

SILMAX®

QUALITY AS A STANDARD

SOLUZIONI PER IMPELLER

IMPELLER
SOLUTIONS



SILMAX.IT

CATALOGHI SILMAX

SILMAX CATALOGUES / SILMAX-KATALOGE / CATALOGUES SILMAX



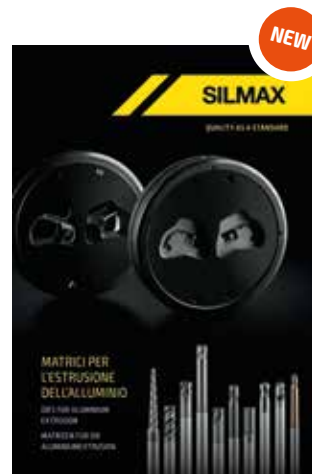
Catalogo generale
General Catalog



Alto Rendimento
High Performance



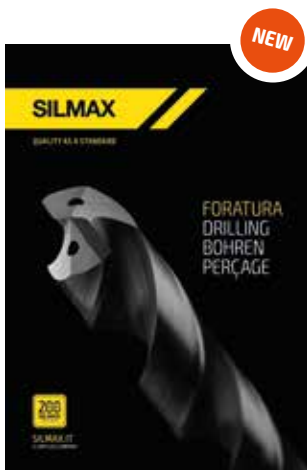
Titanio Superleghe, Acciaio Inox
Titanium Super Alloys, Stainless Steel



Matrici per l'estrusione dell'alluminio
Dies for aluminum extrusion



Stampi
Molds



Foratura
Drilling



Punte a cannone
Gun drills



Maschi
Taps



Aerospace
Aerospace



Leghe leggere
Light Alloys



Materiali compositi
Composite Materials



Silsaving
Silsaving

LA NOSTRA STORIA

OUR HISTORY / UNSERE GESCHICHTE / NOTRE HISTOIRE

1819



Paul Alessio inizia a forgiare i suoi primi utensili. La piccola officina si chiama "L'Usine".

Paul Alessio begins to forge his first tools. The small workshop is called "L'Usine".

Paul Alessio beginnt seine ersten Werkzeuge zu schmieden. Die kleine Werkstatt heißt "L'Usine".

Paul Alessio commence à forger ses premiers outils. Le petit atelier s'appelle « L'Usine ».

1955



Sotto la guida di Enrico M. Fumagalli "L'Usine" riprende l'attività produttiva.

Under the control of Enrico M. Fumagalli, the "Usine" resumed its tool production.

Unter der Leitung von Enrico M. Fumagalli nimmt die "Usine" die Produktionstätigkeit wieder auf.

Sous la direction de Monsieur Enrico M. Fumagalli, « L'Usine » reprend son activité de production.

1975



"L'Usine" diventa **Silmax, una moderna SPA.**

"L'Usine" becomes **the modern Silmax, SPA.**

Aus "L'Usine" wird **Silmax modernes SPA.**

« L'Usine » devient **Silmax, une SPA moderne.**

1984



Joint-venture Silmax Spa **Balzers AG.**

Joint-venture Silmax Spa **Balzers AG.**

Joint-venture Silmax Spa **Balzers AG.**

Joint-venture Silmax Spa **Balzers AG.**

2005



Silmax celebra i suoi **50 anni.**

Silmax celebrates its **50th birthday.**

Silmax feiert seine **50 Jahre.**

Silmax fête son **50e anniversaire.**

2012



Vengono inaugurate le sedi commerciali in **India, Cina e Germania.**

New commercial branches open in **India, China and Germany.**

Verkaufsbüros in **Indien, China und Deutschland** werden eröffnet.

Des bureaux de vente sont inaugurés en **Inde, en Chine, en Allemagne.**

2013



Silmax inaugura il **nuovo centro di rivestimento.**

Silmax **new plant for PVD coating.**

Silmax eröffnet das **neue Zentrum der Beschichtung.**

Silmax inaugure un **nouveau centre de revêtement.**

2019



Silmax 200 anni!

Silmax 200 years!

Silmax 200 Jahre!

Silmax fête son 200 anniversaire!

2021



5 nuove rettifiche e 1 nuovo impianto PVD.

5 new grinding machines and 1 new PVD unit.

5 neue Schleifmaschinen 1 neues PVD-System.

5 nouvelles rectifieuses et 1 nouveau système PVD.

2022



Silmax continua la sua storia e il suo **sviluppo** sempre attenta a mantenere alta la qualità dei suoi prodotti e la soddisfazione dei suoi clienti.

Silmax continues its history and its **development**, always careful to maintain the high quality of its products and the satisfaction of its customers.

Silmax setzt seine Geschichte und **Entwicklung** mit dem Ziel fort, die hohe Qualität seiner Produkte und die Zufriedenheit seiner Kunden zu.

Aujourd'hui, Silmax poursuit son histoire et son **développement** en veillant toujours à maintenir en haute la qualité de ses produits et la satisfaction de ses clients.

2023



Nuova apertura dello stabilimento in China.

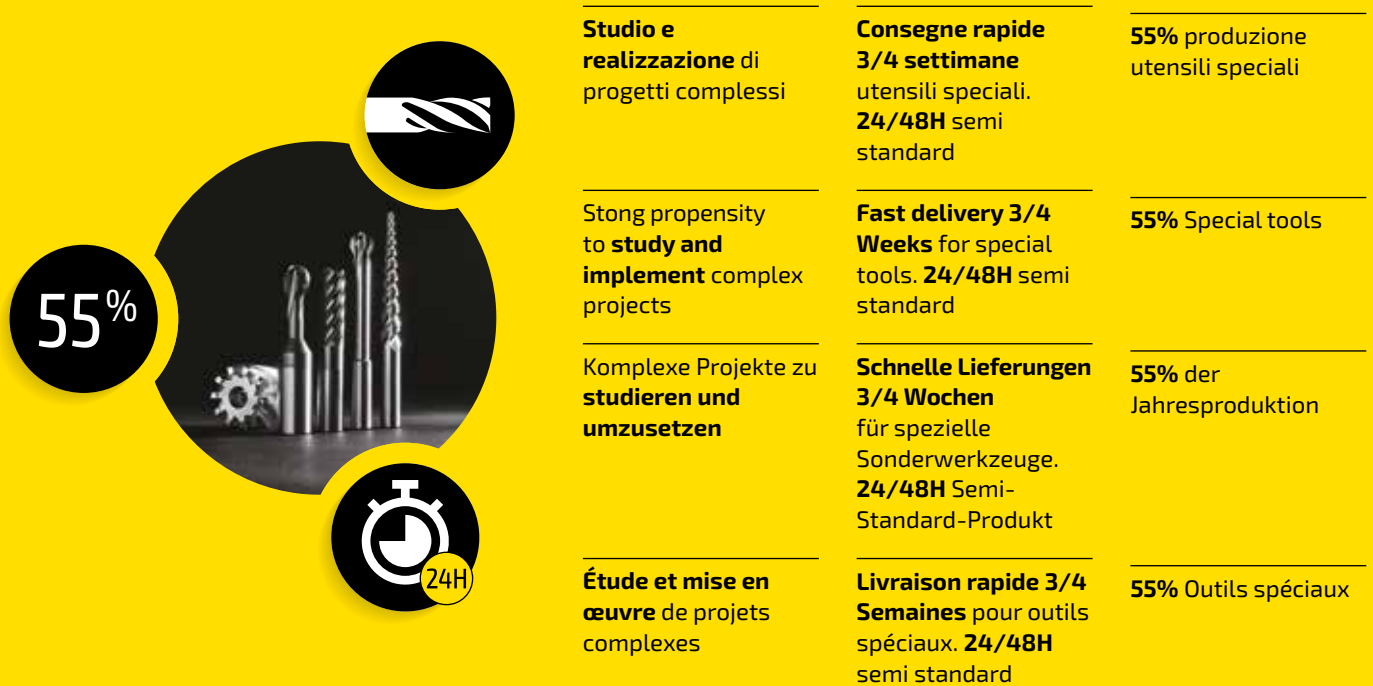
New plant opening in China.

Neue Produktionsanlagen in China.

Ouverture d'une nouvelle usine en Chine.

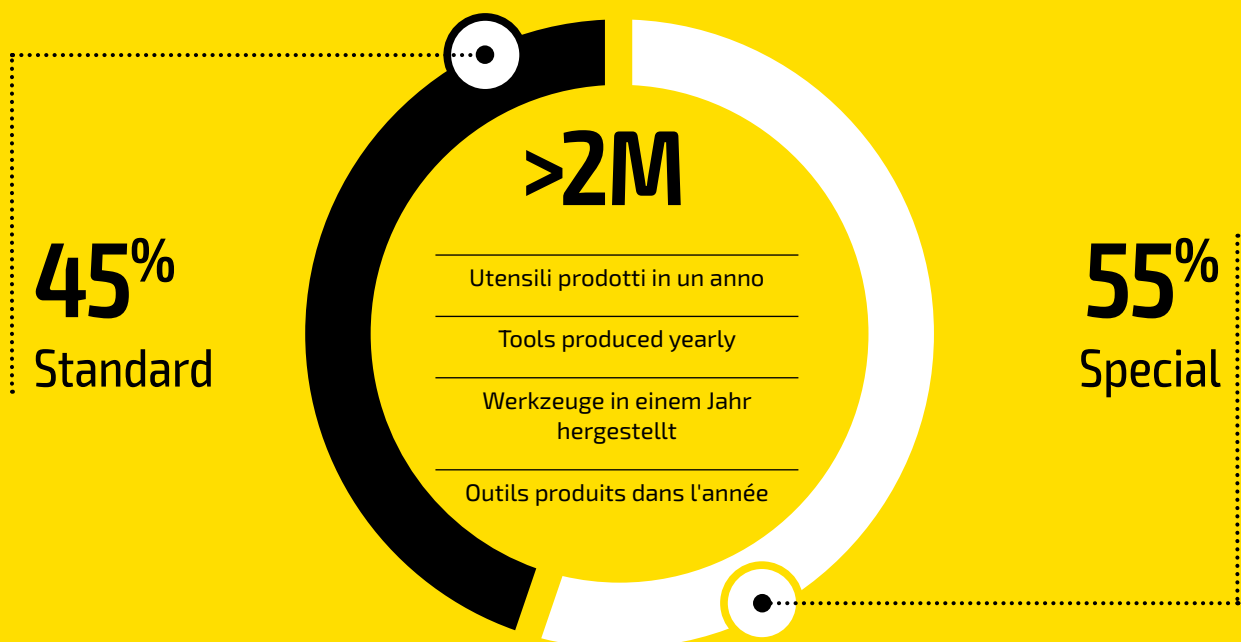
PRODOTTI SPECIALI

SPECIAL TOOLS / SPEZIELLE PRODUKTE / PRODUITS SPÉCIAUX



I NUMERI DI SILMAX

SILMAX FIGURES / SILMAX ZAHLEN / CHIFFRES SILMAX



DIVERSE TIPOLOGIE DI IMPELLER

DIFFERENT IMPELLER CLASSES / VERSCHIEDENE ARTEN VON IMPELLER /
DIFFÉRENTS TYPES DE IMPELLER

1

Girante del compressore centrifugo

Centrifugal compressor impeller
Zentrifugalkompressor Laufrad
Roues de compresseur centrifuge



2

Elica a vite per imbarcazioni

Boat screw propeller
Bootschraubenpropeller
Hélice à vis pour bateau



3

Blink

Blink
Blink
Blink



4

Paletta

Blade
Klinge
Lame



5

Paletta singola

Single blade
Einzelne Klinge
Lame unique



6

Diffusore

Diffuser
Diffusor
Diffuseur



SOLUZIONE COMPLETA DI FRESATURA PER IMPELLER

COMPLETE MILLING SOLUTION FOR IMPELLER / KOMPLETTE FRÄSLÖSUNG FÜR IMPELLER / SOLUTION AVANCE'E DE FRAISAGE POUR IMPELLER

Nuova gamma di **utensili standard e speciali** e applicazioni di successo per la lavorazione dei principali componenti di compressori, turbocompressori e motori aeronautici in **acciaio inossidabile, PH, titanio, leghe resistenti al calore ed alluminio**.

New range of **standard and special tools** and successful applications for machining major compressor, turbocharger and aircraft engine components in **stainless steel, PH, titanium, heat-resistant alloys and aluminium**.

Neue Produktpalette von **Standard- und Sonderwerkzeuge** und erfolgreiche Anwendungen für die Bearbeitung wichtiger Komponenten von Kompressoren, Turboladern und Flugzeugtriebwerken aus **Edelstahl, PH, Titan, hitzebeständigen Legierungen und Aluminium**.

Nouvelle gamme d'**outils standard et spéciaux** et applications performantes pour l'usinage des principaux composants des compresseurs, turbocompresseurs et moteurs aéronautiques en **acier inoxydable, PH, titane, alliages résistants à la chaleur, aluminium**.

L'implementazione di nuovi processi di **lavorazione evoluti** consente di risparmiare molto tempo ciclo e di migliorare l'efficienza, garantendo uno standard qualitativo superiore. Lo sviluppo del software per le lavorazioni in 5 assi richiede un utilizzo crescente di utensili speciali appositamente sviluppati.

New **advance processes implementation** allows customers to reduce cycle time and to improve efficiency, guaranteeing a higher quality standard. The 5-axis machining software development determines an increase for special tools, especially designed for that specific purpose.

Die Einführung der neuen Verfahren **spart viel Zykluszeit** und verbessert die Effizienz, wodurch ein höherer Qualitätsstandard gewährleistet wird. Die Softwareentwicklung für die 5-Achsen-Bearbeitung erfordert den zunehmenden Einsatz speziell entwickelter Werkzeuge.

La mise en œuvre des nouveaux **processus de point** permet d'économiser beaucoup de temps de cycle et d'améliorer l'efficacité, tout en garantissant un niveau de qualité plus élevé. Le développement de logiciels pour l'usinage à 5 axes nécessite l'utilisation croissante d'outils spécialement développés.

SILMAX ha sviluppato le **nuove gamme di utensili standard TIS ed ALU e la nuova gamma di utensili conici testa sferica**. Le ultime evoluzioni rispondono in particolar modo alla crescente **implementazione di strategie DTC**. L'implementazione di soluzioni con tacche di interruzione del truciolo permette di ottenere una migliore gestione del truciolo, un incremento della vita utensile e parametri di taglio superiori. La **nuova geometria frontale** con gash ottimizzato permette di ottenere ottime performance in fresatura dinamica e di fresatura laterale.

SILMAX has developed the **new standard tool TIS and ALU range and the new taper ballnose tool range**. The latest developments respond to the growing **implementation of DTC milling strategies**. The implementation of chip splitter solution allows to achieve better chip management, increased tool life and superior cutting parameters. The **new front geometry** presents an optimized gash and gives excellent performance in dynamic milling as well in side milling.

SILMAX hat **die neuen Standardwerkzeugreihen TIS und ALU sowie die neue Reihe** von Kugelkopfkegelwerkzeugen entwickelt. Die neuesten Entwicklungen reagieren insbesondere auf den zunehmenden **Einsatz von DTC-Strategien**. Der Einsatz von Lösungen mit Spanbruchkerben ermöglicht ein besseres Spänenmanagement, höhere Standzeiten und höhere Schnittparameter. Die **neue Stirngeometrie mit optimiertem Einschnitt** ermöglicht hervorragende Leistungen beim dynamischen Fräsen und Seitenfräsen.

SILMAX a développé les **nouvelles gammes d'outils standard TIS et ALU ainsi que la nouvelle gamme d'outils coniques à tête sphérique**. Les derniers développements répondent en particulier à la mise en **œuvre croissante des stratégies DTC**. La mise en place de solutions avec rajout brises copeaux permet une meilleure gestion des copeaux, une augmentation de la durée de vie de l'outil et des paramètres de coupe plus élevés. La nouvelle géométrie frontale avec gash optimisée permet d'excellentes performances en fraisage dynamique et en fraisage latéral.

L'esclusivo trattamento Silmax 45 riduce l'attrito e i problemi del tagliente.

Exclusive Silmax 45 treatment reduces friction and cutting edge problems.

Die exklusive Silmax 45-Beschichtung reduziert die Reibung und Probleme mit aufgesetzten Schneidkanten.

Le traitement exclusif Silmax 45 réduit la friction et les problèmes d'arête de coupe rapportée.

FRESA CONICA FRONTALE SFERICO

TAPER BALL NOSE TOOL / KEGELKUGELKOPFWERKZEUG /
FRAISE CONIQUE À BOUT SPHÉRIQUE

Gamma di utensili per la lavorazione di:

- Alluminio Z2
- Acciaio inossidabile e titanio Z3 e Z4
- Leghe resistenti al calore Z3 e Z4

Tool range for machining:

- Aluminum Z2
- Stainless steel and titanium Z3 and Z4
- Heat resistant superalloy Z3 and Z4

Palette von Werkzeugen für die Bearbeitung:

- Aluminium Z2
- Rostfreier Stahl und Titan Z3 und Z4
- Hitzebeständige Legierungen Z3 und Z4

Gamme d'outils pour l'usinage:

- Aluminium Z2
- Acier inoxydable et titane Z3 et Z4
- Alliages résistants à la chaleur Z3 et Z4

Rivestimento Balinit® Tisaflex + trattamento 4S per le migliori performance nella lavorazione di materiali difficili

Balinit® Tisaflex coating + 4S smooth surface for high performance in difficult material machining

Balinit® Tisaflex-Beschichtung + 4S-Behandlung für beste Leistung bei der Verarbeitung schwieriger Materialien

Revêtement Balinit® Tisaflex + traitement 4S pour une meilleure performance lors du traitement de matériaux difficiles

Geometria frontale ottimizzata, il design del gash sagomato permette una perfetta transizione del truciolo tra zona frontale e vano gola

Optimised front geometry, the shaped gash determines a perfect chip flow from front to flute

Die optimierte Stirngeometrie und das konturierte Gash design ermöglichen einen perfekten Spanübergang zwischen dem Stirnbereich und dem Halsbereich

Géométrie frontale optimisée, le design du gash permet une évacuation parfaite des copeaux entre la goujure frontale et postérieure



Bilanciate by design
Balanced by design
Ausgewogenheit durch Design
Un design équilibré

Superfici lucidate
Polished surfaces
Polierte Oberflächen
Surfaces polies

Spoglie radiali ottimizzate
Optimized radial relief
Optimierte Radialflügel
Dépouilles radiales optimisées

IMPELLER

Codice
Code

Ø
(D mm)

Z



Cava
Slotting
Nutenfräsen
Rainurage

Contornitura
Side and face milling
Konturfraßen
Contournage

Copiatura 3D
3D Copy
3D Kopie
Copiage 3D

Trocoidale
Trochoidal
Trochoidalfräsen
Trochoidal

Assiale
Plunging
Eintauchfräsen
Fraisage en plongée

Rampa
Diagonal plunging
Rampefräsen
Ramping

FRESE CONICHE TAPER END MILLS / KONISCHE FRÄSER / FRAISES CONIQUES

	9001	2,0 ÷ 12,0	3	•	•	•	•	-	•
	9002	2,0 ÷ 12,0	4	-	•	•	•	-	•
	9003	3,0 ÷ 8,0	3	•	•	•	•	-	•
	9004	3,0 ÷ 8,0	4	-	•	•	•	-	•
	9005	2,0 ÷ 8,0	2	•	•	•	•	•	•

UTENSILI STANDARD STANDARD TOOLS / STANDARDWERZEUGE / OUTILS STANDARD

	013EV	3,0 ÷ 20,0	4	•	•	-	-	-	•
	118	4,0 ÷ 20,0	4	•	•	-	•	-	-
	184EV	1,0 ÷ 25,0	4	•	•	-	•	-	-
	185T	6,0 ÷ 20,0	5	-	•	-	•	-	-
	185R	6,0 ÷ 20,0	5	-	•	-	•	-	-
	015S	8,0 ÷ 20,0	3	•	•	-	-	-	•

Acciaio
Steel
Stahl
Acier



Acciaio Temprato
Hardened Steel Gehärteter
Stahl
Acier trempé



Ghisa
Cast Iron
Gusseisen
Fonte



Acciaio Inox
Stainless Steel
Edelstahl
Acier Inoxydable



HRSA - Titanio
HRSA - Titanium
HRSA - Titan
HRSA - Titane



Metalli non ferrosi
Non-ferrous metals
NE-Metalle
Matières non ferreuses



NON ISO
Not ISO
Keine ISO
Pas d'ISO



Pagina
Page
Seite
Page








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IMPELLER

	Codice Code	Ø (Dmm)	Z	Cava Slotting Nutenfräsen Rainurage	Contornitura Side and face milling Konturfräsen Contournage	Copiatura 3D 3D Copy 3D Kopie Copiage 3D	Trocoideale Trochoidal Trochoidalfräsen Trochoidal	Assiale Plunging Eintauchfräsen Fraisage en plongée	Rampa Diagonal plunging Rampenfräsen Ramping
	125	30 ± 20,0	3	●	●	-	●	●	-
	127	6,0 ± 20,0	3	●	●	-	●	●	-
	129	10,0 ± 16,0	3	●	●	-	●	●	-
	735	6,0 ± 16,0	2	-	-	●	-	-	-
	765	3,0 ± 20,0	2	-	-	●	-	-	-

ALTRE FRESE TIS

TIS OTHER / ANDERE TIS-FRÄSER / AUTRES FRAISES TIS

PARTE TECNICA

TECHNICAL SECTION / TECHNISCHER TEIL / SECTION TECHNIQUE

BUSINESS CASES

UTENSILI SPECIALI

SPECIAL TOOLS / SONDERWERKZEUGE / OUTILS SPÉCIAUX

SERVIZIO DI RIAFFILATURA E RIGENERAZIONE

RE-SHARPENING AND REGENERATION SERVICE / SERVICE FÜR NACHSCHLIFF UND REGENERATION / SERVICE DE RÉAFFÛTAGE ET RÉGÉNÉRATION

Acciaio
Steel
Stahl
Acier

P

Acciaio Temprato
Hardened Steel/Gehärteter
Stahl
Acier trempé

H

Ghisa
Cast Iron
Gusseisen
Fonte

K

Acciaio Inox
Stainless Steel
Edelstahl
Acier Inoxydable

M

HRSA - Titanio
HRSA - Titanium
HRSA - Titan
HRSA - Titane

S

Metalli non ferrosi
Non-ferrous metals
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Matériaux non ferreuxes

N

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Not ISO
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O

Pagina
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Seite
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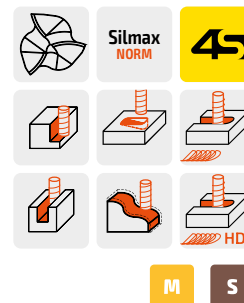
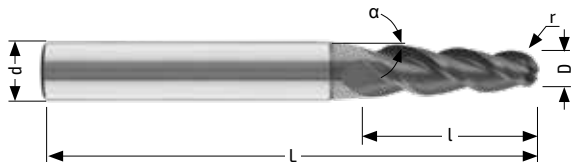
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Download the digital version of the brochure.

9001

Fresa conica testa sferica 3 taglienti per lavorazione acciaio inossidabile e titanio
 Conical end mill head 3 cutting edge for stainless steel machining and Titanium
 Konischer Messerkopf 3 Schneiden für die Edelstahlbearbeitung und Titan
 Fraise carbure conique arrondi 3 pour l'usinage de l'acier inoxydable et Titane



D	Cr/r	a/2	l	L	d	Z	Balinit® Latuma
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2,0	1,00	4,0	20,0	57	6	3	HMC900140020020
2,0	1,00	5,0	25,0	57	6	3	HMC900150025020
3,0	1,50	3,0	20,0	63	8	3	HMC900130020030
3,0	1,50	4,0	25,0	63	8	3	HMC900140025030
3,0	1,50	5,0	30,0	63	8	3	HMC900150030030
4,0	2,00	3,0	25,0	72	10	3	HMC900130025040
4,0	2,00	4,0	30,0	72	10	3	HMC900140030040
4,0	2,00	5,0	35,0	72	10	3	HMC900150035040
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8,0	4,00	5,0	60,0	92	16	3	HMC900150060080
9,0	4,50	3,0	40,0	92	16	3	HMC900130040090
9,0	4,50	4,0	50,0	92	16	3	HMC900140050090
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11,0	5,50	4,0	55,0	104	20	3	HMC9001400550110
11,0	5,50	5,0	65,0	104	20	3	HMC9001500650110
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12,0	6,00	4,0	55,0	104	20	3	HMC9001400550120
12,0	6,00	5,0	65,0	104	20	3	HMC9001500650120

P

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Hardened Steel
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S

HRSA - Titanio
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N

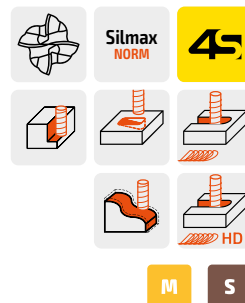
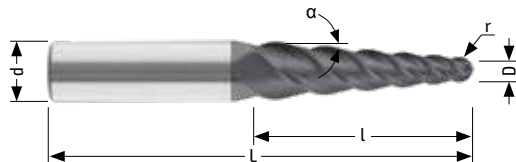
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Non-ferrous metals
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Matières non ferreuses

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9002

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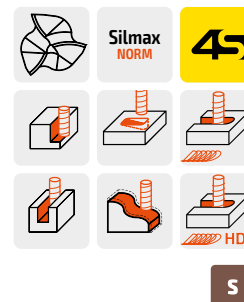
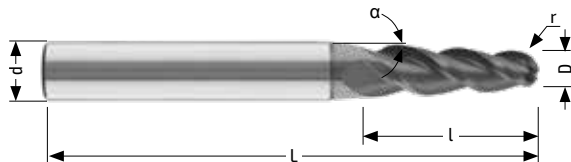


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3,0	1,50	3,0	20,0	63	8	4	HMC900230020030
3,0	1,50	4,0	25,0	63	8	4	HMC900240025030
3,0	1,50	5,0	30,0	63	8	4	HMC900250030030
4,0	2,00	3,0	25,0	72	10	4	HMC900230025040
4,0	2,00	4,0	30,0	72	10	4	HMC900240030040
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8,0	4,00	4,0	50,0	92	16	4	HMC900240050080
8,0	4,00	5,0	60,0	92	16	4	HMC900250060080
9,0	4,50	3,0	40,0	92	16	4	HMC900230040090
9,0	4,50	4,0	50,0	92	16	4	HMC900240050090
9,0	4,50	5,0	60,0	92	16	4	HMC900250060090
10,0	5,00	3,0	40,0	92	16	4	HMC9002300400100
10,0	5,00	4,0	50,0	92	16	4	HMC9002400500100
10,0	5,00	5,0	60,0	92	16	4	HMC9002500600100
11,0	5,50	3,0	45,0	104	20	4	HMC9002300450110
11,0	5,50	4,0	55,0	104	20	4	HMC9002400550110
11,0	5,50	5,0	65,0	104	20	4	HMC9002500650110
12,0	6,00	3,0	45,0	104	20	4	HMC9002300450120
12,0	6,00	4,0	55,0	104	20	4	HMC9002400550120
12,0	6,00	5,0	65,0	104	20	4	HMC9002500650120

Notes

9003

Fresa conica testa sferica 3 taglienti per lavorazione superleghe
 Conical cutter with ball head 3 cutting edges for superalloy machining
 Konischer Fräser mit Kugelkopf 3 Schneiden für die Bearbeitung von Superlegierungen
 Fraise carbure conique arrondi 3 pour l'usinage des superalliages



D	R	a/2	l	L	d	Z	Balinit® Latuma
3,0	1,50	3,0	20,0	63	8	3	HMC900330020030
3,0	1,50	4,0	25,0	63	8	3	HMC900340025030
3,0	1,50	5,0	30,0	63	8	3	HMC900350030030
4,0	2,00	3,0	25,0	72	10	3	HMC900330025040
4,0	2,00	4,0	30,0	72	10	3	HMC900340030040
4,0	2,00	5,0	35,0	72	10	3	HMC900350035040
5,0	2,50	3,0	25,0	72	10	3	HMC900330025050
5,0	2,50	4,0	30,0	72	10	3	HMC900340030050
5,0	2,50	5,0	35,0	72	10	3	HMC900350035050
6,0	3,00	3,0	30,0	83	12	3	HMC900330030060
6,0	3,00	4,0	35,0	83	12	3	HMC900340035060
6,0	3,00	5,0	40,0	83	12	3	HMC900350040060
7,0	3,50	3,0	30,0	83	12	3	HMC900330030070
7,0	3,50	4,0	35,0	83	12	3	HMC900340035070
7,0	3,50	5,0	40,0	83	12	3	HMC900350040070
8,0	4,00	3,0	40,0	92	16	3	HMC900330040080
8,0	4,00	4,0	50,0	92	16	3	HMC900340050080
8,0	4,00	5,0	60,0	92	16	3	HMC900350060080

P

Acciaio
Steel
Stahl
Acier

H

Acciaio Temprato
Hardened Steel
Gehärteter Stahl
Acier trempé

K

Ghisa
Cast Iron
Gusseisen
Fonte

M

Acciaio Inox
Stainless Steel
Edelstahl
Acier Inoxydable

S

HRSA - Titanio
HRSA - Titanium
HRSA - Titan
HRSA - Titane

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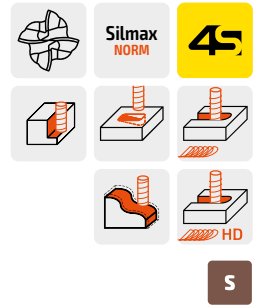
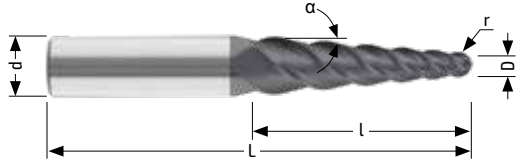
Metalli non ferrosi
Non-ferrous metals
NE-Metalle
Matières non ferreuses

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NON ISO
Not ISO
Keine ISO
Pas d'ISO

9004

Fresa conica testa sferica 4 taglienti per lavorazione superleghe
 Conical cutter with ball head 4 cutting edges for superalloy machining
 Konischer Fräser mit Kugelkopf 4 Schneiden für die Bearbeitung von Superlegierungen
 Fraise carbure conique arrondi 4 pour l'usinage des superalliages

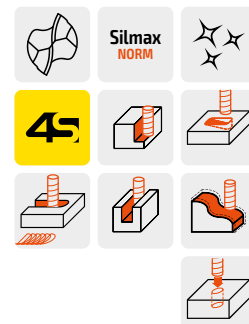


D	R	a/2	l	L	d	Z	Balinit® Latuma
3,0	1,50	3,0	20,0	63	8	4	HMC900430020030
3,0	1,50	4,0	25,0	63	8	4	HMC900440025030
3,0	1,50	5,0	30,0	63	8	4	HMC900450030030
4,0	2,00	3,0	25,0	72	10	4	HMC900430025040
4,0	2,00	4,0	30,0	72	10	4	HMC900440030040
4,0	2,00	5,0	35,0	72	10	4	HMC900450035040
5,0	2,50	3,0	25,0	72	10	4	HMC900430025050
5,0	2,50	4,0	30,0	72	10	4	HMC900440030050
5,0	2,50	5,0	35,0	72	10	4	HMC900450035050
6,0	3,00	3,0	30,0	83	12	4	HMC900430030060
6,0	3,00	4,0	35,0	83	12	4	HMC900440035060
6,0	3,00	5,0	40,0	83	12	4	HMC900450040060
7,0	3,50	3,0	30,0	83	12	4	HMC900430030070
7,0	3,50	4,0	35,0	83	12	4	HMC900440035070
7,0	3,50	5,0	40,0	83	12	4	HMC900450040070
8,0	4,00	3,0	40,0	92	16	4	HMC900430040080
8,0	4,00	4,0	50,0	92	16	4	HMC900440050080
8,0	4,00	5,0	60,0	92	16	4	HMC900450060080

Notes

9005

Fresa conica testa sferica 2 taglienti per lavorazione leghe leggere
 Conical end mill with spherical head 2 cutting edges for light alloy machining
 Konischer Fräser mit kugelförmigem Kopf 2 Schneiden für Bearbeitung von Leichtmetall
 Fraise conique à tête sphérique arête de coupe à 2 dents pour l'usinage d'alliages légers



N

D	R	a/2	l	L	d	Z	Uncoated
2,0	1,00	3,0	15,0	57	6	2	HM0900530015020
2,0	1,00	4,0	20,0	57	6	2	HM0900540020020
2,0	1,00	5,0	25,0	57	6	2	HM0900550025020
3,0	1,50	3,0	20,0	63	8	2	HM0900530020030
3,0	1,50	4,0	25,0	63	8	2	HM0900540025030
3,0	1,50	5,0	30,0	63	8	2	HM0900550030030
4,0	2,00	3,0	25,0	72	10	2	HM0900530025040
4,0	2,00	4,0	30,0	72	10	2	HM0900540030040
4,0	2,00	5,0	35,0	72	10	2	HM0900550035040
5,0	2,50	3,0	25,0	72	10	2	HM0900530025050
5,0	2,50	4,0	30,0	72	10	2	HM0900540030050
5,0	2,50	5,0	35,0	72	10	2	HM0900550035050
6,0	3,00	3,0	30,0	83	12	2	HM0900530030060
6,0	3,00	4,0	35,0	83	12	2	HM0900540035060
6,0	3,00	5,0	40,0	83	12	2	HM0900550040060
7,0	3,50	3,0	30,0	83	12	2	HM0900530030070
7,0	3,50	4,0	35,0	83	12	2	HM0900540035070
7,0	3,50	5,0	40,0	83	12	2	HM0900550040070
8,0	4,00	3,0	40,0	92	16	2	HM0900530040080
8,0	4,00	4,0	50,0	92	16	2	HM0900540050080
8,0	4,00	5,0	60,0	92	16	2	HM0900550060080

P

Acciaio
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Stahl
Acier

H

Acciaio Temprato
Hardened Steel
Gehärteter Stahl
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Fonte

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Edelstahl
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N

Metalli non ferrosi
Non-ferrous metals
NE-Metalle
Matières non ferreuses

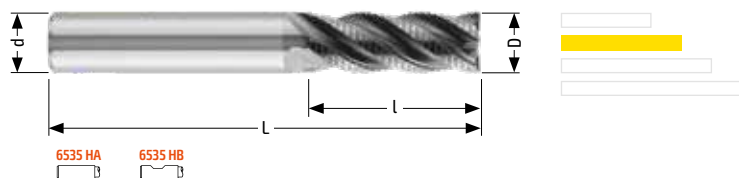
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Pas d'ISO



013EV

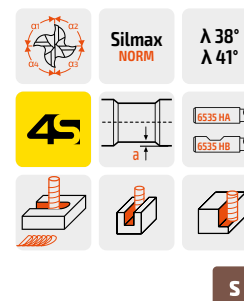
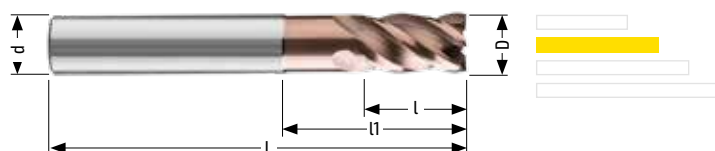
Fresa 4 taglienti a rompitruciolo con eliche differenziate e divisione irregolare
 4 flute roughing end mill with chip breaker, variable helix and unequal flute spacing
 Vierschneidige Fräser mit ungleichem Drallwinkel und ungleicher Teilung
 Fraise à 4 dents avec hélices variables et pas décalé



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

118

Fresa 4 taglienti per lavorazioni di superleghe
 4 flute end mill for superalloys machining
 Vierschneidige Fräser für die Bearbeitung von Superlegierungen
 Fraise à 4 dents pour l'usinage des superalliages

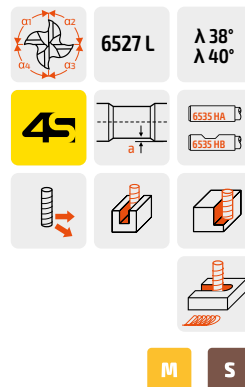
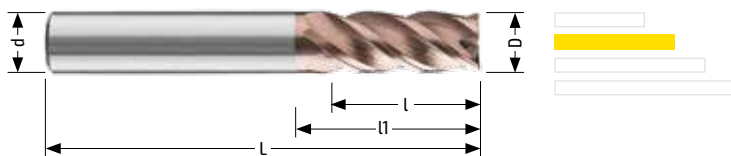


45°	D	d	L	l	l1	a	45°	Z	Balinit® Tisaflex	Balinit® Tisaflex
	e8	h6		ap						
	4,0	6	57	6,0	-	-	0,05	4	HMH118040	HMH118040W
	5,0	6	57	7,5	-	-	0,05	4	HMH118050	HMH118050W
	6,0	6	57	9,0	18,0	0,15	0,05	4	HMH118060	HMH118060W
	8,0	8	63	12,0	24,0	0,15	0,05	4	HMH118080	HMH118080W
	10,0	10	72	15,0	30,0	0,15	0,05	4	HMH118100	HMH118100W
	12,0	12	83	18,0	36,0	0,20	0,05	4	HMH118120	HMH118120W
	16,0	16	92	24,0	42,0	0,20	0,05	4	HMH118160	HMH118160W
	20,0	20	104	30,0	52,0	0,20	0,05	4	HMH118200	HMH118200W

Cr	D	d	L	l	l1	a	Cr	Z	Balinit® Tisaflex	Balinit® Tisaflex
	e8	h6		ap						
	6,0	6	57	9,0	18,0	0,15	0,50	4	HMH118060CR05	HMH118060CR05W
	8,0	8	63	12,0	24,0	0,15	0,50	4	HMH118080CR05	HMH118080CR05W
	10,0	10	72	15,0	30,0	0,15	1,00	4	HMH118100CR10	HMH118100CR10W
	12,0	12	83	18,0	36,0	0,20	1,00	4	HMH118120CR10	HMH118120CR10W
	16,0	16	92	24,0	42,0	0,20	1,00	4	HMH118160CR10	HMH118160CR10W
	20,0	20	104	30,0	52,0	0,20	1,00	4	HMH118200CR10	HMH118200CR10W

184EV

Fresa 4 taglienti per lavorazioni ad elevate asportazioni
4 flute end mill for high chip removal
Vierschneidige Fräser mit hohem Spanabfuhr
Fraise à 4 dents, pour débit coupeaux élevés



45°

D h10	d h6	L	l ap	l1	a	45°	Z	Balinit® Tisaflex	Balinit® Tisaflex
1,0	6	50	2,0	-	-	0,05	4	HMH184010EV	HMH184010EVW
2,0	6	50	4,0	-	-	0,05	4	HMH184020EV	HMH184020EVW
3,0	6	57	6,0	-	-	0,10	4	HMH184030EV	HMH184030EVW
4,0	6	57	9,0	-	-	0,10	4	HMH184040EV	HMH184040EVW
5,0	6	57	13,0	-	-	0,10	4	HMH184050EV	HMH184050EVW
6,0	6	57	13,0	20,0	0,15	0,15	4	HMH184060EV	HMH184060EVW
8,0	8	63	19,0	25,0	0,15	0,20	4	HMH184080EV	HMH184080EVW
10,0	10	72	22,0	30,0	0,15	0,20	4	HMH184100EV	HMH184100EVW
12,0	12	83	26,0	36,0	0,20	0,25	4	HMH184120EV	HMH184120EVW
16,0	16	92	32,0	42,0	0,20	0,30	4	HMH184160EV	HMH184160EVW
20,0	20	104	38,0	52,0	0,20	0,30	4	HMH184200EV	HMH184200EVW
25,0	25	124	45,0	65,0	0,25	0,30	4	HMH184250EV	HMH184250EVW

Cr

D h10	d h6	L	l ap	l1	a	Cr	Z	Balinit® Tisaflex	Balinit® Tisaflex
6,0	6	57	13,0	20,0	0,15	0,50	4	HMH184060EV05	HMH184060EV05W
6,0	6	57	13,0	20,0	0,15	1,00	4	HMH184060EV10	HMH184060EV10W
8,0	8	63	19,0	25,0	0,15	0,50	4	HMH184080EV05	HMH184080EV05W
8,0	8	63	19,0	25,0	0,15	1,00	4	HMH184080EV10	HMH184080EV10W
8,0	8	63	19,0	25,0	0,15	2,00	4	HMH184080EV20	HMH184080EV20W
10,0	10	72	22,0	30,0	0,15	0,50	4	HMH184100EV05	HMH184100EV05W
10,0	10	72	22,0	30,0	0,15	1,00	4	HMH184100EV10	HMH184100EV10W
10,0	10	72	22,0	30,0	0,15	2,00	4	HMH184100EV20	HMH184100EV20W
12,0	12	83	26,0	36,0	0,20	0,50	4	HMH184120EV05	HMH184120EV05W
12,0	12	83	26,0	36,0	0,20	1,00	4	HMH184120EV10	HMH184120EV10W
12,0	12	83	26,0	36,0	0,20	2,00	4	HMH184120EV20	HMH184120EV20W
12,0	12	83	26,0	36,0	0,20	3,00	4	HMH184120EV30	HMH184120EV30W
16,0	16	92	32,0	42,0	0,20	1,00	4	HMH184160EV10	HMH184160EV10W
16,0	16	92	32,0	42,0	0,20	2,00	4	HMH184160EV20	HMH184160EV20W
16,0	16	92	32,0	42,0	0,20	3,00	4	HMH184160EV30	HMH184160EV30W
16,0	16	92	32,0	42,0	0,20	4,00	4	HMH184160EV40	HMH184160EV40W
20,0	20	104	38,0	52,0	0,20	1,00	4	HMH184200EV10	HMH184200EV10W
20,0	20	104	38,0	52,0	0,20	2,00	4	HMH184200EV20	HMH184200EV20W
20,0	20	104	38,0	52,0	0,20	3,00	4	HMH184200EV30	HMH184200EV30W
20,0	20	104	38,0	52,0	0,20	4,00	4	HMH184200EV40	HMH184200EV40W
25,0	25	124	45,0	65,0	0,25	2,00	4	HMH184250EV20	HMH184250EV20W
25,0	25	124	45,0	65,0	0,25	3,00	4	HMH184250EV30	HMH184250EV30W
25,0	25	124	45,0	65,0	0,25	4,00	4	HMH184250EV40	HMH184250EV40W

P

Acciaio
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H

Acciaio Temprato
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S

HRSA - Titanio
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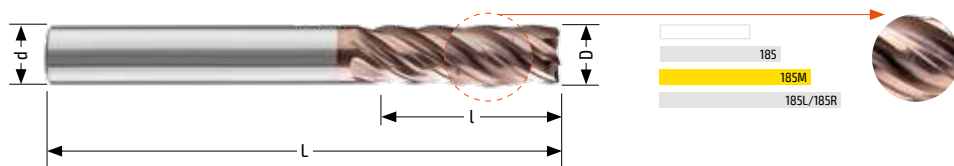
Metalli non ferrosi
Non-ferrous metals
NE-Metalle
Matières non ferreuses

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NON ISO
Not ISO
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185T

Fresa 5 taglienti con tagliente lungo 3xD e taglio interrotto
 5 flute end mill with long helix 3xD and with chip braker
 5-Schneiden-Schaftfräser mit langer schneide 3xD und unterbrochener Schnitt
 Fraise 5 dents avec partie coupante longue 3xD et brise coupeau



45°

D h10	d h6	L	l ap	45°	Z	Balinit® Tisaflex	Balinit® Tisaflex
6,0	6	64	19,0	0,15	5		
8,0	8	70	25,0	0,20	5		
10,0	10	78	31,0	0,20	5		
12,0	12	92	38,0	0,25	5		
16,0	16	110	50,0	0,30	5		
20,0	20	125	62,0	0,30	5		

Cr

D h10	d h6	L	l ap	Cr	Z	Balinit® Tisaflex	Balinit® Tisaflex
6,0	6	64	19,0	0,50	5		
6,0	6	64	19,0	1,00	5		
8,0	8	70	25,0	0,50	5		
8,0	8	70	25,0	1,00	5		
8,0	8	70	25,0	2,00	5		
10,0	10	78	31,0	0,50	5		
10,0	10	78	31,0	1,00	5		
10,0	10	78	31,0	2,00	5		
12,0	12	92	38,0	0,50	5		
12,0	12	92	38,0	1,00	5		
12,0	12	92	38,0	2,00	5		
12,0	12	92	38,0	3,00	5		
16,0	16	110	50,0	1,00	5		
16,0	16	110	50,0	2,00	5		
16,0	16	110	50,0	3,00	5		
16,0	16	110	50,0	4,00	5		
20,0	20	125	62,0	2,00	5		
20,0	20	125	62,0	3,00	5		
20,0	20	125	62,0	4,00	5		

P

Acciaio
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Hardened Steel
Gehärteter Stahl
Acier trempé

K

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S

HRSA - Titanio
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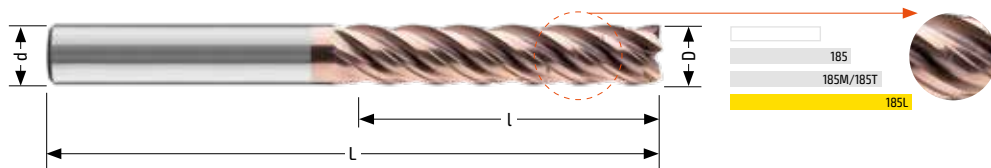
Metalli non ferrosi
Non-ferrous metals
NE-Metalle
Matières non ferreuses

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NON ISO
Not ISO
Keine ISO
Pas d'ISO

185R

Fresa 5 taglienti con tagliente extra lungo 5xD e taglio interrotto
 5 flute end mill with extra long helix 5xD and with chip braker
 5-Schneiden-Schaftfräser mit extra langer Schneide 5xD und unterbrochener Schnitt
 Fraise 5 dents avec partie coupante extra longue 5xD et brise coupeau

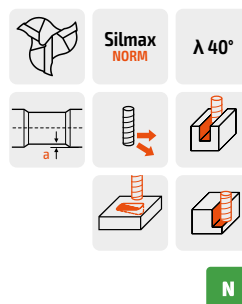
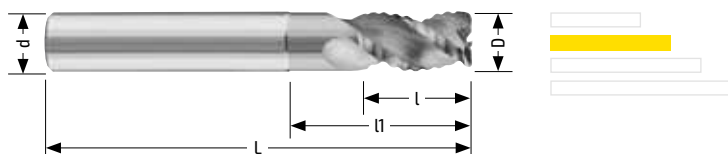


45°	D	d	L	l	45°	Z	Balinit® Tisaflex	Balinit® Tisaflex
	h10	h6		ap				
	6,0	6	74	30,0	0,15	5	HMH185R060	HMH185R060W
	8,0	8	84	40,0	0,20	5	HMH185R080	HMH185R080W
	10,0	10	100	50,0	0,20	5	HMH185R100	HMH185R100W
	12,0	12	115	60,0	0,25	5	HMH185R120	HMH185R120W
	16,0	16	142	80,0	0,30	5	HMH185R160	HMH185R160W
	20,0	20	165	100,0	0,30	5	HMH185R200	HMH185R200W

Cr	D	d	L	l	Cr	Z	Balinit® Tisaflex	Balinit® Tisaflex
	h10	h6		ap				
	6,0	6	74	30,0	0,50	5	HMH185R060CR05	HMH185R060CR05W
	8,0	8	84	40,0	0,50	5	HMH185R080CR05	HMH185R080CR05W
	10,0	10	100	50,0	0,50	5	HMH185R100CR05	HMH185R100CR05W
	12,0	12	115	60,0	0,50	5	HMH185R120CR05	HMH185R120CR05W
	16,0	16	142	80,0	0,50	5	HMH185R160CR05	HMH185R160CR05W
	20,0	20	165	100,0	0,50	5	HMH185R200CR05	HMH185R200CR05W

015S

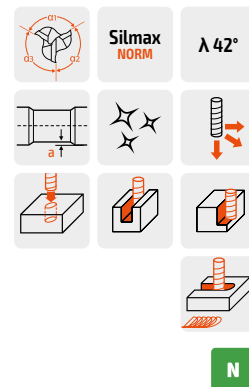
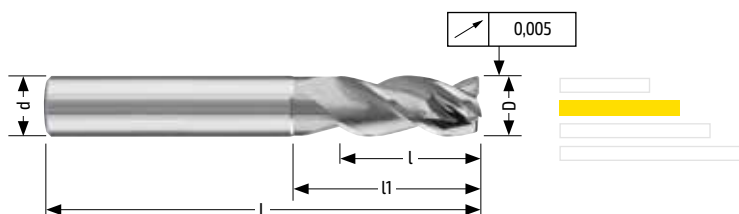
Fresa 3 taglienti a sgrossare serie normale con rompitruciolo
 3 flute roughing end mill with chip breaker, regular version
 Dreischneidige Schruppfräser, normale Ausführung mit Spanbrecher
 Fraise ébauche à 3 dents avec brise copeaux, série normale



Cr	D	d	L	l	l1	a	Cr	Z	Non rivestito	AluSpeed®
	h10	h6		ap					Uncoated	
	8,0	8	63	12,0	24,0	0,15	1,00	3	HM0015080	HMA015080
	10,0	10	72	15,0	30,0	0,15	1,00	3	HM0015100	HMA015100
	12,0	12	83	18,0	36,0	0,20	1,00	3	HM0015120	HMA015120
	16,0	16	92	24,0	42,0	0,20	1,00	3	HM0015160	HMA015160
	20,0	20	104	30,0	52,0	0,20	1,00	3	HM0015200	HMA015200

125

Fresa 3 taglienti serie normale con divisone irregolare
 3 flute end mill, regular version with unequal flute spacing
 Dreischneidige Fräser, normale Ausführung mit ungleicher Teilung
 Fraise à 3 dents à pas décalé, série normale



N

45°

D	d	L	l	l1	a	45°	Z	Non rivestito	AluSpeed®
h6	h6		ap			+0,05/+0		Uncoated	
3,0	6	57	8,0	-	-	0,05	3	HM0125030	HMA125030
4,0	6	57	11,0	-	-	0,05	3	HM0125040	HMA125040
5,0	6	57	13,0	-	-	0,10	3	HM0125050	HMA125050
6,0	6	57	13,0	20,0	0,15	0,10	3	HM0125060	HMA125060
8,0	8	63	19,0	25,0	0,15	0,15	3	HM0125080	HMA125080
10,0	10	72	22,0	30,0	0,15	0,20	3	HM0125100	HMA125100
12,0	12	83	26,0	36,0	0,20	0,25	3	HM0125120	HMA125120
16,0	16	92	32,0	42,0	0,20	0,30	3	HM0125160	HMA125160
20,0	20	104	38,0	52,0	0,20	0,35	3	HM0125200	HMA125200

Cr

D	d	L	l	l1	a	Cr	Z	Non rivestito	AluSpeed®
h6	h6		ap					Uncoated	
6,0	6	57	13,0	20,0	0,15	0,50	3	HM0125060CR05	HMA125060CR05
8,0	8	63	19,0	25,0	0,15	0,50	3	HM0125080CR05	HMA125080CR05
8,0	8	63	19,0	25,0	0,15	1,00	3	HM0125080CR10	HMA125080CR10
10,0	10	72	22,0	30,0	0,15	1,00	3	HM0125100CR10	HMA125100CR10
10,0	10	72	22,0	30,0	0,15	1,50	3	HM0125100CR15	HMA125100CR15
10,0	10	72	22,0	30,0	0,15	2,00	3	HM0125100CR20	HMA125100CR20
12,0	12	83	26,0	36,0	0,20	1,00	3	HM0125120CR10	HMA125120CR10
12,0	12	83	26,0	36,0	0,20	1,50	3	HM0125120CR15	HMA125120CR15
12,0	12	83	26,0	36,0	0,20	2,00	3	HM0125120CR20	HMA125120CR20
16,0	16	92	32,0	42,0	0,20	1,00	3	HM0125160CR10	HMA125160CR10
16,0	16	92	32,0	42,0	0,20	2,00	3	HM0125160CR20	HMA125160CR20
16,0	16	92	32,0	42,0	0,20	3,00	3	HM0125160CR30	HMA125160CR30
20,0	20	104	38,0	52,0	0,20	2,00	3	HM0125200CR20	HMA125200CR20
20,0	20	104	38,0	52,0	0,20	3,00	3	HM0125200CR30	HMA125200CR30

P

Acciaio
Steel
Stahl
Acier

H

Acciaio Temprato
Hardened Steel
Gehärteter Stahl
Acier trempé

K

Ghisa
Cast Iron
Gusseisen
Fonte

M

Acciaio Inox
Stainless Steel
Edelstahl
Acier Inoxydable

S

HRSA - Titanio
HRSA - Titanium
HRSA - Titan
HRSA - Titane

N

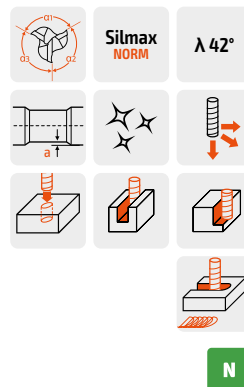
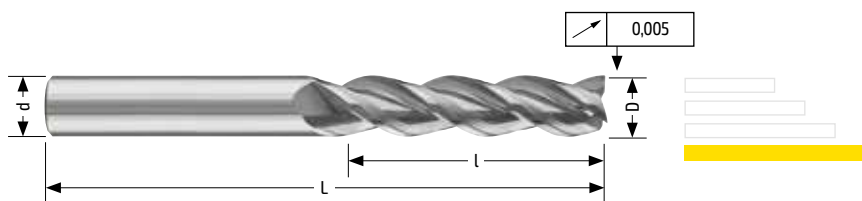
Metalli non ferrosi
Non-ferrous metals
NE-Metalle
Matières non ferreuses

O

NON ISO
Not ISO
Keine ISO
Pas d'ISO

127

Fresa 3 taglienti serie lunga con divisone irregolare
3 flute end mill, long version with unequal flute spacing
Dreischneidige Fräser, lange Ausführung mit ungleicher Teilung
Fraise à 3 dents, à pas décalé, série longue

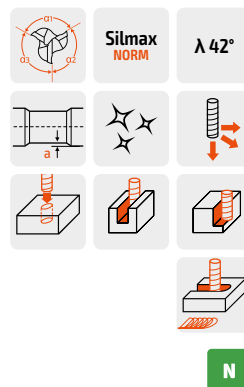
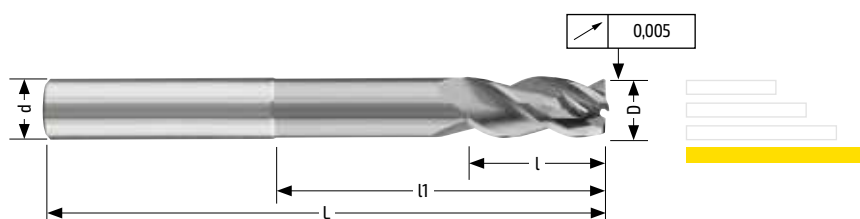


45°

D h6	d h6	L	l ap	45° +0,05/+0	Z	Non rivestito Uncoated	AluSpeed®
6,0	6	75	26,0	0,10	3	HM0127060	HMA127060
8,0	8	78	36,0	0,15	3	HM0127080	HMA127080
10,0	10	104	45,0	0,20	3	HM0127100	HMA127100
12,0	12	110	53,0	0,25	3	HM0127120	HMA127120
16,0	16	130	63,0	0,30	3	HM0127160	HMA127160
20,0	20	150	75,0	0,35	3	HM0127200	HMA127200

129

Fresa 3 taglienti serie lunga con divisone irregolare
3 flute end mill, long version with unequal flute spacing
Dreischneidige Fräser, lange Ausführung mit ungleicher Teilung
Fraise à 3 dents, à pas décalé, série longue

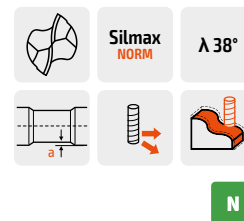
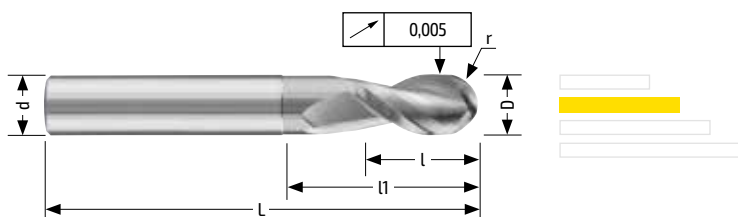


45°

D h6	d h6	L	l ap	l1	a	45° +0,05/+0	Z	Non rivestito Uncoated	AluSpeed®
10,0	10	104	22,0	55,0	0,15	0,20	3	HM0129100	HMA129100
12,0	12	110	26,0	64,0	0,20	0,25	3	HM0129120	HMA129120
16,0	16	130	32,0	75,0	0,20	0,30	3	HM0129160	HMA129160

735

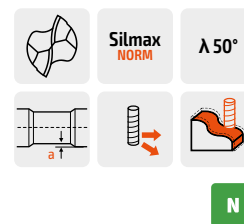
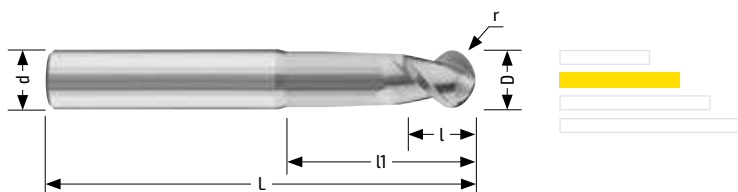
Fresa 2 taglienti serie normale semisferica
 2 flute ball nose end mill, regular version
 Zweischneidige Kugelfräser, normale Ausführung
 Fraise à 2 dents, bout hémisphérique, série normale



D	d	L	l	l1	a	r	Z	Non rivestito	AluSpeed®
h6	h6		ap			+/-0,01		Uncoated	
6,0	6	57	10,0	21,0	0,15	3,00	2	HM0735060	HMA735060
8,0	8	63	16,0	27,0	0,15	4,00	2	HM0735080	HMA735080
10,0	10	72	19,0	30,0	0,15	5,00	2	HM0735100	HMA735100
12,0	12	83	22,0	38,0	0,20	6,00	2	HM0735120	HMA735120
16,0	16	92	26,0	42,0	0,20	8,00	2	HM0735160	HMA735160

765

Fresa 2 taglienti semisferica per elevate asportazioni
 2 flute ball nose end mill, for high chip removal
 Zweischneidige Kugelfräser mit hohem Spanabfuhr
 Fraise à 2 dents, bout hémisphérique, pour débit copeaux élevés



D	d	L	l	l1	a	r	Z	Non rivestito	AluSpeed®
h10	h6		ap			f8		Uncoated	
3,0	3	50	3,0	22,0	0,15	1,50	2	HM0765030	HMA765030
4,0	4	50	4,0	22,0	0,20	2,00	2	HM0765040	HMA765040
5,0	5	50	5,0	22,0	0,20	2,50	2	HM0765050	HMA765050
6,0	6	57	6,0	21,0	0,25	3,00	2	HM0765060	HMA765060
8,0	8	63	8,0	27,0	0,35	4,00	2	HM0765080	HMA765080
10,0	10	72	10,0	32,0	0,50	5,00	2	HM0765100	HMA765100
12,0	12	83	12,0	38,0	0,50	6,00	2	HM0765120	HMA765120
16,0	16	92	16,0	44,0	0,80	8,00	2	HM0765160	HMA765160
20,0	20	104	20,0	54,0	0,90	10,00	2	HM0765200	HMA765200

P

Acciaio
Steel
Stahl
Acier

H

Acciaio Temprato
Hardened Steel
Gehärteter Stahl
Acier trempé

K

Ghisa
Cast Iron
Gusseisen
Fonte

M

Acciaio Inox
Stainless Steel
Edelstahl
Acier Inoxydable

S

HRSA - Titanio
HRSA - Titanium
HRSA - Titan
HRSA - Titane

N

Metalli non ferrosi
Non-ferrous metals
NE-Metalle
Matières non ferreuses

O

NON ISO
Not ISO
Keine ISO
Pas d'ISO

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silmax.it/tis

183

Fresa 3 taglienti per lavorazioni ad elevate asportazioni

3 flute end mill for high chip removal

Dreischneidige Fräser mit hohem Spanabfuhr

Fraise à 3 dents, pour débit copeaux élevés

184EV

Fresa 4 taglienti per lavorazioni ad elevate asportazioni

4 flute end mill for high chip removal

Vierschneidige Fräser mit hohem Spanabfuhr

Fraise à 4 dents, pour débit copeaux élevés

284EV

Fresa 4 taglienti con fori di lubrificazione per lavorazioni ad elevate asportazioni

4 flute end mill with internal coolant for high chip removal

Vierschneidige Fräser mit innerer Kühlung und hohem Spanabfuhr

Fraise à 4 dents avec trous de lubrification pour débit copeaux élevés

119

Fresa 4 taglienti per lavorazioni di duplex

4 flute end mill for duplex machining

Vierschneidige Fräser für die Bearbeitung von Duplex

Fraise à 4 dents pour l'usinage de duplex

118

Fresa 4 taglienti per lavorazioni di superleghe

4 flute end mill for superalloys machining

Vierschneidige Fräser für die Bearbeitung von Superlegierungen

Fraise à 4 dents pour l'usinage des superalliages

185

Fresa 5 taglienti per lavorazioni ad elevate asportazioni

5 flute end mill for high chip removal

Fünfschneidige Fräser mit hohem Spanabfuhr

Fraise à 5 dents, pour débit copeaux élevés

185M

Fresa 5 taglienti con tagliente lungo 3xD

5 flute end mill with long helix 3xD

5-Schneiden-Schaftfräser mit langer Schneide 3xD

Fraise 5 dents avec partie coupante longue 3xD

185T

Fresa 5 taglienti con tagliente lungo 3xD e taglio interrotto

5 flute end mill with long helix 3xD and with chip braker

5-Schneiden-Schaftfräser mit langer schneide 3xD und unterbrochener Schnitt

Fraise 5 dents avec partie coupante longue 3xD et brise coupeau

185L

Fresa 5 taglienti extra lunga 5xD

5 flutes end mill with extra long helix 5xD

5-schneidiger Schaftfräser mit extra langer Schneid 5xD

Fraise 5 dents avec partie coupante extra longue 5xD

185R

Fresa 5 taglienti con tagliente extra lungo 5xD e taglio interrotto

5 flute end mill with extra long helix 5xD and with chip braker

5-Schneiden-Schaftfräser mit extra langer Schneide 5xD und unterbrochener Schnitt

Fraise 5 dents avec partie coupante extra longue 5xD et brise coupeau

157

Fresa a 7 taglienti serie lunga per lavorazioni di titanio

7 flute end mill long version for Titanium machining

7-schneidiger Fräser, lange Ausführung für die Bearbeitung von Titan

Fraise à 7 dents, série longue, pour l'usinage de Titane

737

Fresa 2 taglienti semisferica serie normale

2 flute ball nose end mill, long version

Zweischneidige Kugelfräser, normale Ausführung

Fraise hémisphérique à 2 dents, série normale

737R

Fresa 2 taglienti serie normale semisferica con gambo rinforzato

2 flute ball nose end mill regular version with reinforced shank

Zweischneidige Kugelfräser mit verstärktem Schaft

Fraise hémisphérique à 2 dents avec queue renforcée série normale

133

Fresa 4 taglienti semisferica serie lunga

4 flute ball nose end mill, long version

Vierschneidige Kugelfräser, lange Ausführung

Fraise hémisphérique à 4 dents, série longue



PARTE TECNICA

TECHNICAL SECTION / TECHNISCHER TEIL / SECTION TECHNIQUE

Soluzione Silmax per Impeller

La nuovissima proposta Silmax per la **lavorazione delle giranti** consiste in una soluzione di fresatura completa e personalizzata, che comprende **utensili standard ad alta performance disponibili a magazzino e utensili speciali, su richiesta del cliente.**

I nuovi prodotti Silmax specifici per la lavorazione degli impeller consentono:

- **Aumento delle prestazioni e strategia di fresatura efficiente**
- **Riduzione dei tempi di ciclo e risparmio sui costi**
- **Una maggiore durata dell'utensile grazie all'elevata qualità della finitura superficiale.**

Gli specialisti Silmax possono supportarvi con un servizio professionale di soluzioni

di **fresatura a 5 assi (CAM, selezione degli utensili, scelta del refrigerante, parametri di taglio).**

La linea di prodotti è adatta alla lavorazione di giranti in **alluminio, inox, titanio e superleghe** e comprende frese cilindriche per sgrossatura e semi-finitura e frese coniche per semi-finitura e finitura di tutti i componenti della girante (mozzo e pala).

Silmax Impeller Solution

The brand-new Silmax proposal for impeller machining consists in a complete and customized milling solution, including high performing **standard tools available in stock and special tools, upon customer's**

request.

The new Silmax products specific for impeller machining allow:

- **Performance increase and efficient milling strategy**
- **Cycle time reduction and cost saving**
- **Longer tool life thanks to high surface finishing quality.**

Silmax specialists can support you with a professional **5-Axis milling solution**

service (CAM, proper tool selection, coolant suggestion, cutting parameters).

The product line is suitable for **Aluminium, Inox, Titanium and Superalloy** impeller machining and includes cylindrical end mills for roughing and semi-finishing and conical end mills for semi-finishing and finishing of all the impeller components (hub and blade).

Silmax Impeller Loesungen

Das brandneue Angebot von SILMAX für die Impellerbearbeitung besteht aus einer kompletten und Maßgeschneiderte Fräslösung, **einschließlich leistungsstarker Standardwerkzeuge auf Lager und Sonderwerkzeugen auf Kundenwunsch.**

Die neuen für die Impellerbearbeitung

konzipierten Produkte ermöglichen:

- **Leistungssteigerung und effiziente Frässtrategie**
- **Reduzierung der Zykluszeit und Kosteneinsparung.**
- **Längere Werkzeugstandzeiten dank hoher Oberflächengüte.**

Die Silmax-Spezialisten können Sie mit einem professionellen Lösungsservice für **das 5-Achsen-Fräsen (CAM, Werkzeugauswahl,**

Kühlmittelauswahl, Schnittparameter) unterstützen.

Die Produktlinie ist für die Bearbeitung von Impeller aus **Aluminium, Edelstahl, Titan und Superlegierungen** geeignet und sie umfasst zylindrische Schaftfräser zum Schruppen und Halbschlichten sowie konische Schaftfräser zum Halbschlichten und Schlichten aller Impellerkomponenten (Nabe und Schaufel).

Solution d'usage pour roues de soufflante (Impellor)

Le nouveau développement Silmax pour usinage roues de soufflante apporte une solution entièrement personnalisée et complète, comprenant soit outils standard de haute performance disponibles en stock soit outils spéciaux selon conception client.

Les nouveaux produits Silmax étudiés pour l'usinage de roues de soufflante permettent:

- **D'améliorer les performances et optimiser la stratégie de fraisage**
- **Réduction du temps de cycle et des coûts**
- **Qualité du traitement de finition de surface très élevée qui augmente la vie des outils.**

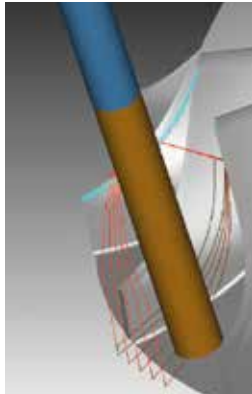
Les experts Silmax peuvent également vous accompagner dans l'usinage, avec solutions souples et complètes de





fraisage 5 axes (FAO, sélection d'outils appropriés, suggestion de liquide de refroidissement, paramètres de coupe). La gamme de produits est en mesure de satisfaire toutes les exigences et adaptée à l'usinage de turbines en **aluminium, inox, titane et superalliages.**

La gamme comprend des fraises cylindriques pour l'ébauche et la semi-finition et des fraises coniques pour la semi-finition et la finition de tous les composants de la roue (moyeu et pale).

**Sgrossatura (strategia convenzionale) / Roughing (traditional strategy) /
Schruppen (konventionelle Strategie) / Ebauche (stratégie conventionnelle)**

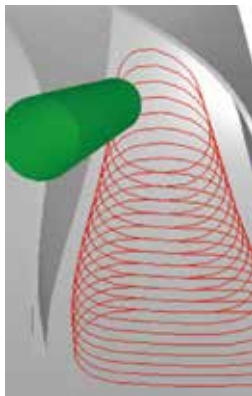
Fresa a sgrossare per esecuzione cave / Rough profile end mill for slotting / Schruppfräser für Nutenbearbeitung / Fraise d'ébauche pour l'exécution de rainures





M	S	S	N
17-4PH	Titanium	Titanium	Aluminum
			
013EV	184EV	184EV	015S
Vc: 70 m/min	Vc: 50-70 m/min	Vc: 50-60 m/min	Vc: 300-700 m/min
fz: 0.07 mm	fz: 0.06 mm	fz: 0.02-0.03 mm	fz: 0.1-0.17 mm
ap: 0.5 D-D	ap: 0.6 D-1.5 D	ap: 0.5 D-D	ap: 0.5 D-D
ae: 0.7 D-D	ae: 0.5 D-D	ae: 0.5 D-D	ae: 0.7 D-D

**Sgrossatura (strategia convenzionale) / Roughing (traditional strategy) /
Schruppen (konventionelle Strategie) / Ebauche (stratégie conventionnelle)**

Fresa DTC per lavorazioni in alta dinamica / DTC (Dynamic Trochoidal Cutting) end mill / DTC Fräser für hochdynamische Bearbeitungen / Fraise DTC pour l'usinage en haute dynamique

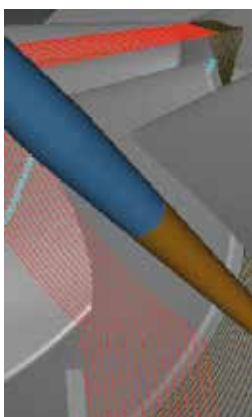




M	S
17-4PH	Titanium
	
185T	SPECIAL
Vc: 120-230 m/min	Vc: 100-190 m/min
fz: 0.1 mm	fz: 0.1-0.15 mm
ap: D-4 D	ap: D-4 D
ae: 0.1 D-0.3	ae: 0.1 D-0.3



**Semifinitura e finitura (HUB) / Semi-finishing and finishing (HUB) /
Vorschlicht- und Schlichtbearbeitungsanwendungen (HUB) / Semi-finition et finition (HUB)**

Alto avanzamento point milling / High feedrate point milling / Hochvorschubsfräser (point milling) / Fraisage à point d'avance élevé

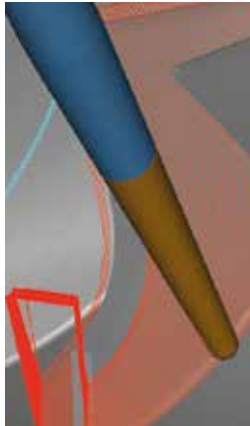


M	M
17-4PH	17-4PH
	
133	SPECIAL
Vc: 90-110 m/min	Vc: 70-100 m/min
fz: 0.1-0.4 mm	fz: 0.1-0.4 mm
ap: 0.1-0.2 mm	ap: 0.1-0.2 mm
ae: refer surface finishing	ae: refer surface finishing



Semifinitura e finitura (Paletta) / Semi-finishing and finishing (Blade) / Vorschlicht- und Schlichtbearbeitungsanwendungen (Paletten) / Semi-finition et finition (Paddle)

Alto avanzamento point milling / High feedrate point milling / Hochvorschubsfräser (point milling) / Fraisage à point d'avance élevé



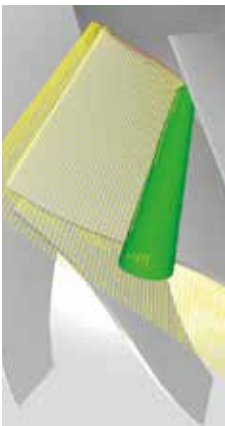
M	N
17-4PH	Aluminum
SPECIAL	765S
Vc: 70-100 m/min	Vc: 300-900 m/min
fz: 0.05-0.15 mm	fz: 0.05-0.1 mm
ap: 0.1-0.3 mm	ap: 0.1-0.3 mm
ae: refer surface finishing	ae: refer surface finishing



BLADE SURFACE

Semifinitura e finitura (Paletta) / Semi-finishing and finishing (Blade) / Vorschlicht- und Schlichtbearbeitungsanwendungen (Paletten) / Semi-finition et finition (Paddle)

Contornatura di ruled surface / Side milling rule surface / Besäumen von runden Oberflächen / Contournement de la surface roulée



M	S	S	N	N
17-4PH SEMI-FINISHING FINISHING	Titanium SEMI-FINISHING	Titanium FINISHING	Aluminum SEMI-FINISHING	Aluminum FINISHING
SPECIAL	SPECIAL	SPECIAL	SPECIAL	SPECIAL
Vc: 70-100 m/min	Vc: 90 m/min	Vc: 60 m/min	Vc: 300-700 m/min	Vc: 300-800 m/min
fz: 0.03-0.07 mm	fz: 0.07-0.1 mm	fz: 0.03 mm	fz: 0.1-0.17 mm	fz: 0.05-0.1 mm
ap: blade height	ap: blade height	ap: blade height	ap: 0.5 D-D	ap: blade height
ae: 0.07-0.1 mm	ae: 0.5-1 mm	ae: 0.15-0.2 mm	ae: 0.7 D-D	ae: 0.2-1 mm

P

Acciaio
Steel
Stahl
Acier

H

Acciaio Temprato
Hardened Steel
Gehärteter Stahl
Acier trempé

K

Ghisa
Cast Iron
Gusseisen
Fonte

M

Acciaio Inox
Stainless Steel
Edelstahl
Acier Inoxydable

S

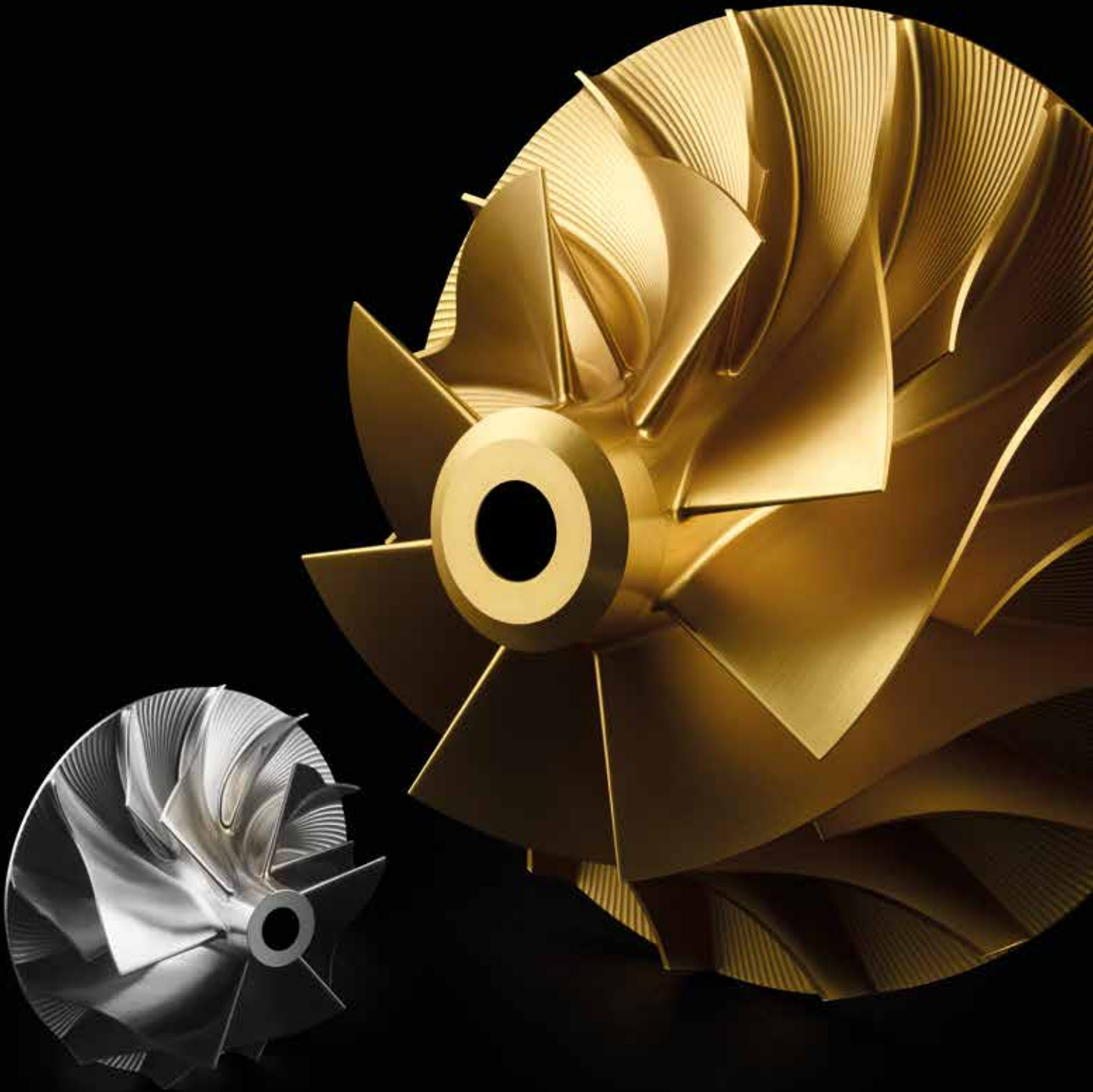
HRSA - Titanio
HRSA - Titanium
HRSA - Titan
HRSA - Titane

N

Metalli non ferrosi
Non-ferrous metals
NE-Metalle
Matières non ferreuses






O

NON ISO
Not ISO
Keine ISO
Pas d'ISO








BUSINESS CASES









PARTE DEL MOTORE / ENGINE PART / MOTORTEIL / PARTIE DU MOTEUR

	<table border="1"> <thead> <tr> <th>Tool</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>Taper ball nose tool</td> <td>Al-Mg-Zn-Cu-Ni ALLOY</td> </tr> </tbody> </table>	Tool	Material	Taper ball nose tool	Al-Mg-Zn-Cu-Ni ALLOY	<table border="1"> <tbody> <tr> <td>D [mm]</td> <td>R1.5-A5-35-80-D10-Z2</td> </tr> <tr> <td>ap [mm]</td> <td>30</td> </tr> <tr> <td>ae [mm]</td> <td>0,5</td> </tr> <tr> <td>Vc [m/m]</td> <td>350</td> </tr> </tbody> </table>	D [mm]	R1.5-A5-35-80-D10-Z2	ap [mm]	30	ae [mm]	0,5	Vc [m/m]	350	
	Tool	Material													
	Taper ball nose tool	Al-Mg-Zn-Cu-Ni ALLOY													
	D [mm]	R1.5-A5-35-80-D10-Z2													
ap [mm]	30														
ae [mm]	0,5														
Vc [m/m]	350														
<table border="1"> <thead> <tr> <th>Compoents</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>Turbocharger impeller</td> <td>  Side Milling Contouring </td> </tr> </tbody> </table>	Compoents	Operation	Turbocharger impeller	 Side Milling Contouring	<table border="1"> <tbody> <tr> <td>s [rpm]</td> <td>14000</td> </tr> <tr> <td>fz [mm]</td> <td>0,18</td> </tr> <tr> <td>F [mm/min]</td> <td>5000</td> </tr> </tbody> </table>	s [rpm]	14000	fz [mm]	0,18	F [mm/min]	5000				
Compoents	Operation														
Turbocharger impeller	 Side Milling Contouring														
s [rpm]	14000														
fz [mm]	0,18														
F [mm/min]	5000														
<p>Special tool</p>	<p>SILMAX offre al cliente una soluzione completa. SILMAX makes a complete solution for the customer. SILMAX bietet eine Komplettlösung für den Kunden. SILMAX offre une solution complète au client.</p>														

PARTE DEL MOTORE / ENGINE PART / MOTORTEIL / PARTIE DU MOTEUR

	<table border="1"> <thead> <tr> <th>Tool</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>Taper ball nose tool</td> <td>17-4 PH</td> </tr> </tbody> </table>	Tool	Material	Taper ball nose tool	17-4 PH	<table border="1"> <tbody> <tr> <td>D [mm]</td> <td>R2.5-A5-40-82-D12-T2</td> </tr> <tr> <td>ap [mm]</td> <td>30</td> </tr> <tr> <td>ae [mm]</td> <td>0,5</td> </tr> <tr> <td>Vc [m/m]</td> <td>110</td> </tr> </tbody> </table>	D [mm]	R2.5-A5-40-82-D12-T2	ap [mm]	30	ae [mm]	0,5	Vc [m/m]	110	
	Tool	Material													
	Taper ball nose tool	17-4 PH													
	D [mm]	R2.5-A5-40-82-D12-T2													
ap [mm]	30														
ae [mm]	0,5														
Vc [m/m]	110														
<table border="1"> <thead> <tr> <th>Compoents</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>Open or enclosed impeller</td> <td>  Trochoidal </td> </tr> </tbody> </table>	Compoents	Operation	Open or enclosed impeller	 Trochoidal	<table border="1"> <tbody> <tr> <td>s [rpm]</td> <td>3500</td> </tr> <tr> <td>fz [mm]</td> <td>0,07</td> </tr> <tr> <td>F [mm/min]</td> <td>1000</td> </tr> <tr> <td>Tool life</td> <td>20H</td> </tr> </tbody> </table>	s [rpm]	3500	fz [mm]	0,07	F [mm/min]	1000	Tool life	20H		
Compoents	Operation														
Open or enclosed impeller	 Trochoidal														
s [rpm]	3500														
fz [mm]	0,07														
F [mm/min]	1000														
Tool life	20H														
<p>Special tool</p>	<p>Al cliente è stata fornita una soluzione completa per giranti aperte e chiuse. Complete open and enclosed Impeller solution has been provided to customer. Dem Kunden wurde eine komplette offene und geschlossene Impellerlösung zur Verfügung gestellt. Le client a reçu une solution complète pour les Impeller ouvertes et fermées.</p>														












PARTE DEL MOTORE / ENGINE PART / MOTORTEIL / PARTIE DU MOTEUR

	<table border="1"> <tr> <th>Tool</th> <th>Material</th> </tr> <tr> <td>  </td> <td> <div style="border: 1px solid black; padding: 5px; text-align: center;"> AISI 314 </div> </td> </tr> </table>	Tool	Material		<div style="border: 1px solid black; padding: 5px; text-align: center;"> AISI 314 </div>	<p>D [mm] 12</p> <p>ap [mm] 40</p> <p>ae [mm] 0,5</p> <p>Vc [m/m] 113</p>	
	Tool	Material					
	<div style="border: 1px solid black; padding: 5px; text-align: center;"> AISI 314 </div>						
<table border="1"> <tr> <th>Compoents</th> <th>Operation</th> </tr> <tr> <td> <div style="border: 1px solid black; padding: 5px; text-align: center;">Blade</div> </td> <td>  </td> </tr> </table>	Compoents	Operation	<div style="border: 1px solid black; padding: 5px; text-align: center;">Blade</div>		<p>s [rpm] 3000</p> <p>fz [mm] 0,125</p> <p>F [mm/min] 1500</p>		
Compoents	Operation						
<div style="border: 1px solid black; padding: 5px; text-align: center;">Blade</div>							
<p>158</p>	<p>Il tempo di ciclo dell'operazione di sgrossatura è stato ridotto del 50% grazie all'implementazione della strategia di fresatura dinamica. Roughing operation cycle time 50% reduction achieved by implementing dynamic milling strategy. Reduzierung der Zykluszeit beim Schruppen um 50 % durch Implementierung einer dynamischen Frässtrategie. Le temps du cycle de l'opération d'ébauche a été réduit de 50 % grâce à la mise en œuvre d'une stratégie de fraisage dynamique.</p>						












PARTE DEL MOTORE / ENGINE PART / MOTORTEIL / PARTIE DU MOTEUR

	<table border="1"> <tr> <th>Tool</th> <th>Material</th> </tr> <tr> <td> <div style="border: 1px solid black; padding: 5px; text-align: center;">Special tool</div> </td> <td> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Inconel 718 </div> </td> </tr> </table>	Tool	Material	<div style="border: 1px solid black; padding: 5px; text-align: center;">Special tool</div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Inconel 718 </div>	<p>D [mm] 2,7</p> <p>ap [mm] 0,2</p> <p>ae [mm] 2,7</p> <p>Vc [m/m] 17</p>	
	Tool	Material					
<div style="border: 1px solid black; padding: 5px; text-align: center;">Special tool</div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Inconel 718 </div>						
<table border="1"> <tr> <th>Compoents</th> <th>Operation</th> </tr> <tr> <td> <div style="border: 1px solid black; padding: 5px; text-align: center;">Blisk</div> </td> <td>  </td> </tr> </table>	Compoents	Operation	<div style="border: 1px solid black; padding: 5px; text-align: center;">Blisk</div>		<p>s [rpm] 2000</p> <p>fz [mm] 0,0125</p> <p>F [mm/min] 100</p> <p>Tool life 7H</p>		
Compoents	Operation						
<div style="border: 1px solid black; padding: 5px; text-align: center;">Blisk</div>							
<p>Special tool</p>	<p>Riduzione del 50% dei tempi di ciclo e aumento del 40% della durata degli utensili rispetto alla concorrenza di fascia alta. Cycle time 50% reduction and 40% tool life increase compared to high end competition. Reduzierung der Zykluszeit um 50 % und Erhöhung der Werkzeugstandzeit um 40 % im Vergleich zur High-End-Konkurrenz. Temps du cycle réduit de 50 % et durée de vie de l'outil augmentée de 40 % par rapport à la haute gamme des concurrents.</p>						


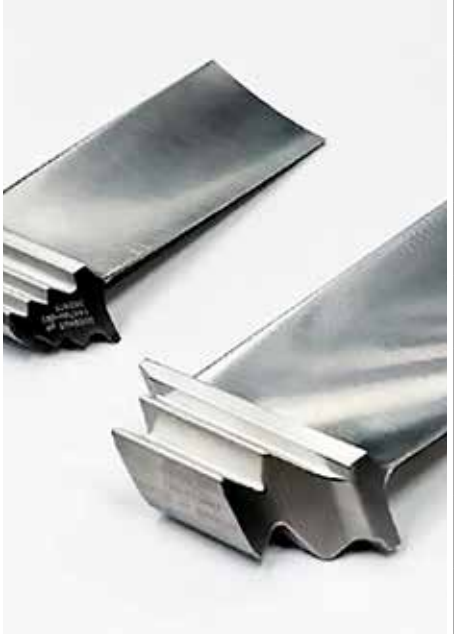



PARTE DEL MOTORE / ENGINE PART / MOTORTEIL / PARTIE DU MOTEUR

	5 flute end mill for high chip removal												
	<table border="1"> <tr> <th>Tool</th> <th>Material</th> </tr> <tr> <td>  HMC185160CR30 </td> <td> TA16 </td> </tr> </table>	Tool		Material	 HMC185160CR30	TA16	<table border="1"> <tr> <td>D [mm]</td> <td>16R3</td> </tr> <tr> <td>ap [mm]</td> <td>30</td> </tr> <tr> <td>ae [mm]</td> <td>0,5</td> </tr> <tr> <td>Vc [m/m]</td> <td>100</td> </tr> </table>	D [mm]	16R3	ap [mm]	30	ae [mm]	0,5
Tool	Material												
 HMC185160CR30	TA16												
D [mm]	16R3												
ap [mm]	30												
ae [mm]	0,5												
Vc [m/m]	100												
<table border="1"> <tr> <th>Compoents</th> <th>Operation</th> </tr> <tr> <td>  Cartridge receiver </td> <td>  Trochoidal </td> </tr> </table>	Compoents	Operation	 Cartridge receiver	 Trochoidal	<table border="1"> <tr> <td>s [rpm]</td> <td>2000</td> </tr> <tr> <td>fz [mm]</td> <td>0,15</td> </tr> <tr> <td>F [mm/min]</td> <td>1200</td> </tr> </table>	s [rpm]	2000	fz [mm]	0,15	F [mm/min]	1200		
Compoents	Operation												
 Cartridge receiver	 Trochoidal												
s [rpm]	2000												
fz [mm]	0,15												
F [mm/min]	1200												
<p>185</p>	<p>Durata doppia rispetto alla concorrenza. Double tool life compared to high end competition. Doppelte Standzeit im Vergleich zur High-End-Konkurrenz. Durée de vie de l'outil doublée par rapport à la haute gamme des concurrents.</p>												









PARTE DEL MOTORE / ENGINE PART / MOTORTEIL / PARTIE DU MOTEUR

	5 flute end mill for high chip removal												
	<table border="1"> <tr> <th>Tool</th> <th>Material</th> </tr> <tr> <td>  HMC154160 </td> <td> GH706 Fe-Ni-Cr Based </td> </tr> </table>	Tool		Material	 HMC154160	GH706 Fe-Ni-Cr Based	<table border="1"> <tr> <td>D [mm]</td> <td>16</td> </tr> <tr> <td>ap [mm]</td> <td>25</td> </tr> <tr> <td>ae [mm]</td> <td>0,5</td> </tr> <tr> <td>Vc [m/m]</td> <td>50</td> </tr> </table>	D [mm]	16	ap [mm]	25	ae [mm]	0,5
Tool	Material												
 HMC154160	GH706 Fe-Ni-Cr Based												
D [mm]	16												
ap [mm]	25												
ae [mm]	0,5												
Vc [m/m]	50												
<table border="1"> <tr> <th>Compoents</th> <th>Operation</th> </tr> <tr> <td>  Cartridge receiver </td> <td>  Trochoidal </td> </tr> </table>	Compoents	Operation	 Cartridge receiver	 Trochoidal	<table border="1"> <tr> <td>s [rpm]</td> <td>1000</td> </tr> <tr> <td>fz [mm]</td> <td>0,12</td> </tr> <tr> <td>F [mm/min]</td> <td>600</td> </tr> <tr> <td>Tool life</td> <td>90MINS</td> </tr> </table>	s [rpm]	1000	fz [mm]	0,12	F [mm/min]	600	Tool life	90MINS
Compoents	Operation												
 Cartridge receiver	 Trochoidal												
s [rpm]	1000												
fz [mm]	0,12												
F [mm/min]	600												
Tool life	90MINS												
<p>154</p>	<p>Forte riduzione del tempo di ciclo e aumento della durata degli utensili. Strong cycle time reduction and tool life increase. Starke Reduzierung der Zykluszeit und Erhöhung der Werkzeugstandzeit. Forte réduction du temps de cycle et augmentation de la durée de vie des outils.</p>												

PARTE DEL MOTORE / ENGINE PART / MOTORTEIL / PARTIE DU MOTEUR

	<table border="1"> <tr> <th>Tool</th> <th>Material</th> </tr> <tr> <td>Special</td> <td>Ti6Al4V</td> </tr> </table>	Tool	Material	Special	Ti6Al4V	<table border="1"> <tr> <td>D [mm]</td> <td>12R3</td> </tr> <tr> <td>ap [mm]</td> <td>0,7</td> </tr> <tr> <td>ae [mm]</td> <td>1</td> </tr> <tr> <td>Vc [m/m]</td> <td>94</td> </tr> </table>	D [mm]	12R3	ap [mm]	0,7	ae [mm]	1	Vc [m/m]	94	
	Tool	Material													
Special	Ti6Al4V														
D [mm]	12R3														
ap [mm]	0,7														
ae [mm]	1														
Vc [m/m]	94														
<table border="1"> <tr> <th>Compoents</th> <th>Operation</th> </tr> <tr> <td>Blade root</td> <td>  Step by step </td> </tr> </table>	Compoents	Operation	Blade root	 Step by step	<table border="1"> <tr> <td>s [rpm]</td> <td>2500</td> </tr> <tr> <td>fz [mm]</td> <td>0,1</td> </tr> <tr> <td>F [mm/min]</td> <td>1000</td> </tr> </table>	s [rpm]	2500	fz [mm]	0,1	F [mm/min]	1000				
Compoents	Operation														
Blade root	 Step by step														
s [rpm]	2500														
fz [mm]	0,1														
F [mm/min]	1000														
<p>Special tool</p>	<p>Durata doppia rispetto alla concorrenza. Double tool life compared to high end competition. Doppelte Standzeit im Vergleich zur High-End-Konkurrenz. Durée de vie de l'outil doublée par rapport à la haute gamme des concurrents.</p>														

PARTE DEL MOTORE / ENGINE PART / MOTORTEIL / PARTIE DU MOTEUR

	<p>5 flute end mill for high chip removal</p>														
	<table border="1"> <tr> <th>Tool</th> <th>Material</th> </tr> <tr> <td>  HMH184080EV05 </td> <td> <table border="1"> <tr> <th>Material</th> </tr> <tr> <td>AISI 314</td> </tr> </table> </td> </tr> </table>	Tool		Material	 HMH184080EV05	<table border="1"> <tr> <th>Material</th> </tr> <tr> <td>AISI 314</td> </tr> </table>	Material	AISI 314	<table border="1"> <tr> <td>D [mm]</td> <td>8</td> </tr> <tr> <td>ap [mm]</td> <td>4,5</td> </tr> <tr> <td>ae [mm]</td> <td>8</td> </tr> <tr> <td>Vc [m/m]</td> <td>118</td> </tr> </table>	D [mm]	8	ap [mm]	4,5	ae [mm]	8
Tool	Material														
 HMH184080EV05	<table border="1"> <tr> <th>Material</th> </tr> <tr> <td>AISI 314</td> </tr> </table>	Material	AISI 314												
Material															
AISI 314															
D [mm]	8														
ap [mm]	4,5														
ae [mm]	8														
Vc [m/m]	118														
<table border="1"> <tr> <th>Compoents</th> <th>Operation</th> </tr> <tr> <td>Cartridge receiver</td> <td>  Slot milling </td> </tr> </table>	Compoents	Operation	Cartridge receiver	 Slot milling	<table border="1"> <tr> <td>s [rpm]</td> <td>4700</td> </tr> <tr> <td>fz [mm]</td> <td>0,04</td> </tr> <tr> <td>F [mm/min]</td> <td>750</td> </tr> </table>	s [rpm]	4700	fz [mm]	0,04	F [mm/min]	750				
Compoents	Operation														
Cartridge receiver	 Slot milling														
s [rpm]	4700														
fz [mm]	0,04														
F [mm/min]	750														
<p>184EV</p>	<p>Elevato tasso di asportazione del materiale. High material remove rate. Hohe Materialabtragsleistung. Taux d'enlèvement de matière élevé.</p>														

Utensili speciali

Silmax ha maturato, grazie ad un'esperienza pluridecennale, una forte propensione alla risoluzione di progetti complessi, realizzando, un'ampia gamma di utensili speciali, sia in metallo duro che in acciaio super rapido.

Lo sviluppo di un utensile speciale, utilizzando le conoscenze acquisite con le attività di Ricerca e Sviluppo, permette di realizzare un prodotto ottimizzato in termini di materiale di base, geometria dell'utensile, trattamento delle superfici e ricopertura PVD.

L'attività di consulenza svolta si concretizza nella preparazione di un'offerta inclusiva di disegni tecnici, indicazione dei parametri di taglio per un efficace utilizzo dell'utensile e dei tempi di consegna che generalmente non superano le 3-4 settimane

Le nostre applicazioni sono utilizzate con grande soddisfazione in numerosi settori industriali: dall'energia all'aeronautico, alla meccanica di precisione, oleodinamica, ed in generale in tutte le lavorazioni con asportazione di truciolo.

Sonderwerkzeuge

Aufgrund seiner jahrzehntelangen Erfahrung in der Produktion eines breiten Sortiments an Sonderwerkzeugen aus Hartmetall und Schnellarbeitsstahl ist Silmax in der Lage Lösungen für komplexe Projekte zu finden.

Nach einer eingehenden Analyse schlagen die Ingenieure des technischen Büros die bestmöglichen Lösungen zur Herstellung eines Werkzeuges vor – ausgehend sowohl von der Zeichnung des Kunden als auch vom Entwurf eines Sonderwerkzeuges für den eines speziellen Anwendungsbereiches.

Dank der durch Forschung und Entwicklung erworbenen Kenntnisse können Sonderwerkzeuge – d.h. optimierte Produkte bezüglich Ausgangsmaterial, Werkzeuggeometrie, Oberflächenbehandlung und PVD-Beschichtung – entwickelt werden.

Diese Tätigkeit findet ihren konkreten Ausdruck in der Erarbeitung eines Kostenvoranschlags mit Angabe der Lieferzeiten, des Layout, der technologischen Schneidparameter, der technischen Beratung.

Die Beratungstätigkeit kommt konkret zum Ausdruck mit der Ausarbeitung eines Angebotes, einschließlich technischer Zeichnungen, der Angabe der Schnittwertempfehlungen für eine effiziente Nutzung des Werkzeuges und der Lieferzeiten, die selten 3-4 Wochen überschreiten.

Unsere Produkte finden mit großer Zufriedenheit in zahlreichen Industriebranchen Anwendung: vom Energiebereich zum Luftfahrtsektor, in der Feinmechanik, Hydraulik und global gesehen überall dort wo spanabhebende Bearbeitung gefragt ist.

Special tools

Thanks to its long-standing experience, Silmax developed a strong propensity to find solutions for complex projects, creating a wide range of special tools, both in carbide and in high-speed steel, studying the technical drawing and proceeding with the analysis of the specific application.

The development of a special tool by using the know-how acquired through the R&D activities allows the manufacture of a product that is optimised with regard to raw material, tool geometry, surface treatment and PVD coating.

Our consulting activity focuses on the preparation of an exclusive offer including technical drawings, indication of cutting parameters for an effective use of tools. Lead-time usually does not exceed 3-4 weeks.

Our tool applications are successfully used in many industrial sectors: energy, aerospace, precision mechanics, oil-hydraulics and, in general, for all types of machining requiring chip removal.

Outils spéciaux

Silmax a développé, grâce à des décennies d'expérience, une forte propension à résoudre des projets complexes, en produisant une large gamme d'outils spéciaux, tant en carbure qu'en acier rapide supérieur.

Les ingénieurs du département technique, après une étude approfondie, proposent les meilleures solutions, qu'il s'agisse de créer un outil à partir d'un dessin du client ou de développer un outil spécial à partir d'une application spécifique.

Le développement d'un outil spécial, utilisant les connaissances acquises dans le cadre des activités de R&D, permet de réaliser un produit optimisé en termes de matériau de base, de géométrie de l'outil, de traitement de surface et de revêtement PVD.

Cette activité se concrétise dans l'élaboration d'une estimation des coûts avec les délais de livraison, les dessins, les paramètres technologiques de coupe et une consultation technique.

L'activité de consultation réalisée se traduit par la préparation d'une offre comprenant des dessins techniques, l'indication des paramètres de coupe pour une utilisation efficace de l'outil et des délais de livraison qui ne dépassent généralement pas 3-4 semaines.

Nos applications sont utilisées avec grande satisfaction dans de nombreux secteurs industriels: de l'énergie à l'aéronautique, en passant par la mécanique de précision, l'hydraulique, et en général dans toutes les opérations d'usinage par enlèvement de copeaux.



Riaffilatura e rigenerazione: da usato a nuovo

Silmax è in grado di riaffilare e/o rigenerare come nuove frese, punte e alesatori, nelle versioni normali e speciali, utilizzando gli stessi impianti a 5 assi usati per la loro produzione.

Re-sharpening and re-conditioning: from used to new.

Silmax can re-sharpen and/or re-condition standard and special end mills, drills and reamers like new, using the same 5-axis machines used for their production.

Nachschliff und Regeneration: von gebraucht bis neu

Silmax ist in der Lage, wie neue Fräser, Bohren und Reibahlen in Standard- und Sonderversionen unter Verwendung derselben 5-Achsen-Produktionssysteme erneut zu schärfen und/oder zu regenerieren.

Réaffûtage et régénération

Réaffûtage et régénération de fraises, de forets et d'aleoires standard et spéciaux en utilisant les mêmes installations à 5 axes utilisées pour leur fabrication.



Esecuzione perfetta

Esecuzione perfetta con la garanzia del produttore e collaudo effettuato su strumenti di controllo di alta precisione Zoller Genius e Walter Helicheck con emissione di certificato su richiesta.

Perfect execution

A perfect execution with the manufacturer's warranty and testing carried out with Zoller Genius and Walter Helicheck high-precision measurement instruments, with issuing of certificate on request.

Perfekte Ausführung

Perfekte Ausführung mit der Garantie des Herstellers und Kontrolle mittels der Messmaschinen „Genius“ der Firma Zoller und „Helicheck“ der Firma Walter Maschinenbau mit Ausstellung des Zertifikates auf Anfrage.

Exécution parfaite

Exécution parfaite avec garantie du fabricant et essais sur des instruments de contrôle de haute précision Zoller Genius, Walter Helicheck et Alicona avec certificat délivré sur demande.



Rivestimento PVD

Rivestimento PVD eseguito nel nostro centro di rivestimento interno in Lanzo Torinese con la tecnologia Balzers sia per HSS che HM come Alcrona, Futura, Alnova, Latuma, TiN e Tisaflex.

PVD Coating

PVD coating in our in-house coating centre in Lanzo Torinese is carried out using Balzers technology, such as Alcrona, Futura, Alnova, Latuma, TiN and Tisaflex, both for HSS and HM tools.

PVD-Beschichtung

Durchgeführt in unserem internen Beschichtungszentrum in Lanzo Torinese, mit der Oerlikon Balzers Technologie sowohl für HSS als auch für HM wie Alcrona, Futura, Alnova, Latuma, TiN und Tisaflex.

Revêtement PVD

Revêtement PVD effectué dans notre centre à Lanzo Torinese avec la technologie Balzers pour HSS et HM comme Alcrona, Futura, Alnova, Latuma, TiN et Tisaflex.



Trattamento 4S

Trattamento 4S di super finitura superficiale del filo tagliente pre e post rivestimento, eseguito con impianto OTEC e verificato con strumento di misura Alicona.

4S Treatment

4S super-finishing surface treatment of cutting edge before and after the coating process, is carried out using OTEC system and checked with Alicona measuring instrument.

4S-Behandlung

4S-Behandlung mit dem Superfinish Verfahren für die Feinbearbeitung der Schneidkantenoberfläche der Werkzeuge vor und nach der Beschichtung mittels Anlage der Firma OTEC Präzisionsfinish GmbH und mit Messinstrumenten der Firma Alicona überprüft.

Traitement 4S

Traitement 4S de super finition de la surface de l'arête coupe avant et après le revêtement, effectué avec l'équipement OTEC et vérifié avec l'instrument de mesure Alicona.



Consegna rapida

Consegna rapida entro 10 giorni lavorativi dal ricevimento degli utensili per riaffilatura e rivestimento.

Fast delivery

Fast delivery within 10 working days from receipt of tools for resharpener and coating.

Schnelle Lieferung

Schnelle Lieferung innerhalb von 10 Werktagen ab Empfang der Werkzeuge.

Livraison rapide

Livraison rapide dans les 10 jours ouvrables suivant la réception des outils.

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