



C300

BOOSTER



SVILUPPATO
& PROGETTATO



IN ITALIA

C400

ELLIPSE



WWW.TTETEC.EU

VALIDA FINO AL 29/03/2019



Azione promozionale valida fino al 29/03/2019

APPROFONDIMENTI



N° 168

INFOTECH

RIMANI AGGIORNATO SULLE ULTIME APPLICAZIONI FATTE

C300...
C400...



CORPO FRESA

INSERTI
QUANTITÀ

Ø 16-35

1 €
a corpo fresa

20

Ø 40-63

1 €
a corpo fresa

40

Ø 66-Ø 125

1,50 €
al mm

40

Importante

Inserti C400 disponibili:
XDHT 120408... ST PP35 / XDHT 120408... ST PM40



C300



SCARICA LA NOSTRA
BROCHURE DEDICATA



C400



SCARICA LA NOSTRA
BROCHURE DEDICATA

Rivenditore autorizzato



DEVELOPED
& DESIGNED



IN ITALY

BOOSTER

HFRM HIGH FEED REMOVE MATERIAL

WWW.TTETEC.EU

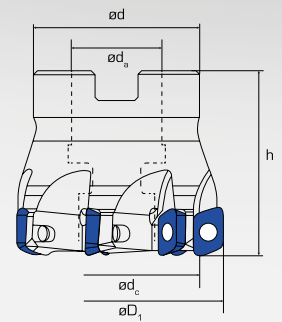


2019.2 IT-ENG

C300A / ATTACCO A MANICOTTO TIPO A / FACE MILL TYPE A

FRESA AD ALTO AVANZAMENTO HIGH FEED CUTTING

Cod.	ϕd_c	ϕD_1	h	ϕd	ϕd_a	z
C300A-40R06-07	29	40	40	35	16	6
C300A-50R07-07	39	50	40	41	22	7
C300A-52R07-07	41	52	40	41	22	7
C300A-63R08-07	52	63	50	60	22	8
C300A-66R08-07	55	66	50	60	27	8
C300A-80R09-07	69	80	50	60	27	9

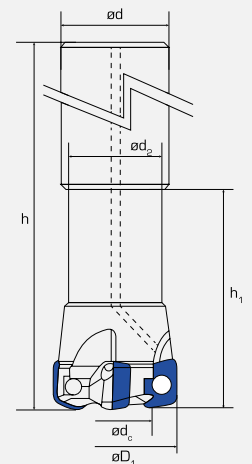


Esempio d'ordine How to order **C300A-40R06-07**

C300C / ATTACCO CILINDRICO TIPO C / ENDMILL TYPE C

FRESA AD ALTO AVANZAMENTO HIGH FEED CUTTING

Cod.	ϕd_c	ϕD_1	h	ϕd	ϕd_2	h_1	z
C300C-16R02-07	5	16	160	16	14	30	2
C300C-20R03-07	9	20	200	20	18	32	3
C300C-25R04-07	14	25	200	25	23	40	4
C300C-32R05-07	21	32	250	32	30	51	5

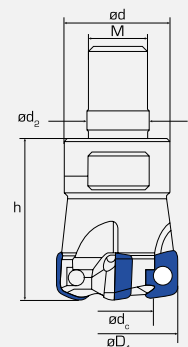


Esempio d'ordine How to order **C300C-16R02-07**

C300G / ATTACCO FILETTATO TIPO G / THREAD CUTTER TYPE G

FRESA AD ALTO AVANZAMENTO HIGH FEED CUTTING

Cod.	ϕd_c	ϕD_1	h	ϕd	ϕd_2	M	z
C300G-16R02-07	5	16	23	13	8,5	8	2
C300G-20R03-07	9	20	30	18	10,5	10	3
C300G-22R03-07	11	22	30	18	10,5	10	3
C300G-25R04-07	14	25	35	21	12,5	12	4
C300G-32R05-07	21	32	40	29	17	16	5
C300G-35R05-07	24	35	40	29	17	16	5
C300G-42R06-07	31	42	40	29	17	16	6



Esempio d'ordine How to order **C300G-16R02-07**

PARTI DI RICAMBIO SPARE PARTS

FORZA SERRAGGIO /TIGHTENING FORCE 1,2 Nm

Cod.	M	l	N _m	Tx plus
V0300800	3	8	1,2	TX 08

Esempio d'ordine How to order **V0300800**

EPHW / EPHT

Cod.	l	s	r	L ₁	P	H	M	K	S
					Acciai Steel	Acciai Temprati Hardened Steel	Acciai Inox Stainless Steel	Chise Cast Iron	Super Leghe Heat Res. Alloys
New EPHW-070315-TTW	11	3,35	8,5	7	P615	P615	P615	P615	
EPHW-070315-TT	11	3,35	8,5	7		P615		P615	
EPHT-070315-ST	11	3,35	8,5	7	PP35		PM40		
EPHT-070315-XT	11	3,35	8,5	7			C535 C540		C535 C540
EPHT-070315-HTM	11	3,35	8,5	7	PP35				
EPHT-070315-XTM	11	3,35	8,5	7			C540		C540

Esempio d'ordine How to order
EPHT-070315-HTM PP35

GEOMETRIA / GEOMETRY

TT-TTW		HTM		ST		XT		XTM	
H	Acciai Temprati Hardened Steel	P	Acciai Steel	P	Acciai Steel	S	Super Leghe Heat Res. Alloys	S	Super Leghe Heat Res. Alloys
				M	Acciai Inox Stainless Steel	M	Acciai Inox Stainless Steel		

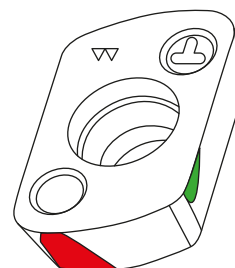
QUALITÀ MD / GRADE DESIGNATION

Qualità Grade	Dim. Grano Grain Size	Rivestimento Coating	HV 30	Utilizzo Use		Tenacità Toughness	Res. Usura Wear Resistance	Impiego Type of Use
				Umido Wet	Secco Dry			
P615	0,4 μ		1730		✓	6	7	ACCIAI TEMPRATI HARDENED STEEL
PP35	1-2 μ		1400	✓	✓	8	7	ACCIAI STEEL
PM40	1 μ		1380	✓	✓	9	8	ACCIAI INOSSIDABILI STAINLESS STEEL
C535	2 μ		1330		✓	5	7	ACCIAI INOSSIDABILI E LEGHE RESISTENTI AL CALORE STAINLESS STEEL AND HEAT RES. ALLOYS
C540	2 μ		1330	✓	✓	7	7	TITANIO E LEGHE RESISTENTI AL CALORE TITANIUM AND HEAT RES. ALLOYS

Materiale Material		Resistenza Mechanical Strength (N/mm ²)	GR	PP35 / P135		PM40 / P235		P615		C535		C540	
				Secco Dry	Emul. Wet	Secco Dry	Emul. Wet	Secco Dry	Emul. Wet	Secco Dry	Emul. Wet	Secco Dry	Emul. Wet
				V _c (m/min)		V _c (m/min)		V _c (m/min)		V _c (m/min)		V _c (m/min)	
P	Acciai Steel	Non Legati Non-Alloy	600-800	1-2-3	300/160	190/140							
		Basso Legati Low-Alloy	800-1000	4-5-6	250/120	150/100							
		Medio Legati Medium-Alloy	1000-1200	7-9	200/100	140/80							
		Alto Legati High-Alloy	1200-1300	10	180/100	160/80							
1400-1500	11		120/80	100/60			160/80						
M	Acciai Inox Stainless Steel	Martensitico Martensitic	700-800	12			300/150	180/120					
		Austenitico Austenitic	600-700	13			250/130	150/110			250/140	140/80	
		Inox-Duplex Duplex	800-900	14			140/80			250/140	250/140	140/80	
		Inox-Super Duplex Super Duplex	900-1100	14,1			110/60			200/120	200/100		
S	Super Leghe Heat Res. Alloy	Fe	600-900	31-32						85/45		80/45	
		Ni-Co	900-1000	34-35								70/45	
			1200	36								40/20	
		Leghe Titanio Titanium Alloy	α β	37								85/60	
H	Acciai Temprati Hardened Steel		45-50 Hrc	38				200/150					
			50-55 Hrc	39				150/100					
			> 55 Hrc	40				80/60					
K	Ghise Cast Iron		≤ 200 HB	15				250/150					

INSERTO BOOSTER PER SEMIFINITURA / BOOSTER INSERT FOR SEMI-FINISHING OPERATION

Materiale Material		Resistenza Mechanical Strength (N/mm ²)	GR	V _c (m/min)		
				Secco Dry	Emul. Wet	
				V _c (m/min)		
P	Acciai Steel	Basso Legati Low-Alloy	800-1000	4-5-6	250	-
		Medio Legati Medium-Alloy	1000-1200	7-9		
		Alto Legati High-Alloy	1200-1300	10	120	-
			1400-1500	11		
M	Acciai Inox Stainless Steel	Martensitico Martensitic	700-800	12	250	-
		Austenitico Austenitic	600-700	13		
		Inox-Duplex Duplex	800-900	14	140	-
		Inox-Super Duplex Super Duplex	900-1100	14,1		
H	Acciai Temprati Hardened Steel		< 55 Hrc	38	150	-
				39		
			> 55 Hrc	40	80	-



EPHW070315-TTW-P615

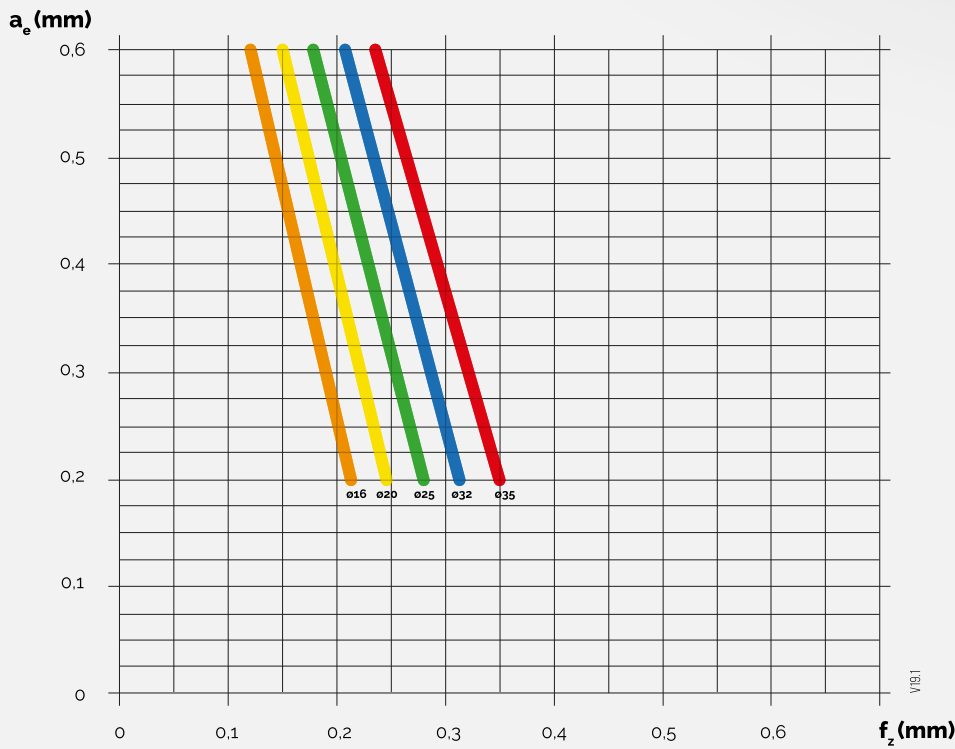




	Nome Name	GR	DIN	UNI	AISI /ASTM	N° Materiale N° Material	Note Notes	
P	C 15	1	C 15	C 15		1,0401		
	15 CrMo5	6		15 CrMo5		1,7262		
	C45	3	C45	C45		1,0503		
	38NCD5	9		40NiCrMo6		1,6565	Bonificato Hardened and Tempered Steel	
	1,2311	9	40 CrMgMo 7	40 CrMgMo 7		1,2311		
	1,2312	9						
	1,2714	9						
	1,2738	9		40 CrMnNi Mo 8 6 1		1,2738	Bonificato Hardened and Tempered Steel	
	1,2738 HH	11				1,2738 HH		
	1,2343	11				1,2343		
	1,2344	11						
	1,2083 STAVAX	11						
	1,2365	11						
	1,2367	11						
	100Cr 6	9			100Cr6		1,2067	
	36 CrNiMo4	9			36 CrNiMo4		1,6511	
	21 NiCrMo2	9			21 NiCrMo2		1,6523	
	X100CrMoV5 1	11			X100CrMoV5 1		1,2363	Bonificato Hardened and Tempered Steel
	NIMAX	9					1,2738/P20	
	DAC MAGIC	9						
	W 300	11					1,2343	
	IMPAX	11						
	1,2080	10						
	K110	10					1,2379	
	K720	11					1,2842	
K390	11							
K890	11							
M4- HSS	11				M4			
M	AISI 304	13		X 5Cr Ni 18 10	630	1,4301		
	304LN	14		XCrNiN	304LN	1		
	AISI 316L	13		X 2 Cr Ni Mo 17 12 2	316L	1,4404		
	FA6	13						
	AISI 420	12		X 30Cr 13	420	1,4028		
	AISI 904L	13		X1NiCrMoCu25 20 5	904L	1,4539		
	17-4PH	14						
	15-5PH	14						
	F53	14,1		X 2 Cr Ni Mo 25 7 4	F53	1,4410		
	F51	14						
	F44	14,1						
F55	14,1							
S	NIMONIC 80 A	34				2,4631		
	MONEL K500	34				2,4375		
	INCONEL 625	35				2,4856		
	INCONEL 718	36				2,4668		
	INCONEL 718 INVECCHIATO / AGED	36				2,4668	Invecchiato /Aged	
TITANIO / TITANIUM	37	TiAl6V4				3,7165		
H	1,2738	38		40 CrMnNi Mo 8 6 1		1,2738		
	1,2738 HH	39				1,2738 HH		
	1,2343	38				1,2343	45 / 50	
	1,2344	38						
	1,2083 STAVAX	40				1		
	1,2365	39					50 / 55	
	1,2367	39						
	TOOLOX 33	39					33	
	TOOLOX 44	39					44	
	DAC MAGIC	39					48	
	W 300	38				1,2343	45 / 50	
	IMPAX	39					50 / 55	
	1,2080	39					50 / 60	
	K110	40				1,2379		
	K720	40				1,2842		
	K390	40					58 / 63	
	K890	40						
M4- HSS	40				M4			
K	G25 GHISA / CAST IRON	15	GG25	G25		0,6025		

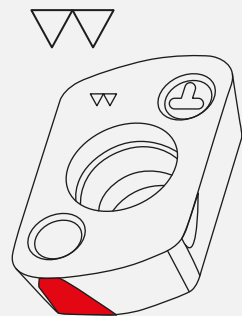
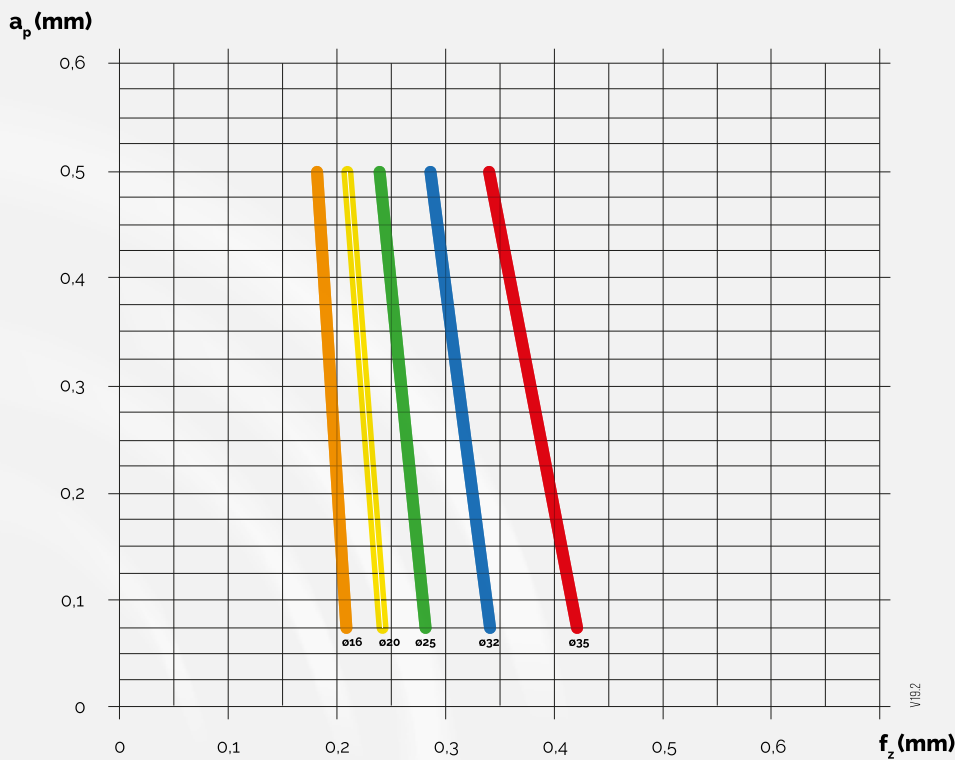


SPALLAMENTO DI SEMIFINITURA /SEMI-FINISHING SHOULDER

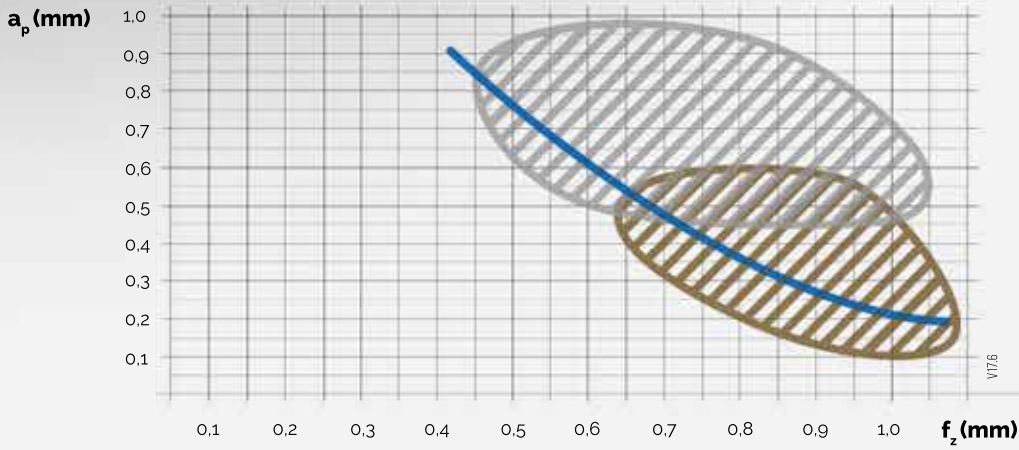


- D₁ 16 / a_p = 2,00 mm max
- D₁ 20 / a_p = 2,00 mm max
- D₁ 25 / a_p = 2,00 mm max
- D₁ 32 / a_p = 2,00 mm max
- D₁ 35 / a_p = 2,00 mm max

SPIANATURA DI SEMIFINITURA /SEMI-FINISHING FACING



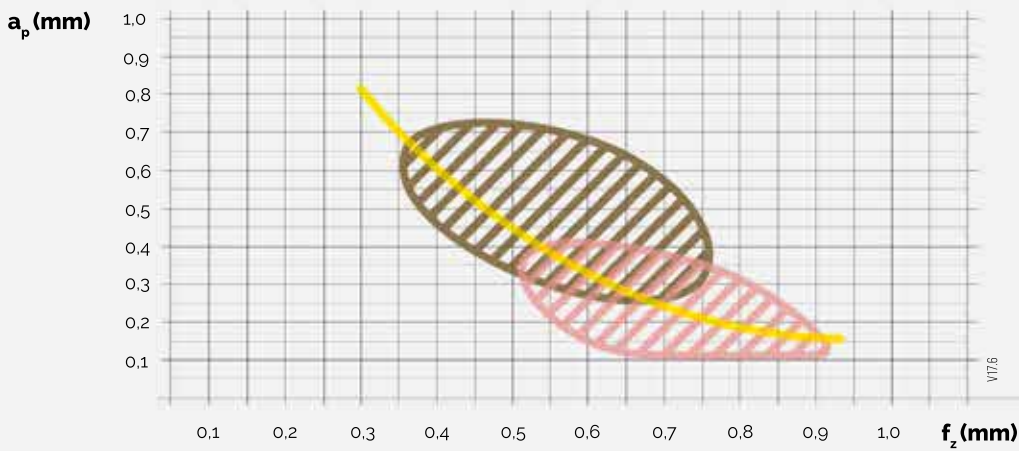
- D₁ = 16 / a_e = 6 mm max
- D₁ = 20 / a_e = 10 mm max
- D₁ = 25 / a_e = 15 mm max
- D₁ = 32 / a_e = 22 mm max
- D₁ = 35 / a_e = 25 mm max



P
Steel

HTM

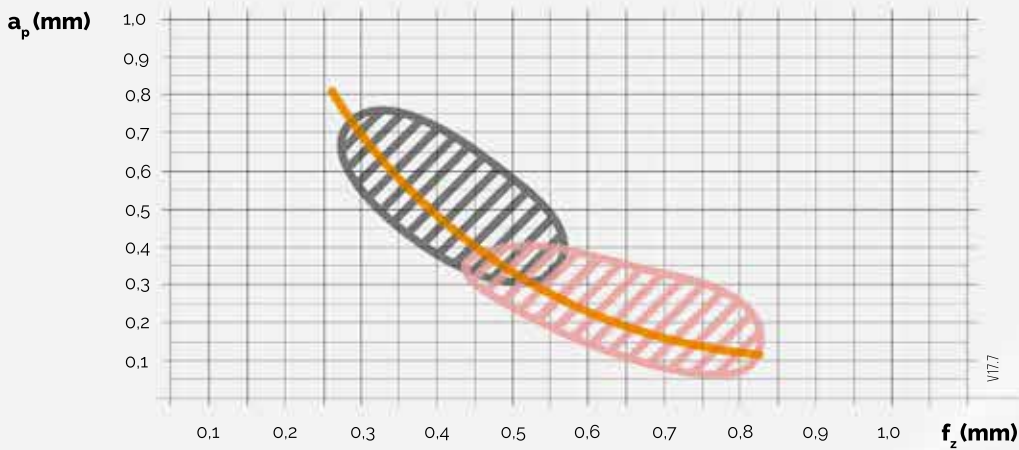
ST



M
Stainless Steel

ST

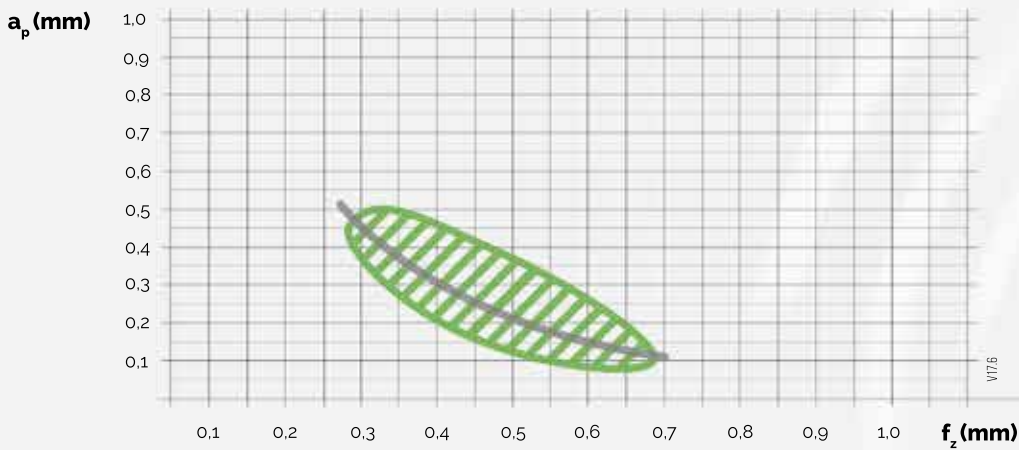
XT



S
Heat Res. Alloys

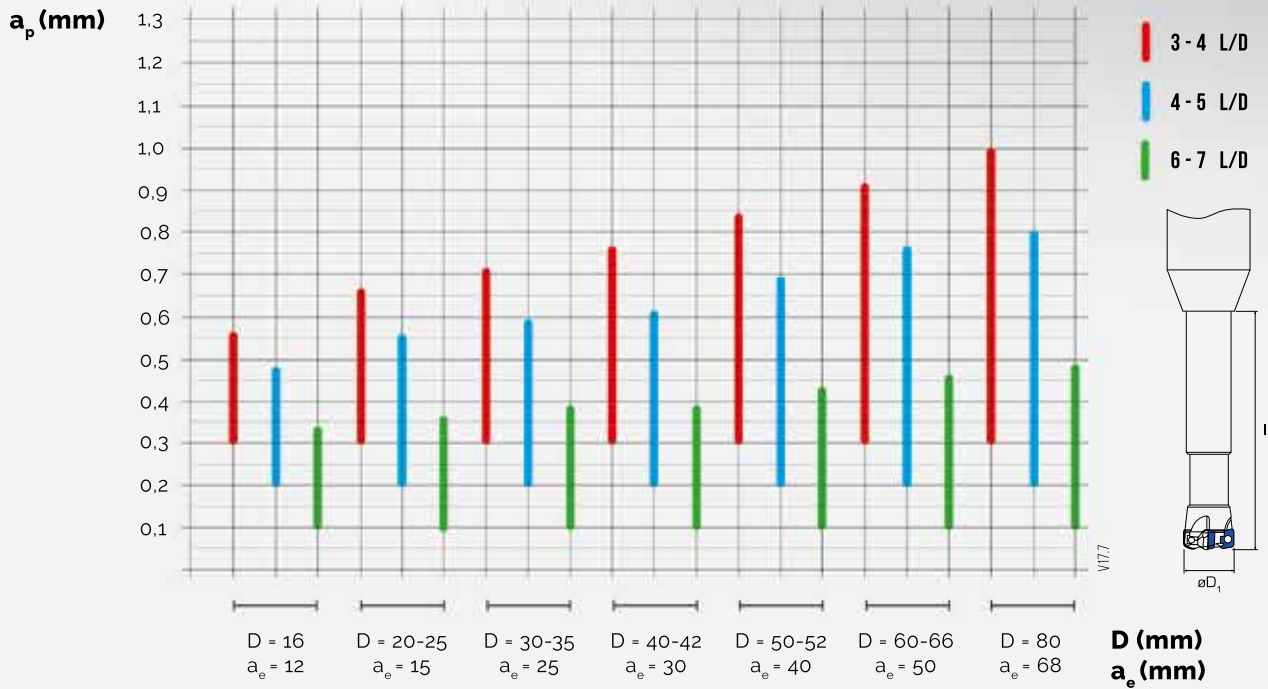
XTM

XT



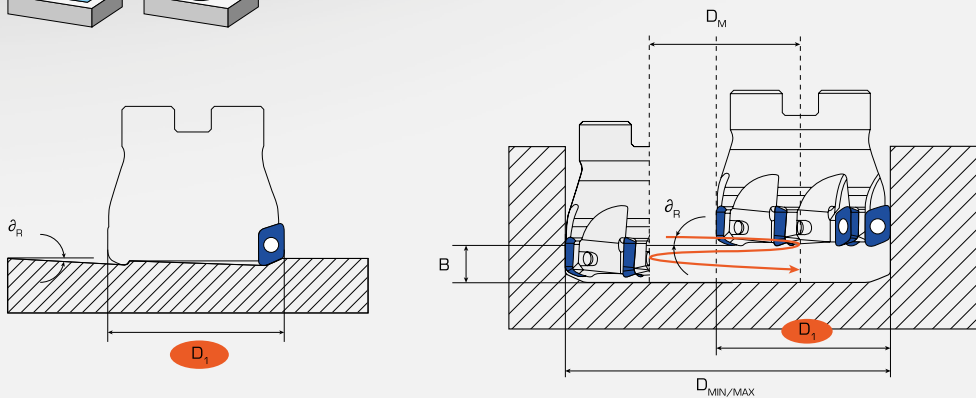
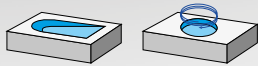
H
Hardened Steel

TT



Formule Formula Collection	Tipi di usure Wear Type	
<p>VELOCITÀ DI TAGLIO CUTTING SPEED (m/min)</p> $V_c = \frac{D_1 \cdot \pi \cdot n}{1000}$		<p>USURA DI CRATERIZZAZIONE SOLUZIONE: - IMPIEGARE QUALITÀ DI METALLO DURO PIÙ RESISTENTE ALL'USURA - RIDURRE LA VELOCITÀ DI TAGLIO</p> <p>CRATERING WEAR SOLUTION: - MUST BE USED CEMENTED CARBIDE GRADE WITH MORE WEAR RESISTANCE - REDUCE CUTTING SPEED</p>
<p>NUMERO DI GIRI DEL MANDRINO RPM (min⁻¹)</p> $n = \frac{V_c \cdot 1000}{D_1 \cdot \pi}$		<p>SCHEGGIATURA ESTERNA SOLUZIONE: - RIDURRE LA PROFONDITÀ DI TAGLIO MANTENENDO COSTANTE L'AVANZAMENTO - ABBASSARE L'AVANZAMENTO MANTENENDO COSTANTE LA PROFONDITÀ DI TAGLIO</p> <p>EXTERNAL CHIPPING SOLUTION: - REDUCE DEEP OF CUT, MAINTAINING SAME FEED - REDUCE FEED, MAINTAINING SAME DEEP OF CUT</p>
<p>AVANZAMENTO FEED RATE (mm/min)</p> $V_f = f_z \cdot n \cdot z$		<p>USURA INTERNA SOLUZIONE: - AUMENTARE L'AVANZAMENTO TAGLIANTE</p> <p>INTERNAL WEAR SOLUTION: - MUST BE INCREASED FEED RATE</p>
<p>VOLUME TRUCIOLO PER UNITÀ DI TEMPO CHIP VOLUME (cm³/min)</p> $Q = \frac{a_p \cdot a_e \cdot V_f}{1000}$		<p>TAGLIANTE DI RIPORTO SOLUZIONE: - AUMENTARE LA VELOCITÀ DI TAGLIO - IMPIEGARE QUALITÀ DI METALLO DURO CON RICOPERTURA ANTIFRIZIONE C540</p> <p>BUILT UP EDGE SOLUTION: - MUST BE INCREASED CUTTING SPEED - MUST BE USED A CARBIDE GRADE WITH ANTIFRICTION COATING, C540</p>
<p>AVANZAMENTO AL DENTE FEED PER TOOTH (mm)</p> $f_z = h_m \cdot \sqrt{\frac{D_1}{a_e}}$		<p>MICRO FESSURAZIONI A PETTINE SOLUZIONE: - NON IMPIEGARE EMULSIONE MA ARIA</p> <p>PERPENDICULAR MICROCRACKS SOLUTION: - DO NOT USE COOLANT, USE AIR</p>

PENETRAZIONE AD INTERPOLAZIONE ELICOIDALE ELICOIDAL RAMPING



$$B \text{ [mm]} = D_M \times \pi \times \tan \alpha_R$$

D_1		16	20	25	32	35	40 / 42	50 / 52	63 / 66	80
EP 07	D_{MIN}	20	28	38	52	58	68	92	120	140
	D_{MAX}	30	38	48	62	68	85	102	130	160
	α_R [°]	2	2	2	2	2	1,5	1,5	1	0,5

Note / Notes

α_R valore massimo consentito. / α_R maximum value allowed.

APPROCCI E METODI DI LAVORAZIONE HOW TO APPROACH

SI RACCOMANDA / IT IS RECOMMENDED

- 1 **INGRESSO E USCITA CON V_f RIDOTTA 50%**
COMPONENT APPROACH, REDUCE FEED 50%
- 2 **LAVORAZIONE CONCORDE**
UP MILLING MACHINING
- 3 **INSERIRE RACCORDI XY RAGGIATI**
USE SMOOTHING MILLING
- 4 **UTILIZZO ARIA O EMULSIONE INTERNA**
USE INTERNAL COOLING OR AIR
- 5 **QUANDO SI LAVORA TITANIO, DUPLEX, SUPER-DUPLEX USARE % OLIO $\geq 10\%$**
WHILE WORKING TITANIUM, DUPLEX, SUPER DUPLEX MUST USE % OF OIL $\geq 10\%$

PROGRAMMAZIONE CAM CAM PROGRAM

NELLA PROGRAMMAZIONE CAM IL RAGGIO TEORICO DOVREBBE ESSERE IMPOSTATO $R = 2,0 \text{ mm}$ SE VIENE IMPOSTATO UN RAGGIO MAGGIORE SI VERIFICHERÀ UN'ASPORTAZIONE DI MATERIALE IN ECCESSO.

IN PROGRAMMING CAM THE THEORETICAL RADIUS MUST BE $R = 2,0 \text{ mm}$. IF BY MISTAKE YOU USE A BIGGER RADIUS YOU WILL HAVE A HIGHER CHIP REMOVAL.

r	R	t	α
1,2	2	0,69	2°



R = raggio di programmazione
program radius



tte srl Via Trebbia, 41/A - 23868 Valmadrera (Lecco) - Tel. +39 0341 207108 - Fax. +39 0341 202940

E-mail: info@ttetec.it - www.ttetec.eu



SVILUPPATO
& PROGETTATO



IN ITALIA

ELLIPSE C400

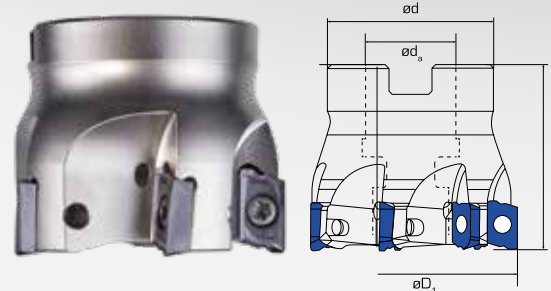
WWW.TTETEC.EU



2019.3 IT-ENG

C400A / ATTACCO A MANICOTTO TIPO A / FACE MILL TYPE A

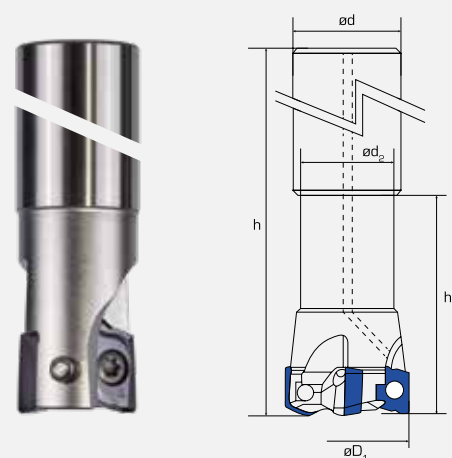
Cod.	$\varnothing D_1$	h	$\varnothing d$	$\varnothing d_2$	z
C400A-40R04-12	40	40	38	16	4
C400A-50R05-12	50	40	41	22	5
C400A-63R06-12	63	40	48	22	6
C400A-80R07-12	80	50	58	27	7
C400A-100R09-12	100	50	78	32	9
C400A-125R10-12	125	63	88	40	10



Esempio d'ordine How to order **C400A-80R07-12**

C400C / ATTACCO CILINDRICO TIPO C / ENDMILL TYPE C

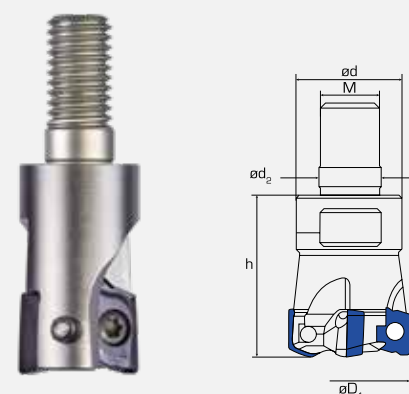
Cod.	$\varnothing D_1$	h	$\varnothing d$	$\varnothing d_2$	h_1	z
C400C-20R02-12	20	200	20	18	32	2
C400C-25R03-12	25	200	25	23	40	3
C400C-32R04-12	32	250	32	30	50	4



Esempio d'ordine How to order **C400C-25R03-12**

C400G / ATTACCO FILETTATO TIPO G / THREAD CUTTER TYPE G

Cod.	$\varnothing D_1$	h	$\varnothing d$	$\varnothing d_2$	M	z
C400G-20R02-12	20	30	18	10,5	10	2
C400G-25R03-12	25	35	21	12,5	12	3
C400G-32R04-12	32	40	29	17	16	4



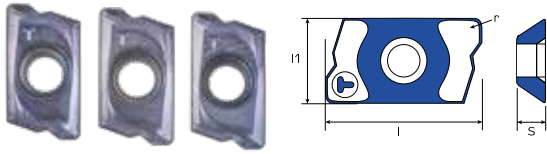
Esempio d'ordine How to order **C400G-20R02-12**

PARTI DI RICAMBIO SPARE PARTS

FORZA SERRAGGIO /TIGHTENING FORCE 3,2 Nm

Cod.	$\varnothing D_1$	l	N_m	Tx plus	M
VT0350670	20-32	6,7	3,2	15	3,5
VT0350720	40-125	7,2	3,2	15	3,5

XDHT / XDMT



Cod.	l	s	r	L ₁	P	H	M	K	S
					Acciai Steel	Acciai Temprati Hardened Steel	Acciai Inox Stainless Steel	Chise Cast Iron	Super Leghe Heat Resistant Alloys
XDHT-120408 PDER-ST	14,6	4,7	0,8	8	● PP35				
XDHT-120408 PDER-HT	14,6	4,7	0,8	8	● PP35				
XDHT-120408 PDER-ST	14,6	4,7	0,8	8			● PM40		
XDHT-120408 PDER-XT	14,6	4,7	0,8	8			● C540		● C540
XDMT-120408 PDER-HT	14,6	4,7	0,8	8	● PP35				

Esempio d'ordine How to order
XDHT-120408 PDER-HT PP35

GEOMETRIA / GEOMETRY

HT		ST		XT	
P	Acciai Steel	P	Acciai Steel	S	Super Leghe Heat Res. Alloys
		M	Acciai Inox Stainless Steel	M	Acciai Inox Stainless Steel

QUALITÀ MD / GRADE DESIGNATION

Qualità Grade	Dim. Grano Grain Size	Rivestimento Coating	HV 30	Utilizzo Use		Tenacità Toughness	Res. Usura Wear Resistance	Impiego Type of Use
				Umido Wet	Secco Dry			
PP35	1-2 μ		1400	✓	✓	8	7	ACCIAI STEEL
PM40	1 μ		1380	✓	✓	9	8	ACCIAI INOSSIDABILI STAINLESS STEEL
C540	2 μ		1330	✓	✓	7	7	TITANIO E LEGHE RESISTENTI AL CALORE TITANIUM AND HEAT RESISTANT ALLOYS

PARAMETRI DI LAVORO CUTTING DATA



Materiale Material		Resistenza Mechanical Strength (N/mm ²)	GR	PP35 / P135		PM40 / P235		P615		C535		C540		
				Secco Dry	Emulsione Wet	Secco Dry	Emulsione Wet	Secco Dry	Emulsione Wet	Secco Dry	Emulsione Wet	Secco Dry	Emulsione Wet	
				V _c (m/min)		V _c (m/min)		V _c (m/min)		V _c (m/min)		V _c (m/min)		
P	Acciaï Steel	Non Legati Non-Alloy	600-800	1-2-3	300 / 160	190 / 140								
		Basso Legati Low-Alloy	800-1000	4-5-6	250 / 120	150 / 100								
		Medio Legati Medium-Alloy	1000-1200	7-9	200 / 100	140 / 80								
		Alto Legati High-Alloy	1200-1300	10	180 / 100	160 / 80								
			1400-1500	11	120 / 80	100 / 60			160 / 80					
M	Acciaï Inox Stainless Steel	Martensitico Martensitic	700-800	12			300 / 150	180 / 120						
		Austenitico Austenitic	600-700	13			250 / 130	150 / 110			250 / 140	140 / 80		
		Inox Duplex Duplex	800-900	14				140 / 80			250 / 140	250 / 140	140 / 80	
		Inox Super Duplex Super Duplex	900-1100	14.1				110 / 60			200 / 120	200 / 100		
S	Super Leghe Heat Res. Alloys	Fe	600-900	31-32						85 / 45		80 / 45		
		Ni-Co	900-1000	34-35									70 / 45	
			1200	36									40 / 20	
	Leghe Titanio Titanium Alloy	α-β		37								85 / 60		
H	Acciaï Temprati Hardened Steel	45-50 Hrc		38					200 / 150					
		50-55 Hrc		39					150 / 100					
		> 55 Hrc		40					80 / 60					
K	Chise Cast Iron	≤ 200 HB		15					250 / 150					

Nome Name		GR	DIN	UNI	AISI /ASTM	N° Materiale N° Material	Note Notes
P	C 15	1	C 15	C 15		1.0401	
	Fe 37	1	ST 37-2	Fe 37		1.0038	
	15 CrMo5	6		15 CrMo5		1.7262	
	C45	3	C45	C45		1.0503	
	38NCD5	9		40NiCrMo6		1.6565	Bonificato /Hardened and Tempered Steel
	1.2162	6					
	1.2311	9	40 CrMgMo 7	40 CrMgMo 7		1.2311	Bonificato /Hardened and Tempered Steel
	1.2312	9					
	1.2714	9					
	1.2738	9			40 CrMnNi Mo 8 6 1	1.2738	
	1.2738 HH	11				1.2738 HH	Bonificato /Hardened and Tempered Steel
	1.2343	11				1.2343	
1.2344	11						
HP1	11						

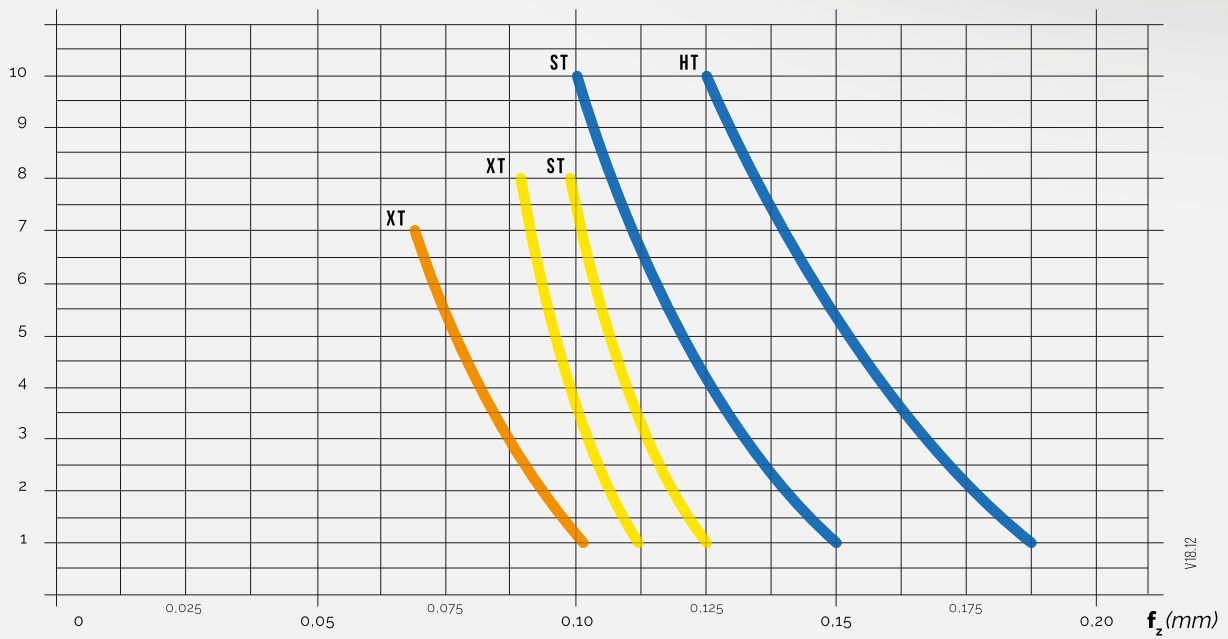


	Nome Name	GR	DIN	UNI	AISI /ASTM	N° Materiale N° Material	Note Notes
P	1.2083 STAVAX	11	X 40 Cr 13		420		
	ELMAX	11					
	1.2085	11	X 33 CrS 16		422		
	1.2365	11					
	1.2367	11					
	100Cr 6	9		100Cr6		1.2067	Bonificato /Hardened and Tempered Steel
	36 CrNiMo4	9		36 CrNiMo4		1.6511	
	42 CrMo4	10		42 CrMo4		1.7225	
	38 NiCrMo4	10		38 NiCrMo		1.6511	
	21 NiCrMo2	9		21 NiCrMo2		1.6523	Bonificato /Hardened and Tempered Steel
	Hardox 450	11					
	X100CrMoV5 1	11		X100CrMoV5 1		1.2363	
	NIMAX	9				1.2738 / P20	Bonificato /Hardened and Tempered Steel
	DAC MAGIC	9					
	W 300	11				1.2343	
	IMPAX	11					
	1.2080	10					
	K100	10					
	K110	10				1.2379	
	K720	11				1.2842	
K390	11						
K890	11						
M4- HSS	11				M4		
M	AISI 304	13		X 5Cr Ni 18 10	630	1.4301	
	304LN	14		XCrNiN	304LN	1.4311	
	AISI 316L	13		X 2 Cr Ni Mo 17 12 2	316L	1.4404	
	FA6	13					
	AISI 420	12		X 30Cr 13	420	1.4028	
	AISI 904L	13		XINiCrMoCu25 20 5	904L	1.4539	
	17-4PH	14					
	15-5PH	14					
	F53	14.1		X 2 Cr Ni Mo 25 7 4	F53	1.4410	
	F51	14					
	F44	14.1					
	F55	14.1					
S	NIMONIC 80 A	34				2.4631	
	HASTELLOY C22	36					
	MONEL K500	34				2.4375	
	INCONEL 625	35				2.4856	
	INCONEL 718	36				2.4668	
	INCONEL 718 INVECCHIATO / AGED	36				2.4668	Invecchiato /Aged
K	TITANIO / TITANIUM	37	TiAl6V4			3.7165	
	G25 GHISA / CAST IRON	15	G25	G25		0.6025	



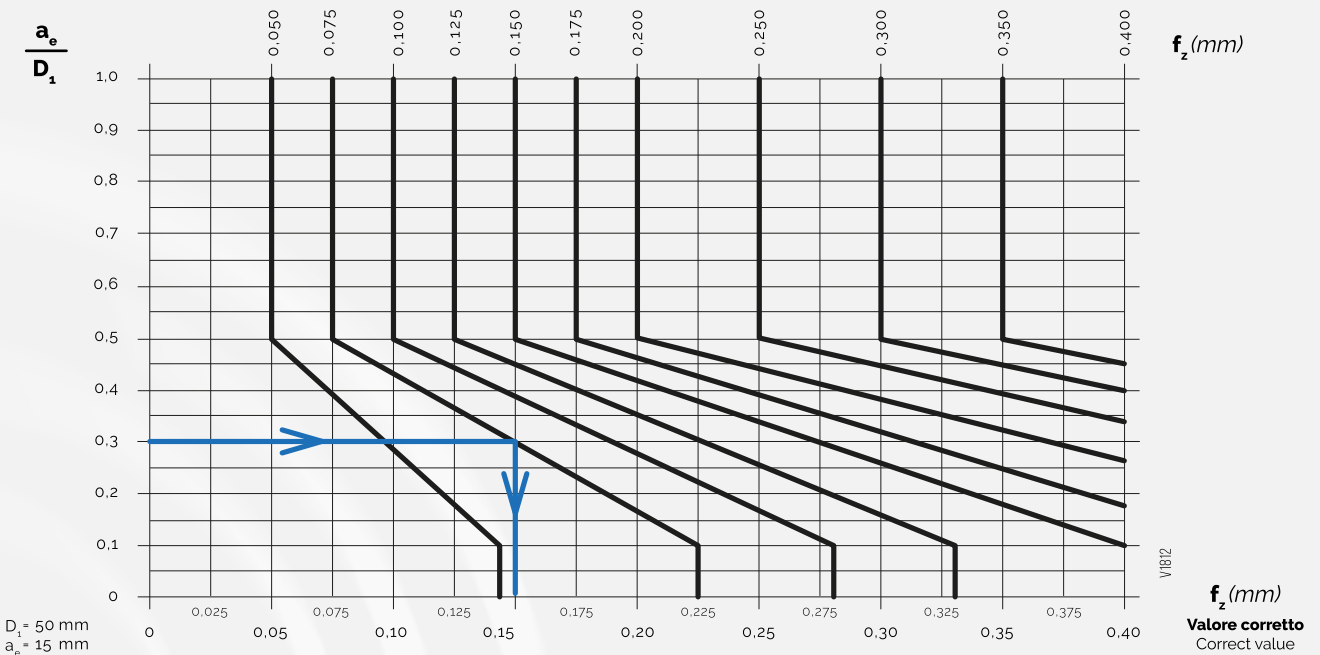
AVANZAMENTO AL DENTE f_z / FEED PER TOOTH

a_p (mm)



P	Acciai Steel	HT ST	M	Acciai Inox Stainless Steel	ST XT	S	Super Leghe Heat Res. Alloys	XT
---	--------------	----------	---	--------------------------------	----------	---	---------------------------------	----

CORREZIONE VALORE f_z PER LO SPALLAMENTO RETTO (90°) / CORRECTION VALUE FOR SQUARE SHOULDER



$D_1 = 50$ mm
 $a_e = 15$ mm

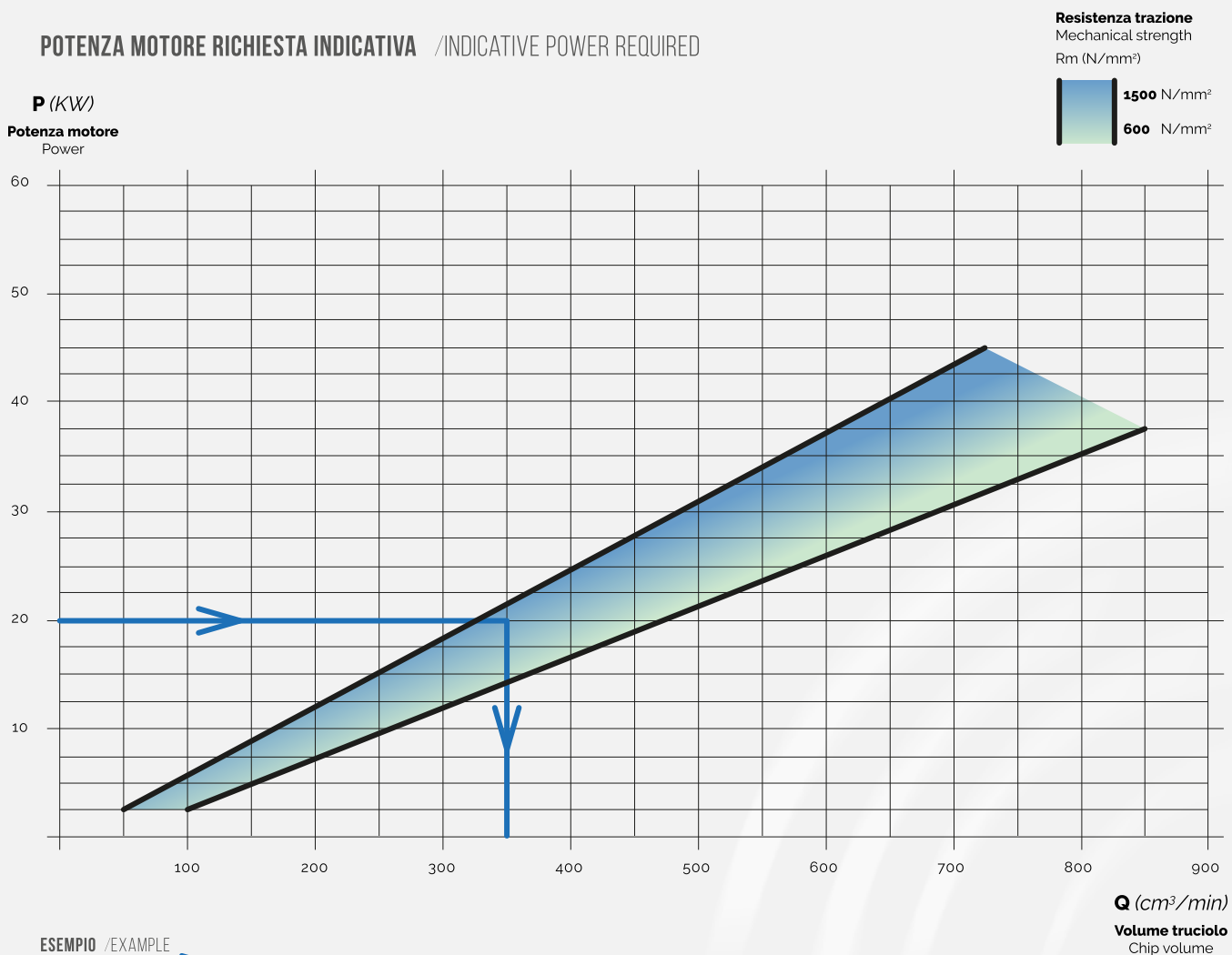
ESEMPIO /EXAMPLE

Con $f_z = 0.075$ mm
E $a_e/D_1 = 0.3$
Il valore corretto $f_z = 0.15$ mm

If $f_z = 0.075$ mm
And $a_e/D_1 = 0.3$
Correct value of $f_z = 0.15$ mm

<p>FORMULE FORMULA COLLECTION</p>	<p>VELOCITÀ DI TAGLIO CUTTING SPEED (m/min)</p> $V_c = \frac{D_1 \cdot \pi \cdot n}{1000}$	<p>NUMERO DI GIRI DEL MANDRINO RPM (min⁻¹)</p> $n = \frac{V_c \cdot 1000}{D_1 \cdot \pi}$
	<p>AVANZAMENTO FEED RATE (mm/min)</p> $V_f = f_z \cdot n \cdot z$	<p>VOLUME TRUCIOLO PER UNITÀ DI TEMPO CHIP VOLUME (cm³/min)</p> $Q = \frac{a_p \cdot a_e \cdot V_f}{1000}$

POTENZA MOTORE RICHIESTA INDICATIVA /INDICATIVE POWER REQUIRED

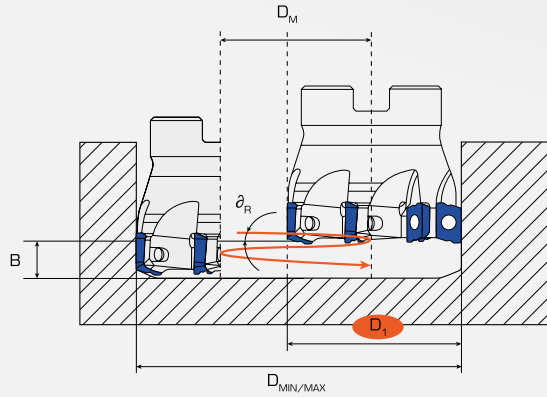
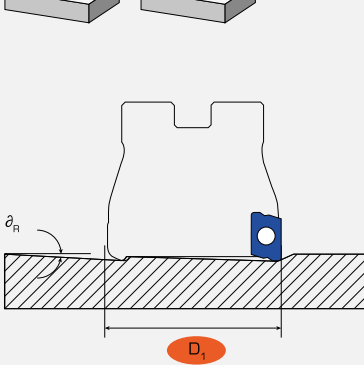
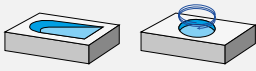


ESEMPIO /EXAMPLE

Materiale x100CrMoV5 - GR11
Volume truciolo Q=350 cm³/min
Potenza motore P=20 KW

Material x100CrMoV5 - GR11
Chip volume Q=350 cm³/min
Power P=20 KW

PENETRAZIONE AD INTERPOLAZIONE ELICOIDALE ELICOIDAL RAMPING



$$D_M \text{ [mm]} = D_{MAX} - D_1$$

$$B \text{ [mm]} = D_M \times \pi \times \tan \alpha_R$$

$$D_M \text{ [mm]} = D_{MIN} - D_1$$

D_1		20	25	32	40	50	63	80	100	125
XD 12	D_{MIN}	30	40	53	72	93	118	152	191	242
	D_{MAX}	37	47	61	77	98	123	157	197	247
	α_R [°]	5	4	3	2	1,5	1,5	1	0,8	0,6

Note / Notes

α_R valore massimo consentito. / α_R maximum value allowed.

APPROCCI E METODI DI LAVORAZIONE HOW TO APPROACH

SI RACCOMANDA / IT IS RECOMMENDED

- 1 **INGRESSO E USCITA CON V_f RIDOTTA 50%**
COMPONENT APPROACH, REDUCE FEED 50%
- 2 **LAVORAZIONE CONCORDE**
UP MILLING MACHINING
- 3 **INSERIRE RACCORDI XY RAGGIATI**
USE SMOOTHING MILLING
- 4 **UTILIZZO ARIA O EMULSIONE INTERNA**
USE INTERNAL COOLING OR AIR
- 5 **QUANDO SI LAVORA TITANIO, DUPLEX, SUPER-DUPLEX USARE % OLIO \geq 10%**
WHILE WORKING TITANIUM, DUPLEX, SUPER DUPLEX MUST USE % OF OIL \geq 10 %

TABELLA CONVERSIONI DUREZZE ACCIAI HARDNESS CONVERSION TABLE



HRC	HV	HB	HRA	Rm
Cono diamante	Vickers 30	Brinell 3000 Kgf	Cono diamante	N/mm ² MPa
68	940	-	85.6	-
67	900	-	85.0	-
66	865	-	84.5	-
65	832	739	83.9	-
64	800	722	83.4	-
63	772	706	82.8	-
62	746	688	82.3	-
61	720	670	81.8	-
60	697	654	81.2	-
59	674	634	80.7	2420
58	653	615	80.1	2330
57	633	595	79.6	2240
56	613	577	79.0	2160
55	595	560	78.5	2070
54	577	543	78.0	2010
53	560	525	77.4	1950
52	544	512	76.8	1880
51	528	496	76.3	1820
50	513	482	75.9	1760
49	498	468	75.2	1700
48	484	455	74.7	1640
47	471	442	74.1	1580
46	458	432	73.6	1520
45	446	421	73.1	1480
44	434	409	72.5	1430
43	423	400	72.0	1390
42	412	390	71.5	1340
41	402	381	70.9	1300
40	392	371	70.4	1250
39	382	362	69.9	1220
38	372	353	69.4	1180
37	363	344	68.9	1140
36	354	336	68.4	1110
35	345	327	67.9	1080
34	336	319	67.4	1050
33	327	311	66.8	1030
32	318	301	66.3	1010
31	310	294	65.8	970
30	302	286	65.3	950
29	294	279	64.6	930
28	286	271	64.3	900
27	279	264	63.8	880
26	272	258	63.3	860
25	266	253	62.8	850
24	260	247	62.4	820
23	254	243	62.0	810
22	248	237	61.5	790
21	243	231	61.0	770
20	238	226	60.5	760



Rivenditore autorizzato

tte srl Via Trebbia, 41/A - 23868 Valmadrera (Lecco) - Tel. +39 0341 207108 - Fax. +39 0341 202940

E-mail: info@ttetec.it - www.ttetec.eu