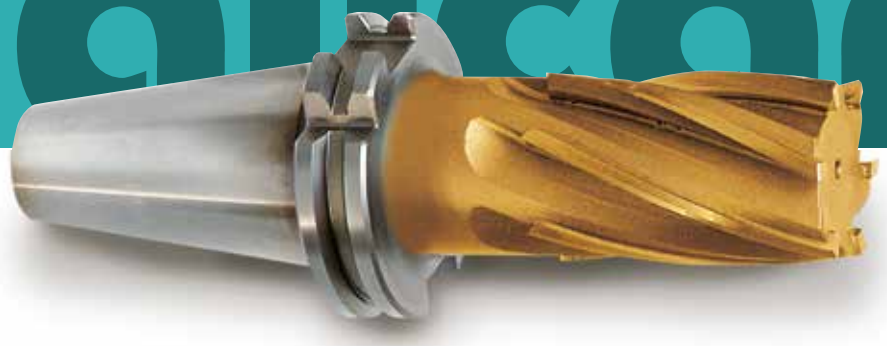
UTENSILI
SALDOBRASATI

Talicarb

ED. 26



OUTILS EN CARBURE BRASÉ

CARBIDE TIPPED TOOLS

HM-BESTÜCKTE WERKZEUGE

Talicarb

Talicarb, società appartenente dal 1990 al gruppo Angelo Ghezzi & C. S.p.A. , è particolarmente specializzata nella progettazione e realizzazione di utensili in metallo duro saldobrasato ed integrale e, recentemente, anche a fissaggio meccanico. Da 60 anni produce frese per cave, frese per sgrossatura e finitura, alesatori, utensili monotaglienti secondo le normative ISO, che consegna entro le 24 ore, con un livello di servizio giornaliero pari al 95,78% dell'ordinato. In questi ultimi anni ha poi molto intensificato i suoi programmi di utensili speciali a disegno e grazie ad una contemporanea politica di forti investimenti (Mazak, CNC Walter Helitronic, Walter Helicheck, Presetter Zoller per il controllo) è in grado di essere costantemente all'avanguardia in settori di grande tradizione tecnologica quali l'aeronautico, oil & gas, eolico, automotive, stampi.

(Richiedici inoltre i cataloghi "Programma di fresatura integrale" e "Utensili & Inserti")



Talicarb

Talicarb, company belonging since 1990 to the Angelo Ghezzi & C. S.p.A. group, is particularly specialized in the design and manufacture of brazed and solid carbide tools and, recently, also with indexable insert tools. For 60 years it has been producing end mills for slots, end mills for roughing and finishing, reamers, carbide tipped turning tools according to ISO standards, which it delivers within 24 hours, with a daily service level of 95.78% of the order. In recent years it has also intensified its programs of special customized tools and thanks to a recent policy of considerable investments (Mazak, CNC Walter Helitronic, Walter Helicheck, Presetter Zoller for control) is able to be constantly at the forefront in fields with a great technological tradition such as aerospace, oil & gas, wind power, automotive, molds.

(Please ask us also for the catalogues "Solid carbide end mills" and "Tools & Inserts").

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TALICARB

PLACCHETTE E INSERTI PER FRESA IN METALLO DURO



Plaquettes en métal dur

Carbide tips and inserts

Hartmetall- Schneidplättchen und Einsätze

UTENSILI IN METALLO DURO BRASATI



Outils de tournage en métal dur brasés

Carbide tipped turning tools

Gelötete Hartmetall-Drehwerkzeuge

FRESE SPECIALI CON RIPORTO IN METALLO DURO



Fraises speciales en carbure brasè

Special carbide brazed end mills

Sonder-hartmetall-bestückte Fräser

FRESE CON RIPORTO IN METALLO DURO



Fraises avec plaquettes en métal dur brasées

Carbide tipped milling cutters

Gelötete Hartmetall-Fräser

ALESATORI CON RIPORTO IN METALLO DURO



Alésoirs avec plaquettes en métal dur brasés

Carbide tipped reamers

Gelötete Hartmetall-Reibahlen

TABELLE TECNICHE TOLLERANZE

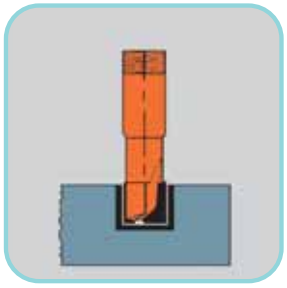


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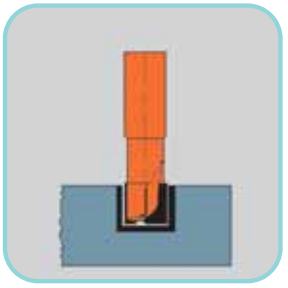
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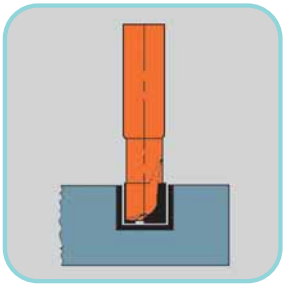
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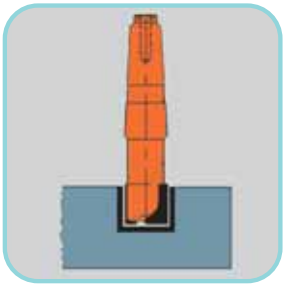
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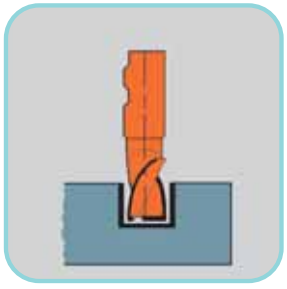
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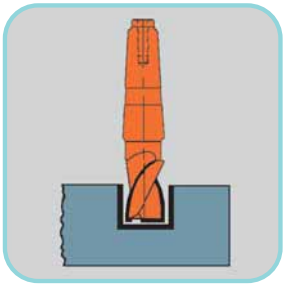
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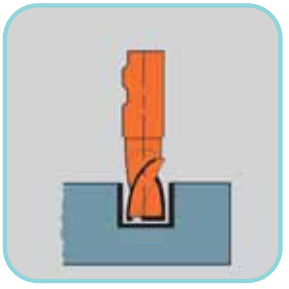
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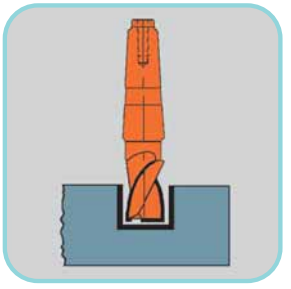
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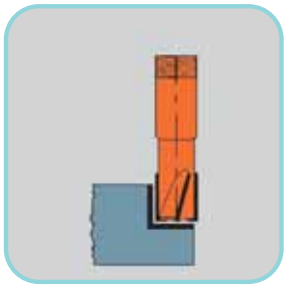
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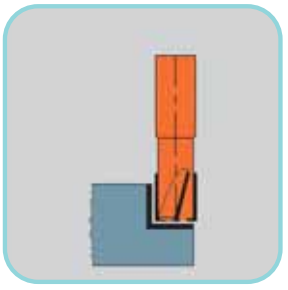
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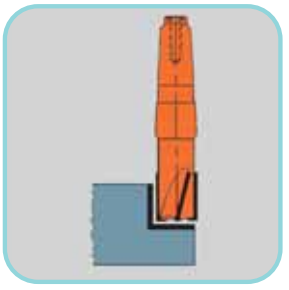
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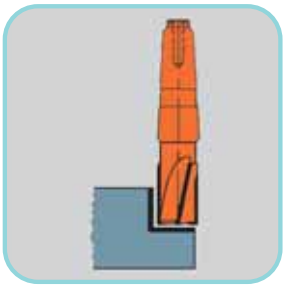
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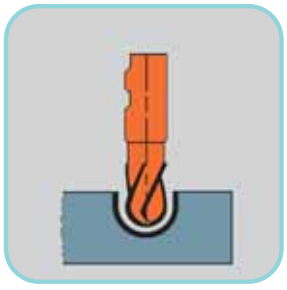
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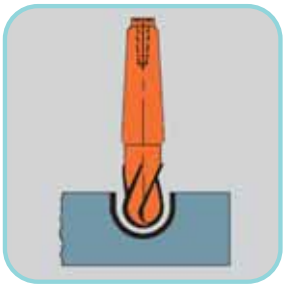
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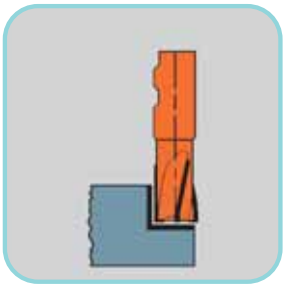
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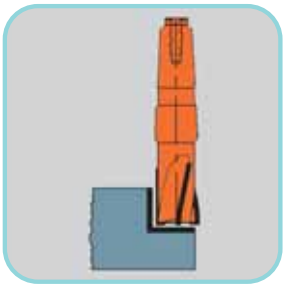
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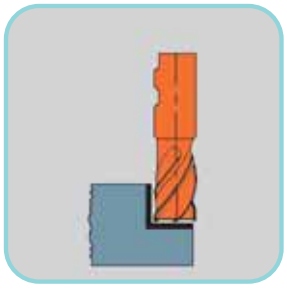
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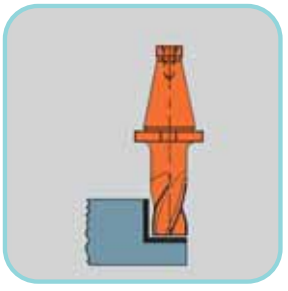
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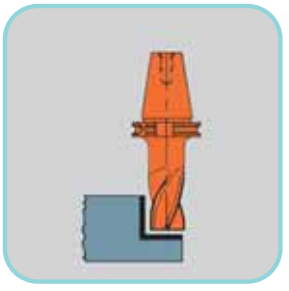
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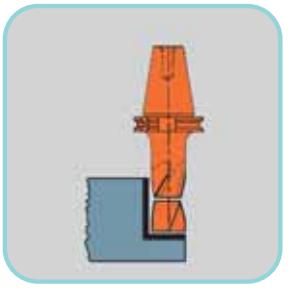
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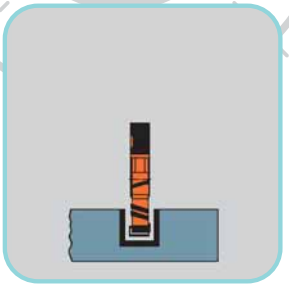
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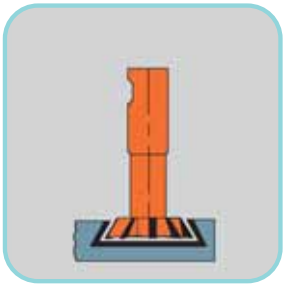
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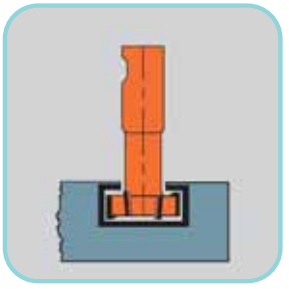
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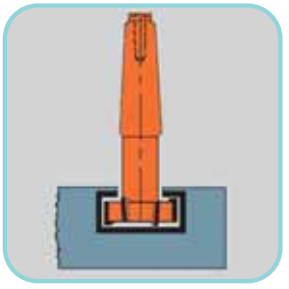
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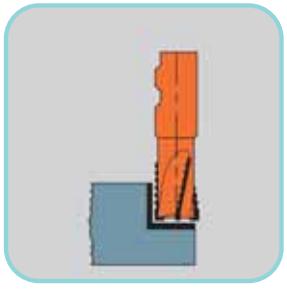
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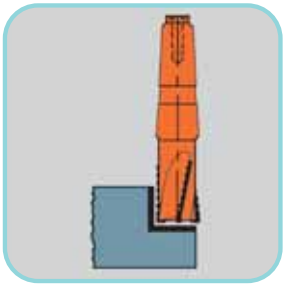
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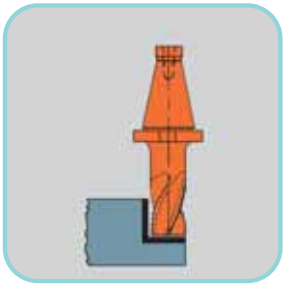
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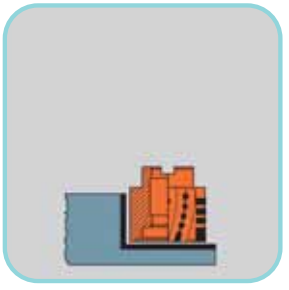
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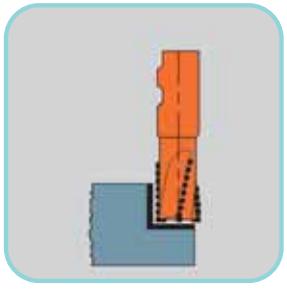
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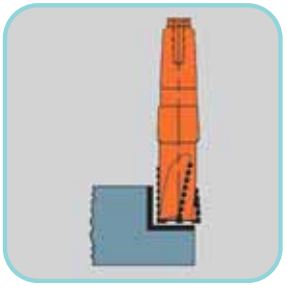
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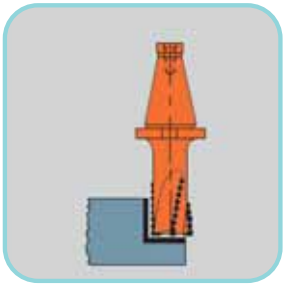
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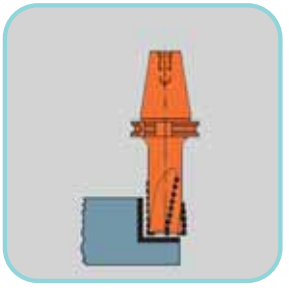
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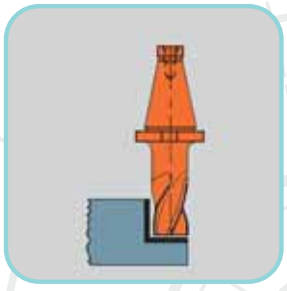
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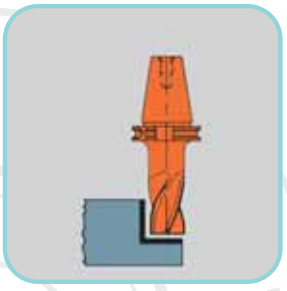
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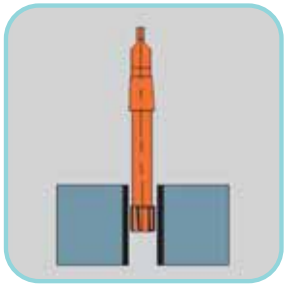
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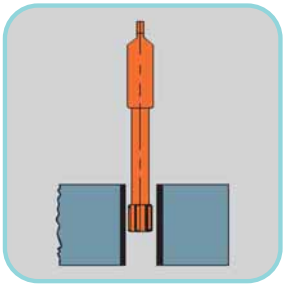
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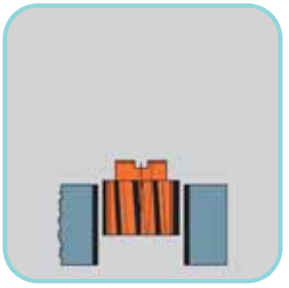
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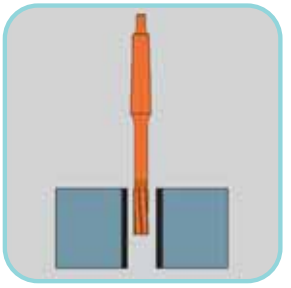
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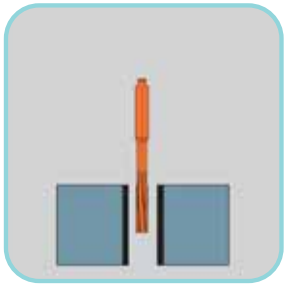
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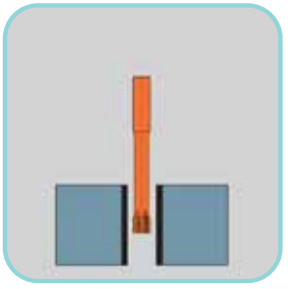
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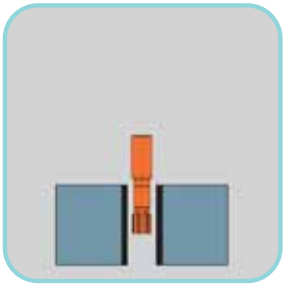
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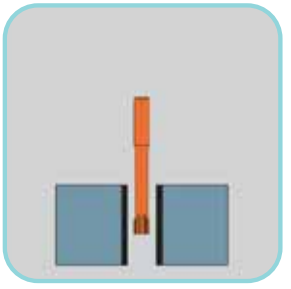
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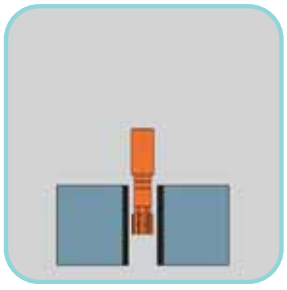
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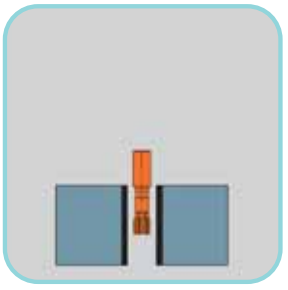
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Angelo Ghezzi & C SpA

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PLACCHETTE E INSERTI PER FRESA
IN METALLO DURO



PLAQUETTES EN MÉTAL DUR

CARBIDE TIPS AND INSERTS

HARMETALL-SCHNEIDPLÄTTCHEN UND EINSÄTZE

Talicarb

PLACCHETTE NORME ISO

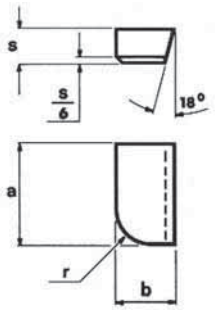
PLAQUETTES SELON NORMES ISO
CARBIDE TIPS ACCORDING TO ISO NORMS
SCHNEIDPLÄTTCHEN NACH ISO-NORM

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

A



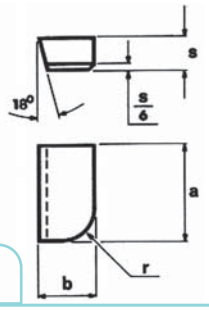


Esempio d'ordine | Ordering Example
AK10 5

COD. ORDINE N° de commande Item number - Bestell. NR.	a	b	s	r
A 5	5	3	2	2
A 6	6	4	2,5	2,5
A 8	8	5	3	3
A 10	10	6	4	4
A 12	12	8	5	5
A 16	16	10	6	6
A 20	20	12	7	7
A 25	25	14	8	8
A 32	32	18	10	10

B



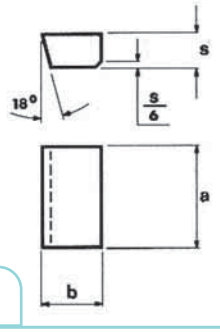


Esempio d'ordine | Ordering Example
BK10 5

B 5	5	3	2	2
B 6	6	4	2,5	2,5
B 8	8	5	3	3
B 10	10	6	4	4
B 12	12	8	5	5
B 16	16	10	6	6
B 20	20	12	7	7
B 25	25	14	8	8
B 32	32	18	10	10

C



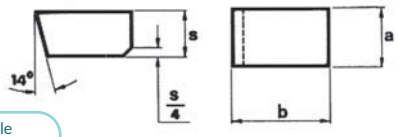


Esempio d'ordine | Ordering Example
CK10 5

C 5	5	3	2	
C 6	6	4	2,5	
C 8	8	5	3	
C 10	10	6	4	
C 12	12	8	5	
C 16	16	10	6	
C 20	20	12	7	
C 25	25	14	8	
C 32	32	18	10	
C 40	40	22	12	

D

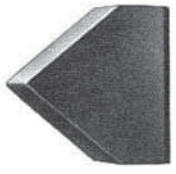


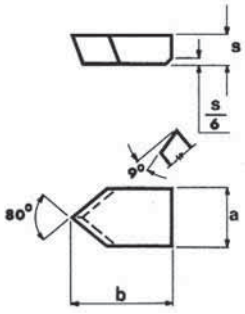


Esempio d'ordine | Ordering Example
DK10 3

D 3	3,5	8	3	
D 4	4,5	10	4	
D 5	5,5	12	5	
D 6	6,5	14	6	
D 8	8,5	16	8	
D 10	10,5	18	10	
D 12	12,5	20	12	

E





Esempio d'ordine | Ordering Example
EK10 4

E 4	4	10	2,5	
E 5	5	12	3	
E 6	6	13	3,5	
E 8	8	16	4	
E 10	10	18	5	
E 12	12	20	6	
E 16	16	22	7	
E 20	20	25	8	
E 25	25	28	9	
E 32	32	32	10	

PLACCHETTE VARIE

PLAQUETTES EN MÉTAL DUR

CARBIDE TIPS

HARTMETALL-SCHNEIDPLÄTTCHEN

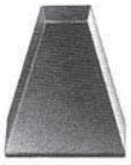
QUALITÀ K10/P25

NUANCES K10/P25

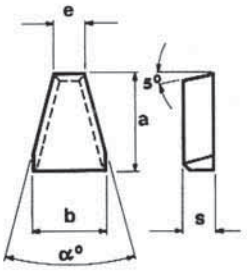
GRADES K10/P25

SORTEN K10/P25

CR



α = 34°

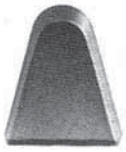


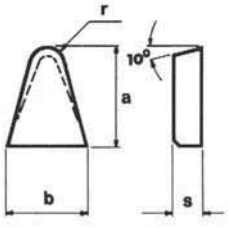
Esempio d'ordine | Ordering Example

CRK10 12

COD. ORDINE N° de commande Item number - Bestell. NR.	a	b	s	e
CR 12	15	12	5	4,5
CR 16	18	16	6	5,4
CR 20	22	20	6	7,1
CR 25	30	25	8	9,4

G





Esempio d'ordine | Ordering Example

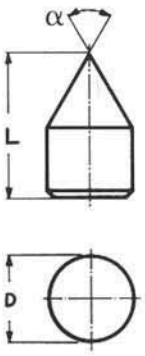
GK10 8

COD. ORDINE N° de commande Item number - Bestell. NR.	a	b	s	r
G 8	12	8	4	1
G 10	14	10	4	1,5
G 12	17	12	5	2,5
G 16	20	16	6	3,5
G 20	24	20	6	4,5
G 25	28	25	8	6

CP



α = 60°



Esempio d'ordine | Ordering Example

CPK10 6

COD. ORDINE N° de commande Item number - Bestell. NR.	Ø	L
CP 6	6	12
CP 8	8	16
CP 10	10	20
CP 12	12	22
CP 14	14	25
CP 18	18	32
CP 25	25	40
CP 40	40	60

PLACCHETTE VARIE

PLAQUETTES EN MÉTAL DUR

CARBIDE TIPS

HARTMETALL-SCHNEIDPLÄTTCHEN

QUALITÀ K10/P25

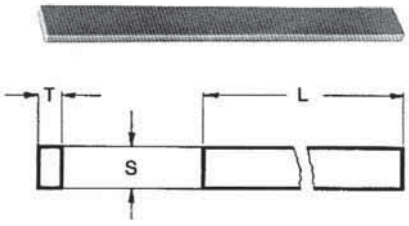
NUANCES K10/P25

GRADES K10/P25

SORTEN K10/P25

BR

BARRETTE RETTANGOLARI IN METALLO DURO
Barreaux réctangulaires en métal dur massif
Rectangular solid carbide blanks
Rechteckige Vollhartmetallstäbe



ESECUZIONE GREZZA - SOVRAMETALLO + 0,3 mm
Exécution brute avec surépaisseur 0,3 mm
Just sintered execution with 0,3 mm oversize
Rohe Ausführung mit 0,3 mm übermass

Esempio d'ordine | Ordering Example
BRK10 3

COD. ORDINE N° de commande Item number - Bestell. NR.	L	S	T
BR 3	100	3	1,5
BR 5	100	5	2
BR 6	100	6	2,5
BR 8	100	8	3
BR 10	100	10	3
BR 12	140	12	3,5
BR 15	140	15	5
BR 8,2	100	8	2
BR 10,2	100	10	2
BR 12,2	100	12	2
BR 15,2	100	15	2

UTENSILI IN METALLO DURO BRASATI



OUTILS DE TOURNAGE EN MÉTAL DUR BRASÉS

CARBIDE TIPED TURNING TOOLS

GELÖTETE HARTMETALL- DREHWERKZEUGE

Talicarb

UTENSILI PER TORNIO

OUTILS DE TOURNAGE EN MÉTAL DUR BRASÉS
CARBIDE TIPPED TURNING TOOLS
GELÖTETE HARTMETALL- DREHWERKZEUGE

QUALITÀ K10/P25/K05/P10/P40

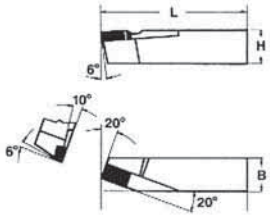
NUANCES K10/P25/K05/P10/P40
GRADES K10/P25/K05/P10/P40
SORTEN K10/P25/K05/P10/P40

ISO1

UTENSILE SGROSSATORE
Outil droit à charioter
Bar turning tool
Gerader Schruppstahl

UNI 4102
110





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

Esempio d'ordine | Ordering Example
IS1K10 10X10R

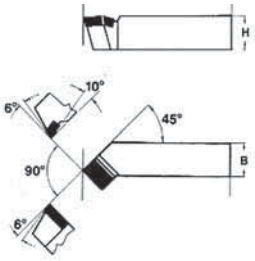
PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
C 8	10 x 10 x 90
C 10	12 x 12 x 100
C 12	16 x 16 x 110
C 16	20 x 20 x 125
C 20	25 x 25 x 140
C 25	32 x 32 x 170
C 32	40 x 40 x 200

ISO2

UTENSILE SGROSSATORE 45°
Outil à charioter 45°
45° cranked turning tool
45° Gebogener Schruppstahl

UNI 4103
111





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

Esempio d'ordine | Ordering Example
IS2K10 10X10R

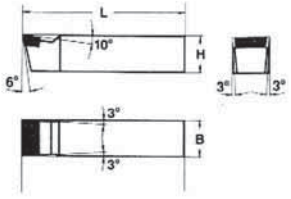
PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
C 8	10 x 10 x 90
C 10	12 x 12 x 100
C 12	16 x 16 x 110
C 16	20 x 20 x 125
C 20	25 x 25 x 140
C 25	32 x 32 x 170
C 32	40 x 40 x 200

ISO4

UTENSILE FRONTALE
Outil à planer
Straight facing tool
Kopfstahl

UNI 4107
127





Esempio d'ordine | Ordering Example
IS4K10 10X10R

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
C 10	10 x 10 x 90
C 12	12 x 12 x 100
C 16	16 x 16 x 110
C 20	20 x 20 x 125
C 25	25 x 25 x 140
C 12	20 x 12 x 125
C 16	25 x 16 x 140
C 20	32 x 20 x 170
C 25	40 x 25 x 200

UTENSILI PER TORNIO

OUTILS DE TOURNAGE EN MÉTAL DUR BRASÉS
CARBIDE TIPPED TURNING TOOLS
GELÖTETE HARTMETALL- DREHWERKZEUGE

QUALITÀ K10/P25/K05/P10/P40

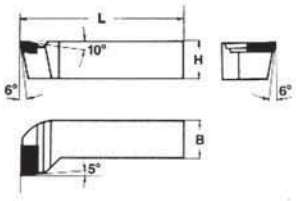
NUANCES K10/P25/K05/P10/P40
GRADES K10/P25/K05/P10/P40
SORTEN K10/P25/K05/P10/P40

ISO5

UTENSILE SPIANATORE
Outil à défoncer
Facing and side turning tool
Plandrehstahl

UNI 4108
126





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

Esempio d'ordine | Ordering Example
IS5K10 10X10R

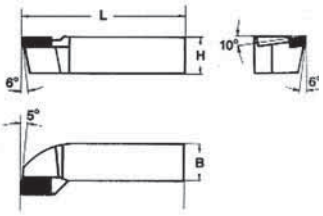
PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
C 8	10 x 10 x 90
C 10	12 x 12 x 100
C 12	16 x 16 x 110
C 16	20 x 20 x 125
C 20	25 x 25 x 140
C 25	32 x 32 x 170
C 32	40 x 40 x 200

ISO6

UTENSILE SFACCIATORE
Outil d'angle
Cranked facing tool
Eckdrehstahl

UNI 4104
117





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

Esempio d'ordine | Ordering Example
IS6K10 10X10R

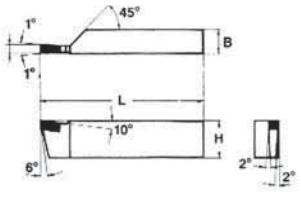
PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
C 8	10 x 10 x 90
C 10	12 x 12 x 100
C 12	16 x 16 x 110
C 16	20 x 20 x 125
C 20	25 x 25 x 140
C 25	32 x 32 x 170
C 32	40 x 40 x 200

ISO7

UTENSILE TRONCATORE
Outil à tronçonne
Parting tool
Abstechstahl

UNI 4109
150





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

Esempio d'ordine | Ordering Example
IS7K10 12X8R

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
D 3	12 x 8 x 100
D 4	16 x 10 x 110
D 5	20 x 12 x 125
D 6	25 x 16 x 140
D 8	32 x 20 x 170
D 10	40 x 25 x 200
D 12	50 x 32 x 240

UTENSILI PER TORNIO

OUTILS DE TOURNAGE EN MÉTAL DUR BRASÉS
CARBIDE TIPPED TURNING TOOLS
GELÖTETE HARTMETALL- DREHWERKZEUGE

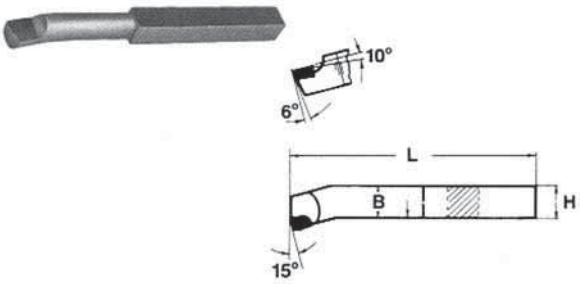
QUALITÀ K10/P25/K05/P10/P40

NUANCES K10/P25/K05/P10/P40
GRADES K10/P25/K05/P10/P40
SORTEN K10/P25/K05/P10/P40

ISO8

UTENSILE PER FORI PASSANTI
Outil à aléser
Boring tool
Innenschrupp-stahl

UNI 4110
131



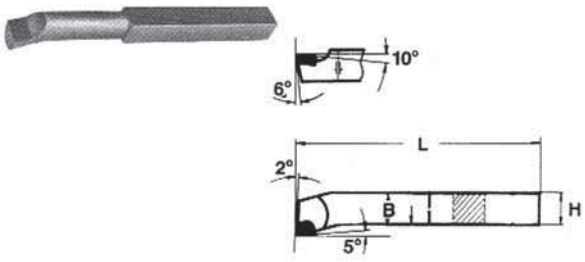
Esempio d'ordine | Ordering Example
IS8K10 10X10R

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
A 6	10 x 10 x 150
A 8	12 x 12 x 180
A 10	16 x 16 x 210
A 12	20 x 20 x 250
A 16	25 x 25 x 300
A 20	32 x 32 x 355
A 25	40 x 40 x 355

ISO9

UTENSILE PER FORI CIECHI
Outil à dresser les founds
Cranked internal facing tool
Inneneckstahl

UNI 4111
136



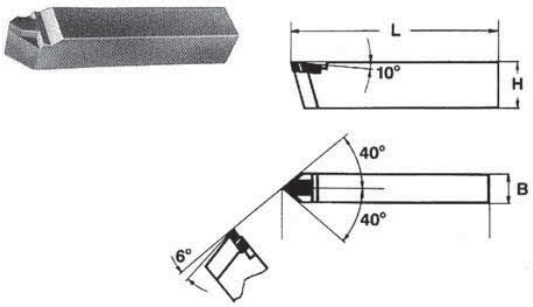
Esempio d'ordine | Ordering Example
IS9K10 10X10R

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
A 6	10 x 10 x 150
A 8	12 x 12 x 180
A 10	16 x 16 x 210
A 12	20 x 20 x 250
A 16	25 x 25 x 300
A 20	32 x 32 x 355
A 25	40 x 40 x 355

975

UTENSILE FINITORE
Outil droite à finir
Straight finishing tool
Schlichstahl

UNI 4105



Esempio d'ordine | Ordering Example
975K10 12X12

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
E 4	10 x 10 x 90
E 5	12 x 12 x 100
E 6	16 x 16 x 110
E 8	20 x 20 x 125
E 10	25 x 25 x 140
E 12	32 x 32 x 170
E 16	40 x 40 x 200

UTENSILI PER TORNIO

OUTILS DE TOURNAGE EN MÉTAL DUR BRASÉS
CARBIDE TIPPED TURNING TOOLS
GELÖTETE HARTMETALL- DREHWERKZEUGE

QUALITÀ K10/P25/K05/P10/P40

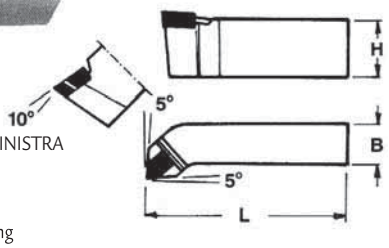
NUANCES K10/P25/K05/P10/P40
GRADES K10/P25/K05/P10/P40
SORTEN K10/P25/K05/P10/P40

976

UTENSILE FINITORE 45°
Outil coudé à finir 45°
Cranked finishing tool
45° gebogener Schlichtstahl

UNI 4106





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

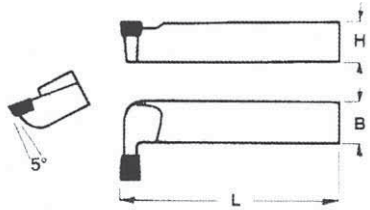
Esempio d'ordine | Ordering Example
976K10 10X10R

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
E 4	10 x 10 x 90
E 5	12 x 12 x 100
E 6	16 x 16 x 110
E 8	20 x 20 x 125
E 10	25 x 25 x 140
E 12	32 x 32 x 170
E 16	40 x 40 x 200

114

UTENSILE PER INCASTRI
Outil à chambrer
Internal recessing tool
Hakenstahl





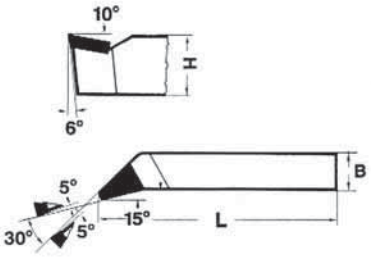
Esempio d'ordine | Ordering Example
114K10 16X16X180

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
D 3	10 x 10 x **140**
D 4	12 x 12 x **160**
D 5	16 x 16 x **180**
D 6	20 x 20 x **210**
D 8	25 x 25 x **250**

115

UTENSILE PER RACCORDI
Outil coudé à raccorder
Cranked round nose tool
Rundnasenmeibel





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

Esempio d'ordine | Ordering Example
115K10 32X20R

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
G 12	20 x 12 x 125
G 16	25 x 16 x 140
G 20	32 x 20 x 170
G 25	40 x 25 x 200

UTENSILI PER TORNIO

OUTILS DE TOURNAGE EN MÉTAL DUR BRASÉS
CARBIDE TIPPED TURNING TOOLS
GELÖTETE HARTMETALL- DREHWERKZEUGE

QUALITÀ K10/P25/K05/P10/P40

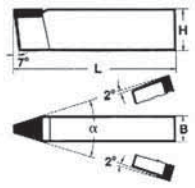
NUANCES K10/P25/K05/P10/P40
GRADES K10/P25/K05/P10/P40
SORTEN K10/P25/K05/P10/P40

164

UTENSILE PER GOLE TRAPEZOIDALI
Outil pour gorges des pouliers
Vee-pulley grooving tool
Keilriemen- Profistahl



α = 34° - 36° - 38° - 40°



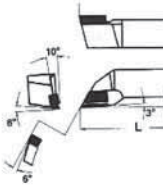
Esempio d'ordine | Ordering Example
164K10 20X12X125/36

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
CR 12	20 x 12 x **125**
CR 16	25 x 16 x **140**
CR 20	32 x 20 x 170
CR 25	40 x 25 x 200

165

UTENSILE PER COPIA
Outil pour tours à copier
Copying lathe tool
Kopierdreh meibel





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

Esempio d'ordine | Ordering Example
165K10 16X16X125R

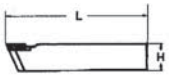
PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
C 12	16 x 16 x **125**
C 16	20 x 20 x **140**
C 20	25 x 25 x **170**

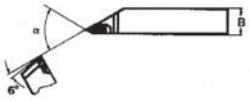
166

UTENSILE FILETTATORE ESTERNO
Outil à fileter extérieur
External threading tool
Aussengewindestahl



α = 60° - 55°





ESECUZIONE DESTRA E SINISTRA
Exécution droite et gauche
Right and left version
Rechte und linke Ausführung

Esempio d'ordine | Ordering Example
166K10 16X10R/60

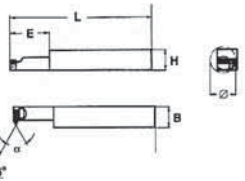
PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
E 4	16 x 10 x 110
E 5	20 x 12 x 125
E 6	25 x 16 x 140
E 8	32 x 20 x 170

167

UTENSILE FILETTATORE INTERNO
Outil à fileter intérieur
Internal threading tool
Innengewindestahl



α = 60° - 55°



Esempio d'ordine | Ordering Example
167K10 10X10X140/55

PLACCHETTA Plaquette - Carbide tip Schneidplatte	H x B x L
E 4	10 x 10 x **140**
E 5	12 x 12 x **160**
E 6	16 x 16 x **180**
E 8	20 x 20 x **210**
E 10	25 x 25 x **250**

UTENSILI ORIENTABILI

OUTIL ORIENTABLES EN MÉTAL DUR BRASÉS
CARBIDE TIPPED ROTARY TOOLS
SCHWENKBARE HARTMETALLBESTÜCKTE WERKZEUGE

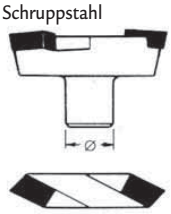
QUALITÀ K10/P25/K05/P10/P40

NUANCES K10/P25/K05/P10/P40
GRADES K10/P25/K05/P10/P40
SORTEN K10/P25/K05/P10/P40

125

UTENSILE SGROSSATORE DESTRO
Outil d'ébauche à droite
R.H. roughing tool
Rechter Schruppstahl





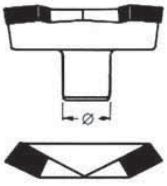
Esempio d'ordine | Ordering Example
125K10 12

PLACCHETTA Plaquette - Carbide tip Schneidplatte	Ø
C 12	12
C 12	14
C 16	16
C 20	18

126

UTENSILE SGROSSATORE DESTRO-SINISTRO
Outil d'ébauche à droite et à gauche
R.H. and L. H. roughing tool
Linker und rechter Schruppstahl





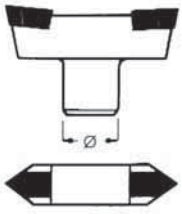
Esempio d'ordine | Ordering Example
126K10 14

PLACCHETTA Plaquette - Carbide tip Schneidplatte	Ø
C 12	12
C 12	14
C 16	16
C 20	18

127

UTENSILE FINITORE
Outil de finition
Finishing tool
Schlichtmesser





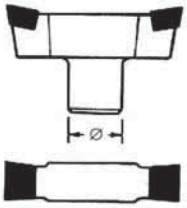
Esempio d'ordine | Ordering Example
127K10 16

PLACCHETTA Plaquette - Carbide tip Schneidplatte	Ø
E 4	12
E 5	14
E 6	16
E 8	18

128

UTENSILE A TESTA PIATTA
Outil pelle
Plain form tool
Kopfmesser





Esempio d'ordine | Ordering Example
128P25 14

PLACCHETTA Plaquette - Carbide tip Schneidplatte	Ø
C 12	12
C 12	14
C 16	16

UTENSILI PER INTERNI

OUTILS EN MÉTAL DUR BRASÉS POUR PORTE OUTILS
CARBIDE TIPPED TOOLS FOR TOOL-HOLDERS
HARTMETALLBESTÜCKTE WERZEUGE FÜR WERKEZEUGHALTER

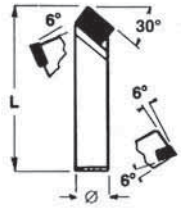
QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

142

UTENSILE SGROSSATORE 60°
Outil à charioter à 60°
60° roughing tool
60° Schruppmesser





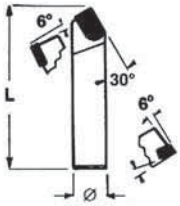
Esempio d'ordine | Ordering Example
142K10 10

PLACCHETTA Plaquette - Carbide tip Schneidplatte	Ø x L
C 5	4 x 18
C 5	5 x 20
C 6	7 x 25
C 8	8 x 30
C 10	10 x 45
C 12	12 x 50
C 16	16 x 70

143

UTENSILE SGROSSATORE 90°
Outil à charioter à 90°
90° roughing tool
90° Schruppmesser





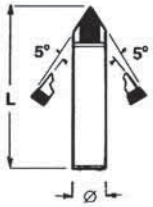
Esempio d'ordine | Ordering Example
143K10 16

PLACCHETTA Plaquette - Carbide tip Schneidplatte	Ø x L
C 5	4 x 18
C 5	5 x 20
C 6	7 x 25
C 8	8 x 30
C 10	10 x 45
C 12	12 x 50
C 16	16 x 70

144

UTENSILE FINITORE
Outil de finition
Finishing tool
Schlichtwerkzeug





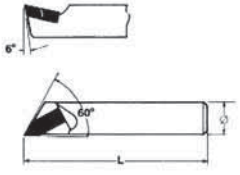
Esempio d'ordine | Ordering Example
144P25 8

PLACCHETTA Plaquette - Carbide tip Schneidplatte	Ø x L
E 4	4 x 18
E 4	5 x 20
E 4	7 x 25
E 5	8 x 30
E 6	10 x 45
E 8	12 x 50
E 10	16 x 70

145

UTENSILE FILETTATORE 60°
Outil à filiter à 60°
60° threading tool
60° Gewindeschneidwerzeug





Esempio d'ordine | Ordering Example
145P25 10

PLACCHETTA Plaquette - Carbide tip Schneidplatte	Ø x L
E 4	4 x 18
E 4	5 x 20
E 4	7 x 25
E 5	8 x 30
E 6	10 x 45
E 8	12 x 50
E 10	16 x 70

FRESE SPECIALI CON RIPORTO IN METALLO DURO



FRAISES SPECIALES EN CARBURE BRASÉ

SPECIAL CARBIDE BRAZED END MILLS

SONDERHARTMETALL- BESTÜCKTE FRÄSER

Talicarb

PARAMETRI DI LAVORAZIONE FRESA 45°

PARAMÈTRES D'USINAGE POUR FRAISE 45°

WORKING PARAMETERS 45° END MILL

RICHTWERTTABELLE FÜR FRÄSER 45°

MATERIALI - Matière - Material - Werkstoff	Vt m/1'	F mm/z
ACCIAIO NON LEGATO FINO R=550 N/mm² Acier non allié jusqu'à R=550 N/mm² - Unalloyed Steel to R=550 N/mm² - Nichtlegierter Stahl bis R=550 N/mm²	120	0,10 ÷ 0,15
ACCIAIO NON LEGATO FINO R=850 N/mm² Acier non allié jusqu'à R=850 N/mm² - Unalloyed Steel to R=850 N/mm² - Nichtlegierter Stahl bis R=850 N/mm²	70	0,10 ÷ 0,15
ACCIAIO BASSO LEGATO Acier faiblement allié - Weakly alloyed Steel - Nichtlegierter Stahl	100	0,08 ÷ 0,12
ACCIAIO ALTAMENTE LEGATO Acier fortement allié - Highly alloyed Steel - Hochlegierter Stahl	45	0,08 ÷ 0,12
ACCIAIO INOSSIDABILE FINO R=550 N/mm² Acier inoxydable jusqu'à R=550 N/mm² - Stainless Steel to R=550 N/mm² - Rostfreier Stahl bis R=550 N/mm²	70	0,1 ÷ 0,16
ACCIAIO INOSSIDABILE FINO R=700 N/mm² Acier inoxydable jusqu'à R=700 N/mm² - Stainless Steel to R=700 N/mm² - Rostfreier Stahl bis R=700 N/mm²	60	0,1 ÷ 0,16
ACCIAIO INOSSIDABILE FINO R=800 N/mm² Acier inoxydable jusqu'à R=800 N/mm² - Stainless Steel to R=800 N/mm² - Rostfreier Stahl bis R=800 N/mm²	45	0,1 ÷ 0,16
ACCIAIO REFRATTARIO FINO R=650 N/mm² Acier réfractaire jusqu'à R=650 N/mm² - Heat-resistant Steel to R=650 N/mm² - Warmfester Stahl bis R=650 N/mm²	60	0,1 ÷ 0,15
ACCIAIO REFRATTARIO FINO R=850 N/mm² Acier réfractaire jusqu'à R=850 N/mm² - Heat-resistant Steel to R=850 N/mm² - Warmfester Stahl bis R=850 N/mm²	45	0,1 ÷ 0,15
ACCIAIO REFRATTARIO OLTRE R=850 N/mm² Acier réfractaire plus de R=850 N/mm² - Heat-resistant Steel over R=850 N/mm² - Warmfester Stahl über R=850 N/mm²	30	0,1 ÷ 0,15
GHISA FINO 200HB Fonte jusqu'à 200HB - Cast Iron to 200HB - Guss bis 200HB	120	0,16 ÷ 0,20
GHISA FINO 250HB Fonte jusqu'à 250GHB - Cast Iron to 250HB - Guss bis 250HB	95	0,16 ÷ 0,20
GHISA FINO 320HB Fonte jusqu'à 320HB - Cast Iron to 320HB - Guss bis 320HB	75	0,16 ÷ 0,20
ALLUMINIO PURO Aluminium pur - Pure Aluminium - Reinaluminium	400	0,12 ÷ 0,20
Al-Si FINO 7% Si Al-Si jusqu'à 7% Si - Al-Si to 7% Si - Al-Si bis 7% Si	250	0,12 ÷ 0,20
Al-Si FINO 12% Si Al-Si jusqu'à 12% Si - Al-Si to 12% Si - Al-Si bis 12% Si	200	0,12 ÷ 0,20
Al-Si OLTRE 12% Si Al-Si plus de 12% Si - Al-Si over 12% Si - Al-Si über 12% Si	150	0,12 ÷ 0,20
LEGHE DI TITANIO Alliages de Titane - Titanium alloys - Titanlegierungen	30 ÷ 75	0,08 ÷ 0,12
LEGHE DI RAME Alliages de Cuivre - Copper alloys - Kupferlegierungen	120	0,08 ÷ 0,16
OTTONE-BRONZO Laiton-Bronze - Brass-Bronze - Messing-Bronze	160	0,08 ÷ 0,16
MATERIE SINTETICHE Matières plastiques - Plastics - Kunststoffe	100	0,08 ÷ 0,1
TERMOPLASTICHE Matières thermoplastiques - Thermoplastics - Thermoplaste	100	0,08 ÷ 0,1
PLASTICHE DURE Matières plastiques thermodurcissables - Thermoset - Duroplast	100	0,08 ÷ 0,1
FIBRE DI VETRO Fibres de verre - Glass fiber - Glasfiber	100	0,08 ÷ 0,1
KEVLAR Kevlar - Kevlar - Kevlar	100	0,08 ÷ 0,1

FRESE FRONTALI CON ANGOLO ELICA 45°

FRAISES 2 TAILLEC AVEC ANGLE HÉLICE 45°

45° HELIX ANGLE END MILLS

STIRNFRÄSER MIT SPIRALWINKEL 45°

QUALITÀ K10/P25

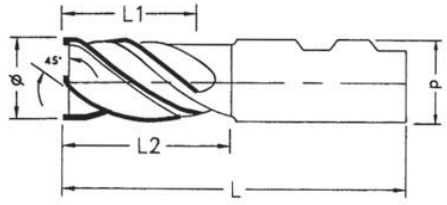
NUANCES K10/P25

GRADES K10/P25

SORTEN K10/P25

850

ATTACCO CILINDRICO WELDON DIN 1835B
Queue cylindrique avec méplat
Weldom cylndrical shank
Zylinderschaft mit Spannfläche



Esempio d'ordine | Ordering Example
850K 32

Ø e8	L	L1	L2	d h6	Z
16	95	30	47	16	3
20	115	40	59	25	3
25	118	50	62	25	4
32	125	50	65	32	4
40	145	63	85	32	6
50	157	75	97	32	6

Scomposizione della forza di "F" nelle sue componenti "f_1" e "f_2" con elica 25°.
25° helix angle. Resolution of cutting force "F" and "f_1" e "f_2".

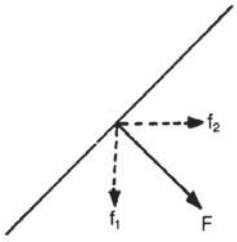


fig. 1

Scomposizione della forza di "F" nelle sue componenti "f_1" e "f_2" con elica 45°.
25° helix angle. Resolution of cutting force "F" and "f_1" e "f_2"

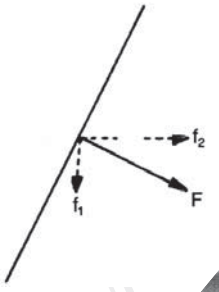


fig. 2

LE FRESE CON ELICA A 45°

vengono proposte all'utilizzatore come utensili finotori, adatti a lavorazioni di contornatura interna ed esterna.

L'elevata inclinazione dell'elica consente di ottenere, rispetto alla tradizionale 25°, un differente sviluppo delle forze di taglio presenti nelle lavorazioni (vedi fig. 1 e 2).

Così facendo l'utensile ci permette di ottenere un taglio molto dolce e fluido garantendo lavorazioni omogenee, ottime finiture superficiali con un grado di rugosità molto basso.

THE END WITH 45° HELIX ANGLE

is a finishing cutter suitable to execute inner and outer contours.

The high helix inclination developes particular cutting edge forces which are different from the ones obtained using standard 25° end mills (pls. see fig. 1 and fig. 2).

As a result, the cut is soft and guarantees even working, execellent surface finishing and a low level of roughness.

FRESE ELICOIDALI SEMISFERICHE

FRAISES HÉLICOÏDALES - BOUTH HÉMISPHÉRIQUE
HELICAL END MILLS - BALL NOSE
DRALLNUTIGE HALBBRUNDFRÄSER

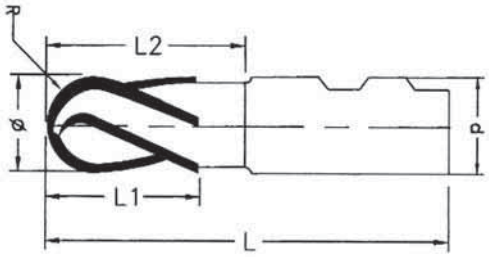
QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

202

ATTACCO CILINDRICO WELDON DIN 1835B TAGLIO AL CENTRO
Queue cylindrique avec méplat Coupe au centre
Weldon cylindrical shank - Center cutting
Zylinderschaft mit Spannfläche - Mit Zentrumschneide





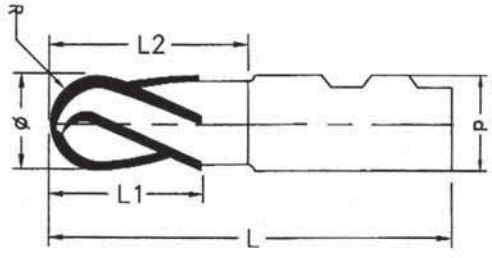
Esempio d'ordine | Ordering Example
202P 25

Ø ± 0,05	L	L1	L2	R	d h6	Z
16	95	30	45	8	20	3
20	115	40	59	10	25	3
25	118	50	62	12,5	25	3
32	125	50	65	16	32	4

203

SERIE LUNGA - ATTACCO CILINDRICO
WELDON DIN 1835B - TAGLIO AL CENTRO
Serie longue - Queue cylindrique avec méplat - Coupe au centre
Long series - Weldon cylindrical shank - Center cutting
Lange AusfÜhrung - Zylinderschaft mit Spannfläche - Mit Zentruschneide





Esempio d'ordine | Ordering Example
203K 25

Ø ± 0,05	L	L1	L2	R	d h6	Z
16	113	30	63	8	20	3
20	131	40	75	10	25	3
25	156	50	100	12,5	25	3
32	185	50	125	16	32	4

FRESE ELICOIDALI “RADIUS”

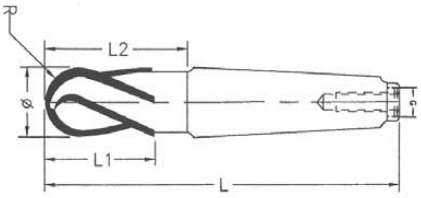
FRAISES HÉLICOÏDALES “RADIUS”
HELICAL END MILLS “RADIUS”
DRALLNUTIGE STIRNFRÄSER “RADIUS”

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

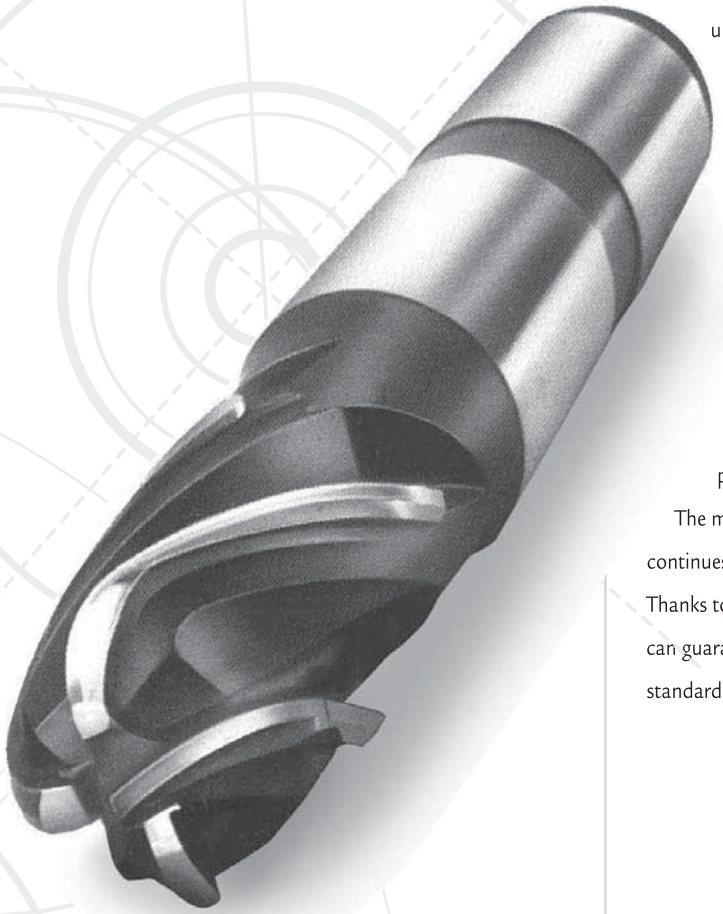
683

ATTACCO CONO MORSE DIN 228
Queue cône Morse
Morse tapershank
Zylinderschaft mit Spannfläche - Mit morsekegel



Esempio d'ordine | Ordering Example
683K 20X145

Ø e8	L	L1	L2	R	CM	Z
16	134	50	65	8	2	4
20	145	40	59	10	3	4
20	164	63	78	10	3	4
25	160	50	74	12,5	3	4
32	200	63	91	16	4	4
40	205	80	96	20	4	4
40	225	100	116	20	4	4



LE FRESE RAGGIATE “RADIUS”

sono specifiche per la realizzazione di particolari in contornatura aventi raggi di rinforzo (punzoni in sago-ma), lavori in copiatura e profilatura.

Particolarità saliente di questo utensile è l’avere un‘elica con un’inclinazione di 25° su tutto il tagliente compreso il raggio di testa.

Grazie a questa esecuzione abbinata alla disponibilità di un dente passante dal centro, garantiamo una uniformità di taglio ed una finitura di qualità decisamente superiori alle tradizionali.

BALL NOSE END MILL “RADIUS”

are specifically designed to execute conturs having stiffening radius (for: force plugs)’ copying and profiling work.

The main feature of this tool is helix angle of 25° that continues on the ball end.

Thanks to above characteristic and to the center cutting tooth we can guarantee cutting evenness and finishing quality higher that standard.

FRESE ELICOIDALI FRONTALI CON LUNGHEZZE SPECIALI

FRAISES HÉLICOÏDALES AVEC LONGUEURS SPÉCIALES

HELICAL END MILLS - SPECIAL LENGTHS

DRALLNUTIGE STIRNFRÄSER MIT SONDER-SCHNEIDENLÄNGEN

QUALITÀ K10/P25

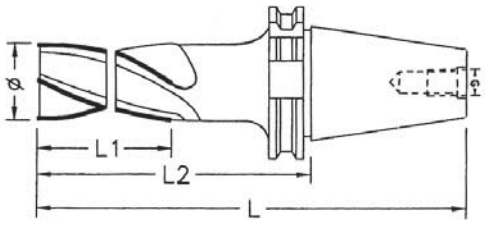
NUANCES K10/P25

GRADES K10/P25

SORTEN K10/P25

681*

ATTACCO ISO DIN 69871A
Queue cône ISO
ISO taper shank
Mit ISO Steilkegel

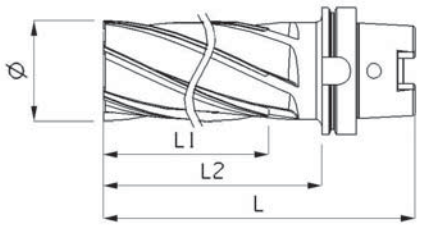


* Prezzo a richiesta - Prix sur demande - Price on request - Preis auf Aufrage

Ø e8	L		L1		L2		G	ISO	Z
	min	max	min	max	min	max			
40	217	317	100	200	149	249	M16	40	6
50	255	405	100	250	153	303	M24	50	6
63	260	460	100	300	158	358	M24	50	6

682*

ATTACCO HSK DIN 69893-1-A
Queue cône ISO
ISO taper shank
Mit ISO Steilkegel



* Prezzo a richiesta - Prix sur demande - Price on request - Preis auf Aufrage

Ø e8	L		L1		L2		G	HSK	Z
	min	max	min	max	min	max			
*50		276		200		225		50	6
*63		283		200		225		63	6
*80		341		250		275		80	8
*100		354		250		275		100	8

FRESE ELICOIDALI FRONTALI CON LUNGHEZZE SPECIALI

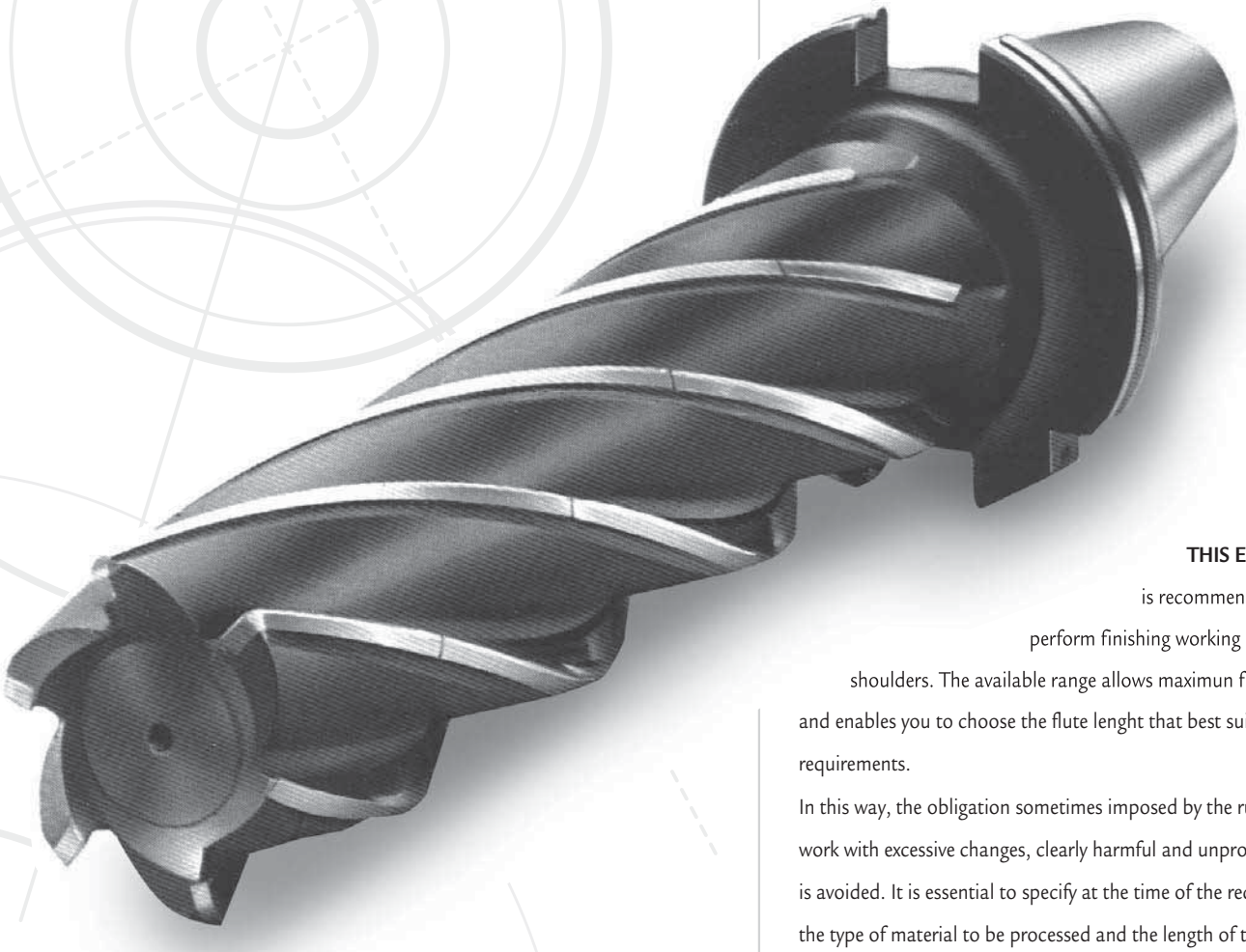
FRAISES HÉLICOÏDALES AVEC LONGUEURS SPÉCIALES
HELICAL END MILLS - SPECIAL LENGTHS
DRALLNUTIGE STIRNFRÄSER MIT SONDER-SCHNEIDENLÄNGEN

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

QUESTA TIPOLOGIA DI FRESE

con lunghezza speciale permette operazioni di finitura su particolari con spallamenti molto alti. Sul fronte della gamma abbiamo preferito una soluzione che ci consenta il massimo grado di flessibilità, offrendovi la possibilità di scegliere le lunghezze come meglio si addicono alle vostre esigenze. In questo modo si evita l'obbligo talvolta imposto dalle norme di lavorare con sbalzi eccessivi, chiaramente dannosi e improduttivi.
È indispensabile specificare al momento della richiesta il tipo di materiale da lavorare e la lunghezza dell'elica necessaria.
Il campo di applicazione sono le finiture su ghisa, acciaio e leghe leggere.



THIS END MILL

is recommended to perform finishing working on high shoulders. The available range allows maximun flexibility and enables you to choose the flute lenght that best suits your requirements.
In this way, the obligation sometimes imposed by the rules to work with excessive changes, clearly harmful and unproductive, is avoided. It is essential to specify at the time of the request the type of material to be processed and the length of the helix required. The field of application are finishes in cast iron, steel and light alloys.

FRESE ELICOIDALI FRONTALI "CUT-ROUGHING"

FRAISES HÉLICOÏDALES "CUT-ROUGHING"
HELICAL END MILLS "CUT-ROUGHING"
DRALLNUTIGE STIRNFRÄSER "CUT-ROUGHING"

QUALITÀ K10/P25*

NUANCES K10/P25*
GRADES K10/P25*
SORTEN K10/P25*



PROGRAMMA DI SGROSSATURA RAPIDA "CUT-ROUGHING"

Nuove macchine e più moderni metodi nel campo della fresatura, richiedono il continuo progresso anche nella realizzazione di utensili sempre più efficienti. Le nuove frese "Cut-Roughing", sono utensili a nuovo profilo tagliente particolarmente studiati per ottenere il miglior rendimento.

Questo nuovo profilo direttamente ricavato lungo il petto dell'angolo radiale di taglio, si è dimostrato molto valido per ottenere una migliore rottura del truciolo asportato a tutto vantaggio di una migliore resa del lavoro ed in modo particolare nella esecuzione di alti spallamenti.

Si è inoltre ottenuto con l'uso di frese "Cut-Roughing" una notevole diminuzione del fenomeno di incollamento del truciolo al tagliente, fenomeno che porta ad un rapido deterioramento dello stesso. Altri vantaggi ottenuti sono un'ottima dispersione del calore, dovuta alla facile frantumazione del truciolo asportato, ed una riduzione nell'assorbimento di potenza.

I migliori vantaggi nell'uso delle frese "Cut-Roughing", si ottengono naturalmente con la combinazione tra una giusta velocità di taglio unita ad un forte avanzamento di lavoro.

QUICK "CUT-ROUGHUNG" PROGRAM

New machines and more advanced methods in the field of milling require a continuous progress also in the manufacturing of increasingly effective tools. Thenew mills of the "CUT-ROUGHING" PROGRAM are tools characterized by a new cooting profile specifically designed to achieve the best performance.

This new profile, directly created along the face of the radical cutting angle, proved to be particularly suitable for achieving a better breaking of the chip removed, wich in turn improves the efficiency of the maching, above all in the execution of high shoulders.

Moreover, the advantages of using of the "CUT-ROUGHING" mills can abviously be obtained by combining an adequate cutting speed with a considerable working feed.

FRESE ELICOIDALI FRONTALI "CUT-ROUGHING"

FRAISES HÉLICOÏDALES "CUT-ROUGHING"
HELICAL END MILLS "CUT-ROUGHING"
DRALLNUTIGE STIRNFRÄSER "CUT-ROUGHING"

QUALITÀ K10/P25*

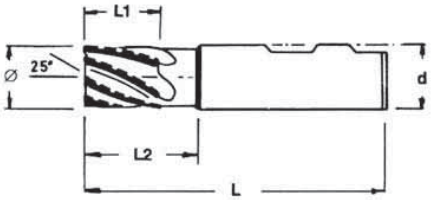
NUANCES K10/P25*
GRADES K10/P25*
SORTEN K10/P25*

* P25 A RICHIESTA
Sur demande - On request - Auf Aufrage

660

ATTACCO CILINDRICO WELDON DIN 1835B
Queue cylindrique avec méplat
Weldon cylindrical shank
Zylinderschft mit Spannfläche





Esempio d'ordine | Ordering Example
660K 36

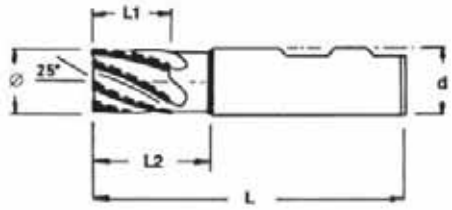
Ø e8	L	L1	L2	d h6	Z
20	115	40	59	25	3
32	125	50	65	32	4
36	130	50	70	32	5
40	145	63	85	32	6

660 TN

ATTACCO CILINDRICO WELDON DIN 1835B
Queue cylindrique avec méplat
Weldon cylindrical shank
Zylinderschft mit Spannfläche



CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet



Esempio d'ordine | Ordering Example
660KTN 32

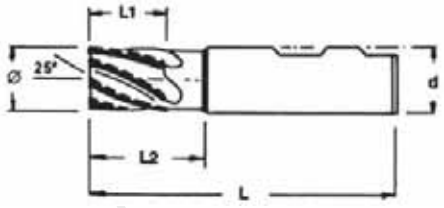
Ø e8	L	L1	L2	d h6	Z
20	115	40	59	25	3
32	125	50	65	32	4
36	130	50	70	32	5
40	145	63	85	32	6

660 TC

ATTACCO CILINDRICO WELDON DIN 1835B
Queue cylindrique avec méplat
Weldon cylindrical shank
Zylinderschft mit Spannfläche



CON RIVESTIMENTO TiCN
Revêtues TiCN
TiCN -Coated
TiCN-beschichtet



Esempio d'ordine | Ordering Example
660KTC 36

Ø e8	L	L1	L2	d h6	Z
20	115	40	59	25	3
32	125	50	65	32	4
36	130	50	70	32	5
40	145	63	85	32	6

FRESE ELICOIDALI FRONTALI "CUT-ROUGHING"

FRAISES HÉLICOÏDALES "CUT-ROUGHING"
HELICAL END MILLS "CUT-ROUGHING"
DRALLNUTIGE STIRNFRÄSER "CUT-ROUGHING"

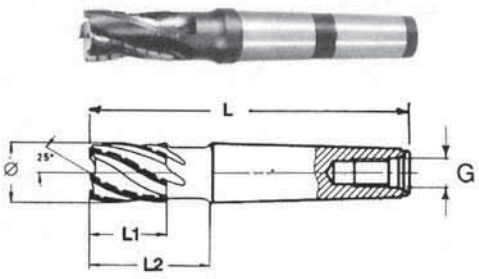
QUALITÀ K10/P25*

NUANCES K10/P25*
GRADES K10/P25*
SORTEN K10/P25*

* P25 A RICHIESTA
Sur demande - On request - Auf Aufrage

661

ATTACCO CONO MORSE DIN 228
* ART. 661F - ATTACCO CONO MORSE DIN 2207
Queue cône Morse
Morse taper shank
Mit Morseke gel



Esempio d'ordine | Ordering Example
661K 32

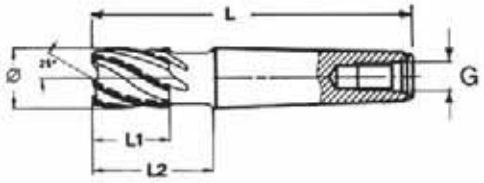
Ø e8	L	L1	L2	G	CM	Z
32	200	50	91	M16	4	4
40	215	63	106	M16	4	4
*32	213	50	81	M16	4	4
*36	213	50	81	M16	4	4
*40	232	63	100	M16	4	4

661 TN

ATTACCO CONO MORSE DIN 228
* ART. 661FN - ATTACCO CONO MORSE DIN 2207
Queue cône Morse
Morse taper shank
Mit Morsekegel



CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet



Esempio d'ordine | Ordering Example
661KTN 20

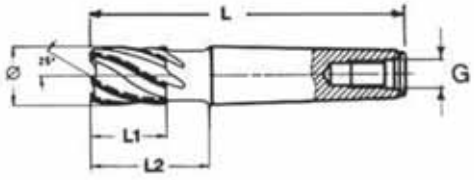
Ø e8	L	L1	L2	G	CM	Z
20	145	40	59	M12	3	3
32	200	50	80	M16	4	6
40	215	63	106	M16	4	6
*32	213	50	81	M16	4	4
*36	213	50	81	M16	4	5
*40	232	63	96	M16	4	6

661 TC

ATTACCO CONO MORSE DIN 228
*ATTACCO CONO MORSE DIN 2207
Queue cône Morse
Morse taper shank
Mit Morseke-gel



CON RIVESTIMENTO TiCN
Revêtues TiCN
TiCN -Coated
TiCN-beschichtet



Esempio d'ordine | Ordering Example
661KTC 20

Ø e8	L	L1	L2	G	CM	Z
20	145	40	59	M12	3	3
*32	213	50	81	M16	4	4
*36	213	50	81	M16	4	5
*40	232	63	96	M16	4	6

FRESE ELICOIDALI FRONTALI "CUT-ROUGHING"

FRAISES HÉLICOÏDALES "CUT-ROUGHING"

HELICAL END MILLS "CUT-ROUGHING"

DRALLNUTIGE STIRNFRÄSER "CUT-ROUGHING"

QUALITÀ K10/P25*

NUANCES K10/P25*

GRADES K10/P25*

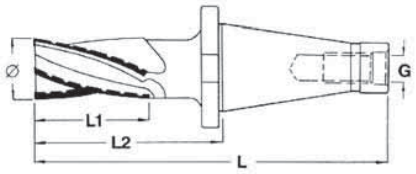
SORTEN K10/P25*

* P25 A RICHIESTA
Sur demande - On request - Auf Aufrage

662

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel





Esempio d'ordine | Ordering Example
662K 32

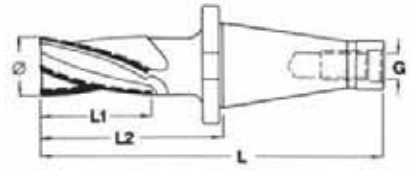
Ø e8	L	L1	L2	G	ISO	Z
32	180	50	87	M16	40	4
40	200	63	107	M16	40	6
50	260	80	133	M24	50	6
63	280	100	153	M24	50	6

662 TN

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet



Esempio d'ordine | Ordering Example
662KTN 40

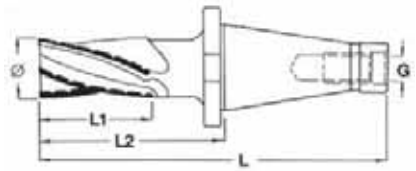
Ø e8	L	L1	L2	G	ISO	Z
32	180	50	87	M16	40	4
40	200	63	107	M16	40	6
50	260	80	133	M24	50	6
63	280	100	153	M24	50	6

662 TC

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



CON RIVESTIMENTO TiCN
Revêtues TiCN
TiCN -Coated
TiCN-beschichtet



Esempio d'ordine | Ordering Example
662PTC 32

Ø e8	L	L1	L2	G	ISO	Z
32	180	50	87	M16	40	4
40	200	63	107	M12	40	6
50	260	80	133	M24	50	6
63	280	100	153	M24	50	6

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FRESE CON RIPORTO IN METALLO DURO



FRAISES AVEC PLAQUETTES EN MÉTAL DUR BRASÉES

CARBIDE TIPED MILLING CUTTERS

GELÖTETE HARTMETALL- FRÄSER

Talicarb

FRESE A 2 TAGLI

FRAISES À 2 DENTS
2 FLUTE END MILLS
ZWEISCHNEIDIGE FRÄSER

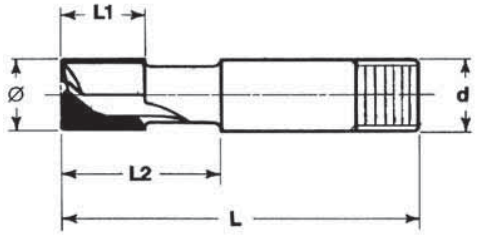
QUALITÀ K10

NUANCES K10
GRADES K10
SORTEN K10

211

ATTACCO CILINDRICO FILETTATTO DIN 1835D
TAGLIO AL CENTRO - PER CAVE
Queue cylindrique filetée - Coupe au centre - Pour rainures
Threaded cylindrical shank end mill - Center cutting
Langlochfräser - Mit Zentrumschneide Zylinderschaft mit Aussenanzugsge-winde





Esempio d'ordine | Ordering Example
211K 12

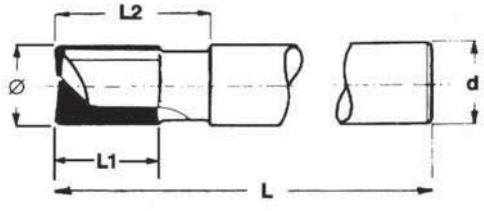
Ø e8	L	L1	L2	d h8
6	56	12	20	6
8	60	12	20	10
10	60	12	20	10
12	70	16	25	12
14	70	19	25	12
16	80	22	32	16
18	80	22	32	16
20	80	22	32	16
22	100	25	44	25
24	100	25	44	25
25	100	25	44	25
26	100	25	44	25
28	100	25	44	25
30	100	25	44	25
32	100	25	50	32
35	120	30	60	32
36	120	30	60	32
38	120	30	60	32
40	120	30	60	32

215

SIMILARE DIN 8027
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO DIN 1835A
TAGLIO AL CENTRO - PER CAVE
Queue cylindrique - Coupe au centre - Pour rainures
Cylindrical shank end mill Center cutting
Langlochfräse - MitZentrumschnei- de Zylinderschaft





☐ ATTACCO CILINDRICO WELDON DIN 1835B
Queue cylindri-que avec méplat
Weldon cylin-drical shank
Zylinderschaft mit Spannfläche

Esempio d'ordine | Ordering Example
215K 9

Ø e8	L	L1	L2	d h6
5	56	12	20	6
6	56	12	20	6
7	56	12	20	8
8	56	12	20	8
9	60	12	20	10
10	60	12	20	10
11	70	16	25	12
12	70	16	25	12
13	70	19	25	12
14	70	19	25	12
15	80	19	32	16
16	80	22	32	16
17	80	22	32	16
18	80	22	32	16
19	90	22	40	20
20	90	22	40	20
☐ 22	100	25	44	25
☐ 24	100	25	44	25
☐ 25	100	25	44	25
☐ 26	100	25	44	25
☐ 28	100	25	44	25
☐ 30	100	25	44	25
☐ 32	100	25	44	25

FRESE A 2 TAGLI

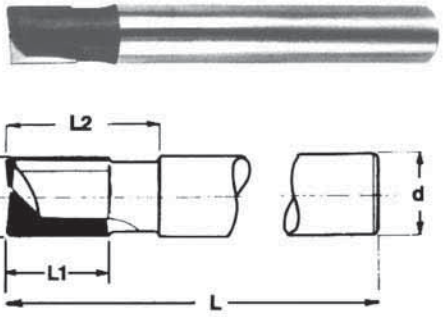
FRAISES À 2 DENTS
2 FLUTE END MILLS
ZWEISCHNEIDIGE FRÄSER

QUALITÀ K10

NUANCES K10
GRADES K10
SORTEN K10

215L

SERIE LUNGA - ATTACCO CILINDRICO
TAGLIO AL CENTRO - PER CAVE
Série longue - Queue cylindrique - Coupe au centre - Pour rainures
Long series - Straight shank end mill - Center cutting
Lange Ausführung - Langlochfräser - Mit Zentrumschneide Zylinderschaft



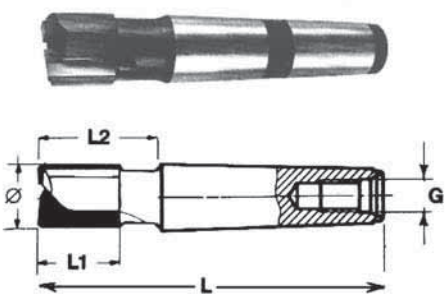
Esempio d'ordine | Ordering Example
215LK 6

Ø e8	L	L1	L2	d h8
6	100	12	20	6
8	100	12	20	8
10	100	12	20	10
12	150	16	25	12
14	150	19	25	12
16	150	22	32	16
18	150	22	32	16
20	150	22	32	20

215C

SIMILARE DIN 8026
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO DIN 1835A
TAGLIO AL CENTRO - PER CAVE
Queue cylindrique - Coupe au centre - Pour rainures
Cylindrical shank end mill Center cutting
Langlochfräse - MitZentrumschnei- de Zylinderschaft



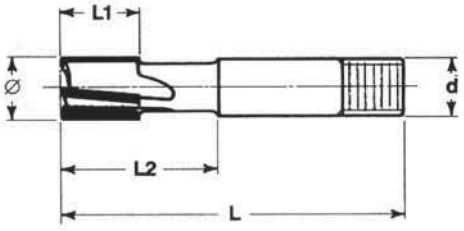
Esempio d'ordine | Ordering Example
215CK 24

Ø e8	L	L1	L2	G	CM
10	94	12	25	M10	2
12	94	16	25	M10	2
14	94	19	25	M10	2
15	94	19	25	M10	2
16	101	22	32	M10	2
18	101	22	32	M10	2
20	125	22	39	M12	3
22	125	25	39	M12	3
24	131	25	45	M12	3
25	131	25	45	M12	3
26	131	25	45	M12	3
28	131	25	45	M12	3
30	131	25	45	M12	3
32	131	25	45	M12	3
35	165	30	56	M16	4
40	165	30	56	M16	4

212

ATTACCO CILINDRICO FILETTATO DIN 1835D
Queue cylindri-que filetée
Thereaded cylin-drical shank
Zylinderschaft mit Aussenanzugsgewinde





Esempio d'ordine | Ordering Example
212K 14

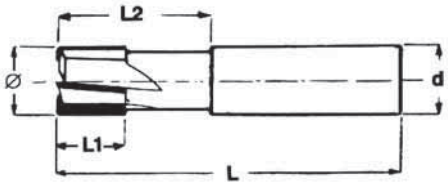
Ø e8	L	L1	L2	d h8	Z
8	63	12	23	10	3
10	63	12	23	10	3
12	75	16	30	12	3
14	75	16	30	12	4
16	80	16	32	16	4
18	80	19	32	16	4
20	90	19	42	16	4
25	100	22	44	25	4
30	100	22	44	25	6
32	110	22	50	32	6
35	120	25	60	32	6
36	120	25	60	32	6
40	120	25	60	32	6

216

SIMILARE DIN 8044
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO DIN 1835A
Queue cylindrique
Cylindrical shanck
Zylinderschaft





☐ ATTACCO CILINDRICO WELDON DIN 1835B
Queue cylindri-que avec méplat
Weldon cylin-drical shank
Zylinderschaft mit Spannfläche

Esempio d'ordine | Ordering Example
216K 19

Ø e8	L	L1	L2	d h6	Z
8	63	12	27	8	3
9	63	12	23	10	3
10	63	12	23	10	3
11	75	16	30	12	3
12	75	16	30	12	3
13	75	16	30	12	4
14	75	16	30	16	4
15	80	16	32	16	4
16	80	16	32	16	4
17	80	19	32	16	4
18	80	19	32	20	4
19	90	19	40	20	4
20	90	19	40	25	4
☐ 22	100	22	50	25	4
☐ 24	100	22	50	25	4
☐ 25	100	22	50	25	4
☐ 26	100	22	50	25	6
☐ 28	100	22	50	25	6
☐ 30	100	22	50	25	6

FRESE FRONTALI

FRAISES DEUX TAILLES
END MILLS
SCHAFTFRÄSER

QUALITÀ K10

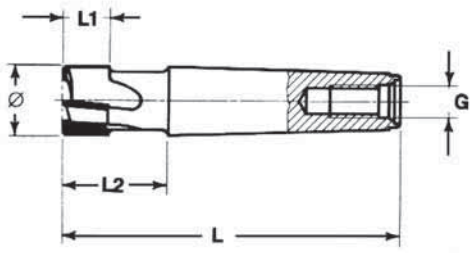
NUANCES K10
GRADES K10
SORTEN K10

217

SIMILARE DIN 8045
Semblable à - Similar to - Ähnlich

ATTACCO CONO MORSE DIN 228
* ART. 217F - ATTACCO CONO MORSE DIN 2207
Queue cône morse
Molrse tapershanck
Mit morsekegel





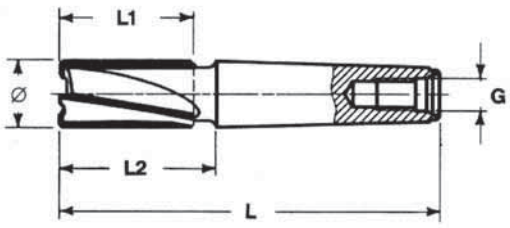
Esempio d'ordine | Ordering Example
217K 12

Ø js 16	L	L1	L2	G	CM	Z
11	105	16	36	M10	2	3
12	105	16	36	M10	2	4
13	105	16	36	M10	2	4
14	105	16	36	M10	2	4
15	105	16	36	M10	2	4
16	105	16	36	M10	2	4
18	105	19	36	M10	2	4
20	125	19	39	M12	3	4
22	125	19	39	M12	3	4
24	125	19	39	M12	3	4
25	131	19	45	M12	3	6
26	131	22	45	M12	3	6
28	131	22	45	M12	3	6
30	131	22	45	M12	3	6
32	160	22	51	M16	4	6
35	165	25	56	M16	4	6
38	165	25	56	M16	4	6
40	165	25	56	M16	4	6
*32	180	22	48	M16	4	6
*35	180	25	48	M16	4	6
*38	180	25	48	M16	4	6
*40	180	25	48	M16	4	6

317

SERIE LUNGA - ATTACCO CONo MORSE DIN 228
*ART. 317F-ATTACCO CONO MORSE DIN 2207
Série longue - Queue cône Morse
Long series - Morse taper shank
Lange Ausführung - Mit morsekegel





Esempio d'ordine | Ordering Example
317P 25

Ø js 16	L	L1	L2	G	CM	Z
20	131	30	45	M12	3	4
25	136	35	50	M12	3	6
30	146	40	60	M12	3	6
35	180	40	71	M16	4	6
40	190	50	81	M16	4	6
*35	200	40	68	M16	4	6
*40	210	50	78	M16	4	6

FRESE FRONTALI

FRAISES DEUX TAILLES
END MILLS
SCHAFTFRÄSER

QUALITÀ K10/P25*

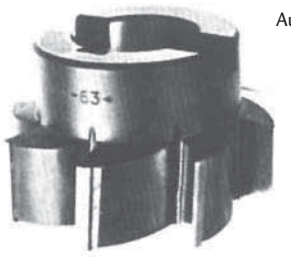
NUANCES K10/P25*
GRADES K10/P25*
SORTEN K10/P25*

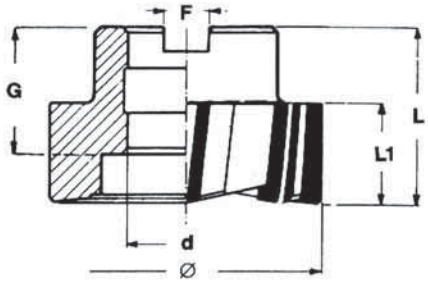
* P25 A RICHIESTA
Sur demande - On request - Auf Aufrage

218

SIMILARE DIN 8056
Semblable à - Similar to - Ähnlich

ATTACCO MANICOTTO
Fraise en bout
Shell end mill
Aufsteckfräser



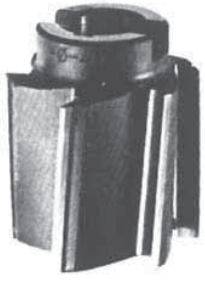


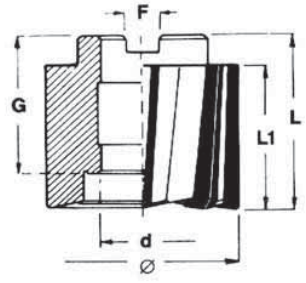
Ø js 16	L	L1	G	F	d H7	Z
40	28	16	19	8	16	6
50	32	16	22	10	22	6
63	40	20	28	12	27	8
80	45	22	30	14	32	8
100	50	22	35	16	40	10
125	60	25	40	18	40	12

Esempio d'ordine | Ordering Example
218K 100

222

SERIE LUNGA-ATTACCO MANICOTTO
Série longue - Fraise en bout
Long series - Shell end mill
Lange Ausführung - Aufsteckfräser





Ø js 16	L	L1	G	F	d H7	Z
40	48	40	40	8	16	6
50	60	50	50	10	22	6
63	72	60	60	12	27	8
80	95	80	80	14	32	8
100	115	100	95	16	40	10

Esempio d'ordine | Ordering Example
222K 80

FRESE A 2 TAGLI CON ANGOLO ELICA 25°*

FRAISES 2 DENTS AVEC ANGLE HÉLICE 25°

2 FLUTE END MILLS - 25° HELEX ANGLE

ZWEISCHNEI- DIGE FRÄSER MIT SPIRALWINKEL 25°

***| A richiesta angolo elica a 35°** - Sur demande - On request - Auf Aufrage

QUALITÀ K10

NUANCES K10

GRADES K10

SORTEN K10

810

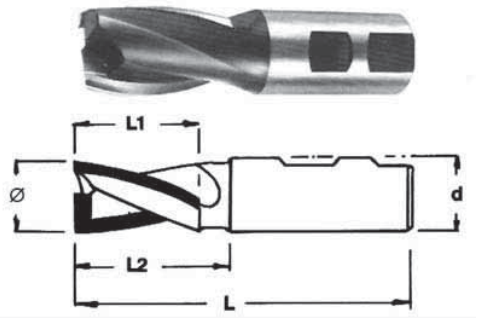
ATTACCO CILINDRICO WELDON DIN 1835B

TAGLIO AL CENTRO

Queue cylindrique avec méplat - Coupeau centre

Weldon cylindrical shank - Center cutting

Zylinderschaft mit Spannfläche - Mit Zentrumscheide



Esempio d'ordine | Ordering Example

810K 20

Ø +0,05 0	L	L1	L2	d h6	Z
16	95	30	47	16	2
18	115	40	65	20	2
20	115	40	65	20	2
22	118	50	62	25	2
25	118	50	62	25	2
28	121	50	65	25	2
32	125	50	65	32	2
36	145	63	85	32	2
40	145	63	85	32	2
50	170	80	110	32	2

811

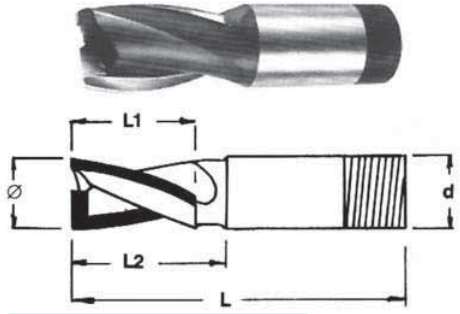
ATTACCO CILINDRICO FILETTATO DIN 1835D

TAGLIO AL CENTRO

Queue cylindrique filetée - Coupe au centre

Thereaded cylindrical shank - Center cutting

Zylinderschaft mit Aussenanzungsgewinde - Mit Zentrumscheide



Esempio d'ordine | Ordering Example

811K 25

Ø +0,05 0	L	L1	L2	d h8	Z
16	95	30	47	16	2
20	115	40	59	25	2
25	118	50	62	25	2
32	125	50	65	32	2

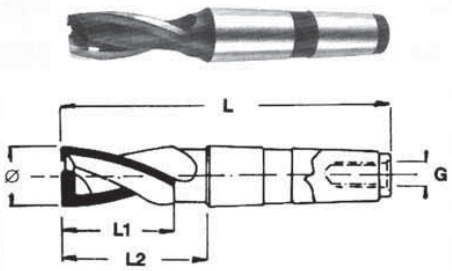
812

ATTACCO CONO MORSE DIN 228 - TAGLIO AL CENTRO

Queue cône Morse - Coupe au centre

Morse taper shank - Center cutting

Mit Zentrumscheide



Esempio d'ordine | Ordering Example

812K 28

Ø +0,05 0	L	L1	L2	G	CM	Z
16	115	30	46	M10	2	2
18	145	40	59	M12	3	2
20	145	40	59	M12	3	2
22	160	40	74	M12	3	2
25	160	50	74	M12	3	2
28	166	50	80	M12	3	2
32	200	50	91	M16	4	2
36	215	63	106	M16	4	2
40	215	63	106	M16	4	2
50	224	80	105	M16	4	2

FRESE A 2 TAGLI CON ANGOLO ELICA 25° PER LEGHE LEGGERE

FRAISES 2 DENTS AVECANGLE HÉLI-CE 25° POUR ALLIAGES LÉGERES

2 FLUTE END MILLS - 25° HELIX ANGLE FOR LIGHT ALLOYS

ZWEISCHNEIDIGE FRÄSER MIT SPIRALWINKEL 25° FÜR LEICHTMETALL

QUALITÀ K10

NUANCES K10

GRADES K10

SORTEN K10

983

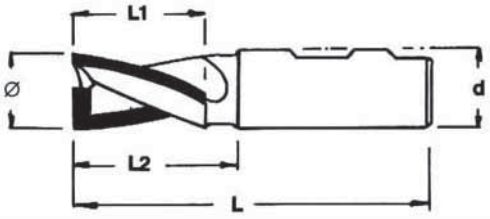
ATTACCO CILINDRICO WELDON DIN 1835B - TAGLIO AL CENTRO

Queue cylindrique avec méplat - Coupe au centre

Weldon cylindrical shank - Center cutting

Zylinderschaft mit Spannfläche - Mit Zentrumscheide





A richiesta sono realizzabili attacchi filettati e combinati.

Sur demande on peut realiser attaches filettés et combinés.

On request we can produce threated and combined shanks.

Auf Anfrage können Schafte mit Aussenanzugsgewinde und Kombischafte werden hergestellt.

Esempio d'ordine | Ordering Example

983K 25X116

Ø ±0,05	L	L1	L2	d h6	Z
16	88	25	40	16	2
16	103	40	55	16	2
20	105	40	55	20	2
20	115	50	65	20	2
25	116	45	60	25	2
25	134	63	78	25	2
32	125	50	65	32	2
32	155	80	95	32	2
40	140	50	70	40	2
40	170	80	100	40	2

985

ATTACCO CONO MORSE DIN 228 - UNI 521

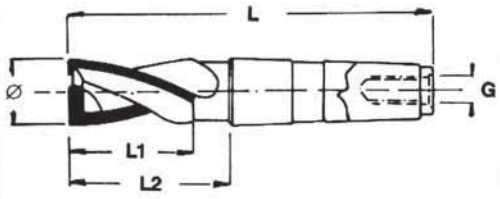
TAGLIO AL CENTRO

Queue cône Morse - Coupe au centre

Morse taper shank - Center cutting

Mit Morsekegel - Mit Zentrumschneide





Esempio d'ordine | Ordering Example

985K 32X202

Ø ±0,05	L	L1	L2	CM	Z
16	116	32	47	2	2
16	124	40	55	2	2
20	143	40	57	3	2
20	153	50	67	3	2
25	146	45	60	3	2
25	166	63	80	3	2
32	172	50	63	4	2
32	202	80	93	4	2
40	172	50	63	4	2
40	222	100	113	4	2
50	172	50	63	4	2
50	222	100	113	4	2
63	212	90	103	4	2

FRESE A 2 TAGLI CON ANGOLO ELICA 25° PER LEGHE LEGGERE

FRAISES 2 DENTS AVECANGLE HÉLI-CE 25° POUR ALLIAGES LÉGERES

2 FLUTE END MILLS - 25° HELIX ANGLE FOR LIGHT ALLOYS

ZWEISCHNEIDIGE FRÄSER MIT SPIRALWINKEL 25° FÜR LEICHTMETALL

QUALITÀ K10

NUANCES K10

GRADES K10

SORTEN K10

987

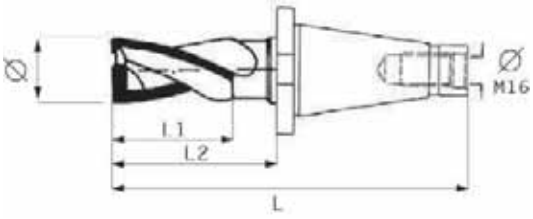
ATTACCO ISO DIN 2080

Queue cône ISO

ISO taper shank

Mit ISO-Steilkegel





A richiesta è realizzabile l'attacco ISO 40 senza flangia.

Sur demande on peut realiser attacementes ISO 40 sans collerette.

On request we can produce ISO 40 taper shanks without flange.

Auf Anfrage kann man den Schaft ISO 40 ohne Flansch herstellen.

Esempio d'ordine | Ordering Example

987K 50X212

Ø ±0,05	L	L1	L2	ISO	Z
32	173	50	70	40	2
32	223	100	120	40	2
40	173	50	70	40	2
40	262	100	120	40	2
50	212	50	70	50	2
50	282	120	140	50	2
63	225	63	83	50	2
63	312	150	170	50	2

989

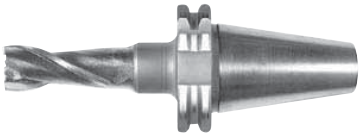
ATTACCO CONO MORSE DIN 69871

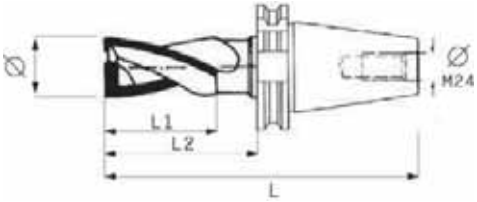
TAGLIO AL CENTRO

Queue cône - Morse - Coupe au centre

Morse taper shank - Center cutting

Mit Morsekegel - Mit Zentrumschneide





Esempio d'ordine | Ordering Example

989K 50X191

Ø ±0,05	L	L1	L2	ISO	Z
32	158	50	70	40	2
32	208	100	120	40	2
40	158	50	70	40	2
40	208	100	120	40	2
50	191	50	70	50	2
50	261	120	140	50	2
63	204	63	83	50	2
63	291	150	170	50	2

FRESE ELICOIDALI FRONTALI

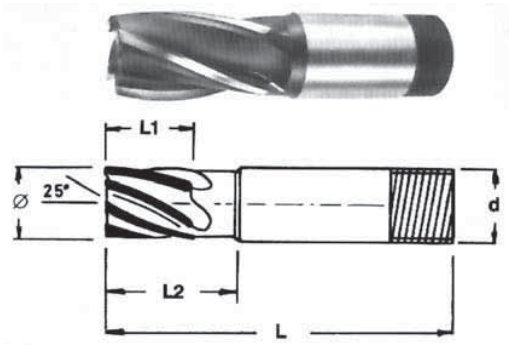
FRAISES HÉLICOÏDALES
HELICAL END MILLS
DRALLNUTIGE STIRNFRÄSER

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

779

ATTACCO CILINDRICO FILETTATO DIN 1835D
Queue cylindrique filetée
Threaded cylindrical shank
Zylinderschaft mit Aussenanzugsgewinde

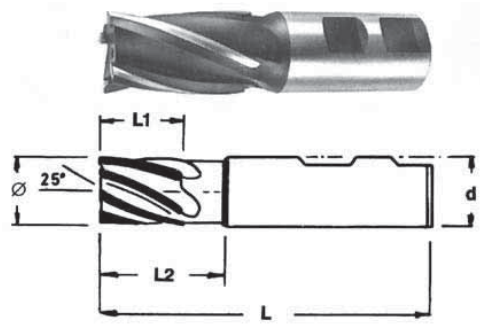


Esempio d'ordine | Ordering Example
779K 25

Ø e8	L	L1	L2	d h8	Z
16	95	30	47	16	3
20	115	40	59	25	3
25	118	50	62	25	4
32	125	50	65	32	4

780

ATTACCO CILINDRICO WELDON DIN 1835B
Queue cylindrique avec méplat
Weldon cylindrical shank
Zylinderschaft mit Spannfläche



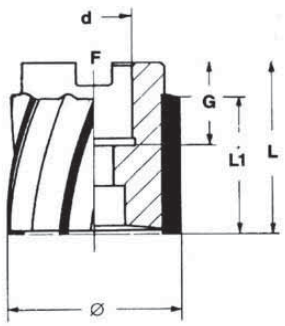
Esempio d'ordine | Ordering Example
780K 28

Ø e8	L	L1	L2	d h6	Z
16	95	30	47	16	3
18	109	40	59	20	3
20	115	40	59	25	3
22	118	50	62	25	4
25	118	50	62	25	4
28	121	50	65	25	4
32	125	50	65	32	4
36	130	50	70	32	5
38	135	50	75	32	6
40	145	63	85	32	6

879

ATTACCO A MANICOTTO
Fraise en bout
Shell end mill
Ausfsteckfräser





Esempio d'ordine | Ordering Example
879K 100

Ø e8	L	L1	G	F	d h7	Z
40	50	40	24	8,4	16	6
50	50	40	24	10,4	22	6
63	63	50	32	12,4	27	6
80	63	50	34	14,4	32	8
100	80	63	38	16,4	40	8

FRESE ELICOIDALI FRONTALI

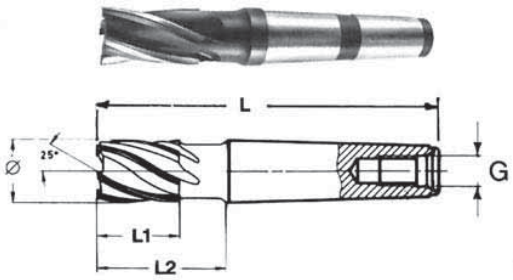
FRAISES HÉLICOÏDALES
HELICAL END MILLS
DRALLNUTIGE STIRNFRÄSER

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

579

ATTACCO CONO MORSE DIN 228
***ART. 579F - ATTACCO CONO MORSE DIN 2207**
Queue cône Morse
Morse taper shank
Mit Morsekegel

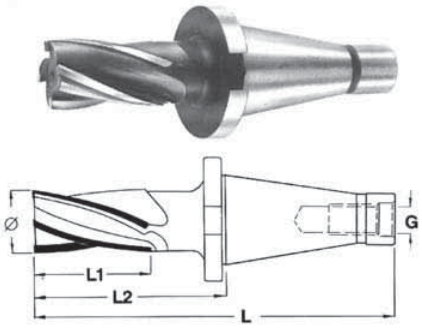


Esempio d'ordine | Ordering Example
579K 28

Ø e8	L	L1	L2	G	CM	Z
16	116	30	47	M10	2	3
18	145	40	59	M12	3	3
20	145	40	59	M12	3	3
22	160	50	74	M12	3	4
25	160	50	74	M12	3	4
28	166	50	80	M12	3	4
32	200	50	80	M16	4	4
36	200	50	80	M16	4	5
40	215	63	95	M16	4	6
*32	213	50	81	M16	4	4
*36	213	50	81	M16	4	5
*40	228	63	96	M16	4	6
*50	249	80	117	M16	4	6

679

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel

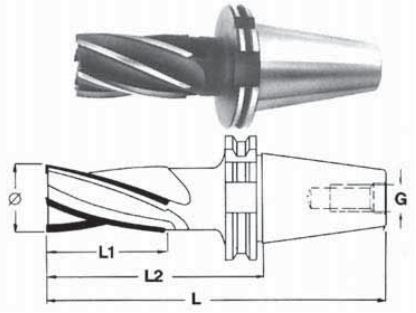


Esempio d'ordine | Ordering Example
679P 50X40

Ø e8	L	L1	L2	G	ISO	Z
32	180	50	86	M16	40	4
40	200	63	106	M16	40	6
50	228	80	135	M16	40	6
50	260	80	133	M24	50	6
63	280	100	153	M24	50	6

680

ATTACCO ISO DIN 69871A
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



Esempio d'ordine | Ordering Example
680K 63X50

Ø e8	L	L1	L2	G	ISO	Z
40	180	63	112	M16	40	6
50	200	80	132	M16	40	6
50	235	80	133	M24	50	6
63	260	100	158	M24	50	6

FRESE ELICOIDALI FRONTALI

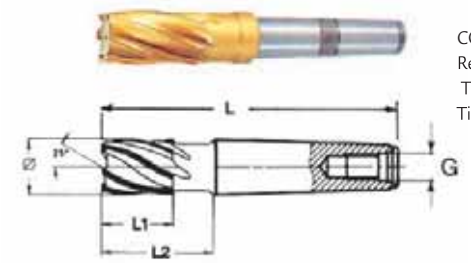
FRAISES HÉLICOÏDALES
HELICAL END MILLS
DRALLNUTIGE STIRNFRÄSER

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

579 TN

ATTACCO CONO MORSE DIN 228
*ART. 579FN - ATTACCO CONO MORSE
DIN 2207
Queue cône Morse
Morse taper shank
Mit Morsekegel



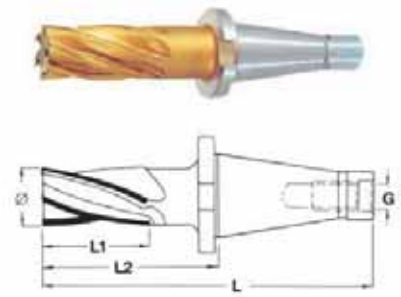
CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
579PTN 32

Ø e8	L	L1	L2	G	CM	Z
16	116	30	47	M10	2	3
18	145	40	59	M12	3	3
20	145	40	59	M12	3	3
22	160	50	74	M12	3	4
25	160	50	74	M12	3	4
28	166	50	80	M16	4	4
32	200	50	80	M16	4	4
36	200	50	80	M16	4	5
40	215	63	95	M16	4	6
*32	213	50	81	M16	4	4
*36	213	50	81	M16	4	5
*40	228	63	96	M16	4	6
*50	249	80	117	M16	4	6

679 TN

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



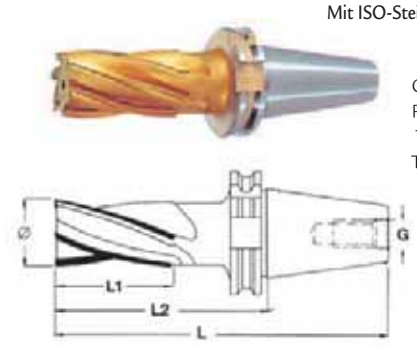
CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
679KTN 50X40

Ø e8	L	L1	L2	G	ISO	Z
32	180	50	86	M16	40	4
40	200	63	106	M16	40	6
50	228	80	135	M16	40	6
50	260	80	133	M24	50	6
63	280	100	153	M24	50	6

680 TN

ATTACCO ISO DIN 69871A
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
680KTN 50X40

Ø e8	L	L1	L2	G	ISO	Z
40	180	63	112	M16	40	6
50	200	80	132	M16	40	6
50	235	80	133	M24	50	6
63	260	100	158	M24	50	6

FRESE ELICOIDALI FRONTALI

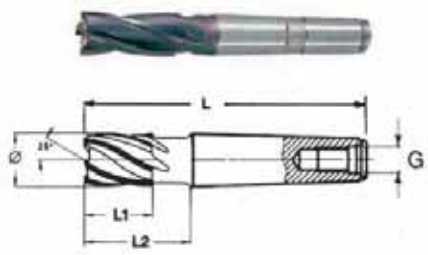
FRAISES HÉLICOÏDALES
HELICAL END MILLS
DRALLNUTIGE STIRNFRÄSER

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

579 TC

ATTACCO CONO MORSE DIN 228
* ART. 579FC - ATTACCO CONO MORSE
DIN 2207
Queue cône Morse
Morse taper shank
Mit Morsekegel



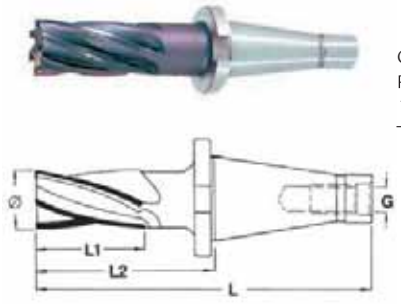
CON RIVESTIMENTO TiCN
Revêtues TiCN
TiCN -Coated
TiCN-beschichtet

Esempio d'ordine | Ordering Example
579KTC 25

Ø e8	L	L1	L2	G	CM	Z
16	116	30	47	M10	2	3
18	145	40	59	M12	3	3
20	145	40	59	M12	3	3
22	160	50	74	M12	3	4
25	160	50	74	M12	3	4
28	166	50	80	M16	4	4
32	200	50	80	M16	4	4
36	200	50	80	M16	4	5
40	215	63	95	M16	4	6
*32	213	50	81	M16	4	4
*36	213	50	81	M16	4	5
*40	228	63	96	M16	4	6
*50	249	80	117	M16	4	6

679 TC

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



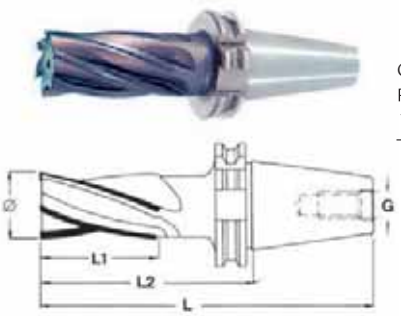
CON RIVESTIMENTO TiCN
Revêtues TiCN
TiCN -Coated
TiCN-beschichtet

Esempio d'ordine | Ordering Example
679KTC 50X40

Ø e8	L	L1	L2	G	ISO	Z
32	180	50	86	M16	40	4
40	200	63	106	M16	40	6
50	228	80	135	M16	40	6
50	260	80	133	M24	50	6
63	280	100	153	M24	50	6

680 TC

ATTACCO ISO DIN 69871A
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



CON RIVESTIMENTO TiCN
Revêtues TiCN
TiCN -Coated
TiCN-beschichtet

Esempio d'ordine | Ordering Example
680KTC 40X40

Ø e8	L	L1	L2	G	ISO	Z
40	180	63	112	M16	40	6
50	200	80	132	M16	40	6
50	235	80	133	M24	50	6
63	260	100	158	M24	50	6

FRESE A SGROSSARE

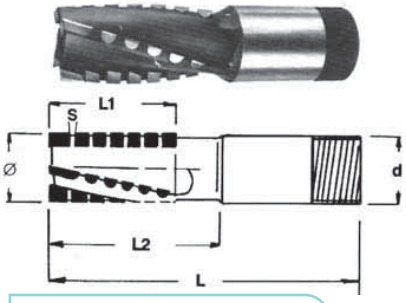
FRAISES D'ÉBAUCHE
ROUGHING END MILLS
SCHRUPPFRÄSER

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

312

ATTACCO CILINDRICO FILETTATO DIN 1835D
Queue cylindrique filetée
Threaded cylindrical shank
Zylinderschaft mit Aussenanzugsgewinde

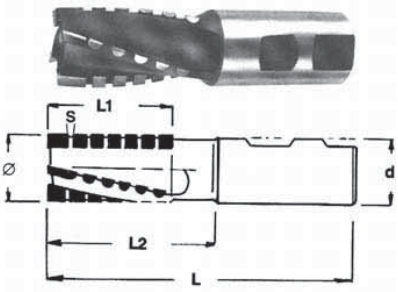


Esempio d'ordine | Ordering Example
312K 16X2.5

Ø e8	L	L1	L2	d h8	Z	S ■■
16	95	40	47	16	3	2,5
20	115	44	59	25	4	2,5
25	118	52	62	25	4	2,5
32	125	57	65	32	4	3,0
16	95	34	47	16	3	1,2
20	115	45	59	25	4	1,2
25	118	50	62	25	4	1,2
32	130	60	70	32	4	1,4

412

ATTACCO CILINDRICO WELDON DIN 1835 B
Queue cylindrique avec méplat
Weldon cylindrical shank
Zylinderschaft mit Spannfläche



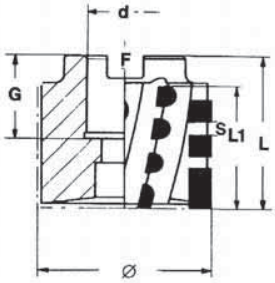
Esempio d'ordine | Ordering Example
412K 20X1.2

Ø e8	L	L1	L2	d h8	Z	S ■■
16	95	40	47	16	3	2,5
20	115	44	59	25	4	2,5
25	118	52	62	25	4	2,5
32	125	57	65	32	4	3,0
16	95	34	47	16	3	1,2
20	115	45	59	25	4	1,2
25	118	50	62	25	4	1,2
32	130	60	70	32	4	1,4
36	140	70	80	32	4	1,4
38	150	80	90	32	4	1,4
40	155	80	95	32	4	1,4

322

ATTACCO A MANICOTTO
Fraise en bout
Shell end mill
Aufsteckfräser





Esempio d'ordine | Ordering Example
322K 100X1.4

Ø js 16	L	L1	G	F	d h8	Z	S ■■
50	45	35	24	10,4	22	6	3,0
63	63	50	32	12,4	27	6	3,0
80	70	60	34	14,4	32	8	3,0
50	45	35	24	10,4	22	6	1,4
63	63	50	32	12,4	27	6	1,4
80	70	60	34	14,4	32	8	1,4
100	70	60	38	16,4	40	8	1,4

■■ SPECIFICARE IL VALORE DI "S" CON ANGOLO ELICA 20°
Spécifier la valeur "S" avec angle hélice 20° - Indicate value of "S" with 20° helix angle - Die Steigung "S" genau anzugeben mit Siralwinkel 20°

FRESE A SGROSSARE

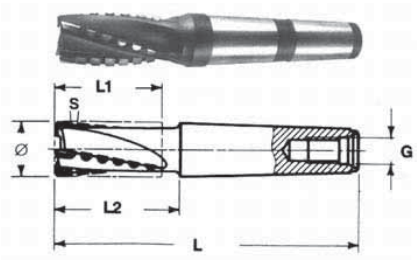
FRAISES D'ÉBAUCHE
ROUGHING END MILLS
SCHRUPPFRÄSER

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

417

ATTACCO CONO MORSE DIN 228
*ART. 417F - ATTACCO CONO MORSE DIN 2207
Queue cône Morse
Morse taper shank
Mit Morsekegel

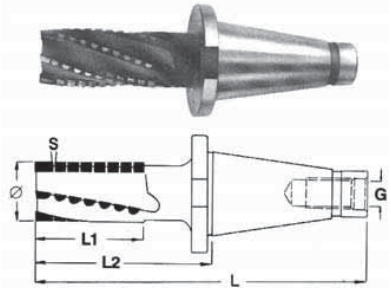


Esempio d'ordine | Ordering Example
417K 20X1.2

Ø js 16	L	L1	L2	G	CM	Z	S ■■
20	145	44	59	M12	3	4	2,5
20	145	45	59	M12	3	4	1,2
25	160	50	74	M12	3	4	2,5
25	160	50	74	M12	3	4	1,2
28	160	52	74	M12	3	4	2,5
28	160	54	74	M12	3	4	1,2
32	200	60	81	M16	4	4	3,0
40	215	80	96	M16	4	4	3,0
*32	213	60	73	M16	4	4	1,4
*36	213	60	73	M16	4	4	1,4
*40	228	80	88	M16	4	4	1,4

517

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel

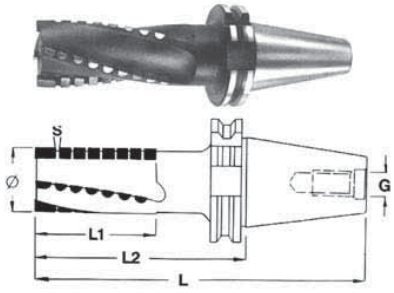


Esempio d'ordine | Ordering Example
517K 63X1.4

Ø js 16	L	L1	L2	G	ISO	Z	S ■■
40	220	80	126	M16	40	4	3,0
50	275	100	148	M24	50	6	3,0
63	295	115	168	M24	50	6	3,0
32	190	60	96	M16	40	4	1,4
40	220	80	126	M16	40	4	1,4
50	275	100	148	M24	50	6	1,4
63	295	115	168	M24	50	6	1,4

617

ATTACCO ISO DIN 69871A
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



Esempio d'ordine | Ordering Example
617K 50X50X1.4

Ø js 16	L	L1	L2	G	ISO	Z	S ■■
40	220	80	132	M16	40	4	3,0
50	220	100	152	M16	40	6	3,0
50	255	100	153	M24	50	6	3,0
63	275	115	173	M24	50	8	3,0
40	220	80	132	M16	40	4	1,4
50	220	100	152	M16	40	6	1,4
50	255	100	153	M24	50	8	1,4
63	275	115	173	M24	50	8	1,4

■■ SPECIFICARE IL VALORE DI "S" CON ANGOLO ELICA 20°
Spécifier la valeur "S" avec angle hélice 20° - Indicate value of "S" with 20° helix angle - Die Steigung "S" genau anzugeben mit Siralwinkel 20°

FRESE A SGROSSARE

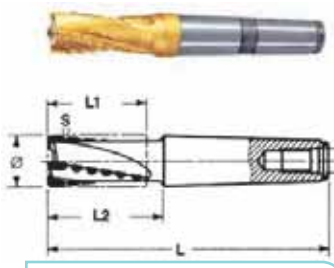
FRAISES D'ÉBAUCHE
ROUGHING END MILLS
SCHRUPPFRÄSER

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

417 TN

ATTACCO CONO MORSE DIN 228
***ART. 417FN - ATTACCO CONO MORSE**
DIN 2207
Queue cône Morse
Morse taper shank
Mit Morsekegel



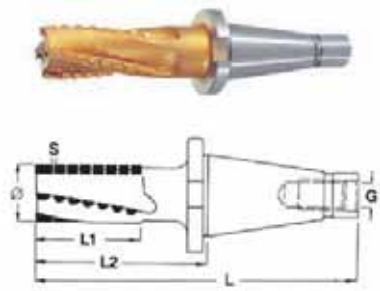
CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
417KTN 20X1.2

Ø js 16	L	L1	L2	G	CM	Z	S ■■
20	145	44	59	M12	3	4	2,5
25	160	50	74	M12	3	4	2,5
28	160	52	74	M12	3	4	2,5
32	200	60	81	M16	4	4	3,0
40	215	80	96	M16	4	4	3,0
20	145	45	59	M12	3	4	1,2
25	160	50	74	M12	3	4	1,2
28	160	54	74	M12	3	4	1,2
*32	213	60	81	M16	4	4	1,4
*36	213	60	81	M16	4	4	1,4
*40	228	80	96	M16	4	4	1,4

517 TN

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



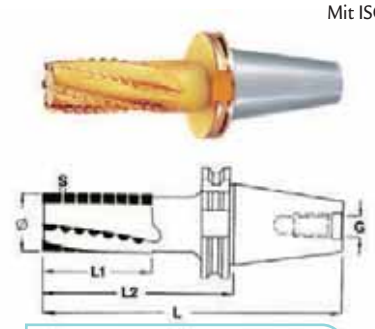
CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
517KTN 40X3

Ø js 16	L	L1	L2	G	ISO	Z	S ■■
40	220	80	126	M16	40	4	3,0
50	275	100	148	M24	50	6	3,0
63	295	115	168	M24	50	6	3,0
32	190	60	96	M16	40	4	1,4
40	220	80	126	M16	40	4	1,4
50	275	100	148	M24	50	6	1,4
63	295	115	168	M24	50	6	1,4

617 TN

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
617KTN 40X40X1.4

Ø js 16	L	L1	L2	G	ISO	Z	S ■■
40	220	80	132	M16	40	4	3,0
50	220	100	152	M16	40	6	3,0
50	255	100	152	M24	50	6	3,0
63	275	115	173	M24	50	6	3,0
40	220	80	132	M16	40	4	1,4
50	220	100	152	M16	40	6	1,4
50	255	100	152	M24	50	6	1,4
63	275	115	173	M24	50	6	1,4

■■ SPECIFICARE IL VALORE DI "S" CON ANGOLO ELICA 20°
Spécifier la valeur "S" avec angle hélice 20° - Indicate value of "S" with 20° helix angle - Die Steigung "S" genau anzugeben mit Siralwinkel 20°

FRESE A SGROSSARE

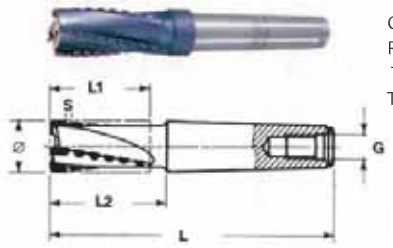
FRAISES D'ÉBAUCHE
ROUGHING END MILLS
SCHRUPPFRÄSER

QUALITÀ K10/P25

NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

417 TC

ATTACCO CONO MORSE DIN 228
ANGOLO ELICA 20°
* ATTACCO CONO MORSE DIN 2207
Queue cône Morse - Angle hélice 20°
Morse taper shank - 20° helix angle
Mit Morsekegel -Spiralwinker 20°



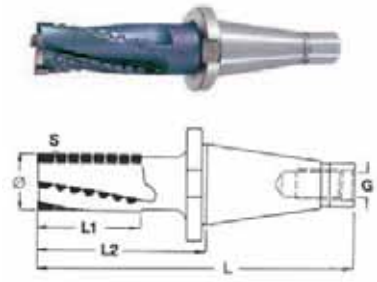
CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
417KTC 20

Ø js 16	L	L1	L2	G	CM	Z	S
20	145	45	59	M12	3	4	1,2
25	160	50	74	M12	3	4	1,2
28	160	54	74	M12	3	4	1,2
*32	213	60	81	M16	4	4	1,4
*36	213	60	81	M16	4	4	1,4
*40	228	80	96	M16	4	4	1,4

517 TC

ATTACCO ISO DIN 2080
Queue cône ISO
ISO taper shank
Mit ISO-Steilkegel



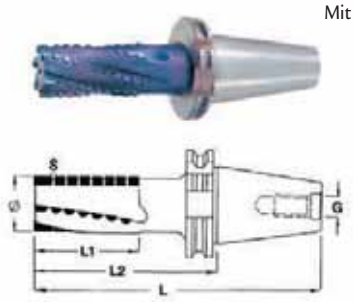
CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
517KTC 63

Ø js 16	L	L1	L2	G	ISO	Z	S
32	190	60	96	M16	40	4	1,4
40	220	80	126	M16	40	4	1,4
50	275	100	148	M24	50	6	1,4
63	295	115	168	M24	50	6	1,4

617 TC

ATTACCO ISO DIN 69871A
ANGOLO ELICA 20°
Queue cône ISO - Angle hélice 20°
ISO taper shank - 20° helix angle
Mit ISO-Steikegel - Spiralwinker 20°



CON RIVESTIMENTO TiN
Revêtues TiN
Tin -Coated
Tin-beschichtet

Esempio d'ordine | Ordering Example
617KTC 50X50

Ø js 16	L	L1	L2	G	ISO	Z	S
40	220	80	132	M16	40	4	1,4
50	220	100	152	M16	40	6	1,4
50	255	100	152	M24	50	6	1,4
63	275	115	173	M24	50	6	1,4

FRESE AD ANGOLO

FRAISES CONIQUES 2 TAILLES
SINGLES ANGLE CUTTERS
WINKELFRÄSER

QUALITÀ K10/P25

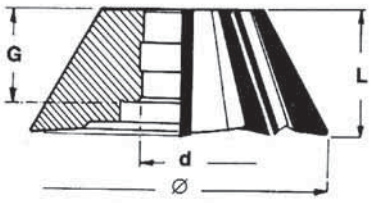
NUANCES K10/P25
GRADES K10/P25
SORTEN K10/P25

219

SIMILARE DIN 842
Semblable à - Similar to - Ähnlich



A RICHIESTA
Sur demande
On request
Auf Anfrage



Esempio d'ordine | Ordering Example
219K 63/50

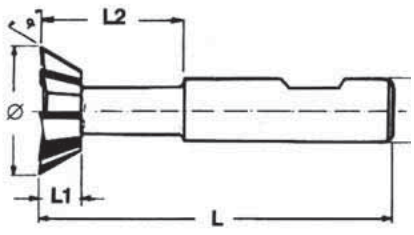
	Ø js 16	L	G	d h7	Z
α 60°	50	16	10	13	6
	63	22	12	16	8
	80	29	15	22	8
	100	37	21	27	10
	125	45	28	32	12
α 55°	50	15	10	13	6
	63	21	12	16	8
	80	27	15	22	8
	100	34	21	27	10
	125	43	28	32	12
α 50°	50	15	10	13	6
	63	20	12	16	8
	80	25	15	22	8
	100	32	21	27	10
	125	40	28	32	12

220

SIMILARE DIN 1833
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO WELDON DIN 1835B
Queue cylindrique avec méplat
Weldon cylindrical shank
Zylinderschaft mit Spannfläche





Esempio d'ordine | Ordering Example
220K 32/60

	Ø js 16	L	L1	L2	d h6	Z
α 60°	20	68	7	23	12	6
	25	70	8	25	12	6
	32	80	10	32	16	6
	40	85	12	35	20	6
α 50°	20	68	6	23	12	6
	25	70	7	25	12	6
	32	80	9	32	16	6
	40	85	11	35	20	6

FRESE PER CAVE A “T”

FRAISES POUR RAINURES À “T”

T-SLOT CUTTERS

NUTENFRÄSER T-PROFILE

QUALITÀ K10

NUANCES K10

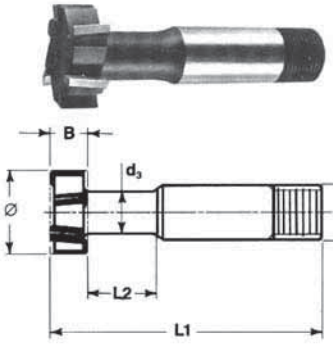
GRADES K10

SORTEN K10

241

SIMILARE DIN 851 AD

Semblable à - Similar to - Ähnlich



ATTACCO CILINDRICO
FILETTATO DIN 1835D
Queue cylindrique filetée
Threaded cylindrical shank
Zylinderschaft mit Aussenanzugsgewinde

Esempio d'ordine | Ordering Example

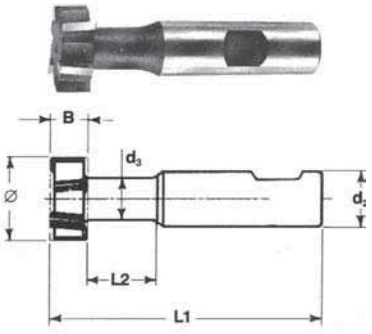
241K 19

Ø h11	L1	B k11	L2	d3	d3 h8	Z
12,5	57	6	7	5	10	6
16	62	8	10	7	10	6
19	70	9	13	8	12	6
22	74	10	16	10	12	6
25	82	11	17	12	16	6
28	85	12	20	13	16	6

242

SIMILARE DIN 851 AB

Semblable à - Similar to - Ähnlich



ATTACCO WELDON
Queue cylindrique avec méplat
Weldon cylindrical shank
Zylinderschaft mit Spannfläche

Esempio d'ordine | Ordering Example

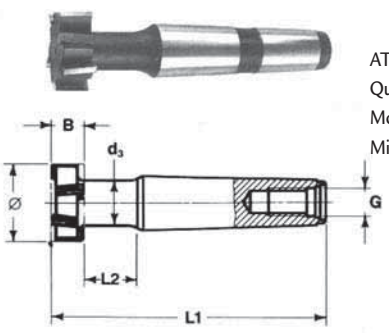
242K 19

Ø h11	L1	B k11	L2	d3	d3 h8	Z
12,5	57	6	7	5	10	6
16	62	8	10	7	10	6
19	70	9	13	8	12	6
22	74	10	16	10	12	6
25	82	11	17	12	16	6
28	85	12	20	13	16	6

240

SIMILARE DIN 851 B

Semblable à - Similar to - Ähnlich



ATTACCO CONO MORSE
Queue cône Morse
Morse taper shank
Mit Morsekegel

Esempio d'ordine | Ordering Example

240K 32

Ø h11	L1	B k11	L2	d3	G	CM	Z
22	97	10	8	10	M10	2	6
25	100	11	11	12	M10	2	6
28	104	12	14	13	M10	2	6
32	109	14	19	15	M10	2	8
36	131	16	19	17	M12	3	8
40	136	18	23	19	M12	3	8
45	141	20	27	21	M12	3	8
50	147	22	35	23	M12	3	8
56	180	24	36	28	M16	4	8

FRESE A DISCO K10

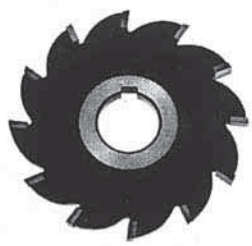
FRAISE 3 TAILLES
STAGGERED TOOTH MILLING CUTTERS
SCHEIBENFRÄSER

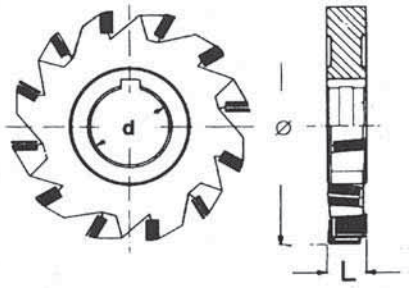
QUALITÀ K10

NUANCES K10
GRADES K10
SORTEN K10

334

SIMILARE DIN 8047 A
Semblable à - Similar to - Ähnlich





Ø js 16	L k 11	d h7	Z
63	6	22	8
63	8	22	8
63	10	22	8
63	12	22	8
80	6	27	8
80	8	27	8
80	10	27	8
80	12	27	8
100	6	27	10
100	6	32	10
100	8	27	10
100	8	32	10
100	10	27	10
100	10	32	10
100	12	27	10
100	12	32	10
100	14	27	10
100	14	32	10
100	16	27	10
100	16	32	10
125	6	32	12
125	8	32	12
125	10	32	12
125	12	32	12
125	14	32	12
125	16	32	12
125	18	32	12
125	20	32	12
160	10	40	16
160	12	40	16
160	14	40	16
160	16	40	16
160	18	40	16
160	20	40	16
200	14	40	20
200	16	40	20
200	18	40	20

Esempio d'ordine | Ordering Example
334K 100X6X27

ALESATORI CON RIPORTO IN METALLO DURO



ALÉSOIRS AVEC PLAQUETTES EN MÉTAL DUR BRASÉS

CARBIDE TIPPED REAMERS

GELÖTETE HARTMETALL- REIBAHLEN

Talicarb

ALESATORI A MACCHINA

ALÉSOIRS POUR MACHINES
MACHINE REAMERS
MASCHINENREIBAHLEN

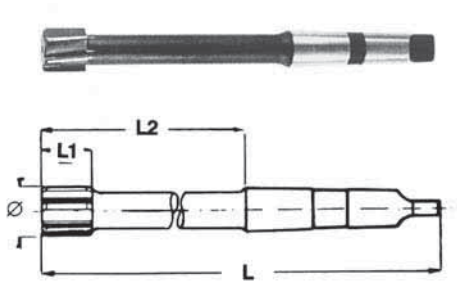
QUALITÀ K10

NUANCES K10
GRADES K10
SORTEN K10

228

SIMILARE DIN 8051
Semblable à - Similar to - Ähnlich

ATTACCO CONICO
Queue conique
Taper shank
Morsekegel



Ø H7	L	L1	L2	CM	Z
5	170	12	104	1	4
6	170	12	104	1	4
7	170	16	104	1	4
8	170	16	104	1	4
9	170	19	104	1	4
10	170	19	104	1	4
11	170	19	104	1	4
12	182	19	116	1	6
13	182	19	116	1	6
14	189	19	123	1	6
15	204	19	124	2	6
16	210	22	130	2	6
17	214	22	134	2	6
18	219	22	139	2	6
19	223	22	143	2	6
20	228	22	148	2	6
21	228	25	148	2	6
22	237	25	157	2	6
23	237	25	157	2	6
■ 24	268	25	169	3	6
■ 25	268	25	169	3	6
■ 26	273	25	174	3	6
■ 27	277	30	178	3	8
■ 28	277	30	178	3	8
■ 29	281	30	182	3	8
■ 30	281	30	182	3	8
■ 31	281	30	182	3	8
■ 32	281	30	182	3	8
■ 33	281	30	182	3	8
■ 34	310	30	186	4	8
■ 35	310	30	186	4	8
■ 36	310	30	186	4	8
■ 37	310	30	186	4	8
■ 38	310	30	186	4	8
■ 39	310	30	186	4	8
■ 40	310	30	186	4	8

■ ESECUZIONE A TAGLIENTI INCLINATI NEGATIVI
Exécution avec denture hélicoïdale negative
Helical flutes with negative rake angle
Gedrallte Ausführung mit Minus-Spanwinkel

Esempio d'ordine | Ordering Example
228K 11

ALESATORI A MACCHINA

ALÉSOIRS POUR MACHINES
MACHINE REAMERS
MASCHINENREIBAHLEN

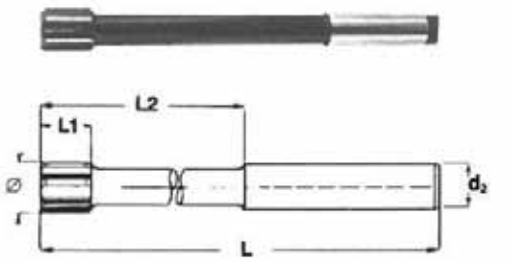
QUALITÀ K10

NUANCES K10
GRADES K10
SORTEN K10

229

SIMILARE DIN 8050
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO
Queue cylindrique
Straight shank
Zylinderschaft



■ METALLO DURO INTEGRALE
Carbure massif
Solid carbide
Vollhartmetall

Esempio d'ordine | Ordering Example
229K 5/INT

Ø H7	L	L1	L2	d2 h8	Z
■ 2/INT	49	12	28	2	4
■ 3/INT	60	15	28	3	4
■ 4/INT	75	19	42	4	4
■ 5/INT	86	21	42	5	4
5	100	12	70	5	4
6	100	12	70	6	4
7	100	16	70	8	4
8	118	16	85	8	4
9	125	19	85	10	4
10	132	19	90	10	4
11	132	19	90	12	4
12	150	19	100	12	6
13	160	19	110	14	6
14	170	19	115	14	6
15	170	19	115	16	6
16	180	22	120	16	6
17	190	22	130	18	6
18	190	22	130	18	6
19	200	22	130	20	6
20	200	22	130	20	6

ALESATORI A MACCHINA

ALÉSOIRS POUR MACHINES
MACHINE REAMERS
MASCHINENREIBAHLEN

QUALITÀ K10

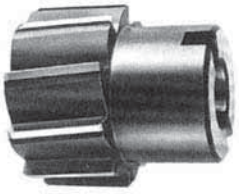
NUANCES K10
GRADES K10
SORTEN K10

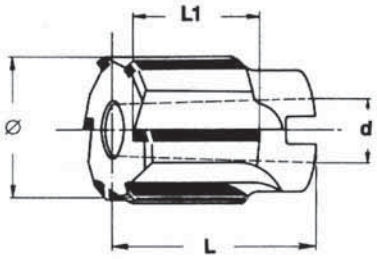
230

SIMILARE DIN 8054
Semblable à - Similar to - Ähnlich

ATTACCO A MANICOTTO
Fraise en bout
Shell end mill
Aufsteckfräser

FORO CONICO 1:30 - TAGLIENTI INCLINATI NEGATIVI
Alésage conique 1:30 - Denture hélicoïdale negative
Taper hole 1:30 - Helical flutes with negative rake angle
Konische Bohrung 1:30 - Gedrallte Ausführung mit Minus-Spanwinkel





Ø H7	L	L1	d H7	Z
30	45	30	16	6
31	45	30	16	6
32	45	30	16	6
33	45	30	16	6
34	45	30	16	6
35	45	30	16	6
36	50	30	16	6
37	50	30	16	6
38	50	30	16	6
39	50	30	16	6
40	50	30	16	6
42	50	30	19	8
43	50	30	19	8
44	50	30	19	8
45	50	30	19	8
46	56	30	19	8
47	56	30	19	8
48	56	30	19	8
49	56	30	19	8
50	56	30	19	8
52	56	30	22	10
54	63	30	22	10
55	63	30	22	10
58	63	30	22	10
60	63	30	22	10
62	63	30	27	10
65	71	30	27	10
68	71	30	27	10
69	71	30	27	10
70	71	30	27	10
72	71	30	32	12
75	71	30	32	12
80	71	30	32	12
85	71	30	32	12
90	71	40	40	12
95	71	40	40	12
100	71	40	40	12
105	71	40	40	14
110	71	40	40	14
115	71	40	40	14
120	71	40	40	14

Esempio d'ordine | Ordering Example
230K 36

ALESATORI A MACCHINA

ALÉSOIRS POUR MACHINES
MACHINE REAMERS
MASCHINENREIBAHLEN

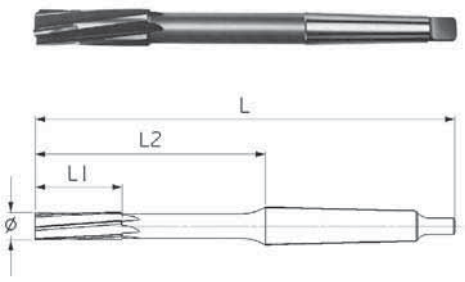
QUALITÀ K10

NUANCES K10
GRADES K10
SORTEN K10

231

SIMILARE DIN 8094
Semblable à - Similar to - Ähnlich

ATTACCO CONICO
Queue conique
Taper shank
Morsekegel



ESECUZIONE A TAGLIENTI INCLINATI NEGATIVI
Exécution avec denture hélicoïdale negative
Helical flutes with negative rake angle
Gedrallte Ausführung mit Minus-spanwinkel

* Talicarb Norm

Esempio d'ordine | Ordering Example
231 10

Ø H7	L	L1	L2	CM	Z
*5	133	30	67	1	4
*6	138	30	72	1	4
*7	150	30	84	1	4
8	156	30	90	1	4
9	162	30	96	1	4
10	168	45	102	1	6
11	175	45	109	1	6
12	182	45	116	1	6
13	182	45	116	1	6
14	189	45	123	1	6
15	204	45	124	2	6
16	210	45	130	2	6
17	214	56	134	2	6
18	219	56	139	2	6
19	223	56	143	2	6
20	228	56	148	2	6
21	232	56	152	2	6
22	237	56	157	2	6
23	241	56	161	2	6
24	268	70	169	3	6
25	268	70	169	3	6
26	273	70	174	3	6
27	277	70	178	3	6
28	277	70	178	3	6
29	281	70	182	3	6
30	281	70	182	3	6
31	285	70	186	3	6
32	317	70	193	4	6
34	321	70	197	4	6
35	321	70	197	4	6
36	325	70	201	4	6
38	329	70	205	4	6
40	329	70	205	4	6

ALESATORI A MACCHINA

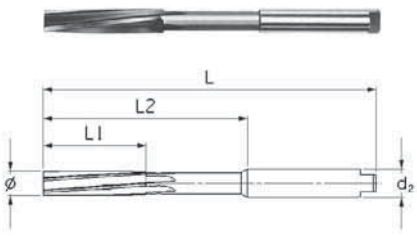
ALÉSOIRS POUR MACHINES
MACHINE REAMERS
MASCHINENREIBAHLEN

QUALITÀ K10

NUANCES K10
GRADES K10
SORTEN K10

232

SIMILARE DIN 8093
Semblable à - Similar to - Ähnlich



ATTACCO CILINDRICO
Queue cylindrique
Straight shank
Zylinderschaft

ESECUZIONE A TAGLIENTI INCLINATI NEGATIVI
Exécution avec denture hélicoïdale negative
Helical flutes with negative rake angle
Gedrallte Ausführung mit Minus-spanwinkel

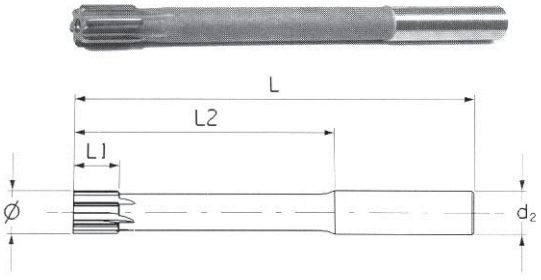
Esempio d'ordine | Ordering Example
231 10

Ø H7	L	L1	L2	d2 e9	Z
6	93	26	57	5	4
7	109	31	69	7	4
8	117	33	75	8	4
9	125	36	81	9	4
10	133	38	87	10	6
11	142	41	96	10	6
12	151	44	105	10	6
13	151	44	105	10	6
14	160	47	110	12	6
15	162	50	112	12	6
16	170	52	120	12	6
17	175	54	123	14	6
18	182	56	130	14	6
19	189	58	131	16	6
20	195	60	137	16	6

233

TALICARB NORM
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO CON REFRIGERAZIONE RADIALE*
Queue cylindrique Sortie du réfrigerant à côté du coupant
Straight shank With inner coolant feed - outlet at blade level
Zylinderschaft Mit innenkühlung aus den Schneiden



* Art 233A - Su richiesta attacco cilindrico con refrigerazione assiale
-Sur demande sortie du réfrigérant au centre - On request outlet from centre
Auf Anfrage Innenkühlung aus der Mitte

Esempio d'ordine | Ordering Example
233 13

Ø H7	L	L1	L2	d2 e9	Z
6	123	12	85	12	4
8	123	16	85	12	4
9	123	19	85	12	6
10	160	19	115	12	6
11	160	19	115	12	6
12	160	19	115	12	6
13	160	19	115	12	6
14	160	19	115	12	6
15	160	19	115	12	6
16	180	22	130	16	6
17	180	22	130	16	6
18	180	22	130	16	6
19	200	22	140	20	6
20	200	22	140	20	6
21	200	22	140	20	6
22	200	22	140	20	6
23	200	22	140	20	6
24	200	22	140	20	6
25	200	22	140	20	6
26	210	22	150	25	6
27	210	22	150	25	6
28	210	22	150	25	6
29	210	22	150	25	6
30	210	22	150	25	6

ALESATORI A MACCHINA

ALÉSOIRS POUR MACHINES
MACHINE REAMERS
MASCHINENREIBAHLEN

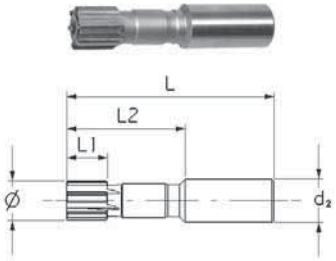
QUALITÀ K10

NUANCES K10
GRADES K10
SORTEN K10

234

TALICARB NORM
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO CON REFRIGERAZIONE RADIALE*
Queue cylindrique Sortie du réfrigerant à côté du coupant
Straight shank With inner coolant feed - outlet at blade level
Zylinderschaft Mit innenkühlung aus den Schneiden



* Art 234A - Su richiesta attacco cilindrico con refrigerazione assiale
-Sur demande sortie du réfrigérant au centre - On request outlet from centre
Auf Anfrage Innenkühlung aus der Mitte

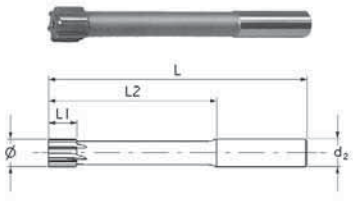
Esempio d'ordine | Ordering Example
234 15

Ø H7	L	L1	L2	d2 h6	Z
8	78	16	40	12	4
9	88	19	50	12	6
10	95	19	50	12	6
11	95	19	50	12	6
12	95	19	50	12	6
13	95	19	50	12	6
14	95	19	50	12	6
15	95	19	50	12	6
16	100	22	50	16	6
17	100	22	50	16	6
18	100	22	50	16	6
19	120	22	60	20	6
20	120	22	60	20	6
21	120	22	60	20	6
22	120	22	60	20	6
23	120	22	60	20	6
24	120	22	60	20	6
25	120	22	60	20	6
26	135	22	75	20	6
27	135	22	75	25	6
28	135	22	75	25	6
29	135	22	75	25	6
30	135	22	75	25	6

T235

TALICARB NORM
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO CON REFRIGERAZIONE RADIALE*
Queue cylindrique Sortie du réfrigerant à côté du coupant
Straight shank With inner coolant feed - outlet at blade level
Zylinderschaft Mit innenkühlung aus den Schneiden



ALESATORI REGISTRABILI - ESPANSIONE MAX 0,1 MM PER IL Ø NOMINALE
Alésoirs expansible - développment max 0,1 mm au delá du diamètre nominal
Expanding reamers - max expansion 0,1 mm above the nominal diameter
Nachstellbar Reihbahlen - nachstellbereich max. 0,1 mm über dem Nenndurchmesser

* Art 235A - Su richiesta attacco cilindrico con refrigerazione assiale
-Sur demande sortie du réfrigérant au centre - On request outlet from centre
Auf Anfrage Innenkühlung aus der Mitte

Esempio d'ordine | Ordering Example
T235 17

Ø H7	L	L1	L2	d2 h6	Z
8	123	16	85	12	4
9	123	19	85	12	4
10	160	19	115	12	6
11	160	19	115	12	6
12	160	19	115	12	6
13	160	19	115	12	6
14	160	19	115	12	6
15	160	19	115	12	6
16	180	22	130	16	6
17	180	22	130	16	6
18	180	22	130	16	6
19	200	22	140	20	6
20	200	22	140	20	6
21	200	22	140	20	6
22	200	22	140	20	6
23	200	22	140	20	6
24	200	22	140	20	6
25	200	22	140	20	6
26	210	22	150	25	6
27	210	22	150	25	6
28	210	22	150	25	6
29	210	22	150	25	6
30	210	22	150	25	6

ALESATORI A MACCHINA

ALÉSOIRS POUR MACHINES
MACHINE REAMERS
MASCHINENREIBAHLEN

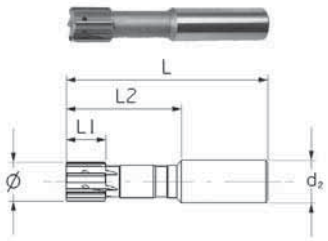
QUALITÀ CERMET (SU RICHIESTA)

NUANCES CERMET (Sur demande)
GRADES CERMET (On request)
SORTEN CERMET (Auf Anfrage)

236

TALICARB NORM
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO CON REFRIGERAZIONE RADIALE*
Queue cylindrique Sortie du réfrigerant à côté du coupant
Straight shank With inner coolant feed - outlet at blade level
Zylinderschaft Mit innenkühlung aus den Schneiden



* Art 236A - Su richiesta attacco cilindrico con refrigerazione assiale
Sur demande sortie du réfrigérant au centre - On request outlet from centre
Auf Anfrage Innenkühlung aus der Mitte

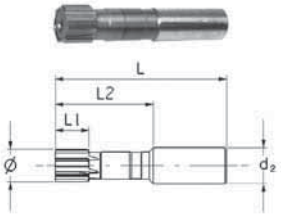
Esempio d'ordine | Ordering Example
236 12

Ø H7	L	L1	L2	d2 e9	Z
8	78	16	40	12	4
9	88	19	50	12	4
10	95	19	50	12	6
11	95	19	50	12	6
12	95	19	50	12	6
13	95	19	50	12	6
14	95	19	50	12	6
15	95	19	50	12	6
16	100	22	50	16	6
17	100	22	50	16	6
18	100	22	50	16	6
19	120	22	60	20	6
20	120	22	60	20	6
21	120	22	60	20	6
22	120	22	60	20	6
23	120	22	60	20	6
24	120	22	60	20	6
25	120	22	60	20	6
26	135	22	75	25	6
27	135	22	75	25	6
28	135	22	75	25	6
29	135	22	75	25	6
30	135	22	75	25	6

237

TALICARB NORM
Semblable à - Similar to - Ähnlich

ATTACCO CILINDRICO CON REFRIGERAZIONE RADIALE*
Queue cylindrique Sortie du réfrigerant à côté du coupant
Straight shank With inner coolant feed - outlet at blade level
Zylinderschaft Mit innenkühlung aus den Schneiden



ALESATORI REGISTRABILI - ESPANSIONE MAX 0,1 mm PER IL Ø NOMINALE
Alésoirs expansible - développment max 0,1 mm au delá du diamètre nominal
Expanding reamers - max expansion 0,1 mm above the nominal diameter
Nachstellbar Reihbahlen - nachstellbereich max. 0,1 mm über dem Nenndurchmesser

* Art 236A - Su richiesta attacco cilindrico con refrigerazione assiale
Sur demande sortie du réfrigérant au centre - On request outlet from centre
Auf Anfrage Innenkühlung aus der Mitte

Esempio d'ordine | Ordering Example
237 14

Ø H7	L	L1	L2	d2 e9	Z
8	78	16	40	12	4
9	88	19	50	12	4
10	95	19	50	12	6
11	95	19	50	12	6
12	95	19	50	12	6
13	95	19	50	12	6
14	95	19	50	12	6
15	95	19	50	12	6
16	100	22	50	16	6
17	100	22	50	16	6
18	100	22	50	16	6
19	120	22	60	20	6
20	120	22	60	20	6
21	120	22	60	20	6
22	120	22	60	20	6
23	120	22	60	20	6
24	120	22	60	20	6
25	120	22	60	20	6
26	135	22	75	25	6
27	135	22	75	25	6
28	135	22	75	25	6
29	135	22	75	25	6
30	135	22	75	25	6

TABELLE TECNICHE
TOLLERANZE



TABLEAUX TECHNIQUES - TOLÉRANCES

TECHNICAL MANUFACTURING DATA - TOLERANCES

RICHTWEITTABELLEN - HERSTELLUNGS TOLERANZE

Talicarb

VALORI ORIENTATIVI DI FRESATURA - VELOCITÀ - AVANZAMENTO

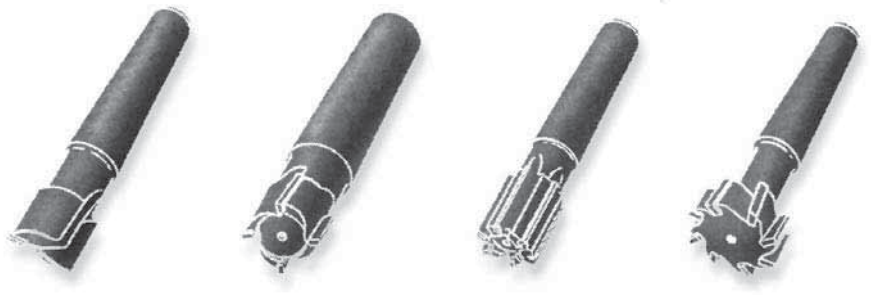
PARAMÉTRES INDICATIFS POUR FRAISAGE - VITESSE-AVANCE

MILLING APPROXIMATE PARAMETERS - SPEEDFEED

RICHTWERTTABELLE FÜR FRÄSER - SCHNITTGESCHWINDIGKEIT UND VORSCHUB

A = VALORI PER FRESE INFERIORI m/m 20
Pour fraises jusqu'à 20 m/m de diamétre - For mills to 20 m/m diameter - Für Fräserdurchmesse s 20 m/m

B = VALORI PER FRESE DA m/m 20 FINO A m/m 40
Pour fraises de 20 m/m à 40 m/m de diamétre - For mills from 20 m/m to 40 m/m diameter - Für Fräserdurchmesser von 20 m/m bis 40 m/m



ACCIAI NON LEGATI CON BASSO TENORE DI CARBONIO
Aciers non alliés avec faible teneur en carbone
Unalloyed steel low carbon
Nichtlegierte niedriggekohlte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,06 - 0,12	0,04 - 0,08	90 - 170	120 - 230
B	0,06 - 0,2	0,04 - 0,1	90 - 170	120 - 230

ACCIAI NON LEGATI O DEBOLMENTE LEGATI R= da450 a 850 N/mm²
Aciers non alliés ou faiblement alliés
Unalloyed or weakly alloyed steels
Nicht-oder niedriglegierte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,06 - 0,12	0,04 - 0,08	70 - 140	100 - 180
B	0,06 - 0,15	0,04 - 0,1	70 - 140	100 - 180

ACCIAI FUSI DI MEDIA QUALITÀ
Aciers coulés de moyenne qualité
Medium quality cast steel
Stahlguss mittlerer Qualität

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,06 - 0,12	0,04 - 0,08	50 - 140	60 - 180
B	0,06 - 0,15	0,04 - 0,1	50 - 140	60 - 180

ACCIAI FORTEMENTE LEGATI R= da 1000 a 1600 N/mm²
Aciers fortement alliés
Highly alloyed steels
Hochlegierte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,05 - 0,1	0,04 - 0,08	55 - 90	65 - 100
B	0,05 - 0,1	0,04 - 0,08	55 - 90	65 - 100

GHISA GRIGIA DI MEDIA DUREZZA
Fonte grise de moyenne dureté
Medium hardness grey cast iron
Grauguss mittlerer Härta

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,06 - 0,12	0,04 - 0,08	50 - 80	60 - 90
B	0,06 - 0,2	0,04 - 0,15	50 - 80	60 - 90

LEGHE LEGGERE (AlSi)
Alliages légers (AlSi)
Light alloys (AlSi)
AlSi-Legierungen

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,05 - 0,2	0,03 - 0,08	300 - 800	400 - 900
B	0,05 - 0,2	0,03 - 0,1	300 - 800	400 - 900

VALORI ORIENTATIVI DI FRESATURA - VELOCITÀ - AVANZAMENTO

PARAMÉTRES INDICATIFS POUR FRAISAGE - VITESSE-AVANCE

MILLING APPROXIMATE PARAMETERS - SPEEDFEED

RICHTWERTTABELLE FÜR FRÄSER - SCHNITTGESCHWINDIGKEIT UND VORSCHUB

A = VALORI PER FRESE FRONTALI CON FORO
Pour fraises 2 tailles avec trou - For end mills with hole - Richtwerte für Aufsteckfräser

B = VALORI PER FRESE FRONTALI CON GAMBO
Pour fraises 2 tailles avec queue - For schank end mills - Richtwerte für Schaftfräser



ACCIAI NON LEGATI CON BASSO TENORE DI CARBONIO
Aciers non alliés avec faible teneur en carbone
Unalloyed steel low carbon
Nichtlegierte niedriggekohlte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,4	0,1 - 0,2	80 - 170	100 - 230
B	0,08 - 0,2	0,06 - 0,1	90 - 170	120 - 230

ACCIAI NON LEGATI O DEBOLMENTE LEGATI R= da450 a 850 N/mm²
Aciers non alliés ou faiblement alliés
Unalloyed or weakly alloyed steels
Nicht-oder niedriglegierte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,4	0,1 - 0,2	70 - 140	100 - 180
B	0,08 - 0,2	0,08 - 0,2	70 - 140	100 - 180

ACCIAI FUSI DI MEDIA QUALITÀ
Aciers coulés de moyenne qualité
Medium quality cast steel
Stahlguss mittlerer Qualität

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,4	0,1 - 0,2	50 - 140	60 - 140
B	0,08 - 0,2	0,06 - 0,1	50 - 140	60 - 140

ACCIAI FORTEMENTE LEGATI R= da 1000 a 1600 N/mm²
Aciers fortement alliés
Highly alloyed steels
Hochlegierte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,2	0,1	55 - 90	55 - 100
B	0,06 - 0,15	0,05 - 0,1	50 - 90	65 - 100

GHISA GRIGIA DI MEDIA DUREZZA
Fonte grise de moyenne dureté
Medium hardness grey cast iron
Grauguss mittlerer Härta

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,4	0,1 - 0,2	60 - 90	70 - 120
B	0,08 - 0,2	0,06 - 0,1	60 - 90	70 - 120

LEGHE LEGGERE (AlSi)
Alliages légers (AlSi)
Light alloys (AlSi)
AlSi-Legierungen

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,06 - 0,12	0,04 - 0,08	70 - 140	100 - 180
B	0,06 - 0,15	0,04 - 0,1	70 - 140	100 - 180

VALORI ORIENTATIVI DI FRESATURA - VELOCITÀ - AVANZAMENTO

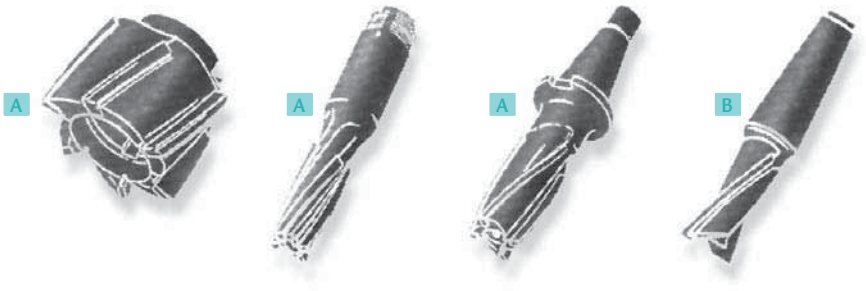
PARAMÉTRES INDICATIFS POUR FRAISAGE - VITESSE-AVANCE

MILLING APPROXIMATE PARAMETERS - SPEEDFEED

RICHTWERTTABELLE FÜR FRÄSER - SCHNITTGESCHWINDIGKEIT UND VORSCHUB

A = VALORI PER FRESE ELICOIDALI CON PIÙ TAGLI
Pour fraises hélicoïdales avec plusieurs dents - For helical end mills with several flutes - Richtwerte für multi-Schneidende Spiralfräser

B = VALORI PER FRESE ELICOIDALI CON 2 TAGLI
Pour fraises hélicoïdales avec 2 dents - For helical 2 flute end mills - Richtwerte für Zweischneidende Spiralfräser



ACCIAI NON LEGATI CON BASSO TENORE DI CARBONIO
Aciers non alliés avec faible teneur en carbone
Unalloyed steel low carbon
Nichtlegierte niedriggekohlte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A		0,04 - 0,15		90 - 200

ACCIAI NON LEGATI O DEBOLMENTE LEGATI R= da450 a 850 N/mm²
Aciers non alliés ou faiblement alliés
Unalloyed or weakly alloyed steels
Nicht-oder niedriglegierte Stähle

AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
	0,04 - 0,15		90 - 200

ACCIAI FUSI DI MEDIA QUALITÀ
Aciers coulés de moyenne qualité
Medium quality cast steel
Stahlguss mittlerer Qualität

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A		0,04 - 0,15		60 - 180

ACCIAI FORTEMENTE LEGATI R= da 1000 a 1600 N/mm²
Aciers fortement alliés
Highly alloyed steels
Hochlegierte Stähle

AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
			90 - 200

GHISA GRIGIA DI MEDIA DUREZZA
Fonte grise de moyenne dureté
Medium hardness grey cast iron
Grauguss mittlerer Härta

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A		0,04 - 0,2		60 - 100
B	0,06 - 0,2	0,05 - 0,15	50 - 80	

LEGHE LEGGERE (AlSi)
Alliages légers (AlSi)
Light alloys (AlSi)
AlSi-Legierungen

AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
0,05 - 0,2	0,03 - 0,1	300 - 800	400 - 900
0,05 - 0,2	0,03 - 0,2	300 - 800	400 - 900

VALORI ORIENTATIVI DI FRESATURA - VELOCITÀ - AVANZAMENTO

PARAMÉTRES INDICATIFS POUR FRAISAGE - VITESSE-AVANCE

MILLING APPROXIMATE PARAMETERS - SPEEDFEED

RICHTWERTTABELLE FÜR FRÄSER - SCHNITTGESCHWINDIGKEIT UND VORSCHUB

A = VALORI PER FRESE FRONTALI
Pour fraises deux tailles - For end mills - Richtwerte für Aufsteckfräser

B = VALORI PER FRESE AD ANGOLO
Pour fraises conique deux tailles · For single angle milling cutters · Richtwerte für Winkelfräser

C = VALORI PER FRESE A TRE TAGLI ALTERNATI
Pour fraises trois tailles alternés - For staggered side-tooth milling cutters - Richtwerte für Scheibenfräser

A 

B 

C 

ACCIAI NON LEGATI CON BASSO TENORE DI CARBONIO
Aciers non alliés avec faible teneur en carbone
Unalloyed steel low carbon
Nichtlegierte niedriggekohlte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,3	0,1 - 0,2	80 - 150	100 - 190

ACCIAI NON LEGATI O DEBOLMENTE LEGATI R= da450 a 850 N/mm²
Aciers non alliés ou faiblement alliés
Unalloyed or weakly alloyed steels
Nicht-oder niedriglegierte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,3	0,1 - 0,2	60 - 120	80 - 150

ACCIAI FUSI DI MEDIA QUALITÀ
Aciers coulés de moyenne qualité
Medium quality cast steel
Stahlguss mittlerer Qualität

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,3	0,1 - 0,2	50 - 90	60 - 110

ACCIAI FORTEMENTE LEGATI R= da 1000 a 1600 N/mm²
Aciers fortement alliés
Highly alloyed steels
Hochlegierte Stähle

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,3	0,1	45 - 80	50 - 90

GHISA GRIGIA DI MEDIA DUREZZA
Fonte grise de moyenne dureté
Medium hardness grey cast iron
Grauguss mittlerer Härta

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,1 - 0,3	0,1 - 0,2	60 - 80	70 - 90
B	0,06 - 0,2	0,04 - 0,15	50 - 80	60 - 90
C	0,12 - 0,2	0,05 - 0,12	50 - 70	60 -90

LEGHE LEGGERE (AlSi)
Alliages légers (AlSi)
Light alloys (AlSi)
AlSi-Legierungen

	AVANZAMENTO PER DENTE Avance par dent Feed per flute Vorschub pro Schneide		VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	
	SGROSSATURA S_z [mm] Dégrossisage - Roughing Schruppen	FINITURA S_z [mm] Finissage - Finishing Schlichten	SGROSSATURA v [m/min] Dégrossisage - Roughing Schruppen	FINITURA v [m/min] Finissage - Finishing Schlichten
A	0,05 - 0,2	0,05 - 0,1	300 - 800	400 - 1000
B				
C		0,15 - 0,3		200 - 600

TABELLA DI CONVERSIONE DELLA VELOCITÀ PER FRESE CON RIPORTO IN METALLO DURO

TABELLE DE CONVERSION DE VITESSE POUR FRAISES BRASÉES

CONVERSION CHART OF CUTTING SPEED FOR CARBIDE TIPPED END MILLS

UMRECHNUNG DER SCHNITTGESCHWINDIGKEIT FÜR HARTMETALL-BESTÜCKTE FRÄSER



Ø FRESA Fraise Mill - Fräser	VELOCITÀ DI TAGLIO IN METRI AL MINUTO PRIMO Vitesse de coupe m/mm Cutting speed m/mm Schnittgeschwindigkeit m/mm								
	30	40	50	60	80	100	120	150	200
16	595	795	995	1195	1590	1990	2385	2985	3980
18	530	705	885	1060	1415	1770	2120	2650	3535
20	475	635	795	955	1275	1590	1910	2385	3185
25	380	510	635	765	1020	1275	1525	1910	2545
28	340	455	570	680	910	1135	1365	1705	2275
32	300	395	495	595	795	995	1195	1490	1990
40	240	320	395	475	635	790	955	1185	1580
50	190	255	315	380	505	630	765	945	1260
63	150	200	250	300	405	505	605	760	1010
80	120	160	200	240	320	400	480	600	800
100	95	130	160	190	255	320	380	480	640
125	75	100	125	150	200	250	305	375	500
160	60	80	100	120	160	200	240	300	400

I NOSTRI SERVIZI SEMPRE A VOSTRA DISPOSIZIONE · PROMPT SERVICES ALWAYS READY FOR YOU



SERVIZIO TECNICO

TECHNICAL SUPPORT



SERVIZIO DI RIAFFILATURA E RIVESTIMENTO

RE-SHARPENING AND COATING SERVICE



UTENSILI SPECIALI

SPECIAL-TOOLS DEPARTMENT



E-COMMERCE

VELOCITÀ DI TAGLIO E AVANZAMENTO IN ALESATURA

VITESSE DE COUPE ET AVANCE POUR ALÉSAGE

CUTTING SPEED AND FEED FOR REAMING

FÜR DIE EINZELNEN WERKSTOFFE EMPFOHLENE REIBAHLEN-SCHNITTGESWINDIGKEITEN UND VORSCHÜBE

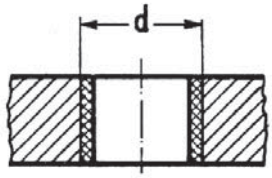
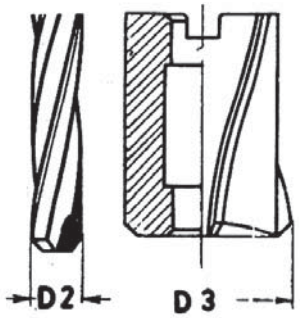
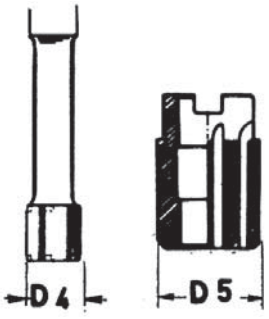


MATERIALI Matière Material Werkstoff	VELOCITÀ DI TAGLIO Vitesse de coupe Cutting speed Schnittgeschwindigkeit	AVANZAMENTI PER GIRO CON ALESATORI DI Ø Avance par tour avec alésoirs de Ø Feed per turn with reamers of Ø Vorschub pro Umdrehung je. nach Ø			REFRIGERANTE Réfrigérant Coolan Schmierung
	m/min	FINO A Jusqu'à - To - Bis 10 mm	FINO A Jusqu'à - To - Bis 20 mm	OLTRE Plus de - Over - Über 20 mm	
ACCIAIO con Acier avec - Steel with - Stahl mit **R = 1000 N/mm²**	10 ÷ 15	0,2	0,4	0,6	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
GHISA con Fonte avec - Cast iron with - Guesseisen mit **R = 180-220 N/mm²**	10 ÷ 15	0,2	0,4	0,6	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
GHISA con Fonte avec - Cast iron with - Guesseisen mit **R = 260-330 N/mm²**	8 ÷ 12	0,2	0,4	0,6	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
GHISA con Fonte avec - Cast iron with - Guesseisen mit **HB 400**	6 ÷ 10	0,2	0,3	0,4	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
GHISA DURA IN CONCHIGLIA Fonte dure en conquille Chilled cast iron - Hartguss	6 ÷ 8	0,15	0,2	0,3	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
ACCIAIO LEGATO Cr Ni con Acier allié Cr Ni avec Cr Ni alloyed steel with Cr Ni-Legierter Stahl **1000 N/mm²**	10 ÷ 12	0,2	0,4	0,5	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
ACCIAIO LEGATO Cr Ni con Acier allié Cr Ni avec Cr Ni alloyed steel with Cr Ni-Legierter Stahl **1400 N/mm²**	6 ÷ 8	0,15	0,3	0,4	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
OTTONE – BRONZO Laiton-Bronze Brass-Bronze Messing-Bronze	15 ÷ 30	0,2	0,4	0,6	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
BRONZO DURO Bronze au manganèse Manganese Bronze Mangan Bronze	12 ÷ 25	0,15	0,3	0,5	ACQUA EMULS. – OLIO Emulsion d'huile - Huile Oil-in-water,emulsion - Oil öl-in-wasser-Emulsion - Erdöl
ALLUMINIO E SUE LEGHE Aluminium et alliages Aluminium and alloys Alu-Legierungen	15 ÷ 30	0,2	0,4	0,6	PETROLIO – ALCOOL Pétrole - alcool Petroleum - alcohol Erdöl - Alkohol
MATERIALI SINTETICI Matières synthétiques - Plastics Thermoplastische Kunststoffe	15 ÷ 30	0,2	0,4	0,6	A SECCO A sec - Without - Ohne

PREFORI PER ALLARGATURA ED ALESATURA

PRÉTROUS POUR ÉVASEMENT ET ALÉSAGE
TAPPING DRILLS FOR COUNTER BORING AND REAMING
KERNLOCHDURCHMESSER FÜR AUFBOHREN UND REIBEN

ESEMPI PER ESECUZIONE DI FORI H 7 - H 8 - E 9
Examples avec trous H7 - H8 - E9
Examples with H7 - H8 - E9 holes
Beispiele mit Bohrungen H7 - H8 - E9

LAVORAZIONE Usinage Working Bearbeitungsbeschreibung				FORATURA Perçage Drilling Bohren	ALLARGATURA Èvasement Counterboring Aufbohren			ALESATURA Alésage Reaming Reiben		
										
DIAMETRO NOMINALE Diamétre nominal Nominal diameter Nenndurchmesser	TOLLERANZA Tolérance Tolerance Toleranz						MATERIALE DA ASPORTARE Matière à emporter Material to remove Abtragungszugabe			MATERIALE DA ASPORTARE Matière à emporter Material to remove Abtragungszugabe
d	H7	H8	E9	D1	D2	D3		D4	D5	
9	0	0	+ 0,025	7,5	8,8	–	1,3	9	–	0,2
10	+ 0,015	+ 0,022	+ 0,061	8,5	9,8	–		10	–	
11				9,5	10,8	–		11	–	
12				10,5	11,8	–		12		–
14	0	0	+ 0,032	12,5	13,8	–		14		–
15	+ 0,018	+ 0,027	+ 0,075	13,5	14,8	–	1,3	15	–	0,2
16				14,5	15,8	–		16		–
18				16,5	17,8	–		18		–
20				18	19,7	–	1,7	20		20
22				20	21,7	–		22		22
24	0	0	+ 0,040	21,5	23,7	–		24		24
25	+ 0,021	+ 0,033	+ 0,092	22,5	24,7	24,7	2,2	25	25	0,3
28				25,5	27,7	27,7		28		28
30				27,5	29,7	29,7		30		30
32				29	31,6	31,6		32		32
34				31	33,6	33,6		–		34
36				33	35,6	35,6		–		36
38	0	0	+ 0,050	35	37,6	37,6	2,6	–		38
40	+ 0,025	+ 0,039	+ 0,112	37	39,6	39,6		–		40
42				39	41,6	41,6		–		42
45				42	44,6	44,6		–		45
50				47	49,6	49,6		–		50
52				49	–	51,6	2,6	–	52	0,4
56				52	–	55,6		–		56
60				56	–	59,6	3,6	–		60
63	0	0	+ 0,060	59	–	62,6		–		63
68	+ 0,030	+ 0,046	+ 0,134	64	–	67,6		–		68
70				65	–	69,6		–		70
75				70	–	74,6	4,6	–		75
80				75	–	79,6		–		80

TOLLERANZE RELATIVE ALLA COSTRUZIONE DI FRESE

TOLÉRANCES RELATIVES À LA CONSTRUCTION DE FRAISES
BUILDING TOLERANCES FOR MILLING CUTTERS
HERSTELLUNGS-TOLERANZEN FÜR FRÄSER

VALORI ESPRESSI IN MICRON
Valeurs en Micron
Values in Micron
Werte in µm. Ausgedrückt



Ø	h_8	h_{11}	k_{11}	k_{16}	f_8	e_8	d_9	j^s_{16}	s_{15}
1 ÷ 3	0 - 14	0 - 60	+ 60 0	+ 600 0	- 6 - 20	- 14 - 28	- 20 - 45	+ 300 - 300	+ 415 + 15
3 ÷ 6	0 - 18	0 - 75	+ 75 0	+ 750 0	- 10 - 28	- 20 - 38	- 30 - 60	+ 375 - 375	+ 499 + 19
6 ÷ 10	0 - 22	0 - 90	+ 90 0	+ 900 0	- 13 - 35	- 25 - 47	- 40 - 76	+ 450 - 450	+ 603 + 23
10 ÷ 18	0 - 27	0 - 110	+ 110 0	+ 1100 0	- 16 - 43	- 32 - 59	- 50 - 93	+ 550 - 550	+ 728 + 28
18 ÷ 30	0 - 33	0 - 130	+ 130 0	+ 1300 0	- 20 - 53	- 40 - 73	- 65 - 117	+ 650 - 650	+ 875 + 35
30 ÷ 50	0 - 39	0 - 160	+ 160 0	+ 1600 0	- 25 - 64	- 50 - 89	- 80 - 142	+ 800 - 800	+ 1043 + 43
50 ÷ 65	0 - 46	0 - 190	+ 190 0	+ 1900 0	- 30 - 76	- 60 - 106	- 100 - 174	+ 950 - 950	+ 1250 + 53
80 ÷ 100	0 - 54	0 - 220	+ 220 0	+ 2200 0	- 36 - 90	- 72 - 126	- 120 - 207	+ 110 - 1100	- -
100 ÷ 120	0 - 54	0 - 220	+ 220 0	+ 2200 0	- 36 - 90	- 72 - 126	- 120 - 207	+ 1100 - 1100	- -
120 ÷ 140	0 - 63	0 - 250	+ 250 0	+ 2500 0	- 43 - 106	- 85 - 148	- 145 - 245	+ 1250 - 1250	- -
140 ÷ 160	0 - 63	0 - 250	+ 250 0	+ 2500 0	- 43 - 106	- 85 - 148	- 145 - 245	+ 1250 - 1250	- -
160 ÷ 180	0 - 63	0 - 250	+ 250 0	+ 2500 0	- 43 - 106	- 85 - 148	- 145 - 245	+ 1250 - 1250	- -
180 ÷ 200	0 - 72	0 - 290	+ 290 0	+ 2900 0	- 52 - 122	- 100 - 172	- 170 - 285	+ 1450 - 1450	- -

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ECONOMIA ED ECOLOGIA IN ARMONIA
ENVIRONMENTAL FRIENDLY POLICY

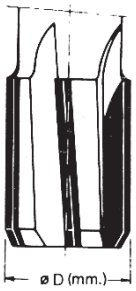
TOLLERANZE RELATIVE ALLA COSTRUZIONE DI ALESATORI

TOLÉRANCES RELATIVES À LA CONSTRUCTION D'ALÉSOIRS

BUILDING TOLERANCES FOR REAMERS

HERSTELLUNGS-TOLERANZEN FÜR REIBAHLEN

VALORI ESPRESSI IN MICRON
Valeurs en Micron
Values in Micron
Werte in µm. Ausgedrückt



Ø	A9	A11	B8	B9	B11	C8	C9	C11
1 ÷ 3	+ 291 + 282	+ 321 + 300	+ 151 + 146	+ 161 + 152	+ 191 + 170	+ 71 + 66	+ 81 + 72	+ 111 + 90
3 ÷ 6	+ 295 + 284	+ 333 + 306	+ 155 + 148	+ 165 + 154	+ 203 + 176	+ 85 + 78	+ 95 + 84	+ 133 + 106
6 ÷ 10	+ 310 + 297	+ 365 + 324	+ 168 + 160	+ 180 + 167	+ 226 + 194	+ 98 + 90	+ 110 + 97	+ 156 + 124
10 ÷ 18	+ 326 + 310	+ 383 + 344	+ 172 + 162	+ 186 + 170	+ 243 + 204	+ 117 + 107	+ 131 + 115	+ 188 + 149
18 ÷ 30	+ 344 + 325	+ 410 + 364	+ 188 + 176	+ 204 + 185	+ 270 + 224	+ 138 + 126	+ 154 + 135	+ 220 + 174
30 ÷ 40	+ 362 + 340	+ 446 + 390	+ 203 + 189	+ 222 + 200	+ 306 + 250	+ 153 + 139	+ 172 + 150	+ 256 + 200
40 ÷ 50	+ 372 + 350	+ 456 + 400	+ 215 + 199	+ 232 + 210	+ 316 + 260	+ 163 + 149	+ 182 + 160	+ 266 + 210
50 ÷ 65	+ 402 + 376	+ 501 + 434	+ 229 + 212	+ 252 + 226	+ 351 + 284	+ 179 + 162	+ 202 + 176	+ 301 + 234
65 ÷ 80	+ 422 + 396	+ 521 + 454	+ 239 + 222	+ 262 + 236	+ 361 + 294	+ 189 + 172	+ 212 + 186	+ 311 + 244
80 ÷ 100	+ 453 + 422	+ 567 + 490	+ 265 + 246	+ 293 + 262	+ 407 + 330	+ 215 + 196	+ 243 + 212	+ 357 + 280
100 ÷ 120	+ 483 + 452	+ 597 + 520	+ 283 + 266	+ 313 + 282	+ 427 + 350	+ 225 + 206	+ 253 + 222	+ 367 + 290
120 ÷ 140	+ 545 + 510	+ 672 + 584	+ 313 + 290	+ 345 + 310	+ 472 + 384	+ 253 + 230	+ 285 + 250	+ 412 + 324
140 ÷ 160	+ 605 + 570	+ 732 + 644	+ 333 + 310	+ 365 + 330	+ 492 + 404	+ 263 + 240	+ 295 + 260	+ 422 + 334
160 ÷ 180	+ 665 + 630	+ 792 + 704	+ 363 + 340	+ 395 + 360	+ 522 + 434	+ 283 + 260	+ 315 + 280	+ 442 + 354

Ø	D8	D9	D10	D11	E7	E8	E9	F6	F7	F8	F9	G6	G7	H6	H7	H8
1 ÷ 3	+ 31 + 26	+ 41 + 32	+ 54 + 40	+ 71 + 50	+ 22 + 18	+ 25 + 20	+ 35 + 26	+ 11 + 8	+ 14 + 10	+ 17 + 12	+ 27 + 18	+ 7 + 4	+ 10 + 6	+ 5 + 2	+ 8 + 4	+ 11 + 6
3 ÷ 6	+ 45 + 38	+ 55 + 44	+ 70 + 53	+ 93 + 66	+ 30 + 25	+ 35 + 28	+ 45 + 34	+ 16 + 13	+ 20 + 15	+ 25 + 18	+ 35 + 24	+ 10 + 7	+ 14 + 9	+ 6 + 3	+ 10 + 5	+ 15 + 8
6 ÷ 10	+ 58 + 50	+ 70 + 57	+ 89 + 68	+ 116 + 84	+ 37 + 31	+ 43 + 35	+ 55 + 42	+ 20 + 16	+ 25 + 19	+ 31 + 23	+ 43 + 30	+ 12 + 8	+ 17 + 11	+ 7 + 3	+ 12 + 6	+ 18 + 10
10 ÷ 18	+ 72 + 62	+ 86 + 70	+ 109 + 84	+ 143 + 104	+ 47 + 40	+ 54 + 44	+ 68 + 52	+ 25 + 21	+ 31 + 24	+ 38 + 28	+ 52 + 36	+ 15 + 11	+ 21 + 14	+ 9 + 5	+ 15 + 8	+ 22 + 12
18 ÷ 30	+ 93 + 81	+ 109 + 90	+ 136 + 106	+ 175 + 129	+ 57 + 49	+ 68 + 56	+ 84 + 65	+ 31 + 26	+ 37 + 29	+ 48 + 36	+ 64 + 45	+ 18 + 13	+ 24 + 16	+ 11 + 6	+ 17 + 9	+ 28 + 16
30 ÷ 50	+ 113 + 99	+ 132 + 110	+ 165 + 130	+ 216 + 160	+ 71 + 62	+ 83 + 69	+102 + 80	+ 38 + 32	+ 46 + 37	+ 58 + 44	+ 77 + 55	+ 22 + 16	+ 30 + 21	+ 13 + 7	+ 21 + 12	+ 33 + 19
50 ÷ 80	+ 139 + 122	+ 162 + 136	+ 202 + 160	+ 261 + 194	+ 85 + 74	+ 99 + 82	+122 + 96	+ 46 + 39	+ 55 + 44	+ 69 + 52	+ 92 + 66	+ 26 + 19	+ 35 + 24	+ 16 + 9	+ 25 + 14	+ 39 + 22
80 ÷ 120	+ 165 + 146	+ 193 + 162	+ 239 + 190	+ 307 + 230	+101 + 88	+ 117 + 98	+145 +114	+ 54 + 46	+ 65 + 52	+ 81 + 62	+109 + 78	+ 30 + 22	+ 41 + 28	+ 18 + 10	+ 29 + 16	+ 45 + 26
120 ÷ 180	+ 198 + 175	+ 230 + 195	+ 281 + 225	+ 357 + 269	+119 +105	+ 138 + 115	+170 +135	+ 64 + 55	+ 77 + 63	+ 96 + 73	+128 + 93	+ 35 + 26	+ 48 + 34	+ 21 + 12	+ 34 + 20	+ 53 + 30

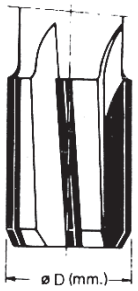
TOLLERANZE RELATIVE ALLA COSTRUZIONE DI ALESATORI

TOLÉRANCES RELATIVES À LA CONSTRUCTION D'ALÉSOIRS

BUILDING TOLERANCES FOR REAMERS

HERSTELLUNGS-TOLERANZEN FÜR REIBAHLEN

VALORI ESPRESSI IN MICRON
Valeurs en Micron
Values in Micron
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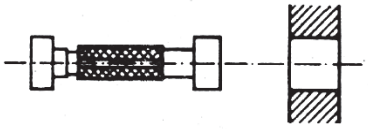
Ø	H9	H10	H11	H12	J6	J7	J8	Js6	Js7	Js8	Js9	K6	K7	K8	M6	M7
1 ÷ 3	+ 21 + 12	+ 34 + 20	+ 51 + 30	+ 85 + 50	+ 1 - 2	+ 2 - 2	+ 3 - 2	+ 2 - 1	+ 3 - 1	+ 4 - 1	+ 8 - 1	- 1 - 4	- 2 - 6	- 3 - 8	- 3 - 6	- 4 - 8
3 ÷ 6	+ 25 + 14	+ 40 + 23	+ 63 + 36	+ 102 + 60	+ 3 0	+ 4 - 1	+ 7 0	+ 2 - 1	+ 4 - 1	+ 6 - 1	+ 10 - 1	0 - 3	+ 1 - 4	+ 2 - 5	- 3 - 6	- 2 - 7
6 ÷ 10	+ 30 + 17	+ 49 + 28	+ 76 + 44	+ 127 + 74	+ 3 - 1	+ 5 - 1	+ 8 0	+ 3 - 1	+ 5 - 1	+ 7 - 1	+ 12 - 1	0 - 4	+ 2 - 4	+ 2 - 6	- 5 - 9	- 3 - 9
10 ÷ 18	+ 36 + 20	+ 59 + 34	+ 93 + 54	+ 153 + 90	+ 4 0	+ 7 0	+ 10 0	+ 3 - 1	+ 6 - 1	+ 9 - 1	+ 15 - 1	0 - 4	+ 3 - 4	+ 3 - 7	- 6 - 10	- 3 - 10
18 ÷ 30	+ 44 + 25	+ 71 + 41	+ 110 + 64	+ 178 + 104	+ 6 + 1	+ 8 0	+ 15 + 3	+ 4 - 1	+ 7 - 1	+ 11 - 1	+ 18 - 1	0 - 5	+ 2 - 6	+ 5 - 7	- 6 - 11	- 4 - 12
30 ÷ 50	+ 52 + 30	+ 85 + 50	+ 136 + 80	+ 212 + 124	+ 7 + 1	+ 10 + 1	+ 18 + 4	+ 5 - 1	+ 8 - 1	+ 13 - 1	+ 21 - 1	0 - 6	+ 3 - 6	+ 6 - 8	- 7 - 13	- 4 - 13
50 ÷ 80	+ 62 + 36	+ 102 + 60	+ 161 + 94	+ 255 + 150	+ 10 + 3	+ 13 + 2	+ 21 + 4	+ 6 - 1	+ 10 - 1	+ 16 - 1	+ 25 - 1	+ 1 - 6	+ 4 - 7	+ 7 - 10	- 8 - 15	- 5 - 16
80 ÷ 120	+ 73 + 42	+ 119 + 70	+ 187 + 110	+ 297 + 174	+ 12 + 4	+ 16 + 3	+ 25 + 6	+ 7 - 1	+ 12 - 1	+ 18 - 1	+ 30 - 1	0 - 8	+ 4 - 9	+ 7 - 12	- 10 - 18	- 6 - 19
120 ÷ 180	+ 85 + 50	+ 136 + 80	+ 212 + 124	+ 340 + 200	+ 14 + 5	+ 20 + 6	+ 31 + 8	+ 8 - 1	+ 14 0	+ 22 - 1	+ 35 0	0 - 9	+ 6 - 8	+ 10 - 13	- 12 - 21	- 6 - 20

Ø	M8	N6	N7	N8	N9	N10	N11	P6	P7	R6	R7	S6	S7	T6	U6	U7
1 ÷ 3	- 5 - 10	- 5 - 8	- 6 - 10	- 7 - 12	- 8 - 17	- 10 - 24	- 13 - 34	- 7 - 10	- 8 - 12	- 11 - 14	- 12 - 16	- 15 - 18	- 16 - 20	- 19 - 22	- 19 - 22	- 20 - 24
3 ÷ 6	- 1 - 8	- 7 - 10	- 6 - 11	- 5 - 12	- 5 - 16	- 8 - 25	- 12 - 39	- 11 - 14	- 10 - 15	- 14 - 17	- 13 - 18	- 18 - 21	- 17 - 22	- 22 - 25	- 22 - 25	- 21 - 26
6 ÷ 10	- 3 - 11	- 9 - 13	- 7 - 13	- 7 - 15	- 6 - 19	- 9 - 30	- 14 - 46	- 14 - 18	- 12 - 18	- 18 - 22	- 16 - 22	- 22 - 26	- 20 - 26	- 27 - 31	- 27 - 31	- 25 - 31
10 ÷ 18	- 3 - 13	- 11 - 15	- 8 - 15	- 8 - 18	- 7 - 23	- 11 - 36	- 17 - 56	- 17 - 21	- 14 - 21	- 22 - 26	- 19 - 26	- 27 - 31	- 24 - 31	- 32 - 36	- 32 - 36	- 29 - 36
18 ÷ 24	- 1	- 13	- 11	- 8	- 8	- 13	- 20	- 20	- 18	- 26	- 24	- 33	- 31	- 39	- 39 - 44	- 37 - 45
24 ÷ 30	- 13	- 18	- 19	- 20	- 27	- 43	- 66	- 25	- 26	- 31	- 32	- 38	- 39	- 44	- 46 - 51	- 44 - 52
30 ÷ 40	- 1	- 15	- 12	- 9	- 10	- 15	- 24	- 24	- 21	- 32	- 29	- 41	- 38	- 46 - 52	- 58 - 64	- 55 - 64
40 ÷ 50	- 15	- 21	- 21	- 23	- 32	- 50	- 80	- 30	- 30	- 38	- 38	- 47	- 47	- 52 - 58	- 68 - 74	- 65 - 74
50 ÷ 65	- 2	- 17	- 14	- 11	- 12	- 18	- 29	- 29	- 26	- 38 - 45	- 35 - 46	- 50 - 57	- 47 - 58	- 63 - 70	- 84 - 91	- 81 - 92
65 ÷ 80	- 19	- 24	- 25	- 28	- 38	- 60	- 96	- 36	- 37	- 40 - 47	- 37 - 48	- 56 - 63	- 53 - 64	- 72 - 79	- 99 -106	- 96 -107
80 ÷ 100	- 3	- 20	- 16	- 13	- 14	- 21	- 33	- 34	- 30	- 48 - 56	- 44 - 57	- 68 - 76	- 64 - 77	- 88 - 96	-121 -129	-117 -130
100 ÷ 120	- 22	- 28	- 29	- 32	- 45	- 70	-110	- 42	- 43	- 51 - 59	- 47 - 60	- 76 - 84	- 72 - 85	-101 -109	-141 -149	-137 -150
120 ÷ 140										- 60 - 69	- 54 - 68	- 89 - 98	- 83 - 97	-119 -128	-167 -176	-161 -175
140 ÷ 160	- 2 - 25	- 24 - 33	- 18 - 32	- 14 - 37	- 15 - 50	- 24 - 80	- 38 -126	- 40 - 49	- 34 - 48	- 62 - 71	- 56 - 70	- 97 -106	- 91 -105	-131 -140	-187 -196	-181 -195
160 ÷ 180										- 65 - 74	- 59 - 73	-105 -114	- 99 -113	-143 -152	-207 -216	-201 -215

TOLLERANZE ISO - FORO BASE

TOLÉRANCES ISO POUR ALÉSAGE BASE
ISO-TOLERANCES FOR BASE HOLE
ISO-TOLERANZEN FÜR EINHEITSBOHRUNGEN

VALORI ESPRESSI IN MICRON
Valeurs en Micron
Values in Micron
Werte in µm. Ausgedrückt

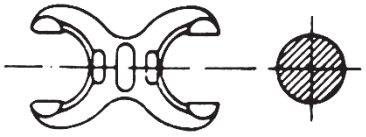


GRUPPI DIMENSIONI mm Groupes-Dimensions Groups-Sizes Gruppen-Abmessungen		>1 ≤3		>3 ≤6		>6 ≤10		>10 ≤18		>18 ≤30		>30 ≤50		>50 ≤80		>80 ≤120		>120 ≤180	
6a QUALITÀ Qualité - Quality Sorte	G 6	+ 3	+ 10	+ 4	+ 12	+ 5	+ 14	+ 6	+ 17	+ 7	+ 20	+ 9	+ 25	+ 10	+ 29	+12	+ 34	+ 14	+ 39
	H 6	0	+ 7	0	+ 8	0	+ 9	0	+ 11	0	+ 13	0	+ 16	0	+ 19	0	+ 22	0	+ 25
	J 6	- 4	+ 3	- 4	+ 4	- 4	+ 5	- 5	+ 6	- 5	+ 8	- 6	+ 10	- 6	+ 13	- 6	+ 16	- 7	+ 18
	K 6	-	-	-	-	- 7	+ 2	- 9	+ 2	-11	+ 2	- 13	+ 3	- 15	+ 4	-18	+ 4	- 21	+ 4
	M 6	- 7	0	- 9	- 1	- 12	- 3	- 15	- 4	-17	- 4	- 20	- 4	- 24	- 5	-28	- 6	- 33	- 8
	N 6	-11	- 4	- 13	- 5	- 16	- 7	- 20	- 9	-24	- 11	- 28	- 12	- 33	- 14	-38	- 16	- 45	- 20
7a QUALITÀ Qualité - Quality Sorte	E 7	+14	+ 23	+ 20	+ 32	+ 25	+ 40	+ 32	+ 50	+40	+ 61	+ 50	+ 75	+ 60	+ 90	+72	+107	+ 85	+ 125
	F 7	+ 7	+ 16	+ 10	+ 22	+ 13	+ 28	+ 16	+ 34	+20	+ 41	+ 25	+ 50	+ 30	+ 60	+36	+ 71	+ 43	+ 83
	G 7	+ 3	+ 12	+ 4	+ 16	+ 5	+ 20	+ 6	+ 24	+ 7	+ 28	+ 9	+ 34	+ 10	+ 40	+12	+ 47	+ 14	+ 54
	H 7	0	+ 9	0	+ 12	0	+ 15	0	+ 18	0	+ 21	0	+ 25	0	+ 30	0	+ 35	0	+ 40
	J 7	- 6	+ 3	- 7	+ 5	- 7	+ 8	- 8	+ 10	- 9	+ 12	- 11	+ 14	- 12	+ 18	-13	+ 22	- 14	+ 26
	K 7	-	-	-	-	- 10	+ 5	- 12	+ 6	-15	+ 6	- 18	+ 7	- 21	+ 9	-25	+ 10	- 28	+ 12
	M 7	- 9	0	- 12	0	- 15	0	- 18	0	- 21	0	- 25	0	- 30	0	-35	0	- 40	0
	N 7	-13	- 4	- 16	- 4	- 19	- 4	- 23	- 5	-28	- 7	- 33	- 8	- 39	- 9	-45	- 10	- 52	- 12
	P 7	-16	- 7	- 20	- 8	- 24	- 9	- 29	- 11	-35	- 14	- 42	- 17	- 51	- 21	-59	- 24	- 68	- 28
8a QUALITÀ Qualité - Quality Sorte	D 8	+20	+ 34	+ 30	+ 48	+ 40	+ 62	+ 50	+ 77	+65	+ 98	+ 80	+119	+100	+146	+120	+174	+145	+ 208
	E 8	+14	+ 28	+ 20	+ 38	+ 25	+ 47	+ 32	+ 59	+40	+ 73	+ 50	+ 89	+ 60	+106	+72	+126	+ 85	+ 148
	F 8	+ 7	+ 21	+ 10	+ 28	+ 13	+ 35	+ 16	+ 43	+20	+ 53	+ 25	+ 64	+ 30	+ 76	+36	+ 90	+ 43	+ 106
	H 8	0	+ 14	0	+ 18	0	+ 22	0	+ 27	0	+ 33	0	+ 39	0	+ 46	0	+ 54	0	+ 63
	J 8	- 7	+ 7	- 9	+ 9	- 10	+ 12	- 12	+ 15	-13	+ 20	- 15	+ 24	- 18	+ 28	-20	+ 34	- 22	+ 41
	K 8	-	-	-	-	- 16	+ 6	- 19	+ 8	-23	+ 10	- 27	+ 12	- 32	+ 14	-38	+ 16	- 43	+ 20
	M 8	-	-	-	-	- 21	+ 1	- 25	+ 2	-29	+ 4	- 34	+ 5	- 41	+ 5	-48	+ 6	- 55	+ 8
	N 8	-15	- 1	- 20	- 2	- 25	- 3	- 30	- 3	-36	- 3	- 42	- 3	- 50	- 4	-58	- 4	- 67	- 4
9a QUALITÀ Qualité - Quality Sorte	D 9	+20	+ 45	+ 30	+ 60	+ 40	+ 76	+ 50	+ 93	+65	+117	+ 80	+142	+100	+174	+120	+207	+145	+ 245
	E 9	+14	+ 39	+ 20	+ 50	+ 25	+ 61	+ 32	+ 75	+40	+ 92	+ 50	+112	+ 60	+134	+72	+159	+ 85	+ 185
	H 9	0	+ 25	0	+ 30	0	+ 36	0	+ 43	0	+ 52	0	+ 62	0	+ 74	0	+ 87	0	+ 100
	J 9	-13	+ 12	- 15	+ 15	- 18	+ 18	- 22	+ 21	-26	+ 26	- 31	+ 31	- 37	+ 37	-44	+ 43	- 50	+ 50
10a QUALITÀ Qualité - Quality Sorte	D 10	+20	+ 60	+ 30	+ 78	+ 40	+ 98	+ 50	+120	+65	+149	+ 80	+180	+100	+220	+120	+260	+145	+ 305
	H 10	0	+ 40	0	+ 48	0	+ 58	0	+ 70	0	+ 84	0	+100	0	+120	0	+140	0	+ 160
	J 10	-20	+ 20	- 24	+ 24	- 29	+ 29	- 35	+ 35	-42	+ 42	- 50	+ 50	- 60	+ 60	-70	+ 70	- 80	+ 80
11a QUALITÀ Qualité - Quality Sorte	D 11	+20	+ 80	+ 30	+105	+ 40	+130	+ 50	+160	+65	+195	+ 80	+240	+100	+290	+120	+340	+145	+ 395
	H 11	0	+ 60	0	+ 75	0	+ 90	0	+110	0	+130	0	+160	0	+190	0	+220	0	+ 250
	J 11	-30	+ 30	- 38	+ 37	- 45	+ 45	- 55	+ 55	-65	+ 65	- 80	+ 80	- 95	+ 95	-110	+110	-125	+ 125

TOLLERANZE ISO - ALBERO BASE

TOLÉRANCES ISO POUR ARBRE BASE
ISO-TOLERANCES FOR STANDARD SHAFT
ISO-TOLERANZEN FÜR EINHEITSWELLEN

VALORI ESPRESSI IN MICRON
Valeurs en Micron
Values in Micron
Werte in µm. Ausgedrückt

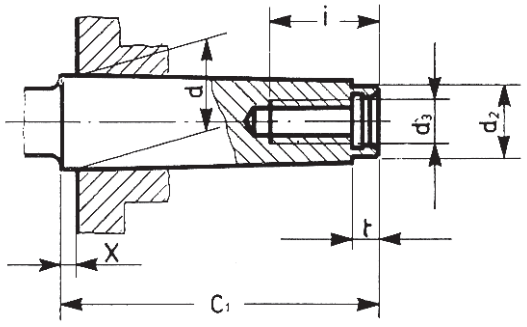


GRUPPI DIMENSIONI mm Groupes-Dimensions Groups-Sizes Gruppen-Abmessungen		>1 ≤3		>3 ≤6		>6 ≤10		>10 ≤18		>18 ≤30		>30 ≤50		>50 ≤80		>80 ≤120		>120 ≤180	
5a QUALITÀ Qualité - Quality Sorte	g 5	- 3	- 8	- 4	- 9	- 5	- 11	- 6	- 14	- 7	- 16	- 9	- 20	- 10	- 23	-12	- 27	- 14	- 32
	h 5	0	- 5	0	- 5	0	- 6	0	- 8	0	- 9	0	- 11	0	- 13	0	- 15	0	- 18
	j 5	+ 4	- 1	+ 4	- 1	+ 4	- 2	+ 5	- 3	+ 5	- 4	+ 6	- 5	+ 6	- 7	+ 6	- 9	+ 7	- 11
	k 5	-	-	-	-	+ 7	+ 1	+ 9	+ 1	+11	+ 2	+ 13	+ 2	+ 15	+ 2	+18	+ 3	+ 21	+ 3
	m 5	+ 7	+ 2	+ 9	+ 4	+ 12	+ 6	+ 15	+ 7	+17	+ 8	+ 20	+ 9	+ 24	+ 11	+28	+ 13	+ 33	+ 15
	n 5	+11	+ 6	+ 13	+ 8	+ 16	+ 10	+ 20	+ 12	+24	+ 15	+ 28	+ 17	+ 33	+ 20	+38	+ 23	+ 45	+ 27
6a QUALITÀ Qualité - Quality Sorte	g 6	- 3	- 10	- 4	- 12	- 5	- 14	- 6	- 17	- 7	- 20	- 9	- 25	- 10	- 29	-12	- 34	- 14	- 39
	h 6	0	- 7	0	- 8	0	- 9	0	- 11	0	- 13	0	- 16	0	- 19	0	- 22	0	- 25
	j 6	+ 6	- 1	+ 7	- 1	+ 7	- 2	+ 8	- 3	+ 9	- 4	+ 11	- 5	+ 12	- 7	+13	- 9	+ 14	- 11
	k 6	-	-	-	-	+ 10	+ 1	+ 12	+ 1	+ 15	+ 2	+ 18	+ 2	+ 21	+ 2	+25	+ 3	+ 28	+ 3
	m 6	+ 9	+ 2	+ 12	+ 4	+ 15	+ 6	+ 18	+ 7	+ 21	+ 8	+ 25	+ 9	+ 30	+ 11	+35	+ 13	+ 40	+ 15
	n 6	+13	+ 6	+ 16	+ 8	+ 19	+ 10	+ 23	+ 12	+ 28	+ 15	+ 33	+ 17	+ 39	+ 20	+45	+ 23	+ 52	+ 27
	p 6	+16	+ 9	+ 20	+ 12	+ 24	+ 15	+ 29	+ 18	+ 35	+ 22	+ 42	+ 26	+ 51	+ 32	+59	+ 37	+ 68	+ 43
7a QUALITÀ Qualité - Quality Sorte	e 7	-14	- 23	- 20	- 32	- 25	- 40	- 32	- 50	- 40	- 61	- 50	- 75	- 60	- 90	-72	-107	- 85	- 125
	f 7	- 7	- 16	- 10	- 22	- 13	- 28	- 16	- 34	- 20	- 41	- 25	- 50	- 30	- 60	-36	- 71	- 43	- 83
	h 7	0	- 9	0	- 12	0	- 15	0	- 18	0	- 21	0	- 25	0	- 30	0	- 35	0	- 40
	j 7	+ 7	- 2	+ 9	- 3	+ 10	- 5	+ 12	- 6	+ 13	- 8	+ 15	- 10	+ 18	- 12	+20	- 15	+ 22	- 18
	k 7	-	-	-	-	+ 16	+ 1	+ 19	+ 1	+ 23	+ 2	+ 27	+ 2	+ 32	+ 2	+38	+ 3	+ 43	+ 3
	m 7	-	-	-	-	+ 21	+ 6	+ 25	+ 7	+ 29	+ 8	+ 34	+ 9	+ 41	+ 11	+48	+ 13	+ 55	+ 15
	n 7	+15	+ 6	+ 20	+ 8	+ 25	+ 10	+ 30	+ 12	+ 36	+ 15	+ 42	+ 17	+ 50	+ 20	+58	+ 23	+ 67	+ 27
8a QUALITÀ Qualité - Quality Sorte	d 8	-20	- 34	- 30	- 48	- 40	- 62	- 50	- 77	- 65	- 93	- 80	-119	-100	-146	-120	-174	-145	- 208
	e 8	-14	- 28	- 20	- 38	- 25	- 47	- 32	- 59	- 40	- 73	- 50	- 89	- 60	-106	-72	-126	- 85	- 148
	f 8	- 7	- 21	- 10	- 28	- 13	- 35	- 16	- 43	- 20	- 53	- 25	- 64	- 30	- 76	-36	- 90	- 43	- 106
	h 8	0	- 14	0	- 18	0	- 22	0	- 27	0	- 33	0	- 39	0	- 46	0	- 54	0	- 63
	j 8	+ 7	- 7	+ 9	- 9	+ 11	- 11	+ 14	- 13	+ 17	- 16	+ 20	- 19	+ 23	- 23	+27	- 27	+ 32	- 31
	k 8	+14	0	+ 18	0	+ 22	0	+ 27	0	+ 33	0	+ 39	0	+ 46	0	+54	0	+ 63	0
9a QUALITÀ Qualité - Quality Sorte	d 9	-20	- 45	- 30	- 60	- 40	- 76	- 50	- 93	- 65	-117	- 80	-142	-100	-174	-120	-207	-145	- 245
	e 9	-14	- 39	- 20	- 50	- 25	- 61	- 32	- 75	- 40	- 92	- 50	-112	- 60	-134	-72	-159	- 85	- 185
	h 9	0	- 25	0	- 30	0	- 36	0	- 43	0	- 52	0	- 62	0	- 74	0	- 87	0	- 100
	j 9	+13	- 12	+ 15	- 15	+ 18	- 18	+ 22	- 21	+ 26	- 26	+ 31	- 31	+ 37	- 37	+44	- 43	+ 50	- 50
	k 9	+25	0	+ 30	0	+ 36	0	+ 43	0	+ 52	0	+ 62	0	+ 74	0	+87	0	+100	0
10a QUALITÀ Qualité - Quality Sorte	d 10	-20	- 60	- 30	- 78	- 40	- 98	- 50	-120	- 65	-149	- 80	-180	-100	-220	-120	-260	-145	- 305
	h 10	0	- 40	0	- 48	0	- 58	0	- 70	0	- 84	0	-100	0	-120	0	-140	0	- 160
	j 10	+20	- 20	+ 24	- 24	+ 29	- 29	+ 35	- 35	+ 42	- 42	+ 50	- 50	+ 60	- 60	+70	- 70	+ 80	- 80
	k 10	+40	0	+ 48	0	+ 58	0	+ 70	0	+ 84	0	+100	0	+120	0	+140	0	+160	0
11a QUALITÀ Qualité - Quality Sorte	d 11	-20	- 80	- 30	-105	- 40	-130	- 50	-160	- 65	-195	- 80	-240	-100	-290	-120	-340	-145	- 395
	h 11	0	- 60	0	- 75	0	- 90	0	-110	0	-130	0	-160	0	-190	0	-220	0	- 250
	j 11	+30	- 30	+ 38	- 37	+ 45	- 45	+ 55	- 55	+ 65	- 65	+ 80	- 80	+ 95	- 95	+110	-110	+125	- 125
	k 11	+60	0	+ 75	0	+ 90	0	+110	0	+130	0	+160	0	+190	0	+220	0	+250	0

ATTACCHI CONO MORSE DIN 228 - UNI 521

QUEUES CÔNE MORSE
MORSE TAPER SHANKS
MORSEKEGEL SCHÄFTE

UNI 521 - CODOLO CON FORO FILETTATO - TIPO A
Queue avec trou fileté Type A
Shank with threaded hole Type A
Morsekegel mit Innengewinde Ausführung A

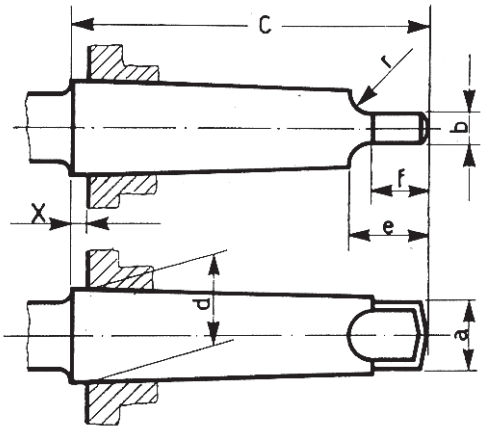


DESIGNAZIONE Désignation Designation Bezeichnung			d mm	x mm	CONICITÀ Conicité Taper Kegeligkeit		CODOLO CON LORO FILETTATO Queue avec trou fileté Shank with threaded hole Morsekegel mit Innengewinde				
TIPO Type - Type Ausführung	CODOLO Queue - Shank Schaft				p%	1 : K	c1 mm	d2 mm	d3 mm	i mm	t mm
A	-	Metrico 4 Métrique - Metric - Metrish	4	2	5	1 : 20	25	2,5	-	-	2
A	-	Metrico 6 Métrique - Metric - Metrish	6	3			35	4	-	-	3
A	-	Morse 0	9.045	3	5.250	1 : 19.212	53	6	-	-	4
A	B	Morse 1	12.065	3,5	4.988	1 : 20.047	57	9	M 6	16	5
A	B	Morse 2	17.780	5	4.995	1 : 20.020	69	14	M 10	24	5
A	B	Morse 3	23.825	5	5.020	1 : 19.922	86	19	M 12	28	7
A	B	Morse 4	31.267	6,5	5.194	1 : 19.254	109	25	M 16	32	9
A	B	Morse 5	44.399	6,5	5.263	1 : 19.002	136	35,7	M 20	40	10
A	B	Morse 6	63.348	8	5.214	1 : 19.180	190	51	M 24	50	16
A	B	Metrico 80 Métrique - Metric - Metrish	80				204	67	M 30	65	24
A	B	Metrico 100 Métrique - Metric - Metrish	100	10			242	85	M 36	80	30
A	B	Metrico 120 Métrique - Metric - Metrish	120	12	5	1 : 20	280	102	M 36	80	36
A	B	Metrico 160 Métrique - Metric - Metrish	160	16			356	138	M 48	100	48
A	B	Metrico 200 Métrique - Metric - Metrish	200	20			432	174	M 48	100	60

ATTACCHI CONO MORSE DIN 228 - UNI 521

QUEUES CÔNE MORSE
MORSE TAPER SHANKS
MORSEKEGEL SCHÄFTE

UNI 521 - CODOLO CON FORO FILETTATO - TIPO A
Queue avec trou fileté Type A
Shank with threaded hole Type A
Morsekegel mit Innengewinde Ausführung A



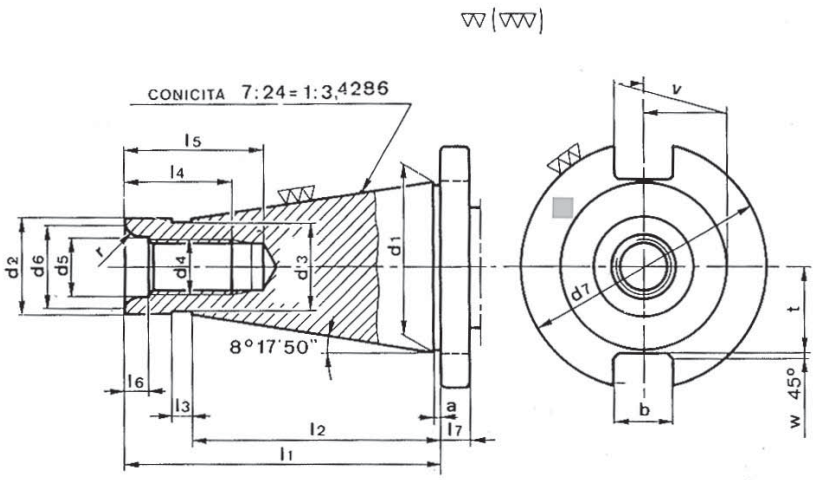
DESIGNAZIONE Désignation Designation Bezeichnung			d mm	x mm	CONICITÀ Conicité Taper Kegeligkeit		CODOLO CON LORO FILETTATO Queue avec trou fileté Shank with threaded hole Morsekegel mit Innengewinde					
TIPO Type - Type Ausführung	CODOLO Queue - Shank Schaft				p%	1 : K	c mm	f mm	a mm	b mm	e mm	r mm
A	-	Metrico 4 Métrique - Metric - Metrish	4	2	5	1 : 20	-	-	-	-	-	-
A	-	Metrico 6 Métrique - Metric - Metrish	6	3			-	-	-	-	-	-
A	-	Morse 0	9.045	3	5.250	1 : 19.212	59,5	6,5	6	3,9	10,5	4
A	B	Morse 1	12.065	3,5	4.988	1 : 20.047	65,5	8,5	8,7	5,2	13,5	5
A	B	Morse 2	17.780	5	4.995	1 : 20.020	80	10	13,5	6,3	16	6
A	B	Morse 3	23.825	5	5.020	1 : 19.922	99	13	18,5	7,9	20	7
A	B	Morse 4	31.267	6,5	5.194	1 : 19.254	124	16	24,5	11,9	24	8
A	B	Morse 5	44.399	6,5	5.263	1 : 19.002	156	19	35,7	15,9	29	10
A	B	Morse 6	63.348	8	5.214	1 : 19.180	218	27	51	19	40	13
A	B	Metrico 80 Métrique - Metric - Metrish	80				228	24	67	26	48	24
A	B	Metrico 100 Métrique - Metric - Metrish	100	10			270	28	85	32	58	30
A	B	Metrico 120 Métrique - Metric - Metrish	120	12	5	1 : 20	312	32	102	38	68	36
A	B	Metrico 160 Métrique - Metric - Metrish	160	16			396	40	138	50	88	48
A	B	Metrico 200 Métrique - Metric - Metrish	200	20			480	48	174	62	108	60

ATTACCHI PER FRESE CONO ISO DIN 2080

CÔNE ISO POUR FRAISES

ISO-TAPER FOR END MILLS

ISO-STEIKEGEL FÜR SCHAFTFRÄSER



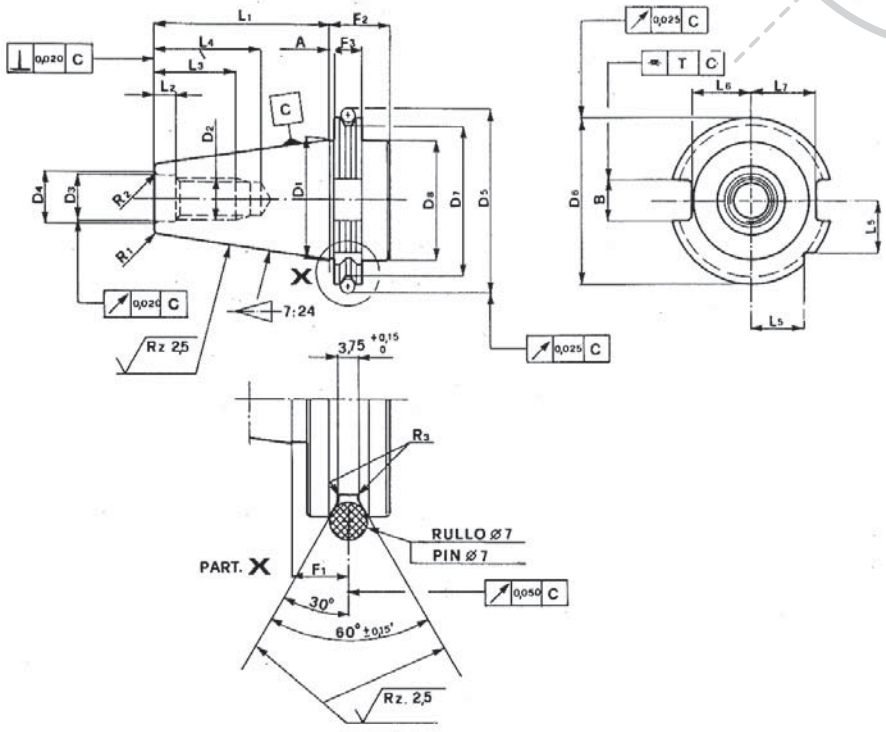
CONO ISO Cône ISO ISO Taper ISO-Steikegel	30	40	45	50	55	60
a ± 0,2	1,6	1,6	3,2	3,2	3,2	3,2
b H12	16,1	16,1	19,3	25,7	25,7	25,7
d1	31,75	44,45	57,15	69,85	88,9	107,95
a10	17,4	25,3	32,4	39,6	50,4	60,2
d2 max.	17,11	25,00	32,09	39,29	50,06	59,86
min.	17,04	24,92	31,99	39,19	49,94	59,74
d3	16,5	24	30	38	48	58
d4	M 12	M 16	M 20	M 24	M 24	M 30
d5	13	17	21	26	26	32
d6	15,5	21	26	31	31	42
d7 0 / 0,4	50	63	80	97,5	130	156
l1	70	95	110	130	168	210
l2	50	67	86	105	130	165
l3	3	5	6	8	9	10
l4	24	32	40	47	47	59
l5 min.	33,5	42,5	52,5	61,5	61,5	76
l6 0 / + 0,5	5,5	8,2	10	11,5	11,5	14
l7 ± 0,15	8	10	12	12	14	16
t max	16,2	22,5	29	35,3	45	60
r	3	4	6	6	6	8
v	0,06	0,06	0,1	0,1	0,1	0,1
w	1,6	1,6	1,6	2	2	2

ATTACCO PER FRESE CONO ISO DIN 69871 A

CÔNE ISO POUR FRAISES

ISO-TAPER FOR END MILLS

ISO-STEIKEGEL FÜR SCHAFTFRÄSER



CONO ISO Cône ISO ISO Taper ISO-Steikegel		40	45	50
A	± 0,1		3,2	
B	H12	16,1	19,3	25,7
D1		44,5	57,15	69,85
D2		M 16	M 20	M 24
D3	H7	17	21	25
D4	max	19	23,4	28
D5	± 0,05	72,3	91,35	107,25
D6	0 - 0,1	63,55	82,55	97,50
D7	0 - 0,5	56,25	75,25	91,25
D8	max	50	63	80
F8	± 0,1		11,1	

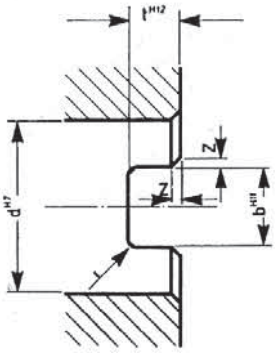
CONO ISO Cône ISO ISO Taper ISO-Steikegel		40	45	50
F2	min.		35	
F3	0 - 0,1		15,9	
L1	0 - 0,3	68,4	10	11,5
L2	+ 0,5 0	8,2	10	11,5
L3	min.	32	40	47
L4	min.	42,5	52,5	61,5
L5	0 - 0,3	18,5	24	30
L7	0 - 0,4	22,8	29,1	35,5
R1	0 - 0,5	1,2	2	2,5
R2	0 - 0,5	1	1,2	1,5
T		0,12	0,12	0,20

ATTACCO PER FRESE UNI 3809 (DIN 138) con dente frontale di trascinamento

QUEUE POUR FRAISES UNI-3809 (DIN 138) AVEC TENON D'ENTRAÎNEMENT FRONTAL

SHANK FOR MILLS UNI 3809 (DIN 138) WITH TANG DRIVE

FRÄSERSCHAFT GEMÄSS UNI 3809 (DIN 138) MIT QUERNUT



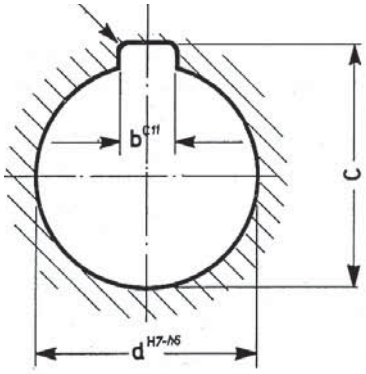
d mm	b mm	t mm	r mm	z mm
5	-	-	-	-
8	5,4	4	0,6	0,4
10	6,4	4,5	0,8	0,5
13	8,4	5	1	0,5
16	8,4	5,6	1	0,6
19	10,4	6,3	1,2	0,6
22	10,4	6,3	1,2	0,6
27	12,4	7	1,2	0,8
32	14,4	8	1,6	0,8
40	16,4	9	2	1
50	18,4	10	2	1
60	20,5	11,2	2	1

ATTACCO PER FRESE UNI 3810 (DIN 138) con cava di trascinamento longitudinale

QUEUE POUR FRAISES UNI 3810 (DIN 138) AVEC RAINURE D'ENTRAÎNEMENT LONGITUDINAL

SHANK FOR MILLS UNI 3810 (DIN 138) WITH LONGITUDINAL KEYWAY

FRÄSERSCHAFT GEMÄSS UNI 3810 (DIN 138) MIT LANGSMITNAHMENUT



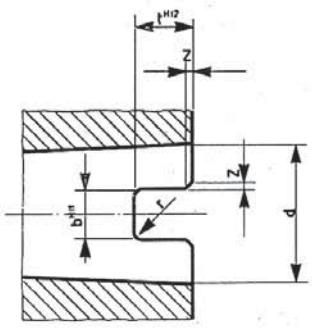
d mm	c mm	Tolleranza su c Tolérance sur C Tolerance on C Toleranz auf C	b mm	r mm
13	14,6	0 + 0,1	3	0,6
16	17,7	0 + 0,1	4	0,6
22	24,1	0 + 0,2	6	1
27	29,8	0 + 0,2	7	1,2
32	34,8	0 + 0,2	8	1,2
40	43,5	0 + 0,2	10	1,6
50	53,5	0 + 0,2	12	1,6
60	64,25	0 + 0,2	14	1,6
70	75	0 + 0,2	16	2
80	85,5	0 + 0,2	18	2
100	107	0 + 0,2	24	2,5

ATTACCO PER ALESATORI UNI 440 (DIN 138) foro conico 1 : 30

QUEUE POUR ALÉSOIR UNI 440 (DIN 138) ALÉSAGE CONIQUE 1 : 30

SHANK FOR REAMERS UNI 440 (DIN 138) TAPER HOLE 1: 30

REIBAHLESCHAFT GEMÄSS UNI 440 (DIN 138) KEGELBOHRUNG 1 : 30



d mm	b mm	t mm
8	3,3	4
10	4,3	5,6
13	4,3	5,6
16	5,4	6,6
19	6,4	8,2
22	7,4	9,2
27	8,4	10,3
32	10,4	11,8
40	12,4	13

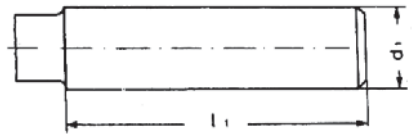
ATTACCHI CILINDRICI PER FRESE

QUEUES CYLINDRIQUES POOR FRAISES

CYLINDRICAL SHANKS FOR MILLING CUTTERS

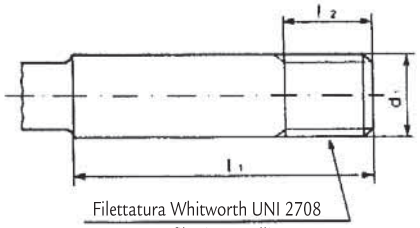
ZYLINDERSCHÄFTE FÜR FRÄSER

UNI 7738 A
DIN 1835 A



d1 h8	l1 ±1	d1 h8	l1 ±1	d1 h8	l1 ±1
4	28	10	40	32	60
5	28	12	45	40	70
6	36	16	48	50	80
8	36	20	50	63	90
		25	56		

UNI 7738 B

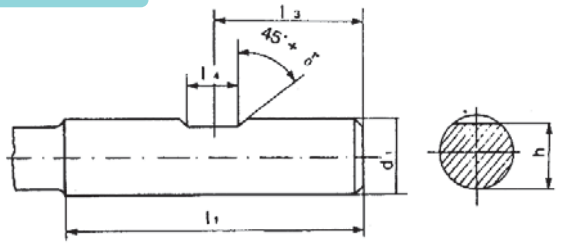


Filettatura Whitworth UNI 2708
N°20 filetti per pollice

d1 h8	l1 =	l2 ±1	d1 h8	l1 =	l2 ±1
6	36	10	16	48	10
8	36	10	20	50	15
10	40	10	25	56	15
12	45	10	32	60	15

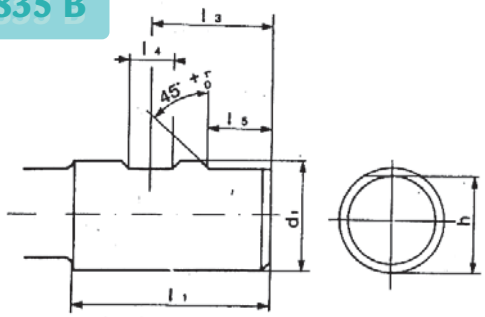
Filétage Whitworth	Whitworth thread	Whitworth-Gewinde
N° 20 Filéts au pouce	N. 20 threads per inch	Nr. 20 Gänge auf 1 Zoll

UNI 7738 C
DIN 1835 B



d1 h6	l1 ±1	l3 ±0,5	l4 +0,05/0	h 0/-0,4
6	36	18	4,2	4,8
8	36	18	5,5	6,6
10	40	20	7	8,4
12	45	22,5	8	10,4
16	48	24	10	14,2
20	50	25	11	18,2

UNI 7738 D
DIN 1835 B



d1 h6	l1 ±1	l3 ±0,5	l4 +0,05/0	l5 +1/0	h 0/-0,4
25	56	32	12	17	23
32	60	36	14	19	30
40	70	40	14	19	38
50	80	45	18	23	47,8
63	90	50	18	23	60,8

TABELLA DI CONVERSIONE: POLLICI-MILLIMETRI

TABELLA DE CONVERSION: POUCES-MILLIMÉTRES
CONVERSION CHART: INCHES-MILLIMETERS
UMRECHNUNG VON ZOLL IN MILLIMETER

FRAZIONI DI POLLICE Franctions de pouce Inch fractions Zollbruch	DEC. DI POLL. Décimals de pouce Inch decimal Zoldezimal	MILLIMETRI Milimétres Millimerters Milimeter
1/64	.0156	0.3969
1/32	.0312	0.7938
3/64	.0469	1.1906
1/16	.0625	1.5875
5/64	.0781	1.9844
3/32	.0937	2.3813
7/64	.1094	2.7781
1/8	.1250	3.1750
9/64	.1406	3.5719
5/32	.1562	3.9688
11/64	.1719	4.3656
3/16	.1875	4.7625
13/64	.2031	5.1594
7/32	.2187	5.5563
15/64	.2344	5.9531
1/4	.2500	6.3500
17/64	.2656	6.7469
9/32	.2812	7.1438
19/64	.2969	7.5406
5/16	.3125	7.9375
21/64	.3281	8.3344
11/32	.3437	8.7313
23/64	.3594	9.1281
3/8	.3750	9.5250
25/64	.3906	9.9219
13/32	.4062	10.3188
27/64	.4219	10.7156
7/16	.4375	11.1125
29/64	.4531	11.5094
15/32	.4687	11.9063
31/64	.4844	12.3031
1/2	.5000	12.7000

FRAZIONI DI POLLICE Franctions de pouce Inch fractions Zollbruch	DEC. DI POLL. Décimals de pouce Inch decimal Zoldezimal	MILLIMETRI Milimétres Millimerters Milimeter
33/64	.5156	13.0969
17/32	.5312	13.4938
35/64	.5469	13.8906
9/16	.5625	14.2875
37/64	.5781	14.6844
19/32	.5937	15.0813
39/64	.6094	15.4782
5/8	.6250	15.8750
41/64	.6406	16.2719
21/32	.6562	16.6688
43/64	.6719	17.0657
11/16	.6875	17.4625
45/64	.7031	17.8594
23/32	.7187	18.2563
47/64	.7344	18.6532
3/4	.7500	19.0500
49/64	.7645	19.4469
25/32	.7812	19.8438
51/64	.7969	20.2407
13/16	.8125	20.6375
53/64	.8281	21.0344
27/32	.8437	21.4313
55/64	.8594	21.8282
7/8	.8750	22.2250
57/64	.8906	22.6219
29/32	.9062	23.0188
59/64	.9219	23.4157
15/16	.9375	23.8125
61/64	.9531	24.2094
31/32	.9687	24.6063
63/64	.9844	25.0032
1	1.0000	25.4000

TABELLA COMPARATIVA DELLE DUREZZE

TABELLE COMPARATIVE DES DURETÉS

HARDNESSES COMPATATIVE CHART

VERGLEICHENDE HÄRTETABELLE

B Acciaio Acier - Steel - Stahl Kg./mm²	Vickers HV	Brinell HB	Rockwell HRC	Shore " C "
70	200		19.2	28
74	210		21.2	29
77	220		23.0	30
81	230		24.7	31
84	240		26.1	33
88	250		27.6	34
91	260		29.0	35
95	270		30.3	36
98	280		31.5	37
102	290		32.9	39
105	300		33.8	40
109	310		34.9	41
112	320		36.0	42
115	330		37.0	43
119	340		38.0	44
123	350		38.9	45
126	360	359	39.8	46
130	370	368	40.7	47
133	380	373	41.5	48
137	390	385	42.3	49
140	400	393	43.2	50
144	410	400	44.0	51
147	420	407	44.8	52
151	430	416	45.5	53
154	440	423	46.3	54
158	450	429	47.0	55
161	460	435	47.7	56
165	470	441	48.3	57
168	480	450	49.0	58
172	490	457	49.6	59
175	500	465	50.3	60
179	510	474	50.9	61
182	520	482	51.5	62
186	530	489	52.1	63
189	540	496	52.7	64
193	550	503		65
196	560	511		66
200	570	520		67

B Acciaio Acier - Steel - Stahl Kg./mm²	Vickers HV	Brinell HB	Rockwell HRC	Shore " C "
203	580	527	53.3	68
207	590	533	53.8	69
210	600	533	54.4	70
214	610	543	54.9	71
217	620	549	55.4	72
221	630	555	55.9	73
224	640	561	56.4	74
228	650	568	56.9	75
231	660	574	57.4	75
235	670	581	57.9	76
238	680	588	58.7	77
241	690	595	58.9	78
245	700	602	59.3	79
248	710	609	59.8	80
252	720	616	60.2	81
255	730	622	60.7	82
259	740	627	61.1	83
263	750	633	61.5	83
266	760	639	61.9	84
270	770	644	62.3	85
273	780	650	62.7	86
277	790	656	63.1	86
280	800	661	63.5	87
284	810	666	63.9	87
287	820	670	64.3	88
291	830	677	64.6	89
294	840	682	65.0	89
298	850		65.3	90
301	860		65.7	90
305	870		66.0	91
308	880		66.3	91
312	890		66.6	92
315	900		66.9	92
319	910		67.2	
322	920		67.5	
326	930		67.7	
329	940		68.0	

EVITATE QUESTI INCONVENIENTI PER LA MIGLIORE RESA DEI NOSTRI UTENSILI

PREVENT THESE PROBLEM TO ACHIEVE AN IMPROVED EFFICIENCY OF OUR TOOLS

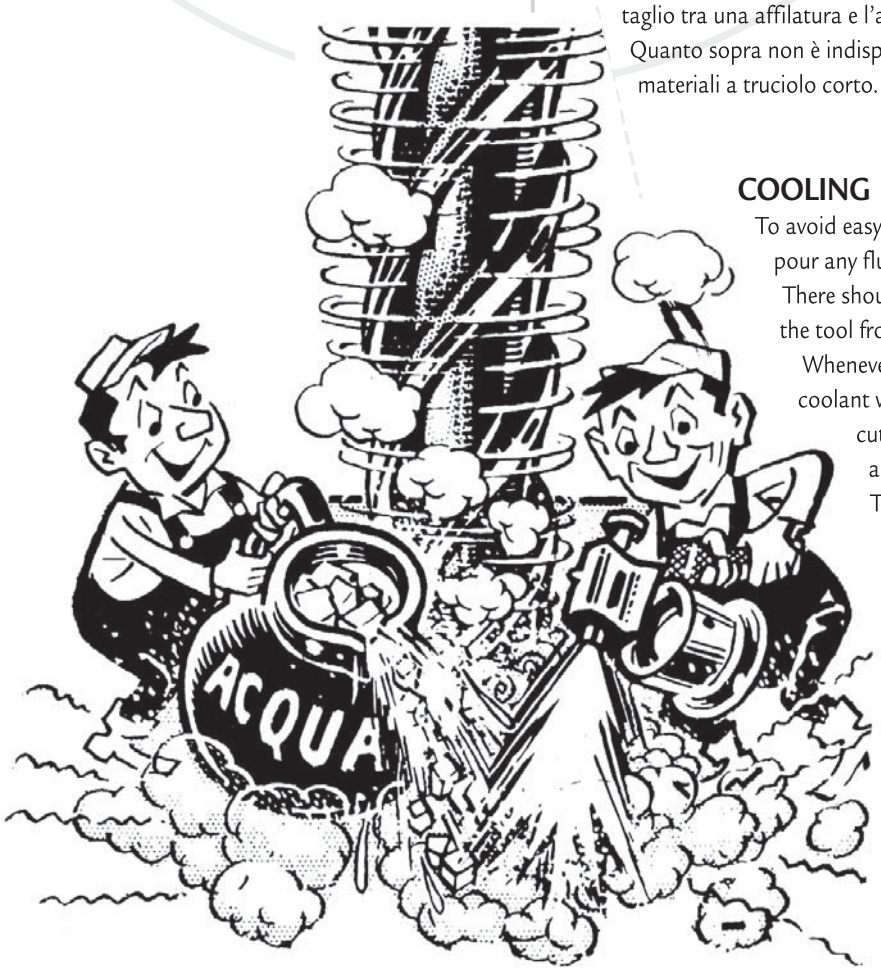
RAFFREDDAMENTO

Per evitare una facile incrinatura dei taglienti in metallo duro non bisogna assolutamente versare liquidi su frese surriscaldate.

La refrigerazione deve essere abbondante e continua in modo che l'utensile non raggiunga un calore eccessivo.

È consigliabile, qualora le condizioni lo permettano, di usare sempre nella lavorazione di acciaio un buon refrigerante in modo da aumentare la durata di taglio tra una affilatura e l'altra.

Quanto sopra non è indispensabile nella lavorazione di ghisa ed altri materiali a truciolo corto.



COOLING

To avoid easy crackings of hard-metal cutting edges, never pour any fluids on overheated mills.

There should be a steady and extensive coolin to prevent the tool from reaching too high temperatures.

Whenever possible, it is advisable to use a good-quality coolant when machining steel in order to extend the cutting edge life between one grinding operation and the subsequent one.

The above precautions are not required when machining cast iron or other materials that produce short chips.

EVITATE QUESTI INCONVENIENTI PER LA MIGLIORE RESA DEI NOSTRI UTENSILI

PREVENT THESE PROBLEM TO ACHIEVE AN IMPROVED EFFICIENCY OF OUR TOOLS



SCHEGGIATURA

Questo inconveniente è in massima parte dovuto a vibrazioni della fresa, oppure a vibrazioni del pezzo che si lavora.

Per eliminare questa causa si deve controllare il mandrino della macchina, lo staffaggio del pezzo sul bancale, ed eventualmente se la fresa o il mandrino non lavorano con eccessivo sbalzo.

Controllare anche l'avanzamento, poichè se fosse troppo forte è causa della scheggiatura.

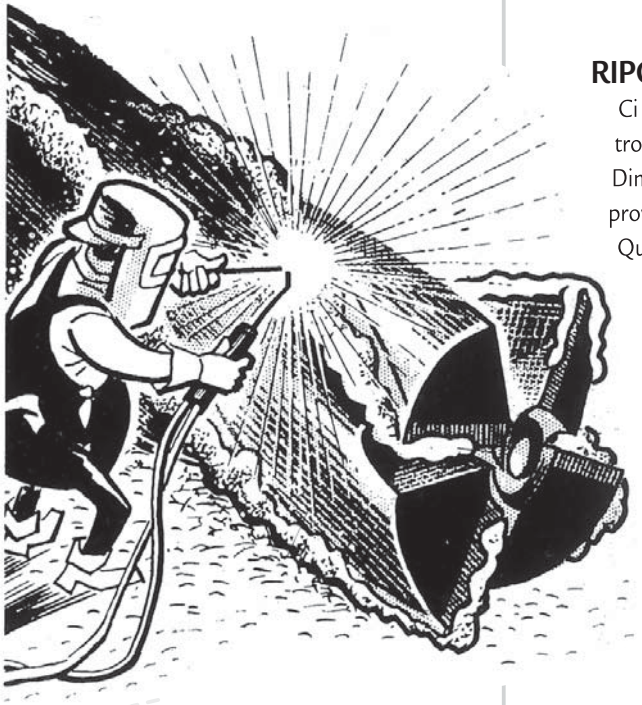
SPLINTERING

This problem is mostly due to vibrations of the mill or of the workpiece.

To remove the causes, inspect the machine spindle and the workpiece clamping on the bench.

If necessary, check if the mill or the spindle move too violently.

The feed should also be checked since if it is excessive it may cause the splintering, too.



RIPORTO DI MATERIALE

Ci si può trovare di fronte a questo inconveniente per velocità della fresa troppo bassa, unito ad un forte avanzamento per dente.

Diminuire quindi l'avanzamento, o aumentare la velocità, e se possibile provvedere con una buona refrigerazione.

Qualora la causa non si elimini devono essere verificati gli angoli di spoglia della fresa, i quali possono essere insufficienti.

BUILT-UP MATERIAL

This problem may be caused by too low speeds of the mill combined with a high feed per tooth.

Consequently, reduce the feed or increase the speed and if possible, perform adequate cooling.

Should the problem continue, check the mill rake angles since these may be too short.

EVITATE QUESTI INCONVENIENTI PER LA MIGLIORE RESA DEI NOSTRI UTENSILI

PREVENT THESE PROBLEM TO ACHIEVE AN IMPROVED EFFICIENCY OF OUR TOOLS



ABRASIONE

Questo tipo di usura del tagliente della fresa si presenta prevalentemente nella lavorazione di materiali altamente abrasivi, quali ghisa o acciai al silicio.
In questo tipo di lavorazione è quindi indispensabile trovare un giusto rapporto tra avanzamento e velocità di taglio.
Altre cause di una abrasione rapida del tagliente possono essere: un troppo basso valore di avanzamento per dente; una eccessiva velocità di rotazione della fresa.

ABRASION

This type of wear of the mill cutting edge mainly occure when machining highly abrasive materials such as cast iron or silicon steel.
In this kind of machining it is therefore essential to find the right ratio between cutting speed and feed.
Further causes of a rapid abrasion of the cutting edge may be too low feed values per tooth and too high revolving speeda of the mill.



SURRISCALDAMENTO

Si deve fare attenzione a quanto sopra, perché questa causa provoca il rapido deterioramento del filo di taglio della fresa.
Generalmente il surriscaldamento avviene per eccessiva velocità di rotazione dell'utensile.
Occorre provvedere, quindi, alla diminuzione della velocità di taglio.

OVERHEATING

Special attention should be devoted to this problem since overheating causes a rapid deterioration of the mill cutting edge.
This is generally due to an excessive revolving speed of the tool.
The cutting speed should therefore be reduced in order to eliminate the problem.

EVITATE QUESTI INCONVENIENTI PER LA MIGLIORE RESA DEI NOSTRI UTENSILI

PREVENT THESE PROBLEM TO ACHIEVE AN IMPROVED EFFICIENCY OF OUR TOOLS



CRATERIZZAZIONE

Tale difetto che provoca un sensibile indebolimento del tagliente è generalmente da imputare ad una eccessiva velocità di taglio oppure all'uso di un grado di metallo duro non idoneo al materiale che si lavora.

Modificare quindi le velocità e passare eventualmente ad un grado maggiore di metallo duro.

CRATERING

This defect leads to a considerable weakening of the cutting edge and is usually due to an excessive cutting speed or to the use of a type of hard metal which is not suitable for the material being machined.

The speeds should therefore be modified and if necessary, hard metal of a higher degree should be used.



INTASAMENTO

Problema che si verifica in occasione di eccessivo avanzamento e profondità di passata. Ridurre quindi queste condizioni di lavoro, oppure procedere con frese a basso numero di taglienti.

Può anche essere appropriato un efficiente sistema di aria compressa per l'espulsione dei trucioli, oppure un'abbondante refrigerazione.

CLOGGING

A problem caused by an excessive feed and cutting depth.

Reduce these working conditions or use mills having a low number of cutting edges. An efficient compressed-air system for shavings ejection or extensive cooling can also help to solve this problem.

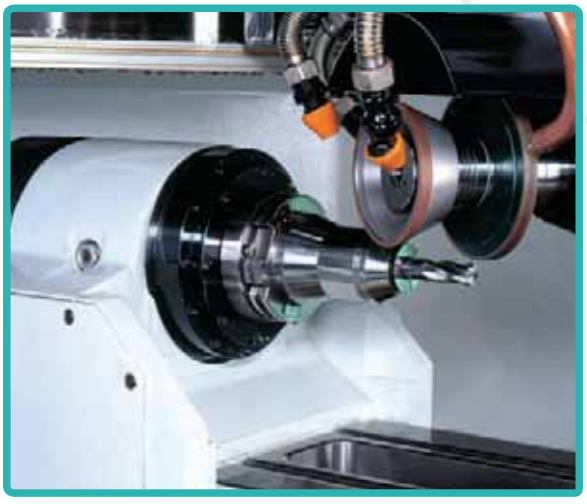
EVITATE QUESTI INCONVENIENTI
PER LA MIGLIORE RESA DEI NOSTRI UTENSILI

PREVENT THESE PROBLEM TO ACHIEVE AN IMPROVED EFFICIENCY OF OUR TOOLS

LA PROGETTAZIONE
THE PROJECTING



LA PRODUZIONE
THE PRODUCTION



IL CONTROLLO
THE CONTROL



CONDIZIONI GENERALI DI VENDITA

1) La (presente) proposta è ferma e irrevocabile da parte nostra, sino alla accettazione o al suo rifiuto da parte della A. Ghezzi & C. S.p.A.
Ove questa ritenga di accettarla, essa potrà a sua scelta, darne comunicazione espilicita mediante conferma d'ordine oppure dare diretta esecuzione alla presente.
In tale secondo caso la consegna della merce al vettore o allo spedizioniere rappresenterà "inizio di esecuzione" (art. 1327 Cod. Civ.) ed il contratto si avrà per concluso fra le parti alle condizioni tutte di cui alla presente.

2) L'eventuale rifiuto della (presente) proposta da parte della
A. Ghezzi & C. S.p.A. sarà comunicata per iscritto al proponente, con contemporanea restituzione di somme versate a titolo di acconto, deposito o altro. Nessun indennizzo, compenso o interesse spetterà al proponente in tale eventualità.

3) L'evasione della proposta che sia stata accettata dalla
A. Ghezzi & C. S.p.A. seguirà nel tempo consentito dalle condizioni di disponibilità.
Eventuali termini di consegna segnati sulla stessa hanno valore puramente indicativo.
Detta evasione potrà essere effettuata in tempi differiti senza che il proponente possa richiedere indennizzi di qualsiasi tipo, penali od altro.
Nei casi previsti dalla legge la A. Ghezzi & C. S.p.A. ha facoltà di recedere in tutto o in parte dal contratto di vendita.

4) I prezzi convenuti sono relativi al listino A. Ghezzi & C. S.p.A. in vigore, al netto di eventuali sconti e/o aumenti
Resta tuttavia inteso che la merce sarà fatturata, ed il proponente si impegna a pagarla, ai prezzi in vigore presso la A. Ghezzi & C. S.p.A. al momento della sua consegna.

5) Qualora le variazioni di prezzo risultassero superiori al 10% il proponente avrà facoltà, salvo si tratti di merce appositamente allestita per il proponente, di recedere comunicando per iscritto la sua intenzione entro 10 giorni dalla comunicazione delle variazioni dei prezzi.

6) La merce viaggia sempre a rischio e pericolo dell'acquirente anche se spedita franco-destinazione. Eventuali irregolarità o ammanchi di merce, desumibili dalla bolla di accompagnamento dei beni devono essere denunciati, a pena di decadenza, all'atto del ricevimento delle merci.

7) Qualunque reclamo relativo alla qualità dei prodotti forniti dovrà essere comunicato per iscritto alla A. Ghezzi & C. S.p.A. entro 15
giorni dal ricevimento della merce a pena di decadenza. Se il reclamo risulta fondato, A. Ghezzi & C. S.p.A. provvederà alla sostituzione della merce difettosa o difforme oppure all'accredito del relativo importo, escluso il risarcimento dei danni di qualsiasi natura.
La sostituzione del materiale, o l'eventuale accredito, sarà effettuato solo a restituzione avvenuta della merce contestata.
La pendenza di contestazione sulla merce non legittimerà in nessun modo sospensioni di pagamento che, se arbitrariamente effettuate, daranno diritto alla A. Ghezzi & C. S.p.A. di addebitare gli interessi di mora al tasso di svalutazione corrente.

8) Tutti i pagamenti qui previsti dovranno essere effettutati presso la sede amministrativa della A. Ghezzi & C. S.p.A.
20037 Paderno Dugnano (Mi) - Via Privata Gorlich, 1.

9) La competenza a decidere ogni eventuale controversia spetterà in via esclusiva al Foro di Milano.

PREZZI IVA ESCLUSA

Talicarb

Talicarb

Angelo Ghezzi & C SpA

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