0,040	4	6	9.023	1.444
	8	4	170	0,050	6	8	6.768	1.354
	10	4	170	0,060	8	10	5.414	1.299
	12	4	170	0,070	9	12	4.512	1.263
	16	4	170	0,080	10	16	3.384	1.083
N/mm2 850-1200	4	4	120	0,030	3	4	9.554	1.146
	6	4	120	0,040	4	6	6.369	1.019
	8	4	120	0,050	6	8	4.777	955
	10	4	120	0,060	8	10	3.822	917
	12	4	120	0,070	9	12	3.185	892
	16	4	120	0,080	10	16	2.389	764
HRC 30-42	4	4	70	0,020	3	4	5.573	446
	6	4	70	0,030	4	6	3.715	446
	8	4	70	0,040	6	8	2.787	446
	10	4	70	0,050	8	10	2.229	446
	12	4	70	0,060	9	12	1.858	446
	16	4	70	0,070	10	16	1.393	390

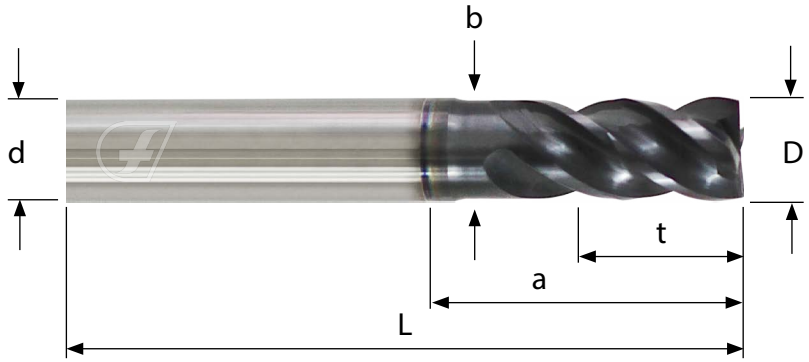
Frese per lavorazioni di cave

Pocket milling

90°

HM ULTRA FINE

differenziato Z4



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

HRC 30-42

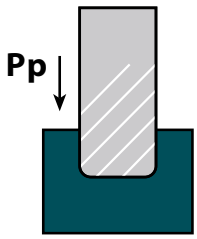
dimensions mm								code	quality
Dh10	L	t	dh6	a	b	*Helix*	*radius*		HS 700
4	51	5	4	12	3,8	40°	-	FC 491 40 04	★
6	51	7	6	18	5,7	40°	-	FC 491 40 06	★
8	64	9	8	22	7,6	40°	-	FC 491 40 08	★
10	64	11	10	24	9,6	40°	-	FC 491 40 10	★
12	80	13	12	27	11,5	40°	-	FC 491 40 12	★
16	97	17	16	36	15,4	40°	-	FC 491 40 16	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 492 40 ..

HS 700



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	170	0,030	3	4	13.535	1.624
	6	4	170	0,040	4	6	9.023	1.444
	8	4	170	0,050	6	8	6.768	1.354
	10	4	170	0,060	8	10	5.414	1.299
	12	4	170	0,070	9	12	4.512	1.263
	16	4	170	0,080	10	16	3.384	1.083
	20	4	170	0,090	12	20	2.707	975
N/mm2 850-1200	4	4	120	0,030	3	4	9.554	1.146
	6	4	120	0,040	4	6	6.369	1.019
	8	4	120	0,050	6	8	4.777	955
	10	4	120	0,060	8	10	3.822	917
	12	4	120	0,070	9	12	3.185	892
	16	4	120	0,080	10	16	2.389	764
	20	4	120	0,090	12	20	1.911	688
HRC 30-42	4	4	70	0,020	3	4	5.573	446
	6	4	70	0,030	4	6	3.715	446
	8	4	70	0,040	6	8	2.787	446
	10	4	70	0,050	8	10	2.229	446
	12	4	70	0,060	9	12	1.858	446
	16	4	70	0,070	10	16	1.393	390
	20	4	70	0,080	12	20	1.115	357

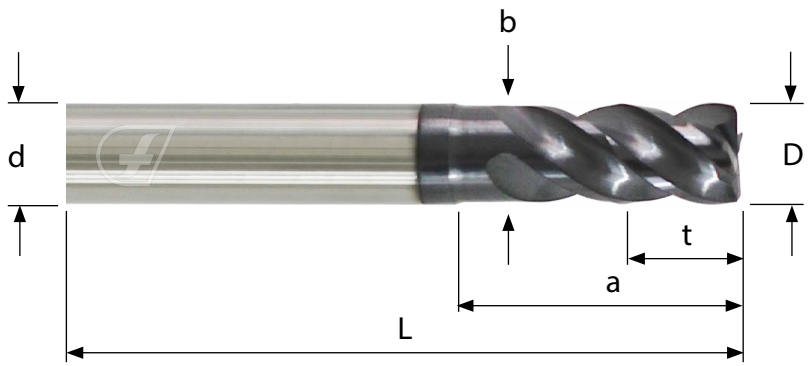
Frese per lavorazioni di cave

Pocket milling

R

HM ULTRA FINE

differenziato Z4



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

HRC 30-42

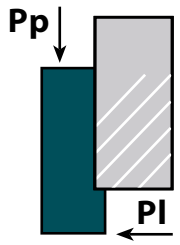
dimensions mm								code	quality
Dh10	L	t	dh6	a	b	Helix	radius		HS 700
4	51	5	4	12	3,8	40°	**0,5**	FC 492 40 04	★
6	51	7	6	18	5,7	40°	**0,5**	FC 492 40 06	★
8	64	9	8	22	7,6	40°	**0,5**	FC 492 40 08	★
10	64	11	10	24	9,6	40°	**0,5**	FC 492 40 10	★
12	80	13	12	27	11,5	40°	**0,5**	FC 492 40 12	★
16	97	17	16	36	15,4	40°	**0,5**	FC 492 40 16	★
20	97	22	20	40	19,3	40°	**0,5**	FC 492 40 20	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

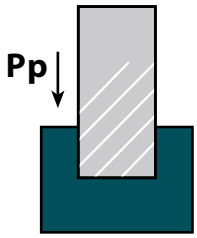
FC 493 00 ..

ZR 800



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	140	0,050	12	0,60	11.146	2.229
	5	4	140	0,055	14	0,70	8.917	1.962
	6	4	140	0,060	16	0,80	7.431	1.783
	7	4	140	0,070	19	0,90	6.369	1.783
	8	4	140	0,080	21	1,00	5.573	1.783
	9	4	140	0,085	23	1,10	4.954	1.684
	10	4	140	0,090	24	1,25	4.459	1.605
	11	4	140	0,100	25	1,35	4.053	1.621
	12	4	140	0,110	28	1,50	3.715	1.635
	14	4	140	0,120	29	1,75	3.185	1.529
	16	4	140	0,130	39	2,00	2.787	1.449
	18	4	140	0,140	39	2,25	2.477	1.387
	20	4	140	0,150	43	2,50	2.229	1.338
N/mm2 850-1200	4	4	120	0,050	12	0,60	9.554	1.911
	5	4	120	0,055	14	0,70	7.643	1.682
	6	4	120	0,060	16	0,80	6.369	1.529
	7	4	120	0,070	19	0,90	5.460	1.529
	8	4	120	0,080	21	1,00	4.777	1.529
	9	4	120	0,085	23	1,10	4.246	1.444
	10	4	120	0,090	24	1,25	3.822	1.376
	11	4	120	0,100	25	1,35	3.474	1.390
	12	4	120	0,110	28	1,50	3.185	1.401
	14	4	120	0,120	29	1,75	2.730	1.310
	16	4	120	0,130	39	2,00	2.389	1.242
	18	4	120	0,140	39	2,25	2.123	1.189
	20	4	120	0,150	43	2,50	1.911	1.146
INOX STAINLESS	4	4	60	0,030	12	0,60	4.777	573
	5	4	60	0,035	14	0,70	3.822	535
	6	4	60	0,045	16	0,80	3.185	573
	7	4	60	0,050	19	0,90	2.730	546
	8	4	60	0,060	21	1,00	2.389	573
	9	4	60	0,070	23	1,10	2.123	594
	10	4	60	0,080	24	1,25	1.911	611
	11	4	60	0,090	25	1,35	1.737	625
	12	4	60	0,100	28	1,50	1.592	637
	14	4	60	0,110	29	1,75	1.365	601
	16	4	60	0,120	39	2,00	1.194	573
	18	4	60	0,130	39	2,25	1.062	552
	20	4	60	0,140	43	2,50	955	535

ZR 800



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	110	0,023	3	4	8.758	806
	5	4	110	0,030	3,5	5	7.006	841
	6	4	110	0,035	4,5	6	5.839	817
	7	4	110	0,042	5	7	5.005	841
	8	4	110	0,050	5,5	8	4.379	876
	9	4	110	0,055	6	9	3.892	856
	10	4	110	0,060	7	10	3.503	841
	11	4	110	0,067	7,5	11	3.185	854
	12	4	110	0,075	8	12	2.919	876
	14	4	110	0,080	9	14	2.502	801
	16	4	110	0,090	10	16	2.189	788
	18	4	110	0,095	12	18	1.946	740
	20	4	110	0,100	14	20	1.752	701
N/mm2 850-1200	4	4	90	0,023	2	4	7.166	659
	5	4	90	0,030	2,5	5	5.732	688
	6	4	90	0,035	3	6	4.777	669
	7	4	90	0,042	3,5	7	4.095	688
	8	4	90	0,050	4	8	3.583	717
	9	4	90	0,055	4,5	9	3.185	701
	10	4	90	0,060	5	10	2.866	688
	11	4	90	0,067	5,5	11	2.606	698
	12	4	90	0,075	6	12	2.389	717
	14	4	90	0,080	7	14	2.047	655
	16	4	90	0,090	8	16	1.791	645
	18	4	90	0,095	9	18	1.592	605
	20	4	90	0,100	10	20	1.433	573

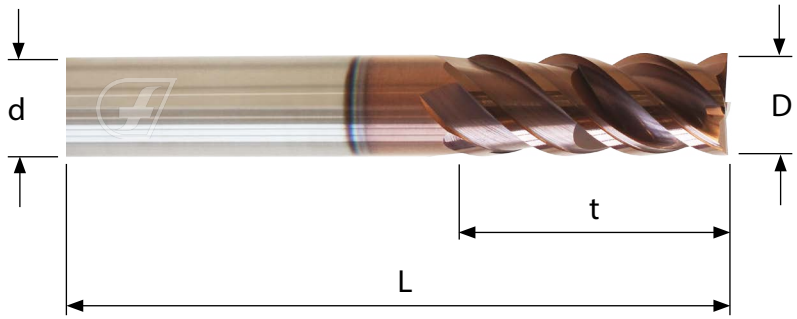
Frese per lavorazioni di cave e contornatura

Pocket milling - profailing

90°

HM MICRO GRAIN

differenziato Z4



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

INOX STAINLESS

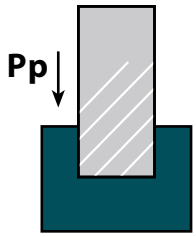
dimensions mm								code	quality
Dh10	L	t	dh6	a	b	*Helix*	*radius*		ZR 800
4	51	14	4	-	-	45°	-	FC 493 00 04	★
5	51	16	5	-	-	45°	-	FC 493 00 05	★
6	51	18	6	-	-	45°	-	FC 493 00 06	★
7	64	21	8	-	-	45°	-	FC 493 00 07	★
8	64	23	8	-	-	45°	-	FC 493 00 08	★
9	64	25	10	-	-	45°	-	FC 493 00 09	★
10	64	26	10	-	-	45°	-	FC 493 00 10	★
11	80	28	12	-	-	45°	-	FC 493 00 11	★
12	80	31	12	-	-	45°	-	FC 493 00 12	★
14	80	32	14	-	-	45°	-	FC 493 00 14	★
16	97	42	16	-	-	45°	-	FC 493 00 16	★
18	97	42	18	-	-	45°	-	FC 493 00 18	★
20	108	47	20	-	-	45°	-	FC 493 00 20	★

Qualità HM
HM Quality
pag. 25

★ **Pronto**
Ready

FC 495 40 ..

XO 300



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	170	0,030	3	4	13.535	1.624
	6	4	170	0,040	4	6	9.023	1.444
	8	4	170	0,050	6	8	6.768	1.354
	10	4	170	0,060	8	10	5.414	1.299
	12	4	170	0,070	9	12	4.512	1.263
	16	4	170	0,080	10	16	3.384	1.083
INOX STAINLESS	4	4	70	0,010	2	4	5.573	223
	6	4	70	0,020	3	6	3.715	297
	8	4	70	0,030	4	8	2.787	334
	10	4	70	0,040	6	10	2.229	357
	12	4	70	0,050	7	12	1.858	372
	16	4	70	0,060	8	16	1.393	334
TITANIUM	4	4	40	0,020	2	4	3.185	255
	6	4	40	0,030	3	6	2.123	255
	8	4	40	0,035	4	8	1.592	223
	10	4	40	0,030	6	10	1.274	153
	12	4	40	0,040	7	12	1.062	170
	16	4	40	0,050	8	16	796	159

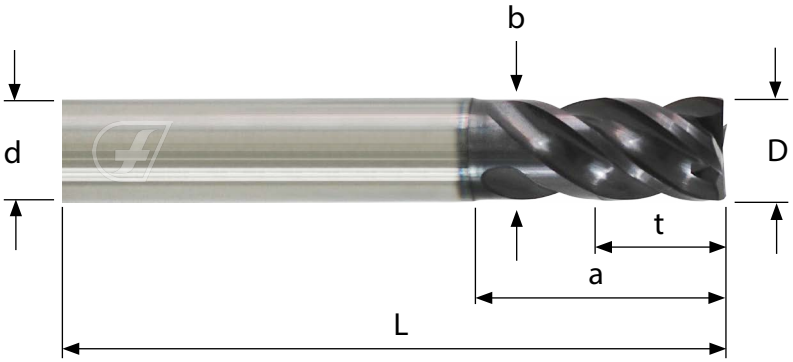
Frese per lavorazioni di cave

Pocket milling

90°

HM MICRO GRAIN

differenziato Z4



Sgrossatura

Finitura

N/mm2 <850

INOX STAINLESS

Ti Titanium

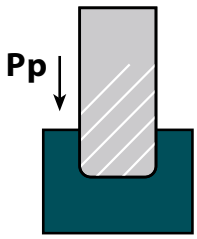
dimensions mm								*code*	*quality*
Dh10	L	t	dh6	a	b	*Helix*	*radius*		XO 300
4	51	5	4	12	3,8	40°	-	FC 495 40 04	★
6	51	7	6	18	5,7	40°	-	FC 495 40 06	★
8	64	9	8	22	7,6	40°	-	FC 495 40 08	★
10	64	11	10	24	9,6	40°	-	FC 495 40 10	★
12	80	13	12	27	11,5	40°	-	FC 495 40 12	★
16	97	17	16	36	15,4	40°	-	FC 495 40 16	★

Qualità HM *HM Quality* pag. 25

★ Pronto *Ready*

FC 496 40 ..

XO 300



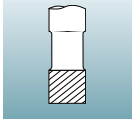
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	170	0,030	3	4	13.535	1.624
	6	4	170	0,040	4	6	9.023	1.444
	8	4	170	0,050	6	8	6.768	1.354
	10	4	170	0,060	8	10	5.414	1.299
	12	4	170	0,070	9	12	4.512	1.263
	16	4	170	0,080	10	16	3.384	1.083
	20	4	170	0,090	12	20	2.707	975
INOX STAINLESS	4	4	70	0,010	2	4	5.573	223
	6	4	70	0,020	3	6	3.715	297
	8	4	70	0,030	4	8	2.787	334
	10	4	70	0,040	6	10	2.229	357
	12	4	70	0,050	7	12	1.858	372
	16	4	70	0,060	8	16	1.393	334
	20	4	70	0,070	10	20	1.115	312
TITANIUM	4	4	40	0,020	2	4	3.185	255
	6	4	40	0,030	3	6	2.123	255
	8	4	40	0,035	4	8	1.592	223
	10	4	40	0,030	6	10	1.274	153
	12	4	40	0,040	7	12	1.062	170
	16	4	40	0,050	8	16	796	159
	20	4	40	0,060	10	20	637	153

Frese per lavorazioni di cave

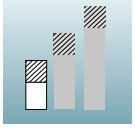
Pocket milling

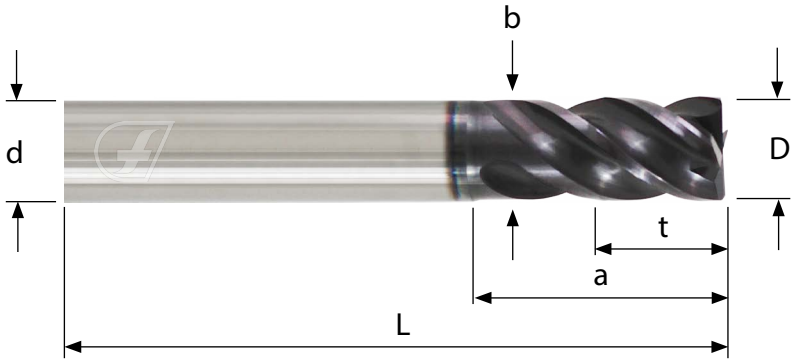
R

HM MICRO GRAIN



differenziato Z4





Sgrossatura

Finitura

N/mm2 <850

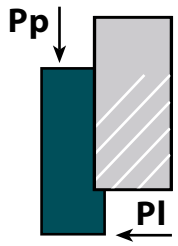
INOX STAINLESS

Ti Titanium

dimensions mm								code	quality
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	XO 300
4	51	5	4	12	3,8	40°	**0,5**	FC 496 40 04	★
6	51	7	6	18	5,7	40°	**0,5**	FC 496 40 06	★
8	64	9	8	22	7,6	40°	**0,5**	FC 496 40 08	★
10	64	11	10	24	9,6	40°	**0,5**	FC 496 40 10	★
12	80	13	12	27	11,5	40°	**0,5**	FC 496 40 12	★
16	97	17	16	36	15,4	40°	**0,5**	FC 496 40 16	★
20	97	22	20	48	19,3	40°	**0,8**	FC 496 40 20	★

FC 101 00 ..

X9000



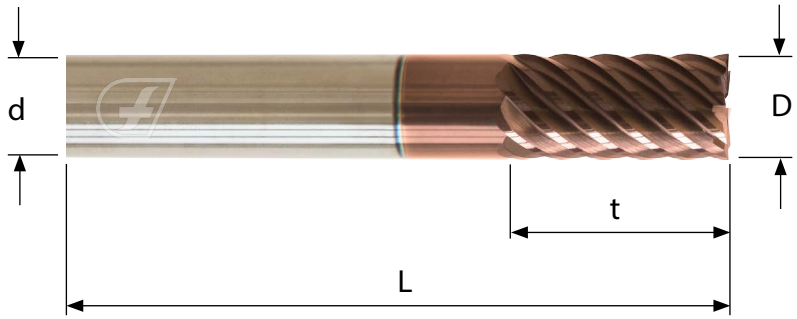
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 30-42	6	6	170	0,025	9	0,1	9.023	1.354
	8	6	170	0,030	12	0,1	6.768	1.218
	10	8	170	0,035	15	0,1	5.414	1.516
	12	8	170	0,040	18	0,1	4.512	1.444
	14	10	170	0,045	21	0,1	3.867	1.740
	16	10	170	0,050	24	0,2	3.384	1.692
	20	10	170	0,060	30	0,2	2.707	1.624
HRC 42-48	6	6	140	0,020	9	0,1	7.431	892
	8	6	140	0,025	12	0,1	5.573	836
	10	8	140	0,030	15	0,1	4.459	1.070
	12	8	140	0,035	18	0,1	3.715	1.040
	14	10	140	0,040	21	0,1	3.185	1.274
	16	10	140	0,045	24	0,2	2.787	1.254
	20	10	140	0,050	30	0,2	2.229	1.115
HRC 48-52	6	6	110	0,020	9	0,1	5.839	701
	8	6	110	0,025	12	0,1	4.379	657
	10	8	110	0,030	15	0,1	3.503	841
	12	8	110	0,035	18	0,1	2.919	817
	14	10	110	0,040	21	0,1	2.502	1.001
	16	10	110	0,045	24	0,2	2.189	985
	20	10	110	0,050	30	0,2	1.752	876
HRC 52-60	6	6	70	0,020	9	0,1	3.715	446
	8	6	70	0,025	12	0,1	2.787	418
	10	8	70	0,030	15	0,1	2.229	535
	12	8	70	0,035	18	0,1	1.858	520
	14	10	70	0,040	21	0,1	1.592	637
	16	10	70	0,045	24	0,2	1.393	627
	20	10	70	0,050	30	0,2	1.115	557
CAST IRON	6	6	180	0,020	9	0,1	9.554	1.146
	8	6	180	0,025	12	0,1	7.166	1.075
	10	8	180	0,030	15	0,1	5.732	1.376
	12	8	180	0,035	18	0,1	4.777	1.338
	14	10	180	0,040	21	0,1	4.095	1.638
	16	10	180	0,045	24	0,2	3.583	1.612
	20	10	180	0,050	30	0,2	2.866	1.433
TITAN	6	6	70	0,020	9	0,1	3.715	446
	8	6	70	0,025	12	0,1	2.787	418
	10	8	70	0,030	15	0,1	2.229	535
	12	8	70	0,035	18	0,1	1.858	520
	14	10	70	0,040	21	0,1	1.592	637
	16	10	70	0,045	24	0,2	1.393	627
	20	10	70	0,050	30	0,2	1.115	557

Frese per contornatura

Profailing

90°

HM ULTRA FINE



Sgrossatura

Finitura

HRC 30-42

HRC 42-48

HRC 48-52

HRC 52-60

CAST IRON

TITAN

dimensions mm									code	quality
Dh10	L	t	dh6	a	b	*Helix*	*radius*	Z		X9000
6	51	14	6	-	-	45°	-	6	FC 101 00 06	★
8	64	18	8	-	-	45°	-	6	FC 101 00 08	★
10	64	22	10	-	-	45°	-	8	FC 101 00 10	★
12	80	25	12	-	-	45°	-	8	FC 101 00 12	★
14	80	25	14	-	-	45°	-	10	FC 101 00 14	★
16	97	32	16	-	-	45°	-	10	FC 101 00 16	★
20	108	38	20	-	-	45°	-	10	FC 101 00 20	★

Qualità HM
HM Quality
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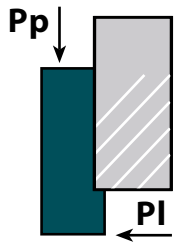
★ Pronto
Ready

FC 140 20 ..

X9000



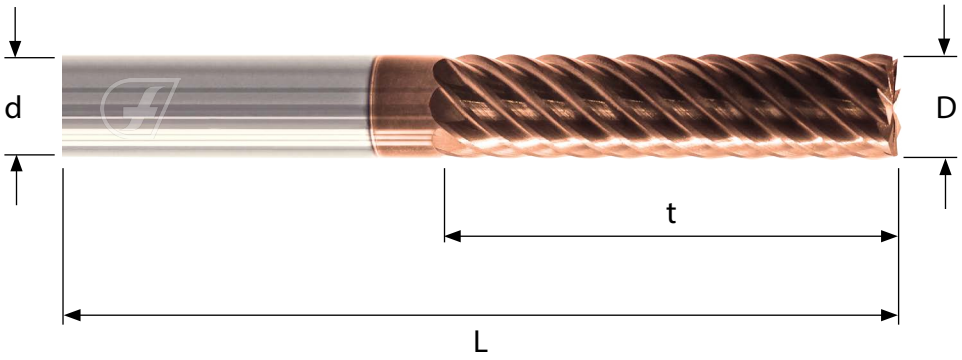
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 30-42	8	6	140	0,030	32	0,1	5.573	1.003
	10	8	140	0,035	40	0,1	4.459	1.248
	12	8	140	0,040	48	0,1	3.715	1.189
	16	10	140	0,050	56	0,2	2.787	1.393
	20	10	140	0,060	80	0,2	2.229	1.338
HRC 42-48	8	6	120	0,025	32	0,1	4.777	717
	10	8	120	0,030	40	0,1	3.822	917
	12	8	120	0,035	48	0,1	3.185	892
	16	10	120	0,045	56	0,2	2.389	1.075
	20	10	120	0,050	80	0,2	1.911	955
HRC 48-52	8	6	90	0,025	32	0,1	3.583	537
	10	8	90	0,030	40	0,1	2.866	688
	12	8	90	0,035	48	0,1	2.389	669
	16	10	90	0,045	56	0,2	1.791	806
	20	10	90	0,050	80	0,2	1.433	717
HRC 52-60	8	6	50	0,025	32	0,1	1.990	299
	10	8	50	0,030	40	0,1	1.592	382
	12	8	50	0,035	48	0,1	1.327	372
	16	10	50	0,045	56	0,2	995	448
	20	10	50	0,050	80	0,2	796	398
CAST IRON	8	6	150	0,025	32	0,1	5.971	896
	10	8	150	0,030	40	0,1	4.777	1.146
	12	8	150	0,035	48	0,1	3.981	1.115
	16	10	150	0,045	56	0,2	2.986	1.344
	20	10	150	0,050	80	0,2	2.389	1.194
TITAN	8	6	50	0,025	32	0,1	1.990	299
	10	8	50	0,030	40	0,1	1.592	382
	12	8	50	0,035	48	0,1	1.327	372
	16	10	50	0,045	56	0,2	995	448
	20	10	50	0,050	80	0,2	796	398

Frese per contornatura

Profailing

90°

HM ULTRA FINE



Sgrossatura

Finitura

HRC 30-42

HRC 42-48

HRC 48-52

HRC 52-60

CAST IRON

TITAN

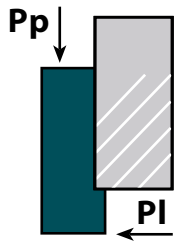
dimensions mm										*quality*
Dh10	L	t	dh6	a	b	*Helix*	*radius*	Z	***code***	X9000
8	80	38	8	-	-	45°	-	6	FC 140 20 08	★
10	100	45	10	-	-	45°	-	8	FC 140 20 10	★
12	108	52	12	-	-	45°	-	8	FC 140 20 12	★
16	130	60	16	-	-	45°	-	10	FC 140 20 16	★
20	160	90	20	-	-	45°	-	10	FC 140 20 20	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 401 00 ..

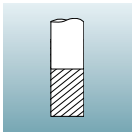
BLACK

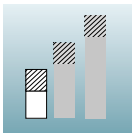


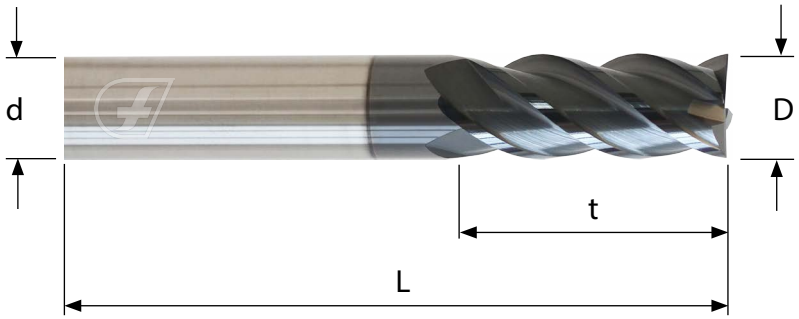
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	160	0,015	6,0	0,3	12.739	764
	5	4	160	0,015	7,5	0,4	10.191	611
	6	4	160	0,020	9,0	0,5	8.493	679
	8	4	160	0,025	12,0	0,6	6.369	637
	10	4	160	0,030	15,0	0,8	5.096	611
	12	4	160	0,035	18,0	1,0	4.246	594
	14	4	160	0,040	21,0	1,2	3.640	582
	16	4	160	0,050	24,0	1,5	3.185	637
	20	4	160	0,060	30,0	1,8	2.548	611
N/mm2 850-1200	4	4	100	0,015	6,0	0,3	7.962	478
	5	4	100	0,015	7,5	0,4	6.369	382
	6	4	100	0,020	9,0	0,5	5.308	425
	8	4	100	0,025	12,0	0,6	3.981	398
	10	4	100	0,030	15,0	0,8	3.185	382
	12	4	100	0,035	18,0	1,0	2.654	372
	14	4	100	0,040	21,0	1,2	2.275	364
	16	4	100	0,050	24,0	1,5	1.990	398
	20	4	100	0,060	30,0	1,8	1.592	382
CAST IRON	4	4	120	0,015	6,0	0,3	9.554	573
	5	4	120	0,015	7,5	0,4	7.643	459
	6	4	120	0,020	9,0	0,5	6.369	510
	8	4	120	0,025	12,0	0,6	4.777	478
	10	4	120	0,030	15,0	0,8	3.822	459
	12	4	120	0,035	18,0	1,0	3.185	446
	14	4	120	0,040	21,0	1,2	2.730	437
	16	4	120	0,050	24,0	1,5	2.389	478
	20	4	120	0,060	30,0	1,8	1.911	459
HRC 30-42	4	4	90	0,015	6,0	0,3	7.166	430
	5	4	90	0,015	7,5	0,4	5.732	344
	6	4	90	0,020	9,0	0,5	4.777	382
	8	4	90	0,025	12,0	0,6	3.583	358
	10	4	90	0,030	15,0	0,8	2.866	344
	12	4	90	0,035	18,0	1,0	2.389	334
	14	4	90	0,040	21,0	1,2	2.047	328
	16	4	90	0,050	24,0	1,5	1.791	358
	20	4	90	0,060	30,0	1,8	1.433	344
HRC 42-48	4	4	70	0,015	6,0	0,3	5.573	334
	5	4	70	0,015	7,5	0,4	4.459	268
	6	4	70	0,020	9,0	0,5	3.715	297
	8	4	70	0,025	12,0	0,6	2.787	279
	10	4	70	0,030	15,0	0,8	2.229	268
	12	4	70	0,035	18,0	1,0	1.858	260
	14	4	70	0,040	21,0	1,2	1.592	255
	16	4	70	0,050	24,0	1,5	1.393	279
	20	4	70	0,060	30,0	1,8	1.115	268
INOX STAINLESS	4	4	70	0,015	6,0	0,3	5.573	334
	5	4	70	0,015	7,5	0,4	4.459	268
	6	4	70	0,020	9,0	0,5	3.715	297
	8	4	70	0,025	12,0	0,6	2.787	279
	10	4	70	0,030	15,0	0,8	2.229	268
	12	4	70	0,035	18,0	1,0	1.858	260
	14	4	70	0,040	21,0	1,2	1.592	255
	16	4	70	0,050	24,0	1,5	1.393	279
	20	4	70	0,060	30,0	1,8	1.115	268

Frese per contornatura

Profailing







Sgrossatura

Finitura

N/mm2 <850 | N/mm2 850-1200 | CAST IRON | HRC 30-42 | HRC 42-48 | INOX STAINLESS

dimensions mm								*code*	*quality* BLACK	
Dh10	L	t	dh6	a	b	*Helix*	*radius*			
4	51	8	4	-	-	40°	-	FC 401 00 04	★	
5	51	12	5	-	-	40°	-	FC 401 00 05	★	
6	51	15	6	-	-	40°	-	FC 401 00 06	★	
8	64	20	8	-	-	40°	-	FC 401 00 08	★	
10	64	22	10	-	-	40°	-	FC 401 00 10	★	
12	80	28	12	-	-	40°	-	FC 401 00 12	★	
14	80	28	14	-	-	40°	-	FC 401 00 14	★	
16	97	36	16	-	-	40°	-	FC 401 00 16	★	
20	97	40	20	-	-	40°	-	FC 401 00 20	★	

Qualità HM
HM Quality
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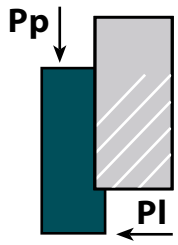
★ Pronto
Ready

FC 401 10 ..

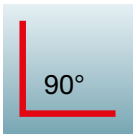
BLACK



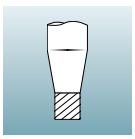
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	4	160	0,010	4,5	0,3	16.985	679
	4	4	160	0,015	6,0	0,4	12.739	764
	5	4	160	0,015	7,5	0,5	10.191	611
N/mm2 850-1200	3	4	110	0,010	4,5	0,3	11.677	467
	4	4	110	0,015	6,0	0,4	8.758	525
	5	4	110	0,015	7,5	0,5	7.006	420
CAST IRON	3	4	120	0,010	4,5	0,3	12.739	510
	4	4	120	0,015	6,0	0,4	9.554	573
	5	4	120	0,015	7,5	0,5	7.643	459
HRC 30-42	3	4	100	0,010	4,5	0,3	10.616	425
	4	4	100	0,015	6,0	0,4	7.962	478
	5	4	100	0,015	7,5	0,5	6.369	382
HRC 42-48	3	4	80	0,010	4,5	0,3	8.493	340
	4	4	80	0,015	6,0	0,4	6.369	382
	5	4	80	0,015	7,5	0,5	5.096	306
INOX STAINLESS	3	4	70	0,010	4,5	0,3	7.431	297
	4	4	70	0,015	6,0	0,4	5.573	334
	5	4	70	0,015	7,5	0,5	4.459	268

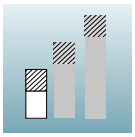
Frese per contornatura

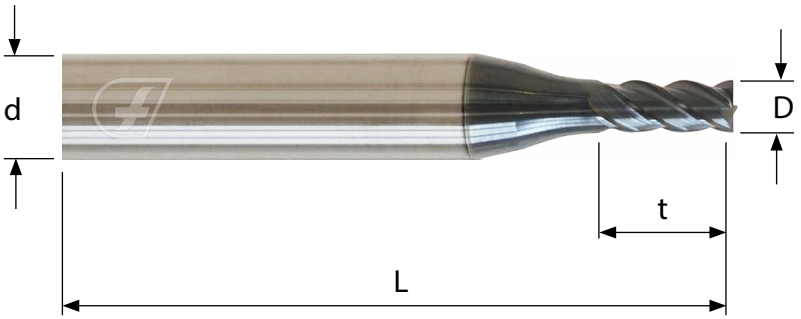
Profailing



HM MICRO GRAIN







Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

HRC 42-48

INOX STAINLESS

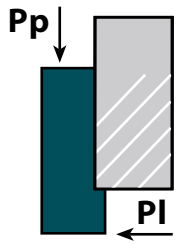
dimensions mm								*code*	*quality*	
Dh10	L	t	dh6	a	b	*Helix*	*radius*		BLACK	
3	51	7	6	-	-	40°	-	FC 401 10 03	★	
4	51	9	6	-	-	40°	-	FC 401 10 04	★	
5	51	11	6	-	-	40°	-	FC 401 10 05	★	

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

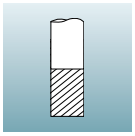
FC 440 20 .. FC 440 21 ..

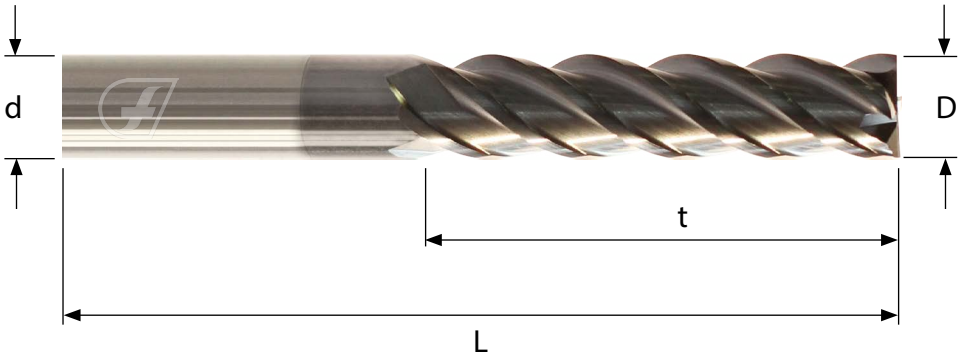
BLACK



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	6	4	100	0,020	24	0,5	5.308	425
	8	4	100	0,025	32	0,6	3.981	398
	10	4	100	0,030	40	0,8	3.185	382
	12	4	100	0,035	48	1,0	2.654	372
	16	4	100	0,050	56	1,5	1.990	398
	20	4	100	0,060	80	1,8	1.592	382
N/mm2 850-1200	6	4	70	0,020	24	0,5	3.715	297
	8	4	70	0,025	32	0,6	2.787	279
	10	4	70	0,030	40	0,8	2.229	268
	12	4	70	0,035	48	1,0	1.858	260
	16	4	70	0,050	56	1,5	1.393	279
	20	4	70	0,060	80	1,8	1.115	268
CAST IRON	6	4	80	0,020	24	0,5	4.246	340
	8	4	80	0,025	32	0,6	3.185	318
	10	4	80	0,030	40	0,8	2.548	306
	12	4	80	0,035	48	1,0	2.123	297
	16	4	80	0,050	56	1,5	1.592	318
	20	4	80	0,060	80	1,8	1.274	306
HRC 30-42	6	4	60	0,020	24	0,5	3.185	255
	8	4	60	0,025	32	0,6	2.389	239
	10	4	60	0,030	40	0,8	1.911	229
	12	4	60	0,035	48	1,0	1.592	223
	16	4	60	0,050	56	1,5	1.194	239
	20	4	60	0,060	80	1,8	955	229
HRC 42-48	6	4	50	0,020	24	0,5	2.654	212
	8	4	50	0,025	32	0,6	1.990	199
	10	4	50	0,030	40	0,8	1.592	191
	12	4	50	0,035	48	1,0	1.327	186
	16	4	50	0,050	56	1,5	995	199
	20	4	50	0,060	80	1,8	796	191
INOX STAINLESS	6	4	50	0,020	24	0,5	2.654	212
	8	4	50	0,025	32	0,6	1.990	199
	10	4	50	0,030	40	0,8	1.592	191
	12	4	50	0,035	48	1,0	1.327	186
	16	4	50	0,050	56	1,5	995	199
	20	4	50	0,060	80	1,8	796	191

Frese per contornatura
Profailing





N/mm2 <850 | N/mm2 850-1200 | CAST IRON | HRC 30-42 | HRC 42-48 | INOX STAINLESS

FC 440 20 ..

dimensions mm									quality	
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	BLACK	
6	80	28	6	-	-	40°	-	FC 440 20 06	★	
8	80	38	8	-	-	40°	-	FC 440 20 08	★	
10	100	45	10	-	-	40°	-	FC 440 20 10	★	
12	108	52	12	-	-	40°	-	FC 440 20 12	★	
16	130	60	16	-	-	40°	-	FC 440 20 16	★	
20	160	100	20	-	-	40°	-	FC 440 20 20	★	

FC 440 21 ..

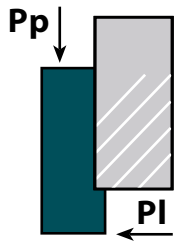
20	130	70	20	-	-	40°	-	FC 440 21 20	★	

Qualità HM
HM Quality pag. 25

★ Pronto
Ready

FC 403 00 ..

X9000



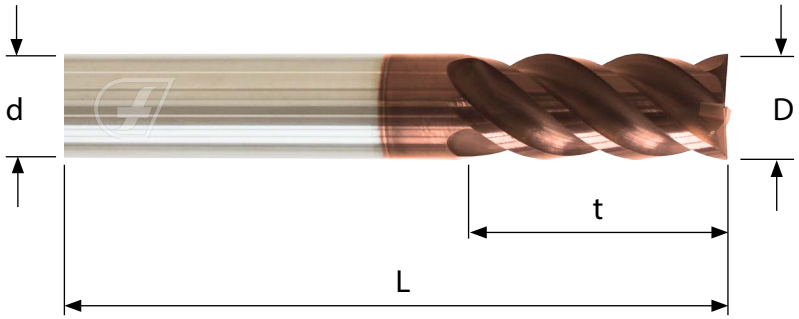
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
CAST IRON	4	4	160	0,030	6	0,3	12.739	1.529
	5	4	160	0,040	7	0,4	10.191	1.631
	6	4	160	0,050	9	0,5	8.493	1.699
	8	4	160	0,070	12	0,6	6.369	1.783
	10	4	160	0,090	15	0,8	5.096	1.834
	12	4	160	0,110	18	1,0	4.246	1.868
	16	4	160	0,130	24	1,3	3.185	1.656
	18	4	160	0,140	27	1,5	2.831	1.585
HRC 42-48	4	4	120	0,030	6	0,3	9.554	1.146
	5	4	120	0,040	7	0,4	7.643	1.223
	6	4	120	0,050	9	0,5	6.369	1.274
	8	4	120	0,070	12	0,6	4.777	1.338
	10	4	120	0,090	15	0,8	3.822	1.376
	12	4	120	0,110	18	1,0	3.185	1.401
	16	4	120	0,130	24	1,3	2.389	1.242
	18	4	120	0,140	27	1,5	2.123	1.189
HRC 48-52	4	4	80	0,020	6	0,3	6.369	510
	5	4	80	0,030	7	0,4	5.096	611
	6	4	80	0,035	9	0,5	4.246	594
	8	4	80	0,050	12	0,6	3.185	637
	10	4	80	0,060	15	0,8	2.548	611
	12	4	80	0,070	18	1,0	2.123	594
	16	4	80	0,090	24	1,3	1.592	573
	18	4	80	0,110	27	1,5	1.415	623
HRC 52-60	4	4	45	0,015	6	0,3	3.583	215
	5	4	45	0,020	7	0,4	2.866	229
	6	4	45	0,025	9	0,5	2.389	239
	8	4	45	0,030	12	0,6	1.791	215
	10	4	45	0,040	15	0,8	1.433	229
	12	4	45	0,050	18	1,0	1.194	239
	16	4	45	0,065	24	1,3	896	233
	18	4	45	0,075	27	1,5	796	239

Frese per contornatura
Profailing

90°

HM ULTRA FINE

Z4



Sgrossatura

Finitura

CAST IRON

HRC 42-48

HRC 48-52

HRC 52-60

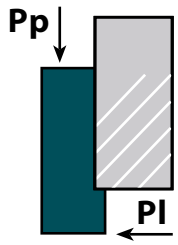
dimensions mm									*quality*
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	X9000
4	51	8	4	-	-	42°	-	FC 403 00 04	★
5	51	12	5	-	-	42°	-	FC 403 00 05	★
6	51	15	6	-	-	42°	-	FC 403 00 06	★
8	64	20	8	-	-	42°	-	FC 403 00 08	★
10	64	24	10	-	-	42°	-	FC 403 00 10	★
12	80	27	12	-	-	42°	-	FC 403 00 12	★
14	80	27	14	-	-	42°	-	FC 403 00 14	★
16	97	32	16	-	-	42°	-	FC 403 00 16	★
18	97	36	18	-	-	42°	-	FC 403 00 18	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 490 00 ..

X9000

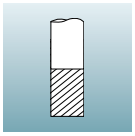


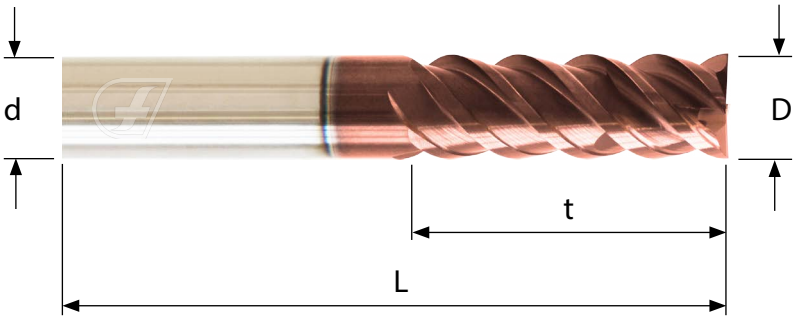
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	210	0,030	11	0,4	16.720	2.006
	6	4	210	0,045	15	0,6	11.146	2.006
	8	4	210	0,065	17	0,8	8.360	2.174
	10	4	210	0,080	22	1,0	6.688	2.140
	12	4	210	0,095	28	1,2	5.573	2.118
	16	4	210	0,120	37	1,6	4.180	2.006
	20	4	210	0,150	44	2,0	3.344	2.006
N/mm2 850-1200	4	4	150	0,030	11	0,4	11.943	1.433
	6	4	150	0,045	15	0,6	7.962	1.433
	8	4	150	0,065	17	0,8	5.971	1.553
	10	4	150	0,080	22	1,0	4.777	1.529
	12	4	150	0,095	28	1,2	3.981	1.513
	16	4	150	0,120	37	1,6	2.986	1.433
	20	4	150	0,150	44	2,0	2.389	1.433
CAST IRON	4	4	150	0,030	11	0,4	11.943	1.433
	6	4	150	0,045	15	0,6	7.962	1.433
	8	4	150	0,065	17	0,8	5.971	1.553
	10	4	150	0,080	22	1,0	4.777	1.529
	12	4	150	0,095	28	1,2	3.981	1.513
	16	4	150	0,120	37	1,6	2.986	1.433
	20	4	150	0,150	44	2,0	2.389	1.433
HRC 30-42	4	4	120	0,030	11	0,4	9.554	1.146
	6	4	120	0,045	15	0,6	6.369	1.146
	8	4	120	0,065	17	0,8	4.777	1.242
	10	4	120	0,080	22	1,0	3.822	1.223
	12	4	120	0,095	28	1,2	3.185	1.210
	16	4	120	0,120	37	1,6	2.389	1.146
	20	4	120	0,150	44	2,0	1.911	1.146
HRC 42-48	4	4	80	0,030	11	0,4	6.369	764
	6	4	80	0,045	15	0,6	4.246	764
	8	4	80	0,065	17	0,8	3.185	828
	10	4	80	0,080	22	1,0	2.548	815
	12	4	80	0,095	28	1,2	2.123	807
	16	4	80	0,120	37	1,6	1.592	764
	20	4	80	0,150	44	2,0	1.274	764
HRC 48-52	4	4	60	0,030	11	0,4	4.777	573
	6	4	60	0,045	15	0,6	3.185	573
	8	4	60	0,065	17	0,8	2.389	621
	10	4	60	0,080	22	1,0	1.911	611
	12	4	60	0,095	28	1,2	1.592	605
	16	4	60	0,120	37	1,6	1.194	573
	20	4	60	0,150	44	2,0	955	573
INOX STAINLESS	4	4	60	0,030	11	0,4	4.777	573
	6	4	60	0,045	15	0,6	3.185	573
	8	4	60	0,065	17	0,8	2.389	621
	10	4	60	0,080	22	1,0	1.911	611
	12	4	60	0,095	28	1,2	1.592	605
	16	4	60	0,120	37	1,6	1.194	573
	20	4	60	0,150	44	2,0	955	573

Frese per contornatura

Profailing

HM ULTRA FINE





Sgrossatura

Finitura

N/mm2 <850-1200 | CAST IRON | HRC 30-42 | HRC 42-48 | HRC 48-52 | INOX STAINLESS

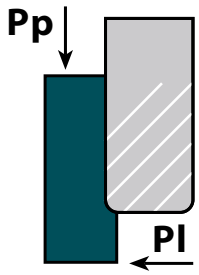
dimensions mm								*code*	*quality*
Dh10	L	t	dh6	a	b	*Helix*	*radius*		X9000
4	51	15	4	-	-	50°	-	FC 490 00 04	★
6	64	21	6	-	-	50°	-	FC 490 00 06	★
8	80	24	8	-	-	50°	-	FC 490 00 08	★
10	80	27	10	-	-	50°	-	FC 490 00 10	★
12	95	35	12	-	-	50°	-	FC 490 00 12	★
16	97	45	16	-	-	50°	-	FC 490 00 16	★
20	108	50	20	-	-	50°	-	FC 490 00 20	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 497 00 ..

XO 300



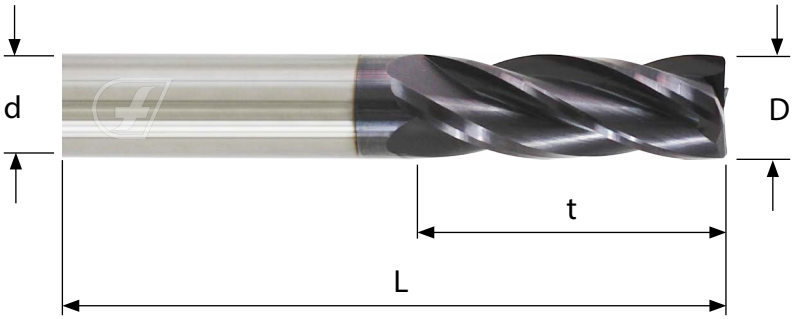
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	170	0,020	10	0,6	13.535	1.083
	6	4	170	0,040	15	0,9	9.023	1.444
	8	4	170	0,050	17	1,2	6.768	1.354
	10	4	170	0,060	22	1,5	5.414	1.299
	12	4	170	0,070	26	1,8	4.512	1.263
	14	4	170	0,075	28	2,2	3.867	1.160
	16	4	170	0,080	32	2,4	3.384	1.083
	20	4	170	0,100	37	3,0	2.707	1.083
INOX STAINLESS	4	4	70	0,020	10	0,6	5.573	446
	6	4	70	0,040	15	0,9	3.715	594
	8	4	70	0,050	17	1,2	2.787	557
	10	4	70	0,060	22	1,5	2.229	535
	12	4	70	0,070	26	1,8	1.858	520
	14	4	70	0,075	28	2,2	1.592	478
	16	4	70	0,080	32	2,4	1.393	446
	20	4	70	0,100	37	3,0	1.115	446
TITANIUM	4	4	40	0,020	10	0,6	3.185	255
	6	4	40	0,030	15	0,9	2.123	255
	8	4	40	0,035	17	1,2	1.592	223
	10	4	40	0,030	22	1,5	1.274	153
	12	4	40	0,040	26	1,8	1.062	170
	14	4	40	0,045	28	2,2	910	164
	16	4	40	0,050	32	2,4	796	159
	20	4	40	0,070	37	3,0	637	178

Frese per contornatura
Profailing

R

HM MICRO GRAIN

differenziato Z4



Sgrossatura

Finitura

N/mm2 <850

INOX STAINLESS

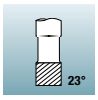
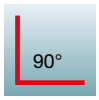
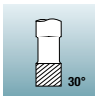
Ti Titanium

dimensions mm								code	quality
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	XO 300
4	51	15	4	-	-	30°	**0,5**	FC 497 00 04	★
6	51	21	6	-	-	30°	**0,5**	FC 497 00 06	★
8	64	24	8	-	-	30°	**0,5**	FC 497 00 08	★
10	64	27	10	-	-	30°	**0,5**	FC 497 00 10	★
12	80	35	12	-	-	30°	**0,5**	FC 497 00 12	★
14	80	37	14	-	-	30°	**0,5**	FC 497 00 14	★
16	97	40	16	-	-	30°	**0,5**	FC 497 00 16	★
20	97	48	20	-	-	30°	**0,8**	FC 497 00 20	★

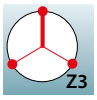
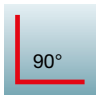
Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

Frese per lavorazioni di cave - *Pocket milling*

	FC X02 00 ..	AL11 DIAL55					Ø 3 ÷ 12	ALUMINIUM	PLASTIC	pag. 75
	FC X02 10 ..	AL11 DIAL55					Ø 3 ÷ 6	ALUMINIUM	PLASTIC	pag. 77
	FC X02 40 ..	AL11 DIAL55					Ø 8 ÷ 10	ALUMINIUM	PLASTIC	pag. 79
	FC 202 00 ..	AL11 DIAL55					Ø 3 ÷ 16	ALUMINIUM	PLASTIC	pag. 81
	FC 203 00 ..	AL11 DIAL55					Ø 3 ÷ 16	ALUMINIUM	PLASTIC	pag. 83
	FC 330 40 ..	AL11 DIAL55					Ø 6 ÷ 20 r 0,5 ÷ 1,0	ALUMINIUM		pag. 85

Frese per contornatura - *Profailing*

	FC 203 00 ..	AL11 DIAL55					Ø 3 ÷ 16	ALUMINIUM	PLASTIC	pag. 83
	FC 302 00 ..	AL11 DIAL55					Ø 4 ÷ 20	ALUMINIUM COPPER	PLASTIC	pag. 87
	FC 342 20 ..	AL11 DIAL55					Ø 8 ÷ 20	ALUMINIUM COPPER	PLASTIC	pag. 89

Frese con testa torica - *Corner radius end mills*

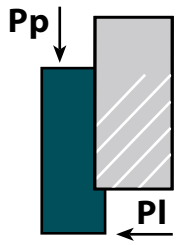
FC 205 40 ..	RA15 DIAL900	Z2	R	30°		Ø 2 ÷ 12 r 0,5	ALUMINIUM	COPPER	pag. 91
FC 270 40 ..	AL11 DIAL55	Z2	R	45°		Ø 3 ÷ 16 r 0,5 ÷ 3,0	ALUMINIUM COPPER	PLASTIC	pag. 93

Frese con testa semisferica - *Ball nose end mills*

FC 220 20 ..	RA15 DIAL900	Z2	R	30°		Ø 2 ÷ 12	ALUMINIUM	COPPER	pag. 95
FC 280 20 ..	AL11 DIAL55	Z2	R	45°		Ø 3 ÷ 16	ALUMINIUM COPPER	PLASTIC	pag. 97

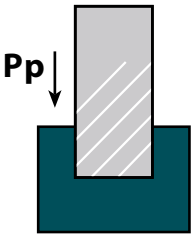
FC X02 00 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	1	500	0,030	4,5	1,5	53.079	1.592
	4	1	500	0,045	6,0	2,0	39.809	1.791
	5	1	500	0,060	7,5	2,5	31.847	1.911
	6	1	500	0,075	9,0	3,0	26.539	1.990
	8	1	500	0,100	12,0	4,0	19.904	1.990
	10	1	500	0,110	15,0	5,0	15.924	1.752
	12	1	500	0,130	18,0	6,0	13.270	1.725
ALU & ALLOYS Si>6% Air	3	1	300	0,030	4,5	1,5	31.847	955
	4	1	300	0,045	6,0	2,0	23.885	1.075
	5	1	300	0,060	7,5	2,5	19.108	1.146
	6	1	300	0,075	9,0	3,0	15.924	1.194
	8	1	300	0,100	12,0	4,0	11.943	1.194
	10	1	300	0,110	15,0	5,0	9.554	1.051
	12	1	300	0,130	18,0	6,0	7.962	1.035
PLASTIC Air	3	1	700	0,030	4,5	1,5	74.310	2.229
	4	1	700	0,045	6,0	2,0	55.732	2.508
	5	1	700	0,060	7,5	2,5	44.586	2.675
	6	1	700	0,075	9,0	3,0	37.155	2.787
	8	1	700	0,100	12,0	4,0	27.866	2.787
	10	1	700	0,110	15,0	5,0	22.293	2.452
	12	1	700	0,130	18,0	6,0	18.577	2.415
PLASTIC GLASS FIBER	3	1	300	0,020	4,5	1,5	31.847	637
	4	1	300	0,030	6,0	2,0	23.885	717
	5	1	300	0,045	7,5	2,5	19.108	860
	6	1	300	0,060	9,0	3,0	15.924	955
	8	1	300	0,080	12,0	4,0	11.943	955
	10	1	300	0,090	15,0	5,0	9.554	860
	12	1	300	0,100	18,0	6,0	7.962	796

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	1	500	0,030	3	3	53.079	1.592
	4	1	500	0,045	4	4	39.809	1.791
	5	1	500	0,060	5	5	31.847	1.911
	6	1	500	0,075	6	6	26.539	1.990
	8	1	500	0,100	8	8	19.904	1.990
	10	1	500	0,110	10	10	15.924	1.752
	12	1	500	0,130	12	12	13.270	1.725
ALU & ALLOYS Si>6% Air	3	1	300	0,030	3	3	31.847	955
	4	1	300	0,045	4	4	23.885	1.075
	5	1	300	0,060	5	5	19.108	1.146
	6	1	300	0,075	6	6	15.924	1.194
	8	1	300	0,100	8	8	11.943	1.194
	10	1	300	0,110	10	10	9.554	1.051
	12	1	300	0,130	12	12	7.962	1.035
PLASTIC Air	3	1	700	0,030	3	3	74.310	2.229
	4	1	700	0,045	4	4	55.732	2.508
	5	1	700	0,060	5	5	44.586	2.675
	6	1	700	0,075	6	6	37.155	2.787
	8	1	700	0,100	8	8	27.866	2.787
	10	1	700	0,110	10	10	22.293	2.452
	12	1	700	0,130	12	12	18.577	2.415
PLASTIC GLASS FIBER	3	1	300	0,020	3	3	31.847	637
	4	1	300	0,030	4	4	23.885	717
	5	1	300	0,045	5	5	19.108	860
	6	1	300	0,060	6	6	15.924	955
	8	1	300	0,080	8	8	11.943	955
	10	1	300	0,090	10	10	9.554	860
	12	1	300	0,100	12	12	7.962	796

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Per estrusi e profili di alluminio

Materiali Materials	D mm	Z	Velocità di rotazione g/min	Velocità di sfondamento mm/min	Velocità di asportazione cen/giro	Velocità di asportazione mm/min
ESTRUSI E PROFILI DI ALLUMINIO *ALUMINIUM EXTRUDED PROFILES*	3	1	15.000 ÷ 18.000	70	2 ÷ 4	300 ÷ 600
	4	1	15.000 ÷ 18.000	70	4 ÷ 6	600 ÷ 1.000
	5	1	15.000 ÷ 18.000	100	5 ÷ 7	700 ÷ 1.100
	6	1	14.000 ÷ 16.000	120	8 ÷ 10	1.100 ÷ 1.500
	8	1	13.000 ÷ 15.000	140	9 ÷ 11	1.200 ÷ 1.600
	10	1	12.000 ÷ 14.000	140	10 ÷ 12	1.200 ÷ 1.700
	12	1	10.000 ÷ 12.000	140	13 ÷ 15	1.300 ÷ 1.800

Frese per lavorazioni di cave e contornatura

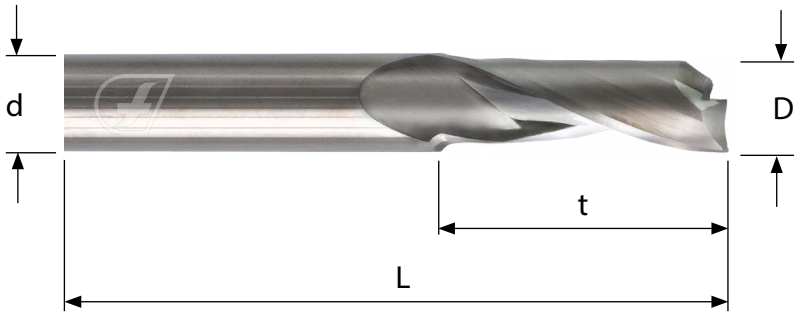
Pocket milling and profailing

DIAMOND COATED

45°

HM MICRO GRAIN

Z1



Sgrossatura

Finitura

ALUMINIUM

PLASTIC

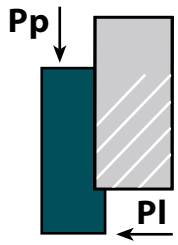
dimensions mm								*code*	*quality*	
Dh10	L	t	dh6	a	b	*Helix*	*radius*		**AL11**	DIAL55
3	40	12	3	-	-	23°	-	FC X02 00 03	★	★
4	51	16	4	-	-	23°	-	FC X02 00 04	★	★
5	64	18	5	-	-	23°	-	FC X02 00 05	★	★
6	80	24	6	-	-	23°	-	FC X02 00 06	★	★
8	80	27	8	-	-	23°	-	FC X02 00 08	★	★
10	80	30	10	-	-	23°	-	FC X02 00 10	★	★
12	95	32	12	-	-	23°	-	FC X02 00 12	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

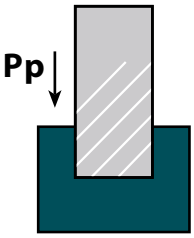
FC X02 10 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	1	500	0,030	4,5	1,5	53.079	1.592
	4	1	500	0,045	6,0	2,0	39.809	1.791
	5	1	500	0,060	7,5	2,5	31.847	1.911
	6	1	500	0,075	9,0	3,0	26.539	1.990
ALU & ALLOYS Si>6% Air	3	1	300	0,030	4,5	1,5	31.847	955
	4	1	300	0,045	6,0	2,0	23.885	1.075
	5	1	300	0,060	7,5	2,5	19.108	1.146
	6	1	300	0,075	9,0	3,0	15.924	1.194
PLASTIC Air	3	1	700	0,030	4,5	1,5	74.310	2.229
	4	1	700	0,045	6,0	2,0	55.732	2.508
	5	1	700	0,060	7,5	2,5	44.586	2.675
	6	1	700	0,075	9,0	3,0	37.155	2.787
PLASTIC GLASS FIBER	3	1	300	0,020	4,5	1,5	31.847	637
	4	1	300	0,030	6,0	2,0	23.885	717
	5	1	300	0,045	7,5	2,5	19.108	860
	6	1	300	0,060	9,0	3,0	15.924	955

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	1	500	0,030	3	3	53.079	1.592
	4	1	500	0,045	4	4	39.809	1.791
	5	1	500	0,060	5	5	31.847	1.911
	6	1	500	0,075	6	6	26.539	1.990
ALU & ALLOYS Si>6% Air	3	1	300	0,030	3	3	31.847	955
	4	1	300	0,045	4	4	23.885	1.075
	5	1	300	0,060	5	5	19.108	1.146
	6	1	300	0,075	6	6	15.924	1.194
PLASTIC Air	3	1	700	0,030	3	3	74.310	2.229
	4	1	700	0,045	4	4	55.732	2.508
	5	1	700	0,060	5	5	44.586	2.675
	6	1	700	0,075	6	6	37.155	2.787
PLASTIC GLASS FIBER	3	1	300	0,020	3	3	31.847	637
	4	1	300	0,030	4	4	23.885	717
	5	1	300	0,045	5	5	19.108	860
	6	1	300	0,060	6	6	15.924	955

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Per estrusi e profili di alluminio

Materiali Materials	D mm	Z	Velocità di rotazione g/min	Velocità di sfondamento mm/min	Velocità di asportazione	
					cen/giro	mm/min
ESTRUSI E PROFILI DI ALLUMINIO ***ALUMINIUM EXTRUDED PROFILES***	3	1	15.000 ÷ 18.000	70	2 ÷ 4	300 ÷ 600
	4	1	15.000 ÷ 18.000	70	4 ÷ 6	600 ÷ 1.000
	5	1	15.000 ÷ 18.000	100	5 ÷ 7	700 ÷ 1.100
	6	1	14.000 ÷ 16.000	120	8 ÷ 10	1.100 ÷ 1.500

Frese per lavorazioni di cave e contornatura

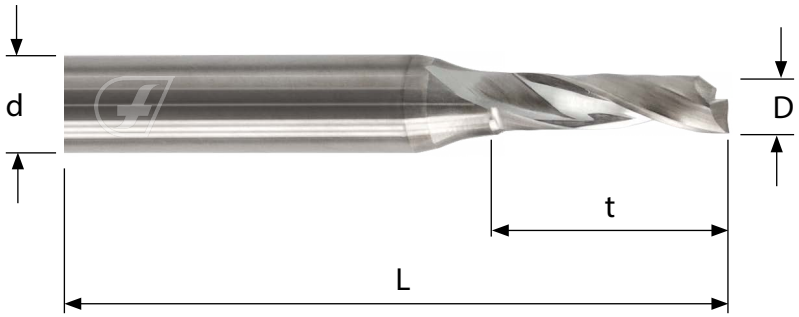
Pocket milling and profailing

DIAMOND COATED

45°

HM MICRO GRAIN

Z1



Sgrossatura

Finitura

ALUMINIUM

PLASTIC

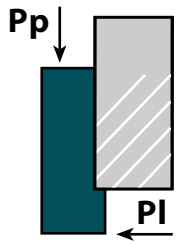
dimensions mm								*quality*	
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	**AL11**	DIAL55
3	64	13	6	-	-	23°	-	FC X02 10 03	★	★
4	80	16	8	-	-	23°	-	FC X02 10 04	★	★
5	80	18	8	-	-	23°	-	FC X02 10 05	★	★
6	80	24	8	-	-	23°	-	FC X02 10 06	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

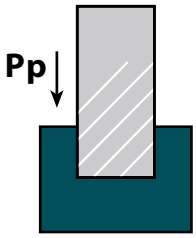
FC X02 40 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	8	1	400	0,100	12,0	4,0	15.924	1.592
	10	1	400	0,110	15,0	5,0	12.739	1.401
ALU & ALLOYS Si>6% Air	8	1	200	0,100	12,0	4,0	7.962	796
	10	1	200	0,110	15,0	5,0	6.369	701
PLASTIC Air	8	1	500	0,100	12,0	4,0	19.904	1.990
	10	1	500	0,110	15,0	5,0	15.924	1.752
PLASTIC GLASS FIBER	8	1	200	0,080	12,0	4,0	7.962	637
	10	1	200	0,090	15,0	5,0	6.369	573

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	8	1	400	0,100	8	8	15.924	1.592
	10	1	400	0,110	10	10	12.739	1.401
ALU & ALLOYS Si>6% Air	8	1	200	0,100	8	8	7.962	796
	10	1	200	0,110	10	10	6.369	701
PLASTIC Air	8	1	500	0,100	8	8	19.904	1.990
	10	1	500	0,110	10	10	15.924	1.752
PLASTIC GLASS FIBER	8	1	200	0,080	8	8	7.962	637
	10	1	200	0,090	10	10	6.369	573

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Per estrusi e profili di alluminio

Materiali Materials	D mm	Z	Velocità di rotazione g/min	Velocità di sfondamento mm/min	Velocità di asportazione cen/giro	Velocità di asportazione mm/min
ESTRUSI E PROFILI DI ALLUMINIO *ALUMINIUM EXTRUDED PROFILES*	8	1	13.000 ÷ 15.000	120	6 ÷ 7	780 ÷ 1.100
	10	1	12.000 ÷ 14.000	140	6 ÷ 7	720 ÷ 870

Frese per lavorazioni di cave e contornatura

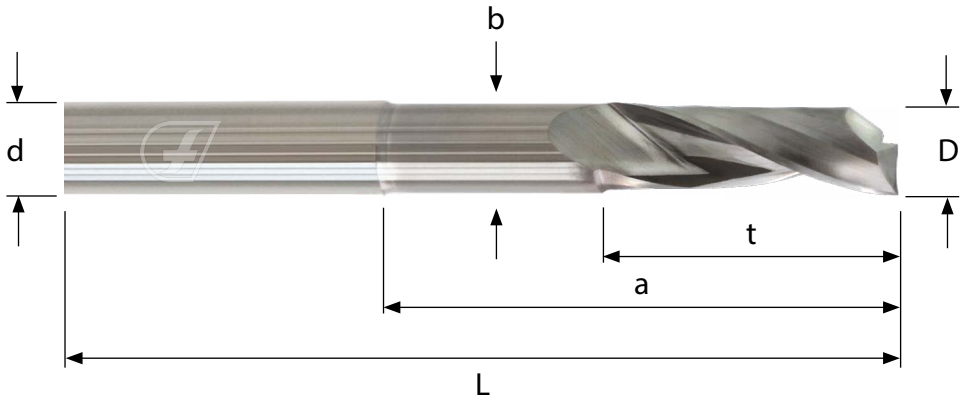
Pocket milling and profailing

DIAMOND COATED

45°

HM MICRO GRAIN

Z1



Sgrossatura

Finitura

ALUMINIUM

PLASTIC

dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	**AL11**	DIAL55
8	100	27	8	65	7,5	23°	-	FC X02 40 08	★	★
10	120	30	10	75	9,5	23°	-	FC X02 40 10	★	★

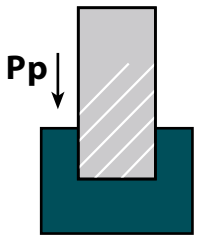
Qualità HM
HM Quality

pag. 25

★ Pronto
Ready

FC 202 00 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	2	500	0,030	2	3	53.079	3.185
	4	2	500	0,040	3	4	39.809	3.185
	5	2	500	0,050	4	5	31.847	3.185
	6	2	500	0,060	5	6	26.539	3.185
	8	2	500	0,080	6	8	19.904	3.185
	10	2	500	0,100	7	10	15.924	3.185
	12	2	500	0,120	8	12	13.270	3.185
	14	2	500	0,140	9	14	11.374	3.185
	16	2	500	0,160	10	16	9.952	3.185
ALU & ALLOYS Si>6% Air	3	2	300	0,030	2	3	31.847	1.911
	4	2	300	0,040	3	4	23.885	1.911
	5	2	300	0,050	4	5	19.108	1.911
	6	2	300	0,060	5	6	15.924	1.911
	8	2	300	0,080	6	8	11.943	1.911
	10	2	300	0,100	7	10	9.554	1.911
	12	2	300	0,120	8	12	7.962	1.911
	14	2	300	0,140	9	14	6.824	1.911
	16	2	300	0,160	10	16	5.971	1.911
PLASTIC Air	3	2	700	0,030	2	3	74.310	4.459
	4	2	700	0,040	3	4	55.732	4.459
	5	2	700	0,050	4	5	44.586	4.459
	6	2	700	0,060	5	6	37.155	4.459
	8	2	700	0,080	6	8	27.866	4.459
	10	2	700	0,100	7	10	22.293	4.459
	12	2	700	0,120	8	12	18.577	4.459
	14	2	700	0,140	9	14	15.924	4.459
	16	2	700	0,160	10	16	13.933	4.459
PLASTIC GLASS FIBER Air	3	2	300	0,030	2	3	31.847	1.911
	4	2	300	0,040	3	4	23.885	1.911
	5	2	300	0,050	4	5	19.108	1.911
	6	2	300	0,060	5	6	15.924	1.911
	8	2	300	0,080	6	8	11.943	1.911
	10	2	300	0,100	7	10	9.554	1.911
	12	2	300	0,120	8	12	7.962	1.911
	14	2	300	0,140	9	14	6.824	1.911
	16	2	300	0,160	10	16	5.971	1.911
COPPER	3	2	300	0,020	2	3	31.847	1.274
	4	2	300	0,030	3	4	23.885	1.433
	5	2	300	0,040	4	5	19.108	1.529
	6	2	300	0,050	5	6	15.924	1.592
	8	2	300	0,060	6	8	11.943	1.433
	10	2	300	0,080	7	10	9.554	1.529
	12	2	300	0,100	8	12	7.962	1.592
	14	2	300	0,120	9	14	6.824	1.638
	16	2	300	0,140	10	16	5.971	1.672

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Frese per lavorazioni di cave

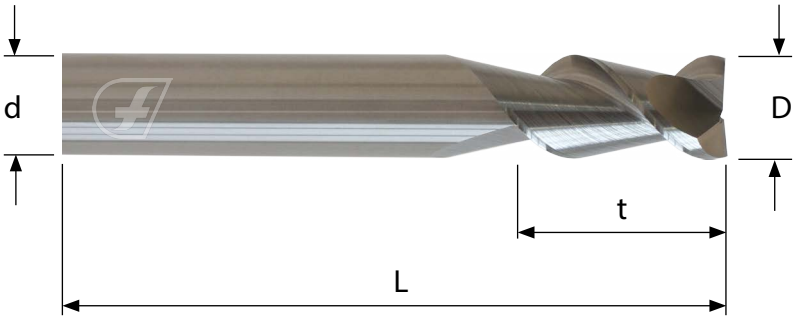
Pocket milling

DIAMOND COATED

90°

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

ALUMINIUM

PLASTIC

COPPER

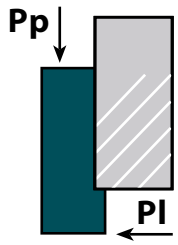
dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	**AL11**	DIAL55
3	40	8	3	-	-	50°	-	FC 202 00 03	★	★
4	51	10	4	-	-	50°	-	FC 202 00 04	★	★
5	51	12	5	-	-	50°	-	FC 202 00 05	★	★
6	51	14	6	-	-	50°	-	FC 202 00 06	★	★
8	64	16	8	-	-	50°	-	FC 202 00 08	★	★
10	64	20	10	-	-	50°	-	FC 202 00 10	★	★
12	80	22	12	-	-	50°	-	FC 202 00 12	★	★
14	80	27	14	-	-	50°	-	FC 202 00 14	★	★
16	97	32	16	-	-	50°	-	FC 202 00 16	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

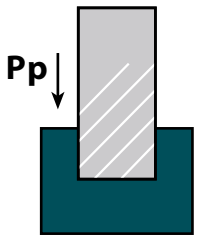
FC 203 00 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	2	500	0,040	4,5	1,5	53.079	4.246
	4	2	500	0,060	6,0	2,0	39.809	4.777
	5	2	500	0,080	7,5	2,5	31.847	5.096
	6	2	500	0,110	9,0	3,0	26.539	5.839
	7	2	500	0,120	10,5	3,5	22.748	5.460
	8	2	500	0,140	12,0	4,0	19.904	5.573
	10	2	500	0,170	15,0	5,0	15.924	5.414
	12	2	500	0,200	18,0	6,0	13.270	5.308
	16	2	500	0,230	24,0	8,0	9.952	4.578
ALU & ALLOYS Si>6% Air	3	2	300	0,040	4,5	1,5	31.847	2.548
	4	2	300	0,060	6,0	2,0	23.885	2.866
	5	2	300	0,080	7,5	2,5	19.108	3.057
	6	2	300	0,110	9,0	3,0	15.924	3.503
	7	2	300	0,120	10,5	3,5	13.649	3.276
	8	2	300	0,140	12,0	4,0	11.943	3.344
	10	2	300	0,170	15,0	5,0	9.554	3.248
	12	2	300	0,200	18,0	6,0	7.962	3.185
	16	2	300	0,230	24,0	8,0	5.971	2.747
PLASTIC Air	3	2	700	0,040	4,5	1,5	74.310	5.945
	4	2	700	0,060	6,0	2,0	55.732	6.688
	5	2	700	0,080	7,5	2,5	44.586	7.134
	6	2	700	0,110	9,0	3,0	37.155	8.174
	7	2	700	0,120	10,5	3,5	31.847	7.643
	8	2	700	0,140	12,0	4,0	27.866	7.803
	10	2	700	0,170	15,0	5,0	22.293	7.580
	12	2	700	0,200	18,0	6,0	18.577	7.431
	16	2	700	0,230	24,0	8,0	13.933	6.409
PLASTIC GLASS FIBER Air	3	2	300	0,020	4,5	1,5	31.847	1.274
	4	2	300	0,030	6,0	2,0	23.885	1.433
	5	2	300	0,040	7,5	2,5	19.108	1.529
	6	2	300	0,050	9,0	3,0	15.924	1.592
	7	2	300	0,120	10,5	3,5	13.649	3.276
	8	2	300	0,060	12,0	4,0	11.943	1.433
	10	2	300	0,080	15,0	5,0	9.554	1.529
	12	2	300	0,100	18,0	6,0	7.962	1.592
	16	2	300	0,140	24,0	8,0	5.971	1.672
COPPER	3	2	300	0,020	4,5	1,5	31.847	1.274
	4	2	300	0,030	6,0	2,0	23.885	1.433
	5	2	300	0,040	7,5	2,5	19.108	1.529
	6	2	300	0,050	9,0	3,0	15.924	1.592
	7	2	300	0,120	10,5	3,5	13.649	3.276
	8	2	300	0,060	12,0	4,0	11.943	1.433
	10	2	300	0,080	15,0	5,0	9.554	1.529
	12	2	300	0,100	18,0	6,0	7.962	1.592
	16	2	300	0,140	24,0	8,0	5.971	1.672

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	2	500	0,040	3	3	53.079	4.246
	4	2	500	0,060	4	4	39.809	4.777
	5	2	500	0,070	5	5	31.847	4.459
	6	2	500	0,090	6	6	26.539	4.777
	7	2	500	0,100	7	7	22.748	4.550
	8	2	500	0,110	8	8	19.904	4.379
	10	2	500	0,130	10	10	15.924	4.140
	12	2	500	0,160	12	12	13.270	4.246
	16	2	500	0,190	16	16	9.952	3.782
ALU & ALLOYS Si>6% Air	3	2	300	0,040	3	3	31.847	2.548
	4	2	300	0,060	4	4	23.885	2.866
	5	2	300	0,070	5	5	19.108	2.675
	6	2	300	0,090	6	6	15.924	2.866
	7	2	300	0,100	7	7	13.649	2.730
	8	2	300	0,110	8	8	11.943	2.627
	10	2	300	0,130	10	10	9.554	2.484
	12	2	300	0,160	12	12	7.962	2.548
	16	2	300	0,190	16	16	5.971	2.269
PLASTIC Air	3	2	700	0,020	3	3	74.310	2.972
	4	2	700	0,030	4	4	55.732	3.344
	5	2	700	0,040	5	5	44.586	3.567
	6	2	700	0,050	6	6	37.155	3.715
	7	2	700	0,100	7	7	31.847	6.369
	8	2	700	0,060	8	8	27.866	3.344
	10	2	700	0,080	10	10	22.293	3.567
	12	2	700	0,100	12	12	18.577	3.715
	16	2	700	0,190	16	16	13.933	5.295
PLASTIC GLASS FIBER Air	3	2	300	0,020	3	3	31.847	1.274
	4	2	300	0,030	4	4	23.885	1.433
	5	2	300	0,040	5	5	19.108	1.529
	6	2	300	0,050	6	6	15.924	1.592
	7	2	300	0,100	7	7	13.649	2.730
	8	2	300	0,060	8	8	11.943	1.433
	10	2	300	0,080	10	10	9.554	1.529
	12	2	300	0,100	12	12	7.962	1.592
	16	2	300	0,140	16	16	5.971	1.672
COPPER	3	2	300	0,020	3	3	31.847	1.274
	4	2	300	0,030	4	4	23.885	1.433
	5	2	300	0,040	5	5	19.108	1.529
	6	2	300	0,050	6	6	15.924	1.592
	7	2	300	0,100	7	7	13.649	2.730
	8	2	300	0,060	8	8	11.943	1.433
	10	2	300	0,080	10	10	9.554	1.529
	12	2	300	0,100	12	12	7.962	1.592
	16	2	300	0,140	16	16	5.971	1.672

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Frese per lavorazioni di cave e contornatura

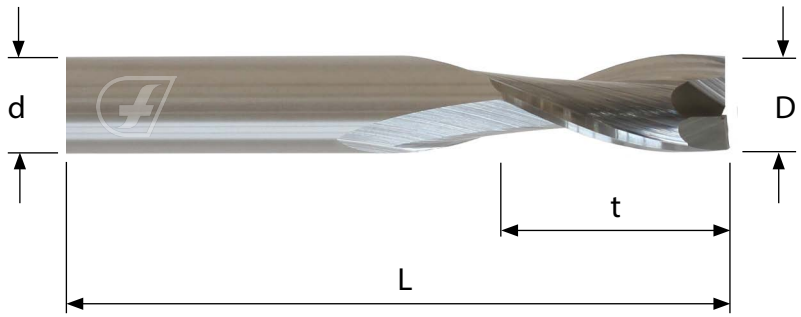
Pocket milling and profailing

DIAMOND COATED

90°

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

ALUMINIUM

PLASTIC

COPPER

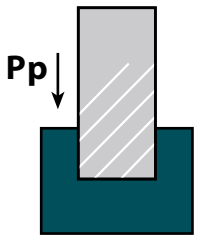
dimensions mm									*quality*	
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	**AL11**	DIAL55
3	40	12	3	-	-	25°	-	FC 203 00 03	★	★
4	51	12	4	-	-	25°	-	FC 203 00 04	★	★
5	51	12	5	-	-	25°	-	FC 203 00 05	★	★
6	64	18	6	-	-	25°	-	FC 203 00 06	★	★
7	64	18	7	-	-	25°	-	FC 203 00 07	★	★
8	64	18	8	-	-	25°	-	FC 203 00 08	★	★
10	80	22	10	-	-	25°	-	FC 203 00 10	★	★
12	80	22	12	-	-	25°	-	FC 203 00 12	★	★
16	97	25	16	-	-	25°	-	FC 203 00 16	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 330 40 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	6	3	500	0,080	3	6	26.539	6.369
	8	3	500	0,100	4	8	19.904	5.971
	10	3	500	0,120	5	10	15.924	5.732
	12	3	500	0,150	6	12	13.270	5.971
	16	3	500	0,190	8	16	9.952	5.673
	20	3	500	0,220	10	20	7.962	5.255
ALU & ALLOYS Si>6%	6	3	300	0,080	3	6	15.924	3.822
	8	3	300	0,100	4	8	11.943	3.583
	10	3	300	0,120	5	10	9.554	3.439
	12	3	300	0,150	6	12	7.962	3.583
	16	3	300	0,190	8	16	5.971	3.404
	20	3	300	0,220	10	20	4.777	3.153

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Frese per lavorazioni di cave

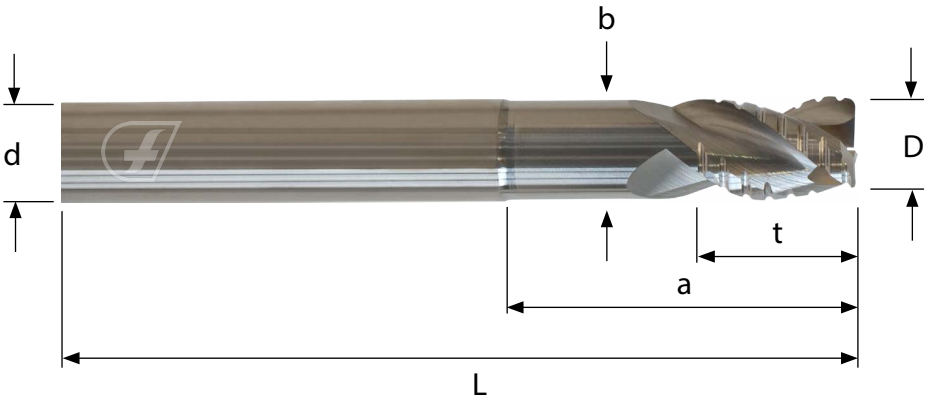
Pocket milling

DIAMOND COATED

R

HM MICRO GRAIN

Z3



Sgrossatura

Finitura

ALUMINIUM

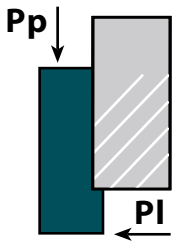
dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***		**AL11**	DIAL55
6	64	9	6	25	5,5	30°	**0,5**	FC 330 40 06	★	★
8	80	11	8	30	7,5	30°	**0,5**	FC 330 40 08	★	★
10	80	13	10	35	9,5	30°	**1,0**	FC 330 40 10	★	★
12	95	15	12	40	11,5	30°	**1,0**	FC 330 40 12	★	★
16	108	20	16	50	15,4	30°	**1,0**	FC 330 40 16	★	★
20	108	24	20	55	19,0	30°	**1,0**	FC 330 40 20	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 302 00 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	4	3	550	0,040	13	1,5	43.790	5.255
	6	3	550	0,060	18	2,0	29.193	5.255
	8	3	550	0,080	20	3,0	21.895	5.255
	10	3	550	0,100	23	4,0	17.516	5.255
	12	3	550	0,120	27	5,0	14.597	5.255
	16	3	550	0,160	36	6,0	10.947	5.255
	20	3	550	0,200	44	8,0	8.758	5.255
ALU & ALLOYS Si>6% Air	4	3	350	0,020	13	1,5	27.866	1.672
	6	3	350	0,040	18	2,0	18.577	2.229
	8	3	350	0,060	20	3,0	13.933	2.508
	10	3	350	0,080	23	4,0	11.146	2.675
	12	3	350	0,100	27	5,0	9.289	2.787
	16	3	350	0,130	36	6,0	6.967	2.717
	20	3	350	0,160	44	8,0	5.573	2.675
PLASTIC Air	4	3	800	0,040	13	1,5	55.000	7.643
	6	3	800	0,060	18	2,0	42.463	7.643
	8	3	800	0,080	20	3,0	31.847	7.643
	10	3	800	0,100	23	4,0	25.478	7.643
	12	3	800	0,120	27	5,0	21.231	7.643
	16	3	800	0,160	36	6,0	15.924	7.643
	20	3	800	0,200	44	8,0	12.739	7.643
PLASTIC GLASS FIBER Air	4	3	350	0,020	13	1,5	27.866	1.672
	6	3	350	0,040	18	2,0	18.577	2.229
	8	3	350	0,060	20	3,0	13.933	2.508
	10	3	350	0,080	23	4,0	11.146	2.675
	12	3	350	0,100	27	5,0	9.289	2.787
	16	3	350	0,130	36	6,0	6.967	2.717
	20	3	350	0,160	44	8,0	5.573	2.675
COPPER	4	3	400	0,020	13	1,5	31.847	1.911
	6	3	400	0,040	18	2,0	21.231	2.548
	8	3	400	0,060	20	3,0	15.924	2.866
	10	3	400	0,080	23	4,0	12.739	3.057
	12	3	400	0,100	27	5,0	10.616	3.185
	16	3	400	0,130	36	6,0	7.962	3.105
	20	3	400	0,160	44	8,0	6.369	3.057

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

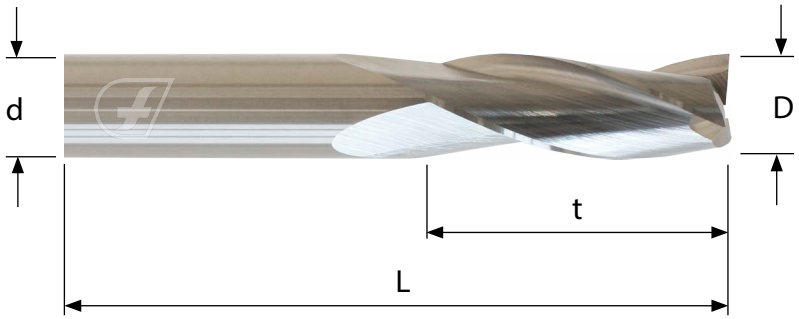
Frese per contornatura
Profailing

DIAMOND COATED

90°

HM MICRO GRAIN

Z3



Sgrossatura

Finitura

ALUMINIUM

COPPER

PLASTIC

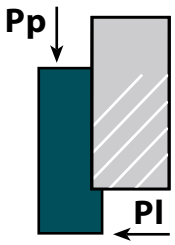
dimensions mm									*quality*	
Dh10	L	t	dh6	a	b	*Helix*	*radius*	***code***	**AL11**	DIAL55
4	51	16	4	-	-	25°	-	FC 302 00 04	★	★
5	51	19	5	-	-	25°	-	FC 302 00 05	★	★
6	80	23	6	-	-	25°	-	FC 302 00 06	★	★
8	80	25	8	-	-	25°	-	FC 302 00 08	★	★
10	80	28	10	-	-	25°	-	FC 302 00 10	★	★
12	95	32	12	-	-	25°	-	FC 302 00 12	★	★
16	108	42	16	-	-	25°	-	FC 302 00 16	★	★
20	108	50	20	-	-	25°	-	FC 302 00 20	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 342 20 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	8	3	400	0,080	30	3	15.924	3.822
	10	3	400	0,100	35	4	12.739	3.822
	12	3	400	0,120	40	5	10.616	3.822
	16	3	400	0,160	50	6	7.962	3.822
	20	3	400	0,180	80	7	6.369	3.439
ALU & ALLOYS Si>6%	8	3	250	0,050	30	3	9.952	1.493
	10	3	250	0,070	35	4	7.962	1.672
	12	3	250	0,100	40	5	6.635	1.990
	16	3	250	0,130	50	6	4.976	1.941
	20	3	250	0,180	80	7	3.981	2.150
PLASTIC	8	3	600	0,080	30	3	23.885	5.732
	10	3	600	0,100	35	4	19.108	5.732
	12	3	600	0,120	40	5	15.924	5.732
	16	3	600	0,160	50	6	11.943	5.732
	20	3	600	0,180	80	7	9.554	5.159
PLASTIC GLASS FIBER	8	3	250	0,050	30	3	9.952	1.493
	10	3	250	0,070	35	4	7.962	1.672
	12	3	250	0,100	40	5	6.635	1.990
	16	3	250	0,130	50	6	4.976	1.941
	20	3	250	0,150	80	7	3.981	1.791
COPPER	8	3	250	0,050	30	3	9.952	1.493
	10	3	250	0,070	35	4	7.962	1.672
	12	3	250	0,100	40	5	6.635	1.990
	16	3	250	0,130	50	6	4.976	1.941
	20	3	250	0,150	80	7	3.981	1.791

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Frese per contornatura

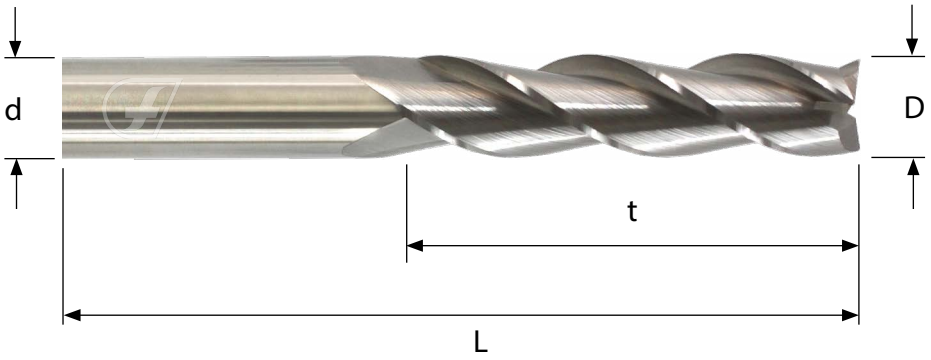
Profailing

DIAMOND COATED

90°

HM MICRO GRAIN

Z3



Sgrossatura

Finitura

ALUMINIUM

PLASTIC

COPPER

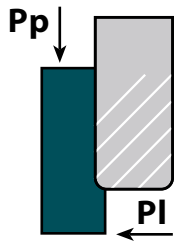
dimensions mm								*code*	*quality*	
Dh10	L	t	dh6	a	b	*Helix*	*radius*		**AL11**	DIAL55
8	80	38	8	-	-	35°	-	FC 342 20 08	★	★
10	100	45	10	-	-	35°	-	FC 342 20 10	★	★
12	108	52	12	-	-	35°	-	FC 342 20 12	★	★
16	130	60	16	-	-	35°	-	FC 342 20 16	★	★
20	160	90	20	-	-	35°	-	FC 342 20 20	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

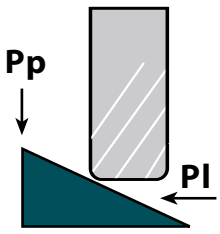
FC 205 40 ..

DIAL900



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	2	2	500	0,025	1,0	0,50	79.618	3.981
	3	2	500	0,040	1,5	0,75	53.079	4.246
	4	2	500	0,055	2,0	1,00	39.809	4.379
	5	2	500	0,070	2,5	1,25	31.847	4.459
	6	2	500	0,090	3,0	1,50	26.539	4.777
	8	2	500	0,120	4,0	2,00	19.904	4.777
	10	2	500	0,150	5,0	2,50	15.924	4.777
	12	2	500	0,170	6,0	3,00	13.270	4.512
ALU & ALLOYS Si>6%	2	2	300	0,020	1,0	0,50	47.771	1.911
	3	2	300	0,030	1,5	0,75	31.847	1.911
	4	2	300	0,050	2,0	1,00	23.885	2.389
	5	2	300	0,060	2,5	1,25	19.108	2.293
	6	2	300	0,080	3,0	1,50	15.924	2.548
	8	2	300	0,100	4,0	2,00	11.943	2.389
	10	2	300	0,120	5,0	2,50	9.554	2.293
	12	2	300	0,140	6,0	3,00	7.962	2.229
COPPER	2	2	400	0,020	1,0	0,50	63.694	2.548
	3	2	400	0,030	1,5	0,75	42.463	2.548
	4	2	400	0,040	2,0	1,00	31.847	2.548
	5	2	400	0,050	2,5	1,25	25.478	2.548
	6	2	400	0,060	3,0	1,50	21.231	2.548
	8	2	400	0,080	4,0	2,00	15.924	2.548
	10	2	400	0,100	5,0	2,50	12.739	2.548
	12	2	400	0,120	6,0	3,00	10.616	2.548

DIAL900



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	2	2	500	0,040	0,10	0,10	79.618	6.369
	3	2	500	0,060	0,15	0,15	53.079	6.369
	4	2	500	0,080	0,20	0,20	39.809	6.369
	5	2	500	0,100	0,25	0,25	31.847	6.369
	6	2	500	0,120	0,30	0,30	26.539	6.369
	8	2	500	0,160	0,35	0,35	19.904	6.369
	10	2	500	0,200	0,40	0,40	15.924	6.369
	12	2	500	0,250	0,45	0,45	13.270	6.635
ALU & ALLOYS Si>6%	2	2	300	0,033	0,10	0,10	47.771	3.153
	3	2	300	0,050	0,15	0,15	31.847	3.185
	4	2	300	0,065	0,20	0,20	23.885	3.105
	5	2	300	0,080	0,25	0,25	19.108	3.057
	6	2	300	0,100	0,30	0,30	15.924	3.185
	8	2	300	0,130	0,35	0,35	11.943	3.105
	10	2	300	0,160	0,40	0,40	9.554	3.057
	12	2	300	0,200	0,45	0,45	7.962	3.185
COPPER	2	2	400	0,033	0,10	0,10	63.694	4.204
	3	2	400	0,050	0,15	0,15	42.463	4.246
	4	2	400	0,065	0,20	0,20	31.847	4.140
	5	2	400	0,080	0,25	0,25	25.478	4.076
	6	2	400	0,100	0,30	0,30	21.231	4.246
	8	2	400	0,130	0,35	0,35	15.924	4.140
	10	2	400	0,160	0,40	0,40	12.739	4.076
	12	2	400	0,200	0,45	0,45	10.616	4.246

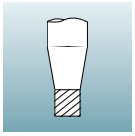
Tolleranza raggio mm / ***Radius tollerance mm***		
D	raggio ***radius***	tolleranza ***tollerance***
4	0,5	± 0,01
5	0,5	
6	0,5	
8	0,5	
10	0,5	
12	0,5	

Frese per lavorazioni di cave e contornatura

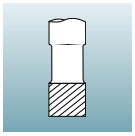
Pocket milling and profailing

DIAMOND COATED

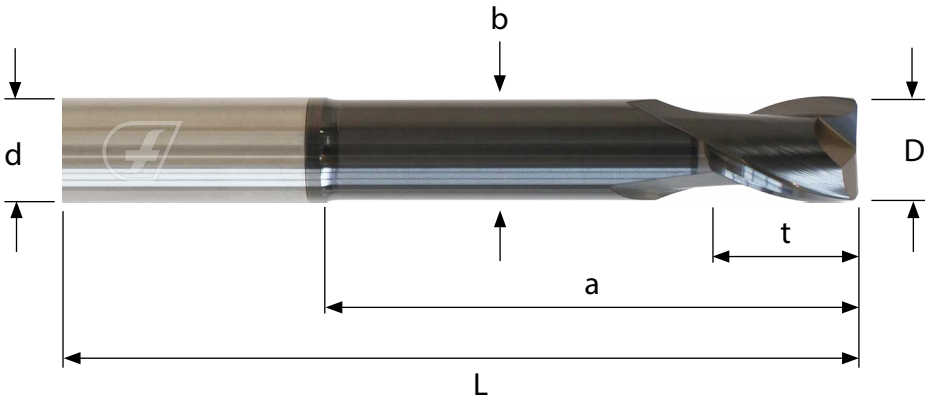
R



HM MICRO GRAIN



Z2



Sgrossatura

Finitura

ALUMINIUM

COPPER

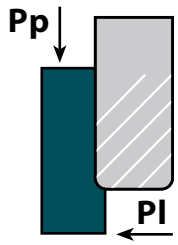
dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	**RA15**	DIAL900
2	80	4	4	15	1,9	30°	**0,5**	FC 205 40 02	★	★
3	80	5	4	20	2,9	30°	**0,5**	FC 205 40 03	★	★
4	80	6	4	25	3,8	30°	**0,5**	FC 205 40 04	★	★
5	80	7	5	30	4,8	30°	**0,5**	FC 205 40 05	★	★
6	100	9	6	35	5,6	30°	**0,5**	FC 205 40 06	★	★
8	100	11	8	40	7,6	30°	**0,5**	FC 205 40 08	★	★
10	120	13	10	50	9,5	30°	**0,5**	FC 205 40 10	★	★
12	140	15	12	60	11,5	30°	**0,5**	FC 205 40 12	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

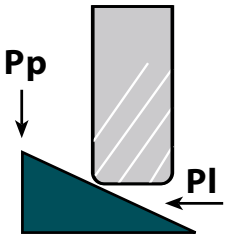
FC 270 40 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	2	500	0,040	1,5	0,75	53.079	4.246
	4	2	500	0,055	2,0	1,00	39.809	4.379
	5	2	500	0,070	2,5	1,25	31.847	4.459
	6	2	500	0,090	3,0	1,50	26.539	4.777
	8	2	500	0,120	4,0	2,00	19.904	4.777
	10	2	500	0,150	5,0	2,50	15.924	4.777
	12	2	500	0,170	6,0	3,00	13.270	4.512
	16	2	500	0,240	8,0	4,00	9.952	4.777
ALU & ALLOYS Si>6% Air	3	2	300	0,030	1,5	0,75	31.847	1.911
	4	2	300	0,050	2,0	1,00	23.885	2.389
	5	2	300	0,060	2,5	1,25	19.108	2.293
	6	2	300	0,080	3,0	1,50	15.924	2.548
	8	2	300	0,100	4,0	2,00	11.943	2.389
	10	2	300	0,120	5,0	2,50	9.554	2.293
	12	2	300	0,140	6,0	3,00	7.962	2.229
	16	2	300	0,190	8,0	4,00	5.971	2.269
COPPER Air	3	2	400	0,030	1,5	0,75	42.463	2.548
	4	2	400	0,040	2,0	1,00	31.847	2.548
	5	2	400	0,050	2,5	1,25	25.478	2.548
	6	2	400	0,060	3,0	1,50	21.231	2.548
	8	2	400	0,080	4,0	2,00	15.924	2.548
	10	2	400	0,100	5,0	2,50	12.739	2.548
	12	2	400	0,120	6,0	3,00	10.616	2.548
	16	2	400	0,160	8,0	4,00	7.962	2.548
PLASTIC Air	3	2	700	0,040	1,5	0,75	74.310	5.945
	4	2	700	0,055	2,0	1,00	55.732	6.131
	5	2	700	0,070	2,5	1,25	44.586	6.242
	6	2	700	0,090	3,0	1,50	37.155	6.688
	8	2	700	0,120	4,0	2,00	27.866	6.688
	10	2	700	0,150	5,0	2,50	22.293	6.688
	12	2	700	0,170	6,0	3,00	18.577	6.316
	16	2	700	0,240	8,0	4,00	13.933	6.688

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6% Air	3	2	500	0,060	0,15	0,15	53.079	6.369
	4	2	500	0,080	0,20	0,20	39.809	6.369
	5	2	500	0,100	0,25	0,25	31.847	6.369
	6	2	500	0,120	0,30	0,30	26.539	6.369
	8	2	500	0,160	0,35	0,35	19.904	6.369
	10	2	500	0,200	0,40	0,40	15.924	6.369
	12	2	500	0,250	0,45	0,45	13.270	6.635
	16	2	500	0,330	0,60	0,60	9.952	6.568
ALU & ALLOYS Si>6% Air	3	2	300	0,050	0,15	0,15	31.847	3.185
	4	2	300	0,065	0,20	0,20	23.885	3.105
	5	2	300	0,080	0,25	0,25	19.108	3.057
	6	2	300	0,100	0,30	0,30	15.924	3.185
	8	2	300	0,130	0,35	0,35	11.943	3.105
	10	2	300	0,160	0,40	0,40	9.554	3.057
	12	2	300	0,200	0,45	0,45	7.962	3.185
	16	2	300	0,270	0,60	0,60	5.971	3.225
COPPER Air	3	2	400	0,050	0,15	0,15	42.463	4.246
	4	2	400	0,065	0,20	0,20	31.847	4.140
	5	2	400	0,080	0,25	0,25	25.478	4.076
	6	2	400	0,100	0,30	0,30	21.231	4.246
	8	2	400	0,130	0,35	0,35	15.924	4.140
	10	2	400	0,160	0,40	0,40	12.739	4.076
	12	2	400	0,200	0,45	0,45	10.616	4.246
	16	2	400	0,270	0,60	0,60	7.962	4.299
PLASTIC Air	3	2	700	0,030	0,15	0,15	74.310	4.459
	4	2	700	0,040	0,20	0,20	55.732	4.459
	5	2	700	0,050	0,25	0,25	44.586	4.459
	6	2	700	0,060	0,30	0,30	37.155	4.459
	8	2	700	0,080	0,35	0,35	27.866	4.459
	10	2	700	0,100	0,40	0,40	22.293	4.459
	12	2	700	0,190	0,45	0,45	18.577	7.059
	16	2	700	0,260	0,60	0,60	13.933	7.245

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	3	0,5	+ - 0,01
	4	1,0	
	5	1,0	
	6	1,0	
	8	2,0	
	10	2,0	
	12	2,0	
	16	3,0	

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Frese per lavorazioni di cave e contornatura

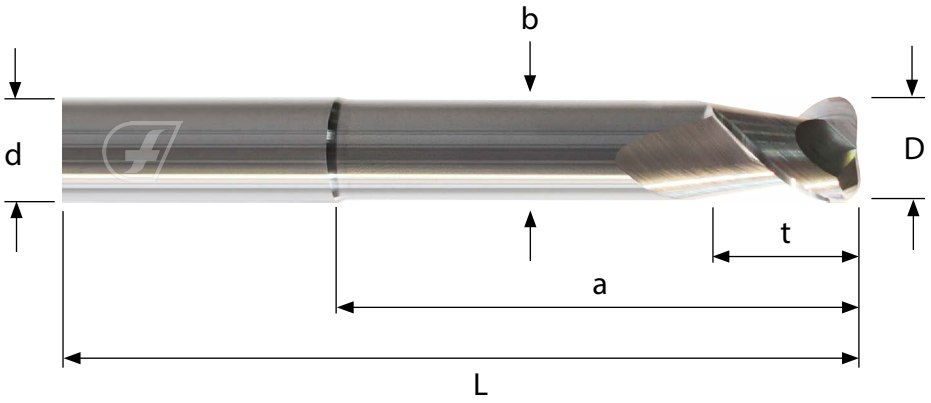
Pocket milling and profailing

DIAMOND COATED

R

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

ALUMINIUM | COPPER | PLASTIC

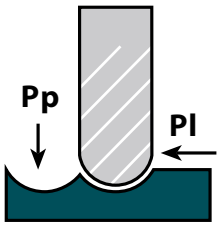
dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	**AL11**	DIAL55
3	80	5	6	20	2,8	45°	**0,5**	FC 270 40 03	★	★
4	80	6	6	25	3,8	45°	**1,0**	FC 270 40 04	★	★
5	80	7	6	30	4,6	45°	**1,0**	FC 270 40 05	★	★
6	100	9	6	35	5,6	45°	**1,0**	FC 270 40 06	★	★
8	100	11	8	40	7,6	45°	**2,0**	FC 270 40 08	★	★
10	120	13	10	50	9,5	45°	**2,0**	FC 270 40 10	★	★
12	140	15	12	60	11,5	45°	**2,0**	FC 270 40 12	★	★
16	160	18	16	70	15,0	45°	**3,0**	FC 270 40 16	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

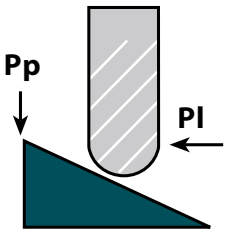
FC 220 20 ..

DIAL900



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	2	2	500	0,025	0,2	0,2	55.000	3.981
	3	2	500	0,040	0,3	0,3	53.079	4.246
	4	2	500	0,055	0,4	0,4	39.809	4.379
	5	2	500	0,070	0,6	0,6	31.847	4.459
	6	2	500	0,090	0,8	0,8	26.539	4.777
	8	2	500	0,120	1,0	1,0	19.904	4.777
	10	2	500	0,150	1,2	1,2	15.924	4.777
	12	2	500	0,170	1,4	1,4	13.270	4.512
ALU & ALLOYS Si>6%	2	2	300	0,020	0,2	0,2	47.771	1.911
	3	2	300	0,030	0,3	0,3	31.847	1.911
	4	2	300	0,045	0,4	0,4	23.885	2.150
	5	2	300	0,055	0,6	0,6	19.108	2.102
	6	2	300	0,065	0,8	0,8	15.924	2.070
	8	2	300	0,090	1,0	1,0	11.943	2.150
	10	2	300	0,110	1,2	1,2	9.554	2.102
	12	2	300	0,130	1,4	1,4	7.962	2.070
COPPER	2	2	400	0,020	0,2	0,2	55.000	2.548
	3	2	400	0,030	0,3	0,3	42.463	2.548
	4	2	400	0,040	0,4	0,4	31.847	2.548
	5	2	400	0,050	0,6	0,6	25.478	2.548
	6	2	400	0,060	0,8	0,8	21.231	2.548
	8	2	400	0,080	1,0	1,0	15.924	2.548
	10	2	400	0,100	1,2	1,2	12.739	2.548
	12	2	400	0,120	1,4	1,4	10.616	2.548

DIAL900



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	2	2	600	0,035	0,10	0,10	55.000	6.688
	3	2	600	0,045	0,12	0,12	55.000	5.732
	4	2	600	0,055	0,14	0,14	47.771	5.255
	5	2	600	0,060	0,16	0,16	38.217	4.586
	6	2	600	0,065	0,18	0,18	31.847	4.140
	8	2	600	0,070	0,20	0,20	23.885	3.344
	10	2	600	0,075	0,22	0,22	19.108	2.866
	12	2	600	0,080	0,24	0,24	15.924	2.548
ALU & ALLOYS Si>6%	2	2	400	0,020	0,10	0,10	55.000	2.548
	3	2	400	0,025	0,12	0,12	42.463	2.123
	4	2	400	0,030	0,14	0,14	31.847	1.911
	5	2	400	0,035	0,16	0,16	25.478	1.783
	6	2	400	0,040	0,18	0,18	21.231	1.699
	8	2	400	0,050	0,20	0,20	15.924	1.592
	10	2	400	0,060	0,22	0,22	12.739	1.529
	12	2	400	0,065	0,24	0,24	10.616	1.380
COPPER	2	2	500	0,025	0,10	0,10	55.000	3.981
	3	2	500	0,030	0,12	0,12	53.079	3.185
	4	2	500	0,035	0,14	0,14	39.809	2.787
	5	2	500	0,040	0,16	0,16	31.847	2.548
	6	2	500	0,050	0,18	0,18	26.539	2.654
	8	2	500	0,060	0,20	0,20	19.904	2.389
	10	2	500	0,065	0,22	0,22	15.924	2.070
	12	2	500	0,070	0,24	0,24	13.270	1.858

Tolleranza raggio mm / ***Radius tollerance mm***

D	raggio *radius*	tolleranza f8 *tollerance f8*
2	1,0	- 0,006 0,020
3	1,5	
4	2,0	
5	2,5	
6	3,0	
8	4,0	- 0,010 0,028
10	5,0	

Frese per lavorazioni di cave e contornatura

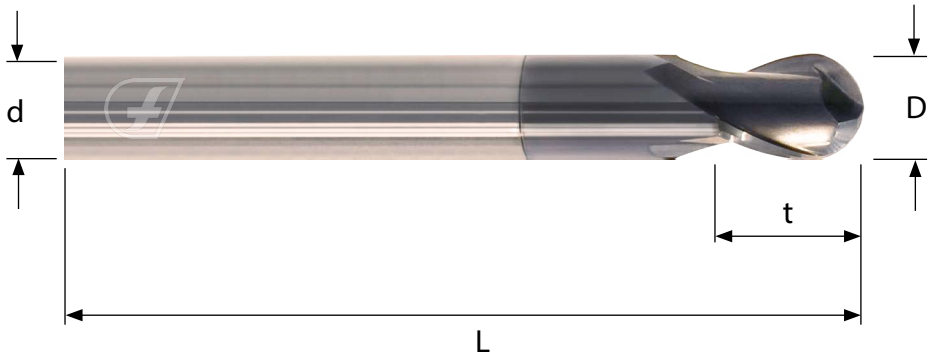
Pocket milling and profailing

DIAMOND COATED

R

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

ALUMINIUM

COPPER

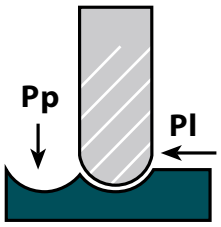
Rf8	D	dimensions mm L	t	dh6	a	b	Helix	code	quality RA15	DIAL900
1,0	2	80	4	4	15	1,9	30°	FC 220 20 02	★	★
1,5	3	80	5	4	20	2,9	30°	FC 220 20 03	★	★
2,0	4	80	6	4	-	-	30°	FC 220 20 04	★	★
2,5	5	80	7	5	-	-	30°	FC 220 20 05	★	★
3,0	6	100	9	6	-	-	30°	FC 220 20 06	★	★
4,0	8	100	11	8	-	-	30°	FC 220 20 08	★	★
5,0	10	120	13	10	-	-	30°	FC 220 20 10	★	★
6,0	12	140	16	12	-	-	30°	FC 220 20 12	★	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

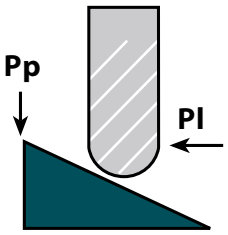
FC 280 20 ..

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	3	2	500	0,040	0,3	0,3	53.079	4.246
	4	2	500	0,055	0,4	0,4	39.809	4.379
	5	2	500	0,070	0,6	0,6	31.847	4.459
	6	2	500	0,090	0,8	0,8	26.539	4.777
	8	2	500	0,120	1,0	1,0	19.904	4.777
	10	2	500	0,150	1,2	1,2	15.924	4.777
	12	2	500	0,170	1,4	1,4	13.270	4.512
	16	2	500	0,210	1,6	1,6	9.952	4.180
ALU & ALLOYS Si>6%	3	2	300	0,030	0,3	0,3	31.847	1.911
	4	2	300	0,045	0,4	0,4	23.885	2.150
	5	2	300	0,055	0,6	0,6	19.108	2.102
	6	2	300	0,065	0,8	0,8	15.924	2.070
	8	2	300	0,090	1,0	1,0	11.943	2.150
	10	2	300	0,110	1,2	1,2	9.554	2.102
	12	2	300	0,130	1,4	1,4	7.962	2.070
	16	2	300	0,170	1,6	1,6	5.971	2.030
COPPER	3	2	400	0,030	0,3	0,3	42.463	2.548
	4	2	400	0,040	0,4	0,4	31.847	2.548
	5	2	400	0,050	0,6	0,6	25.478	2.548
	6	2	400	0,060	0,8	0,8	21.231	2.548
	8	2	400	0,080	1,0	1,0	15.924	2.548
	10	2	400	0,100	1,2	1,2	12.739	2.548
	12	2	400	0,120	1,4	1,4	10.616	2.548
	16	2	400	0,160	1,6	1,6	7.962	2.548
PLASTIC	3	2	700	0,040	0,3	0,3	55.000	5.945
	4	2	700	0,055	0,4	0,4	55.732	6.131
	5	2	700	0,070	0,6	0,6	44.586	6.242
	6	2	700	0,090	0,8	0,8	37.155	6.688
	8	2	700	0,120	1,0	1,0	27.866	6.688
	10	2	700	0,150	1,2	1,2	22.293	6.688
	12	2	700	0,170	1,4	1,4	18.577	6.316
	16	2	700	0,210	1,6	1,6	13.933	5.852

DIAL55



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	3	2	600	0,045	0,12	0,12	55.000	5.732
	4	2	600	0,055	0,14	0,14	47.771	5.255
	5	2	600	0,060	0,16	0,16	38.217	4.586
	6	2	600	0,065	0,18	0,18	31.847	4.140
	8	2	600	0,070	0,20	0,20	23.885	3.344
	10	2	600	0,075	0,22	0,22	19.108	2.866
	12	2	600	0,080	0,24	0,24	15.924	2.548
	16	2	600	0,110	0,26	0,26	11.943	2.627
ALU & ALLOYS Si>6%	3	2	400	0,025	0,12	0,12	42.463	2.123
	4	2	400	0,030	0,14	0,14	31.847	1.911
	5	2	400	0,035	0,16	0,16	25.478	1.783
	6	2	400	0,040	0,18	0,18	21.231	1.699
	8	2	400	0,050	0,20	0,20	15.924	1.592
	10	2	400	0,060	0,22	0,22	12.739	1.529
	12	2	400	0,065	0,24	0,24	10.616	1.380
	16	2	400	0,090	0,26	0,26	7.962	1.433
COPPER	3	2	500	0,030	0,12	0,12	53.079	3.185
	4	2	500	0,035	0,14	0,14	39.809	2.787
	5	2	500	0,040	0,16	0,16	31.847	2.548
	6	2	500	0,050	0,18	0,18	26.539	2.654
	8	2	500	0,060	0,20	0,20	19.904	2.389
	10	2	500	0,065	0,22	0,22	15.924	2.070
	12	2	500	0,070	0,24	0,24	13.270	1.858
	16	2	500	0,095	0,26	0,26	9.952	1.891
PLASTIC	3	2	700	0,045	0,12	0,12	74.310	6.688
	4	2	700	0,055	0,14	0,14	55.732	6.131
	5	2	700	0,060	0,16	0,16	44.586	5.350
	6	2	700	0,065	0,18	0,18	37.155	4.830
	8	2	700	0,070	0,20	0,20	27.866	3.901
	10	2	700	0,075	0,22	0,22	22.293	3.344
	12	2	700	0,080	0,24	0,24	18.577	2.972
	16	2	700	0,110	0,26	0,26	13.933	3.065

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza f8 ***tollerance f8***
	3	1,5	- 0,006 0,020
	4	2,0	
	5	2,5	
	6	3,0	
	8	4,0	- 0,010 0,028
	10	5,0	
	12	6,0	
	16	8,0	

Se si utilizzano frese Futura Carbide AL11 diminuire i parametri del 20% - *When using Futura Carbide AL11 end mills, decrease the parameters by* 20%

Frese per lavorazioni di cave e contornatura

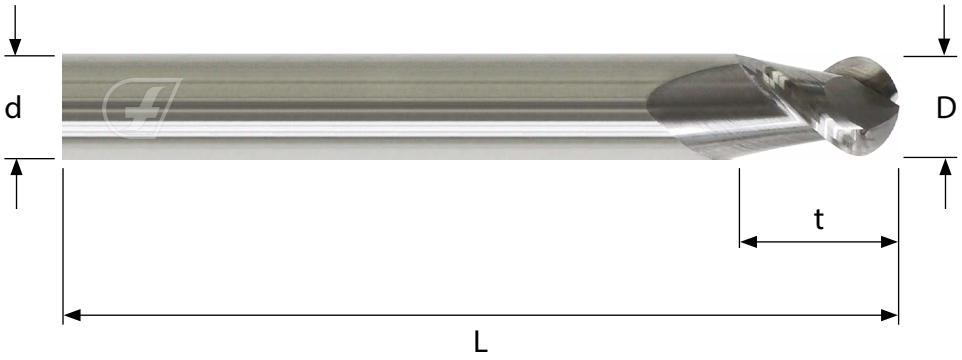
Pocket milling and profailing

DIAMOND COATED

R

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

ALUMINIUM

COPPER

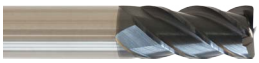
PLASTIC

Rf8	*dimensions mm* D	L	t	dh6	a	b	*Helix*	*code*	*quality* AL11	DIAL55
1,5	3	80	5	6	20	3	45°	FC 280 20 03	★	★
2,0	4	80	6	6	25	4	45°	FC 280 20 04	★	★
2,5	5	80	7	6	30	5	45°	FC 280 20 05	★	★
3,0	6	100	9	6	-	-	45°	FC 280 20 06	★	★
4,0	8	100	11	8	-	-	45°	FC 280 20 08	★	★
5,0	10	120	13	10	-	-	45°	FC 280 20 10	★	★
6,0	12	140	15	12	-	-	45°	FC 280 20 12	★	★
8,0	16	160	20	16	-	-	45°	FC 280 20 16	★	★

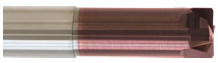
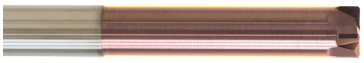
Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

Frese con testa torica - *Corner radius end mills*

	FC 205 10 .. BK500	Z2	R	30°		Ø 2 ÷ 5 r 0,5	N/mm2 <850-1200	HRC 30-48	pag. 103
	FC 305 30 .. SM500	Z3	R	40°		Ø 2 ÷ 5 r 0,5	N/mm2 850-1200	HRC 30-60	pag. 105
	FC 305 40 .. BK500	Z3	R	40°		Ø 3 ÷ 10 r 0,5	N/mm2 <850-1200	HRC 30-48	pag. 107
	FC 310 40 .. BK500	Z3	R	40°		Ø 6 ÷ 12 r 1,0	N/mm2 <850-1200	HRC 30-48	pag. 107
	FC 363 40 .. X9000	Z3	R	0°		Ø 2 ÷ 3 r 0,2 ÷ 0,5	HRC 48-52	HRC 52-60>	pag. 113
	FC 370 30 .. X9000	Z3	R	15°		Ø 2 ÷ 4 r 0,2 ÷ 0,5	N/mm2 850-1200	HRC 30-52	pag. 117
	FC 370 31 .. X9000	Z3	R	15°		Ø 2 ÷ 4 r 0,2 ÷ 0,5	N/mm2 850-1200	HRC 30-52	pag. 117
	FC 370 32 .. X9000	Z3	R	15°		Ø 2 ÷ 4 r 0,2 ÷ 0,5	N/mm2 850-1200	HRC 30-52	pag. 117
	FC 375 30 .. X9000	Z3	R	15°		Ø 4 r 1,0	N/mm2 850-1200	HRC 30-52	pag. 117
	FC 375 31 .. X9000	Z3	R	15°		Ø 4 r 1,0	N/mm2 850-1200	HRC 30-52	pag. 117
	FC 375 32 .. X9000	Z3	R	15°		Ø 4 r 1,0	N/mm2 850-1200	HRC 30-52	pag. 117
	FC 370 40 .. X9000	Z3	R	15°		Ø 2 ÷ 4 r 0,2 ÷ 0,5	N/mm2 850-1200	HRC 30-52	pag. 121
	FC 405 00 .. BK500	Z4	R	40°		Ø 4 ÷ 10 r 0,5	N/mm2 <850-1200	HRC 30-48	pag. 109
	FC 410 00 .. BK500	Z4	R	45°		Ø 6 ÷ 12 r 1,0	N/mm2 <850-1200	HRC 30-48	pag. 109
	FC 405 40 .. XT900	Z4	R	55°		Ø 3 ÷ 12 r 0,5	N/mm2 850-1200	HRC 30-52	pag. 111
	FC 410 40 .. XT900	Z4	R	55°		Ø 6 ÷ 12 r 1,0	N/mm2 850-1200	HRC 30-52	pag. 111

Frese con testa torica - *Corner radius end mills*

	FC 463 40 .. X9000	Z4	R	0°		Ø 4 ÷ 8 r 0,5	HRC 48-52	HRC 52-60>	pag. 113
	FC 465 40 .. X9000	Z4	R	0°		Ø 6 ÷ 10 r 1,0	HRC 48-52	HRC 52-60>	pag. 113
	FC 467 40 .. X9000	Z4	R	0°		Ø 10÷12 r 1,5	HRC 48-52	HRC 52-60>	pag. 113
	FC 463 45 .. X9000	Z4	R	0°		Ø 6 ÷ 8 r 0,5	HRC 48-52	HRC 52-60>	pag. 115
	FC 465 45 .. X9000	Z4	R	0°		Ø 6 ÷ 10 r 1,0	HRC 48-52	HRC 52-60>	pag. 115
	FC 470 30 .. X9000	Z4	R	15°		Ø 5 r 0,5	N/mm2 850-1200	HRC 30-52	pag. 119
	FC 470 31 .. X9000	Z4	R	15°		Ø 5 r 0,5	N/mm2 850-1200	HRC 30-52	pag. 119
	FC 475 30 .. X9000	Z4	R	15°		Ø 5 r 1,0	N/mm2 850-1200	HRC 30-52	pag. 119
	FC 475 31 .. X9000	Z4	R	15°		Ø 5 r 1,0	N/mm2 850-1200	HRC 30-52	pag. 119
	FC 470 40 .. X9000	Z4	R	15°		Ø 5 ÷ 10 r 0,5	N/mm2 850-1200	HRC 30-52	pag. 121
	FC 475 40 .. X9000	Z4	R	15°		Ø 6 ÷ 12 r 1,0	N/mm2 850-1200	HRC 30-52	pag. 121
	FC 477 40 .. X9000	Z4	R	15°		Ø 6 ÷ 12 r 1,5 ÷ 2.0	N/mm2 850-1200	HRC 30-52	pag. 121
	FC 470 45 .. X9000	Z4	R	15°		Ø 6 ÷ 10 r 0,5	N/mm2 850-1200	HRC 30-52	pag. 123
	FC 475 45 .. X9000	Z4	R	15°		Ø 6 ÷ 12 r 1,0	N/mm2 850-1200	HRC 30-52	pag. 123
	FC 477 45 .. X9000	Z4	R	15°		Ø 6 ÷ 12 r 1,5 ÷ 2.0	N/mm2 850-1200	HRC 30-52	pag. 123

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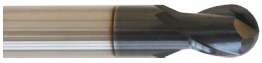
Frese con testa semisferica - *Ball nose end mills*

	FC 220 00 .. BK500	Z2	R	30°		Ø 2 ÷ 12	N/mm2 <850-1200	HRC 30-48	pag. 125
	FC 220 10 .. BK500	Z2	R	30°		Ø 2 ÷ 5	N/mm2 <850-1200	HRC 30-48	pag. 127
	FC 220 20 .. BK500	Z2	R	30°		Ø 3 ÷ 12	N/mm2 <850-1200	HRC 30-48	pag. 129
	FC 220 20 .. X9000	Z2	R	30°		Ø 6 ÷ 12	N/mm2 850-1200	HRC 30-52	pag. 131
	FC 220 21 .. X9000	Z2	R	30°		Ø 2 ÷ 5	N/mm2 850-1200	HRC 30-52	pag. 131
	FC 220 22 .. X9000	Z2	R	30°		Ø 2 ÷ 4	N/mm2 850-1200	HRC 30-52	pag. 131
	FC 220 23 .. X9000	Z2	R	30°		Ø 2 ÷ 4	N/mm2 850-1200	HRC 30-52	pag. 131
	FC 220 24 .. X9000	Z2	R	30°		Ø 2 ÷ 4	N/mm2 850-1200	HRC 30-52	pag. 131
	FC 220 30 .. SM500	Z2	R	30°		Ø 2 ÷ 5	N/mm2 850-1200	HRC 30-60	pag. 133
	FC 320 19 .. X9000	Z3	R	15°		Ø 2 ÷ 5	N/mm2 850-1200	HRC 30-52	pag. 135
	FC 320 20 .. X9000	Z3	R	15°		Ø 3 ÷ 10	N/mm2 850-1200	HRC 30-52	pag. 135
	FC 320 21 .. X9000	Z3	R	15°		Ø 3 ÷ 5	N/mm2 850-1200	HRC 30-52	pag. 135
	FC 420 00 .. X9000	Z4	R	40°		Ø 4 ÷ 10	N/mm2 850-1200	HRC 30-52	pag. 137
	FC 420 20 .. X9000	Z4	R	40°		Ø 4 ÷ 10	N/mm2 850-1200	HRC 30-52	pag. 139
	FC 452 30 .. X9000	Z4	R	0°		Ø 2 ÷ 4	HRC 48-52	HRC 52-60>	pag. 141
	FC 453 40 .. X9000	Z4	R	0°		Ø 6 ÷ 12	HRC 48-52	HRC 52-60>	pag. 143

FC 205 10 ..

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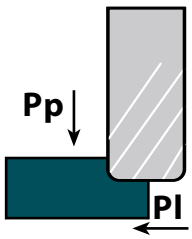

Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	2	2	190	0,025	0,11	0,7	30.255	1.513
	3	2	190	0,040	0,14	0,9	20.170	1.614
	4	2	190	0,050	0,16	1,1	15.127	1.513
	5	2	190	0,060	0,19	1,3	12.102	1.452
N/mm2 850-1200	2	2	170	0,020	0,11	0,7	27.070	1.083
	3	2	170	0,035	0,14	0,9	18.047	1.263
	4	2	170	0,050	0,16	1,1	13.535	1.354
	5	2	170	0,060	0,19	1,3	10.828	1.299
HRC 30-42	2	2	150	0,020	0,11	0,7	23.885	955
	3	2	150	0,030	0,14	0,9	15.924	955
	4	2	150	0,045	0,16	1,1	11.943	1.075
	5	2	150	0,055	0,19	1,3	9.554	1.051
HRC 42-48	2	2	130	0,015	0,11	0,7	20.701	621
	3	2	130	0,025	0,14	0,9	13.800	690
	4	2	130	0,040	0,16	1,1	10.350	828
	5	2	130	0,050	0,19	1,3	8.280	828

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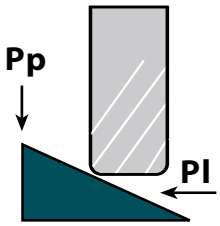
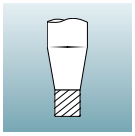


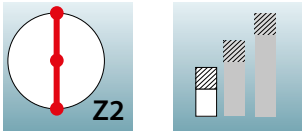
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	2	2	300	0,060	0,10	0,10	47.771	5.732
	3	2	300	0,080	0,11	0,11	31.847	5.096
	4	2	300	0,110	0,12	0,12	23.885	5.255
	5	2	300	0,130	0,15	0,15	19.108	4.968
N/mm2 850-1200	2	2	260	0,050	0,10	0,10	41.401	4.140
	3	2	260	0,090	0,11	0,11	27.601	4.968
	4	2	260	0,100	0,12	0,12	20.701	4.140
	5	2	260	0,120	0,15	0,15	16.561	3.975
HRC 30-42	2	2	220	0,050	0,10	0,10	35.032	3.503
	3	2	220	0,070	0,11	0,11	23.355	3.270
	4	2	220	0,090	0,12	0,12	17.516	3.153
	5	2	220	0,110	0,15	0,15	14.013	3.083
HRC 42-48	2	2	190	0,040	0,10	0,10	30.255	2.420
	3	2	190	0,060	0,11	0,11	20.170	2.420
	4	2	190	0,080	0,12	0,12	15.127	2.420
	5	2	190	0,100	0,15	0,15	12.102	2.420

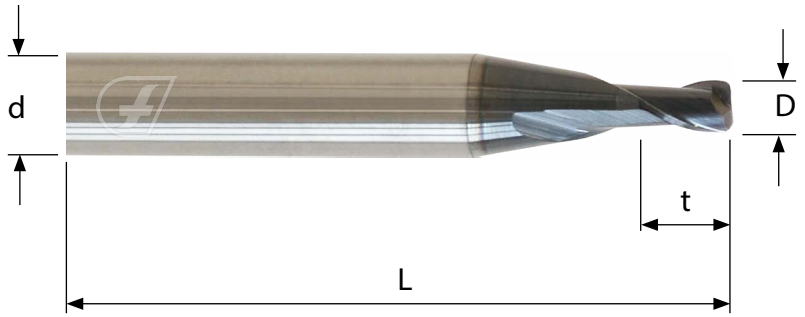
Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	2	0,5	+ 0,01 -
	3	0,5	
	4	0,5	
	5	0,5	

Frese con testa torica
Corner radius end mills

HM MICRO GRAIN







Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

HRC 30-42

HRC 42-48

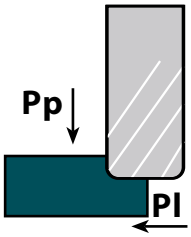
dimensions mm								code	quality
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	BK 500
2	51	4	4	-	-	30°	**0,5**	FC 205 10 02	★
3	51	5	6	-	-	30°	**0,5**	FC 205 10 03	★
4	51	6	6	-	-	30°	**0,5**	FC 205 10 04	★
5	51	6	6	-	-	30°	**0,5**	FC 205 10 05	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

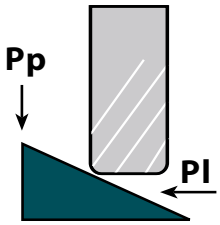
FC 305 30 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	3	180	0,020	0,11	0,7	28.662	1.720
	3	3	180	0,035	0,14	0,9	19.108	2.006
	4	3	180	0,050	0,16	1,1	14.331	2.150
	5	3	180	0,060	0,19	1,3	11.465	2.064
HRC 30-42	2	3	150	0,020	0,11	0,7	23.885	1.433
	3	3	150	0,030	0,14	0,9	15.924	1.433
	4	3	150	0,045	0,16	1,1	11.943	1.612
	5	3	150	0,055	0,19	1,3	9.554	1.576
HRC 42-48	2	3	130	0,015	0,11	0,7	20.701	932
	3	3	130	0,025	0,14	0,9	13.800	1.035
	4	3	130	0,040	0,16	1,1	10.350	1.242
	5	3	130	0,050	0,19	1,3	8.280	1.242
HRC 48-52	2	3	100	0,015	0,11	0,7	15.924	717
	3	3	100	0,025	0,14	0,9	10.616	796
	4	3	100	0,040	0,16	1,1	7.962	955
	5	3	100	0,050	0,19	1,3	6.369	955
HRC 52-60	2	3	60	0,015	0,11	0,7	9.554	430
	3	3	60	0,025	0,14	0,9	6.369	478
	4	3	60	0,040	0,16	1,1	4.777	573
	5	3	60	0,050	0,19	1,3	3.822	573

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	3	260	0,050	0,10	0,10	41.401	6.210
	3	3	260	0,090	0,11	0,11	27.601	7.452
	4	3	260	0,100	0,12	0,12	20.701	6.210
	5	3	260	0,120	0,15	0,15	16.561	5.962
HRC 30-42	2	3	220	0,050	0,10	0,10	35.032	5.255
	3	3	220	0,070	0,11	0,11	23.355	4.904
	4	3	220	0,090	0,12	0,12	17.516	4.729
	5	3	220	0,110	0,15	0,15	14.013	4.624
HRC 42-48	2	3	190	0,040	0,10	0,10	30.255	3.631
	3	3	190	0,060	0,11	0,11	20.170	3.631
	4	3	190	0,080	0,12	0,12	15.127	3.631
	5	3	190	0,100	0,15	0,15	12.102	3.631
HRC 48-52	2	3	130	0,040	0,10	0,10	20.701	2.484
	3	3	130	0,060	0,11	0,11	13.800	2.484
	4	3	130	0,080	0,12	0,12	10.350	2.484
	5	3	130	0,100	0,15	0,15	8.280	2.484
HRC 52-60	2	3	80	0,040	0,10	0,10	12.739	1.529
	3	3	80	0,060	0,11	0,11	8.493	1.529
	4	3	80	0,080	0,12	0,12	6.369	1.529
	5	3	80	0,100	0,15	0,15	5.096	1.529

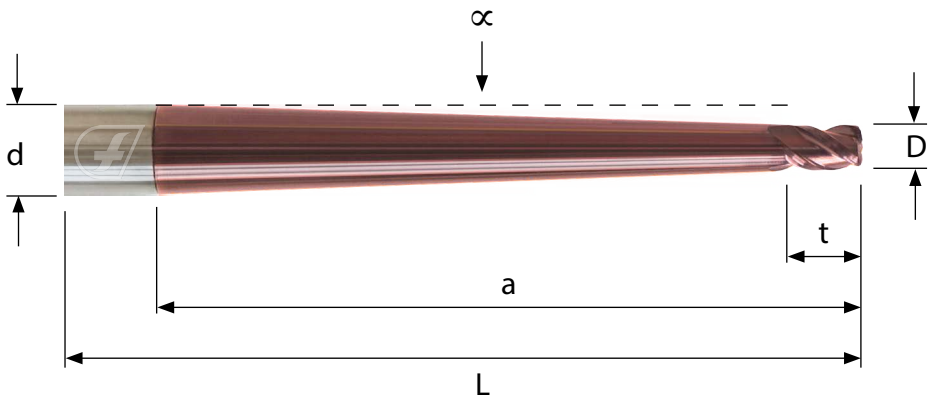
Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio *radius*	tolleranza *tollerance*
	2	0,5	+ 0,01 -
	3	0,5	
	4	0,5	
	5	0,5	

Frese con testa torica
Corner radius end mills

R

HM ULTRA FINE

Z3



Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

HRC 42-48

HRC 48-52

HRC 52-60

dimensions mm								code	quality
Dh10	L	t	dh6	a	∝	*Helix*	***radius***	***code***	SM 500
2	100	4	6	48	2°60′	40°	**0,5**	FC 305 30 02	★
3	100	5	6	48	2°00'	40°	**0,5**	FC 305 30 03	★
4	100	6	6	50	1°30′	40°	**0,5**	FC 305 30 04	★
5	100	6	6	50	0°65′	40°	**0,5**	FC 305 30 05	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

FC 305 40 .. FC 310 40 ..

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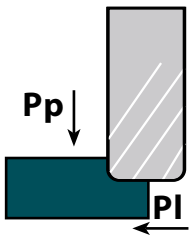

Materiali Materials	D mm	z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	3	210	0,030	0,20	0,3	22.293	2.006
	4	3	210	0,040	0,25	0,5	16.720	2.006
	5	3	210	0,050	0,30	0,7	13.376	2.006
	6	3	210	0,060	0,40	1,0	11.146	2.006
	8	3	210	0,080	0,50	1,4	8.360	2.006
	10	3	210	0,090	0,70	1,8	6.688	1.806
	12	3	210	0,110	0,90	2,1	5.573	1.839
N/mm2 850-1200	3	3	180	0,020	0,20	0,3	19.108	1.146
	4	3	180	0,030	0,25	0,5	14.331	1.290
	5	3	180	0,040	0,30	0,7	11.465	1.376
	6	3	180	0,055	0,40	1,0	9.554	1.576
	8	3	180	0,070	0,50	1,4	7.166	1.505
	10	3	180	0,085	0,70	1,8	5.732	1.462
	12	3	180	0,100	0,90	2,1	4.777	1.433
HRC 30-42	3	3	170	0,015	0,20	0,3	18.047	812
	4	3	170	0,025	0,25	0,5	13.535	1.015
	5	3	170	0,035	0,30	0,7	10.828	1.137
	6	3	170	0,050	0,40	1,0	9.023	1.354
	8	3	170	0,065	0,50	1,4	6.768	1.320
	10	3	170	0,080	0,70	1,8	5.414	1.299
	12	3	170	0,090	0,90	2,1	4.512	1.218
HRC 42-48	3	3	140	0,010	0,10	0,3	14.862	446
	4	3	140	0,020	0,10	0,5	11.146	669
	5	3	140	0,030	0,15	0,7	8.917	803
	6	3	140	0,040	0,20	1,0	7.431	892
	8	3	140	0,055	0,30	1,4	5.573	920
	10	3	140	0,070	0,45	1,8	4.459	936
	12	3	140	0,080	0,60	2,1	3.715	892

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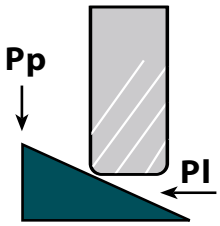
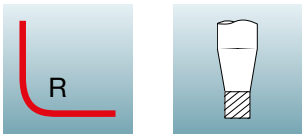


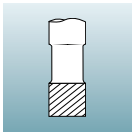
Materiali Materials	D mm	z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	3	320	0,040	0,10	0,10	33.970	4.076
	4	3	320	0,060	0,12	0,12	25.478	4.586
	5	3	320	0,080	0,14	0,14	20.382	4.892
	6	3	320	0,110	0,18	0,18	16.985	5.605
	8	3	320	0,130	0,20	0,20	12.739	4.968
	10	3	320	0,160	0,23	0,23	10.191	4.892
	12	3	320	0,180	0,26	0,26	8.493	4.586
N/mm2 850-1200	3	3	270	0,035	0,10	0,10	28.662	3.010
	4	3	270	0,050	0,12	0,12	21.497	3.225
	5	3	270	0,070	0,14	0,14	17.197	3.611
	6	3	270	0,080	0,18	0,18	14.331	3.439
	8	3	270	0,100	0,20	0,20	10.748	3.225
	10	3	270	0,140	0,23	0,23	8.599	3.611
	12	3	270	0,160	0,26	0,26	7.166	3.439
HRC 30-42	3	3	230	0,030	0,10	0,10	24.416	2.197
	4	3	230	0,040	0,12	0,12	18.312	2.197
	5	3	230	0,055	0,14	0,14	14.650	2.417
	6	3	230	0,070	0,18	0,18	12.208	2.564
	8	3	230	0,090	0,20	0,20	9.156	2.472
	10	3	230	0,125	0,23	0,23	7.325	2.747
	12	3	230	0,145	0,26	0,26	6.104	2.655
HRC 42-48	3	3	180	0,020	0,10	0,10	19.108	1.146
	4	3	180	0,030	0,12	0,12	14.331	1.290
	5	3	180	0,050	0,14	0,14	11.465	1.720
	6	3	180	0,065	0,18	0,18	9.554	1.863
	8	3	180	0,085	0,20	0,20	7.166	1.827
	10	3	180	0,110	0,23	0,23	5.732	1.892
	12	3	180	0,130	0,26	0,26	4.777	1.863

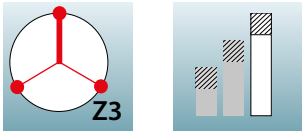
Tolleranza raggio mm / ***Radius tollerance mm***		
D	raggio *radius*	tolleranza *tollerance*
3	0,5	+ - 0,01
4	0,5	
5	0,5	
6	0,5 - 1,0	
8	0,5 - 1,0	
10	0,5 - 1,0	
12	0,5 - 1,0	

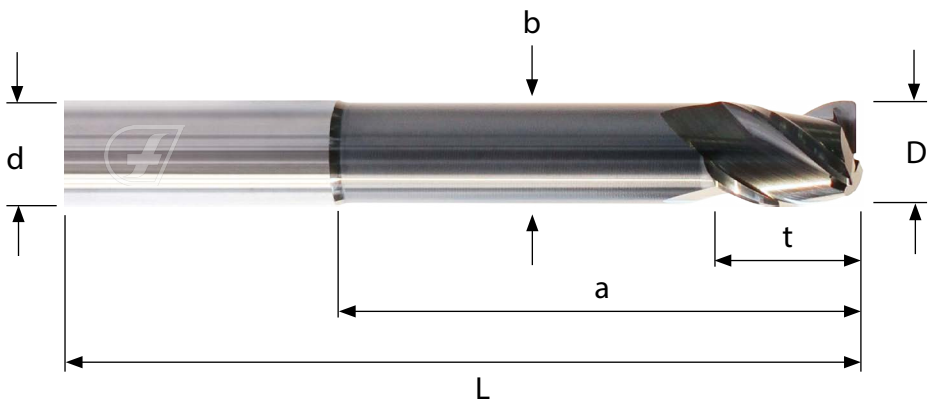
Frese con testa torica
Corner radius end mills



HM MICRO GRAIN







Sgrossatura

Finitura

N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-48		

FC 305 40 ..

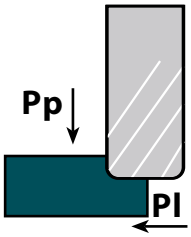
dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	BK 500	
3	80	4	4	20	2,8	40°	**0,5**	FC 305 40 03	★	
4	80	6	4	25	3,8	40°	**0,5**	FC 305 40 04	★	
5	80	7	5	30	4,8	40°	**0,5**	FC 305 40 05	★	
6	100	9	6	35	5,6	40°	**0,5**	FC 305 40 06	★	
8	100	11	8	40	7,6	40°	**0,5**	FC 305 40 08	★	
10	120	13	10	50	9,5	40°	**0,5**	FC 305 40 10	★	

FC 310 40 ..

6	100	9	6	35	5,6	40°	**1,0**	FC 310 40 06	★	
8	100	11	8	40	7,6	40°	**1,0**	FC 310 40 08	★	
10	120	13	10	50	9,5	40°	**1,0**	FC 310 40 10	★	
12	140	15	12	60	11,5	40°	**1,0**	FC 310 40 12	★	

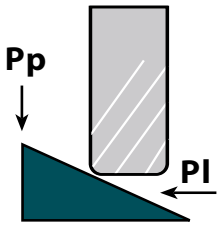
FC 405 00 .. FC 410 00 ..

BK 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	190	0,040	0,25	0,5	15.127	2.420
	5	4	190	0,050	0,30	0,7	12.102	2.420
	6	4	190	0,060	0,40	1,0	10.085	2.420
	8	4	190	0,080	0,50	1,4	7.564	2.420
	10	4	190	0,090	0,70	1,8	6.051	2.178
	12	4	190	0,110	0,90	2,1	5.042	2.219
N/mm2 850-1200	4	4	170	0,030	0,25	0,5	13.535	1.624
	5	4	170	0,040	0,30	0,7	10.828	1.732
	6	4	170	0,055	0,40	1,0	9.023	1.985
	8	4	170	0,070	0,50	1,4	6.768	1.895
	10	4	170	0,085	0,70	1,8	5.414	1.841
	12	4	170	0,100	0,90	2,1	4.512	1.805
HRC 30-42	4	4	150	0,025	0,25	0,5	11.943	1.194
	5	4	150	0,035	0,30	0,7	9.554	1.338
	6	4	150	0,050	0,40	1,0	7.962	1.592
	8	4	150	0,065	0,50	1,4	5.971	1.553
	10	4	150	0,080	0,70	1,8	4.777	1.529
	12	4	150	0,090	0,90	2,1	3.981	1.433
HRC 42-48	4	4	130	0,020	0,10	0,5	10.350	828
	5	4	130	0,030	0,15	0,7	8.280	994
	6	4	130	0,040	0,20	1,0	6.900	1.104
	8	4	130	0,055	0,30	1,4	5.175	1.139
	10	4	130	0,070	0,45	1,8	4.140	1.159
	12	4	130	0,080	0,60	2,1	3.450	1.104

BK 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	4	4	300	0,060	0,12	0,12	23.885	5.732
	5	4	300	0,080	0,14	0,14	19.108	6.115
	6	4	300	0,100	0,18	0,18	15.924	6.369
	8	4	300	0,130	0,20	0,20	11.943	6.210
	10	4	300	0,160	0,23	0,23	9.554	6.115
	12	4	300	0,180	0,26	0,26	7.962	5.732
N/mm2 850-1200	4	4	240	0,050	0,12	0,12	19.108	3.822
	5	4	240	0,070	0,14	0,14	15.287	4.280
	6	4	240	0,080	0,18	0,18	12.739	4.076
	8	4	240	0,100	0,20	0,20	9.554	3.822
	10	4	240	0,140	0,23	0,23	7.643	4.280
	12	4	240	0,160	0,26	0,26	6.369	4.076
HRC 30-42	4	4	200	0,040	0,12	0,12	15.924	2.548
	5	4	200	0,055	0,14	0,14	12.739	2.803
	6	4	200	0,070	0,18	0,18	10.616	2.972
	8	4	200	0,090	0,20	0,20	7.962	2.866
	10	4	200	0,125	0,23	0,23	6.369	3.185
	12	4	200	0,145	0,26	0,26	5.308	3.079
HRC 42-48	4	4	150	0,040	0,12	0,12	11.943	1.911
	5	4	150	0,050	0,14	0,14	9.554	1.911
	6	4	150	0,065	0,18	0,18	7.962	2.070
	8	4	150	0,085	0,20	0,20	5.971	2.030
	10	4	150	0,110	0,23	0,23	4.777	2.102
	12	4	150	0,130	0,26	0,26	3.981	2.070

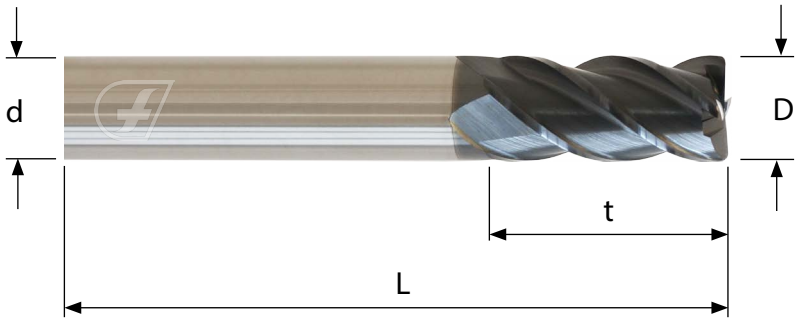
Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	4	0,5	+ - 0,01
	5	0,5	
	6	0,5 - 1,0	
	8	0,5 - 1,0	
	10	0,5 - 1,0	
	12	0,5 - 1,0	

Frese con testa torica
Corner radius end mills

R

HM MICRO GRAIN

Z4



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

HRC 30-42

HRC 42-48

FC 405 00 ..

dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	BK 500	
4	51	8	4	-	-	40°	**0,5**	FC 405 00 04	★	
5	51	12	5	-	-	40°	**0,5**	FC 405 00 05	★	
6	51	15	6	-	-	40°	**0,5**	FC 405 00 06	★	
8	64	18	8	-	-	40°	**0,5**	FC 405 00 08	★	
10	64	20	10	-	-	40°	**0,5**	FC 405 00 10	★	

FC 410 00 ..

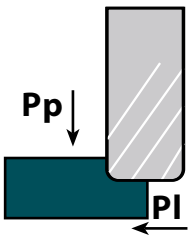
6	51	15	6	-	-	40°	**1,0**	FC 410 00 06	★	
8	64	18	8	-	-	40°	**1,0**	FC 410 00 08	★	
10	64	20	10	-	-	40°	**1,0**	FC 410 00 10	★	
12	80	25	12	-	-	40°	**1,0**	FC 410 00 12	★	

Qualità HM *HM Quality* pag. 25

★ Pronto *Ready*

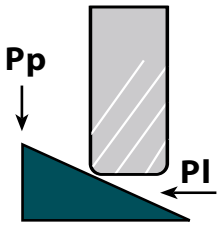
FC 405 40 .. FC 410 40 ..

XT 900



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	3	4	200	0,040	0,15	0,3	21.231	3.397
	4	4	200	0,050	0,25	0,5	15.924	3.185
	6	4	200	0,060	0,40	1,0	10.616	2.548
	8	4	200	0,080	0,50	1,4	7.962	2.548
	10	4	200	0,090	0,70	1,8	6.369	2.293
	12	4	200	0,110	0,90	2,1	5.308	2.335
HRC 30-42	3	4	160	0,030	0,15	0,3	16.985	2.038
	4	4	160	0,040	0,25	0,5	12.739	2.038
	6	4	160	0,055	0,40	1,0	8.493	1.868
	8	4	160	0,070	0,50	1,4	6.369	1.783
	10	4	160	0,085	0,70	1,8	5.096	1.732
	12	4	160	0,100	0,90	2,1	4.246	1.699
HRC 42-48	3	4	140	0,020	0,10	0,3	14.862	1.189
	4	4	140	0,030	0,10	0,5	11.146	1.338
	6	4	140	0,045	0,20	1,0	7.431	1.338
	8	4	140	0,060	0,30	1,4	5.573	1.338
	10	4	140	0,070	0,45	1,8	4.459	1.248
	12	4	140	0,085	0,60	2,1	3.715	1.263
HRC 48-52	3	4	110	0,010	0,10	0,3	11.677	467
	4	4	110	0,020	0,10	0,5	8.758	701
	6	4	110	0,035	0,20	1,0	5.839	817
	8	4	110	0,050	0,30	1,4	4.379	876
	10	4	110	0,060	0,45	1,8	3.503	841
	12	4	110	0,070	0,60	2,1	2.919	817

XT 900

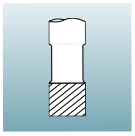


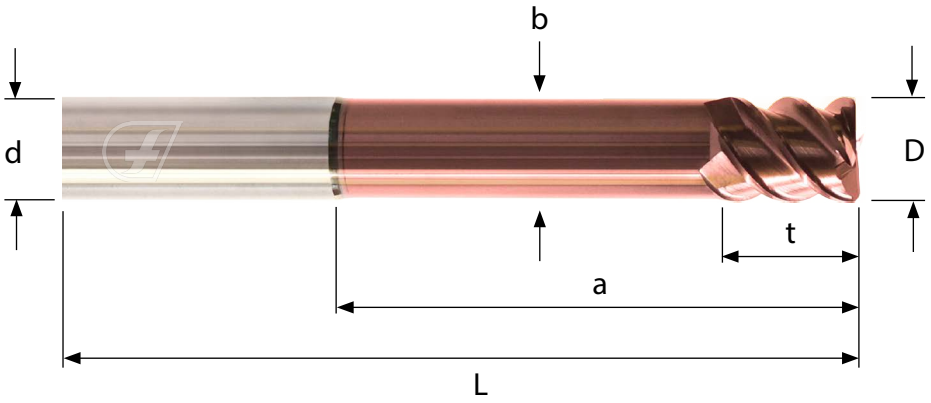
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	3	4	300	0,040	0,15	0,15	31.847	5.096
	4	4	300	0,060	0,18	0,18	23.885	5.732
	6	4	300	0,100	0,18	0,18	15.924	6.369
	8	4	300	0,130	0,20	0,20	11.943	6.210
	10	4	300	0,160	0,23	0,23	9.554	6.115
	12	4	300	0,180	0,26	0,26	7.962	5.732
HRC 30-42	3	4	270	0,035	0,15	0,15	28.662	4.013
	4	4	270	0,050	0,18	0,18	21.497	4.299
	6	4	270	0,080	0,18	0,18	14.331	4.586
	8	4	270	0,100	0,20	0,20	10.748	4.299
	10	4	270	0,140	0,23	0,23	8.599	4.815
	12	4	270	0,160	0,26	0,26	7.166	4.586
HRC 42-48	3	4	240	0,025	0,15	0,15	25.478	2.548
	4	4	240	0,040	0,18	0,18	19.108	3.057
	6	4	240	0,070	0,18	0,18	12.739	3.567
	8	4	240	0,090	0,20	0,20	9.554	3.439
	10	4	240	0,125	0,23	0,23	7.643	3.822
	12	4	240	0,145	0,26	0,26	6.369	3.694
HRC 48-52	3	4	200	0,025	0,15	0,15	21.231	2.123
	4	4	200	0,040	0,18	0,18	15.924	2.548
	6	4	200	0,065	0,18	0,18	10.616	2.760
	8	4	200	0,085	0,20	0,20	7.962	2.707
	10	4	200	0,110	0,23	0,23	6.369	2.803
	12	4	200	0,130	0,26	0,26	5.308	2.760

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	3	0,5	+ - 0,01
	4	0,5	
	6	0,5 - 1,0	
	8	0,5 - 1,0	
	10	0,5 - 1,0	
	12	0,5 - 1,0	

Frese con testa torica
Corner radius end mills

HM ULTRA FINE





Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

HRC 42-48

HRC 48-52

FC 405 40 ..

dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	XT 900	
3	80	4	4	15	2,8	55°	**0,5**	FC 405 40 03	★	
4	80	6	4	20	3,8	55°	**0,5**	FC 405 40 04	★	
6	100	9	6	30	5,6	55°	**0,5**	FC 405 40 06	★	
8	100	11	8	40	7,6	55°	**0,5**	FC 405 40 08	★	
10	120	13	10	50	9,5	55°	**0,5**	FC 405 40 10	★	
12	140	15	12	60	11,5	55°	**0,5**	FC 405 40 12	★	

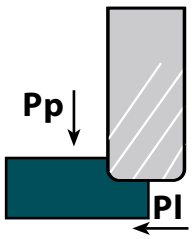
FC 410 40 ..

6	100	9	6	30	5,6	55°	**1,0**	FC 410 40 06	★	
8	100	11	8	40	7,6	55°	**1,0**	FC 410 40 08	★	
10	120	13	10	50	9,5	55°	**1,0**	FC 410 40 10	★	
12	140	15	12	60	11,5	55°	**1,0**	FC 410 40 12	★	

Qualità HM
HM Quality
pag. 25

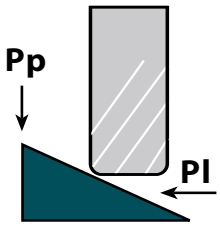
★ Pronto
Ready

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 48-52 Air	2	3	160	0,045	0,15	0,4	25.478	3.439
	3	3	160	0,065	0,20	0,7	16.985	3.312
	4	4	160	0,070	0,25	1,0	12.739	3.567
	5	4	160	0,090	0,15	1,5	10.191	3.669
	6	4	160	0,110	0,20	2,0	8.493	3.737
	8	4	160	0,140	0,25	2,7	6.369	3.567
	10	4	160	0,160	0,35	3,5	5.096	3.261
	12	4	160	0,180	0,45	4,0	4.246	3.057
HRC 52-60 Air	2	3	100	0,035	0,15	0,4	15.924	1.672
	3	3	100	0,050	0,20	0,7	10.616	1.592
	4	4	100	0,055	0,25	1,0	7.962	1.752
	5	4	100	0,070	0,15	1,5	6.369	1.783
	6	4	100	0,090	0,20	2,0	5.308	1.911
	8	4	100	0,110	0,25	2,7	3.981	1.752
	10	4	100	0,130	0,35	3,5	3.185	1.656
	12	4	100	0,150	0,45	4,0	2.654	1.592

X9000

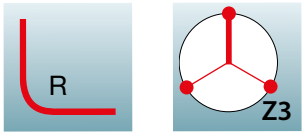


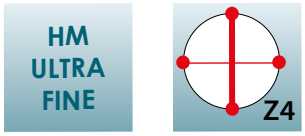
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 48-52 Air	2	3	270	0,040	0,10	0,10	42.994	5.159
	3	3	270	0,060	0,11	0,11	28.662	5.159
	4	4	270	0,080	0,12	0,12	21.497	6.879
	5	4	270	0,100	0,15	0,15	17.197	6.879
	6	4	270	0,120	0,18	0,18	14.331	6.879
	8	4	270	0,160	0,20	0,20	10.748	6.879
	10	4	270	0,180	0,23	0,23	8.599	6.191
	12	4	270	0,200	0,26	0,26	7.166	5.732
HRC 52-60 Air	2	3	210	0,030	0,10	0,10	33.439	3.010
	3	3	210	0,045	0,11	0,11	22.293	3.010
	4	4	210	0,060	0,12	0,12	16.720	4.013
	5	4	210	0,080	0,15	0,15	13.376	4.280
	6	4	210	0,100	0,18	0,18	11.146	4.459
	8	4	210	0,140	0,20	0,20	8.360	4.682
	10	4	210	0,160	0,23	0,23	6.688	4.280
	12	4	210	0,180	0,26	0,26	5.573	4.013

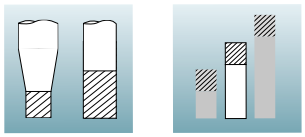
Tolleranza raggio mm / ***Radius tollerance mm***

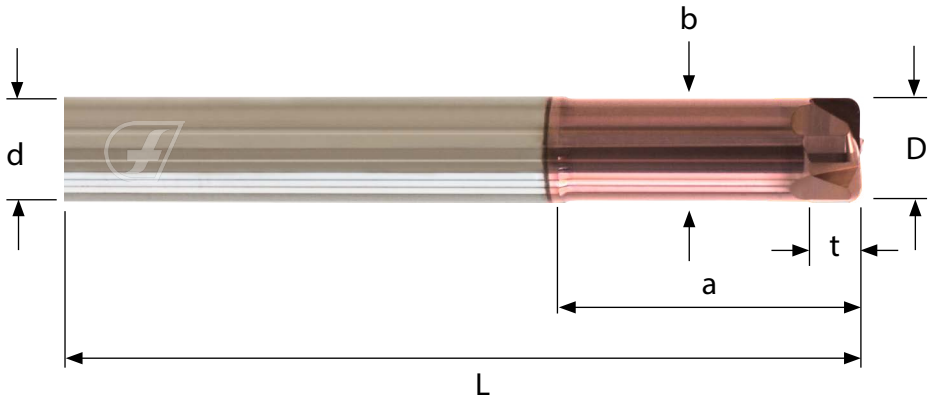
D	raggio *radius*	tolleranza *tollerance*
2	0,2	+ - 0,01
3	0,5	
4	0,5	
5	0,5	
6	0,5 - 1,0	
8	0,5 - 1,0	
10	1,0 - 1,5	
12	1,5	

Frese con testa torica
Corner radius end mills









Sgrossatura | Finitura | HRC 48-52 | HRC 52-60

FC 363 40 ..

dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***	***code***	X9000	
2	51	1,5	4	10	1,9	0°	**0,2**	FC 363 40 02	★	
3	51	2,0	4	14	2,8	0°	**0,5**	FC 363 40 03	★	

FC 463 40 ..

4	51	2,0	4	14	3,8	0°	**0,5**	FC 463 40 04	★	
5	51	2,5	5	16	4,7	0°	**0,5**	FC 463 40 05	★	
6	64	2,5	6	18	5,7	0°	**0,5**	FC 463 40 06	★	
8	80	3,5	8	22	7,7	0°	**0,5**	FC 463 40 08	★	

FC 465 40 ..

6	64	2,5	6	18	5,7	0°	**1,0**	FC 465 40 06	★	
8	80	3,5	8	22	7,7	0°	**1,0**	FC 465 40 08	★	
10	80	4,0	10	25	9,6	0°	**1,0**	FC 465 40 10	★	

FC 467 40 ..

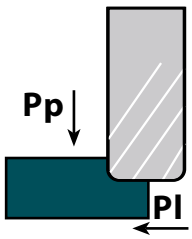
10	80	4,0	10	25	9,6	0°	**1,5**	FC 467 40 10	★	
12	95	4,5	12	30	11,5	0°	**1,5**	FC 467 40 12	★	

Qualità HM
HM Quality pag. 25

★ Pronto
Ready

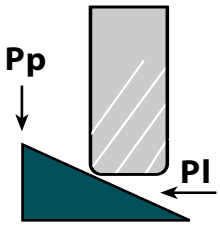
FC 463 45 .. FC 465 45 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 48-52 Air	6	4	160	0,110	0,20	2,0	8.493	3.737
	8	4	160	0,140	0,25	2,7	6.369	3.567
	10	4	160	0,160	0,35	3,5	5.096	3.261
HRC 52-60 Air	6	4	100	0,090	0,20	2,0	5.308	1.911
	8	4	100	0,110	0,25	2,7	3.981	1.752
	10	4	100	0,130	0,35	3,5	3.185	1.656

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 48-52 Air	6	4	270	0,065	0,18	0,18	14.331	3.726
	8	4	270	0,090	0,20	0,20	10.748	3.869
	10	4	270	0,110	0,23	0,23	8.599	3.783
HRC 52-60 Air	6	4	210	0,050	0,18	0,18	11.146	2.229
	8	4	210	0,070	0,20	0,20	8.360	2.341
	10	4	210	0,100	0,23	0,23	6.688	2.675

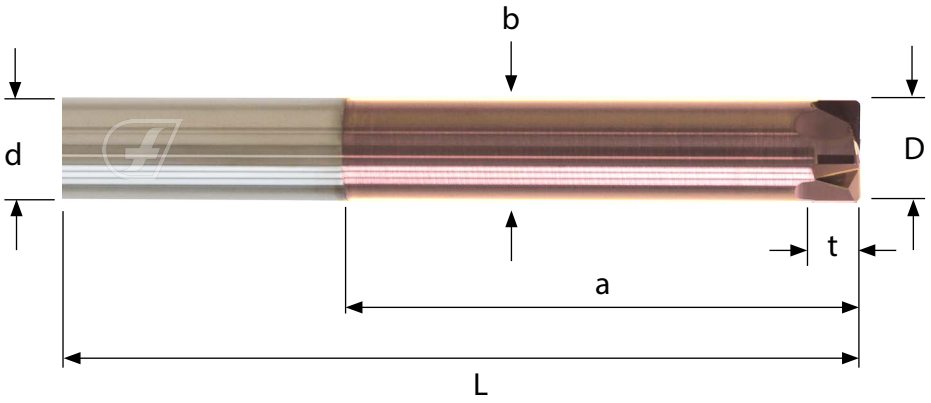
Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	6	0,5	+ - 0,01
	6 8 10	1,0	

Frese con testa torica
Corner radius end mills

R

HM ULTRA FINE

Z4



Sgrossatura

Finitura

HRC 48-52

HRC 52-60

FC 463 45 ..

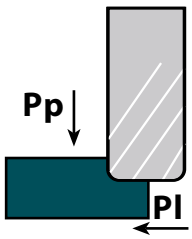
dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***		X9000	
6	80	2,5	6	36	5,7	0°	**0,5**	FC 463 45 06	★	
8	100	3,5	8	40	7,7	0°	**0,5**	FC 463 45 08	★	

FC 465 45 ..

6	80	2,5	6	36	5,7	0°	**1,0**	FC 465 45 06	★	
8	100	3,5	8	40	7,7	0°	**1,0**	FC 465 45 08	★	
10	120	4,0	10	50	9,6	0°	**1,0**	FC 465 45 10	★	

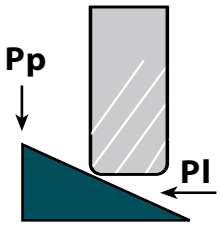
FC 370 3. .. FC 375 3. ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	3	200	0,030	0,11	0,7	31.847	2.866
	3	3	200	0,040	0,15	1,0	21.231	2.548
	4	3	200	0,055	0,17	1,3	15.924	2.627
HRC 30-42	2	3	200	0,030	0,11	0,7	31.847	2.866
	3	3	200	0,040	0,15	1,0	21.231	2.548
	4	3	200	0,055	0,17	1,3	15.924	2.627
HRC 42-48	2	3	170	0,030	0,11	0,7	27.070	2.436
	3	3	170	0,040	0,15	1,0	18.047	2.166
	4	3	170	0,055	0,17	1,3	13.535	2.233
HRC 48-52	2	3	150	0,030	0,11	0,7	23.885	2.150
	3	3	150	0,040	0,15	1,0	15.924	1.911
	4	3	150	0,055	0,17	1,3	11.943	1.971

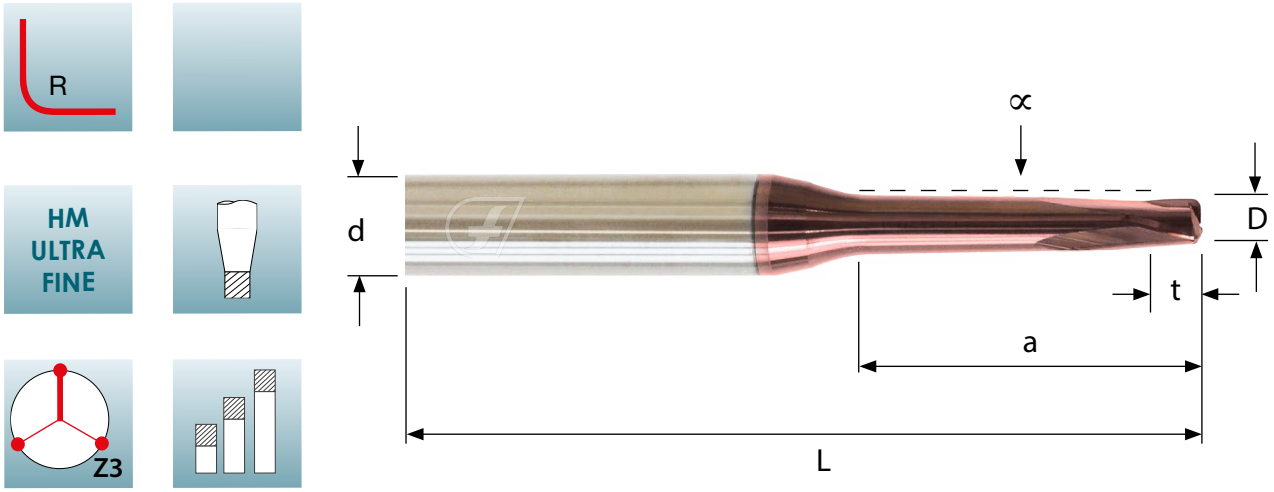
X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	3	350	0,050	0,10	0,10	55.732	8.360
	3	3	350	0,070	0,11	0,11	37.155	7.803
	4	3	350	0,090	0,12	0,12	27.866	7.524
HRC 30-42	2	3	350	0,050	0,10	0,10	55.732	8.360
	3	3	350	0,070	0,11	0,11	37.155	7.803
	4	3	350	0,090	0,12	0,12	27.866	7.524
HRC 42-48	2	3	300	0,040	0,10	0,10	47.771	5.732
	3	3	300	0,060	0,11	0,11	31.847	5.732
	4	3	300	0,080	0,12	0,12	23.885	5.732
HRC 48-52	2	3	270	0,035	0,10	0,10	42.994	4.514
	3	3	270	0,055	0,11	0,11	28.662	4.729
	4	3	270	0,075	0,12	0,12	21.497	4.837

Tolleranza raggio mm / ***Radius tollerance mm***		
D	raggio ***radius***	tolleranza ***tollerance***
2	0,2	+ 0,01 -
3	0,5	
4	0,5 - 1,0	

Frese con testa torica
Corner radius end mills



Sgrossatura | Finitura | N/mm2 850-1200 | HRC 30-42 | HRC 42-48 | HRC 48-52

FC 370 3. ..

dimensions mm								code	quality
Dh10	L	t	dh6	a	∝	*Helix*	***radius***	***code***	X9000
2	64	3,0	6	15	0,9°	15°	**0,2**	FC 370 30 02	★
2	64	3,0	6	20	0,9°	15°	**0,2**	FC 370 31 02	★
2	80	3,0	6	25	0,9°	15°	**0,2**	FC 370 32 02	★
3	64	4,5	6	20	0,9°	15°	**0,5**	FC 370 30 03	★
3	80	4,5	6	28	0,9°	15°	**0,5**	FC 370 31 03	★
3	80	4,5	6	35	0,9°	15°	**0,5**	FC 370 32 03	★
4	64	6,0	6	25	0,9°	15°	**0,5**	FC 370 30 04	★
4	80	6,0	6	33	0,9°	15°	**0,5**	FC 370 31 04	★
4	80	6,0	6	40	0,9°	15°	**0,5**	FC 370 32 04	★

FC 375 3. ..

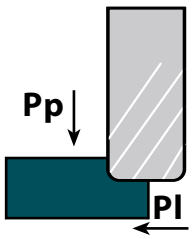
4	64	6,0	6	25	0,9°	15°	**1,0**	FC 375 30 04	★
4	80	6,0	6	33	0,9°	15°	**1,0**	FC 375 31 04	★
4	80	6,0	6	40	0,9°	15°	**1,0**	FC 375 32 04	★

Qualità HM
HM Quality pag. 25

★ Pronto
Ready

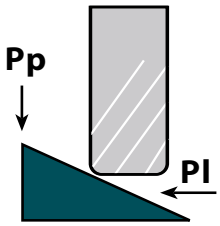
FC 470 30 .. FC 470 31 .. FC 475 30 .. FC 475 31 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	5	4	200	0,060	0,17	1,3	12.739	3.057
HRC 30-42	5	4	200	0,060	0,17	1,3	12.739	3.057
HRC 42-48	5	4	170	0,060	0,17	1,3	10.828	2.599
HRC 48-52	5	4	150	0,060	0,17	1,3	9.554	2.293

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	5	4	350	0,090	0,12	0,12	22.293	8.025
HRC 30-42	5	4	350	0,085	0,12	0,12	22.293	7.580
HRC 42-48	5	4	300	0,080	0,12	0,12	19.108	6.115
HRC 48-52	5	4	270	0,075	0,12	0,12	17.197	5.159

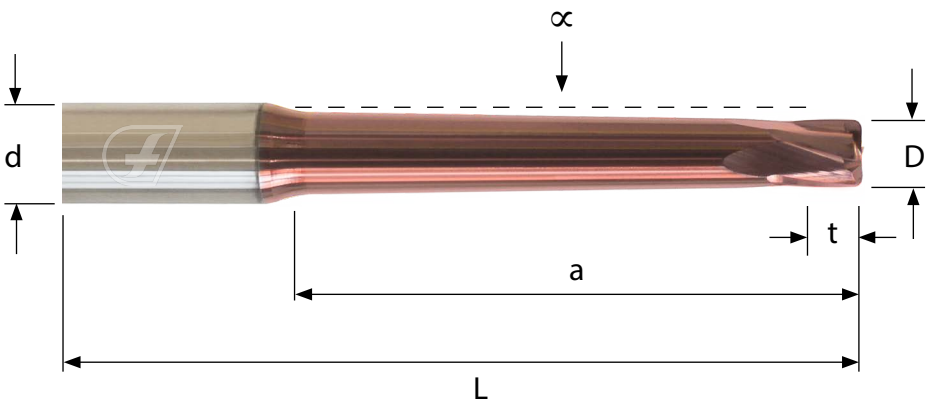
Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	5	0,5 - 1,0	$\pm$ 0,01

Frese con testa torica
Corner radius end mills

R

HM ULTRA FINE

Z3



Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

HRC 42-48

HRC 48-52

FC 470 30 ..

dimensions mm								code	quality	
Dh10	L	t	dh6	a	∝	*Helix*	***radius***	***code***	X9000	
5	80	7	6	30	0,9°	15°	**0,5**	FC 470 30 05	★	

FC 470 31 ..

5	80	7	6	45	0,75°	15°	**0,5**	FC 470 31 05	★	

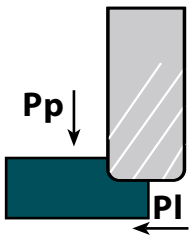
FC 475 30 ..

5	80	7	6	30	0,9°	15°	**1,0**	FC 475 30 05	★	

FC 475 31 ..

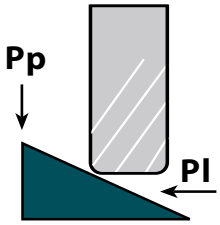
5	80	7	6	45	0,75°	15°	**1,0**	FC 475 31 05	★	

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	3	200	0,030	0,11	0,7	31.847	2.866
	3	3	200	0,045	0,15	1,0	21.231	2.866
	4	3	200	0,060	0,17	1,3	15.924	2.866
	5	4	200	0,070	0,19	1,6	12.739	3.567
	6	4	200	0,090	0,20	2,0	10.616	3.822
	8	4	200	0,110	0,21	2,3	7.962	3.503
	10	4	200	0,130	0,22	2,8	6.369	3.312
	12	4	200	0,150	0,24	3,2	5.308	3.185
HRC 30-42	2	3	200	0,030	0,11	0,7	31.847	2.866
	3	3	200	0,040	0,15	1,0	21.231	2.548
	4	3	200	0,055	0,17	1,3	15.924	2.627
	5	4	200	0,060	0,19	1,6	12.739	3.057
	6	4	200	0,080	0,20	2,0	10.616	3.397
	8	4	200	0,100	0,21	2,3	7.962	3.185
	10	4	200	0,120	0,22	2,8	6.369	3.057
	12	4	200	0,140	0,24	3,2	5.308	2.972
HRC 42-48	2	3	170	0,025	0,11	0,7	27.070	2.030
	3	3	170	0,040	0,15	1,0	18.047	2.166
	4	3	170	0,055	0,17	1,3	13.535	2.233
	5	4	170	0,060	0,19	1,6	10.828	2.599
	6	4	170	0,070	0,20	2,0	9.023	2.527
	8	4	170	0,090	0,21	2,3	6.768	2.436
	10	4	170	0,110	0,22	2,8	5.414	2.382
	12	4	170	0,130	0,24	3,2	4.512	2.346
HRC 48-52	2	3	150	0,025	0,11	0,7	23.885	1.791
	3	3	150	0,040	0,15	1,0	15.924	1.911
	4	3	150	0,050	0,17	1,3	11.943	1.791
	5	4	150	0,055	0,19	1,6	9.554	2.102
	6	4	150	0,065	0,20	2,0	7.962	2.070
	8	4	150	0,080	0,21	2,3	5.971	1.911
	10	4	150	0,100	0,22	2,8	4.777	1.911
	12	4	150	0,120	0,24	3,2	3.981	1.911

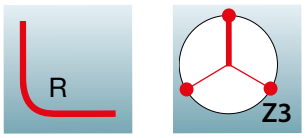
X9000

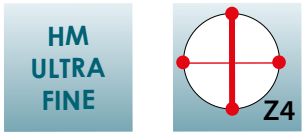


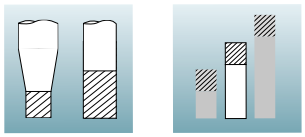
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	3	350	0,040	0,10	0,10	55.732	6.688
	3	3	350	0,060	0,11	0,11	37.155	6.688
	4	3	350	0,080	0,12	0,12	27.866	6.688
	5	4	350	0,095	0,15	0,15	22.293	8.471
	6	4	350	0,110	0,18	0,18	18.577	8.174
	8	4	350	0,150	0,20	0,20	13.933	8.360
	10	4	350	0,180	0,23	0,23	11.146	8.025
	12	4	350	0,210	0,26	0,26	9.289	7.803
HRC 30-42	2	3	350	0,045	0,10	0,10	55.732	7.524
	3	3	350	0,065	0,11	0,11	37.155	7.245
	4	3	350	0,080	0,12	0,12	27.866	6.688
	5	4	350	0,085	0,15	0,15	22.293	7.580
	6	4	350	0,100	0,18	0,18	18.577	7.431
	8	4	350	0,140	0,20	0,20	13.933	7.803
	10	4	350	0,170	0,23	0,23	11.146	7.580
	12	4	350	0,200	0,26	0,26	9.289	7.431
HRC 42-48	2	3	300	0,040	0,10	0,10	47.771	5.732
	3	3	300	0,055	0,11	0,11	31.847	5.255
	4	3	300	0,075	0,12	0,12	23.885	5.374
	5	4	300	0,085	0,15	0,15	19.108	6.497
	6	4	300	0,100	0,18	0,18	15.924	6.369
	8	4	300	0,135	0,20	0,20	11.943	6.449
	10	4	300	0,160	0,23	0,23	9.554	6.115
	12	4	300	0,190	0,26	0,26	7.962	6.051
HRC 48-52	2	3	270	0,035	0,10	0,10	42.994	4.514
	3	3	270	0,055	0,11	0,11	28.662	4.729
	4	3	270	0,070	0,12	0,12	21.497	4.514
	5	4	270	0,080	0,15	0,15	17.197	5.503
	6	4	270	0,100	0,18	0,18	14.331	5.732
	8	4	270	0,130	0,20	0,20	10.748	5.589
	10	4	270	0,150	0,23	0,23	8.599	5.159
	12	4	270	0,180	0,26	0,26	7.166	5.159

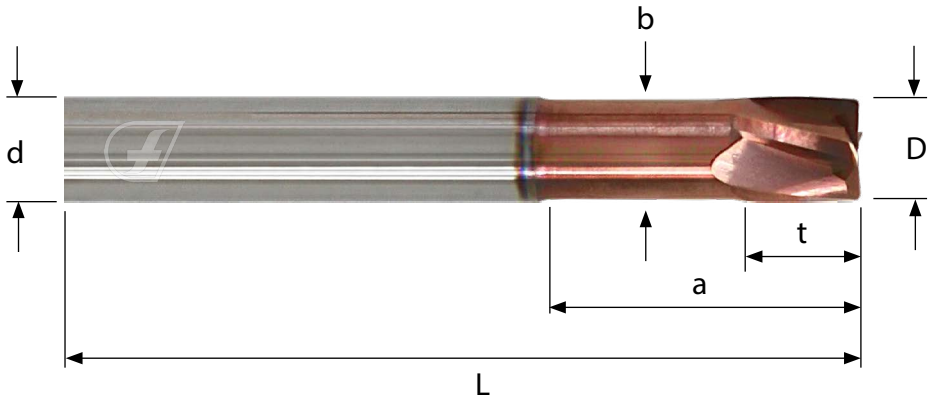
Tolleranza raggio mm / ***Radius tollerance mm***		
D	raggio ***radius***	tolleranza ***tollerance***
2	0,2	+ - 0,01
3	0,5	
4	0,5	
5	0,5	
6	0,5 - 1,0 - 1,5	
8	0,5 - 1,0 - 2,0	
10	1,0 - 2,0	
12	1,0 - 2,0	

Frese con testa torica
Corner radius end mills









Sgrossatura

Finitura

N/mm2 850-1200 | HRC 30-42 | HRC 42-48 | HRC 48-52

FC 370 40 ..

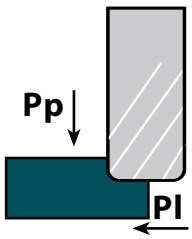
dimensions mm								code	quality	
Dh10	L	t	dh6	a	b	*Helix*	***radius***		X9000	
2	51	3	4	10	1,9	15°	**0,2**	FC 370 40 02	★	
3	51	4	4	12	2,8	15°	**0,5**	FC 370 40 03	★	
4	51	5	4	14	3,8	15°	**0,5**	FC 370 40 04	★	
FC 470 40 ..										
5	51	6	5	16	4,8	15°	**0,5**	FC 470 40 05	★	
6	64	7	6	18	5,7	15°	**0,5**	FC 470 40 06	★	
8	80	9	8	25	7,7	15°	**0,5**	FC 470 40 08	★	
10	80	11	10	30	9,6	15°	**0,5**	FC 470 40 10	★	
FC 475 40 ..										
6	64	7	6	18	5,7	15°	**1,0**	FC 475 40 06	★	
8	80	9	8	25	7,7	15°	**1,0**	FC 475 40 08	★	
10	80	11	10	30	9,6	15°	**1,0**	FC 475 40 10	★	
12	80	13	12	35	11,5	15°	**1,0**	FC 475 40 12	★	
FC 477 40 ..										
6	64	7	6	18	5,7	15°	**1,5**	FC 477 40 06	★	
8	80	9	8	25	7,7	15°	**2,0**	FC 477 40 08	★	
10	80	11	10	30	9,6	15°	**2,0**	FC 477 40 10	★	
12	80	13	12	35	11,5	15°	**2,0**	FC 477 40 12	★	

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

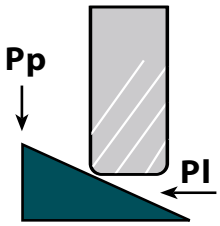
FC 470 45 .. FC 475 45 .. FC 477 45 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	6	4	200	0,080	0,20	2,0	10.616	3.397
	8	4	200	0,100	0,21	2,3	7.962	3.185
	10	4	200	0,120	0,22	2,8	6.369	3.057
	12	4	200	0,140	0,23	3,2	5.308	2.972
HRC 30-42	6	4	200	0,070	0,20	2,0	10.616	2.972
	8	4	200	0,090	0,21	2,3	7.962	2.866
	10	4	200	0,110	0,22	2,8	6.369	2.803
	12	4	200	0,130	0,23	3,2	5.308	2.760
HRC 42-48	6	4	170	0,060	0,20	2,0	9.023	2.166
	8	4	170	0,080	0,21	2,3	6.768	2.166
	10	4	170	0,100	0,22	2,8	5.414	2.166
	12	4	170	0,120	0,23	3,2	4.512	2.166
HRC 48-52	6	4	150	0,050	0,20	2,0	7.962	1.592
	8	4	150	0,070	0,21	2,3	5.971	1.672
	10	4	150	0,090	0,22	2,8	4.777	1.720
	12	4	150	0,110	0,23	3,2	3.981	1.752

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	6	4	350	0,090	0,18	0,18	18.577	6.688
	8	4	350	0,130	0,20	0,20	13.933	7.245
	10	4	350	0,160	0,23	0,23	11.146	7.134
	12	4	350	0,190	0,26	0,26	9.289	7.059
HRC 30-42	6	4	350	0,080	0,18	0,18	18.577	5.945
	8	4	350	0,130	0,20	0,20	13.933	7.245
	10	4	350	0,150	0,23	0,23	11.146	6.688
	12	4	350	0,180	0,26	0,26	9.289	6.688
HRC 42-48	6	4	300	0,075	0,18	0,18	15.924	4.777
	8	4	300	0,115	0,20	0,20	11.943	5.494
	10	4	300	0,140	0,23	0,23	9.554	5.350
	12	4	300	0,170	0,26	0,26	7.962	5.414
HRC 48-52	6	4	270	0,080	0,18	0,18	14.331	4.586
	8	4	270	0,110	0,20	0,20	10.748	4.729
	10	4	270	0,130	0,23	0,23	8.599	4.471
	12	4	270	0,160	0,26	0,26	7.166	4.586

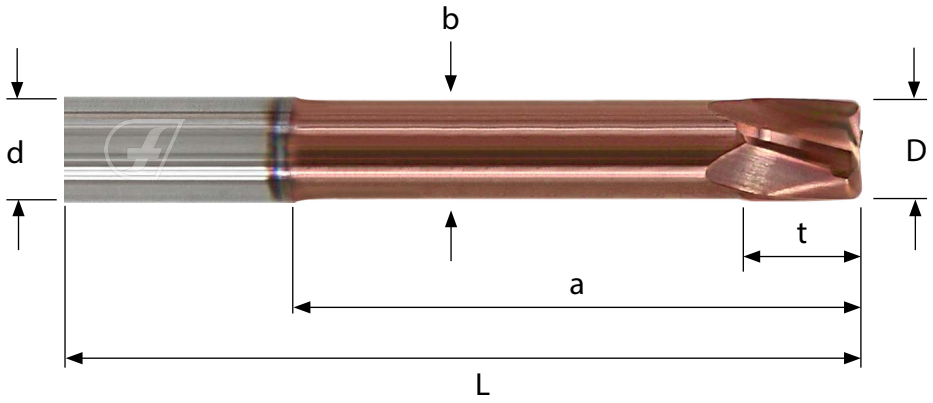
Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	6	0,5 - 1,0 - 1,5	+ 0,01 -
	8	0,5 - 1,0 - 2,0	
	10	0,5 - 1,0 - 2,0	
	12	1,0 - 2,0	

Frese con testa torica
Corner radius end mills

R

HM ULTRA FINE

Z4



Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

HRC 42-48

HRC 48-52

FC 470 45 ..

dimensions mm							code	quality	
Dh10	L	t	dh6	a	b	*radius*		X9000	
6	100	7	6	30	5,7	**0,5**	FC 470 45 06	★	
8	100	9	8	40	7,7	**0,5**	FC 470 45 08	★	
10	120	11	10	50	9,6	**0,5**	FC 470 45 10	★	

FC 475 45 ..

6	100	7	6	30	5,7	**1,0**	FC 475 45 06	★	
8	100	9	8	40	7,7	**1,0**	FC 475 45 08	★	
10	120	11	10	50	9,6	**1,0**	FC 475 45 10	★	
12	140	13	12	60	11,5	**1,0**	FC 475 45 12	★	

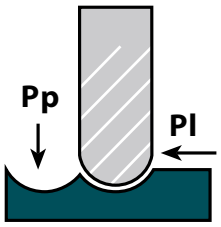
FC 477 45 ..

6	100	7	6	30	5,7	**1,5**	FC 477 45 06	★	
8	100	9	8	40	7,7	**2,0**	FC 477 45 08	★	
10	120	11	10	50	9,6	**2,0**	FC 477 45 10	★	
12	140	13	12	60	11,5	**2,0**	FC 477 45 12	★	

Qualità HM
HM Quality pag. 25

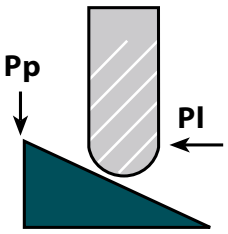
FC 220 00 ..

BK 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	2	2	230	0,030	0,20	0,20	36.624	2.197
	3	2	230	0,050	0,22	0,22	24.416	2.442
	4	2	230	0,070	0,24	0,24	18.312	2.564
	5	2	230	0,090	0,30	0,30	14.650	2.637
	6	2	230	0,110	0,36	0,36	12.208	2.686
	8	2	230	0,130	0,40	0,40	9.156	2.381
	10	2	230	0,150	0,46	0,46	7.325	2.197
	12	2	230	0,170	0,52	0,52	6.104	2.075
N/mm2 850-1200	2	2	200	0,020	0,20	0,20	31.847	1.274
	3	2	200	0,040	0,22	0,22	21.231	1.699
	4	2	200	0,060	0,24	0,24	15.924	1.911
	5	2	200	0,080	0,30	0,30	12.739	2.038
	6	2	200	0,100	0,36	0,36	10.616	2.123
	8	2	200	0,120	0,40	0,40	7.962	1.911
	10	2	200	0,140	0,46	0,46	6.369	1.783
	12	2	200	0,160	0,52	0,52	5.308	1.699
HRC 30-42	2	2	170	0,020	0,20	0,20	27.070	1.083
	3	2	170	0,030	0,22	0,22	18.047	1.083
	4	2	170	0,050	0,24	0,24	13.535	1.354
	5	2	170	0,070	0,30	0,30	10.828	1.516
	6	2	170	0,090	0,36	0,36	9.023	1.624
	8	2	170	0,110	0,40	0,40	6.768	1.489
	10	2	170	0,130	0,46	0,46	5.414	1.408
	12	2	170	0,150	0,52	0,52	4.512	1.354
HRC 42-48	2	2	150	0,020	0,20	0,20	23.885	955
	3	2	150	0,030	0,22	0,22	15.924	955
	4	2	150	0,045	0,24	0,24	11.943	1.075
	5	2	150	0,060	0,30	0,30	9.554	1.146
	6	2	150	0,080	0,36	0,36	7.962	1.274
	8	2	150	0,100	0,40	0,40	5.971	1.194
	10	2	150	0,120	0,46	0,46	4.777	1.146
	12	2	150	0,140	0,52	0,52	3.981	1.115

BK 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	2	2	340	0,020	0,10	0,10	54.140	2.166
	3	2	340	0,030	0,11	0,11	36.093	2.166
	4	2	340	0,040	0,12	0,12	27.070	2.166
	5	2	340	0,050	0,15	0,15	21.656	2.166
	6	2	340	0,060	0,18	0,18	18.047	2.166
	8	2	340	0,070	0,20	0,20	13.535	1.895
	10	2	340	0,080	0,23	0,23	10.828	1.732
	12	2	340	0,090	0,26	0,26	9.023	1.624
N/mm2 850-1200	2	2	290	0,020	0,10	0,10	46.178	1.847
	3	2	290	0,025	0,11	0,11	30.786	1.539
	4	2	290	0,030	0,12	0,12	23.089	1.385
	5	2	290	0,045	0,15	0,15	18.471	1.662
	6	2	290	0,055	0,18	0,18	15.393	1.693
	8	2	290	0,065	0,20	0,20	11.545	1.501
	10	2	290	0,075	0,23	0,23	9.236	1.385
	12	2	290	0,085	0,26	0,26	7.696	1.308
HRC 30-42	2	2	240	0,015	0,10	0,10	38.217	1.146
	3	2	240	0,020	0,11	0,11	25.478	1.019
	4	2	240	0,030	0,12	0,12	19.108	1.146
	5	2	240	0,040	0,15	0,15	15.287	1.223
	6	2	240	0,050	0,18	0,18	12.739	1.274
	8	2	240	0,060	0,20	0,20	9.554	1.146
	10	2	240	0,070	0,23	0,23	7.643	1.070
	12	2	240	0,080	0,26	0,26	6.369	1.019
HRC 42-48	2	2	210	0,013	0,10	0,10	33.439	869
	3	2	210	0,020	0,11	0,11	22.293	892
	4	2	210	0,025	0,12	0,12	16.720	836
	5	2	210	0,035	0,15	0,15	13.376	936
	6	2	210	0,044	0,18	0,18	11.146	981
	8	2	210	0,055	0,20	0,20	8.360	920
	10	2	210	0,065	0,23	0,23	6.688	869
	12	2	210	0,075	0,26	0,26	5.573	836

Tolleranza raggio mm / ***Radius tollerance mm***

D	raggio *radius*	tolleranza f8 *tollerance f8*
2	1,0	- 0,006 0,020
3	1,5	
4	2,0	
5	2,5	
6	3,0	
8	4,0	- 0,010 0,028
10	5,0	
12	6,0	

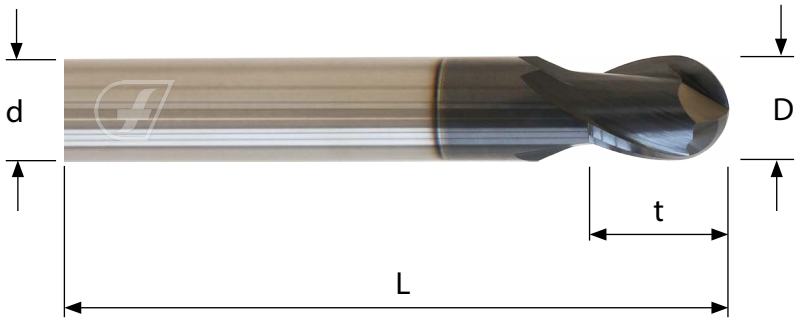
Frese con testa semisferica

Ball nose end mills

R

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

HRC 30-42

HRC 42-48

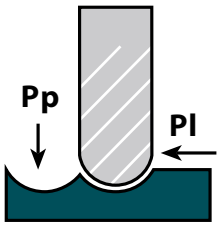
dimensions mm								quality	
Rf8	D	L	t	dh6	a	b	*Helix*	*code*	BK 500	
1,0	2	40	4	2	-	-	30°	FC 220 00 02	★	
1,5	3	40	5	3	-	-	30°	FC 220 00 03	★	
2,0	4	51	6	4	-	-	30°	FC 220 00 04	★	
2,5	5	51	7	5	-	-	30°	FC 220 00 05	★	
3,0	6	51	9	6	-	-	30°	FC 220 00 06	★	
4,0	8	64	11	8	-	-	30°	FC 220 00 08	★	
5,0	10	64	13	10	-	-	30°	FC 220 00 10	★	
6,0	12	80	16	12	-	-	30°	FC 220 00 12	★	

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

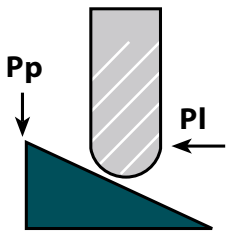
FC 220 10 ..

BK 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	2	2	230	0,030	0,20	0,20	36.624	2.197
	3	2	230	0,050	0,22	0,22	24.416	2.442
	4	2	230	0,070	0,24	0,24	18.312	2.564
	5	2	230	0,090	0,30	0,30	14.650	2.637
N/mm2 850-1200	2	2	200	0,020	0,20	0,20	31.847	1.274
	3	2	200	0,040	0,22	0,22	21.231	1.699
	4	2	200	0,060	0,24	0,24	15.924	1.911
	5	2	200	0,080	0,30	0,30	12.739	2.038
HRC 30-42	2	2	170	0,020	0,20	0,20	27.070	1.083
	3	2	170	0,030	0,22	0,22	18.047	1.083
	4	2	170	0,050	0,24	0,24	13.535	1.354
	5	2	170	0,070	0,30	0,30	10.828	1.516
HRC 42-48	2	2	150	0,020	0,20	0,20	23.885	955
	3	2	150	0,030	0,22	0,22	15.924	955
	4	2	150	0,040	0,24	0,24	11.943	955
	5	2	150	0,060	0,30	0,30	9.554	1.146

BK 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	2	2	340	0,020	0,10	0,10	54.140	2.166
	3	2	340	0,030	0,11	0,11	36.093	2.166
	4	2	340	0,040	0,12	0,12	27.070	2.166
	5	2	340	0,050	0,15	0,15	21.656	2.166
N/mm2 850-1200	2	2	290	0,020	0,10	0,10	46.178	1.847
	3	2	290	0,025	0,11	0,11	30.786	1.539
	4	2	290	0,030	0,12	0,12	23.089	1.385
	5	2	290	0,045	0,15	0,15	18.471	1.662
HRC 30-42	2	2	240	0,015	0,10	0,10	38.217	1.146
	3	2	240	0,020	0,11	0,11	25.478	1.019
	4	2	240	0,030	0,12	0,12	19.108	1.146
	5	2	240	0,040	0,15	0,15	15.287	1.223
HRC 42-48	2	2	210	0,013	0,10	0,10	33.439	869
	3	2	210	0,020	0,11	0,11	22.293	892
	4	2	210	0,025	0,12	0,12	16.720	836
	5	2	210	0,035	0,15	0,15	13.376	936

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza f8 ***tollerance f8***
	2	1,0	- 0,006 0,020
	3	1,5	
	4	2,0	
	5	2,5	

Frese con testa semisferica

Ball nose end mills

R

HM MICRO GRAIN

Z2

Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

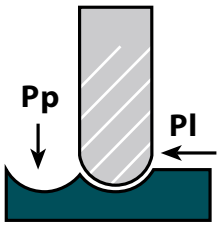
HRC 30-42

HRC 42-48

dimensions mm								*code*	*quality*	
Rf8	D	L	t	dh6	a	b	*Helix*		BK 500	
1,0	2	40	4	4	-	-	30°	FC 220 10 02	★	
1,5	3	51	5	6	-	-	30°	FC 220 10 03	★	
2,0	4	51	6	6	-	-	30°	FC 220 10 04	★	
2,5	5	51	6	6	-	-	30°	FC 220 10 05	★	

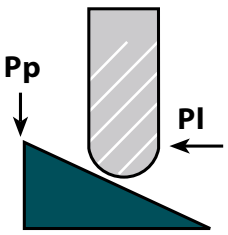
FC 220 20 ..

BK 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	2	210	0,050	0,22	0,22	22.293	2.229
	4	2	210	0,070	0,24	0,24	16.720	2.341
	5	2	210	0,090	0,30	0,30	13.376	2.408
	6	2	210	0,110	0,36	0,36	11.146	2.452
	8	2	210	0,130	0,40	0,40	8.360	2.174
	10	2	210	0,150	0,46	0,46	6.688	2.006
	12	2	210	0,170	0,52	0,52	5.573	1.895
N/mm2 850-1200	3	2	180	0,040	0,22	0,22	19.108	1.529
	4	2	180	0,060	0,24	0,24	14.331	1.720
	5	2	180	0,080	0,30	0,30	11.465	1.834
	6	2	180	0,100	0,36	0,36	9.554	1.911
	8	2	180	0,120	0,40	0,40	7.166	1.720
	10	2	180	0,140	0,46	0,46	5.732	1.605
	12	2	180	0,160	0,52	0,52	4.777	1.529
HRC 30-42	3	2	150	0,035	0,22	0,22	15.924	1.115
	4	2	150	0,050	0,24	0,24	11.943	1.194
	5	2	150	0,070	0,30	0,30	9.554	1.338
	6	2	150	0,090	0,36	0,36	7.962	1.433
	8	2	150	0,110	0,40	0,40	5.971	1.314
	10	2	150	0,130	0,46	0,46	4.777	1.242
	12	2	150	0,150	0,52	0,52	3.981	1.194
HRC 42-48	3	2	130	0,025	0,22	0,22	13.800	690
	4	2	130	0,040	0,24	0,24	10.350	828
	5	2	130	0,060	0,30	0,30	8.280	994
	6	2	130	0,080	0,36	0,36	6.900	1.104
	8	2	130	0,100	0,40	0,40	5.175	1.035
	10	2	130	0,120	0,46	0,46	4.140	994
	12	2	130	0,140	0,52	0,52	3.450	966

BK 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	3	2	310	0,030	0,11	0,11	32.909	1.975
	4	2	310	0,040	0,12	0,12	24.682	1.975
	5	2	310	0,050	0,15	0,15	19.745	1.975
	6	2	310	0,060	0,18	0,18	16.454	1.975
	8	2	310	0,070	0,20	0,20	12.341	1.728
	10	2	310	0,080	0,23	0,23	9.873	1.580
	12	2	310	0,090	0,26	0,26	8.227	1.481
N/mm2 850-1200	3	2	260	0,025	0,11	0,11	27.601	1.380
	4	2	260	0,030	0,12	0,12	20.701	1.242
	5	2	260	0,045	0,15	0,15	16.561	1.490
	6	2	260	0,055	0,18	0,18	13.800	1.518
	8	2	260	0,065	0,20	0,20	10.350	1.346
	10	2	260	0,075	0,23	0,23	8.280	1.242
	12	2	260	0,085	0,26	0,26	6.900	1.173
HRC 30-42	3	2	210	0,020	0,11	0,11	22.293	892
	4	2	210	0,030	0,12	0,12	16.720	1.003
	5	2	210	0,040	0,15	0,15	13.376	1.070
	6	2	210	0,050	0,18	0,18	11.146	1.115
	8	2	210	0,060	0,20	0,20	8.360	1.003
	10	2	210	0,070	0,23	0,23	6.688	936
	12	2	210	0,080	0,26	0,26	5.573	892
HRC 42-48	3	2	180	0,020	0,11	0,11	19.108	764
	4	2	180	0,025	0,12	0,12	14.331	717
	5	2	180	0,035	0,15	0,15	11.465	803
	6	2	180	0,044	0,18	0,18	9.554	841
	8	2	180	0,055	0,20	0,20	7.166	788
	10	2	180	0,065	0,23	0,23	5.732	745
	12	2	180	0,075	0,26	0,26	4.777	717

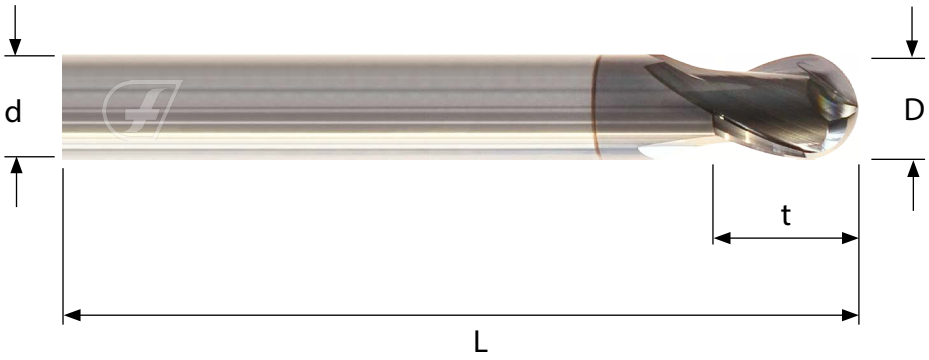
Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio *radius*	tolleranza f8 *tollerance f8*
	3	1,5	- 0,006 0,020
	4	2,0	
	5	2,5	
	6	3,0	
	8	4,0	- 0,010 0,028
	10	5,0	
	12	6,0	

Frese con testa semisferica
Ball nose end mills

R

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

HRC 30-42

HRC 42-48

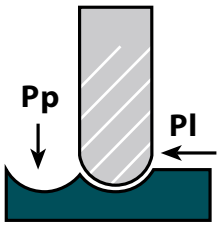
dimensions mm								*code*	*quality*
Rf8	D	L	t	dh6	a	b	*Helix*		BK 500
1,5	3	80	5	3	-	-	30°	FC 220 20 03	★
2,0	4	80	6	4	-	-	30°	FC 220 20 04	★
2,5	5	80	7	5	-	-	30°	FC 220 20 05	★
3,0	6	100	9	6	-	-	30°	FC 220 20 06	★
4,0	8	100	11	8	-	-	30°	FC 220 20 08	★
5,0	10	120	13	10	-	-	30°	FC 220 20 10	★
6,0	12	140	16	12	-	-	30°	FC 220 20 12	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

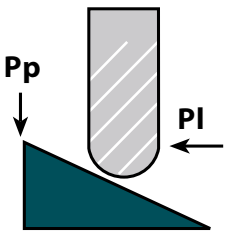
FC 220 20 .. 21 .. 22 .. 23 .. 24 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	2	260	0,070	0,20	0,20	41.401	5.796
	3	2	260	0,080	0,22	0,22	27.601	4.416
	4	2	260	0,090	0,24	0,24	20.701	3.726
	5	2	260	0,100	0,30	0,30	16.561	3.312
	6	2	260	0,110	0,36	0,36	13.800	3.036
	8	2	260	0,130	0,40	0,40	10.350	2.691
	10	2	260	0,150	0,46	0,46	8.280	2.484
	12	2	260	0,160	0,52	0,52	6.900	2.208
HRC 30-42	2	2	230	0,060	0,20	0,20	36.624	4.395
	3	2	230	0,070	0,22	0,22	24.416	3.418
	4	2	230	0,080	0,24	0,24	18.312	2.930
	5	2	230	0,090	0,30	0,30	14.650	2.637
	6	2	230	0,100	0,36	0,36	12.208	2.442
	8	2	230	0,120	0,40	0,40	9.156	2.197
	10	2	230	0,140	0,46	0,46	7.325	2.051
	12	2	230	0,150	0,52	0,52	6.104	1.831
HRC 42-48	2	2	180	0,050	0,20	0,20	28.662	2.866
	3	2	180	0,060	0,22	0,22	19.108	2.293
	4	2	180	0,070	0,24	0,24	14.331	2.006
	5	2	180	0,080	0,30	0,30	11.465	1.834
	6	2	180	0,090	0,36	0,36	9.554	1.720
	8	2	180	0,110	0,40	0,40	7.166	1.576
	10	2	180	0,130	0,46	0,46	5.732	1.490
	12	2	180	0,140	0,52	0,52	4.777	1.338
HRC 48-52	2	2	140	0,040	0,20	0,20	22.293	1.783
	3	2	140	0,050	0,22	0,22	14.862	1.486
	4	2	140	0,060	0,24	0,24	11.146	1.338
	5	2	140	0,070	0,30	0,30	8.917	1.248
	6	2	140	0,080	0,36	0,36	7.431	1.189
	8	2	140	0,100	0,40	0,40	5.573	1.115
	10	2	140	0,120	0,46	0,46	4.459	1.070
	12	2	140	0,130	0,52	0,52	3.715	966

X9000



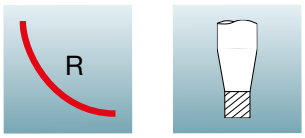
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	2	320	0,035	0,07	0,07	50.955	3.567
	3	2	320	0,040	0,09	0,09	33.970	2.718
	4	2	320	0,055	0,10	0,10	25.478	2.803
	5	2	320	0,070	0,11	0,11	20.382	2.854
	6	2	320	0,085	0,12	0,12	16.985	2.887
	8	2	320	0,080	0,14	0,14	12.739	2.038
	10	2	320	0,095	0,17	0,17	10.191	1.936
	12	2	320	0,110	0,21	0,21	8.493	1.868
HRC 30-42	2	2	300	0,020	0,07	0,07	47.771	1.911
	3	2	300	0,030	0,09	0,09	31.847	1.911
	4	2	300	0,040	0,10	0,10	23.885	1.911
	5	2	300	0,050	0,11	0,11	19.108	1.911
	6	2	300	0,060	0,12	0,12	15.924	1.911
	8	2	300	0,065	0,14	0,14	11.943	1.553
	10	2	300	0,075	0,17	0,17	9.554	1.433
	12	2	300	0,085	0,21	0,21	7.962	1.354
HRC 42-48	2	2	270	0,015	0,07	0,07	42.994	1.290
	3	2	270	0,020	0,09	0,09	28.662	1.146
	4	2	270	0,030	0,10	0,10	21.497	1.290
	5	2	270	0,040	0,11	0,11	17.197	1.376
	6	2	270	0,050	0,12	0,12	14.331	1.433
	8	2	270	0,060	0,14	0,14	10.748	1.290
	10	2	270	0,070	0,17	0,17	8.599	1.204
	12	2	270	0,080	0,21	0,21	7.166	1.146
HRC 48-52	2	2	220	0,013	0,07	0,07	35.032	911
	3	2	220	0,020	0,09	0,09	23.355	934
	4	2	220	0,025	0,10	0,10	17.516	876
	5	2	220	0,035	0,11	0,11	14.013	981
	6	2	220	0,040	0,12	0,12	11.677	934
	8	2	220	0,055	0,14	0,14	8.758	963
	10	2	220	0,065	0,17	0,17	7.006	911
	12	2	220	0,075	0,21	0,21	5.839	876

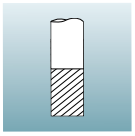
Tolleranza raggio mm / ***Radius tollerance mm***

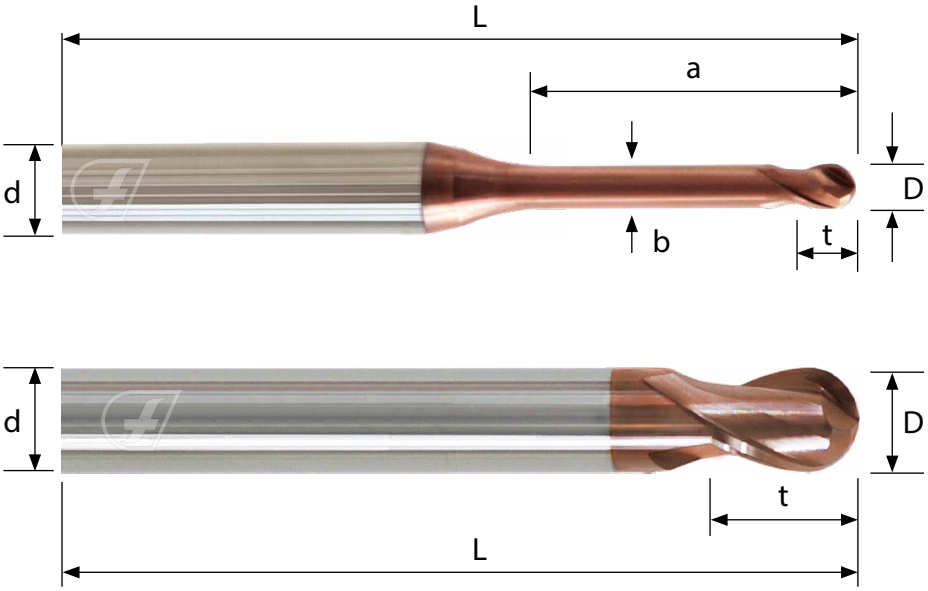
D	raggio *radius*	tolleranza f8 *tollerance f8*
2	1,0	- 0,006 0,020
3	1,5	
4	2,0	
5	2,5	
6	3,0	
8	4,0	- 0,010 0,028
10	5,0	
12	6,0	

Frese con testa semisferica

Ball nose end mills







Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

HRC 42-48

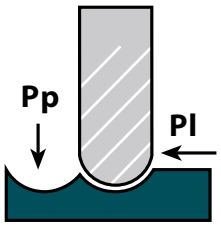
HRC 48-52

dimensions mm								code	quality
Rf8	D	L	t	dh6	a	b	*Helix*		X9000
1,0	2	51	3	6	6	1,9	30°	FC 220 21 02	★
1,0	2	51	3	6	10	1,9	30°	FC 220 22 02	★
1,0	2	51	3	6	14	1,9	30°	FC 220 23 02	★
1,0	2	64	3	6	20	1,9	30°	FC 220 24 02	★
1,5	3	51	4	6	9	2,8	30°	FC 220 21 03	★
1,5	3	64	4	6	15	2,8	30°	FC 220 22 03	★
1,5	3	64	4	6	21	2,8	30°	FC 220 23 03	★
1,5	3	80	4	6	30	2,8	30°	FC 220 24 03	★
2,0	4	51	6	6	12	3,8	30°	FC 220 21 04	★
2,0	4	64	6	6	20	3,8	30°	FC 220 22 04	★
2,0	4	64	6	6	28	3,8	30°	FC 220 23 04	★
2,0	4	80	6	6	40	3,8	30°	FC 220 24 04	★
2,5	5	64	7	6	25	4,8	30°	FC 220 21 05	★
3,0	6	80	9	6	-	-	30°	FC 220 20 06	★
4,0	8	100	11	8	-	-	30°	FC 220 20 08	★
5,0	10	120	13	10	-	-	30°	FC 220 20 10	★
6,0	12	140	16	12	-	-	30°	FC 220 20 12	★

Qualità HM
HM Quality pag. 25

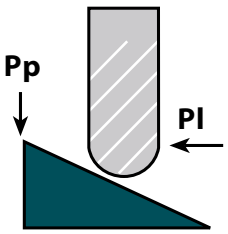
FC 220 30 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	2	200	0,060	0,20	0,20	31.847	3.822
	3	2	200	0,070	0,22	0,22	21.231	2.972
	4	2	200	0,080	0,24	0,24	15.924	2.548
	5	2	200	0,100	0,30	0,30	12.739	2.548
HRC 30-42	2	2	170	0,050	0,20	0,20	27.070	2.707
	3	2	170	0,060	0,22	0,22	18.047	2.166
	4	2	170	0,075	0,24	0,24	13.535	2.030
	5	2	170	0,090	0,30	0,30	10.828	1.949
HRC 42-48	2	2	150	0,040	0,20	0,20	23.885	1.911
	3	2	150	0,050	0,22	0,22	15.924	1.592
	4	2	150	0,070	0,24	0,24	11.943	1.672
	5	2	150	0,080	0,30	0,30	9.554	1.529
HRC 48-52	2	2	150	0,030	0,20	0,20	23.885	1.433
	3	2	150	0,040	0,22	0,22	15.924	1.274
	4	2	150	0,065	0,24	0,24	11.943	1.553
	5	2	150	0,075	0,30	0,30	9.554	1.433
HRC 52-60	2	2	90	0,030	0,15	0,15	14.331	860
	3	2	90	0,040	0,18	0,18	9.554	764
	4	2	90	0,060	0,21	0,21	7.166	860
	5	2	90	0,070	0,25	0,25	5.732	803

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	2	2	290	0,025	0,10	0,10	46.178	2.309
	3	2	290	0,030	0,11	0,11	30.786	1.847
	4	2	290	0,040	0,12	0,12	23.089	1.847
	5	2	290	0,055	0,15	0,15	18.471	2.032
HRC 30-42	2	2	240	0,025	0,10	0,10	38.217	1.911
	3	2	240	0,030	0,11	0,11	25.478	1.529
	4	2	240	0,040	0,12	0,12	19.108	1.529
	5	2	240	0,055	0,15	0,15	15.287	1.682
HRC 42-48	2	2	210	0,020	0,10	0,10	33.439	1.338
	3	2	210	0,025	0,11	0,11	22.293	1.115
	4	2	210	0,035	0,12	0,12	16.720	1.170
	5	2	210	0,035	0,15	0,15	13.376	936
HRC 48-52	2	2	210	0,020	0,10	0,10	33.439	1.338
	3	2	210	0,025	0,11	0,11	22.293	1.115
	4	2	210	0,030	0,12	0,12	16.720	1.003
	5	2	210	0,045	0,15	0,15	13.376	1.204
HRC 52-60	2	2	130	0,020	0,06	0,06	20.701	828
	3	2	130	0,025	0,08	0,08	13.800	690
	4	2	130	0,030	0,12	0,12	10.350	621
	5	2	130	0,045	0,15	0,15	8.280	745

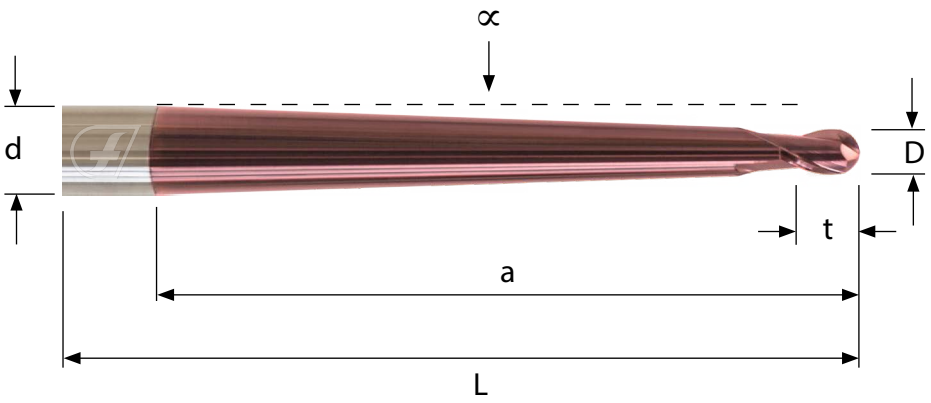
Tolleranza raggio mm / ***Radius tollerance mm***			
D	raggio *radius*	tolleranza f8 *tollerance f8*	
2	1,0	- 0,006 0,020	
3	1,5		
4	2,0		
5	2,5		

Frese con testa semisferica
Ball nose end mills

R

HM ULTRA FINE

Z2



Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

HRC 42-48

HRC 48-52

HRC 52-60

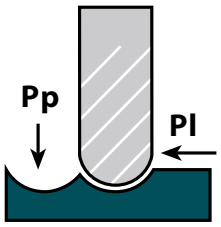
dimensions mm								*code*	*quality*
Rf8	D	L	t	dh6	a	∝	*Helix*		SM 500
1,0	2	100	4	6	48	2°60′	30°	FC 220 30 02	★
1,5	3	100	5	6	48	2°00'	30°	FC 220 30 03	★
2,0	4	100	6	6	50	1°30′	30°	FC 220 30 04	★
2,5	5	100	6	6	50	0°65′	30°	FC 220 30 05	★

Qualità HM
HM Quality pag. 25

★ Pronto
Ready

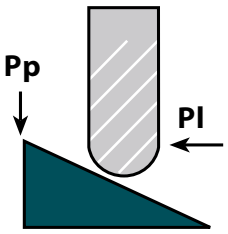
FC 320 19 .. FC 320 20 .. FC 320 21 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200 Air	3	3	260	0,060	0,10	0,10	27.601	4.968
	4	3	260	0,070	0,12	0,12	20.701	4.347
	5	3	260	0,080	0,14	0,14	16.561	3.975
	6	3	260	0,090	0,16	0,16	13.800	3.726
	8	3	260	0,110	0,20	0,20	10.350	3.416
	10	3	260	0,130	0,24	0,24	8.280	3.229
HRC 30-42 Air	3	3	230	0,050	0,10	0,10	24.416	3.662
	4	3	230	0,060	0,12	0,12	18.312	3.296
	5	3	230	0,070	0,14	0,14	14.650	3.076
	6	3	230	0,080	0,16	0,16	12.208	2.930
	8	3	230	0,100	0,20	0,20	9.156	2.747
	10	3	230	0,120	0,24	0,24	7.325	2.637
HRC 42-48 Air	3	3	180	0,060	0,10	0,10	19.108	3.439
	4	3	180	0,070	0,12	0,12	14.331	3.010
	5	3	180	0,080	0,14	0,14	11.465	2.752
	6	3	180	0,090	0,16	0,16	9.554	2.580
	8	3	180	0,110	0,20	0,20	7.166	2.365
	10	3	180	0,130	0,24	0,24	5.732	2.236
HRC 48-52 Air	3	3	140	0,050	0,10	0,10	14.862	2.229
	4	3	140	0,060	0,12	0,12	11.146	2.006
	5	3	140	0,070	0,14	0,14	8.917	1.873
	6	3	140	0,080	0,16	0,16	7.431	1.783
	8	3	140	0,100	0,20	0,20	5.573	1.672
	10	3	140	0,120	0,24	0,24	4.459	1.605

X9000

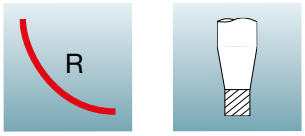


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200 Air	3	3	340	0,040	0,05	0,05	36.093	4.331
	4	3	340	0,050	0,06	0,06	27.070	4.061
	5	3	340	0,060	0,07	0,07	21.656	3.898
	6	3	340	0,070	0,08	0,08	18.047	3.790
	8	3	340	0,080	0,10	0,10	13.535	3.248
	10	3	340	0,090	0,12	0,12	10.828	2.924
HRC 30-42 Air	3	3	320	0,040	0,05	0,05	33.970	4.076
	4	3	320	0,050	0,06	0,06	25.478	3.822
	5	3	320	0,060	0,07	0,07	20.382	3.669
	6	3	320	0,070	0,08	0,08	16.985	3.567
	8	3	320	0,080	0,10	0,10	12.739	3.057
	10	3	320	0,090	0,12	0,12	10.191	2.752
HRC 42-48 Air	3	3	290	0,040	0,05	0,05	30.786	3.694
	4	3	290	0,050	0,06	0,06	23.089	3.463
	5	3	290	0,060	0,07	0,07	18.471	3.325
	6	3	290	0,070	0,08	0,08	15.393	3.232
	8	3	290	0,080	0,10	0,10	11.545	2.771
	10	3	290	0,090	0,12	0,12	9.236	2.494
HRC 48-52 Air	3	3	270	0,040	0,05	0,05	28.662	3.439
	4	3	270	0,050	0,06	0,06	21.497	3.225
	5	3	270	0,060	0,07	0,07	17.197	3.096
	6	3	270	0,070	0,08	0,08	14.331	3.010
	8	3	270	0,080	0,10	0,10	10.748	2.580
	10	3	270	0,090	0,12	0,12	8.599	2.322

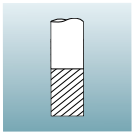
Tolleranza raggio mm / ***Radius tollerance mm***			
D	raggio *radius*	tolleranza f8 *tollerance f8*	
3	1,5	- 0,006 0,020	
4	2,0		
5	2,5		
6	3,0		
8	4,0	- 0,010 0,028	
10	5,0		

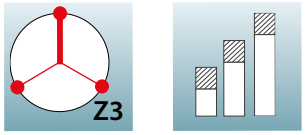
Frese con testa semisferica

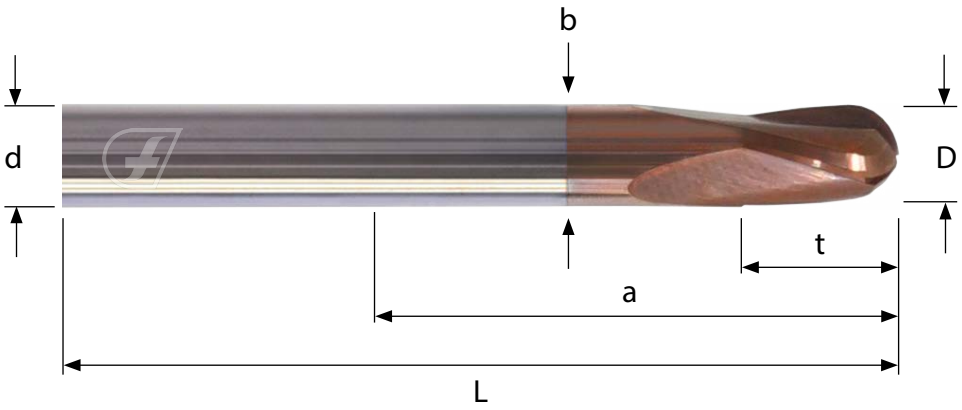
Ball nose end mills



HM ULTRA FINE







Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

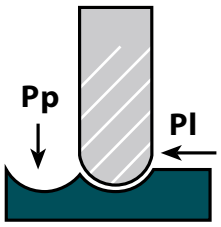
HRC 42-48

HRC 48-52

dimensions mm								*code*	*quality*	
Rf8	**D**	L	t	dh6	a	b	*Helix*		X9000	
1,0	**2**	51	4	6	-	-	15°	FC 320 19 02	★	
1,5	**3**	51	5	6	-	-	15°	FC 320 19 03	★	
1,5	**3**	64	5	6	15	2,8	15°	FC 320 20 03	★	
1,5	**3**	80	5	6	30	2,8	15°	FC 320 21 03	★	
2,0	**4**	51	6	6	-	-	15°	FC 320 19 04	★	
2,0	**4**	64	6	6	20	3,8	15°	FC 320 20 04	★	
2,0	**4**	80	6	6	40	3,8	15°	FC 320 21 04	★	
2,5	**5**	51	7	6	-	-	15°	FC 320 19 05	★	
2,5	**5**	80	7	6	25	4,7	15°	FC 320 20 05	★	
2,5	**5**	100	7	6	50	4,7	15°	FC 320 21 05	★	
3,0	**6**	80	9	6	-	-	15°	FC 320 20 06	★	
4,0	**8**	100	11	8	-	-	15°	FC 320 20 08	★	
5,0	**10**	120	13	10	-	-	15°	FC 320 20 10	★	

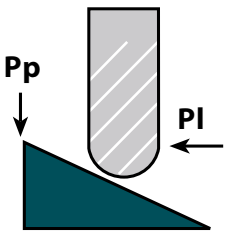
FC 420 00 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	4	4	280	0,060	0,12	0,12	22.293	5.350
	6	4	280	0,080	0,16	0,16	14.862	4.756
	8	4	280	0,120	0,20	0,20	11.146	5.350
	10	4	280	0,140	0,30	0,30	8.917	4.994
HRC 30-42	4	4	260	0,055	0,12	0,12	20.701	4.554
	6	4	260	0,070	0,16	0,16	13.800	3.864
	8	4	260	0,100	0,20	0,20	10.350	4.140
	10	4	260	0,120	0,30	0,30	8.280	3.975
HRC 42-48	4	4	210	0,050	0,12	0,12	16.720	3.344
	6	4	210	0,065	0,16	0,16	11.146	2.898
	8	4	210	0,080	0,20	0,20	8.360	2.675
	10	4	210	0,090	0,30	0,30	6.688	2.408
HRC 48-52	4	4	180	0,040	0,12	0,12	14.331	2.293
	6	4	180	0,055	0,16	0,16	9.554	2.102
	8	4	180	0,060	0,20	0,20	7.166	1.720
	10	4	180	0,070	0,30	0,30	5.732	1.605

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	4	4	340	0,045	0,05	0,05	27.070	4.873
	6	4	340	0,055	0,08	0,08	18.047	3.970
	8	4	340	0,060	0,11	0,11	13.535	3.248
	10	4	340	0,070	0,15	0,15	10.828	3.032
HRC 30-42	4	4	310	0,040	0,05	0,05	24.682	3.949
	6	4	310	0,050	0,08	0,08	16.454	3.291
	8	4	310	0,055	0,11	0,11	12.341	2.715
	10	4	310	0,060	0,15	0,15	9.873	2.369
HRC 42-48	4	4	280	0,035	0,05	0,05	22.293	3.121
	6	4	280	0,040	0,08	0,08	14.862	2.378
	8	4	280	0,045	0,11	0,11	11.146	2.006
	10	4	280	0,050	0,15	0,15	8.917	1.783
HRC 48-52	4	4	240	0,030	0,05	0,05	19.108	2.293
	6	4	240	0,035	0,08	0,08	12.739	1.783
	8	4	240	0,040	0,11	0,11	9.554	1.529
	10	4	240	0,045	0,15	0,15	7.643	1.376

Tolleranza raggio mm / ***Radius tollerance mm***

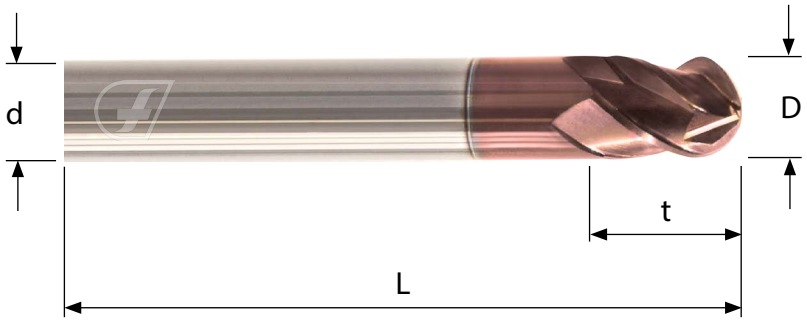
D	raggio *radius*	tolleranza f8 *tollerance f8*
4	2,0	- 0,006
6	3,0	0,020
8	4,0	- 0,020
10	5,0	0,028

Frese con testa semisferica
Ball nose end mills

R

HM ULTRA FINE

Z4



Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

HRC 42-48

HRC 48-52

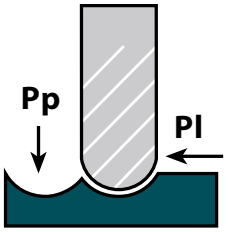
dimensions mm								code	quality
Rf8	D	L	t	dh6	a	b	*Helix*		X9000
2,0	4	50	6	4	-	-	40°	FC 420 00 04	★
3,0	6	51	9	6	-	-	40°	FC 420 00 06	★
4,0	8	64	11	8	-	-	40°	FC 420 00 08	★
5,0	10	64	13	10	-	-	40°	FC 420 00 10	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

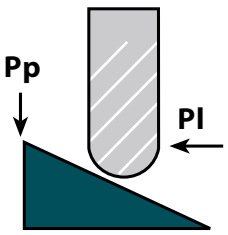
FC 420 20 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	4	4	260	0,060	0,12	0,12	20.701	4.968
	6	4	260	0,080	0,16	0,16	13.800	4.416
	8	4	260	0,120	0,20	0,20	10.350	4.968
	10	4	260	0,140	0,30	0,30	8.280	4.637
HRC 30-42	4	4	240	0,055	0,12	0,12	19.108	4.204
	6	4	240	0,070	0,16	0,16	12.739	3.567
	8	4	240	0,100	0,20	0,20	9.554	3.822
	10	4	240	0,120	0,30	0,30	7.643	3.669
HRC 42-48	4	4	190	0,050	0,12	0,12	15.127	3.025
	6	4	190	0,065	0,16	0,16	10.085	2.622
	8	4	190	0,080	0,20	0,20	7.564	2.420
	10	4	190	0,090	0,30	0,30	6.051	2.178
HRC 48-52	4	4	160	0,040	0,12	0,12	12.739	2.038
	6	4	160	0,055	0,16	0,16	8.493	1.868
	8	4	160	0,060	0,20	0,20	6.369	1.529
	10	4	160	0,070	0,30	0,30	5.096	1.427

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	4	4	320	0,045	0,05	0,05	25.478	4.586
	6	4	320	0,055	0,08	0,08	16.985	3.737
	8	4	320	0,060	0,11	0,11	12.739	3.057
	10	4	320	0,070	0,15	0,15	10.191	2.854
HRC 30-42	4	4	290	0,040	0,05	0,05	23.089	3.694
	6	4	290	0,050	0,08	0,08	15.393	3.079
	8	4	290	0,055	0,11	0,11	11.545	2.540
	10	4	290	0,060	0,15	0,15	9.236	2.217
HRC 42-48	4	4	260	0,035	0,05	0,05	20.701	2.898
	6	4	260	0,040	0,08	0,08	13.800	2.208
	8	4	260	0,045	0,11	0,11	10.350	1.863
	10	4	260	0,050	0,15	0,15	8.280	1.656
HRC 48-52	4	4	220	0,030	0,05	0,05	17.516	2.102
	6	4	220	0,035	0,08	0,08	11.677	1.635
	8	4	220	0,040	0,11	0,11	8.758	1.401
	10	4	220	0,045	0,15	0,15	7.006	1.261

Tolleranza raggio mm / ***Radius tollerance mm***			
D	raggio ***radius***	tolleranza f8 ***tollerance f8***	
4	2,0	-	0,006
6	3,0		0,020
8	4,0	-	0,010
10	5,0		0,028

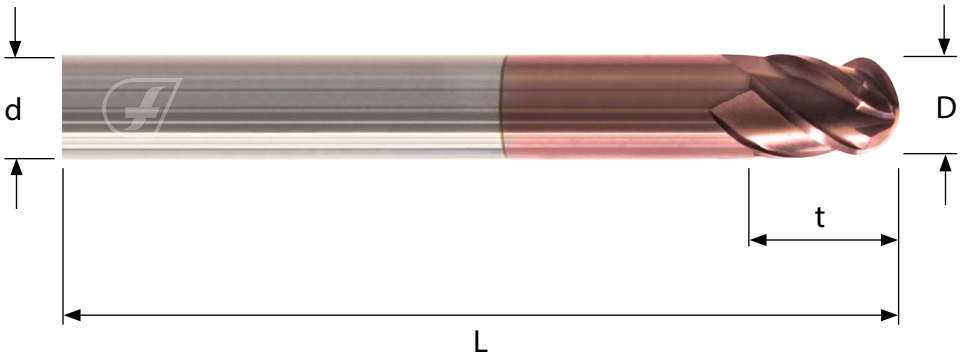
Frese con testa semisferica

Ball nose end mills

R

HM ULTRA FINE

Z4



Sgrossatura

Finitura

N/mm2 850-1200

HRC 30-42

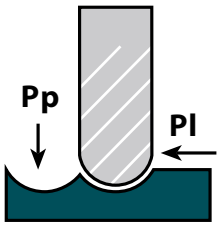
HRC 42-48

HRC 48-52

dimensions mm								*code*	*quality*
Rf8	D	L	t	dh6	a	b	*Helix*		X9000
2,0	4	80	6	4	-	-	40°	FC 420 20 04	★
3,0	6	100	9	6	-	-	40°	FC 420 20 06	★
4,0	8	100	11	8	-	-	40°	FC 420 20 08	★
5,0	10	120	13	10	-	-	40°	FC 420 20 10	★

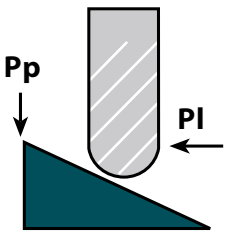
FC 452 30 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 48-52 Air	2	4	200	0,050	0,10	0,10	31.847	6.369
	3	4	200	0,060	0,14	0,14	21.231	5.096
	4	4	200	0,070	0,18	0,18	15.924	4.459
HRC 52-60 Air	2	4	150	0,035	0,10	0,10	23.885	3.344
	3	4	150	0,050	0,14	0,14	15.924	3.185
	4	4	150	0,060	0,18	0,18	11.943	2.866

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 48-52 Air	2	4	300	0,035	0,05	0,05	47.771	6.688
	3	4	300	0,050	0,07	0,07	31.847	6.369
	4	4	300	0,060	0,09	0,09	23.885	5.732
HRC 52-60 Air	2	4	200	0,030	0,05	0,05	31.847	3.822
	3	4	200	0,040	0,07	0,07	21.231	3.397
	4	4	200	0,050	0,09	0,09	15.924	3.185

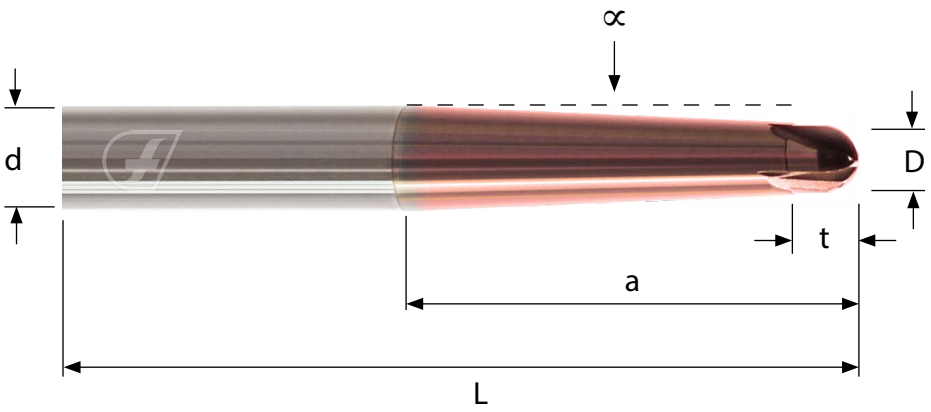
Tolleranza raggio mm / ***Radius tollerance mm***			
D	raggio ***radius***	tolleranza f8 ***tollerance f8***	
2	1,0	- 0,006 0,020	
3	1,5		
4	2,0		

Frese con testa semisferica
Ball nose end mills

R

HM ULTRA FINE

Z4



Sgrossatura

Finitura

HRC 48-52

HRC 52-60

dimensions mm								code	quality
Rf8	D	L	t	dh6	a	∝	Helix		X9000
1,0	2	64	2	4	18,5	3°5'	0°	FC 452 30 02	★
1,5	3	80	3	6	28,5	3°5'	0°	FC 452 30 03	★
2,0	4	80	4	6	28,5	2°5'	0°	FC 452 30 04	★

Qualità HM
HM Quality
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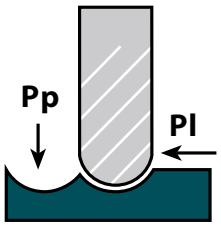
★ Pronto
Ready

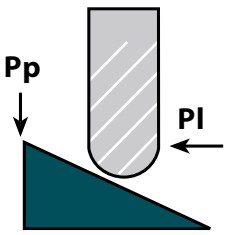
FC 453 40 ..

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 48-52 Air	6	4	160	0,080	0,14	0,14	8.493	2.718
	8	4	160	0,095	0,16	0,16	6.369	2.420
	10	4	160	0,110	0,20	0,20	5.096	2.242
	12	4	160	0,120	0,24	0,24	4.246	2.038
HRC 52-60 Air	6	4	110	0,075	0,14	0,14	5.839	1.752
	8	4	110	0,090	0,16	0,16	4.379	1.576
	10	4	110	0,100	0,20	0,20	3.503	1.401
	12	4	110	0,110	0,24	0,24	2.919	1.285

X9000



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
HRC 48-52 Air	6	4	300	0,070	0,07	0,07	15.924	4.459
	8	4	300	0,080	0,08	0,08	11.943	3.822
	10	4	300	0,090	0,10	0,10	9.554	3.439
	12	4	300	0,100	0,12	0,12	7.962	3.185
HRC 52-60 Air	6	4	200	0,060	0,07	0,07	10.616	2.548
	8	4	200	0,070	0,08	0,08	7.962	2.229
	10	4	200	0,080	0,10	0,10	6.369	2.038
	12	4	200	0,090	0,12	0,12	5.308	1.911

Tolleranza raggio mm / ***Radius tollerance mm***		
D	raggio ***radius***	tolleranza f8 ***tollerance f8***
6	3,0	- 0,006 0,020
8 10 12	4,0 5,0 6,0	- 0,010 0,028

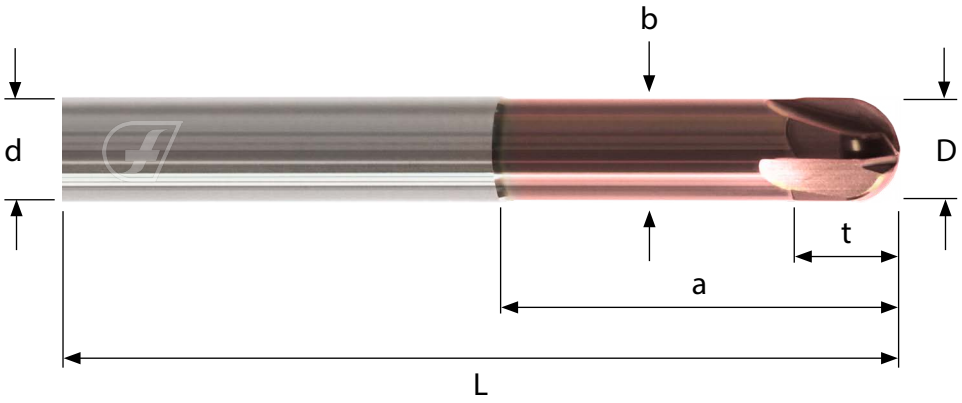
Frese con testa semisferica

Ball nose end mills

R

HM ULTRA FINE

Z4



Sgrossatura

Finitura

HRC 48-52

HRC 52-60

dimensions mm								*code*	*quality*
Rf8	**D**	L	t	dh6	a	b	*Helix*		X9000
3,0	**6**	80	7,5	6	30	5,6	0°	FC 453 40 06	★
4,0	**8**	100	9,5	8	40	7,6	0°	FC 453 40 08	★
5,0	**10**	120	12,0	10	50	9,6	0°	FC 453 40 10	★
6,0	**12**	140	14,0	12	60	11,5	0°	FC 453 40 12	★

Frese con testa torica - *Corner radius end mills*

FC 205 40 .. DG300

Ø 2 ÷ 12
r 0,5

GRAPHITE

pag. 147

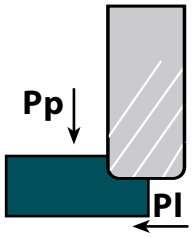
Frese con testa semisferica - *Ball nose end mills*

FC 220 20 .. DG300

Z2 | R | 30° | Ø 1 ÷ 12 | GRAPHITE | pag. 149

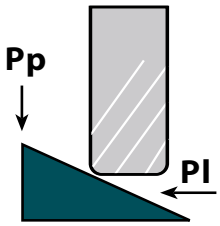
FC 205 40 ..

DG300



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
GRAPHITE	2	2	500	0,030	0,25	2,0	55.000	3.300
	3	2	500	0,040	0,35	2,5	53.079	4.246
	4	2	500	0,050	0,50	2,0	39.809	3.981
	5	2	500	0,060	0,75	2,5	31.847	3.822
	6	2	500	0,080	1,00	3,0	26.539	4.246
	8	2	500	0,100	1,50	4,0	19.904	3.981
	10	2	500	0,120	2,00	5,0	15.924	3.822
	12	2	500	0,140	2,50	6,0	13.270	3.715
GRAPHITE	2	2	300	0,030	1,0	0,30	47.771	2.866
	3	2	300	0,040	1,5	0,40	31.847	2.548
	4	2	300	0,050	2,0	0,50	23.885	2.389
	5	2	300	0,060	2,5	0,75	19.108	2.293
	6	2	300	0,080	3,0	1,00	15.924	2.548
	8	2	300	0,100	4,0	1,50	11.943	2.389
	10	2	300	0,120	5,0	2,00	9.554	2.293
	12	2	300	0,140	6,0	2,50	7.962	2.229

DG300



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
GRAPHITE	2	2	700	0,030	0,20	0,20	55.000	3.300
	3	2	700	0,040	0,30	0,30	55.000	4.400
	4	2	700	0,050	0,40	0,40	55.732	5.573
	5	2	700	0,060	0,50	0,50	44.586	5.350
	6	2	700	0,080	0,60	0,60	37.155	5.945
	8	2	700	0,100	0,80	0,80	27.866	5.573
	10	2	700	0,120	1,00	1,00	22.293	5.350
	12	2	700	0,140	1,20	1,20	18.577	5.202

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	2	0,5	+ - 0,01
	3	0,5	
	4	0,5	
	5	0,5	
	6	0,5	
	8	0,5	
	10	0,5	
	12	0,5	

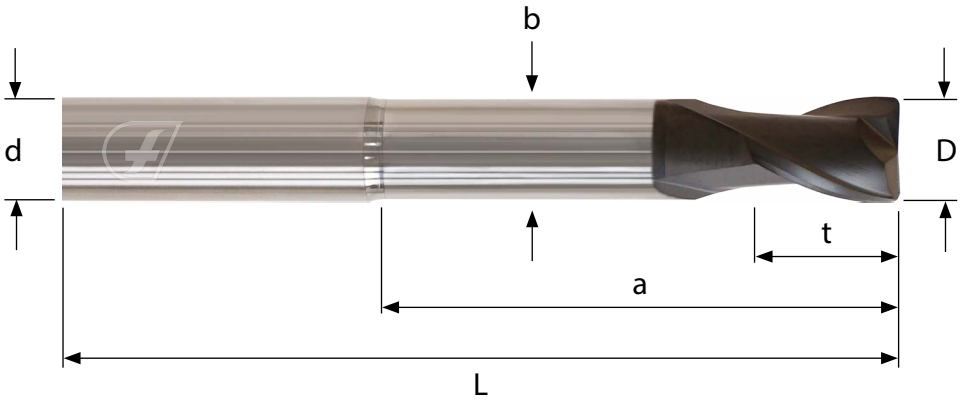
Frese con testa torica
Corner radius end mills

DIAMOND COATED

R

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

GRAPHITE

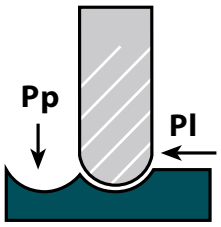
dimensions mm								*code*	*quality*
Dh10	L	t	dh6	a	b	*Helix*	***radius***		DG300
2	80	4	4	15	1,9	30°	**0,5**	FC 205 40 02	★
3	80	5	4	20	2,9	30°	**0,5**	FC 205 40 03	★
4	80	6	4	25	3,8	30°	**0,5**	FC 205 40 04	★
5	80	7	5	30	4,8	30°	**0,5**	FC 205 40 05	★
6	100	9	6	35	5,6	30°	**0,5**	FC 205 40 06	★
8	100	11	8	40	7,6	30°	**0,5**	FC 205 40 08	★
10	120	13	10	50	9,5	30°	**0,5**	FC 205 40 10	★
12	140	15	12	60	11,5	30°	**0,5**	FC 205 40 12	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

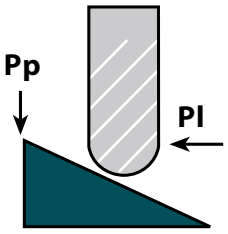
FC 220 20 .. FC 220 21 ..

DG300



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
GRAPHITE	1	2	500	0,005	0,10	0,10	55.000	1.592
	1,5	2	500	0,008	0,20	0,20	55.000	1.699
	2	2	500	0,015	0,25	0,25	55.000	2.389
	3	2	500	0,030	0,40	0,40	53.079	3.185
	4	2	500	0,045	0,60	0,60	39.809	3.583
	5	2	500	0,060	0,80	0,80	31.847	3.822
	6	2	500	0,080	0,90	0,90	26.539	4.246
	8	2	500	0,100	1,20	1,20	19.904	3.981
	10	2	500	0,120	1,40	1,40	15.924	3.822
	12	2	500	0,140	1,80	1,80	13.270	3.715
GRAPHITE	1	2	300	0,005	0,20	0,20	55.000	955
	1,5	2	300	0,008	0,40	0,40	55.000	1.019
	2	2	300	0,015	0,50	0,50	47.771	1.433
	3	2	300	0,030	0,80	0,80	31.847	1.911
	4	2	300	0,045	1,20	1,20	23.885	2.150
	5	2	300	0,060	1,60	1,60	19.108	2.293
	6	2	300	0,080	1,80	1,80	15.924	2.548
	8	2	300	0,100	2,40	2,40	11.943	2.389
	10	2	300	0,120	2,80	2,80	9.554	2.293
	12	2	300	0,140	3,60	3,60	7.962	2.229

DG300



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
GRAPHITE	1	2	700	0,005	0,10	0,10	222.930	2.229
	1,5	2	700	0,007	0,15	0,15	148.620	2.081
	2	2	700	0,010	0,20	0,20	111.465	2.229
	3	2	700	0,024	0,30	0,30	74.310	3.567
	4	2	700	0,035	0,40	0,40	55.732	3.901
	5	2	700	0,045	0,50	0,50	44.586	4.013
	6	2	700	0,060	0,60	0,60	37.155	4.459
	8	2	700	0,080	0,80	0,80	27.866	4.459
	10	2	700	0,100	1,00	1,00	22.293	4.459
	12	2	700	0,120	1,20	1,20	18.577	4.459

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza f8 ***tollerance f8***
	1	0,5	- 0,006 0,020
	1,5	0,75	
	2	1,0	
	3	1,5	
	4	2,0	
	5	2,5	
	6	3,0	
	8	4,0	- 0,010 0,028
	10	5,0	
	12	6,0	

Frese con testa semisferica

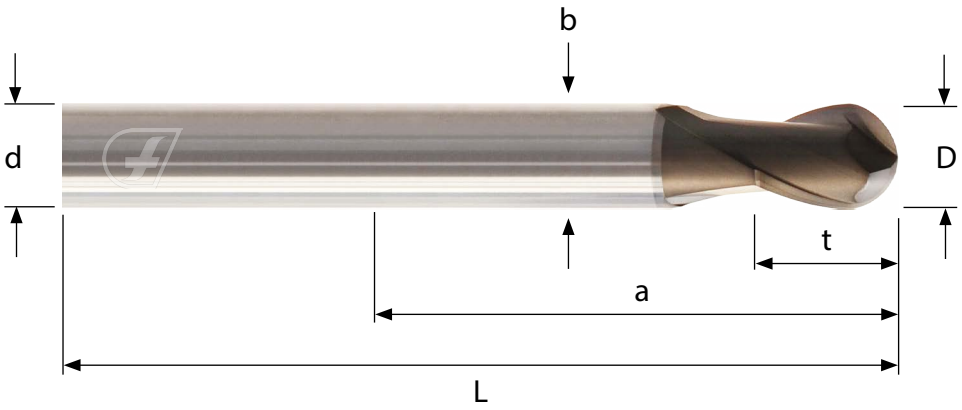
Ball nose end mills

DIAMOND COATED

R

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

GRAPHITE

dimensions mm								code	quality
Rf8	D	L	t	dh6	a	b	*Helix*		DG300
0,5	1	80	1,5	4	10	0,95	30°	FC 220 20 1,0	★
0,5	1	80	1,5	4	20	0,95	30°	FC 220 21 1,0	★
0,75	1,5	80	2	4	15	1,40	30°	FC 220 20 1,5	★
0,75	1,5	80	2	4	25	1,40	30°	FC 220 21 1,5	★
1,0	2	80	4	4	15	1,90	30°	FC 220 20 02	★
1,5	3	80	5	4	20	2,80	30°	FC 220 20 03	★
2,0	4	80	6	4	-	-	30°	FC 220 20 04	★
2,5	5	80	7	5	-	-	30°	FC 220 20 05	★
3,0	6	100	9	6	-	-	30°	FC 220 20 06	★
4,0	8	100	11	8	-	-	30°	FC 220 20 08	★
5,0	10	120	13	10	-	-	30°	FC 220 20 10	★
6,0	12	140	16	12	-	-	30°	FC 220 20 12	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

Microfrese con testa piana - *Square miniatures*

	FC 201 51 .. SM500	Z2	90°	20°		Ø 0,5 ÷ 2 3 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 153
	FC 201 52 .. SM500	Z2	90°	20°		Ø 0,5 ÷ 2 5 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 155
	FC 201 53 .. SM500	Z2	90°	20°		Ø 0,5 ÷ 2 7 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 157
	FC 201 54 .. SM500	Z2	90°	20°		Ø 0,8 ÷ 2 10 x Ø codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 159
	FC 201 55 .. SM500	Z2	90°	20°		Ø 1 ÷ 2 15 x Ø codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 161

Microfrese con testa torica - *Corner miniatures*

	FC 204 51 .. SM500	Z2	R	20°		Ø 0,5 ÷ 2 3 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 163
	FC 204 52 .. SM500	Z2	R	20°		Ø 0,5 ÷ 2 5 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 165
	FC 204 53 .. SM500	Z2	R	20°		Ø 0,5 ÷ 2 7 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 167
	FC 204 54 .. SM500	Z2	R	20°		Ø 0,8 ÷ 2 10 x Ø codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 169
	FC 204 55 .. SM500	Z2	R	20°		Ø 1 ÷ 2 15 x Ø codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 171

Microfrese con testa semisferica - *Ball nose miniatures*

	FC 220 51 .. SM500	Z2	R	20°		Ø 0,5 ÷ 2 3 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 173
	FC 220 52 .. SM500	Z2	R	20°		Ø 0,5 ÷ 2 5 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 175
	FC 220 53 .. SM500	Z2	R	20°		Ø 0,5 ÷ 2 7 x Ø codolo Ø 4	N/mm2 <850-1200	HRC <60	pag. 177
	FC 220 54 .. SM500	Z2	R	20°		Ø 0,8 ÷ 2 10 x Ø codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 179
	FC 220 55 .. SM500	Z2	R	20°		Ø 1 ÷ 2 15 x Ø codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 181

Microfrese per nervature con testa torica - *Corner radius miniatures for Rib*

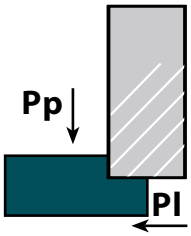
	FC 204 31 .. SM500	Z2	R	20°		Ø 1 ÷ 2 angle 0,9° codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 183
	FC 204 32 .. SM500	Z2	R	20°		Ø 1 ÷ 2 angle 0,9° codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 183
	FC 204 33 .. SM500	Z2	R	20°		Ø 1 ÷ 2 angle 0,9° codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 183

Microfrese per nervature con testa semisferica - *Ball nose miniatures for Rib*

	FC 220 31 .. SM500	Z2	R	20°		Ø 1 ÷ 2 angle 0,9° codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 185
	FC 220 32 .. SM500	Z2	R	20°		Ø 1 ÷ 2 angle 0,9° codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 185
	FC 220 33 .. SM500	Z2	R	20°		Ø 1 ÷ 2 angle 0,9° codolo Ø 6	N/mm2 <850-1200	HRC <60	pag. 185

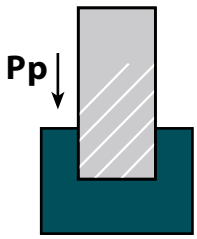
FC 201 51 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	180	0,015	0,03	0,15	55.000	1.650
	0,8	2	180	0,020	0,04	0,20	55.000	2.200
	1,0	2	180	0,025	0,05	0,25	55.000	2.750
	1,2	2	180	0,030	0,07	0,30	47.771	2.866
	1,5	2	180	0,035	0,10	0,40	38.217	2.675
	2,0	2	180	0,045	0,12	0,50	28.662	2.580
HRC 30-42	0,5	2	170	0,015	0,03	0,15	55.000	1.650
	0,8	2	170	0,020	0,04	0,20	55.000	2.200
	1,0	2	170	0,025	0,05	0,25	54.140	2.707
	1,2	2	170	0,030	0,07	0,30	45.117	2.707
	1,5	2	170	0,035	0,10	0,40	36.093	2.527
	2,0	2	170	0,045	0,12	0,50	27.070	2.436
HRC 42-48	0,5	2	140	0,010	0,03	0,15	55.000	1.100
	0,8	2	140	0,015	0,04	0,20	55.000	1.650
	1,0	2	140	0,020	0,05	0,25	44.586	1.783
	1,2	2	140	0,025	0,07	0,30	37.155	1.858
	1,5	2	140	0,030	0,10	0,40	29.724	1.783
	2,0	2	140	0,040	0,12	0,50	22.293	1.783
HRC 48-52	0,5	2	120	0,010	0,03	0,15	55.000	1.100
	0,8	2	120	0,015	0,04	0,20	47.771	1.433
	1,0	2	120	0,020	0,05	0,25	38.217	1.529
	1,2	2	120	0,025	0,07	0,30	31.847	1.592
	1,5	2	120	0,030	0,10	0,40	25.478	1.529
	2,0	2	120	0,040	0,12	0,50	19.108	1.529
HRC 52-60	0,5	2	80	0,005	0,03	0,15	50.955	510
	0,8	2	80	0,010	0,04	0,20	31.847	637
	1,0	2	80	0,015	0,05	0,25	25.478	764
	1,2	2	80	0,020	0,07	0,30	21.231	849
	1,5	2	80	0,025	0,10	0,40	16.985	849
	2,0	2	80	0,035	0,12	0,50	12.739	892

SM 500



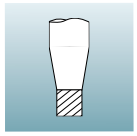
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	160	0,010	0,03	0,6	55.000	1.100
	0,8	2	160	0,015	0,05	0,8	55.000	1.650
	1,0	2	160	0,020	0,07	1,0	50.955	2.038
	1,2	2	160	0,025	0,10	1,2	42.463	2.123
	1,5	2	160	0,030	0,13	1,5	33.970	2.038
	2,0	2	160	0,040	0,16	2,0	25.478	2.038
HRC 30-42	0,5	2	140	0,010	0,03	0,6	55.000	1.100
	0,8	2	140	0,015	0,05	0,8	55.000	1.650
	1,0	2	140	0,020	0,07	1,0	44.586	1.783
	1,2	2	140	0,025	0,10	1,2	37.155	1.858
	1,5	2	140	0,030	0,13	1,5	29.724	1.783
	2,0	2	140	0,040	0,16	2,0	22.293	1.783
HRC 42-48	0,5	2	120	0,007	0,03	0,6	55.000	770
	0,8	2	120	0,012	0,05	0,8	47.771	1.146
	1,0	2	120	0,018	0,07	1,0	38.217	1.376
	1,2	2	120	0,022	0,10	1,2	31.847	1.401
	1,5	2	120	0,027	0,13	1,5	25.478	1.376
	2,0	2	120	0,035	0,16	2,0	19.108	1.338
HRC 48-52	0,5	2	100	0,007	0,03	0,6	55.000	770
	0,8	2	100	0,012	0,05	0,8	39.809	955
	1,0	2	100	0,018	0,07	1,0	31.847	1.146
	1,2	2	100	0,022	0,10	1,2	26.539	1.168
	1,5	2	100	0,027	0,13	1,5	21.231	1.146
	2,0	2	100	0,035	0,16	2,0	15.924	1.115
HRC 52-60	0,5	2	60	0,005	0,03	0,6	38.217	382
	0,8	2	60	0,010	0,05	0,8	23.885	478
	1,0	2	60	0,015	0,07	1,0	19.108	573
	1,2	2	60	0,020	0,10	1,2	15.924	637
	1,5	2	60	0,025	0,13	1,5	12.739	637
	2,0	2	60	0,030	0,16	2,0	9.554	573

Microfrese con testa piana
Square miniatures

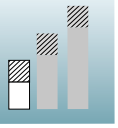
90°

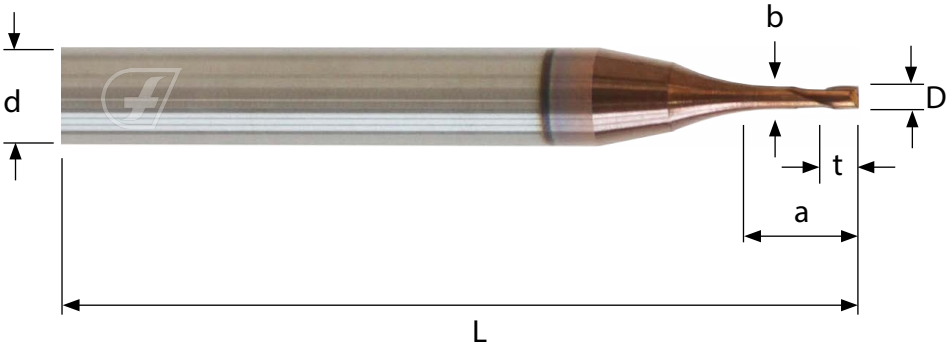
3 x Ø
codolo Ø 4

HM
ULTRA
FINE



Z2





Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

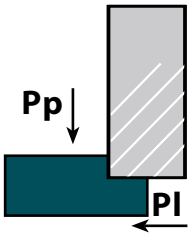
HRC
48-52

HRC
52-60

dimensions mm								code	quality
Dh8	L	t	dh6	a	b	*Helix*	*radius*		SM 500
0,5	51	0,6	4	1,5	0,46	20°	-	FC 201 51 0,5	★
0,8	51	1,0	4	2,4	0,75	20°	-	FC 201 51 0,8	★
1,0	51	1,2	4	3,0	0,95	20°	-	FC 201 51 1,0	★
1,2	51	1,4	4	3,6	1,15	20°	-	FC 201 51 1,2	★
1,5	51	1,7	4	4,5	1,45	20°	-	FC 201 51 1,5	★
2,0	51	2,4	4	6,0	1,95	20°	-	FC 201 51 2,0	★

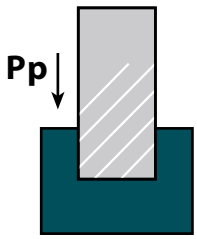
FC 201 52 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	180	0,015	0,03	0,15	55.000	1.650
	0,8	2	180	0,020	0,04	0,20	55.000	2.200
	1,0	2	180	0,025	0,05	0,25	55.000	2.750
	1,2	2	180	0,030	0,07	0,30	47.771	2.866
	1,5	2	180	0,035	0,10	0,40	38.217	2.675
	2,0	2	180	0,045	0,12	0,50	28.662	2.580
HRC 30-42	0,5	2	170	0,015	0,03	0,15	55.000	1.650
	0,8	2	170	0,020	0,04	0,20	55.000	2.200
	1,0	2	170	0,025	0,05	0,25	54.140	2.707
	1,2	2	170	0,030	0,07	0,30	45.117	2.707
	1,5	2	170	0,035	0,10	0,40	36.093	2.527
	2,0	2	170	0,045	0,12	0,50	27.070	2.436
HRC 42-48	0,5	2	140	0,010	0,03	0,15	55.000	1.100
	0,8	2	140	0,015	0,04	0,20	55.000	1.650
	1,0	2	140	0,020	0,05	0,25	44.586	1.783
	1,2	2	140	0,025	0,07	0,30	37.155	1.858
	1,5	2	140	0,030	0,10	0,40	29.724	1.783
	2,0	2	140	0,040	0,12	0,50	22.293	1.783
HRC 48-52	0,5	2	120	0,010	0,03	0,15	55.000	1.100
	0,8	2	120	0,015	0,04	0,20	47.771	1.433
	1,0	2	120	0,020	0,05	0,25	38.217	1.529
	1,2	2	120	0,025	0,07	0,30	31.847	1.592
	1,5	2	120	0,030	0,10	0,40	25.478	1.529
	2,0	2	120	0,040	0,12	0,50	19.108	1.529
HRC 52-60	0,5	2	80	0,005	0,03	0,15	50.955	510
	0,8	2	80	0,010	0,04	0,20	31.847	637
	1,0	2	80	0,015	0,05	0,25	25.478	764
	1,2	2	80	0,020	0,07	0,30	21.231	849
	1,5	2	80	0,025	0,10	0,40	16.985	849
	2,0	2	80	0,035	0,12	0,50	12.739	892

SM 500



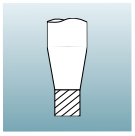
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	160	0,010	0,03	0,6	55.000	1.100
	0,8	2	160	0,015	0,05	0,8	55.000	1.650
	1,0	2	160	0,020	0,07	1,0	50.955	2.038
	1,2	2	160	0,025	0,10	1,2	42.463	2.123
	1,5	2	160	0,030	0,13	1,5	33.970	2.038
	2,0	2	160	0,040	0,16	2,0	25.478	2.038
HRC 30-42	0,5	2	140	0,010	0,03	0,6	55.000	1.100
	0,8	2	140	0,015	0,05	0,8	55.000	1.650
	1,0	2	140	0,020	0,07	1,0	44.586	1.783
	1,2	2	140	0,025	0,10	1,2	37.155	1.858
	1,5	2	140	0,030	0,13	1,5	29.724	1.783
	2,0	2	140	0,040	0,16	2,0	22.293	1.783
HRC 42-48	0,5	2	120	0,007	0,03	0,6	55.000	770
	0,8	2	120	0,012	0,05	0,8	47.771	1.146
	1,0	2	120	0,018	0,07	1,0	38.217	1.376
	1,2	2	120	0,022	0,10	1,2	31.847	1.401
	1,5	2	120	0,027	0,13	1,5	25.478	1.376
	2,0	2	120	0,035	0,16	2,0	19.108	1.338
HRC 48-52	0,5	2	100	0,007	0,03	0,6	55.000	770
	0,8	2	100	0,012	0,05	0,8	39.809	955
	1,0	2	100	0,018	0,07	1,0	31.847	1.146
	1,2	2	100	0,022	0,10	1,2	26.539	1.168
	1,5	2	100	0,027	0,13	1,5	21.231	1.146
	2,0	2	100	0,035	0,16	2,0	15.924	1.115
HRC 52-60	0,5	2	60	0,005	0,03	0,6	38.217	382
	0,8	2	60	0,010	0,05	0,8	23.885	478
	1,0	2	60	0,015	0,07	1,0	19.108	573
	1,2	2	60	0,020	0,10	1,2	15.924	637
	1,5	2	60	0,025	0,13	1,5	12.739	637
	2,0	2	60	0,030	0,16	2,0	9.554	573

Microfrese con testa piana
Square miniatures

90°

5 x Ø
codolo Ø 4

HM
ULTRA
FINE



Z2

Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

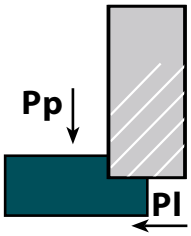
HRC
48-52

HRC
52-60

dimensions mm								*code*	*quality*
Dh8	L	t	dh6	a	b	*Helix*	*radius*		SM 500
0,5	51	0,6	4	2,5	0,46	20°	-	FC 201 52 0,5	★
0,8	51	1,0	4	4,0	0,75	20°	-	FC 201 52 0,8	★
1,0	51	1,2	4	5,0	0,95	20°	-	FC 201 52 1,0	★
1,2	51	1,4	4	6,0	1,15	20°	-	FC 201 52 1,2	★
1,5	51	1,7	4	7,5	1,45	20°	-	FC 201 52 1,5	★
2,0	51	2,4	4	10	1,95	20°	-	FC 201 52 2,0	★

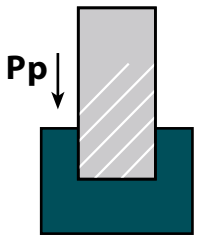
FC 201 53 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	180	0,015	0,02	0,10	55.000	1.650
	0,8	2	180	0,020	0,03	0,12	55.000	2.200
	1,0	2	180	0,025	0,04	0,15	55.000	2.750
	1,2	2	180	0,030	0,05	0,20	47.771	2.866
	1,5	2	180	0,035	0,06	0,30	38.217	2.675
	2,0	2	180	0,045	0,08	0,40	28.662	2.580
HRC 30-42	0,5	2	170	0,015	0,02	0,10	55.000	1.650
	0,8	2	170	0,020	0,03	0,12	55.000	2.200
	1,0	2	170	0,025	0,04	0,15	54.140	2.707
	1,2	2	170	0,030	0,05	0,20	45.117	2.707
	1,5	2	170	0,035	0,06	0,30	36.093	2.527
	2,0	2	170	0,045	0,08	0,40	27.070	2.436
HRC 42-48	0,5	2	140	0,010	0,02	0,10	55.000	1.100
	0,8	2	140	0,015	0,03	0,12	55.732	1.672
	1,0	2	140	0,020	0,04	0,15	44.586	1.783
	1,2	2	140	0,025	0,05	0,20	37.155	1.858
	1,5	2	140	0,030	0,06	0,30	29.724	1.783
	2,0	2	140	0,040	0,08	0,40	22.293	1.783
HRC 48-52	0,5	2	120	0,010	0,02	0,10	55.000	1.100
	0,8	2	120	0,015	0,03	0,12	47.771	1.433
	1,0	2	120	0,020	0,04	0,15	38.217	1.529
	1,2	2	120	0,025	0,05	0,20	31.847	1.592
	1,5	2	120	0,030	0,06	0,30	25.478	1.529
	2,0	2	120	0,040	0,08	0,40	19.108	1.529
HRC 52-60	0,5	2	80	0,005	0,02	0,10	50.955	510
	0,8	2	80	0,010	0,03	0,12	31.847	637
	1,0	2	80	0,015	0,04	0,15	25.478	764
	1,2	2	80	0,020	0,05	0,20	21.231	849
	1,5	2	80	0,025	0,06	0,30	16.985	849
	2,0	2	80	0,035	0,08	0,40	12.739	892

SM 500



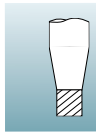
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	160	0,010	0,02	0,6	55.000	1.100
	0,8	2	160	0,015	0,03	0,8	55.000	1.650
	1,0	2	160	0,020	0,04	1,0	50.955	2.038
	1,2	2	160	0,025	0,07	1,2	42.463	2.123
	1,5	2	160	0,030	0,10	1,5	33.970	2.038
	2,0	2	160	0,040	0,12	2,0	25.478	2.038
HRC 30-42	0,5	2	140	0,010	0,02	0,6	55.000	1.100
	0,8	2	140	0,015	0,03	0,8	55.000	1.650
	1,0	2	140	0,020	0,04	1,0	44.586	1.783
	1,2	2	140	0,025	0,07	1,2	37.155	1.858
	1,5	2	140	0,030	0,10	1,5	29.724	1.783
	2,0	2	140	0,040	0,12	2,0	22.293	1.783
HRC 42-48	0,5	2	120	0,007	0,02	0,6	55.000	770
	0,8	2	120	0,012	0,03	0,8	47.771	1.146
	1,0	2	120	0,018	0,04	1,0	38.217	1.376
	1,2	2	120	0,022	0,07	1,2	31.847	1.401
	1,5	2	120	0,027	0,10	1,5	25.478	1.376
	2,0	2	120	0,035	0,12	2,0	19.108	1.338
HRC 48-52	0,5	2	100	0,007	0,02	0,6	55.000	770
	0,8	2	100	0,012	0,03	0,8	39.809	955
	1,0	2	100	0,018	0,04	1,0	31.847	1.146
	1,2	2	100	0,022	0,07	1,2	26.539	1.168
	1,5	2	100	0,027	0,10	1,5	21.231	1.146
	2,0	2	100	0,035	0,12	2,0	15.924	1.115
HRC 52-60	0,5	2	60	0,005	0,02	0,6	38.217	382
	0,8	2	60	0,010	0,03	0,8	23.885	478
	1,0	2	60	0,015	0,04	1,0	19.108	573
	1,2	2	60	0,020	0,07	1,2	15.924	637
	1,5	2	60	0,025	0,10	1,5	12.739	637
	2,0	2	60	0,030	0,12	2,0	9.554	573

Microfrese con testa piana
Square miniatures

90°

7 x Ø
codolo Ø 4

HM
ULTRA
FINE



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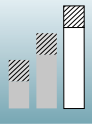
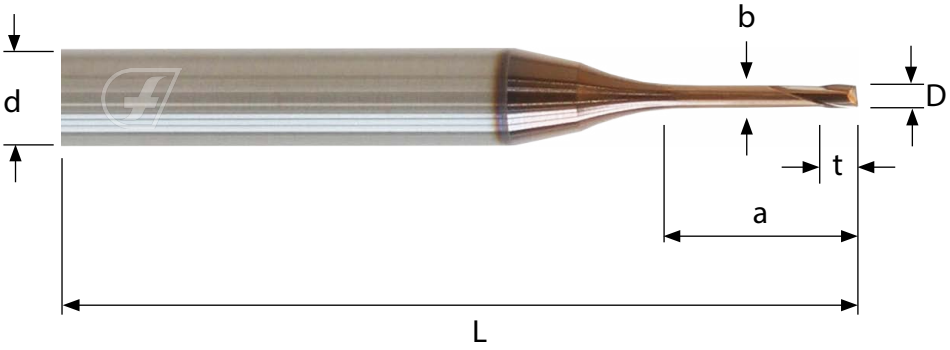




Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

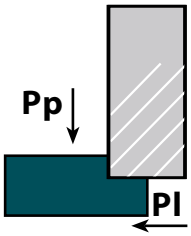
HRC
48-52

HRC
52-60

dimensions mm								code	quality
Dh8	L	t	dh6	a	b	*Helix*	*radius*		SM 500
0,5	51	0,6	4	3,5	0,46	20°	-	FC 201 53 0,5	★
0,8	51	1,0	4	5,6	0,75	20°	-	FC 201 53 0,8	★
1,0	51	1,2	4	7,0	0,95	20°	-	FC 201 53 1,0	★
1,2	51	1,4	4	8,4	1,15	20°	-	FC 201 53 1,2	★
1,5	51	1,7	4	10,5	1,45	20°	-	FC 201 53 1,5	★
2,0	51	2,4	4	14,0	1,95	20°	-	FC 201 53 2,0	★

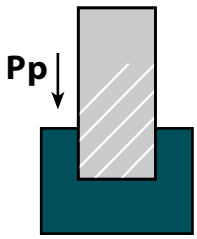
FC 201 54 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,8	2	180	0,020	0,02	0,10	55.000	2.200
	1,0	2	180	0,025	0,03	0,13	55.000	2.750
	1,2	2	180	0,030	0,04	0,18	47.771	2.866
	1,5	2	180	0,035	0,05	0,28	38.217	2.675
	2,0	2	180	0,045	0,07	0,36	28.662	2.580
HRC 30-42	0,8	2	170	0,020	0,02	0,10	55.000	2.200
	1,0	2	170	0,025	0,03	0,13	54.140	2.707
	1,2	2	170	0,030	0,04	0,18	45.117	2.707
	1,5	2	170	0,035	0,05	0,28	36.093	2.527
	2,0	2	170	0,045	0,07	0,36	27.070	2.436
HRC 42-48	0,8	2	140	0,015	0,02	0,10	55.000	1.650
	1,0	2	140	0,020	0,03	0,13	44.586	1.783
	1,2	2	140	0,025	0,04	0,18	37.155	1.858
	1,5	2	140	0,030	0,05	0,28	29.724	1.783
	2,0	2	140	0,040	0,07	0,36	22.293	1.783
HRC 48-52	0,8	2	120	0,015	0,02	0,10	47.771	1.433
	1,0	2	120	0,020	0,03	0,13	38.217	1.529
	1,2	2	120	0,025	0,04	0,18	31.847	1.592
	1,5	2	120	0,030	0,05	0,28	25.478	1.529
	2,0	2	120	0,040	0,07	0,36	19.108	1.529
HRC 52-60	0,8	2	80	0,010	0,02	0,10	31.847	637
	1,0	2	80	0,015	0,03	0,13	25.478	764
	1,2	2	80	0,020	0,04	0,18	21.231	849
	1,5	2	80	0,025	0,05	0,28	16.985	849
	2,0	2	80	0,035	0,07	0,36	12.739	892

SM 500



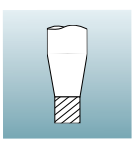
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,8	2	160	0,015	0,02	0,8	55.000	1.650
	1,0	2	160	0,020	0,03	1,0	50.955	2.038
	1,2	2	160	0,025	0,06	1,2	42.463	2.123
	1,5	2	160	0,030	0,08	1,5	33.970	2.038
	2,0	2	160	0,040	0,10	2,0	25.478	2.038
HRC 30-42	0,8	2	140	0,015	0,02	0,8	55.000	1.650
	1,0	2	140	0,020	0,03	1,0	44.586	1.783
	1,2	2	140	0,025	0,06	1,2	37.155	1.858
	1,5	2	140	0,030	0,08	1,5	29.724	1.783
	2,0	2	140	0,040	0,10	2,0	22.293	1.783
HRC 42-48	0,8	2	120	0,012	0,02	0,8	47.771	1.146
	1,0	2	120	0,018	0,03	1,0	38.217	1.376
	1,2	2	120	0,022	0,06	1,2	31.847	1.401
	1,5	2	120	0,027	0,08	1,5	25.478	1.376
	2,0	2	120	0,035	0,10	2,0	19.108	1.338
HRC 48-52	0,8	2	100	0,012	0,02	0,8	39.809	955
	1,0	2	100	0,018	0,03	1,0	31.847	1.146
	1,2	2	100	0,022	0,06	1,2	26.539	1.168
	1,5	2	100	0,027	0,08	1,5	21.231	1.146
	2,0	2	100	0,035	0,10	2,0	15.924	1.115
HRC 52-60	0,8	2	60	0,010	0,02	0,8	23.885	478
	1,0	2	60	0,015	0,03	1,0	19.108	573
	1,2	2	60	0,020	0,06	1,2	15.924	637
	1,5	2	60	0,025	0,08	1,5	12.739	637
	2,0	2	60	0,030	0,10	2,0	9.554	573

Microfrese con testa piana
Square miniatures

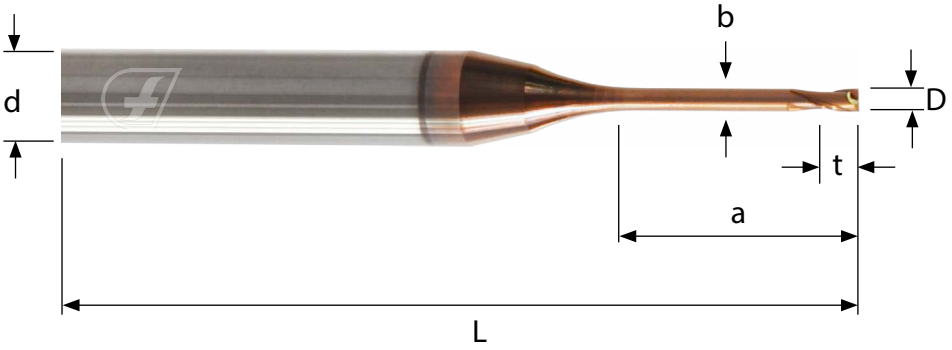
90°

10 x Ø
codolo Ø 6

HM
ULTRA
FINE



Z2



Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

HRC
48-52

HRC
52-60

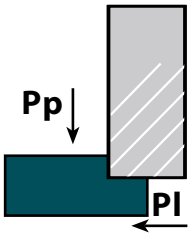
dimensions mm								code	quality
Dh8	**L**	t	dh6	a	b	*Helix*	*radius*		SM 500
0,8	64	1,0	6	8	0,75	20°	-	FC 201 54 0,8	★
1,0	64	1,2	6	10	0,95	20°	-	FC 201 54 1,0	★
1,2	64	1,4	6	12	1,15	20°	-	FC 201 54 1,2	★
1,5	64	1,7	6	15	1,45	20°	-	FC 201 54 1,5	★
2,0	80	2,4	6	20	1,95	20°	-	FC 201 54 2,0	★

Qualità HM
HM Quality pag. 25

★ Pronto
Ready

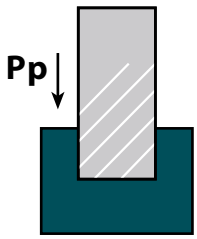
FC 201 55 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	180	0,025	0,02	0,11	55.000	2.750
	1,2	2	180	0,030	0,03	0,15	47.771	2.866
	1,5	2	180	0,035	0,04	0,25	38.217	2.675
	2,0	2	180	0,045	0,06	0,33	28.662	2.580
HRC 30-42	1,0	2	170	0,025	0,02	0,11	54.140	2.707
	1,2	2	170	0,030	0,03	0,15	45.117	2.707
	1,5	2	170	0,035	0,04	0,25	36.093	2.527
	2,0	2	170	0,045	0,06	0,33	27.070	2.436
HRC 42-48	1,0	2	140	0,020	0,02	0,11	44.586	1.783
	1,2	2	140	0,025	0,03	0,15	37.155	1.858
	1,5	2	140	0,030	0,04	0,25	29.724	1.783
	2,0	2	140	0,040	0,06	0,33	22.293	1.783
HRC 48-52	1,0	2	120	0,020	0,02	0,11	38.217	1.529
	1,2	2	120	0,025	0,03	0,15	31.847	1.592
	1,5	2	120	0,030	0,04	0,25	25.478	1.529
	2,0	2	120	0,040	0,06	0,33	19.108	1.529
HRC 52-60	1,0	2	80	0,015	0,02	0,11	25.478	764
	1,2	2	80	0,020	0,03	0,15	21.231	849
	1,5	2	80	0,025	0,04	0,25	16.985	849
	2,0	2	80	0,035	0,06	0,33	12.739	892

SM 500



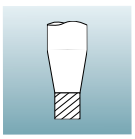
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	160	0,020	0,03	1,0	50.955	2.038
	1,2	2	160	0,025	0,05	1,2	42.463	2.123
	1,5	2	160	0,030	0,07	1,5	33.970	2.038
	2,0	2	160	0,040	0,09	2,0	25.478	2.038
HRC 30-42	1,0	2	140	0,020	0,03	1,0	44.586	1.783
	1,2	2	140	0,025	0,05	1,2	37.155	1.858
	1,5	2	140	0,030	0,07	1,5	29.724	1.783
	2,0	2	140	0,040	0,09	2,0	22.293	1.783
HRC 42-48	1,0	2	120	0,018	0,03	1,0	38.217	1.376
	1,2	2	120	0,022	0,05	1,2	31.847	1.401
	1,5	2	120	0,027	0,07	1,5	25.478	1.376
	2,0	2	120	0,035	0,09	2,0	19.108	1.338
HRC 48-52	1,0	2	100	0,018	0,03	1,0	31.847	1.146
	1,2	2	100	0,022	0,05	1,2	26.539	1.168
	1,5	2	100	0,027	0,07	1,5	21.231	1.146
	2,0	2	100	0,035	0,09	2,0	15.924	1.115
HRC 52-60	1,0	2	60	0,015	0,03	1,0	19.108	573
	1,2	2	60	0,020	0,05	1,2	15.924	637
	1,5	2	60	0,025	0,07	1,5	12.739	637
	2,0	2	60	0,030	0,09	2,0	9.554	573

Microfrese con testa piana
Square miniatures

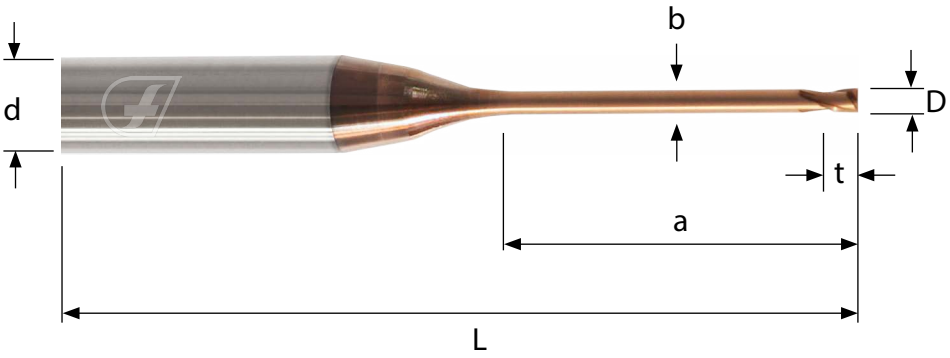
90°

15 x Ø
codolo Ø 6

HM
ULTRA
FINE



Z2



Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

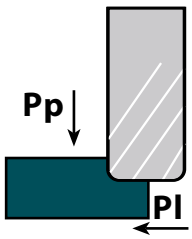
HRC
48-52

HRC
52-60

dimensions mm								code	quality
Dh8	**L**	t	dh6	a	b	*Helix*	*radius*		SM 500
1,0	64	1,2	6	15,0	0,95	20°	-	FC 201 55 1,0	★
1,2	64	1,4	6	18,0	1,15	20°	-	FC 201 55 1,2	★
1,5	80	1,7	6	22,5	1,45	20°	-	FC 201 55 1,5	★
2,0	80	2,4	6	30,0	1,95	20°	-	FC 201 55 2,0	★

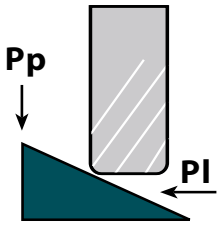
FC 204 51 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	180	0,019	0,03	0,07	55.000	2.090
	0,8	2	180	0,025	0,04	0,10	55.000	2.750
	1,0	2	180	0,030	0,06	0,13	55.000	3.300
	1,2	2	180	0,040	0,09	0,18	47.771	3.822
	1,5	2	180	0,050	0,11	0,28	38.217	3.822
	2,0	2	180	0,060	0,14	0,36	28.662	3.439
HRC 30-42	0,5	2	170	0,019	0,03	0,07	55.000	2.090
	0,8	2	170	0,025	0,04	0,10	55.000	2.750
	1,0	2	170	0,030	0,06	0,13	54.140	3.248
	1,2	2	170	0,040	0,09	0,18	45.117	3.609
	1,5	2	170	0,050	0,11	0,28	36.093	3.609
	2,0	2	170	0,060	0,14	0,36	27.070	3.248
HRC 42-48	0,5	2	140	0,014	0,03	0,07	55.000	1.540
	0,8	2	140	0,018	0,04	0,10	55.000	1.980
	1,0	2	140	0,022	0,06	0,13	44.586	1.962
	1,2	2	140	0,028	0,09	0,18	37.155	2.081
	1,5	2	140	0,035	0,11	0,28	29.724	2.081
	2,0	2	140	0,045	0,14	0,36	22.293	2.006
HRC 48-52	0,5	2	120	0,010	0,02	0,07	55.000	1.100
	0,8	2	120	0,015	0,04	0,10	47.771	1.433
	1,0	2	120	0,020	0,06	0,13	38.217	1.529
	1,2	2	120	0,025	0,09	0,18	31.847	1.592
	1,5	2	120	0,030	0,11	0,28	25.478	1.529
	2,0	2	120	0,040	0,14	0,36	19.108	1.529
HRC 52-60	0,5	2	80	0,010	0,02	0,07	50.955	1.019
	0,8	2	80	0,015	0,04	0,10	31.847	955
	1,0	2	80	0,018	0,06	0,13	25.478	917
	1,2	2	80	0,022	0,09	0,18	21.231	934
	1,5	2	80	0,028	0,11	0,28	16.985	951
	2,0	2	80	0,037	0,14	0,36	12.739	943

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	300	0,012	0,020	0,030	55.000	1.320
	0,8	2	300	0,016	0,030	0,030	55.000	1.760
	1,0	2	300	0,020	0,050	0,050	55.000	2.200
	1,2	2	300	0,024	0,060	0,060	55.000	2.640
	1,5	2	300	0,028	0,070	0,070	55.000	3.080
	2,0	2	300	0,032	0,090	0,090	47.771	3.057
HRC 30-42	0,5	2	300	0,012	0,020	0,030	55.000	1.320
	0,8	2	300	0,016	0,030	0,030	55.000	1.760
	1,0	2	300	0,020	0,050	0,050	55.000	2.200
	1,2	2	300	0,024	0,060	0,060	55.000	2.640
	1,5	2	300	0,028	0,070	0,070	55.000	3.080
	2,0	2	300	0,032	0,090	0,090	47.771	3.057
HRC 42-48	0,5	2	280	0,011	0,020	0,030	55.000	1.210
	0,8	2	280	0,015	0,030	0,030	55.000	1.650
	1,0	2	280	0,017	0,050	0,050	55.000	1.870
	1,2	2	280	0,021	0,060	0,060	55.000	2.310
	1,5	2	280	0,025	0,070	0,070	55.000	2.750
	2,0	2	280	0,029	0,090	0,090	44.586	2.586
HRC 48-52	0,5	2	230	0,010	0,020	0,030	55.000	1.100
	0,8	2	230	0,014	0,030	0,030	55.000	1.540
	1,0	2	230	0,017	0,050	0,050	55.000	1.870
	1,2	2	230	0,020	0,060	0,060	55.000	2.200
	1,5	2	230	0,023	0,070	0,070	48.832	2.246
	2,0	2	230	0,026	0,090	0,090	36.624	1.904
HRC 52-60	0,5	2	170	0,008	0,020	0,030	55.000	880
	0,8	2	170	0,012	0,030	0,030	55.000	1.320
	1,0	2	170	0,015	0,050	0,050	54.140	1.624
	1,2	2	170	0,018	0,060	0,060	45.117	1.624
	1,5	2	170	0,021	0,070	0,070	36.093	1.516
	2,0	2	170	0,024	0,090	0,090	27.070	1.299

Tolleranza raggio mm / ***Radius tollerance mm***

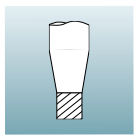
D	raggio *radius*	tolleranza *tollerance*
0,5	0,10	± 0,01
0,8	0,20	
1,0		
1,2		
1,5		
2,0		

Microfrese con testa torica
Corner radius miniatures

R

3 x Ø
codolo Ø 4

HM
ULTRA
FINE



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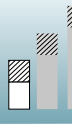
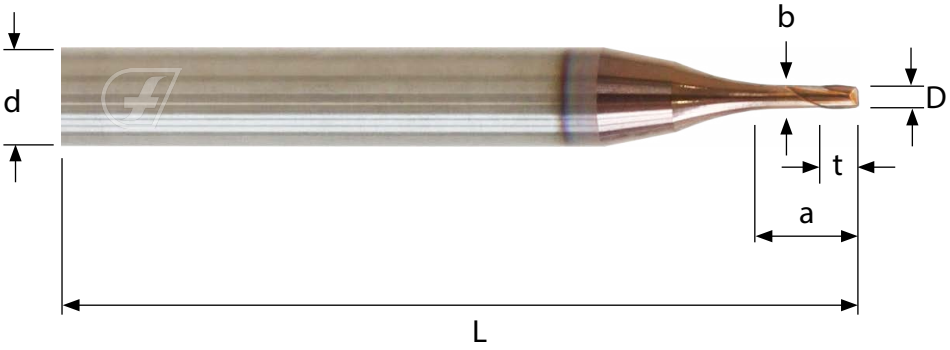




Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

HRC
48-52

HRC
52-60

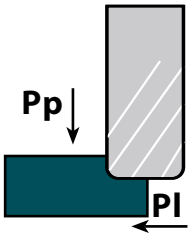
dimensions mm								*code*	*quality*
Dh8	L	t	dh6	a	b	*Helix*	***radius***		SM 500
0,5	51	0,6	4	1,5	0,46	20°	**0,1**	FC 204 51 0,5	★
0,8	51	1,0	4	2,4	0,75	20°	**0,2**	FC 204 51 0,8	★
1,0	51	1,2	4	3,0	0,95	20°	**0,2**	FC 204 51 1,0	★
1,2	51	1,4	4	3,6	1,15	20°	**0,2**	FC 204 51 1,2	★
1,5	51	1,7	4	4,5	1,45	20°	**0,2**	FC 204 51 1,5	★
2,0	51	2,4	4	6,0	1,95	20°	**0,2**	FC 204 51 2,0	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

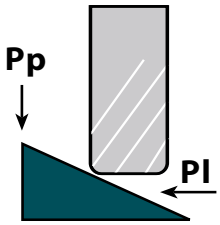
FC 204 52 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200 Air	0,5	2	180	0,015	0,02	0,08	55.000	1.650
	0,8	2	180	0,025	0,03	0,10	55.000	2.750
	1,0	2	180	0,030	0,04	0,13	55.000	3.300
	1,2	2	180	0,040	0,06	0,18	47.771	3.822
	1,5	2	180	0,050	0,09	0,28	38.217	3.822
	2,0	2	180	0,060	0,11	0,36	28.662	3.439
HRC 30-42 Air	0,5	2	170	0,015	0,02	0,08	55.000	1.650
	0,8	2	170	0,025	0,03	0,10	55.000	2.750
	1,0	2	170	0,030	0,04	0,13	54.140	3.248
	1,2	2	170	0,040	0,06	0,18	45.117	3.609
	1,5	2	170	0,050	0,09	0,28	36.093	3.609
	2,0	2	170	0,060	0,11	0,36	27.070	3.248
HRC 42-48 Air	0,5	2	140	0,013	0,02	0,08	55.000	1.430
	0,8	2	140	0,018	0,03	0,10	55.000	1.980
	1,0	2	140	0,022	0,04	0,13	44.586	1.962
	1,2	2	140	0,028	0,06	0,18	37.155	2.081
	1,5	2	140	0,035	0,09	0,28	29.724	2.081
	2,0	2	140	0,045	0,11	0,36	22.293	2.006
HRC 48-52 Air	0,5	2	120	0,010	0,02	0,08	55.000	1.100
	0,8	2	120	0,015	0,03	0,10	47.771	1.433
	1,0	2	120	0,020	0,04	0,13	38.217	1.529
	1,2	2	120	0,025	0,06	0,18	31.847	1.592
	1,5	2	120	0,030	0,09	0,28	25.478	1.529
	2,0	2	120	0,040	0,11	0,36	19.108	1.529
HRC 52-60 Air	0,5	2	80	0,010	0,02	0,08	50.955	1.019
	0,8	2	80	0,015	0,03	0,10	31.847	955
	1,0	2	80	0,018	0,04	0,13	25.478	917
	1,2	2	80	0,022	0,06	0,18	21.231	934
	1,5	2	80	0,028	0,09	0,28	16.985	951
	2,0	2	80	0,037	0,11	0,36	12.739	943

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200 Air	0,5	2	300	0,012	0,020	0,020	55.000	1.320
	0,8	2	300	0,016	0,025	0,025	55.000	1.760
	1,0	2	300	0,020	0,030	0,030	55.000	2.200
	1,2	2	300	0,024	0,040	0,040	55.000	2.640
	1,5	2	300	0,028	0,055	0,055	55.000	3.080
	2,0	2	300	0,032	0,075	0,075	47.771	3.057
HRC 30-42 Air	0,5	2	300	0,012	0,020	0,020	55.000	1.320
	0,8	2	300	0,016	0,025	0,025	55.000	1.760
	1,0	2	300	0,020	0,030	0,030	55.000	2.200
	1,2	2	300	0,024	0,040	0,040	55.000	2.640
	1,5	2	300	0,028	0,055	0,055	55.000	3.080
	2,0	2	300	0,032	0,075	0,075	47.771	3.057
HRC 42-48 Air	0,5	2	280	0,011	0,020	0,020	55.000	1.210
	0,8	2	280	0,015	0,025	0,025	55.000	1.650
	1,0	2	280	0,017	0,030	0,030	55.000	1.870
	1,2	2	280	0,021	0,040	0,040	55.000	2.310
	1,5	2	280	0,025	0,055	0,055	55.000	2.750
	2,0	2	280	0,029	0,075	0,075	44.586	2.586
HRC 48-52 Air	0,5	2	230	0,010	0,020	0,020	55.000	1.100
	0,8	2	230	0,014	0,025	0,025	55.000	1.540
	1,0	2	230	0,017	0,030	0,030	55.000	1.870
	1,2	2	230	0,020	0,040	0,040	55.000	2.200
	1,5	2	230	0,023	0,055	0,055	48.832	2.246
	2,0	2	230	0,026	0,075	0,075	36.624	1.904
HRC 52-60 Air	0,5	2	170	0,008	0,020	0,020	55.000	880
	0,8	2	170	0,012	0,025	0,025	55.000	1.320
	1,0	2	170	0,015	0,030	0,030	54.140	1.624
	1,2	2	170	0,018	0,040	0,040	45.117	1.624
	1,5	2	170	0,021	0,055	0,055	36.093	1.516
	2,0	2	170	0,024	0,075	0,075	27.070	1.299

Tolleranza raggio mm / ***Radius tollerance mm***

D	raggio *radius*	tolleranza *tollerance*
0,5	0,10	± 0,01
0,8	0,20	
1,0		
1,2		
1,5		
2,0		

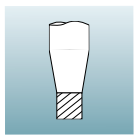
Microfrese con testa torica

Corner radius miniatures

R

5 x Ø
codolo Ø 4

HM
ULTRA
FINE



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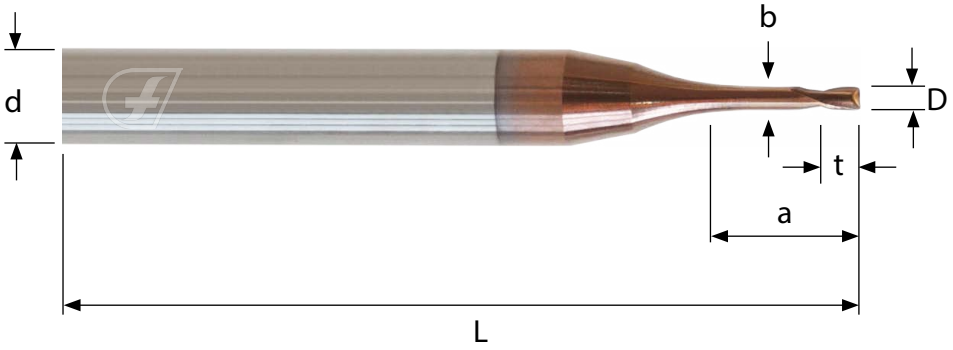


Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

HRC
48-52

HRC
52-60

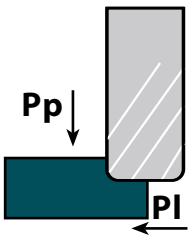
dimensions mm								*code*	*quality*
Dh8	L	t	dh6	a	b	*Helix*	***radius***		SM 500
0,5	51	0,6	4	2,5	0,46	20°	**0,1**	FC 204 52 0,5	★
0,8	51	1,0	4	4	0,75	20°	**0,2**	FC 204 52 0,8	★
1,0	51	1,2	4	5	0,95	20°	**0,2**	FC 204 52 1,0	★
1,2	51	1,4	4	6	1,15	20°	**0,2**	FC 204 52 1,2	★
1,5	51	1,7	4	7,5	1,45	20°	**0,2**	FC 204 52 1,5	★
2,0	51	2,4	4	10	1,95	20°	**0,2**	FC 204 52 2,0	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

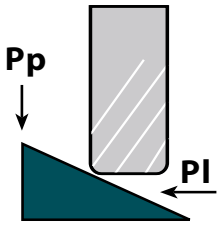
FC 204 53 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	180	0,015	0,02	0,06	55.000	1.650
	0,8	2	180	0,025	0,03	0,08	55.000	2.750
	1,0	2	180	0,030	0,04	0,11	55.000	3.300
	1,2	2	180	0,040	0,05	0,16	47.771	3.822
	1,5	2	180	0,050	0,08	0,26	38.217	3.822
	2,0	2	180	0,060	0,10	0,32	28.662	3.439
HRC 30-42	0,5	2	170	0,015	0,02	0,06	55.000	1.650
	0,8	2	170	0,025	0,03	0,08	55.000	2.750
	1,0	2	170	0,030	0,04	0,11	54.140	3.248
	1,2	2	170	0,040	0,05	0,16	45.117	3.609
	1,5	2	170	0,050	0,08	0,26	36.093	3.609
	2,0	2	170	0,060	0,10	0,32	27.070	3.248
HRC 42-48	0,5	2	140	0,013	0,02	0,06	55.000	1.430
	0,8	2	140	0,018	0,03	0,08	55.000	1.980
	1,0	2	140	0,022	0,04	0,11	44.586	1.962
	1,2	2	140	0,028	0,05	0,16	37.155	2.081
	1,5	2	140	0,035	0,08	0,26	29.724	2.081
	2,0	2	140	0,045	0,10	0,32	22.293	2.006
HRC 48-52	0,5	2	120	0,010	0,02	0,06	55.000	1.100
	0,8	2	120	0,015	0,03	0,08	47.771	1.433
	1,0	2	120	0,020	0,04	0,11	38.217	1.529
	1,2	2	120	0,025	0,05	0,16	31.847	1.592
	1,5	2	120	0,030	0,08	0,26	25.478	1.529
	2,0	2	120	0,040	0,10	0,32	19.108	1.529
HRC 52-60	0,5	2	80	0,010	0,02	0,06	50.955	1.019
	0,8	2	80	0,015	0,03	0,08	31.847	955
	1,0	2	80	0,018	0,04	0,11	25.478	917
	1,2	2	80	0,022	0,05	0,16	21.231	934
	1,5	2	80	0,028	0,08	0,26	16.985	951
	2,0	2	80	0,037	0,10	0,32	12.739	943

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	300	0,012	0,015	0,015	55.000	1.320
	0,8	2	300	0,016	0,020	0,020	55.000	1.760
	1,0	2	300	0,020	0,025	0,025	55.000	2.200
	1,2	2	300	0,024	0,030	0,030	55.000	2.640
	1,5	2	300	0,028	0,045	0,045	55.000	3.080
	2,0	2	300	0,032	0,065	0,065	47.771	3.057
HRC 30-42	0,5	2	300	0,012	0,015	0,015	55.000	1.320
	0,8	2	300	0,016	0,020	0,020	55.000	1.760
	1,0	2	300	0,020	0,025	0,025	55.000	2.200
	1,2	2	300	0,024	0,030	0,030	55.000	2.640
	1,5	2	300	0,028	0,045	0,045	55.000	3.080
	2,0	2	300	0,032	0,065	0,065	47.771	3.057
HRC 42-48	0,5	2	280	0,011	0,015	0,015	55.000	1.210
	0,8	2	280	0,015	0,020	0,020	55.000	1.650
	1,0	2	280	0,017	0,025	0,025	55.000	1.870
	1,2	2	280	0,021	0,030	0,030	55.000	2.310
	1,5	2	280	0,025	0,045	0,045	55.000	2.750
	2,0	2	280	0,029	0,065	0,065	44.586	2.586
HRC 48-52	0,5	2	230	0,010	0,015	0,015	55.000	1.100
	0,8	2	230	0,014	0,020	0,020	55.000	1.540
	1,0	2	230	0,017	0,025	0,025	55.000	1.870
	1,2	2	230	0,020	0,030	0,030	55.000	2.200
	1,5	2	230	0,023	0,045	0,045	48.832	2.246
	2,0	2	230	0,026	0,065	0,065	36.624	1.904
HRC 52-60	0,5	2	170	0,008	0,015	0,015	55.000	880
	0,8	2	170	0,012	0,020	0,020	55.000	1.320
	1,0	2	170	0,015	0,025	0,025	54.140	1.624
	1,2	2	170	0,018	0,030	0,030	45.117	1.624
	1,5	2	170	0,021	0,045	0,045	36.093	1.516
	2,0	2	170	0,024	0,065	0,065	27.070	1.299

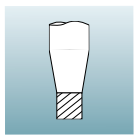
Tolleranza raggio mm / ***Radius tollerance mm***		
D	raggio *radius*	tolleranza *tollerance*
0,5	0,10	± 0,01
0,8 1,0 1,2 1,5 2,0	0,20	

Microfrese con testa torica
Corner radius miniatures

R

7 x Ø
codolo Ø 4

HM
ULTRA
FINE



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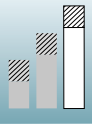
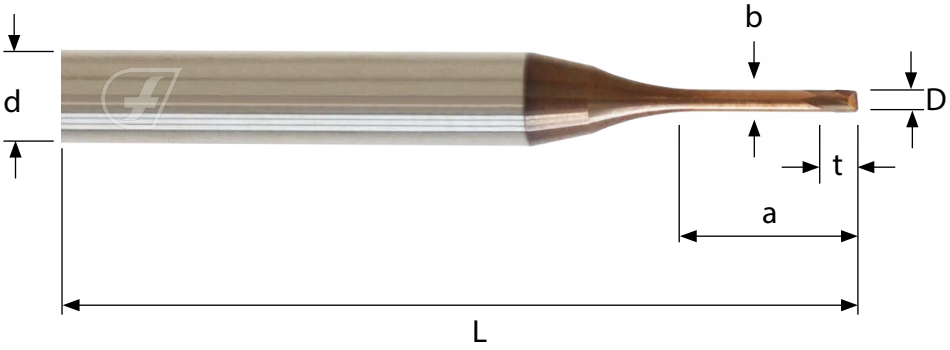




Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

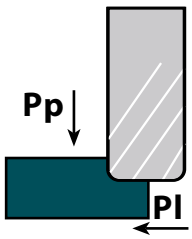
HRC
48-52

HRC
52-60

dimensions mm								*code*	*quality*
Dh8	L	t	dh6	a	b	*Helix*	***radius***		SM 500
0,5	51	0,6	4	3,5	0,46	20°	**0,1**	FC 204 53 0,5	★
0,8	51	1,0	4	5,6	0,75	20°	**0,2**	FC 204 53 0,8	★
1,0	51	1,2	4	7,0	0,95	20°	**0,2**	FC 204 53 1,0	★
1,2	51	1,4	4	8,4	1,15	20°	**0,2**	FC 204 53 1,2	★
1,5	51	1,7	4	10,5	1,45	20°	**0,2**	FC 204 53 1,5	★
2,0	51	2,4	4	14,0	1,95	20°	**0,2**	FC 204 53 2,0	★

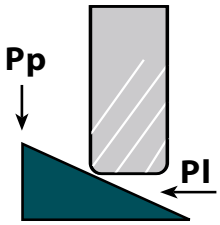
FC 204 54 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,8	2	180	0,025	0,03	0,08	55.000	2.750
	1,0	2	180	0,030	0,04	0,10	55.000	3.300
	1,2	2	180	0,040	0,05	0,14	47.771	3.822
	1,5	2	180	0,050	0,07	0,24	38.217	3.822
	2,0	2	180	0,060	0,09	0,30	28.662	3.439
HRC 30-42	0,8	2	170	0,025	0,03	0,08	55.000	2.750
	1,0	2	170	0,030	0,04	0,10	54.140	3.248
	1,2	2	170	0,040	0,05	0,14	45.117	3.609
	1,5	2	170	0,050	0,07	0,24	36.093	3.609
	2,0	2	170	0,060	0,09	0,30	27.070	3.248
HRC 42-48	0,8	2	140	0,018	0,03	0,08	55.000	1.980
	1,0	2	140	0,022	0,04	0,10	44.586	1.962
	1,2	2	140	0,028	0,05	0,14	37.155	2.081
	1,5	2	140	0,035	0,07	0,24	29.724	2.081
	2,0	2	140	0,045	0,09	0,30	22.293	2.006
HRC 48-52	0,8	2	120	0,015	0,03	0,08	47.771	1.433
	1,0	2	120	0,020	0,04	0,10	38.217	1.529
	1,2	2	120	0,025	0,05	0,14	31.847	1.592
	1,5	2	120	0,030	0,07	0,24	25.478	1.529
	2,0	2	120	0,040	0,09	0,30	19.108	1.529
HRC 52-60	0,8	2	80	0,015	0,03	0,08	31.847	955
	1,0	2	80	0,018	0,04	0,10	25.478	917
	1,2	2	80	0,022	0,05	0,14	21.231	934
	1,5	2	80	0,028	0,07	0,24	16.985	951
	2,0	2	80	0,037	0,09	0,30	12.739	943

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,8	2	300	0,016	0,015	0,015	55.000	1.760
	1,0	2	300	0,020	0,020	0,020	55.000	2.200
	1,2	2	300	0,024	0,025	0,025	55.000	2.640
	1,5	2	300	0,028	0,040	0,040	55.000	3.080
	2,0	2	300	0,032	0,055	0,055	47.771	3.057
HRC 30-42	0,8	2	300	0,016	0,015	0,015	55.000	1.760
	1,0	2	300	0,020	0,020	0,020	55.000	2.200
	1,2	2	300	0,024	0,025	0,025	55.000	2.640
	1,5	2	300	0,028	0,040	0,040	55.000	3.080
	2,0	2	300	0,032	0,055	0,055	47.771	3.057
HRC 42-48	0,8	2	280	0,015	0,015	0,015	55.000	1.650
	1,0	2	280	0,017	0,020	0,020	55.000	1.870
	1,2	2	280	0,021	0,025	0,025	55.000	2.310
	1,5	2	280	0,025	0,040	0,040	55.000	2.750
	2,0	2	280	0,029	0,055	0,055	44.586	2.586
HRC 48-52	0,8	2	230	0,014	0,015	0,015	55.000	1.540
	1,0	2	230	0,017	0,020	0,020	55.000	1.870
	1,2	2	230	0,020	0,025	0,025	55.000	2.200
	1,5	2	230	0,023	0,040	0,040	48.832	2.246
	2,0	2	230	0,026	0,055	0,055	36.624	1.904
HRC 52-60	0,8	2	170	0,012	0,015	0,015	55.000	1.320
	1,0	2	170	0,015	0,020	0,020	54.140	1.624
	1,2	2	170	0,018	0,025	0,025	45.117	1.624
	1,5	2	170	0,021	0,040	0,040	36.093	1.516
	2,0	2	170	0,024	0,055	0,055	27.070	1.299

Tolleranza raggio mm / ***Radius tollerance mm***

D	raggio *radius*	tolleranza *tollerance*
0,8 1,0 1,2 1,5 2,0	0,20	± 0,01

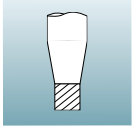
Microfrese con testa torica

Corner radius miniatures

R

10 x Ø
codolo Ø 6

HM
ULTRA
FINE



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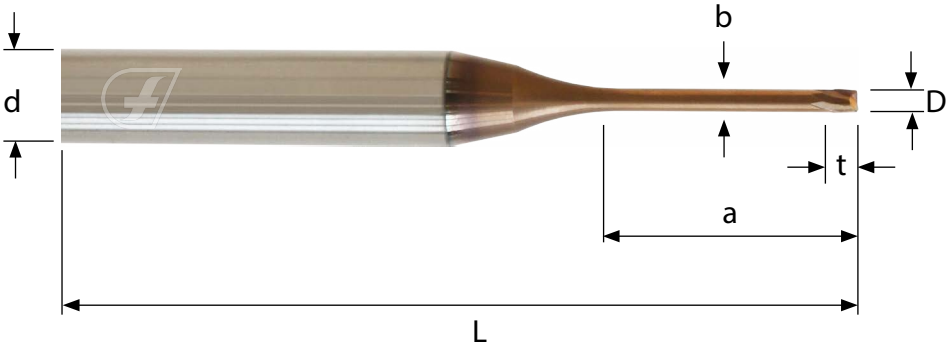


Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

HRC
48-52

HRC
52-60

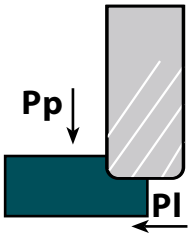
dimensions mm								*code*	*quality*
Dh8	L	t	dh6	a	b	*Helix*	***radius***		SM 500
0,8	64	1,0	6	8	0,75	20°	**0,2**	FC 204 54 0,8	★
1,0	64	1,2	6	10	0,95	20°	**0,2**	FC 204 54 1,0	★
1,2	64	1,4	6	12	1,15	20°	**0,2**	FC 204 54 1,2	★
1,5	64	1,7	6	15	1,45	20°	**0,2**	FC 204 54 1,5	★
2,0	80	2,4	6	20	1,95	20°	**0,2**	FC 204 54 2,0	★

Qualità HM
HM Quality
pag. 25

★ Pronto
Ready

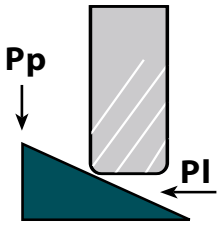
FC 204 55 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	180	0,030	0,03	0,10	55.000	3.300
	1,2	2	180	0,040	0,04	0,12	47.771	3.822
	1,5	2	180	0,050	0,06	0,22	38.217	3.822
	2,0	2	180	0,060	0,08	0,28	28.662	3.439
HRC 30-42	1,0	2	170	0,030	0,03	0,10	54.140	3.248
	1,2	2	170	0,040	0,04	0,12	45.117	3.609
	1,5	2	170	0,050	0,06	0,22	36.093	3.609
	2,0	2	170	0,060	0,08	0,28	27.070	3.248
HRC 42-48	1,0	2	140	0,022	0,03	0,10	44.586	1.962
	1,2	2	140	0,028	0,04	0,12	37.155	2.081
	1,5	2	140	0,035	0,06	0,22	29.724	2.081
	2,0	2	140	0,045	0,08	0,28	22.293	2.006
HRC 48-52	1,0	2	120	0,020	0,03	0,10	38.217	1.529
	1,2	2	120	0,025	0,04	0,12	31.847	1.592
	1,5	2	120	0,030	0,06	0,22	25.478	1.529
	2,0	2	120	0,040	0,08	0,28	19.108	1.529
HRC 52-60	1,0	2	80	0,018	0,03	0,10	25.478	917
	1,2	2	80	0,022	0,04	0,12	21.231	934
	1,5	2	80	0,028	0,06	0,22	16.985	951
	2,0	2	80	0,037	0,08	0,28	12.739	943
	2,0	2	80	0,037	0,09	0,30	12.739	943

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	300	0,020	0,015	0,015	55.000	2.200
	1,2	2	300	0,024	0,020	0,020	55.000	2.640
	1,5	2	300	0,028	0,035	0,035	55.000	3.080
	2,0	2	300	0,032	0,050	0,050	47.771	3.057
HRC 30-42	1,0	2	300	0,020	0,015	0,015	55.000	2.200
	1,2	2	300	0,024	0,020	0,020	55.000	2.640
	1,5	2	300	0,028	0,035	0,035	55.000	3.080
	2,0	2	300	0,032	0,050	0,050	47.771	3.057
HRC 42-48	1,0	2	280	0,017	0,015	0,015	55.000	1.870
	1,2	2	280	0,021	0,020	0,020	55.000	2.310
	1,5	2	280	0,025	0,035	0,035	55.000	2.750
	2,0	2	280	0,029	0,050	0,050	44.586	2.586
HRC 48-52	1,0	2	230	0,017	0,015	0,015	55.000	1.870
	1,2	2	230	0,020	0,020	0,020	55.000	2.200
	1,5	2	230	0,023	0,035	0,035	48.832	2.246
	2,0	2	230	0,026	0,050	0,050	36.624	1.904
HRC 52-60	1,0	2	170	0,015	0,015	0,015	54.140	1.624
	1,2	2	170	0,018	0,020	0,020	45.117	1.624
	1,5	2	170	0,021	0,035	0,035	36.093	1.516
	2,0	2	170	0,024	0,050	0,050	27.070	1.299

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	1,0 1,2 1,5 2,0	0,20	+ 0,01 -

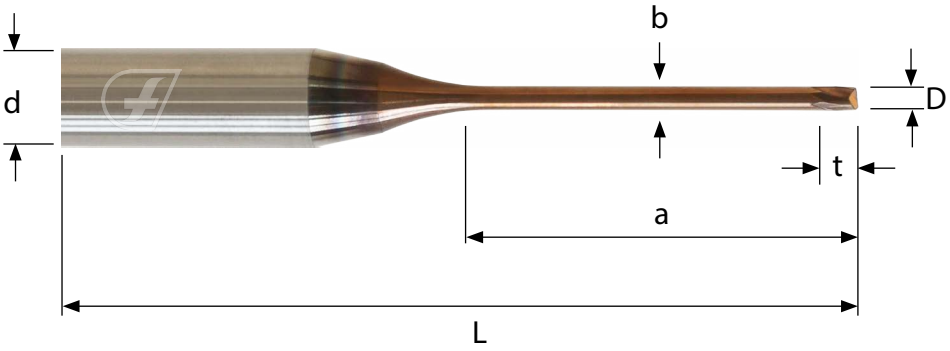
Microfrese con testa torica
Corner radius miniatures

R

15 x Ø
codolo Ø 6

HM
ULTRA
FINE

Z2



Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

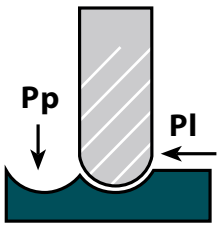
HRC
48-52

HRC
52-60

dimensions mm								*code*	*quality*	
Dh8	L	t	dh6	a	b	*Helix*	***radius***		SM 500	
1,0	64	1,2	6	15,0	0,95	20°	**0,2**	FC 204 55 1,0	★	
1,2	64	1,4	6	18,0	1,15	20°	**0,2**	FC 204 55 1,2	★	
1,5	80	1,7	6	22,5	1,45	20°	**0,2**	FC 204 55 1,5	★	
2,0	80	2,4	6	30,0	1,95	20°	**0,2**	FC 204 55 2,0	★	

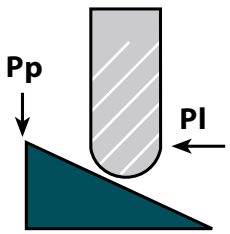
FC 220 51 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	180	0,015	0,04	0,15	55.000	1.650
	0,8	2	180	0,020	0,05	0,02	55.000	2.200
	1,0	2	180	0,025	0,06	0,25	55.000	2.750
	1,2	2	180	0,030	0,07	0,30	47.771	2.866
	1,5	2	180	0,035	0,09	0,35	38.217	2.675
	2,0	2	180	0,045	0,11	0,40	28.662	2.580
HRC 30-42	0,5	2	170	0,015	0,04	0,15	55.000	1.650
	0,8	2	170	0,020	0,05	0,02	55.000	2.200
	1,0	2	170	0,025	0,06	0,25	54.140	2.707
	1,2	2	170	0,030	0,07	0,30	45.117	2.707
	1,5	2	170	0,035	0,09	0,35	36.093	2.527
	2,0	2	170	0,045	0,11	0,40	27.070	2.436
HRC 42-48	0,5	2	140	0,010	0,04	0,15	55.000	1.100
	0,8	2	140	0,015	0,05	0,02	55.000	1.650
	1,0	2	140	0,020	0,06	0,25	44.586	1.783
	1,2	2	140	0,025	0,07	0,30	37.155	1.858
	1,5	2	140	0,030	0,09	0,35	29.724	1.783
	2,0	2	140	0,040	0,11	0,40	22.293	1.783
HRC 48-52	0,5	2	120	0,010	0,04	0,15	55.000	1.100
	0,8	2	120	0,015	0,05	0,02	47.771	1.433
	1,0	2	120	0,020	0,06	0,25	38.217	1.529
	1,2	2	120	0,025	0,07	0,30	31.847	1.592
	1,5	2	120	0,030	0,09	0,35	25.478	1.529
	2,0	2	120	0,040	0,11	0,40	19.108	1.529
HRC 52-60	0,5	2	80	0,005	0,04	0,15	50.955	510
	0,8	2	80	0,010	0,05	0,02	31.847	637
	1,0	2	80	0,015	0,06	0,25	25.478	764
	1,2	2	80	0,020	0,07	0,30	21.231	849
	1,5	2	80	0,025	0,09	0,35	16.985	849
	2,0	2	80	0,035	0,11	0,40	12.739	892

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	300	0,016	0,03	0,03	55.000	1.760
	0,8	2	300	0,020	0,04	0,04	55.000	2.200
	1,0	2	300	0,022	0,05	0,05	55.000	2.420
	1,2	2	300	0,026	0,06	0,06	55.000	2.860
	1,5	2	300	0,032	0,07	0,07	55.000	3.520
	2,0	2	300	0,034	0,08	0,08	47.771	3.248
HRC 30-42	0,5	2	300	0,016	0,03	0,03	55.000	1.760
	0,8	2	300	0,020	0,04	0,04	55.000	2.200
	1,0	2	300	0,022	0,05	0,05	55.000	2.420
	1,2	2	300	0,026	0,06	0,06	55.000	2.860
	1,5	2	300	0,032	0,07	0,07	55.000	3.520
	2,0	2	300	0,034	0,08	0,08	47.771	3.248
HRC 42-48	0,5	2	280	0,015	0,03	0,03	55.000	1.650
	0,8	2	280	0,018	0,04	0,04	55.000	1.980
	1,0	2	280	0,020	0,05	0,05	55.000	2.200
	1,2	2	280	0,024	0,06	0,06	55.000	2.640
	1,5	2	280	0,030	0,07	0,07	55.000	3.300
	2,0	2	280	0,032	0,08	0,08	44.586	2.854
HRC 48-52	0,5	2	230	0,014	0,03	0,03	55.000	1.540
	0,8	2	230	0,016	0,04	0,04	55.000	1.760
	1,0	2	230	0,018	0,05	0,05	55.000	1.980
	1,2	2	230	0,022	0,06	0,06	55.000	2.420
	1,5	2	230	0,027	0,07	0,07	55.000	2.970
	2,0	2	230	0,030	0,08	0,08	36.624	2.197
HRC 52-60	0,5	2	170	0,012	0,03	0,03	55.000	1.320
	0,8	2	170	0,014	0,04	0,04	55.000	1.540
	1,0	2	170	0,016	0,05	0,05	54.140	1.732
	1,2	2	170	0,020	0,06	0,06	45.117	1.805
	1,5	2	170	0,023	0,07	0,07	36.093	1.660
	2,0	2	170	0,026	0,08	0,08	27.070	1.408

Tolleranza raggio mm / ***Radius tollerance mm***		
D	raggio ***radius***	tolleranza ***tollerance***
0,5	0,25	- 0 / 0,015
0,8	0,40	
1,0	0,50	
1,2	0,60	
1,5	0,75	
2,0	1,00	

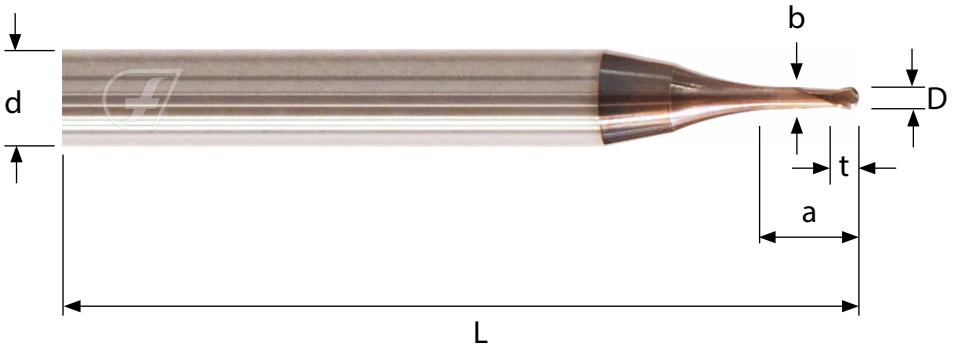
Microfrese con testa semisferica
Ball nose miniatures

R

3 x Ø
codolo Ø 4

HM
ULTRA
FINE

Z2



Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

HRC
48-52

HRC
52-60

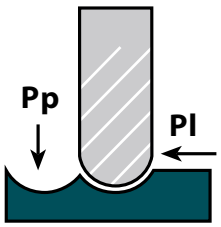
dimensions mm								*code*	*quality*
Rf8	D	L	t	dh6	a	b	*Helix*		SM 500
0,25	0,5	51	0,6	4	1,5	0,46	20°	FC 220 51 0,5	★
0,4	0,8	51	1,0	4	2,4	0,75	20°	FC 220 51 0,8	★
0,5	1,0	51	1,2	4	3,0	0,95	20°	FC 220 51 1,0	★
0,6	1,2	51	1,4	4	3,6	1,15	20°	FC 220 51 1,2	★
0,75	1,5	51	1,7	4	4,5	1,45	20°	FC 220 51 1,5	★
1,0	2,0	51	2,4	4	6,0	1,95	20°	FC 220 51 2,0	★

Qualità HM
HM Quality pag. 25

★ Pronto
Ready

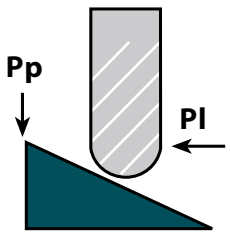
FC 220 52 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	180	0,020	0,03	0,14	55.000	2.200
	0,8	2	180	0,020	0,03	0,14	55.000	2.200
	1,0	2	180	0,025	0,04	0,17	55.000	2.750
	1,2	2	180	0,030	0,05	0,20	47.771	2.866
	1,5	2	180	0,035	0,06	0,25	38.217	2.675
	2,0	2	180	0,045	0,08	0,30	28.662	2.580
HRC 30-42	0,5	2	170	0,020	0,03	0,14	55.000	2.200
	0,8	2	170	0,020	0,03	0,14	55.000	2.200
	1,0	2	170	0,025	0,04	0,17	54.140	2.707
	1,2	2	170	0,030	0,05	0,20	45.117	2.707
	1,5	2	170	0,035	0,06	0,25	36.093	2.527
	2,0	2	170	0,045	0,08	0,30	27.070	2.436
HRC 42-48	0,5	2	140	0,015	0,03	0,14	55.000	1.650
	0,8	2	140	0,015	0,03	0,14	55.000	1.650
	1,0	2	140	0,020	0,04	0,17	44.586	1.783
	1,2	2	140	0,025	0,05	0,20	37.155	1.858
	1,5	2	140	0,030	0,06	0,25	29.724	1.783
	2,0	2	140	0,040	0,08	0,30	22.293	1.783
HRC 48-52	0,5	2	120	0,015	0,03	0,14	55.000	1.650
	0,8	2	120	0,015	0,03	0,14	47.771	1.433
	1,0	2	120	0,020	0,04	0,17	38.217	1.529
	1,2	2	120	0,025	0,05	0,20	31.847	1.592
	1,5	2	120	0,030	0,06	0,25	25.478	1.529
	2,0	2	120	0,040	0,08	0,30	19.108	1.529
HRC 52-60	0,5	2	80	0,010	0,03	0,14	50.955	1.019
	0,8	2	80	0,010	0,03	0,14	31.847	637
	1,0	2	80	0,015	0,04	0,17	25.478	764
	1,2	2	80	0,020	0,05	0,20	21.231	849
	1,5	2	80	0,025	0,06	0,25	16.985	849
	2,0	2	80	0,035	0,08	0,30	12.739	892

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,5	2	300	0,016	0,02	0,02	55.000	1.760
	0,8	2	300	0,020	0,02	0,02	55.000	2.200
	1,0	2	300	0,022	0,03	0,03	55.000	2.420
	1,2	2	300	0,026	0,04	0,04	55.000	2.860
	1,5	2	300	0,032	0,05	0,05	55.000	3.520
	2,0	2	300	0,034	0,06	0,06	47.771	3.248
HRC 30-42	0,5	2	300	0,016	0,02	0,02	55.000	1.760
	0,8	2	300	0,020	0,02	0,02	55.000	2.200
	1,0	2	300	0,022	0,03	0,03	55.000	2.420
	1,2	2	300	0,026	0,04	0,04	55.000	2.860
	1,5	2	300	0,032	0,05	0,05	55.000	3.520
	2,0	2	300	0,034	0,06	0,06	47.771	3.248
HRC 42-48	0,5	2	280	0,015	0,02	0,02	55.000	1.650
	0,8	2	280	0,018	0,02	0,02	55.000	1.980
	1,0	2	280	0,020	0,03	0,03	55.000	2.200
	1,2	2	280	0,024	0,04	0,04	55.000	2.640
	1,5	2	280	0,030	0,05	0,05	55.000	3.300
	2,0	2	280	0,032	0,06	0,06	44.586	2.854
HRC 48-52	0,5	2	230	0,014	0,02	0,02	55.000	1.540
	0,8	2	230	0,016	0,02	0,02	55.000	1.760
	1,0	2	230	0,018	0,03	0,03	55.000	1.980
	1,2	2	230	0,022	0,04	0,04	55.000	2.420
	1,5	2	230	0,027	0,05	0,05	55.000	2.970
	2,0	2	230	0,030	0,06	0,06	36.624	2.197
HRC 52-60	0,5	2	170	0,012	0,02	0,02	55.000	1.320
	0,8	2	170	0,014	0,02	0,02	55.000	1.540
	1,0	2	170	0,016	0,03	0,03	54.140	1.732
	1,2	2	170	0,020	0,04	0,04	45.117	1.805
	1,5	2	170	0,023	0,05	0,05	36.093	1.660
	2,0	2	170	0,026	0,06	0,06	27.070	1.408

Tolleranza raggio mm / ***Radius tollerance mm***		
D	raggio ***radius***	tolleranza ***tollerance***
0,5	0,25	- 0 / 0,015
0,8	0,40	
1,0	0,50	
1,2	0,60	
1,5	0,75	
2,0	1,00	

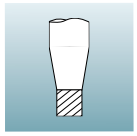
Microfrese con testa semisferica

Ball nose miniatures

R

5 x Ø
codolo Ø 4

HM
ULTRA
FINE



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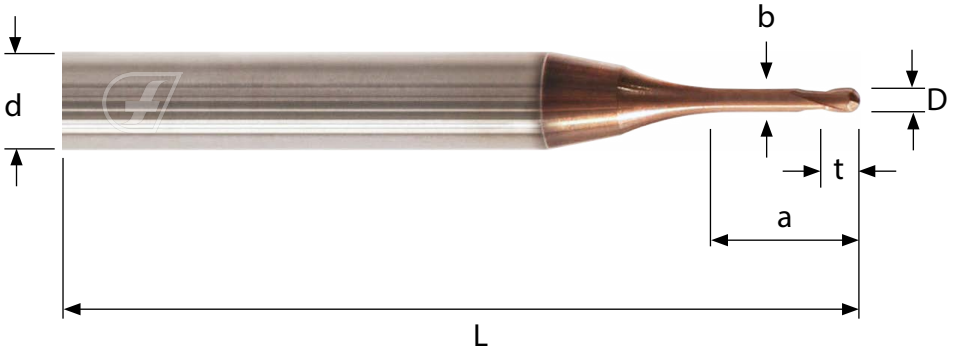


Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

HRC
48-52

HRC
52-60

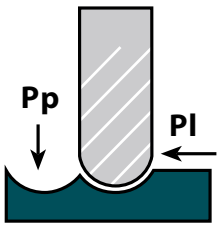
dimensions mm								code	quality
Rf8	D	L	t	dh6	a	b	Helix		SM 500
0,25	0,5	51	0,6	4	2,5	0,46	20°	FC 220 52 0,5	★
0,4	0,8	51	1,0	4	4,0	0,75	20°	FC 220 52 0,8	★
0,5	1,0	51	1,2	4	5,0	0,95	20°	FC 220 52 1,0	★
0,6	1,2	51	1,4	4	6,0	1,15	20°	FC 220 52 1,2	★
0,75	1,5	51	1,7	4	7,5	1,45	20°	FC 220 52 1,5	★
1,0	2,0	51	2,4	4	10	1,95	20°	FC 220 52 2,0	★

Qualità HM
HM Quality pag. 25

★ Pronto
Ready

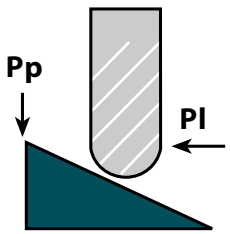
FC 220 53 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200 Air	0,5	2	180	0,020	0,02	0,14	55.000	2.200
	0,8	2	180	0,020	0,02	0,14	55.000	2.200
	1,0	2	180	0,025	0,03	0,17	55.000	2.750
	1,2	2	180	0,030	0,04	0,20	47.771	2.866
	1,5	2	180	0,035	0,05	0,25	38.217	2.675
	2,0	2	180	0,045	0,07	0,30	28.662	2.580
HRC 30-42 Air	0,5	2	170	0,020	0,02	0,14	55.000	2.200
	0,8	2	170	0,020	0,02	0,14	55.000	2.200
	1,0	2	170	0,025	0,03	0,17	54.140	2.707
	1,2	2	170	0,030	0,04	0,20	45.117	2.707
	1,5	2	170	0,035	0,05	0,25	36.093	2.527
	2,0	2	170	0,045	0,07	0,30	27.070	2.436
HRC 42-48 Air	0,5	2	140	0,015	0,02	0,14	55.000	1.650
	0,8	2	140	0,015	0,02	0,14	55.000	1.650
	1,0	2	140	0,020	0,03	0,17	44.586	1.783
	1,2	2	140	0,025	0,04	0,20	37.155	1.858
	1,5	2	140	0,030	0,05	0,25	29.724	1.783
	2,0	2	140	0,040	0,07	0,30	22.293	1.783
HRC 48-52 Air	0,5	2	120	0,015	0,02	0,14	55.000	1.650
	0,8	2	120	0,015	0,02	0,14	47.771	1.433
	1,0	2	120	0,020	0,03	0,17	38.217	1.529
	1,2	2	120	0,025	0,04	0,20	31.847	1.592
	1,5	2	120	0,030	0,05	0,25	25.478	1.529
	2,0	2	120	0,040	0,07	0,30	19.108	1.529
HRC 52-60 Air	0,5	2	80	0,010	0,02	0,14	50.955	1.019
	0,8	2	80	0,010	0,02	0,14	31.847	637
	1,0	2	80	0,015	0,03	0,17	25.478	764
	1,2	2	80	0,020	0,04	0,20	21.231	849
	1,5	2	80	0,025	0,05	0,25	16.985	849
	2,0	2	80	0,035	0,07	0,30	12.739	892

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200 Air	0,5	2	300	0,016	0,015	0,015	55.000	1.760
	0,8	2	300	0,020	0,015	0,015	55.000	2.200
	1,0	2	300	0,022	0,025	0,025	55.000	2.420
	1,2	2	300	0,026	0,035	0,035	55.000	2.860
	1,5	2	300	0,032	0,045	0,045	55.000	3.520
	2,0	2	300	0,034	0,055	0,055	47.771	3.248
HRC 30-42 Air	0,5	2	300	0,016	0,015	0,015	55.000	1.760
	0,8	2	300	0,020	0,015	0,015	55.000	2.200
	1,0	2	300	0,022	0,025	0,025	55.000	2.420
	1,2	2	300	0,026	0,035	0,035	55.000	2.860
	1,5	2	300	0,032	0,045	0,045	55.000	3.520
	2,0	2	300	0,034	0,055	0,055	47.771	3.248
HRC 42-48 Air	0,5	2	280	0,015	0,015	0,015	55.000	1.650
	0,8	2	280	0,018	0,015	0,015	55.000	1.980
	1,0	2	280	0,020	0,025	0,025	55.000	2.200
	1,2	2	280	0,024	0,035	0,035	55.000	2.640
	1,5	2	280	0,030	0,045	0,045	55.000	3.300
	2,0	2	280	0,032	0,055	0,055	44.586	2.854
HRC 48-52 Air	0,5	2	230	0,014	0,015	0,015	55.000	1.540
	0,8	2	230	0,016	0,015	0,015	55.000	1.760
	1,0	2	230	0,018	0,025	0,025	55.000	1.980
	1,2	2	230	0,022	0,035	0,035	55.000	2.420
	1,5	2	230	0,027	0,045	0,045	55.000	2.970
	2,0	2	230	0,030	0,055	0,055	36.624	2.197
HRC 52-60 Air	0,5	2	170	0,012	0,015	0,015	55.000	1.320
	0,8	2	170	0,014	0,015	0,015	55.000	1.540
	1,0	2	170	0,016	0,025	0,025	54.140	1.732
	1,2	2	170	0,020	0,035	0,035	45.117	1.805
	1,5	2	170	0,023	0,045	0,045	36.093	1.660
	2,0	2	170	0,026	0,055	0,055	27.070	1.408

Tolleranza raggio mm / ***Radius tollerance mm***

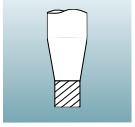
D	raggio *radius*	tolleranza *tollerance*
0,5	0,25	- 0 / 0,015
0,8	0,40	
1,0	0,50	
1,2	0,60	
1,5	0,75	
2,0	1,00	

Microfrese con testa semisferica
Ball nose miniatures

R

7 x Ø
codolo Ø 4

HM
ULTRA
FINE



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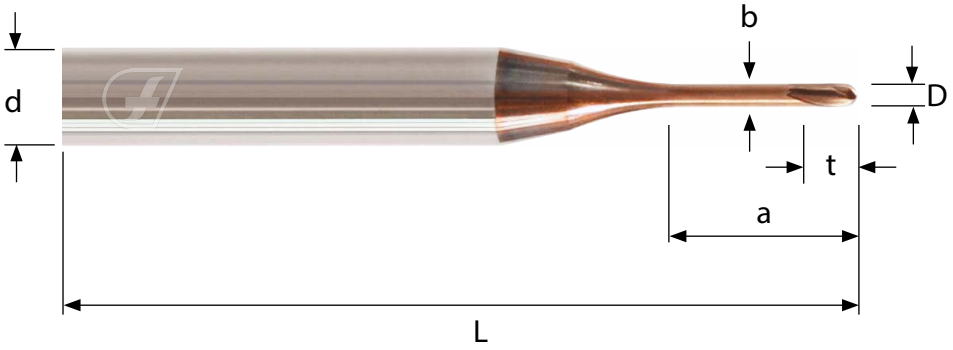


Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

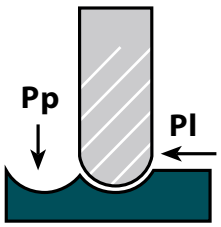
HRC
48-52

HRC
52-60

dimensions mm								code	quality
Rf8	D	L	t	dh6	a	b	*Helix*		SM 500
0,25	0,5	51	0,6	4	3,5	0,46	20°	FC 220 53 0,5	★
0,4	0,8	51	1,0	4	5,6	0,75	20°	FC 220 53 0,8	★
0,5	1,0	51	1,2	4	7,0	0,95	20°	FC 220 53 1,0	★
0,6	1,2	51	1,4	4	8,4	1,15	20°	FC 220 53 1,2	★
0,75	1,5	51	1,7	4	10,5	1,45	20°	FC 220 53 1,5	★
1,0	2,0	51	2,4	4	14	1,95	20°	FC 220 53 2,0	★

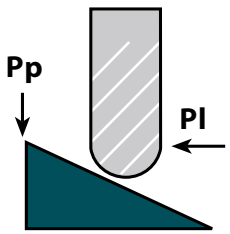
FC 220 54 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,8	2	180	0,020	0,02	0,12	55.000	2.200
	1,0	2	180	0,025	0,02	0,15	55.000	2.750
	1,2	2	180	0,030	0,03	0,18	47.771	2.866
	1,5	2	180	0,035	0,04	0,23	38.217	2.675
	2,0	2	180	0,045	0,06	0,28	28.662	2.580
HRC 30-42	0,8	2	170	0,020	0,02	0,12	55.000	2.200
	1,0	2	170	0,025	0,02	0,15	54.140	2.707
	1,2	2	170	0,030	0,03	0,18	45.117	2.707
	1,5	2	170	0,035	0,04	0,23	36.093	2.527
	2,0	2	170	0,045	0,06	0,28	27.070	2.436
HRC 42-48	0,8	2	140	0,015	0,02	0,12	55.000	1.650
	1,0	2	140	0,020	0,02	0,15	44.586	1.783
	1,2	2	140	0,025	0,03	0,18	37.155	1.858
	1,5	2	140	0,030	0,04	0,23	29.724	1.783
	2,0	2	140	0,040	0,06	0,28	22.293	1.783
HRC 48-52	0,8	2	120	0,015	0,02	0,12	47.771	1.433
	1,0	2	120	0,020	0,02	0,15	38.217	1.529
	1,2	2	120	0,025	0,03	0,18	31.847	1.592
	1,5	2	120	0,030	0,04	0,23	25.478	1.529
	2,0	2	120	0,040	0,06	0,28	19.108	1.529
HRC 52-60	0,8	2	80	0,010	0,02	0,12	31.847	637
	1,0	2	80	0,015	0,02	0,15	25.478	764
	1,2	2	80	0,020	0,03	0,18	21.231	849
	1,5	2	80	0,025	0,04	0,23	16.985	849
	2,0	2	80	0,035	0,06	0,28	12.739	892

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	0,8	2	300	0,020	0,010	0,010	55.000	2.200
	1,0	2	300	0,022	0,020	0,020	55.000	2.420
	1,2	2	300	0,026	0,030	0,030	55.000	2.860
	1,5	2	300	0,032	0,040	0,040	55.000	3.520
	2,0	2	300	0,034	0,050	0,050	47.771	3.248
HRC 30-42	0,8	2	300	0,020	0,010	0,010	55.000	2.200
	1,0	2	300	0,022	0,020	0,020	55.000	2.420
	1,2	2	300	0,026	0,030	0,030	55.000	2.860
	1,5	2	300	0,032	0,040	0,040	55.000	3.520
	2,0	2	300	0,034	0,050	0,050	47.771	3.248
HRC 42-48	0,8	2	280	0,018	0,010	0,010	55.000	1.980
	1,0	2	280	0,020	0,020	0,020	55.000	2.200
	1,2	2	280	0,024	0,030	0,030	55.000	2.640
	1,5	2	280	0,030	0,040	0,040	55.000	3.300
	2,0	2	280	0,032	0,050	0,050	44.586	2.854
HRC 48-52	0,8	2	230	0,016	0,010	0,010	55.000	1.760
	1,0	2	230	0,018	0,020	0,020	55.000	1.980
	1,2	2	230	0,022	0,030	0,030	61.040	2.686
	1,5	2	230	0,027	0,040	0,040	48.832	2.637
	2,0	2	230	0,030	0,050	0,050	36.624	2.197
HRC 52-60	0,8	2	170	0,014	0,010	0,010	55.000	1.540
	1,0	2	170	0,016	0,020	0,020	54.140	1.732
	1,2	2	170	0,020	0,030	0,030	45.117	1.805
	1,5	2	170	0,023	0,040	0,040	36.093	1.660
	2,0	2	170	0,026	0,050	0,050	27.070	1.408

Tolleranza raggio mm / ***Radius tollerance mm***

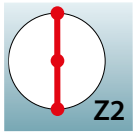
D	raggio *radius*	tolleranza *tollerance*
0,8	0,40	- 0 / 0,015
1,0	0,50	
1,2	0,60	
1,5	0,75	
2,0	1,00	

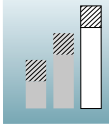
Microfrese con testa semisferica

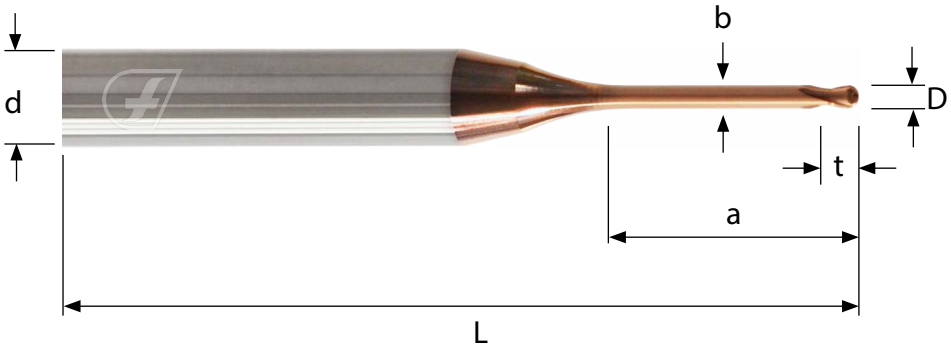
Ball nose miniatures

10 x Ø
codolo Ø 6

HM
ULTRA
FINE







Sgrossatura

Finitura

N/mm2 850-1200	HRC 30-42	HRC 42-48	HRC 48-52	HRC 52-60	

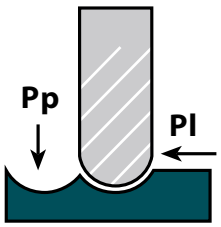
dimensions mm								*code*	*quality*	
Rf8	D	L	t	dh6	a	b	*Helix*		SM 500	
0,4	0,8	64	1,0	6	8	0,75	20°	FC 220 54 0,8	★	
0,5	1,0	64	1,2	6	10	0,95	20°	FC 220 54 1,0	★	
0,6	1,2	64	1,4	6	12	1,15	20°	FC 220 54 1,2	★	
0,75	1,5	64	1,7	6	15	1,45	20°	FC 220 54 1,5	★	
1,0	2,0	80	2,4	6	20	1,95	20°	FC 220 54 2,0	★	

Qualità HM
HM Quality pag. 25

★ Pronto
Ready

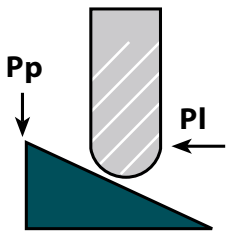
FC 220 55 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	180	0,025	0,02	0,13	55.000	2.750
	1,2	2	180	0,030	0,03	0,16	47.771	2.866
	1,5	2	180	0,035	0,04	0,21	38.217	2.675
	2,0	2	180	0,045	0,06	0,26	28.662	2.580
HRC 30-42	1,0	2	170	0,025	0,02	0,13	54.140	2.707
	1,2	2	170	0,030	0,03	0,16	45.117	2.707
	1,5	2	170	0,035	0,04	0,21	36.093	2.527
	2,0	2	170	0,045	0,06	0,26	27.070	2.436
HRC 42-48	1,0	2	140	0,020	0,02	0,13	44.586	1.783
	1,2	2	140	0,025	0,03	0,16	37.155	1.858
	1,5	2	140	0,030	0,04	0,21	29.724	1.783
	2,0	2	140	0,040	0,06	0,26	22.293	1.783
HRC 48-52	1,0	2	120	0,020	0,02	0,13	38.217	1.529
	1,2	2	120	0,025	0,03	0,16	31.847	1.592
	1,5	2	120	0,030	0,04	0,21	25.478	1.529
	2,0	2	120	0,040	0,06	0,26	19.108	1.529
HRC 52-60	1,0	2	80	0,015	0,02	0,13	25.478	764
	1,2	2	80	0,020	0,03	0,16	21.231	849
	1,5	2	80	0,025	0,04	0,21	16.985	849
	2,0	2	80	0,035	0,06	0,26	12.739	892

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	300	0,022	0,020	0,020	55.000	2.420
	1,2	2	300	0,026	0,025	0,025	55.000	2.860
	1,5	2	300	0,032	0,035	0,035	55.000	3.520
	2,0	2	300	0,034	0,045	0,045	47.771	3.248
HRC 30-42	1,0	2	300	0,022	0,020	0,020	55.000	2.420
	1,2	2	300	0,026	0,025	0,025	55.000	2.860
	1,5	2	300	0,032	0,035	0,035	55.000	3.520
	2,0	2	300	0,034	0,045	0,045	47.771	3.248
HRC 42-48	1,0	2	280	0,020	0,020	0,020	55.000	2.200
	1,2	2	280	0,024	0,025	0,025	55.000	2.640
	1,5	2	280	0,030	0,035	0,035	55.000	3.300
	2,0	2	280	0,032	0,045	0,045	44.586	2.854
HRC 48-52	1,0	2	230	0,018	0,020	0,020	55.000	1.980
	1,2	2	230	0,022	0,025	0,025	55.000	2.420
	1,5	2	230	0,027	0,035	0,035	48.832	2.637
	2,0	2	230	0,030	0,045	0,045	36.624	2.197
HRC 52-60	1,0	2	170	0,016	0,020	0,020	54.140	1.732
	1,2	2	170	0,020	0,025	0,025	45.117	1.805
	1,5	2	170	0,023	0,035	0,035	36.093	1.660
	2,0	2	170	0,026	0,045	0,045	27.070	1.408

Tolleranza raggio mm / ***Radius tollerance mm***

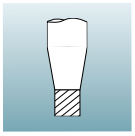
D	raggio *radius*	tolleranza *tollerance*
1,0	0,50	- 0 / 0,015
1,2	0,60	
1,5	0,75	
2,0	1,00	

Microfrese con testa semisferica
Ball nose miniatures

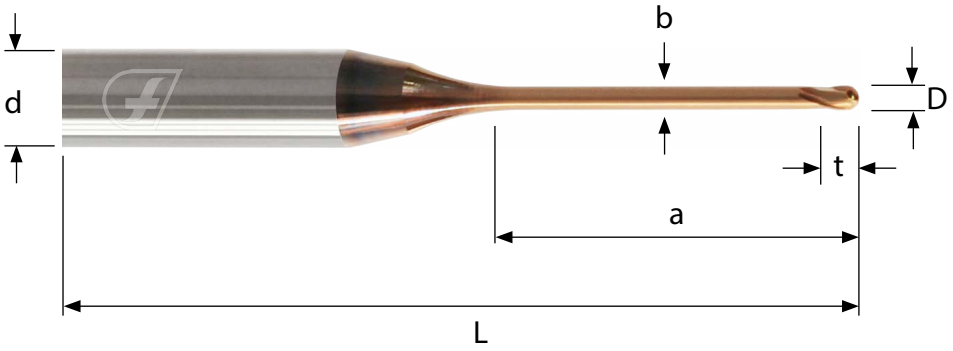
R

15 x Ø
codolo Ø 6

HM
ULTRA
FINE



Z2



Sgrossatura

Finitura

N/mm2
850-1200

HRC
30-42

HRC
42-48

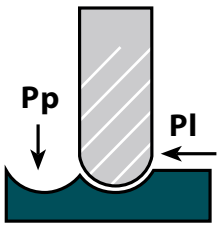
HRC
48-52

HRC
52-60

dimensions mm								code	quality
Rf8	D	L	t	dh6	a	b	*Helix*		SM 500
0,5	1,0	64	1,2	6	15,0	0,95	20°	FC 220 55 1,0	★
0,6	1,2	64	1,4	6	18,0	1,15	20°	FC 220 55 1,2	★
0,75	1,5	80	1,7	6	22,5	1,45	20°	FC 220 55 1,5	★
1,0	2,0	80	2,4	6	30,0	1,95	20°	FC 220 55 2,0	★

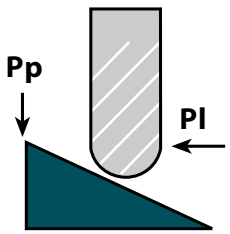
FC 204 31 .. FC 204 32 .. FC 204 33 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	180	0,030	0,03	0,12	55.000	3.300
	1,5	2	180	0,050	0,04	0,18	38.217	3.822
	2,0	2	180	0,060	0,05	0,22	28.662	3.439
HRC 30-42	1,0	2	170	0,030	0,03	0,12	54.140	3.248
	1,5	2	170	0,050	0,04	0,18	36.093	3.609
	2,0	2	170	0,060	0,05	0,22	27.070	3.248
HRC 42-48	1,0	2	140	0,022	0,03	0,12	44.586	1.962
	1,5	2	140	0,035	0,04	0,18	29.724	2.081
	2,0	2	140	0,045	0,05	0,22	22.293	2.006
HRC 48-52	1,0	2	120	0,020	0,03	0,12	38.217	1.529
	1,5	2	120	0,030	0,04	0,18	25.478	1.529
	2,0	2	120	0,040	0,05	0,22	19.108	1.529
HRC 52-60	1,0	2	80	0,018	0,03	0,12	25.478	917
	1,5	2	80	0,028	0,04	0,18	16.985	951
	2,0	2	80	0,037	0,05	0,22	12.739	943

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	300	0,020	0,015	0,015	55.000	2.200
	1,5	2	300	0,028	0,030	0,030	55.000	3.080
	2,0	2	300	0,032	0,040	0,040	47.771	3.057
HRC 30-42	1,0	2	300	0,020	0,015	0,015	55.000	2.200
	1,5	2	300	0,028	0,030	0,030	55.000	3.080
	2,0	2	300	0,032	0,040	0,040	47.771	3.057
HRC 42-48	1,0	2	280	0,017	0,015	0,015	55.000	1.870
	1,5	2	280	0,025	0,030	0,030	55.000	2.750
	2,0	2	280	0,029	0,040	0,040	44.586	2.586
HRC 48-52	1,0	2	230	0,017	0,015	0,015	55.000	1.870
	1,5	2	230	0,023	0,030	0,030	48.832	2.246
	2,0	2	230	0,026	0,040	0,040	36.624	1.904
HRC 52-60	1,0	2	170	0,015	0,015	0,015	54.140	1.624
	1,5	2	170	0,021	0,030	0,030	36.093	1.516
	2,0	2	170	0,024	0,040	0,040	27.070	1.299

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio *radius*	tolleranza *tollerance*
	1,0 1,5 2,0	0,20	$\pm$ 0,01

Microfrese per nervature con testa torica

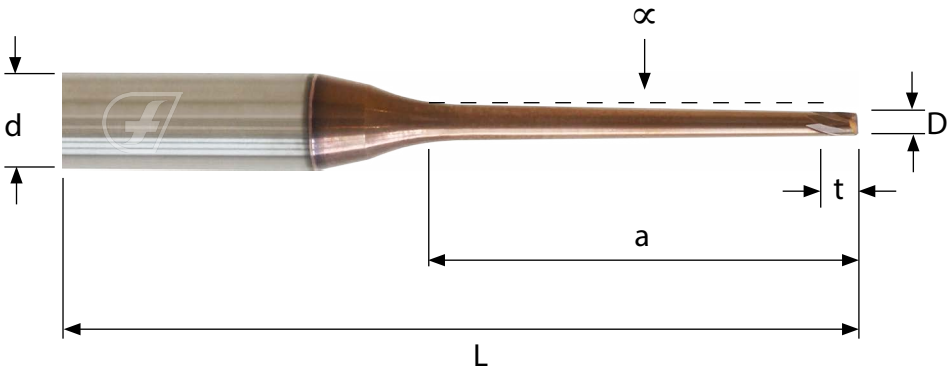
Corner radius miniatures for Rib

R

angle 0,9° codolo Ø 6

HM ULTRA FINE

Z2



Sgrossatura

Finitura

N/mm2 850-1200 | HRC 30-42 | HRC 42-48 | HRC 48-52 | HRC 52-60

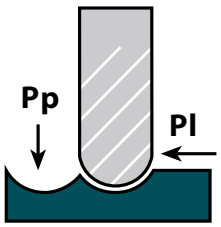
dimensions mm								*code*	*quality*
Dh8	L	t	dh6	a	∝	*Helix*	***radius***		SM 500
1,0	64	1,0	6	20	0,9°	20°	**0,2**	FC 204 31 1,0	★
1,0	80	1,0	6	30	0,9°	20°	**0,2**	FC 204 32 1,0	★
1,0	100	1,0	6	40	0,9°	20°	**0,2**	FC 204 33 1,0	★
1,5	80	1,5	6	25	0,9°	20°	**0,2**	FC 204 31 1,5	★
1,5	80	1,5	6	35	0,9°	20°	**0,2**	FC 204 32 1,5	★
1,5	100	1,5	6	45	0,9°	20°	**0,2**	FC 204 33 1,5	★
2,0	80	2,0	6	35	0,9°	20°	**0,2**	FC 204 31 2,0	★
2,0	100	2,0	6	45	0,9°	20°	**0,2**	FC 204 32 2,0	★
2,0	100	2,0	6	55	0,9°	20°	**0,2**	FC 204 33 2,0	★

Qualità HM *HM Quality* pag. 25

★ Pronto *Ready*

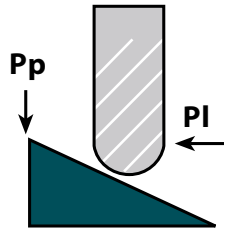
FC 220 31 .. FC 220 32 .. FC 220 33 ..

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	180	0,025	0,02	0,12	55.000	2.750
	1,5	2	180	0,035	0,04	0,18	38.217	2.675
	2,0	2	180	0,045	0,06	0,24	28.662	2.580
HRC 30-42	1,0	2	170	0,025	0,02	0,12	54.140	2.707
	1,5	2	170	0,035	0,04	0,18	36.093	2.527
	2,0	2	170	0,045	0,06	0,24	27.070	2.436
HRC 42-48	1,0	2	140	0,020	0,02	0,12	44.586	1.783
	1,5	2	140	0,030	0,04	0,18	29.724	1.783
	2,0	2	140	0,040	0,06	0,24	22.293	1.783
HRC 48-52	1,0	2	120	0,020	0,02	0,12	38.217	1.529
	1,5	2	120	0,030	0,04	0,18	25.478	1.529
	2,0	2	120	0,040	0,06	0,24	19.108	1.529
HRC 52-60	1,0	2	80	0,015	0,02	0,12	25.478	764
	1,5	2	80	0,025	0,04	0,18	16.985	849
	2,0	2	80	0,035	0,06	0,24	12.739	892

SM 500



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	1,0	2	300	0,022	0,020	0,020	55.000	2.420
	1,5	2	300	0,032	0,035	0,035	55.000	3.520
	2,0	2	300	0,034	0,045	0,045	47.771	3.248
HRC 30-42	1,0	2	300	0,022	0,020	0,020	55.000	2.420
	1,5	2	300	0,032	0,035	0,035	55.000	3.520
	2,0	2	300	0,034	0,045	0,045	47.771	3.248
HRC 42-48	1,0	2	280	0,020	0,020	0,020	55.000	2.200
	1,5	2	280	0,030	0,035	0,035	55.000	3.300
	2,0	2	280	0,032	0,045	0,045	44.586	2.854
HRC 48-52	1,0	2	230	0,018	0,020	0,020	55.000	1.980
	1,5	2	230	0,027	0,035	0,035	48.832	2.637
	2,0	2	230	0,030	0,045	0,045	36.624	2.197
HRC 52-60	1,0	2	170	0,016	0,020	0,020	54.140	1.732
	1,5	2	170	0,023	0,035	0,035	36.093	1.660
	2,0	2	170	0,026	0,045	0,045	27.070	1.408

Tolleranza raggio mm / ***Radius tollerance mm***			
	D	raggio ***radius***	tolleranza ***tollerance***
	1,0	0,50	- 0 / 0,015
	1,5	0,75	
	2,0	1,00	

Microfrese per nervature con testa semisferica

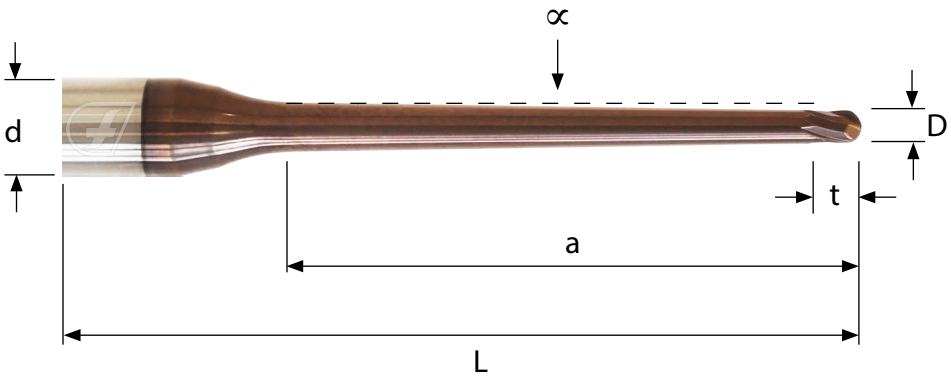
Ball nose miniatures for Rib

R

angle 0,9° codolo Ø 6

HM ULTRA FINE

Z2



Sgrossatura

Finitura

N/mm2 850-1200 | HRC 30-42 | HRC 42-48 | HRC 48-52 | HRC 52-60

dimensions mm								code	quality
Rf8	D	L	t	dh6	a	∝	Helix		SM 500
0,5	1,0	64	1,0	6	20	0,9°	20°	FC 220 31 1,0	★
0,5	1,0	80	1,0	6	30	0,9°	20°	FC 220 32 1,0	★
0,5	1,0	100	1,0	6	40	0,9°	20°	FC 220 33 1,0	★
0,75	1,5	80	1,5	6	25	0,9°	20°	FC 220 31 1,5	★
0,75	1,5	80	1,5	6	35	0,9°	20°	FC 220 32 1,5	★
0,75	1,5	100	1,5	6	45	0,9°	20°	FC 220 33 1,5	★
1,0	2,0	80	2,0	6	35	0,9°	20°	FC 220 31 2,0	★
1,0	2,0	100	2,0	6	45	0,9°	20°	FC 220 32 2,0	★
1,0	2,0	100	2,0	6	55	0,9°	20°	FC 220 33 2,0	★

Qualità HM *HM Quality* pag. 25

★ Pronto *Ready*

PUNTE SENZA FORI DI RAFFREDDAMENTO / *DRILL WITHOUT INTERNAL COOLANT*

ACCIAIO / *STEEL*
GHISA / *CAST IRON*
ACCIAIO INOX / *INOX*
TITANIO / *TITAN*

pag. 192 - 197

PUNTE CON FORI DI RAFFREDDAMENTO / *DRILL WITH INTERNAL COOLANT*

ACCIAIO / *STEEL*
GHISA / *CAST IRON*
ACCIAIO INOX / *INOX*
TITANIO / *TITAN*

pag. 198 - 203

CENTRI / *CENTER*

ACCIAIO / *STEEL*
GHISA / *CAST IRON*
ACCIAIO INOX / *INOX*
TITANIO / *TITAN*

pag. 204 - 207

SMUSSI / *CHAMFER*

ACCIAIO / *STEEL*
GHISA / *CAST IRON*
ACCIAIO INOX / *INOX*
TITANIO / *TITAN*

pag. 208 - 209

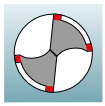
LEGENDA DEI SIMBOLI E DELLA PAGINA DEGLI UTENSILI
KEY OF SYMBOLS AND PRODUCT PAGE

pag. 188 - 189

QUALITÀ HM / *HM QUALITY*

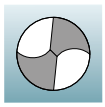
pag. 190

LEGENDA DEI SIMBOLI / *KEY OF SYMBOLS*

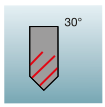


Punta con quattro guide
Drill with four guides

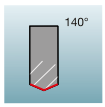
Punta con adduzione interna del refrigerante
Drill with internal coolant



Punta senza adduzione interna del refrigerante
Drill without internal coolant



Angolo dell'elica
Helix angle



Punta con angolo di testa a 140°
Drill with angular 140°

Lunghezza utile di lavoro 4 x diametro
Utility lenght 4 x diameter

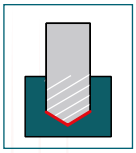
Lunghezza utile di lavoro 5 x diametro
Utility lenght 5 x diameter

Due taglienti Z2 con 2 taglienti al centro
Two tooths with double center cutting

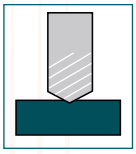
Quattro taglienti Z4
Four tooths

LEGENDA DELLA PAGINA DEGLI UTENSILI / *KEY OF PRODUCTS PAGE*

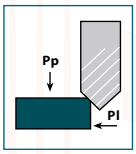
D	Diametro della punta (mm) *Diameter of the drill (mm)*
dh6	Diametro del codolo (mm) *Diameter of the shank (mm)*
L	Lunghezza totale dell'utensile (mm) *Total length of the tool (mm)*
L1	Lunghezza totale dell'utensile (mm) *Total length of the tool (mm)*
L2	Lunghezza totale dell'utensile (mm) *Total length of the tool (mm)*
L3	Lunghezza totale dell'utensile (mm) *Total length of the tool (mm)*
t	Lunghezza del tagliente (mm) *Length of the cutting edge (mm)*
N/mm2 1100-1300	Acciai legati; acciai da utensili; acciai da utensili *Low alloy steel; tool and high alloy steel*
CAST IRON	Ghisa grigia; ghisa sferoidale *Grey cast iron; nodular cast iron*
INOX STAINLESS	Acciai inossidabili martensitici e austenitici; duplex *Martensitic and austenitic stainless steel; duplex*
Ti Titanium	Leghe di titanio *Titanium alloys*
Helix	Angolo dell'elica *Tool angle*
N/mm2 <850	Acciai a basso, medio e alto tenore di carbonio *Low, medium e high carbon steel*
N/mm2 850-1100	Acciai debolmente legati ; acciai legati; acciai da utensili *Low alloy steel; Alloy steel; tool and high alloy steel*



Lavorazioni di foratura
Processing of drilling



Lavorazioni di centratura
Processing of centering



Lavorazioni di smussatura
Pricessing of chamfering

QUALITÀ HM / *HM QUALITY*

Qualità HM	Grado HM	Durezza HM	Co% HM	Tipo Rivestimento
SIL 55	micro grain	1660 HV	10%	AlTiSiN PVD

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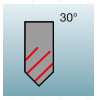
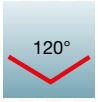
Punte per foratura - *Drill*

	FC DN 4D .. SIL 55			N/mm2 <1300	CAST IRON	INOX Stainless	TITANIUM	pag. 193-197
	FC DNF 5D .. SIL 55			N/mm2 <1300	CAST IRON	INOX Stainless	TITANIUM	pag. 199-203

Centri - *Center*

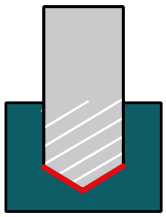
	FC 285 20 .. SIL 55			Ø 6 ÷ 12	N/mm2 <1200	CAST IRON	HRC 30-48	pag. 205
	FC 286 20 .. SIL 55			Ø 6 ÷ 12	N/mm2 <1200	CAST IRON	HRC 30-48	pag. 207

Smussi - *Chamfer*

	FC 485 20 .. SIL 55			Ø 6 ÷ 12	N/mm2 <1200	CAST IRON	HRC 30-48	pag. 209

FC DN 4D ..

SIL 55

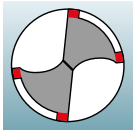


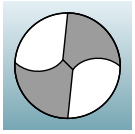
Materiali Materials	D mm	Vc m/min	fZ mm	n g/min	Vf mm/min
N/mm2 <850	3,7	120	0,085	10.329	878
	4,0	120	0,090	9.554	860
	4,3	120	0,100	8.888	889
	4,5	120	0,100	8.493	849
	4,7	120	0,105	8.131	854
	5,0	120	0,110	7.643	841
	5,1	120	0,110	7.493	824
	5,2	120	0,115	7.349	845
	5,5	120	0,120	6.948	834
	5,6	120	0,120	6.824	819
	6,0	120	0,130	6.369	828
N/mm2 850-1100	3,7	90	0,070	7.747	542
	4,0	90	0,075	7.166	537
	4,3	90	0,075	6.666	500
	4,5	90	0,075	6.369	478
	4,7	90	0,075	6.098	457
	5,0	90	0,080	5.732	459
	5,1	90	0,080	5.620	450
	5,2	90	0,085	5.512	469
	5,5	90	0,090	5.211	469
	5,6	90	0,090	5.118	461
	6,0	90	0,100	4.777	478
N/mm2 1100-1300	3,7	60	0,055	5.164	284
	4,0	60	0,060	4.777	287
	4,3	60	0,060	4.444	267
	4,5	60	0,060	4.246	255
	4,7	60	0,060	4.066	244
	5,0	60	0,065	3.822	248
	5,1	60	0,065	3.747	244
	5,2	60	0,070	3.675	257
	5,5	60	0,075	3.474	261
	5,6	60	0,075	3.412	256
	6,0	60	0,080	3.185	255
CAST IRON	3,7	150	0,095	12.911	1.227
	4,0	150	0,100	11.943	1.194
	4,3	150	0,105	11.109	1.166
	4,5	150	0,105	10.616	1.115
	4,7	150	0,100	10.164	1.016
	5,0	150	0,120	9.554	1.146
	5,1	150	0,120	9.367	1.124
	5,2	150	0,125	9.187	1.148
	5,5	150	0,130	8.686	1.129
	5,6	150	0,130	8.530	1.109
	6,0	150	0,145	7.962	1.154
INOX STAINLESS	3,7	40	0,035	3.443	121
	4,0	40	0,040	3.185	127
	4,3	40	0,045	2.963	133
	4,5	40	0,047	2.831	133
	4,7	40	0,050	2.710	136
	5,0	40	0,050	2.548	127
	5,1	40	0,050	2.498	125
	5,2	40	0,055	2.450	135
	5,5	40	0,060	2.316	139
	5,6	40	0,060	2.275	136
	6,0	40	0,065	2.123	138
LEGHE DI TITANIO	3,7	25	0,035	2.152	75
	4,0	25	0,040	1.990	80
	4,3	25	0,045	1.852	83
	4,5	25	0,047	1.769	83
	4,7	25	0,050	1.694	85
	5,0	25	0,050	1.592	80
	5,1	25	0,050	1.561	78
	5,2	25	0,055	1.531	84
	5,5	25	0,060	1.448	87
	5,6	25	0,060	1.422	85
	6,0	25	0,065	1.327	86

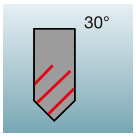
Punte senza Fori di Raffreddamento
Drill without Internal Coolant

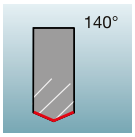
HM MICRO GRAIN

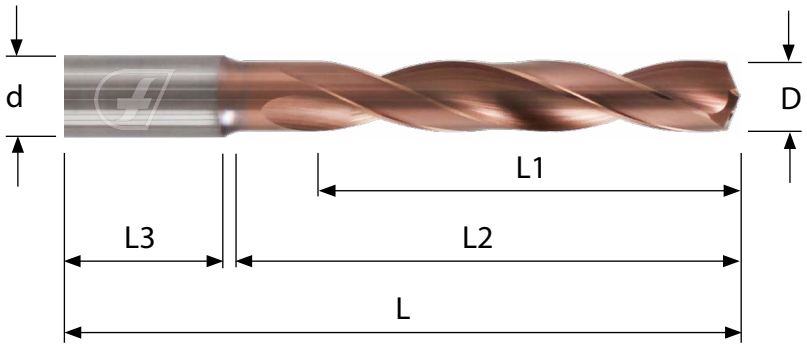
4xd











N/mm2 <850 | N/mm2 850-1100 | N/mm2 1100-1300 | CAST IRON | INOX STAINLESS | Ti TITANIUM

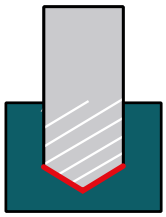
dimensions mm							*code*	*quality*
Dh10	dh6	L	L1	L2	L3			SIL 55
3,7	6	68	23	30	36	M4 Rullare ☺☺☺	FC DN 4D 3,7	★
4,0	6	68	23	30	36		FC DN 4D 4,0	★
4,3	6	68	23	30	36	M5 ☺☺☺	FC DN 4D 4,3	★
4,5	6	68	23	30	36		FC DN 4D 4,5	★
4,7	6	73	28	35	36	M5 Rullare ☺☺☺	FC DN 4D 4,7	★
5,0	6	73	28	35	36	M6 ☺	FC DN 4D 5,0	★
5,1	6	73	28	35	36	M6 ☺☺	FC DN 4D 5,1	★
5,2	6	73	28	35	36	M6 ☺☺☺	FC DN 4D 5,2	★
5,5	6	73	28	35	36		FC DN 4D 5,5	★
5,6	6	73	28	35	36	M6 Rullare ☺☺☺	FC DN 4D 5,6	★
6,0	6	73	28	35	36		FC DN 4D 6,0	★

Qualità HM *HM Quality* pag. 190

★ Pronto *Ready*

FC DN 4D ..

SIL 55

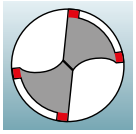


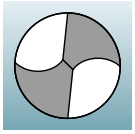
Materiali Materials	D mm	Vc m/min	fZ mm	n g/min	Vf mm/min
N/mm2 <850	6,5	120	0,145	5.879	853
	6,8	120	0,155	5.620	871
	6,9	120	0,155	5.539	858
	7,0	120	0,155	5.460	846
	7,5	120	0,170	5.096	866
	8,0	120	0,180	4.777	860
	8,5	120	0,190	4.496	854
	8,7	120	0,195	4.393	857
	9,0	120	0,210	4.246	892
	9,4	120	0,215	4.066	874
N/mm2 850-1100	6,5	90	0,105	4.410	463
	6,8	90	0,110	4.215	464
	6,9	90	0,110	4.154	457
	7,0	90	0,120	4.095	491
	7,5	90	0,125	3.822	478
	8,0	90	0,130	3.583	466
	8,5	90	0,140	3.372	472
	8,7	90	0,145	3.295	478
	9,0	90	0,150	3.185	478
	9,4	90	0,160	3.049	488
N/mm2 1100-1300	6,5	60	0,090	2.940	265
	6,8	60	0,095	2.810	267
	6,9	60	0,095	2.769	263
	7,0	60	0,095	2.730	259
	7,5	60	0,100	2.548	255
	8,0	60	0,110	2.389	263
	8,5	60	0,120	2.248	270
	8,7	60	0,120	2.196	264
	9,0	60	0,125	2.123	265
	9,4	60	0,130	2.033	264
CAST IRON	6,5	150	0,155	7.349	1.139
	6,8	150	0,160	7.025	1.124
	6,9	150	0,160	6.923	1.108
	7,0	150	0,160	6.824	1.092
	7,5	150	0,180	6.369	1.146
	8,0	150	0,195	5.971	1.164
	8,5	150	0,210	5.620	1.180
	8,7	150	0,215	5.491	1.181
	9,0	150	0,220	5.308	1.168
	9,4	150	0,230	5.082	1.169
INOX STAINLESS	6,5	40	0,070	1.960	137
	6,8	40	0,070	1.873	131
	6,9	40	0,075	1.846	138
	7,0	40	0,080	1.820	146
	7,5	40	0,085	1.699	144
	8,0	40	0,090	1.592	143
	8,5	40	0,100	1.499	150
	8,7	40	0,100	1.464	146
	9,0	40	0,110	1.415	156
	9,4	40	0,110	1.355	149
LEGHE DI TITANIO	6,5	25	0,070	1.225	86
	6,8	25	0,070	1.171	82
	6,9	25	0,075	1.154	87
	7,0	25	0,080	1.137	91
	7,5	25	0,085	1.062	90
	8,0	25	0,090	995	90
	8,5	25	0,100	937	94
	8,7	25	0,100	915	92
	9,0	25	0,110	885	97
	9,4	25	0,110	847	93

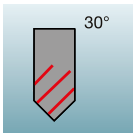
Punte senza Fori di Raffreddamento
Drill without Internal Coolant

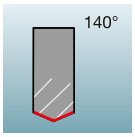
HM MICRO GRAIN

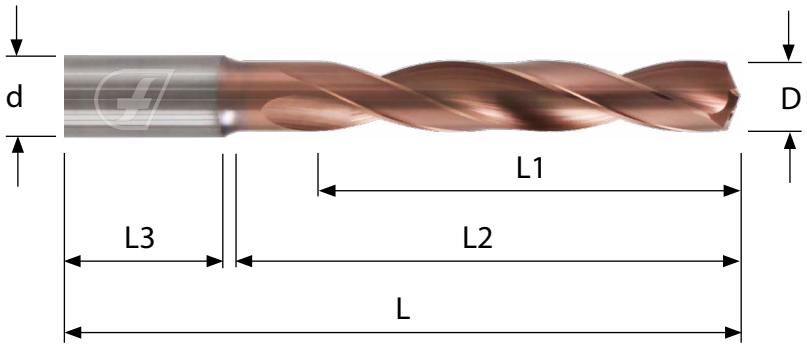
4xd











N/mm2 <850 | N/mm2 850-1100 | N/mm2 1100-1300 | CAST IRON | INOX STAINLESS | Ti TITANIUM

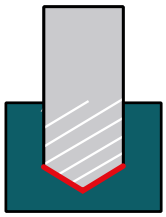
dimensions mm							*code*	*quality* SIL 55
Dh10	dh6	L	L1	L2	L3			
6,5	8	81	32	43	36		FC DN 4D 6,5	★
6,8	8	81	32	43	36	M8 ☺☺	FC DN 4D 6,8	★
6,9	8	81	32	43	36	M8 ☺☺☺	FC DN 4D 6,9	★
7,0	8	81	32	43	36		FC DN 4D 7,0	★
7,5	8	81	32	43	36	M8 Rullare ☺☺☺	FC DN 4D 7,5	★
8,0	8	81	32	43	36		FC DN 4D 8,0	★
8,5	10	99	42	57	40	M10 ☺☺	FC DN 4D 8,5	★
8,7	10	99	42	57	40	M10 ☺☺☺	FC DN 4D 8,7	★
9,0	10	99	42	57	40		FC DN 4D 9,0	★
9,4	10	99	42	57	40	M10 Rullare ☺☺☺	FC DN 4D 9,4	★

Qualità HM *HM Quality* pag. 190

★ Pronto *Ready*

FC DN 4D ..

SIL 55

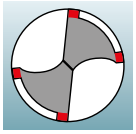


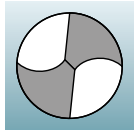
Materiali Materials	D mm	Vc m/min	fZ mm	n g/min	Vf mm/min
N/mm2 <850	10,0	120	0,225	3.822	860
	10,3	120	0,230	3.710	853
	10,5	120	0,235	3.640	855
	11,3	120	0,240	3.382	812
N/mm2 850-1100	10,0	90	0,170	2.866	487
	10,3	90	0,175	2.783	487
	10,5	90	0,180	2.730	491
	11,3	90	0,185	2.536	469
N/mm2 1100-1300	10,0	60	0,140	1.911	268
	10,3	60	0,145	1.855	269
	10,5	60	0,150	1.820	273
	11,3	60	0,155	1.691	262
CAST IRON	10,0	150	0,240	4.777	1.146
	10,3	150	0,250	4.638	1.159
	10,5	150	0,260	4.550	1.183
	11,3	150	0,270	4.227	1.141
INOX STAINLESS	10,0	40	0,115	1.274	146
	10,3	40	0,120	1.237	148
	10,5	40	0,120	1.213	146
	11,3	40	0,125	1.127	141
LEGHE DI TITANIO	10,0	25	0,115	796	92
	10,3	25	0,120	773	93
	10,5	25	0,120	758	91
	11,3	25	0,125	705	88

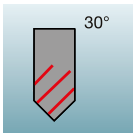
Punte senza Fori di Raffreddamento
Drill without Internal Coolant

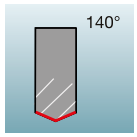
HM MICRO GRAIN

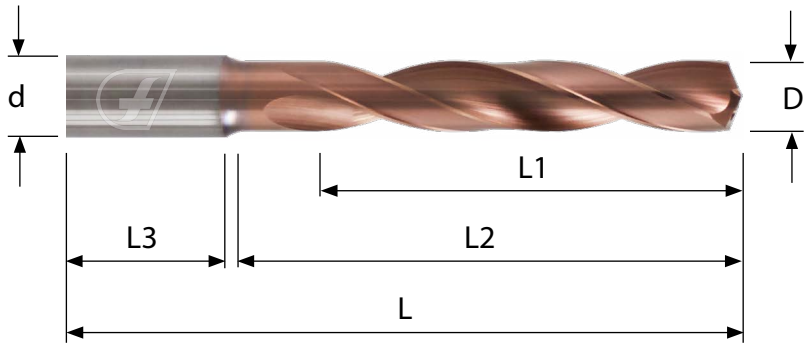
4xd









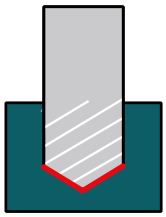


N/mm2 <850 | N/mm2 850-1100 | N/mm2 1100-1300 | CAST IRON | INOX STAINLESS | Ti TITANIUM

dimensions mm							*code*	*quality* SIL 55	
Dh10	dh6	L	L1	L2	L3				
10,0	10	99	42	57	40		FC DN 4D 10,0	★	
10,3	12	109	47	62	45	M12 ☺☺	FC DN 4D 10,3	★	
10,5	12	109	47	62	45	M12 ☺☺☺	FC DN 4D 10,5	★	
11,3	12	109	47	62	45	M12 Rullare ☺☺☺	FC DN 4D 11,3	★	

FC DNF 5D ..

SIL 55

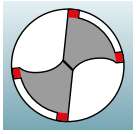


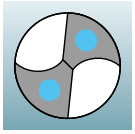
Materiali Materials	D mm		Vc m/min	fZ mm			n g/min	Vf mm/min
N/mm2 <850	3,7		170	0,160			14.632	2.341
	4,0		170	0,170			13.535	2.301
	4,3		170	0,180			12.591	2.266
	4,5		170	0,185			12.031	2.226
	4,7		170	0,190			11.519	2.189
	5,0		170	0,205			10.828	2.220
	5,1		170	0,230			10.616	2.442
	5,2		170	0,280			10.412	2.915
	5,5		170	0,300			9.844	2.953
	5,6		170	0,300			9.668	2.900
	6,0		170	0,250			9.023	2.256
N/mm2 850-1100	3,7		140	0,140			12.050	1.687
	4,0		140	0,150			11.146	1.672
	4,3		140	0,160			10.369	1.659
	4,5		140	0,165			9.908	1.635
	4,7		140	0,175			9.486	1.660
	5,0		140	0,190			8.917	1.694
	5,1		140	0,190			8.742	1.661
	5,2		140	0,190			8.574	1.629
	5,5		140	0,210			8.107	1.702
	5,6		140	0,210			7.962	1.672
	6,0		140	0,230			7.431	1.709
N/mm2 1100-1300	3,7		100	0,110			8.607	947
	4,0		100	0,120			7.962	955
	4,3		100	0,130			7.406	963
	4,5		100	0,135			7.077	955
	4,7		100	0,140			6.776	949
	5,0		100	0,150			6.369	955
	5,1		100	0,155			6.245	968
	5,2		100	0,155			6.124	949
	5,5		100	0,160			5.790	926
	5,6		100	0,160			5.687	910
	6,0		100	0,180			5.308	955
CAST IRON	3,7		200	0,150			17.215	2.582
	4,0		200	0,160			15.924	2.548
	4,3		200	0,180			14.813	2.666
			200	0,185			14.154	2.619
	4,7		200	0,190			13.552	2.575
	5,0		200	0,200			12.739	2.548
	5,1		200	0,210			12.489	2.623
	5,2		200	0,210			12.249	2.572
	5,5		200	0,240			11.581	2.779
	5,6		200	0,240			11.374	2.730
	6,0		200	0,270			10.616	2.866
INOX STAINLESS	3,7		60	0,075			5.164	387
	4,0		60	0,080			4.777	382
	4,3		60	0,095			4.444	422
	4,5		60	0,095			4.246	403
	4,7		60	0,095			4.066	386
	5,0		60	0,100			3.822	382
	5,1		60	0,105			3.747	393
	5,2		60	0,105			3.675	386
	5,5		60	0,120			3.474	417
	5,6		60	0,120			3.412	409
	6,0		60	0,135			3.185	430
LEGHE DI TITANIO	3,7		40	0,075			3.443	258
	4,0		40	0,080			3.185	255
	4,3		40	0,095			2.963	281
	4,5		40	0,095			2.831	269
	4,7		40	0,095			2.710	257
	5,0		40	0,100			2.548	255
	5,1		40	0,105			2.498	262
	5,2		40	0,105			2.450	257
	5,5		40	0,120			2.316	278
	5,6		40	0,120			2.275	273
	6,0		40	0,135			2.123	287

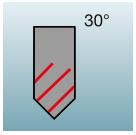
Punte con Fori di Raffreddamento
Drill with Internal Coolant

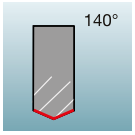
HM MICRO GRAIN

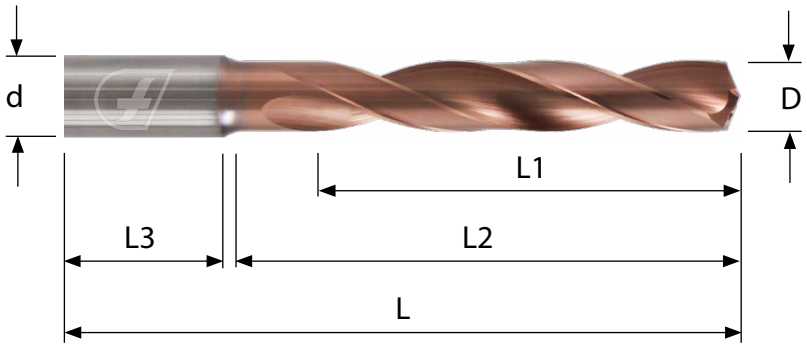
5xd











N/mm2 <850 | N/mm2 850-1100 | N/mm2 1100-1300 | CAST IRON | INOX STAINLESS | Ti TITANIUM

dimensions mm							*code*	*quality* SIL 55	
Dh10	dh6	L	L1	L2	L3				
3,7	6	73	29	36	36	M4 Rullare ☺☺☺	FC DNF 5D 3,7	★	
4,0	6	73	29	36	36		FC DNF 5D 4,0	★	
4,3	6	73	29	36	36	M5 ☺☺☺	FC DNF 5D 4,3	★	
4,5	6	73	29	36	36		FC DNF 5D 4,5	★	
4,7	6	82	35	44	36	M5 Rullare ☺☺☺	FC DNF 5D 4,7	★	
5,0	6	82	35	44	36	M6 ☺	FC DNF 5D 5,0	★	
5,1	6	82	35	44	36	M6 ☺☺	FC DNF 5D 5,1	★	
5,2	6	82	35	44	36	M6 ☺☺☺	FC DNF 5D 5,2	★	
5,5	6	82	35	44	36		FC DNF 5D 5,5	★	
5,6	6	82	35	44	36	M6 Rullare ☺☺☺	FC DNF 5D 5,6	★	
6,0	6	82	35	44	36		FC DNF 5D 6,0	★	

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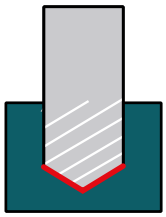
★ Pronto *Ready*

FC DNF 5D ..

SIL 55

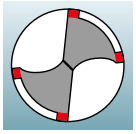


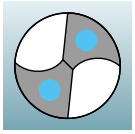
Materiali Materials	D mm		Vc m/min	fZ mm			n g/min	Vf mm/min
N/mm2 <850	6,5		170	0,280			8.329	2.332
	6,8		170	0,300			7.962	2.389
	6,9		170	0,300			7.846	2.354
	7,0		170	0,300			7.734	2.320
	7,5		170	0,315			7.219	2.274
	8,0		170	0,330			6.768	2.233
	8,5		170	0,370			6.369	2.357
	8,7		170	0,390			6.223	2.427
	9,0		170	0,410			6.016	2.466
	9,4		170	0,420			5.760	2.419
N/mm2 850-1100	6,5		140	0,260			6.859	1.783
	6,8		140	0,280			6.557	1.836
	6,9		140	0,280			6.462	1.809
	7,0		140	0,280			6.369	1.783
	7,5		140	0,300			5.945	1.783
	8,0		140	0,320			5.573	1.783
	8,5		140	0,350			5.245	1.836
	8,7		140	0,370			5.125	1.896
	9,0		140	0,390			4.954	1.932
	9,4		140	0,400			4.743	1.897
N/mm2 1100-1300	6,5		100	0,200			4.900	980
	6,8		100	0,230			4.683	1.077
	6,9		100	0,230			4.616	1.062
	7,0		100	0,230			4.550	1.046
	7,5		100	0,240			4.246	1.019
	8,0		100	0,250			3.981	995
	8,5		100	0,260			3.747	974
	8,7		100	0,260			3.661	952
	9,0		100	0,270			3.539	955
	9,4		100	0,280			3.388	949
CAST IRON	6,5		200	0,300			9.799	2.940
	6,8		200	0,320			9.367	2.997
	6,9		200	0,320			9.231	2.954
	7,0		200	0,340			9.099	3.094
	7,5		200	0,350			8.493	2.972
	8,0		200	0,370			7.962	2.946
	8,5		200	0,390			7.493	2.922
	8,7		200	0,400			7.321	2.928
	9,0		200	0,420			7.077	2.972
	9,4		200	0,440			6.776	2.981
INOX STAINLESS	6,5		60	0,150			2.940	441
	6,8		60	0,160			2.810	450
	6,9		60	0,160			2.769	443
	7,0		60	0,160			2.730	437
	7,5		60	0,170			2.548	433
	8,0		60	0,180			2.389	430
	8,5		60	0,200			2.248	450
	8,7		60	0,200			2.196	439
	9,0		60	0,220			2.123	467
	9,4		60	0,225			2.033	457
LEGHE DI TITANIO	6,5		40	0,150			1.960	294
	6,8		40	0,160			1.873	300
	6,9		40	0,160			1.846	295
	7,0		40	0,160			1.820	291
	7,5		40	0,170			1.699	289
	8,0		40	0,180			1.592	287
	8,5		40	0,200			1.499	300
	8,7		40	0,200			1.464	293
	9,0		40	0,220			1.415	311
	9,4		40	0,225			1.355	305

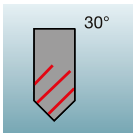
Punte con Fori di Raffreddamento
Drill with Internal Coolant

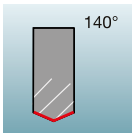
HM MICRO GRAIN

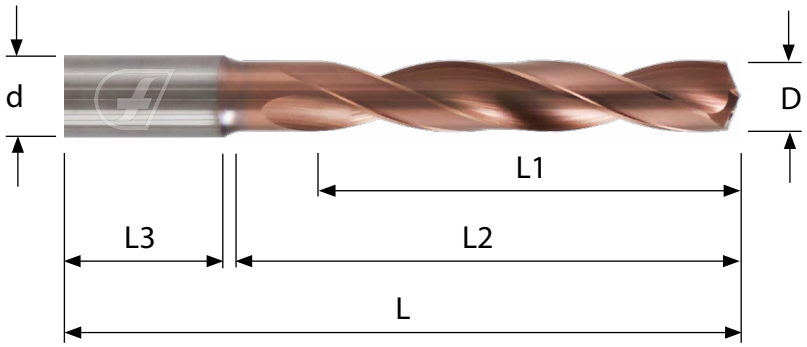
5xd











N/mm2 <850 | N/mm2 850-1100 | N/mm2 1100-1300 | CAST IRON | INOX STAINLESS | Ti TITANIUM

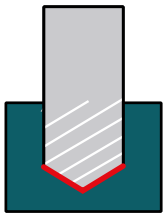
dimensions mm							*code*	*quality* SIL 55	
Dh10	dh6	L	L1	L2	L3				
6,5	8	91	43	53	36		FC DNF 5D 6,5	★	
6,8	8	91	43	53	36	M8 ☺☺	FC DNF 5D 6,8	★	
6,9	8	91	43	53	36	M8 ☺☺☺	FC DNF 5D 6,9	★	
7,0	8	91	43	53	36		FC DNF 5D 7,0	★	
7,5	8	91	43	53	36	M8 Rullare ☺☺☺	FC DNF 5D 7,5	★	
8,0	8	91	43	53	36		FC DNF 5D 8,0	★	
8,5	10	103	49	61	40	M10 ☺☺	FC DNF 5D 8,5	★	
8,7	10	103	49	61	40	M10 ☺☺☺	FC DNF 5D 8,7	★	
9,0	10	103	49	61	40		FC DNF 5D 9,0	★	
9,4	10	103	49	61	40	M10 Rullare ☺☺☺	FC DNF 5D 9,4	★	

Qualità HM *HM Quality* pag. 190

★ Pronto *Ready*

FC DNF 5D ..

SIL 55

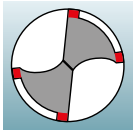


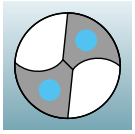
Materiali Materials	D mm		Vc m/min	fZ mm			n g/min	Vf mm/min
N/mm2 <850	10,0		170	0,430			5.414	2.328
	10,3		170	0,450			5.256	2.365
	10,5		170	0,450			5.156	2.320
	11,3		170	0,480			4.791	2.300
N/mm2 850-1100	10,0		140	0,410			4.459	1.828
	10,3		140	0,420			4.329	1.818
	10,5		140	0,420			4.246	1.783
	11,3		140	0,440			3.946	1.736
N/mm2 1100-1300	10,0		100	0,290			3.185	924
	10,3		100	0,310			3.092	959
	10,5		100	0,310			3.033	940
	11,3		100	0,340			2.818	958
CAST IRON	10,0		200	0,460			6.369	2.930
	10,3		200	0,470			6.184	2.906
	10,5		200	0,470			6.066	2.851
	11,3		200	0,480			5.637	2.706
INOX STAINLESS	10,0		60	0,230			1.911	439
	10,3		60	0,240			1.855	445
	10,5		60	0,240			1.820	437
	11,3		60	0,250			1.691	423
LEGHE DI TITANIO	10,0		40	0,230			1.274	293
	10,3		40	0,240			1.237	297
	10,5		40	0,240			1.213	291
	11,3		40	0,250			1.127	282

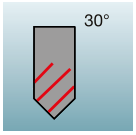
Punte con Fori di Raffreddamento
Drill with Internal Coolant

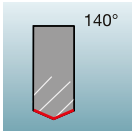
HM MICRO GRAIN

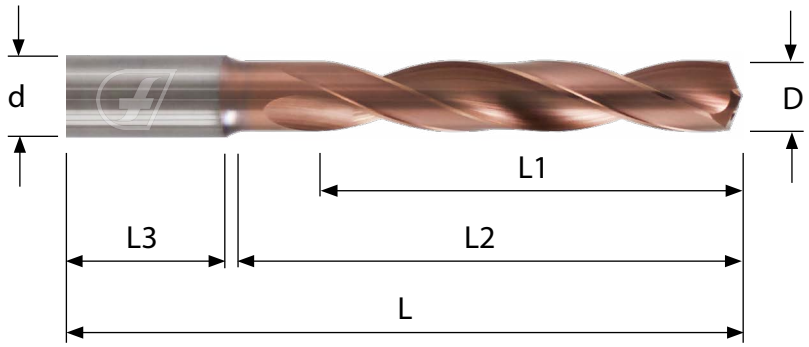
5xd











N/mm2 <850 | N/mm2 850-1100 | N/mm2 1100-1300 | CAST IRON | INOX STAINLESS | Ti TITANIUM

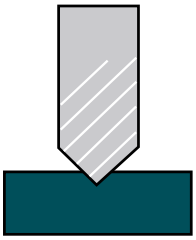
dimensions mm							*code*	*quality* SIL 55	
Dh10	dh6	L	L1	L2	L3				
10,0	10	103	49	61	40		FC DNF 5D 10,0	★	
10,3	12	120	56	71	45	M12 ☺☺	FC DNF 5D 10,3	★	
10,5	12	120	56	71	45	M12 ☺☺☺	FC DNF 5D 10,5	★	
11,3	12	120	56	71	45	M12 Rullare ☺☺☺	FC DNF 5D 11,3	★	

Qualità HM *HM Quality* pag. 190

★ Pronto *Ready*

FC 285 20 ..

SIL 55



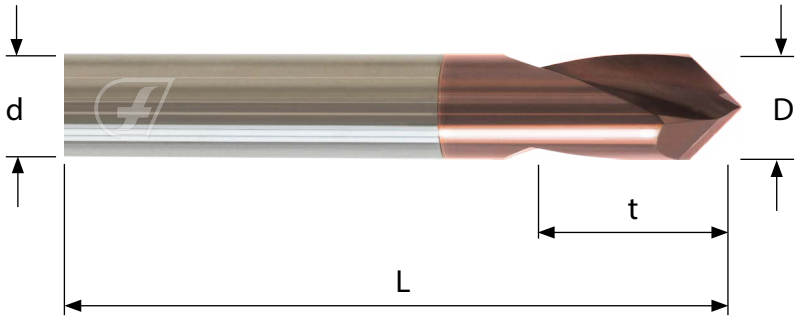
Materiali Materials	D mm	Z	Vc m/min	fZ mm			n g/min	Vf mm/min
N/mm2 <850	6	2	160	0,020			8.493	340
	8	2	160	0,025			6.369	318
	10	2	160	0,030			5.096	306
	12	2	160	0,035			4.246	297
N/mm2 850-1200	6	2	100	0,020			5.308	212
	8	2	100	0,025			3.981	199
	10	2	100	0,030			3.185	191
	12	2	100	0,035			2.654	186
CAST IRON	6	2	160	0,020			8.493	340
	8	2	160	0,025			6.369	318
	10	2	160	0,030			5.096	306
	12	2	160	0,035			4.246	297
HRC 30-42	6	2	90	0,020			4.777	191
	8	2	90	0,025			3.583	179
	10	2	90	0,030			2.866	172
	12	2	90	0,035			2.389	167
INOX STAINLESS	6	2	70	0,020			3.715	149
	8	2	70	0,025			2.787	139
	10	2	70	0,030			2.229	134
	12	2	70	0,035			1.858	130

Centri
Center

90°

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

INOX STAINLESS

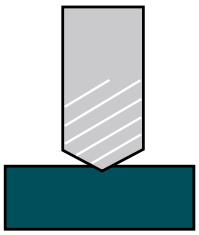
dimensions mm						*quality*	
Dh10	L	t	dh6	*Helix*	***code***	SIL 55	
6	80	12	6	20°	FC 285 20 06	★	
8	80	16	8	20°	FC 285 20 08	★	
10	80	20	10	20°	FC 285 20 10	★	
12	95	24	12	20°	FC 285 20 12	★	

Qualità HM
HM Quality
pag. 190

★ Pronto
Ready

FC 286 20 ..

SIL 55



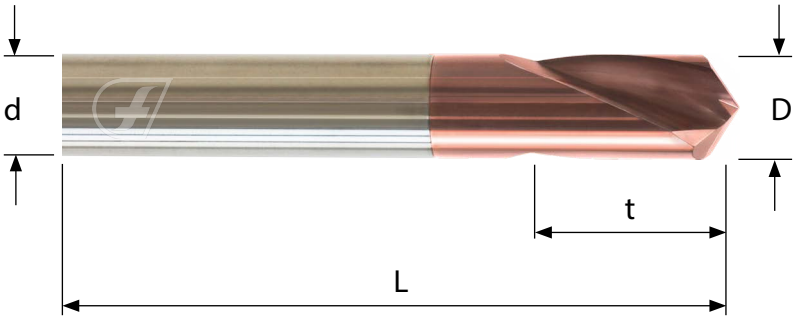
Materiali Materials	D mm	Z	Vc m/min	fZ mm			n g/min	Vf mm/min
N/mm2 <850	6	2	160	0,020			8.493	340
	8	2	160	0,025			6.369	318
	10	2	160	0,030			5.096	306
	12	2	160	0,035			4.246	297
N/mm2 850-1200	6	2	100	0,020			5.308	212
	8	2	100	0,025			3.981	199
	10	2	100	0,030			3.185	191
	12	2	100	0,035			2.654	186
CAST IRON	6	2	160	0,020			8.493	340
	8	2	160	0,025			6.369	318
	10	2	160	0,030			5.096	306
	12	2	160	0,035			4.246	297
HRC 30-42	6	2	90	0,020			4.777	191
	8	2	90	0,025			3.583	179
	10	2	90	0,030			2.866	172
	12	2	90	0,035			2.389	167
INOX STAINLESS	6	2	70	0,020			3.715	149
	8	2	70	0,025			2.787	139
	10	2	70	0,030			2.229	134
	12	2	70	0,035			1.858	130

Centri
Center

120°

HM MICRO GRAIN

Z2



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

INOX STAINLESS

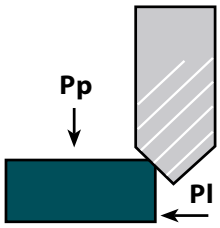
dimensions mm						*quality*	
Dh10	L	t	dh6	*Helix*	***code***	SIL 55	
6	80	12	6	20°	FC 286 20 06	★	
8	80	16	8	20°	FC 286 20 08	★	
10	80	20	10	20°	FC 286 20 10	★	
12	95	24	12	20°	FC 286 20 12	★	

Qualità HM
HM Quality pag. 190

★ Pronto
Ready

FC 485 20 ..

SIL 55



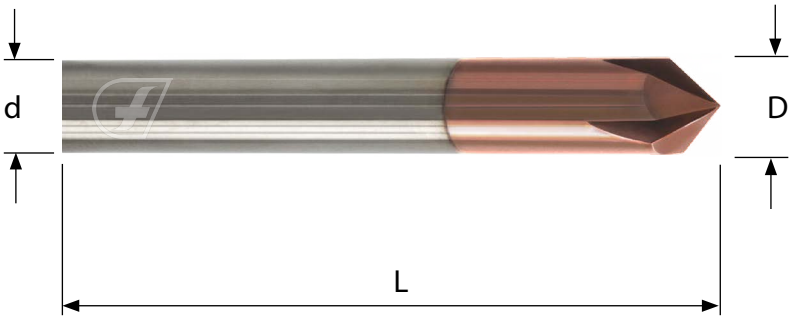
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	6	4	160	0,060	0,6	0,6	8.493	2.038
	8	4	160	0,080	0,8	0,8	6.369	2.038
	10	4	160	0,100	1,0	1,0	5.096	2.038
	12	4	160	0,120	1,2	1,2	4.246	2.038
N/mm2 850-1200	6	4	100	0,060	0,6	0,6	5.308	1.274
	8	4	100	0,080	0,8	0,8	3.981	1.274
	10	4	100	0,100	1,0	1,0	3.185	1.274
	12	4	100	0,120	1,2	1,2	2.654	1.274
CAST IRON	6	4	160	0,060	0,6	0,6	8.493	2.038
	8	4	160	0,080	0,8	0,8	6.369	2.038
	10	4	160	0,100	1,0	1,0	5.096	2.038
	12	4	160	0,120	1,2	1,2	4.246	2.038
HRC 30-42	6	4	90	0,060	0,6	0,6	4.777	1.146
	8	4	90	0,080	0,8	0,8	3.583	1.146
	10	4	90	0,100	1,0	1,0	2.866	1.146
	12	4	90	0,120	1,2	1,2	2.389	1.146
INOX STAINLESS	6	4	70	0,060	0,6	0,6	3.715	892
	8	4	70	0,080	0,8	0,8	2.787	892
	10	4	70	0,100	1,0	1,0	2.229	892
	12	4	70	0,120	1,2	1,2	1.858	892

Smussi
Bevel

90°

HM MICRO GRAIN

Z4



Sgrossatura

Finitura

N/mm2 <850

N/mm2 850-1200

CAST IRON

HRC 30-42

INOX STAINLESS

dimensions mm						*quality*	
Dh10	L	t	dh6	*Helix*	***code***	SIL 55	
6	64	-	6	-	FC 485 20 06	★	
8	64	-	8	-	FC 485 20 08	★	
10	64	-	10	-	FC 485 20 10	★	
12	80	-	12	-	FC 485 20 12	★	

Qualità HM
HM Quality
pag. 190

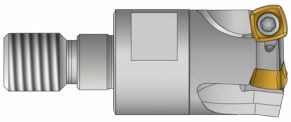
★ Pronto
Ready

Prolunghe in metallo duro - *Extensions carbide*

PMD .... M...

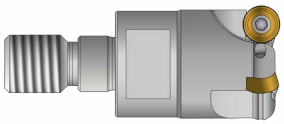
Ø 12 ÷ 22			MD			pag. 219

Testine per lavorazioni di acciaio - *Modular milling tools for steel*



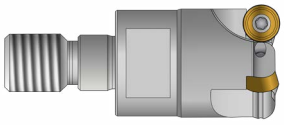
TM.. SP06

Ø 16 ÷ 32	N/mm2 <850-1200	HRC 30-42	HRC 42-52	HRC 52-60	pag. 221



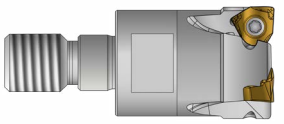
TM.. RD07

Ø 16 ÷ 25	N/mm2 <850-1200	HRC 30-42	HRC 42-52	HRC 52-60	pag. 223



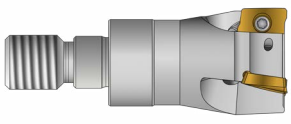
TM.. RD10

Ø 20 ÷ 32	N/mm2 <850-1200	HRC 30-42	HRC 42-52	HRC 52-60	pag. 225



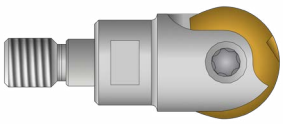
TM.. WN04

Ø 20 ÷ 25	N/mm2 <850-1200	HRC 30-42	HRC 42-52	HRC 52-60	pag. 227

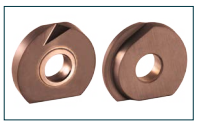


TM.. AP10

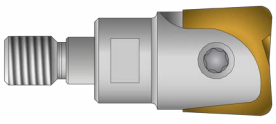
Ø 16 ÷ 25	N/mm2 <850-1200	HRC 30-42	HRC 42-52	HRC 52-60	pag. 229



TM.. TEC..



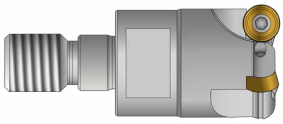
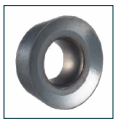
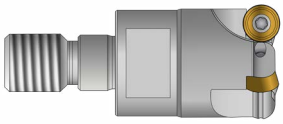
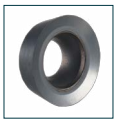
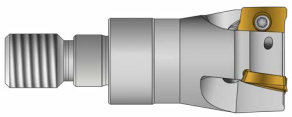
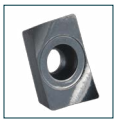
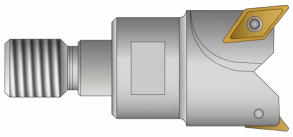
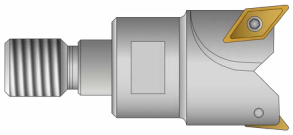
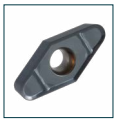
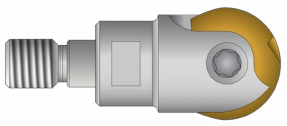
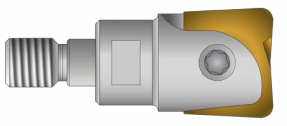
Ø 12 ÷ 20	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	pag. 231



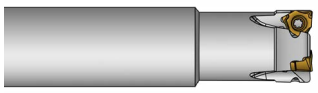
TM.. TEW..

Ø 12 ÷ 20	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	pag. 233

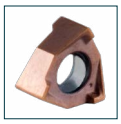
Testine per lavorazioni di alluminio - plastica - compositi
Modular milling tools for aluminium - plastic - composite

	TM.. RD07AL		Ø 16	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 235
	TM.. RD10		Ø 20 ÷ 32	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 237
	TM.. AP10		Ø 16 ÷ 25	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 239
	TM.. VD11		Ø 16 ÷ 25	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 241
	TM.. VC22		Ø 32	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 243
	TM.. TEC..		Ø 12 ÷ 20	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 245
	TM.. TEW..		Ø 12 ÷ 20	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 247

Frese cilindriche per lavorazioni di acciaio
Milling Cutters with cylindrical shank for steel

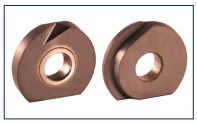


FC.. WN04



Ø	N/mm2	N/mm2	HRC		
20 ÷ 25	850	850-1200	30-52		pag. 249

FC.. TEC..



Ø	N/mm2	HRC	HRC	HRC	
12 ÷ 20	<850-1200	30-42	42-52	52-60	pag. 251

FC.. TEW..

Ø	N/mm2	HRC	HRC	HRC	
12 ÷ 20	<850-1200	30-42	42-52	52-60	pag. 253

Frese cilindriche per lavorazioni di alluminio - plastica - compositi
Milling cutters with cylindrical shank for aluminium - plastic - composite

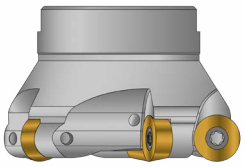
FC.. TEC..

Ø					
12 ÷ 20	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 255

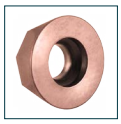
FC.. TEW..

Ø					
12 ÷ 20	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 257

Frese a manicotto per lavorazioni di acciaio
Shell shank for steel

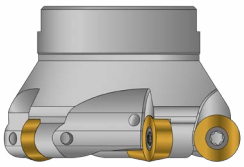


SM.. RP12

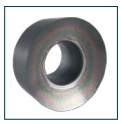


Ø	N/mm2	N/mm2	HRC		
40 ÷ 63	850	850-1200	30-52		pag. 259

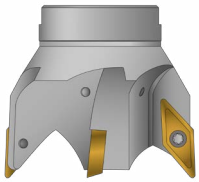
Frese a manicotto per lavorazioni di alluminio - plastica - compositi
Shell shank for aluminium - plastic - composite



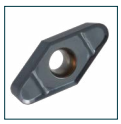
MR.. RP12



Ø					
40 ÷ 63	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 261



SM.. VC22



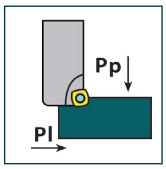
Ø					
52 ÷ 63	Aluminium	COPPER	PLASTIC	COMPOSITE	pag. 263

LEGENDA DELLA PAGINA DEI CORPI FRESA / *KEY OF PRODUCTS PAGE*

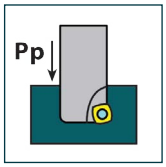
N/mm2 <850	Acciai a basso, medio e alto tenore di carbonio *Low, medium e high carbon steel*
N/mm2 850-1200	Acciai debolmente legati ; acciai legati; acciai da utensili *Low alloy steel; Alloy steel; tool and high alloy steel*
CAST IRON	Ghisa grigia; ghisa sferoidale *Grey cast iron; nodular cast iron*
HRC 30-42	Acciai temprati *Hardned steel*
HRC 42-48	Acciai temprati *Hardned steel*
HRC 48-52	Acciai temprati *Hardned steel*
HRC 52-60	Acciai temprati *Hardned steel*
INOX STAINLESS	Acciai inossidabili martensitici e austenitici; duplex *Martensitic and austenitic stainless steel; duplex*
COPPER	Rame *Copper*
Ti Titanium	Leghe di titanio *Titanium alloys*
GRAPHITE	Grafite *Graphite*
PLASTIC	Plastica; plastica caricata vetro *Plastic; plastic glass fiber*
ALUMINIUM	Alluminio laminato; alluminio pressofuso *Wrought and rolled aluminium; die-cast aluminium*
COMPOSITE	Materiali compositi *Composite*

D	Diametro del corpo fresa *Diameter of the cassette holder*
L	Lunghezza totale del corpo fresa *Total lenght of the cassette holder*
H	Lunghezza utile del corpo fresa *Utility lenght of the cassette holder*
M	Misura del filetto dell'attacco *Thread measure of the shank*
d	Misura del codolo *Measure of the shank*
Z	Numero dei taglienti *Number of the tooth*

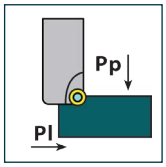
LEGENDA DELLA PAGINA DEI CORPI FRESA / *KEY OF PRODUCTS PAGE*



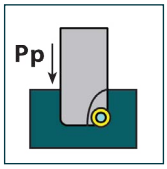
Lavorazioni di spianatura con utensile ad alto avanzamento
Smoothing with high feed end mills



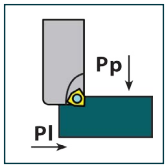
Lavorazioni di cave con utensile ad alto avanzamento
Pocket milling with high feed end mills



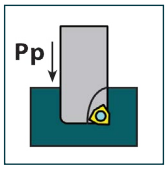
Lavorazioni di spianatura con utensile rotondo
Smoothing with rounded end mills



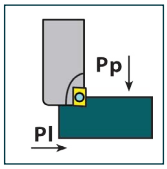
Lavorazioni di cave con utensile rotondo
Pocket milling with rounded end mills



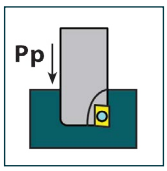
Lavorazioni di spianatura con utensile a spallamento retto
Smoothing with square shoulder cutting tool



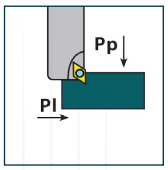
Lavorazioni di cave con utensile a spallamento retto
Pocket milling with square shoulder cutting tool



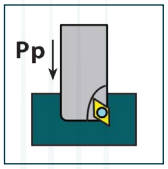
Lavorazioni di spianatura con utensile a spallamento retto
Smoothing with square shoulder cutting tool



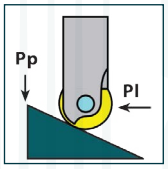
Lavorazioni di cave con utensile a spallamento retto
Pocket milling with square shoulder cutting tool



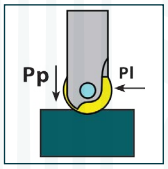
Lavorazioni di spianatura con inserto a spallamento retto
Smoothing with square shoulder cutting inserts



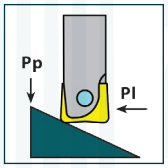
Lavorazioni di cave con inserto a spallamento retto
Pocket milling with square shoulder cutting inserts



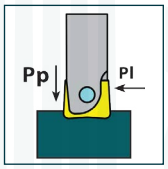
Lavorazioni 3D di finitura con utensile semisferico
Finishing 3D with ball nose end mills



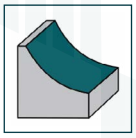
Lavorazioni 3D di sgrossatura con utensile semisferico
Roughing 3D with ball nose end mills



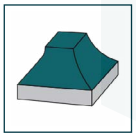
Lavorazioni 3D di finitura con utensile a testa torica
Finishing 3D with corner radius end mills



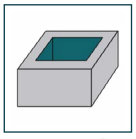
Lavorazioni 3D di sgrossatura con utensile a testa torica
Roughing 3D with corner radius end mills



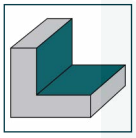
Lavorazioni di copiatura
Copy milling



Lavorazioni 3D
3D end milling



Lavorazioni di cave
Pocket milling



Lavorazioni di spallamento retto
Square shoulder cutting

Lavorazioni consigliate con utilizzo di refrigerante / *Processing with the use of coolant*

Lavorazioni consigliate senza utilizzo di refrigerante / *Processing without the use of coolant*

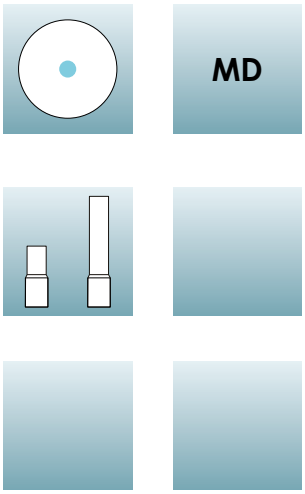
Lavorazioni consigliate con utilizzo di aria / *Processing with the use of air*

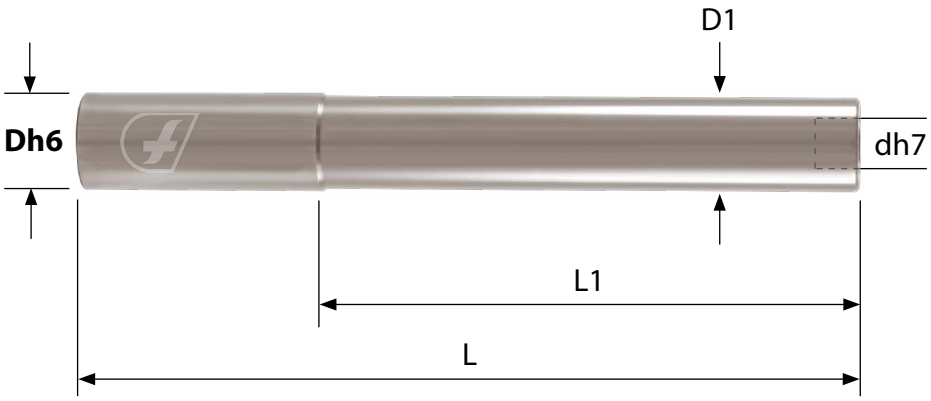
QUALITÀ HM / *HM QUALITY*

Qualità HM	Grado HM	Durezza HM	ISO GRADE	Tipo Rivestimento
FK100	ultra fine	1900 HV	K05-K10	AlTiSiN PVD
FK200	micro grain	1600 HV	K10-K15	AlTiSiN PVD
FK300	medium grain	1450 HV	K15-K20	AlTiSiN PVD
FDL10	micro grain	1600 HV	K10-K15	Diamond PVD

Prolunghe in metallo duro con foro di raffreddamento

Extensions carbide with cooling hole

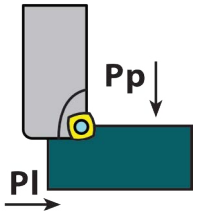




dimensions mm							
Dh6	D1	dh7	L	L1	M		***code***
12	11,5	6,5	160	60	M6		PMD 12.160 M6 ★
16	15,0	8,5	110	60	M8		PMD 16.110 M8 ★
16	15,0	8,5	160	110	M8		PMD 16.160 M8 ★
20	19,0	10,5	110	60	M10		PMD 20.110 M10 ★
20	19,0	10,5	160	110	M10		PMD 20.160 M10 ★
22	22,0	12,5	200	-	M12		PMD 22.200 M12 ★

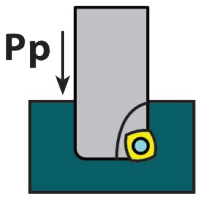
TM.. SP06

FK100



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	16	2	240	1,000	0,40	10,0	4.777	9.554
		20	3	240	1,000	0,40	12,0	3.822	11.465
		25	4	240	1,000	0,40	15,0	3.057	12.229
		32	5	240	1,000	0,40	19,0	2.389	11.943
	160	16	2	210	0,800	0,30	6,5	4.180	6.688
		20	3	210	0,800	0,30	8,0	3.344	8.025
		25	4	210	0,800	0,30	10,0	2.675	8.561
		32	5	210	0,800	0,30	12,5	2.090	8.360
N/mm2 850-1200	110	16	2	210	0,800	0,40	10,0	4.180	6.688
		20	3	210	0,800	0,40	12,0	3.344	8.025
		25	4	210	0,800	0,40	15,0	2.675	8.561
		32	5	210	0,800	0,40	19,0	2.090	8.360
	160	16	2	180	0,650	0,30	6,5	3.583	4.658
		20	3	180	0,650	0,30	8,0	2.866	5.589
		25	4	180	0,650	0,30	10,0	2.293	5.962
		32	5	180	0,650	0,30	12,5	1.791	5.822
HRC 30-42	110	16	2	180	0,650	0,30	10,0	3.583	4.658
		20	3	180	0,650	0,30	12,0	2.866	5.589
		25	4	180	0,650	0,30	15,0	2.293	5.962
		32	5	180	0,650	0,30	19,0	1.791	5.822
	160	16	2	160	0,500	0,20	6,5	3.185	3.185
		20	3	160	0,500	0,20	8,0	2.548	3.822
		25	4	160	0,500	0,20	10,0	2.038	4.076
		32	5	160	0,500	0,20	12,5	1.592	3.981
HRC 42-52	110	16	2	120	0,500	0,20	10,0	2.389	2.389
		20	3	120	0,500	0,20	12,0	1.911	2.866
		25	4	120	0,500	0,20	15,0	1.529	3.057
		32	5	120	0,500	0,20	19,0	1.194	2.986
	160	16	2	95	0,400	0,15	6,5	1.891	1.513
		20	3	95	0,400	0,15	8,0	1.513	1.815
		25	4	95	0,400	0,15	10,0	1.210	1.936
		32	5	95	0,400	0,15	12,5	945	1.891
HRC 52-60	110	16	2	95	0,350	0,20	10,0	1.891	1.324
		20	3	95	0,350	0,20	12,0	1.513	1.588
		25	4	95	0,350	0,20	15,0	1.210	1.694
		32	5	95	0,350	0,20	19,0	945	1.655
	160	16	2	70	0,200	0,15	6,5	1.393	557
		20	3	70	0,200	0,15	8,0	1.115	669
		25	4	70	0,200	0,15	10,0	892	713
		32	5	70	0,200	0,15	12,5	697	697

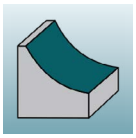
FK100

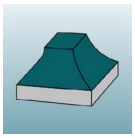


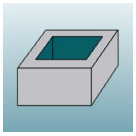
Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	16	2	200	1,000	0,40	16,0	3.981	7.962
		20	3	200	1,000	0,40	20,0	3.185	9.554
		25	4	200	1,000	0,40	25,0	2.548	10.191
		32	5	200	1,000	0,40	32,0	1.990	9.952
	160	16	2	180	0,800	0,30	16,0	3.583	5.732
		20	3	180	0,800	0,30	20,0	2.866	6.879
		25	4	180	0,800	0,30	25,0	2.293	7.338
		32	5	180	0,800	0,30	32,0	1.791	7.166
N/mm2 850-1200	110	16	2	180	0,800	0,40	16,0	3.583	5.732
		20	3	180	0,800	0,40	20,0	2.866	6.879
		25	4	180	0,800	0,40	25,0	2.293	7.338
		32	5	180	0,800	0,40	32,0	1.791	7.166
	160	16	2	160	0,650	0,30	16,0	3.185	4.140
		20	3	160	0,650	0,30	20,0	2.548	4.968
		25	4	160	0,650	0,30	25,0	2.038	5.299
		32	5	160	0,650	0,30	32,0	1.592	5.175
HRC 30-42	110	16	2	160	0,650	0,30	16,0	3.185	4.140
		20	3	160	0,650	0,30	20,0	2.548	4.968
		25	4	160	0,650	0,30	25,0	2.038	5.299
		32	5	160	0,650	0,30	32,0	1.592	5.175
	160	16	2	140	0,500	0,20	16,0	2.787	2.787
		20	3	140	0,500	0,20	20,0	2.229	3.344
		25	4	140	0,500	0,20	25,0	1.783	3.567
		32	5	140	0,500	0,20	32,0	1.393	3.483
HRC 42-52	110	16	2	100	0,500	0,20	16,0	1.990	1.990
		20	3	100	0,500	0,20	20,0	1.592	2.389
		25	4	100	0,500	0,20	25,0	1.274	2.548
		32	5	100	0,500	0,20	32,0	995	2.488
	160	16	2	80	0,400	0,15	16,0	1.592	1.274
		20	3	80	0,400	0,15	20,0	1.274	1.529
		25	4	80	0,400	0,15	25,0	1.019	1.631
		32	5	80	0,400	0,15	32,0	796	1.592
HRC 52-60	110	16	2	80	0,350	0,20	16,0	1.592	1.115
		20	3	80	0,350	0,20	20,0	1.274	1.338
		25	4	80	0,350	0,20	25,0	1.019	1.427
		32	5	80	0,350	0,20	32,0	796	1.393
	160	16	2	60	0,200	0,15	16,0	1.194	478
		20	3	60	0,200	0,15	20,0	955	573
		25	4	60	0,200	0,15	25,0	764	611
		32	5	60	0,200	0,15	32,0	597	597

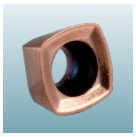
Testine per la lavorazione di acciaio con passaggio refrigerante

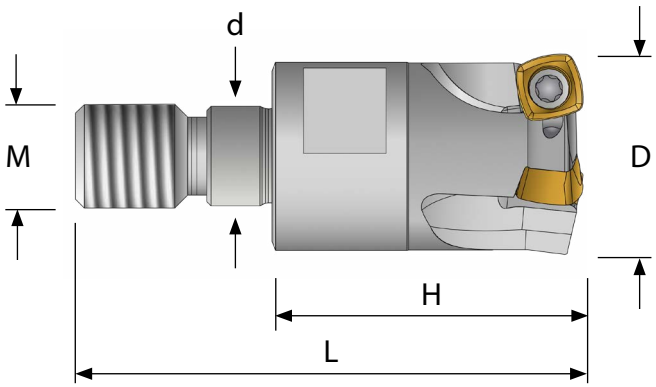
Modular milling tools with cooling holes


Copiatura


3D


Cava



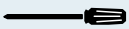


Sgrossatura	Finitura	N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	

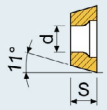
dimensions mm							code		
D	L	H	M	d	Z				
16	40	23	M8	8,5	2	10	TM16 SP06	★	
20	50	30	M10	10,5	3	15	TM20 SP06	★	
25	56	35	M12	12,5	4	17	TM25 SP06	★	
32	68	43	M16	17,0	5	24	TM32 SP06	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTM25


T07

Per la programmazione CAD/CAM inserire R. 1,5.



INSERTO / *INSERT*

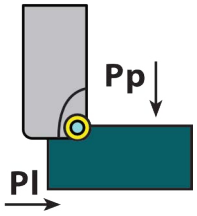
dimensions mm					code	quality
I	IC	S	d	R		
6,20	6,20	3,20	2,80	0,8	SPAT 060308	**FK100**

Qualità HM *HM Quality* pag. 218

★ Pronto *Ready*

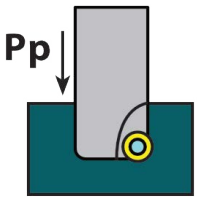
TM.. RD07

FK200



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	16	3	240	1,000	0,40	10,0	4.777	14.331
		20	4	240	1,000	0,40	12,0	3.822	15.287
		25	5	240	1,000	0,40	15,0	3.057	15.287
	160	16	3	210	0,800	0,30	6,5	4.180	10.032
		20	4	210	0,800	0,30	8,0	3.344	10.701
		25	5	210	0,800	0,30	10,0	2.675	10.701
N/mm2 850-1200	110	16	3	210	0,800	0,30	10,0	4.180	10.032
		20	4	210	0,800	0,30	12,0	3.344	10.701
		25	5	210	0,800	0,30	15,0	2.675	10.701
	160	16	3	180	0,650	0,20	6,5	3.583	6.986
		20	4	180	0,650	0,20	8,0	2.866	7.452
		25	5	180	0,650	0,20	10,0	2.293	7.452
HRC 30-42	110	16	3	180	0,650	0,30	10,0	3.583	6.986
		20	4	180	0,650	0,30	12,0	2.866	7.452
		25	5	180	0,650	0,30	15,0	2.293	7.452
	160	16	3	160	0,500	0,20	6,5	3.185	4.777
		20	4	160	0,500	0,20	8,0	2.548	5.096
		25	5	160	0,500	0,20	10,0	2.038	5.096
HRC 42-52	110	16	3	120	0,500	0,20	10,0	2.389	3.583
		20	4	120	0,500	0,20	12,0	1.911	3.822
		25	5	120	0,500	0,20	15,0	1.529	3.822
	160	16	3	95	0,400	0,15	6,5	1.891	2.269
		20	4	95	0,400	0,15	8,0	1.513	2.420
		25	5	95	0,400	0,15	10,0	1.210	2.420
HRC 52-60	110	16	3	95	0,350	0,20	10,0	1.891	1.985
		20	4	95	0,350	0,20	12,0	1.513	2.118
		25	5	95	0,350	0,20	15,0	1.210	2.118
	160	16	3	70	0,200	0,15	6,5	1.393	836
		20	4	70	0,200	0,15	8,0	1.115	892
		25	5	70	0,200	0,15	10,0	892	892

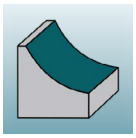
FK200



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	16	3	200	1,000	0,40	16,0	3.981	11.943
		20	4	200	1,000	0,40	20,0	3.185	12.739
		25	5	200	1,000	0,40	25,0	2.548	12.739
	160	16	3	180	0,800	0,30	16,0	3.583	8.599
		20	4	180	0,800	0,30	20,0	2.866	9.172
		25	5	180	0,800	0,30	25,0	2.293	9.172
N/mm2 850-1200	110	16	3	180	0,800	0,30	16,0	3.583	8.599
		20	4	180	0,800	0,30	20,0	2.866	9.172
		25	5	180	0,800	0,30	25,0	2.293	9.172
	160	16	3	160	0,650	0,20	16,0	3.185	6.210
		20	4	160	0,650	0,20	20,0	2.548	6.624
		25	5	160	0,650	0,20	25,0	2.038	6.624
HRC 30-42	110	16	3	160	0,650	0,30	16,0	3.185	6.210
		20	4	160	0,650	0,30	20,0	2.548	6.624
		25	5	160	0,650	0,30	25,0	2.038	6.624
	160	16	3	140	0,500	0,20	16,0	2.787	4.180
		20	4	140	0,500	0,20	20,0	2.229	4.459
		25	5	140	0,500	0,20	25,0	1.783	4.459
HRC 42-52	110	16	3	100	0,500	0,20	16,0	1.990	2.986
		20	4	100	0,500	0,20	20,0	1.592	3.185
		25	5	100	0,500	0,20	25,0	1.274	3.185
	160	16	3	80	0,400	0,15	16,0	1.592	1.911
		20	4	80	0,400	0,15	20,0	1.274	2.038
		25	5	80	0,400	0,15	25,0	1.019	2.038
HRC 52-60	110	16	3	80	0,350	0,20	16,0	1.592	1.672
		20	4	80	0,350	0,20	20,0	1.274	1.783
		25	5	80	0,350	0,20	25,0	1.019	1.783
	160	16	3	60	0,200	0,15	16,0	1.194	717
		20	4	60	0,200	0,15	20,0	955	764
		25	5	60	0,200	0,15	25,0	764	764

Testine per la lavorazione di acciaio con passaggio refrigerante

Modular milling tools with cooling holes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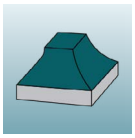
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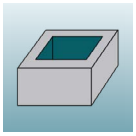
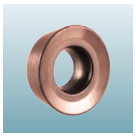
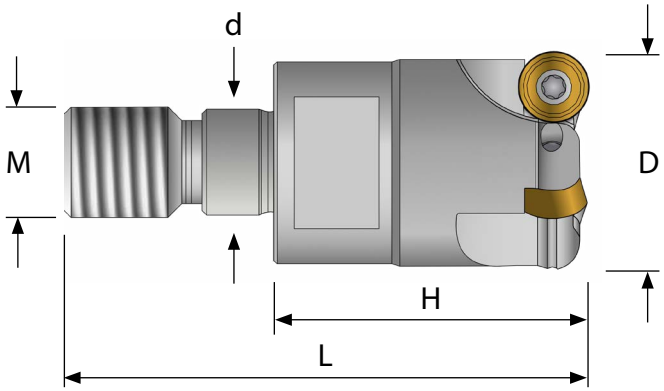

Cava





Sgrossatura

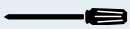
Finitura

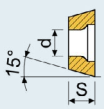
N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60

dimensions mm							code		
D	L	H	M	d	Z				
16	40	23	M8	8,5	3	10	TM16 RD07	★	
20	50	30	M10	10,5	4	15	TM20 RD07	★	
25	56	35	M12	12,5	5	17	TM25 RD07	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTR25


T07



INSERTO / *INSERT*

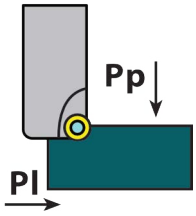
dimensions mm				code	quality
IC	S	d	R		
7,00	2,40	2,80	3,50	RDET 07T2MO	FK200

Qualità HM *HM Quality* pag. 218

★ Pronto *Ready*

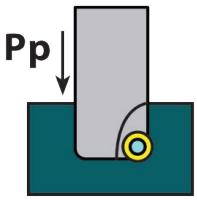
TM.. RD10

FK200



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	20	2	240	1,000	0,50	10,0	3.822	7.643
		25	3	240	1,000	0,50	12,0	3.057	9.172
		32	4	240	1,000	0,50	15,0	2.389	9.554
	160	20	2	210	0,800	0,40	6,5	3.344	5.350
		25	3	210	0,800	0,40	8,0	2.675	6.420
		32	4	210	0,800	0,40	10,0	2.090	6.688
N/mm2 850-1200	110	20	2	210	0,800	0,40	10,0	3.344	5.350
		25	3	210	0,800	0,40	12,0	2.675	6.420
		32	4	210	0,800	0,40	15,0	2.090	6.688
	160	20	2	180	0,650	0,30	6,5	2.866	3.726
		25	3	180	0,650	0,30	8,0	2.293	4.471
		32	4	180	0,650	0,30	10,0	1.791	4.658
HRC 30-42	110	20	2	180	0,650	0,40	10,0	2.866	3.726
		25	3	180	0,650	0,40	12,0	2.293	4.471
		32	4	180	0,650	0,40	15,0	1.791	4.658
	160	20	2	160	0,500	0,30	6,5	2.548	2.548
		25	3	160	0,500	0,30	8,0	2.038	3.057
		32	4	160	0,500	0,30	10,0	1.592	3.185
HRC 42-52	110	20	2	120	0,500	0,30	10,0	1.911	1.911
		25	3	120	0,500	0,30	12,0	1.529	2.293
		32	4	120	0,500	0,30	15,0	1.194	2.389
	160	20	2	95	0,400	0,20	6,5	1.513	1.210
		25	3	95	0,400	0,20	8,0	1.210	1.452
		32	4	95	0,400	0,20	10,0	945	1.513
HRC 52-60	110	20	2	95	0,350	0,20	10,0	1.513	1.059
		25	3	95	0,350	0,20	12,0	1.210	1.271
		32	4	95	0,350	0,20	15,0	945	1.324
	160	20	2	70	0,200	0,15	6,5	1.115	446
		25	3	70	0,200	0,15	8,0	892	535
		32	4	70	0,200	0,15	10,0	697	557

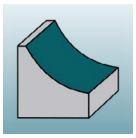
FK200

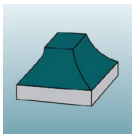


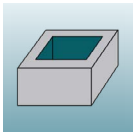
Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	20	2	200	1,000	0,50	20,0	3.185	6.369
		25	3	200	1,000	0,50	25,0	2.548	7.643
		32	4	200	1,000	0,50	32,0	1.990	7.962
	160	20	2	180	0,800	0,40	20,0	2.866	4.586
		25	3	180	0,800	0,40	25,0	2.293	5.503
		32	4	180	0,800	0,40	32,0	1.791	5.732
N/mm2 850-1200	110	20	2	180	0,800	0,40	20,0	2.866	4.586
		25	3	180	0,800	0,40	25,0	2.293	5.503
		32	4	180	0,800	0,40	32,0	1.791	5.732
	160	20	2	160	0,650	0,30	20,0	2.548	3.312
		25	3	160	0,650	0,30	25,0	2.038	3.975
		32	4	160	0,650	0,30	32,0	1.592	4.140
HRC 30-42	110	20	2	160	0,650	0,40	20,0	2.548	3.312
		25	3	160	0,650	0,40	25,0	2.038	3.975
		32	4	160	0,650	0,40	32,0	1.592	4.140
	160	20	2	140	0,500	0,30	20,0	2.229	2.229
		25	3	140	0,500	0,30	25,0	1.783	2.675
		32	4	140	0,500	0,30	32,0	1.393	2.787
HRC 42-52	110	20	2	100	0,500	0,30	20,0	1.592	1.592
		25	3	100	0,500	0,30	25,0	1.274	1.911
		32	4	100	0,500	0,30	32,0	995	1.990
	160	20	2	80	0,400	0,20	20,0	1.274	1.019
		25	3	80	0,400	0,20	25,0	1.019	1.223
		32	4	80	0,400	0,20	32,0	796	1.274
HRC 52-60	110	20	2	80	0,350	0,20	20,0	1.274	892
		25	3	80	0,350	0,20	25,0	1.019	1.070
		32	4	80	0,350	0,20	32,0	796	1.115
	160	20	2	60	0,200	0,15	20,0	955	382
		25	3	60	0,200	0,15	25,0	764	459
		32	4	60	0,200	0,15	32,0	597	478

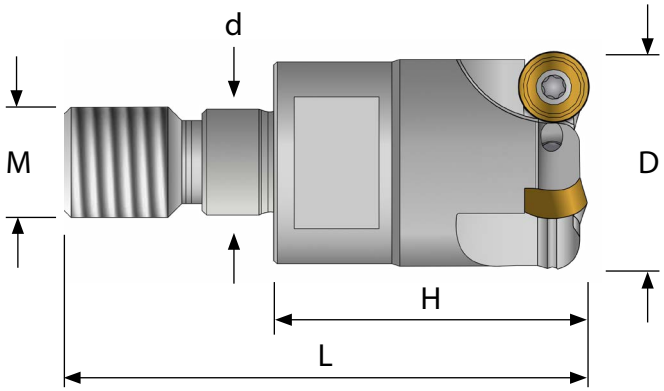
Testine per la lavorazione di acciaio con passaggio refrigerante

Modular milling tools with cooling holes


Copiatura


3D


Cava



Sgrossatura

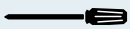
Finitura

N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60

D	L	H	M	d	Z		code		
				dimensions mm					
20	50	30	M10	10,5	2	15	TM20 RD10	★	
25	56	35	M12	12,5	3	17	TM25 RD10	★	
32	68	43	M16	17,0	4	24	TM32 RD10	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTM35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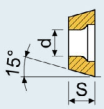


INSERTO / *INSERT*

IC	S	d	R	code	quality
		dimensions mm			
10,00	3,18	4,40	5,00	RDET 1003MO	FK200

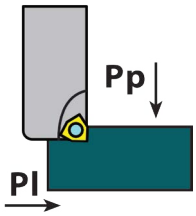
Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

TM.. WN04

FK100

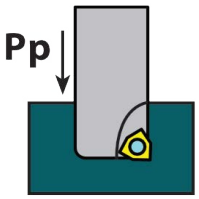
FINITURA



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	20	3	250	0,600	0,40	12,0	3.981	7.166
		25	4	250	0,600	0,40	15,0	3.185	7.643
	160	20	3	210	0,500	0,30	12,0	3.344	5.016
		25	4	210	0,500	0,30	15,0	2.675	5.350
N/mm2 850-1200	110	20	3	210	0,500	0,40	12,0	3.344	5.016
		25	4	210	0,500	0,40	15,0	2.675	5.350
	160	20	3	180	0,400	0,30	12,0	2.866	3.439
		25	4	180	0,400	0,30	15,0	2.293	3.669
HRC 30-42	110	20	3	180	0,500	0,40	12,0	2.866	4.299
		25	4	180	0,500	0,40	15,0	2.293	4.586
	160	20	3	160	0,400	0,30	12,0	2.548	3.057
		25	4	160	0,400	0,30	15,0	2.038	3.261
HRC 42-52	110	20	3	120	0,400	0,30	12,0	1.911	2.293
		25	4	120	0,400	0,30	15,0	1.529	2.446
	160	20	3	95	0,300	0,20	12,0	1.513	1.361
		25	4	95	0,300	0,20	15,0	1.210	1.452
HRC 52-60	110	20	3	95	0,200	0,20	12,0	1.513	908
		25	4	95	0,200	0,20	15,0	1.210	968
	160	20	3	70	0,150	0,15	12,0	1.115	502
		25	4	70	0,150	0,15	15,0	892	535

FK300

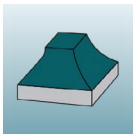
SGROSSATURA

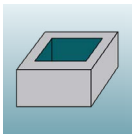


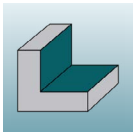
Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	20	3	220	0,600	1,30	20,0	3.503	6.306
		25	4	220	0,600	1,30	25,0	2.803	6.726
	160	20	3	180	0,500	1,10	20,0	2.866	4.299
		25	4	180	0,500	1,10	25,0	2.293	4.586
N/mm2 850-1200	110	20	3	180	0,500	0,40	20,0	2.866	4.299
		25	4	180	0,500	0,40	25,0	2.293	4.586
	160	20	3	160	0,400	0,30	20,0	2.548	3.057
		25	4	160	0,400	0,30	25,0	2.038	3.261
HRC 30-42	110	20	3	160	0,500	0,40	20,0	2.548	3.822
		25	4	160	0,500	0,40	25,0	2.038	4.076
	160	20	3	140	0,400	0,30	20,0	2.229	2.675
		25	4	140	0,400	0,30	25,0	1.783	2.854
HRC 42-52	110	20	3	100	0,400	0,30	20,0	1.592	1.911
		25	4	100	0,400	0,30	25,0	1.274	2.038
	160	20	3	80	0,300	0,20	20,0	1.274	1.146
		25	4	80	0,300	0,20	25,0	1.019	1.223
HRC 52-60	110	20	3	80	0,200	0,20	20,0	1.274	764
		25	4	80	0,200	0,20	25,0	1.019	815
	160	20	3	60	0,150	0,15	20,0	955	430
		25	4	60	0,150	0,15	25,0	764	459

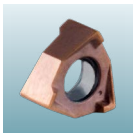
Testine per la lavorazione di acciaio con passaggio refrigerante

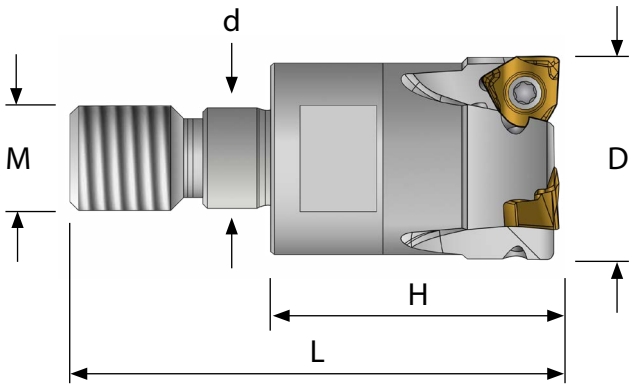
Modular milling tools with cooling holes


3D


Cava


Spallamento retto





Sgrossatura

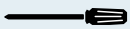
Finitura

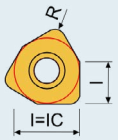
N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	

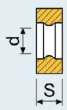
dimensions mm D	L	H	M	d	Z		*code*		
20	50	30	M10	10,5	3	15	TM20 WN04	★	
25	56	35	M12	12,5	4	17	TM25 WN04	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTM25


T07





INSERTO / *INSERT*

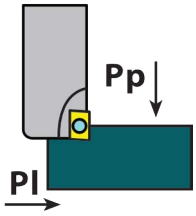
dimensions mm I	IC	S	d	R	*code*	*quality*	
5,00	6,70	3,28	2,80	0,40	WNAT 040304	FK100	FK300

Qualità HM *HM Quality* pag. 218

★ Pronto *Ready*

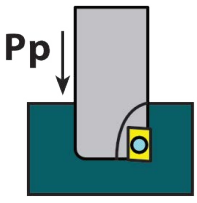
TM.. AP10

FK100



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	16	2	240	0,450	0,40	10,0	4.777	4.299
		20	3	240	0,450	0,40	12,0	3.822	5.159
		25	4	240	0,450	0,40	15,0	3.057	5.503
	160	16	2	210	0,450	0,30	6,5	4.180	3.344
		20	3	210	0,450	0,30	8,0	3.344	4.013
		25	4	210	0,450	0,30	10,0	2.675	4.280
N/mm2 850-1200	110	16	2	210	0,400	0,40	10,0	4.180	3.344
		20	3	210	0,400	0,40	12,0	3.344	4.013
		25	4	210	0,400	0,40	15,0	2.675	4.280
	160	16	2	180	0,350	0,30	6,5	3.583	2.508
		20	3	180	0,350	0,30	8,0	2.866	3.010
		25	4	180	0,350	0,30	10,0	2.293	3.210
HRC 30-42	110	16	2	180	0,350	0,30	10,0	3.583	2.508
		20	3	180	0,350	0,30	12,0	2.866	3.010
		25	4	180	0,350	0,30	15,0	2.293	3.210
	160	16	2	160	0,300	0,20	6,5	3.185	1.911
		20	3	160	0,300	0,20	8,0	2.548	2.293
		25	4	160	0,300	0,20	10,0	2.038	2.446
HRC 42-52	110	16	2	120	0,300	0,20	10,0	2.389	1.433
		20	3	120	0,300	0,20	12,0	1.911	1.720
		25	4	120	0,300	0,20	15,0	1.529	1.834
	160	16	2	95	0,250	0,15	6,5	1.891	945
		20	3	95	0,250	0,15	8,0	1.513	1.135
		25	4	95	0,250	0,15	10,0	1.210	1.210
HRC 52-60	110	16	2	95	0,250	0,20	10,0	1.891	945
		20	3	95	0,250	0,20	12,0	1.513	1.135
		25	4	95	0,250	0,20	15,0	1.210	1.210
	160	16	2	70	0,200	0,15	6,5	1.393	557
		20	3	70	0,200	0,15	8,0	1.115	669
		25	4	70	0,200	0,15	10,0	892	713

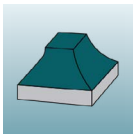
FK100

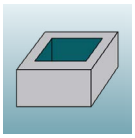


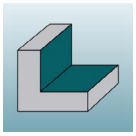
Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	110	16	2	200	0,450	0,40	16,0	3.981	3.583
		20	3	200	0,450	0,40	20,0	3.185	4.299
		25	4	200	0,450	0,40	25,0	2.548	4.586
	160	16	2	180	0,400	0,30	16,0	3.583	2.866
		20	3	180	0,400	0,30	20,0	2.866	3.439
		25	4	180	0,400	0,30	25,0	2.293	3.669
N/mm2 850-1200	110	16	2	180	0,400	0,40	16,0	3.583	2.866
		20	3	180	0,400	0,40	20,0	2.866	3.439
		25	4	180	0,400	0,40	25,0	2.293	3.669
	160	16	2	160	0,350	0,30	16,0	3.185	2.229
		20	3	160	0,350	0,30	20,0	2.548	2.675
		25	4	160	0,350	0,30	25,0	2.038	2.854
HRC 30-42	110	16	2	160	0,350	0,30	16,0	3.185	2.229
		20	3	160	0,350	0,30	20,0	2.548	2.675
		25	4	160	0,350	0,30	25,0	2.038	2.854
	160	16	2	140	0,300	0,20	16,0	2.787	1.672
		20	3	140	0,300	0,20	20,0	2.229	2.006
		25	4	140	0,300	0,20	25,0	1.783	2.140
HRC 42-52	110	16	2	100	0,300	0,20	16,0	1.990	1.194
		20	3	100	0,300	0,20	20,0	1.592	1.433
		25	4	100	0,300	0,20	25,0	1.274	1.529
	160	16	2	80	0,250	0,15	16,0	1.592	796
		20	3	80	0,250	0,15	20,0	1.274	955
		25	4	80	0,250	0,15	25,0	1.019	1.019
HRC 52-60	110	16	2	80	0,250	0,20	16,0	1.592	796
		20	3	80	0,250	0,20	20,0	1.274	955
		25	4	80	0,250	0,20	25,0	1.019	1.019
	160	16	2	60	0,200	0,15	16,0	1.194	478
		20	3	60	0,200	0,15	20,0	955	573
		25	4	60	0,200	0,15	25,0	764	611

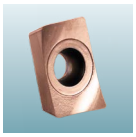
Testine per la lavorazione di acciaio con passaggio refrigerante

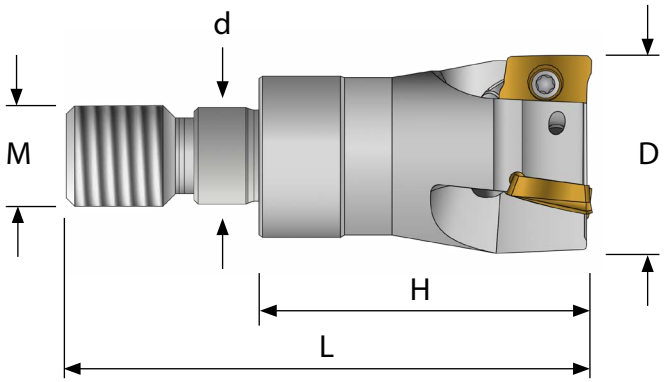
Modular milling tools with cooling holes


3D


Cava


Spallamento retto





Sgrossatura

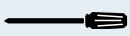
Finitura

N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	

dimensions mm D	L	H	M	d	Z		code		
16	45	25	M8	8,5	2	10	TM16 AP10	★	
20	50	30	M10	10,5	3	15	TM20 AP10	★	
25	56	35	M12	12,5	4	17	TM25 AP10	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTM25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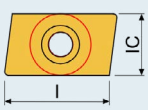

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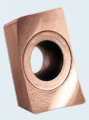


dimensions mm l	IC	S	d	R	code	quality
5,00	6,70	3,28	2,80	0,40	APET 100304	FK100

Qualità HM *HM Quality* pag. 218

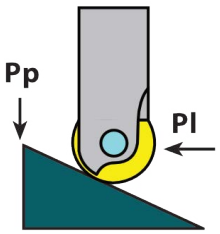
★ Pronto *Ready*

TM.. TEC..

TEC.. X

FK200

FINITURA

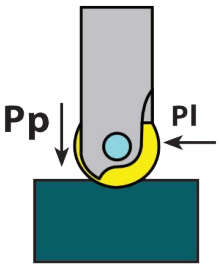


Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	110	12	2	280	0,150	0,18	0,18	7.431	2.229
		16	2	280	0,150	0,24	0,24	5.573	1.672
		20	2	280	0,150	0,30	0,30	4.459	1.338
	160	12	2	230	0,150	0,15	0,18	6.104	1.831
		16	2	230	0,150	0,18	0,24	4.578	1.373
		20	2	230	0,150	0,24	0,30	3.662	1.099
HRC 30-42	110	12	2	250	0,120	0,18	0,18	6.635	1.592
		16	2	250	0,120	0,24	0,24	4.976	1.194
		20	2	250	0,120	0,30	0,30	3.981	955
	160	12	2	220	0,120	0,15	0,18	5.839	1.401
		16	2	220	0,120	0,18	0,24	4.379	1.051
		20	2	220	0,120	0,24	0,30	3.503	841
HRC 42-52	110	12	2	230	0,100	0,18	0,18	6.104	1.221
		16	2	230	0,100	0,24	0,24	4.578	916
		20	2	230	0,100	0,30	0,30	3.662	732
	160	12	2	200	0,100	0,15	0,18	5.308	1.062
		16	2	200	0,100	0,18	0,24	3.981	796
		20	2	200	0,100	0,24	0,30	3.185	637
HRC 52-60	110	12	2	150	0,100	0,18	0,18	3.981	796
		16	2	150	0,100	0,24	0,24	2.986	597
		20	2	150	0,100	0,30	0,30	2.389	478
	160	12	2	130	0,100	0,15	0,18	3.450	690
		16	2	130	0,100	0,18	0,24	2.588	518
		20	2	130	0,100	0,24	0,30	2.070	414

TEC..

FK200

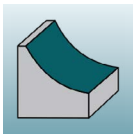
SGROSSATURA



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	110	12	2	200	0,250	1,20	1,20	5.308	2.654
		16	2	200	0,250	1,60	1,60	3.981	1.990
		20	2	200	0,250	2,00	2,00	3.185	1.592
	160	12	2	180	0,250	1,20	1,20	4.777	2.389
		16	2	180	0,250	1,60	1,60	3.583	1.791
		20	2	180	0,250	2,00	2,00	2.866	1.433
N/mm2 850-1200	110	12	2	160	0,200	1,20	1,20	4.246	1.699
		16	2	160	0,200	1,60	1,60	3.185	1.274
		20	2	160	0,200	2,00	2,00	2.548	1.019
	160	12	2	140	0,200	1,20	1,20	3.715	1.486
		16	2	140	0,200	1,60	1,60	2.787	1.115
		20	2	140	0,200	2,00	2,00	2.229	892
N/mm2 30-42	110	12	2	140	0,180	0,60	0,60	3.715	1.338
		16	2	140	0,180	0,80	0,80	2.787	1.003
		20	2	140	0,180	1,00	1,00	2.229	803
	160	12	2	120	0,180	0,60	0,60	3.185	1.146
		16	2	120	0,180	0,80	0,80	2.389	860
		20	2	120	0,180	1,00	1,00	1.911	688
N/mm2 42-52	110	12	2	120	0,160	0,60	0,60	3.185	1.019
		16	2	120	0,160	0,80	0,80	2.389	764
		20	2	120	0,160	1,00	1,00	1.911	611
	160	12	2	100	0,160	0,60	0,60	2.654	849
		16	2	100	0,160	0,80	0,80	1.990	637
		20	2	100	0,160	1,00	1,00	1.592	510

Testine per la lavorazione di acciaio con passaggio refrigerante

Modular milling tools with cooling holes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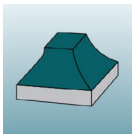
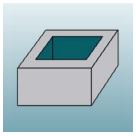
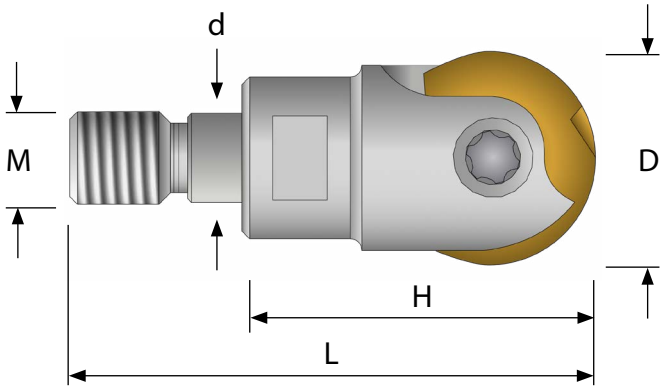

3D


Cava



Sgrossatura

Finitura

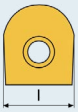
N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	

dimensions mm								
D	L	H	M	d	Z		*code*	
12	37	20	M6	6,5	2	8	TM12 TEC12	★
16	40	23	M8	8,5	2	10	TM16 TEC16	★
20	50	30	M10	10,5	2	15	TM20 TEC20	★

PARTI DI RICAMBIO / *SPARE PARTS*


VTM12 - VTM16 - VTM20


T15 - T20 - T25



INSERTO / *INSERT*

dimensions mm					
I	S	d	R	*code*	*quality*
12,00	2,50	5,00	6,00	TEC 12T2MO	**FK200**
16,00	3,00	5,00	8,00	TEC 1603MO	**FK200**
20,00	3,00	5,00	10,00	TEC 2003MO	**FK200**
12,00	2,50	5,00	6,00	TEC 12T2MO X	**FK200**
16,00	3,00	5,00	8,00	TEC 1603MO X	**FK200**
20,00	3,00	5,00	10,00	TEC 2003MO X	**FK200**

Qualità HM
HM Quality pag. 218

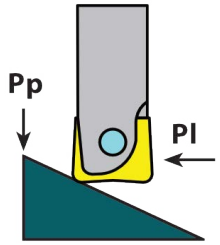
★ Pronto
Ready

TM.. TEW..

TEW.. X

FK200

FINITURA

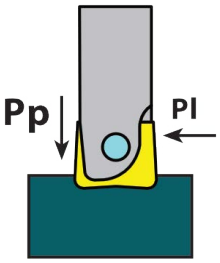


Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	110	12	2	320	0,200	0,24	0,24	8.493	3.397
		16	2	320	0,230	0,32	0,32	6.369	2.930
		20	2	320	0,270	0,40	0,40	5.096	2.752
	160	12	2	290	0,200	0,24	0,24	7.696	3.079
		16	2	290	0,230	0,32	0,32	5.772	2.655
		20	2	290	0,270	0,40	0,40	4.618	2.494
HRC 30-42	110	12	2	320	0,180	0,24	0,24	8.493	3.057
		16	2	320	0,210	0,32	0,32	6.369	2.675
		20	2	320	0,250	0,40	0,40	5.096	2.548
	160	12	2	290	0,180	0,24	0,24	7.696	2.771
		16	2	290	0,210	0,32	0,32	5.772	2.424
		20	2	290	0,250	0,40	0,40	4.618	2.309
HRC 42-52	110	12	2	280	0,160	0,24	0,24	7.431	2.378
		16	2	280	0,190	0,32	0,32	5.573	2.118
		20	2	280	0,230	0,40	0,40	4.459	2.051
	160	12	2	260	0,160	0,24	0,24	6.900	2.208
		16	2	260	0,190	0,32	0,32	5.175	1.967
		20	2	260	0,230	0,40	0,40	4.140	1.904
HRC 52-60	110	12	2	250	0,140	0,24	0,24	6.635	1.858
		16	2	250	0,170	0,32	0,32	4.976	1.692
		20	2	250	0,200	0,40	0,40	3.981	1.592
	160	12	2	230	0,140	0,24	0,24	6.104	1.709
		16	2	230	0,170	0,32	0,32	4.578	1.557
		20	2	230	0,200	0,40	0,40	3.662	1.465

TEW..

FK200

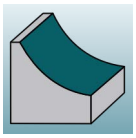
SGROSSATURA



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	110	12	2	250	0,250	0,24	12	6.635	3.317
		16	2	250	0,250	0,32	16	4.976	2.488
		20	2	250	0,250	0,40	20	3.981	1.990
	160	12	2	230	0,250	0,24	12	6.104	3.052
		16	2	230	0,250	0,32	16	4.578	2.289
		20	2	230	0,250	0,40	20	3.662	1.831
N/mm2 850-1200	110	12	2	230	0,200	0,24	12	6.104	2.442
		16	2	230	0,200	0,32	16	4.578	1.831
		20	2	230	0,200	0,40	20	3.662	1.465
	160	12	2	210	0,200	0,24	12	5.573	2.229
		16	2	210	0,200	0,32	16	4.180	1.672
		20	2	210	0,200	0,40	20	3.344	1.338
N/mm2 30-42	110	12	2	200	0,180	0,24	12	5.308	1.911
		16	2	200	0,180	0,32	16	3.981	1.433
		20	2	200	0,180	0,40	20	3.185	1.146
	160	12	2	180	0,180	0,24	12	4.777	1.720
		16	2	180	0,180	0,32	16	3.583	1.290
		20	2	180	0,180	0,40	20	2.866	1.032
N/mm2 42-52	110	12	2	170	0,160	0,24	12	4.512	1.444
		16	2	170	0,160	0,32	16	3.384	1.083
		20	2	170	0,160	0,40	20	2.707	866
	160	12	2	150	0,160	0,24	12	3.981	1.274
		16	2	150	0,160	0,32	16	2.986	955
		20	2	150	0,160	0,40	20	2.389	764

Testine per la lavorazione di acciaio con passaggio refrigerante

Modular milling tools with cooling holes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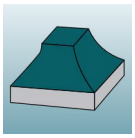
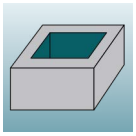

3D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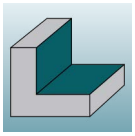
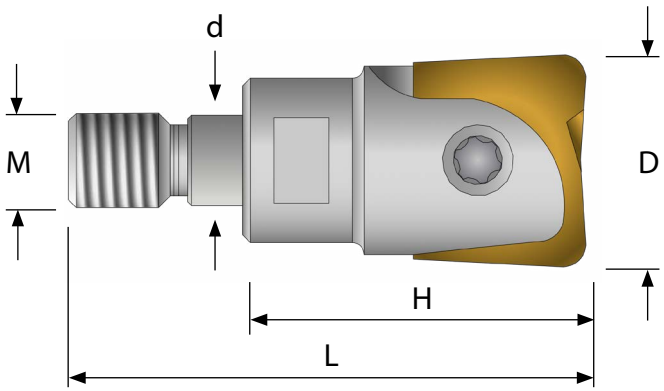

Spallamento retto



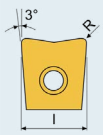
Sgrossatura	Finitura	N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	
							

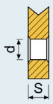
dimensions mm D	L	H	M	d	Z		*code*		
12	37	20	M6	6,5	2	8	TM12 TEW12	★	
16	40	23	M8	8,5	2	10	TM16 TEW16	★	
20	50	30	M10	10,5	2	15	TM20 TEW20	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTM12 - VTM16 - VTM20


T15 - T20 - T25





INSERTO / *INSERT*

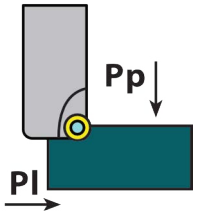
dimensions mm I	S	d	R	*code*	*quality*
12,00	2,50	5,00	1,00	TEW 12T210	**FK200**
16,00	3,00	5,00	1,30	TEW 160313	**FK200**
20,00	3,00	5,00	1,60	TEW 200316	**FK200**
12,00	2,50	5,00	1,00	TEW 12T210 X	**FK200**
16,00	3,00	5,00	1,30	TEW 160313 X	**FK200**
20,00	3,00	5,00	1,60	TEW 200316 X	**FK200**

Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

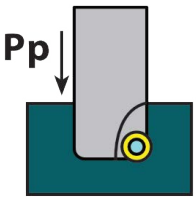
TM.. RD07AL

FDL10



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	110	16	2	600	0,450	1,00	9,5	11.943	10.748
	160	16	2	500	0,450	1,00	9,5	9.952	8.957
ALU & ALLOYS Si>6%	110	16	2	500	0,400	1,00	9,5	9.952	7.962
	160	16	2	400	0,400	1,00	9,5	7.962	6.369
PLASTIC	110	16	2	600	0,450	1,00	9,5	11.943	10.748
	160	16	2	500	0,450	1,00	9,5	9.952	8.957
COMPOSIT	110	16	2	300	0,400	1,00	9,5	5.971	4.777
	160	16	2	250	0,400	1,00	9,5	4.976	3.981
COPPER	110	16	2	500	0,400	1,00	9,5	9.952	7.962
	160	16	2	400	0,400	1,00	9,5	7.962	6.369

FDL10

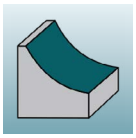


Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	110	16	2	550	0,450	1,00	16,0	10.947	9.853
	160	16	2	450	0,450	1,00	16,0	8.957	8.061
ALU & ALLOYS Si>6%	110	16	2	450	0,400	1,00	16,0	8.957	7.166
	160	16	2	350	0,400	1,00	16,0	6.967	5.573
PLASTIC	110	16	2	550	0,450	1,00	16,0	10.947	9.853
	160	16	2	450	0,450	1,00	16,0	8.957	8.061
COMPOSIT	110	16	2	250	0,400	1,00	16,0	4.976	3.981
	160	16	2	200	0,400	1,00	16,0	3.981	3.185
COPPER	110	16	2	450	0,400	1,00	16,0	8.957	7.166
	160	16	2	350	0,400	1,00	16,0	6.967	5.573

Se si usa la qualità **FK200** diminuire i parametri del 25%.

Testine per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

Modular milling tools for aluminium-plastic-composite with cooling holes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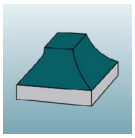
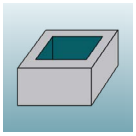
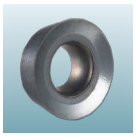
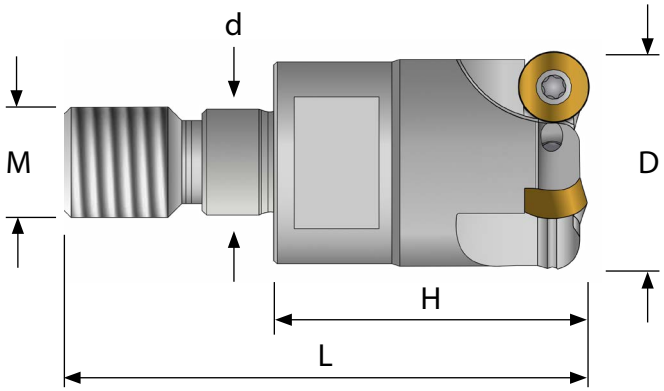

3D


Cava





Sgrossatura

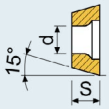
Finitura

Aluminium | COPPER | Plastic | Composite

dimensions mm							code		
D	L	H	M	d	Z		*code*		
16	40	23	M8	8,5	2	10	TM16 RD07AL	★	

PARTI DI RICAMBIO / *SPARE PARTS*

VTR25 — T07



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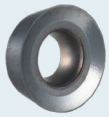


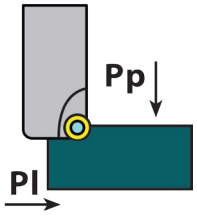
dimensions mm				*code*	*quality*	
IC	S	d	R			
7,00	2,40	2,80	3,50	RDGT 07T2MO	**FK200**	**FDL10**

Qualità HM *HM Quality* pag. 218

★ Pronto *Ready*

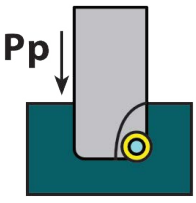
TM.. RD10

FDL10



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	20	2	600	0,450	1,30	12,0	9.554	8.599
		25	3	600	0,450	1,30	15,0	7.643	10.318
		32	4	600	0,450	1,30	19,0	5.971	10.748
	160	20	2	500	0,450	1,30	12,0	7.962	7.166
		25	3	500	0,450	1,30	15,0	6.369	8.599
		32	4	500	0,450	1,30	19,0	4.976	8.957
ALU & ALLOYS Si >6%	110	20	2	500	0,400	1,30	12,0	7.962	6.369
		25	3	500	0,400	1,30	15,0	6.369	7.643
		32	4	500	0,400	1,30	19,0	4.976	7.962
	160	20	2	400	0,400	1,30	12,0	6.369	5.096
		25	3	400	0,400	1,30	15,0	5.096	6.115
		32	4	400	0,400	1,30	19,0	3.981	6.369
PLASTIC	110	20	2	600	0,450	1,30	12,0	9.554	8.599
		25	3	600	0,450	1,30	15,0	7.643	10.318
		32	4	600	0,450	1,30	19,0	5.971	10.748
	160	20	2	500	0,450	1,30	12,0	7.962	7.166
		25	3	500	0,450	1,30	15,0	6.369	8.599
		32	4	500	0,450	1,30	19,0	4.976	8.957
COMPOSIT	110	20	2	300	0,400	1,30	12,0	4.777	3.822
		25	3	300	0,400	1,30	15,0	3.822	4.586
		32	4	300	0,400	1,30	19,0	2.986	4.777
	160	20	2	250	0,400	1,30	12,0	3.981	3.185
		25	3	250	0,400	1,30	15,0	3.185	3.822
		32	4	250	0,400	1,30	19,0	2.488	3.981
COPPER	110	20	2	500	0,400	1,30	12,0	7.962	6.369
		25	3	500	0,400	1,30	15,0	6.369	7.643
		32	4	500	0,400	1,30	19,0	4.976	7.962
	160	20	2	400	0,400	1,30	12,0	6.369	5.096
		25	3	400	0,400	1,30	15,0	5.096	6.115
		32	4	400	0,400	1,30	19,0	3.981	6.369

FDL10

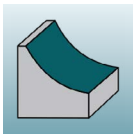


Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	20	2	550	0,450	1,30	20	8.758	7.882
		25	3	550	0,450	1,30	25	7.006	9.459
		32	4	550	0,450	1,30	32	5.474	9.853
	160	20	2	450	0,450	1,30	20	7.166	6.449
		25	3	450	0,450	1,30	25	5.732	7.739
		32	4	450	0,450	1,30	32	4.479	8.061
ALU & ALLOYS Si >6%	110	20	2	450	0,400	1,30	20	7.166	5.732
		25	3	450	0,400	1,30	25	5.732	6.879
		32	4	450	0,400	1,30	32	4.479	7.166
	160	20	2	350	0,400	1,30	20	5.573	4.459
		25	3	350	0,400	1,30	25	4.459	5.350
		32	4	350	0,400	1,30	32	3.483	5.573
PLASTIC	110	20	2	550	0,450	1,30	20	8.758	7.882
		25	3	550	0,450	1,30	25	7.006	9.459
		32	4	550	0,450	1,30	32	5.474	9.853
	160	20	2	450	0,450	1,30	20	7.166	6.449
		25	3	450	0,450	1,30	25	5.732	7.739
		32	4	450	0,450	1,30	32	4.479	8.061
COMPOSIT	110	20	2	250	0,400	1,30	20	3.981	3.185
		25	3	250	0,400	1,30	25	3.185	3.822
		32	4	250	0,400	1,30	32	2.488	3.981
	160	20	2	200	0,400	1,30	20	3.185	2.548
		25	3	200	0,400	1,30	25	2.548	3.057
		32	4	200	0,400	1,30	32	1.990	3.185
COPPER	110	20	2	450	0,400	1,30	20	7.166	5.732
		25	3	450	0,400	1,30	25	5.732	6.879
		32	4	450	0,400	1,30	32	4.479	7.166
	160	20	2	350	0,400	1,30	20	5.573	4.459
		25	3	350	0,400	1,30	25	4.459	5.350
		32	4	350	0,400	1,30	32	3.483	5.573

Se si usa la qualità **FK200** diminuire i parametri del 25%.

Testine per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

Modular milling tools for aluminium-plastic-composite with cooling holes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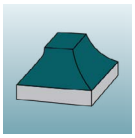
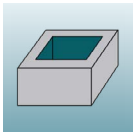
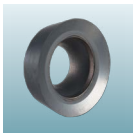
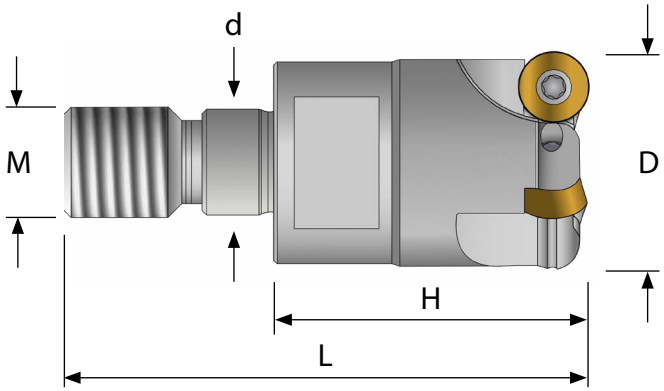

3D


Cava





Sgrossatura

Finitura

Aluminium

COPPER

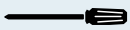
Plastic

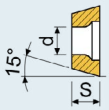
Composite

dimensions mm							code		
D	L	H	M	d	Z				
20	50	30	M10	10,5	2	15	TM20 RD10	★	
25	56	35	M12	12,5	3	17	TM25 RD10	★	
32	68	43	M16	17,0	4	24	TM32 RD10	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTM35


T15



INSERTO / *INSERT*

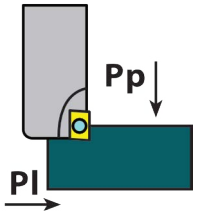
dimensions mm						
IC	S	d	R	code	quality	
10,00	3,18	4,40	5,00	RDGT 1003MO	FK200	FDL10

Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

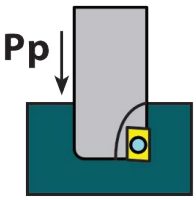
TM.. AP10

FDL10



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	16	2	600	0,450	1,30	9,5	11.943	10.748
		20	3	600	0,450	1,30	12,0	9.554	12.898
		25	4	600	0,450	1,30	15,0	7.643	13.758
	160	16	2	500	0,450	1,30	9,5	9.952	8.957
		20	3	500	0,450	1,30	12,0	7.962	10.748
		25	4	500	0,450	1,30	15,0	6.369	11.465
ALU & ALLOYS Si >6%	110	16	2	500	0,400	1,00	9,5	9.952	7.962
		20	3	500	0,400	1,00	12,0	7.962	9.554
		25	4	500	0,400	1,00	15,0	6.369	10.191
	160	16	2	400	0,400	0,80	9,5	7.962	6.369
		20	3	400	0,400	0,80	12,0	6.369	7.643
		25	4	400	0,400	0,80	15,0	5.096	8.153
PLASTIC	110	16	2	600	0,450	1,30	9,5	11.943	10.748
		20	3	600	0,450	1,30	12,0	9.554	12.898
		25	4	600	0,450	1,30	15,0	7.643	13.758
	160	16	2	500	0,450	1,30	9,5	9.952	8.957
		20	3	500	0,450	1,30	12,0	7.962	10.748
		25	4	500	0,450	1,30	15,0	6.369	11.465
COMPOSIT	110	16	2	300	0,400	1,00	9,5	5.971	4.777
		20	3	300	0,400	1,00	12,0	4.777	5.732
		25	4	300	0,400	1,00	15,0	3.822	6.115
	160	16	2	250	0,400	0,80	9,5	4.976	3.981
		20	3	250	0,400	0,80	12,0	3.981	4.777
		25	4	250	0,400	0,80	15,0	3.185	5.096
COPPER	110	16	2	500	0,400	1,00	9,5	9.952	7.962
		20	3	500	0,400	1,00	12,0	7.962	9.554
		25	4	500	0,400	1,00	15,0	6.369	10.191
	160	16	2	400	0,400	0,80	9,5	7.962	6.369
		20	3	400	0,400	0,80	12,0	6.369	7.643
		25	4	400	0,400	0,80	15,0	5.096	8.153

FDL10

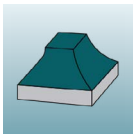


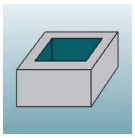
Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	2	500	0,350	0,450	1,30	16	9.952	6.967
		3	500	0,350	0,450	1,30	20	7.962	8.360
		4	500	0,350	0,450	1,30	25	6.369	8.917
	160	2	450	0,300	0,450	1,30	16	8.957	5.374
		3	450	0,300	0,450	1,30	20	7.166	6.449
		4	450	0,300	0,450	1,30	25	5.732	6.879
ALU & ALLOYS Si >6%	110	16	2	450	0,300	1,00	16	8.957	5.374
		20	3	450	0,300	1,00	20	7.166	6.449
		25	4	450	0,300	1,00	25	5.732	6.879
	160	16	2	350	0,250	1,00	16	6.967	3.483
		20	3	350	0,250	1,00	20	5.573	4.180
		25	4	350	0,250	1,00	25	4.459	4.459
PLASTIC	110	16	2	550	0,350	1,30	16	10.947	7.663
		20	3	550	0,350	1,30	20	8.758	9.196
		25	4	550	0,350	1,30	25	7.006	9.809
	160	16	2	450	0,300	1,30	16	8.957	5.374
		20	3	450	0,300	1,30	20	7.166	6.449
		25	4	450	0,300	1,30	25	5.732	6.879
COMPOSIT	110	16	2	250	0,300	0,80	16	4.976	2.986
		20	3	250	0,300	0,80	20	3.981	3.583
		25	4	250	0,300	0,80	25	3.185	3.822
	160	16	2	200	0,250	0,80	16	3.981	1.990
		20	3	200	0,250	0,80	20	3.185	2.389
		25	4	200	0,250	0,80	25	2.548	2.548
COPPER	110	16	2	450	0,350	1,00	16	8.957	6.270
		20	3	450	0,350	1,00	20	7.166	7.524
		25	4	450	0,350	1,00	25	5.732	8.025
	160	16	2	350	0,300	1,00	16	6.967	4.180
		20	3	350	0,300	1,00	20	5.573	5.016
		25	4	350	0,300	1,00	25	4.459	5.350

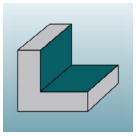
Se si usa la qualità **FK100** diminuire i parametri del 25%.

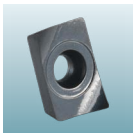
Testine per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

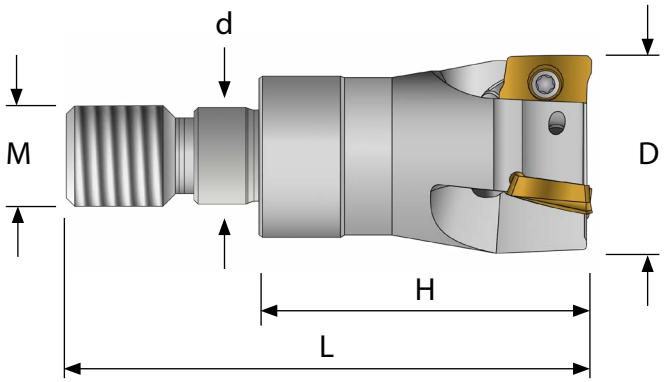
Modular milling tools for aluminium-plastic-composite with cooling holes


3D


Cava


Spallamento retto





Sgrossatura

Finitura

Aluminium

COPPER

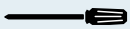
Plastic

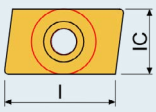
Composite

dimensions mm							*code*		
D	L	H	M	d	Z				
16	40	25	M8	8,5	2	10	TM16 AP10	★	
20	50	30	M10	10,5	3	15	TM20 AP10	★	
25	56	35	M12	12,5	4	17	TM25 AP10	★	

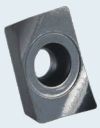
PARTI DI RICAMBIO / *SPARE PARTS*


VTM25


T07



INSERTO / *INSERT*



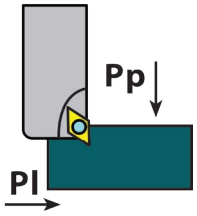
dimensions mm					*code*	*quality*	
l	IC	S	d	R			
11,00	6,35	2,70	2,80	0,40	APGT 100304	**FK100**	**FDL10**

Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

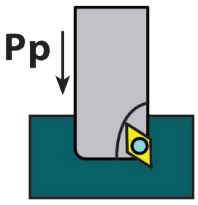
TM.. VD11

FDL10



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	16	2	600	0,450	1,30	9,5	11.943	10.748
		20	2	600	0,450	1,30	12,0	9.554	8.599
		25	2	600	0,450	1,30	15,0	7.643	6.879
	160	16	2	500	0,450	1,30	9,5	9.952	8.957
		20	2	500	0,450	1,30	12,0	7.962	7.166
		25	2	500	0,450	1,30	15,0	6.369	5.732
ALU & ALLOYS Si >6%	110	16	2	500	0,400	1,30	9,5	9.952	7.962
		20	2	500	0,400	1,30	12,0	7.962	6.369
		25	2	500	0,400	1,30	15,0	6.369	5.096
	160	16	2	400	0,400	1,30	9,5	7.962	6.369
		20	2	400	0,400	1,30	12,0	6.369	5.096
		25	2	400	0,400	1,30	15,0	5.096	4.076
PLASTIC	110	16	2	600	0,450	1,30	9,5	11.943	10.748
		20	2	600	0,450	1,30	12,0	9.554	8.599
		25	2	600	0,450	1,30	15,0	7.643	6.879
	160	16	2	500	0,450	1,30	9,5	9.952	8.957
		20	2	500	0,450	1,30	12,0	7.962	7.166
		25	2	500	0,450	1,30	15,0	6.369	5.732
COMPOSIT	110	16	2	300	0,400	1,30	9,5	5.971	4.777
		20	2	300	0,400	1,30	12,0	4.777	3.822
		25	2	300	0,400	1,30	15,0	3.822	3.057
	160	16	2	250	0,400	1,30	9,5	4.976	3.981
		20	2	250	0,400	1,30	12,0	3.981	3.185
		25	2	250	0,400	1,30	15,0	3.185	2.548
COPPER	110	16	2	500	0,400	1,30	9,5	9.952	7.962
		20	2	500	0,400	1,30	12,0	7.962	6.369
		25	2	500	0,400	1,30	15,0	6.369	5.096
	160	16	2	400	0,400	1,30	9,5	7.962	6.369
		20	2	400	0,400	1,30	12,0	6.369	5.096
		25	2	400	0,400	1,30	15,0	5.096	4.076

FDL10

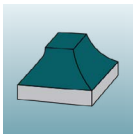


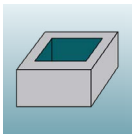
Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	2	550	0,450	0,450	1,30	16,0	10.947	9.853
		2	550	0,450	0,450	1,30	20,0	8.758	7.882
		2	550	0,450	0,450	1,30	25,0	7.006	6.306
	160	2	450	0,450	0,450	1,30	16,0	8.957	8.061
		2	450	0,450	0,450	1,30	20,0	7.166	6.449
		2	450	0,450	0,450	1,30	25,0	5.732	5.159
ALU & ALLOYS Si >6%	110	16	2	450	0,400	1,30	16,0	8.957	7.166
		20	2	450	0,400	1,30	20,0	7.166	5.732
		25	2	450	0,400	1,30	25,0	5.732	4.586
	160	16	2	350	0,400	1,30	16,0	6.967	5.573
		20	2	350	0,400	1,30	20,0	5.573	4.459
		25	2	350	0,400	1,30	25,0	4.459	3.567
PLASTIC	110	16	2	550	0,450	1,30	16,0	10.947	9.853
		20	2	550	0,450	1,30	20,0	8.758	7.882
		25	2	550	0,450	1,30	25,0	7.006	6.306
	160	16	2	450	0,450	1,30	16,0	8.957	8.061
		20	2	450	0,450	1,30	20,0	7.166	6.449
		25	2	450	0,450	1,30	25,0	5.732	5.159
COMPOSIT	110	16	2	250	0,400	1,30	16,0	4.976	3.981
		20	2	250	0,400	1,30	20,0	3.981	3.185
		25	2	250	0,400	1,30	25,0	3.185	2.548
	160	16	2	200	0,400	1,30	16,0	3.981	3.185
		20	2	200	0,400	1,30	20,0	3.185	2.548
		25	2	200	0,400	1,30	25,0	2.548	2.038
COPPER	110	16	2	450	0,400	1,30	16,0	8.957	7.166
		20	2	450	0,400	1,30	20,0	7.166	5.732
		25	2	450	0,400	1,30	25,0	5.732	4.586
	160	16	2	350	0,400	1,30	16,0	6.967	5.573
		20	2	350	0,400	1,30	20,0	5.573	4.459
		25	2	350	0,400	1,30	25,0	4.459	3.567

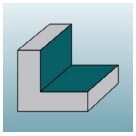
Se si usa la qualità **FK200** diminuire i parametri del 25%.

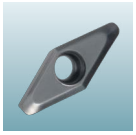
Testine per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

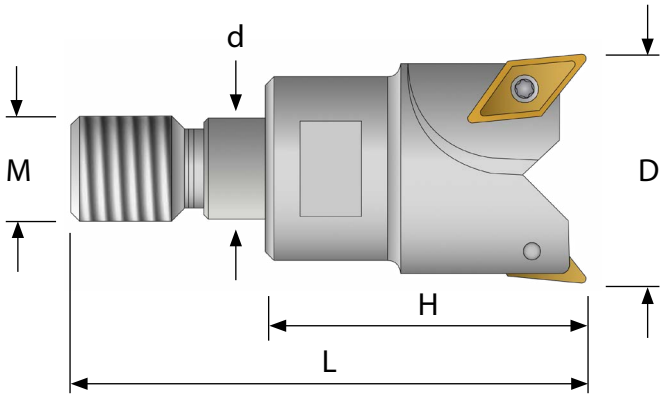
Modular milling tools for aluminium-plastic-composite with cooling holes


3D


Cava


Spallamento retto





Sgrossatura

Finitura

Aluminium

COPPER

Plastic

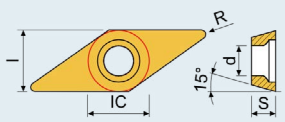
Composite

dimensions mm								
D	L	H	M	d	Z		***code***	
16	40	23	M8	8,5	2	10	TM16 VD11	★
20	50	30	M10	10,5	2	15	TM20 VD11	★
25	56	35	M12	12,5	2	17	TM25 VD11	★

PARTI DI RICAMBIO / *SPARE PARTS*


VTM25


T07



INSERTO / *INSERT*

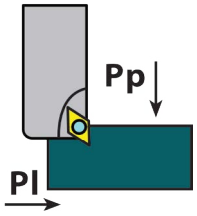
dimensions mm							
l	IC	S	d	R	***code***	***quality***	
11,00	6,35	2,70	2,80	1,00	VDGT 11T210	**FK200**	**FDL10**

Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

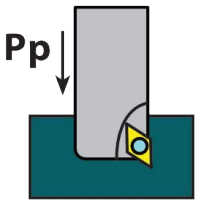
TM.. VC22

FDL10



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%		32	2	700	0,450	5,00	19,0	6.967	6.270
ALU & ALLOYS Si >6%		32	2	600	0,400	5,00	19,0	5.971	4.777
PLASTIC		32	2	700	0,450	5,00	19,0	6.967	6.270
COMPOSIT		32	2	400	0,400	5,00	19,0	3.981	3.185
COPPER		32	2	500	0,400	5,00	19,0	4.976	3.981

FDL10

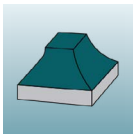


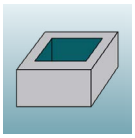
Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%		32	2	650	0,450	5,00	32,0	6.469	5.822
ALU & ALLOYS Si >6%		32	2	550	0,400	5,00	32,0	5.474	4.379
PLASTIC		32	2	650	0,450	5,00	32,0	6.469	5.822
COMPOSIT		32	2	350	0,400	5,00	32,0	3.483	2.787
COPPER		32	2	450	0,400	5,00	32,0	4.479	3.583

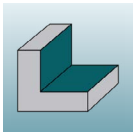
Se si usa la qualità **FK200** diminuire i parametri del 25%.

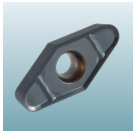
Testine per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

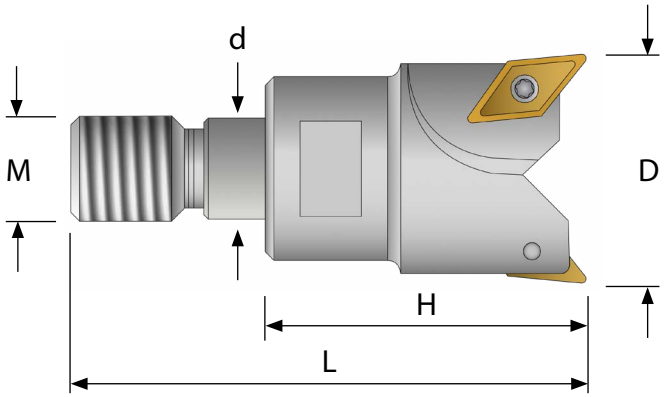
Modular milling tools for aluminium-plastic-composite with cooling holes


3D


Cava


Spallamento retto





Sgrossatura

Finitura

Aluminium

COPPER

Plastic

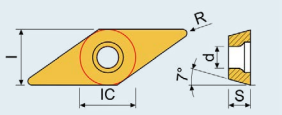
Composite

dimensions mm D	L	H	M	d	Z		*code*		
32	68	43	M16	17	2	32	TM32 VC22	★	

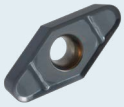
PARTI DI RICAMBIO / *SPARE PARTS*

VTM50

T15



INSERTO / *INSERT*



dimensions mm I	IC	S	d	R	*code*	*quality*	
22,00	12,70	5,50	5,20	3,00	VCGT 220530	**FK200**	**FDL10**

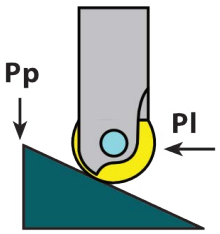
Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

TM.. TEC..

FDL10

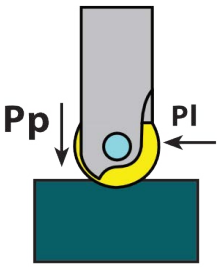
FINITURA



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	12	2	600	0,450	0,18	0,18	15.924	14.331
		16	2	600	0,450	0,24	0,24	11.943	10.748
		20	2	600	0,450	0,30	0,30	9.554	8.599
	160	12	2	500	0,450	0,15	0,18	13.270	11.943
		16	2	500	0,450	0,18	0,24	9.952	8.957
		20	2	500	0,450	0,24	0,30	7.962	7.166
ALU & ALLOYS Si >6%	110	12	2	500	0,400	0,18	0,18	13.270	10.616
		16	2	500	0,400	0,24	0,24	9.952	7.962
		20	2	500	0,400	0,30	0,30	7.962	6.369
	160	12	2	400	0,400	0,15	0,18	10.616	8.493
		16	2	400	0,400	0,18	0,24	7.962	6.369
		20	2	400	0,400	0,24	0,30	6.369	5.096
PLASTIC	110	12	2	600	0,450	0,18	0,18	15.924	14.331
		16	2	600	0,450	0,24	0,24	11.943	10.748
		20	2	600	0,450	0,30	0,30	9.554	8.599
	160	12	2	500	0,450	0,15	0,18	13.270	11.943
		16	2	500	0,450	0,18	0,24	9.952	8.957
		20	2	500	0,450	0,24	0,30	7.962	7.166
COMPOSIT	110	12	2	300	0,400	0,18	0,18	7.962	6.369
		16	2	300	0,400	0,24	0,24	5.971	4.777
		20	2	300	0,400	0,30	0,30	4.777	3.822
	160	12	2	250	0,400	0,15	0,18	6.635	5.308
		16	2	250	0,400	0,18	0,24	4.976	3.981
		20	2	250	0,400	0,24	0,30	3.981	3.185
COPPER	110	12	2	500	0,400	0,18	0,18	13.270	10.616
		16	2	500	0,400	0,24	0,24	9.952	7.962
		20	2	500	0,400	0,30	0,30	7.962	6.369
	160	12	2	400	0,400	0,15	0,18	10.616	8.493
		16	2	400	0,400	0,18	0,24	7.962	6.369
		20	2	400	0,400	0,24	0,30	6.369	5.096

FDL10

SGROSSATURA

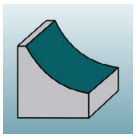


Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	12	2	550	0,450	1,20	1,20	14.597	13.137
		16	2	550	0,450	1,60	1,60	10.947	9.853
		20	2	550	0,450	2,00	2,00	8.758	7.882
	160	12	2	450	0,450	1,20	1,20	11.943	10.748
		16	2	450	0,450	1,60	1,60	8.957	8.061
		20	2	450	0,450	2,00	2,00	7.166	6.449
ALU & ALLOYS Si >6%	110	12	2	450	0,400	1,20	1,20	11.943	9.554
		16	2	450	0,400	1,60	1,60	8.957	7.166
		20	2	450	0,400	2,00	2,00	7.166	5.732
	160	12	2	350	0,400	1,20	1,20	9.289	7.431
		16	2	350	0,400	1,60	1,60	6.967	5.573
		20	2	350	0,400	2,00	2,00	5.573	4.459
PLASTIC	110	12	2	550	0,450	0,60	0,60	14.597	13.137
		16	2	550	0,450	0,80	0,80	10.947	9.853
		20	2	550	0,450	1,00	1,00	8.758	7.882
	160	12	2	450	0,450	0,60	0,60	11.943	10.748
		16	2	450	0,450	0,80	0,80	8.957	8.061
		20	2	450	0,450	1,00	1,00	7.166	6.449
COMPOSIT	110	12	2	250	0,400	0,60	0,60	6.635	5.308
		16	2	250	0,400	0,80	0,80	4.976	3.981
		20	2	250	0,400	1,00	1,00	3.981	3.185
	160	12	2	200	0,400	0,60	0,60	5.308	4.246
		16	2	200	0,400	0,80	0,80	3.981	3.185
		20	2	200	0,400	1,00	1,00	3.185	2.548
COPPER	110	12	2	450	0,400	0,60	0,60	11.943	9.554
		16	2	450	0,400	0,80	0,80	8.957	7.166
		20	2	450	0,400	1,00	1,00	7.166	5.732
	160	12	2	350	0,400	0,60	0,60	9.289	7.431
		16	2	350	0,400	0,80	0,80	6.967	5.573
		20	2	350	0,400	1,00	1,00	5.573	4.459

Se si usa la qualità **FK200** diminuire i parametri del 25%.

Testine per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

Modular milling tools for aluminium-plastic-composite with cooling holes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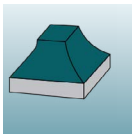
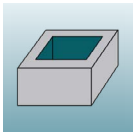
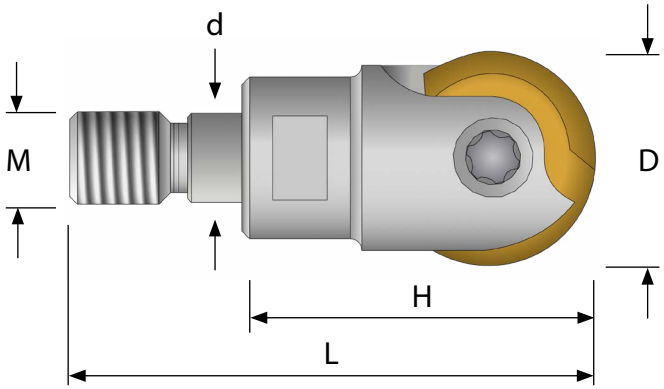

3D


Cava



Sgrossatura

Finitura

Aluminium

COPPER

Plastic

Composite

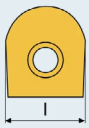
dimensions mm							code		
D	L	H	M	d	Z				
12	37	20	M6	6,5	2	8	TM12 TEC12	★	
16	40	23	M8	8,5	2	10	TM16 TEC16	★	
20	50	30	M10	10,5	2	15	TM20 TEC20	★	

PARTI DI RICAMBIO / *SPARE PARTS*

VTM12 - VTM16 - VTM20

T15 - T20 - T25

INSERTO / *INSERT*



dimensions mm				code	quality	
l	S	d	R			
12,00	2,50	5,00	6,00	TEC 12T2MO X	**FK200**	**FDL10**
16,00	3,00	5,00	8,00	TEC 1603MO X	**FK200**	**FDL10**
20,00	3,00	5,00	10,00	TEC 2003MO X	**FK200**	**FDL10**

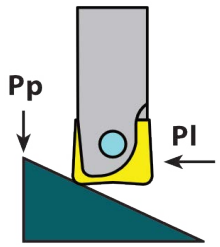
Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

TM.. TEW..

FDL10

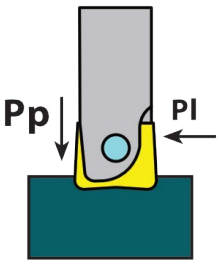
FINITURA



Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	12	2	600	0,450	0,24	0,24	15.924	14.331
		16	2	600	0,450	0,32	0,32	11.943	10.748
		20	2	600	0,450	0,40	0,40	9.554	8.599
	160	12	2	500	0,450	0,24	0,24	13.270	11.943
		16	2	500	0,450	0,32	0,32	9.952	8.957
		20	2	500	0,450	0,40	0,40	7.962	7.166
ALU & ALLOYS Si >6%	110	12	2	500	0,400	0,24	0,24	13.270	10.616
		16	2	500	0,400	0,32	0,32	9.952	7.962
		20	2	500	0,400	0,40	0,40	7.962	6.369
	160	12	2	400	0,400	0,24	0,24	10.616	8.493
		16	2	400	0,400	0,32	0,32	7.962	6.369
		20	2	400	0,400	0,40	0,40	6.369	5.096
PLASTIC	110	12	2	600	0,450	0,24	0,24	15.924	14.331
		16	2	600	0,450	0,32	0,32	11.943	10.748
		20	2	600	0,450	0,40	0,40	9.554	8.599
	160	12	2	500	0,450	0,24	0,24	13.270	11.943
		16	2	500	0,450	0,32	0,32	9.952	8.957
		20	2	500	0,450	0,40	0,40	7.962	7.166
COMPOSIT	110	12	2	300	0,400	0,24	0,24	7.962	6.369
		16	2	300	0,400	0,32	0,32	5.971	4.777
		20	2	300	0,400	0,40	0,40	4.777	3.822
	160	12	2	250	0,400	0,24	0,24	6.635	5.308
		16	2	250	0,400	0,32	0,32	4.976	3.981
		20	2	250	0,400	0,40	0,40	3.981	3.185
COPPER	110	12	2	500	0,400	0,24	0,24	13.270	10.616
		16	2	500	0,400	0,32	0,32	9.952	7.962
		20	2	500	0,400	0,40	0,40	7.962	6.369
	160	12	2	400	0,400	0,24	0,24	10.616	8.493
		16	2	400	0,400	0,32	0,32	7.962	6.369
		20	2	400	0,400	0,40	0,40	6.369	5.096

FDL10

SGROSSATURA

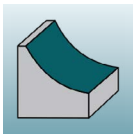


Materiali Materials	PMD L mm	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si <6%	110	12	2	550	0,450	0,24	12,0	14.597	13.137
		16	2	550	0,450	0,32	16,0	10.947	9.853
		20	2	550	0,450	0,40	20,0	8.758	7.882
	160	12	2	450	0,450	0,24	12,0	11.943	10.748
		16	2	450	0,450	0,32	16,0	8.957	8.061
		20	2	450	0,450	0,40	20,0	7.166	6.449
ALU & ALLOYS Si >6%	110	12	2	450	0,400	0,24	12,0	11.943	9.554
		16	2	450	0,400	0,32	16,0	8.957	7.166
		20	2	450	0,400	0,40	20,0	7.166	5.732
	160	12	2	350	0,400	0,24	12,0	9.289	7.431
		16	2	350	0,400	0,32	16,0	6.967	5.573
		20	2	350	0,400	0,40	20,0	5.573	4.459
PLASTIC	110	12	2	550	0,450	0,24	12,0	14.597	13.137
		16	2	550	0,450	0,32	16,0	10.947	9.853
		20	2	550	0,450	0,40	20,0	8.758	7.882
	160	12	2	450	0,450	0,24	12,0	11.943	10.748
		16	2	450	0,450	0,32	16,0	8.957	8.061
		20	2	450	0,450	0,40	20,0	7.166	6.449
COMPOSIT	110	12	2	250	0,400	0,24	12,0	6.635	5.308
		16	2	250	0,400	0,32	16,0	4.976	3.981
		20	2	250	0,400	0,40	20,0	3.981	3.185
	160	12	2	200	0,400	0,24	12,0	5.308	4.246
		16	2	200	0,400	0,32	16,0	3.981	3.185
		20	2	200	0,400	0,40	20,0	3.185	2.548
COPPER	110	12	2	450	0,400	0,24	12,0	11.943	9.554
		16	2	450	0,400	0,32	16,0	8.957	7.166
		20	2	450	0,400	0,40	20,0	7.166	5.732
	160	12	2	350	0,400	0,24	12,0	9.289	7.431
		16	2	350	0,400	0,32	16,0	6.967	5.573
		20	2	350	0,400	0,40	20,0	5.573	4.459

Se si usa la qualità **FK200** diminuire i parametri del 25%.

Testine per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

Modular milling tools for aluminium-plastic-composite with cooling holes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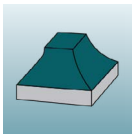
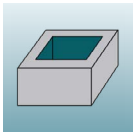
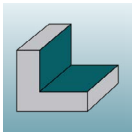
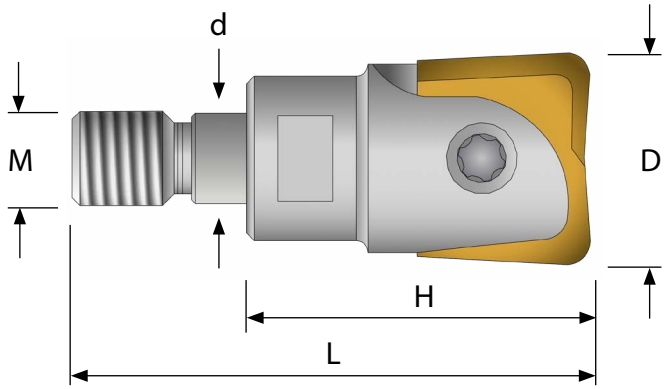

3D


Cava


Spallamento retto



Sgrossatura

Finitura

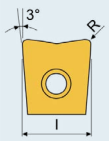
Aluminium | COPPER | Plastic | Composite

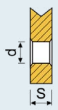
dimensions mm							code		
D	L	H	M	d	Z				
12	37	20	M6	6,5	2	8	TM12 TEW12	★	
16	40	23	M8	8,5	2	10	TM16 TEW16	★	
20	50	30	M10	10,5	2	15	TM20 TEW20	★	

PARTI DI RICAMBIO / *SPARE PARTS*

VTM12 - VTM16 - VTM20

T15 - T20 - T25





INSERTO / *INSERT*

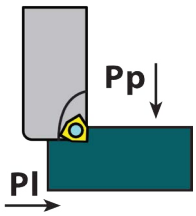
dimensions mm				code	quality	
l	S	d	R			
12,00	2,50	5,00	1,00	TEW 12T210 X	**FK200**	**FDL10**
16,00	3,00	5,00	1,30	TEW 160313 X	**FK200**	**FDL10**
20,00	3,00	5,00	1,60	TEW 200316 X	**FK200**	**FDL10**

Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

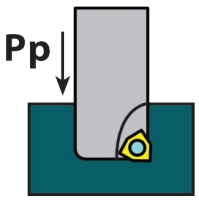
FC.. WN04

FK100



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	20	3	250	0,600	1,30	10,0	3.981	7.166
	25	4	250	0,600	1,30	10,0	3.185	7.643
N/mm2 850-1200	20	3	210	0,500	0,40	10,0	3.344	5.016
	25	4	210	0,500	0,40	10,0	2.675	5.350
HRC 30-42	20	3	180	0,500	0,40	10,0	2.866	4.299
	25	4	180	0,500	0,40	10,0	2.293	4.586
HRC 42-52	20	3	120	0,400	0,30	10,0	1.911	2.293
	25	4	120	0,400	0,30	10,0	1.529	2.446
HRC 52-60	20	3	95	0,200	0,20	10,0	1.513	908
	25	4	95	0,200	0,20	10,0	1.210	968

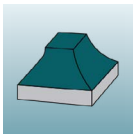
FK300

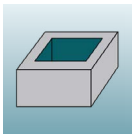


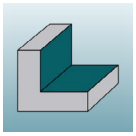
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	20	3	220	0,400	1,30	20	3.503	4.204
	25	4	220	0,400	1,30	25	2.803	4.484
N/mm2 850-1200	20	3	180	0,300	0,40	20	2.866	2.580
	25	4	180	0,300	0,40	25	2.293	2.752
HRC 30-42	20	3	160	0,300	0,40	20	2.548	2.293
	25	4	160	0,300	0,40	25	2.038	2.446
HRC 42-52	20	3	100	0,250	0,30	20	1.592	1.194
	25	4	100	0,250	0,30	25	1.274	1.274
HRC 52-60	20	3	80	0,100	0,20	20	1.274	382
	25	4	80	0,100	0,20	25	1.019	408

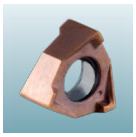
Frese cilindriche per lavorazione di acciaio

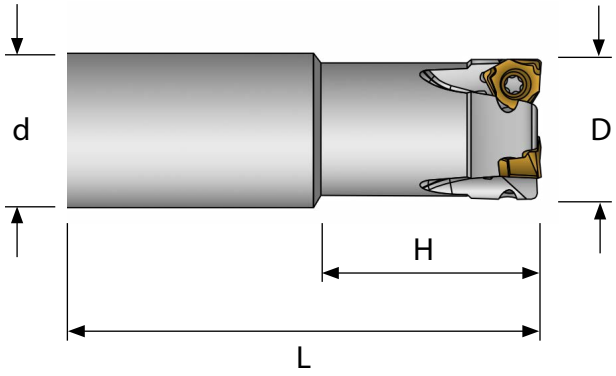
Milling tools with cilindrical shank


3D


Cava


Spallamento retto





Sgrossatura

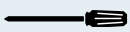
Finitura

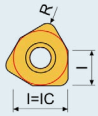
N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	

dimensions mm D	L	H	M	d	Z		*code*		
20	150	30	-	20	3	-	FC20 WN04	★	
25	150	30	-	25	4	-	FC25 WN04	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTM25


T07



INSERTO / *INSERT*

dimensions mm I	IC	S	d	R	*code*	*quality*	
5,00	6,70	3,28	2,80	0,4	WNAT 040304	FK100	FK300

Qualità HM
HM Quality pag. 218

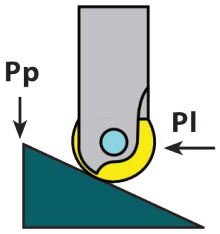
★ Pronto
Ready

FC.. TEC..

TEC.. X

FK200

FINITURA

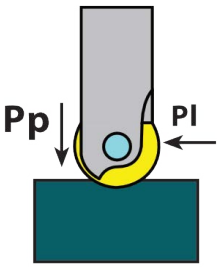


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	12	2	230	0,150	0,15	0,18	6.104	1.831
	16	2	230	0,150	0,18	0,24	4.578	1.373
	20	2	230	0,150	0,24	0,30	3.662	1.099
HRC 30-42	12	2	220	0,120	0,15	0,18	5.839	1.401
	16	2	220	0,120	0,18	0,24	4.379	1.051
	20	2	220	0,120	0,24	0,30	3.503	841
HRC 42-52	12	2	200	0,100	0,15	0,18	5.308	1.062
	16	2	200	0,100	0,18	0,24	3.981	796
	20	2	200	0,100	0,24	0,30	3.185	637
HRC 52-60	12	2	130	0,100	0,15	0,18	3.450	690
	16	2	130	0,100	0,18	0,24	2.588	518
	20	2	130	0,100	0,24	0,30	2.070	414

TEC..

FK200

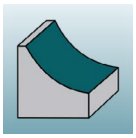
SGROSSATURA



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	12	2	180	0,250	1,20	1,20	4.777	2.389
	16	2	180	0,250	1,60	1,60	3.583	1.791
	20	2	180	0,250	2,00	2,00	2.866	1.433
HRC 30-42	12	2	140	0,200	1,20	1,20	3.715	1.486
	16	2	140	0,200	1,60	1,60	2.787	1.115
	20	2	140	0,200	2,00	2,00	2.229	892
HRC 42-52	12	2	120	0,180	0,60	0,60	3.185	1.146
	16	2	120	0,180	0,80	0,80	2.389	860
	20	2	120	0,180	1,00	1,00	1.911	688
HRC 52-60	12	2	100	0,160	0,60	0,60	2.654	849
	16	2	100	0,160	0,80	0,80	1.990	637
	20	2	100	0,160	1,00	1,00	1.592	510

Frese cilindriche per lavorazione di acciaio

Milling tools with cilindrical shank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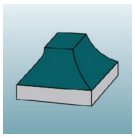
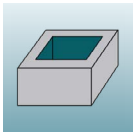
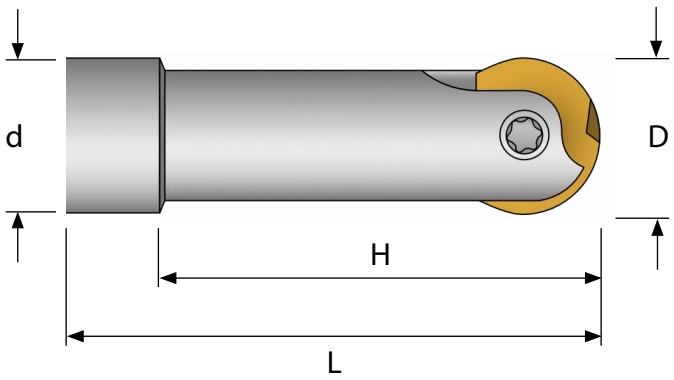

3D


Cava



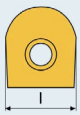
Sgrossatura	Finitura	N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	

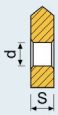
dimensions mm D	L	H	M	d	Z		*code*		
12	160	40	-	12	2	-	FC12 TEC12	★	
16	175	40	-	16	2	-	FC16 TEC16	★	
20	190	60	-	20	2	-	FC20 TEC20	★	

PARTI DI RICAMBIO / *SPARE PARTS*

VTM12 - VTM16 - VTM20

T15 - T20 - T25





INSERTO / *INSERT*

dimensions mm I	S	d	R	*code*	*quality*
12,00	2,50	5,00	6,00	TEC 12T2MO	**FK200**
16,00	3,00	5,00	8,00	TEC 1603MO	**FK200**
20,00	3,00	5,00	10,00	TEC 2003MO	**FK200**
12,00	2,50	5,00	6,00	TEC 12T2MO X	**FK200**
16,00	3,00	5,00	8,00	TEC 1603MO X	**FK200**
20,00	3,00	5,00	10,00	TEC 2003MO X	**FK200**

Qualità HM
HM Quality
pag. 218

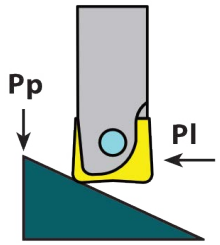
★ Pronto
Ready

FC.. TEW..

TEW.. X

FK200

FINITURA

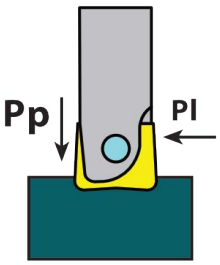


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	12	2	290	0,200	0,24	0,24	7.696	3.079
	16	2	290	0,230	0,32	0,32	5.772	2.655
	20	2	290	0,270	0,40	0,40	4.618	2.494
HRC 30-42	12	2	290	0,180	0,24	0,24	7.696	2.771
	16	2	290	0,210	0,32	0,32	5.772	2.424
	20	2	290	0,250	0,40	0,40	4.618	2.309
HRC 42-52	12	2	260	0,160	0,24	0,24	6.900	2.208
	16	2	260	0,190	0,32	0,32	5.175	1.967
	20	2	260	0,230	0,40	0,40	4.140	1.904
HRC 52-60	12	2	230	0,140	0,24	0,24	6.104	1.709
	16	2	230	0,170	0,32	0,32	4.578	1.557
	20	2	230	0,200	0,40	0,40	3.662	1.465

TEW..

FK200

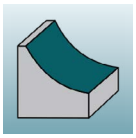
SGROSSATURA



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 850-1200	12	2	230	0,250	0,24	12,0	6.104	3.052
	16	2	230	0,250	0,32	16,0	4.578	2.289
	20	2	230	0,250	0,40	20,0	3.662	1.831
HRC 30-42	12	2	210	0,200	0,24	12,0	5.573	2.229
	16	2	210	0,200	0,32	16,0	4.180	1.672
	20	2	210	0,200	0,40	20,0	3.344	1.338
HRC 42-52	12	2	180	0,180	0,24	12,0	4.777	1.720
	16	2	180	0,180	0,32	16,0	3.583	1.290
	20	2	180	0,180	0,40	20,0	2.866	1.032
HRC 52-60	12	2	150	0,160	0,24	12,0	3.981	1.274
	16	2	150	0,160	0,32	16,0	2.986	955
	20	2	150	0,160	0,40	20,0	2.389	764

Frese cilindriche per lavorazione di acciaio

Milling tools with cilindrical shank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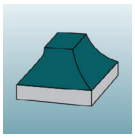
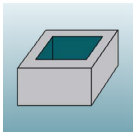
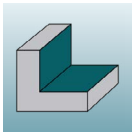
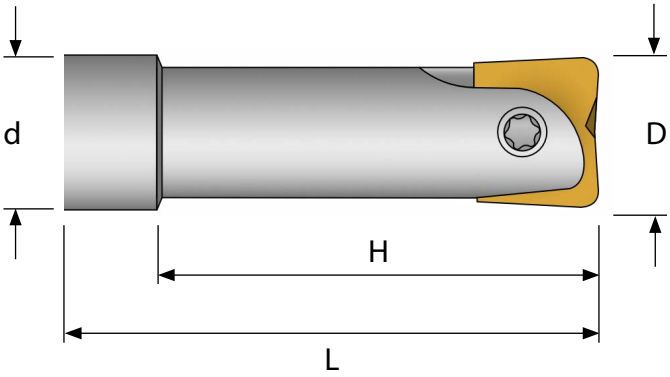

3D


Cava


Spallamento retto



Sgrossatura

Finitura

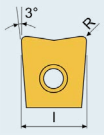
N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60	

dimensions mm								
D	L	H	M	d	Z		***code***	
12	160	40	-	12	2	-	FC12 TEW12	★
16	175	40	-	16	2	-	FC16 TEW16	★
20	190	60	-	20	2	-	FC20 TEW20	★

PARTI DI RICAMBIO / *SPARE PARTS*

VTM12 - VTM16 - VTM20

T15 - T20 - T25



INSERTO / *INSERT*

dimensions mm					
I	S	d	R	***code***	***quality***
12,00	2,50	5,00	1,00	TEW 12T210	**FK200**
16,00	3,00	5,00	1,30	TEW 160313	**FK200**
20,00	3,00	5,00	1,60	TEW 200316	**FK200**
12,00	2,50	5,00	1,00	TEW 12T210 X	**FK200**
16,00	3,00	5,00	1,30	TEW 160313 X	**FK200**
20,00	3,00	5,00	1,60	TEW 200316 X	**FK200**

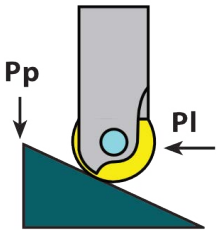
Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

FC.. TEC..

FDL10

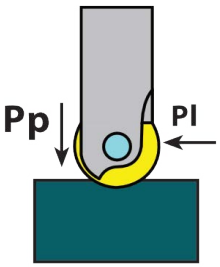
FINITURA



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	12	2	500	0,450	0,15	0,18	13.270	11.943
	16	2	500	0,450	0,18	0,24	9.952	8.957
	20	2	500	0,450	0,24	0,30	7.962	7.166
ALU & ALLOYS Si>6%	12	2	400	0,400	0,15	0,18	10.616	8.493
	16	2	400	0,400	0,18	0,24	7.962	6.369
	20	2	400	0,400	0,24	0,30	6.369	5.096
PLASTIC	12	2	500	0,450	0,15	0,18	13.270	11.943
	16	2	500	0,450	0,18	0,24	9.952	8.957
	20	2	500	0,450	0,24	0,30	7.962	7.166
COMPOSIT	12	2	250	0,400	0,15	0,18	6.635	5.308
	16	2	250	0,400	0,18	0,24	4.976	3.981
	20	2	250	0,400	0,24	0,30	3.981	3.185
COPPER	12	2	400	0,400	0,15	0,18	10.616	8.493
	16	2	400	0,400	0,18	0,24	7.962	6.369
	20	2	400	0,400	0,24	0,30	6.369	5.096

FDL10

SGROSSATURA

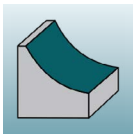


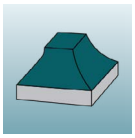
Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	12	2	450	0,450	1,20	1,20	11.943	10.748
	16	2	450	0,450	1,60	1,60	8.957	8.061
	20	2	450	0,450	2,00	2,00	7.166	6.449
ALU & ALLOYS Si>6%	12	2	350	0,400	1,20	1,20	9.289	7.431
	16	2	350	0,400	1,60	1,60	6.967	5.573
	20	2	350	0,400	2,00	2,00	5.573	4.459
PLASTIC	12	2	450	0,450	0,60	0,60	11.943	10.748
	16	2	450	0,450	0,80	0,80	8.957	8.061
	20	2	450	0,450	1,00	1,00	7.166	6.449
COMPOSIT	12	2	200	0,400	0,60	0,60	5.308	4.246
	16	2	200	0,400	0,80	0,80	3.981	3.185
	20	2	200	0,400	1,00	1,00	3.185	2.548
COPPER	12	2	350	0,400	0,60	0,60	9.289	7.431
	16	2	350	0,400	0,80	0,80	6.967	5.573
	20	2	350	0,400	1,00	1,00	5.573	4.459

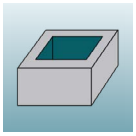
Se si usa la qualità **FK200** diminuire i parametri del 25%.

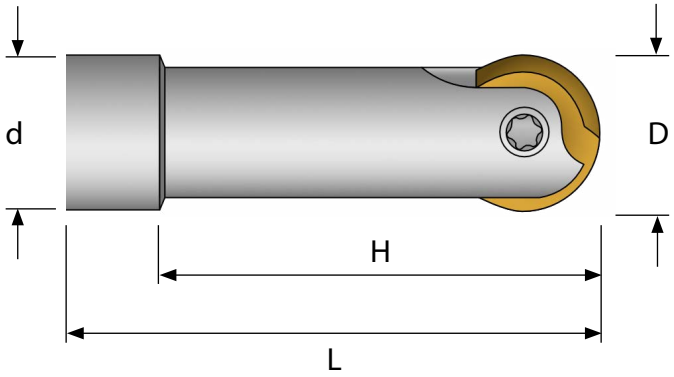
Frese cilindriche per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

Milling tools with cilindrical shank for aluminium-plastic-composite with cooling holes


Copiatura


3D


Cava



Sgrossatura

Finitura

Aluminium

COPPER

Plastic

Composite

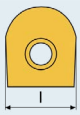
dimensions mm							code		
D	L	H	M	d	Z				
12	160	40	-	12	2	-	FC12 TEC12	★	
16	175	40	-	16	2	-	FC16 TEC16	★	
20	190	60	-	20	2	-	FC20 TEC20	★	

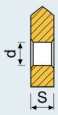
PARTI DI RICAMBIO / *SPARE PARTS*

VTM12 - VTM16 - VTM20

T15 - T20 - T25

INSERTO / *INSERT*





dimensions mm				code	quality	
l	S	d	R			
12,00	2,50	5,00	6,00	TEC 12T2MO X	FK200	FDL10
16,00	3,00	5,00	8,00	TEC 1603MO X	FK200	FDL10
20,00	3,00	5,00	10,00	TEC 2003MO X	FK200	FDL10

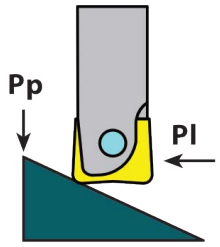
Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

FC.. TEW

FDL10

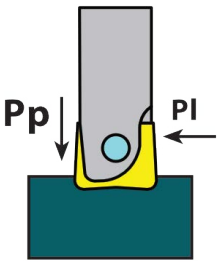
FINITURA



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	12	2	500	0,450	0,24	0,24	13.270	11.943
	16	2	500	0,450	0,32	0,32	9.952	8.957
	20	2	500	0,450	0,40	0,40	7.962	7.166
ALU & ALLOYS Si>6%	12	2	400	0,400	0,24	0,24	10.616	8.493
	16	2	400	0,400	0,32	0,32	7.962	6.369
	20	2	400	0,400	0,40	0,40	6.369	5.096
PLASTIC	12	2	500	0,450	0,24	0,24	13.270	11.943
	16	2	500	0,450	0,32	0,32	9.952	8.957
	20	2	500	0,450	0,40	0,40	7.962	7.166
COMPOSIT	12	2	250	0,400	0,24	0,24	6.635	5.308
	16	2	250	0,400	0,32	0,32	4.976	3.981
	20	2	250	0,400	0,40	0,40	3.981	3.185
COPPER	12	2	400	0,400	0,24	0,24	10.616	8.493
	16	2	400	0,400	0,32	0,32	7.962	6.369
	20	2	400	0,400	0,40	0,40	6.369	5.096

FDL10

SGROSSATURA

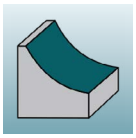


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	12	2	450	0,450	0,24	12,0	11.943	10.748
	16	2	450	0,450	0,32	16,0	8.957	8.061
	20	2	450	0,450	0,40	20,0	7.166	6.449
ALU & ALLOYS Si>6%	12	2	350	0,400	0,24	12,0	9.289	7.431
	16	2	350	0,400	0,32	16,0	6.967	5.573
	20	2	350	0,400	0,40	20,0	5.573	4.459
PLASTIC	12	2	450	0,450	0,24	12,0	11.943	10.748
	16	2	450	0,450	0,32	16,0	8.957	8.061
	20	2	450	0,450	0,40	20,0	7.166	6.449
COMPOSIT	12	2	200	0,400	0,24	12,0	5.308	4.246
	16	2	200	0,400	0,32	16,0	3.981	3.185
	20	2	200	0,400	0,40	20,0	3.185	2.548
COPPER	12	2	350	0,400	0,24	12,0	9.289	7.431
	16	2	350	0,400	0,32	16,0	6.967	5.573
	20	2	350	0,400	0,40	20,0	5.573	4.459

Se si usa la qualità **FK200** diminuire i parametri del 25%.

Frese cilindriche per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

Milling tools with cilindrical shank for aluminium-plastic-composite with cooling holes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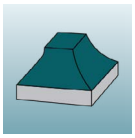
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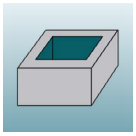
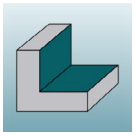
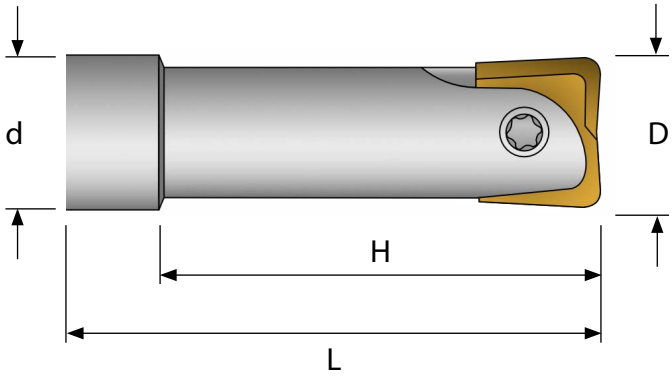

Cava


Spallamento retto



Sgrossatura

Finitura

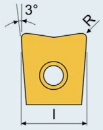
Aluminium | COPPER | Plastic | Composite

dimensions mm							code		
D	L	H	M	d	Z		*code*		
12	160	40	-	12	2	-	FC12 TEW12	★	
16	175	40	-	16	2	-	FC16 TEW16	★	
20	190	60	-	20	2	-	FC20 TEW20	★	

PARTI DI RICAMBIO / *SPARE PARTS*

VTM12 - VTM16 - VTM20

T15 - T20 - T25



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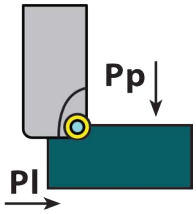
dimensions mm				code	quality	
l	S	d	R	*code*	*quality*	
12,00	2,50	5,00	1,00	TEW 12T210 X	FK200	FDL10
16,00	3,00	5,00	1,30	TEW 160313 X	FK200	FDL10
20,00	3,00	5,00	1,60	TEW 200316 X	FK200	FDL10

Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

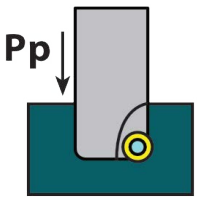
SM.. RP12

FK200



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	40	4	230	0,600	1,50	24,0	1.831	4.395
	52	4	230	0,600	1,50	31,0	1.409	3.382
	63	5	230	0,600	1,50	38,0	1.163	3.488
N/mm2 850-1200	40	4	200	0,500	1,30	24,0	1.592	3.185
	52	4	200	0,500	1,30	31,0	1.225	2.450
	63	5	200	0,500	1,30	38,0	1.011	2.528
HRC 30-42	40	4	200	0,400	1,30	24,0	1.592	2.548
	52	4	200	0,400	1,30	31,0	1.225	1.960
	63	5	200	0,400	1,30	38,0	1.011	2.022
HRC 42-52	40	4	90	0,330	0,70	24,0	717	946
	52	4	90	0,330	0,70	31,0	551	727
	63	5	90	0,330	0,70	38,0	455	751
HRC 52-60	40	4	50	0,300	0,50	24,0	398	478
	52	4	50	0,300	0,50	31,0	306	367
	63	5	50	0,300	0,50	38,0	253	379

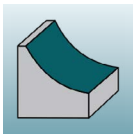
FK200



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
N/mm2 <850	40	4	220	0,500	1,50	40,0	1.752	3.503
	52	4	220	0,500	1,50	52,0	1.347	2.694
	63	5	220	0,500	1,50	63,0	1.112	2.780
N/mm2 850-1200	40	4	180	0,400	1,30	40,0	1.433	2.293
	52	4	180	0,400	1,30	52,0	1.102	1.763
	63	5	180	0,400	1,30	63,0	910	1.820
HRC 30-42	40	4	180	0,350	1,30	40,0	1.433	2.006
	52	4	180	0,350	1,30	52,0	1.102	1.543
	63	5	180	0,350	1,30	63,0	910	1.592
HRC 42-52	40	4	80	0,330	0,70	40,0	637	841
	52	4	80	0,330	0,70	52,0	490	648
	63	5	80	0,330	0,70	63,0	404	667
HRC 52-60	40	4	45	0,300	0,50	40,0	358	430
	52	4	45	0,300	0,50	52,0	276	331
	63	5	45	0,300	0,50	63,0	227	341

Frese a manicotto per la lavorazione di acciaio con passaggio refrigerante

Shell shank Milling Tools with cooling holes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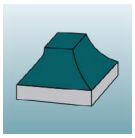
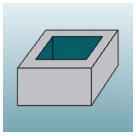
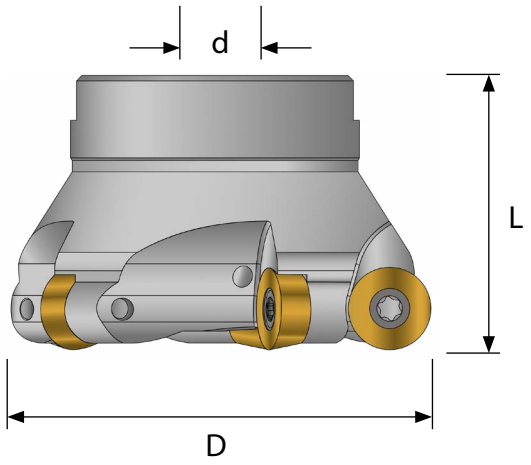

3D


Cava



Sgrossatura

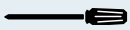
Finitura

N/mm2 <850	N/mm2 850-1200	HRC 30-42	HRC 42-52	HRC 52-60

dimensions mm D	L	d	Z		code		
40	40	16	4	-	SM40 RP12	★	
52	50	22	4	-	SM52 RP12	★	
63	56	22	5	-	SM63 RP12	★	

PARTI DI RICAMBIO / *SPARE PARTS*


VTM40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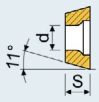


INSERTO / *INSERT*

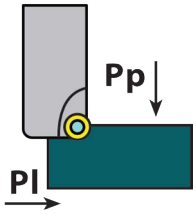
dimensions mm IC	S	d	R	code	quality
12,00	4,76	4,40	6,00	RPHX 1204MO	FK200

Qualità HM *HM Quality* pag. 218

★ Pronto *Ready*

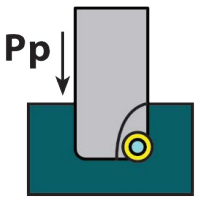
SM.. RP12

FDL10



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	40	4	600	0,500	1,50	24,0	4.777	9.554
	52	4	550	0,500	1,50	31,0	3.368	5.389
	63	5	500	0,500	1,50	38,0	2.528	6.319
ALU & ALLOYS Si>6%	40	4	500	0,500	1,50	24,0	3.981	7.962
	52	4	450	0,500	1,50	31,0	2.756	5.512
	63	5	400	0,500	1,50	38,0	2.022	5.055
PLASTIC	40	4	600	0,500	1,50	24,0	4.777	9.554
	52	4	550	0,500	1,50	31,0	3.368	6.736
	63	5	500	0,500	1,50	38,0	2.528	6.319
COMPOSIT	40	4	400	0,500	1,50	24,0	3.185	6.369
	52	4	350	0,500	1,50	31,0	2.144	4.288
	63	5	300	0,500	1,50	38,0	1.517	3.791
COPPER	40	4	400	0,500	1,50	24,0	3.185	6.369
	52	4	350	0,500	1,50	31,0	2.144	4.288
	63	5	300	0,500	1,50	38,0	1.517	3.791

FDL10

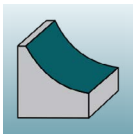


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	40	4	500	0,500	1,50	40,0	3.981	7.962
	52	4	450	0,500	1,50	52,0	2.756	5.512
	63	5	400	0,500	1,50	63,0	2.022	5.055
ALU & ALLOYS Si>6%	40	4	400	0,500	1,50	40,0	3.185	6.369
	52	4	350	0,500	1,50	52,0	2.144	4.288
	63	5	300	0,500	1,50	63,0	1.517	3.791
PLASTIC	40	4	500	0,500	1,50	40,0	3.981	7.962
	52	4	450	0,500	1,50	52,0	2.756	5.512
	63	5	400	0,500	1,50	63,0	2.022	5.055
COMPOSIT	40	4	300	0,500	1,50	40,0	2.389	4.777
	52	4	250	0,500	1,50	52,0	1.531	3.062
	63	5	200	0,500	1,50	63,0	1.011	2.528
COPPER	40	4	300	0,500	1,50	40,0	2.389	4.777
	52	4	250	0,500	1,50	52,0	1.531	3.062
	63	5	200	0,500	1,50	63,0	1.011	2.528

Se si usa la qualità **FK200** diminuire i parametri del 25%.

Frese a manicotto per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

Shell shank milling tools for aluminium-plastic-composite with cooling holes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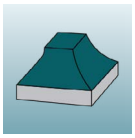
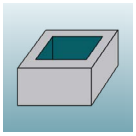
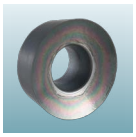
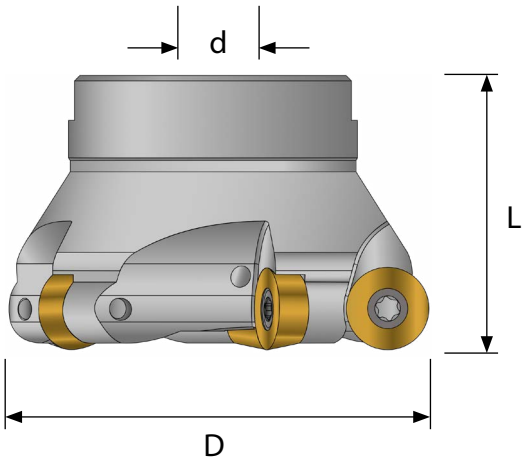

3D


Cava





Sgrossatura

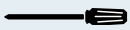
Finitura

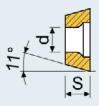
Aluminium | COPPER | Plastic | Composite

dimensions mm D	L	d	Z		code		
40	40	16	4	-	SM40 RP12	★	
52	50	22	4	-	SM52 RP12	★	
63	56	22	5	-	SM63 RP12	★	

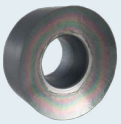
PARTI DI RICAMBIO / *SPARE PARTS*


VTR40


T15



INSERTO / *INSERT*



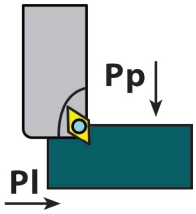
dimensions mm IC	S	d	R	code	quality	
12,00	4,76	4,40	6,00	RPGT 1204MO	FK200	FDL10

Qualità HM
HM Quality
pag. 218

★ Pronto
Ready

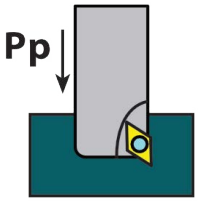
SM.. VC22

FDL10



Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	52	3	700	0,550	5,00	31,0	4.287	7.074
	63	4	700	0,550	5,00	38,0	3.539	7.785
ALU & ALLOYS Si>6%	52	3	600	0,450	5,00	31,0	3.675	4.961
	63	4	600	0,450	5,00	38,0	3.033	5.460
PLASTIC	52	3	700	0,550	5,00	31,0	4.287	7.074
	63	4	700	0,550	5,00	38,0	3.539	7.785
COMPOSIT	52	3	450	0,400	5,00	31,0	2.756	3.307
	63	4	450	0,400	5,00	38,0	2.275	3.640
COPPER	52	3	550	0,400	5,00	31,0	3.368	4.042
	63	4	550	0,400	5,00	38,0	2.780	4.448

FDL10

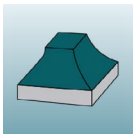


Materiali Materials	D mm	Z	Vc m/min	fZ mm	Pp mm	Pl mm	n g/min	Vf mm/min
ALU & ALLOYS Si<6%	52	3	650	0,500	5,00	52,0	3.981	5.971
	63	4	650	0,500	5,00	63,0	3.286	6.572
ALU & ALLOYS Si>6%	52	3	550	0,400	5,00	52,0	3.368	4.042
	63	4	550	0,400	5,00	63,0	2.780	4.448
PLASTIC	52	3	650	0,500	5,00	52,0	3.981	5.971
	63	4	650	0,500	5,00	63,0	3.286	6.572
COMPOSIT	52	3	400	0,350	5,00	52,0	2.450	2.572
	63	4	400	0,350	5,00	63,0	2.022	2.831
COPPER	52	3	500	0,350	5,00	52,0	3.062	3.215
	63	4	500	0,350	5,00	63,0	2.528	3.539

Se si usa la qualità **FK200** diminuire i parametri del 25%.

Frese a manicotto per la lavorazione di alluminio-plastica-compositi con passaggio refrigerante

Shell shank milling tools for aluminium-plastic-composite with cooling holes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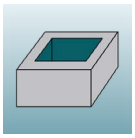
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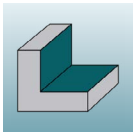
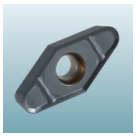
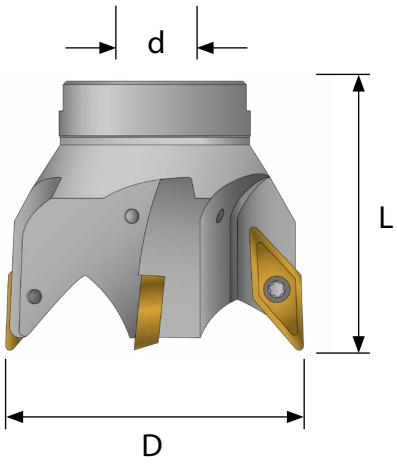

Spallamento retto





Sgrossatura

Finitura

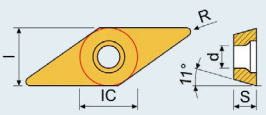
Aluminium | COPPER | Plastic | Composite

dimensions mm						code		
D	t	L	d	Z		***code***		
52	15	55	22	3	-	SM52 VC22	★	
63	15	60	27	4	-	SM63 VC22	★	

PARTI DI RICAMBIO / *SPARE PARTS*

VTM50

T20



INSERTO / *INSERT*

dimensions mm					code	quality	
I	IC	S	d	R	***code***	***quality***	
22,0	12,70	5,50	5,20	3,00	VCGT 220530	**FK200**	**FDL10**

Qualità HM *HM Quality* pag. 218

★ Pronto *Ready*

FORMULE / *FORMULAS*

D = Diametro della fresa (mm)
End mill diameter (mm)

Z = Numero di taglienti
Flute number

Vc = Velocità di taglio (m/min)
Cutting speed (m/min)

fz = Avanzamento al dente (mm)
Feed per tooth (mm)

Pp = Profondità di taglio (mm)
Cut depth (mm)

P1 = Ampiezza di taglio (mm)
Cut width (mm)

n = Velocità di rotazione (giri/min)
Rotation speed (rpm)

Vf = Velocità di avanzamento (mm/min)
Feed speed (mm/min)

$$n = \frac{Vc \times 1.000}{\pi \times D} \text{ (giri/min)}$$

$$Vf = Fz \times Z \times n \text{ (mm/min)}$$

$$Vc = \frac{\pi \times D \times n}{1.000} \text{ (m/min)}$$

$$fz = \frac{Vf}{Z \times n} \text{ (mm)}$$

SUGGERIMENTI TECNICI / *TECHNICAL ADVICES*

Intasamento truciolo / *Chip clogging*

Soluzione / *Solution* :

- Ridurre l'avanzamento / *Reduce the feed*
- Ridurre larghezza e profondità del taglio / *Reduce width and cut depth*

Usura sul fianco / *Flank wear*

Soluzione / *Solution* :

- Aumentare l'avanzamento per dente / *Increase the feed per tooth*
- Ridurre la velocità di taglio / *Reduce the cutting speed*

Scheggiatura / *Chipping*

Soluzione / *Solution* :

- Ridurre l'avanzamento / *Reduce the feed*
- Fresatura concorde / *Climb milling*
- Verificare il bloccaggio del pezzo / *Check the workpiece*
- Ridurre la lunghezza della sporgenza / *Reduce the length of the tool overhang*

Rottura utensile / *Tool breakage*

Soluzione / *Solution* :

- Ridurre l'avanzamento / *Reduce the feed*
- Aumentare la velocità di taglio / *Increase the cutting speed*
- Ridurre la lunghezza della sporgenza / *Reduce the length of the overhang tool*
- Ridurre la lunghezza di taglio / *Reduce the length of cut*

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TABELLA DELLE DUREZZE / *HARDNESS TABLE*

R_m N/mm^2	HV 10 Vickers	HB Brinnel	HRC Rockwell	R_m N/mm^2	HV 10 Vickers	HB Brinnel	HRC Rockwell
255	80	76,0		1200	373	354	38
270	85	80,7		1230	382	363	39
285	90	85,5		1260	392	372	40
305	95	90,2		1300	403	383	41
320	100	95,0		1330	413	393	42
335	105	99,8		1360	423	413	44
350	110	105		1440	446	424	45
370	115	109		1480	458	435	46
385	120	114		1530	473	449	47
400	125	119		1570	484	460	48
415	130	124		1620	497	472	49
430	135	128		1680	514	488	50
450	140	133		1730	527	501	51
465	145	138		1790	544	517	52
480	150	143		1845	560	532	53
495	155	147		1910	578	549	54
510	160	152		1980	596	567	55
530	165	157		2050	615	584	56
545	170	162		2140	639	607	57
560	175	166			655	622	58
575	180	171			675		59
595	185	176			698		60
610	190	181			720		61
625	195	185			745		62
640	200	190			773		63
660	205	195			800		64
675	210	199			829		65
690	215	204			864		66
705	220	209			900		67
720	225	214			940		68
740	230	219					
755	235	223					
770	240	228					
785	245	233					
800	250	238	22				
820	255	242	23				
835	260	247	24				
920	287	273	28				
940	293	278	29				
970	302	287	30				
995	310	295	31				
1020	317	301	32				
1050	327	311	33				
1080	336	319	34				
1110	345	328	35				
1140	355	337	36				
1170	364	346	37				

TABELLE DI CONVERSIONE / *CONVERSION TABLES*

MATERIALI / *MATERIALS*	UNI	EN	ISO	GENERICO	AFONR	DIN	BS	AISI
N/mm2 <550 **Acciaio a basso tenore di carbonio** ***Low carbon and free cutting steel***	Fe360B FN	-	-	-	E24-2Ne	RSt37-2	4360 40C	A570-36
	-	-	-	-	NFA35-501E28	St44-2	4360 43C	A36
	Fe37-3	-	-	-	E24-U	St37-3	4360 40B	A573-81 65
	-	-	-	-	Fd5	St36	-	1006
	-	-	-	-	A37CP	HI	1501 161	A515-65
	080M15	-	-	-	CC12	C15	080 M15	1015
	C20 C21	-	-	-	CC20	C22	050 A20	1020
	Fe410 1KW	-	-	-	A42CP	HII	-	-
	CF9SMn28	11 SMn28	-	AVP	S250	9 SMn28	230 M07	1213
	-	-	-	-	-	15S20	210 A15	-
	-	35 S 20	-	-	35MF6	35S20	212 M36	1140
	-	-	-	-	45MF4	45S20	212 M44	1146
	CF9SMn36	-	-	AVZ	S300	9 SMn36	240 M07	1215
	36SMnPb14	-	-	PR80	-	-	-	-
	C10	2 C10	-	-	XC10	Ck10	045 M10	1010
	-	-	-	-	-	St37-1	4360 40A	-
	G22Mn3	-	-	-	20M5	GS-20Mn 5	120 M19	1022
	080M15	-	-	-	XC18	Ck15	080 M15	1015
	C25	1 C25	-	-	XC25	Ck 25	070 M26	1025
	Fe360B	-	-	-	-	-	-	1018
N/mm2 470-700 **Acciaio a medio tenore di carbonio** ***Medium carbon steel***	-	-	-	-	A48FP	Ast45	1501 224	A662 C
	C35	1 C35	-	-	CC35	C35	080 M36	1035
	C45	1 C45	-	-	CC45	C45	080 M46	1045
	C40	1 C40	-	-	AF60 C40	C40	080 M40	1040
	C55	2 C55	-	-	AF70 C55	C55	070 M55	1055
	Fe510	-	-	-	E36-3	St52-3	4360 50B	-
	-	-	-	-	A52FP	Ast52	1501 224	A738
	-	-	-	-	35M5	40Mn4	150 M36	1039
	C35	-	-	-	XC38	Ck35	060 A35	1035
	C36	-	-	-	XC38TS	Cf35	080 M36	1035
	C45	-	-	-	XC45	Ck45	808 M46	1045
	C50	1 C55	-	-	XC55	Ck55	070 M55	1055
	C53	2 C50	-	-	XC48TS	Cf 53	060 A52	1050
	-	2 C45	-	-	Y342	C45W	En43B	1045
	FeE390KG	-	-	-	-	StE380	4360 55E	A572-60
	-	-	-	-	-	StE460	HP6	-
N/mm2 550-850 **Acciaio a elevato tenore di carbonio** ***High carbon steel***	C60	-	-	-	CC55	C60	060 A62	1060
	C60	-	-	-	XC65	Ck60	060 A62	1064
	C70	-	-	-	XC68	Ck67	070 A72	1070
	-	-	-	-	XC75	Ck75	060 A78	1080
	-	-	-	-	XC100	Ck101	060 A96	1095
N/mm2 600-900 **Acciai debolmente legati** ***Low alloy steel***	5SSi8	-	-	-	55S7	55Si7	250 A53	9255
	-	-	-	-	40M5	36Mn5	150 M36	1335
	C28Mn	28Mn 6	-	-	20M5	28Mn6	150 M28	1330
	-	-	-	-	-	X6CrMo4	-	P4
	100Cr6	100Cr6	-	-	100C6	100Cr6	534 A99	52100
	16Mo3KW	-	-	-	15D3	15Mo3	1501 240	A204A
	20NiCrMo2	-	-	-	20NCD2	21NiCrMo2	805 M20	8620
	40NiCrMo2 (KB)	-	-	-	40NCD2	40NiCrMo22	311-Type7	8740
	-	-	-	-	18NCD6	17CrNiMo6	820 A16	-
	34Cr4 (KB)	-	-	-	32C4	34Cr4	530 A32	5132
	40Cr4	-	-	-	42C4	41Cr4	530 A40	5140
	41Cr4 KB	-	-	-	42C2	41Cr4	530 A40	5140
	16MnCr5	16MnCr5KD	-	-	16MC5	16MnCr5	527 M20	5115
	55Cr3	-	-	-	55C3	55Cr3	527 A60	5155
	25CrMo4 (KB)	-	-	-	25CD4	25CrMo4	1717CDS 110	4130
	34CrMo4 (KB)	-	-	-	35CD4	35CrMo4	708 A37	4135
	41CrMo4	-	-	-	42CD4TS	41CrMo4	708 M40	4142
	40CrMo4	-	-	-	40CD4	42CrMo4	708 M40	4140
	42CrMo4	-	-	-	42CD4	42CrMo4	708 M40	4137
	12CrMo910	-	-	-	15CD4.5	16CrMo44	1501 620	A387 12-2
	30CrMo12	-	-	-	30CD12	32CrMo12	722 M24	-
	12CrMo910	-	-	-	12CD9, 10	10CrMo9 10	1501 622	A182 F-22
	50CrV4	51CrV4	-	-	50CV4	50CrV 4	735 A50	6150
	30CrMo12	-	-	-	30CD12	31CrMo12	722 M24	-
	-	-	-	-	-	-	-	-

TABELLE DI CONVERSIONE / *CONVERSION TABLES*

MATERIALI / *MATERIALS*	UNI	EN	ISO	GENERICO	AFONR	DIN	BS	AISI
N/mm2 700-1000 **Acciai legati** ***Alloy steel***	C100KU	-	-	-	Y105	C105W1	BW1A	W1
	-	-	-	-	Y100C6	100Cr6	BL3	L3
	-	-	-	-	-	115CrV3	-	L2
	-	-	-	Holdax	40CMD8 + S	40CrMnMoS8 6	-	P20 + S
	107WCr5KU	-	-	-	105WC13	105WCr6	-	-
	95MnWCr5KU	-	-	-	90MnWCrV5	100MnCrW4	BO1	O1
	45WCrV8Ku	-	-	-	55W20	45WCrV7	BS1	S1
	35NiCrMo6KB	35NiCrMo6	-	-	35NCD6	34CrNiMo6	817 M40	4340
	-	-	-	-	20MC5	20MnCr5	-	5120
	-	-	-	Weldox 700	-	-	-	-
N/mm2 900-1200 **Acciai da utensili e fortemente legati** ***Tool and high alloy steel***	X210Cr13KU	-	-	K100	Z200C12	X210Cr12	BD3	D3
	-	-	-	-	40CMD8	40CrMnMo7	-	P20 + S
	X40CrMoV511KU	-	-	-	Z40CDV5	X40CrMoV5 1	BH13	H13
	X100CrMoV51KU	-	-	-	Z100CDV12	X100CrMoV5 1	BA2	A2
	X155CrVMo121KU	-	-	K110	Z160CDV12	X155CrMoV12 1	BD2	D2
	X215CrW121KU	-	-	-	Z200CDV12	X210CrW12	BD6	D4 - D6
	X30WCrV93KU	-	-	-	Z30WCV9	X30WCrV9 3	BH21	H21
	-	-	-	-	55NCDV7	55NiCrMoV6	-	L6
	HS6-5-5	-	-	-	6-5-2-5	S6/5/2/5	BM35	M 35
	HS6-5-2-2	-	-	-	Z85WDCV	S6/5/2	BM2	M 2
	HS2-9-2	-	-	-	2 9 2	S2/9/2	-	M 7
	X45CrSi8	-	-	-	Z45CS9	X45CrSi9 3	401 S45	HW 3
	30CrMo4	-	-	-	-	20MoCr4	-	-
HRC 30-60 **Acciai temprati** ***Ardened steel***								
	-	-	-	-	-	-	-	-
Acciai inossidabili martensitici e ferritici ***Martensitic and ferritic stainless steel***	-	-	-	WRB	-	X43Cr16	-	420 C
	-	-	-	WRA	-	X90CrMoV18	-	440 B/1
	-	-	-	-	Z40C14	X42Cr13	-	-
	X6Cr13	X6Cr13	-	-	Z6C13	X6Cr13	403 S17	403
	X6Cr13	X6CrAl13	-	-	Z8C13	X6CrAl13	405 S17	405
	X12CrS13	X12CrS13	-	-	Z11CF13	X12CrS13	416 S21	416
	X12Cr13	X12Cr13	-	-	Z10C14	X10Cr13	401 S21	410
	X8Cr17	-	-	-	Z8C17	X6Cr17	430 S17	430
	X20Cr13	X20Cr13	-	-	Z20C13	X20Cr13	420 S37	420
	X30Cr13	X30Cr13	-	-	Z30C13	X30Cr13	420 S45	420F
	-	-	-	-	Z40C14	X20CrNi17 2	431 S29	431
	X10CrS17	X10CrMoS17	-	-	Z10CF17	X12CrMoS17	-	430F
	X8CrMo17	X8CrMo17	-	-	Z8CD17.01	X6CrMo17	434 S17	434
	X6CrTi17	X6CrTi17	-	-	Z4CT17	X6CrTi17	-	430Ti
	X6CrTi12	-	-	-	Z6CT12	X5CrTi12	409 S17	409
Acciai inossidabili austenitici ***Austenitic stainless steel***	X5CrNi18 10	X5CrNi18 10KD	-	-	Z6CN18.09	X5CrNi18 9	304 S15	304
	X8CrNi19 10	-	-	-	Z8CN18.12	X5CrNi18 12	305 S19	305
	X10CrNiS18 09	X10CrNiS18 09	-	-	Z10CNF18.09	X12CrNiS18 8	303 S21	303
	X2CrNi18 11	-	-	-	Z2CN18.10	X2CrNiS18 9	304 S12	304L
	X12CrNI17 07	X12CrNI17 7	-	-	Z12CN17.07	X12CrNi17 7	-	301
	X5CrNi18 10	-	-	-	Z6CN18.09	X5CrNi18 9	304 S31	304
	X5CrNiMo17 12	-	-	-	Z6CND17.11	X5CrNiMo18 10	316 S16	316
	X2CrNiMo17 12	-	-	-	Z2CND17.13	X2CrNiMoN18 13	-	316LN
	X2CrNiMo17 12	-	-	-	Z2CND17.13	X2CrNiMo18 12	316 S12/13/14/22	316L
	X8CrNiMo17 13	-	-	-	Z2CND18-12-03	-	316 S33	316
	X2CrNiMo18 16	-	-	-	Z2CND19.15	X2CrNiMo18 16	317 S12	317L
	-	-	-	-	Z5CND27.05.Az	X3CrNiMoN27 52	-	329
	X6CrNiTi18 11	-	-	-	Z6CND18.10	X10CrNiTi18 9	321 S12	321
	X6CrNiNb18 11	-	-	-	Z6CNNb18.10	X10CrNiNb18 9	347 S17	347
	X6CrNiMoTi17 12	-	-	-	Z6CNDT17.12	X10CrNiMoTi18 10	320 S17	316Ti
	X16CrNI24 12	-	-	-	Z15CNS20.12	X15CrNiSi20 12	309 S24	309
	-	-	-	-	Z12CNS35.16	X12CrNiSi36 16	-	330
Duplex	-	-	-	-	Z3CND25.06Az	X2CrNiMoN25 74	-	S32750
	-	-	-	-	Z2CND18.05.03	X2CrNiMoSi19 5	-	S31500
	-	-	-	-	Z3CND22.05 (Az)	X2CrNiMoN22 53	-	S31803
	-	-	-	ZERON 100	Z3CND25.06Az	X3CrNiMoN25 7	-	S32760
	-	-	-	-	-	X5CrNiCNb16-4	-	630
	-	-	-	17/4 PH	-	-	-	A564 / 630

TABELLE DI CONVERSIONE / *CONVERSION TABLES*

MATERIALI / *MATERIALS*	UNI	EN	ISO	GENERICO	AFONR	DIN	BS	AISI
Ghisa grigia *Grey cast iron*	G10	-	-	-	-	GG-10	Grade 100	A48-20B
	G15	-	-	-	Ft15D	GG-15	Grade 150	A48-25B
	G20	-	-	-	Ft20D	GG-20	Grade 200	A48-30B
	G25	-	-	-	Ft25D	GG-25	Grade 250	A48-40B
	G30	-	-	-	Ft30D	GG-30	Grade 300	A48-45B
	G35	-	-	-	Ft35D	GG-35	Grade 350	A48-50B
	GMN45	-	-	-	MN450	GTS-45	P440/7	A220-40010
	GMN55	-	-	-	MP50-5	GTS-55-04	P510/4	A220-50005
	GMN65	-	-	-	MN650-3	GTS-65-02	P570/3	A220-70003
	GMN70	-	-	-	MN700-2	GTS-70-02	P690/2	A220-80002
Ghisa sferoidale *Nodular cast iron*	GS400-12	-	-	-	FGS400/12	GGG-40	420/12	60/40/18
	GS500-7	-	-	-	FGS500/7	GGG-50	500/7	65/45/12
	GS600-3	-	-	-	FGS600/3	GGG-60	600/3	80/55/06
	GS700-2	-	-	-	FGS700/2	GGG-70	700/2	100/70/03
	GS-800-2	-	-	-	FGS800/2	GGG-80	800/2	120/90/02
Alluminio laminato *Wrought (rolled) aluminium*	9003/3	-	-	-	-	AlMn1	N3	3103
	9003/1	-	-	Aluman 100	AM1	AlMn	N3	3003
	9003/4	-	-	-	AMG0,5	AlMn1Mg0,5	-	3005
	9003/2	-	-	-	AM1G	AlMn1Mg1	-	3004
	9002/3	-	-	Avional 660	AU4SG	AlCuSiMn	H15	2014
	9002/1	-	-	Avional 050	AU2G	AlCuMg0,5	L86	2117
	9002/2	-	-	Avional 100	AU4G	AlCuMg1	H14	2017
	9002/4	-	-	Avional 150	AU4G1	AlCuMg2	DTD5090	2024
	9002/8	-	-	-	AU4Pb	AlCuMgPb	-	2030
	9002/5	-	-	Recidal 11	AU5PbBi	AlCuBiPb	FC1	2011
	9006/4	-	-	Anticorodal 100	ASGM0,7	ALMgSi1	H30	6082
	9006/1	-	-	Anticorodal 063	AGS	AlMgSi0,5	H9	6060
	9006/6	-	-	-	ASG0,5	AlMgSi0,7	-	6005
	9006/2	-	-	Anticorodal 061	AGSUC	AlMg1SiCu	H20	6061
	9005/1	-	-	Peraluman 080	AG0,6	AlMg1	N41	5005
	9005/7	-	-	Peraluman 150	-	AlMg1,5	-	5050
	9005/2	-	-	Peraluman 250	AG2,5C	AlMg2,5	-	5052
	-	-	-	-	AG2M	AlMg2Mn0,3	N4	5251
	9005/8	-	-	Peraluman 350	AG3	AlMg3	N5/N56	5154
	9005/3	-	-	-	AG2,5MC	AlMg2,7Mn	N51	5454
	9005/4	-	-	-	AG4MC	AlMg4Mn	-	5086
	9005/5	-	-	Peraluman 440	AG4,5MC	AlMg4,5Mn	N8	5083
	-	-	-	Peraluman 500	A-G5	AlMg5	N6	5056
	9007/1	-	-	-	AZ5G	AlZn4,5Mg1	H17	7020
	9007/2	-	-	Ergal 55	AZ5GU	AlZnMgCu1,5	2L95	7075
	9007/4	-	-		-	AlZn6MgCu	DTD5130	7010
Alluminio pressofuso *Die-cast aluminium* **Si<12%**	-	42000	AlSi7Mg	-	A-57G	G-AlSi7Mg	LM25	A356
	-	-	-	-	-	G-AlSi9Mg	-	-
	-	43100	AlSi10Mg	-	A-S10G	G-AlSi10Mg	LM9	A360
	-	44100	AlSi12	-	A-S12U	G-AlSi12	LM6	A413.2
	-	-	-	-	-	GD-AlSi12	-	A413.0
	-	47000	AlSi12 (Cu)	-	A-S12U	GD-AlSi12 (Cu)	LM20	A413.1
	-	51300	AlMg6	-	A-SU12	G-AlMg5	LM5	-
	-	-	-	-	G-Z4TR	G-MgZn4SE1Zr1	MAG5	-
	-	-	-	-	G-TR3Z2	MgSE3Zn2Zr1	MAG6	-
	-	-	-	-	G-Ag22,5	G-MgAg3SE2Zr1	MAG12	-
	-	-	-	-	G-A9	G-MgAl8Zn1	MAG12	-
	-	-	-	-	G-A9Z1	G-MgAl9Zn1	MAG2	-
	-	45300	AlSiCu1	-	A-S4GU	G-AlSi5	LM16	355.1
	-	46500	AlSi9Cu3	-	A-S9U3	G-AlSi8Cu3	LM24	A380
	-	45000	AlSi6Cu4	-	A-S5UZ	G-AlSi6Cu4	LM21	319
	-	45400	AlSi5Cu3	-	A-S5UZ	G-AlSi6Cu4	LM22	319.2

TABELLE DI CONVERSIONE / *CONVERSION TABLES*

MATERIALI / *MATERIALS*	UNI	EN	ISO	GENERICO	AFONR	DIN	BS	AISI
Rame ***Copper***	-	CW008A	Cu-OF	-	Cu/c1	OF Cu	C103	C10200
	E-Cu57	CW004A	Cu-ETP	-	Cu7a1	E-Cu57	C101	C11000
	-	CW021A	-	-	-	SE Cu	-	C10300
	-	CW024A	Cu-DHP	-	Cu/b	SF Cu	C106	C12200
	-	CR006A	-	-	Cu/A3	Cu-FRTP	C104	C12500
	-	CW112C	CuNi3Si	-	-	-	-	C70320
	-	-	Cu-AsP	-	-	-	C107	C14200
	-	-	CuCd1	-	-	-	C108	C16200
	-	CW105C	CuCr1	-	-	-	CC101	C18200
	-	CW109C	CuNi1Si	-	-	-	-	C191010
	-	CW111C	CuNi2Si	-	-		CC102	C70250
	-	CW101C	CuBe2	-	-	-	CB101	C17200
	-	CW102C	CuBe2Pb	-	-	-	-	C17300
	-	CW110C	CuNi2Be	-	-	-	-	17510
	-	CW104C	CuCo2Be	-	-	-	C112	C17500
	-	CW120C	CuZr	-	-	-	-	C15000
	-	CW115C	CuSi2Mn	-	-	-	-	C65100
	-	CW116C	CuSi3Mn1	-	-	-	CS101	C65500
	-	CW118C	CuTeP	-	-	-	C109	C14500
	-	CW114C	CuSP	-	-	-	C111	C14700
	-	CW113C	CuPb1P	-	-	-	-	C18700
HRC <30 **Leghe di nichel** ***Nickel alloys***	-	-	-	Incoloy 800	-	X10NiCrAlTi32-21	3075 (NA15)	N08800
	-	-	-	Nimonic 75	NC20T	NiCr20Ti	HR5,203-4	N06075
	-	-	-	Nimonic 80A	NC20TA	NIiCr20TiAl	HR401,601	N07080
	-	-	-	Inconel 617	-	-	-	N06617
	-	-	-	Hastelloy X	NC22FeD	NiCr22FeMo	HR6,204	N06002
	-	-	-	Inconel 600	NC15Fe	-	-	N06600
	-	-	-	Inconel 601	-	NiCr23Fe	-	N06601
	-	-	-	Inconel 625	NC22DNb	NiCr22Mo9Nb	-	N06625
	-	-	-	Incoloy 825	NC21FeDU	NiCr21Mo	3072-76	N08825
HRC >30 **Leghe di nichel** ***Nickel alloys***	-	-	-	Hastelloy B	-	NiMo28	-	N10665
	-	-	-	Hastelloy C	NC17DWY	NiCr17Mo17Few	-	N10002
	-	-	-	Hastelloy N	-	-	-	N10003
	-	-	-	Inconel 690	-	-	-	-
	-	-	-	Inconel 700	NK27CADT	NiCr29Cr15MoAlTi	-	-
	-	-	-	Inconel 718	NC19FeNb	NiCr19Fe19NbMo	HR8	N07718
	-	-	-	Inconel 722	NC16FeTi	NiCr16FeTi	-	-
	-	-	-	Inconel 725	-	-	-	N07725
	-	-	-	Inconel 750-X	NC19FeNb	NiCr15Fe7TIAl	HR505	N07750
	-	-	-	Inconel 751	-	-		N07751
Hardox 400 **Stavax** **Ramax**								
	-	-	-	Hardox 400	-	-		-
	-	-	-	Ramax	-	-		-
	-	-	-	Stavax	-	-		-
Leghe di titanio ***Titanium alloys***	-	-	-	-	TA1	Ti99,8	-	-
	-	-	-	-	TA2-5	Ti99,7a	-	-
	-	-	-	-	-	Ti99,6	-	-
	-	-	-	-	TA6	Ti99,5	-	-
	-	-	-	-	A6V	TiAl55n2,5	TA14 / TA17	-
	-	-	-	-	T-A5E	TiAl6V4	TA10-13 / TA29	-
	-	-	-	-	-	TiAl6V6Sn2	-	-
	-	-	-	-	-	TiAlMoASn2	-	-

TOLLERANZE ISO / *ISO TOLLERANCE*

Tolleranze	Diametro mm				
	<1 ÷ 3	3 ÷ 6	6 ÷ 10	10 ÷ 18	18 ÷ 30
e8	- 0,014 - 0,028	- 0,020 - 0,038	- 0,025 - 0,047	- 0,032 - 0,059	- 0,040 - 0,073
h5	0 - 0,004	0 - 0,005	0 - 0,006	0 - 0,008	0 - 0,009
h6	0 - 0,006	0 - 0,008	0 - 0,009	0 - 0,011	0 - 0,013
h7	0 - 0,010	0 - 0,012	0 - 0,015	0 - 0,018	0 - 0,021
h8	0 - 0,014	0 - 0,018	0 - 0,022	0 - 0,027	0 - 0,033
h9	0 - 0,025	0 - 0,030	0 - 0,036	0 - 0,043	0 - 0,052
h10	0 - 0,040	0 - 0,048	0 - 0,058	0 - 0,070	0 - 0,084
h11	0 - 0,060	0 - 0,075	0 - 0,090	0 - 0,110	0 - 0,130
h12	0 - 0,100	0 - 0,120	0 - 0,150	0 - 0,180	0 - 0,210

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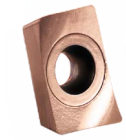


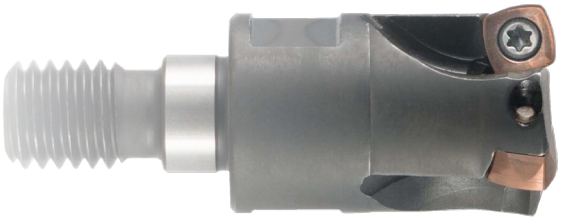

INDICE ALFABETICO DELLE FRESE / *ALPHABETICAL INDEX OF END MILLS*

INDICE ALFABETICO DELLE FRESE / *ALPHABETICAL INDEX OF END MILLS*

INDICE ALFABETICO DELLE PUNTE / *ALPHABETICAL INDEX OF DRILLS*

INDICE ALFABETICO FRESE AD INSERTI / *ALPHABETICAL INDEX MILLING TOOLS*

FRESE AD INSERTI

INSERTI

PROLUNGHE

RICAMBI

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